

SAR TEST REPORT



The following samples were submitted and identified on behalf of the client as:

Equipment Under Test Nautiz X9
Brand Name handheld
Model No. 14249 -RF2-B
Company Name Handheld Group AB
Company Address Kinnegatan 17, 53133, Lidköping, Sweden
Standards IEEE/ANSI C95.1-1992, IEEE 1528-2013,
KDB248227D01v02r02,KDB865664D01v01r04,
KDB865664D02v01r02,KDB941225D01v03r01,
KDB941225D05v02r05,KDB941225D06v02r01,
KDB447498D01v06,KDB648474D04v01r03
FCC ID YY3-14249-RF2
Date of Receipt Oct. 17, 2016
Date of Test(s) Oct. 28, 2016 ~ Nov. 08, 2016
Date of Issue Mar. 02, 2018

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Signed on behalf of SGS

| Clerk / Ruby Ou | Engineer / Matt Kuo | Asst. Manager / John Yeh |
|-----------------|---------------------|--------------------------|
| | | |

Date: Mar. 02, 2018

Revision History

| Report Number | Revision | Description | Issue Date |
|---------------|----------|------------------------------|---------------|
| E5/2018/20035 | Rev.00 | Initial creation of document | Mar. 02, 2018 |
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1. General Information

1.1 Testing Laboratory

| | |
|--|---|
| SGS Taiwan Ltd. Electronics & Communication Laboratory | |
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| Fax | +886-2-2298-0488 |
| Internet | http://www.tw.sgs.com/ |

1.2 Details of Applicant

| | |
|-----------------|---|
| Company Name | Handheld Group AB |
| Company Address | Kinnegatan 17, 53133, Lidköping, Sweden |

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1.3 Description of EUT

| | | | |
|-----------------------------|--|---|--------|
| EUT Name | Nautiz X9 | | |
| Brand Name | handheld | | |
| Model No. | 14249 -RF2-B | | |
| Mode of Operation | <input checked="" type="checkbox"/> GSM <input checked="" type="checkbox"/> GPRS <input checked="" type="checkbox"/> EDGE <input checked="" type="checkbox"/> WCDMA <input checked="" type="checkbox"/> HSDPA <input checked="" type="checkbox"/> HSUPA <input checked="" type="checkbox"/> LTE FDD <input checked="" type="checkbox"/> CDMA 1x EVDO Rev.0/ Rev.A <input checked="" type="checkbox"/> WLAN802.11 a/b/g/n(20M/40M) <input checked="" type="checkbox"/> Bluetooth | | |
| Duty Cycle | GSM (DTM multi class B) | 1/8.3 | |
| | GPRS (support multi class 12 max) | 1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP) 1/8.3 (1Dn1UP) | |
| | EDGE (support multi class 12 max) | 1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP) 1/8.3 (1Dn1UP) | |
| | WCDMA | 1 | |
| | CDMA 1xRTT/ EVDO Rev.0/ Rev. A | 1 | |
| | LTE FDD | 1 | |
| | WLAN802.11 a/b/g/n(20M/40M) | 1 | |
| | Bluetooth | 1 | |
| | | | |
| TX Frequency Range (MHz) | GSM850 | 824 | — 848 |
| | GSM1900 | 1850 | — 1910 |
| | WCDMA Band II | 1850 | — 1910 |
| | WCDMA Band V | 824 | — 849 |
| | LTE FDD Band II | 1850 | — 1910 |
| | LTE FDD Band IV | 1710 | — 1755 |
| | LTE FDD Band V | 824 | — 849 |

| | | | | |
|--------------------------|--------------------------|-------|---|-------|
| TX Frequency Range (MHz) | LTE FDD Band VII | 2500 | — | 2570 |
| | LTE FDD Band XII | 699 | — | 716 |
| | LTE FDD Band XIII | 777 | — | 787 |
| | LTE FDD Band XVII | 704 | — | 716 |
| | CDMA Cellular BC0 | 824 | — | 849 |
| | CDMA PCS BC1 | 1850 | — | 1910 |
| | WLAN802.11 b/g/n(20M) | 2412 | — | 2462 |
| | WLAN802.11 n(40M) | 2422 | — | 2452 |
| | WLAN802.11 a/n(20M) 5.2G | 5180 | — | 5240 |
| | WLAN802.11 n(40M) 5.2G | 5190 | — | 5230 |
| | WLAN802.11 a/n(20M) 5.8G | 5745 | — | 5825 |
| | WLAN802.11 n(40M) 5.8G | 5755 | — | 5795 |
| | Bluetooth | 2402 | — | 2480 |
| Channel Number (ARFCN) | GSM850 | 128 | — | 251 |
| | GSM1900 | 512 | — | 810 |
| | WCDMA Band II | 9262 | — | 9538 |
| | WCDMA Band V | 4132 | — | 4233 |
| | LTE FDD Band II | 18607 | — | 19193 |
| | LTE FDD Band IV | 19957 | — | 20393 |
| | LTE FDD Band V | 20407 | — | 20643 |

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| | | | | |
|---------------------------|--------------------------|-------|---|-------|
| Channel Number (ARFCN) | LTE FDD Band VII | 20775 | — | 21425 |
| | LTE FDD Band XII | 23007 | — | 23173 |
| | LTE FDD Band XIII | 23205 | — | 23255 |
| | LTE FDD Band XVII | 23755 | — | 23825 |
| | CDMA Cellular BC0 | 1013 | — | 777 |
| | CDMA PCS BC1 | 25 | — | 1175 |
| | WLAN802.11 b/g/n(20M) | 1 | — | 11 |
| | WLAN802.11 n(40M) | 3 | — | 9 |
| | WLAN802.11 a/n(20M) 5.2G | 36 | — | 48 |
| | WLAN802.11 n(40M) 5.2G | 38 | — | 46 |
| | WLAN802.11 a/n(20M) 5.8G | 149 | — | 165 |
| | WLAN802.11 n(40M) 5.8G | 151 | — | 159 |
| | Bluetooth | 0 | — | 78 |

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| Max. SAR (1 g) (Unit: W/Kg) | | | | |
|-----------------------------|-------------------|----------|----------|---|
| Mode | Band | Measured | Reported | Position / Channel |
| Head | GSM 850 | 0.022 | 0.032 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 190 Channel |
| | GSM 1900 | 0.036 | 0.042 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 810 Channel |
| | WCDMA Band II | 0.092 | 0.092 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 9538 Channel |
| | WCDMA Band V | 0.018 | 0.025 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 4183 Channel |
| | LTE FDD Band II | 0.091 | 0.091 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 18900 Channel |
| | LTE FDD Band IV | 0.010 | 0.011 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 20050 Channel |
| | LTE FDD Band V | 0.013 | 0.013 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 20600 Channel |
| | LTE FDD Band VII | 0.008 | 0.010 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 21100 Channel |
| | LTE FDD Band XII | 0.071 | 0.079 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 23130 Channel |
| | LTE FDD Band XIII | 0.066 | 0.074 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 23230 Channel |
| | LTE FDD Band XVII | 0.067 | 0.084 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 23780 Channel |

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| Max. SAR (1 g) (Unit: W/Kg) | | | | |
|-----------------------------|-------------------|----------|----------|---|
| Mode | Band | Measured | Reported | Position / Channel |
| Head | CDMA Cellular BC0 | 0.003 | 0.004 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 384 Channel |
| | CDMA PCS BC1 | 0.276 | 0.369 | <input checked="" type="checkbox"/> Left <input type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 25 Channel |
| | WLAN802.11 b | 0.012 | 0.012 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 1 Channel |
| | WLAN802.11 a 5.2G | 0.020 | 0.020 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 40 Channel |
| | WLAN802.11 a 5.8G | 0.055 | 0.056 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 165 Channel |

| Max. SAR (1 g) (Unit: W/Kg) | | | | |
|-----------------------------|-------------------|----------|----------|---|
| Mode | Band | Measured | Reported | Position / Channel |
| Body-worn | GSM 850 | 0.110 | 0.159 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 190 Channel |
| | GSM 1900 | 0.201 | 0.236 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 810 Channel |
| | CDMA Cellular BC0 | 0.035 | 0.051 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 1013 Channel |
| | CDMA PCS BC1 | 0.484 | 0.647 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 25 Channel |
| | WLAN802.11 a 5.2G | 0.344 | 0.347 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 40 Channel |
| | WLAN802.11 a 5.8G | 0.422 | 0.428 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 165 Channel |

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| Max. SAR (1 g) (Unit: W/Kg) | | | | |
|-----------------------------|--------------------|----------|----------|--|
| Mode | Band | Measured | Reported | Position / Channel |
| Hotspot mode | GPRS 850 (1Dn4UP) | 0.258 | 0.438 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 128 Channel |
| | GPRS 1900 (1Dn4UP) | 0.435 | 0.587 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 810 Channel |
| | WCDMA Band II | 1.070 | 1.087 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 9400 Channel |
| | WCDMA Band V | 0.101 | 0.142 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 4183 Channel |
| | LTE FDD Band II | 0.711 | 0.711 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 18900 Channel |
| | LTE FDD Band IV | 0.200 | 0.229 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 20050 Channel |
| | LTE FDD Band V | 0.079 | 0.082 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 20600 Channel |
| | LTE FDD Band VII | 0.290 | 0.354 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 21100 Channel |
| | LTE FDD Band XII | 0.232 | 0.259 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 23130 Channel |
| | LTE FDD Band XIII | 0.206 | 0.230 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 23230 Channel |
| | LTE FDD Band VXII | 0.209 | 0.262 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 23780 Channel |

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| Max. SAR (1 g) (Unit: W/Kg) | | | | |
|-----------------------------|-------------------|----------|----------|---|
| Mode | Band | Measured | Reported | Position / Channel |
| Hotspot mode | CDMA Cellular BC0 | 0.061 | 0.086 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 1013 Channel |
| | CDMA PCS BC1 | 0.814 | 1.051 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 1175 Channel |
| | WLAN802.11 b | 0.061 | 0.063 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right 1 Channel |

| Max. SAR (10 g) (Unit: W/Kg) | | | | |
|------------------------------|-------------------|----------|----------|--|
| Mode | Band | Measured | Reported | Position / Channel |
| product specific 10-g SAR | WLAN802.11 a 5.2G | 0.371 | 0.374 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Top <input type="checkbox"/> Left 40 Channel |
| | WLAN802.11 a 5.8G | 0.554 | 0.562 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Top <input type="checkbox"/> Left 165 Channel |

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GSM/GPRS/EDGE conducted power table:

| EUT mode | Frequency (MHz) | CH | Max. Rated Avg. Power + Max. Tolerance (dBm) | Burst average power | Source -based time average power |
|--|-----------------|-----|--|---------------------|----------------------------------|
| | | | | Avg. (dBm) | Avg. (dBm) |
| GSM850 (GMSK) | 824.2 | 128 | 34 | 32.40 | 23.37 |
| | 836.6 | 190 | 34 | 32.40 | 23.37 |
| | 848.8 | 251 | 34 | 32.30 | 23.27 |
| The division factor compared to the number of TX time slot | | | | | |
| Division factor | | | | 1 TX time slot | |
| | | | | -9.03 | |

| Burst average power | | | | | | |
|--|-----------------|-----|----------------|----------------|----------------|----------------|
| Max. Rated Avg. Power + Max. Tolerance (dBm) | | | 34 | 33.5 | 32 | 31.5 |
| | | | 1Dn1UP | 1Dn2UP | 1Dn3UP | 1Dn4UP |
| EUT mode | Frequency (MHz) | CH | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) |
| GPRS 850 | 824.2 | 128 | 32.40 | 31.80 | 30.20 | 29.20 |
| | 836.6 | 190 | 32.40 | 31.80 | 30.20 | 29.10 |
| | 848.8 | 251 | 32.30 | 31.80 | 30.20 | 29.00 |
| Source-based time average power | | | | | | |
| GPRS 850 | 824.2 | 128 | 23.37 | 25.78 | 25.94 | 26.19 |
| | 836.6 | 190 | 23.37 | 25.78 | 25.94 | 26.09 |
| | 848.8 | 251 | 23.27 | 25.78 | 25.94 | 25.99 |
| The division factor compared to the number of TX time slot | | | | | | |
| Division factor | | | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
| | | | -9.03 | -6.02 | -4.26 | -3.01 |

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| Burst average power | | | | | | |
|--|-----------------|-----|----------------|----------------|----------------|----------------|
| Max. Rated Avg. Power + Max. Tolerance (dBm) | | | 28 | 27.5 | 26 | 25.5 |
| | | | 1Dn1UP | 1Dn2UP | 1Dn3UP | 1Dn4UP |
| EUT mode | Frequency (MHz) | CH | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) |
| EDGE 850 (MCS5) | 824.2 | 128 | 27.90 | 26.90 | 25.00 | 23.90 |
| | 836.6 | 190 | 27.80 | 26.80 | 24.90 | 23.80 |
| | 848.8 | 251 | 27.70 | 26.70 | 24.80 | 23.70 |
| Source-based time average power | | | | | | |
| EDGE 850 (MCS5) | 824.2 | 128 | 18.87 | 20.88 | 20.74 | 20.89 |
| | 836.6 | 190 | 18.77 | 20.78 | 20.64 | 20.79 |
| | 848.8 | 251 | 18.67 | 20.68 | 20.54 | 20.69 |
| The division factor compared to the number of TX time slot | | | | | | |
| Division factor | | | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
| | | | -9.03 | -6.02 | -4.26 | -3.01 |

| EUT mode | Frequency (MHz) | CH | Max. Rated Avg. Power + Max. Tolerance (dBm) | Burst average power | Source -based time average power |
|--|-----------------|-----|--|---------------------|----------------------------------|
| | | | | Avg. (dBm) | Avg. (dBm) |
| GSM1900 (GMSK) | 1850.2 | 512 | 31 | 30.00 | 20.97 |
| | 1800 | 661 | 31 | 30.20 | 21.17 |
| | 1909.8 | 810 | 31 | 30.30 | 21.27 |
| The division factor compared to the number of TX time slot | | | | | |
| Division factor | | | | 1 TX time slot | |
| | | | | -9.03 | |

| Burst average power | | | | | | |
|--|--------------------|-----|----------------|----------------|----------------|----------------|
| Max. Rated Avg. Power + Max. Tolerance (dBm) | | | 31 | 30.5 | 29 | 28.5 |
| | | | 1Dn1UP | 1Dn2UP | 1Dn3UP | 1Dn4UP |
| EUT mode | Frequency (MHz) | CH | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) |
| GPRS 1900 | 1850.2 | 512 | 30.00 | 29.40 | 27.80 | 26.60 |
| | 1880 | 661 | 30.20 | 29.60 | 28.00 | 26.90 |
| | 1909.8 | 810 | 30.30 | 29.70 | 28.20 | 27.20 |
| Source-based time average power | | | | | | |
| GPRS 1900 | 1850.2 | 512 | 20.97 | 23.38 | 23.54 | 23.59 |
| | 1880 | 661 | 21.17 | 23.58 | 23.74 | 23.89 |
| | 1909.8 | 810 | 21.27 | 23.68 | 23.94 | 24.19 |
| The division factor compared to the number of TX time slot | | | | | | |
| Division factor | | | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
| | | | -9.03 | -6.02 | -4.26 | -3.01 |

| Burst average power | | | | | | |
|--|--------------------|-----|----------------|----------------|----------------|----------------|
| Max. Rated Avg. Power + Max. Tolerance (dBm) | | | 28 | 27.5 | 26 | 25.5 |
| | | | 1Dn1UP | 1Dn2UP | 1Dn3UP | 1Dn4UP |
| EUT mode | Frequency (MHz) | CH | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) |
| EDGE 1900 (MCS5) | 1850.2 | 512 | 27.30 | 26.20 | 24.20 | 23.00 |
| | 1880 | 661 | 27.40 | 26.30 | 24.30 | 23.10 |
| | 1909.8 | 810 | 27.60 | 26.40 | 24.40 | 23.20 |
| Source-based time average power | | | | | | |
| EDGE 1900 (MCS5) | 1850.2 | 512 | 18.27 | 20.18 | 19.94 | 19.99 |
| | 1880 | 661 | 18.37 | 20.28 | 20.04 | 20.09 |
| | 1909.8 | 810 | 18.57 | 20.38 | 20.14 | 20.19 |
| The division factor compared to the number of TX time slot | | | | | | |
| Division factor | | | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
| | | | -9.03 | -6.02 | -4.26 | -3.01 |

WCDMA Band II / Band V - HSDPA / HSUPA conducted power table:

| Band | | WCDMA II | | |
|--|-----------------|----------|-------|--------|
| TX Channel | | 9262 | 9400 | 9538 |
| Frequency (MHz) | | 1852.4 | 1880 | 1907.6 |
| Max. Rated Avg. Power+Max. Tolerance (dBm) | | 25.00 | | |
| 3GPP Rel 99 | RMC 12.2Kbps | 24.74 | 24.93 | 24.98 |
| 3GPP Rel 5 | HSDPA Subtest-1 | 23.57 | 23.86 | 24.11 |
| | HSDPA Subtest-2 | 22.39 | 22.73 | 23.28 |
| | HSDPA Subtest-3 | 21.74 | 21.66 | 22.36 |
| | HSDPA Subtest-4 | 21.66 | 21.61 | 22.02 |
| 3GPP Rel 6 | HSUPA Subtest-1 | 23.49 | 23.63 | 23.14 |
| | HSUPA Subtest-2 | 23.26 | 23.42 | 23.87 |
| | HSUPA Subtest-3 | 22.96 | 23.20 | 23.61 |
| | HSUPA Subtest-4 | 22.77 | 22.98 | 23.39 |
| | HSUPA Subtest-5 | 22.55 | 22.84 | 24.02 |

| Band | | WCDMA V | | |
|--|-----------------|---------|-------|-------|
| TX Channel | | 4132 | 4183 | 4233 |
| Frequency (MHz) | | 826.4 | 836.6 | 846.6 |
| Max. Rated Avg. Power+Max. Tolerance (dBm) | | 25.00 | | |
| 3GPP Rel 99 | RMC 12.2Kbps | 23.45 | 23.53 | 23.32 |
| 3GPP Rel 5 | HSDPA Subtest-1 | 22.24 | 22.33 | 22.19 |
| | HSDPA Subtest-2 | 22.13 | 22.19 | 21.98 |
| | HSDPA Subtest-3 | 21.86 | 21.96 | 21.83 |
| | HSDPA Subtest-4 | 21.84 | 21.89 | 21.78 |
| 3GPP Rel 6 | HSUPA Subtest-1 | 22.13 | 22.21 | 22.02 |
| | HSUPA Subtest-2 | 21.76 | 21.87 | 21.63 |
| | HSUPA Subtest-3 | 21.95 | 22.08 | 21.89 |
| | HSUPA Subtest-4 | 21.84 | 21.96 | 21.77 |
| | HSUPA Subtest-5 | 22.28 | 22.37 | 22.13 |

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Sub-test for HSDPA

| SUB-TEST | β_c | β_d | β_d (SF) | β_c/β_d | β_{HS} (Note 1, Note 2) | CM (dB) (Note 3) | MPR (dB) (Note 3) |
|----------|-----------|-----------|-------------------|-------------------|----------------------------------|---------------------|----------------------|
| 1 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 0.0 | 0.0 |
| 2 | 12/15 | 15/15 | 64 | 12/15 | 24/15 | 1.0 | 0.0 |
| 3 | 15/15 | 8/15 | 64 | 15/8 | 30/15 | 1.5 | 0.5 |
| 4 | 15/15 | 4/15 | 64 | 15/4 | 30/15 | 1.5 | 0.5 |

Sub-test for HSUPA

| SUB-TEST | β_c | β_d | β_d (SF) | β_c/β_d | β_{HS} (Note 1) | β_{ec} | β_{ed} (Note 5) (Note 6) | β_{ed} (SF) | β_{ed} (Codes) | CM (dB) (Note 2) | MPR (dB) (Note 2) | AG Index (Note 6) | E-TFCI |
|----------|-----------|-----------|-------------------|-------------------|--------------------------|--------------|--|----------------------|-------------------------|------------------------|-------------------------|-------------------------|--------|
| 1 | 11/15 | 15/15 | 64 | 11/15 | 22/15 | 209/225 | 1309/225 | 4 | 1 | 1.0 | 0.0 | 20 | 75 |
| 2 | 6/15 | 15/15 | 64 | 6/15 | 12/15 | 12/15 | 94/75 | 4 | 1 | 3.0 | 2.0 | 12 | 67 |
| 3 | 15/15 | 9/15 | 64 | 15/9 | 30/15 | 30/15 | β_{ed1} : 47/15 β_{ed2} : 47/15 | 4 4 | 2 | 2.0 | 1.0 | 15 | 92 |
| 4 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 2/15 | 56/75 | 4 | 1 | 3.0 | 2.0 | 17 | 71 |
| 5 | 15/15 | 15/15 | 64 | 15/15 | 30/15 | 24/15 | 134/15 | 4 | 1 | 1.0 | 0.0 | 21 | 81 |

**LTE FDD Band II / Band IV / Band V / Band VII / Band XII / Band XIII / Band XVII
power table:**

| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 20 | QPSK | 1 RB | 0 | 1860 | 18700 | 23.23 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.20 | 23.5 | 0 | |
| | | | | 1900 | 19100 | 23.12 | 23.5 | 0 | |
| | | | 50 | 1860 | 18700 | 22.79 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.50 | 23.5 | 0 | |
| | | | | 1900 | 19100 | 23.34 | 23.5 | 0 | |
| | | | 99 | 1860 | 18700 | 23.12 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.00 | 23.5 | 0 | |
| | | | | 1900 | 19100 | 23.44 | 23.5 | 0 | |
| | | 50 RB | 0 | 1860 | 18700 | 22.21 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.47 | 22.5 | 0-1 | |
| | | | | 1900 | 19100 | 22.25 | 22.5 | 0-1 | |
| | | | 25 | 1860 | 18700 | 22.05 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.48 | 22.5 | 0-1 | |
| | | | | 1900 | 19100 | 22.43 | 22.5 | 0-1 | |
| | | | 50 | 1860 | 18700 | 22.07 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.45 | 22.5 | 0-1 | |
| | | | | 1900 | 19100 | 22.50 | 22.5 | 0-1 | |
| | | 100RB | | | 1860 | 18700 | 22.14 | 22.5 | 0-1 |
| | | | | | 1880 | 18900 | 22.46 | 22.5 | 0-1 |
| | | | | | 1900 | 19100 | 22.48 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1860 | 18700 | 22.18 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.46 | 22.5 | 0-1 | |
| | | | | 1900 | 19100 | 22.13 | 22.5 | 0-1 | |
| | | | 50 | 1860 | 18700 | 21.82 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.41 | 22.5 | 0-1 | |
| | | | | 1900 | 19100 | 22.48 | 22.5 | 0-1 | |
| | | | 99 | 1860 | 18700 | 22.40 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.05 | 22.5 | 0-1 | |
| | | | | 1900 | 19100 | 22.47 | 22.5 | 0-1 | |
| | | | 50 RB | 0 | 1860 | 18700 | 21.14 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.31 | 21.5 | 0-2 |
| | | | | | 1900 | 19100 | 21.15 | 21.5 | 0-2 |
| | | | | 25 | 1860 | 18700 | 20.90 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.42 | 21.5 | 0-2 |
| | | | | | 1900 | 19100 | 21.37 | 21.5 | 0-2 |
| | | 50 | 1860 | 18700 | 20.99 | 21.5 | 0-2 | | |
| | | | 1880 | 18900 | 21.33 | 21.5 | 0-2 | | |
| | | | 1900 | 19100 | 21.42 | 21.5 | 0-2 | | |
| | | 100RB | | | 1860 | 18700 | 21.06 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.38 | 21.5 | 0-2 |
| | | | | | 1900 | 19100 | 21.34 | 21.5 | 0-2 |

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| FDD Band 2 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 15 | QPSK | 1 RB | 0 | 1857.5 | 18675 | 23.11 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.20 | 23.5 | 0 |
| | | | | 1902.5 | 19125 | 23.09 | 23.5 | 0 |
| | | | 36 | 1857.5 | 18675 | 22.80 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.31 | 23.5 | 0 |
| | | | | 1902.5 | 19125 | 23.31 | 23.5 | 0 |
| | | | 74 | 1857.5 | 18675 | 22.79 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.11 | 23.5 | 0 |
| | | | | 1902.5 | 19125 | 23.35 | 23.5 | 0 |
| | | 36 RB | 0 | 1857.5 | 18675 | 22.12 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.39 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.31 | 22.5 | 0-1 |
| | | | 18 | 1857.5 | 18675 | 22.00 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.45 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.44 | 22.5 | 0-1 |
| | | | 37 | 1857.5 | 18675 | 21.92 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.42 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.48 | 22.5 | 0-1 |
| | | | 75RB | 1857.5 | 18675 | 22.03 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.39 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.46 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1857.5 | 18675 | 22.16 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.43 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.06 | 22.5 | 0-1 |
| | | | 36 | 1857.5 | 18675 | 22.05 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.35 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.40 | 22.5 | 0-1 |
| | | | 74 | 1857.5 | 18675 | 21.84 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.19 | 22.5 | 0-1 |
| | | | | 1902.5 | 19125 | 22.50 | 22.5 | 0-1 |
| | | 36 RB | 0 | 1857.5 | 18675 | 20.98 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.24 | 21.5 | 0-2 |
| | | | | 1902.5 | 19125 | 21.26 | 21.5 | 0-2 |
| | | | 18 | 1857.5 | 18675 | 20.84 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.34 | 21.5 | 0-2 |
| | | | | 1902.5 | 19125 | 21.45 | 21.5 | 0-2 |
| | | | 37 | 1857.5 | 18675 | 20.84 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.34 | 21.5 | 0-2 |
| | | | | 1902.5 | 19125 | 21.50 | 21.5 | 0-2 |
| | | | 75RB | 1857.5 | 18675 | 20.90 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.29 | 21.5 | 0-2 |
| | | | | 1902.5 | 19125 | 21.37 | 21.5 | 0-2 |

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| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 10 | QPSK | 1 RB | 0 | 1855 | 18650 | 22.76 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 22.84 | 23.5 | 0 | |
| | | | | 1905 | 19150 | 23.02 | 23.5 | 0 | |
| | | | 25 | 1855 | 18650 | 22.79 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.17 | 23.5 | 0 | |
| | | | | 1905 | 19150 | 23.37 | 23.5 | 0 | |
| | | | 49 | 1855 | 18650 | 22.40 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 22.85 | 23.5 | 0 | |
| | | | | 1905 | 19150 | 23.04 | 23.5 | 0 | |
| | | 25 RB | 0 | 1855 | 18650 | 22.04 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.33 | 22.5 | 0-1 | |
| | | | | 1905 | 19150 | 22.42 | 22.5 | 0-1 | |
| | | | 12 | 1855 | 18650 | 21.98 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.42 | 22.5 | 0-1 | |
| | | | | 1905 | 19150 | 22.48 | 22.5 | 0-1 | |
| | | | 25 | 1855 | 18650 | 21.93 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.34 | 22.5 | 0-1 | |
| | | | | 1905 | 19150 | 22.49 | 22.5 | 0-1 | |
| | | 50RB | | | 1855 | 18650 | 22.00 | 22.5 | 0-1 |
| | | | | | 1880 | 18900 | 22.37 | 22.5 | 0-1 |
| | | | | | 1905 | 19150 | 22.44 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1855 | 18650 | 22.07 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 21.67 | 22.5 | 0-1 | |
| | | | | 1905 | 19150 | 22.04 | 22.5 | 0-1 | |
| | | | 25 | 1855 | 18650 | 22.14 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.07 | 22.5 | 0-1 | |
| | | | | 1905 | 19150 | 22.43 | 22.5 | 0-1 | |
| | | | 49 | 1855 | 18650 | 21.52 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 21.65 | 22.5 | 0-1 | |
| | | | | 1905 | 19150 | 21.84 | 22.5 | 0-1 | |
| | | | 25 RB | 0 | 1855 | 18650 | 20.88 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.29 | 21.5 | 0-2 |
| | | | | | 1905 | 19150 | 21.41 | 21.5 | 0-2 |
| | | | | 12 | 1855 | 18650 | 20.93 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.34 | 21.5 | 0-2 |
| | | | | | 1905 | 19150 | 21.50 | 21.5 | 0-2 |
| | | | 25 | 1855 | 18650 | 20.87 | 21.5 | 0-2 | |
| | | | | 1880 | 18900 | 21.28 | 21.5 | 0-2 | |
| | | | | 1905 | 19150 | 21.36 | 21.5 | 0-2 | |
| | | 50RB | | | 1855 | 18650 | 20.96 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.32 | 21.5 | 0-2 |
| | | | | | 1905 | 19150 | 21.40 | 21.5 | 0-2 |

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| FDD Band 2 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 1852.5 | 18625 | 22.86 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.24 | 23.5 | 0 |
| | | | | 1907.5 | 19175 | 23.46 | 23.5 | 0 |
| | | | 12 | 1852.5 | 18625 | 22.67 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.03 | 23.5 | 0 |
| | | | | 1907.5 | 19175 | 23.02 | 23.5 | 0 |
| | | | 24 | 1852.5 | 18625 | 22.81 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.16 | 23.5 | 0 |
| | | | | 1907.5 | 19175 | 23.38 | 23.5 | 0 |
| | | 12 RB | 0 | 1852.5 | 18625 | 21.90 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.27 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.38 | 22.5 | 0-1 |
| | | | 6 | 1852.5 | 18625 | 21.79 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.26 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.23 | 22.5 | 0-1 |
| | | | 13 | 1852.5 | 18625 | 21.85 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.29 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.32 | 22.5 | 0-1 |
| | | 25RB | | 1852.5 | 18625 | 21.86 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.25 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.30 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1852.5 | 18625 | 21.98 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.29 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.44 | 22.5 | 0-1 |
| | | | 12 | 1852.5 | 18625 | 21.85 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.27 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.43 | 22.5 | 0-1 |
| | | | 24 | 1852.5 | 18625 | 22.29 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.29 | 22.5 | 0-1 |
| | | | | 1907.5 | 19175 | 22.49 | 22.5 | 0-1 |
| | | 12 RB | 0 | 1852.5 | 18625 | 21.03 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.37 | 21.5 | 0-2 |
| | | | | 1907.5 | 19175 | 21.40 | 21.5 | 0-2 |
| | | | 6 | 1852.5 | 18625 | 20.88 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.34 | 21.5 | 0-2 |
| | | | | 1907.5 | 19175 | 21.32 | 21.5 | 0-2 |
| | | | 13 | 1852.5 | 18625 | 20.98 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.31 | 21.5 | 0-2 |
| | | | | 1907.5 | 19175 | 21.38 | 21.5 | 0-2 |
| | | 25RB | | 1852.5 | 18625 | 21.00 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.39 | 21.5 | 0-2 |
| | | | | 1907.5 | 19175 | 21.36 | 21.5 | 0-2 |

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| FDD Band 2 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 3 | QPSK | 1 RB | 0 | 1851.5 | 18615 | 22.71 | 23.5 | 0 |
| | | | | 1880 | 18900 | 22.98 | 23.5 | 0 |
| | | | | 1908.5 | 19185 | 23.06 | 23.5 | 0 |
| | | | 7 | 1851.5 | 18615 | 22.76 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.06 | 23.5 | 0 |
| | | | | 1908.5 | 19185 | 23.13 | 23.5 | 0 |
| | | | 14 | 1851.5 | 18615 | 22.69 | 23.5 | 0 |
| | | | | 1880 | 18900 | 23.00 | 23.5 | 0 |
| | | | | 1908.5 | 19185 | 23.11 | 23.5 | 0 |
| | | 8 RB | 0 | 1851.5 | 18615 | 21.85 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.11 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.35 | 22.5 | 0-1 |
| | | | 4 | 1851.5 | 18615 | 21.82 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.11 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.37 | 22.5 | 0-1 |
| | | | 7 | 1851.5 | 18615 | 21.83 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.11 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.36 | 22.5 | 0-1 |
| | | 15RB | | 1851.5 | 18615 | 21.89 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.14 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.37 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1851.5 | 18615 | 21.82 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 21.94 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.36 | 22.5 | 0-1 |
| | | | 7 | 1851.5 | 18615 | 21.98 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 21.86 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.37 | 22.5 | 0-1 |
| | | | 14 | 1851.5 | 18615 | 21.93 | 22.5 | 0-1 |
| | | | | 1880 | 18900 | 22.26 | 22.5 | 0-1 |
| | | | | 1908.5 | 19185 | 22.48 | 22.5 | 0-1 |
| | | 8 RB | 0 | 1851.5 | 18615 | 20.83 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.09 | 21.5 | 0-2 |
| | | | | 1908.5 | 19185 | 21.48 | 21.5 | 0-2 |
| | | | 4 | 1851.5 | 18615 | 20.89 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.27 | 21.5 | 0-2 |
| | | | | 1908.5 | 19185 | 21.49 | 21.5 | 0-2 |
| | | | 7 | 1851.5 | 18615 | 20.87 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.20 | 21.5 | 0-2 |
| | | | | 1908.5 | 19185 | 21.43 | 21.5 | 0-2 |
| | | 15RB | | 1851.5 | 18615 | 20.81 | 21.5 | 0-2 |
| | | | | 1880 | 18900 | 21.14 | 21.5 | 0-2 |
| | | | | 1908.5 | 19185 | 21.31 | 21.5 | 0-2 |

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| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 1.4 | QPSK | 1 RB | 0 | 1850.7 | 18607 | 22.93 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.14 | 23.5 | 0 | |
| | | | | 1909.3 | 19193 | 23.31 | 23.5 | 0 | |
| | | | 2 | 1850.7 | 18607 | 22.80 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.21 | 23.5 | 0 | |
| | | | | 1909.3 | 19193 | 23.29 | 23.5 | 0 | |
| | | | 5 | 1850.7 | 18607 | 22.88 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.15 | 23.5 | 0 | |
| | | | | 1909.3 | 19193 | 23.37 | 23.5 | 0 | |
| | | 3 RB | 0 | 1850.7 | 18607 | 22.92 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.29 | 23.5 | 0 | |
| | | | | 1909.3 | 19193 | 23.36 | 23.5 | 0 | |
| | | | 2 | 1850.7 | 18607 | 22.89 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.28 | 23.5 | 0 | |
| | | | | 1909.3 | 19193 | 23.32 | 23.5 | 0 | |
| | | | 3 | 1850.7 | 18607 | 22.86 | 23.5 | 0 | |
| | | | | 1880 | 18900 | 23.26 | 23.5 | 0 | |
| | | | | 1909.3 | 19193 | 23.30 | 23.5 | 0 | |
| | | 6RB | | | 1850.7 | 18607 | 22.06 | 22.5 | 0-1 |
| | | | | | 1880 | 18900 | 22.34 | 22.5 | 0-1 |
| | | | | | 1909.3 | 19193 | 22.50 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1850.7 | 18607 | 22.03 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.19 | 22.5 | 0-1 | |
| | | | | 1909.3 | 19193 | 22.45 | 22.5 | 0-1 | |
| | | | 2 | 1850.7 | 18607 | 22.09 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.44 | 22.5 | 0-1 | |
| | | | | 1909.3 | 19193 | 22.41 | 22.5 | 0-1 | |
| | | | 5 | 1850.7 | 18607 | 22.04 | 22.5 | 0-1 | |
| | | | | 1880 | 18900 | 22.20 | 22.5 | 0-1 | |
| | | | | 1909.3 | 19193 | 22.45 | 22.5 | 0-1 | |
| | | | 3 RB | 0 | 1850.7 | 18607 | 22.06 | 22.5 | 0-1 |
| | | | | | 1880 | 18900 | 22.20 | 22.5 | 0-1 |
| | | | | | 1909.3 | 19193 | 22.49 | 22.5 | 0-1 |
| | | | | 2 | 1850.7 | 18607 | 22.02 | 22.5 | 0-1 |
| | | | | | 1880 | 18900 | 22.07 | 22.5 | 0-1 |
| | | | | | 1909.3 | 19193 | 22.32 | 22.5 | 0-1 |
| | | 3 | 1850.7 | 18607 | 22.02 | 22.5 | 0-1 | | |
| | | | 1880 | 18900 | 22.14 | 22.5 | 0-1 | | |
| | | | 1909.3 | 19193 | 22.46 | 22.5 | 0-1 | | |
| | | 6RB | | | 1850.7 | 18607 | 21.12 | 21.5 | 0-2 |
| | | | | | 1880 | 18900 | 21.46 | 21.5 | 0-2 |
| | | | | | 1909.3 | 19193 | 21.47 | 21.5 | 0-2 |

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| FDD Band 4 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 20 | QPSK | 1 RB | 0 | 1720 | 20050 | 23.72 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.80 | 24.5 | 0 |
| | | | | 1745 | 20300 | 23.89 | 24.5 | 0 |
| | | | 50 | 1720 | 20050 | 23.91 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.83 | 24.5 | 0 |
| | | | | 1745 | 20300 | 23.87 | 24.5 | 0 |
| | | | 99 | 1720 | 20050 | 23.81 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.81 | 24.5 | 0 |
| | | | | 1745 | 20300 | 23.80 | 24.5 | 0 |
| | | 50 RB | 0 | 1720 | 20050 | 22.90 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.95 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 22.97 | 23.5 | 0-1 |
| | | | 25 | 1720 | 20050 | 22.89 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.93 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 22.91 | 23.5 | 0-1 |
| | | | 50 | 1720 | 20050 | 22.91 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.96 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 22.89 | 23.5 | 0-1 |
| | | 100RB | | 1720 | 20050 | 22.86 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.96 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 22.93 | 23.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1720 | 20050 | 23.29 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.11 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 23.41 | 23.5 | 0-1 |
| | | | 50 | 1720 | 20050 | 22.75 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.02 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 23.00 | 23.5 | 0-1 |
| | | | 99 | 1720 | 20050 | 23.13 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.99 | 23.5 | 0-1 |
| | | | | 1745 | 20300 | 22.80 | 23.5 | 0-1 |
| | | 50 RB | 0 | 1720 | 20050 | 21.89 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.02 | 22.5 | 0-2 |
| | | | | 1745 | 20300 | 21.98 | 22.5 | 0-2 |
| | | | 25 | 1720 | 20050 | 21.88 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.96 | 22.5 | 0-2 |
| | | | | 1745 | 20300 | 21.97 | 22.5 | 0-2 |
| | | | 50 | 1720 | 20050 | 21.89 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.94 | 22.5 | 0-2 |
| | | | | 1745 | 20300 | 21.94 | 22.5 | 0-2 |
| | | 100RB | | 1720 | 20050 | 21.93 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.99 | 22.5 | 0-2 |
| | | | | 1745 | 20300 | 21.87 | 22.5 | 0-2 |

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| FDD Band 4 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 15 | QPSK | 1 RB | 0 | 1717.5 | 20025 | 23.71 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.90 | 24.5 | 0 |
| | | | | 1747.5 | 20325 | 23.87 | 24.5 | 0 |
| | | | 36 | 1717.5 | 20025 | 23.82 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.84 | 24.5 | 0 |
| | | | | 1747.5 | 20325 | 23.87 | 24.5 | 0 |
| | | | 74 | 1717.5 | 20025 | 23.85 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.85 | 24.5 | 0 |
| | | | | 1747.5 | 20325 | 23.71 | 24.5 | 0 |
| | | 36 RB | 0 | 1717.5 | 20025 | 22.86 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.98 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 22.97 | 23.5 | 0-1 |
| | | | 18 | 1717.5 | 20025 | 22.89 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.99 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 22.91 | 23.5 | 0-1 |
| | | | 37 | 1717.5 | 20025 | 22.93 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.96 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 22.92 | 23.5 | 0-1 |
| | | | 75RB | 1717.5 | 20025 | 22.87 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.97 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 22.88 | 23.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1717.5 | 20025 | 23.25 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.82 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 23.06 | 23.5 | 0-1 |
| | | | 36 | 1717.5 | 20025 | 22.95 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.09 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 23.02 | 23.5 | 0-1 |
| | | | 74 | 1717.5 | 20025 | 23.37 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.06 | 23.5 | 0-1 |
| | | | | 1747.5 | 20325 | 23.11 | 23.5 | 0-1 |
| | | 36 RB | 0 | 1717.5 | 20025 | 21.82 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.01 | 22.5 | 0-2 |
| | | | | 1747.5 | 20325 | 21.93 | 22.5 | 0-2 |
| | | | 18 | 1717.5 | 20025 | 21.93 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.98 | 22.5 | 0-2 |
| | | | | 1747.5 | 20325 | 21.97 | 22.5 | 0-2 |
| | | | 37 | 1717.5 | 20025 | 22.01 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.02 | 22.5 | 0-2 |
| | | | | 1747.5 | 20325 | 21.92 | 22.5 | 0-2 |
| | | | 75RB | 1717.5 | 20025 | 21.86 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.96 | 22.5 | 0-2 |
| | | | | 1747.5 | 20325 | 21.89 | 22.5 | 0-2 |

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| FDD Band 4 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 10 | QPSK | 1 RB | 0 | 1715 | 20000 | 23.76 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.85 | 24.5 | 0 |
| | | | | 1750 | 20350 | 23.75 | 24.5 | 0 |
| | | | 25 | 1715 | 20000 | 23.83 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.85 | 24.5 | 0 |
| | | | | 1750 | 20350 | 23.91 | 24.5 | 0 |
| | | | 49 | 1715 | 20000 | 23.74 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.57 | 24.5 | 0 |
| | | | | 1750 | 20350 | 23.68 | 24.5 | 0 |
| | | 25 RB | 0 | 1715 | 20000 | 22.81 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.93 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 22.85 | 23.5 | 0-1 |
| | | | 12 | 1715 | 20000 | 22.80 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.93 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 22.86 | 23.5 | 0-1 |
| | | | 25 | 1715 | 20000 | 22.80 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.94 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 22.86 | 23.5 | 0-1 |
| | | 50RB | | 1715 | 20000 | 22.85 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.94 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 22.87 | 23.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1715 | 20000 | 22.79 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.94 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 23.03 | 23.5 | 0-1 |
| | | | 25 | 1715 | 20000 | 23.00 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.76 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 22.70 | 23.5 | 0-1 |
| | | | 49 | 1715 | 20000 | 22.96 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.32 | 23.5 | 0-1 |
| | | | | 1750 | 20350 | 22.62 | 23.5 | 0-1 |
| | | 25 RB | 0 | 1715 | 20000 | 21.84 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.96 | 22.5 | 0-2 |
| | | | | 1750 | 20350 | 21.93 | 22.5 | 0-2 |
| | | | 12 | 1715 | 20000 | 21.89 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.89 | 22.5 | 0-2 |
| | | | | 1750 | 20350 | 21.94 | 22.5 | 0-2 |
| | | | 25 | 1715 | 20000 | 21.87 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.99 | 22.5 | 0-2 |
| | | | | 1750 | 20350 | 21.85 | 22.5 | 0-2 |
| | | 50RB | | 1715 | 20000 | 21.82 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.02 | 22.5 | 0-2 |
| | | | | 1750 | 20350 | 21.90 | 22.5 | 0-2 |

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| FDD Band 4 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 1712.5 | 19975 | 23.69 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.87 | 24.5 | 0 |
| | | | | 1752.5 | 20375 | 23.76 | 24.5 | 0 |
| | | | 12 | 1712.5 | 19975 | 23.77 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.96 | 24.5 | 0 |
| | | | | 1752.5 | 20375 | 23.77 | 24.5 | 0 |
| | | | 24 | 1712.5 | 19975 | 23.73 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.79 | 24.5 | 0 |
| | | | | 1752.5 | 20375 | 23.63 | 24.5 | 0 |
| | | 12 RB | 0 | 1712.5 | 19975 | 22.76 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.96 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 22.92 | 23.5 | 0-1 |
| | | | 6 | 1712.5 | 19975 | 22.79 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.98 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 22.89 | 23.5 | 0-1 |
| | | | 13 | 1712.5 | 19975 | 22.79 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.95 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 22.88 | 23.5 | 0-1 |
| | | 25RB | | 1712.5 | 19975 | 22.76 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.91 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 22.85 | 23.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1712.5 | 19975 | 23.15 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.80 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 23.01 | 23.5 | 0-1 |
| | | | 12 | 1712.5 | 19975 | 22.77 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.34 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 22.70 | 23.5 | 0-1 |
| | | | 24 | 1712.5 | 19975 | 22.82 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.86 | 23.5 | 0-1 |
| | | | | 1752.5 | 20375 | 22.82 | 23.5 | 0-1 |
| | | 12 RB | 0 | 1712.5 | 19975 | 21.83 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.04 | 22.5 | 0-2 |
| | | | | 1752.5 | 20375 | 21.92 | 22.5 | 0-2 |
| | | | 6 | 1712.5 | 19975 | 21.80 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.03 | 22.5 | 0-2 |
| | | | | 1752.5 | 20375 | 21.90 | 22.5 | 0-2 |
| | | | 13 | 1712.5 | 19975 | 21.81 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.94 | 22.5 | 0-2 |
| | | | | 1752.5 | 20375 | 21.91 | 22.5 | 0-2 |
| | | 25RB | | 1712.5 | 19975 | 21.76 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.94 | 22.5 | 0-2 |
| | | | | 1752.5 | 20375 | 21.89 | 22.5 | 0-2 |

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| FDD Band 4 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 3 | QPSK | 1 RB | 0 | 1711.5 | 19965 | 23.53 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.72 | 24.5 | 0 |
| | | | | 1753.5 | 20385 | 23.68 | 24.5 | 0 |
| | | | 7 | 1711.5 | 19965 | 23.75 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.86 | 24.5 | 0 |
| | | | | 1753.5 | 20385 | 23.70 | 24.5 | 0 |
| | | | 14 | 1711.5 | 19965 | 23.63 | 24.5 | 0 |
| | | | | 1732.5 | 20175 | 23.76 | 24.5 | 0 |
| | | | | 1753.5 | 20385 | 23.70 | 24.5 | 0 |
| | | 8 RB | 0 | 1711.5 | 19965 | 22.74 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.95 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.89 | 23.5 | 0-1 |
| | | | 4 | 1711.5 | 19965 | 22.74 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.90 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.87 | 23.5 | 0-1 |
| | | | 7 | 1711.5 | 19965 | 22.81 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.95 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.84 | 23.5 | 0-1 |
| | | 15RB | | 1711.5 | 19965 | 22.74 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.93 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.84 | 23.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1711.5 | 19965 | 23.12 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.75 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.83 | 23.5 | 0-1 |
| | | | 7 | 1711.5 | 19965 | 22.81 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 23.27 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.94 | 23.5 | 0-1 |
| | | | 14 | 1711.5 | 19965 | 22.94 | 23.5 | 0-1 |
| | | | | 1732.5 | 20175 | 22.86 | 23.5 | 0-1 |
| | | | | 1753.5 | 20385 | 22.79 | 23.5 | 0-1 |
| | | 8 RB | 0 | 1711.5 | 19965 | 21.85 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.97 | 22.5 | 0-2 |
| | | | | 1753.5 | 20385 | 21.96 | 22.5 | 0-2 |
| | | | 4 | 1711.5 | 19965 | 21.81 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 22.02 | 22.5 | 0-2 |
| | | | | 1753.5 | 20385 | 21.79 | 22.5 | 0-2 |
| | | | 7 | 1711.5 | 19965 | 21.86 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.99 | 22.5 | 0-2 |
| | | | | 1753.5 | 20385 | 21.90 | 22.5 | 0-2 |
| | | 15RB | | 1711.5 | 19965 | 21.79 | 22.5 | 0-2 |
| | | | | 1732.5 | 20175 | 21.97 | 22.5 | 0-2 |
| | | | | 1753.5 | 20385 | 21.87 | 22.5 | 0-2 |

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| FDD Band 4 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 1.4 | QPSK | 1 RB | 0 | 1710.7 | 19957 | 23.60 | 24.5 | 0 | |
| | | | | 1732.5 | 20175 | 23.78 | 24.5 | 0 | |
| | | | | 1754.3 | 20393 | 23.78 | 24.5 | 0 | |
| | | | 2 | 1710.7 | 19957 | 23.66 | 24.5 | 0 | |
| | | | | 1732.5 | 20175 | 23.89 | 24.5 | 0 | |
| | | | | 1754.3 | 20393 | 23.77 | 24.5 | 0 | |
| | | | 5 | 1710.7 | 19957 | 23.65 | 24.5 | 0 | |
| | | | | 1732.5 | 20175 | 23.84 | 24.5 | 0 | |
| | | | | 1754.3 | 20393 | 23.73 | 24.5 | 0 | |
| | | 3 RB | 0 | 1710.7 | 19957 | 23.75 | 24.5 | 0 | |
| | | | | 1732.5 | 20175 | 23.87 | 24.5 | 0 | |
| | | | | 1754.3 | 20393 | 23.84 | 24.5 | 0 | |
| | | | 2 | 1710.7 | 19957 | 23.66 | 24.5 | 0 | |
| | | | | 1732.5 | 20175 | 23.92 | 24.5 | 0 | |
| | | | | 1754.3 | 20393 | 23.81 | 24.5 | 0 | |
| | | | 3 | 1710.7 | 19957 | 23.74 | 24.5 | 0 | |
| | | | | 1732.5 | 20175 | 23.91 | 24.5 | 0 | |
| | | | | 1754.3 | 20393 | 23.80 | 24.5 | 0 | |
| | | 6RB | | | 1710.7 | 19957 | 22.71 | 23.5 | 0-1 |
| | | | | | 1732.5 | 20175 | 22.91 | 23.5 | 0-1 |
| | | | | | 1754.3 | 20393 | 22.82 | 23.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1710.7 | 19957 | 22.77 | 23.5 | 0-1 | |
| | | | | 1732.5 | 20175 | 23.25 | 23.5 | 0-1 | |
| | | | | 1754.3 | 20393 | 23.19 | 23.5 | 0-1 | |
| | | | 2 | 1710.7 | 19957 | 22.95 | 23.5 | 0-1 | |
| | | | | 1732.5 | 20175 | 23.11 | 23.5 | 0-1 | |
| | | | | 1754.3 | 20393 | 23.02 | 23.5 | 0-1 | |
| | | | 5 | 1710.7 | 19957 | 22.77 | 23.5 | 0-1 | |
| | | | | 1732.5 | 20175 | 23.26 | 23.5 | 0-1 | |
| | | | | 1754.3 | 20393 | 23.24 | 23.5 | 0-1 | |
| | | 3 RB | 0 | 1710.7 | 19957 | 22.75 | 23.5 | 0-1 | |
| | | | | 1732.5 | 20175 | 22.94 | 23.5 | 0-1 | |
| | | | | 1754.3 | 20393 | 22.73 | 23.5 | 0-1 | |
| | | | 2 | 1710.7 | 19957 | 22.75 | 23.5 | 0-1 | |
| | | | | 1732.5 | 20175 | 22.80 | 23.5 | 0-1 | |
| | | | | 1754.3 | 20393 | 22.67 | 23.5 | 0-1 | |
| | | | 3 | 1710.7 | 19957 | 22.69 | 23.5 | 0-1 | |
| | | | | 1732.5 | 20175 | 22.88 | 23.5 | 0-1 | |
| | | | | 1754.3 | 20393 | 22.69 | 23.5 | 0-1 | |
| | | 6RB | | | 1710.7 | 19957 | 21.71 | 22.5 | 0-2 |
| | | | | | 1732.5 | 20175 | 21.95 | 22.5 | 0-2 |
| | | | | | 1754.3 | 20393 | 21.83 | 22.5 | 0-2 |

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| FDD Band 5 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 10 | QPSK | 1 RB | 0 | 829 | 20450 | 22.18 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.24 | 22.5 | 0 |
| | | | | 844 | 20600 | 22.35 | 22.5 | 0 |
| | | | 25 | 829 | 20450 | 22.27 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.27 | 22.5 | 0 |
| | | | | 844 | 20600 | 22.27 | 22.5 | 0 |
| | | | 49 | 829 | 20450 | 22.26 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.17 | 22.5 | 0 |
| | | | | 844 | 20600 | 22.16 | 22.5 | 0 |
| | | 25 RB | 0 | 829 | 20450 | 21.25 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.34 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.29 | 21.5 | 0-1 |
| | | | 12 | 829 | 20450 | 21.27 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.28 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.30 | 21.5 | 0-1 |
| | | | 25 | 829 | 20450 | 21.31 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.31 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.25 | 21.5 | 0-1 |
| | | 50RB | | 829 | 20450 | 21.27 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.34 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.30 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 829 | 20450 | 21.36 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.42 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.41 | 21.5 | 0-1 |
| | | | 25 | 829 | 20450 | 21.47 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.46 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.41 | 21.5 | 0-1 |
| | | | 49 | 829 | 20450 | 21.22 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.31 | 21.5 | 0-1 |
| | | | | 844 | 20600 | 21.50 | 21.5 | 0-1 |
| | | 25 RB | 0 | 829 | 20450 | 20.32 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.38 | 20.5 | 0-2 |
| | | | | 844 | 20600 | 20.27 | 20.5 | 0-2 |
| | | | 12 | 829 | 20450 | 20.31 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.33 | 20.5 | 0-2 |
| | | | | 844 | 20600 | 20.22 | 20.5 | 0-2 |
| | | | 25 | 829 | 20450 | 20.24 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.28 | 20.5 | 0-2 |
| | | | | 844 | 20600 | 20.23 | 20.5 | 0-2 |
| | | 500RB | | 829 | 20450 | 20.27 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.29 | 20.5 | 0-2 |
| | | | | 844 | 20600 | 20.34 | 20.5 | 0-2 |

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| FDD Band 5 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 826.5 | 20425 | 22.17 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.26 | 22.5 | 0 |
| | | | | 846.5 | 20625 | 22.17 | 22.5 | 0 |
| | | | 12 | 826.5 | 20425 | 22.17 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.35 | 22.5 | 0 |
| | | | | 846.5 | 20625 | 22.19 | 22.5 | 0 |
| | | | 24 | 826.5 | 20425 | 22.07 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.24 | 22.5 | 0 |
| | | | | 846.5 | 20625 | 22.16 | 22.5 | 0 |
| | | 12 RB | 0 | 826.5 | 20425 | 21.29 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.35 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.30 | 21.5 | 0-1 |
| | | | 6 | 826.5 | 20425 | 21.28 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.32 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.28 | 21.5 | 0-1 |
| | | | 13 | 826.5 | 20425 | 21.24 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.33 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.26 | 21.5 | 0-1 |
| | | | 25RB | 826.5 | 20425 | 21.22 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.29 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.24 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 826.5 | 20425 | 21.26 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.44 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.29 | 21.5 | 0-1 |
| | | | 12 | 826.5 | 20425 | 21.13 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.31 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.12 | 21.5 | 0-1 |
| | | | 24 | 826.5 | 20425 | 21.45 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.47 | 21.5 | 0-1 |
| | | | | 846.5 | 20625 | 21.30 | 21.5 | 0-1 |
| | | 12 RB | 0 | 826.5 | 20425 | 20.36 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.33 | 20.5 | 0-2 |
| | | | | 846.5 | 20625 | 20.33 | 20.5 | 0-2 |
| | | | 6 | 826.5 | 20425 | 20.30 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.37 | 20.5 | 0-2 |
| | | | | 846.5 | 20625 | 20.23 | 20.5 | 0-2 |
| | | | 13 | 826.5 | 20425 | 20.32 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.36 | 20.5 | 0-2 |
| | | | | 846.5 | 20625 | 20.27 | 20.5 | 0-2 |
| | | | 25RB | 826.5 | 20425 | 20.28 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.28 | 20.5 | 0-2 |
| | | | | 846.5 | 20625 | 20.22 | 20.5 | 0-2 |

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| FDD Band 5 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 3 | QPSK | 1 RB | 0 | 825.5 | 20415 | 22.09 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.22 | 22.5 | 0 |
| | | | | 847.5 | 20635 | 22.09 | 22.5 | 0 |
| | | | 7 | 825.5 | 20415 | 22.30 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.17 | 22.5 | 0 |
| | | | | 847.5 | 20635 | 22.10 | 22.5 | 0 |
| | | | 14 | 825.5 | 20415 | 22.09 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.09 | 22.5 | 0 |
| | | | | 847.5 | 20635 | 22.13 | 22.5 | 0 |
| | | 8 RB | 0 | 825.5 | 20415 | 21.27 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.29 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.24 | 21.5 | 0-1 |
| | | | 4 | 825.5 | 20415 | 21.23 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.28 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.24 | 21.5 | 0-1 |
| | | | 7 | 825.5 | 20415 | 21.27 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.30 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.23 | 21.5 | 0-1 |
| | | 15RB | | 825.5 | 20415 | 21.26 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.26 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.21 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 825.5 | 20415 | 21.28 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.48 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.09 | 21.5 | 0-1 |
| | | | 7 | 825.5 | 20415 | 21.37 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.18 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.34 | 21.5 | 0-1 |
| | | | 14 | 825.5 | 20415 | 21.30 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.36 | 21.5 | 0-1 |
| | | | | 847.5 | 20635 | 21.45 | 21.5 | 0-1 |
| | | 8 RB | 0 | 825.5 | 20415 | 20.36 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.37 | 20.5 | 0-2 |
| | | | | 847.5 | 20635 | 20.36 | 20.5 | 0-2 |
| | | | 4 | 825.5 | 20415 | 20.36 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.31 | 20.5 | 0-2 |
| | | | | 847.5 | 20635 | 20.25 | 20.5 | 0-2 |
| | | | 7 | 825.5 | 20415 | 20.23 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.27 | 20.5 | 0-2 |
| | | | | 847.5 | 20635 | 20.30 | 20.5 | 0-2 |
| | | 15RB | | 825.5 | 20415 | 20.31 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.28 | 20.5 | 0-2 |
| | | | | 847.5 | 20635 | 20.14 | 20.5 | 0-2 |

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| FDD Band 5 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 1.4 | QPSK | 1 RB | 0 | 824.7 | 20407 | 22.22 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.19 | 22.5 | 0 |
| | | | | 848.3 | 20643 | 22.10 | 22.5 | 0 |
| | | | 2 | 824.7 | 20407 | 22.25 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.28 | 22.5 | 0 |
| | | | | 848.3 | 20643 | 22.49 | 22.5 | 0 |
| | | | 5 | 824.7 | 20407 | 22.13 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.16 | 22.5 | 0 |
| | | | | 848.3 | 20643 | 22.11 | 22.5 | 0 |
| | | 3 RB | 0 | 824.7 | 20407 | 22.27 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.47 | 22.5 | 0 |
| | | | | 848.3 | 20643 | 22.22 | 22.5 | 0 |
| | | | 2 | 824.7 | 20407 | 22.25 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.23 | 22.5 | 0 |
| | | | | 848.3 | 20643 | 22.17 | 22.5 | 0 |
| | | | 3 | 824.7 | 20407 | 22.23 | 22.5 | 0 |
| | | | | 836.5 | 20525 | 22.28 | 22.5 | 0 |
| | | | | 848.3 | 20643 | 22.26 | 22.5 | 0 |
| | | 6RB | | 824.7 | 20407 | 21.26 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.22 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 21.19 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 824.7 | 20407 | 21.42 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.45 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 21.05 | 21.5 | 0-1 |
| | | | 2 | 824.7 | 20407 | 21.37 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.24 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 21.42 | 21.5 | 0-1 |
| | | | 5 | 824.7 | 20407 | 21.16 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.40 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 21.33 | 21.5 | 0-1 |
| | | 3 RB | 0 | 824.7 | 20407 | 21.26 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.31 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 21.31 | 21.5 | 0-1 |
| | | | 2 | 824.7 | 20407 | 21.20 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.40 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 20.89 | 21.5 | 0-1 |
| | | | 3 | 824.7 | 20407 | 21.28 | 21.5 | 0-1 |
| | | | | 836.5 | 20525 | 21.19 | 21.5 | 0-1 |
| | | | | 848.3 | 20643 | 21.20 | 21.5 | 0-1 |
| | | 6RB | | 824.7 | 20407 | 20.43 | 20.5 | 0-2 |
| | | | | 836.5 | 20525 | 20.43 | 20.5 | 0-2 |
| | | | | 848.3 | 20643 | 19.77 | 20.5 | 0-2 |

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| FDD Band 7 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 20 | QPSK | 1 RB | 0 | 2510 | 20850 | 21.61 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.63 | 22.5 | 0 |
| | | | | 2560 | 21350 | 21.46 | 22.5 | 0 |
| | | | 50 | 2510 | 20850 | 21.50 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.46 | 22.5 | 0 |
| | | | | 2560 | 21350 | 21.22 | 22.5 | 0 |
| | | | 99 | 2510 | 20850 | 21.58 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.44 | 22.5 | 0 |
| | | | | 2560 | 21350 | 21.34 | 22.5 | 0 |
| | | 50 RB | 0 | 2510 | 20850 | 20.68 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.57 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.40 | 21.5 | 0-1 |
| | | | 25 | 2510 | 20850 | 20.62 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.52 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.32 | 21.5 | 0-1 |
| | | | 50 | 2510 | 20850 | 20.62 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.54 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.37 | 21.5 | 0-1 |
| | | 100RB | | 2510 | 20850 | 20.63 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.54 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.34 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 2510 | 20850 | 21.00 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.96 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.62 | 21.5 | 0-1 |
| | | | 50 | 2510 | 20850 | 20.69 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.58 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.41 | 21.5 | 0-1 |
| | | | 99 | 2510 | 20850 | 20.76 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.84 | 21.5 | 0-1 |
| | | | | 2560 | 21350 | 20.44 | 21.5 | 0-1 |
| | | 50 RB | 0 | 2510 | 20850 | 19.68 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.56 | 20.5 | 0-2 |
| | | | | 2560 | 21350 | 19.34 | 20.5 | 0-2 |
| | | | 25 | 2510 | 20850 | 19.67 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.47 | 20.5 | 0-2 |
| | | | | 2560 | 21350 | 19.36 | 20.5 | 0-2 |
| | | | 50 | 2510 | 20850 | 19.61 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.61 | 20.5 | 0-2 |
| | | | | 2560 | 21350 | 19.28 | 20.5 | 0-2 |
| | | 100RB | | 2510 | 20850 | 19.65 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.54 | 20.5 | 0-2 |
| | | | | 2560 | 21350 | 19.34 | 20.5 | 0-2 |

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| FDD Band 7 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 15 | QPSK | 1 RB | 0 | 2507.5 | 20825 | 21.69 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.52 | 22.5 | 0 |
| | | | | 2562.5 | 21375 | 21.31 | 22.5 | 0 |
| | | | 36 | 2507.5 | 20825 | 21.59 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.41 | 22.5 | 0 |
| | | | | 2562.5 | 21375 | 21.23 | 22.5 | 0 |
| | | | 74 | 2507.5 | 20825 | 21.50 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.55 | 22.5 | 0 |
| | | | | 2562.5 | 21375 | 21.28 | 22.5 | 0 |
| | | 36 RB | 0 | 2507.5 | 20825 | 20.67 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.57 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.38 | 21.5 | 0-1 |
| | | | 18 | 2507.5 | 20825 | 20.67 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.61 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.34 | 21.5 | 0-1 |
| | | | 37 | 2507.5 | 20825 | 20.65 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.54 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.36 | 21.5 | 0-1 |
| | | | 75RB | 2507.5 | 20825 | 20.67 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.53 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.39 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 2507.5 | 20825 | 20.54 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.42 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.77 | 21.5 | 0-1 |
| | | | 36 | 2507.5 | 20825 | 20.63 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.61 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.41 | 21.5 | 0-1 |
| | | | 74 | 2507.5 | 20825 | 20.55 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.86 | 21.5 | 0-1 |
| | | | | 2562.5 | 21375 | 20.72 | 21.5 | 0-1 |
| | | 36 RB | 0 | 2507.5 | 20825 | 19.73 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.58 | 20.5 | 0-2 |
| | | | | 2562.5 | 21375 | 19.34 | 20.5 | 0-2 |
| | | | 18 | 2507.5 | 20825 | 19.70 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.62 | 20.5 | 0-2 |
| | | | | 2562.5 | 21375 | 19.31 | 20.5 | 0-2 |
| | | | 37 | 2507.5 | 20825 | 19.67 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.54 | 20.5 | 0-2 |
| | | | | 2562.5 | 21375 | 19.29 | 20.5 | 0-2 |
| | | | 75RB | 2507.5 | 20825 | 19.68 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.56 | 20.5 | 0-2 |
| | | | | 2562.5 | 21375 | 19.37 | 20.5 | 0-2 |

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| FDD Band 7 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 10 | QPSK | 1 RB | 0 | 2505 | 20800 | 21.69 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.43 | 22.5 | 0 |
| | | | | 2565 | 21400 | 21.21 | 22.5 | 0 |
| | | | 25 | 2505 | 20800 | 21.58 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.36 | 22.5 | 0 |
| | | | | 2565 | 21400 | 21.18 | 22.5 | 0 |
| | | | 49 | 2505 | 20800 | 21.61 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.42 | 22.5 | 0 |
| | | | | 2565 | 21400 | 21.29 | 22.5 | 0 |
| | | 25 RB | 0 | 2505 | 20800 | 20.64 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.51 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.32 | 21.5 | 0-1 |
| | | | 12 | 2505 | 20800 | 20.64 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.47 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.31 | 21.5 | 0-1 |
| | | | 25 | 2505 | 20800 | 20.66 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.51 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.31 | 21.5 | 0-1 |
| | | 50RB | | 2505 | 20800 | 20.66 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.54 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.34 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 2505 | 20800 | 20.52 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.50 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.46 | 21.5 | 0-1 |
| | | | 25 | 2505 | 20800 | 20.72 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.93 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.69 | 21.5 | 0-1 |
| | | | 49 | 2505 | 20800 | 20.72 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.93 | 21.5 | 0-1 |
| | | | | 2565 | 21400 | 20.58 | 21.5 | 0-1 |
| | | 25 RB | 0 | 2505 | 20800 | 19.66 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.44 | 20.5 | 0-2 |
| | | | | 2565 | 21400 | 19.29 | 20.5 | 0-2 |
| | | | 12 | 2505 | 20800 | 19.68 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.48 | 20.5 | 0-2 |
| | | | | 2565 | 21400 | 19.27 | 20.5 | 0-2 |
| | | | 25 | 2505 | 20800 | 19.65 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.52 | 20.5 | 0-2 |
| | | | | 2565 | 21400 | 19.23 | 20.5 | 0-2 |
| | | 50RB | | 2505 | 20800 | 19.69 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.55 | 20.5 | 0-2 |
| | | | | 2565 | 21400 | 19.26 | 20.5 | 0-2 |

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| FDD Band 7 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 2502.5 | 20775 | 21.68 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.40 | 22.5 | 0 |
| | | | | 2567.5 | 21425 | 21.29 | 22.5 | 0 |
| | | | 12 | 2502.5 | 20775 | 21.52 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.36 | 22.5 | 0 |
| | | | | 2567.5 | 21425 | 21.26 | 22.5 | 0 |
| | | 24 | 24 | 2502.5 | 20775 | 21.64 | 22.5 | 0 |
| | | | | 2535 | 21100 | 21.46 | 22.5 | 0 |
| | | | | 2567.5 | 21425 | 21.11 | 22.5 | 0 |
| | | 12 RB | 0 | 2502.5 | 20775 | 20.71 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.56 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.33 | 21.5 | 0-1 |
| | | | 6 | 2502.5 | 20775 | 20.70 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.55 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.33 | 21.5 | 0-1 |
| | | | 13 | 2502.5 | 20775 | 20.68 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.50 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.33 | 21.5 | 0-1 |
| | | 25RB | | 2502.5 | 20775 | 20.67 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.46 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.30 | 21.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 2502.5 | 20775 | 21.03 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.84 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.78 | 21.5 | 0-1 |
| | | | 12 | 2502.5 | 20775 | 21.04 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.79 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.48 | 21.5 | 0-1 |
| | | | 24 | 2502.5 | 20775 | 20.48 | 21.5 | 0-1 |
| | | | | 2535 | 21100 | 20.30 | 21.5 | 0-1 |
| | | | | 2567.5 | 21425 | 20.20 | 21.5 | 0-1 |
| | | 12 RB | 0 | 2502.5 | 20775 | 19.74 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.60 | 20.5 | 0-2 |
| | | | | 2567.5 | 21425 | 19.30 | 20.5 | 0-2 |
| | | | 6 | 2502.5 | 20775 | 19.69 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.49 | 20.5 | 0-2 |
| | | | | 2567.5 | 21425 | 19.32 | 20.5 | 0-2 |
| | | | 13 | 2502.5 | 20775 | 19.75 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.55 | 20.5 | 0-2 |
| | | | | 2567.5 | 21425 | 19.38 | 20.5 | 0-2 |
| | | 25RB | | 2502.5 | 20775 | 19.68 | 20.5 | 0-2 |
| | | | | 2535 | 21100 | 19.56 | 20.5 | 0-2 |
| | | | | 2567.5 | 21425 | 19.30 | 20.5 | 0-2 |

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| FDD Band 12 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 10 | QPSK | 1 RB | 0 | 704 | 23060 | 22.42 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.25 | 23 | 0 |
| | | | | 711 | 23130 | 22.38 | 23 | 0 |
| | | | 25 | 704 | 23060 | 22.45 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.47 | 23 | 0 |
| | | | | 711 | 23130 | 22.41 | 23 | 0 |
| | | | 49 | 704 | 23060 | 22.39 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.50 | 23 | 0 |
| | | | | 711 | 23130 | 22.53 | 23 | 0 |
| | | 25 RB | 0 | 704 | 23060 | 21.39 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.43 | 22 | 0-1 |
| | | | | 711 | 23130 | 21.45 | 22 | 0-1 |
| | | | 12 | 704 | 23060 | 21.42 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.47 | 22 | 0-1 |
| | | | | 711 | 23130 | 21.48 | 22 | 0-1 |
| | | | 25 | 704 | 23060 | 21.48 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.47 | 22 | 0-1 |
| | | | | 711 | 23130 | 21.53 | 22 | 0-1 |
| | | 50RB | | 704 | 23060 | 21.42 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.48 | 22 | 0-1 |
| | | | | 711 | 23130 | 21.53 | 22 | 0-1 |
| | 16-QAM | 1 RB | 0 | 704 | 23060 | 21.54 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.78 | 22 | 0-1 |
| | | | | 711 | 23130 | 21.90 | 22 | 0-1 |
| | | | 25 | 704 | 23060 | 21.65 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.73 | 22 | 0-1 |
| | | | | 711 | 23130 | 22.00 | 22 | 0-1 |
| | | | 49 | 704 | 23060 | 22.00 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.76 | 22 | 0-1 |
| | | | | 711 | 23130 | 21.99 | 22 | 0-1 |
| | | 25 RB | 0 | 704 | 23060 | 20.40 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.51 | 21 | 0-2 |
| | | | | 711 | 23130 | 20.42 | 21 | 0-2 |
| | | | 12 | 704 | 23060 | 20.43 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.56 | 21 | 0-2 |
| | | | | 711 | 23130 | 20.50 | 21 | 0-2 |
| | | | 25 | 704 | 23060 | 20.51 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.57 | 21 | 0-2 |
| | | | | 711 | 23130 | 20.53 | 21 | 0-2 |
| | | 50RB | | 704 | 23060 | 20.43 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.55 | 21 | 0-2 |
| | | | | 711 | 23130 | 20.49 | 21 | 0-2 |

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| FDD Band 12 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 701.5 | 23035 | 22.25 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.42 | 23 | 0 |
| | | | | 713.5 | 23155 | 22.40 | 23 | 0 |
| | | | 12 | 701.5 | 23035 | 22.35 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.44 | 23 | 0 |
| | | | | 713.5 | 23155 | 22.45 | 23 | 0 |
| | | | 24 | 701.5 | 23035 | 22.24 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.40 | 23 | 0 |
| | | | | 713.5 | 23155 | 22.46 | 23 | 0 |
| | | 12 RB | 0 | 701.5 | 23035 | 21.43 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.45 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 21.50 | 22 | 0-1 |
| | | | 6 | 701.5 | 23035 | 21.47 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.50 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 21.54 | 22 | 0-1 |
| | | | 13 | 701.5 | 23035 | 21.45 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.56 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 21.63 | 22 | 0-1 |
| | | 25RB | | 701.5 | 23035 | 21.39 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.44 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 21.49 | 22 | 0-1 |
| | 16-QAM | 1 RB | 0 | 701.5 | 23035 | 21.41 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.62 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 21.45 | 22 | 0-1 |
| | | | 12 | 701.5 | 23035 | 21.62 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.54 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 21.93 | 22 | 0-1 |
| | | | 24 | 701.5 | 23035 | 21.91 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.62 | 22 | 0-1 |
| | | | | 713.5 | 23155 | 22.00 | 22 | 0-1 |
| | | 12 RB | 0 | 701.5 | 23035 | 20.45 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.48 | 21 | 0-2 |
| | | | | 713.5 | 23155 | 20.44 | 21 | 0-2 |
| | | | 6 | 701.5 | 23035 | 20.39 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.59 | 21 | 0-2 |
| | | | | 713.5 | 23155 | 20.60 | 21 | 0-2 |
| | | | 13 | 701.5 | 23035 | 20.53 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.64 | 21 | 0-2 |
| | | | | 713.5 | 23155 | 20.66 | 21 | 0-2 |
| | | 25RB | | 701.5 | 23035 | 20.42 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.49 | 21 | 0-2 |
| | | | | 713.5 | 23155 | 20.48 | 21 | 0-2 |

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| FDD Band 12 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 3 | QPSK | 1 RB | 0 | 700.5 | 23025 | 22.32 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.28 | 23 | 0 |
| | | | | 714.5 | 23165 | 22.41 | 23 | 0 |
| | | | 7 | 700.5 | 23025 | 22.39 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.34 | 23 | 0 |
| | | | | 714.5 | 23165 | 22.44 | 23 | 0 |
| | | | 14 | 700.5 | 23025 | 22.32 | 23 | 0 |
| | | | | 707.5 | 23095 | 22.38 | 23 | 0 |
| | | | | 714.5 | 23165 | 22.40 | 23 | 0 |
| | | 8 RB | 0 | 700.5 | 23025 | 21.53 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.44 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.50 | 22 | 0-1 |
| | | | 4 | 700.5 | 23025 | 21.45 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.48 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.56 | 22 | 0-1 |
| | | | 7 | 700.5 | 23025 | 21.70 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.49 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.51 | 22 | 0-1 |
| | | 15RB | | 700.5 | 23025 | 21.38 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.45 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.54 | 22 | 0-1 |
| | 16-QAM | 1 RB | 0 | 700.5 | 23025 | 21.85 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.42 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.78 | 22 | 0-1 |
| | | | 7 | 700.5 | 23025 | 21.40 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 22.00 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.44 | 22 | 0-1 |
| | | | 14 | 700.5 | 23025 | 21.88 | 22 | 0-1 |
| | | | | 707.5 | 23095 | 21.76 | 22 | 0-1 |
| | | | | 714.5 | 23165 | 21.98 | 22 | 0-1 |
| | | 8 RB | 0 | 700.5 | 23025 | 20.50 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.63 | 21 | 0-2 |
| | | | | 714.5 | 23165 | 20.51 | 21 | 0-2 |
| | | | 4 | 700.5 | 23025 | 20.39 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.60 | 21 | 0-2 |
| | | | | 714.5 | 23165 | 20.58 | 21 | 0-2 |
| | | | 7 | 700.5 | 23025 | 20.46 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.52 | 21 | 0-2 |
| | | | | 714.5 | 23165 | 20.63 | 21 | 0-2 |
| | | 15RB | | 700.5 | 23025 | 20.47 | 21 | 0-2 |
| | | | | 707.5 | 23095 | 20.46 | 21 | 0-2 |
| | | | | 714.5 | 23165 | 20.51 | 21 | 0-2 |

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| FDD Band 12 | | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 1.4 | QPSK | 1 RB | 0 | 699.7 | 23017 | 22.38 | 23 | 0 | |
| | | | | 707.5 | 23095 | 22.31 | 23 | 0 | |
| | | | | 715.3 | 23173 | 22.47 | 23 | 0 | |
| | | | 2 | 699.7 | 23017 | 22.36 | 23 | 0 | |
| | | | | 707.5 | 23095 | 22.53 | 23 | 0 | |
| | | | | 715.3 | 23173 | 22.57 | 23 | 0 | |
| | | | 5 | 699.7 | 23017 | 22.27 | 23 | 0 | |
| | | | | 707.5 | 23095 | 22.34 | 23 | 0 | |
| | | | | 715.3 | 23173 | 22.45 | 23 | 0 | |
| | | 3 RB | 0 | 699.7 | 23017 | 22.34 | 23 | 0 | |
| | | | | 707.5 | 23095 | 22.47 | 23 | 0 | |
| | | | | 715.3 | 23173 | 22.59 | 23 | 0 | |
| | | | 2 | 699.7 | 23017 | 22.40 | 23 | 0 | |
| | | | | 707.5 | 23095 | 22.40 | 23 | 0 | |
| | | | | 715.3 | 23173 | 22.47 | 23 | 0 | |
| | | | 3 | 699.7 | 23017 | 22.35 | 23 | 0 | |
| | | | | 707.5 | 23095 | 22.46 | 23 | 0 | |
| | | | | 715.3 | 23173 | 22.61 | 23 | 0 | |
| | | 6RB | | | 699.7 | 23017 | 21.37 | 22 | 0-1 |
| | | | | | 707.5 | 23095 | 21.51 | 22 | 0-1 |
| | | | | | 715.3 | 23173 | 21.49 | 22 | 0-1 |
| | 16-QAM | 1 RB | 0 | 699.7 | 23017 | 21.60 | 22 | 0-1 | |
| | | | | 707.5 | 23095 | 21.55 | 22 | 0-1 | |
| | | | | 715.3 | 23173 | 21.64 | 22 | 0-1 | |
| | | | 2 | 699.7 | 23017 | 21.92 | 22 | 0-1 | |
| | | | | 707.5 | 23095 | 21.94 | 22 | 0-1 | |
| | | | | 715.3 | 23173 | 21.79 | 22 | 0-1 | |
| | | | 5 | 699.7 | 23017 | 21.57 | 22 | 0-1 | |
| | | | | 707.5 | 23095 | 21.40 | 22 | 0-1 | |
| | | | | 715.3 | 23173 | 21.73 | 22 | 0-1 | |
| | | 3 RB | 0 | 699.7 | 23017 | 21.42 | 22 | 0-1 | |
| | | | | 707.5 | 23095 | 21.57 | 22 | 0-1 | |
| | | | | 715.3 | 23173 | 21.65 | 22 | 0-1 | |
| | | | 2 | 699.7 | 23017 | 21.50 | 22 | 0-1 | |
| | | | | 707.5 | 23095 | 21.31 | 22 | 0-1 | |
| | | | | 715.3 | 23173 | 21.55 | 22 | 0-1 | |
| | | | 3 | 699.7 | 23017 | 21.46 | 22 | 0-1 | |
| | | | | 707.5 | 23095 | 21.54 | 22 | 0-1 | |
| | | | | 715.3 | 23173 | 21.62 | 22 | 0-1 | |
| | | 6RB | | | 699.7 | 23017 | 20.63 | 21 | 0-2 |
| | | | | | 707.5 | 23095 | 20.49 | 21 | 0-2 |
| | | | | | 715.3 | 23173 | 20.71 | 21 | 0-2 |

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| FDD Band 13 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 10 | QPSK | 1 RB | 0 | 782 | 23230 | 22.92 | 23.5 | 0 |
| | | | 25 | 782 | 23230 | 23.03 | 23.5 | 0 |
| | | | 49 | 782 | 23230 | 22.99 | 23.5 | 0 |
| | | 25 RB | 0 | 782 | 23230 | 22.04 | 22.5 | 0-1 |
| | | | 12 | 782 | 23230 | 21.97 | 22.5 | 0-1 |
| | | | 25 | 782 | 23230 | 21.97 | 22.5 | 0-1 |
| | | 50RB | | 782 | 23230 | 22.03 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 782 | 23230 | 22.24 | 22.5 | 0-1 |
| | | | 25 | 782 | 23230 | 21.90 | 22.5 | 0-1 |
| | | | 49 | 782 | 23230 | 22.44 | 22.5 | 0-1 |
| | | 25 RB | 0 | 782 | 23230 | 21.08 | 21.5 | 0-2 |
| | | | 12 | 782 | 23230 | 21.08 | 21.5 | 0-2 |
| | | | 25 | 782 | 23230 | 21.03 | 21.5 | 0-2 |
| | | 50RB | | 782 | 23230 | 20.99 | 21.5 | 0-2 |

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| FDD Band 13 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 779.5 | 23205 | 22.91 | 23.5 | 0 |
| | | | | 782 | 23230 | 22.91 | 23.5 | 0 |
| | | | | 784.5 | 23255 | 22.90 | 23.5 | 0 |
| | | | 12 | 779.5 | 23205 | 23.03 | 23.5 | 0 |
| | | | | 782 | 23230 | 22.93 | 23.5 | 0 |
| | | | | 784.5 | 23255 | 22.96 | 23.5 | 0 |
| | | | 24 | 779.5 | 23205 | 22.82 | 23.5 | 0 |
| | | | | 782 | 23230 | 22.85 | 23.5 | 0 |
| | | | | 784.5 | 23255 | 22.90 | 23.5 | 0 |
| | | 12 RB | 0 | 779.5 | 23205 | 22.06 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 22.03 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 22.04 | 22.5 | 0-1 |
| | | | 6 | 779.5 | 23205 | 21.99 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 22.02 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 21.97 | 22.5 | 0-1 |
| | | | 13 | 779.5 | 23205 | 21.98 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 22.03 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 21.97 | 22.5 | 0-1 |
| | | | 25RB | 779.5 | 23205 | 21.99 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 21.96 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 21.97 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 779.5 | 23205 | 22.11 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 22.49 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 21.92 | 22.5 | 0-1 |
| | | | 12 | 779.5 | 23205 | 22.39 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 22.18 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 22.40 | 22.5 | 0-1 |
| | | | 24 | 779.5 | 23205 | 21.82 | 22.5 | 0-1 |
| | | | | 782 | 23230 | 22.05 | 22.5 | 0-1 |
| | | | | 784.5 | 23255 | 21.93 | 22.5 | 0-1 |
| | | 12 RB | 0 | 779.5 | 23205 | 21.01 | 21.5 | 0-2 |
| | | | | 782 | 23230 | 21.10 | 21.5 | 0-2 |
| | | | | 784.5 | 23255 | 20.99 | 21.5 | 0-2 |
| | | | 6 | 779.5 | 23205 | 21.07 | 21.5 | 0-2 |
| | | | | 782 | 23230 | 21.05 | 21.5 | 0-2 |
| | | | | 784.5 | 23255 | 20.98 | 21.5 | 0-2 |
| | | | 13 | 779.5 | 23205 | 21.04 | 21.5 | 0-2 |
| | | | | 782 | 23230 | 21.09 | 21.5 | 0-2 |
| | | | | 784.5 | 23255 | 21.02 | 21.5 | 0-2 |
| | | | 25RB | 779.5 | 23205 | 20.93 | 21.5 | 0-2 |
| | | | | 782 | 23230 | 21.02 | 21.5 | 0-2 |
| | | | | 784.5 | 23255 | 20.96 | 21.5 | 0-2 |

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| FDD Band 17 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 10 | QPSK | 1 RB | 0 | 709 | 23780 | 22.19 | 23.5 | 0 |
| | | | | 710 | 23790 | 22.25 | 23.5 | 0 |
| | | | | 711 | 23800 | 22.20 | 23.5 | 0 |
| | | | 25 | 709 | 23780 | 22.31 | 23.5 | 0 |
| | | | | 710 | 23790 | 22.44 | 23.5 | 0 |
| | | | | 711 | 23800 | 22.50 | 23.5 | 0 |
| | | | 49 | 709 | 23780 | 22.52 | 23.5 | 0 |
| | | | | 710 | 23790 | 22.50 | 23.5 | 0 |
| | | | | 711 | 23800 | 22.44 | 23.5 | 0 |
| | | 25 RB | 0 | 709 | 23780 | 21.32 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.36 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.36 | 22.5 | 0-1 |
| | | | 12 | 709 | 23780 | 21.38 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.44 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.39 | 22.5 | 0-1 |
| | | | 25 | 709 | 23780 | 21.50 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.49 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.45 | 22.5 | 0-1 |
| | | 50RB | | 709 | 23780 | 21.43 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.42 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.44 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 709 | 23780 | 21.86 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.24 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.85 | 22.5 | 0-1 |
| | | | 25 | 709 | 23780 | 21.97 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 22.03 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.87 | 22.5 | 0-1 |
| | | | 49 | 709 | 23780 | 21.92 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 22.07 | 22.5 | 0-1 |
| | | | | 711 | 23800 | 21.77 | 22.5 | 0-1 |
| | | 25 RB | 0 | 709 | 23780 | 20.39 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.37 | 21.5 | 0-2 |
| | | | | 711 | 23800 | 20.41 | 21.5 | 0-2 |
| | | | 12 | 709 | 23780 | 20.37 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.47 | 21.5 | 0-2 |
| | | | | 711 | 23800 | 20.43 | 21.5 | 0-2 |
| | | | 25 | 709 | 23780 | 20.47 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.45 | 21.5 | 0-2 |
| | | | | 711 | 23800 | 20.51 | 21.5 | 0-2 |
| | | 50RB | | 709 | 23780 | 20.44 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.41 | 21.5 | 0-2 |
| | | | | 711 | 23800 | 20.43 | 21.5 | 0-2 |

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| FDD Band 17 | | | | | | | | |
|-------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 5 | QPSK | 1 RB | 0 | 706.5 | 23755 | 22.31 | 23.5 | 0 |
| | | | | 710 | 23790 | 22.32 | 23.5 | 0 |
| | | | | 713.5 | 23825 | 22.28 | 23.5 | 0 |
| | | | 12 | 706.5 | 23755 | 22.26 | 23.5 | 0 |
| | | | | 710 | 23790 | 22.33 | 23.5 | 0 |
| | | | | 713.5 | 23825 | 22.36 | 23.5 | 0 |
| | | | 24 | 706.5 | 23755 | 22.29 | 23.5 | 0 |
| | | | | 710 | 23790 | 22.31 | 23.5 | 0 |
| | | | | 713.5 | 23825 | 22.42 | 23.5 | 0 |
| | | 12 RB | 0 | 706.5 | 23755 | 21.37 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.45 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 21.47 | 22.5 | 0-1 |
| | | | 6 | 706.5 | 23755 | 21.36 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.42 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 21.51 | 22.5 | 0-1 |
| | | | 13 | 706.5 | 23755 | 21.39 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.46 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 21.53 | 22.5 | 0-1 |
| | | 25RB | | 706.5 | 23755 | 21.31 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.39 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 21.42 | 22.5 | 0-1 |
| | 16-QAM | 1 RB | 0 | 706.5 | 23755 | 21.49 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.54 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 21.55 | 22.5 | 0-1 |
| | | | 12 | 706.5 | 23755 | 21.42 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.87 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 21.38 | 22.5 | 0-1 |
| | | | 24 | 706.5 | 23755 | 21.50 | 22.5 | 0-1 |
| | | | | 710 | 23790 | 21.59 | 22.5 | 0-1 |
| | | | | 713.5 | 23825 | 22.00 | 22.5 | 0-1 |
| | | 12 RB | 0 | 706.5 | 23755 | 20.38 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.49 | 21.5 | 0-2 |
| | | | | 713.5 | 23825 | 20.46 | 21.5 | 0-2 |
| | | | 6 | 706.5 | 23755 | 20.39 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.46 | 21.5 | 0-2 |
| | | | | 713.5 | 23825 | 20.52 | 21.5 | 0-2 |
| | | | 13 | 706.5 | 23755 | 20.37 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.51 | 21.5 | 0-2 |
| | | | | 713.5 | 23825 | 20.60 | 21.5 | 0-2 |
| | | 25RB | | 706.5 | 23755 | 20.41 | 21.5 | 0-2 |
| | | | | 710 | 23790 | 20.44 | 21.5 | 0-2 |
| | | | | 713.5 | 23825 | 20.46 | 21.5 | 0-2 |

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CDMA conducted power table:

| Band | Channel | Frequency (MHz) | Target Power + Max. Tolerance (dBm) | 1xRTT | | | | EVDO | |
|----------------|---------|-----------------|-------------------------------------|-------|-------|-----------|-----------|---------------------------|-----------------------------|
| | | | | SO55 | SO55 | TDSO/SO32 | TDSO/SO32 | 1x EvDO Rev. 0, FTAP/RTAP | 1x EvDO Rev. A, FETAP/RETAP |
| | | | | RC1 | RC3 | FCH+SCH | FCH | Subtype 0/1 | Subtype 2 |
| Cellular (BC0) | 1013 | 824.7 | 26.50 | 24.84 | 24.89 | 24.54 | 24.83 | 25.00 | 24.91 |
| | 384 | 836.52 | 26.50 | 24.11 | 24.21 | 23.84 | 24.48 | 24.99 | 24.95 |
| | 777 | 848.31 | 26.50 | 23.95 | 24.13 | 23.77 | 24.06 | 24.83 | 24.78 |
| PCS (BC1) | 25 | 1851.25 | 26.00 | 24.69 | 24.74 | 24.91 | 25.18 | 25.96 | 24.83 |
| | 600 | 1880 | 26.00 | 24.07 | 24.12 | 24.79 | 24.87 | 24.95 | 24.77 |
| | 1175 | 1908.75 | 26.00 | 24.01 | 24.18 | 24.66 | 24.76 | 24.89 | 24.62 |

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WLAN802.11 a/b/g/n(20M/40M) conducted power table:

| 802.11 b | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power (dBm) |
|----------|--------------------|--|---|
| CH | Frequency (MHz) | | Data Rate (Mbps) |
| | | | 1 |
| 1 | 2412 | 14.5 | 14.35 |
| 6 | 2437 | 14.5 | 14.33 |
| 11 | 2462 | 14.5 | 14.19 |

| 802.11 g | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power (dBm) |
|----------|--------------------|--|---|
| CH | Frequency (MHz) | | Data Rate (Mbps) |
| | | | 6 |
| 1 | 2412 | 11.5 | 10.55 |
| 6 | 2437 | 11.5 | 11.41 |
| 11 | 2462 | 11.5 | 10.26 |

| 802.11 n(20M) | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power (dBm) |
|---------------|--------------------|--|---|
| CH | Frequency (MHz) | | Data Rate (Mbps) |
| | | | 6.5 |
| 1 | 2412 | 11.5 | 10.55 |
| 6 | 2437 | 11.5 | 11.41 |
| 11 | 2462 | 11.5 | 10.41 |

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| 802.11 n(40M) | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power (dBm) |
|---------------|--------------------|--|---|
| CH | Frequency (MHz) | | Data Rate (Mbps) |
| | | | 6.5 |
| 3 | 2422 | 11.5 | 8.57 |
| 6 | 2437 | 11.5 | 11.42 |
| 9 | 2452 | 11.5 | 8.47 |

| 802.11 a | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power(dBm) |
|----------|--------------------|--|--|
| 5.2/5.8G | | | Data Rate (Mbps) |
| CH | Frequency (MHz) | | 6 |
| 36 | 5180 | 12 | 11.82 |
| 40 | 5200 | 12 | 11.96 |
| 44 | 5220 | 12 | 11.74 |
| 48 | 5240 | 12 | 11.77 |
| 149 | 5745 | 10.5 | 10.35 |
| 157 | 5785 | 10.5 | 10.42 |
| 165 | 5825 | 10.5 | 10.44 |

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| 802.11 n(20M) | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power(dBm) |
|---------------|--------------------|--|--|
| 5.2/5.8G | | | Data Rate (Mbps) |
| CH | Frequency (MHz) | | 6.5 |
| 36 | 5180 | 12 | 11.86 |
| 40 | 5200 | 12 | 11.92 |
| 44 | 5220 | 12 | 11.91 |
| 48 | 5240 | 12 | 11.97 |
| 149 | 5745 | 10.5 | 10.27 |
| 157 | 5785 | 10.5 | 10.47 |
| 165 | 5825 | 10.5 | 10.41 |

| 802.11 n(40M) | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average conducted output power(dBm) |
|---------------|--------------------|--|--|
| 5.2/5.8G | | | Data Rate (Mbps) |
| CH | Frequency (MHz) | | |
| 38 | 5190 | 11 | 10.89 |
| 46 | 5230 | 11 | 10.97 |
| 151 | 5755 | 9.5 | 9.45 |
| 159 | 5795 | 9.5 | 9.14 |

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Bluetooth conducted power table:

| Mode | Channel | Frequency(MHz) | Tune-up (dBm) | Average power (dBm) | | |
|--------|---------|----------------|---------------|---------------------|-------|-------|
| | | | | 1Mbps | 2Mbps | 3Mbps |
| BR/EDR | CH 00 | 2402 | 4.5 | 2.31 | 2.02 | 1.54 |
| | CH 39 | 2441 | | 2.00 | 1.82 | 1.48 |
| | CH 78 | 2480 | | 1.84 | 1.71 | 1.22 |

| Mode | Channel | Frequency(MHz) | Tune-up (dBm) | Average power (dBm) | | |
|------|---------|----------------|---------------|---------------------|--|--|
| | | | | GFSK | | |
| LE | CH 00 | 2402 | -2 | -4.05 | | |
| | CH 20 | 2442 | | -4.28 | | |
| | CH 39 | 2480 | | -4.83 | | |

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1.4 Test Environment

Ambient Temperature: $22\pm 2^{\circ}\text{C}$

Tissue Simulating Liquid: $22\pm 2^{\circ}\text{C}$

1.5 Operation Description

1. The EUT is controlled by using a Radio Communication Tester (Anritsu MT8820C), and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power. The data mode with highest specified time-averaged output power should be tested for SAR compliance. The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode. Since the maximum output power in a secondary mode (8-PSK EDGE) is $\leq \frac{1}{4}$ dB higher than the primary mode (GMSK GPRS/EDGE), SAR measurement is not required for the secondary mode (8-PSK EDGE).
5. The 3G SAR test reduction procedure is applied to HSDPA with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSDPA) is $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA).
6. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSPA) is $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA).
7. SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode since the maximum output power in

a secondary mode (RC1) is $\leq \frac{1}{4}$ dB higher than the primary mode (RC3). When VOIP is supported by Ev-Do devices for next to the ear use, head exposure SAR is required. 1x Ev-Do Rev. A may support VOIP operations.

8. Body-worn accessory SAR is measured in RC3 with the handset configured in TDSO/SO32 to transmit at full rate on FCH only with all other code channels disabled. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode. The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. For handsets with Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. The 3G SAR test reduction procedure is applied separately to Rev. A and Rev. B, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode.
9. Hotspot SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode
10. LTE modes test according to **KDB 941225D05v02r05**.
 - a. Per Section 5.2.1, the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation.
 - Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
 - When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.
 - When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
 - b. Per Section 5.2.2, the largest channel bandwidth and measure SAR for QPSK with 50% RB allocation
 - The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.
 - c. Per Section 5.2.3, the largest channel bandwidth and measure SAR for QPSK with 100% RB allocation
 - For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg.

- Otherwise, SAR is measured for the highest output power channel and if the reported SAR is $> 1.45 \text{ W/kg}$, the remaining required test channels must also be tested.

d. Per Section 5.2.4, Higher order modulations

- For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 5.2.1, 5.2.2 and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2} \text{ dB}$ higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is $> 1.45 \text{ W/kg}$.

e. Per Section 5.3, other channel bandwidth standalone SAR test requirements

- For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2} \text{ dB}$ higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is $> 1.45 \text{ W/kg}$. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.

WLAN

802.11b DSSS SAR Test Requirements:

11. SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is $\leq 0.8 \text{ W/kg}$, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
12. When the reported SAR is $> 0.8 \text{ W/kg}$, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is $> 1.2 \text{ W/kg}$, SAR is required for the third channel; i.e., all channels require testing.

802.11g/n OFDM SAR Test Exclusion Requirements:

13. SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is $\leq 1.2 \text{ W/kg}$.

Initial Test Configuration:

14. An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band.
15. SAR is measured using the highest measured maximum output power channel. When the reported SAR of the initial test configuration is $> 0.8 \text{ W/kg}$, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is $\leq 1.2 \text{ W/kg}$ or all required channels are tested.
16. For WLAN antenna, 5.2a/5.8a is chosen to be the initial test configurations.
17. Since the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $< 1.2 \text{ W/kg}$, SAR is not required for subsequent test configuration.
18. BT and WLAN use the same antenna path and Bluetooth can't transmit simultaneously with WLAN.
19. CDMA and GSM/WCDMA/LTE use the different antenna path but they can't transmit simultaneously.
20. WLAN hotspot function is only supported in WLAN 2.4GHz only.
21. According to **KDB447498D01v06**, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is $\leq 0.8 \text{ W/kg}$, when the transmission band is $\leq 100 \text{ MHz}$.
22. According to **KDB865664D01v01r04**, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is $\geq 0.8 \text{ W/kg}$, repeated that measurement once. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is $\geq 1.45 \text{ W/kg}$ ($\sim 10\%$ from the 1-g SAR limit)

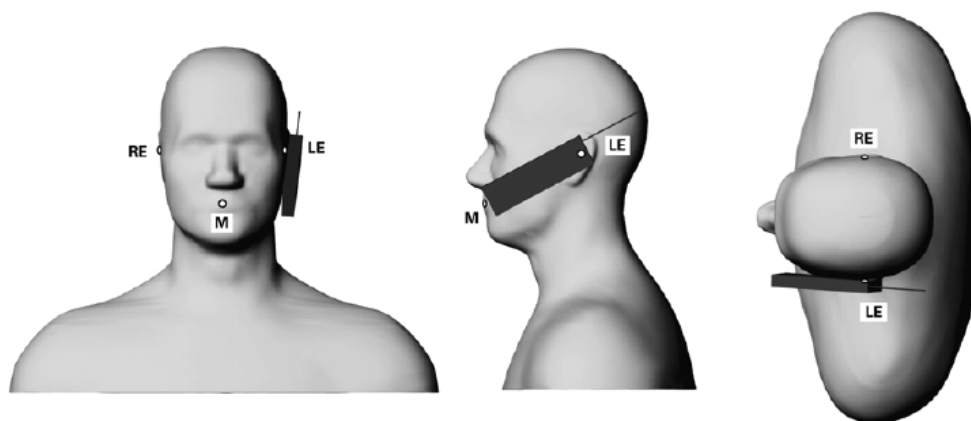
23. According to **KDB447498D01v06** – The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by: $[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for product specific 10-g SAR.

| mode | position | max. power (dB) | max. power (mW) | f(GHz) | calculation | SAR exclusion threshold | SAR test exclusion |
|------|-----------|-----------------|-----------------|--------|-------------|-------------------------|--------------------|
| BT | body-worn | 4.5 | 2.818 | 2.48 | 0.296 | 3 | yes |

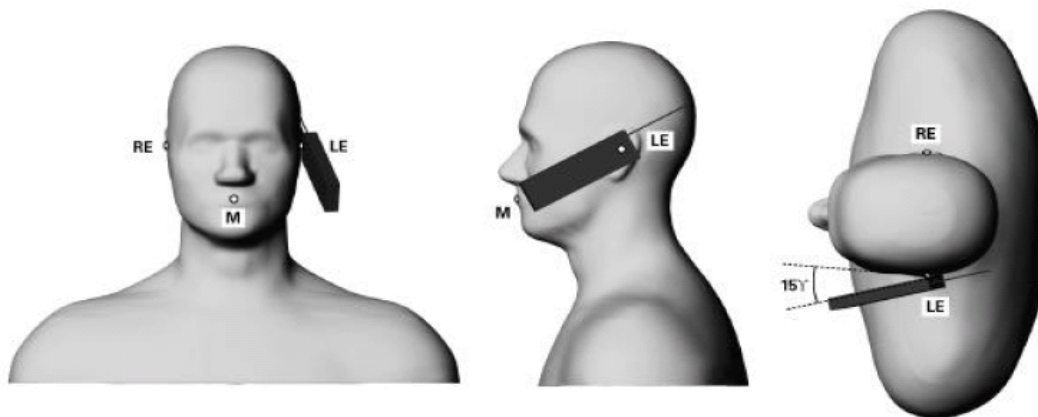
24. The device supports NFC function. Per **KDB 648474 D04v01r03** Phones with built-in NFC functions do not require separate SAR testing and can generally be tested according to the SAR measurement procedures normally required for the phone. Influences of the hardware introduced by the built-in NFC functions are inherently considered through testing of the other transmitters that require SAR.

1.6 Positioning Procedure

Head SAR measurement statement



Phone position 1, “cheek” or “touch” position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, “tilted position.” The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

Body SAR measurement statement

1. Body-worn exposure: 15mm

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

2. Hotspot exposure: 10mm

A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge when the form factor of a handset is larger than 9 cm \times 5 cm

3. Phablet SAR test consideration

Since the device is a phablet (overall diagonal dimension > 16.0 cm), the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for product specific 10-g SAR. When hotspot mode applies, product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. The generation of a high-resolution mesh within the measured volume.
4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points

between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is then moved around until the highest averaged SAR is found.

If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

1.8 Probe Calibration Procedures

For the calibration of E-field probes in lossy liquids, an electric field with an accurately known field strength must be produced within the measured liquid. For standardization purposes it would be desirable if all measurements which are necessary to assess the correct field strength would be traceable to standardized measurement procedures. In the following two different calibration techniques are summarized:

1.8.1 Transfer Calibration with Temperature Probes

In lossy liquids the specific absorption rate (SAR) is related both to the electric field (E) and the temperature gradient ($\delta T / \delta t$) in the liquid.

$$SAR = \frac{\sigma}{\rho} |E|^2 = c \frac{\delta T}{\delta t}$$

Whereby σ is the conductivity, ρ the density and c the heat capacity of the liquid.

Hence, the electric field in lossy liquid can be measured indirectly by measuring the temperature gradient in the liquid. Non-disturbing temperature probes (optical probes or thermistor probes with resistive lines) with high spatial resolution (<1-2 mm) and fast reaction time (<1 s) are available and can be easily calibrated with high precision [1]. The setup and the exciting source have no influence on the calibration; only the relative positioning uncertainties of the standard temperature probe and the E-field probe to be calibrated must be considered. However, several problems limit the available accuracy of probe calibrations with temperature probes:

1. The temperature gradient is not directly measurable but must be evaluated from temperature measurements at different time steps. Special precaution is necessary to avoid measurement errors caused by temperature gradients due to energy equalizing effects or convection currents in the liquid. Such effects cannot be completely avoided, as the measured field itself destroys the

thermal equilibrium in the liquid. With a careful setup these errors can be kept small.

2. The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.
3. The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures ($\sim 2\%$ for c ; much better for ρ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed $\pm 5\%$.
4. Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

Considering these problems, the possible accuracy of the calibration of E-field probes with temperature gradient measurements in a carefully designed setup is about $\pm 10\%$ (RSS) [2]. Recently, a setup which is a combination of the waveguide techniques and the thermal measurements was presented in [3]. The estimated uncertainty of the setup is $\pm 5\%$ (RSS) when the same liquid is used for the calibration and for actual measurements and $\pm 7-9\%$ (RSS) when not, which is in good agreement with the estimates given in [2].

1.8.2 Calibration with Analytical Fields

In this method a technical setup is used in which the field can be calculated analytically from measurements of other physical magnitudes (e.g., input power). This corresponds to the standard field method for probe calibration in air; however, there is no standard defined for fields in lossy liquids.

When using calculated fields in lossy liquids for probe calibration, several points must be considered in the assessment of the uncertainty:

1. The setup must enable accurate determination of the incident power.
2. The accuracy of the calculated field strength will depend on the assessment of the dielectric parameters of the liquid.
3. Due to the small wavelength in liquids with high permittivity, even small setups might be above the resonant cutoff frequencies. The field distribution in the setup must be carefully checked for conformity with the theoretical field distribution.

References

- (1) N. Kuster, Q. Balzano, and J.C. Lin, Eds., *Mobile Communications Safety*, Chapman & Hall, London, 1997.
- (2) K. Meier, M. Burkhardt, T. Schmid, and N. Kuster, "Broadband calibration of E-field probes in lossy media", *IEEE Transactions on Microwave Theory and Techniques*, vol. 44, no. 10, pp. 1954-1962, Oct. 1996.
- (3) K. Jokela, P. Hyysalo, and L. Puranen, "Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", *IEEE Transactions on Instrumentation and Measurements*, vol. 47, no. 2, pp. 432-438, Apr. 1998.

1.9 The SAR Measurement System

A block diagram of the SAR measurement system is given in Fig. a. This SAR measurement system uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). Model EX3DV4 field probes are used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E_i|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant.

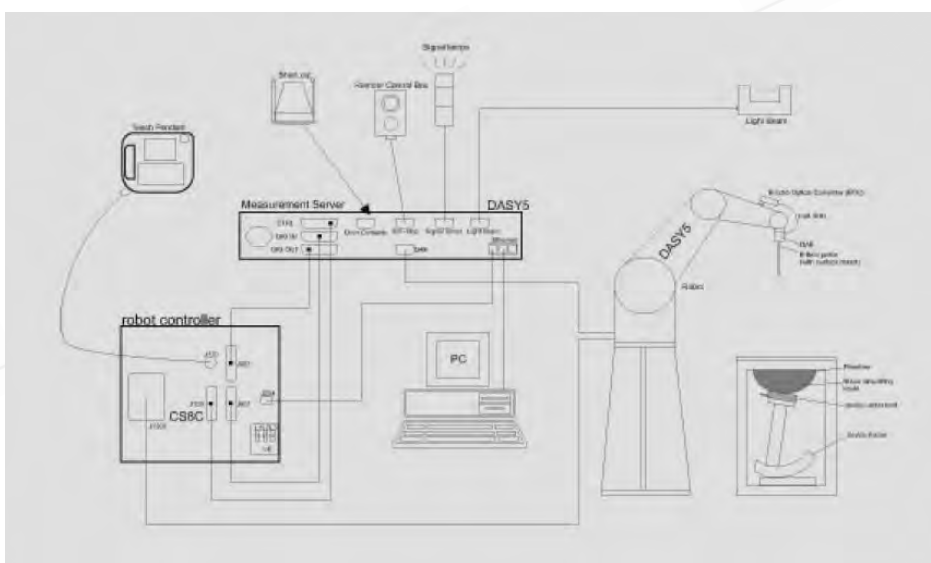



Fig. a A block diagram of the SAR measurement system

The DASY 5 system for performing compliance tests consists of the following items:


1. A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
7. A computer operating Windows7
8. DASY 5 software.
9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
10. The SAM twin phantom enabling testing left-hand and right-hand usage.
11. The device holder for handheld mobile phones.
12. Tissue simulating liquid mixed according to the given recipes.
13. Validation dipole kits allowing to validate the proper functioning of the system.

1.10 System Components


EX3DV4 E-Field Probe

| | | |
|---------------|--|---|
| Construction | Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  |
| Calibration | Basic Broad Band Calibration in air Conversion Factors (CF) for HSL750/835/1750/1900/2450/2600/5200/ 5800 MHz Additional CF for other liquids and frequencies upon request | |
| Frequency | 10 MHz to > 6 GHz, Linearity: ± 0.6 dB | |
| Directivity | ± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis) | |
| Dynamic Range | 10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g) | |
| Dimensions | Tip diameter: 2.5 mm | |
| Application | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%. | |

SAM PHANTOM V4.0C

| | | |
|------------------|--|---|
| Construction: | <p>The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209.</p> <p>It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.</p> | |
| Shell Thickness: | 2 ± 0.2 mm |  |
| Filling Volume: | Approx. 25 liters | |
| Dimensions: | <p>Height: 850 mm;</p> <p>Length: 1000 mm;</p> <p>Width: 500 mm</p> | |

DEVICE HOLDER

| | | |
|--------------|--|--|
| Construction | <p>In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).</p> |  <p>Device Holder</p> |
|--------------|--|--|

1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ (according to KDB865664D01v01r04) from the target SAR values.

These tests were done at 750/835/1750/1900/2450/2600/5200/5800 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was 21.7°C , the relative humidity was 62% and the liquid depth above the ear reference points was above 15 cm ($\leq 3\text{G}$) or 10 cm ($> 3\text{G}$) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

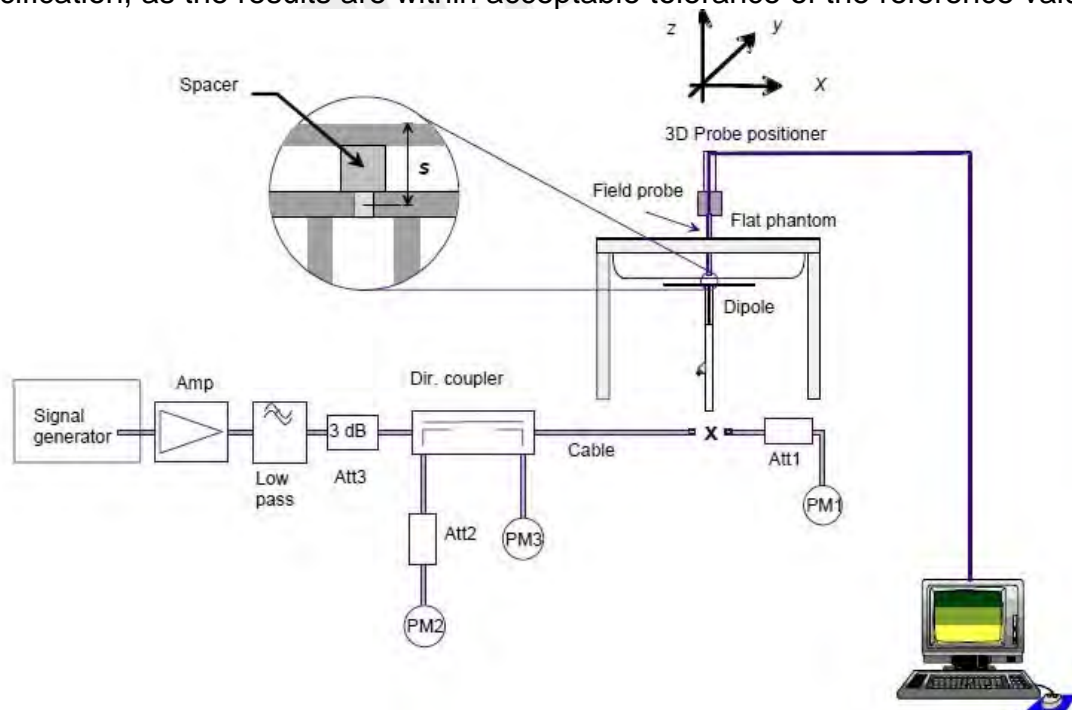


Fig. b The block diagram of system verification

| Validation Kit | S/N | Frequency (MHz) | | 1W Target SAR-1g (mW/g) | Measured SAR-1g (mW/g) | Measured SAR-1g normalized to 1W (mW/g) | Deviation (%) | Measured Date |
|----------------|-------|-----------------|------|-------------------------|------------------------|---|---------------|---------------|
| D750V3 | 1015 | 750 | Head | 8.32 | 2.03 | 8.12 | -2.40% | Oct. 28, 2016 |
| | | | Body | 8.77 | 2.24 | 8.96 | 2.17% | Nov. 01, 2016 |
| D835V2 | 4d063 | 835 | Head | 9.40 | 2.36 | 9.44 | 0.43% | Nov. 05, 2016 |
| | | | Body | 9.57 | 2.38 | 9.52 | -0.52% | Nov. 07, 2016 |
| D1750V2 | 1008 | 1750 | Head | 37.20 | 9.57 | 38.28 | 2.90% | Nov. 05, 2016 |
| | | | Body | 37.30 | 8.93 | 35.72 | -4.24% | Nov. 07, 2016 |
| D1900V2 | 5d027 | 1900 | Head | 38.70 | 9.6 | 38.4 | -0.78% | Nov. 06, 2016 |
| | | | Body | 39.70 | 10.10 | 40.4 | 1.76% | Nov. 08, 2016 |
| D2450V2 | 727 | 2450 | Head | 51.00 | 12.7 | 50.8 | -0.39% | Nov. 06, 2016 |
| | | | Body | 49.60 | 12.9 | 51.6 | 4.03% | Nov. 08, 2016 |
| D2600V2 | 1005 | 2600 | Head | 55.20 | 13.8 | 55.2 | 0.00% | Nov. 06, 2016 |
| | | | Body | 53.90 | 14.3 | 57.2 | 6.12% | Nov. 02, 2016 |
| D5GHzV2 | 1023 | 5200 | Head | 77 | 7.5 | 75 | -2.60% | Nov. 02, 2016 |
| | | | Body | 71.9 | 7.54 | 75.4 | 4.87% | Nov. 02, 2016 |
| | | 5800 | Head | 77.3 | 7.98 | 79.8 | 3.23% | Nov. 02, 2016 |
| | | | Body | 75.3 | 7.59 | 75.9 | 0.80% | Nov. 02, 2016 |

Table 1. Results of system validation

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1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070E Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Network Analyzer.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was at least 15 cm ($\leq 3G$) or 10 cm ($> 3G$) during all tests. (Appendix Fig. 2)

| Tissue Type | Measured Frequency (MHz) | Target Dielectric Constant, ϵ_r | Target Conductivity, σ (S/m) | Measured Dielectric Constant, ϵ_r | Measured Conductivity, σ (S/m) | % dev ϵ_r | % dev σ | Measurement Date |
|-------------|--------------------------|--|-------------------------------------|--|---------------------------------------|--------------------|----------------|------------------|
| Head | 709 | 42.155 | 0.890 | 41.936 | 0.853 | 0.52% | 4.18% | 2016/10/28 |
| | 711 | 42.144 | 0.890 | 41.726 | 0.855 | 0.99% | 3.97% | |
| | 750 | 41.942 | 0.893 | 41.205 | 0.894 | 1.76% | -0.07% | |
| | 782 | 41.775 | 0.896 | 40.728 | 0.926 | 2.51% | -3.36% | |
| | 824.7 | 41.554 | 0.899 | 40.183 | 0.865 | 3.30% | 3.80% | |
| | 835 | 41.500 | 0.900 | 40.183 | 0.866 | 3.17% | 3.78% | 2016/11/5 |
| | 836.5 | 41.500 | 0.902 | 40.182 | 0.867 | 3.18% | 3.84% | |
| | 836.52 | 41.500 | 0.902 | 40.182 | 0.867 | 3.18% | 3.84% | |
| | 836.6 | 41.500 | 0.902 | 40.182 | 0.867 | 3.18% | 3.85% | |
| | 844 | 41.500 | 0.910 | 40.174 | 0.875 | 3.20% | 3.81% | |
| | 1720 | 40.126 | 1.354 | 39.935 | 1.374 | 0.48% | -1.50% | |
| | 1732.5 | 40.107 | 1.361 | 39.883 | 1.381 | 0.56% | -1.48% | |
| | 1745 | 40.087 | 1.368 | 39.861 | 1.402 | 0.56% | -2.47% | |
| | 1750 | 40.079 | 1.371 | 39.809 | 1.412 | 0.67% | -2.99% | |
| | 1851.25 | 40.000 | 1.400 | 38.841 | 1.386 | 2.90% | 1.00% | 2016/11/6 |
| | 1880 | 40.000 | 1.400 | 38.727 | 1.405 | 3.18% | -0.36% | |
| | 1900 | 40.000 | 1.400 | 38.592 | 1.416 | 3.52% | -1.14% | |
| | 1907.6 | 40.000 | 1.400 | 38.577 | 1.423 | 3.56% | -1.64% | |
| | 1909.8 | 40.000 | 1.400 | 38.554 | 1.425 | 3.61% | -1.79% | |
| | 2412 | 39.268 | 1.766 | 39.274 | 1.808 | -0.02% | -2.37% | |
| | 2450 | 39.200 | 1.800 | 39.021 | 1.841 | 0.46% | -2.28% | |
| | 2510 | 39.124 | 1.865 | 38.260 | 1.868 | 2.21% | -0.14% | |
| | 2535 | 39.092 | 1.893 | 38.219 | 1.894 | 2.23% | -0.07% | |
| | 2600 | 39.009 | 1.964 | 37.938 | 1.959 | 2.75% | 0.24% | 2016/11/2 |
| | 5200 | 35.986 | 4.655 | 34.721 | 4.603 | 3.51% | 1.12% | |
| | 5800 | 35.300 | 5.270 | 34.121 | 5.203 | 3.34% | 1.27% | |
| | 5825 | 35.271 | 5.296 | 34.096 | 5.228 | 3.33% | 1.28% | |

| Tissue Type | Measured Frequency (MHz) | Target Dielectric Constant, ϵ_r | Target Conductivity, σ (S/m) | Measured Dielectric Constant, ϵ_r | Measured Conductivity, σ (S/m) | % dev ϵ_r | % dev σ | Measurement Date |
|-------------|--------------------------|--|-------------------------------------|--|---------------------------------------|--------------------|----------------|------------------|
| Body | 709 | 55.691 | 0.960 | 54.101 | 0.920 | 2.85% | 4.18% | 2016/11/1 |
| | 711 | 55.683 | 0.960 | 54.049 | 0.922 | 2.93% | 3.99% | |
| | 750 | 55.531 | 0.963 | 53.674 | 0.961 | 3.34% | 0.25% | |
| | 782 | 55.406 | 0.966 | 53.245 | 0.993 | 3.90% | -2.81% | |
| | 824.2 | 55.242 | 0.969 | 53.812 | 0.994 | 2.59% | -2.56% | 2016/11/7 |
| | 824.7 | 55.240 | 0.969 | 53.795 | 0.995 | 2.62% | -2.66% | |
| | 835 | 55.200 | 0.970 | 53.767 | 0.997 | 2.60% | -2.78% | |
| | 836.6 | 55.195 | 0.972 | 53.615 | 0.999 | 2.86% | -2.78% | |
| | 844 | 55.172 | 0.981 | 53.531 | 1.007 | 2.97% | -2.64% | |
| | 1720 | 53.511 | 1.469 | 54.573 | 1.415 | -1.99% | 3.71% | |
| | 1732.5 | 53.478 | 1.477 | 54.555 | 1.427 | -2.01% | 3.41% | |
| | 1745 | 53.445 | 1.485 | 54.514 | 1.440 | -2.00% | 3.05% | |
| | 1750 | 53.432 | 1.488 | 54.426 | 1.445 | -1.86% | 2.92% | |
| | 1851.25 | 53.300 | 1.520 | 54.309 | 1.510 | -1.89% | 0.66% | 2016/11/8 |
| | 1852.4 | 53.300 | 1.520 | 54.216 | 1.511 | -1.72% | 0.59% | |
| | 1880 | 53.300 | 1.520 | 54.115 | 1.539 | -1.53% | -1.25% | |
| | 1900 | 53.300 | 1.520 | 54.025 | 1.559 | -1.36% | -2.57% | |
| | 1907.6 | 53.300 | 1.520 | 54.018 | 1.566 | -1.35% | -3.03% | |
| | 1908.75 | 53.300 | 1.520 | 54.015 | 1.567 | -1.34% | -3.09% | |
| | 1909.8 | 53.300 | 1.520 | 54.008 | 1.568 | -1.33% | -3.16% | |
| | 2412 | 52.751 | 1.914 | 52.204 | 1.939 | 1.04% | -1.32% | |
| | 2450 | 52.700 | 1.950 | 51.977 | 1.977 | 1.37% | -1.38% | 2016/11/2 |
| | 2510 | 52.624 | 2.035 | 52.037 | 2.037 | 1.11% | -0.09% | |
| | 2535 | 52.592 | 2.071 | 51.862 | 2.062 | 1.39% | 0.41% | |
| | 2600 | 52.509 | 2.163 | 51.797 | 2.127 | 1.36% | 1.65% | |
| | 5200 | 49.014 | 5.299 | 47.721 | 5.486 | 2.64% | -3.52% | |
| | 5800 | 48.200 | 6.000 | 46.926 | 6.086 | 2.64% | -1.43% | |
| | 5825 | 48.166 | 6.029 | 46.901 | 6.111 | 2.63% | -1.36% | |

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

| Frequency (MHz) | Mode | Ingredient | | | | | | Total amount |
|--------------------|------|------------|----------|---------|------------------|-----------|-------|-----------------|
| | | DGMBE | Water | Salt | Preventol D-7 | Cellulose | Sugar | |
| 750 | Head | — | 532.98 g | 18.3 g | 2.4 g | 3.2 g | 766 g | 1.3L(Kg) |
| | Body | — | 631.68 g | 11.72 g | 1.2 g | — | 600 g | 1.0L(Kg) |
| 850 | Head | — | 532.98 g | 18.3 g | 2.4 g | 3.2 g | 766 g | 1.3L(Kg) |
| | Body | — | 631.68 g | 11.72 g | 1.2 g | — | 600 g | 1.0L(Kg) |
| 1750 | Head | 444.52 g | 552.42 g | 3.06 g | — | — | — | 1.0L(Kg) |
| | Body | 300.67 g | 716.56 g | 4.0 g | — | — | — | 1.0L(Kg) |
| 1900 | Head | 444.52 g | 552.42 g | 3.06 g | — | — | — | 1.0L(Kg) |
| | Body | 300.67 g | 716.56 g | 4.0 g | — | — | — | 1.0L(Kg) |
| 2450 | Head | 550ml | 450ml | — | — | — | — | 1.0L(Kg) |
| | Body | 301.7ml | 698.3ml | — | — | — | — | 1.0L(Kg) |
| 2600 | Head | 550ml | 450ml | — | — | — | — | 1.0L(Kg) |
| | Body | 301.7ml | 698.3ml | — | — | — | — | 1.0L(Kg) |

Simulating Liquids for 5 GHz, Manufactured by SPEAG:

| Ingredients | Water | Esters, Emulsifiers, Inhibitors | Sodium and Salt |
|---------------|-------|---------------------------------|-----------------|
| (% by weight) | 60-80 | 20-40 | 0-1.5 |

Table 3. Recipes for tissue simulating liquid

1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1, By the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

1. Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over a 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

2. Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .6)

| Human Exposure | Uncontrolled Environment General Population | Controlled Environment Occupational |
|--|--|--|
| Spatial Peak SAR (Brain) | 1.60 W/kg | 8.00 W/kg |
| Spatial Average SAR (Whole Body) | 0.08 W/kg | 0.40 W/kg |
| Spatial Peak SAR (Hands/Feet/Ankle/Wrist) | 4.00 W/kg | 20.00 W/kg |

Table 4. RF exposure limits

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

2. Summary of Results

GSM 850

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|----------------------------|-------------|---------------|-----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| GSM850 (Head) | Re Cheek | - | 190 | 836.6 | 34.00 | 32.40 | 44.54% | 0.022 | 0.032 | 101 |
| | Re Tilt | - | 190 | 836.6 | 34.00 | 32.40 | 44.54% | 0.017 | 0.025 | - |
| | Le Cheek | - | 190 | 836.6 | 34.00 | 32.40 | 44.54% | 0.021 | 0.030 | - |
| | Le Tilt | - | 190 | 836.6 | 34.00 | 32.40 | 44.54% | 0.013 | 0.019 | - |
| GSM850 (Body-Worn) | Front side | 15 | 190 | 836.6 | 34.00 | 33.70 | 7.15% | 0.002 | 0.002 | - |
| | Back side | 15 | 190 | 836.6 | 34.00 | 32.40 | 44.54% | 0.110 | 0.159 | 102 |
| GPRS850 (Hotspot) (1Dn4UP) | Front side | 10 | 128 | 824.2 | 31.50 | 29.20 | 69.82% | 0.056 | 0.095 | - |
| | Back side | 10 | 128 | 824.2 | 31.50 | 29.20 | 69.82% | 0.258 | 0.438 | 103 |
| | Bottom side | 10 | 128 | 824.2 | 31.50 | 29.20 | 69.82% | 0.183 | 0.311 | - |
| | Right side | 10 | 128 | 824.2 | 31.50 | 29.20 | 69.82% | 0.077 | 0.131 | - |

GSM 1900

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------------------------|-------------|---------------|-----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| GSM1900 (Head) | Re Cheek | - | 810 | 1909.8 | 31.00 | 30.30 | 17.49% | 0.036 | 0.042 | 104 |
| | Re Tilt | - | 810 | 1909.8 | 31.00 | 30.30 | 17.49% | 0.023 | 0.027 | - |
| | Le Cheek | - | 810 | 1909.8 | 31.00 | 30.30 | 17.49% | 0.021 | 0.025 | - |
| | Le Tilt | - | 810 | 1909.8 | 31.00 | 30.30 | 17.49% | 0.021 | 0.025 | - |
| GSM1900 (Body-Worn) | Front side | 15 | 810 | 1909.8 | 31.00 | 30.30 | 17.49% | 0.006 | 0.007 | - |
| | Back side | 15 | 810 | 1909.8 | 31.00 | 30.30 | 17.49% | 0.201 | 0.236 | 105 |
| GPRS1900 (Hotspot) (1Dn4UP) | Front side | 10 | 810 | 1909.8 | 28.50 | 27.20 | 34.90% | 0.073 | 0.098 | - |
| | Back side | 10 | 810 | 1909.8 | 28.50 | 27.20 | 34.90% | 0.435 | 0.587 | 106 |
| | Bottom side | 10 | 810 | 1909.8 | 28.50 | 27.20 | 34.90% | 0.312 | 0.421 | - |
| | Right side | 10 | 810 | 1909.8 | 28.50 | 27.20 | 34.90% | 0.093 | 0.125 | - |

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WCDMA Band II

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|------------|-------------|---------------|------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| R99 (Head) | RE Cheek | - | 9538 | 1907.6 | 25 | 24.98 | 0.46% | 0.092 | 0.092 | 107 |
| | RE Tilt | - | 9538 | 1907.6 | 25 | 24.98 | 0.46% | 0.040 | 0.040 | - |
| | LE Cheek | - | 9538 | 1907.6 | 25 | 24.98 | 0.46% | 0.055 | 0.055 | - |
| | LE Tilt | - | 9538 | 1907.6 | 25 | 24.98 | 0.46% | 0.062 | 0.062 | - |
| Hotspot | Front side | 10 | 9538 | 1907.6 | 25 | 24.98 | 0.46% | 0.121 | 0.122 | - |
| | Back side | 10 | 9262 | 1852.4 | 25 | 24.74 | 6.17% | 1.010 | 1.072 | - |
| | Back side | 10 | 9400 | 1880 | 25 | 24.93 | 1.62% | 1.070 | 1.087 | 108 |
| | Back side* | 10 | 9400 | 1880 | 25 | 24.93 | 1.62% | 1.060 | 1.077 | - |
| | Back side | 10 | 9538 | 1907.6 | 25 | 24.98 | 0.46% | 0.921 | 0.925 | - |
| | Bottom side | 10 | 9262 | 1852.4 | 25 | 24.98 | 0.46% | 0.536 | 0.538 | - |
| | Right side | 10 | 9262 | 1852.4 | 25 | 24.98 | 0.46% | 0.175 | 0.176 | - |

* - repeated at the highest SAR measurement according to the KDB865664D01v01r04

WCDMA Band V

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|------------|-------------|---------------|------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| R99 (Head) | RE Cheek | - | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.018 | 0.025 | 109 |
| | RE Tilt | - | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.015 | 0.021 | - |
| | LE Cheek | - | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.017 | 0.024 | - |
| | LE Tilt | - | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.010 | 0.014 | - |
| Hotspot | Front side | 10 | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.004 | 0.006 | - |
| | Back side | 10 | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.101 | 0.142 | 110 |
| | Bottom side | 10 | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.059 | 0.083 | - |
| | Right side | 10 | 4183 | 836.6 | 25 | 23.53 | 40.28% | 0.002 | 0.003 | - |

LTE FDD Band II

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 2 (Head) | 20MHz | QPSK | 1 RB | 50 | RE Cheek | - | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.091 | 0.091 | 111 |
| | | | | | RE Tilt | - | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.048 | 0.048 | - |
| | | | | | LE Cheek | - | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.042 | 0.042 | - |
| | | | | | LE Tilt | - | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.040 | 0.040 | - |
| | | | 50 RB | 25 | RE Cheek | - | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.071 | 0.071 | - |
| | | | | | RE Tilt | - | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.034 | 0.034 | - |
| | | | | | LE Cheek | - | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.033 | 0.033 | - |
| | | | | | LE Tilt | - | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.032 | 0.032 | - |
| | | | 100 RB | | RE Cheek | - | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.066 | 0.066 | - |
| | | | | | RE Tilt | - | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.031 | 0.031 | - |
| | | | | | LE Cheek | - | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.029 | 0.029 | - |
| | | | | | LE Tilt | - | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.027 | 0.027 | - |
| LTE Band 2 (Hotspot) | 20MHz | QPSK | 1 RB | 50 | Front side | 10 | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.084 | 0.084 | - |
| | | | | | Back side | 10 | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.711 | 0.711 | 112 |
| | | | | | Bottom side | 10 | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.459 | 0.459 | - |
| | | | | | Right side | 10 | 18900 | 1880 | 23.5 | 23.50 | 0.00% | 0.120 | 0.120 | - |
| | | | 50 RB | 25 | Front side | 10 | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.063 | 0.063 | - |
| | | | | | Back side | 10 | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.568 | 0.571 | - |
| | | | | | Bottom side | 10 | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.358 | 0.360 | - |
| | | | | | Right side | 10 | 18900 | 1880 | 22.5 | 22.48 | 0.46% | 0.095 | 0.095 | - |
| | | | 100 RB | | Front side | 10 | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.044 | 0.044 | - |
| | | | | | Back side | 10 | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.357 | 0.359 | - |
| | | | | | Bottom side | 10 | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.208 | 0.209 | - |
| | | | | | Right side | 10 | 19100 | 1900 | 22.5 | 22.48 | 0.46% | 0.068 | 0.068 | - |

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LTE FDD Band IV

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 4 (Head) | 20MHz | QPSK | 1 RB | 50 | RE Cheek | - | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.010 | 0.011 | 113 |
| | | | | | RE Tilt | - | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.009 | 0.010 | - |
| | | | | | LE Cheek | - | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.004 | 0.005 | - |
| | | | | | LE Tilt | - | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.007 | 0.008 | - |
| | | | 50 RB | 0 | RE Cheek | - | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.009 | 0.010 | - |
| | | | | | RE Tilt | - | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.008 | 0.009 | - |
| | | | | | LE Cheek | - | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.003 | 0.003 | - |
| | | | | | LE Tilt | - | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.005 | 0.006 | - |
| | | | 100 RB | | RE Cheek | - | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.008 | 0.009 | - |
| | | | | | RE Tilt | - | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.007 | 0.008 | - |
| | | | | | LE Cheek | - | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.003 | 0.003 | - |
| | | | | | LE Tilt | - | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.004 | 0.005 | - |
| LTE Band 4 (Hotspot) | 20MHz | QPSK | 1 RB | 50 | Front side | 10 | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.006 | 0.007 | - |
| | | | | | Back side | 10 | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.200 | 0.229 | 114 |
| | | | | | Bottom side | 10 | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.083 | 0.095 | - |
| | | | | | Right side | 10 | 20050 | 1720 | 24.5 | 23.91 | 14.55% | 0.005 | 0.006 | - |
| | | | 50 RB | 0 | Front side | 10 | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.004 | 0.005 | - |
| | | | | | Back side | 10 | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.174 | 0.197 | - |
| | | | | | Bottom side | 10 | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.079 | 0.089 | - |
| | | | | | Right side | 10 | 20300 | 1745 | 23.5 | 22.97 | 12.98% | 0.002 | 0.002 | - |
| | | | 100 RB | | Front side | 10 | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.003 | 0.003 | - |
| | | | | | Back side | 10 | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.145 | 0.164 | - |
| | | | | | Bottom side | 10 | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.055 | 0.062 | - |
| | | | | | Right side | 10 | 20175 | 1732.5 | 23.5 | 22.96 | 13.24% | 0.001 | 0.001 | - |

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LTE FDD Band V

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measure d Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|----------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 5 (Head) | 10MHz | QPSK | 1 RB | 0 | RE Cheek | - | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.013 | 0.013 | 115 |
| | | | | | RE Tilt | - | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.008 | 0.008 | - |
| | | | | | LE Cheek | - | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.011 | 0.011 | - |
| | | | | | LE Tilt | - | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.006 | 0.006 | - |
| | | | 25 RB | 0 | RE Cheek | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.010 | 0.010 | - |
| | | | | | RE Tilt | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.006 | 0.006 | - |
| | | | | | LE Cheek | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.009 | 0.009 | - |
| | | | | | LE Tilt | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.005 | 0.005 | - |
| | | | 50 RB | | RE Cheek | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.009 | 0.009 | - |
| | | | | | RE Tilt | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.006 | 0.006 | - |
| | | | | | LE Cheek | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.008 | 0.008 | - |
| | | | | | LE Tilt | - | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.004 | 0.004 | - |
| LTE Band 5 (Hotspot) | 10MHz | QPSK | 1 RB | 0 | Front side | 10 | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.010 | 0.010 | - |
| | | | | | Back side | 10 | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.079 | 0.082 | 116 |
| | | | | | Bottom side | 10 | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.050 | 0.052 | - |
| | | | | | Right side | 10 | 20600 | 844 | 22.5 | 22.35 | 3.51% | 0.003 | 0.003 | - |
| | | | 25 RB | 0 | Front side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.008 | 0.008 | - |
| | | | | | Back side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.052 | 0.054 | - |
| | | | | | Bottom side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.042 | 0.044 | - |
| | | | | | Right side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.002 | 0.002 | - |
| | | | 50 RB | | Front side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.007 | 0.007 | - |
| | | | | | Back side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.047 | 0.049 | - |
| | | | | | Bottom side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.038 | 0.039 | - |
| | | | | | Right side | 10 | 20525 | 836.5 | 21.5 | 21.34 | 3.75% | 0.002 | 0.002 | - |

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LTE FDD Band VII

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 7 (Head) | 20MHz | QPSK | 1 RB | 0 | RE Cheek | - | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.008 | 0.010 | 117 |
| | | | | | RE Tilt | - | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.007 | 0.009 | - |
| | | | | | LE Cheek | - | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.007 | 0.009 | - |
| | | | | | LE Tilt | - | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.007 | 0.008 | - |
| | | | 50 RB | 0 | RE Cheek | - | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.008 | 0.010 | - |
| | | | | | RE Tilt | - | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.007 | 0.008 | - |
| | | | | | LE Cheek | - | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.006 | 0.007 | - |
| | | | | | LE Tilt | - | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.005 | 0.006 | - |
| | | | 100 RB | | RE Cheek | - | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.008 | 0.010 | - |
| | | | | | RE Tilt | - | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.007 | 0.009 | - |
| | | | | | LE Cheek | - | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.006 | 0.007 | - |
| | | | | | LE Tilt | - | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.005 | 0.006 | - |
| LTE Band 7 (Hotspot) | 20MHz | QPSK | 1 RB | 0 | Front side | 10 | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.009 | 0.011 | - |
| | | | | | Back side | 10 | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.290 | 0.354 | 118 |
| | | | | | Bottom side | 10 | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.057 | 0.070 | - |
| | | | | | Right side | 10 | 21100 | 2535 | 22.5 | 21.63 | 22.18% | 0.007 | 0.009 | - |
| | | | 50 RB | 0 | Front side | 10 | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.007 | 0.008 | - |
| | | | | | Back side | 10 | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.117 | 0.141 | - |
| | | | | | Bottom side | 10 | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.043 | 0.052 | - |
| | | | | | Right side | 10 | 20850 | 2510 | 21.5 | 20.68 | 20.78% | 0.005 | 0.006 | - |
| | | | 100 RB | | Front side | 10 | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.006 | 0.007 | - |
| | | | | | Back side | 10 | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.114 | 0.139 | - |
| | | | | | Bottom side | 10 | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.041 | 0.050 | - |
| | | | | | Right side | 10 | 20850 | 2510 | 21.5 | 20.63 | 22.18% | 0.004 | 0.005 | - |

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LTE FDD Band XII

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 12 (Head) | 10MHz | QPSK | 1 RB | 49 | RE Cheek | - | 23130 | 711 | 23 | 22.53 | 11.43% | 0.071 | 0.079 | 119 |
| | | | | | RE Tilt | - | 23130 | 711 | 23 | 22.53 | 11.43% | 0.052 | 0.058 | - |
| | | | | | LE Cheek | - | 23130 | 711 | 23 | 22.53 | 11.43% | 0.023 | 0.026 | - |
| | | | | | LE Tilt | - | 23130 | 711 | 23 | 22.53 | 11.43% | 0.017 | 0.019 | - |
| | | | 25 RB | 25 | RE Cheek | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.062 | 0.069 | - |
| | | | | | RE Tilt | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.044 | 0.049 | - |
| | | | | | LE Cheek | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.019 | 0.021 | - |
| | | | | | LE Tilt | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.013 | 0.014 | - |
| | | | 50 RB | | RE Cheek | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.061 | 0.068 | - |
| | | | | | RE Tilt | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.041 | 0.046 | - |
| | | | | | LE Cheek | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.017 | 0.019 | - |
| | | | | | LE Tilt | - | 23130 | 711 | 22 | 21.53 | 11.43% | 0.011 | 0.012 | - |
| LTE Band 12 (Hotspot) | 10MHz | QPSK | 1 RB | 49 | Front side | 10 | 23130 | 711 | 23 | 22.53 | 11.43% | 0.013 | 0.014 | - |
| | | | | | Back side | 10 | 23130 | 711 | 23 | 22.53 | 11.43% | 0.232 | 0.259 | 120 |
| | | | | | Bottom side | 10 | 23130 | 711 | 23 | 22.53 | 11.43% | 0.092 | 0.103 | - |
| | | | | | Right side | 10 | 23130 | 711 | 23 | 22.53 | 11.43% | 0.117 | 0.130 | - |
| | | | 25 RB | 25 | Front side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.008 | 0.009 | - |
| | | | | | Back side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.193 | 0.215 | - |
| | | | | | Bottom side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.070 | 0.078 | - |
| | | | | | Right side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.091 | 0.101 | - |
| | | | 50 RB | | Front side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.007 | 0.008 | - |
| | | | | | Back side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.189 | 0.211 | - |
| | | | | | Bottom side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.065 | 0.072 | - |
| | | | | | Right side | 10 | 23130 | 711 | 22 | 21.53 | 11.43% | 0.087 | 0.097 | - |

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LTE FDD Band XIII

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 13 (Head) | 10MHz | QPSK | 1 RB | 25 | RE Cheek | - | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.066 | 0.074 | 121 |
| | | | | | RE Tilt | - | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.046 | 0.051 | - |
| | | | | | LE Cheek | - | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.050 | 0.056 | - |
| | | | | | LE Tilt | - | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.041 | 0.046 | - |
| | | | 25 RB | 0 | RE Cheek | - | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.056 | 0.062 | - |
| | | | | | RE Tilt | - | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.039 | 0.043 | - |
| | | | | | LE Cheek | - | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.044 | 0.049 | - |
| | | | | | LE Tilt | - | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.034 | 0.038 | - |
| | | | 50 RB | | RE Cheek | - | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.053 | 0.059 | - |
| | | | | | RE Tilt | - | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.038 | 0.042 | - |
| | | | | | LE Cheek | - | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.043 | 0.048 | - |
| | | | | | LE Tilt | - | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.032 | 0.036 | - |
| LTE Band 13 (Hotspot) | 10MHz | QPSK | 1 RB | 25 | Front side | 10 | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.047 | 0.052 | - |
| | | | | | Back side | 10 | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.206 | 0.230 | 122 |
| | | | | | Bottom side | 10 | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.128 | 0.143 | - |
| | | | | | Right side | 10 | 23230 | 782 | 23.5 | 23.03 | 11.43% | 0.114 | 0.127 | - |
| | | | 25 RB | 0 | Front side | 10 | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.014 | 0.016 | - |
| | | | | | Back side | 10 | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.167 | 0.186 | - |
| | | | | | Bottom side | 10 | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.105 | 0.117 | - |
| | | | | | Right side | 10 | 23230 | 782 | 22.5 | 22.04 | 11.17% | 0.092 | 0.102 | - |
| | | | 50 RB | | Front side | 10 | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.009 | 0.010 | - |
| | | | | | Back side | 10 | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.147 | 0.164 | - |
| | | | | | Bottom side | 10 | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.090 | 0.100 | - |
| | | | | | Right side | 10 | 23230 | 782 | 22.5 | 22.03 | 11.43% | 0.079 | 0.088 | - |

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LTE FDD Band XVII

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------------------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| LTE Band 17 (Head) | 10MHz | QPSK | 1 RB | 49 | RE Cheek | - | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.067 | 0.084 | 123 |
| | | | | | RE Tilt | - | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.048 | 0.060 | - |
| | | | | | LE Cheek | - | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.023 | 0.029 | - |
| | | | | | LE Tilt | - | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.016 | 0.020 | - |
| | | | 25 RB | 25 | RE Cheek | - | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.052 | 0.065 | - |
| | | | | | RE Tilt | - | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.038 | 0.048 | - |
| | | | | | LE Cheek | - | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.015 | 0.019 | - |
| | | | | | LE Tilt | - | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.013 | 0.016 | - |
| | | | 50 RB | | RE Cheek | - | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.047 | 0.060 | - |
| | | | | | RE Tilt | - | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.034 | 0.043 | - |
| | | | | | LE Cheek | - | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.013 | 0.017 | - |
| | | | | | LE Tilt | - | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.012 | 0.015 | - |
| LTE Band 17 (Hotspot) | 10MHz | QPSK | 1 RB | 25 | Front side | 10 | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.013 | 0.016 | - |
| | | | | | Back side | 10 | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.209 | 0.262 | 124 |
| | | | | | Bottom side | 10 | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.083 | 0.104 | - |
| | | | | | Right side | 10 | 23780 | 709 | 23.5 | 22.52 | 25.31% | 0.111 | 0.139 | - |
| | | | 25 RB | 0 | Front side | 10 | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.007 | 0.009 | - |
| | | | | | Back side | 10 | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.186 | 0.234 | - |
| | | | | | Bottom side | 10 | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.063 | 0.079 | - |
| | | | | | Right side | 10 | 23780 | 709 | 22.5 | 21.50 | 25.89% | 0.088 | 0.111 | - |
| | | | 50 RB | | Front side | 10 | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.005 | 0.006 | - |
| | | | | | Back side | 10 | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.178 | 0.227 | - |
| | | | | | Bottom side | 10 | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.055 | 0.070 | - |
| | | | | | Right side | 10 | 23800 | 711 | 22.5 | 21.44 | 27.64% | 0.083 | 0.106 | - |

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CDMA Cellular BC0

| Mode | Service | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|--------------------------------|--------------------|------------|---------------|------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | Measured | Reported | |
| 1xRTT Cellular BC0 (Head) | SO55/RC3 | Re Cheek | - | 1013 | 824.7 | 26.5 | 24.89 | 44.88% | 0.002 | 0.003 | 125 |
| | | Re Tilt | - | 1013 | 824.7 | 26.5 | 24.89 | 44.88% | 0.001 | 0.001 | - |
| | | Le Cheek | - | 1013 | 824.7 | 26.5 | 24.89 | 44.88% | 0.001 | 0.001 | - |
| | | Le Tilt | - | 1013 | 824.7 | 26.5 | 24.89 | 44.88% | 0.001 | 0.001 | - |
| 1xEVDO Cellular BC0 (Head) | Rev. A Subtype 2 | Re Cheek | - | 384 | 836.52 | 26.5 | 24.95 | 42.89% | 0.003 | 0.004 | 126 |
| | | Re Tilt | - | 384 | 836.52 | 26.5 | 24.95 | 42.89% | 0.001 | 0.001 | - |
| | | Le Cheek | - | 384 | 836.52 | 26.5 | 24.95 | 42.89% | 0.002 | 0.003 | - |
| | | Le Tilt | - | 384 | 836.52 | 26.5 | 24.95 | 42.89% | 0.001 | 0.001 | - |
| 1xRTT Cellular BC0 (Body-worn) | SO32/FCH | Front side | 15 | 1013 | 824.7 | 26.5 | 24.83 | 46.89% | 0.001 | 0.001 | - |
| | | Back side | 15 | 1013 | 824.7 | 26.5 | 24.83 | 46.89% | 0.029 | 0.043 | 127 |
| 1xRTT Cellular BC0 (Body-worn) | SO55/RC3 | Front side | 15 | 1013 | 824.7 | 26.5 | 24.89 | 44.88% | 0.001 | 0.001 | - |
| | | Back side | 15 | 1013 | 824.7 | 26.5 | 24.89 | 44.88% | 0.035 | 0.051 | 128 |
| 1xEVDO Cellular BC0 (Hotspot) | Rev. 0 Subtype 0/1 | Front side | 10 | 1013 | 824.7 | 26.5 | 25 | 41.25% | 0.002 | 0.003 | - |
| | | Back side | 10 | 1013 | 824.7 | 26.5 | 25 | 41.25% | 0.061 | 0.086 | 129 |
| | | Top side | 10 | 1013 | 824.7 | 26.5 | 25 | 41.25% | 0.028 | 0.040 | - |
| | | Right side | 10 | 1013 | 824.7 | 26.5 | 25 | 41.25% | 0.012 | 0.017 | - |

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CDMA PCS BC1

| Mode | Service | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|----------------------------|--------------------|------------|---------------|------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | Measured | Reported | |
| 1xRTT PCS BC1 (Head) | SO55/RC3 | Re Cheek | - | 25 | 1851.25 | 26 | 24.74 | 33.66% | 0.201 | 0.269 | - |
| | | Re Tilt | - | 25 | 1851.25 | 26 | 24.74 | 33.66% | 0.154 | 0.206 | - |
| | | Le Cheek | - | 25 | 1851.25 | 26 | 24.74 | 33.66% | 0.276 | 0.369 | 130 |
| | | Le Tilt | - | 25 | 1851.25 | 26 | 24.74 | 33.66% | 0.213 | 0.285 | - |
| 1xEVDO PCS BC1 (Head) | Rev. A Subtype 2 | Re Cheek | - | 25 | 1851.25 | 26 | 24.83 | 30.92% | 0.215 | 0.281 | - |
| | | Re Tilt | - | 25 | 1851.25 | 26 | 24.83 | 30.92% | 0.162 | 0.212 | - |
| | | Le Cheek | - | 25 | 1851.25 | 26 | 24.83 | 30.92% | 0.260 | 0.340 | 131 |
| | | Le Tilt | - | 25 | 1851.25 | 26 | 24.83 | 30.92% | 0.214 | 0.280 | - |
| 1xRTT PCS BC1 (Body-worn) | SO32/FCH | Front side | 15 | 25 | 1851.25 | 26 | 25.18 | 20.78% | 0.097 | 0.117 | - |
| | | Back side | 15 | 25 | 1851.25 | 26 | 25.18 | 20.78% | 0.466 | 0.563 | 132 |
| 1xRTT PCS BC1 (Body-worn) | SO55/RC3 | Front side | 15 | 25 | 1851.25 | 26 | 24.74 | 33.66% | 0.095 | 0.127 | - |
| | | Back side | 15 | 25 | 1851.25 | 26 | 24.74 | 33.66% | 0.484 | 0.647 | 133 |
| 1xEVDO PCS BC1 (Body-worn) | Rev. 0 Subtype 0/1 | Front side | 15 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.094 | 0.095 | - |
| | | Back side | 15 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.475 | 0.479 | 134 |
| EVDO PCS BC1 (Hotspot) | Rev. 0 Subtype 0/1 | Front side | 10 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.094 | 0.095 | - |
| | | Back side | 10 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.846 | 0.854 | 135 |
| | | Back side* | 10 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.844 | 0.852 | - |
| | | Back side | 10 | 600 | 1880 | 26 | 24.95 | 27.35% | 0.804 | 1.024 | - |
| | | Back side | 10 | 1175 | 1908.75 | 26 | 24.89 | 29.12% | 0.814 | 1.051 | - |
| | | Top side | 10 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.495 | 0.500 | - |
| | | Right side | 10 | 25 | 1851.25 | 26 | 25.96 | 0.93% | 0.259 | 0.261 | - |

* - repeated at the highest SAR measurement according to the KDB865664D01v01r04

WLAN802.11 b

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|---------------------|------------|---------------|----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| WLAN 802.11b (Head) | RE Cheek | - | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.012 | 0.012 | 136 |
| | RE Tilt | - | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.011 | 0.011 | - |
| | LE Cheek | - | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.006 | 0.006 | - |
| | LE Tilt | - | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.006 | 0.006 | - |
| Hotspot | Front side | 10 | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.011 | 0.011 | - |
| | Back side | 10 | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.061 | 0.063 | 137 |
| | Top side | 10 | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.034 | 0.035 | - |
| | Left side | 10 | 1 | 2412 | 14.5 | 14.35 | 3.51% | 0.052 | 0.054 | - |

WLAN802.11 a 5.2G

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|--------------------------|------------|---------------|----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| WLAN 802.11a 5.2G (Head) | RE Cheek | - | 40 | 5200 | 12 | 11.96 | 0.93% | 0.020 | 0.020 | 138 |
| | RE Tilt | - | 40 | 5200 | 12 | 11.96 | 0.93% | 0.010 | 0.010 | - |
| | LE Cheek | - | 40 | 5200 | 12 | 11.96 | 0.93% | 0.006 | 0.006 | - |
| | LE Tilt | - | 40 | 5200 | 12 | 11.96 | 0.93% | 0.009 | 0.009 | - |
| Body-worn | Front side | 15 | 40 | 5200 | 12 | 11.96 | 0.93% | 0.002 | 0.002 | - |
| | Back side | 15 | 40 | 5200 | 12 | 11.96 | 0.93% | 0.344 | 0.347 | 139 |

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 10g (W/kg) | | Plot page |
|---|------------|---------------|----|-------------|--|---------------------------|---------|------------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| WLAN 802.11a 5.2G (Product specific 10- | Front side | 0 | 40 | 5200 | 12 | 11.96 | 0.93% | 0.018 | 0.018 | - |
| | Back side | 0 | 40 | 5200 | 12 | 11.96 | 0.93% | 0.371 | 0.374 | 140 |
| | Top side | 0 | 40 | 5200 | 12 | 11.96 | 0.93% | 0.078 | 0.079 | - |
| | Left side | 0 | 40 | 5200 | 12 | 11.96 | 0.93% | 0.358 | 0.361 | - |

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WLAN802.11 a 5.8G

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|--------------------------|------------|---------------|-----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| WLAN 802.11a 5.8G (Head) | RE Cheek | - | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.055 | 0.056 | 141 |
| | RE Tilt | - | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.038 | 0.039 | - |
| | LE Cheek | - | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.011 | 0.011 | - |
| | LE Tilt | - | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.012 | 0.012 | - |
| Body-worn | Front side | 15 | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.017 | 0.017 | - |
| | Back side | 15 | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.422 | 0.428 | 142 |

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 10g (W/kg) | | Plot page |
|---|------------|---------------|-----|-------------|--|---------------------------|---------|------------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| WLAN 802.11a 5.8G (Product specific 10- | Front side | 0 | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.017 | 0.017 | - |
| | Back side | 0 | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.554 | 0.562 | 143 |
| | Top side | 0 | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.158 | 0.160 | - |
| | Left side | 0 | 165 | 5825 | 10.5 | 10.44 | 1.39% | 0.541 | 0.549 | - |

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3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

| Simultaneous Transmit Configurations | Head | Body-Worn | Hotspot | Product specific 10-g SAR |
|--------------------------------------|------|-----------|---------|---------------------------|
| GSM + 2.4GHz Wi-Fi | Yes | Yes | No | Yes |
| GPRS/EDGE + 2.4GHz Wi-Fi | No | No | Yes | Yes |
| WCDMA + 2.4GHz Wi-Fi | Yes | Yes | Yes | Yes |
| CDMA + 2.4GHz Wi-Fi | Yes | Yes | Yes | Yes |
| LTE + 2.4GHz Wi-Fi | Yes | Yes | Yes | Yes |
| GSM + BT | No | Yes | No | Yes |
| GPRS/EDGE + BT | No | No | No | Yes |
| WCDMA + BT | No | Yes | No | Yes |
| CDMA + BT | No | Yes | No | Yes |
| LTE + BT | No | Yes | No | Yes |
| GSM + 5GHz Wi-Fi | Yes | Yes | No | Yes |
| GPRS/EDGE + 5GHz Wi-Fi | No | No | No | Yes |
| WCDMA + 5GHz Wi-Fi | Yes | Yes | No | Yes |
| LTE + 5GHz Wi-Fi | Yes | Yes | No | Yes |

Notes:

1. The device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Held to ear configurations are not applicable to Bluetooth for this device.
3. Based on KDB447498D01 note 36, when SAR test exclusion is allowed by other published RF exposure KDB procedures, such as the 2.5 cm hotspot mode SAR test exclusion for an edge or surface, then estimated SAR is not required to determine simultaneous SAR test exclusion. Also, based on KDB648474D04 note 6, simultaneous transmission SAR for product specific 10-g SAR requires consideration only when standalone 10-g SAR is required.

3.1 Estimated SAR calculation

According to KDB447498 D01v06, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

$(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})}/x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$, where $x = 7.5$ for 1-g SAR.

When the minimum test separation distance is $< 5 \text{ mm}$, a distance of 5 mm is applied to determine SAR test exclusion

| mode | position | max. power (dB) | max. power (mW) | f(GHz) | distance (mm) | x | Estimated SAR |
|------|-----------|-----------------|-----------------|--------|---------------|-----|---------------|
| BT | body-worn | 4.5 | 2.818 | 2.48 | 15 | 7.5 | 0.039 (1g) |

3.2 SPLSR evaluation and analysis

Per KDB447498D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR sum to peak location separation ratio(SPLSR).

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion.

The ratio is determined by $(\text{SAR1} + \text{SAR2})^{1.5}/R_i$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

Simultaneous Transmission Combination

| reported SAR WWAN and WLAN 2.4GHz, Σ SAR evaluation | | | | | |
|--|----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| GSM 850 | Head | Right cheek | 0.032 | 0.012 | 0.044 |
| | | Right tilt | 0.025 | 0.011 | 0.036 |
| | | Left cheek | 0.030 | 0.006 | 0.036 |
| | | Left tilt | 0.019 | 0.006 | 0.025 |
| GPRS 850 (1Dn4UP) | Hotspot | Front | 0.095 | 0.011 | 0.106 |
| | | Back | 0.438 | 0.063 | 0.501 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.311 | - | - |
| | | Right | 0.131 | - | - |
| | | Left | - | 0.054 | - |
| GSM 1900 | Head | Right cheek | 0.042 | 0.012 | 0.054 |
| | | Right tilt | 0.027 | 0.011 | 0.038 |
| | | Left cheek | 0.025 | 0.006 | 0.031 |
| | | Left tilt | 0.025 | 0.006 | 0.031 |
| GPRS 1900 (1Dn4UP) | Hotspot | Front | 0.098 | 0.011 | 0.109 |
| | | Back | 0.587 | 0.063 | 0.650 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.421 | - | - |
| | | Right | 0.125 | - | - |
| | | Left | - | 0.054 | - |
| WCDMA Band II | Head | Right cheek | 0.092 | 0.012 | 0.104 |
| | | Right tilt | 0.040 | 0.011 | 0.051 |
| | | Left cheek | 0.055 | 0.006 | 0.061 |
| | | Left tilt | 0.062 | 0.006 | 0.068 |
| | Hotspot | Front | 0.122 | 0.011 | 0.133 |
| | | Back | 1.087 | 0.063 | 1.150 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.538 | - | - |
| | | Right | 0.176 | - | - |
| | | Left | - | 0.054 | - |

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|--|----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| WCDMA Band V | Head | Right cheek | 0.025 | 0.012 | 0.037 |
| | | Right tilt | 0.021 | 0.011 | 0.032 |
| | | Left cheek | 0.024 | 0.006 | 0.030 |
| | | Left tilt | 0.014 | 0.006 | 0.020 |
| | Hotspot | Front | 0.006 | 0.011 | 0.017 |
| | | Back | 0.142 | 0.063 | 0.205 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.083 | - | - |
| | | Right | 0.003 | - | - |
| | | Left | - | 0.054 | - |
| LTE FDD Band II | Head | Right cheek | 0.091 | 0.012 | 0.103 |
| | | Right tilt | 0.048 | 0.011 | 0.059 |
| | | Left cheek | 0.042 | 0.006 | 0.048 |
| | | Left tilt | 0.040 | 0.006 | 0.046 |
| | Hotspot | Front | 0.084 | 0.011 | 0.095 |
| | | Back | 0.711 | 0.063 | 0.774 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.459 | - | - |
| | | Right | 0.120 | - | - |
| | | Left | - | 0.054 | - |
| LTE FDD Band IV | Head | Right cheek | 0.011 | 0.012 | 0.023 |
| | | Right tilt | 0.010 | 0.011 | 0.021 |
| | | Left cheek | 0.005 | 0.006 | 0.011 |
| | | Left tilt | 0.008 | 0.006 | 0.014 |
| | Hotspot | Front | 0.007 | 0.011 | 0.018 |
| | | Back | 0.229 | 0.063 | 0.292 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.095 | - | - |
| | | Right | 0.006 | - | - |
| | | Left | - | 0.054 | - |

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| reported SAR WWAN and WLAN 2.4GHz, Σ SAR evaluation | | | | | |
|--|----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| LTE FDD Band V | Head | Right cheek | 0.013 | 0.012 | 0.025 |
| | | Right tilt | 0.008 | 0.011 | 0.019 |
| | | Left cheek | 0.011 | 0.006 | 0.017 |
| | | Left tilt | 0.006 | 0.006 | 0.012 |
| | Hotspot | Front | 0.010 | 0.011 | 0.021 |
| | | Back | 0.082 | 0.063 | 0.145 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.052 | - | - |
| | | Right | 0.003 | - | - |
| | | Left | - | 0.054 | - |
| LTE FDD Band VII | Head | Right cheek | 0.010 | 0.012 | 0.022 |
| | | Right tilt | 0.009 | 0.011 | 0.020 |
| | | Left cheek | 0.009 | 0.006 | 0.015 |
| | | Left tilt | 0.008 | 0.006 | 0.014 |
| | Hotspot | Front | 0.011 | 0.011 | 0.022 |
| | | Back | 0.354 | 0.063 | 0.417 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.070 | - | - |
| | | Right | 0.009 | - | - |
| | | Left | - | 0.054 | - |
| LTE FDD Band XII | Head | Right cheek | 0.079 | 0.012 | 0.091 |
| | | Right tilt | 0.058 | 0.011 | 0.069 |
| | | Left cheek | 0.026 | 0.006 | 0.032 |
| | | Left tilt | 0.019 | 0.006 | 0.025 |
| | Hotspot | Front | 0.014 | 0.011 | 0.025 |
| | | Back | 0.259 | 0.063 | 0.322 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.103 | - | - |
| | | Right | 0.130 | - | - |
| | | Left | - | 0.054 | - |

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|--|----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| LTE FDD Band XIII | Head | Right cheek | 0.074 | 0.012 | 0.086 |
| | | Right tilt | 0.051 | 0.011 | 0.062 |
| | | Left cheek | 0.056 | 0.006 | 0.062 |
| | | Left tilt | 0.046 | 0.006 | 0.052 |
| | Hotspot | Front | 0.052 | 0.011 | 0.063 |
| | | Back | 0.230 | 0.063 | 0.293 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.143 | - | - |
| | | Right | 0.127 | - | - |
| | | Left | - | 0.054 | - |
| LTE FDD Band XVII | Head | Right cheek | 0.084 | 0.012 | 0.096 |
| | | Right tilt | 0.060 | 0.011 | 0.071 |
| | | Left cheek | 0.029 | 0.006 | 0.035 |
| | | Left tilt | 0.020 | 0.006 | 0.026 |
| | Hotspot | Front | 0.016 | 0.011 | 0.027 |
| | | Back | 0.262 | 0.063 | 0.325 |
| | | Top | - | 0.035 | - |
| | | Bottom | 0.104 | - | - |
| | | Right | 0.139 | - | - |
| | | Left | - | 0.054 | - |
| CDMA Callular BC0 | Head | Right cheek | 0.004 | 0.012 | 0.016 |
| | | Right tilt | 0.001 | 0.011 | 0.012 |
| | | Left cheek | 0.003 | 0.006 | 0.009 |
| | | Left tilt | 0.001 | 0.006 | 0.007 |
| | Hotspot | Front | 0.003 | 0.011 | 0.014 |
| | | Back | 0.086 | 0.063 | 0.149 |
| | | Top | 0.040 | 0.035 | 0.075 |
| | | Bottom | - | - | - |
| | | Right | 0.017 | - | - |
| | | Left | - | 0.054 | - |

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| reported SAR WWAN and WLAN 2.4GHz, Σ SAR evaluation | | | | | |
|--|----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| CDMA PCS BC1 | Head | Right cheek | 0.281 | 0.012 | 0.293 |
| | | Right tilt | 0.212 | 0.011 | 0.223 |
| | | Left cheek | 0.369 | 0.006 | 0.375 |
| | | Left tilt | 0.285 | 0.006 | 0.291 |
| | Hotspot | Front | 0.095 | 0.011 | 0.106 |
| | | Back | 1.051 | 0.063 | 1.114 |
| | | Top | 0.500 | 0.035 | 0.535 |
| | | Bottom | - | - | - |
| | | Right | 0.261 | - | - |
| | | Left | - | 0.054 | - |

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| reported SAR WWAN and WLAN 5GHz, Σ SAR evaluation | | | | | |
|--|-----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| GSM 850 | Head | Right cheek | 0.032 | 0.056 | 0.088 |
| | | Right tilt | 0.025 | 0.039 | 0.064 |
| | | Left cheek | 0.030 | 0.011 | 0.041 |
| | | Left tilt | 0.019 | 0.012 | 0.031 |
| | Body-worn | Front | 0.002 | 0.017 | 0.019 |
| | | Back | 0.159 | 0.428 | 0.587 |
| GSM 1900 | Head | Right cheek | 0.042 | 0.056 | 0.098 |
| | | Right tilt | 0.027 | 0.039 | 0.066 |
| | | Left cheek | 0.025 | 0.011 | 0.036 |
| | | Left tilt | 0.025 | 0.012 | 0.037 |
| | Body-worn | Front | 0.007 | 0.017 | 0.024 |
| | | Back | 0.236 | 0.428 | 0.664 |
| WCDMA Band II | Head | Right cheek | 0.092 | 0.056 | 0.148 |
| | | Right tilt | 0.040 | 0.039 | 0.079 |
| | | Left cheek | 0.055 | 0.011 | 0.066 |
| | | Left tilt | 0.062 | 0.012 | 0.074 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| WCDMA Band V | Head | Right cheek | 0.025 | 0.056 | 0.081 |
| | | Right tilt | 0.021 | 0.039 | 0.060 |
| | | Left cheek | 0.024 | 0.011 | 0.035 |
| | | Left tilt | 0.014 | 0.012 | 0.026 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| LTE FDD Band II | Head | Right cheek | 0.091 | 0.056 | 0.147 |
| | | Right tilt | 0.048 | 0.039 | 0.087 |
| | | Left cheek | 0.042 | 0.011 | 0.053 |
| | | Left tilt | 0.040 | 0.012 | 0.052 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| LTE FDD Band IV | Head | Right cheek | 0.011 | 0.056 | 0.067 |
| | | Right tilt | 0.010 | 0.039 | 0.049 |
| | | Left cheek | 0.005 | 0.011 | 0.016 |
| | | Left tilt | 0.008 | 0.012 | 0.020 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |

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| reported SAR WWAN and WLAN 5GHz, Σ SAR evaluation | | | | | |
|--|-----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| LTE FDD Band V | Head | Right cheek | 0.013 | 0.056 | 0.069 |
| | | Right tilt | 0.008 | 0.039 | 0.047 |
| | | Left cheek | 0.011 | 0.011 | 0.022 |
| | | Left tilt | 0.006 | 0.012 | 0.018 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| LTE FDD Band VII | Head | Right cheek | 0.010 | 0.056 | 0.066 |
| | | Right tilt | 0.009 | 0.039 | 0.048 |
| | | Left cheek | 0.009 | 0.011 | 0.020 |
| | | Left tilt | 0.008 | 0.012 | 0.020 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| LTE FDD Band XII | Head | Right cheek | 0.079 | 0.056 | 0.135 |
| | | Right tilt | 0.058 | 0.039 | 0.097 |
| | | Left cheek | 0.026 | 0.011 | 0.037 |
| | | Left tilt | 0.019 | 0.012 | 0.031 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| LTE FDD Band XIII | Head | Right cheek | 0.074 | 0.056 | 0.130 |
| | | Right tilt | 0.051 | 0.039 | 0.090 |
| | | Left cheek | 0.056 | 0.011 | 0.067 |
| | | Left tilt | 0.046 | 0.012 | 0.058 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |
| LTE FDD Band XVII | Head | Right cheek | 0.084 | 0.056 | 0.140 |
| | | Right tilt | 0.060 | 0.039 | 0.099 |
| | | Left cheek | 0.029 | 0.011 | 0.040 |
| | | Left tilt | 0.020 | 0.012 | 0.032 |
| | Body-worn | Front | - | 0.017 | - |
| | | Back | - | 0.428 | - |

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| reported SAR WWAN and WLAN 5GHz, Σ SAR evaluation | | | | | |
|--|-----------|-------------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <1.6W/kg |
| CDMA Cellular BC0 | Head | Right cheek | 0.004 | 0.056 | 0.060 |
| | | Right tilt | 0.001 | 0.039 | 0.040 |
| | | Left cheek | 0.003 | 0.011 | 0.014 |
| | | Left tilt | 0.001 | 0.012 | 0.013 |
| | Body-worn | Front | 0.001 | 0.017 | 0.018 |
| | | Back | 0.051 | 0.428 | 0.479 |
| CDMA PCS BC1 | Head | Right cheek | 0.281 | 0.056 | 0.337 |
| | | Right tilt | 0.212 | 0.039 | 0.251 |
| | | Left cheek | 0.369 | 0.011 | 0.380 |
| | | Left tilt | 0.285 | 0.012 | 0.297 |
| | Body-worn | Front | 0.127 | 0.017 | 0.144 |
| | | Back | 0.647 | 0.428 | 1.075 |

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| reported SAR WWAN and Bluetooth, Σ SAR evaluation | | | | | |
|--|-----------|-------|---------------------|-----------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | Bluetooth | <1.6W/kg |
| GSM 850 | Body-Worn | Front | 0.002 | 0.039 | 0.041 |
| | | Back | 0.159 | 0.039 | 0.198 |
| GSM 1900 | Body-Worn | Front | 0.007 | 0.039 | 0.046 |
| | | Back | 0.236 | 0.039 | 0.275 |
| WCDMA Band II | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| WCDMA Band V | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band II | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band IV | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band V | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band VII | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band XII | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band XIII | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| LTE FDD Band XVII | Body-Worn | Front | - | 0.039 | - |
| | | Back | - | 0.039 | - |
| CDMA Callular BC0 | Body-Worn | Front | 0.001 | 0.039 | 0.040 |
| | | Back | 0.051 | 0.039 | 0.090 |
| CDMA PCS BC1 | Body-Worn | Front | 0.127 | 0.039 | 0.166 |
| | | Back | 0.647 | 0.039 | 0.686 |

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|--|---------------------------|-------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <4.0W/kg |
| GSM 850 | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| GPRS 850 | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| GSM 1900 | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| GPRS 1900 | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| WCDMA Band II | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| WCDMA Band V | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| LTE FDD Band II | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| LTE FDD Band IV | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |

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|--|---------------------------|-------|---------------------|-------|--------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR |
| | | | WWAN | WLAN | <4.0W/kg |
| LTE FDD Band V | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| LTE FDD Band VII | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| LTE FDD Band XII | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| LTE FDD Band XIII | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| LTE FDD Band XVII | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| CDMA Cellular BC0 | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |
| CDMA PCS BC1 | product specific 10-g SAR | Front | - | 0.018 | - |
| | | Back | - | 0.562 | - |
| | | Top | - | 0.160 | - |
| | | Left | - | 0.549 | - |

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4. Instruments List

| Manufacturer | Device | Type | Serial number | Date of last calibration | Date of next calibration |
|---------------------------------|------------------------------|-----------------|---------------|--------------------------|--------------------------|
| Schmid & Partner Engineering AG | Dosimetric E-Field Probe | EX3DV4 | 3831 | Jan.27,2016 | Jan.26,2017 |
| Schmid & Partner Engineering AG | System Validation Dipole | D750V3 | 1015 | Aug.30,2016 | Aug.29,2017 |
| | | D835V2 | 4d063 | Aug.25,2016 | Aug.25,2017 |
| | | D1750V2 | 1008 | Aug.31,2016 | Aug.30,2017 |
| | | D1900V2 | 5d027 | Apr.25,2016 | Apr.24,2017 |
| | | D2450V2 | 727 | Apr.19,2016 | Apr.18,2017 |
| | | D2600V2 | 1005 | Jan.21,2016 | Jan.20,2017 |
| | | D5GHzV2 | 1023 | Jan.26,2016 | Jan.25,2017 |
| Schmid & Partner Engineering AG | Data acquisition Electronics | DAE4 | 1374 | Aug.23,2016 | Aug.22,2017 |
| Schmid & Partner Engineering AG | Software | DASY 52 V52.8.8 | N/A | Calibration not required | Calibration not required |
| Schmid & Partner Engineering AG | Phantom | SAM | N/A | Calibration not required | Calibration not required |
| Network Analyzer | Agilent | E5071C | MY46107530 | Jan.07,2016 | Jan.06,2017 |
| Agilent | Dielectric Probe Kit | 85070E | MY44300677 | Calibration not required | Calibration not required |
| Agilent | Dual-directional coupler | 772D | MY52180142 | Apr.13,2016 | Apr.12,2017 |
| | | 778D | MY52180302 | Apr.13,2016 | Apr.12,2017 |

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| Manufacturer | Device | Type | Serial number | Date of last calibration | Date of next calibration |
|--------------|--------------------------|----------|---------------|--------------------------|--------------------------|
| Agilent | RF Signal Generator | N5181A | MY50145142 | Feb.19,2016 | Feb.18,2017 |
| Agilent | Power Meter | E4417A | MY51410006 | Jan.07,2016 | Jan.06,2017 |
| Agilent | Power Sensor | E9301H | MY51470001 | Jan.07,2016 | Jan.06,2017 |
| | | E9301H | MY51470002 | Jan.07,2016 | Jan.06,2017 |
| TECPEL | Digital thermometer | DTM-303A | TP130073 | Feb.26,2016 | Feb.25,2017 |
| Anritsu | Radio Communication Test | MT8820C | 6201061049 | Apr.08,2016 | Apr.07,2017 |

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5. Measurements

Date: 2016/11/5

GSM 850_Head_Re Cheek_CH 190

Communication System: GSM; Frequency: 836.6 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.867$ S/m; $\epsilon_r = 40.182$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(8.84, 8.84, 8.84); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0245 W/kg

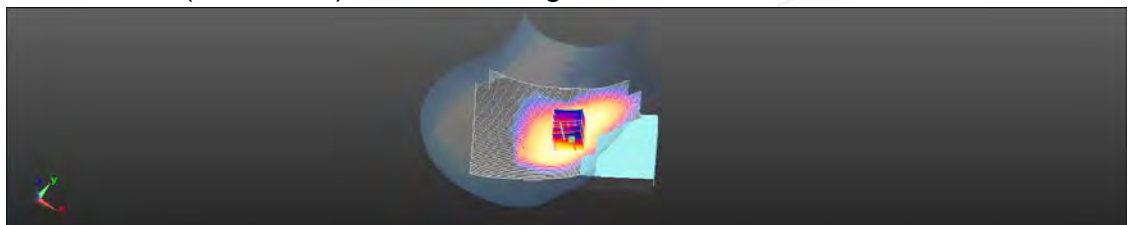
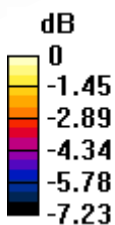
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.283 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.0260 W/kg

SAR(1 g) = 0.022 W/kg; SAR(10 g) = 0.018 W/kg

Maximum value of SAR (measured) = 0.0246 W/kg



0 dB = 0.0246 W/kg = -16.10 dBW/kg

Date: 2016/11/7

GSM 850_Body-worn_Back side_CH 190_15mm

Communication System: GSM; Frequency: 836.6 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.999$ S/m; $\epsilon_r = 53.615$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.134 W/kg

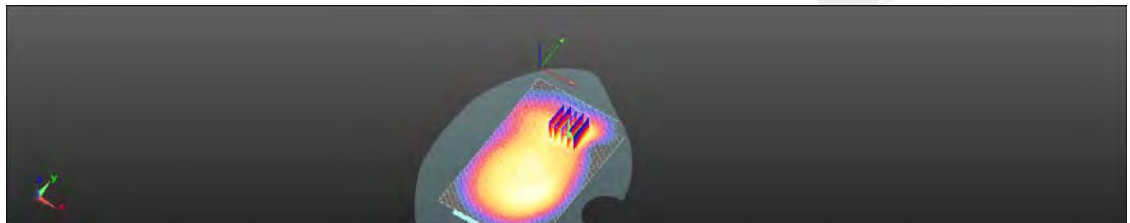
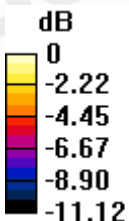
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.04 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.153 W/kg

SAR(1 g) = 0.110 W/kg; SAR(10 g) = 0.073 W/kg

Maximum value of SAR (measured) = 0.136 W/kg



0 dB = 0.136 W/kg = -8.68 dBW/kg

Date: 2016/11/7

GPRS 850_Hotspot_Back side_CH 128_10mm

Communication System: GPRS (1Dn4Up); Frequency: 824.2 MHz

Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.994$ S/m; $\epsilon_r = 53.812$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.321 W/kg

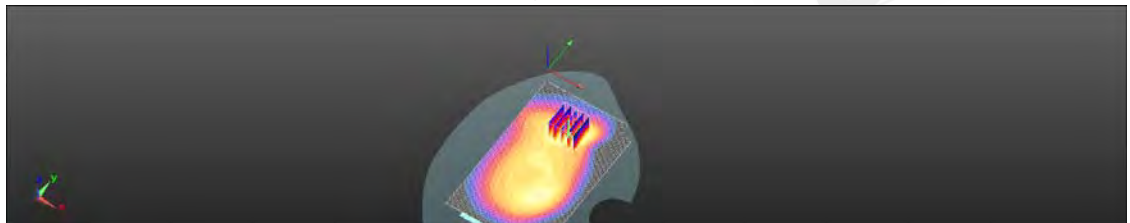
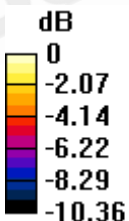
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.25 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.358 W/kg

SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.174 W/kg

Maximum value of SAR (measured) = 0.317 W/kg



0 dB = 0.317 W/kg = -5.00 dBW/kg

Date: 2016/11/6

GSM 1900_Head_Re Cheek_CH 810

Communication System: GSM; Frequency: 1909.8 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.425$ S/m; $\epsilon_r = 38.554$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.66, 7.66, 7.66); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0486 W/kg

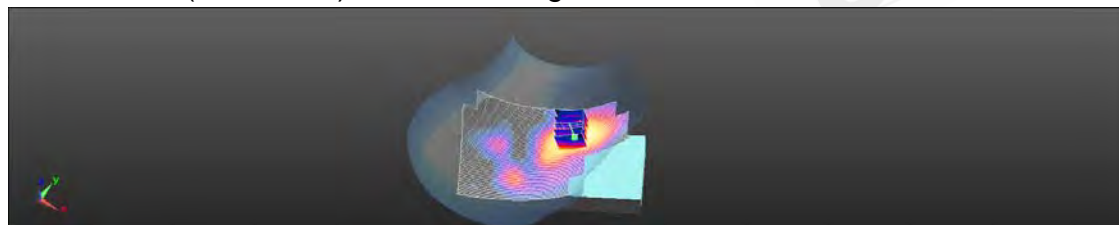
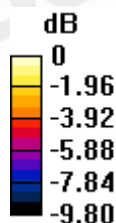
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.763 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.0570 W/kg

SAR(1 g) = 0.036 W/kg; SAR(10 g) = 0.023 W/kg

Maximum value of SAR (measured) = 0.0451 W/kg



0 dB = 0.0451 W/kg = -13.46 dBW/kg

Date: 2016/11/8

GSM 1900 Body-worn Back side CH 810_15mm

Communication System: GSM; Frequency: 1909.8 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.568$ S/m; $\epsilon_r = 54.008$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.272 W/kg

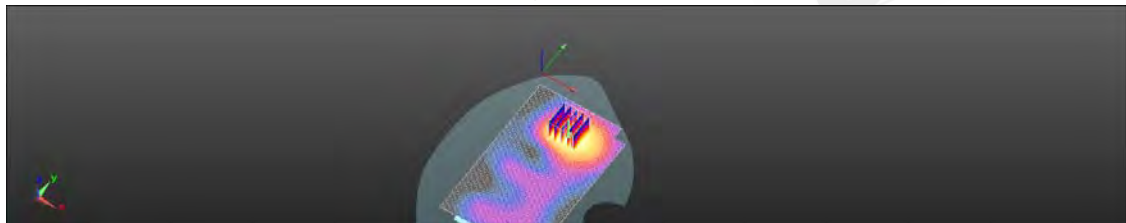
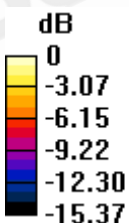
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.367 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.317 W/kg

SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.119 W/kg

Maximum value of SAR (measured) = 0.263 W/kg



0 dB = 0.263 W/kg = -5.80 dBW/kg

Date: 2016/11/8

GPRS 1900_Hotspot_Back side_CH 810_10mm

Communication System: GPRS (1Dn4Up); Frequency: 1909.8 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.568$ S/m; $\epsilon_r = 54.008$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.603 W/kg

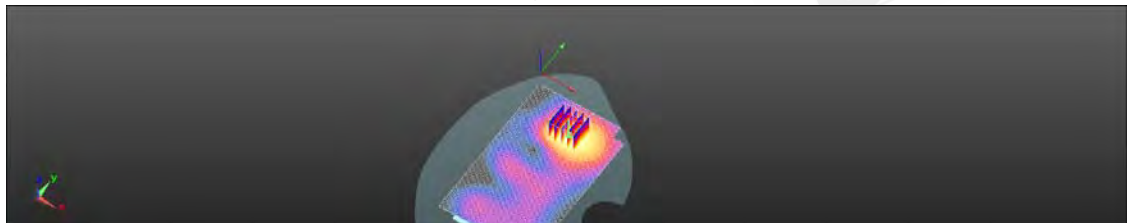
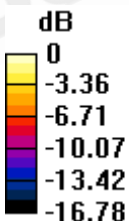
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.279 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.686 W/kg

SAR(1 g) = 0.435 W/kg; SAR(10 g) = 0.255 W/kg

Maximum value of SAR (measured) = 0.567 W/kg



0 dB = 0.567 W/kg = -2.46 dBW/kg

Date: 2016/11/6

WCDMA Band II_Head_Re Cheek_CH 9538

Communication System: WCDMA; Frequency: 1907.6 MHz

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.423$ S/m; $\epsilon_r = 38.577$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.66, 7.66, 7.66); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.113 W/kg

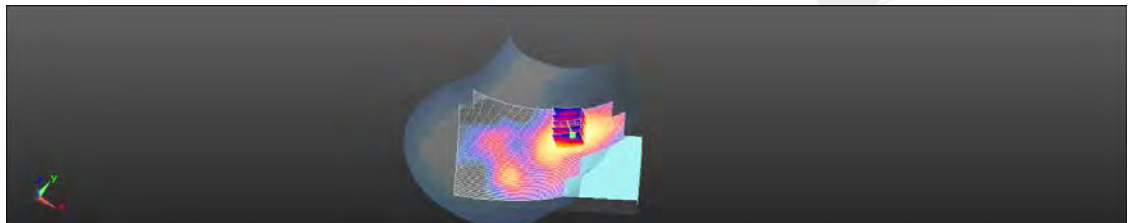
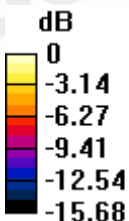
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.706 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.148 W/kg

SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.055 W/kg

Maximum value of SAR (measured) = 0.118 W/kg



0 dB = 0.118 W/kg = -9.29 dBW/kg

Date: 2016/11/8

WCDMA Band II_Hotspot_Back side_CH 9400_10mm

Communication System: WCDMA; Frequency: 1880 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.539$ S/m; $\epsilon_r = 54.115$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.49 W/kg

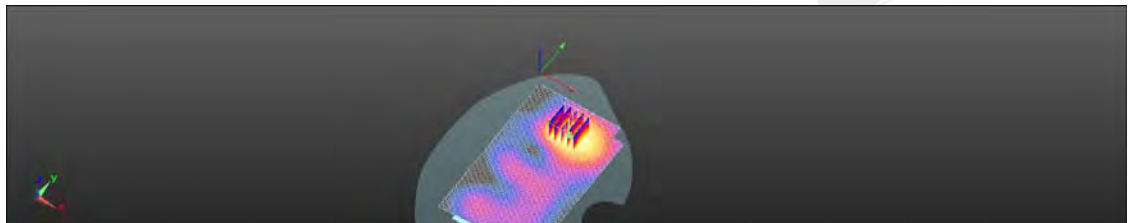
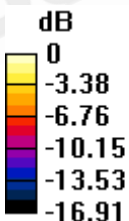
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.03 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.633 W/kg

Maximum value of SAR (measured) = 1.39 W/kg



0 dB = 1.39 W/kg = 1.43 dBW/kg

Date: 2016/11/5

WCDMA Band V_Head_Re Cheek_CH 4183

Communication System: WCDMA; Frequency: 836.6 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.867$ S/m; $\epsilon_r = 40.182$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(8.84, 8.84, 8.84); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0203 W/kg

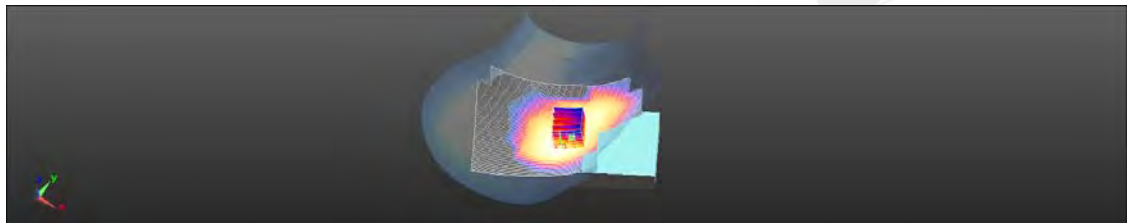
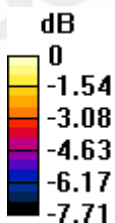
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.331 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.0210 W/kg

SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.015 W/kg

Maximum value of SAR (measured) = 0.0199 W/kg



0 dB = 0.0199 W/kg = -17.00 dBW/kg

Date: 2016/11/7

WCDMA Band V_Hotspot_Back side_CH 4183_10mm

Communication System: WCDMA; Frequency: 836.6 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.999$ S/m; $\epsilon_r = 53.615$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.127 W/kg

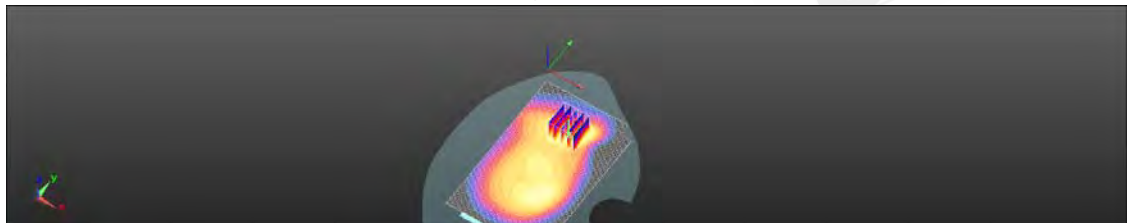
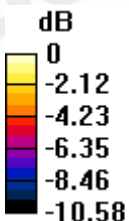
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.967 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.141 W/kg

SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.068 W/kg

Maximum value of SAR (measured) = 0.125 W/kg



0 dB = 0.125 W/kg = -9.03 dBW/kg

Date: 2016/11/6

LTE Band 2 (20MHz)_Head_Re Cheek_CH 18900_QPSK_1-50

Communication System: LTE; Frequency: 1880 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.405$ S/m; $\epsilon_r = 38.727$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.66, 7.66, 7.66); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.118 W/kg

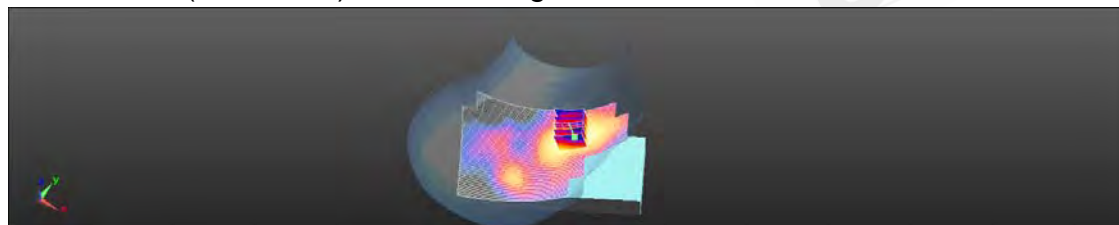
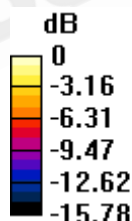
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.595 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.091 W/kg; SAR(10 g) = 0.055 W/kg

Maximum value of SAR (measured) = 0.113 W/kg



0 dB = 0.113 W/kg = -9.46 dBW/kg

Date: 2016/11/8

LTE Band 2 (20MHz)_Hotspot_Back side_CH 18900_QPSK_1-50_10mm

Communication System: LTE; Frequency: 1880 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.539$ S/m; $\epsilon_r = 54.115$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.01 W/kg

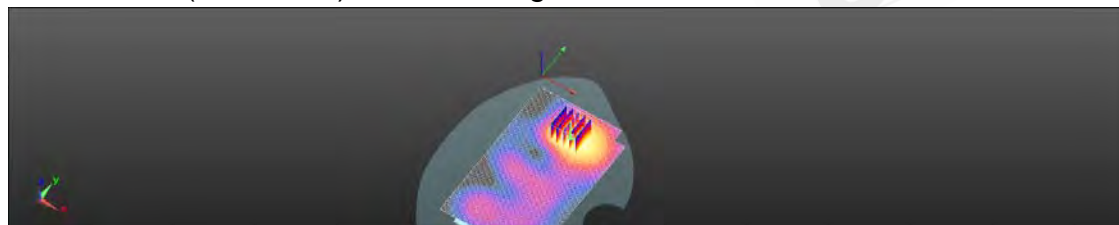
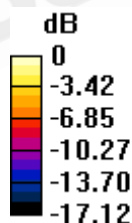
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.326 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.711 W/kg; SAR(10 g) = 0.419 W/kg

Maximum value of SAR (measured) = 0.925 W/kg



0 dB = 0.925 W/kg = -0.34 dBW/kg

Date: 2016/11/5

LTE Band 4 (20MHz)_Head_Re Cheek_CH 20050_QPSK_1-50

Communication System: LTE; Frequency: 1720 MHz

Medium parameters used: $f = 1720$ MHz; $\sigma = 1.374$ S/m; $\epsilon_r = 39.935$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.92, 7.92, 7.92); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0120 W/kg

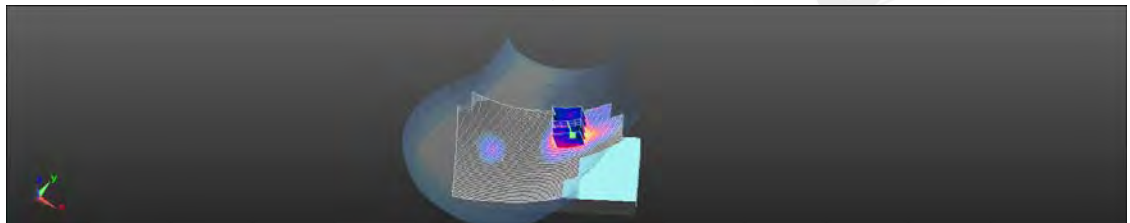
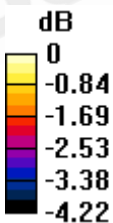
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.804 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.0160 W/kg

SAR(1 g) = 0.010 W/kg; SAR(10 g) = 0.00825 W/kg

Maximum value of SAR (measured) = 0.0128 W/kg



0 dB = 0.0128 W/kg = -18.94 dBW/kg

Date: 2016/11/7

LTE Band 4 (20MHz)_Hotspot_Back side_CH 20050_QPSK_1-50_10mm

Communication System: LTE; Frequency: 1720 MHz

Medium parameters used: $f = 1720.05$ MHz; $\sigma = 1.415$ S/m; $\epsilon_r = 54.573$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.74, 7.74, 7.74); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.267 W/kg

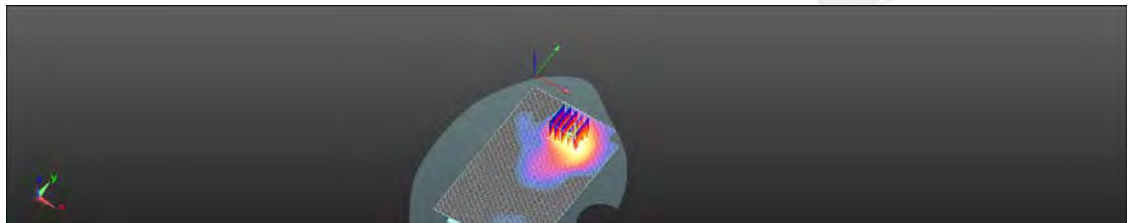
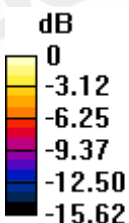
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.008 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.316 W/kg

SAR(1 g) = 0.200 W/kg; SAR(10 g) = 0.117 W/kg

Maximum value of SAR (measured) = 0.259 W/kg



0 dB = 0.259 W/kg = -5.87 dBW/kg

Date: 2016/11/5

LTE Band 5 (10MHz)_Head_Re Cheek_CH 20600_QPSK_1-0

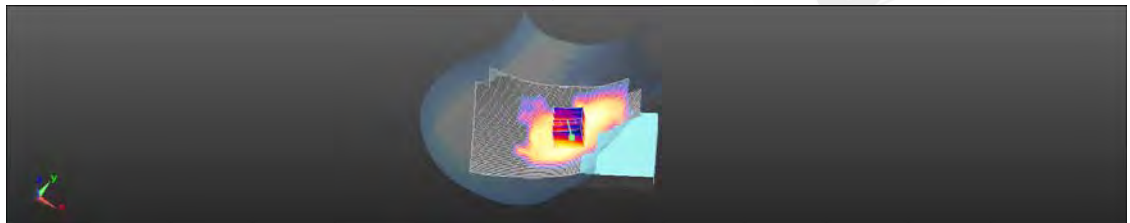
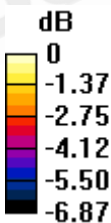
Communication System: LTE; Frequency: 844 MHz

Medium parameters used: $f = 844 \text{ MHz}$; $\sigma = 0.875 \text{ S/m}$; $\epsilon_r = 40.174$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(8.84, 8.84, 8.84); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.0142 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 2.389 V/m ; Power Drift = 0.12 dB Peak SAR (extrapolated) = 0.0160 W/kg **SAR(1 g) = 0.013 W/kg ; SAR(10 g) = 0.011 W/kg** Maximum value of SAR (measured) = 0.0147 W/kg  $0 \text{ dB} = 0.0147 \text{ W/kg} = -18.32 \text{ dBW/kg}$

Date: 2016/11/7

LTE Band 5 (10MHz)_Hotspot_Back side_CH 20600_QPSK_1-0_10mm

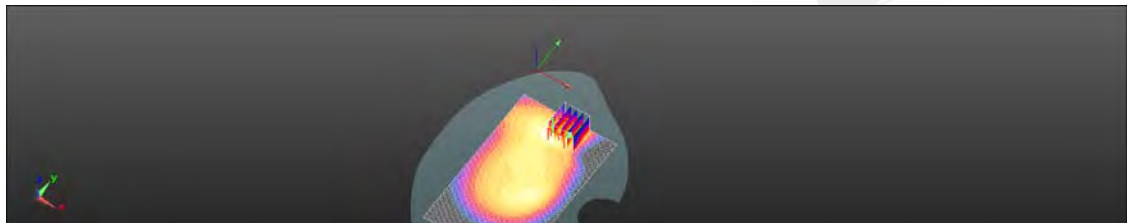
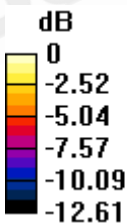
Communication System: LTE; Frequency: 844 MHz

Medium parameters used: $f = 844 \text{ MHz}$; $\sigma = 1.007 \text{ S/m}$; $\epsilon_r = 53.531$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.0932 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 7.554 V/m ; Power Drift = 0.08 dB Peak SAR (extrapolated) = 0.108 W/kg **SAR(1 g) = 0.079 W/kg ; SAR(10 g) = 0.051 W/kg** Maximum value of SAR (measured) = 0.0951 W/kg  $0 \text{ dB} = 0.0951 \text{ W/kg} = -10.22 \text{ dBW/kg}$

Date: 2016/11/6

LTE Band 7 (20MHz)_Head_Re Cheek_CH 21100_QPSK_1-0

Communication System: LTE; Frequency: 2535 MHz

Medium parameters used: $f = 2535$ MHz; $\sigma = 1.894$ S/m; $\epsilon_r = 38.219$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.71, 6.71, 6.71); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (101x171x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0207 W/kg

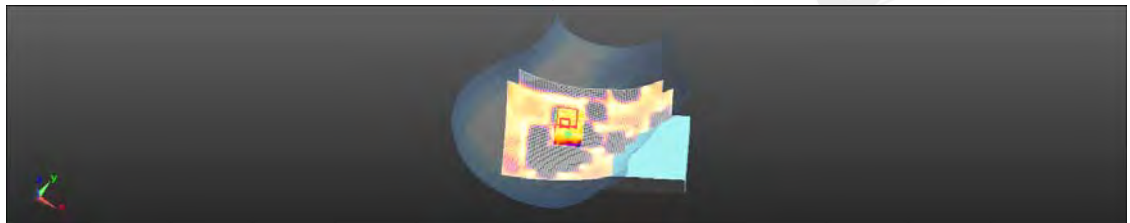
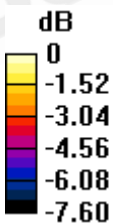
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.725 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.0140 W/kg

SAR(1 g) = 0.00829 W/kg; SAR(10 g) = 0.00702 W/kg

Maximum value of SAR (measured) = 0.0102 W/kg



0 dB = 0.0102 W/kg = -19.90 dBW/kg

Date: 2016/11/2

LTE Band 7 (20MHz)_Hotspot_Back side_CH 21100_QPSK_1-0_10mm

Communication System: LTE; Frequency: 2535 MHz

Medium parameters used: $f = 2535$ MHz; $\sigma = 2.062$ S/m; $\epsilon_r = 51.862$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.71, 6.71, 6.71); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.369 W/kg

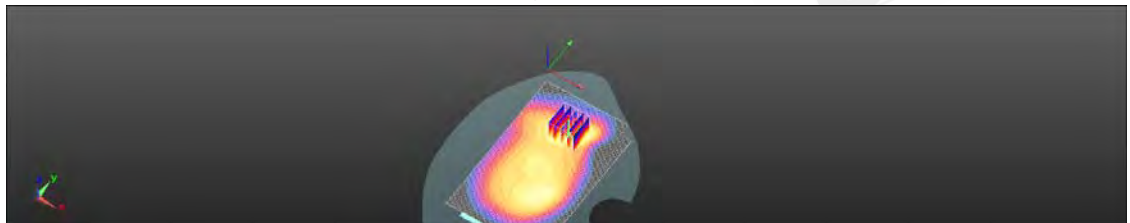
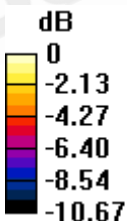
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.32 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.416 W/kg

SAR(1 g) = 0.290 W/kg; SAR(10 g) = 0.194 W/kg

Maximum value of SAR (measured) = 0.362 W/kg



0 dB = 0.362 W/kg = -4.41 dBW/kg

Date: 2016/10/28

LTE Band 12 (10MHz)_Head_Re Cheek_CH 23130_QPSK_1-49

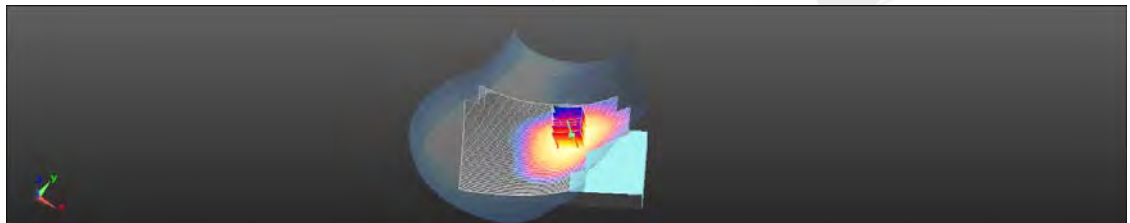
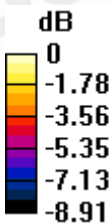
Communication System: LTE; Frequency: 711 MHz

Medium parameters used: $f = 711 \text{ MHz}$; $\sigma = 0.855 \text{ S/m}$; $\epsilon_r = 41.726$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.38, 9.38, 9.38); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.0828 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 3.236 V/m ; Power Drift = 0.07 dB Peak SAR (extrapolated) = 0.0870 W/kg **SAR(1 g) = 0.071 W/kg ; SAR(10 g) = 0.056 W/kg** Maximum value of SAR (measured) = 0.0802 W/kg  $0 \text{ dB} = 0.0802 \text{ W/kg} = -10.96 \text{ dBW/kg}$

Date: 2016/11/1

LTE Band 12 (10MHz)_Hotspot_Back side_CH 23130_QPSK_1-49_10mm

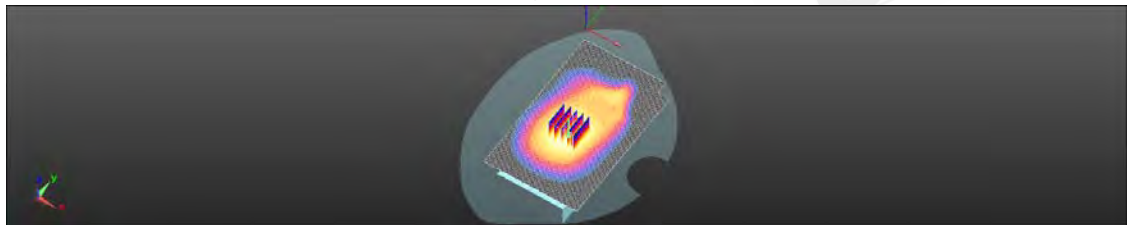
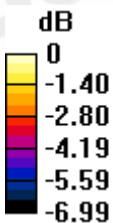
Communication System: LTE; Frequency: 711 MHz

Medium parameters used: $f = 711 \text{ MHz}$; $\sigma = 0.922 \text{ S/m}$; $\epsilon_r = 54.049$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.25, 9.25, 9.25); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.260 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 17.49 V/m ; Power Drift = 0.04 dB Peak SAR (extrapolated) = 0.276 W/kg **SAR(1 g) = 0.232 W/kg ; SAR(10 g) = 0.182 W/kg** Maximum value of SAR (measured) = 0.260 W/kg  $0 \text{ dB} = 0.260 \text{ W/kg} = -5.85 \text{ dBW/kg}$

Date: 2016/10/28

LTE Band 13 (10MHz)_Head_Re Cheek_CH 23230_QPSK_1-25

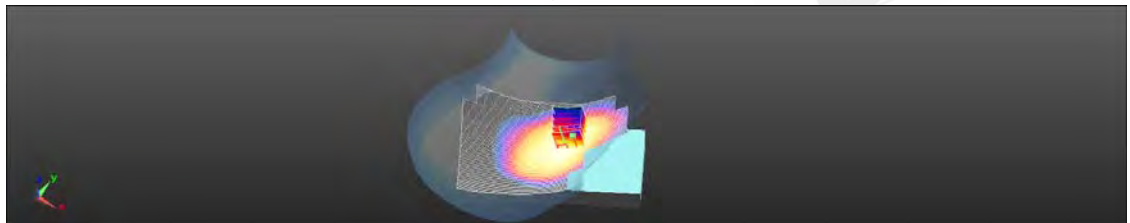
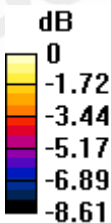
Communication System: LTE; Frequency: 782 MHz

Medium parameters used: $f = 782 \text{ MHz}$; $\sigma = 0.926 \text{ S/m}$; $\epsilon_r = 40.728$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.38, 9.38, 9.38); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.0737 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 5.086 V/m ; Power Drift = 0.17 dB Peak SAR (extrapolated) = 0.0780 W/kg **SAR(1 g) = 0.066 W/kg ; SAR(10 g) = 0.051 W/kg** Maximum value of SAR (measured) = 0.0736 W/kg  $0 \text{ dB} = 0.0736 \text{ W/kg} = -11.33 \text{ dBW/kg}$

Date: 2016/11/1

LTE Band 13 (10MHz)_Hotspot_Back side_CH 23230_QPSK_1-25_10mm

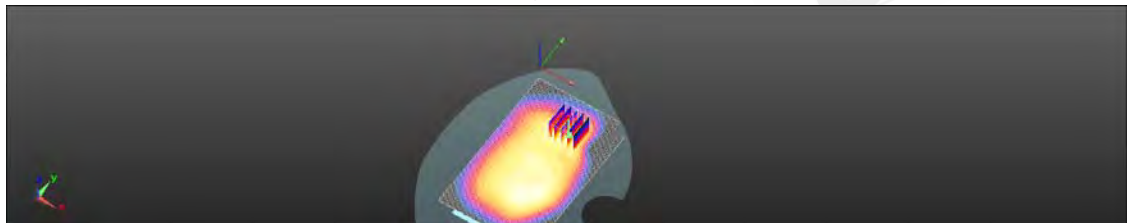
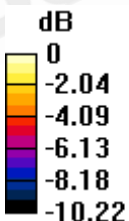
Communication System: LTE; Frequency: 782 MHz

Medium parameters used: $f = 782 \text{ MHz}$; $\sigma = 0.993 \text{ S/m}$; $\epsilon_r = 53.245$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.25, 9.25, 9.25); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.265 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 14.52 V/m ; Power Drift = -0.18 dB Peak SAR (extrapolated) = 0.286 W/kg **SAR(1 g) = 0.206 W/kg ; SAR(10 g) = 0.140 W/kg** Maximum value of SAR (measured) = 0.249 W/kg  $0 \text{ dB} = 0.249 \text{ W/kg} = -6.04 \text{ dBW/kg}$

Date: 2016/10/28

LTE Band 17 (10MHz)_Head_Re Cheek_CH 23780_QPSK_1-49

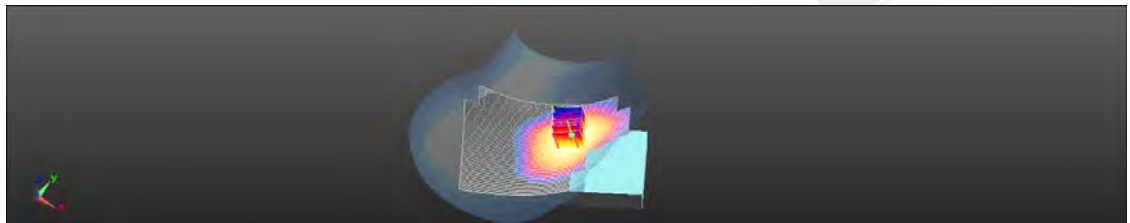
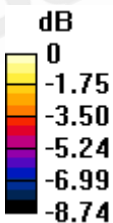
Communication System: LTE; Frequency: 709 MHz

Medium parameters used: $f = 709 \text{ MHz}$; $\sigma = 0.853 \text{ S/m}$; $\epsilon_r = 41.936$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.38, 9.38, 9.38); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.0784 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 3.233 V/m ; Power Drift = 0.14 dB Peak SAR (extrapolated) = 0.0820 W/kg **SAR(1 g) = 0.067 W/kg ; SAR(10 g) = 0.053 W/kg** Maximum value of SAR (measured) = 0.0761 W/kg  $0 \text{ dB} = 0.0761 \text{ W/kg} = -11.19 \text{ dBW/kg}$

Date: 2016/11/1

LTE Band 17 (10MHz)_Hotspot_Back side_CH 23780_QPSK_1-25_10mm

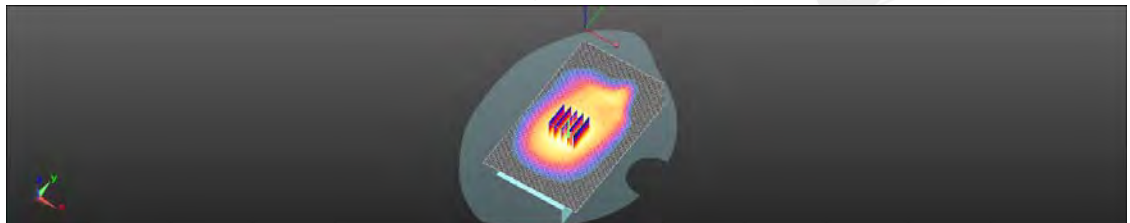
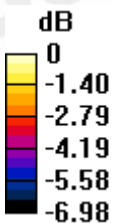
Communication System: LTE; Frequency: 709 MHz

Medium parameters used: $f = 709 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 54.101$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.25, 9.25, 9.25); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$ Maximum value of SAR (interpolated) = 0.236 W/kg **Configuration/Body/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 16.73 V/m ; Power Drift = 0.00 dB Peak SAR (extrapolated) = 0.248 W/kg **SAR(1 g) = 0.209 W/kg ; SAR(10 g) = 0.164 W/kg** Maximum value of SAR (measured) = 0.233 W/kg  $0 \text{ dB} = 0.233 \text{ W/kg} = -6.32 \text{ dBW/kg}$

Date: 2016/11/5

1xRTT Cellular BC0_Head_Re Cheek_CH 1013_SO55/RC3

Communication System: CDMA; Frequency: 824.7 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.865$ S/m; $\epsilon_r = 40.183$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(8.84, 8.84, 8.84); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.00728 W/kg

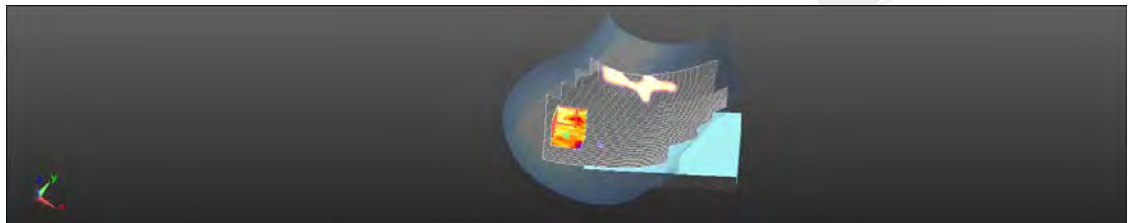
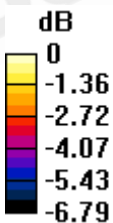
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.550 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.00260 W/kg

SAR(1 g) = 0.00171 W/kg; SAR(10 g) = 0.00125 W/kg

Maximum value of SAR (measured) = 0.00188 W/kg



0 dB = 0.00188 W/kg = -27.26 dBW/kg

Date: 2016/11/5

1xEVDO Cellular BC0_Head_Re Cheek_CH 384_Rev. A

Communication System: CDMA; Frequency: 836.52 MHz

Medium parameters used: $f = 837$ MHz; $\sigma = 0.867$ S/m; $\epsilon_r = 40.182$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(8.84, 8.84, 8.84); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.00622 W/kg

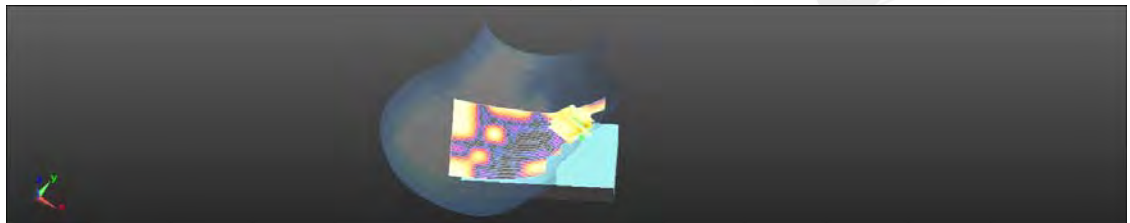
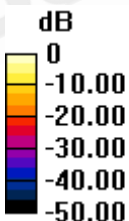
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.0120 W/kg

SAR(1 g) = 0.00259 W/kg; SAR(10 g) = 0.00198 W/kg

Maximum value of SAR (measured) = 0.00264 W/kg



0 dB = 0.00264 W/kg = -25.79 dBW/kg

Date: 2016/11/7

1xRTT Cellular BC0_Body-worn_Back side_CH 1013_15mm_SO32/FCH

Communication System: CDMA; Frequency: 824.7 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.995$ S/m; $\epsilon_r = 53.795$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0344 W/kg

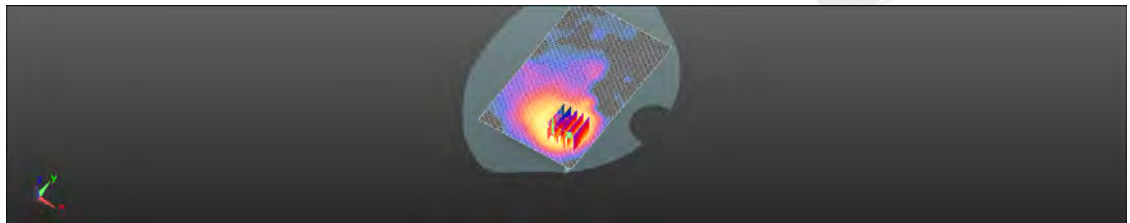
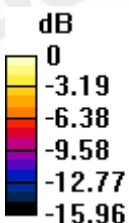
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.832 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.0600 W/kg

SAR(1 g) = 0.029 W/kg; SAR(10 g) = 0.017 W/kg

Maximum value of SAR (measured) = 0.0479 W/kg



0 dB = 0.0479 W/kg = -13.20 dBW/kg

Date: 2016/11/7

1xRTT Cellular BC0_Body-worn_Back side_CH 1013_15mm_SO55/RC3

Communication System: CDMA; Frequency: 824.7 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.995$ S/m; $\epsilon_r = 53.795$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0884 W/kg

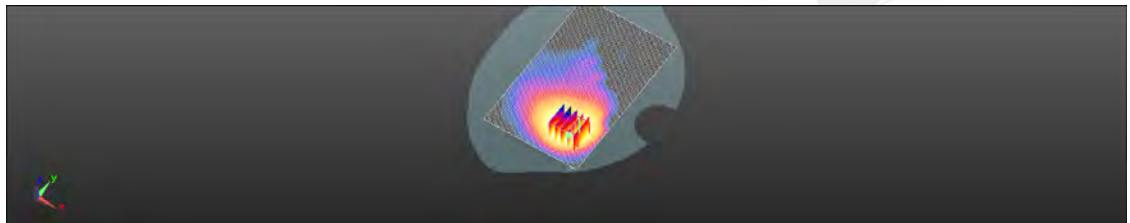
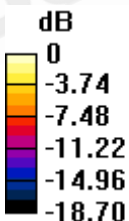
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.282 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.111 W/kg

SAR(1 g) = 0.035 W/kg; SAR(10 g) = 0.027 W/kg

Maximum value of SAR (measured) = 0.0875 W/kg



0 dB = 0.0875 W/kg = -10.58 dBW/kg

Date: 2016/11/7

1xEVDO Cellular BC0_Hotspot_Back side_CH 1013_10mm_Rev. 0

Communication System: CDMA; Frequency: 824.7 MHz

Medium parameters used: $f = 825$ MHz; $\sigma = 0.995$ S/m; $\epsilon_r = 53.795$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0891 W/kg

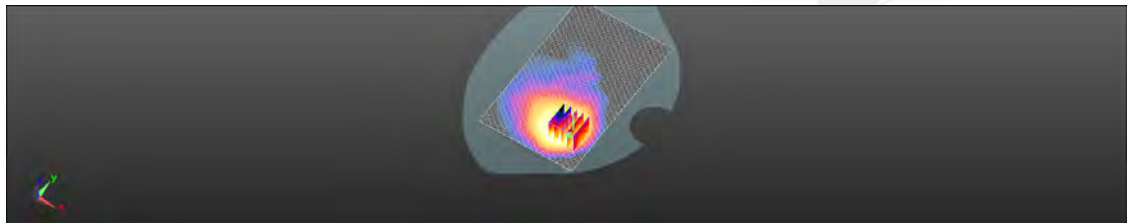
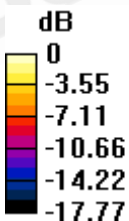
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.937 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.128 W/kg

SAR(1 g) = 0.061 W/kg; SAR(10 g) = 0.035 W/kg

Maximum value of SAR (measured) = 0.0856 W/kg



0 dB = 0.0856 W/kg = -10.67 dBW/kg

Date: 2016/11/6

1xRTT PCS BC1_Head_Le Cheek_CH 25_SO55/RC3

Communication System: CDMA; Frequency: 1851.25 MHz

Medium parameters used: $f = 1851.25$ MHz; $\sigma = 1.386$ S/m; $\epsilon_r = 38.841$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.66, 7.66, 7.66); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x141x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.401 W/kg

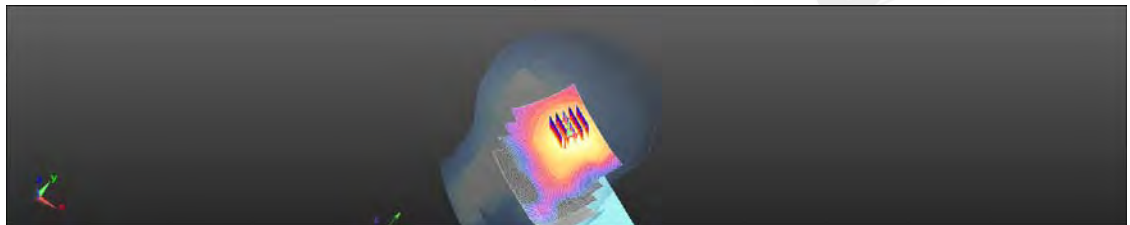
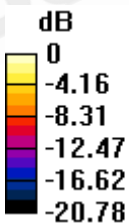
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.015 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.529 W/kg

SAR(1 g) = 0.276 W/kg; SAR(10 g) = 0.148 W/kg

Maximum value of SAR (measured) = 0.400 W/kg



0 dB = 0.400 W/kg = -3.98 dBW/kg

Date: 2016/11/6

1xEVDO PCS BC1_Head_Le Cheek_CH 25_Rev. A

Communication System: CDMA; Frequency: 1851.25 MHz

Medium parameters used: $f = 1851.25$ MHz; $\sigma = 1.386$ S/m; $\epsilon_r = 38.841$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.66, 7.66, 7.66); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.354 W/kg

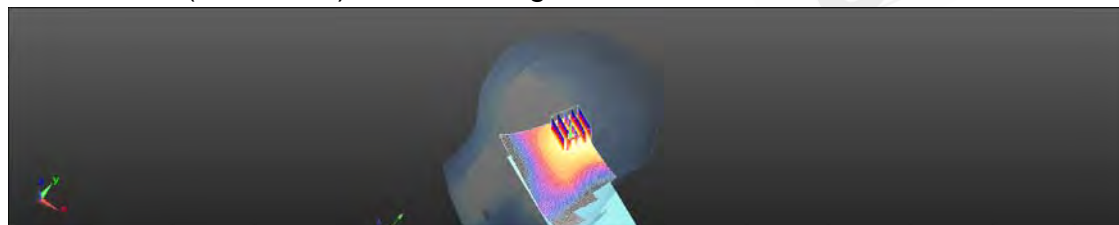
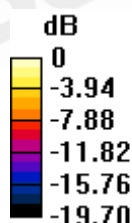
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.771 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.493 W/kg

SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.141 W/kg

Maximum value of SAR (measured) = 0.374 W/kg



0 dB = 0.374 W/kg = -4.27 dBW/kg

Date: 2016/11/8

1xRTT PCS BC1_Body-worn_Back side_CH 25_15mm_SO32/FCH

Communication System: CDMA; Frequency: 1851.25 MHz

Medium parameters used: $f = 1851.71$ MHz; $\sigma = 1.51$ S/m; $\epsilon_r = 54.309$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.639 W/kg

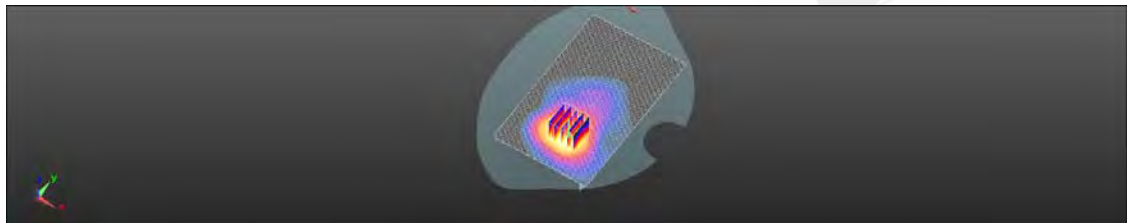
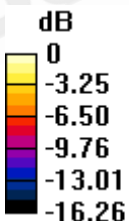
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.611 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.730 W/kg

SAR(1 g) = 0.466 W/kg; SAR(10 g) = 0.281 W/kg

Maximum value of SAR (measured) = 0.607 W/kg



0 dB = 0.607 W/kg = -2.17 dBW/kg

Date: 2016/11/8

1xRTT PCS BC1_Body-worn_Back side_CH 25_15mm_SO55/RC3

Communication System: CDMA; Frequency: 1851.25 MHz

Medium parameters used: $f = 1851.71$ MHz; $\sigma = 1.51$ S/m; $\epsilon_r = 54.309$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.669 W/kg

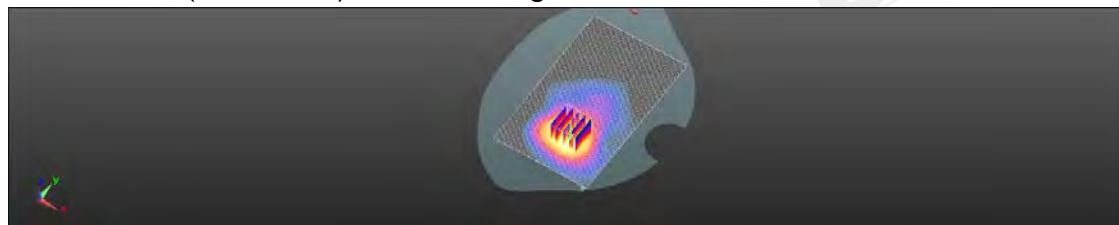
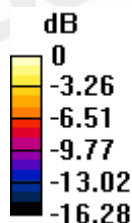
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.468 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.760 W/kg

SAR(1 g) = 0.484 W/kg; SAR(10 g) = 0.292 W/kg

Maximum value of SAR (measured) = 0.631 W/kg



0 dB = 0.631 W/kg = -2.00 dBW/kg

Date: 2016/11/8

1xEVDO PCS BC1_Body-worn_Back side_CH 25_15mm_Rev. 0

Communication System: CDMA; Frequency: 1851.25 MHz

Medium parameters used: $f = 1851.71$ MHz; $\sigma = 1.51$ S/m; $\epsilon_r = 54.309$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.685 W/kg

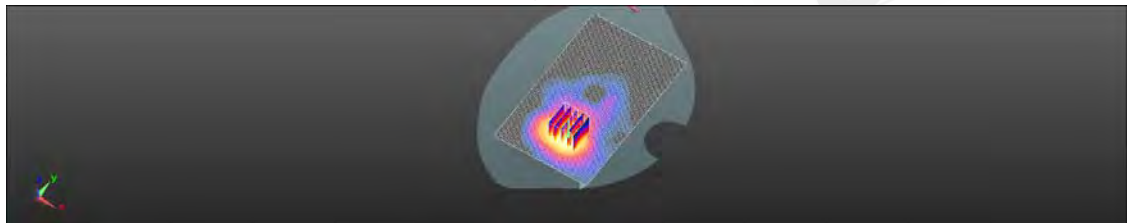
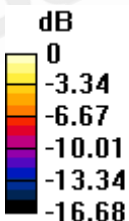
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.753 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.905 W/kg

SAR(1 g) = 0.475 W/kg; SAR(10 g) = 0.286 W/kg

Maximum value of SAR (measured) = 0.649 W/kg



0 dB = 0.649 W/kg = -1.87 dBW/kg

Date: 2016/11/8

1xEVDO PCS BC1_Hotspot_Back side_CH 25_10mm_Rev. 0

Communication System: CDMA; Frequency: 1851.25 MHz

Medium parameters used: $f = 1851.71$ MHz; $\sigma = 1.51$ S/m; $\epsilon_r = 54.309$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (81x131x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.959 W/kg

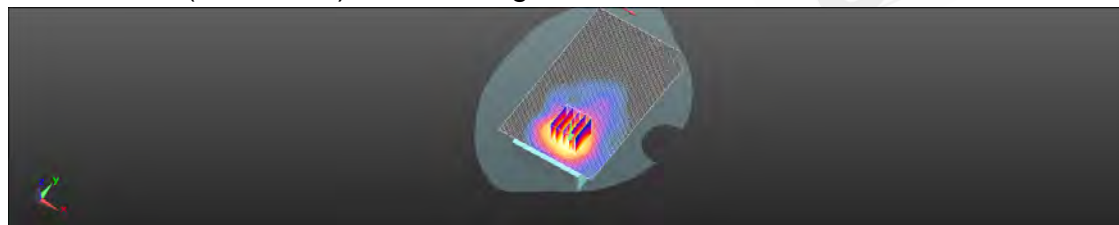
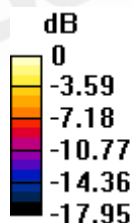
Configuration/Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.030 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.846 W/kg; SAR(10 g) = 0.489 W/kg

Maximum value of SAR (measured) = 1.11 W/kg



0 dB = 1.11 W/kg = 0.44 dBW/kg

Date: 2016/11/6

WLAN 802.11b_Head_Re Cheek_CH 1

Communication System: WLAN(2.45G); Frequency: 2412 MHz

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.808$ S/m; $\epsilon_r = 39.274$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.92, 6.92, 6.92); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (101x171x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0293 W/kg

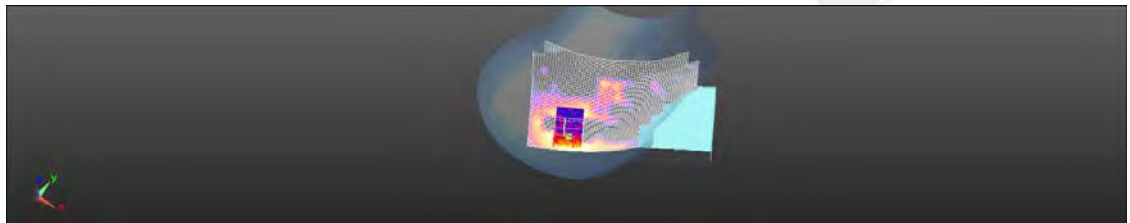
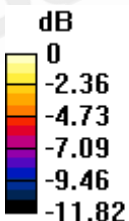
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.112 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.0230 W/kg

SAR(1 g) = 0.012 W/kg; SAR(10 g) = 0.00731 W/kg

Maximum value of SAR (measured) = 0.0179 W/kg



0 dB = 0.0179 W/kg = -17.46 dBW/kg

Date: 2016/11/8

WLAN 802.11b_Hotspot_Back side_CH 1_10mm

Communication System: WLAN(2.45G); Frequency: 2412 MHz

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.939$ S/m; $\epsilon_r = 52.204$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.05, 7.05, 7.05); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (101x161x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0850 W/kg

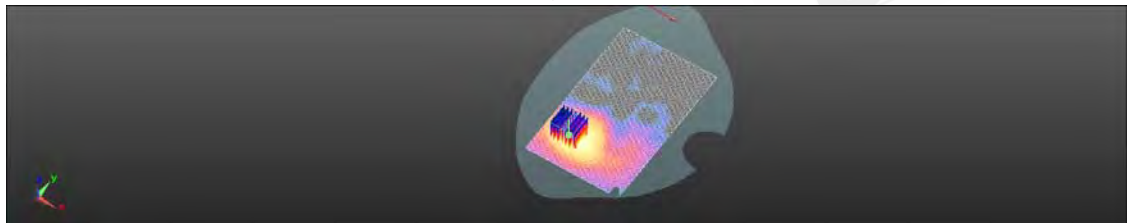
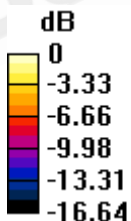
Configuration/Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.089 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.113 W/kg

SAR(1 g) = 0.061 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0869 W/kg



0 dB = 0.0869 W/kg = -10.61 dBW/kg

Date: 2016/11/2

WLAN 802.11a 5.2G_Head_Re Cheek_CH 40

Communication System: WLAN(5G); Frequency: 5200 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.603$ S/m; $\epsilon_r = 34.721$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.76, 4.76, 4.76); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (121x191x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.0860 W/kg

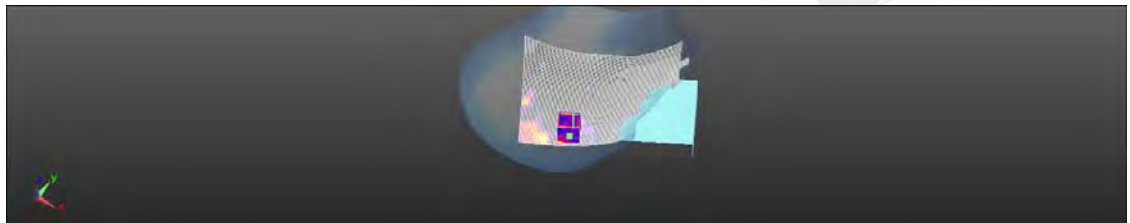
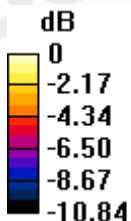
Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.128 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.102 W/kg

SAR(1 g) = 0.020 W/kg; SAR(10 g) = 0.00632 W/kg

Maximum value of SAR (measured) = 0.0544 W/kg



0 dB = 0.0544 W/kg = -12.64 dBW/kg

Date: 2016/11/2

WLAN 802.11a 5.2G_Body-worn_Back side_CH 40_15mm

Communication System: WLAN(5G); Frequency: 5200 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.486$ S/m; $\epsilon_r = 47.721$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.07, 4.07, 4.07); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (121x191x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.627 W/kg

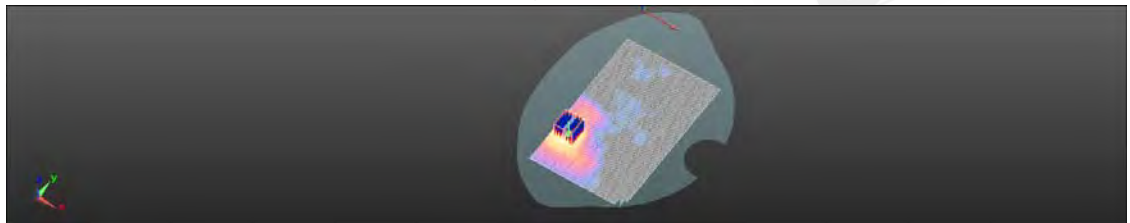
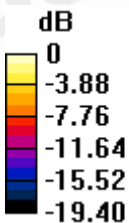
Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.852 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.344 W/kg; SAR(10 g) = 0.140 W/kg

Maximum value of SAR (measured) = 0.621 W/kg



0 dB = 0.621 W/kg = -2.07 dBW/kg

Date: 2016/11/2

WLAN 802.11a 5.2G_Product specific 10-g SAR_Back side_CH 40_0mm

Communication System: WLAN(5G); Frequency: 5200 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.486$ S/m; $\epsilon_r = 47.721$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.07, 4.07, 4.07); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (121x191x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 2.50 W/kg

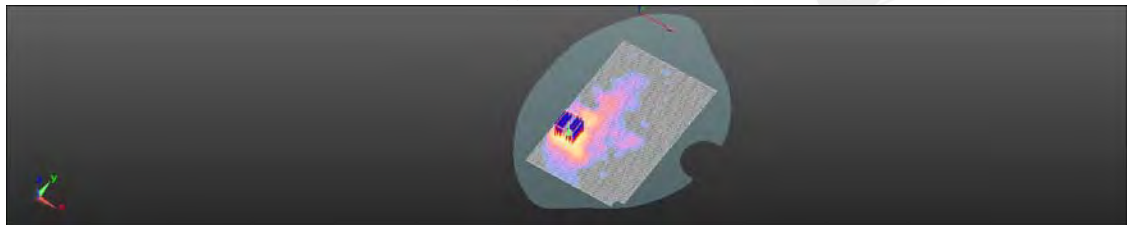
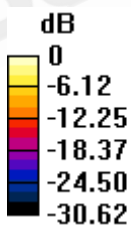
Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.384 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 4.62 W/kg

SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.371 W/kg

Maximum value of SAR (measured) = 2.53 W/kg



0 dB = 2.53 W/kg = 4.04 dBW/kg

Date: 2016/11/2

WLAN 802.11a 5.8G Head_Re Cheek_CH 165

Communication System: WLAN(5G); Frequency: 5825 MHz

Medium parameters used: $f = 5825$ MHz; $\sigma = 5.228$ S/m; $\epsilon_r = 34.096$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.1, 4.1, 4.1); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (121x191x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.160 W/kg

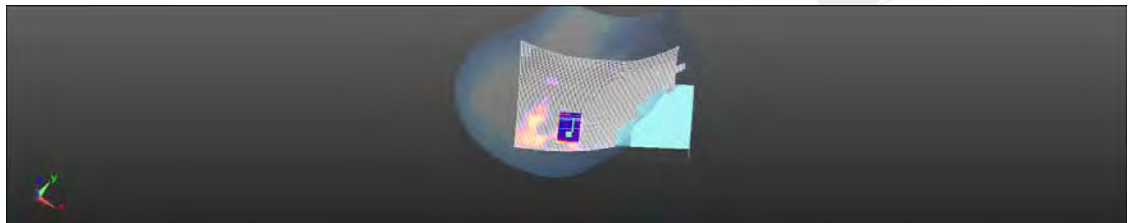
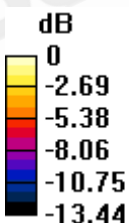
Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.098 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.265 W/kg

SAR(1 g) = 0.055 W/kg; SAR(10 g) = 0.016 W/kg

Maximum value of SAR (measured) = 0.122 W/kg



0 dB = 0.122 W/kg = -9.13 dBW/kg

Date: 2016/11/2

WLAN 802.11a 5.8G_Body-worn_Back side_CH 165_15mm

Communication System: WLAN(5G); Frequency: 5825 MHz

Medium parameters used: $f = 5825$ MHz; $\sigma = 6.111$ S/m; $\epsilon_r = 46.901$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(3.52, 3.52, 3.52); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (121x191x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.752 W/kg

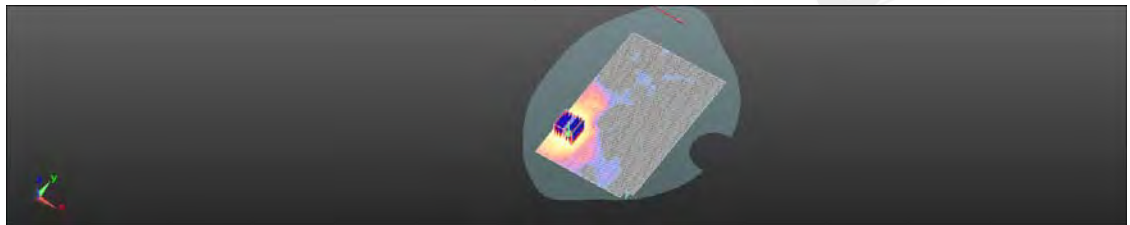
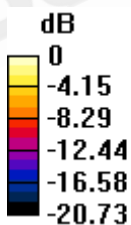
Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.470 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.422 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.753 W/kg



0 dB = 0.753 W/kg = -1.23 dBW/kg

Date: 2016/11/2

WLAN 802.11a 5.8G_Product specific 10-g SAR_Back side_CH 165_0mm

Communication System: WLAN(5G); Frequency: 5825 MHz

Medium parameters used: $f = 5825$ MHz; $\sigma = 6.111$ S/m; $\epsilon_r = 46.901$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(3.52, 3.52, 3.52); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Body/Area Scan (121x191x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 3.39 W/kg

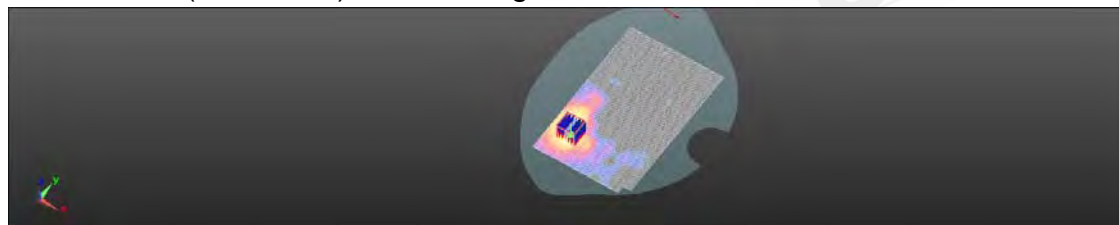
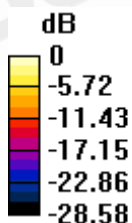
Configuration/Body/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.5700 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 6.42 W/kg

SAR(1 g) = 1.63 W/kg; SAR(10 g) = 0.554 W/kg

Maximum value of SAR (measured) = 3.42 W/kg



0 dB = 3.42 W/kg = 5.35 dBW/kg

6. SAR System Performance Verification

Date: 2016/10/28

Dipole 750 MHz_SN:1015_Head

Communication System: CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.894 \text{ S/m}$; $\epsilon_r = 41.205$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.38, 9.38, 9.38); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 2.55 W/kg

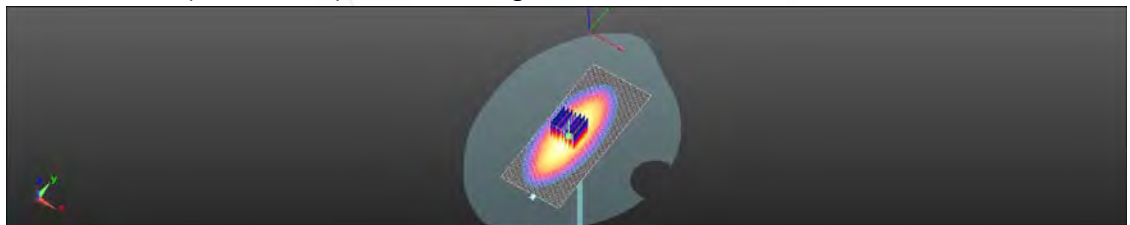
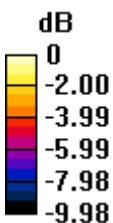
Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 52.39 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 2.99 W/kg

SAR(1 g) = 2.03 W/kg; SAR(10 g) = 1.35 W/kg

Maximum value of SAR (measured) = 2.55 W/kg

 $0 \text{ dB} = 2.55 \text{ W/kg} = 4.07 \text{ dBW/kg}$

Date: 2016/11/1

Dipole 750 MHz_SN:1015_Body

Communication System: CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.961 \text{ S/m}$; $\epsilon_r = 53.674$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.25, 9.25, 9.25); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 2.63 W/kg

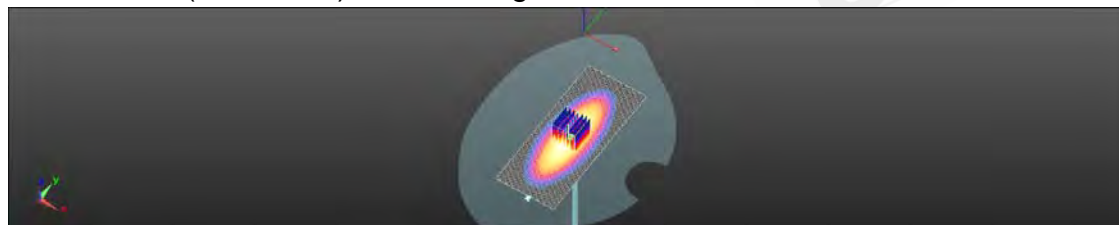
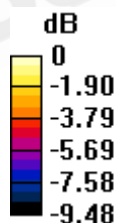
Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.51 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.08 W/kg

SAR(1 g) = 2.24 W/kg; SAR(10 g) = 1.45 W/kg

Maximum value of SAR (measured) = 2.65 W/kg



0 dB = 2.65 W/kg = 4.24 dBW/kg

Date: 2016/11/5

Dipole 835 MHz_SN:4d063_Head

Communication System: UID 10000, CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.866 \text{ S/m}$; $\epsilon_r = 40.183$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(8.84, 8.84, 8.84); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x121x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 3.03 W/kg

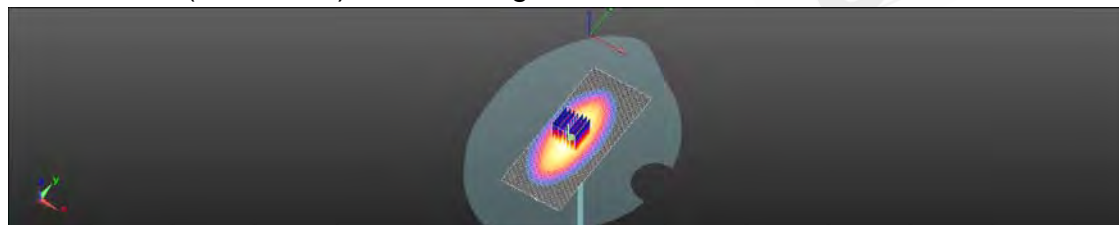
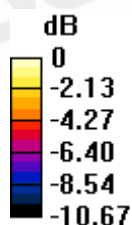
Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.65 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.57 W/kg

SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (measured) = 3.00 W/kg



0 dB = 3.00 W/kg = 4.77 dBW/kg

Date: 2016/11/7

Dipole 835 MHz_SN:4d063_Body

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.997 \text{ S/m}$; $\epsilon_r = 53.767$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(9.08, 9.08, 9.08); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x111x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 2.88 W/kg

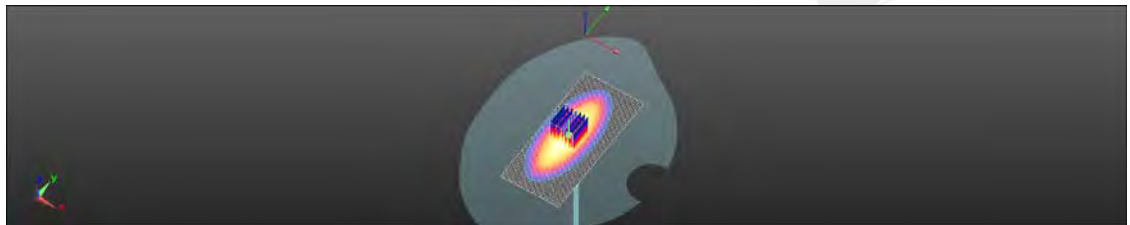
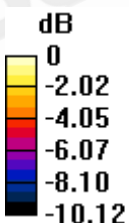
Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.87 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 3.35 W/kg

SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.55 W/kg

Maximum value of SAR (measured) = 2.88 W/kg



0 dB = 2.88 W/kg = 4.59 dBW/kg

Date: 2016/11/5

Dipole 1750 MHz_SN:1008_Head

Communication System: CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.412$ S/m; $\epsilon_r = 39.809$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.92, 7.92, 7.92); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x101x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 13.2 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

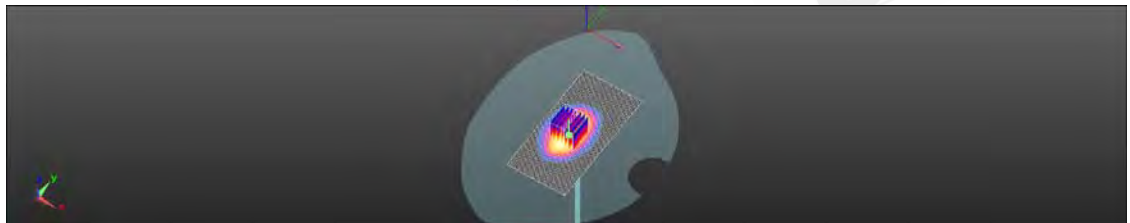
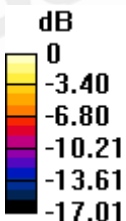
dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.99 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 15.5 W/kg

SAR(1 g) = 9.57 W/kg; SAR(10 g) = 4.93 W/kg

Maximum value of SAR (measured) = 12.0 W/kg



0 dB = 12.0 W/kg = 10.79 dBW/kg

Date: 2016/11/7

Dipole 1750 MHz_SN:1008_Body

Communication System: CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.445$ S/m; $\epsilon_r = 54.426$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.74, 7.74, 7.74); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x101x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.5 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

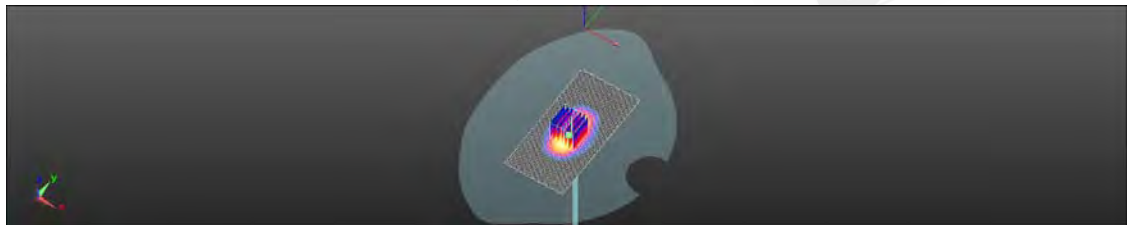
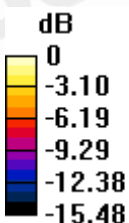
dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.82 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 15.4 W/kg

SAR(1 g) = 8.93 W/kg; SAR(10 g) = 4.89 W/kg

Maximum value of SAR (measured) = 12.4 W/kg



0 dB = 12.4 W/kg = 10.93 dBW/kg

Date: 2016/11/6

Dipole 1900 MHz_SN:5d027_Head

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.416$ S/m; $\epsilon_r = 38.592$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.66, 7.66, 7.66); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (41x81x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.1 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

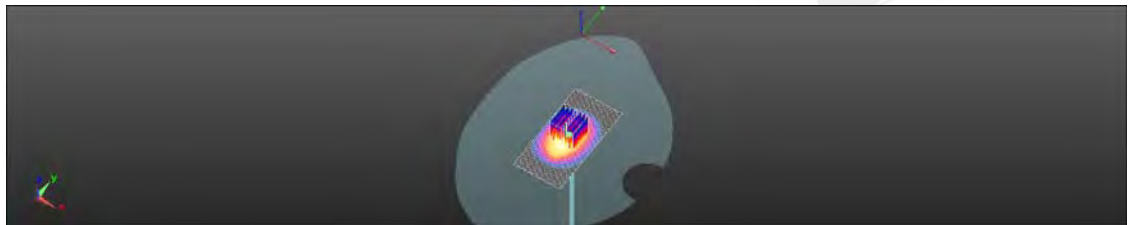
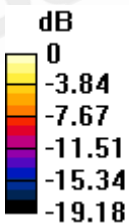
dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.1 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 9.6 W/kg; SAR(10 g) = 4.89 W/kg

Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.46 dBW/kg

Date: 2016/11/8

Dipole 1900 MHz_SN:5d027_Body

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.559$ S/m; $\epsilon_r = 54.025$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.54, 7.54, 7.54); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (41x81x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.9 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

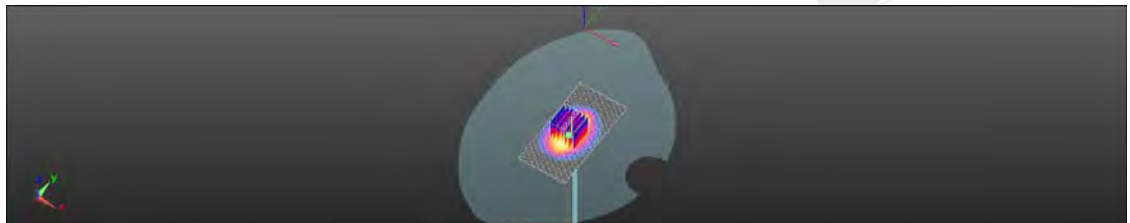
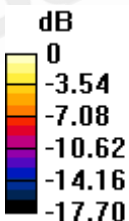
dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.00 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.29 W/kg

Maximum value of SAR (measured) = 14.2 W/kg



0 dB = 14.2 W/kg = 11.51 dBW/kg

Date: 2016/11/6

Dipole 2450 MHz_SN:727_Head

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.841$ S/m; $\epsilon_r = 39.021$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.92, 6.92, 6.92); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 22.8 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

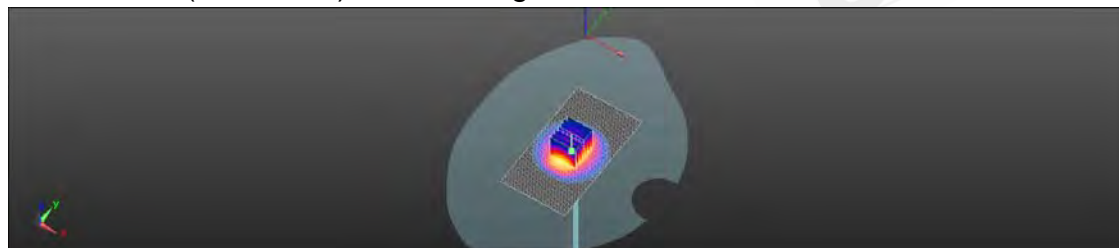
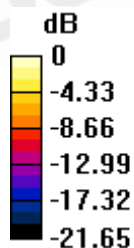
dx=5mm, dy=5mm, dz=5mm

Reference Value = 113.1 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 27.8 W/kg

SAR(1 g) = 12.7 W/kg; SAR(10 g) = 6.01 W/kg

Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 20.9 W/kg = 13.19 dBW/kg

Date: 2016/11/8

Dipole 2450 MHz_SN:727_Body

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.977$ S/m; $\epsilon_r = 51.977$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(7.05, 7.05, 7.05); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.7 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

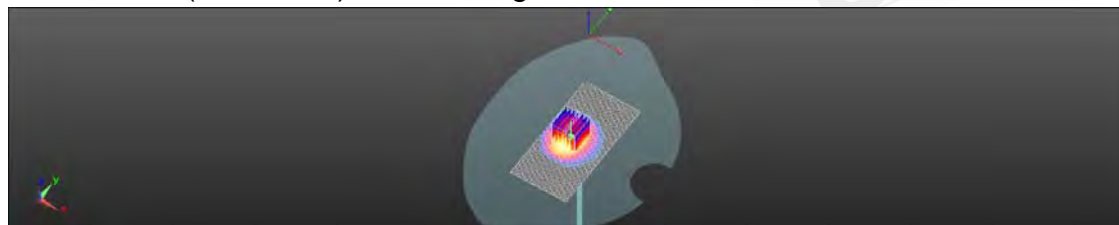
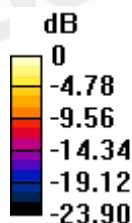
dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.32 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 28.3 W/kg

SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.87 W/kg

Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 20.9 W/kg = 13.20 dBW/kg

Date: 2016/11/6

Dipole 2600 MHz_SN:1005_Head

Communication System: CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.959$ S/m; $\epsilon_r = 37.938$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.71, 6.71, 6.71); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 22.4 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

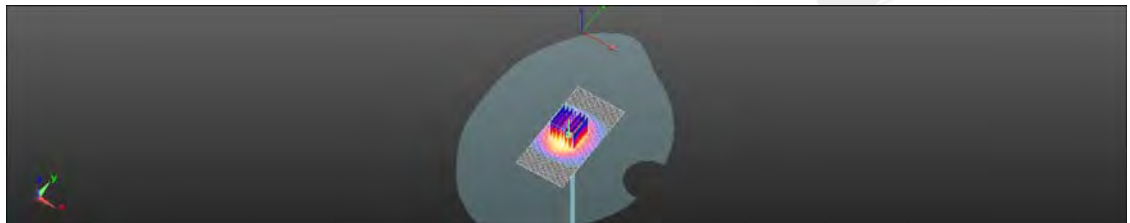
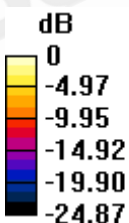
dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.1 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 30.5 W/kg

SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.04 W/kg

Maximum value of SAR (measured) = 21.5 W/kg



0 dB = 21.5 W/kg = 13.33 dBW/kg

Date: 2016/11/2

Dipole 2600 MHz_SN:1005_Body

Communication System: CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.127$ S/m; $\epsilon_r = 51.797$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.71, 6.71, 6.71); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=250mW/Area Scan (51x91x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 24.6 W/kg

Configuration/Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

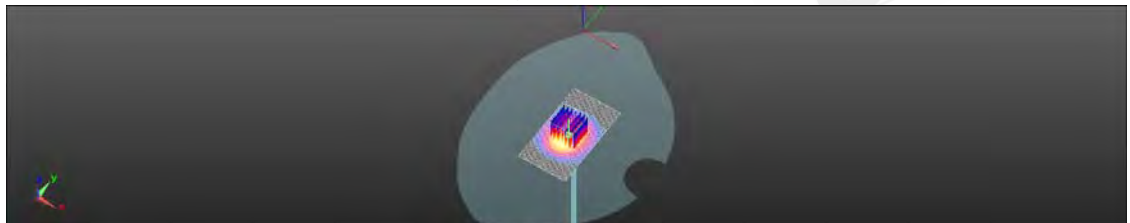
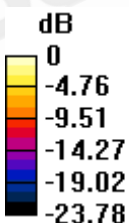
dx=5mm, dy=5mm, dz=5mm

Reference Value = 102.3 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 31.2 W/kg

SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.33 W/kg

Maximum value of SAR (measured) = 22.6 W/kg



0 dB = 22.6 W/kg = 13.54 dBW/kg

Date: 2016/11/2

Dipole 5200 MHz_SN:1023_Head

Communication System: CW; Frequency: 5200 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.603$ S/m; $\epsilon_r = 34.721$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.76, 4.76, 4.76); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 19.9 W/kg

Configuration/Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

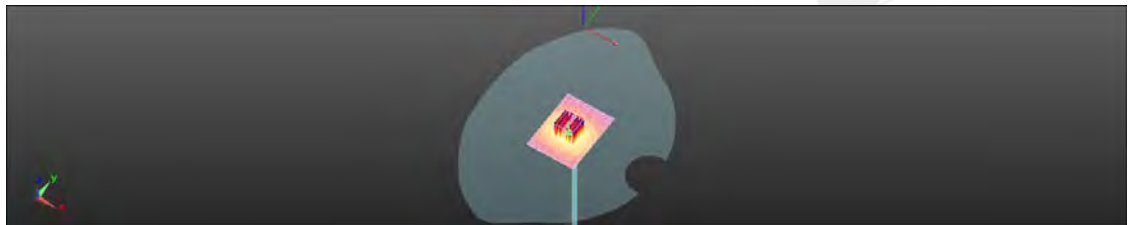
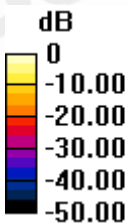
dx=4mm, dy=4mm, dz=2mm

Reference Value = 67.02 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 38.8 W/kg

SAR(1 g) = 7.5 W/kg; SAR(10 g) = 2.22 W/kg

Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg

Date: 2016/11/2

Dipole 5200 MHz_SN:1023_Body

Communication System: CW; Frequency: 5200 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.486$ S/m; $\epsilon_r = 47.721$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.07, 4.07, 4.07); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.9 W/kg

Configuration/Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

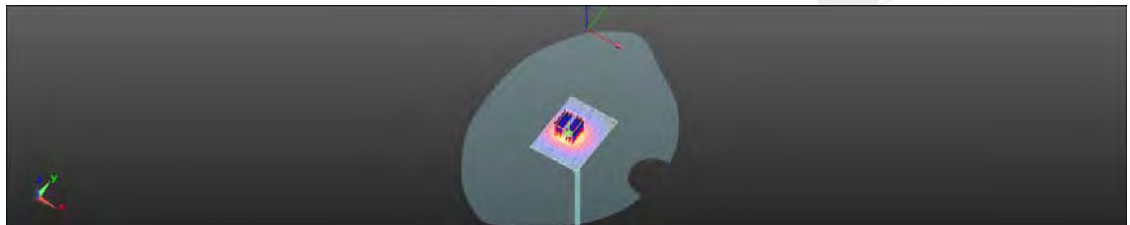
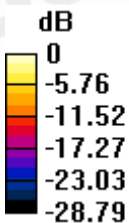
dx=4mm, dy=4mm, dz=2mm

Reference Value = 51.26 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 32.8 W/kg

SAR(1 g) = 7.54 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 18.3 W/kg



0 dB = 18.3 W/kg = 12.62 dBW/kg

Date: 2016/11/2

Dipole 5800 MHz_SN:1023_Head

Communication System: CW; Frequency: 5800 MHz

Medium parameters used: $f = 5700$ MHz; $\sigma = 5.203$ S/m; $\epsilon_r = 34.121$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(4.1, 4.1, 4.1); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.1 W/kg

Configuration/Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

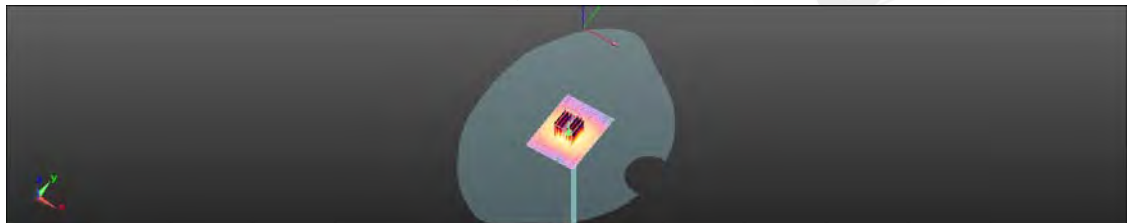
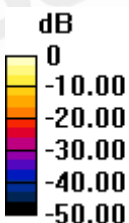
dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.10 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 37.1 W/kg

SAR(1 g) = 7.98 W/kg; SAR(10 g) = 2.26 W/kg

Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 17.2 W/kg = 12.37 dBW/kg

Date: 2016/11/2

Dipole 5800 MHz_SN:1023_Body

Communication System: CW; Frequency: 5800 MHz

Medium parameters used: $f = 5800$ MHz; $\sigma = 6.086$ S/m; $\epsilon_r = 46.926$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(3.52, 3.52, 3.52); Calibrated: 2016/1/27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1374; Calibrated: 2016/8/23
- Phantom: Head
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Configuration/Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 15.4 W/kg

Configuration/Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

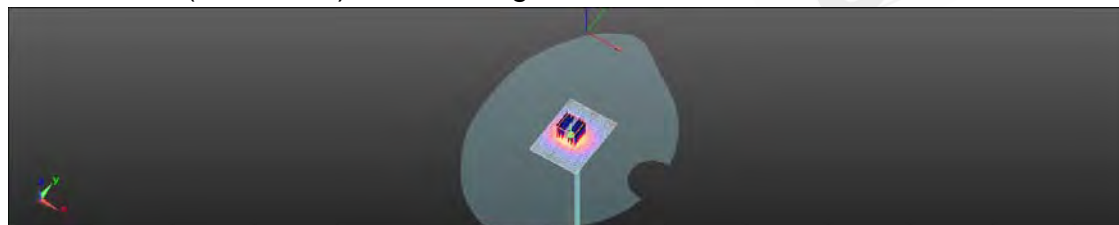
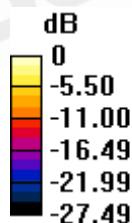
dx=4mm, dy=4mm, dz=2mm

Reference Value = 51.95 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 29.3 W/kg

SAR(1 g) = 7.59 W/kg; SAR(10 g) = 2.16 W/kg

Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.98 dBW/kg

7. DAE & Probe Calibration Certificate

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Accreditation No.: SCS 0108

Client SGS-TW (Auden)

Certificate No: DAE4-1374_Aug16

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BM - SN: 1374

Calibration procedure(s) QA CAL-06.v29
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: August 23, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|------------------------------|--------------------|----------------------------|------------------------|
| Kettley Multimeter Type 2001 | SN: 0810278 | 09-Sep-15 (No.17153) | Sep-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Auto DAE Calibration Unit | SE UMS 003 AA 1001 | 05-Jan-16 (in house check) | In house check: Jan-17 |
| Calibrator Box V2.1 | SE UMS 005 AA 1002 | 05-Jan-16 (in house check) | In house check: Jan-17 |

Calibrated by: Name Dominique Stoffen Function Technician Signature

Approved by: Fin Bommeli Deputy Technical Manager

Issued: August 23, 2016

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Certificate No: DAE4-1374_Aug16

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Accreditation No.: **SCS 0108**

Glossary

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- **DC Voltage Measurement:** Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- **Connector angle:** The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - **DC Voltage Measurement Linearity:** Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - **Common mode sensitivity:** Influence of a positive or negative common mode voltage on the differential measurement.
 - **Channel separation:** Influence of a voltage on the neighbor channels not subject to an input voltage.
 - **AD Converter Values with inputs shorted:** Values on the internal AD converter corresponding to zero input voltage
 - **Input Offset Measurement:** Output voltage and statistical results over a large number of zero voltage measurements.
 - **Input Offset Current:** Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - **Input resistance:** Typical value for information; DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - **Low Battery Alarm Voltage:** Typical value for information. Below this voltage, a battery alarm signal is generated.
 - **Power consumption:** Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution (nominal)

High Range: 1LSB = 9.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1...+3mV

DASY measurement parameters: Auto Zero Time: 3 sec, Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|---------------------|---------------------------|---------------------------|---------------------------|
| High Range | 403.637 \pm 0.02% (k=2) | 403.886 \pm 0.02% (k=2) | 404.160 \pm 0.02% (k=2) |
| Low Range | 3.98275 \pm 1.50% (k=2) | 3.96719 \pm 1.50% (k=2) | 3.98086 \pm 1.50% (k=2) |

Connector Angle

| | |
|---|------------------------------------|
| Connector Angle to be used in DASY-system | 42.5 $^{\circ}$ \pm 1 $^{\circ}$ |
|---|------------------------------------|

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

| High Range | Reading (μV) | Difference (μV) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 200039.11 | 0.18 | 0.00 |
| Channel X + Input | 20005.23 | 0.57 | 0.00 |
| Channel X - Input | -20004.46 | 1.52 | -0.01 |
| Channel Y + Input | 200041.10 | 3.98 | 0.00 |
| Channel Y + Input | 20002.95 | -1.76 | -0.01 |
| Channel Y - Input | -20007.46 | -1.33 | 0.01 |
| Channel Z + Input | 200039.71 | 2.55 | 0.00 |
| Channel Z + Input | 20002.57 | -2.04 | -0.01 |
| Channel Z - Input | -20008.39 | -2.20 | 0.01 |

| Low Range | Reading (μV) | Difference (μV) | Error (%) |
|-------------------|---------------------------|------------------------------|-----------|
| Channel X + Input | 2001.14 | 0.37 | 0.02 |
| Channel X + Input | 200.90 | 0.07 | 0.03 |
| Channel X - Input | -198.75 | 0.41 | -0.20 |
| Channel Y + Input | 2000.82 | 0.06 | 0.00 |
| Channel Y + Input | 200.17 | -0.51 | -0.25 |
| Channel Y - Input | -199.47 | -0.29 | 0.15 |
| Channel Z + Input | 2000.50 | -0.29 | -0.01 |
| Channel Z + Input | 199.36 | -1.24 | -0.62 |
| Channel Z - Input | -200.79 | -1.45 | 0.73 |

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec.

| | Common mode Input Voltage (mV) | High Range Average Reading (μV) | Low Range Average Reading (μV) |
|-----------|--------------------------------|--|---|
| Channel X | 200 | 6.08 | 3.93 |
| | -200 | -2.69 | -4.73 |
| Channel Y | 200 | 7.56 | 7.12 |
| | 200 | -8.69 | -8.98 |
| Channel Z | 200 | 5.83 | 5.98 |
| | -200 | -8.94 | -9.16 |

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec.

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200 | - | -2.29 | -1.91 |
| Channel Y | 200 | 4.65 | - | -1.13 |
| Channel Z | 200 | 10.99 | 2.02 | - |

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec;

| | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 15938 | 14709 |
| Channel Y | 18155 | 14646 |
| Channel Z | 18005 | 15566 |

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec;

Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|-----------|--------------|------------------|------------------|---------------------|
| Channel X | 1.17 | 0.20 | 1.90 | 0.33 |
| Channel Y | 0.61 | -0.17 | 1.24 | 0.30 |
| Channel Z | -1.30 | -2.42 | -0.33 | 0.37 |

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

| | Zeroing (kΩ) | Measuring (MΩ) |
|-----------|--------------|----------------|
| Channel X | 200 | 200 |
| Channel Y | 200 | 200 |
| Channel Z | 200 | 200 |

8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01 | +6 | +14 |
| Supply (- Vcc) | -0.01 | -6 | -6 |

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Accreditation No.: SCS 0108

Client: SGS-TW (Auden)

Certificate No: EX3-3831 Jan16

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3831

Calibration procedure(s): QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: January 27, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3) °C and humidity < 70%.

Calibration Equipment used (MATE critical for calibration):

| Primary Standards | ID | Cal Date (Certificate No.) | Scheduled Calibration |
|----------------------------|-----------------|-----------------------------------|------------------------|
| Power meter E4410B | 0B41293874 | 01-Apr-15 (No. 217-02128) | Mar-16 |
| Power sensor E4412A | MY45490067 | 01-Apr-15 (No. 217-02128) | Mar-16 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 01-Apr-15 (No. 217-02129) | Mar-16 |
| Reference 20 dB Attenuator | SN: S5277 (20a) | 01-Apr-15 (No. 217-02132) | Mar-16 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 01-Apr-15 (No. 217-02133) | Mar-16 |
| Reference Probe ES3DV2 | SN: 3013 | 31-Dec-15 (No. ES3-3013_Dec15) | Dec-16 |
| DAE4 | SN: 650 | 23-Dec-15 (No. DAE4-REC_Dec15) | Dec-16 |
| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
| RF generator HP 8043C | US3642U01700 | 4-Aug-15 (in house check Apr-15) | in house check: Apr-16 |
| Network Analyzer HP 8753E | US37390545 | 18-Oct-11 (in house check Oct-15) | in house check: Oct-16 |

| | | | |
|----------------|-----------------------|---------------------------------|------------|
| Calibrated by: | Name: Jozsef Kacsarai | Function: Laboratory Technician | Signature: |
| Approved by: | Name: Kristin Polovic | Function: Technical Manager | Signature: |

Issued: January 29, 2016

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Certificate No: EX3-3831 Jan16

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Glossary:

| | |
|------------------------|---|
| TSL | tissue simulating liquid |
| $NORM_{x,y,z}$ | sensitivity in free space |
| $ConvF$ | sensitivity in TSL / $NORM_{x,y,z}$ |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization θ | θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 855664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- $NORM_{x,y,z}$: Assessed for E-field polarization $\theta = 0$ ($f < 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). $NORM_{x,y,z}$ are only intermediate values, i.e., the uncertainties of $NORM_{x,y,z}$ does not affect the E^2 field uncertainty inside TSL (see below $ConvF$).
- $NORM(f)_{x,y,z} = NORM_{x,y,z} \cdot \text{frequency_response}$ (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of $ConvF$.
- $DCP_{x,y,z}$: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- $A_{x,y,z}$, $B_{x,y,z}$, $C_{x,y,z}$, $D_{x,y,z}$, $VR_{x,y,z}$, A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- $ConvF$ and Boundary Effect Parameters: Assessed in flat phantom using E-field for Temperature Transfer Standard for $f < 800$ MHz and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to $NORM_{x,y,z} \cdot ConvF$ whereby the uncertainty corresponds to that given for $ConvF$. A frequency dependent $ConvF$ is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical Isotropy (3D deviation from isotropy): In a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe lip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the $NORM_{x,y,z}$ (no uncertainty required).

EX3DV4 – SN:3831

January 27, 2016

Probe EX3DV4

SN:3831

Manufactured: September 6, 2011
Calibrated: January 27, 2016Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

EX3DV4-SN:3831

January 27, 2016

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831**Basic Calibration Parameters**

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|----------|----------|----------|---------------|
| Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A | 0.45 | 0.42 | 0.43 | $\pm 10.1 \%$ |
| DCP (mV) ^B | 100.7 | 102.6 | 99.9 | |

Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB $\sqrt{\mu\text{V}}$ | C | D dB | VR mV | Unc ^C (k=2) |
|-----|---------------------------|---|---------|------------------------------|-----|---------|----------|---------------------------|
| D | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 153.7 | $\pm 3.3 \%$ |
| | | Y | 0.0 | 0.0 | 1.0 | | 139.5 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 143.5 | |

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter; uncertainty not required.

^C Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4- SN:3831

January 27, 2016

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831**Calibration Parameter Determined in Head Tissue Simulating Media**

| f (MHz) ^c | Relative Permittivity ^f | Conductivity (S/m) ^f | ConvF X | ConvF Y | ConvF Z | Alpha ^g | Depth ^h (mm) | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750 | 41.9 | 0.89 | 9.38 | 9.38 | 9.38 | 0.23 | 1.35 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 8.84 | 8.84 | 8.84 | 0.19 | 1.62 | ± 12.0 % |
| 900 | 41.5 | 0.97 | 8.77 | 8.77 | 8.77 | 0.20 | 1.51 | ± 12.0 % |
| 1450 | 40.5 | 1.20 | 8.17 | 8.17 | 8.17 | 0.28 | 0.97 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 7.92 | 7.92 | 7.92 | 0.41 | 0.80 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 7.66 | 7.66 | 7.66 | 0.37 | 0.80 | ± 12.0 % |
| 2000 | 40.0 | 1.40 | 7.61 | 7.61 | 7.61 | 0.32 | 0.80 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 7.33 | 7.33 | 7.33 | 0.31 | 0.96 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 6.92 | 6.92 | 6.92 | 0.27 | 1.09 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 6.71 | 6.71 | 6.71 | 0.40 | 0.89 | ± 12.0 % |
| 3500 | 37.9 | 2.91 | 6.41 | 6.41 | 6.41 | 0.42 | 1.03 | ± 13.1 % |
| 5200 | 36.0 | 4.68 | 4.76 | 4.76 | 4.76 | 0.35 | 1.80 | ± 13.1 % |
| 5300 | 35.9 | 4.76 | 4.46 | 4.46 | 4.46 | 0.40 | 1.80 | ± 13.1 % |
| 5600 | 35.5 | 5.07 | 4.08 | 4.08 | 4.08 | 0.50 | 1.80 | ± 13.1 % |
| 5800 | 35.3 | 5.27 | 4.10 | 4.10 | 4.10 | 0.50 | 1.80 | ± 13.1 % |

^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 60 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^f At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^g Alpha/Depth are determined during calibration. SPESAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4- SN:3831

January 27, 2016

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831**Calibration Parameter Determined in Body Tissue Simulating Media**

| f (MHz) ^c | Relative Permittivity ^f | Conductivity (S/m) ^f | ConvF X | ConvF Y | ConvF Z | Alpha ^g | Depth (mm) ^g | Unc (k=2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|-----------|
| 750 | 55.5 | 0.96 | 9.25 | 9.25 | 9.25 | 0.26 | 1.29 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 9.08 | 9.08 | 9.08 | 0.35 | 1.04 | ± 12.0 % |
| 900 | 55.0 | 1.05 | 9.05 | 8.05 | 9.05 | 0.30 | 1.12 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 7.74 | 7.74 | 7.74 | 0.27 | 1.01 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 7.54 | 7.54 | 7.54 | 0.35 | 0.85 | ± 12.0 % |
| 2000 | 53.3 | 1.52 | 7.62 | 7.62 | 7.62 | 0.37 | 0.84 | ± 12.0 % |
| 2300 | 52.9 | 1.81 | 7.06 | 7.06 | 7.06 | 0.35 | 0.80 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 7.05 | 7.05 | 7.05 | 0.34 | 0.80 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 6.71 | 6.71 | 6.71 | 0.37 | 0.80 | ± 12.0 % |
| 5200 | 49.0 | 5.30 | 4.07 | 4.07 | 4.07 | 0.50 | 1.90 | ± 13.1 % |
| 5300 | 48.9 | 5.42 | 3.81 | 3.81 | 3.81 | 0.55 | 1.90 | ± 13.1 % |
| 5600 | 48.5 | 5.77 | 3.47 | 3.47 | 3.47 | 0.55 | 1.90 | ± 13.1 % |
| 5800 | 48.2 | 6.00 | 3.52 | 3.52 | 3.52 | 0.60 | 1.90 | ± 13.1 % |

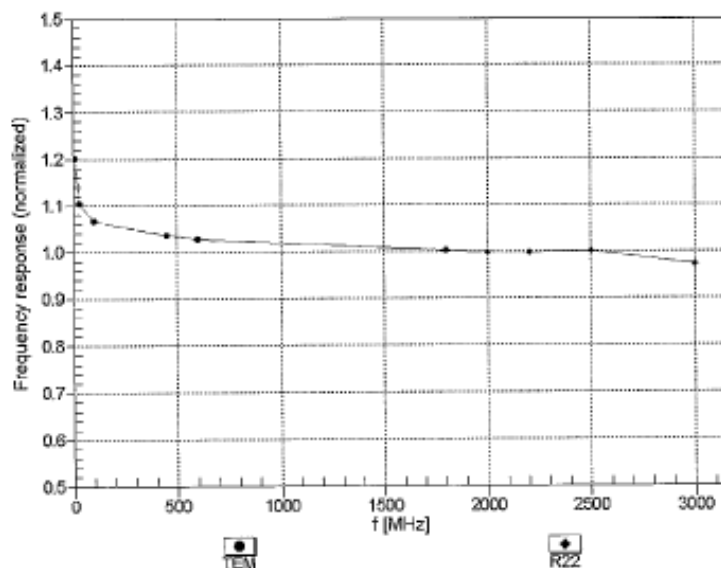
^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^f At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^g Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4- SN:3831

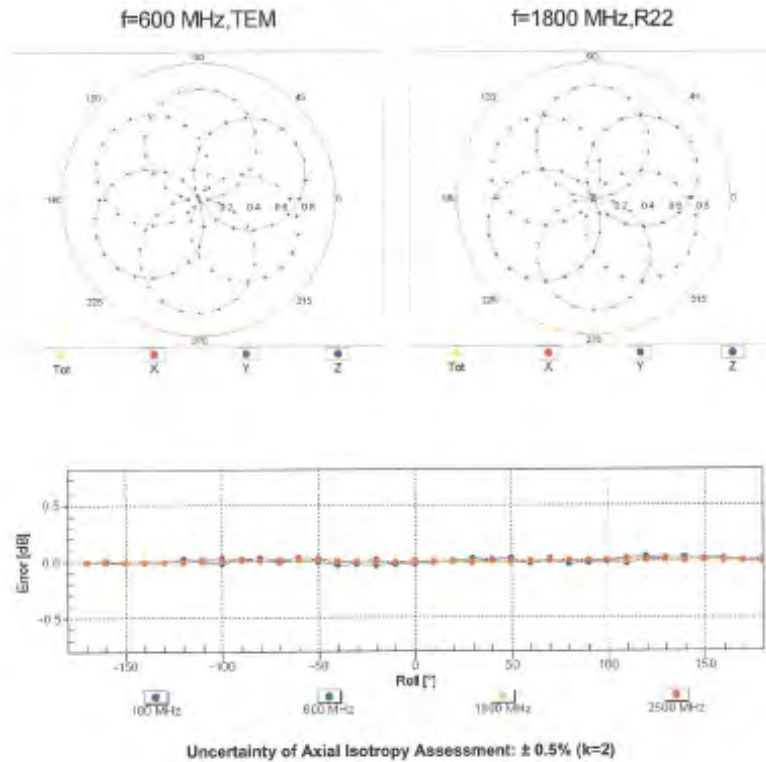
January 27, 2016

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

EX3DV4- SN:3831

January 27, 2016

Receiving Pattern (ϕ), $\theta = 0^\circ$



Certificate No. EX3-3831_Jan16

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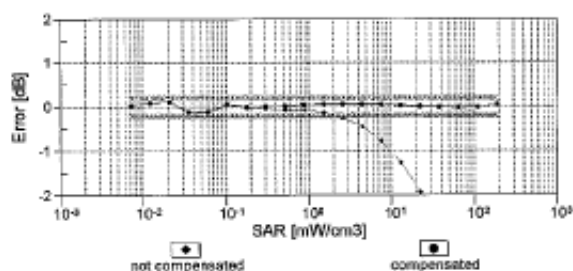
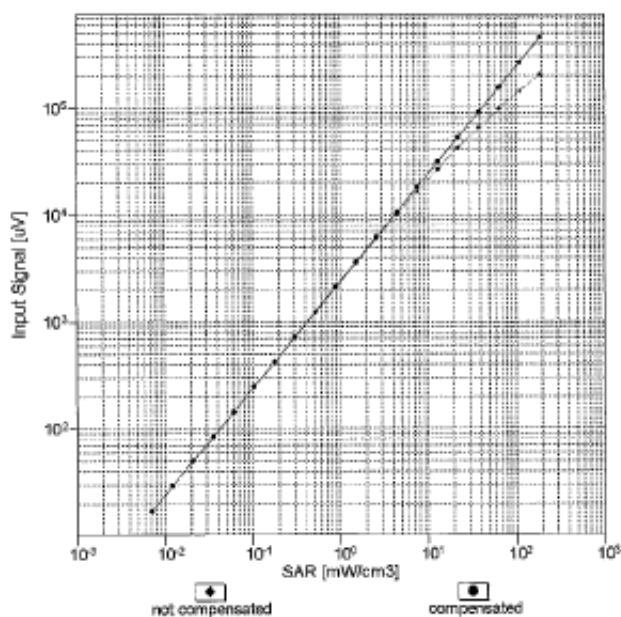
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EX3DV4-SN:3831

January 27, 2018

Dynamic Range f(SAR_{head}) (TEM cell, f_{eval} = 1900 MHz)

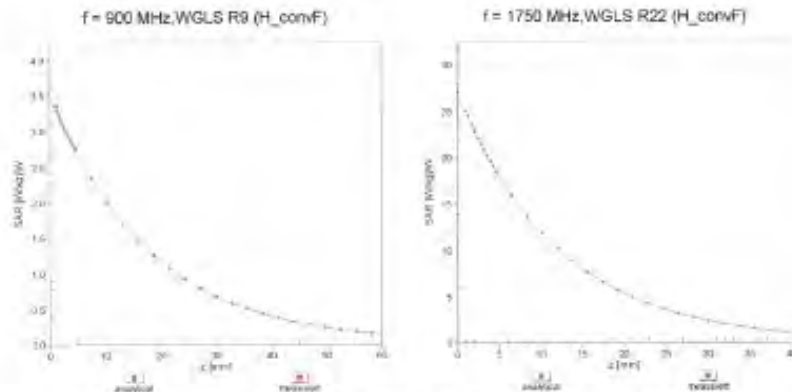


Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

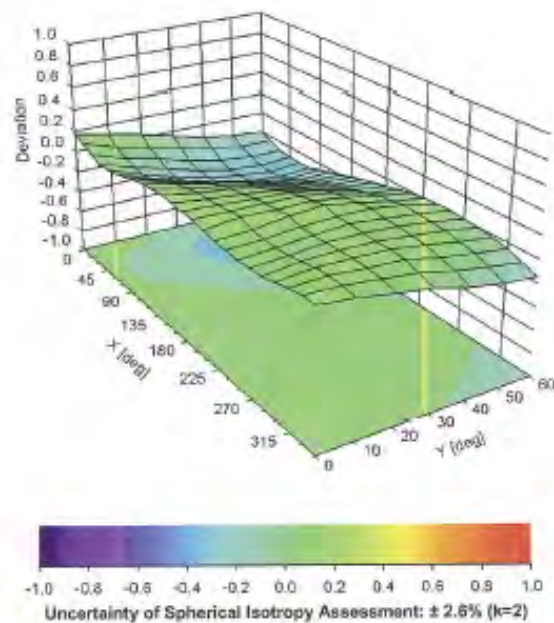
EX3DV4- SN:3831

January 27, 2016

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ , θ), $f = 900$ MHz



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EX3DV4-SN:3831

January 27, 2016

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831**Other Probe Parameters**

| | |
|---|------------|
| Sensor Arrangement | Triangular |
| Connector Angle (°) | -20.3 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 9 mm |
| Tip Diameter | 2.5 mm |
| Probe Tip to Sensor X Calibration Point | 1 mm |
| Probe Tip to Sensor Y Calibration Point | 1 mm |
| Probe Tip to Sensor Z Calibration Point | 1 mm |
| Recommended Measurement Distance from Surface | 1.4 mm |

8. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test (3-6G)

| A | c | D | e | | f | g | $h=c * f / e$ | $i=c * g / e$ | k |
|---|---------------------------|-------------|-----|-----------|---------|----------|-------------------------|-------------------------|-------------|
| Source of Uncertainty | Tolerance/ Uncertainty | Probability | Div | Div Value | ci (1g) | ci (10g) | Standard uncertainty | Standard uncertainty | vi, or Veff |
| Measurement system | | | | | | | | | |
| Probe calibration | 6.55% | N | 1 | 1 | 1 | 1 | 6.55% | 6.55% | ∞ |
| <i>Isotropy , Axial</i> | 3.50% | R | √3 | 1.732 | 1 | 1 | 2.02% | 2.02% | ∞ |
| <i>Isotropy, Hemispherical</i> | 9.60% | R | √3 | 1.732 | 1 | 1 | 5.54% | 5.54% | ∞ |
| Modulation Response | 2.40% | R | √3 | 1.732 | 1 | 1 | 1.40% | 1.40% | ∞ |
| Boundary Effect | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Linearity | 4.70% | R | √3 | 1.732 | 1 | 1 | 2.71% | 2.71% | ∞ |
| Detection Limits | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Readout Electronics | 0.30% | N | 1 | 1 | 1 | 1 | 0.30% | 0.30% | ∞ |
| Response time | 0.80% | R | √3 | 1.732 | 1 | 1 | 0.46% | 0.46% | ∞ |
| Integration Time | 2.60% | R | √3 | 1.732 | 1 | 1 | 1.50% | 1.50% | ∞ |
| Measurement drift (class A evaluation) | 1.75% | R | √3 | 1.732 | 1 | 1 | 1.01% | 1.01% | ∞ |
| RF ambient condition - noise | 3.00% | R | √3 | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| RF ambient conditions - reflections | 3.00% | R | √3 | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| Probe positioner | 0.40% | R | √3 | 1.732 | 1 | 1 | 0.23% | 0.23% | ∞ |
| <u>Mechanical restrictions</u> | | | | | | | | | |
| Probe Positioning with respect to phantom | 2.90% | R | √3 | 1.732 | 1 | 1 | 1.67% | 1.67% | ∞ |
| Post-processing | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Max SAR Eval | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Test Sample related | | | | | | | | | |
| Test sample positioning | 2.90% | N | 1 | 1 | 1 | 1 | 2.90% | 2.90% | M-1 |
| Device Holder Uncertainty | 3.60% | N | 1 | 1 | 1 | 1 | 3.60% | 3.60% | M-1 |
| Drift of output power | 5.00% | R | √3 | 1.732 | 1 | 1 | 2.89% | 2.89% | ∞ |
| Phantom and Setup | | | | | | | | | |
| Phantom Uncertainty | 4.00% | R | √3 | 1.732 | 1 | 1 | 2.31% | 2.31% | ∞ |
| Liquid permittivity (mea.) | 3.51% | N | 1 | 1 | 0.64 | 0.43 | 2.25% | 1.51% | M |
| Liquid Conductivity (mea.) | 3.52% | N | 1 | 1 | 0.6 | 0.49 | 2.11% | 1.72% | M |
| Combined standard uncertainty | | RSS | | | | | 12.11% | 11.93% | |
| Expant uncertainty (95% confidence) | | | | | | | 24.23% | 23.86% | |

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Measurement Uncertainty evaluation template for DUT SAR test (0.3-3G)

| A | c | D | e | f | g | h=c * f / e | i=c * g / e | k | |
|---|---------------------------|-----------------|-----|-----------|---------|-------------|-------------------------|-------------------------|-------------|
| Source of Uncertainty | Tolerance/ Uncertainty | Probabilit y | Div | Div Value | ci (1g) | ci (10g) | Standard uncertainty | Standard uncertainty | vi, or Veff |
| | | | | | | | | | |
| Measurement system | | | | | | | | | |
| Probe calibration | 6.00% | N | 1 | 1 | 1 | 1 | 6.00% | 6.00% | ∞ |
| Isotropy , Axial | 3.50% | R | √3 | 1.732 | 1 | 1 | 2.02% | 2.02% | ∞ |
| Isotropy, Hemispherical | 9.60% | R | √3 | 1.732 | 1 | 1 | 5.54% | 5.54% | ∞ |
| Modulation Response | 2.40% | R | √3 | 1.732 | 1 | 1 | 1.40% | 1.40% | ∞ |
| Boundary Effect | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Linearity | 4.70% | R | √3 | 1.732 | 1 | 1 | 2.71% | 2.71% | ∞ |
| Detection Limits | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Readout Electronics | 0.30% | N | 1 | 1 | 1 | 1 | 0.30% | 0.30% | ∞ |
| Response time | 0.80% | R | √3 | 1.732 | 1 | 1 | 0.46% | 0.46% | ∞ |
| Integration Time | 2.60% | R | √3 | 1.732 | 1 | 1 | 1.50% | 1.50% | ∞ |
| Measurement drift (class A evaluation) | 1.75% | R | √3 | 1.732 | 1 | 1 | 1.01% | 1.01% | ∞ |
| RF ambient condition - noise | 3.00% | R | √3 | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| RF ambient conditions - reflections | 3.00% | R | √3 | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| Probe positioner | 0.40% | R | √3 | 1.732 | 1 | 1 | 0.23% | 0.23% | ∞ |
| Mechanical restrictions | | | | | | | | | |
| Probe Positioning with respect to phantom | 2.90% | R | √3 | 1.732 | 1 | 1 | 1.67% | 1.67% | ∞ |
| Post-processing | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Max SAR Eval | 1.00% | R | √3 | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| | | | | | | | | | |
| Test Sample related | | | | | | | | | |
| Test sample positioning | 2.90% | N | 1 | 1 | 1 | 1 | 2.90% | 2.90% | M-1 |
| Device Holder Uncertainty | 3.60% | N | 1 | 1 | 1 | 1 | 3.60% | 3.60% | M-1 |
| Drift of output power | 5.00% | R | √3 | 1.732 | 1 | 1 | 2.89% | 2.89% | ∞ |
| | | | | | | | | | |
| Phantom and Setup | | | | | | | | | |
| Phantom Uncertainty | 4.00% | R | √3 | 1.732 | 1 | 1 | 2.31% | 2.31% | ∞ |
| Liquid permittivity (mea.) | 3.90% | N | 1 | 1 | 0.64 | 0.43 | 2.50% | 1.68% | M |
| Liquid Conductivity (mea.) | 4.18% | N | 1 | 1 | 0.6 | 0.49 | 2.51% | 2.05% | M |
| Combined standard uncertainty | | RSS | | | | | 11.95% | 11.71% | |
| Expan ^t uncertainty (95% confidence | | | | | | | 23.91% | 23.42% | |

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9. Phantom Description

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone: +41 1 245 9700, Fax: +41 1 245 9773
info@speag.com, http://www.speag.com

Certificate of Conformity / First Article Inspection

| | |
|--------------|--|
| Item | SAM Twin Phantom V4.0 |
| Type No | QD 000 P40 C |
| Series No | TP-1150 and higher |
| Manufacturer | SPEAG Zeughausstrasse 43 CH-8004 Zurich Switzerland |

Tests

The series production process used allows the limitation to test of first articles.

Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1008. Certain parameters have been retested using further series items (called samples) or are tested at each item.

| Test | Requirement | Details | Units tested |
|-----------------------------|--|--|---|
| Dimensions | Compliant with the geometry according to the CAD model. | IT IS CAD File (*) | First article, Samples |
| Material thickness of shell | Compliant with the requirements according to the standards | 2mm +/- 0.2mm in flat and specific areas of head section | First article, Samples, TP-1314 ff. |
| Material thickness at ERP | Compliant with the requirements according to the standards | 6mm +/- 0.2mm at ERP | First article, A3 items |
| Material parameters | Dielectric parameters for required frequencies | 300 MHz – 6 GHz; Relative permittivity < 5; Loss tangent < 0.05 | Material samples |
| Material resistivity | The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility. | DEGMRE based simulating liquids | Pre-series, First article, Material samples |
| Sagging | Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid | < 1% typical < 0.6% if filled with 155mm of HSL900 and without OUT below | Prototypes, Sample testing |

Standards

- (1) CENELEC EN 50361
- (2) IEEE Std 1528-2003
- (3) IEC 62209 Part 1
- (4) FCC OET Bulletin 65, Supplement C, Edition 01-01

(*) The IT IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].

Date 07.07.2005

Signature / Stamp

s p e a g

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info@speag.com, http://www.speag.com

Doc No: SE1 - QD 000 P40 C - 3

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10. System Validation from Original Equipment Supplier

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client: SGS-TW (Auden)

Certificate No: D750V3-1015_Aug16

CALIBRATION CERTIFICATE

Object: D750V3 - SN: 1015

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: August 30, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility, environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (MATE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP | SN: 104775 | 06-Apr-16 (No. 217-02288/02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 100245 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Reference 20 dB Attenuator | SN: 5068 (20K) | 06-Apr-16 (No. 217-02292) | Apr-17 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 06-Apr-16 (No. 217-02295) | Apr-17 |
| Reference Probe EX3DV4 | SN: 7349 | 15-Jun-16 (No. EX3-7349_Jun16) | Jun-17 |
| DAE4 | SN: 601 | 30-Oct-15 (No. DAE4-601_Dec15) | Dec-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power meter EPM-442A | SN: GB37460704 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: US37292783 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: MY41092817 | 07-Oct-15 (No. 217-02223) | In house check: Oct-16 |
| RF generator R&S SMT-06 | SN: 100979 | 15-Jun-16 (in house check Jun-16) | In house check: Oct-16 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

Calibrated by: Michael Weber, Laboratory Technician, Signature: *MWeber*

Approved by: Katja Polovic, Technical Manager, Signature: *Katja Polovic*

Issued: August 30, 2016

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Certificate No: D750V3-1015_Aug16

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S Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|------------------------------|------------------------|-------------|
| DASY Version | DASY5 | V52.6.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | 15 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 750 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 41.9 | 0.89 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 42.4 \pm 6 % | 0.91 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | — | — |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 2.11 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 8.32 W/kg \pm 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 1.36 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 5.45 W/kg \pm 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 55.5 | 0.96 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 54.9 \pm 6 % | 0.99 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | — | — |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 2.25 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 8.77 W/kg \pm 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 1.47 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 5.76 W/kg \pm 16.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 53.1 Ω - 0.2 $j\Omega$ |
| Return Loss | -30.5 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 49.0 Ω - 2.8 $j\Omega$ |
| Return Loss | +30.5 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.037 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of this dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|----------------|
| Manufactured by | SPEAG |
| Manufactured on | March 22, 2010 |

DASY5 Validation Report for Head TSL

Date: 30.08.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1015

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.91 \text{ S/m}$; $\epsilon_r = 42.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

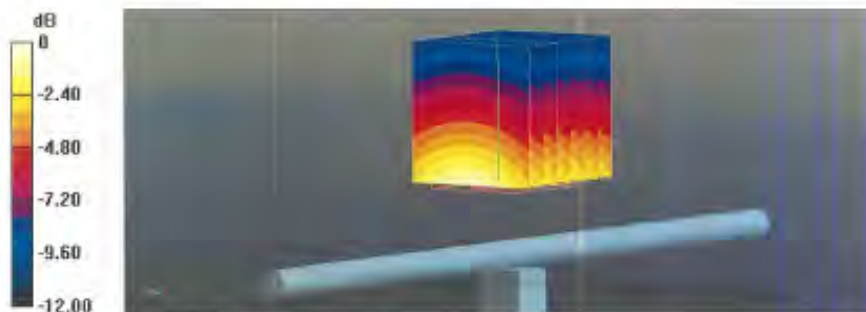
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.26 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 3.16 W/kg

SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.38 W/kg

Maximum value of SAR (measured) = 2.81 W/kg



DASY5 Validation Report for Body TSL

Date: 30.08.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1015

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.99$ S/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

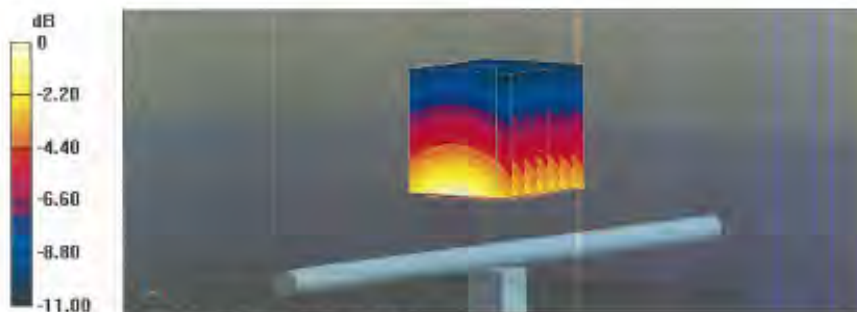
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.47 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.39 W/kg

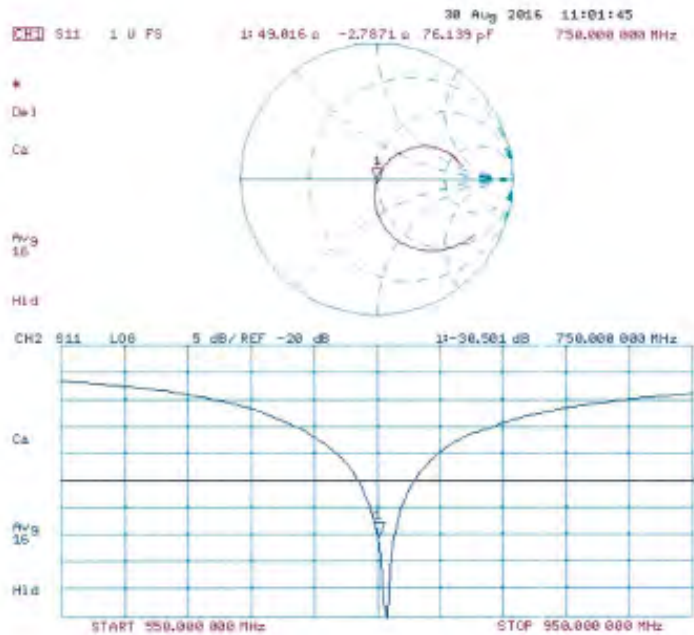
SAR(1 g) = 2.25 W/kg; SAR(10 g) = 1.47 W/kg

Maximum value of SAR (measured) = 2.97 W/kg



0 dB = 2.97 W/kg = 4.73 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

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Client: **SGS-TW (Auden)**

Certificate No: **D835V2-4d063_Aug16**

CALIBRATION CERTIFICATE

Object: **D835V2 - SN:4d063**

Calibration procedure(s): **QA-CAL-05.V9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **August 25, 2016**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurement (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $22 \pm 3^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP | SN: 104778 | 05-Apr-16 (No. 217-02285/02283) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 05-Apr-16 (No. 217-02285) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103240 | 05-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 05-Apr-16 (No. 217-02292) | Apr-17 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 05-Apr-16 (No. 217-02295) | Apr-17 |
| Reference Probe EX3DV4 | SN: 7340 | 15-Jun-16 (No. EX3-7340_Jun16) | Jun-17 |
| DAE4 | SN: 601 | 30-Dec-15 (No. DAE4-B01_Dec15) | Dec-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power meter EPM-142A | SN: 0637480704 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: US57292793 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: NY41000317 | 07-Oct-15 (No. 217-02223) | In house check: Oct-16 |
| RF generator F&S SMT-06 | SN: 100972 | 15-Jun-15 (In house check Jun-16) | In house check: Oct-16 |
| Network Analyzer HP-8753E | SN: US57393585 | 16-Oct-01 (In house check Oct-15) | In house check: Oct-16 |

| | | | |
|----------------|----------------------------|--|------------|
| Calibrated by: | Name: Michael Weber | Function: Laboratory Technician | Signature: |
| Approved by: | Name: Kelja Pokovic | Function: Technical Manager | Signature: |

Issued: August 29, 2016

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: **D835V2-4d063_Aug16**

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Accreditation No.: **SCS 0108**

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1:

| | | |
|------------------------------|------------------------|-------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | ±5 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 835 MHz ± 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied:

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 41.5 | 0.90 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 42.1 ± 6 % | 0.93 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | — | — |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 2.40 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 9.40 W/kg ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 1.54 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 6.05 W/kg ± 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied:

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 55.2 | 0.97 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 54.7 ± 6 % | 1.01 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | — | — |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 2.47 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 9.57 W/kg ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 1.61 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 6.28 W/kg ± 16.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

| | |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $51.2 \Omega - 2.6 j\Omega$ |
| Return Loss | -30.3 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $47.3 \Omega - 5.5 j\Omega$ |
| Return Loss | -24.0 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.392 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|-------------------|
| Manufactured by | SPEAG |
| Manufactured on | November 27, 2006 |

DASY5 Validation Report for Head TSL

Date: 25.08.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.93 \text{ S/m}$; $\epsilon_r = 42$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 100I
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

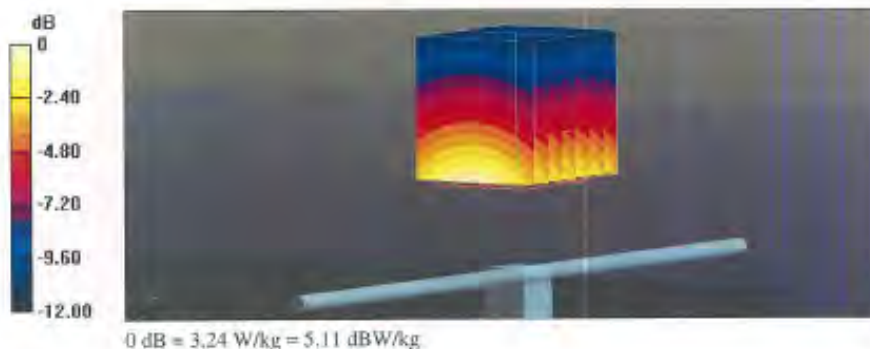
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.75 V/m; Power Drift = 0.03 dB

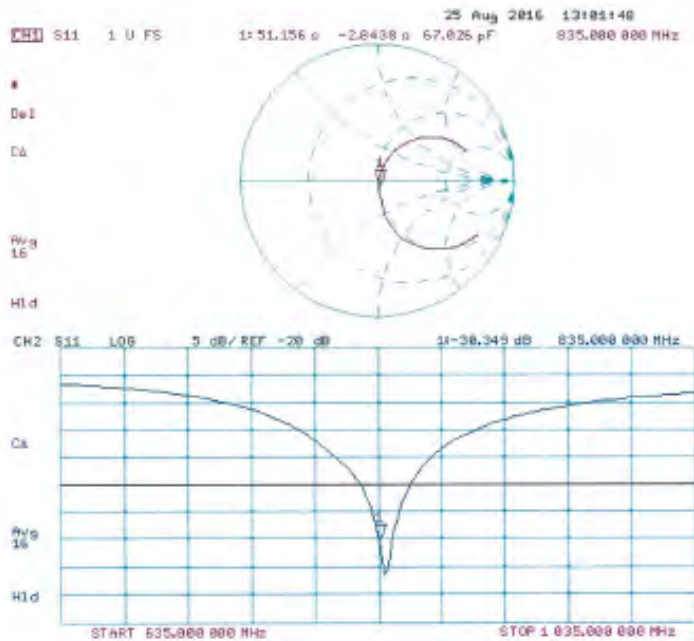
Peak SAR (extrapolated) = 3.65 W/kg

SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (measured) = 3.24 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 25.08.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d063

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ S/m}$; $\epsilon = 54.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, $d=15\text{mm}$ /Zoom Scan (7x7x7)/Cube 0:Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.83 V/m; Power Drift = -0.00 dB

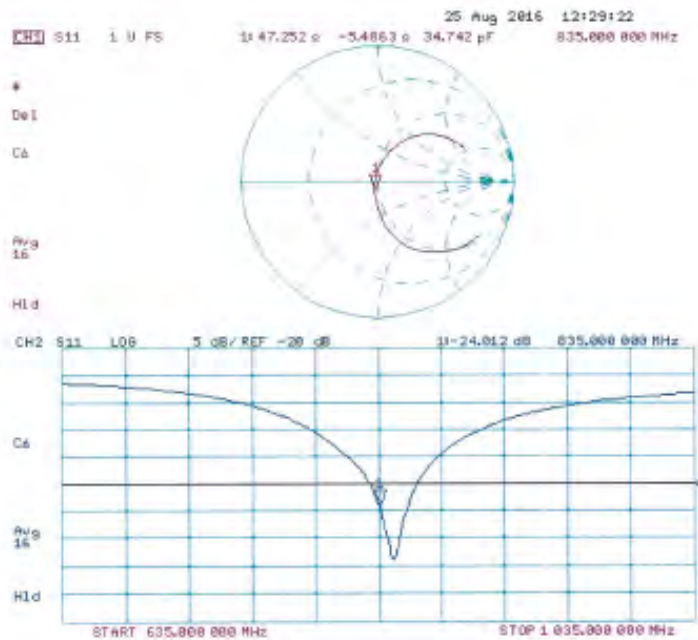
Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.61 W/kg

Maximum value of SAR (measured) = 3.25 W/kg



Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client: SGS-TW (Auden)

Certificate No: D1750V2-1008_Aug16

CALIBRATION CERTIFICATE

Object: D1750V2 - SN:1008

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: August 31, 2016

The calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (MTE critical for calibration):

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP | SN: 104778 | 06-Apr-16 (No. 217-02288/02289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 06-Apr-16 (No. 217-02292) | Apr-17 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 06-Apr-16 (No. 217-02295) | Apr-17 |
| Reference Probe EX3DV4 | SN: 7349 | 15-Jun-16 (No. EX3-7349_Jun16) | Jun-17 |
| DAE4 | SN: 601 | 30-Dec-15 (No. DAE4-601_Dec15) | Dec-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power meter EPM-442A | SN: GB37480704 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8461A | SN: US37292783 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: MY41042317 | 07-Oct-15 (No. 217-02223) | In house check: Oct-16 |
| RF generator R&S SMT-06 | SN: 100972 | 15-Jun-15 (in house check Jun-15) | In house check: Oct-16 |
| Network Analyzer HP 8753E | SN: US37390586 | 16-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

Calibrated by: Johannes Kurka, Name, Function: Laboratory Technician, Signature

Approved by: Kaija Pekovic, Name, Function: Technical Manager, Signature

Issued: August 31, 2016

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Certificate No: D1750V2-1008_Aug16

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**Calibration Laboratory of
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 885664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|------------------------------|------------------------|-------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 1750 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 40.1 | 1.37 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 40.3 \pm 6 % | 1.37 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | — | — |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 9.28 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 37.2 W/kg \pm 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 4.90 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 19.6 W/kg \pm 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 53.4 | 1.49 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 53.1 \pm 6 % | 1.49 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | — | — |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 9.34 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 37.3 W/kg \pm 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 4.96 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 19.9 W/kg \pm 16.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 51.0 Ω - 0.2 j Ω |
| Return Loss | -40.1 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 46.7 Ω - 0.5 j Ω |
| Return Loss | -28.3 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.221 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|--------------|
| Manufactured by | SPEAG |
| Manufactured on | May 27, 2003 |

DASY5 Validation Report for Head TSL

Date: 24.08.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.37$ S/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

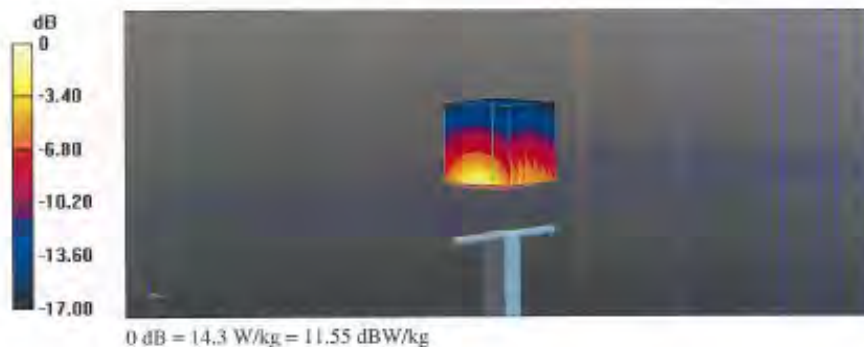
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.8 V/m; Power Drift = 0.03 dB

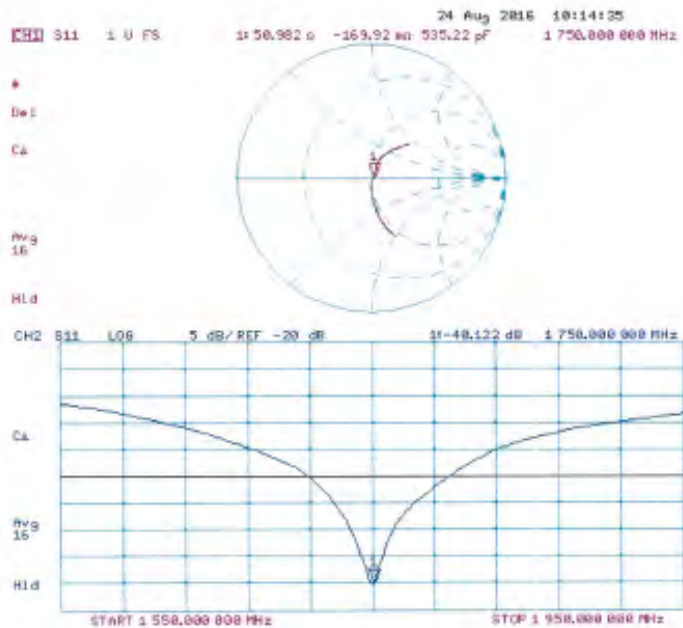
Peak SAR (extrapolated) = 17.2 W/kg

SAR(1 g) = 9.28 W/kg; SAR(10 g) = 4.9 W/kg

Maximum value of SAR (measured) = 14.3 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 31.08.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.49$ S/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

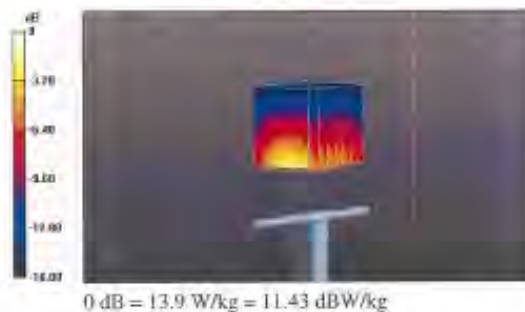
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.8 V/m; Power Drift = -0.02 dB

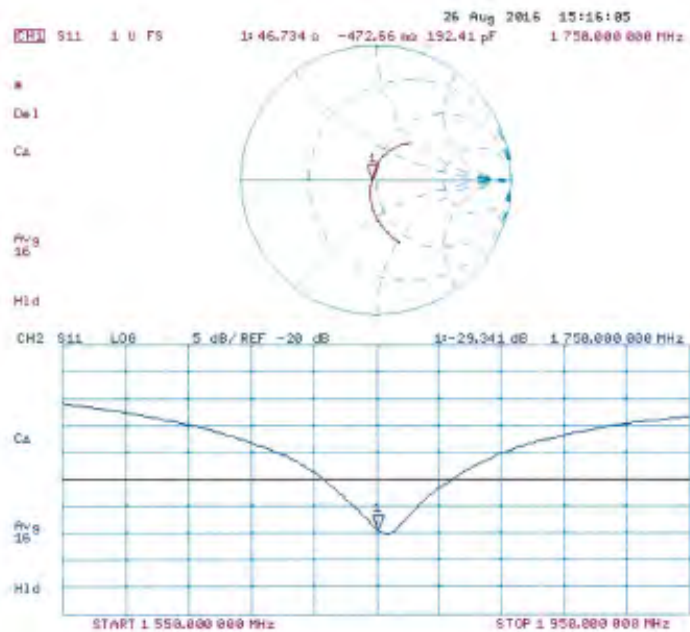
Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 9.34 W/kg; SAR(10 g) = 4.98 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **SGS-TW (Auden)**

Certificate No: **D1900V2-5d027_Apr16**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d027**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date **April 25, 2016**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|---------------------------------|-----------------------|
| Power meter NRP | SN: 104778 | 06-Apr-16 (No. 217-02288/C0289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02289) | Apr-17 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 05-Apr-16 (No. 217-02292) | Apr-17 |
| Type-N mismatch combination | SN: 3047.2 / 06327 | 05-Apr-16 (No. 217-02295) | Apr-17 |
| Reference Probe EX3DV4 | SN: 7349 | 31-Dec-15 (No. EX3-7349_Dec15) | Dec-16 |
| DAE4 | SN: 601 | 30-Dec-15 (No. DAE4-601_Dec15) | Dec-16 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---------------------------|----------------|-----------------------------------|------------------------|
| Power meter EPM-442A | SN: GB37480704 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: US37292783 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: MY41092317 | 07-Oct-15 (No. 217-02223) | In house check: Oct-16 |
| RF generator R&S SMT-06 | SN: 100872 | 15-Jun-15 (in house check Jun-15) | In house check: Oct-16 |
| Network Analyzer HP 8753E | SN: USS7980685 | 16-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

Calibrated by: **Michael Weller** **Michael Weller** **Michael Weller**
Name Function Signature
Laboratory Technician

Approved by: **Kolja Pokovic** **Kolja Pokovic** **Kolja Pokovic**
Name Function Signature
Technical Manager

Issued: April 25, 2016

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D1900V2-5d027_Apr16

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook.

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|------------------------------|------------------------|-------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 1900 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 40.0 | 1.40 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 40.0 \pm 6 % | 1.37 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
| SAR measured | 250 mW input power | 9.55 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 36.7 W/kg \pm 17.0 % (k=2) |
| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
| SAR measured | 250 mW input power | 5.03 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 20.3 W/kg \pm 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 53.3 | 1.52 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 52.9 \pm 6 % | 1.49 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
| SAR measured | 250 mW input power | 9.83 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 39.7 W/kg \pm 17.0 % (k=2) |
| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
| SAR measured | 250 mW input power | 5.21 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 21.0 W/kg \pm 16.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.8 Ω + 4.4 j Ω |
| Return Loss | - 27.0 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 46.5 Ω + 5.6 j Ω |
| Return Loss | - 23.3 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.196 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|-------------------|
| Manufactured by | SPEAG |
| Manufactured on | December 17, 2002 |

DASY5 Validation Report for Head TSL

Date: 25.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027

Communication System: UID 0 - C/W; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.37$ S/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.2, 8.2, 8.2); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

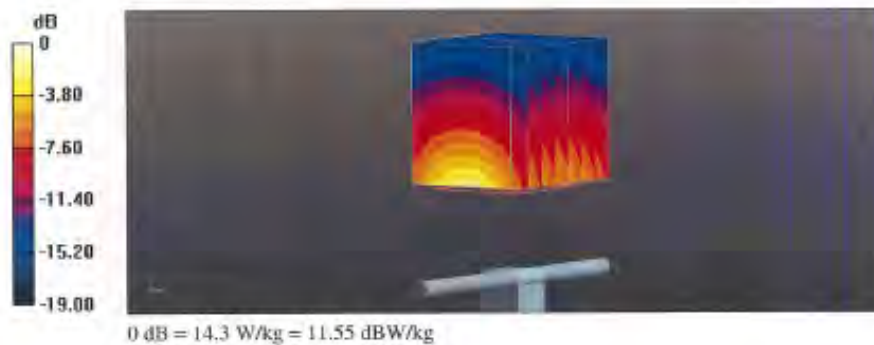
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.9 V/m; Power Drift = 0.02 dB

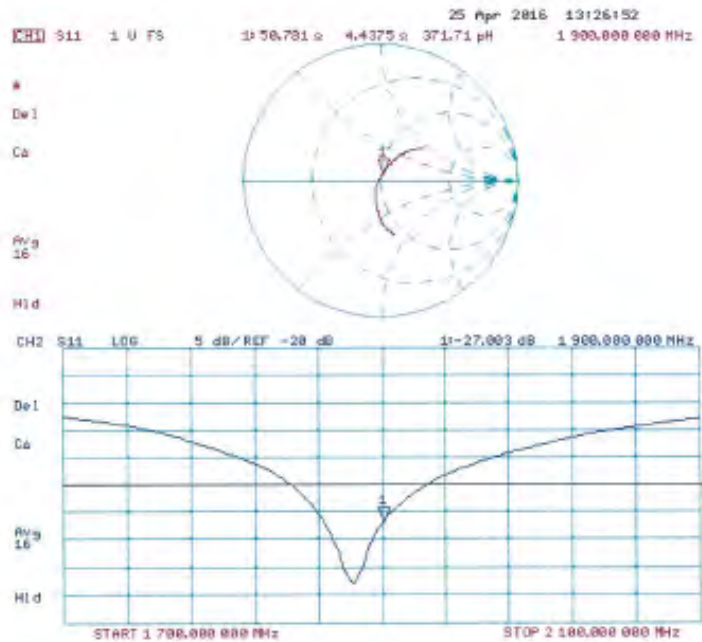
Peak SAR (extrapolated) = 17.2 W/kg

SAR(1 g) = 9.55 W/kg; SAR(10 g) = 5.03 W/kg

Maximum value of SAR (measured) = 14.3 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 25.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d027

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.49$ S/m; $\epsilon_r = 52.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

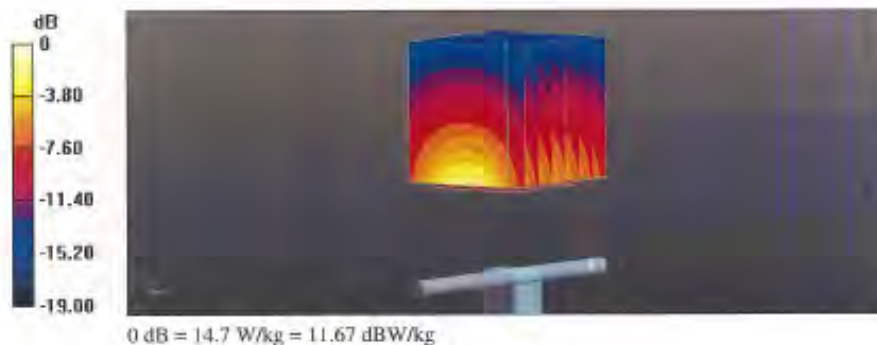
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.2 V/m; Power Drift = 0.02 dB

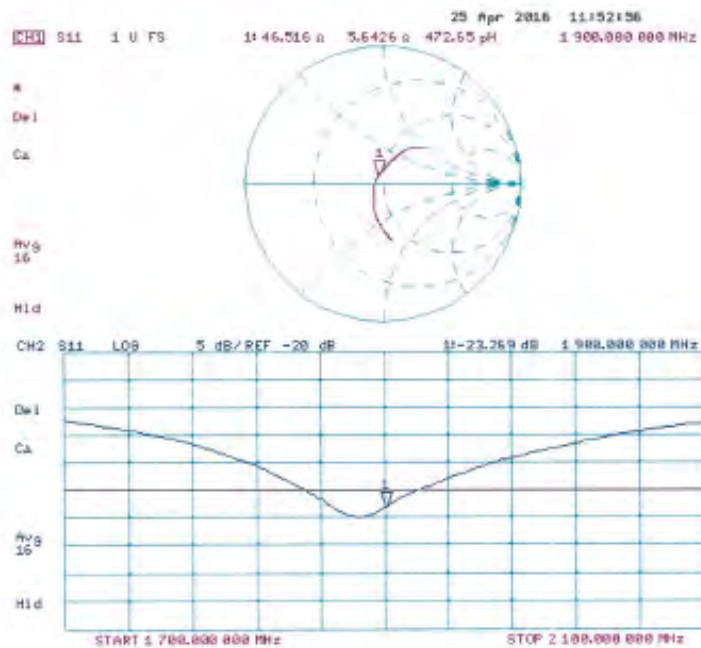
Peak SAR (extrapolated) = 17.2 W/kg

SAR(1 g) = 9.83 W/kg; SAR(10 g) = 5.21 W/kg

Maximum value of SAR (measured) = 14.7 W/kg



Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client: **SGS-TW (Auden)**

Certificate No.: **D2450V2-727_Apr16**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN:727**

Calibration procedure(s): **QA CAL-05.V9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **April 19, 2016**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility; environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $\approx 70\%$.

Calibration Equipment used (M&E critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter NRP | SN: 104778 | 06-Apr-16 (No. 217-02288/02289) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103244 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Power sensor NRP-Z91 | SN: 103245 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Reference 20 dB Attenuator | SN: 5038 (20k) | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 06-Apr-16 (No. 217-02288) | Apr-17 |
| Reference Probe EX3DV4 | SN: 7349 | 31-Dec-15 (No. EX3-7349_Dec15) | Dec-16 |
| OAE4 | SN: 601 | 30-Dec-15 (No. OAE4-601_Dec15) | Dec-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power meter EPM-442A | SN: 0837480704 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: US37292793 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| Power sensor HP 8481A | SN: MY41082317 | 07-Oct-15 (No. 217-02222) | In house check: Oct-16 |
| T/F Generator R&S SMT-06 | SN: 100972 | 15-Jun-15 (in house check Jun-15) | In house check: Oct-16 |
| Network Analyzer HP 8753E | SN: US37390585 | 18-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

| | | | |
|----------------|------------------------|------------------------------------|----------------|
| Calibrated by: | Name: Michael Weber | Function: Laboratory Technician | Signature: |
| Approved by: | Name: Katja Pokovic | Technical Manager: | |

Issued: April 20, 2016

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Certificate No.: D2450V2-727_Apr16

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Accreditation No.: SCS 010R

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 8 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|------------------------------|------------------------|-------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 2450 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 39.2 | 1.80 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 40.0 \pm 6 % | 1.83 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
| SAR measured | 250 mW input power | 12.8 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 51.0 W/kg \pm 17.0 % (k=2) |

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
| SAR measured | 250 mW input power | 5.93 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 23.7 W/kg \pm 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 52.7 | 1.95 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 52.7 \pm 6 % | 1.98 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
| SAR measured | 250 mW input power | 12.5 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 49.6 W/kg \pm 17.0 % (k=2) |

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
| SAR measured | 250 mW input power | 5.86 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 23.3 W/kg \pm 16.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

| | |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $55.3 \Omega + 2.0 j\Omega$ |
| Return Loss | - 25.4 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $52.1 \Omega + 4.8 j\Omega$ |
| Return Loss | - 25.9 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.148 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|------------------|
| Manufactured by | SPEAG |
| Manufactured on | January 09, 2003 |

DASY5 Validation Report for Head TSL

Date: 19.04.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 727

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.83$ S/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvR(7.76, 7.76, 7.76); Calibrated: 31.12.2015
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

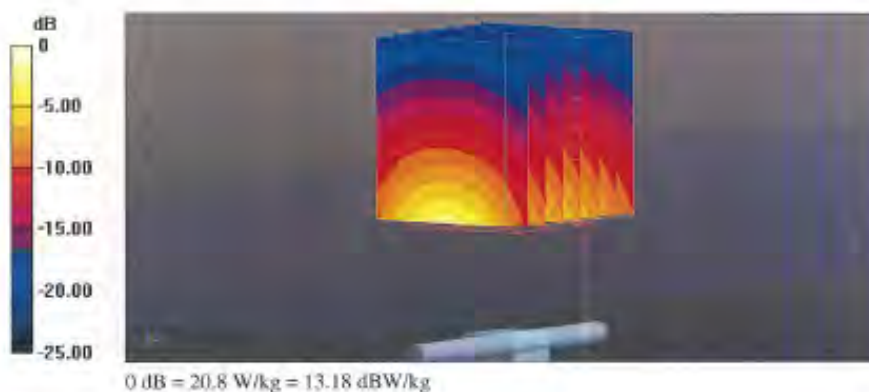
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 112.1 V/m; Power Drift = 0.05 dB

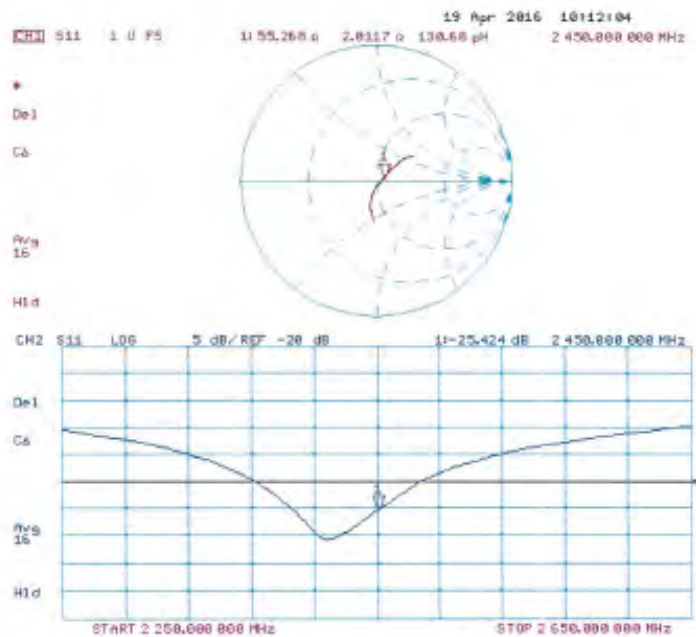
Peak SAR (extrapolated) = 25.7 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.93 W/kg

Maximum value of SAR (measured) = 20.8 W/kg



Impedance Measurement Plot for Head TSL



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Accreditation No.: **SCS 0108**

Client **SGS-TW (Auden)**

Certificate No: **D2600V2-1005_Jan16**

CALIBRATION CERTIFICATE

Object: **D2600V2 - SN: 1005**

Calibration procedure(s): **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **January 21, 2016**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility; environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (MSTE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A | GB37480704 | 07-Oct-15 (No. 217-02222) | Oct-16 |
| Power sensor HP 8481A | US37392783 | 07-Oct-15 (No. 217-02222) | Oct-16 |
| Power sensor HP 8481A | MY41082917 | 07-Oct-15 (No. 217-02223) | Oct-16 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 01-Apr-15 (No. 217-02131) | Mar-16 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 01-Apr-15 (No. 217-02134) | Mar-16 |
| Reference Probe EX3DV4 | SN: 7349 | 31-Dec-15 (No. EX3-7349_Dec15) | Dec-16 |
| DAE4 | SN: 801 | 30-Dec-15 (No. DAE4-801_Dec15) | Dec-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| RF generator R&S SM1-06 | 100972 | 15-Jun-15 (in house check Jun-15) | In house check: Jun-16 |
| Network Analyzer HP 8753E | US37390585 54206 | 16-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

Calibrated by: **Leif Klysner** Name
Function: **Laboratory Technician**

Signature

Approved by: **Katja Pokovic** Name
Function: **Technical Manager**

Issued: **January 26, 2016**

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Certificate No: **D2600V2-1005_Jan16**

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Accreditation No.: SCS 0108

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865684, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|------------------------------|------------------------|-------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 2600 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 39.0 | 1.96 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 37.3 \pm 6 % | 2.04 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | --- | --- |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 14.2 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 55.2 W/kg \pm 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 6.29 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 24.7 W/kg \pm 16.5 % (k=2) |

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Body TSL parameters | 22.0 °C | 52.5 | 2.16 mho/m |
| Measured Body TSL parameters | (22.0 \pm 0.2) °C | 51.6 \pm 6 % | 2.22 mho/m \pm 6 % |
| Body TSL temperature change during test | < 0.5 °C | --- | --- |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 13.7 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 53.9 W/kg \pm 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|------------------------------|
| SAR measured | 250 mW input power | 6.10 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 24.2 W/kg \pm 16.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL**

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 51.2 Ω - 4.2 j Ω |
| Return Loss | - 27.2 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 45.6 Ω - 3.3 j Ω |
| Return Loss | - 24.8 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.154 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|-------------------|
| Manufactured by | SPEAG |
| Manufactured on | December 23, 2006 |

DASY5 Validation Report for Head TSL

Date: 21.01.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1005

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.04$ S/m; $\epsilon_r = 37.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.49, 7.49, 7.49); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

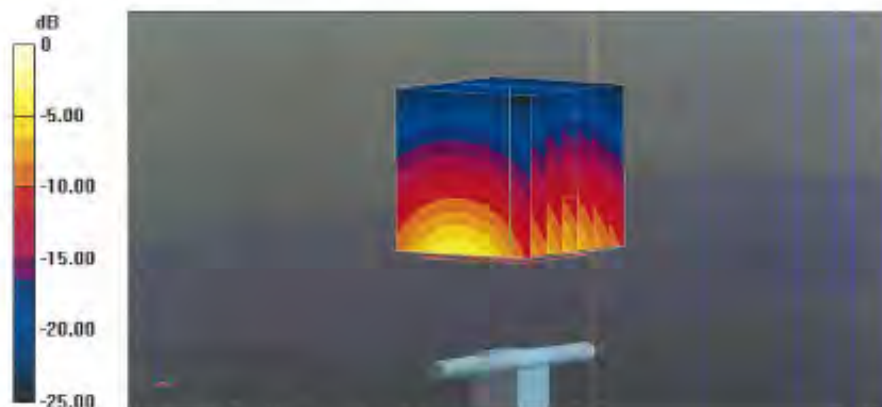
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 114.8 V/m; Power Drift = 0.01 dB

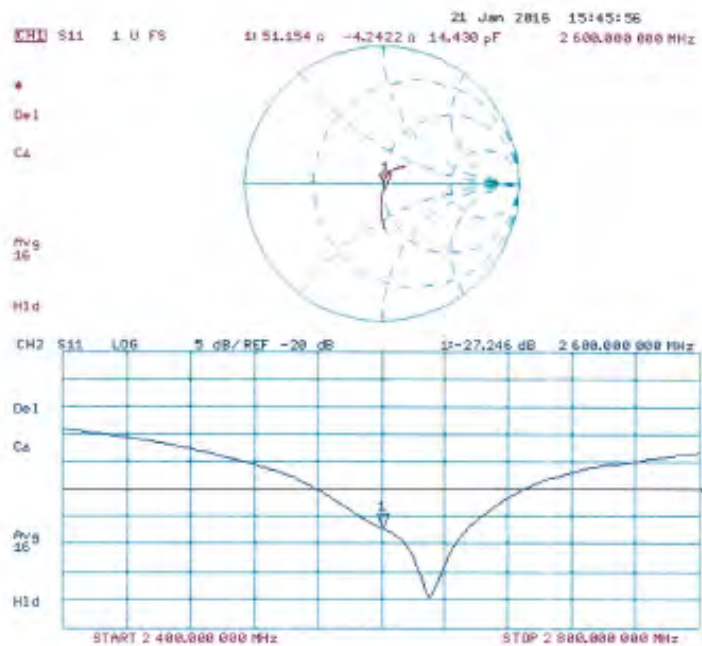
Peak SAR (extrapolated) = 30.2 W/kg

SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.29 W/kg

Maximum value of SAR (measured) = 24.0 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 21.01.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1005

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.22$ S/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.6, 7.6, 7.6); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

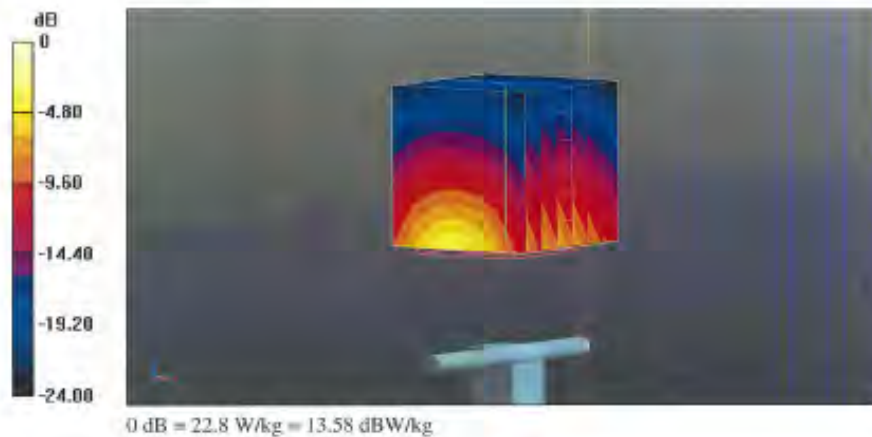
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.7 V/m; Power Drift = 0.02 dB

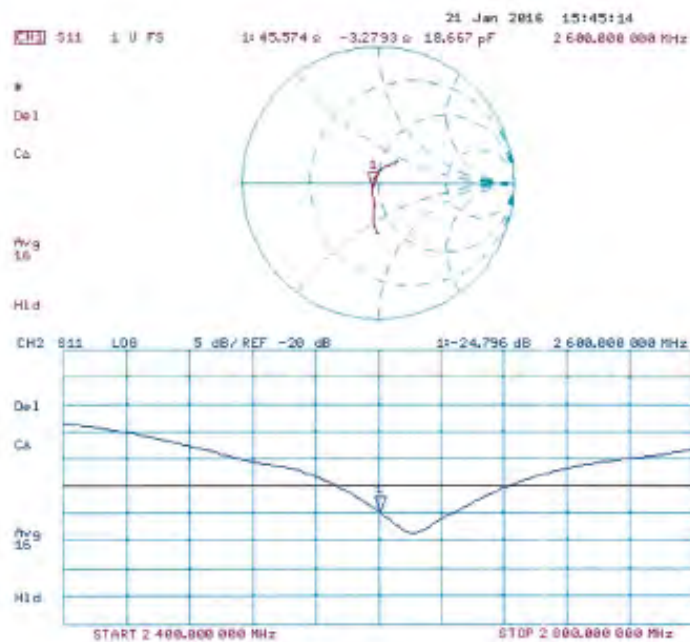
Peak SAR (extrapolated) = 28.4 W/kg

SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.1 W/kg

Maximum value of SAR (measured) = 22.8 W/kg



Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **SGS-TW (Auden)**

Certificate No: **D5GHzV2-1023_Jan16**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1023**

Calibration procedure(s) **QA CAL-22.v2**
Calibration procedure for dipole validation kits between 3-6 GHz

Calibration date **January 26, 2016**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 0.1°C and humidity < 70%).

Calibration Equipment used (M&E critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A | GB37480704 | 07-Oct-15 (No. 217-02222) | Oct-16 |
| Power sensor HP 8481A | US37292785 | 07-Oct-15 (No. 217-02222) | Oct-16 |
| Power sensor HP 8481A | MY41092317 | 07-Oct-15 (No. 217-02222) | Oct-16 |
| Reference 20 dB Attenuator | SN: 5055 (20k) | 01-Apr-15 (No. 217-02131) | Mar-16 |
| Type-N mismatch combination | SN: 5047.2 / 05327 | 01-Apr-15 (No. 217-02134) | Mar-16 |
| Reference Probe EX3DV4 | SN: 3503 | 31-Dec-15 (No. EX3-3503_Dec15) | Dec-16 |
| DAE4 | SN: 601 | 30-Dec-15 (No. DAE4-601_Dec15) | Dec-16 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| RF generator R&S SMT-06 | 100972 | 15-Jun-15 (in house check Jun-15) | In house check: Jun-16 |
| Network Analyzer HP 8753E | US37390685 S4206 | 18-Oct-01 (in house check Oct-15) | In house check: Oct-16 |

Calibrated by: **Michael Weber** Function: **Laboratory Technician**

Signature

Approved by: **Katja Pokovic** Technical Manager

Issued: January 28, 2016

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Certificate No: **D5GHzV2-1023_Jan16**

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Accreditation No.: **SCS 0108**

Glossary:

TSL: tissue simulating liquid
ConvF: sensitivity in TSL / NORM x,y,z
N/A: not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 665664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|------------------------------|--|----------------------------------|
| DASY Version | DASY5 | V52.8.8 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom V5.0 | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy = 4.0 mm, dz = 1.4 mm | Graded Ratio = 1.4 (Z direction) |
| Frequency | 5200 MHz \pm 1 MHz 5300 MHz \pm 1 MHz 5600 MHz \pm 1 MHz 5800 MHz \pm 1 MHz | |

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 36.0 | 4.66 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 35.2 \pm 6 % | 4.51 mho/m \pm 6 % |
| Head TSL temperature change during test | < 0.5 °C | **** | **** |

SAR result with Head TSL at 5200 MHz

| | | |
|---|--------------------|------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
| SAR measured | 100 mW input power | 7.74 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 77.0 W/kg \pm 19.9 % (k=2) |
| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
| SAR measured | 100 mW input power | 2.23 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 22.1 W/kg \pm 19.5 % (k=2) |

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.9 | 4.76 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 35.1 ± 6 % | 4.60 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL at 5300 MHz

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|----------------------------|
| SAR measured | 100 mW input power | 8.03 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 79.9 W / kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.33 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 23.1 W/kg ± 19.5 % (k=2) |

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.5 | 5.07 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 34.7 ± 6 % | 4.90 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL at 5600 MHz

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 8.31 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 82.6 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.38 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 23.6 W/kg ± 19.5 % (k=2) |

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.3 | 5.27 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 34.4 ± 6 % | 5.10 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | --- | --- |

SAR result with Head TSL at 5800 MHz

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.78 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 77.3 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.22 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 22.0 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 49.0 | 5.30 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 47.1 ± 6 % | 5.37 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ----- | ----- |

SAR result with Body TSL at 5200 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.25 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 71.9 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.05 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 20.3 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.9 | 5.42 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 46.9 ± 6 % | 5.50 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ----- | ----- |

SAR result with Body TSL at 5300 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.57 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 75.1 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.14 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 21.2 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.5 | 5.77 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 46.4 ± 6 % | 5.91 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5600 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.89 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 78.3 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.23 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 22.1 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.2 | 6.00 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 46.0 ± 6 % | 6.19 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5800 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.59 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 75.3 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.13 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 21.1 W/kg ± 19.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL at 5200 MHz**

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.1 Ω - 8.4 j Ω |
| Return Loss | - 21.4 dB |

Antenna Parameters with Head TSL at 5300 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.6 Ω - 4.2 j Ω |
| Return Loss | - 27.4 dB |

Antenna Parameters with Head TSL at 5600 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 54.9 Ω - 1.4 j Ω |
| Return Loss | - 26.3 dB |

Antenna Parameters with Head TSL at 5800 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 55.9 Ω + 2.2 j Ω |
| Return Loss | - 24.5 dB |

Antenna Parameters with Body TSL at 5200 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 49.4 Ω - 6.8 j Ω |
| Return Loss | - 23.3 dB |

Antenna Parameters with Body TSL at 5300 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.9 Ω - 2.4 j Ω |
| Return Loss | - 31.8 dB |

Antenna Parameters with Body TSL at 5600 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 56.0 Ω - 0.1 j Ω |
| Return Loss | - 25.0 dB |

Antenna Parameters with Body TSL at 5800 MHz

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 56.4 Ω + 2.4 j Ω |
| Return Loss | - 23.8 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.199 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|-------------------|
| Manufactured by | SPEAG |
| Manufactured on | February 05, 2004 |

DASY5 Validation Report for Head TSL

Date: 26.01.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1023

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.51$ S/m; $\epsilon_r = 35.2$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5300$ MHz; $\sigma = 4.6$ S/m; $\epsilon_r = 35.1$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5600$ MHz; $\sigma = 4.9$ S/m; $\epsilon_r = 34.7$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5800$ MHz; $\sigma = 5.1$ S/m; $\epsilon_r = 34.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.59, 5.59, 5.59); Calibrated: 31.12.2015, ConvF(5.25, 5.25, 5.25); Calibrated: 31.12.2015, ConvF(4.99, 4.99, 4.99); Calibrated: 31.12.2015, ConvF(4.95, 4.95, 4.95); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.68 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 28.1 W/kg

SAR(1 g) = 7.74 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 17.8 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 73.14 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 30.0 W/kg

SAR(1 g) = 8.03 W/kg; SAR(10 g) = 2.33 W/kg

Maximum value of SAR (measured) = 18.7 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

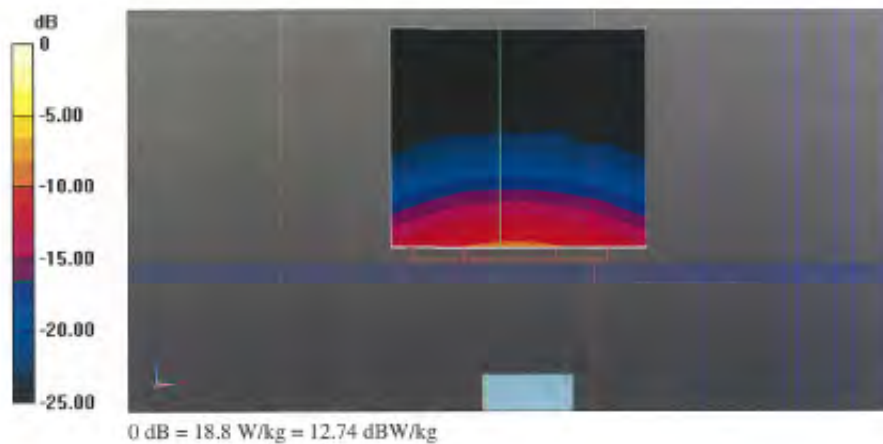
Reference Value = 73.32 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 32.6 W/kg

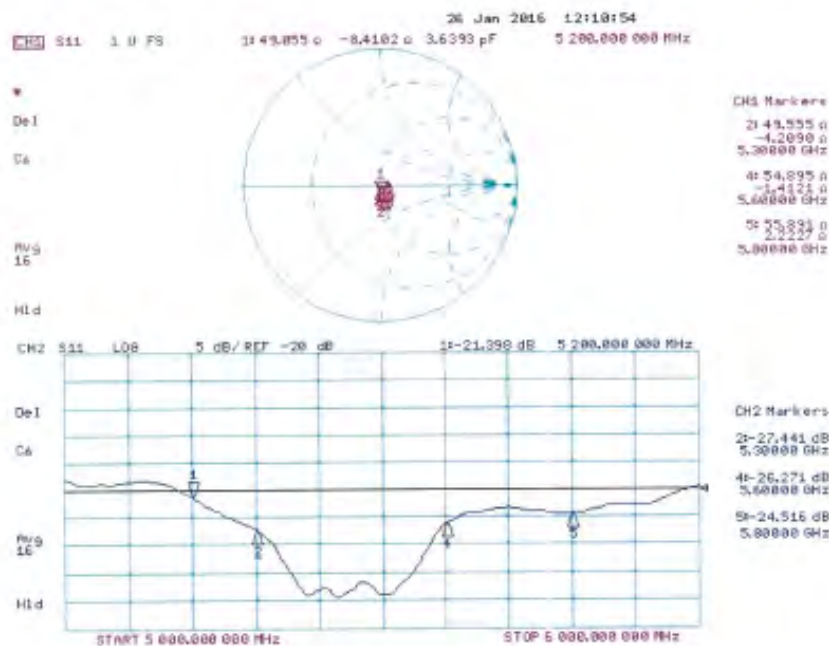
SAR(1 g) = 8.31 W/kg; SAR(10 g) = 2.38 W/kg

Maximum value of SAR (measured) = 19.8 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,
dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.15 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 32.0 W/kg
SAR(1 g) = 7.78 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 25.01.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1023

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.37$ S/m; $\epsilon_r = 47.1$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5300$ MHz; $\sigma = 5.5$ S/m; $\epsilon_r = 46.9$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5600$ MHz; $\sigma = 5.91$ S/m; $\epsilon_r = 46.4$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5800$ MHz; $\sigma = 6.19$ S/m; $\epsilon_r = 46$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.99, 4.99, 4.99); Calibrated: 31.12.2015, ConvF(4.75, 4.75, 4.75); Calibrated: 31.12.2015, ConvF(4.35, 4.35, 4.35); Calibrated: 31.12.2015, ConvF(4.27, 4.27, 4.27); Calibrated: 31.12.2015;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.72 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 27.1 W/kg

SAR(1 g) = 7.25 W/kg; SAR(10 g) = 2.05 W/kg

Maximum value of SAR (measured) = 16.8 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.43 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 29.1 W/kg

SAR(1 g) = 7.57 W/kg; SAR(10 g) = 2.14 W/kg

Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

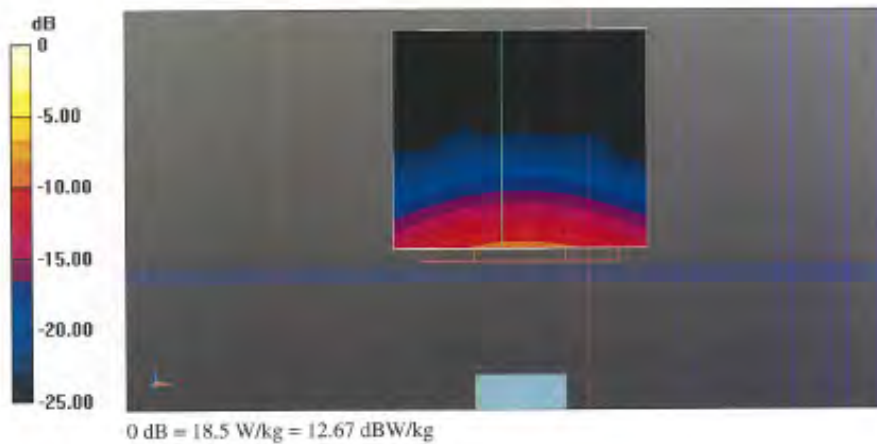
Reference Value = 67.67 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 32.6 W/kg

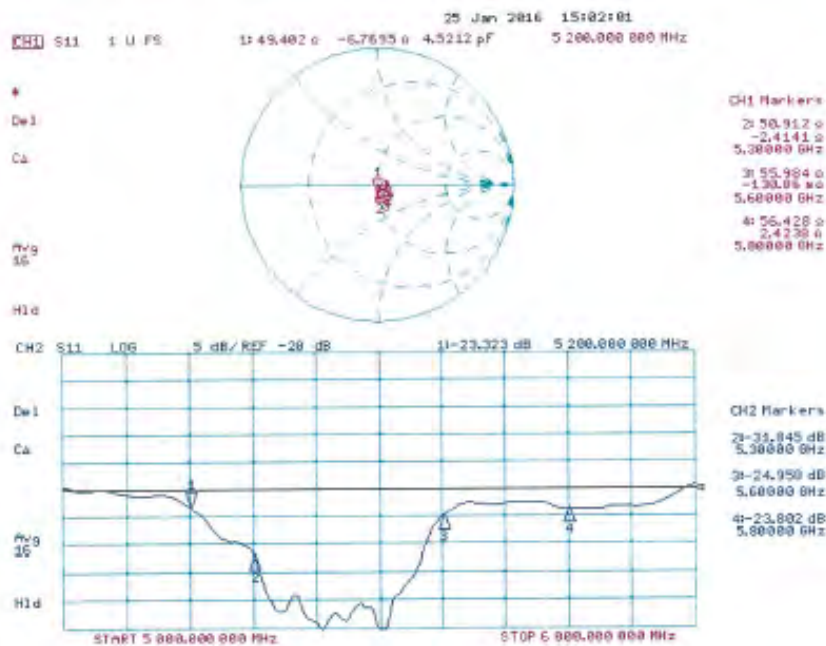
SAR(1 g) = 7.89 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,
dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.76 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 33.0 W/kg
SAR(1 g) = 7.59 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



Impedance Measurement Plot for Body TSL



- End of 1st part of report -

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