FCC SAR TEST REPORT

FCC ID	:	B94HCI001PSR
Equipment	:	Tablet
Brand Name	:	HP
Model Name	:	HSC-I001R
Applicant	:	HP Inc. 1501 Page Mill Road, Palo Alto CA, 94304, USA
Standard	:	FCC 47 CFR Part 2 (2.1093)

The product was installed into Tablet (Brand Name HP, Model Name: HSC-I001R) during test.

The product was received on Jul. 23, 2025 and testing was started from Jul. 28, 2025 and completed on Aug. 08, 2025. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full.

Cona Huang

Approved by: Cona Huang / Deputy Manager

Testing Laboratory 3786

Sporton International Inc. Wensan Laboratory
No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan

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History of this test report

Report No.	Version	Description	Issued Date
FA551409-05	01	Initial issue of report	Sep. 02, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for **HP Inc., Tablet, HSC-I001R,** are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Body (Separation 0mm) 1g SAR (W/kg)	Highest Body Simultaneous Transmission 1g SAR SAR (W/kg)
Licensed	WCDMA	WCDMA V	1.20	1.53
		WCDMA II	0.35	
		WCDMA IV	0.51	
	LTE	LTE Band 7	0.65	
		LTE Band 12/17	1.18	
		LTE Band 13	1.00	
		LTE Band 14	1.16	
		LTE Band 25/2	0.50	
		LTE Band 26/5	1.07	
		LTE Band 30	0.51	
		LTE Band 41/38	0.67	
		LTE Band 48	0.80	
		LTE Band 66/4	0.59	
Date of Testing:			2025/07/28 ~ 2025/08/08	

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation and the FCC designation No. TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Daisy Peng

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Tablet
Brand Name	HP
Model Name	HSC-I001R
FCC ID	B94HCI001PSR
Integrated WWAN Module	Brand Name: Rolling Wireless Model Name: RW101R-GL
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM
Remark: 1. This device has three kinds of sample; RF exposure evaluation selects sample 1 as the main test, sample 2/3 will spot check worst case found in sample 1.	

Module Information	
Integrated WLAN Module	Brand Name: Intel Model Name: AX201D2W
Integrated NFC Module	Brand Name: WNC Model Name: XRAV-1
Wireless Technology and Frequency Range	WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 13.56 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE NFC: ASK
EUT Stage	Production Unit

Remark:
1. The Intel AX201D2W WLAN/BT module (FCC ID: PD9AX201D2) is integrated into this host.
2. NFC module is integrated into this host, and NFC with other transmitters which the maximum of overlapping transmission including network hand-offs is not greater than 30 seconds, therefore NFC with other transmitter for simultaneous transmission analysis and compliance is not required.

WWAN Antenna Information				
Vendor 1 AUP6Y-100103 6036B0293001 Tx1 Antenna	Ant. Type	PIFA	Peak Gain	WCDMA Band II: 2.29 WCDMA Band IV:2.15 WCDMA Band V: -0.99 LTE Band 2: 2.29 LTE Band 4: 2.15 LTE Band 5: -0.99 LTE Band 7: 0.27 LTE Band 12: -0.62 LTE Band 13: 1.26 LTE Band 14: 1.26 LTE Band 17: 0.56 LTE Band 25: 2.29 LTE Band 26: -0.99 LTE Band 30: -1.69 LTE Band 38: 0.27 LTE Band 41: 0.27 LTE Band 48: -1.11 LTE Band 66: 2.15

WLAN Antenna Information									
Vendor 1 6036B0292801 (AUP6Y-100102)	Peak Gain (dBi)				Vendor 1 6036B0292901 (AUP5Y-100006)	Peak Gain (dBi)			
	2400~2483.5MHz	-1.77	5470~5725MHz	-0.53		2400~2483.5MHz	-0.27	5470~5725MHz	-4.20
	5150~5250MHz	-1.13	5725~5850MHz	0.06		5150~5250MHz	-2.64	5725~5850MHz	-3.85
	5250~5350MHz	-1.13				5250~5350MHz	-2.64		

Sample No.	Housing type
Sample 1	Housing-5
Sample 2	Housing-1
Sample 3	Housing-3

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	B94HCI001PSR
Equipment Name	TABLET
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 14: 5MHz, 10MHz LTE Band 17: 5MHz, 10MHz LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 30: 5MHz, 10MHz LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM
LTE MPR permanently built-in by design	**Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3**

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720

M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7

	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

LTE Band 14

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Channel #	Channel #	Freq.(MHz)
L	23305	790.5	23330	793
M	23330	793		
H	23355	795.5		

LTE Band 17

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq. (MHz)
L	23755	706.5	23780	709
M	23790	710	23790	710
H	23825	713.5	23800	711

LTE Band 25

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

LTE Band 26

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5

LTE Band 30

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	27685	2307.5	27710	2310
M	27710	2310		
H	27735	2312.5		

LTE Band 38								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

LTE Band 41								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

LTE Band 48								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560
LM	55810	3607	55815	3607.5	55820	3608	55830	3609
MH	56170	3643	56165	3642.5	56160	3642	56150	3641
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690

LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

4. RF Exposure Limits

4.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

4.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

5. Specific Absorption Rate (SAR)

5.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

5.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

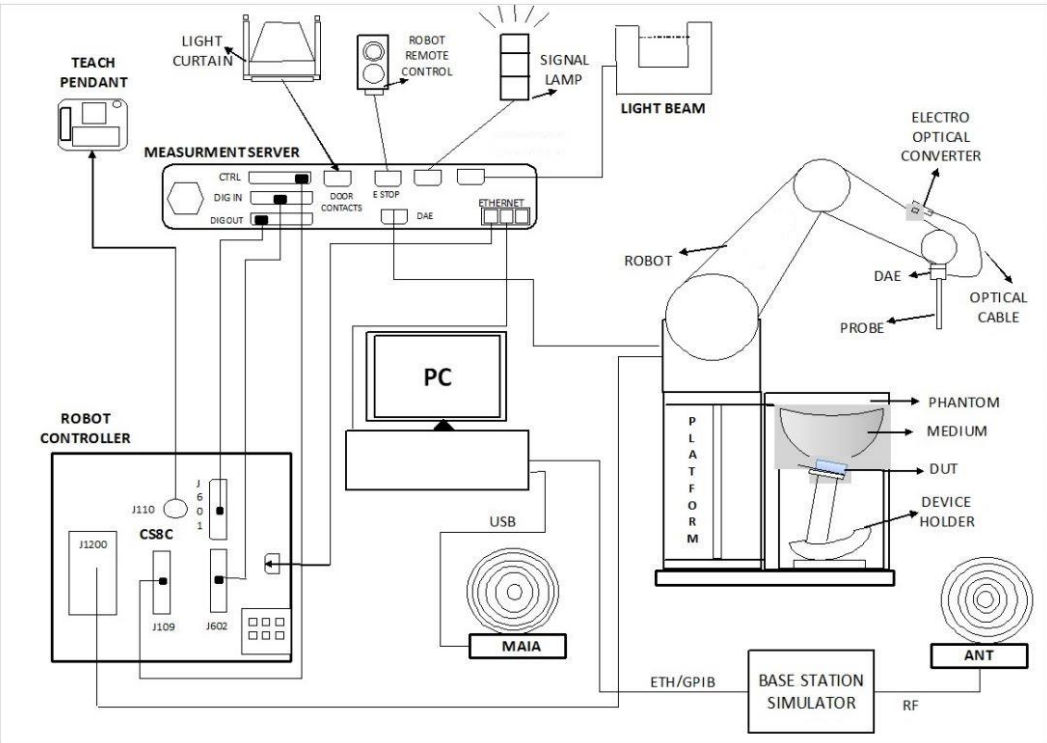
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^{\mathbf{2}}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

6. System Description and Setup

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



- The DASY system in SAR Configuration is shown above
- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A 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.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running windows software and the DASY software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Laboratory	EMC & Wireless Communications Laboratory		Wensan Laboratory				
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan				
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY	SAR18-HY	SAR21-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	SAR16-HY	SAR19-HY	SAR22-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-HY	SAR20-HY	

6.2 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	4 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	4 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

6.3 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

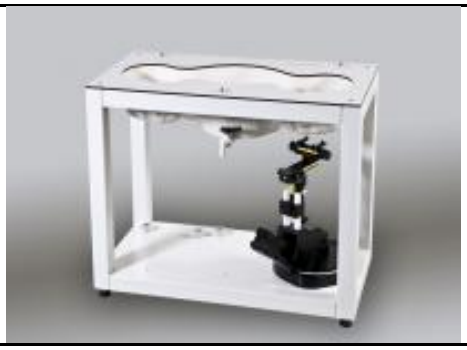
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

6.4 Phantom

<SAM Twin Phantom>

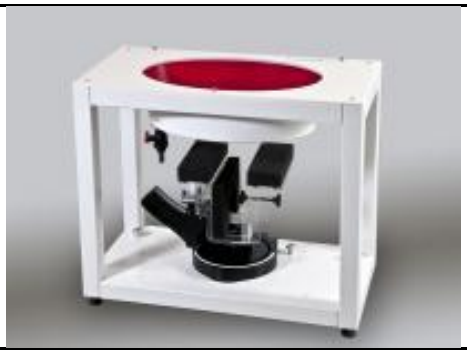
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm



The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

6.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

7.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

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 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

7.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

7.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

7.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

7.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1107	Jun. 11, 2025	Jun. 10, 2026
SPEAG	835MHz System Validation Kit(2)	D835V2	4d167	Nov. 24, 2022	Nov. 21, 2025
SPEAG	1750MHz System Validation Kit	D1750V2	1112	Feb. 20, 2025	Feb. 19, 2026
SPEAG	1900MHz System Validation Kit	D1900V2	5d185	Jun. 11, 2025	Jun. 10, 2026
SPEAG	2300MHz System Validation Kit	D2300V2	1006	Jan. 14, 2025	Jan. 13, 2026
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 15, 2024	Aug. 14, 2025
SPEAG	2600MHz System Validation Kit	D2600V2	1078	Jun. 11, 2025	Jun. 10, 2026
SPEAG	3500MHz System Validation Kit	D3500V2	1014	Jan. 15, 2025	Jan. 14, 2026
SPEAG	3700MHz System Validation Kit	D3700V2	1006	Jun. 12, 2025	Jun. 11, 2026
SPEAG	Data Acquisition Electronics	DAE4	376	Sep. 16, 2024	Sep. 15, 2025
SPEAG	Data Acquisition Electronics	DAE4ip	1800	Jun. 16, 2025	Jun. 15, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	7785	Nov. 28, 2024	Nov. 27, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7814	Jun. 19, 2025	Jun. 18, 2026
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 17, 2024	Sep. 16, 2025
Testo	Hygro meter	608-H1	45196600	Oct. 28, 2024	Oct. 27, 2025
Testo	Hygro meter	608-H1	45207528	Oct. 28, 2024	Oct. 27, 2025
Anritsu	Radio Communication Analyzer	MT8821C	6201074414	Aug. 20, 2024	Aug. 19, 2025
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Sep. 24, 2024	Sep. 23, 2025
Keysight	ENA Network Analyzer	E5071C	MY46104758	Oct. 20, 2024	Oct. 19, 2025
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3252	Jul. 31, 2024	Jul. 30, 2025
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3690	Aug. 07, 2024	Aug. 06, 2025
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3902	Feb. 19, 2025	Feb. 18, 2026
Anritsu	Power Meter	ML2495A	1419002	Aug. 13, 2024	Aug. 12, 2025
Keysight	Power Sensor	U2065XA	MY60000034	Aug. 12, 2024	Aug. 11, 2025
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Aug. 09, 2024	Aug. 08, 2025
Mini-Circuits	Power Amplifier	ZVE-8G+	D120604	Oct. 16, 2024	Oct. 15, 2025
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

9. System Verification

9.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18℃ to 25℃ and within ± 2℃ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.
The liquid tissue depth was at least 15cm in the phantom for all SAR testing

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp (℃)	Conductivity (σ)	Permittivity (εr	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
750	22.5	0.893	42.1	0.89	41.9	0.34	0.48	±5.0	2025-07-28
750	22.3	0.894	42.4	0.89	41.9	0.45	1.19	±5.0	2025-07-31
750	22.5	0.893	42.7	0.89	41.9	0.34	1.91	±5.0	2025-08-08
835	22.5	0.928	41.9	0.9	41.5	3.11	0.96	±5.0	2025-07-28
835	22.3	0.929	42.1	0.9	41.5	3.22	1.45	±5.0	2025-07-31
1750	22.5	1.35	40.4	1.37	40.1	-1.46	0.75	±5.0	2025-07-28
1900	22.5	1.4	39.0	1.4	40.0	0.00	-2.50	±5.0	2025-07-28
1900	22.5	1.39	38.8	1.4	40.0	-0.71	-3.00	±5.0	2025-08-06
2300	22.5	1.65	39.9	1.67	39.5	-1.20	1.01	±5.0	2025-07-28
2300	22.5	1.66	40.6	1.67	39.5	-0.60	2.78	±5.0	2025-08-06
2600	22.5	1.95	39.1	1.96	39.0	-0.51	0.26	±5.0	2025-07-28
2600	22.3	1.97	39.5	1.96	39.0	0.51	1.28	±5.0	2025-07-31
2600	22.5	1.9	38.5	1.96	39.0	-3.06	-1.28	±5.0	2025-08-05
2600	22.5	1.96	39.5	1.96	39.0	0.00	1.28	±5.0	2025-08-06
3500	22.5	2.88	37.1	2.91	37.9	-1.03	-2.11	±5.0	2025-07-28
3500	22.3	2.88	37.3	2.91	37.9	-1.03	-1.58	±5.0	2025-07-31
3500	22.5	2.91	37.5	2.91	37.9	0.00	-1.06	±5.0	2025-08-06
3700	22.5	3.06	36.8	3.12	37.7	-1.92	-2.39	±5.0	2025-07-28
3700	22.3	3.07	37.0	3.12	37.7	-1.60	-1.86	±5.0	2025-07-31
3700	22.5	3.09	37.2	3.12	37.7	-0.96	-1.33	±5.0	2025-08-06

9.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR18	2025-07-28	750	250.00	D750V3 - 1107	EX3DV4 - SN7785	DAE4 Sn376	2.140	8.840	8.560	-3.17
SAR18	2025-07-31	750	250.00	D750V3 - 1107	EX3DV4 - SN7785	DAE4 Sn376	2.140	8.840	8.560	-3.17
SAR17	2025-08-08	750	250.00	D750V3 - 1107	EX3DV4 - SN7814	DAE4ip Sn1800	2.050	8.840	8.200	-7.24
SAR18	2025-07-28	835	250.00	D835V2 - 4d167	EX3DV4 - SN7785	DAE4 Sn376	2.470	9.800	9.880	0.82
SAR18	2025-07-31	835	250.00	D835V2 - 4d167	EX3DV4 - SN7785	DAE4 Sn376	2.460	9.800	9.840	0.41
SAR18	2025-07-28	1750	50.00	D1750V2 - 1112	EX3DV4 - SN7785	DAE4 Sn376	1.740	36.300	34.800	-4.13
SAR18	2025-07-28	1900	50.00	D1900V2 - 5d185	EX3DV4 - SN7785	DAE4 Sn376	2.010	39.600	40.200	1.52
SAR18	2025-08-06	1900	50.00	D1900V2 - 5d185	EX3DV4 - SN7785	DAE4 Sn376	1.850	39.600	37.000	-6.57
SAR18	2025-07-28	2300	250.00	D2300V2 - 1006	EX3DV4 - SN7785	DAE4 Sn376	10.900	48.200	43.600	-9.54
SAR18	2025-08-06	2300	250.00	D2300V2 - 1006	EX3DV4 - SN7785	DAE4 Sn376	11.600	48.200	46.400	-3.73
SAR18	2025-07-28	2600	50.00	D2600V2 - 1078	EX3DV4 - SN7785	DAE4 Sn376	2.510	55.300	50.200	-9.22
SAR18	2025-07-31	2600	50.00	D2600V2 - 1008	EX3DV4 - SN7785	DAE4 Sn376	2.920	55.700	58.400	4.85
SAR18	2025-08-05	2600	250.00	D2600V2 - 1008	EX3DV4 - SN7785	DAE4 Sn376	13.000	55.700	52.000	-6.64
SAR18	2025-08-06	2600	250.00	D2600V2 - 1008	EX3DV4 - SN7785	DAE4 Sn376	13.100	55.700	52.400	-5.92
SAR18	2025-07-28	3500	50.00	D3500V2 - 1014	EX3DV4 - SN7785	DAE4 Sn376	3.190	65.700	63.800	-2.89
SAR18	2025-07-31	3500	50.00	D3500V2 - 1014	EX3DV4 - SN7785	DAE4 Sn376	3.120	65.700	62.400	-5.02
SAR18	2025-08-06	3500	100.00	D3500V2 - 1014	EX3DV4 - SN7785	DAE4 Sn376	6.760	65.700	67.600	2.89
SAR18	2025-07-28	3700	50.00	D3700V2 - 1006	EX3DV4 - SN7785	DAE4 Sn376	3.210	69.900	64.200	-8.15
SAR18	2025-07-31	3700	50.00	D3700V2 - 1006	EX3DV4 - SN7785	DAE4 Sn376	3.150	69.900	63.000	-9.87
SAR18	2025-08-06	3700	100.00	D3700V2 - 1006	EX3DV4 - SN7785	DAE4 Sn376	6.810	69.900	68.100	-2.58

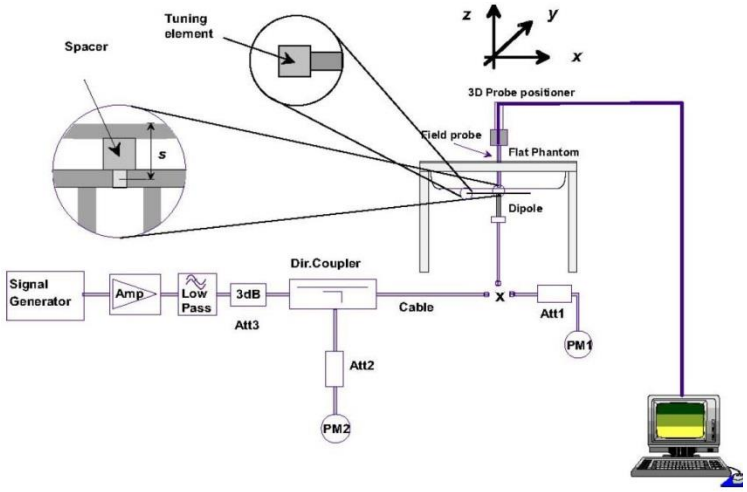


Fig 8.3.1 System Performance Check Setup

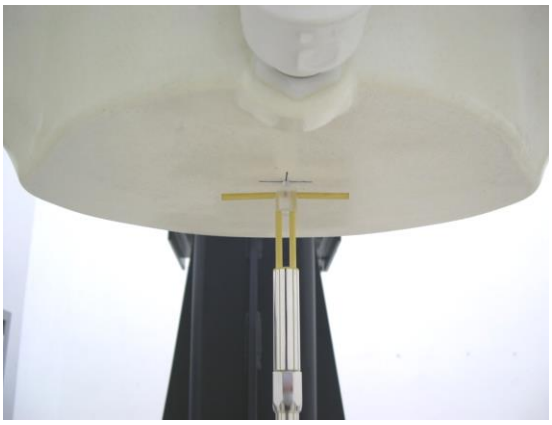


Fig 8.3.2 Setup Photo

10. UMTS/LTE Output Power (Unit: dBm)

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, 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 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	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

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

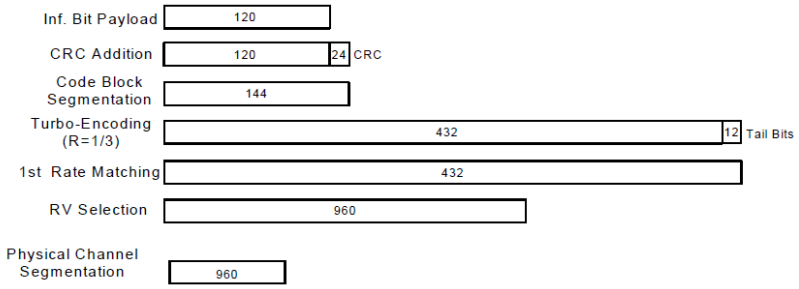


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

【WCDMA II】

TX Channel		9262	9400	9538	Tune-up Limit (dBm)
Frequency (MHz)		1852.4	1880	1907.6	
3GPP Rel 99	RMC 12.2Kbps	13.41	13.24	13.24	14.00
3GPP Rel 6	HSDPA Subtest-1	12.35	12.21	12.26	13.00
3GPP Rel 6	HSDPA Subtest-2	12.37	12.27	12.28	13.00
3GPP Rel 6	HSDPA Subtest-3	11.83	11.66	11.75	12.50
3GPP Rel 6	HSDPA Subtest-4	11.84	11.71	11.82	12.50
3GPP Rel 8	DC-HSDPA Subtest-1	12.20	12.05	12.16	13.00
3GPP Rel 8	DC-HSDPA Subtest-2	12.26	12.11	12.08	13.00
3GPP Rel 8	DC-HSDPA Subtest-3	11.71	11.51	11.60	12.50
3GPP Rel 8	DC-HSDPA Subtest-4	11.67	11.61	11.64	12.50
3GPP Rel 6	HSUPA Subtest-1	11.46	11.19	11.26	13.00
3GPP Rel 6	HSUPA Subtest-2	10.45	10.24	10.27	11.00
3GPP Rel 6	HSUPA Subtest-3	11.98	12.00	11.99	12.00
3GPP Rel 6	HSUPA Subtest-4	10.53	10.26	10.30	11.00
3GPP Rel 6	HSUPA Subtest-5	12.40	12.00	12.20	13.00

【WCDMA IV】

TX Channel		1312	1413	1513	Tune-up Limit (dBm)
Frequency (MHz)		1712.4	1732.6	1752.6	
3GPP Rel 99	RMC 12.2Kbps	13.07	13.20	13.40	13.50
3GPP Rel 6	HSDPA Subtest-1	12.04	12.19	12.45	12.50
3GPP Rel 6	HSDPA Subtest-2	11.75	12.15	12.38	12.50
3GPP Rel 6	HSDPA Subtest-3	11.48	11.65	11.92	12.00
3GPP Rel 6	HSDPA Subtest-4	11.54	11.58	11.89	12.00
3GPP Rel 8	DC-HSDPA Subtest-1	11.88	12.04	12.37	12.50
3GPP Rel 8	DC-HSDPA Subtest-2	11.74	12.00	12.22	12.50
3GPP Rel 8	DC-HSDPA Subtest-3	11.48	11.58	11.82	12.00
3GPP Rel 8	DC-HSDPA Subtest-4	11.48	11.41	11.69	12.00
3GPP Rel 6	HSUPA Subtest-1	11.01	10.92	10.85	12.50
3GPP Rel 6	HSUPA Subtest-2	10.07	9.96	9.78	10.50
3GPP Rel 6	HSUPA Subtest-3	11.49	11.48	11.48	11.50
3GPP Rel 6	HSUPA Subtest-4	10.11	10.07	9.90	10.50
3GPP Rel 6	HSUPA Subtest-5	11.80	11.68	11.50	12.50

【WCDMA V】

TX Channel		4132	4182	4233	Tune-up Limit (dBm)
Frequency (MHz)		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	20.32	20.23	20.28	20.50
3GPP Rel 6	HSDPA Subtest-1	19.37	19.23	19.29	19.50
3GPP Rel 6	HSDPA Subtest-2	19.31	19.17	19.22	19.50
3GPP Rel 6	HSDPA Subtest-3	18.83	18.67	18.83	19.00
3GPP Rel 6	HSDPA Subtest-4	18.77	18.67	18.82	19.00
3GPP Rel 8	DC-HSDPA Subtest-1	19.21	19.08	19.11	19.50
3GPP Rel 8	DC-HSDPA Subtest-2	19.19	19.03	19.08	19.50
3GPP Rel 8	DC-HSDPA Subtest-3	18.63	18.51	18.71	19.00
3GPP Rel 8	DC-HSDPA Subtest-4	18.62	18.55	18.63	19.00
3GPP Rel 6	HSUPA Subtest-1	19.32	19.21	19.22	19.50
3GPP Rel 6	HSUPA Subtest-2	17.34	17.23	17.37	17.50
3GPP Rel 6	HSUPA Subtest-3	18.35	18.18	18.21	18.50
3GPP Rel 6	HSUPA Subtest-4	17.28	17.21	17.45	17.50
3GPP Rel 6	HSUPA Subtest-5	19.30	19.10	18.90	19.50

<LTE Conducted Power>

General Note:

1. A Base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with 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.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, 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 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5/B12/B17/B26/B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2/4/5/17/38 SAR test was covered by Band 25/66/26/12/41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
    a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
    b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations

b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS

c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Base station simulator was used for LTE output power measurements and SAR testing.

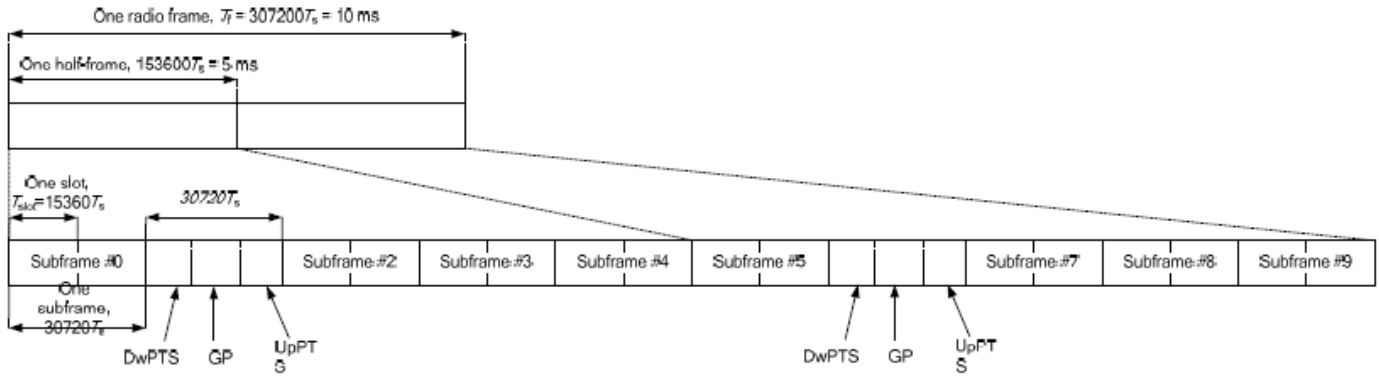


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~4**	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~3**	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.

ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink

iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.167)/5 = 63.3%

iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.143)/5 = 62.9%

v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

vi. The device supports Power Class 3 uplink-downlink configurations 0 and 6, and Power Class 2 uplink-downlink configurations 1 to 5 operations for LTE Band 41.

vii. The highest available duty cycle for Power Class 2 operation is 43.3% using UL-DL configuration 1, for Power Class 3 operation is 63.3% using UL-DL configuration 0. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR among all exposure condition.

【LTE Band 2】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	13.17	12.84	12.80	14.00
20	QPSK	1	49	13.00	12.78	12.92	14.00
20	QPSK	1	99	12.82	12.72	12.82	14.00
20	QPSK	50	0	13.12	12.84	12.86	14.00
20	QPSK	50	24	13.13	12.87	12.97	14.00
20	QPSK	50	50	12.83	12.79	12.95	14.00
20	QPSK	100	0	12.99	12.84	12.84	14.00
20	16QAM	1	0	13.16	13.15	13.13	14.00
20	16QAM	1	49	13.16	13.07	13.21	14.00
20	16QAM	1	99	13.05	13.03	13.12	14.00
20	16QAM	50	0	13.05	12.85	12.86	14.00
20	16QAM	50	24	13.02	12.86	13.00	14.00
20	16QAM	50	50	12.90	12.79	12.94	14.00
20	16QAM	100	0	13.01	12.84	12.82	14.00
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	13.05	12.77	12.72	14.00
15	QPSK	1	37	12.86	12.64	12.81	14.00
15	QPSK	1	74	12.70	12.63	12.74	14.00
15	QPSK	36	0	13.11	12.75	12.82	14.00
15	QPSK	36	20	13.11	12.77	12.92	14.00
15	QPSK	36	39	12.70	12.64	12.80	14.00
15	QPSK	75	0	12.95	12.72	12.76	14.00
15	16QAM	1	0	13.12	13.09	13.09	14.00
15	16QAM	1	37	13.13	12.98	13.11	14.00
15	16QAM	1	74	13.03	12.93	13.10	14.00
15	16QAM	36	0	12.99	12.70	12.76	14.00
15	16QAM	36	20	12.99	12.76	12.89	14.00
15	16QAM	36	39	12.88	12.64	12.87	14.00
15	16QAM	75	0	12.96	12.74	12.73	14.00
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	13.12	12.72	12.67	14.00
10	QPSK	1	25	12.98	12.76	12.89	14.00
10	QPSK	1	49	12.75	12.61	12.73	14.00
10	QPSK	25	0	12.98	12.79	12.82	14.00
10	QPSK	25	12	13.01	12.74	12.92	14.00
10	QPSK	25	25	12.69	12.74	12.93	14.00
10	QPSK	50	0	12.96	12.77	12.75	14.00
10	16QAM	1	0	13.15	13.14	12.99	14.00
10	16QAM	1	25	13.14	12.99	13.09	14.00
10	16QAM	1	49	12.94	12.94	13.03	14.00
10	16QAM	25	0	12.91	12.82	12.81	14.00
10	16QAM	25	12	12.95	12.85	12.93	14.00
10	16QAM	25	25	12.76	12.73	12.84	14.00
10	16QAM	50	0	12.97	12.70	12.74	14.00
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	13.12	12.80	12.66	14.00
5	QPSK	1	12	12.92	12.64	12.89	14.00
5	QPSK	1	24	12.71	12.67	12.69	14.00
5	QPSK	12	0	13.08	12.73	12.78	14.00
5	QPSK	12	7	12.98	12.78	12.87	14.00
5	QPSK	12	13	12.78	12.76	12.87	14.00
5	QPSK	25	0	12.95	12.72	12.71	14.00
5	16QAM	1	0	13.14	13.09	13.00	14.00
5	16QAM	1	12	13.15	12.93	13.08	14.00
5	16QAM	1	24	13.03	12.95	13.07	14.00
5	16QAM	12	0	12.98	12.76	12.77	14.00
5	16QAM	12	7	12.92	12.84	12.90	14.00
5	16QAM	12	13	12.76	12.70	12.86	14.00
5	16QAM	25	0	12.87	12.78	12.77	14.00
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	13.05	12.83	12.75	14.00
3	QPSK	1	8	12.98	12.69	12.91	14.00
3	QPSK	1	14	12.76	12.69	12.70	14.00
3	QPSK	8	0	13.04	12.79	12.74	14.00
3	QPSK	8	4	13.04	12.83	12.91	14.00
3	QPSK	8	7	12.73	12.72	12.82	14.00
3	QPSK	15	0	12.90	12.77	12.72	14.00

3	16QAM	1	0	13.13	13.00	13.07	14.00
3	16QAM	1	8	13.14	12.97	13.09	14.00
3	16QAM	1	14	12.92	12.98	13.06	14.00
3	16QAM	8	0	12.90	12.76	12.72	14.00
3	16QAM	8	4	12.87	12.81	12.85	14.00
3	16QAM	8	7	12.83	12.72	12.88	14.00
3	16QAM	15	0	12.94	12.73	12.71	14.00
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	13.04	12.81	12.75	14.00
1.4	QPSK	1	3	12.97	12.70	12.89	14.00
1.4	QPSK	1	5	12.71	12.66	12.74	14.00
1.4	QPSK	3	0	13.07	12.79	12.80	14.00
1.4	QPSK	3	1	12.99	12.83	12.92	14.00
1.4	QPSK	3	3	12.79	12.68	12.82	14.00
1.4	QPSK	6	0	12.90	12.73	12.81	14.00
1.4	16QAM	1	0	13.16	13.13	13.03	14.00
1.4	16QAM	1	3	13.12	12.93	13.14	14.00
1.4	16QAM	1	5	12.98	13.01	13.07	14.00
1.4	16QAM	3	0	12.91	12.71	12.73	14.00
1.4	16QAM	3	1	12.97	12.71	12.92	14.00
1.4	16QAM	3	3	12.76	12.68	12.79	14.00
1.4	16QAM	6	0	12.89	12.80	12.70	14.00

【LTE Band 4】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	13.45	13.33	13.36	14.00
20	QPSK	1	49	13.46	13.31	13.23	14.00
20	QPSK	1	99	13.24	13.22	13.13	14.00
20	QPSK	50	0	13.47	13.37	13.36	14.00
20	QPSK	50	24	13.41	13.34	13.38	14.00
20	QPSK	50	50	13.32	13.28	13.21	14.00
20	QPSK	100	0	13.37	13.32	13.33	14.00
20	16QAM	1	0	13.89	13.68	13.71	14.00
20	16QAM	1	49	13.90	13.71	13.54	14.00
20	16QAM	1	99	13.62	13.62	13.47	14.00
20	16QAM	50	0	13.52	13.39	13.38	14.00
20	16QAM	50	24	13.43	13.39	13.39	14.00
20	16QAM	50	50	13.39	13.34	13.22	14.00
20	16QAM	100	0	13.38	13.38	13.35	14.00
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	13.44	13.34	13.33	14.00
15	QPSK	1	37	13.40	13.31	13.20	14.00
15	QPSK	1	74	13.25	13.23	13.13	14.00
15	QPSK	36	0	13.49	13.38	13.38	14.00
15	QPSK	36	20	13.42	13.35	13.30	14.00
15	QPSK	36	39	13.37	13.30	13.23	14.00
15	QPSK	75	0	13.37	13.35	13.36	14.00
15	16QAM	1	0	13.82	13.70	13.70	14.00
15	16QAM	1	37	13.77	13.67	13.55	14.00
15	16QAM	1	74	13.63	13.60	13.47	14.00
15	16QAM	36	0	13.54	13.39	13.37	14.00
15	16QAM	36	20	13.42	13.40	13.33	14.00
15	16QAM	36	39	13.36	13.34	13.28	14.00
15	16QAM	75	0	13.40	13.37	13.36	14.00
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	13.26	13.30	13.28	14.00
10	QPSK	1	25	13.34	13.14	13.09	14.00
10	QPSK	1	49	13.20	13.15	12.99	14.00
10	QPSK	25	0	13.29	13.24	13.38	14.00
10	QPSK	25	12	13.24	13.28	13.21	14.00
10	QPSK	25	25	13.25	13.10	13.23	14.00
10	QPSK	50	0	13.36	13.23	13.32	14.00
10	16QAM	1	0	13.74	13.68	13.59	14.00
10	16QAM	1	25	13.64	13.52	13.41	14.00
10	16QAM	1	49	13.54	13.49	13.41	14.00
10	16QAM	25	0	13.48	13.23	13.34	14.00
10	16QAM	25	12	13.37	13.38	13.29	14.00
10	16QAM	25	25	13.27	13.22	13.08	14.00
10	16QAM	50	0	13.26	13.23	13.29	14.00

Channel				19975	20175	20375	Tune-up limit
Frequency (MHz)				1712.5	1732.5	1752.5	(dBm)
5	QPSK	1	0	13.33	13.33	13.31	14.00
5	QPSK	1	12	13.30	13.20	13.10	14.00
5	QPSK	1	24	13.25	13.19	13.04	14.00
5	QPSK	12	0	13.33	13.28	13.18	14.00
5	QPSK	12	7	13.22	13.15	13.17	14.00
5	QPSK	12	13	13.19	13.30	13.12	14.00
5	QPSK	25	0	13.25	13.26	13.18	14.00
5	16QAM	1	0	13.72	13.56	13.57	14.00
5	16QAM	1	12	13.77	13.54	13.40	14.00
5	16QAM	1	24	13.63	13.46	13.42	14.00
5	16QAM	12	0	13.37	13.32	13.32	14.00
5	16QAM	12	7	13.42	13.26	13.26	14.00
5	16QAM	12	13	13.36	13.25	13.12	14.00
5	16QAM	25	0	13.28	13.20	13.22	14.00
Channel				19965	20175	20385	Tune-up limit
Frequency (MHz)				1711.5	1732.5	1753.5	(dBm)
3	QPSK	1	0	13.29	13.30	13.17	14.00
3	QPSK	1	8	13.25	13.12	13.16	14.00
3	QPSK	1	14	13.10	13.05	13.12	14.00
3	QPSK	8	0	13.30	13.20	13.23	14.00
3	QPSK	8	4	13.27	13.29	13.18	14.00
3	QPSK	8	7	13.19	13.11	13.08	14.00
3	QPSK	15	0	13.22	13.17	13.35	14.00
3	16QAM	1	0	13.81	13.52	13.55	14.00
3	16QAM	1	8	13.75	13.55	13.36	14.00
3	16QAM	1	14	13.43	13.52	13.37	14.00
3	16QAM	8	0	13.45	13.27	13.20	14.00
3	16QAM	8	4	13.28	13.40	13.22	14.00
3	16QAM	8	7	13.34	13.34	13.21	14.00
3	16QAM	15	0	13.31	13.35	13.28	14.00
Channel				19957	20175	20393	Tune-up limit
Frequency (MHz)				1710.7	1732.5	1754.3	(dBm)
1.4	QPSK	1	0	13.44	13.17	13.22	14.00
1.4	QPSK	1	3	13.35	13.21	13.03	14.00
1.4	QPSK	1	5	13.08	13.10	12.98	14.00
1.4	QPSK	3	0	13.49	13.22	13.26	14.00
1.4	QPSK	3	1	13.34	13.34	13.15	14.00
1.4	QPSK	3	3	13.31	13.14	13.09	14.00
1.4	QPSK	6	0	13.34	13.26	13.36	14.00
1.4	16QAM	1	0	13.75	13.68	13.51	14.00
1.4	16QAM	1	3	13.57	13.53	13.47	14.00
1.4	16QAM	1	5	13.63	13.46	13.38	14.00
1.4	16QAM	3	0	13.49	13.28	13.37	14.00
1.4	16QAM	3	1	13.23	13.40	13.13	14.00
1.4	16QAM	3	3	13.33	13.33	13.12	14.00
1.4	16QAM	6	0	13.31	13.29	13.21	14.00

【LTE Band 5】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20450	20525	20600	
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	19.37	19.63	19.75	20.00
10	QPSK	1	25	19.58	19.70	19.72	20.00
10	QPSK	1	49	19.61	19.72	19.75	20.00
10	QPSK	25	0	19.52	19.74	19.77	20.00
10	QPSK	25	12	19.66	19.73	19.78	20.00
10	QPSK	25	25	19.68	19.72	19.74	20.00
10	QPSK	50	0	19.61	19.77	19.78	20.00
10	16QAM	1	0	19.77	19.98	20.00	20.00
10	16QAM	1	25	19.93	19.85	19.95	20.00
10	16QAM	1	49	19.98	19.88	19.86	20.00
10	16QAM	25	0	19.55	19.83	19.73	20.00
10	16QAM	25	12	19.66	19.82	19.76	20.00
10	16QAM	25	25	19.76	19.74	19.70	20.00
10	16QAM	50	0	19.66	19.77	19.72	20.00
Channel				20425	20525	20625	Tune-up limit
Frequency (MHz)				826.5	836.5	846.5	(dBm)
5	QPSK	1	0	19.32	19.53	19.69	20.00
5	QPSK	1	12	19.48	19.68	19.59	20.00
5	QPSK	1	24	19.46	19.70	19.61	20.00
5	QPSK	12	0	19.38	19.67	19.73	20.00
5	QPSK	12	7	19.64	19.72	19.73	20.00
5	QPSK	12	13	19.67	19.59	19.68	20.00

5	QPSK	25	0	19.53	19.67	19.75	20.00
5	16QAM	1	0	19.67	19.86	19.87	20.00
5	16QAM	1	12	19.81	19.73	19.98	20.00
5	16QAM	1	24	19.94	19.80	19.92	20.00
5	16QAM	12	0	19.40	19.76	19.66	20.00
5	16QAM	12	7	19.55	19.73	19.64	20.00
5	16QAM	12	13	19.64	19.61	19.64	20.00
5	16QAM	25	0	19.54	19.71	19.68	20.00
Channel				20415	20525	20635	Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	19.34	19.55	19.66	20.00
3	QPSK	1	8	19.50	19.61	19.58	20.00
3	QPSK	1	14	19.47	19.59	19.64	20.00
3	QPSK	8	0	19.48	19.60	19.64	20.00
3	QPSK	8	4	19.65	19.66	19.72	20.00
3	QPSK	8	7	19.61	19.67	19.71	20.00
3	QPSK	15	0	19.58	19.75	19.74	20.00
3	16QAM	1	0	19.71	19.97	19.91	20.00
3	16QAM	1	8	19.86	19.97	19.88	20.00
3	16QAM	1	14	19.87	19.76	19.95	20.00
3	16QAM	8	0	19.42	19.72	19.61	20.00
3	16QAM	8	4	19.57	19.78	19.63	20.00
3	16QAM	8	7	19.62	19.65	19.62	20.00
3	16QAM	15	0	19.61	19.65	19.57	20.00
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	19.30	19.61	19.64	20.00
1.4	QPSK	1	3	19.56	19.69	19.65	20.00
1.4	QPSK	1	5	19.52	19.59	19.61	20.00
1.4	QPSK	3	0	19.41	19.61	19.67	20.00
1.4	QPSK	3	1	19.65	19.59	19.64	20.00
1.4	QPSK	3	3	19.57	19.59	19.59	20.00
1.4	QPSK	6	0	19.55	19.76	19.77	20.00
1.4	16QAM	1	0	19.73	19.95	19.94	20.00
1.4	16QAM	1	3	19.78	19.88	19.95	20.00
1.4	16QAM	1	5	19.93	19.86	19.00	20.00
1.4	16QAM	3	0	19.45	19.73	19.58	20.00
1.4	16QAM	3	1	19.52	19.71	19.65	20.00
1.4	16QAM	3	3	19.73	19.70	19.66	20.00
1.4	16QAM	6	0	19.57	19.67	19.66	20.00

【LTE Band 7】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	12.96	13.07	13.13	14.00
20	QPSK	1	49	12.94	13.11	13.14	14.00
20	QPSK	1	99	13.07	13.17	13.25	14.00
20	QPSK	50	0	12.94	13.08	13.22	14.00
20	QPSK	50	24	13.02	13.14	13.30	14.00
20	QPSK	50	50	13.03	13.24	13.24	14.00
20	QPSK	100	0	13.00	13.14	13.27	14.00
20	16QAM	1	0	13.39	13.43	13.46	14.00
20	16QAM	1	49	13.33	13.46	13.50	14.00
20	16QAM	1	99	13.44	13.56	13.61	14.00
20	16QAM	50	0	12.97	13.08	13.24	14.00
20	16QAM	50	24	13.05	13.21	13.33	14.00
20	16QAM	50	50	13.09	13.28	13.25	14.00
20	16QAM	100	0	13.04	13.18	13.32	14.00
Channel				20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	12.86	12.97	13.03	14.00
15	QPSK	1	37	12.81	13.07	13.01	14.00
15	QPSK	1	74	12.96	13.02	13.10	14.00
15	QPSK	36	0	12.83	12.96	13.16	14.00
15	QPSK	36	20	12.96	13.02	13.28	14.00
15	QPSK	36	39	12.94	13.10	13.11	14.00
15	QPSK	75	0	12.87	13.00	13.24	14.00
15	16QAM	1	0	13.33	13.30	13.43	14.00
15	16QAM	1	37	13.25	13.44	13.43	14.00
15	16QAM	1	74	13.34	13.55	13.60	14.00
15	16QAM	36	0	12.90	12.97	13.14	14.00
15	16QAM	36	20	13.02	13.10	13.22	14.00
15	16QAM	36	39	13.00	13.16	13.12	14.00
15	16QAM	75	0	12.94	13.05	13.19	14.00

Channel				20800	21100	21400	Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565	
10	QPSK	1	0	12.87	12.97	13.05	14.00
10	QPSK	1	25	12.88	13.08	12.99	14.00
10	QPSK	1	49	12.98	13.13	13.12	14.00
10	QPSK	25	0	12.93	13.06	13.13	14.00
10	QPSK	25	12	12.95	13.04	13.18	14.00
10	QPSK	25	25	12.94	13.20	13.10	14.00
10	QPSK	50	0	12.87	13.04	13.20	14.00
10	16QAM	1	0	13.35	13.38	13.32	14.00
10	16QAM	1	25	13.18	13.34	13.44	14.00
10	16QAM	1	49	13.34	13.43	13.59	14.00
10	16QAM	25	0	12.83	12.95	13.15	14.00
10	16QAM	25	12	12.99	13.11	13.20	14.00
10	16QAM	25	25	13.01	13.20	13.21	14.00
10	16QAM	50	0	12.98	13.03	13.28	14.00
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	12.94	12.97	12.98	14.00
5	QPSK	1	12	12.86	13.06	13.07	14.00
5	QPSK	1	24	12.98	13.11	13.18	14.00
5	QPSK	12	0	12.79	13.02	13.18	14.00
5	QPSK	12	7	12.89	13.01	13.21	14.00
5	QPSK	12	13	12.99	13.17	13.17	14.00
5	QPSK	25	0	12.92	13.07	13.15	14.00
5	16QAM	1	0	13.32	13.30	13.42	14.00
5	16QAM	1	12	13.21	13.39	13.47	14.00
5	16QAM	1	24	13.42	13.46	13.50	14.00
5	16QAM	12	0	12.92	13.00	13.22	14.00
5	16QAM	12	7	12.96	13.10	13.22	14.00
5	16QAM	12	13	12.98	13.17	13.24	14.00
5	16QAM	25	0	12.95	13.13	13.27	14.00

【LTE Band 12】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23060	23095	23130	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	19.34	19.22	19.32	20.50
10	QPSK	1	25	19.38	19.33	19.32	20.50
10	QPSK	1	49	19.35	19.32	19.29	20.50
10	QPSK	25	0	19.46	19.41	19.35	20.50
10	QPSK	25	12	19.46	19.42	19.38	20.50
10	QPSK	25	25	19.43	19.40	19.36	20.50
10	QPSK	50	0	19.43	19.40	19.37	20.50
10	16QAM	1	0	19.64	19.59	19.67	20.50
10	16QAM	1	25	19.71	19.69	19.63	20.50
10	16QAM	1	49	19.73	19.67	19.64	20.50
10	16QAM	25	0	19.47	19.42	19.39	20.50
10	16QAM	25	12	19.46	19.45	19.40	20.50
10	16QAM	25	25	19.47	19.42	19.38	20.50
10	16QAM	50	0	19.48	19.42	19.41	20.50
Channel				23035	23095	23115	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	19.30	19.34	19.27	20.50
5	QPSK	1	12	19.29	19.33	19.30	20.50
5	QPSK	1	24	19.37	19.32	19.29	20.50
5	QPSK	12	0	19.33	19.39	19.34	20.50
5	QPSK	12	7	19.38	19.44	19.36	20.50
5	QPSK	12	13	19.47	19.41	19.37	20.50
5	QPSK	25	0	19.43	19.38	19.36	20.50
5	16QAM	1	0	19.61	19.68	19.61	20.50
5	16QAM	1	12	19.60	19.67	19.60	20.50
5	16QAM	1	24	19.71	19.65	19.61	20.50
5	16QAM	12	0	19.40	19.42	19.38	20.50
5	16QAM	12	7	19.44	19.45	19.41	20.50
5	16QAM	12	13	19.46	19.45	19.36	20.50
5	16QAM	25	0	19.48	19.41	19.36	20.50
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	19.30	19.34	19.29	20.50
3	QPSK	1	8	19.31	19.31	19.29	20.50
3	QPSK	1	14	19.30	19.34	19.29	20.50
3	QPSK	8	0	19.37	19.40	19.33	20.50
3	QPSK	8	4	19.40	19.43	19.38	20.50
3	QPSK	8	7	19.36	19.36	19.35	20.50

3	QPSK	15	0	19.35	19.37	19.36	20.50
3	16QAM	1	0	19.66	19.67	19.61	20.50
3	16QAM	1	8	19.61	19.69	19.64	20.50
3	16QAM	1	14	19.61	19.65	19.62	20.50
3	16QAM	8	0	19.45	19.46	19.40	20.50
3	16QAM	8	4	19.45	19.52	19.45	20.50
3	16QAM	8	7	19.40	19.47	19.45	20.50
3	16QAM	15	0	19.38	19.42	19.38	20.50
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	19.25	19.26	19.23	20.50
1.4	QPSK	1	3	19.30	19.32	19.30	20.50
1.4	QPSK	1	5	19.25	19.27	19.20	20.50
1.4	QPSK	3	0	19.27	19.32	19.27	20.50
1.4	QPSK	3	1	19.34	19.35	19.30	20.50
1.4	QPSK	3	3	19.28	19.30	19.29	20.50
1.4	QPSK	6	0	19.27	19.28	19.26	20.50
1.4	16QAM	1	0	19.55	19.61	19.51	20.50
1.4	16QAM	1	3	19.65	19.69	19.62	20.50
1.4	16QAM	1	5	19.54	19.57	19.54	20.50
1.4	16QAM	3	0	19.35	19.35	19.29	20.50
1.4	16QAM	3	1	19.37	19.41	19.34	20.50
1.4	16QAM	3	3	19.32	19.38	19.33	20.50
1.4	16QAM	6	0	19.39	19.42	19.37	20.50

【LTE Band 13】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					23230		
Frequency (MHz)					782		
10	QPSK	1	0		19.77		20.00
10	QPSK	1	25		19.85		20.00
10	QPSK	1	49		19.57		20.00
10	QPSK	25	0		19.82		20.00
10	QPSK	25	12		19.82		20.00
10	QPSK	25	25		19.79		20.00
10	QPSK	50	0		19.80		20.00
10	16QAM	1	0		19.81		20.00
10	16QAM	1	25		19.77		20.00
10	16QAM	1	49		19.83		20.00
10	16QAM	25	0		19.78		20.00
10	16QAM	25	12		19.79		20.00
10	16QAM	25	25		19.81		20.00
10	16QAM	50	0		19.83		20.00
Channel				23205	23230	23255	Tune-up limit (dBm)
Frequency (MHz)				779.5	782	784.5	
5	QPSK	1	0	19.67	19.65	19.63	20.00
5	QPSK	1	12	19.68	19.74	19.51	20.00
5	QPSK	1	24	19.75	19.60	19.47	20.00
5	QPSK	12	0	19.67	19.85	19.70	20.00
5	QPSK	12	7	19.76	19.85	19.61	20.00
5	QPSK	12	13	19.84	19.78	19.55	20.00
5	QPSK	25	0	19.84	19.80	19.67	20.00
5	16QAM	1	0	19.79	19.80	19.79	20.00
5	16QAM	1	12	19.82	19.84	19.78	20.00
5	16QAM	1	24	19.79	19.82	19.83	20.00
5	16QAM	12	0	19.79	19.85	19.73	20.00
5	16QAM	12	7	19.82	19.82	19.66	20.00
5	16QAM	12	13	19.82	19.84	19.61	20.00
5	16QAM	25	0	19.86	19.82	19.72	20.00

【LTE Band 14】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					23330		
Frequency (MHz)					793		
10	QPSK	1	0		19.46		20.50
10	QPSK	1	25		19.30		20.50
10	QPSK	1	49		19.25		20.50
10	QPSK	25	0		19.37		20.50
10	QPSK	25	12		19.37		20.50
10	QPSK	25	25		19.30		20.50
10	QPSK	50	0		19.34		20.50
10	16QAM	1	0		19.83		20.50

10	16QAM	1	25		19.66		20.50
10	16QAM	1	49		19.58		20.50
10	16QAM	25	0		19.43		20.50
10	16QAM	25	12		19.44		20.50
10	16QAM	25	25		19.38		20.50
10	16QAM	50	0		19.39		20.50
Channel				23305	23330	23355	Tune-up limit (dBm)
Frequency (MHz)				790.5	793	795.5	
5	QPSK	1	0	19.45	19.34	19.41	20.50
5	QPSK	1	12	19.32	19.33	19.41	20.50
5	QPSK	1	24	19.27	19.26	19.33	20.50
5	QPSK	12	0	19.50	19.36	19.47	20.50
5	QPSK	12	7	19.39	19.38	19.48	20.50
5	QPSK	12	13	19.36	19.35	19.42	20.50
5	QPSK	25	0	19.35	19.32	19.44	20.50
5	16QAM	1	0	19.84	19.68	19.78	20.50
5	16QAM	1	12	19.70	19.66	19.77	20.50
5	16QAM	1	24	19.63	19.59	19.72	20.50
5	16QAM	12	0	19.55	19.43	19.50	20.50
5	16QAM	12	7	19.47	19.45	19.54	20.50
5	16QAM	12	13	19.44	19.42	19.48	20.50
5	16QAM	25	0	19.39	19.38	19.46	20.50

【LTE Band 17】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23780	23790	23800	
Frequency (MHz)				709	710	711	
10	QPSK	1	0	19.68	19.66	19.65	20.50
10	QPSK	1	25	19.67	19.59	19.59	20.50
10	QPSK	1	49	19.56	19.56	19.55	20.50
10	QPSK	25	0	19.76	19.74	19.72	20.50
10	QPSK	25	12	19.74	19.73	19.73	20.50
10	QPSK	25	25	19.71	19.64	19.61	20.50
10	QPSK	50	0	19.72	19.74	19.75	20.50
10	16QAM	1	0	20.01	20.01	20.00	20.50
10	16QAM	1	25	20.01	19.91	19.90	20.50
10	16QAM	1	49	19.87	19.88	19.90	20.50
10	16QAM	25	0	19.76	19.76	19.74	20.50
10	16QAM	25	12	19.77	19.79	19.76	20.50
10	16QAM	25	25	19.73	19.65	19.62	20.50
10	16QAM	50	0	19.74	19.75	19.75	20.50
Channel				23755	23790	23825	Tune-up limit (dBm)
Frequency (MHz)				706.5	710	713.5	
5	QPSK	1	0	19.59	19.52	19.61	20.50
5	QPSK	1	12	19.52	19.48	19.58	20.50
5	QPSK	1	24	19.53	19.48	19.40	20.50
5	QPSK	12	0	19.68	19.72	19.63	20.50
5	QPSK	12	7	19.67	19.63	19.60	20.50
5	QPSK	12	13	19.68	19.55	19.47	20.50
5	QPSK	25	0	19.67	19.63	19.66	20.50
5	16QAM	1	0	19.99	19.97	19.91	20.50
5	16QAM	1	12	19.91	19.86	19.79	20.50
5	16QAM	1	24	19.81	19.81	19.79	20.50
5	16QAM	12	0	19.67	19.62	19.69	20.50
5	16QAM	12	7	19.73	19.74	19.71	20.50
5	16QAM	12	13	19.66	19.60	19.61	20.50
5	16QAM	25	0	19.70	19.66	19.71	20.50

【LTE Band 25】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26140	26340	26590	
Frequency (MHz)				1860	1880	1905	
20	QPSK	1	0	12.89	12.75	12.68	14.00
20	QPSK	1	49	12.87	12.81	12.57	14.00
20	QPSK	1	99	12.70	12.76	12.54	14.00
20	QPSK	50	0	12.93	12.81	12.74	14.00
20	QPSK	50	24	12.90	12.85	12.80	14.00
20	QPSK	50	50	12.80	12.85	12.66	14.00
20	QPSK	100	0	12.82	12.82	12.80	14.00
20	16QAM	1	0	13.20	13.09	13.01	14.00
20	16QAM	1	49	13.18	13.10	12.90	14.00

20	16QAM	1	99	13.03	13.09	12.85	14.00
20	16QAM	50	0	12.96	12.86	12.78	14.00
20	16QAM	50	24	12.96	12.91	12.76	14.00
20	16QAM	50	50	12.84	12.88	12.68	14.00
20	16QAM	100	0	12.80	12.83	12.74	14.00
Channel				26115	26340	26615	Tune-up limit
Frequency (MHz)				1857.5	1880	1907.5	(dBm)
15	QPSK	1	0	12.76	12.61	12.66	14.00
15	QPSK	1	37	12.81	12.66	12.45	14.00
15	QPSK	1	74	12.60	12.63	12.50	14.00
15	QPSK	36	0	12.87	12.72	12.73	14.00
15	QPSK	36	20	12.78	12.83	12.78	14.00
15	QPSK	36	39	12.76	12.78	12.60	14.00
15	QPSK	75	0	12.71	12.79	12.78	14.00
15	16QAM	1	0	13.10	13.07	12.99	14.00
15	16QAM	1	37	13.12	13.07	12.79	14.00
15	16QAM	1	74	13.00	13.03	12.76	14.00
15	16QAM	36	0	12.95	12.75	12.77	14.00
15	16QAM	36	20	12.88	12.87	12.70	14.00
15	16QAM	36	39	12.71	12.83	12.53	14.00
15	16QAM	75	0	12.70	12.72	12.68	14.00
Channel				26090	26340	26640	Tune-up limit
Frequency (MHz)				1855	1880	1910	(dBm)
10	QPSK	1	0	12.74	12.70	12.64	14.00
10	QPSK	1	25	12.85	12.79	12.45	14.00
10	QPSK	1	49	12.59	12.64	12.50	14.00
10	QPSK	25	0	12.83	12.67	12.61	14.00
10	QPSK	25	12	12.88	12.83	12.77	14.00
10	QPSK	25	25	12.76	12.71	12.53	14.00
10	QPSK	50	0	12.75	12.76	12.78	14.00
10	16QAM	1	0	13.11	12.96	12.94	14.00
10	16QAM	1	25	13.11	13.04	12.77	14.00
10	16QAM	1	49	13.01	12.95	12.81	14.00
10	16QAM	25	0	12.87	12.72	12.73	14.00
10	16QAM	25	12	12.90	12.84	12.62	14.00
10	16QAM	25	25	12.77	12.79	12.63	14.00
10	16QAM	50	0	12.71	12.75	12.64	14.00
Channel				26065	26340	26665	Tune-up limit
Frequency (MHz)				1852.5	1880	1912.5	(dBm)
5	QPSK	1	0	12.85	12.68	12.54	14.00
5	QPSK	1	12	12.85	12.78	12.56	14.00
5	QPSK	1	24	12.65	12.69	12.44	14.00
5	QPSK	12	0	12.82	12.74	12.62	14.00
5	QPSK	12	7	12.79	12.78	12.69	14.00
5	QPSK	12	13	12.71	12.73	12.57	14.00
5	QPSK	25	0	12.75	12.68	12.71	14.00
5	16QAM	1	0	13.15	13.05	12.94	14.00
5	16QAM	1	12	13.12	12.99	12.81	14.00
5	16QAM	1	24	12.97	12.95	12.80	14.00
5	16QAM	12	0	12.95	12.75	12.75	14.00
5	16QAM	12	7	12.92	12.80	12.74	14.00
5	16QAM	12	13	12.73	12.84	12.65	14.00
5	16QAM	25	0	12.76	12.73	12.70	14.00
Channel				26055	26340	26675	Tune-up limit
Frequency (MHz)				1851.5	1880	1913.5	(dBm)
3	QPSK	1	0	12.78	12.64	12.65	14.00
3	QPSK	1	8	12.74	12.70	12.42	14.00
3	QPSK	1	14	12.63	12.72	12.41	14.00
3	QPSK	8	0	12.79	12.78	12.65	14.00
3	QPSK	8	4	12.85	12.70	12.73	14.00
3	QPSK	8	7	12.67	12.73	12.60	14.00
3	QPSK	15	0	12.75	12.78	12.69	14.00
3	16QAM	1	0	13.13	12.94	12.99	14.00
3	16QAM	1	8	13.05	12.97	12.89	14.00
3	16QAM	1	14	12.96	13.06	12.75	14.00
3	16QAM	8	0	12.82	12.78	12.66	14.00
3	16QAM	8	4	12.90	12.79	12.66	14.00
3	16QAM	8	7	12.70	12.85	12.63	14.00
3	16QAM	15	0	12.69	12.72	12.69	14.00
Channel				26047	26340	26683	Tune-up limit
Frequency (MHz)				1850.7	1880	1914.3	(dBm)
1.4	QPSK	1	0	12.79	12.67	12.62	14.00
1.4	QPSK	1	3	12.83	12.77	12.56	14.00
1.4	QPSK	1	5	12.57	12.66	12.49	14.00
1.4	QPSK	3	0	12.89	12.76	12.71	14.00
1.4	QPSK	3	1	12.88	12.83	12.78	14.00
1.4	QPSK	3	3	12.74	12.72	12.51	14.00
1.4	QPSK	6	0	12.75	12.76	12.65	14.00

1.4	16QAM	1	0	13.16	13.00	12.91	14.00
1.4	16QAM	1	3	13.10	13.01	12.84	14.00
1.4	16QAM	1	5	12.92	13.00	12.77	14.00
1.4	16QAM	3	0	12.83	12.77	12.77	14.00
1.4	16QAM	3	1	12.85	12.83	12.66	14.00
1.4	16QAM	3	3	12.76	12.83	12.56	14.00
1.4	16QAM	6	0	12.70	12.74	12.71	14.00

【LTE Band 26__FCC (814~849MHz)】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				26765	26865	26965	
Frequency (MHz)				821.5	831.5	841.5	
15	QPSK	1	0	19.72	19.74	19.72	20.00
15	QPSK	1	37	19.75	19.76	19.66	20.00
15	QPSK	1	74	19.82	19.71	19.60	20.00
15	QPSK	36	0	19.82	19.82	19.75	20.00
15	QPSK	36	20	19.82	19.83	19.74	20.00
15	QPSK	36	39	19.88	19.79	19.65	20.00
15	QPSK	75	0	19.81	19.81	19.72	20.00
15	16QAM	1	0	19.84	19.82	19.88	20.00
15	16QAM	1	37	19.83	19.81	19.81	20.00
15	16QAM	1	74	19.87	19.84	19.95	20.00
15	16QAM	36	0	19.88	19.87	19.76	20.00
15	16QAM	36	20	19.86	19.85	19.77	20.00
15	16QAM	36	39	19.94	19.85	19.69	20.00
15	16QAM	75	0	19.85	19.85	19.75	20.00
Channel				26740	26865	26990	Tune-up limit (dBm)
Frequency (MHz)				819	831.5	844	
10	QPSK	1	0	19.68	19.64	19.65	20.00
10	QPSK	1	25	19.65	19.71	19.53	20.00
10	QPSK	1	49	19.77	19.59	19.54	20.00
10	QPSK	25	0	19.76	19.67	19.68	20.00
10	QPSK	25	12	19.80	19.69	19.72	20.00
10	QPSK	25	25	19.75	19.76	19.61	20.00
10	QPSK	50	0	19.66	19.75	19.67	20.00
10	16QAM	1	0	19.82	19.85	19.83	20.00
10	16QAM	1	25	19.99	19.98	19.93	20.00
10	16QAM	1	49	19.84	19.94	19.87	20.00
10	16QAM	25	0	19.83	19.79	19.70	20.00
10	16QAM	25	12	19.85	19.80	19.73	20.00
10	16QAM	25	25	19.91	19.75	19.60	20.00
10	16QAM	50	0	19.77	19.79	19.69	20.00
Channel				26715	26865	27015	Tune-up limit (dBm)
Frequency (MHz)				816.5	831.5	846.5	
5	QPSK	1	0	19.65	19.59	19.65	20.00
5	QPSK	1	12	19.67	19.67	19.56	20.00
5	QPSK	1	24	19.77	19.59	19.48	20.00
5	QPSK	12	0	19.75	19.79	19.66	20.00
5	QPSK	12	7	19.74	19.78	19.61	20.00
5	QPSK	12	13	19.76	19.68	19.60	20.00
5	QPSK	25	0	19.67	19.79	19.71	20.00
5	16QAM	1	0	19.98	19.93	19.93	20.00
5	16QAM	1	12	19.97	19.97	19.90	20.00
5	16QAM	1	24	19.83	19.95	19.81	20.00
5	16QAM	12	0	19.72	19.76	19.65	20.00
5	16QAM	12	7	19.83	19.78	19.62	20.00
5	16QAM	12	13	19.80	19.72	19.65	20.00
5	16QAM	25	0	19.75	19.77	19.71	20.00
Channel				26705	26865	27025	Tune-up limit (dBm)
Frequency (MHz)				815.5	831.5	847.5	
3	QPSK	1	0	19.59	19.72	19.64	20.00
3	QPSK	1	8	19.62	19.69	19.61	20.00
3	QPSK	1	14	19.75	19.61	19.46	20.00
3	QPSK	8	0	19.77	19.69	19.67	20.00
3	QPSK	8	4	19.67	19.73	19.60	20.00
3	QPSK	8	7	19.87	19.69	19.63	20.00
3	QPSK	15	0	19.72	19.75	19.59	20.00
3	16QAM	1	0	20.00	19.84	19.96	20.00
3	16QAM	1	8	19.85	19.85	20.00	20.00
3	16QAM	1	14	19.91	19.94	19.92	20.00
3	16QAM	8	0	19.76	19.86	19.72	20.00
3	16QAM	8	4	19.74	19.83	19.72	20.00
3	16QAM	8	7	19.92	19.84	19.60	20.00
3	16QAM	15	0	19.71	19.74	19.61	20.00
Channel				26697	26865	27033	Tune-up limit

Frequency (MHz)				814.7	831.5	848.3	(dBm)
1.4	QPSK	1	0	19.64	19.69	19.58	20.00
1.4	QPSK	1	3	19.69	19.75	19.62	20.00
1.4	QPSK	1	5	19.70	19.69	19.48	20.00
1.4	QPSK	3	0	19.69	19.68	19.68	20.00
1.4	QPSK	3	1	19.76	19.72	19.65	20.00
1.4	QPSK	3	3	19.82	19.69	19.61	20.00
1.4	QPSK	6	0	19.75	19.66	19.65	20.00
1.4	16QAM	1	0	19.97	19.85	19.94	20.00
1.4	16QAM	1	3	19.93	19.93	19.95	20.00
1.4	16QAM	1	5	19.88	19.94	19.93	20.00
1.4	16QAM	3	0	19.86	19.72	19.71	20.00
1.4	16QAM	3	1	19.82	19.80	19.62	20.00
1.4	16QAM	3	3	19.89	19.80	19.60	20.00
1.4	16QAM	6	0	19.71	19.78	19.67	20.00

【LTE Band 30】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					27710		
Frequency (MHz)					2310		
10	QPSK	1	0		13.07		14.00
10	QPSK	1	25		13.06		14.00
10	QPSK	1	49		12.98		14.00
10	QPSK	25	0		13.16		14.00
10	QPSK	25	12		13.17		14.00
10	QPSK	25	25		13.13		14.00
10	QPSK	50	0		13.15		14.00
10	16QAM	1	0		13.49		14.00
10	16QAM	1	25		13.39		14.00
10	16QAM	1	49		13.33		14.00
10	16QAM	25	0		13.17		14.00
10	16QAM	25	12		13.19		14.00
10	16QAM	25	25		13.10		14.00
10	16QAM	50	0		13.16		14.00
Channel				27685	27710	27735	Tune-up limit (dBm)
Frequency (MHz)				2307.5	2310	2312.5	
5	QPSK	1	0	13.03	12.99	12.96	14.00
5	QPSK	1	12	13.02	13.05	12.90	14.00
5	QPSK	1	24	12.89	12.91	12.91	14.00
5	QPSK	12	0	13.04	13.02	13.11	14.00
5	QPSK	12	7	13.16	13.00	13.07	14.00
5	QPSK	12	13	13.12	12.96	12.97	14.00
5	QPSK	25	0	13.13	13.15	13.00	14.00
5	16QAM	1	0	13.47	13.36	13.41	14.00
5	16QAM	1	12	13.38	13.38	13.35	14.00
5	16QAM	1	24	13.15	13.17	13.26	14.00
5	16QAM	12	0	13.17	13.09	13.12	14.00
5	16QAM	12	7	13.16	13.05	13.05	14.00
5	16QAM	12	13	13.01	13.02	13.03	14.00
5	16QAM	25	0	13.15	13.05	13.12	14.00

【LTE Band 38】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				37850	38000	38150	
Frequency (MHz)				2580	2595	2610	
20	QPSK	1	0	15.54	15.65	15.48	16.50
20	QPSK	1	49	15.50	15.58	15.58	16.50
20	QPSK	1	99	15.54	15.54	15.53	16.50
20	QPSK	50	0	15.48	15.64	15.47	16.50
20	QPSK	50	24	15.54	15.59	15.56	16.50
20	QPSK	50	50	15.53	15.58	15.60	16.50
20	QPSK	100	0	15.54	15.61	15.53	16.50
20	16QAM	1	0	15.52	15.54	15.44	16.50
20	16QAM	1	49	15.51	15.63	15.60	16.50
20	16QAM	1	99	15.51	15.57	15.56	16.50
20	16QAM	50	0	15.53	15.55	15.47	16.50
20	16QAM	50	24	15.55	15.53	15.51	16.50
20	16QAM	50	50	15.48	15.59	15.56	16.50
20	16QAM	100	0	15.53	15.58	15.54	16.50
Channel				37825	38000	38175	Tune-up limit (dBm)
Frequency (MHz)				2577.5	2595	2612.5	
15	QPSK	1	0	15.36	15.49	15.30	16.50

15	QPSK	1	37	15.31	15.58	15.46	16.50
15	QPSK	1	74	15.38	15.47	15.36	16.50
15	QPSK	36	0	15.33	15.50	15.34	16.50
15	QPSK	36	20	15.45	15.46	15.40	16.50
15	QPSK	36	39	15.34	15.39	15.50	16.50
15	QPSK	75	0	15.53	15.46	15.38	16.50
15	16QAM	1	0	15.33	15.35	15.30	16.50
15	16QAM	1	37	15.41	15.48	15.59	16.50
15	16QAM	1	74	15.48	15.47	15.48	16.50
15	16QAM	36	0	15.38	15.47	15.43	16.50
15	16QAM	36	20	15.37	15.53	15.34	16.50
15	16QAM	36	39	15.48	15.52	15.37	16.50
15	16QAM	75	0	15.33	15.40	15.37	16.50
Channel				37800	38000	38200	Tune-up limit (dBm)
Frequency (MHz)				2575	2595	2615	
10	QPSK	1	0	15.42	15.54	15.29	16.50
10	QPSK	1	25	15.48	15.41	15.58	16.50
10	QPSK	1	49	15.38	15.39	15.42	16.50
10	QPSK	25	0	15.44	15.62	15.37	16.50
10	QPSK	25	12	15.48	15.49	15.36	16.50
10	QPSK	25	25	15.50	15.46	15.43	16.50
10	QPSK	50	0	15.34	15.44	15.48	16.50
10	16QAM	1	0	15.37	15.52	15.43	16.50
10	16QAM	1	25	15.50	15.50	15.47	16.50
10	16QAM	1	49	15.50	15.43	15.44	16.50
10	16QAM	25	0	15.50	15.48	15.32	16.50
10	16QAM	25	12	15.50	15.42	15.45	16.50
10	16QAM	25	25	15.39	15.46	15.42	16.50
10	16QAM	50	0	15.48	15.57	15.37	16.50
Channel				37775	38000	38225	Tune-up limit (dBm)
Frequency (MHz)				2572.5	2595	2617.5	
5	QPSK	1	0	15.44	15.48	15.35	16.50
5	QPSK	1	12	15.39	15.54	15.38	16.50
5	QPSK	1	24	15.40	15.37	15.37	16.50
5	QPSK	12	0	15.34	15.63	15.30	16.50
5	QPSK	12	7	15.39	15.57	15.49	16.50
5	QPSK	12	13	15.43	15.46	15.50	16.50
5	QPSK	25	0	15.54	15.58	15.40	16.50
5	16QAM	1	0	15.35	15.38	15.32	16.50
5	16QAM	1	12	15.31	15.47	15.44	16.50
5	16QAM	1	24	15.47	15.51	15.42	16.50
5	16QAM	12	0	15.48	15.43	15.38	16.50
5	16QAM	12	7	15.44	15.35	15.34	16.50
5	16QAM	12	13	15.44	15.40	15.56	16.50
5	16QAM	25	0	15.38	15.46	15.41	16.50

【LTE Band 41__FCC (2496~2690MHz)】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				39750	40185	40620	41055	41490	
Frequency (MHz)				2506	2549.5	2593	2636.5	2680	
20	QPSK	1	0	15.42	15.50	15.61	15.56	15.48	16.50
20	QPSK	1	49	15.45	15.61	15.63	15.55	15.52	16.50
20	QPSK	1	99	15.57	15.65	15.75	15.53	15.61	16.50
20	QPSK	50	0	15.44	15.61	15.68	15.66	15.52	16.50
20	QPSK	50	24	15.53	15.58	15.74	15.67	15.59	16.50
20	QPSK	50	50	15.58	15.55	15.60	15.50	15.45	16.50
20	QPSK	100	0	15.50	15.47	15.66	15.56	15.42	16.50
20	16QAM	1	0	15.46	15.56	15.69	15.62	15.50	16.50
20	16QAM	1	49	15.55	15.65	15.65	15.57	15.60	16.50
20	16QAM	1	99	15.66	15.67	15.79	15.57	15.66	16.50
20	16QAM	50	0	15.51	15.58	15.67	15.56	15.44	16.50
20	16QAM	50	24	15.55	15.52	15.71	15.64	15.51	16.50
20	16QAM	50	50	15.55	15.56	15.66	15.60	15.54	16.50
20	16QAM	100	0	15.50	15.50	15.68	15.63	15.48	16.50
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5	
15	QPSK	1	0	15.33	15.37	15.57	15.46	15.35	16.50
15	QPSK	1	37	15.41	15.42	15.44	15.52	15.51	16.50
15	QPSK	1	74	15.48	15.63	15.70	15.48	15.58	16.50
15	QPSK	36	0	15.24	15.57	15.65	15.46	15.52	16.50
15	QPSK	36	20	15.47	15.41	15.69	15.48	15.39	16.50
15	QPSK	36	39	15.47	15.63	15.54	15.59	15.42	16.50
15	QPSK	75	0	15.37	15.49	15.71	15.63	15.50	16.50
15	16QAM	1	0	15.36	15.60	15.74	15.58	15.53	16.50

15	16QAM	1	37	15.49	15.58	15.55	15.63	15.65	16.50
15	16QAM	1	74	15.50	15.62	15.79	15.58	15.74	16.50
15	16QAM	36	0	15.44	15.59	15.62	15.51	15.42	16.50
15	16QAM	36	20	15.39	15.47	15.65	15.64	15.55	16.50
15	16QAM	36	39	15.39	15.46	15.59	15.51	15.50	16.50
15	16QAM	75	0	15.32	15.51	15.62	15.65	15.58	16.50
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)
Frequency (MHz)				2501	2547	2593	2639	2685	
10	QPSK	1	0	15.28	15.37	15.56	15.44	15.30	16.50
10	QPSK	1	25	15.36	15.49	15.51	15.38	15.42	16.50
10	QPSK	1	49	15.54	15.47	15.54	15.47	15.57	16.50
10	QPSK	25	0	15.24	15.53	15.48	15.55	15.51	16.50
10	QPSK	25	12	15.38	15.47	15.61	15.55	15.47	16.50
10	QPSK	25	25	15.54	15.47	15.62	15.47	15.52	16.50
10	QPSK	50	0	15.50	15.48	15.57	15.62	15.46	16.50
10	16QAM	1	0	15.44	15.57	15.67	15.58	15.59	16.50
10	16QAM	1	25	15.49	15.63	15.61	15.53	15.67	16.50
10	16QAM	1	49	15.66	15.76	15.70	15.48	15.59	16.50
10	16QAM	25	0	15.33	15.60	15.75	15.64	15.44	16.50
10	16QAM	25	12	15.40	15.46	15.71	15.71	15.51	16.50
10	16QAM	25	25	15.40	15.46	15.67	15.55	15.61	16.50
10	16QAM	50	0	15.47	15.53	15.73	15.60	15.54	16.50
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)
Frequency (MHz)				2498.5	2545.8	2593	2640.3	2687.5	
5	QPSK	1	0	15.22	15.45	15.44	15.50	15.48	16.50
5	QPSK	1	12	15.40	15.54	15.59	15.36	15.35	16.50
5	QPSK	1	24	15.57	15.59	15.61	15.33	15.46	16.50
5	QPSK	12	0	15.38	15.45	15.62	15.60	15.40	16.50
5	QPSK	12	7	15.39	15.46	15.64	15.51	15.52	16.50
5	QPSK	12	13	15.46	15.50	15.50	15.48	15.44	16.50
5	QPSK	25	0	15.38	15.57	15.75	15.56	15.46	16.50
5	16QAM	1	0	15.31	15.55	15.73	15.68	15.48	16.50
5	16QAM	1	12	15.46	15.71	15.69	15.55	15.59	16.50
5	16QAM	1	24	15.51	15.66	15.74	15.65	15.70	16.50
5	16QAM	12	0	15.32	15.62	15.66	15.60	15.48	16.50
5	16QAM	12	7	15.41	15.56	15.73	15.55	15.50	16.50
5	16QAM	12	13	15.53	15.57	15.58	15.52	15.55	16.50
5	16QAM	25	0	15.31	15.40	15.78	15.71	15.44	16.50

【LTE Band 48__FCC_Part 96

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				55340	55830	55990	56150	56640	
Frequency (MHz)				3560	3609	3625	3641	3690	
20	QPSK	1	0	20.86	20.85	20.87	20.80	20.63	21.00
20	QPSK	1	49	20.86	20.77	20.73	20.67	20.48	21.00
20	QPSK	1	99	20.87	20.70	20.69	20.59	20.40	21.00
20	QPSK	50	0	20.83	20.84	20.94	20.80	20.61	21.00
20	QPSK	50	24	20.93	20.84	20.81	20.76	20.56	21.00
20	QPSK	50	50	20.92	20.78	20.75	20.68	20.50	21.00
20	QPSK	100	0	20.91	20.81	20.76	20.71	20.55	21.00
20	16QAM	1	0	19.93	20.72	20.83	20.75	20.60	21.00
20	16QAM	1	49	20.54	20.75	20.70	20.68	20.47	21.00
20	16QAM	1	99	20.48	20.69	20.65	20.56	20.38	21.00
20	16QAM	50	0	19.98	19.88	19.85	19.78	19.60	20.00
20	16QAM	50	24	19.98	19.87	19.82	19.80	19.56	20.00
20	16QAM	50	50	19.93	19.81	19.77	19.70	19.53	20.00
20	16QAM	100	0	19.96	19.83	19.81	19.78	19.53	20.00
Channel				55315	55820	55990	56160	56665	Tune-up limit (dBm)
Frequency (MHz)				3557.5	3608	3625	3642	3692.5	
15	QPSK	1	0	20.98	20.90	20.82	20.79	20.58	21.00
15	QPSK	1	37	20.89	20.78	20.74	20.68	20.45	21.00
15	QPSK	1	74	20.91	20.77	20.70	20.66	20.43	21.00
15	QPSK	36	0	20.90	20.84	20.82	20.75	20.54	21.00
15	QPSK	36	20	20.96	20.84	20.81	20.75	20.54	21.00
15	QPSK	36	39	20.89	20.80	20.72	20.69	20.47	21.00
15	QPSK	75	0	20.94	20.84	20.78	20.72	20.54	21.00
15	16QAM	1	0	20.04	20.80	20.78	20.79	20.57	21.00
15	16QAM	1	37	20.57	20.74	20.74	20.65	20.46	21.00
15	16QAM	1	74	20.56	20.74	20.64	20.62	20.41	21.00
15	16QAM	36	0	19.95	19.86	19.83	19.78	19.59	20.00
15	16QAM	36	20	19.96	19.85	19.83	19.79	19.58	20.00
15	16QAM	36	39	19.93	19.81	19.78	19.71	19.52	20.00

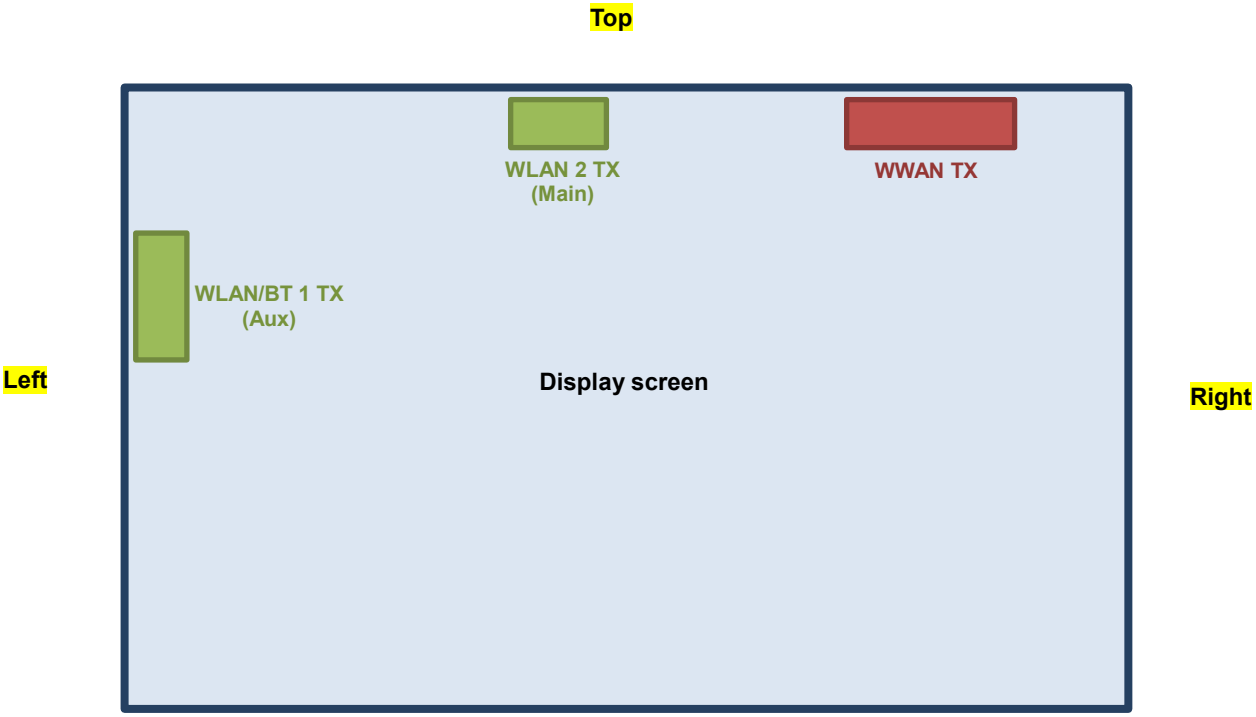
15	16QAM	75	0	19.93	19.83	19.80	19.72	19.51	20.00
Channel				55290	55815	55990	56165	56690	Tune-up limit (dBm)
Frequency (MHz)				3555	3607.5	3625	3642.5	3695	
10	QPSK	1	0	20.81	20.71	20.72	20.65	20.44	21.00
10	QPSK	1	25	20.79	20.71	20.66	20.62	20.42	21.00
10	QPSK	1	49	20.81	20.65	20.63	20.59	20.38	21.00
10	QPSK	25	0	20.87	20.80	20.75	20.71	20.50	21.00
10	QPSK	25	12	20.88	20.80	20.77	20.71	20.47	21.00
10	QPSK	25	25	20.81	20.71	20.70	20.63	20.40	21.00
10	QPSK	50	0	20.87	20.76	20.75	20.68	20.46	21.00
10	16QAM	1	0	20.58	20.78	20.78	20.75	20.52	21.00
10	16QAM	1	25	20.81	20.76	20.72	20.65	20.48	21.00
10	16QAM	1	49	20.82	20.68	20.69	20.62	20.38	21.00
10	16QAM	25	0	19.96	19.80	19.80	19.76	19.58	20.00
10	16QAM	25	12	19.92	19.78	19.82	19.75	19.50	20.00
10	16QAM	25	25	19.91	19.79	19.73	19.68	19.49	20.00
10	16QAM	50	0	19.90	19.81	19.78	19.74	19.50	20.00
Channel				55265	55810	55990	56170	56715	Tune-up limit (dBm)
Frequency (MHz)				3552.5	3607	3625	3643	3697.5	
5	QPSK	1	0	20.82	20.73	20.69	20.65	20.44	21.00
5	QPSK	1	12	20.76	20.66	20.66	20.61	20.40	21.00
5	QPSK	1	24	20.72	20.64	20.59	20.52	20.30	21.00
5	QPSK	12	0	20.86	20.79	20.72	20.70	20.47	21.00
5	QPSK	12	7	20.84	20.76	20.74	20.70	20.47	21.00
5	QPSK	12	13	20.81	20.73	20.71	20.63	20.43	21.00
5	QPSK	25	0	20.83	20.73	20.71	20.66	20.43	21.00
5	16QAM	1	0	20.87	20.79	20.74	20.71	20.49	21.00
5	16QAM	1	12	20.84	20.76	20.70	20.67	20.45	21.00
5	16QAM	1	24	20.80	20.72	20.69	20.65	20.42	21.00
5	16QAM	12	0	19.88	19.77	19.73	19.72	19.46	20.00
5	16QAM	12	7	19.85	19.76	19.71	19.68	19.44	20.00
5	16QAM	12	13	19.79	19.71	19.68	19.66	19.41	20.00
5	16QAM	25	0	19.88	19.80	19.77	19.70	19.52	20.00

【LTE Band 66】

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	13.38	13.37	13.39	14.00
20	QPSK	1	49	13.46	13.40	13.46	14.00
20	QPSK	1	99	13.26	13.24	13.30	14.00
20	QPSK	50	0	13.30	13.30	13.34	14.00
20	QPSK	50	24	13.27	13.24	13.34	14.00
20	QPSK	50	50	13.28	13.25	13.33	14.00
20	QPSK	100	0	13.28	13.27	13.31	14.00
20	16QAM	1	0	13.81	13.72	13.74	14.00
20	16QAM	1	49	13.85	13.78	13.85	14.00
20	16QAM	1	99	13.68	13.63	13.67	14.00
20	16QAM	50	0	13.34	13.32	13.39	14.00
20	16QAM	50	24	13.32	13.26	13.36	14.00
20	16QAM	50	50	13.33	13.29	13.34	14.00
20	16QAM	100	0	13.33	13.29	13.33	14.00
Channel				132047	132322	132597	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	13.36	13.33	13.39	14.00
15	QPSK	1	37	13.40	13.36	13.44	14.00
15	QPSK	1	74	13.28	13.24	13.32	14.00
15	QPSK	36	0	13.25	13.24	13.28	14.00
15	QPSK	36	20	13.37	13.34	13.41	14.00
15	QPSK	36	39	13.22	13.22	13.26	14.00
15	QPSK	75	0	13.25	13.23	13.30	14.00
15	16QAM	1	0	13.70	13.71	13.76	14.00
15	16QAM	1	37	13.78	13.73	13.79	14.00
15	16QAM	1	74	13.64	13.59	13.68	14.00
15	16QAM	36	0	13.29	13.28	13.31	14.00
15	16QAM	36	20	13.39	13.34	13.44	14.00
15	16QAM	36	39	13.27	13.22	13.29	14.00
15	16QAM	75	0	13.28	13.25	13.32	14.00
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	13.40	13.29	13.33	14.00
10	QPSK	1	25	13.40	13.29	13.34	14.00
10	QPSK	1	49	13.34	13.19	13.29	14.00

10	QPSK	25	0	13.37	13.27	13.36	14.00
10	QPSK	25	12	13.39	13.24	13.31	14.00
10	QPSK	25	25	13.34	13.23	13.29	14.00
10	QPSK	50	0	13.35	13.26	13.33	14.00
10	16QAM	1	0	13.77	13.67	13.71	14.00
10	16QAM	1	25	13.77	13.66	13.72	14.00
10	16QAM	1	49	13.70	13.56	13.64	14.00
10	16QAM	25	0	13.41	13.32	13.39	14.00
10	16QAM	25	12	13.40	13.27	13.35	14.00
10	16QAM	25	25	13.28	13.23	13.33	14.00
10	16QAM	50	0	13.32	13.27	13.37	14.00
Channel				131997	132322	132647	Tune-up limit
Frequency (MHz)				1712.5	1745	1777.5	(dBm)
5	QPSK	1	0	13.37	13.27	13.18	14.00
5	QPSK	1	12	13.40	13.28	13.22	14.00
5	QPSK	1	24	13.23	12.99	13.13	14.00
5	QPSK	12	0	13.25	13.22	13.28	14.00
5	QPSK	12	7	13.27	13.13	13.27	14.00
5	QPSK	12	13	13.34	13.09	13.18	14.00
5	QPSK	25	0	13.16	13.06	13.13	14.00
5	16QAM	1	0	13.75	13.62	13.52	14.00
5	16QAM	1	12	13.57	13.57	13.70	14.00
5	16QAM	1	24	13.65	13.53	13.49	14.00
5	16QAM	12	0	13.25	13.12	13.31	14.00
5	16QAM	12	7	13.24	13.07	13.17	14.00
5	16QAM	12	13	13.19	13.16	13.14	14.00
5	16QAM	25	0	13.23	13.14	13.25	14.00
Channel				131987	132322	132657	Tune-up limit
Frequency (MHz)				1711.5	1745	1778.5	(dBm)
3	QPSK	1	0	13.32	13.27	13.33	14.00
3	QPSK	1	8	13.32	13.25	13.33	14.00
3	QPSK	1	14	13.28	13.11	13.26	14.00
3	QPSK	8	0	13.17	13.14	13.35	14.00
3	QPSK	8	4	13.28	13.20	13.26	14.00
3	QPSK	8	7	13.23	13.08	13.17	14.00
3	QPSK	15	0	13.35	13.12	13.18	14.00
3	16QAM	1	0	13.75	13.55	13.58	14.00
3	16QAM	1	8	13.72	13.57	13.63	14.00
3	16QAM	1	14	13.57	13.38	13.49	14.00
3	16QAM	8	0	13.38	13.13	13.24	14.00
3	16QAM	8	4	13.28	13.11	13.33	14.00
3	16QAM	8	7	13.18	13.20	13.24	14.00
3	16QAM	15	0	13.26	13.20	13.25	14.00
Channel				131979	132322	132665	Tune-up limit
Frequency (MHz)				1710.7	1745	1779.3	(dBm)
1.4	QPSK	1	0	13.25	13.10	13.21	14.00
1.4	QPSK	1	3	13.33	13.19	13.15	14.00
1.4	QPSK	1	5	13.32	13.02	13.29	14.00
1.4	QPSK	3	0	13.28	13.17	13.33	14.00
1.4	QPSK	3	1	13.32	13.16	13.31	14.00
1.4	QPSK	3	3	13.17	13.11	13.25	14.00
1.4	QPSK	6	0	13.29	13.22	13.18	14.00
1.4	16QAM	1	0	13.77	13.61	13.64	14.00
1.4	16QAM	1	3	13.69	13.52	13.60	14.00
1.4	16QAM	1	5	13.57	13.45	13.47	14.00
1.4	16QAM	3	0	13.22	13.32	13.21	14.00
1.4	16QAM	3	1	13.40	13.17	13.17	14.00
1.4	16QAM	3	3	13.16	13.03	13.13	14.00
1.4	16QAM	6	0	13.22	13.16	13.36	14.00

11. Antenna Location



Front View

The separation distance for antenna to edge :

Antenna	To Top (mm)	To Right (mm)	To Left (mm)	To Bottom (mm)
WWAN Antenna	< 5	31.5	141	152

SAR test exclusion table

General Note:

1. The below table, when the distance is 50 mm exclusion threshold is "Ratio", when the distance is 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, 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:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at 1500 MHz and ≤ 6 GHz

	Wireless Interface	WCDMA Band V	WCDMA Band IV	WCDMA Band II	LTE Band 12	LTE Band 13	LTE Band 14	LTE Band 17	LTE Band 5	LTE Band 26	LTE Band 4	LTE Band 66	LTE Band 2	LTE Band 25	LTE Band 30	LTE Band 7	LTE Band 38	LTE Band 41	LTE Band 48
Exposure Position	Calculated Frequency (MHz)	846	1750	1907	715	784	795	713	848	848	1754	1779	1909	1914	2312	2567	2617	2687	3697
	Maximum power (dBm)	20.5	13.5	14.0	20.5	20.0	21.0	20.5	20.0	20.0	14.0	14.0	14.0	14.0	14.0	14.0	16.5	16.5	21.0
	Maximum rated power(mW)	112.20	22.39	25.12	112.20	100.00	125.89	112.20	100.00	100.00	25.12	25.12	25.12	25.12	25.12	25.12	44.67	44.67	125.89
Back	Separation distance(mm)	5.0																	
	exclusion threshold	20.6	5.9	6.9	19.0	17.7	22.5	16.9	18.4	18.4	6.7	6.7	6.9	7.0	7.6	8.1	14.5	14.6	48.4
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Top	Separation distance(mm)	5.0																	
	exclusion threshold	20.6	5.9	6.9	19.0	17.7	22.5	16.9	18.4	18.4	6.7	6.7	6.9	7.0	7.6	8.1	14.5	14.6	48.4
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Right	Separation distance(mm)	31.5																	
	exclusion threshold	3.3	0.9	1.1	3.0	2.8	3.6	2.7	2.9	2.9	1.1	1.1	1.1	1.1	1.2	1.3	2.3	2.3	7.7
	Testing required?	Yes	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes
Bottom	Separation distance(mm)	152.0																	
	exclusion threshold	738.0	1133.0	1129.0	664.0	703.0	709.0	662.0	740.0	740.0	1133.0	1132.0	1129.0	1128.0	1119.0	1114.0	1113.0	1112.0	1098.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Left	Separation distance(mm)	141.0																	
	exclusion threshold	676.0	1023.0	1019.0	611.0	645.0	651.0	610.0	677.0	677.0	1023.0	1022.0	1019.0	1018.0	1009.0	1004.0	1003.0	1002.0	988.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

12. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   c. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.

UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with 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.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, 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 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5/B12/B17/B26/B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2/4/5/17/38 SAR test was covered by Band 25/66/26/12/41; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

12.1 Body SAR

【WCDMA SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	WCDMA II	RMC 12.2Kbps	Back	0mm	9262	1852.4	Sample 1	13.41	14.00	0.07	0.307	0.352
	WCDMA II	RMC 12.2Kbps	Top	0mm	9262	1852.4	Sample 1	13.41	14.00	-0.01	0.294	0.337
	WCDMA II	RMC 12.2Kbps	Back	0mm	9262.0	1852.4	Sample 2	13.41	14.00	-0.17	0.165	0.189
	WCDMA II	RMC 12.2Kbps	Back	0mm	9262.0	1852.4	Sample 3	13.41	14.00	-0.18	0.144	0.165
02	WCDMA IV	RMC 12.2Kbps	Back	0mm	1513	1752.6	Sample 1	13.40	13.50	-0.01	0.501	0.513
	WCDMA IV	RMC 12.2Kbps	Top	0mm	1513	1752.6	Sample 1	13.40	13.50	-0.18	0.291	0.298
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1513.0	1752.6	Sample 2	13.40	13.50	-0.12	0.269	0.275
	WCDMA IV	RMC 12.2Kbps	Back	0mm	1513.0	1752.6	Sample 3	13.40	13.50	0.14	0.151	0.154
	WCDMA V	RMC 12.2Kbps	Back	0mm	4132	826.4	Sample 1	20.32	20.50	0.01	1.000	1.042
	WCDMA V	RMC 12.2Kbps	Back	0mm	4182	836.4	Sample 1	20.23	20.50	0.12	0.896	0.953
	WCDMA V	RMC 12.2Kbps	Back	0mm	4233	846.6	Sample 1	20.28	20.50	-0.00	1.020	1.073
	WCDMA V	RMC 12.2Kbps	Right	0mm	4132	826.4	Sample 1	20.32	20.50	-0.11	0.059	0.061
	WCDMA V	RMC 12.2Kbps	Top	0mm	4132	826.4	Sample 1	20.32	20.50	-0.09	0.984	1.025
	WCDMA V	RMC 12.2Kbps	Top	0mm	4182	836.4	Sample 1	20.23	20.50	0.07	1.090	1.160
03	WCDMA V	RMC 12.2Kbps	Top	0mm	4233	846.6	Sample 1	20.28	20.50	0.04	1.140	1.199
	WCDMA V	RMC 12.2Kbps	Top	0mm	4233.0	846.6	Sample 2	20.28	20.50	0.16	1.010	1.063
	WCDMA V	RMC 12.2Kbps	Top	0mm	4132.0	826.4	Sample 2	20.32	20.50	0.07	0.990	1.032
	WCDMA V	RMC 12.2Kbps	Top	0mm	4182.0	836.4	Sample 2	20.23	20.50	0.08	0.987	1.050
	WCDMA V	RMC 12.2Kbps	Top	0mm	4233.0	846.6	Sample 3	20.28	20.50	-0.03	1.130	1.189
	WCDMA V	RMC 12.2Kbps	Top	0mm	4132.0	826.4	Sample 3	20.32	20.50	-0.05	1.110	1.157
	WCDMA V	RMC 12.2Kbps	Top	0mm	4182.0	836.4	Sample 3	20.23	20.50	-0.01	1.120	1.192

【LTE SAR】

Plot No	Band	BW	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7	20M	QPSK	1	99	Back	0mm	21350	2560	Sample 1	13.25	14.00			0.06	0.427	0.508
	LTE Band 7	20M	QPSK	50	24	Back	0mm	21350	2560	Sample 1	13.30	14.00			0.18	0.409	0.481
	LTE Band 7	20M	QPSK	1	99	Top	0mm	21350	2560	Sample 1	13.25	14.00			-0.17	0.445	0.529
	LTE Band 7	20M	QPSK	50	24	Top	0mm	21350	2560	Sample 1	13.30	14.00			0.14	0.520	0.611
	LTE Band 7	20M	QPSK	50	24	Top	0mm	21350.0	2560	Sample 2	13.30	14.00			0.04	0.449	0.528
04	LTE Band 7	20M	QPSK	50	24	Top	0mm	21350.0	2560	Sample 3	13.30	14.00			0.02	0.555	0.652
	LTE Band 12	10M	QPSK	1	25	Back	0mm	23095	707.5	Sample 1	19.33	20.50			-0.06	0.884	1.157
05	LTE Band 12	10M	QPSK	25	12	Back	0mm	23095	707.5	Sample 1	19.42	20.50			0.12	0.923	1.183
	LTE Band 12	10M	QPSK	50	0	Back	0mm	23095	707.5	Sample 1	19.40	20.50			0.13	0.871	1.122
	LTE Band 12	10M	QPSK	1	25	Right	0mm	23095	707.5	Sample 1	19.33	20.50			0.07	0.002	0.003
	LTE Band 12	10M	QPSK	25	12	Right	0mm	23095	707.5	Sample 1	19.42	20.50			-0.13	0.002	0.003
	LTE Band 12	10M	QPSK	1	25	Top	0mm	23095	707.5	Sample 1	19.33	20.50			-0.03	0.835	1.093
	LTE Band 12	10M	QPSK	25	12	Top	0mm	23095	707.5	Sample 1	19.42	20.50			-0.03	0.511	0.655
	LTE Band 12	10M	QPSK	50	0	Top	0mm	23095	707.5	Sample 1	19.40	20.50			-0.03	0.841	1.083
	LTE Band 12	10M	QPSK	25	12	Back	0mm	23095.0	707.5	Sample 2	19.42	20.50			0.16	0.690	0.885
	LTE Band 12	10M	QPSK	25	12	Back	0mm	23095.0	707.5	Sample 3	19.42	20.50			0.13	0.717	0.919
	LTE Band 13	10M	QPSK	1	25	Back	0mm	23230	782	Sample 1	19.85	20.00			0.05	0.849	0.879
	LTE Band 13	10M	QPSK	25	0	Back	0mm	23230	782	Sample 1	19.82	20.00			0.08	0.864	0.900
06	LTE Band 13	10M	QPSK	50	0	Back	0mm	23230	782	Sample 1	19.80	20.00			0.11	0.952	0.997
	LTE Band 13	10M	QPSK	1	25	Top	0mm	23230	782	Sample 1	19.85	20.00			-0.06	0.702	0.727
	LTE Band 13	10M	QPSK	25	0	Top	0mm	23230	782	Sample 1	19.82	20.00			-0.12	0.775	0.808
	LTE Band 13	10M	QPSK	50	0	Top	0mm	23230	782	Sample 1	19.80	20.00			0.10	0.793	0.830
	LTE Band 13	10M	QPSK	50	0	Back	0mm	23230.0	782	Sample 2	19.80	20.00			-0.17	0.860	0.900
	LTE Band 13	10M	QPSK	50	0	Back	0mm	23230.0	782	Sample 3	19.80	20.00			-0.02	0.513	0.537
	LTE Band 14	10M	QPSK	1	0	Back	0mm	23330	793	Sample 1	19.46	20.50			0.18	0.725	0.921
	LTE Band 14	10M	QPSK	25	0	Back	0mm	23330	793	Sample 1	19.37	20.50			-0.01	0.721	0.935
	LTE Band 14	10M	QPSK	50	0	Back	0mm	23330	793	Sample 1	19.34	20.50			0.08	0.836	1.092
	LTE Band 14	10M	QPSK	1	0	Right	0mm	23330	793	Sample 1	19.46	20.50			-0.06	0.054	0.069
	LTE Band 14	10M	QPSK	25	0	Right	0mm	23330	793	Sample 1	19.37	20.50			-0.09	0.058	0.075
	LTE Band 14	10M	QPSK	1	0	Top	0mm	23330	793	Sample 1	19.46	20.50			0.15	0.911	1.158
07	LTE Band 14	10M	QPSK	25	0	Top	0mm	23330	793	Sample 1	19.37	20.50			0.03	0.894	1.160
	LTE Band 14	10M	QPSK	50	0	Top	0mm	23330	793	Sample 1	19.34	20.50			0.18	0.839	1.096
	LTE Band 14	10M	QPSK	25	0	Top	0mm	23330.0	793	Sample 2	19.37	20.50			0.19	0.745	0.966
	LTE Band 14	10M	QPSK	25	0	Top	0mm	23330.0	793	Sample 3	19.37	20.50			-0.16	0.823	1.067
	LTE Band 25	20M	QPSK	1	0	Back	0mm	26140	1860	Sample 1	12.89	14.00			0.15	0.279	0.360
	LTE Band 25	20M	QPSK	50	0	Back	0mm	26140	1860	Sample 1	12.93	14.00			-0.03	0.296	0.379
	LTE Band 25	20M	QPSK	1	0	Top	0mm	26140	1860	Sample 1	12.89	14.00			0.03	0.286	0.369
	LTE Band 25	20M	QPSK	50	0	Top	0mm	26140	1860	Sample 1	12.93	14.00			0.04	0.307	0.393

	LTE Band 25	20M	QPSK	50	0	Top	0mm	26140.0	1860	Sample 2	12.93	14.00			0.01	0.282	0.361
08	LTE Band 25	20M	QPSK	50	0	Top	0mm	26140.0	1860	Sample 3	12.93	14.00			0.01	0.388	0.496
	LTE Band 26	15M	QPSK	1	37	Back	0mm	26865	831.5	Sample 1	19.76	20.00			-0.05	0.827	0.874
	LTE Band 26	15M	QPSK	36	20	Back	0mm	26865	831.5	Sample 1	19.83	20.00			0.19	0.834	0.867
	LTE Band 26	15M	QPSK	75	0	Back	0mm	26865	831.5	Sample 1	19.81	20.00			0.06	0.845	0.883
	LTE Band 26	15M	QPSK	1	37	Top	0mm	26865	831.5	Sample 1	19.76	20.00			-0.18	0.959	1.014
	LTE Band 26	15M	QPSK	36	20	Top	0mm	26865	831.5	Sample 1	19.83	20.00			0.11	0.983	1.022
09	LTE Band 26	15M	QPSK	75	0	Top	0mm	26865	831.5	Sample 1	19.81	20.00			0.03	1.010	1.055
	LTE Band 26	15M	QPSK	75	0	Top	0mm	26865.0	831.5	Sample 2	19.81	20.00			0.09	0.910	0.951
	LTE Band 26	15M	QPSK	75	0	Top	0mm	26865.0	831.5	Sample 3	19.81	20.00			0.16	0.990	1.035
	LTE Band 30	10M	QPSK	1	0	Back	0mm	27710	2310	Sample 1	13.07	14.00			-0.11	0.378	0.468
	LTE Band 30	10M	QPSK	25	12	Back	0mm	27710	2310	Sample 1	13.17	14.00			0.06	0.395	0.478
	LTE Band 30	10M	QPSK	1	0	Top	0mm	27710	2310	Sample 1	13.07	14.00			0.04	0.412	0.510
10	LTE Band 30	10M	QPSK	25	12	Top	0mm	27710	2310	Sample 1	13.17	14.00			-0.09	0.423	0.512
	LTE Band 30	10M	QPSK	25	12	Top	0mm	27710	2310	Sample 2	13.17	14.00			0.11	0.378	0.458
	LTE Band 30	10M	QPSK	25	12	Top	0mm	27710	2310	Sample 3	13.17	14.00			0.17	0.417	0.505
11	LTE Band 66	20M	QPSK	1	49	Back	0mm	132072	1720	Sample 1	13.46	14.00			0.08	0.522	0.591
	LTE Band 66	20M	QPSK	50	0	Back	0mm	132572	1770	Sample 1	13.34	14.00			-0.10	0.486	0.566
	LTE Band 66	20M	QPSK	1	49	Top	0mm	132072	1720	Sample 1	13.46	14.00			-0.08	0.368	0.417
	LTE Band 66	20M	QPSK	50	0	Top	0mm	132572	1770	Sample 1	13.34	14.00			0.01	0.360	0.419
	LTE Band 66	20M	QPSK	1	49	Back	0mm	132072.0	1720	Sample 2	13.46	14.00			0.03	0.265	0.300
	LTE Band 66	20M	QPSK	1	49	Back	0mm	132072.0	1720	Sample 3	13.46	14.00			-0.14	0.184	0.208
	LTE Band 41	20M	QPSK	1	99	Back	0mm	40620	2593	Sample 1	15.75	16.50	62.9	1.006	-0.13	0.398	0.476
	LTE Band 41	20M	QPSK	50	24	Back	0mm	40620	2593	Sample 1	15.74	16.50	62.9	1.006	0.04	0.403	0.483
	LTE Band 41	20M	QPSK	1	99	Top	0mm	40620	2593	Sample 1	15.75	16.50	62.9	1.006	-0.10	0.553	0.661
12	LTE Band 41	20M	QPSK	50	24	Top	0mm	40620	2593	Sample 1	15.74	16.50	62.9	1.006	0.01	0.558	0.669
	LTE Band 41	20M	QPSK	1	99	Top	0mm	39750	2506	Sample 1	15.57	16.50	62.9	1.006	0.11	0.454	0.566
	LTE Band 41	20M	QPSK	50	50	Top	0mm	39750	2506	Sample 1	15.58	16.50	62.9	1.006	-0.19	0.488	0.607
	LTE Band 41	20M	QPSK	1	99	Top	0mm	40185	2549.5	Sample 1	15.65	16.50	62.9	1.006	0.10	0.468	0.573
	LTE Band 41	20M	QPSK	50	0	Top	0mm	40185	2549.5	Sample 1	15.61	16.50	62.9	1.006	0.18	0.517	0.638
	LTE Band 41	20M	QPSK	1	0	Top	0mm	41055	2636.5	Sample 1	15.56	16.50	62.9	1.006	-0.11	0.512	0.640
	LTE Band 41	20M	QPSK	50	24	Top	0mm	41055	2636.5	Sample 1	15.67	16.50	62.9	1.006	0.01	0.533	0.649
	LTE Band 41	20M	QPSK	1	99	Top	0mm	41490	2680	Sample 1	15.61	16.50	62.9	1.006	0.07	0.539	0.665
	LTE Band 41	20M	QPSK	50	24	Top	0mm	41490	2680	Sample 1	15.59	16.50	62.9	1.006	-0.04	0.504	0.625
	LTE Band 41	20M	QPSK	50	50	Top	0mm	39750	2506	Sample 2	15.58	16.50	62.9	1.006	-0.17	0.441	0.548
	LTE Band 41	20M	QPSK	50	0	Top	0mm	40185	2549.5	Sample 2	15.61	16.50	62.9	1.006	-0.10	0.466	0.575
	LTE Band 41	20M	QPSK	50	24	Top	0mm	40620.0	2593	Sample 2	15.74	16.50	62.9	1.006	0.02	0.504	0.604
	LTE Band 41	20M	QPSK	50	24	Top	0mm	41055	2636.5	Sample 2	15.67	16.50	62.9	1.006	0.05	0.481	0.586
	LTE Band 41	20M	QPSK	50	24	Top	0mm	41490	2680	Sample 2	15.59	16.50	62.9	1.006	-0.15	0.455	0.564
	LTE Band 41	20M	QPSK	50	50	Top	0mm	39750	2506	Sample 3	15.58	16.50	62.9	1.006	0.12	0.451	0.561
	LTE Band 41	20M	QPSK	50	0	Top	0mm	40185	2549.5	Sample 3	15.61	16.50	62.9	1.006	-0.13	0.477	0.589
	LTE Band 41	20M	QPSK	50	24	Top	0mm	40620	2593	Sample 3	15.74	16.50	62.9	1.006	0.09	0.516	0.618
	LTE Band 41	20M	QPSK	50	24	Top	0mm	41055	2636.5	Sample 3	15.67	16.50	62.9	1.006	-0.07	0.492	0.599
	LTE Band 41	20M	QPSK	50	24	Top	0mm	41490	2680	Sample 3	15.59	16.50	62.9	1.006	-0.01	0.466	0.578
	LTE Band 48	20M	QPSK	1	0	Back	0mm	55990	3625	Sample 1	20.87	21.00	62.9	1.006	-0.12	0.349	0.362
	LTE Band 48	20M	QPSK	50	0	Back	0mm	55990	3625	Sample 1	20.94	21.00	62.9	1.006	0.18	0.373	0.380
	LTE Band 48	20M	QPSK	1	0	Right	0mm	55990	3625	Sample 1	20.87	21.00	62.9	1.006	0.11	0.050	0.052
	LTE Band 48	20M	QPSK	50	0	Right	0mm	55990	3625	Sample 1	20.94	21.00	62.9	1.006	0.05	0.041	0.042
	LTE Band 48	20M	QPSK	1	0	Top	0mm	55990	3625	Sample 1	20.87	21.00	62.9	1.006	0.18	0.586	0.607
	LTE Band 48	20M	QPSK	1	99	Top	0mm	55340	3560	Sample 1	20.87	21.00	62.9	1.006	-0.19	0.684	0.709
	LTE Band 48	20M	QPSK	1	0	Top	0mm	55830	3609	Sample 1	20.85	21.00	62.9	1.006	-0.10	0.620	0.646
	LTE Band 48	20M	QPSK	1	0	Top	0mm	56150	3641	Sample 1	20.80	21.00	62.9	1.006	-0.17	0.558	0.588
	LTE Band 48	20M	QPSK	1	0	Top	0mm	56640	3690	Sample 1	20.63	21.00	62.9	1.006	0.15	0.531	0.582
	LTE Band 48	20M	QPSK	50	0	Top	0mm	55990	3625	Sample 1	20.94	21.00	62.9	1.006	0.13	0.590	0.602
	LTE Band 48	20M	QPSK	50	24	Top	0mm	55340	3560	Sample 1	20.93	21.00	62.9	1.006	0.08	0.574	0.587
	LTE Band 48	20M	QPSK	50	0	Top	0mm	55830	3609	Sample 1	20.84	21.00	62.9	1.006	-0.18	0.614	0.641
	LTE Band 48	20M	QPSK	50	0	Top	0mm	56150	3641	Sample 1	20.80	21.00	62.9	1.006	-0.15	0.567	0.597
	LTE Band 48	20M	QPSK	50	0	Top	0mm	56640	3690	Sample 1	20.61	21.00	62.9	1.006	0.14	0.540	0.594
	LTE Band 48	20M	QPSK	1	99	Top	0mm	55340.0	3560	Sample 2	20.87	21.00	62.9	1.006	0.11	0.564	0.584
	LTE Band 48	20M	QPSK	1	0	Top	0mm	55830.0	3609	Sample 2	20.85	21.00	62.9	1.006	-0.10	0.465	0.484
	LTE Band 48	20M	QPSK	1	0	Top	0mm	56150.0	3641	Sample 2	20.80	21.00	62.9	1.006	0.17	0.403	0.424
	LTE Band 48	20M	QPSK	1	0	Top	0mm	56640.0	3690	Sample 2	20.63	21.00	62.9	1.006	-0.14	0.352	0.386
13	LTE Band 48	20M	QPSK	1	99	Top	0mm	55340.0	3560	Sample 3	20.87	21.00	62.9	1.006	0.15	0.774	0.802
	LTE Band 48	20M	QPSK	1	0	Top	0mm	55830.0	3609	Sample 3	20.85	21.00	62.9	1.006	-0.08	0.709	0.738
	LTE Band 48	20M	QPSK	1	0	Top	0mm	56150.0	3641	Sample 3	20.80	21.00	62.9	1.006	-0.13	0.679	0.715
	LTE Band 48	20M	QPSK	1	0	Top	0mm	56640.0	3690	Sample 3	20.63	21.00	62.9	1.006	-0.13	0.593	0.650

13. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body
1.	WWAN + WLAN 2.4GHz Main + Bluetooth Aux	Yes
2.	WWAN + WLAN 2.4GHz Main + WLAN 2.4GHz Aux	Yes
3.	WWAN + WLAN 5GHz Main + WLAN 5GHz Aux + Bluetooth Aux	Yes

General Note:

1. NFC transmissions do not overlap with other radio transmitters for more than 30 seconds. Therefore, per FCC KDB 447498 D01v06, additional simultaneous transmission analysis between NFC and other radios is not required.
2. The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
3. WLAN RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode. Therefore SPLSR calculation was choose worst case with SAR test results of each antenna in SISO mode perform evaluation.
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR 1.6W/kg.
   v) The SPLSR calculated results please refer to section 13.2.

13.1 Body Exposure Conditions

Exposure Position	1	3	4	5	6	7	1+3+7 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)	1+5+6+7 Summed 1g SAR (W/kg)	1+3+7 Case	1+3+7 SPLSR	1+3+4 Case	1+3+4 SPLSR	1+5+6+7 Case	1+5+6+7 SPLSR
	Maximum WWAN	WLAN 2.4GHz Main Antenna	WLAN 2.4 Aux Antenna	WLAN 5GHz Main Antenna	WLAN 5GHz Aux Antenna	Bluetooth Aux Antenna									
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)									
Back at 0mm	1.183	0.610	0.120	1.030	0.290	0.010	**1.803**	**1.913**	**2.513**	**Case 4**	**0.020**	**Case 2**	**0.020**	**Case 3**	**0.030**
Right at 0mm	0.075	-	-	-	-	-	**0.075**	**0.075**	**0.075**	-	-	-	-	-	-
Top at 0mm	1.199	0.080	0.020	0.800	0.040	0.000	**1.279**	**1.299**	**2.039**	-	-	-	-	**Case 1**	**0.040**
Left at 0mm	0.003	-	1.200	-	1.450	0.080	**0.083**	**1.203**	**1.533**	-	-	-	-	-	-
Bottom at 0mm	0.003	-	-	-	-	-	**0.003**	**0.003**	**0.003**	-	-	-	-	-	-

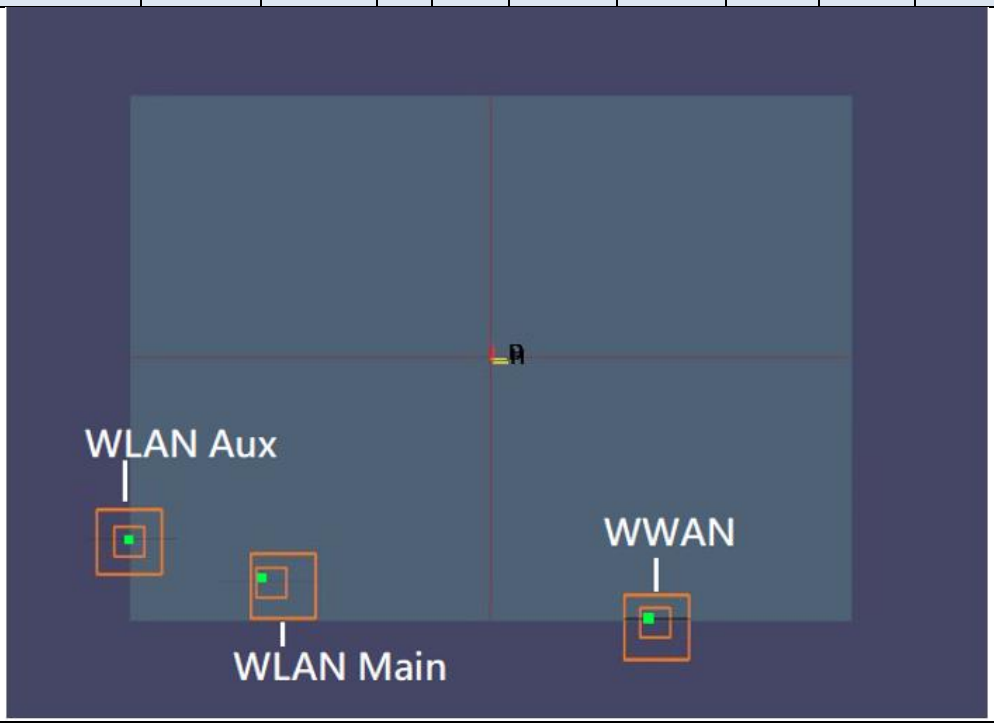
13.2 SPLSR Evaluation and Analysis

General Note:

1. According to antenna location the minimum distance between each transmit antenna is using for SPLSR analysis
2. Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Therefore, the adjacent transmit antennas will be summed first, and then the SPLSR calculation will be evaluated with the farther transmitted antennas.
3. SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
4. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.

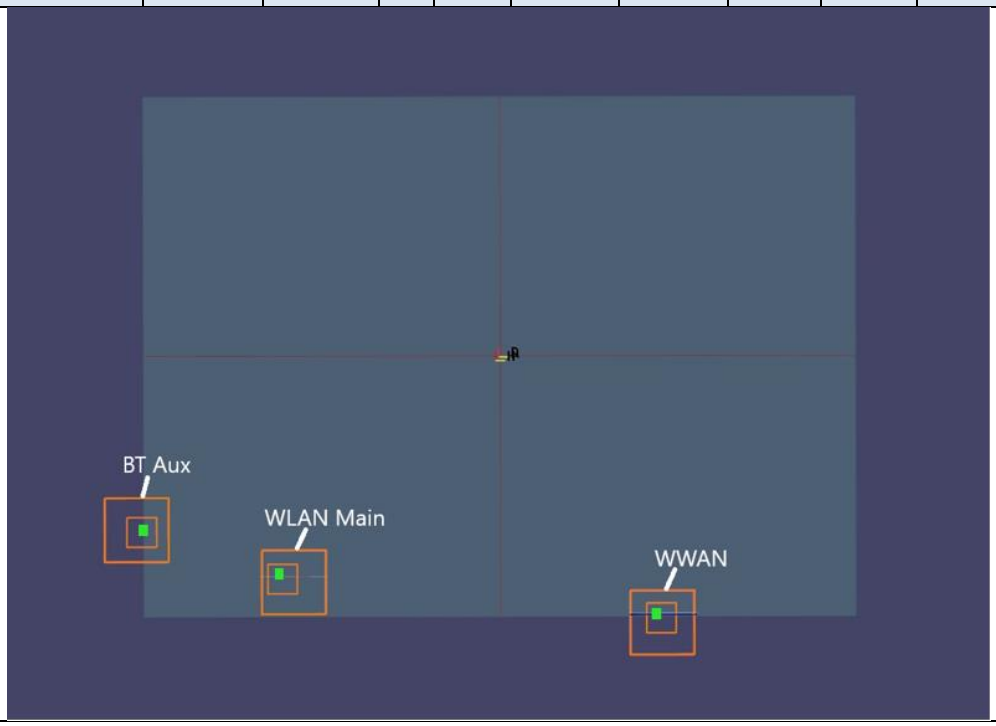
	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 1	WCDMA V	Top	1.199	0	0.5	37.5	-181.7	78.9	2.00	0.04	Not required
	WLAN 5GHz Main		0.8	0	-0.2	-41.3	-177				
	WCDMA V	Top	1.199	0	0.5	37.5	-181.7	154.7	1.24	0.01	Not required
	WLAN 5GHz+BT Aux		0.04	0	-3.1	-117.1	-177				
	WLAN 5GHz Main	Top	0.8	0	-0.2	-41.3	-177	75.9	0.84	0.01	Not required
	WLAN 5GHz+BT Aux		0.04	0	-3.1	-117.1	-177				

	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 2	LTE Band12	Back	1.183	0	85.6	64.7	-177	139.2	1.79	0.02	Not required
	WLAN 2.4GHz Main		0.61	0	74	-74	-177				
	LTE Band12	Back	1.183	0	85.6	64.7	-177	186.5	1.30	0.01	Not required
	WLAN 2.4GHz Aux		0.12	0	60	-120	-177				
	WLAN 2.4GHz Main	Back	0.61	0	74	-74	-177	48.1	0.73	0.01	Not required
	WLAN 2.4GHz Aux		0.12	0	60	-120	-177				



	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 3	LTE Band12	Back	1.183	0	85.6	64.7	-177	108.2	2.21	0.03	Not required
	WLAN 5GHz Main		1.03	0	84.3	-43.5	-177				
	LTE Band12	Back	1.183	0	86.4	54.9	-181	177.5	1.47	0.01	Not required
	WLAN 5GHz Aux		0.29	0	50.2	-118.8	-177				
	LTE Band12	Back	1.183	0	85.6	64.7	-177	180.5	1.19	0.01	Not required
	BT Aux		0.01	0	42	-110.5	-177				
	WLAN 5GHz Main	Back	1.03	0	84.3	-43.5	-177	82.7	1.32	0.02	Not required
	WLAN 5GHz Aux		0.29	0	50.2	-118.8	-177				
	WLAN 5GHz Main	Back	1.03	0	84.3	-43.5	-177	79.2	1.04	0.01	Not required
	BT Aux		0.01	0	42	-110.5	-177				
	WLAN 5GHz Aux	Back	0.29	0	50.2	-118.8	-177	11.7	0.30	0.01	Not required
	BT Aux		0.01	0	42	-110.5	-177				

	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 4	LTE Band12	Back	1.183	0	85.6	64.7	-177	139.2	1.79	0.02	Not required
	WLAN 2.4GHz Main		0.61	0	74	-74	-177				
	LTE Band12	Back	1.183	0	85.6	64.7	-177	180.5	1.19	0.01	Not required
	BT Aux		0.01	0	42	-110.5	-177				
	WLAN 2.4GHz Main	Back	0.61	0	74	-74	-177	48.5	0.62	0.01	Not required
	BT Aux		0.01	0	42	-110.5	-177				



Test Engineer： Samy Lo, Chris Yang and Kevin Guo

14. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is 1.5 W/kg and the measured 10-g SAR within a frequency band is 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.
Declaration of Conformity:
The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[a]	1/k[b]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Applicable for SAR Measurements:

Uncertainty Budget (4 MHz - 10 GHz range)							
Error Description	**Uncertainty Value (±%)**	**Probability**	**Divisor**	**(Ci) 1g**	**(Ci) 10g**	**Standard Uncertainty (1g) (±%)**	**Standard Uncertainty (10g) (±%)**
Measurement System							
Probe Calibration	18.60	N	2	1	1	9.3	9.3
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Linearity	4.70	R	1.732	1	1	2.7	2.7
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Post-processing	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Holder	3.60	N	1	1	1	3.6	3.6
Test sample Positioning	3.03	N	1	1	1	3.0	3.0
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Phantom and Setup							
Phantom Uncertainty	7.60	R	1.732	1	1	4.4	4.4
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.77	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.77	2.3	2.2
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.77	1.1	1.1
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.77	1.7	1.6
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						14.5%	14.2%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						29.0%	28.4%

15. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[6] FCC KDB 648474 D03 v01r04, “Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers” Dec 2015.

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

[9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[10] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

[11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[12] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.