

TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247 and subpart B

FOR:

Vishay Israel Ltd.
Handheld terminal of Jack
Point Wireless Aircraft
Weighing System
Model: Jetway-W master

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1 Applicant information

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Telephone: +972 3634 4131
Fax: +972 3634 4130
E-mail: dania@rfwaves.com
Contact name: Mr. Dani Alon

2 Equipment under test attributes

Product name: Handheld terminal of Jack Point Wireless Aircraft Weighing System
Product type: Transceiver
Model(s): Jetway-W master
Serial number: 1
Hardware version: 1
Software release: 1
Receipt date 12/19/2006

3 Manufacturer information

Manufacturer name: Vishay Israel Ltd.
Address: RF Waves division, 1c Yoni Netanyahu street, Or Yehuda 60376, Israel
Telephone: +972 3634 4131
Fax: +972 3634 4130
E-Mail: dania@rfwaves.com
Contact name: Mr. Dani Alon

4 Test details

Project ID: 17617
Location: Hermon Laboratories Ltd., Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 12/19/2006
Test completed: 5/03/2007
Test specification(s): FCC 47CFR part 15, subpart C §15.247 and subpart B

5 Tests summary

| Test | Status |
|---|--------------|
| Transmitter characteristics | |
| Section 15.247(a)2, 6 dB bandwidth | Pass |
| Section 15.247(b)3, Peak output power | Pass |
| Section 15.247(b)5, RF exposure | Pass |
| Section 15.247(c), Conducted spurious emissions | Pass |
| Section 15.247(c), Radiated spurious emissions | Pass |
| Section 15.247(d), Peak power density | Pass |
| Section 15.207(a), Conducted emission | Pass |
| Section 15.203, Antenna requirement | Pass |
| Unintentional emissions | |
| Section 15.107, Conducted emission at AC power port | Pass |
| Section 15.109, Radiated emission | Pass |
| Section 15.111, Conducted emission at receiver antenna port | Not required |

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested.

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

This test report replaces the previously issued test report identified by Doc ID:VSHRAD_FCC.17617_M_rev2.

| | Name and Title | Date | Signature |
|--------------|---|------------------|---|
| Tested by: | Mr. A. Lane, test engineer | May 3, 2007 |  |
| Reviewed by: | Mrs. M. Cherniavsky, certification engineer | October 31, 2007 |  |
| Approved by: | Mr. M. Nikishin, EMC and radio group leader | October 31, 2007 |  |

6 EUT description

6.1 General information

The EUT is a Jack Point Wireless Aircraft Weighing System including a user terminal (master) communicated with up to five remote wireless load cells (slaves). The EUT is powered from internal battery or from AC mains via AC/DC adapter. The EUT powered from AC mains via AC/DC adapters was tested as the worst case.

The master operates in transceive and standby modes. The slave operates in transceive and receive modes.

6.2 Ports and lines

| Port type | Port description | Connected | | Connector type | Qty. | Cable type | Cable length | Indoor / outdoor |
|-----------|------------------|---------------|---------------|--------------------|------|------------|--------------|------------------|
| | | From | To | | | | | |
| Power | DC power | Master | AC/DC adapter | DC jack | 1 | Unshielded | 1.5 m | Indoor |
| Power | AC mains | AC/DC adapter | AC mains | 2-pole wall-outlet | 1 | NA | NA | Indoor |
| Signal | RS 232 | Master | Open circuit | D type 9 pin | 1 | Shielded | 10 m | Indoor |
| RF | Antenna | Master | Antenna | SMA | 2 | NA | NA | Indoor |
| Power | DC power | Slave | AC/DC adapter | DC jack | 1 | Unshielded | 1.5 m | Indoor |
| Power | AC mains | AC/DC adapter | AC mains | 2-pole wall-outlet | 1 | NA | NA | Indoor |
| RF | Antenna | Slave | Antenna | SMA | 2 | NA | NA | Indoor |

6.3 Power adapters

| Description | Manufacturer | Model number | Serial number |
|-------------------------|-------------------|--------------|----------------|
| AC/DC adapter of master | Delta Electronics | EADP-10BB | 592A601Z9S1OK4 |
| AC/DC adapter of slave | EDACPOWER ELEC. | EA1015AR | 1312D1015ARI |

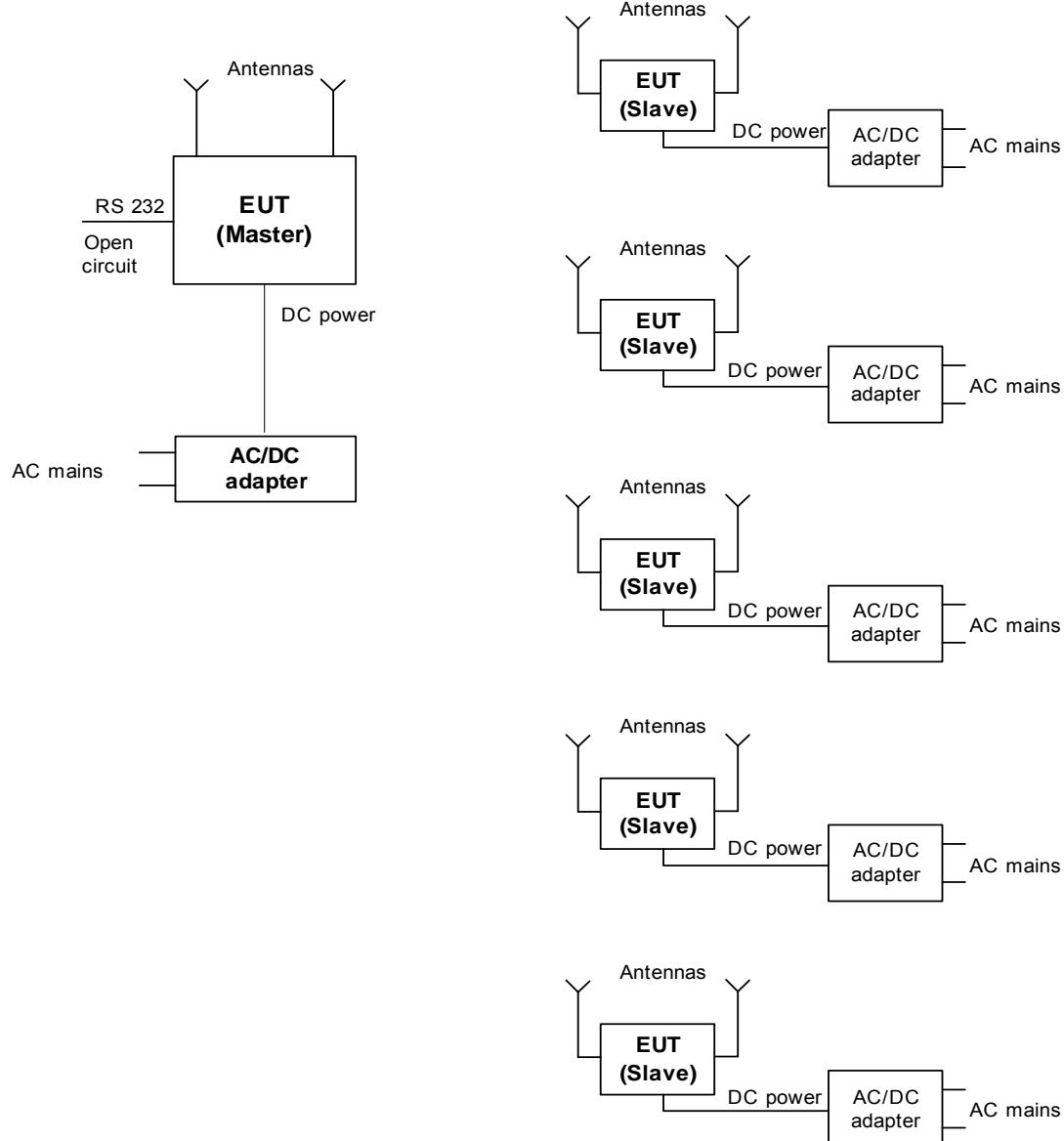
6.4 Operating frequencies

| Source | Frequency, MHz |
|------------|----------------|
| Oscillator | 24 |
| Tx/Rx | 2424 - 2456 |

6.5 Changes made in EUT

No changes were implemented.

6.6 Test configuration





6.7 Transmitter characteristics

| Type of equipment | | | | | | |
|--|--|---|--------------------------------|---|--|--|
| <input checked="" type="checkbox"/> | Stand-alone (Equipment with or without its own control provisions) | | | | | |
| | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) | | | | | |
| | Plug-in card (Equipment intended for a variety of host systems) | | | | | |
| Intended use | Condition of use | | | | | |
| fixed | Always at a distance more than 2 m from all people | | | | | |
| mobile | Always at a distance more than 20 cm from all people | | | | | |
| <input checked="" type="checkbox"/> portable | May operate at a distance closer than 20 cm to human body | | | | | |
| Assigned frequency range | | 2400 – 2483.5 MHz | | | | |
| Operating frequency range | | 2424 -2456 MHz | | | | |
| RF channel spacing | | NA | | | | |
| Maximum peak output power | | At transmitter 50 Ω RF output connector | | 17.6 dBm | | |
| | | Effective radiated power (for equipment with no RF connector) | | | | |
| Is transmitter output power variable? | | X | No | | | |
| | | Yes | continuous variable | | | |
| | | | stepped variable with stepsize | | | |
| Antenna connection | | | | | | |
| X | unique coupling | standard connector | integral | with temporary RF connector without temporary RF connector | | |
| Antenna/s technical characteristics | | | | | | |
| Type | Manufacturer | Model number | Gain | | | |
| Dipole | WANSHIH Electronics | NA | 2 dBi | | | |
| Transmitter 99% power bandwidth | | 22 MHz | | | | |
| Transmitter aggregate data rate/s | | 3 Mbps | | | | |
| Type of modulation | | OOK | | | | |
| Type of multiplexing | | TDMA | | | | |
| Maximum transmitter duty cycle in normal use | | 0.08 % (master) | Tx ON time | 0.035 msec | | |
| | | | Period | 40 msec | | |
| Transmitter power source | | | | | | |
| X | Battery | Nominal rated voltage | 1) 4.2 V | Battery type Lithium | | |
| X | DC | Nominal rated voltage | 2) DC from AC/DC adapter | | | |
| | AC mains | Nominal rated voltage | | Frequency | | |
| Common power source for transmitter and receiver | | X | yes | no | | |
| Spread spectrum technique used | | Digital transmission system (DTS) | | | | |

| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(a)(2) | | |
| Test mode: | Compliance | | |
| Date & Time: | 12/24/2006 1:35:00 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

7 Transmitter tests according to 47CFR part 15 subpart C requirements

7.1 Minimum 6 dB bandwidth

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 The 6 dB bandwidth limits

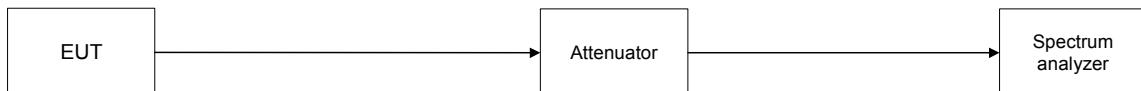
| Assigned frequency, MHz | Modulation envelope reference points*, dBc | Minimum bandwidth, kHz |
|-------------------------|--|------------------------|
| 902.0 – 928.0 | | |
| 2400.0 – 2483.5 | 6.0 | |
| 5725.0 – 5850.0 | | 500.0 |

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

7.1.2 Test procedure

- 7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.
- 7.1.2.2 The EUT was set to transmit modulated carrier.
- 7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer RBW=100 kHz as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plots.

Figure 7.1.1 The 6 dB bandwidth test setup



| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(a)(2) | | |
| Test mode: | Compliance | | |
| Date & Time: | 12/24/2006 1:35:00 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
 DETECTOR USED: Peak
 SWEEP TIME: Auto
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc
 MODULATION: OOK
 MODULATING SIGNAL: ID CODE
 BIT RATE: 3 Mbps

| Carrier frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|------------------------|---------------------|------------|-------------|---------|
| Low frequency 2424 | 6750 | 500 | -6250 | Pass |
| High frequency 2456 | 9100 | 500 | -8600 | Pass |

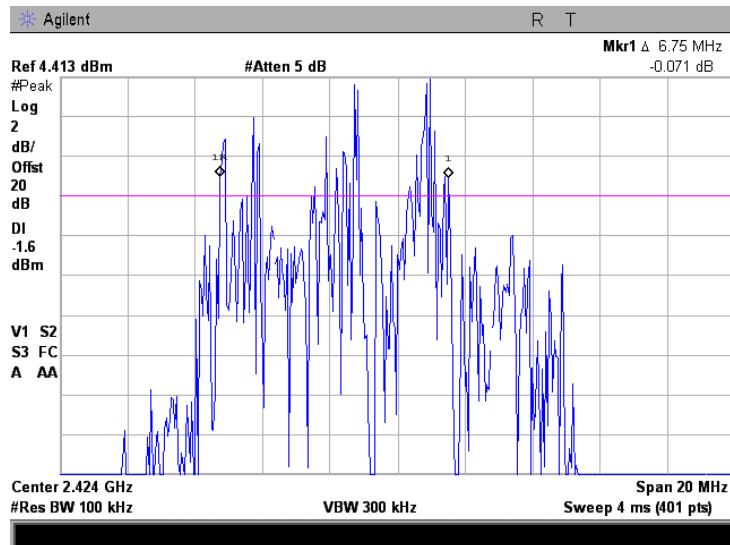
Reference numbers of test equipment used

| | | | | | | |
|---------|---------|--|--|--|--|--|
| HL 2866 | HL 2909 | | | | | |
|---------|---------|--|--|--|--|--|

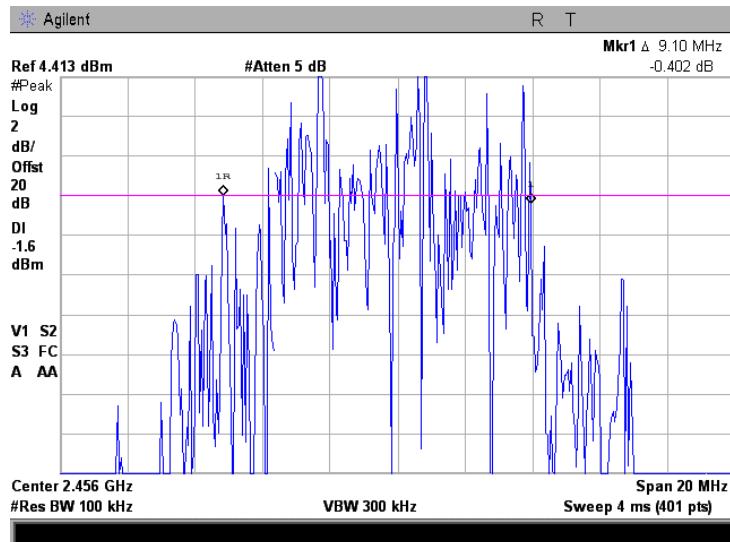
Full description is given in Appendix A.

| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(a)(2) | | |
| Test mode: | Compliance | | |
| Date & Time: | 12/24/2006 1:35:00 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.1.1 The 6 dB bandwidth test result at low frequency



Plot 7.1.2 The 6 dB bandwidth test result at high frequency



| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(b)3, Peak output power | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(b), Option 2, Method #3 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 12/24/2006 10:53:41 AM | Relative Humidity: 51% | Power Supply: 120 V AC |
| Temperature: 20°C | Air Pressure: 1010 hPa | | |
| Remarks: master unit | | | |

7.2 Peak output power

7.2.1 General

This test was performed to measure the maximum peak output power at the transmitter RF antenna connector. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

| Assigned frequency range, MHz | Maximum antenna gain, dBi | Peak output power* | |
|-------------------------------|---------------------------|--------------------|------|
| | | W | dBm |
| 902.0 – 928.0 | | | |
| 2400.0 – 2483.5 | 6.0 | 1.0 | 30.0 |
| 5725.0 – 5850.0 | | | |

*- If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;
without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;
by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

7.2.2 Test procedure

- 7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.
- 7.2.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
- 7.2.2.3 The 1 MHz resolution bandwidth of spectrum analyzer was set, video averaging with max hold and sum across the band were used. Since the transmitter pulse duration (T) is about 0.035msec (refer to plot 7.4.47), a VBW of $1/T = 30$ kHz was used for averaging and the maximum peak output power was measured as provided in Table 7.2.2 and associated plots.

Figure 7.2.1 Peak output power test setup



| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(b)3, Peak output power | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(b), Option 2, Method #3 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 12/24/2006 10:53:41 AM | Relative Humidity: 51% | Power Supply: 120 V AC |
| Temperature: 20°C | Air Pressure: 1010 hPa | | |
| Remarks: master unit | | | |

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY BAND: 2400 - 2483.5 MHz

MODULATION: OOK

MODULATING SIGNAL: ID CODE

BIT RATE: 3 Mbps

TRANSMITTER OUTPUT POWER SETTINGS: Maximum

DETECTOR USED: Peak

EUT 26 dB BANDWIDTH: 22 MHz

RESOLUTION BANDWIDTH: 1 MHz

VIDEO BANDWIDTH: =>1/Ton=30 kHz

| Carrier frequency MHz | Spectrum analyzer reading, dBm | External attenuation dB | Cable loss dB | Peak output power** dBm | Limit, dBm | Margin*, dB | Verdict |
|-----------------------|--------------------------------|-------------------------|---------------|-------------------------|------------|-------------|---------|
| 2424 | 3.672 | included | included | 17.09 | 30 | -12.91 | Pass |
| 2456 | 4.221 | included | included | 17.64 | 30 | -12.36 | Pass |

* - Margin = Peak output power – specification limit.

** - Peak power over EBW = S.A reading + 10 log(EBW/1MHz)

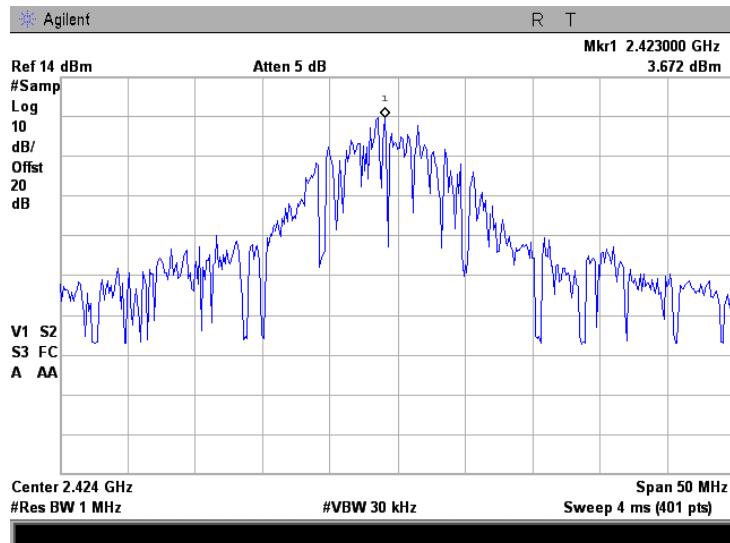
Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|--|--|--|--|--|--|
| HL 2866 | HL 2909 | | | | | | |
|---------|---------|--|--|--|--|--|--|

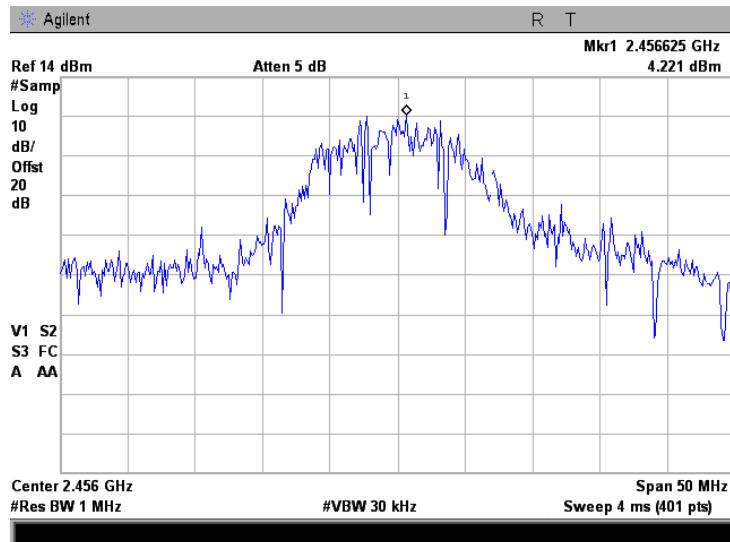
Full description is given in Appendix A.

| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(b)3, Peak output power | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(b), Option 2, Method #3 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 12/24/2006 10:53:41 AM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.2.1 Peak output power at low frequency



Plot 7.2.2 Peak output power at high frequency



| | | | |
|-----------------------------|---|---------------------------|-------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | Relative Humidity: | 51% |
| Temperature: 20°C | Air Pressure: 1010 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

7.3 Spurious emissions at RF antenna connector

7.3.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Spurious emission limits

| Frequency*, MHz | Attenuation below carrier**, dBc |
|-----------------------------------|----------------------------------|
| 0.009 – 10 th harmonic | 30.0 |

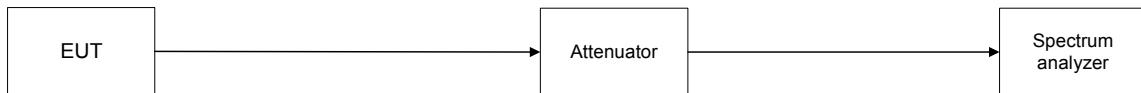
* - The above limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

** - Spurious emission limit is provided in terms of attenuation below the peak of modulated carrier based on the use of RMS averaging over a time interval.

7.3.2 Test procedure

- 7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.
- 7.3.2.2 The EUT was adjusted to produce maximum available to end user RF output power.
- 7.3.2.3 The highest emission level within the authorized band was measured.
- 7.3.2.4 The spurious emission was measured with spectrum analyzer settings as provided in Table 7.3.2 and associated plots and referenced to the highest emission level measured within the authorized band.

Figure 7.3.1 Spurious emission test setup



| | | | |
|-----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | Relative Humidity: | 51% |
| Temperature: 20°C | Air Pressure: 1010 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

Table 7.3.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2400-2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 25000 MHz
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 MODULATION: OOK
 MODULATING SIGNAL: ID CODE
 BIT RATE: 3 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 17.09 dBm at low carrier frequency
 17.64 dBm at high carrier frequency

| Frequency, MHz | Spurious emission, dBm | Emission at carrier, dBm | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|------------------------------------|---------------------------|-----------------------------|-----------------------------------|---------------|----------------|---------|
| All carrier frequencies | | | | | | |
| All spurious are 30 dB below limit | | | | | | Pass |

*- Margin = Attenuation below carrier – specification limit.

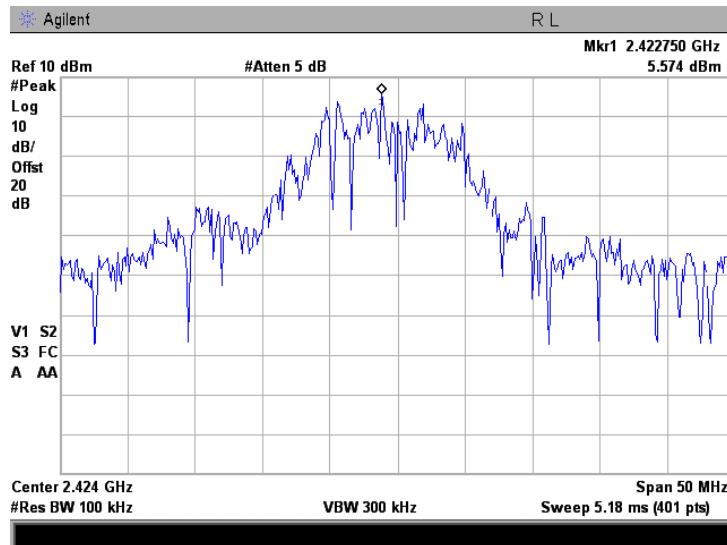
Reference numbers of test equipment used

| | | | | | | |
|---------|---------|--|--|--|--|--|
| HL 2254 | HL 2909 | | | | | |
|---------|---------|--|--|--|--|--|

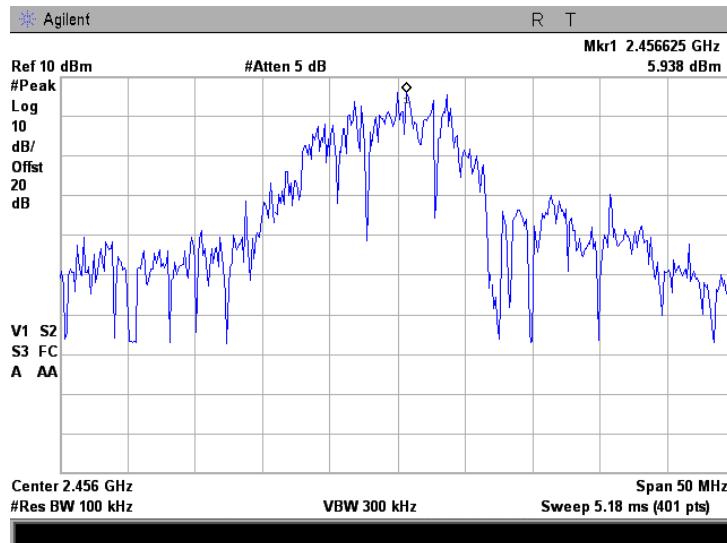
Full description is given in Appendix A.

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.1 The highest emission level within the assigned band at low carrier frequency

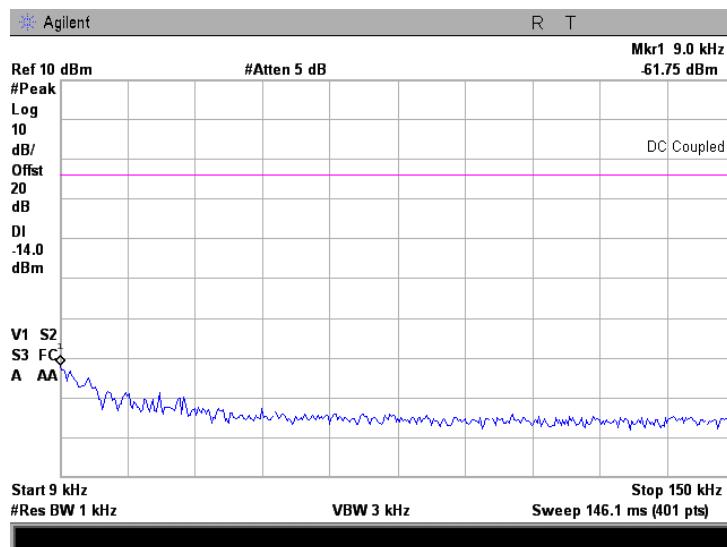


Plot 7.3.2 The highest emission level within the assigned band at high carrier frequency

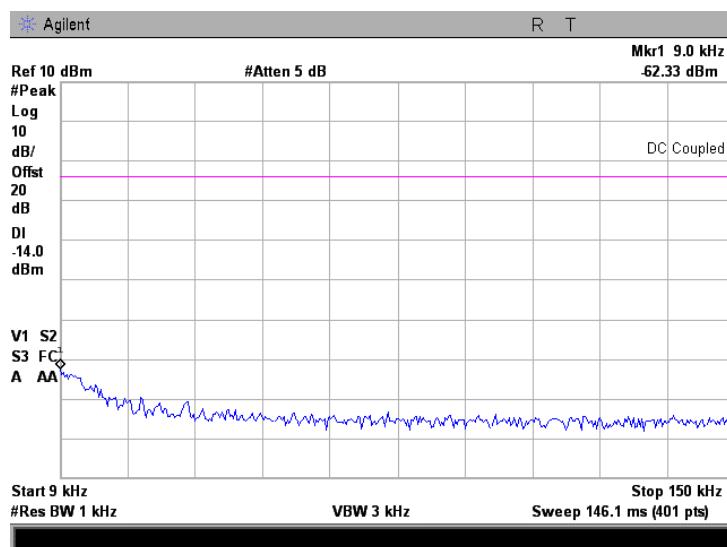


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.3 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

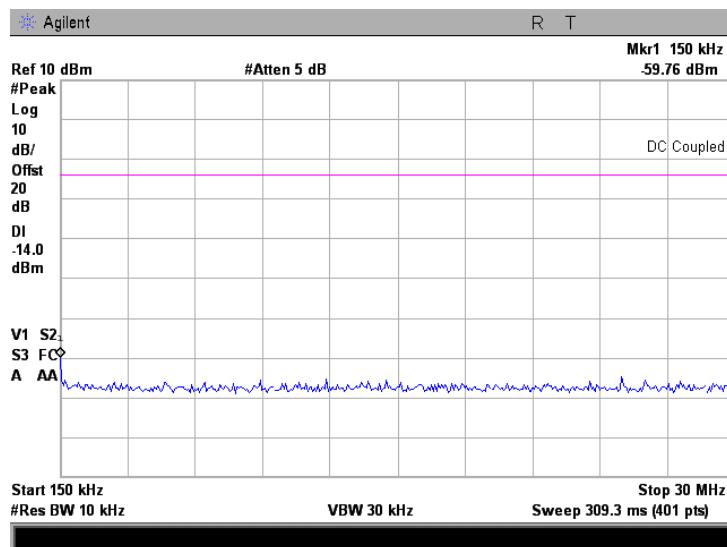


Plot 7.3.4 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

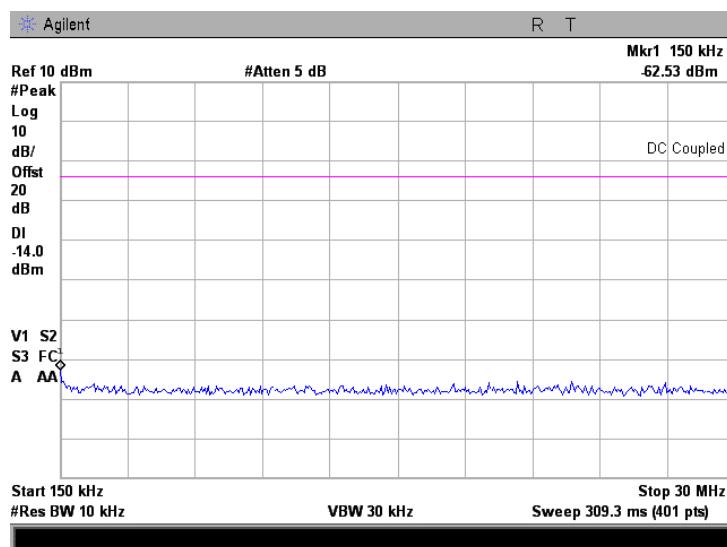


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.5 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency

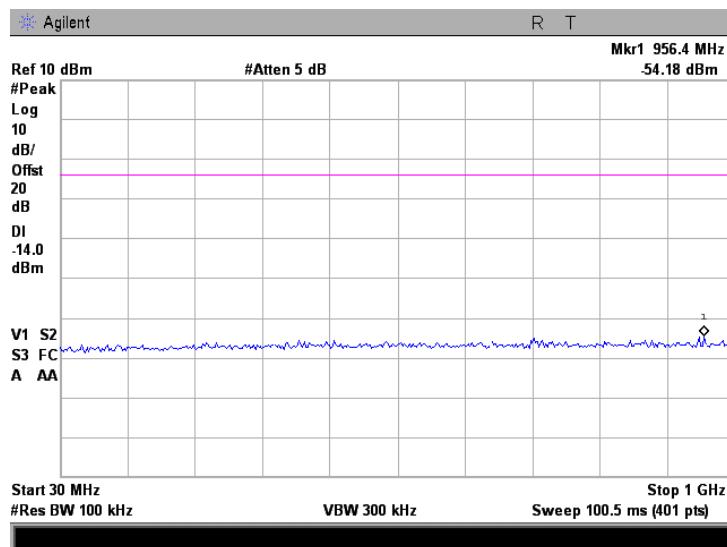


Plot 7.3.6 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency

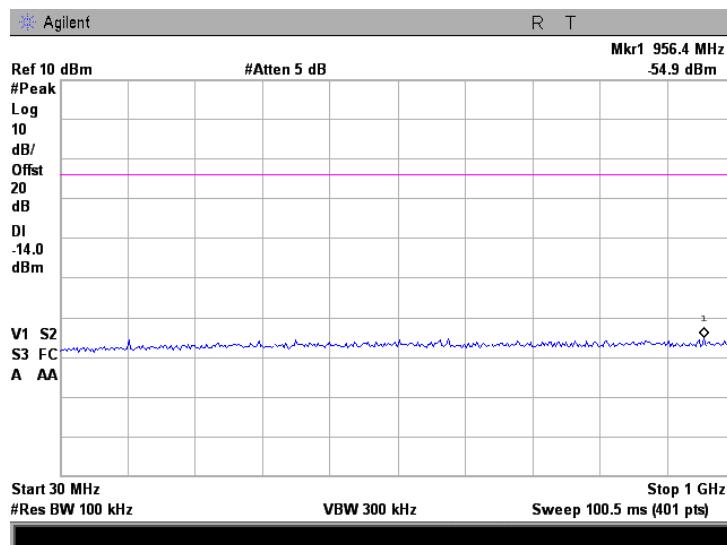


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.7 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency



Plot 7.3.8 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency

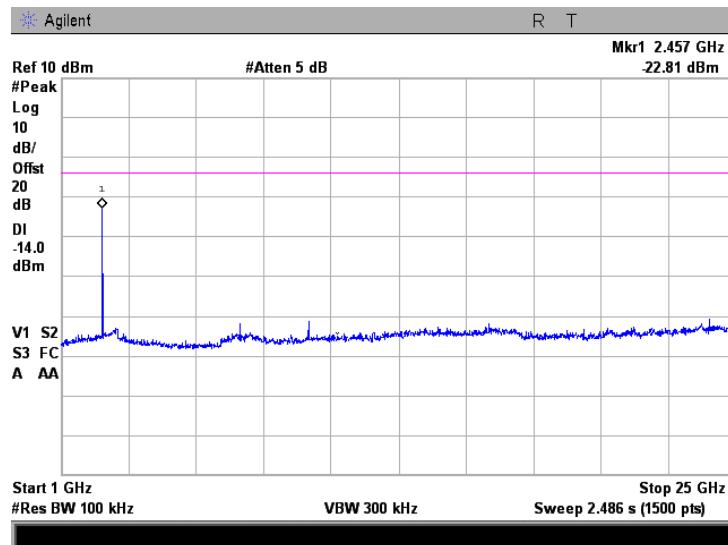




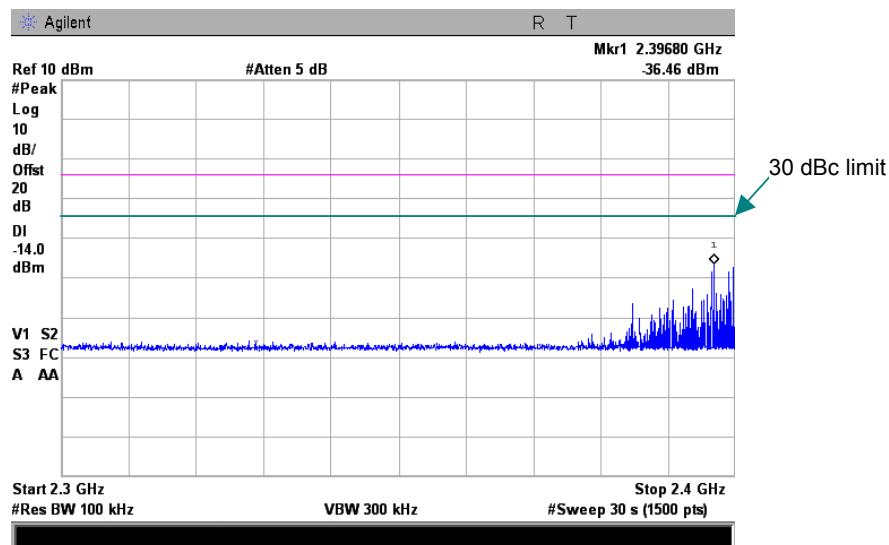
HERMON LABORATORIES

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.9 Spurious emission measurements in 1000 - 25000MHz range at low carrier frequency

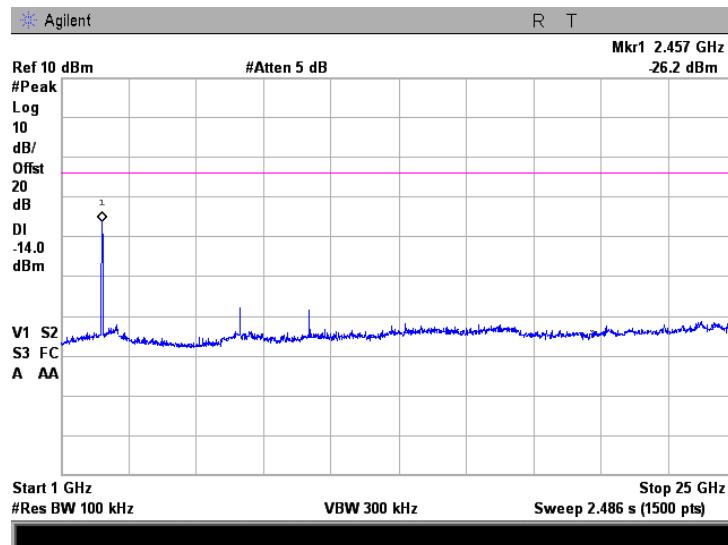


Plot 7.3.10 Spurious emission measurements in 2300 - 2400MHz range at low carrier frequency

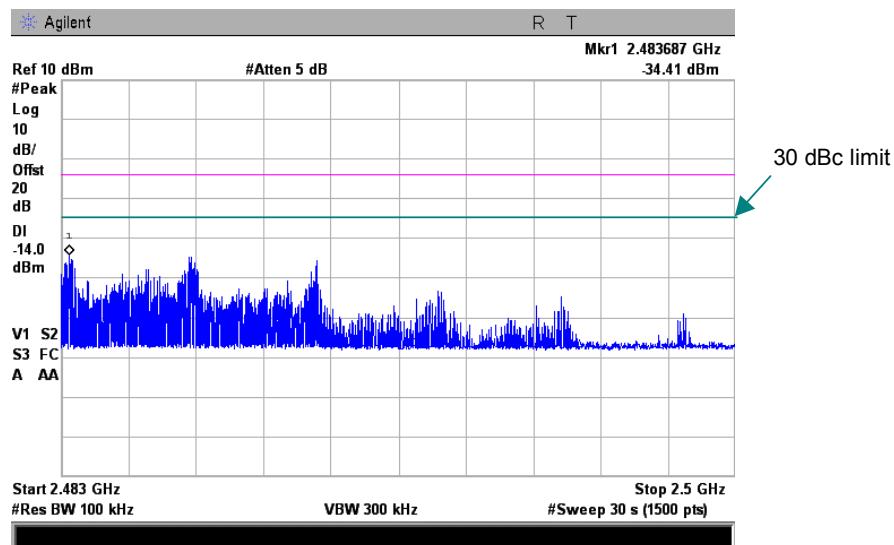


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.11 Spurious emission measurements in 1000 - 25000MHz range at high carrier frequency

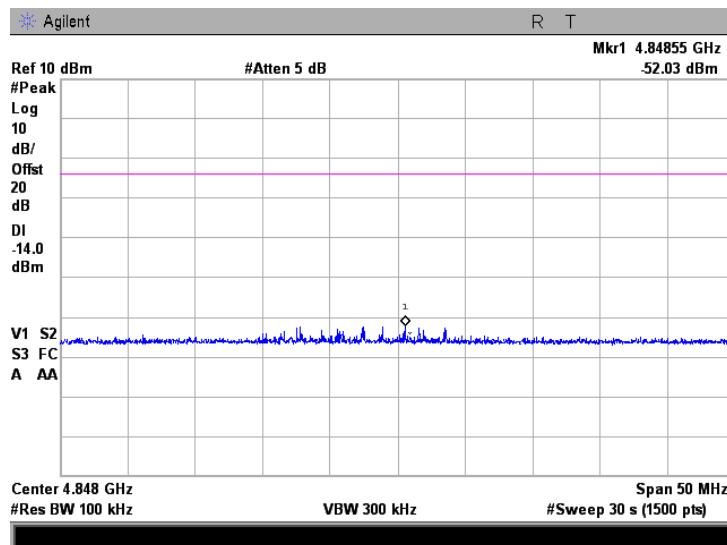


Plot 7.3.12 Spurious emission measurements in 2483.5 - 2500MHz range high carrier frequency

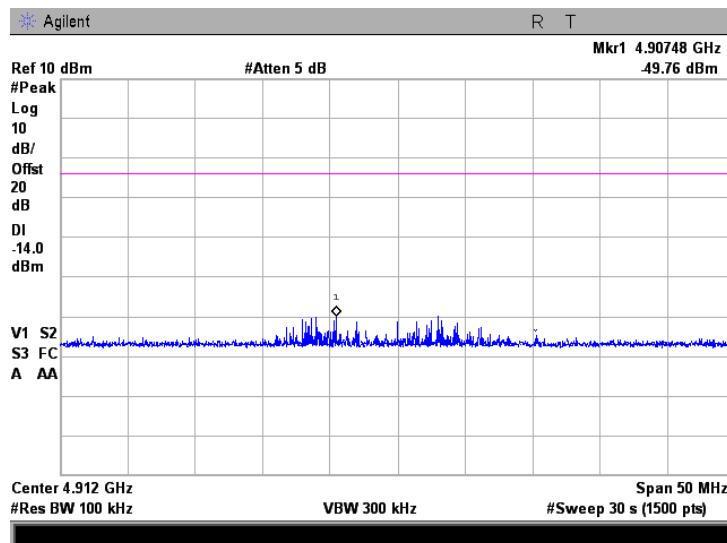


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.13 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency

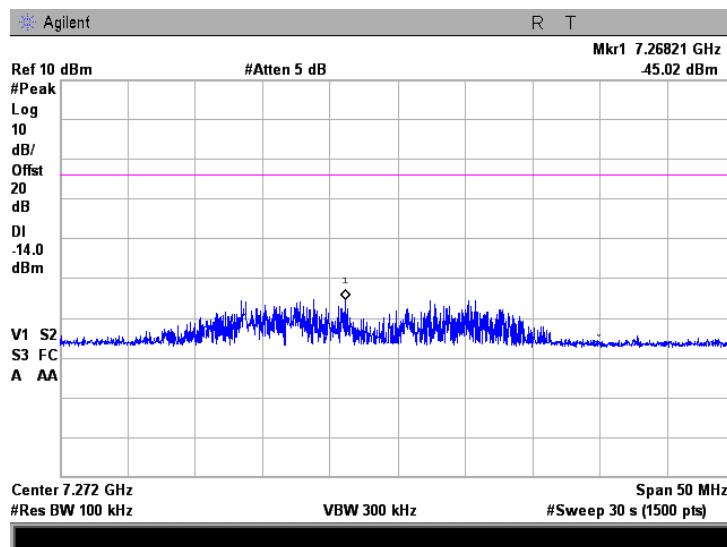


Plot 7.3.14 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency

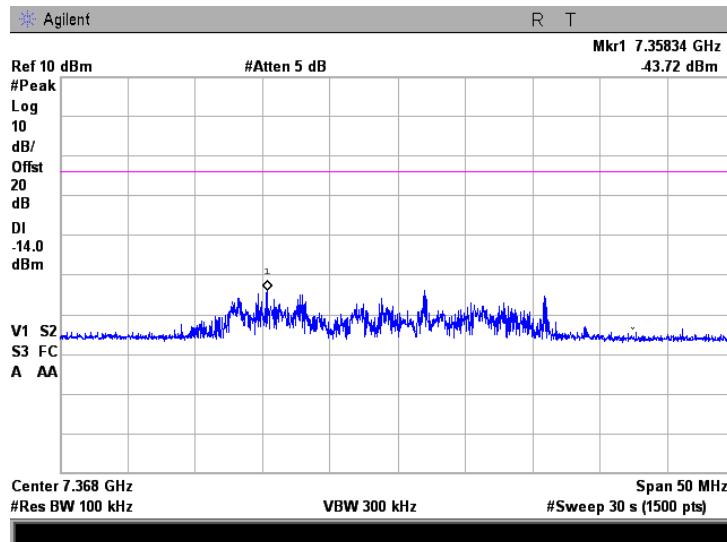


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.15 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency

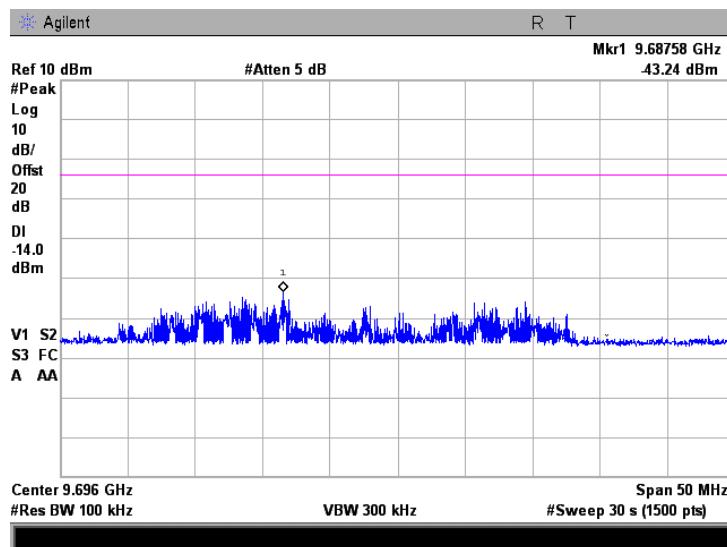


Plot 7.3.16 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency

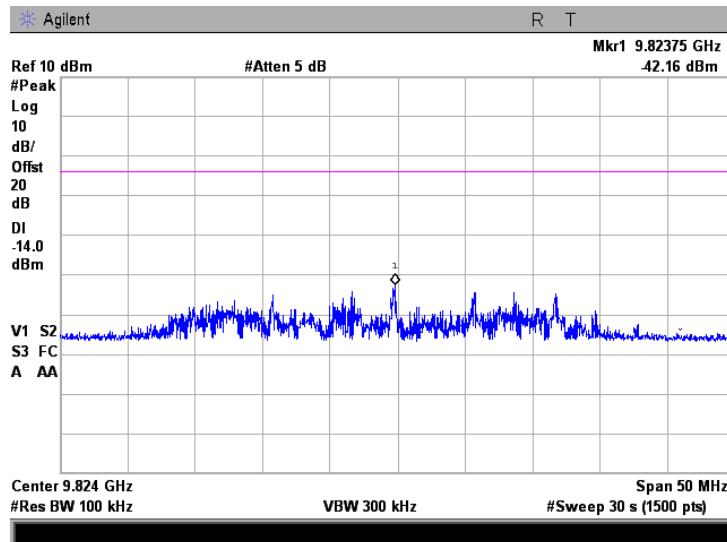


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.17 Conducted spurious emission measurements at the 4th harmonic of low carrier frequency

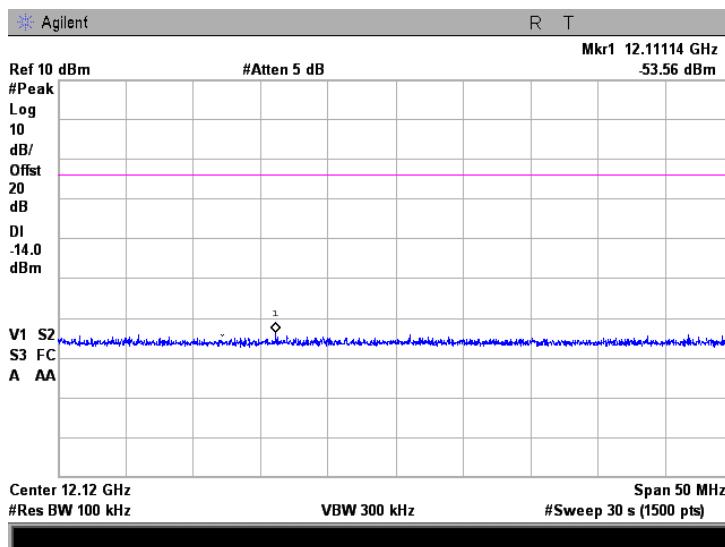


Plot 7.3.18 Conducted spurious emission measurements at the 4th harmonic of high carrier frequency

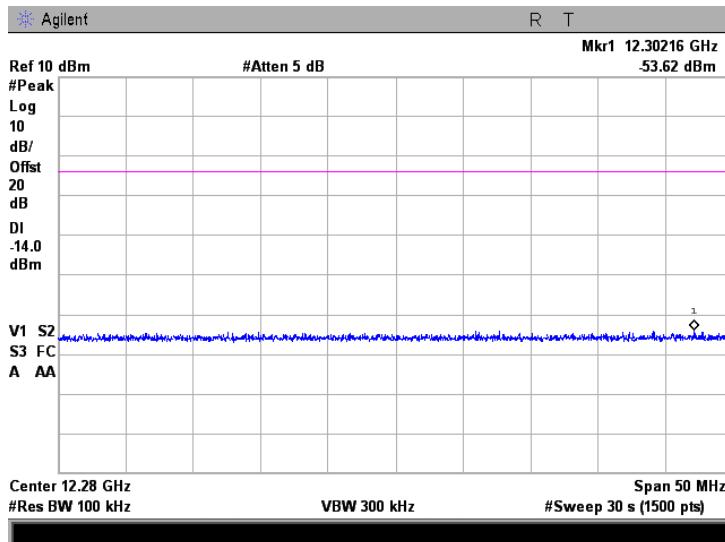


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.19 Conducted spurious emission measurements at the 5th harmonic of low carrier frequency

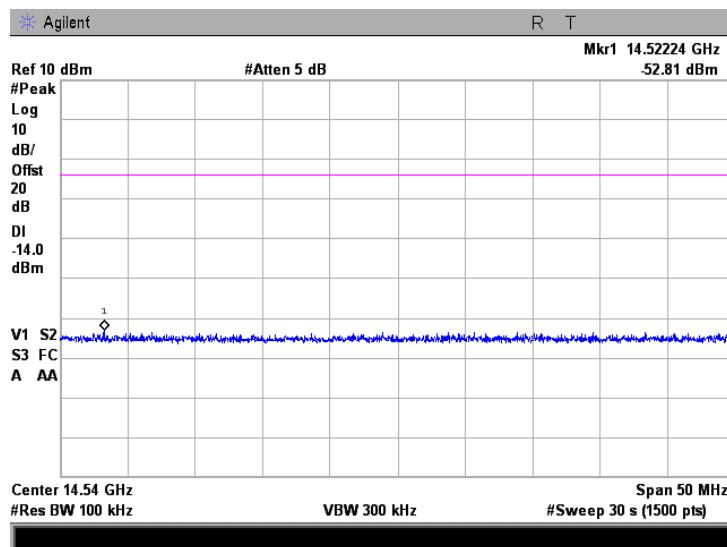


Plot 7.3.20 Conducted spurious emission measurements at the 5th harmonic of high carrier frequency

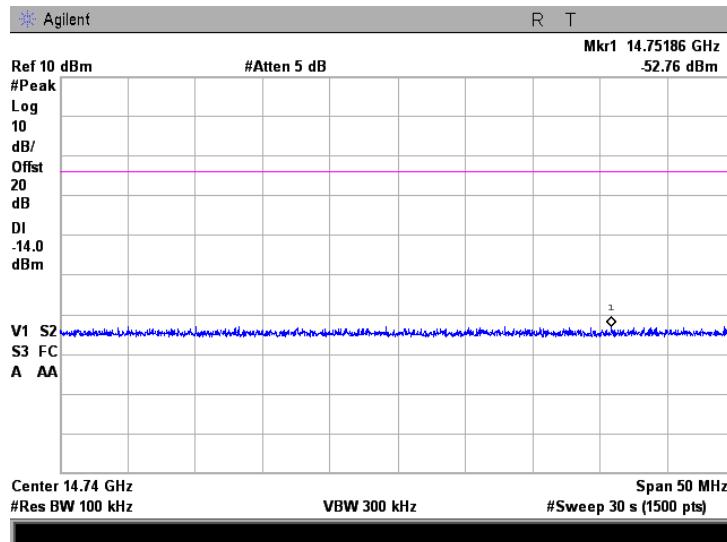


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.21 Conducted spurious emission measurements at the 6th harmonic of low carrier frequency

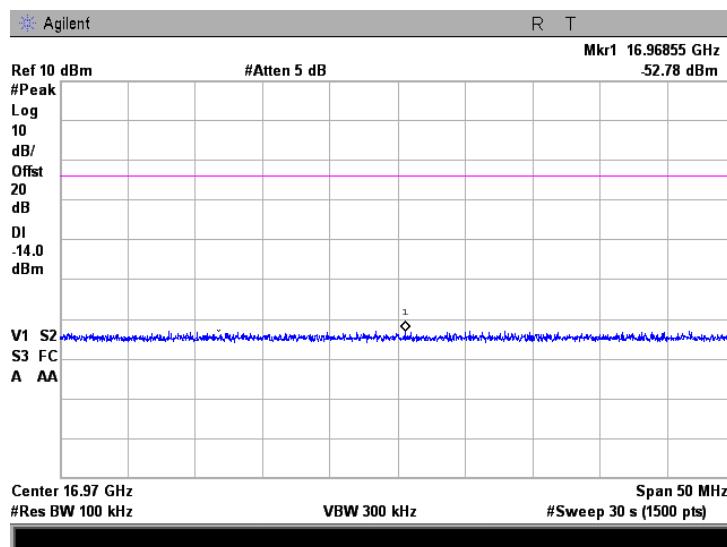


Plot 7.3.22 Conducted spurious emission measurements at the 6th harmonic of high carrier frequency

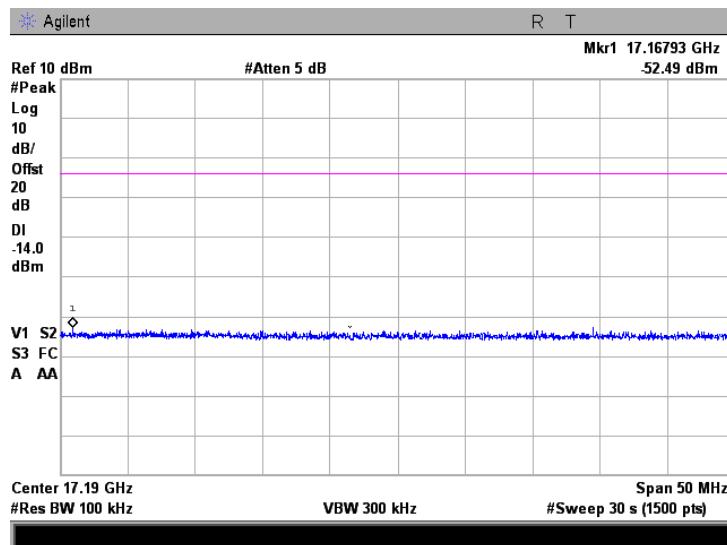


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.23 Conducted spurious emission measurements at the 7th harmonic of low carrier frequency

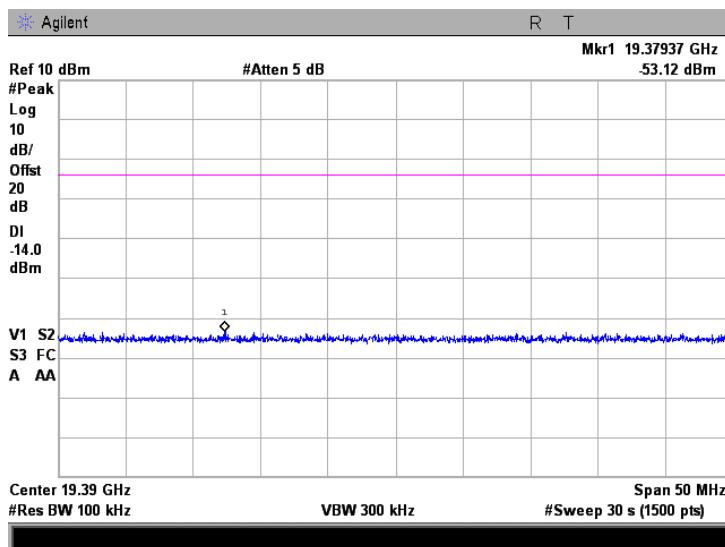


Plot 7.3.24 Conducted spurious emission measurements at the 7th harmonic of high carrier frequency

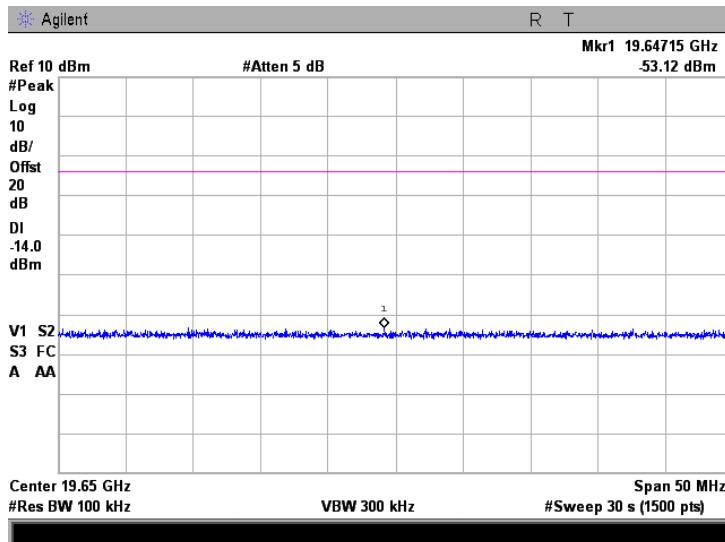


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.25 Conducted spurious emission measurements at the 8th harmonic of low carrier frequency

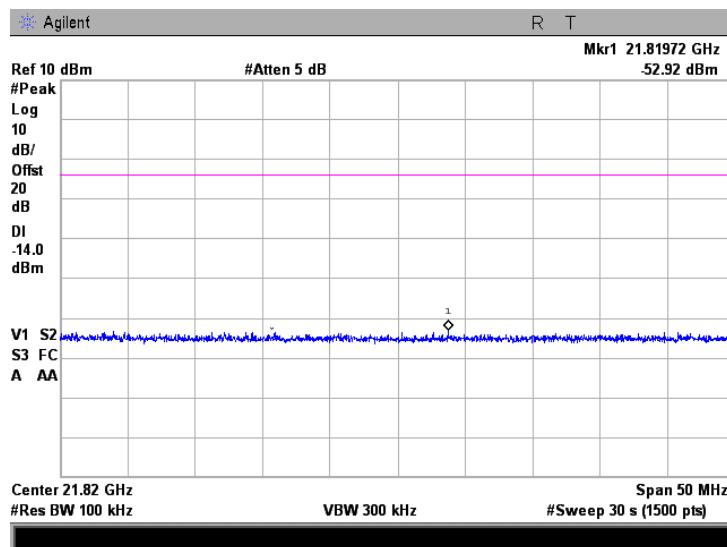


Plot 7.3.26 Conducted spurious emission measurements at the 8th harmonic of high carrier frequency

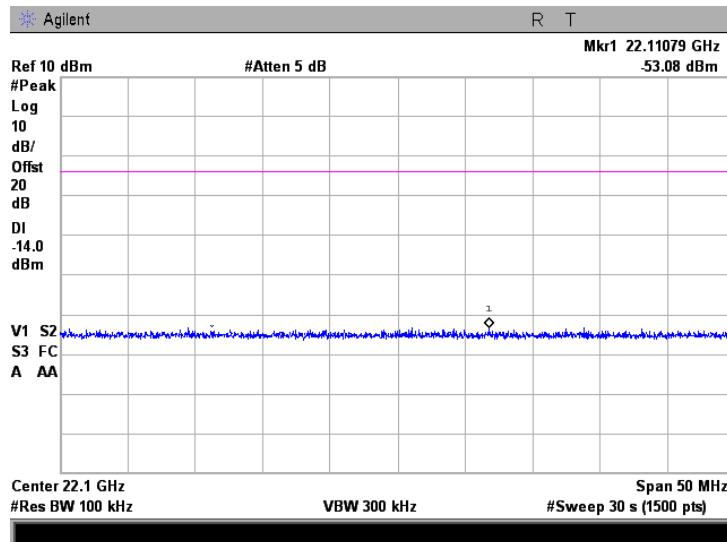


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.27 Conducted spurious emission measurements at the 9th harmonic of low carrier frequency

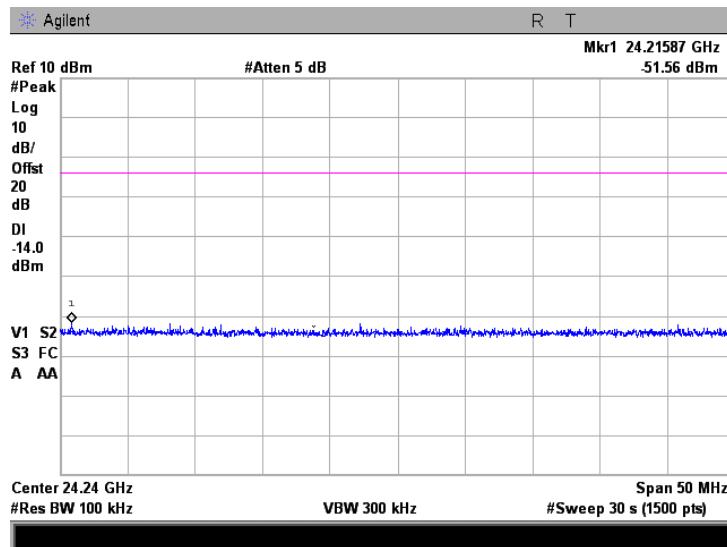


Plot 7.3.28 Conducted spurious emission measurements at the 9th harmonic of high carrier frequency

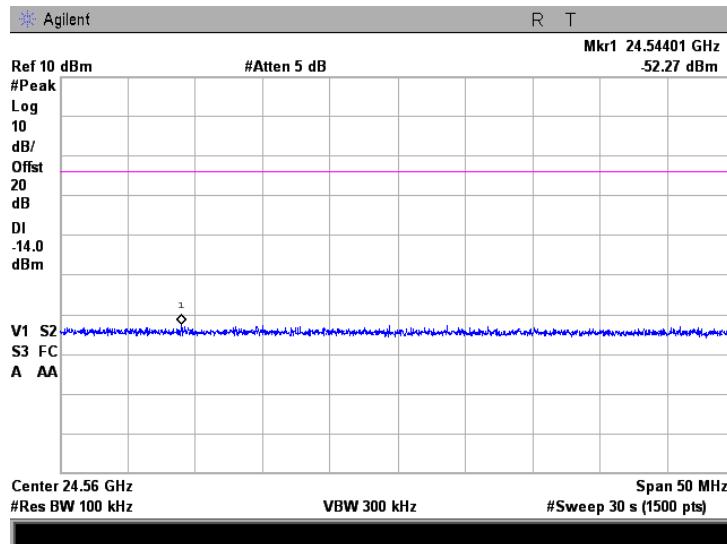


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 2:16:11 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.3.29 Conducted spurious emission measurements at the 10th harmonic of low carrier frequency



Plot 7.3.30 Conducted spurious emission measurements at the 10th harmonic of high carrier frequency



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

7.4 Field strength of spurious emissions

7.4.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emissions limits

| Frequency, MHz | Field strength at 3 m within restricted bands, dB(µV/m)* | | | Attenuation of field strength of spurious versus carrier outside restricted bands, dBc*** | |
|----------------------------------|--|-----------------|-----------------|---|--|
| | Peak | Quasi Peak | Average | | |
| 0.009 – 0.090 | 148.5 – 128.5 | NA | 128.5 – 108.5** | 30.0 | |
| 0.090 – 0.110 | NA | 108.5 – 106.8** | NA | | |
| 0.110 – 0.490 | 126.8 – 113.8 | NA | 106.8 – 93.8** | | |
| 0.490 – 1.705 | NA | 73.8 – 63.0** | NA | | |
| 1.705 – 30.0* | | 69.5 | | | |
| 30 – 88 | | 40.0 | | | |
| 88 – 216 | | 43.5 | | | |
| 216 – 960 | | 46.0 | | | |
| 960 – 1000 | | 54.0 | | | |
| 1000 – 10 th harmonic | | 74.0 | NA | | |

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S2} = \text{Lim}_{S1} + 40 \log (S_1/S_2),$$

where S₁ and S₂ – standard defined and test distance respectively in meters.

**- The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

7.4.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

7.4.2.2 The EUT was tested in 3 orthogonal positions.

7.4.2.3 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

7.4.2.4 The worst test results (the lowest margins) found in Y-axis position (palm screen face up) were shown in the associated plots.

7.4.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.

7.4.3.2 The EUT was tested in 3 orthogonal positions.

7.4.3.3 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.4.3.4 The worst test results (the lowest margins) were found in Y-axis position (palm screen face up), recorded and shown in the associated plots.

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: 48% | Power Supply: 120 V AC |
| Temperature: 21°C | Air Pressure: 1007 hPa | | |
| Remarks: master unit | | | |

Figure 7.4.1 Setup for spurious emission field strength measurements below 30 MHz

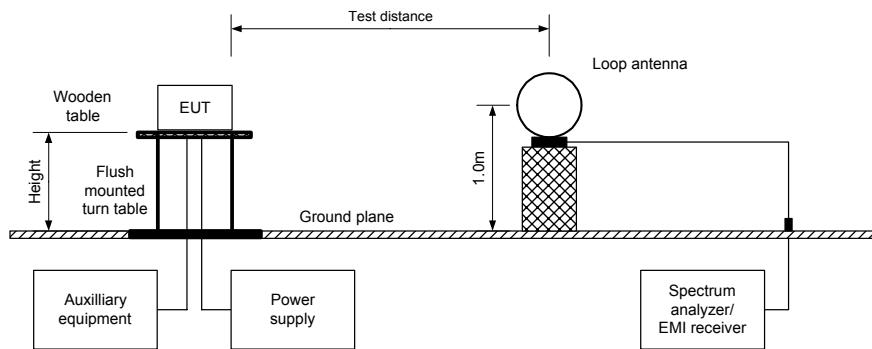
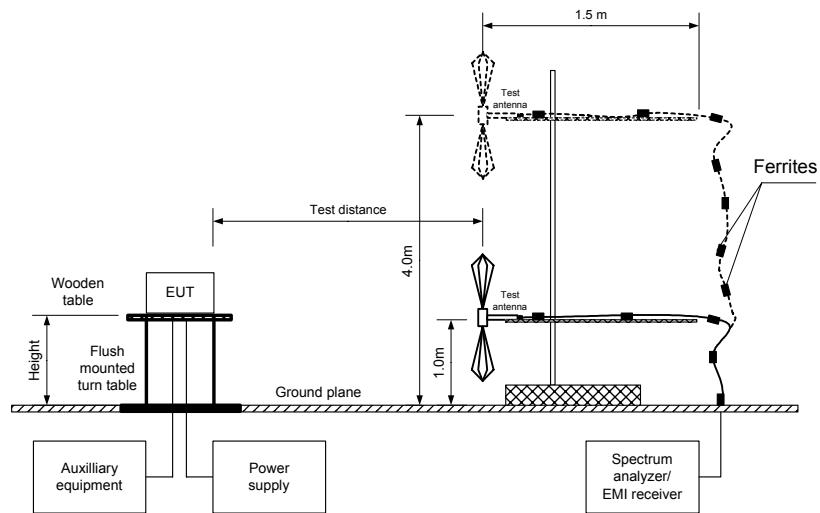


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz



| Test specification: | | Section 15.247(c), Radiated spurious emissions | |
|----------------------|------------------------|---|------------------------|
| Test procedure: | | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 7.4.2 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 -25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: OOK
 MODULATING SIGNAL: PRBS
 BIT RATE: 3 Mbps
 DUTY CYCLE: 0.08 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide

| Frequency MHz | Antenna | | Azimuth degrees | Peak field strength(VBW=3 MHz) | | | Average field strength(VBW=30KHz) | | | Verdict |
|-------------------------------|--------------|-------------|--------------------|--------------------------------|--------------------|-----------------|-----------------------------------|------------------------|--------------------|---------|
| | Polarization | Height m | | Measured dB(µV/m) | Limit, IB(µV/m) | Margin, dB** | Measured dB(µV/m) | Calculated dB(µV/m) | Limit, IB(µV/m) | |
| Low carrier frequency | | | | | | | | | | |
| 2399 | V | 1.2 | 230 | 72.70 | 74.00 | -1.30 | 58.50 | 38.50 | 54.00 | -15.50 |
| 4848 | V | 1.2 | 220 | 65.48 | 74.00 | -8.52 | 56.95 | 36.95 | 54.00 | -17.05 |
| 7272 | V | 1.5 | 230 | 72.92 | 74.00 | -1.08 | 65.06 | 45.06 | 54.00 | -8.94 |
| 9696 | V | 1.2 | 150 | 57.32 | 74.00 | -16.68 | 49.48 | 29.48 | 54.00 | -24.52 |
| High carrier frequency | | | | | | | | | | |
| 2485 | V | 1.2 | 230 | 69.79 | 74.00 | -4.21 | 59.10 | 39.10 | 54.00 | -14.90 |
| 4912 | V | 1.2 | 220 | 66.79 | 74.00 | -7.21 | 52.95 | 32.95 | 54.00 | -21.05 |
| 7368 | V | 1.5 | 230 | 69.91 | 74.00 | -4.09 | 63.31 | 43.31 | 54.00 | -10.69 |
| 9824 | V | 1.2 | 150 | 65.59 | 74.00 | -8.41 | 56.94 | 36.94 | 54.00 | -17.06 |

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin = Measured field strength - specification limit.

***- Margin = Calculated field strength - specification limit,
where Calculated field strength = Measured field strength + average factor.

Table 7.4.3 Average factor calculation

| Transmission pulse | | Transmission train duration, ms | Average factor, dB |
|--------------------|------------|---------------------------------|--------------------|
| Duration, ms | Period, ms | | |
| 0.0355 | 39.5 | NA | -20 |

*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

$$\text{Average factor} = 20 \times \log_{10} \left(\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{\text{Train duration}} \times \text{Number of bursts within pulse train} \right)$$

for pulse train longer than 100 ms:

$$\text{Average factor} = 20 \times \log_{10} \left(\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{100 \text{ ms}} \times \text{Number of bursts within 100 ms} \right)$$

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/2/2007 12:04:27 PM | PASS | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 7.4.4 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009-25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: OOK
 MODULATING SIGNAL: PRBS
 BIT RATE: 3 Mbps
 DUTY CYCLE: 0.08 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

| Frequency MHz | Field strength of spurious, dB(μ V/m) | Antenna polarization | Antenna height, m | Azimuth, degrees* | Field strength of carrier, dB(μ V/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB** | Verdict |
|--------------------------------|--|----------------------|-------------------|-------------------|---|--------------------------------|------------|--------------|---------|
| All carrier frequencies | | | | | | | | | |
| 287.9740 | 50.27 | H | 1.5 | 0 | 105 | 54.73 | 30.0 | 24.73 | Pass |
| 311.9794 | 51.05 | H | 1.5 | 10 | | 53.95 | | 23.95 | |
| 335.9607 | 45.70 | H | 1.3 | 350 | | 59.30 | | 29.30 | |
| 431.9607 | 53.70 | H | 1.4 | 290 | | 51.30 | | 21.30 | |
| 455.9493 | 55.00 | H | 1.5 | 360 | | 50.00 | | 20.00 | |
| 503.9512 | 58.43 | H | 1.5 | 0 | | 46.57 | | 16.57 | |
| 503.9572 | 58.83 | H | 1.4 | 10 | | 46.17 | | 16.17 | |
| 527.9405 | 60.85 | H | 1.4 | 20 | | 44.15 | | 14.15 | |

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin = Attenuation below carrier – specification limit.

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/2/2007 12:04:27 PM | PASS | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 7.4.5 Field strength of spurious emissions below 1 GHz within restricted bands

| | |
|------------------------------------|--|
| ASSIGNED FREQUENCY BAND: | 2400-2483.5 MHz |
| INVESTIGATED FREQUENCY RANGE: | 0.009 – 1000 MHz |
| TEST DISTANCE: | 3 m |
| MODULATION: | OOK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 3Mbps |
| DUTY CYCLE: | 0.08 % |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| RESOLUTION BANDWIDTH: | 0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz) |
| VIDEO BANDWIDTH: | > Resolution bandwidth |
| TEST ANTENNA TYPE: | Active loop (9 kHz – 30 MHz) Log periodic (200 MHz – 1000 MHz) Biconilog (30 MHz – 1000 MHz) |

| Frequency MHz | Peak emission, dB(μ V/m) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict | |
|-------------------------|-------------------------------------|--------------------------------------|--------------------------|-------------------------|-------------------------|----------------------|--------------------------------------|---------|------|
| | | Measured emission, dB(μ V/m) | Limit, dB(μ V/m) | Margin, dB [*] | | | | | |
| All carrier frequencies | | All spurious are from digital part | | | | | | | |
| | | | | | | | | | Pass |

*- Margin = Measured emission – specification limit.

**- EUT front panel refer to 0 degrees position of turntable.

Table 7.4.6 Restricted bands

| MHz | MHz | MHz | MHz | MHz | GHz |
|-------------------|---------------------|-----------------------|-----------------|---------------|---------------|
| 0.09 – 0.11 | 8.37625 – 8.38675 | 73 – 74.6 | 399.9 – 410 | 2690 – 2900 | 10.6 – 12.7 |
| 0.495 – 0.505 | 8.41425 – 8.41475 | 74.8 – 75.2 | 608 – 614 | 3260 – 3267 | 13.25 – 13.4 |
| 2.1735 – 2.1905 | 12.29 – 12.293 | 108 – 121.94 | 960 – 1240 | 3332 – 3339 | 14.47 – 14.5 |
| 4.125 – 4.128 | 12.51975 – 12.52025 | 123 – 138 | 1300 – 1427 | 3345.8 – 3358 | 15.35 – 16.2 |
| 4.17725 – 4.17775 | 12.57675 – 12.57725 | 149.9 – 150.05 | 1435 – 1626.5 | 3600 – 4400 | 17.7 – 21.4 |
| 4.20725 – 4.20775 | 13.36 – 13.41 | 156.52475 – 156.52525 | 1645.5 – 1646.5 | 4500 – 5150 | 22.01 – 23.12 |
| 6.215 – 6.218 | 16.42 – 16.423 | 156.7 – 156.9 | 1660 – 1710 | 5350 – 5460 | 23.6 – 24 |
| 6.26775 – 6.26825 | 16.69475 – 16.69525 | 162.0125 – 167.17 | 1718.8 – 1722.2 | 7250 – 7750 | 31.2 – 31.8 |
| 6.31175 – 6.31225 | 16.80425 – 16.80475 | 167.72 – 173.2 | 2200 – 2300 | 8025 – 8500 | 36.43 – 36.5 |
| 8.291 – 8.294 | 25.5 – 25.67 | 240 – 285 | 2310 – 2390 | 9000 – 9200 | Above 38.6 |
| 8.362 – 8.366 | 37.5 – 38.25 | 322 – 335.4 | 2483.5 – 2500 | 9300 – 9500 | |

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0446 | HL 0569 | HL 0789 | HL 1425 | HL 1553 | HL 1566 | HL 1947 | HL 1984 |
| HL 2697 | HL 2780 | | | | | | |

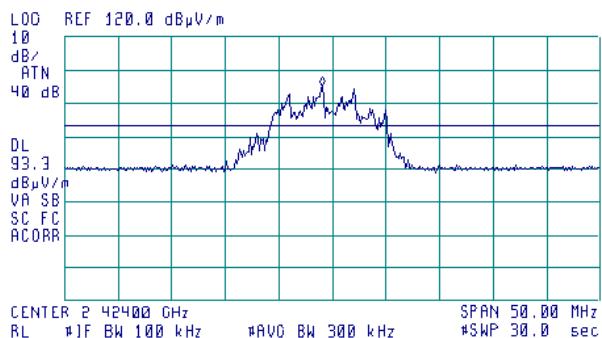
Full description is given in Appendix A.

| | | | |
|-----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: | 48% |
| Temperature: 21°C | Air Pressure: 1007 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.1 Radiated emission measurements at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal

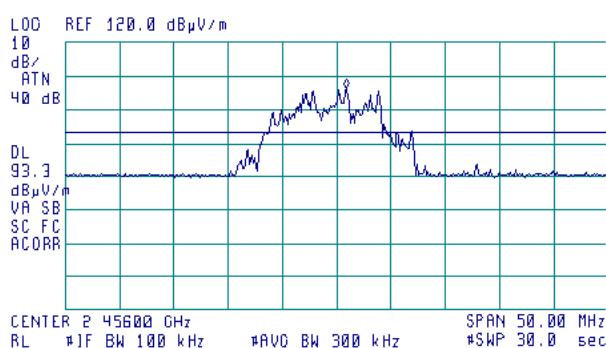
⌚ 11:54:24 JAN 02, 2007
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.42300 GHz
105.06 dB μ V/m



Plot 7.4.2 Radiated emission measurements at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal

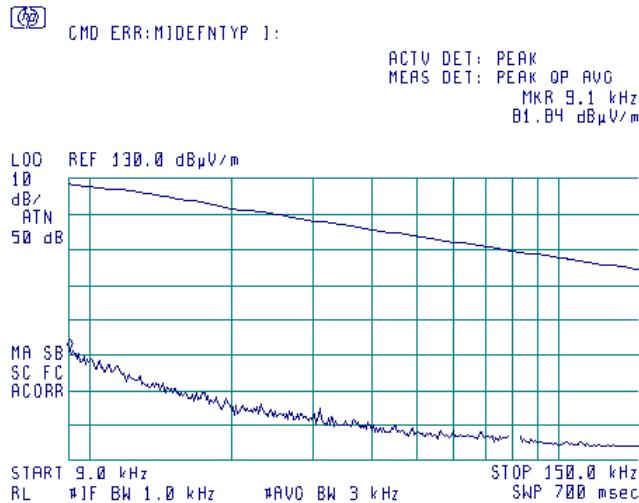
⌚ 12:03:43 JAN 02, 2007
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.45688 GHz
106.14 dB μ V/m



| | | | |
|----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: | 48% |
| Temperature: | 21°C | Air Pressure: | 1007 hPa |
| Remarks: | master unit | Power Supply: | 120 V AC |

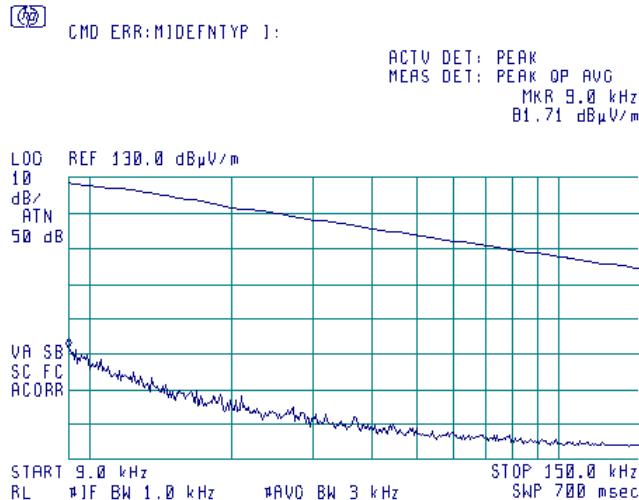
Plot 7.4.3 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.4 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

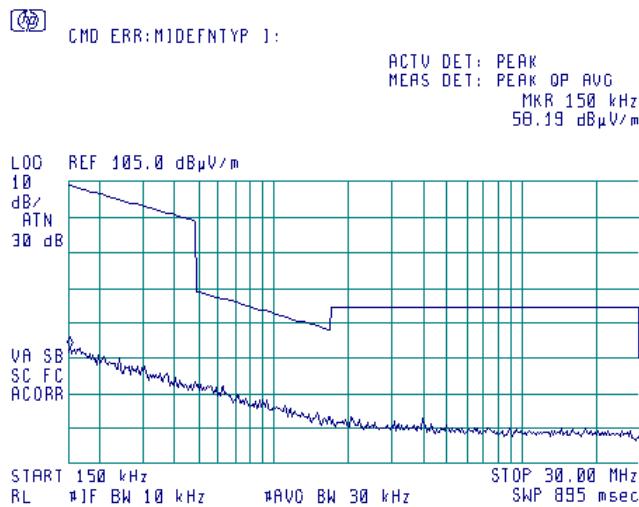
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



| | | | |
|-----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: | 48% |
| Temperature: 21°C | Air Pressure: 1007 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

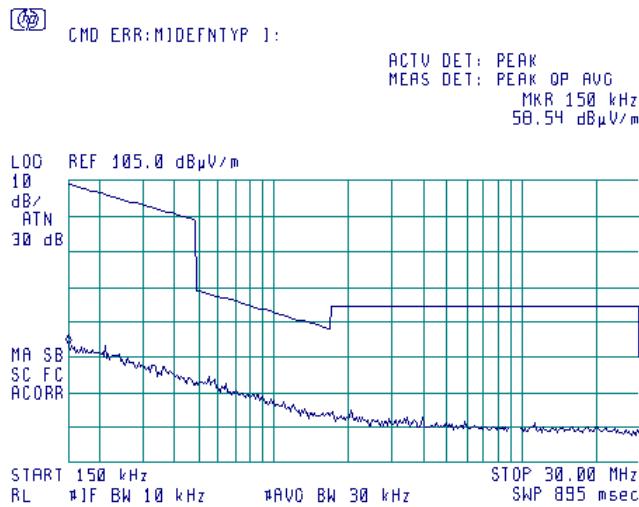
Plot 7.4.5 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.4.6 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

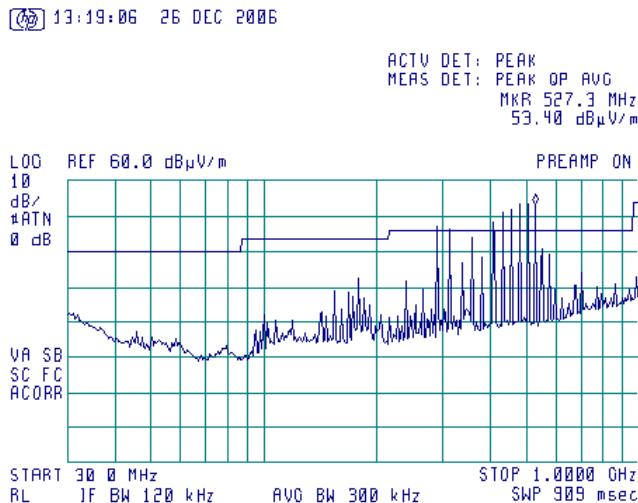
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



| | | | |
|----------------------------|---|---------------------------|------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Temperature: | 21°C |
| Air Pressure: | 1007 hPa | Relative Humidity: | 48% |
| Power Supply: | 120 V AC | | |
| Remarks: | master unit | | |

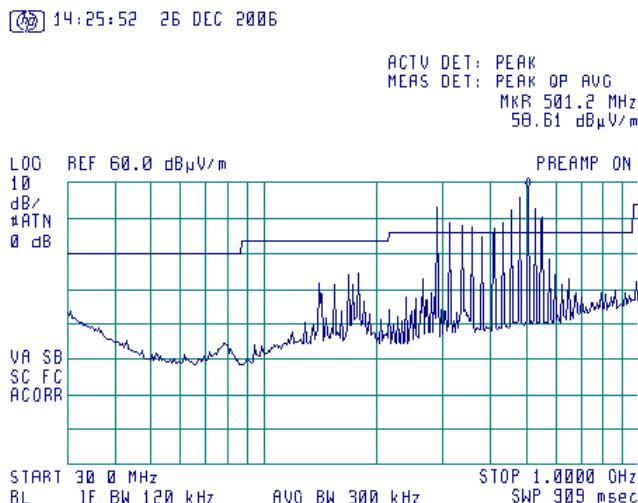
Plot 7.4.7 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.4.8 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

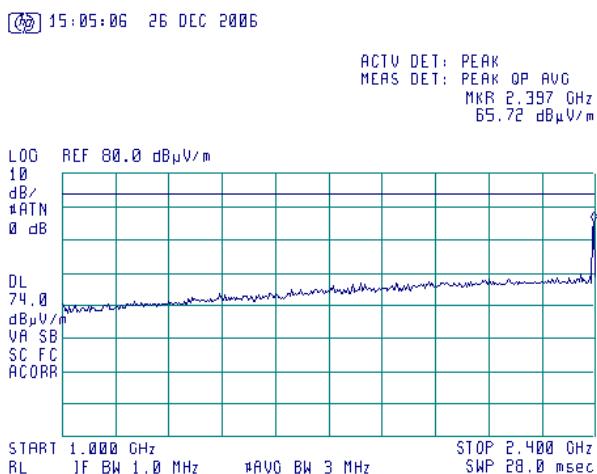
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: | 48% |
| Temperature: 21°C | Air Pressure: 1007 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

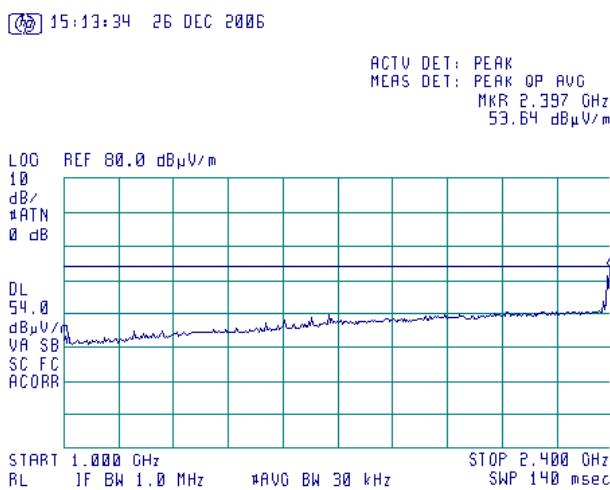
Plot 7.4.9 Radiated emission measurements from 1000 to 2400 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



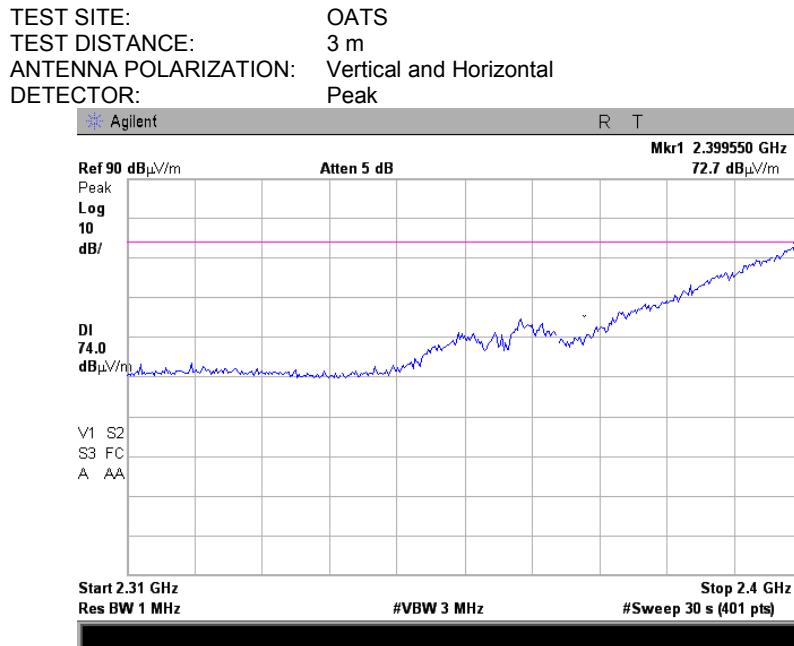
Plot 7.4.10 Radiated emission measurements from 1000 to 2400 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average

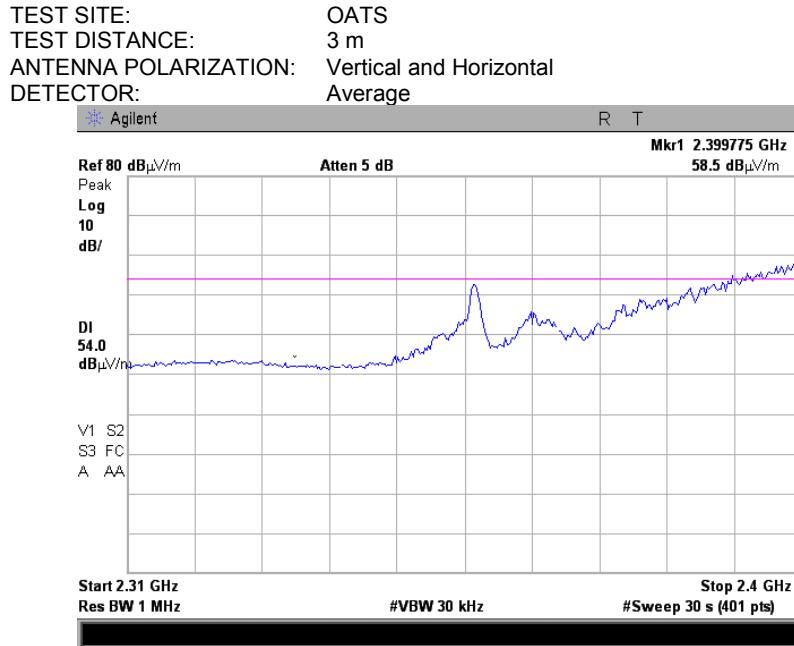


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.11 Radiated emission measurements from 2310 to 2400 MHz at the low carrier frequency



Plot 7.4.12 Radiated emission measurements from 2310 to 2400 MHz at the low carrier frequency



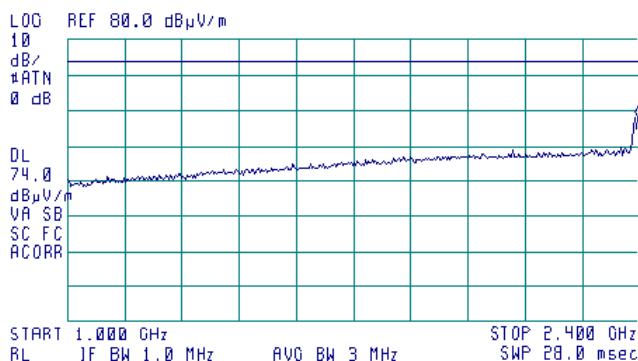
| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.13 Radiated emission measurements from 1000 to 2400 MHz at the high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak

14:52:00 26 DEC 2006

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2,397 GHz
58.34 dB μ V/m

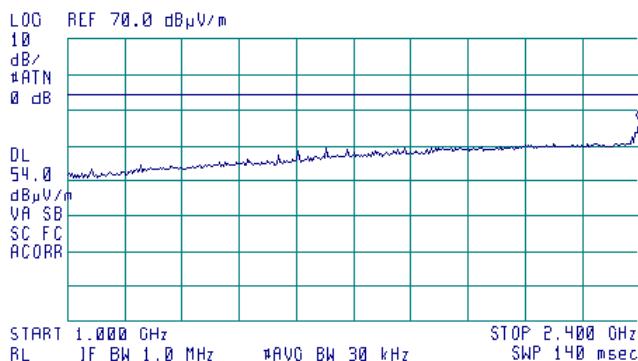


Plot 7.4.14 Radiated emission measurements from 1000 to 2400 MHz at the high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average

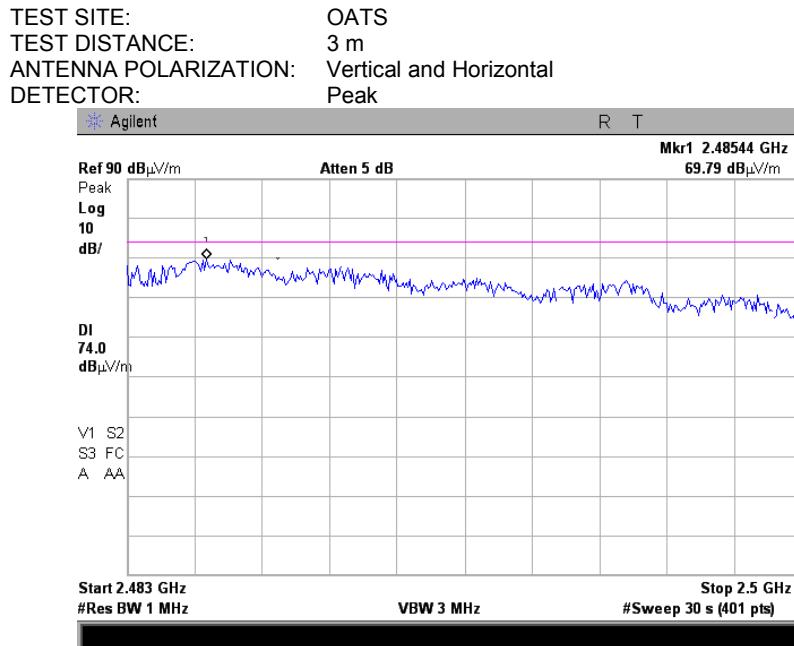
14:56:30 26 DEC 2006

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2,400 GHz
47.10 dB μ V/m

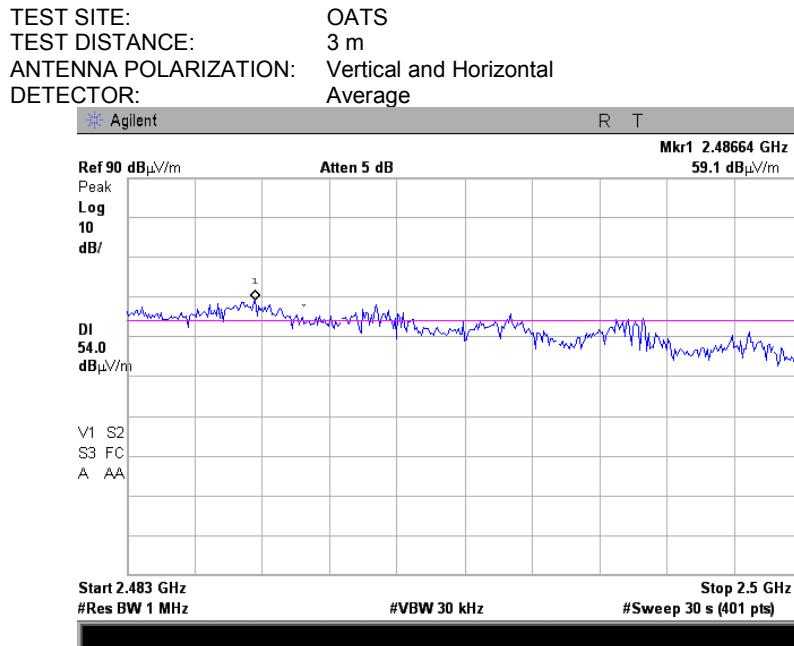


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.15 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency



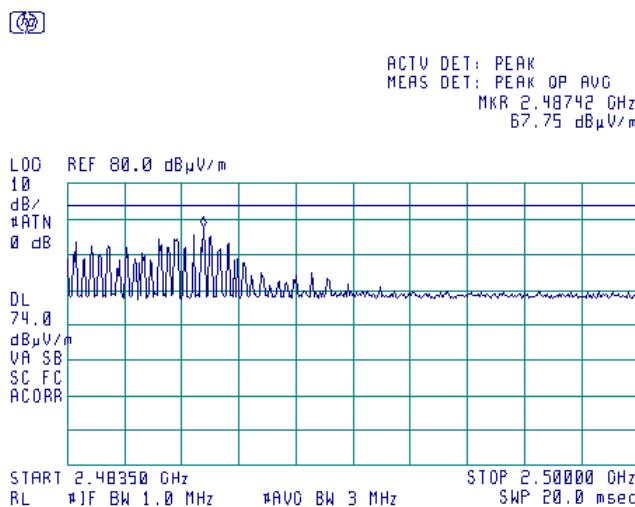
Plot 7.4.16 Radiated emission measurements from 1000 to 2400 MHz at the high carrier frequency



| | | | |
|-----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: | 48% |
| Temperature: 21°C | Air Pressure: 1007 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

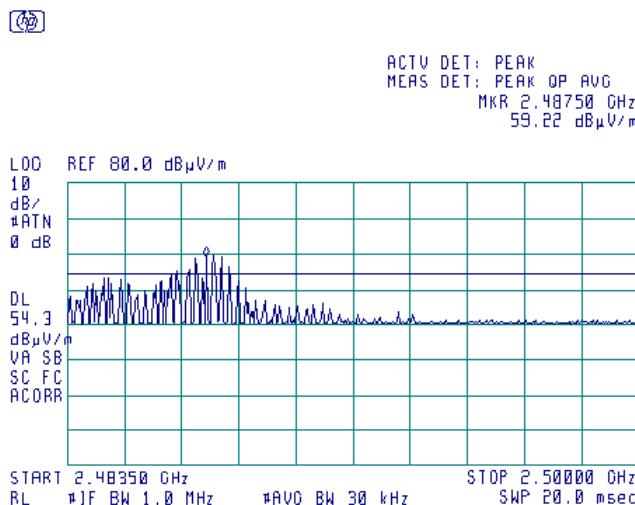
Plot 7.4.17 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



Plot 7.4.18 Radiated emission measurements from 1000 to 2400 MHz at the high carrier frequency

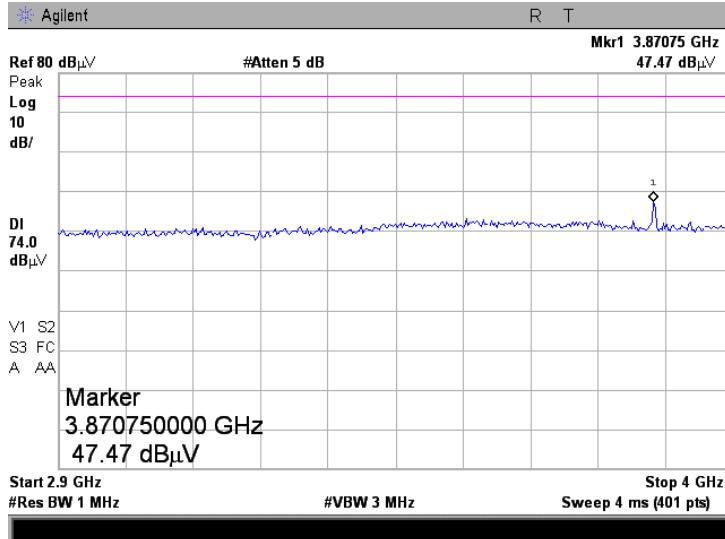
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

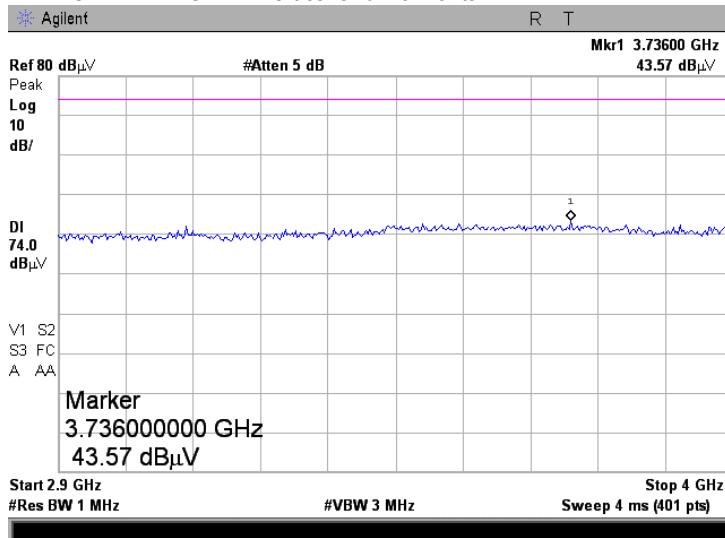
Plot 7.4.19 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.4.20 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency

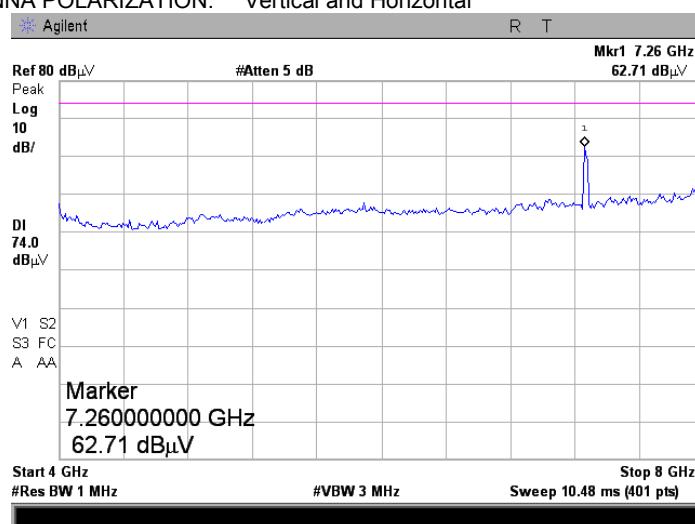
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

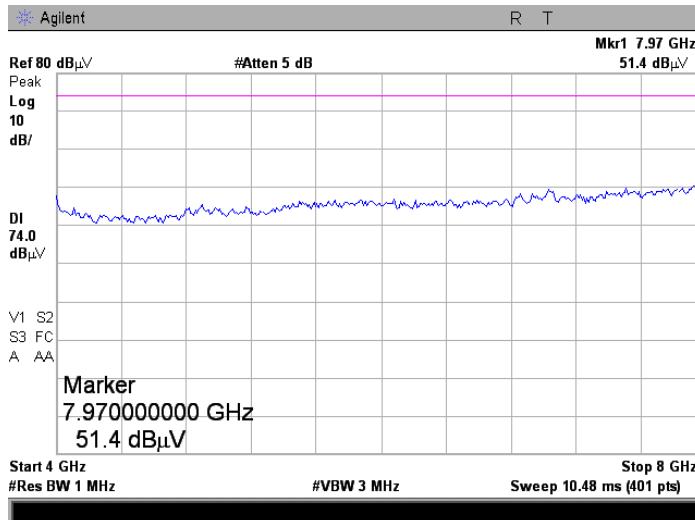
Plot 7.4.21 Radiated emission measurements from 4000 to 8000 MHz at the low carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



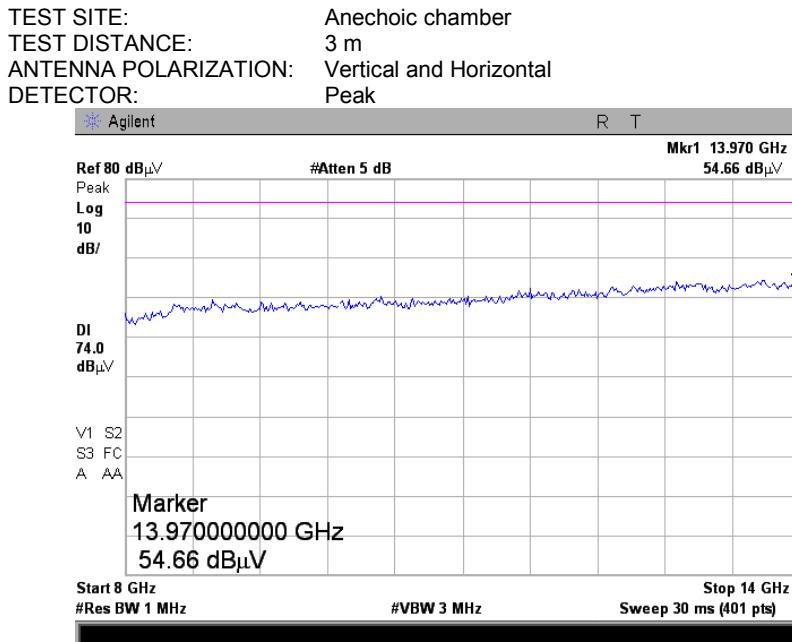
Plot 7.4.22 Radiated emission measurements from 4000 to 8000MHz at the high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

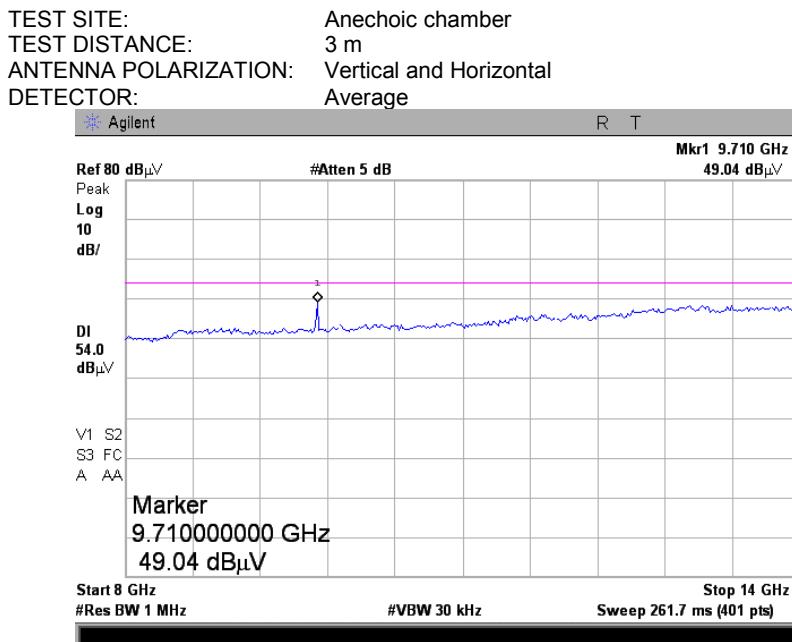


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.23 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency



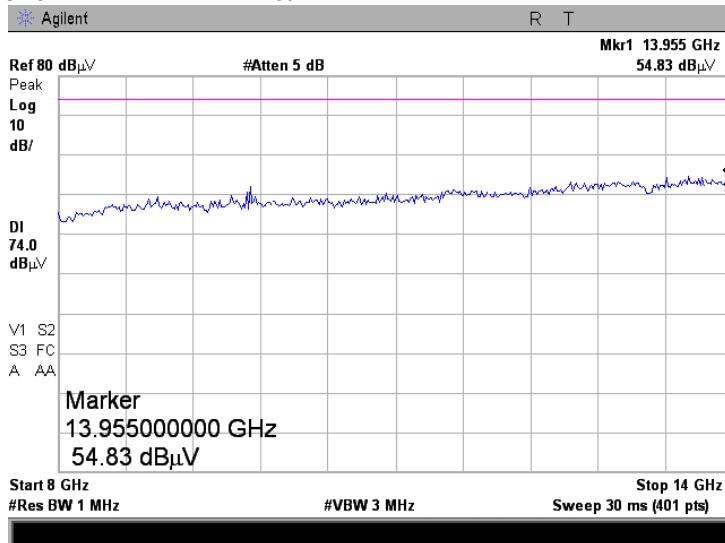
Plot 7.4.24 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

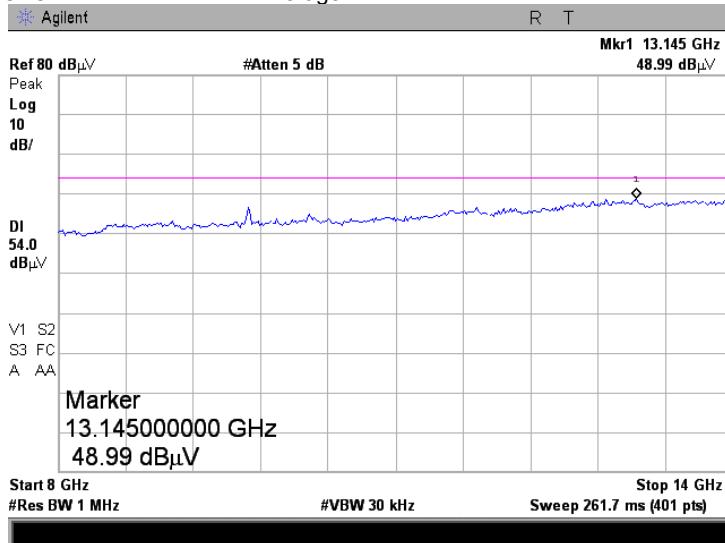
Plot 7.4.25 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



Plot 7.4.26 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency

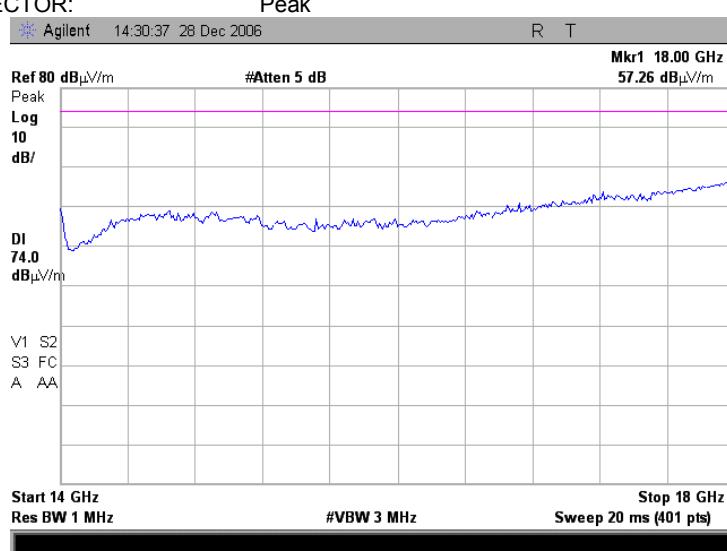
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

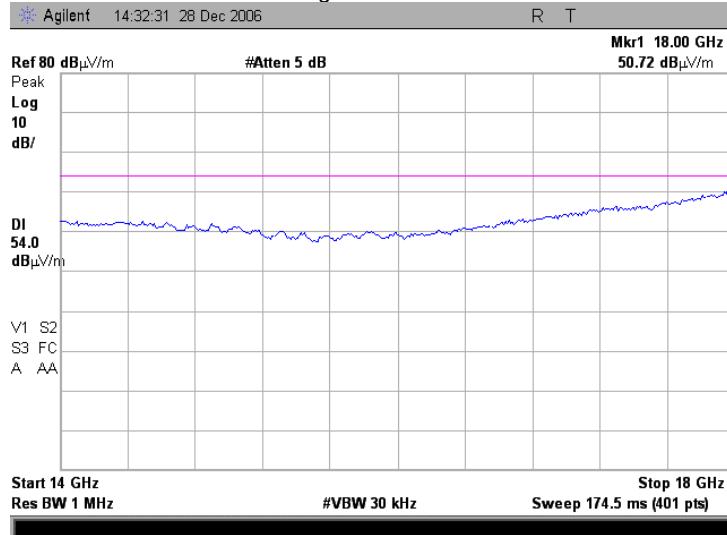
Plot 7.4.27 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



Plot 7.4.28 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

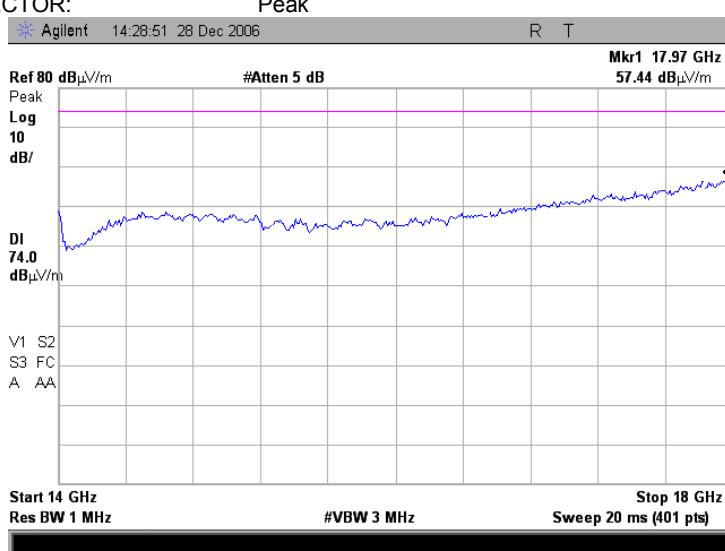
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

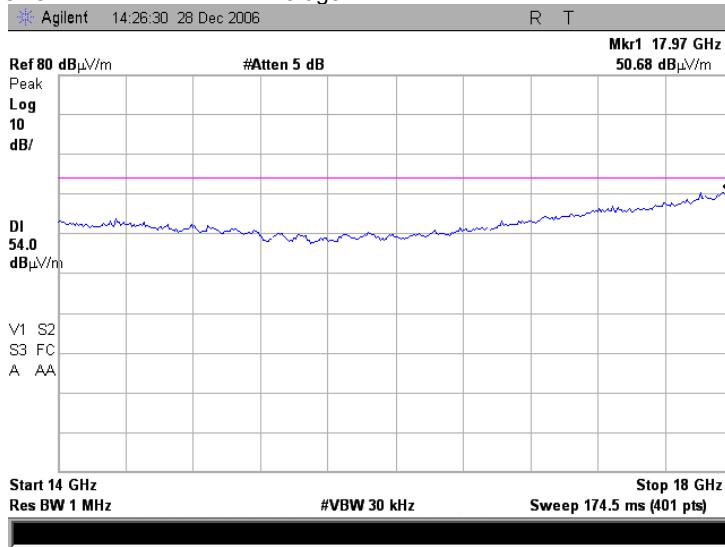
Plot 7.4.29 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



Plot 7.4.30 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

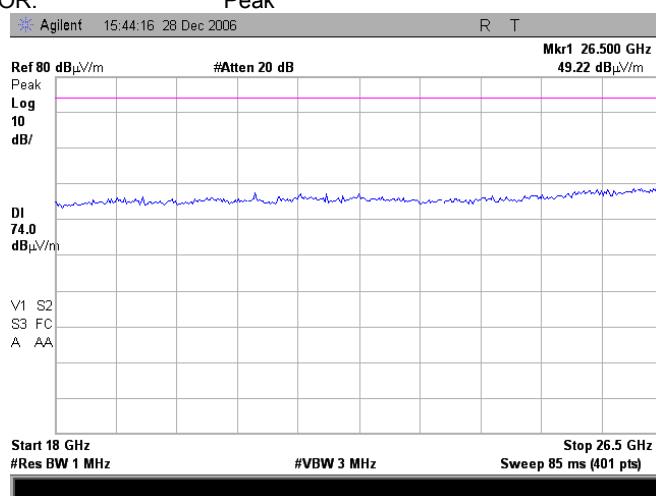
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

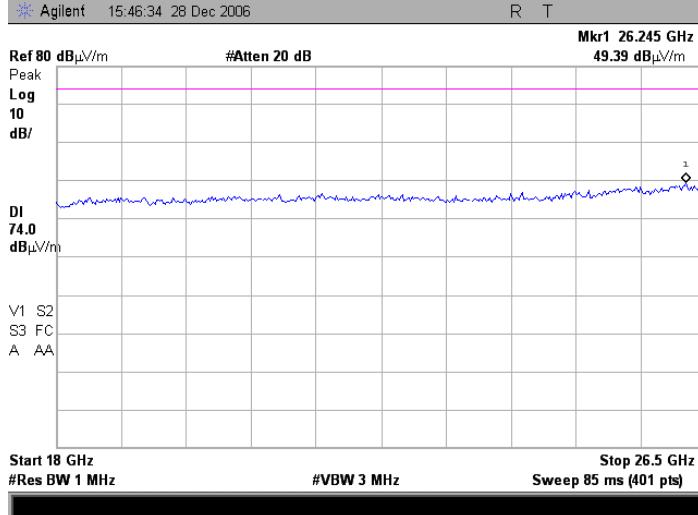
Plot 7.4.31 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



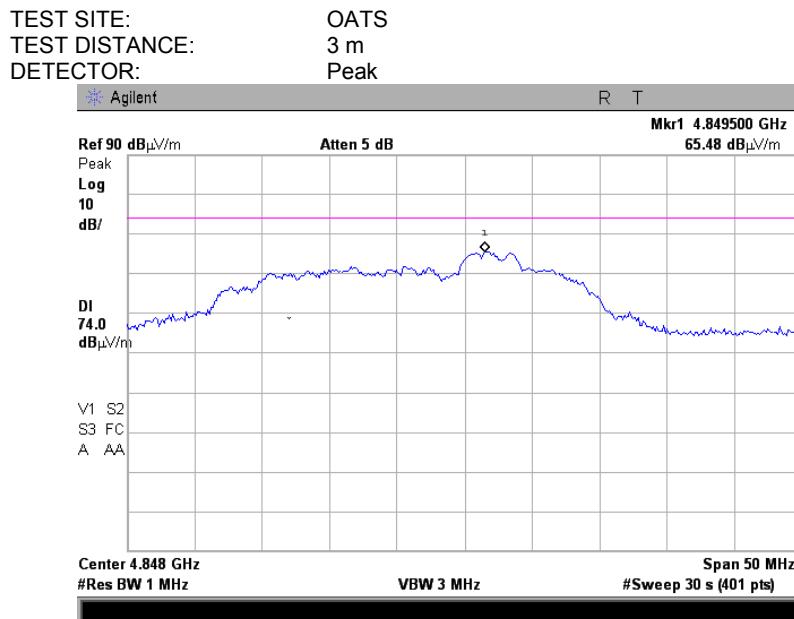
Plot 7.4.32 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak

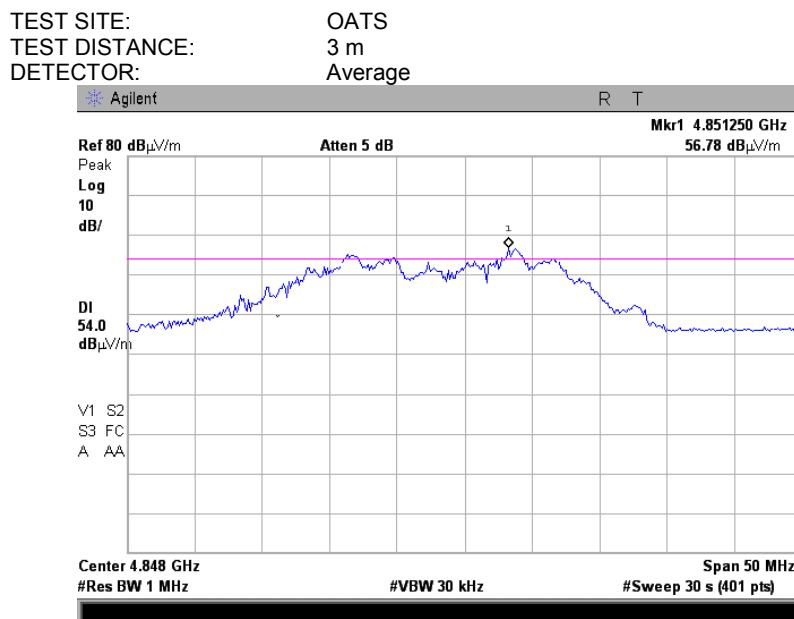


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.33 Radiated emission measurements at the second harmonic of low carrier frequency

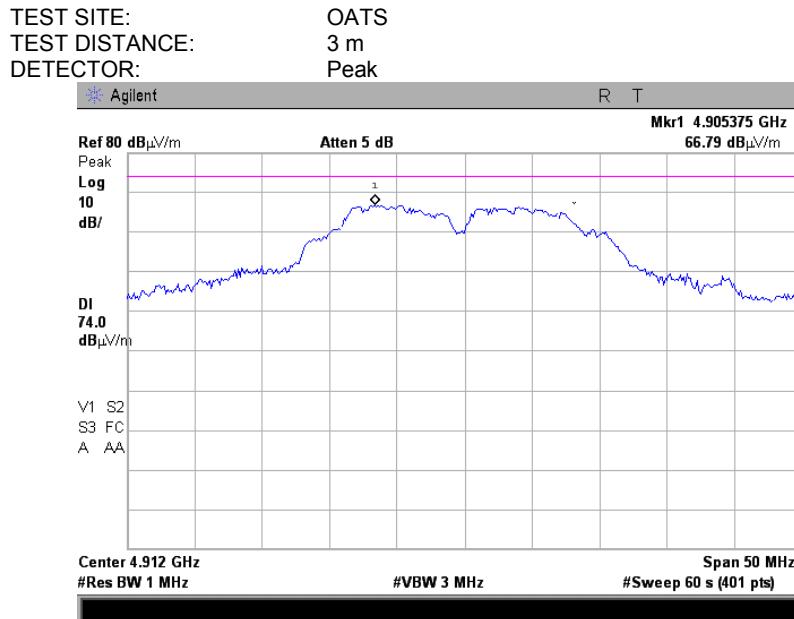


Plot 7.4.34 Radiated emission measurements at the second harmonic of low carrier frequency

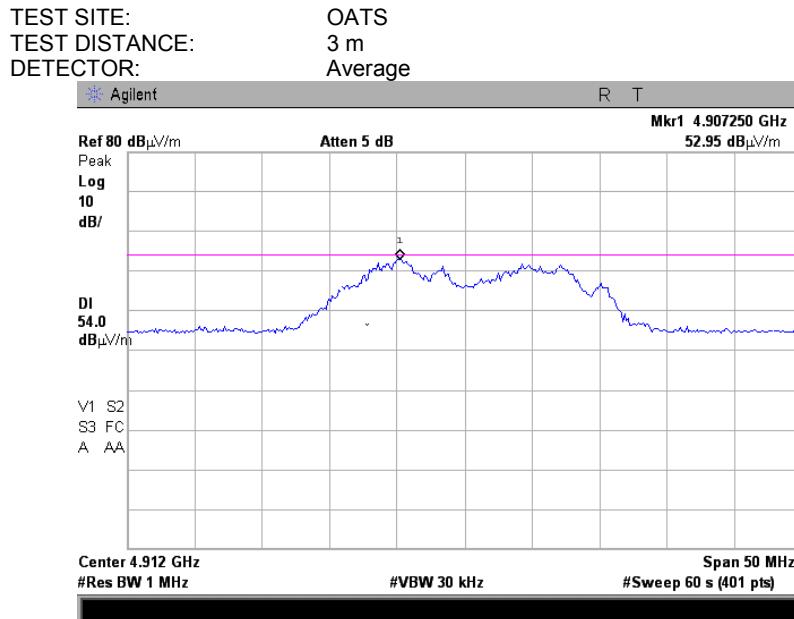


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.35 Radiated emission measurements at the second harmonic of high carrier frequency

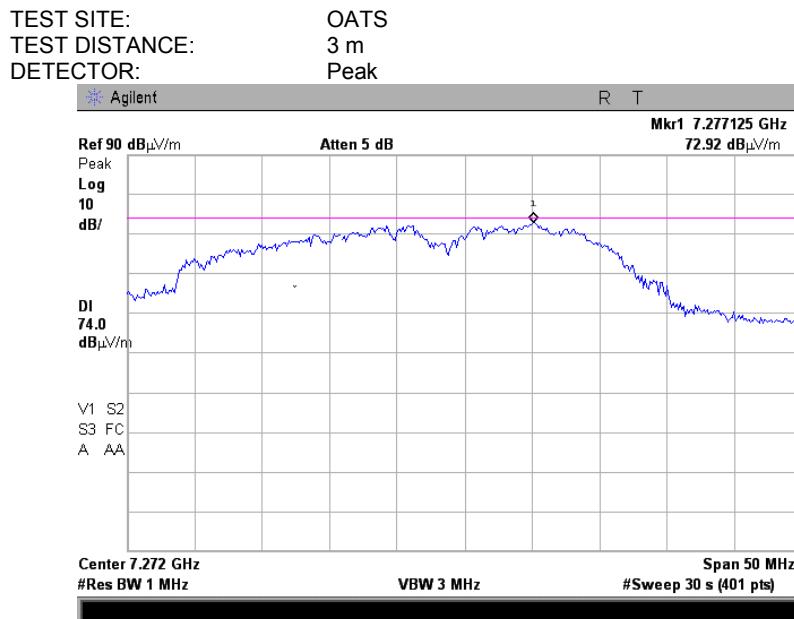


Plot 7.4.36 Radiated emission measurements at the second harmonic of high carrier frequency

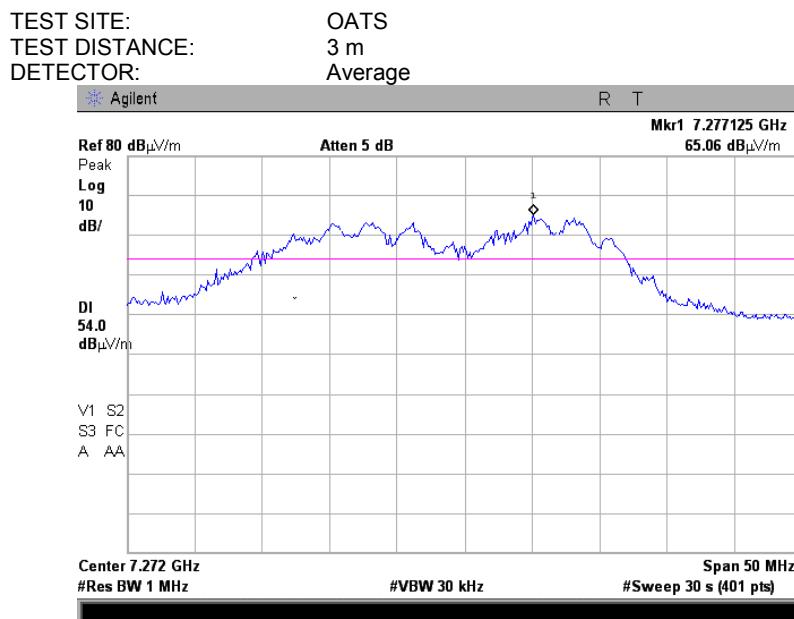


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.37 Radiated emission measurements at the third harmonic of low carrier frequency



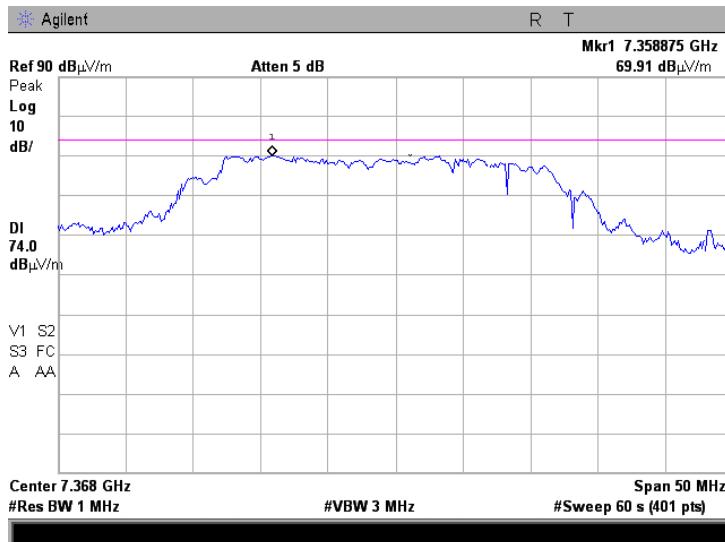
Plot 7.4.38 Radiated emission measurements at the third harmonic of low carrier frequency



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

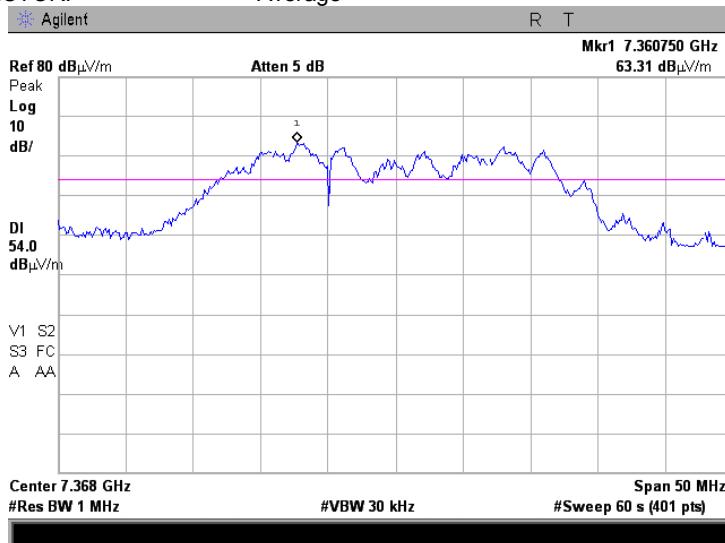
Plot 7.4.39 Radiated emission measurements at the third harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Peak



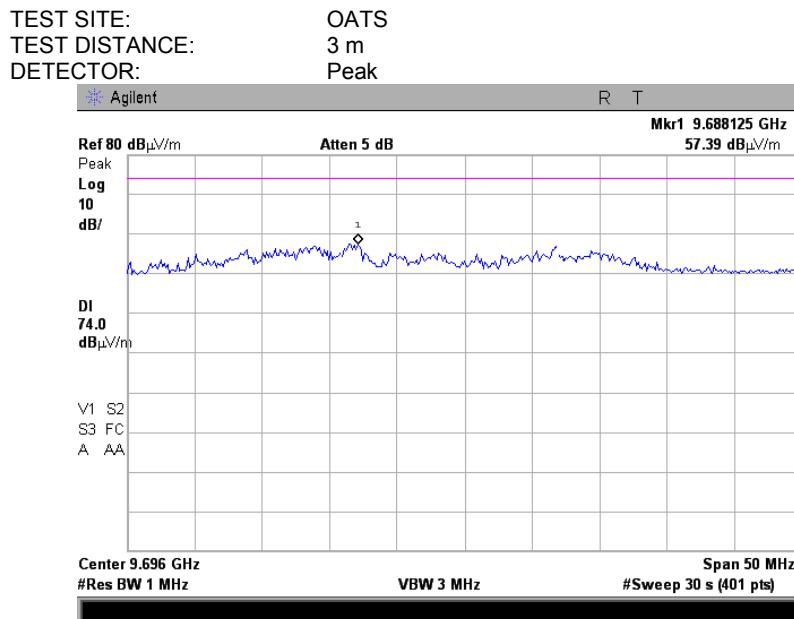
Plot 7.4.40 Radiated emission measurements at the third harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average

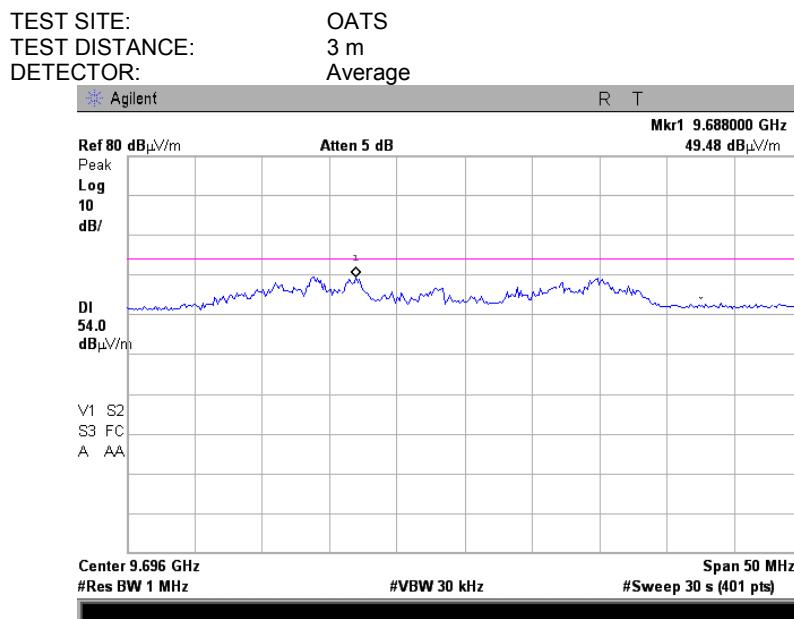


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.41 Radiated emission measurements at the forth harmonic of low carrier frequency

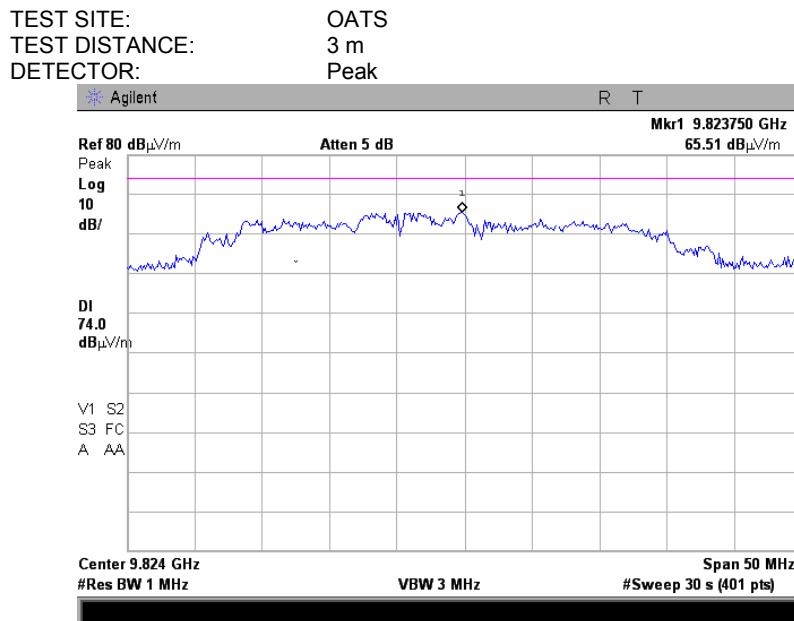


Plot 7.4.42 Radiated emission measurements at the forth harmonic of low carrier frequency

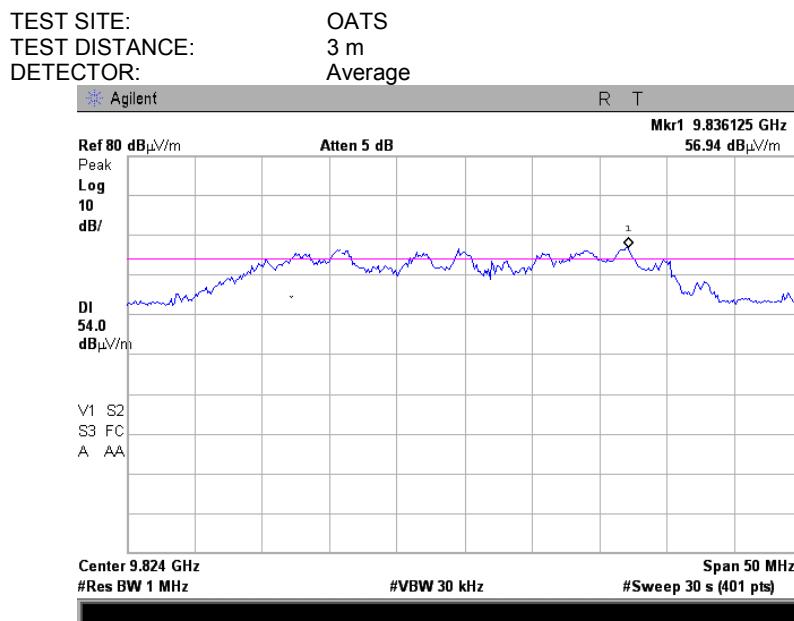


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.43 Radiated emission measurements at the forth harmonic of high carrier frequency

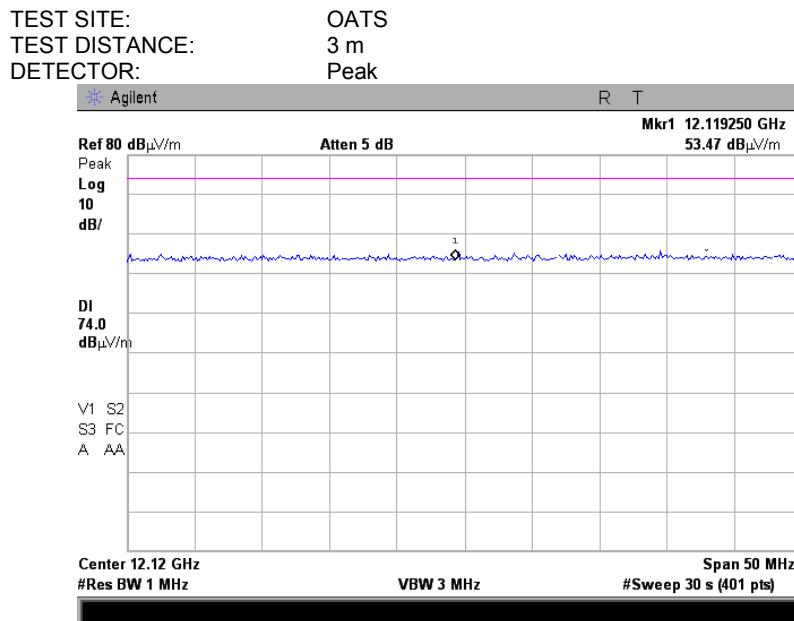


Plot 7.4.44 Radiated emission measurements at the forth harmonic of high carrier frequency

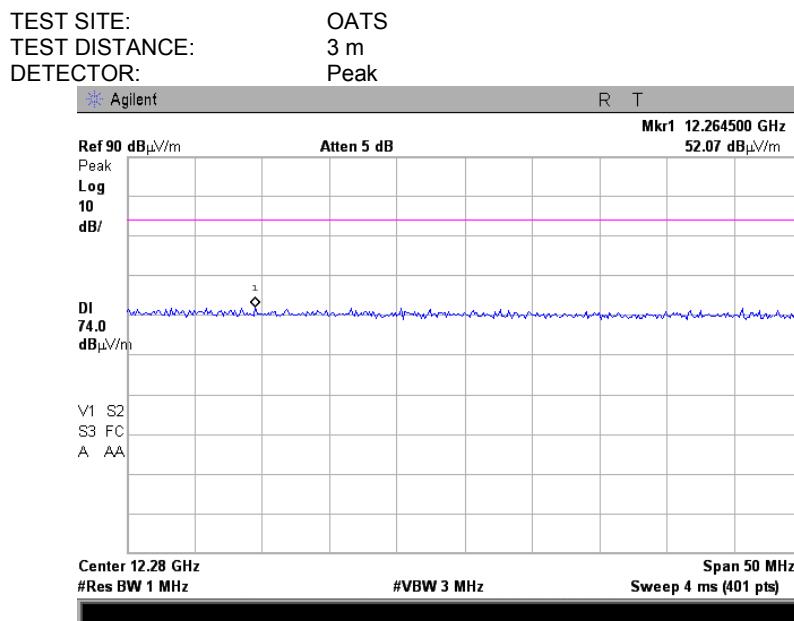


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | | |
| Temperature: 21°C | Air Pressure: 1007 hPa | Relative Humidity: 48% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.45 Radiated emission measurements at the fifth harmonic of low carrier frequency

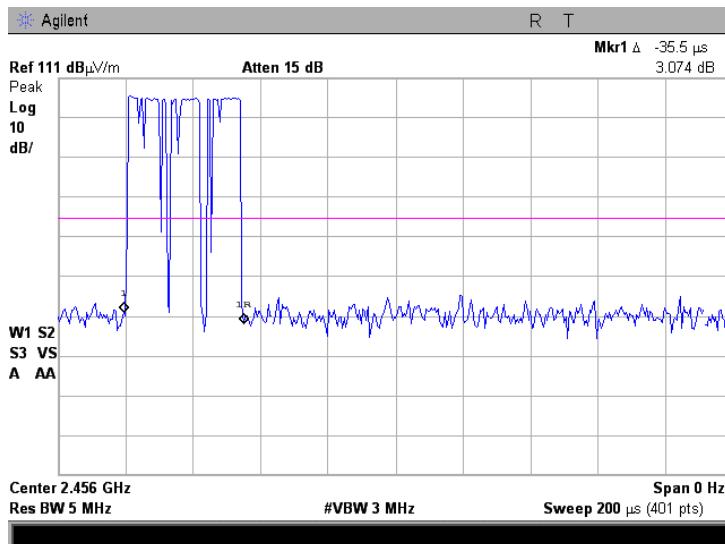


Plot 7.4.46 Radiated emission measurements at the fifth harmonic of high carrier frequency

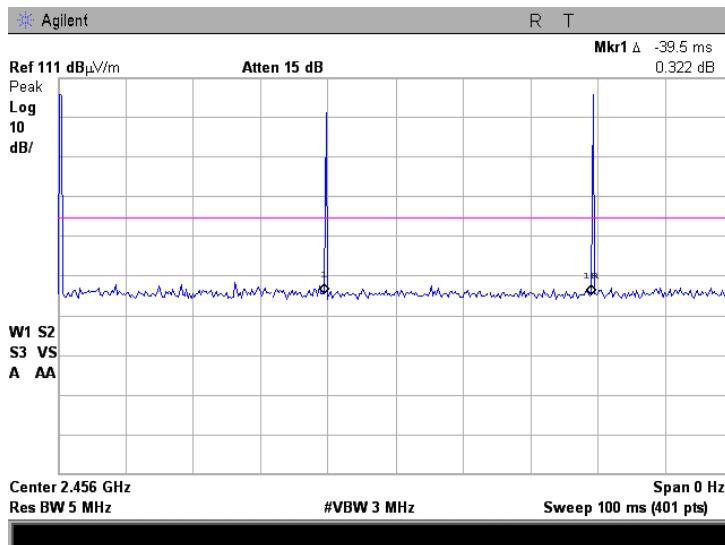


| | | | |
|-----------------------------|---|---------------------------|----------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(c)/ ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 1/2/2007 12:04:27 PM | Relative Humidity: | 48% |
| Temperature: 21°C | Air Pressure: 1007 hPa | Power Supply: | 120 V AC |
| Remarks: master unit | | | |

Plot 7.4.47 Transmission pulse duration



Plot 7.4.48 Transmission pulse period



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(d), Option 2 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 12/24/2006 11:21:30 AM | Relative Humidity: 51% | Power Supply: 120 V AC |
| Temperature: 20°C | Air Pressure: 1010 hPa | | |
| Remarks: master unit | | | |

7.5 Peak spectral power density

7.5.1 General

This test was performed to measure the peak spectral power density at the transmitter RF antenna connector. Specification test limits are given in Table 7.5.1.

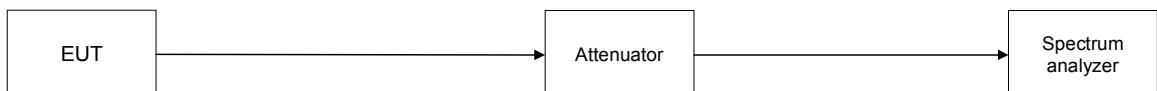
Table 7.5.1 Peak spectral power density limits

| Assigned frequency range, MHz | Measurement bandwidth, kHz | Peak spectral power density, dBm |
|-------------------------------|----------------------------|----------------------------------|
| 2400-2483.5 | 3.0 | 8.0 |

7.5.2 Test procedure

- 7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.
- 7.5.2.2 The EUT was adjusted to produce maximum available to end user RF output power.
- 7.5.2.3 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz.
- 7.5.2.4 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.5.2 and associated plots.

Figure 7.5.1 Peak spectral power density test setup





HERMON LABORATORIES

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(d), Option 2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 11:21:30 AM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 7.5.2 Peak spectral power density test results

| | |
|------------------------------------|---|
| ASSIGNED FREQUENCY: | 2400-2483.5 MHz |
| MODULATION: | OOK |
| MODULATING SIGNAL: | ID CODE |
| BIT RATE: | 3 Mbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| TRANSMITTER OUTPUT POWER: | 17.09 dBm at low carrier frequency 17.64 dBm at high carrier frequency |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 3 kHz |
| VIDEO BANDWIDTH: | 10 kHz |

| Carrier frequency MHz | Spectrum analyzer reading, dBm | External attenuation dB | Cable loss dB | Peak power density, dB(mW/3 kHz) | Limit, dBm | Margin*, dB | Verdict |
|--------------------------|-----------------------------------|----------------------------|------------------|-------------------------------------|---------------|----------------|---------|
| 2424 | -19.84 | included | included | -19.84 | 8.0 | -27.84 | Pass |
| 2456 | -18.85 | included | included | -18.85 | 8.0 | -26.85 | Pass |

* - Margin = Peak power density – specification limit.

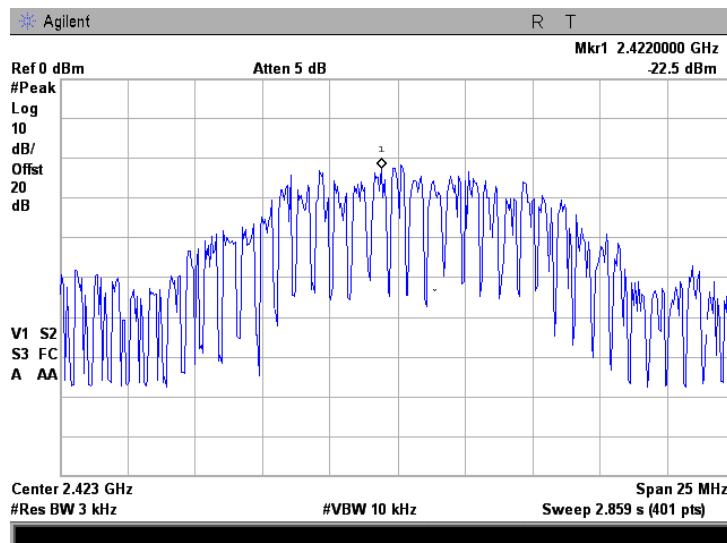
Reference numbers of test equipment used

HL 2866 HL 2909

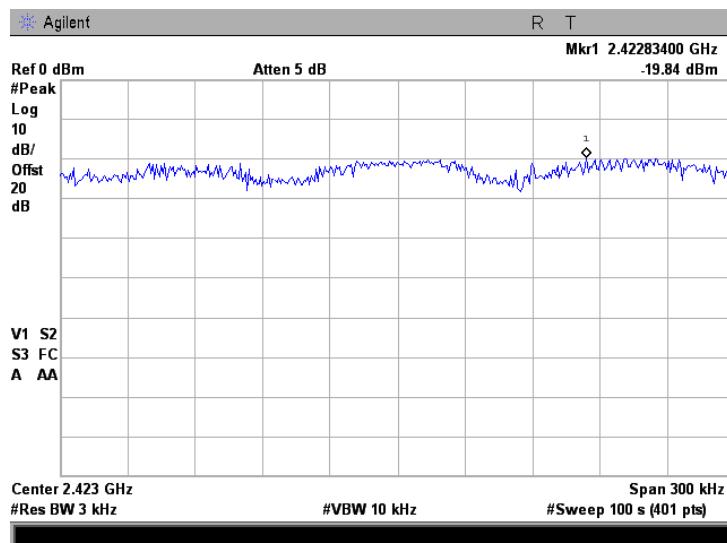
Full description is given in Appendix A.

| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(d), Option 2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 12/24/2006 11:21:30 AM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.5.1 Peak spectral power density at low frequency within 6 dB band

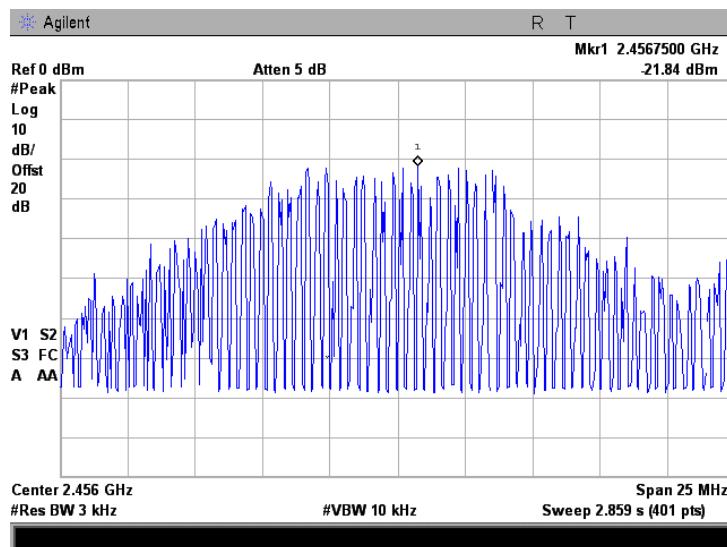


Plot 7.5.2 Peak spectral power density at low frequency zoomed at the peak

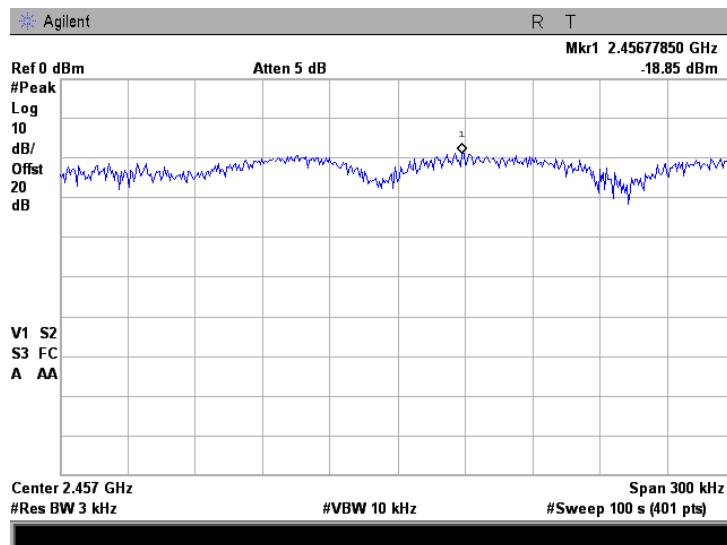


| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(d), Option 2 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 12/24/2006 11:21:30 AM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.5.3 Peak spectral power density at high frequency within 6 dB band

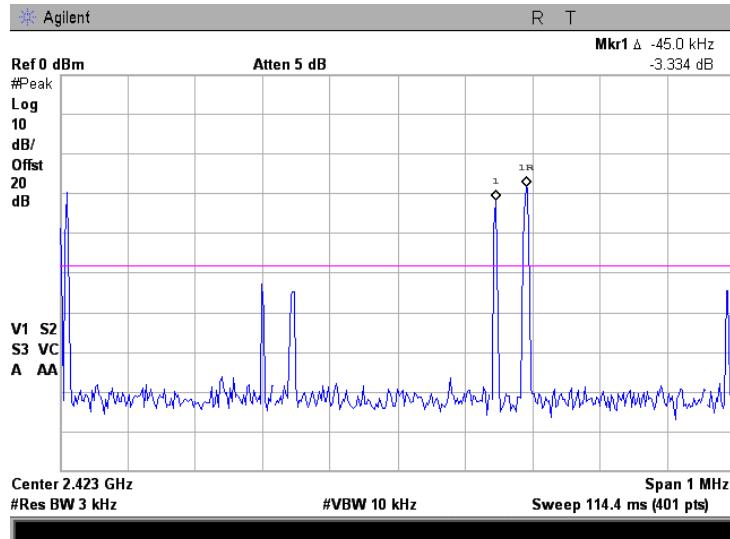


Plot 7.5.4 Peak spectral power density at high frequency zoomed at the peak



| | | | |
|-----------------------------|---|-------------------------------|-------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FCC New Guidance on Measurements for DTS in section 15.247(d), Option 2 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 12/24/2006 11:21:30 AM | PASS | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.5.5 Spectral lines spacing greater than 3 KHz



| | | | |
|-----------------------------|--|----------------------|------------------------|
| Test specification: | Section 15.207(a), Conducted emission | | |
| Test procedure: | ANSI C63.4, Section 13.1.3 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/22/2007 11:03:47 AM | PASS | |
| Temperature: °C | Air Pressure: hPa | Relative Humidity: % | Power Supply: 120 V AC |
| Remarks: master unit | | | |

7.6 Conducted emissions

7.6.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Limits for conducted emissions

| Frequency, MHz | Class B limit, dB(µV) | |
|-------------------|-----------------------|----------|
| | QP | AVRG |
| 0.15 - 0.5 | 66 - 56* | 56 - 46* |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |

* The limit decreases linearly with the logarithm of frequency.

7.6.2 Test procedure

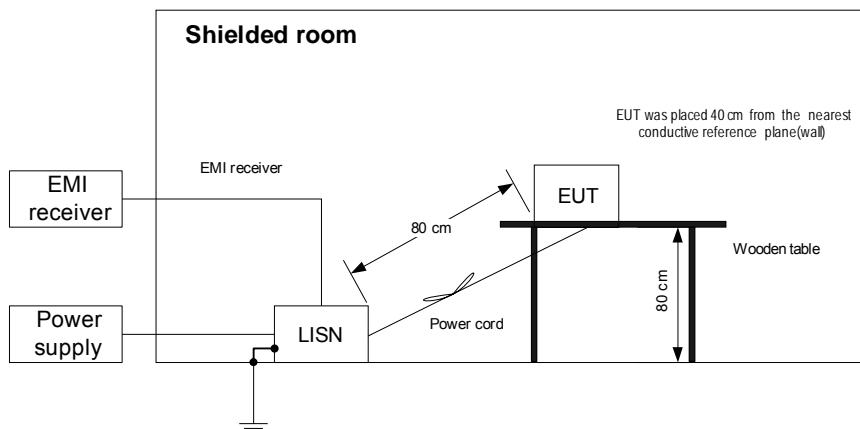
7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and the performance check was conducted.

7.6.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.6.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.6.2.3 The position of the device cables was varied to determine maximum emission level.

7.6.2.4 The worst test results (the lowest margins) were recorded in Table 7.6.2 and shown in the associated plots.

Figure 7.6.1 Setup for conducted emission measurements, table-top equipment



| | | | |
|-----------------------------|--|-----------------------------|-------------------------------|
| Test specification: | Section 15.207(a), Conducted emission | | |
| Test procedure: | ANSI C63.4, Section 13.1.3 | | |
| Test mode: | Compliance | | Verdict: PASS |
| Date & Time: | 1/22/2007 11:03:47 AM | | |
| Temperature: °C | Air Pressure: hPa | Relative Humidity: % | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 7.6.2 Conducted emission test results at master power lines

LINE: AC mains
 EUT OPERATING MODE: Transmit
 EUT SET UP: TABLE-TOP
 TEST SITE: SHIELDED ROOM
 DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
 FREQUENCY RANGE: 150 kHz - 30 MHz
 RESOLUTION BANDWIDTH: 9 kHz

| Frequency, MHz | Peak emission, dB(µV) | Quasi-peak | | | Average | | | Line ID | Verdict |
|----------------|-----------------------|---------------------------|---------------|-------------|---------------------------|---------------|-------------|---------|---------|
| | | Measured emission, dB(µV) | Limit, dB(µV) | Margin, dB* | Measured emission, dB(µV) | Limit, dB(µV) | Margin, dB* | | |
| 0.162669 | 59.08 | 55.39 | 65.38 | -9.99 | 43.79 | 55.38 | -11.59 | L1 | Pass |
| 0.169043 | 56.02 | 48.21 | 65.07 | -16.86 | 33.61 | 55.07 | -21.46 | | |
| 0.176702 | 54.82 | 49.52 | 64.70 | -15.18 | 35.12 | 54.70 | -19.58 | | |
| 0.201277 | 49.67 | 40.87 | 63.60 | -22.73 | 20.60 | 53.60 | -33.00 | | |
| 0.292315 | 41.31 | 33.67 | 60.51 | -26.84 | 5.25 | 50.51 | -45.26 | | |
| 0.177833 | 53.42 | 46.41 | 64.64 | -18.23 | 26.55 | 54.64 | -28.09 | | |
| 0.189475 | 54.29 | 47.15 | 64.07 | -16.92 | 32.16 | 54.07 | -21.91 | | |
| 0.204097 | 52.58 | 45.86 | 63.50 | -17.64 | 33.03 | 53.50 | -20.47 | | |
| 0.211539 | 49.99 | 41.19 | 63.21 | -22.02 | 27.54 | 53.21 | -25.67 | | |
| 0.237241 | 44.73 | 37.37 | 62.22 | -24.85 | 7.94 | 52.22 | -44.28 | | |

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|--|--|
| HL 0163 | HL 0672 | HL 0787 | HL 1215 | HL 1430 | HL 1503 | | |
|---------|---------|---------|---------|---------|---------|--|--|

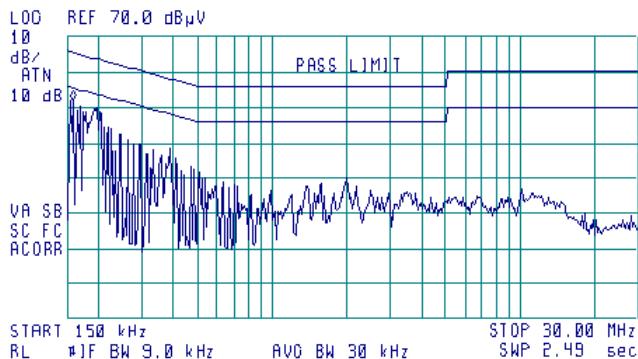
Full description is given in Appendix A.

| | | | |
|-----------------------------|--|-----------------------------|-------------------------------|
| Test specification: | Section 15.207(a), Conducted emission | | |
| Test procedure: | ANSI C63.4, Section 13.1.3 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/22/2007 11:03:47 AM | PASS | |
| Temperature: °C | Air Pressure: hPa | Relative Humidity: % | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 7.6.1 Conducted emission measurements at master power lines

LINE: L1
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK

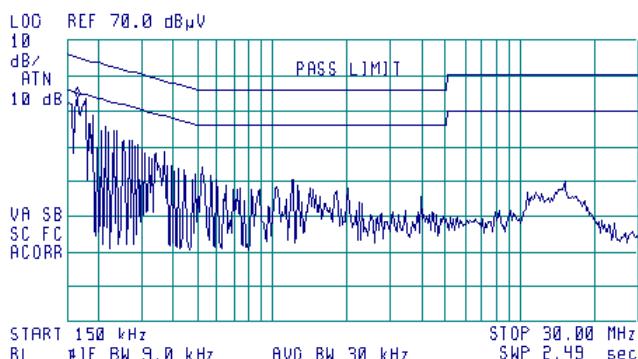
⌚ 14:23:32 JAN 04, 2007
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 160 kHz
52.00 dB μ V



Plot 7.6.2 Conducted emission measurements at master power lines

LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK

⌚ 14:17:31 JAN 04, 2007
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 170 kHz
53.76 dB μ V



| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.203, Antenna requirement | | |
| Test procedure: | Visual inspection | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 12/25/2006 3:47:15 PM | | |
| Temperature: 20°C | Air Pressure: 1010 hPa | Relative Humidity: 51% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

7.7 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.

The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.7.1.

Table 7.7.1 Antenna requirements

| Requirement | Rationale | Verdict |
|--|-------------------|---------|
| The transmitter antenna is permanently attached | Visual inspection | Comply |
| The transmitter employs a unique antenna connector | NA | |
| The transmitter requires professional installation | NA | |

Photograph 7.7.1 Antenna assembly



| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.107, Conducted emission at AC power port | | |
| Test procedure: | ANSI C63.4, Sections 11.5 and 12.1.3 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/22/2007 11:03:27 AM | PASS | |
| Temperature: 21°C | Air Pressure: 1011 hPa | Relative Humidity: 42% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

8 Emission tests according to 47CFR part 15 subpart B requirements

8.1 Conducted emissions

8.1.1 General

This test was performed to measure common mode conducted emissions at the mains power port. Specification test limits are given in Table 8.1.1.

Table 8.1.1 Limits for conducted emissions

| Frequency, MHz | Class B limit, dB(µV) | | Class A limit, dB(µV) | |
|-------------------|-----------------------|----------|-----------------------|------|
| | QP | AVRG | QP | AVRG |
| 0.15 - 0.5 | 66 - 56* | 56 - 46* | 79 | 66 |
| 0.5 - 5.0 | 56 | 46 | 73 | 60 |
| 5.0 - 30 | 60 | 50 | 73 | 60 |

* The limit decreases linearly with the logarithm of frequency.

8.1.2 Test procedure

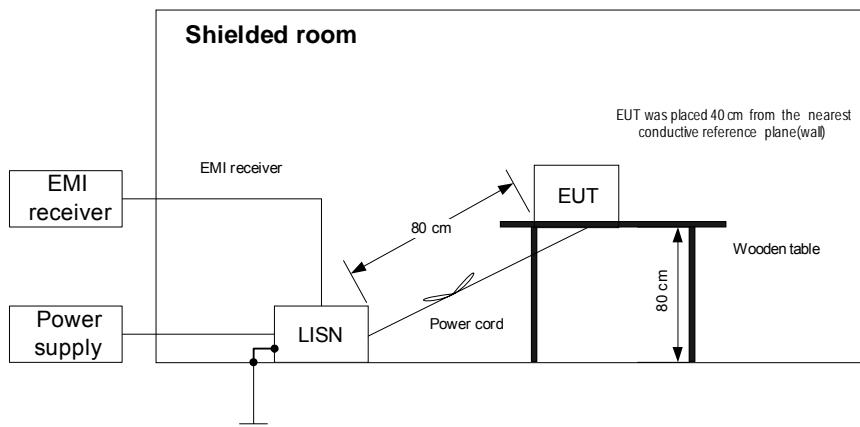
8.1.2.1 The EUT was set up as shown in Figure 8.1.1, energized and the performance check was conducted.

8.1.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 8.1.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

8.1.2.3 The position of the device cables was varied to determine maximum emission level.

8.1.2.4 The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Figure 8.1.1 Setup for conducted emission measurements, table-top equipment



| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.107, Conducted emission at AC power port | | |
| Test procedure: | ANSI C63.4, Sections 11.5 and 12.1.3 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/22/2007 11:03:27 AM | PASS | |
| Temperature: 21°C | Air Pressure: 1011 hPa | Relative Humidity: 42% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Table 8.1.2 Conducted emission test results

LINE: AC mains
 LIMIT: Class B
 EUT OPERATING MODE: Stand-by
 EUT SET UP: TABLE-TOP
 TEST SITE: SHIELDED ROOM
 DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
 FREQUENCY RANGE: 150 kHz - 30 MHz
 RESOLUTION BANDWIDTH: 9 kHz

| Frequency, MHz | Peak emission, dB(µV) | Quasi-peak | | | Average | | | Line ID | Verdict |
|----------------|-----------------------|---------------------------|---------------|-------------|---------------------------|---------------|-------------|---------|---------|
| | | Measured emission, dB(µV) | Limit, dB(µV) | Margin, dB* | Measured emission, dB(µV) | Limit, dB(µV) | Margin, dB* | | |
| 0.165311 | 55.51 | 47.72 | 65.25 | -17.53 | 17.09 | 55.25 | -38.16 | L1 | Pass |
| 0.171187 | 54.23 | 46.99 | 64.97 | -17.98 | 16.21 | 54.97 | -38.76 | | |
| 0.227178 | 48.79 | 41.24 | 62.61 | -21.37 | 12.56 | 52.61 | -40.05 | | |
| 0.250999 | 47.01 | 39.24 | 61.76 | -22.52 | 9.63 | 51.76 | -42.13 | | |
| 0.268123 | 52.24 | 49.50 | 61.24 | -11.74 | 37.09 | 51.24 | -14.15 | | |
| 0.268381 | 52.26 | 49.68 | 61.23 | -11.55 | 37.31 | 51.23 | -13.92 | | |
| 0.161465 | 59.36 | 55.59 | 65.44 | -9.85 | 43.98 | 55.44 | -11.46 | L2 | Pass |
| 0.162669 | 59.08 | 55.39 | 65.38 | -9.99 | 43.79 | 55.38 | -11.59 | | |
| 0.169043 | 56.02 | 48.21 | 65.07 | -16.86 | 33.61 | 55.07 | -21.46 | | |
| 0.170897 | 54.83 | 47.02 | 64.98 | -17.96 | 17.57 | 54.98 | -37.41 | | |
| 0.252474 | 45.84 | 39.11 | 61.71 | -22.60 | 9.39 | 51.71 | -42.32 | | |
| 0.391870 | 39.12 | 31.63 | 58.03 | -26.40 | 4.57 | 48.03 | -43.46 | | |

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

| | | | | | | |
|---------|---------|---------|---------|---------|---------|--|
| HL 0163 | HL 0672 | HL 0787 | HL 1215 | HL 1430 | HL 1503 | |
|---------|---------|---------|---------|---------|---------|--|

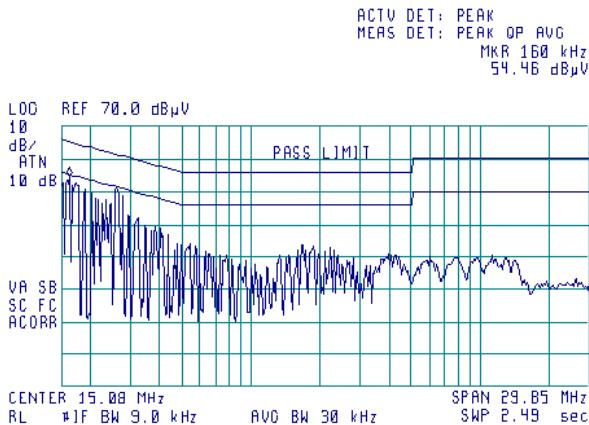
Full description is given in Appendix A.

| | | | |
|-----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.107, Conducted emission at AC power port | | |
| Test procedure: | ANSI C63.4, Sections 11.5 and 12.1.3 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 1/22/2007 11:03:27 AM | PASS | |
| Temperature: 21°C | Air Pressure: 1011 hPa | Relative Humidity: 42% | Power Supply: 120 V AC |
| Remarks: master unit | | | |

Plot 8.1.1 Conducted emission measurements

LINE: L1
LIMIT: Class B
EUT OPERATING MODE: Stand-by
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK

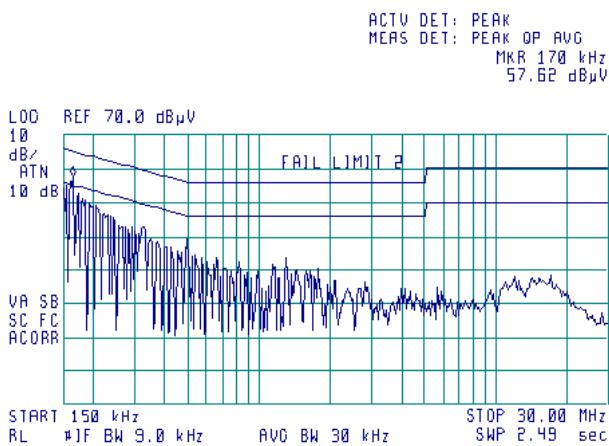
⌚ 13:43:34 JAN 04, 2007



Plot 8.1.2 Conducted emission measurements

LINE: L2
LIMIT: Class B
EUT OPERATING MODE: Stand-by
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK

⌚ 14:06:38 JAN 04, 2007



| | | | |
|----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | | Verdict: |
| Date & Time: | 5/03/2007 1:15:32 PM | | |
| Temperature: 23°C | Air Pressure: 1013 hPa | Relative Humidity: 45% | Power Supply: 120 V AC |
| Remarks: | | | |

8.2 Radiated emission measurements

8.2.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.2.1.

Table 8.2.1 Radiated emission test limits

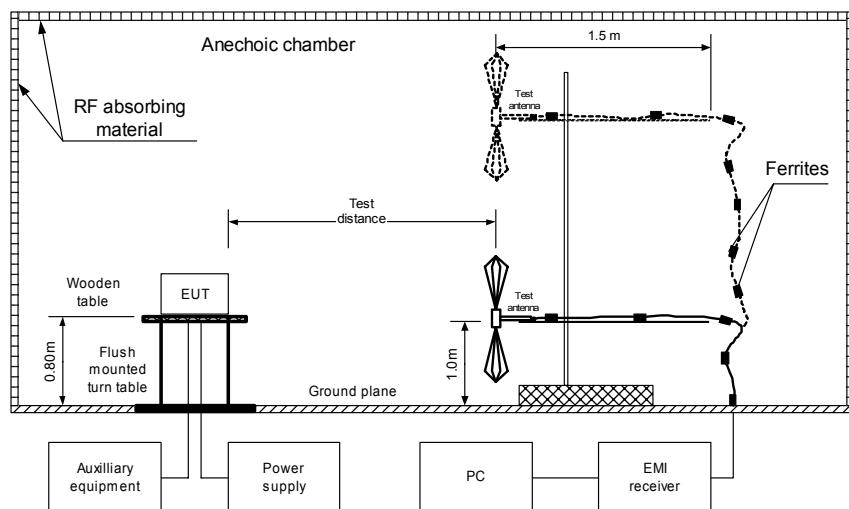
| Frequency, MHz | Class B limit, dB(μ V/m) | | Class A limit, dB(μ V/m) | |
|-------------------|-------------------------------|--------------|-------------------------------|--------------|
| | 10 m distance | 3 m distance | 10 m distance | 3 m distance |
| 30 - 88 | 29.5* | 40.0 | 39.0 | 49.5* |
| 88 - 216 | 33.0* | 43.5 | 43.5 | 54.0* |
| 216 - 960 | 35.5* | 46.0 | 46.4 | 56.9* |
| Above 960 | 43.5* | 54.0 | 49.5 | 60.0* |

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $\text{Lim}_{S_2} = \text{Lim}_{S_1} + 20 \log (S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

8.2.2 Test procedure for measurements in semi-anechoic chamber

- 8.2.2.1 The EUT was set up as shown in Figure 8.2.1, energized and the performance check was conducted.
- 8.2.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.
- 8.2.2.3 The worst test results (the lowest margins) were recorded in Table 8.3.2 and shown in the associated plots.

Figure 8.2.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment



| | | | |
|----------------------------|--|-------------------------------|-----|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 5/03/2007 1:15:32 PM | Relative Humidity: | 45% |
| Temperature: 23°C | Air Pressure: 1013 hPa | Power Supply: 120 V AC | |
| Remarks: | | | |

Table 8.2.2 Radiated emission test results

EUT SET UP:

TABLE-TOP

TEST SITE:

SEMI ANECHOIC CHAMBER

TEST DISTANCE:

3 m

DETECTORS USED:

PEAK / QUASI-PEAK

FREQUENCY RANGE:

30 MHz – 1000 MHz

RESOLUTION BANDWIDTH:

120 kHz

| Frequency, MHz | Peak emission, dB(μ V/m) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|-------------------|-------------------------------------|---|--------------------------|----------------|-------------------------|-------------------------|--------------------------------------|---------|
| | | Measured emission, dB(μ V/m) | Limit, dB(μ V/m) | Margin, dB* | | | | |
| 96.050000 | 33.16 | 28.12 | 43.50 | -15.38 | Vertical | 1.00 | 82 | Pass |
| 105.450000 | 34.50 | 31.37 | 43.50 | -12.13 | Vertical | 1.00 | 102 | |
| 117.867500 | 30.43 | 23.89 | 43.50 | -19.61 | Horizontal | 1.80 | 0 | |
| 120.017500 | 43.03 | 37.09 | 43.50 | -6.41 | Horizontal | 1.90 | 5 | |
| 144.000000 | 39.28 | 35.46 | 43.50 | -8.04 | Vertical | 1.00 | 46 | |
| 166.716100 | 32.68 | 31.04 | 43.50 | -12.46 | Vertical | 1.00 | 38 | |
| 172.888200 | 35.63 | 32.70 | 43.50 | -10.80 | Vertical | 1.10 | 24 | |
| 179.060000 | 32.99 | 30.36 | 43.50 | -13.14 | Vertical | 1.00 | 60 | |

*- Margin = Measured emission - specification limit.

**- EUT front panel refers to 0 degrees position of turntable.

Reference numbers of test equipment used

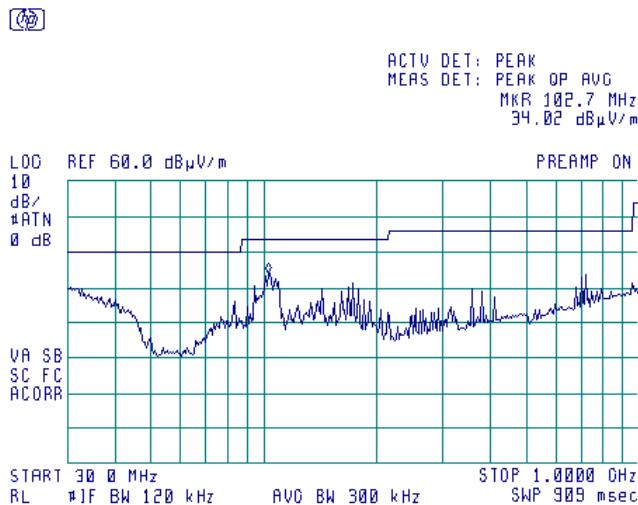
| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|--|
| HL 0465 | HL 0521 | HL 0589 | HL 0593 | HL 0594 | HL 0604 | HL 2009 | |
|---------|---------|---------|---------|---------|---------|---------|--|

Full description is given in Appendix A.

| | | | |
|----------------------------|--|-------------------------------|-------------------------------|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | Verdict: | |
| Date & Time: | 5/03/2007 1:15:32 PM | | |
| Temperature: 23°C | Air Pressure: 1013 hPa | Relative Humidity: 45% | Power Supply: 120 V AC |
| Remarks: | | | |

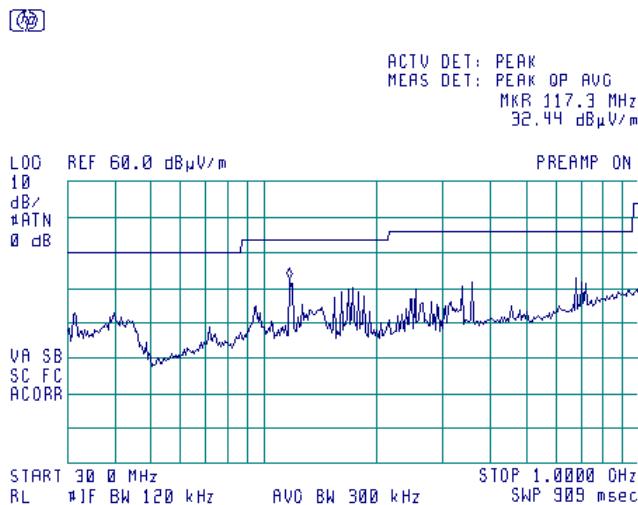
Plot 8.2.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



Plot 8.2.2 Radiated emission measurements in 30 - 1000 MHz range, horizontal antenna polarization

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m



9 APPENDIX A Test equipment and ancillaries used for tests

| HL No | Description | Manufacturer | Model | Ser. No. | Last Cal. | Due Cal. |
|-------|---|--|--------------------|--------------------------|-----------|-----------|
| 0163 | LISN FCC/VDE/50 Ohm/50 uH + 5 Ohm, MIL-STD-461E, CISPR 16-1 | Electro-Metrics | ANS 25/2 | 1314 | 01-Oct-06 | 01-Oct-07 |
| 0446 | Antenna, Loop, Active, 10 kHz - 30 MHz | EMCO | 6502 | 2857 | 28-Jun-06 | 28-Jun-07 |
| 0465 | Anechoic Chamber 9(L) x 6.5(W) x 5.5(H) m | HL | AC - 1 | 023 | 11-Nov-06 | 11-Nov-07 |
| 0521 | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz | Hewlett Packard | 8546A | 3617A 00319, 3448A002 53 | 26-Sep-06 | 26-Sep-07 |
| 0569 | Antenna, Log Periodic, 200 - 1000 MHz | Electro-Metrics | LPA 25/30 | 1953 | 10-Jan-07 | 10-Jan-08 |
| 0589 | Cable Coaxial, GORE A2P01POL118, 2.3 m | HL | GORE-3 | 176 | 02-Dec-06 | 02-Dec-07 |
| 0593 | Antenna Mast, 1-4 m Pneumatic | Madgesh | AM-F1 | 101 | 02-Feb-07 | 02-Feb-08 |
| 0594 | Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic | HL | TT-WDC1 | 102 | 26-Jan-07 | 26-Jan-08 |
| 0604 | Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz | EMCO | 3141 | 9611-1011 | 10-Jan-07 | 10-Jan-08 |
| 0672 | Shielded Room 4,6(L) x 4,2(W) x 2,4(H) m | HL | SR - 3 | 027 | 11-Nov-06 | 11-Nov-07 |
| 0787 | Transient Limiter 9 kHz-200 MHz | Hewlett Packard | 11947A | 3107A018 77 | 21-Nov-06 | 21-Nov-07 |
| 0789 | Power Divider / Combiner 0.5 to 2 GHz | A.E.L. Israel | MW 1225 | 1023 | 01-Jul-06 | 01-Jul-07 |
| 1215 | Gertsch ratio transformer, 350 V | Singer, Alfred, Eaton | RT-60 | 1077 | 01-Jan-07 | 01-Jan-08 |
| 1425 | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427 | Agilent Technologies | 8542E | 3710A002 22, 3705A002 04 | 01-Sep-06 | 01-Sep-07 |
| 1430 | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432 | Agilent Technologies | 8542E | 3807A002 62, 3705A0 0217 | 01-Sep-06 | 01-Sep-07 |
| 1502 | Cable RF, 6 m, BNC/BNC | Belden | M17/167 MIL-C-17 | 1502 | 27-Nov-06 | 27-Nov-07 |
| 1503 | Cable RF, 6 m, BNC/BNC | Belden | M17/167 MIL-C-17 | 1503 | 11-Sep-06 | 11-Sep-07 |
| 1510 | Cable RF, 8 m, BNC/BNC | Belden | M17/167 MIL-C-17 | 1510 | 02-Dec-06 | 02-Dec-07 |
| 1553 | Cable RF, 3.5 m | Alpha Wire | RG-214 | 1553 | 22-May-07 | 22-May-08 |
| 1566 | Cable RF, 2 m | Huber-Suhner | Sucoflex 104PE | 13094/4PE | 02-Dec-06 | 02-Dec-07 |
| 1947 | Cable 18GHz, 6.5 m, blue | Rhophase Microwave Limited | NPS-1803A-6500-NPS | T4974 | 17-Oct-06 | 17-Oct-07 |
| 1984 | Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W | EMC Test Systems | 3115 | 9911-5964 | 03-Mar-07 | 03-Mar-08 |
| 2009 | Cable RF, 8 m | Alpha Wire | RG-214 | C-56 | 20-May-07 | 20-May-08 |
| 2254 | Cable 40GHz, 0.8 m, blue | Rhophase Microwave Limited | KPS-1503A-800-KPS | W4907 | 20-Jun-06 | 20-Jun-07 |
| 2697 | Antenna, 30 MHz - 3.0 GHz | Sunol Sciences. Corp. Pleasanton, California USA | JB3 | A022805 | 10-Jan-07 | 10-Jan-08 |

| HL No | Description | Manufacturer | Model | Ser. No. | Last Cal. | Due Cal. |
|-------|--|----------------------|--------|-------------|-----------|-----------|
| 2780 | EMC analyzer, 100 Hz to 26.5 GHz | Agilent Technologies | E7405A | MY451024 6 | 11-Jun-06 | 11-Jun-07 |
| 2866 | Cable, 18 GHz, 0.6 m, SMA - SMA | Gore | NA | 91P67960 | 01-Jan-07 | 01-Jan-08 |
| 2909 | Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz | Agilent Technologies | E4407B | MY414447 62 | 07-May-07 | 07-May-08 |

10 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

| Test description | Expanded uncertainty |
|---|---|
| Conducted carrier power at RF antenna connector | Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB |
| Conducted emissions at RF antenna connector | 9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB |
| Occupied bandwidth | ± 8.0 % |
| Duty cycle, timing (Tx ON / OFF) and average factor measurements | ± 1.0 % |
| Conducted emissions with LISN | 9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB |
| Radiated emissions at 3 m measuring distance Horizontal polarization | Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB |
| Vertical polarization | Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB |

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Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

11 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility. Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47) and by Industry Canada for electromagnetic emissions (file numbers IC 2186-1 for OATS and IC 2186-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), assessed by TNO Certification EP&S (Netherlands) for a number of EMC, telecommunications, environmental, safety standards, and by AMTAC (UK) for safety of medical devices. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01).

Address: P.O. Box 23, Binyamina 30500, Israel.
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Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

| | |
|---------------------|--|
| 47CFR part 15: 2006 | Radio Frequency Devices. |
| FR Vol.62 | Federal Register, Volume 62, May 13, 1997 |
| ANSI C63.2: 1996 | American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications. |
| ANSI C63.4: 2003 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. |

13 APPENDIX E Abbreviations and acronyms

| | |
|----------------|---|
| A | ampere |
| AC | alternating current |
| AM | amplitude modulation |
| AVRG | average (detector) |
| cm | centimeter |
| dB | decibel |
| dBm | decibel referred to one milliwatt |
| dB(μ V) | decibel referred to one microvolt |
| dB(μ V/m) | decibel referred to one microvolt per meter |
| dB(μ A) | decibel referred to one microampere |
| dB Ω | decibel referred to one Ohm |
| DC | direct current |
| EUT | equipment under test |
| F | frequency |
| GHz | gigahertz |
| GND | ground |
| H | height |
| HL | Hermon laboratories |
| Hz | hertz |
| k | kilo |
| kHz | kilohertz |
| LO | local oscillator |
| m | meter |
| MHz | megahertz |
| min | minute |
| mm | millimeter |
| ms | millisecond |
| μ s | microsecond |
| NA | not applicable |
| NT | not tested |
| OATS | open area test site |
| Ω | Ohm |
| QP | quasi-peak |
| RE | radiated emission |
| RF | radio frequency |
| rms | root mean square |
| Rx | receive |
| s | second |
| T | temperature |
| Tx | transmit |
| V | volt |

14 APPENDIX F Test equipment correction factors

Correction factor
Line impedance stabilization network
Model ANS-25/2, Electro-Metrics, HL 0163

| Frequency, kHz | Correction factor, dB |
|----------------|-----------------------|
| 10 | 4.9 |
| 15 | 2.86 |
| 20 | 1.83 |
| 25 | 1.25 |
| 30 | 0.91 |
| 35 | 0.69 |
| 40 | 0.53 |
| 50 | 0.35 |
| 60 | 0.25 |
| 70 | 0.18 |
| 80 | 0.14 |
| 90 | 0.11 |
| 100 | 0.09 |
| 125 | 0.06 |
| 150 | 0.04 |

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.

**Antenna factor
Active loop antenna
Model 6502, S/N 2857, HL 0446**

| Frequency, MHz | Magnetic antenna factor, dB | Electric antenna factor, dB |
|-------------------|--------------------------------|--------------------------------|
| 0.009 | -32.8 | 18.7 |
| 0.010 | -33.8 | 17.7 |
| 0.020 | -38.3 | 13.2 |
| 0.050 | -41.1 | 10.4 |
| 0.075 | -41.3 | 10.2 |
| 0.100 | -41.6 | 9.9 |
| 0.150 | -41.7 | 9.8 |
| 0.250 | -41.6 | 9.9 |
| 0.500 | -41.8 | 9.8 |
| 0.750 | -41.9 | 9.7 |
| 1.000 | -41.4 | 10.1 |
| 2.000 | -41.5 | 10.0 |
| 3.000 | -41.4 | 10.2 |
| 4.000 | -41.4 | 10.1 |
| 5.000 | -41.5 | 10.1 |
| 10.000 | -41.9 | 9.6 |
| 15.000 | -41.9 | 9.6 |
| 20.000 | -42.2 | 9.3 |
| 25.000 | -42.8 | 8.7 |
| 30.000 | -44.0 | 7.5 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

**Antenna factor
Log periodic antenna
Electro-Metrics, model LPA-25/30
Ser.No.1953, HL 0569**

| Frequency MHz | Antenna Factor dB(1/m) | Frequency MHz | Antenna Factor dB(1/m) |
|------------------|---------------------------|------------------|---------------------------|
| 200 | 15.2 | 625 | 25.2 |
| 225 | 15.1 | 650 | 25.8 |
| 250 | 16.3 | 675 | 27.2 |
| 275 | 17.2 | 700 | 27.6 |
| 300 | 19.6 | 725 | 27.6 |
| 325 | 18.4 | 750 | 27.6 |
| 350 | 19.0 | 775 | 28.0 |
| 375 | 20.0 | 800 | 28.2 |
| 400 | 20.9 | 825 | 29.4 |
| 425 | 21.3 | 850 | 29.9 |
| 450 | 22.1 | 875 | 30.0 |
| 475 | 22.7 | 900 | 30.4 |
| 500 | 23.2 | 925 | 30.6 |
| 525 | 23.9 | 950 | 30.8 |
| 550 | 24.2 | 975 | 31.6 |
| 575 | 24.6 | 1000 | 32.1 |
| 600 | 24.7 | | |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

| Frequency, MHz | Antenna Factor, dB(1/m) |
|----------------|-------------------------|
| 26 | 7.8 |
| 28 | 7.8 |
| 30 | 7.8 |
| 40 | 7.2 |
| 60 | 7.1 |
| 70 | 8.5 |
| 80 | 9.4 |
| 90 | 9.8 |
| 100 | 9.7 |
| 110 | 9.3 |
| 120 | 8.8 |
| 130 | 8.7 |
| 140 | 9.2 |
| 150 | 9.8 |
| 160 | 10.2 |
| 170 | 10.4 |
| 180 | 10.4 |
| 190 | 10.3 |
| 200 | 10.6 |
| 220 | 11.6 |
| 240 | 12.4 |
| 260 | 12.8 |
| 280 | 13.7 |
| 300 | 14.7 |
| 320 | 15.2 |
| 340 | 15.4 |
| 360 | 16.1 |
| 380 | 16.4 |
| 400 | 16.6 |
| 420 | 16.7 |
| 440 | 17.0 |
| 460 | 17.7 |
| 480 | 18.1 |
| 500 | 18.5 |
| 520 | 19.1 |
| 540 | 19.5 |
| 560 | 19.8 |
| 580 | 20.6 |
| 600 | 21.3 |
| 620 | 21.5 |
| 640 | 21.2 |
| 660 | 21.4 |
| 680 | 21.9 |
| 700 | 22.2 |
| 720 | 22.2 |
| 740 | 22.1 |
| 760 | 22.3 |
| 780 | 22.6 |
| 800 | 22.7 |
| 820 | 22.9 |
| 840 | 23.1 |
| 860 | 23.4 |
| 880 | 23.8 |
| 900 | 24.1 |
| 920 | 24.1 |

| Frequency, MHz | Antenna Factor, dB(1/m) |
|----------------|-------------------------|
| 940 | 24.0 |
| 960 | 24.1 |
| 980 | 24.5 |
| 1000 | 24.9 |
| 1020 | 25.0 |
| 1040 | 25.2 |
| 1060 | 25.4 |
| 1080 | 25.6 |
| 1100 | 25.7 |
| 1120 | 26.0 |
| 1140 | 26.4 |
| 1160 | 27.0 |
| 1180 | 27.0 |
| 1200 | 26.7 |
| 1220 | 26.5 |
| 1240 | 26.5 |
| 1260 | 26.5 |
| 1280 | 26.6 |
| 1300 | 27.0 |
| 1320 | 27.8 |
| 1340 | 28.3 |
| 1360 | 28.2 |
| 1380 | 27.9 |
| 1400 | 27.9 |
| 1420 | 27.9 |
| 1440 | 27.8 |
| 1460 | 27.8 |
| 1480 | 28.0 |
| 1500 | 28.5 |
| 1520 | 28.9 |
| 1540 | 29.6 |
| 1560 | 29.8 |
| 1580 | 29.6 |
| 1600 | 29.5 |
| 1620 | 29.3 |
| 1640 | 29.2 |
| 1660 | 29.4 |
| 1680 | 29.6 |
| 1700 | 29.8 |
| 1720 | 30.3 |
| 1740 | 30.8 |
| 1760 | 31.1 |
| 1780 | 31.0 |
| 1800 | 30.9 |
| 1820 | 30.7 |
| 1840 | 30.6 |
| 1860 | 30.6 |
| 1880 | 30.6 |
| 1900 | 30.6 |
| 1920 | 30.7 |
| 1940 | 30.9 |
| 1960 | 31.2 |
| 1980 | 31.6 |
| 2000 | 32.0 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL 1984

| Frequency, MHz | Antenna factor, dB(1/m) |
|-------------------|----------------------------|
| 1000.0 | 24.7 |
| 1500.0 | 25.7 |
| 2000.0 | 27.6 |
| 2500.0 | 28.9 |
| 3000.0 | 31.2 |
| 3500.0 | 32.0 |
| 4000.0 | 32.5 |
| 4500.0 | 32.7 |
| 5000.0 | 33.6 |
| 5500.0 | 35.1 |
| 6000.0 | 35.4 |
| 6500.0 | 34.9 |
| 7000.0 | 36.1 |
| 7500.0 | 37.8 |
| 8000.0 | 38.0 |
| 8500.0 | 38.1 |
| 9000.0 | 39.1 |
| 9500.0 | 38.3 |
| 10000.0 | 38.6 |
| 10500.0 | 38.2 |
| 11000.0 | 38.7 |
| 11500.0 | 39.5 |
| 12000.0 | 40.0 |
| 12500.0 | 40.4 |
| 13000.0 | 40.5 |
| 13500.0 | 41.1 |
| 14000.0 | 41.6 |
| 14500.0 | 41.7 |
| 15000.0 | 38.7 |
| 15500.0 | 38.2 |
| 16000.0 | 38.8 |
| 16500.0 | 40.5 |
| 17000.0 | 42.5 |
| 17500.0 | 45.9 |
| 18000.0 | 49.4 |

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna calibration

Sunol Sciences Inc., model JB3, serial number A022805, HL 2697

| Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain |
|----------------|---------|-----------|----------|----------------|---------|-----------|----------|----------------|---------|-----------|----------|----------------|---------|-----------|----------|----------------|---------|-----------|----------|
| 33 | 22.2 | -22.5 | 0.01 | 620 | 19.7 | 6.3 | 4.27 | 1215 | 24.9 | 7.0 | 5.05 | 1810 | 28.3 | 7.1 | 5.08 | 2405 | 30.9 | 6.9 | 4.93 |
| 35 | 18.5 | -17.4 | 0.02 | 625 | 19.7 | 6.5 | 4.42 | 1220 | 24.9 | 7.0 | 4.99 | 1815 | 28.5 | 6.9 | 4.91 | 2410 | 30.9 | 6.9 | 4.89 |
| 40 | 14.7 | -12.5 | 0.06 | 630 | 19.6 | 6.6 | 4.57 | 1225 | 25.1 | 6.9 | 4.91 | 1820 | 28.6 | 6.8 | 4.74 | 2415 | 31.0 | 6.9 | 4.85 |
| 45 | 11.3 | -8.1 | 0.16 | 635 | 19.7 | 6.5 | 4.48 | 1230 | 25.2 | 6.8 | 4.82 | 1825 | 28.7 | 6.8 | 4.75 | 2420 | 31.0 | 6.8 | 4.82 |
| 45 | 11.3 | -8.1 | 0.16 | 640 | 19.9 | 6.4 | 4.40 | 1235 | 25.1 | 7.0 | 4.96 | 1830 | 28.7 | 6.8 | 4.76 | 2425 | 31.1 | 6.8 | 4.81 |
| 50 | 8.9 | -4.7 | 0.34 | 645 | 19.9 | 6.5 | 4.45 | 1240 | 25.0 | 7.1 | 5.09 | 1835 | 28.7 | 6.7 | 4.72 | 2430 | 31.0 | 6.9 | 4.87 |
| 55 | 7.9 | -2.8 | 0.52 | 650 | 19.9 | 6.5 | 4.51 | 1245 | 25.0 | 7.1 | 5.12 | 1840 | 28.8 | 6.7 | 4.69 | 2435 | 31.0 | 6.9 | 4.88 |
| 60 | 7.8 | -2.1 | 0.62 | 655 | 19.9 | 6.6 | 4.60 | 1250 | 25.0 | 7.1 | 5.15 | 1845 | 28.6 | 6.9 | 4.90 | 2440 | 31.2 | 6.8 | 4.74 |
| 65 | 8.5 | -2.0 | 0.63 | 660 | 19.9 | 6.7 | 4.69 | 1255 | 25.0 | 7.2 | 5.25 | 1850 | 28.4 | 7.1 | 5.12 | 2445 | 31.1 | 6.9 | 4.91 |
| 70 | 9.0 | -1.9 | 0.64 | 665 | 19.9 | 6.7 | 4.70 | 1260 | 24.9 | 7.3 | 5.36 | 1855 | 28.5 | 7.0 | 5.03 | 2450 | 31.0 | 7.0 | 4.96 |
| 75 | 8.3 | -1.1 | 0.76 | 670 | 20.0 | 6.7 | 4.75 | 1265 | 25.0 | 7.3 | 5.01 | 1860 | 28.6 | 7.0 | 5.01 | 2455 | 31.0 | 7.0 | 4.91 |
| 80 | 8.4 | -0.2 | 0.67 | 675 | 20.1 | 6.7 | 4.71 | 1270 | 25.1 | 7.2 | 5.26 | 1865 | 28.5 | 7.1 | 5.17 | 2460 | 30.9 | 7.2 | 5.19 |
| 85 | 8.0 | 0.8 | 1.20 | 680 | 20.1 | 6.7 | 4.71 | 1275 | 25.3 | 7.0 | 5.05 | 1870 | 28.4 | 7.3 | 5.33 | 2465 | 31.1 | 6.9 | 4.95 |
| 90 | 8.2 | 1.1 | 1.29 | 685 | 20.1 | 6.8 | 4.79 | 1280 | 25.5 | 6.8 | 4.84 | 1875 | 28.4 | 7.2 | 5.28 | 2470 | 31.3 | 6.8 | 4.76 |
| 95 | 9.2 | 0.5 | 1.13 | 690 | 20.1 | 6.9 | 4.88 | 1285 | 25.4 | 7.0 | 4.97 | 1880 | 28.5 | 7.2 | 5.22 | 2475 | 31.4 | 6.7 | 4.69 |
| 100 | 10.6 | -0.4 | 0.92 | 695 | 20.2 | 6.8 | 4.82 | 1290 | 25.3 | 7.1 | 5.10 | 1885 | 28.5 | 7.2 | 5.22 | 2480 | 31.3 | 6.8 | 4.79 |
| 110 | 12.6 | -1.6 | 0.70 | 705 | 20.4 | 6.8 | 4.75 | 1300 | 25.2 | 7.3 | 5.33 | 1895 | 28.6 | 7.2 | 5.24 | 2490 | 31.1 | 7.0 | 4.99 |
| 120 | 13.9 | -2.1 | 0.62 | 715 | 20.5 | 6.8 | 4.80 | 1310 | 25.5 | 7.1 | 5.09 | 1905 | 28.5 | 7.3 | 5.36 | 2500 | 30.9 | 7.2 | 5.27 |
| 125 | 14.2 | -2.0 | 0.63 | 720 | 20.5 | 6.9 | 4.85 | 1315 | 25.4 | 7.2 | 5.23 | 1910 | 28.5 | 7.4 | 5.45 | 2505 | 31.1 | 7.1 | 5.15 |
| 130 | 14.2 | -1.7 | 0.68 | 725 | 20.6 | 6.8 | 4.81 | 1320 | 25.3 | 7.3 | 5.36 | 1915 | 28.5 | 7.3 | 5.38 | 2510 | 31.0 | 7.2 | 5.22 |
| 140 | 13.4 | -0.3 | 0.98 | 735 | 20.6 | 6.7 | 4.65 | 1330 | 25.6 | 7.0 | 5.06 | 1925 | 28.8 | 7.3 | 5.35 | 2520 | 31.2 | 7.0 | 5.05 |
| 150 | 12.8 | -0.4 | 0.24 | 745 | 20.7 | 6.7 | 4.65 | 1340 | 25.6 | 7.1 | 5.09 | 1935 | 28.5 | 7.4 | 5.37 | 2530 | 31.0 | 7.3 | 5.27 |
| 160 | 12.7 | 1.8 | 1.44 | 755 | 21.0 | 6.8 | 4.74 | 1350 | 25.7 | 7.1 | 5.17 | 1945 | 28.5 | 7.5 | 5.89 | 2540 | 31.2 | 7.1 | 6.09 |
| 165 | 12.5 | 2.0 | 1.59 | 760 | 21.0 | 6.8 | 4.83 | 1355 | 25.8 | 7.0 | 5.08 | 1950 | 28.6 | 7.4 | 5.48 | 2545 | 31.0 | 7.3 | 5.43 |
| 170 | 12.2 | 2.6 | 1.83 | 765 | 21.1 | 6.8 | 4.73 | 1360 | 25.9 | 6.9 | 4.95 | 1955 | 28.6 | 7.5 | 5.57 | 2550 | 31.0 | 7.3 | 5.39 |
| 175 | 11.8 | 3.3 | 2.13 | 770 | 21.3 | 6.7 | 4.64 | 1365 | 28.0 | 6.9 | 4.95 | 1960 | 28.6 | 7.5 | 5.65 | 2555 | 31.1 | 7.2 | 5.30 |
| 180 | 11.6 | 3.7 | 2.36 | 775 | 21.3 | 6.7 | 4.68 | 1370 | 26.0 | 7.0 | 4.96 | 1965 | 28.7 | 7.4 | 5.47 | 2560 | 31.0 | 7.4 | 5.47 |
| 185 | 11.5 | 4.0 | 2.54 | 780 | 21.3 | 6.7 | 4.72 | 1375 | 26.0 | 7.0 | 5.01 | 1970 | 28.9 | 7.2 | 5.29 | 2565 | 30.8 | 7.6 | 5.70 |
| 190 | 11.6 | 4.2 | 2.61 | 785 | 21.3 | 6.8 | 4.77 | 1380 | 26.0 | 7.0 | 5.06 | 1975 | 28.9 | 7.2 | 5.22 | 2570 | 31.1 | 7.3 | 5.37 |
| 200 | 13.1 | 3.2 | 2.07 | 795 | 21.4 | 6.8 | 4.79 | 1390 | 26.1 | 6.9 | 4.92 | 1985 | 29.1 | 7.1 | 5.11 | 2580 | 31.6 | 6.9 | 4.87 |
| 205 | 12.0 | 4.4 | 2.76 | 800 | 21.5 | 6.8 | 4.77 | 1395 | 26.2 | 6.9 | 4.94 | 1990 | 29.1 | 7.0 | 5.06 | 2585 | 31.6 | 6.8 | 4.79 |
| 210 | 11.0 | 5.6 | 3.66 | 805 | 21.6 | 6.7 | 4.71 | 1400 | 26.2 | 7.0 | 4.96 | 1995 | 29.1 | 7.1 | 5.09 | 2590 | 31.6 | 6.9 | 4.88 |
| 215 | 11.3 | 5.6 | 3.59 | 810 | 21.7 | 6.7 | 4.65 | 1405 | 26.1 | 7.0 | 5.02 | 2000 | 29.1 | 7.1 | 5.11 | 2595 | 31.5 | 7.0 | 4.97 |
| 220 | 11.4 | 5.5 | 3.55 | 815 | 21.7 | 6.7 | 4.72 | 1410 | 26.1 | 7.1 | 5.09 | 2005 | 29.1 | 7.1 | 5.16 | 2600 | 31.6 | 6.9 | 4.86 |
| 225 | 11.7 | 5.5 | 3.55 | 820 | 21.7 | 6.8 | 4.80 | 1415 | 26.2 | 7.0 | 5.02 | 2010 | 29.1 | 7.1 | 5.13 | 2605 | 31.3 | 7.2 | 5.30 |
| 230 | 11.6 | 5.5 | 3.67 | 825 | 21.7 | 6.8 | 4.82 | 1420 | 26.3 | 7.0 | 4.98 | 2015 | 29.2 | 7.1 | 5.13 | 2610 | 31.4 | 7.1 | 5.11 |
| 235 | 12.1 | 5.5 | 3.66 | 830 | 21.7 | 6.8 | 4.85 | 1425 | 26.2 | 7.1 | 5.00 | 2020 | 29.2 | 7.1 | 5.18 | 2615 | 31.7 | 6.9 | 4.88 |
| 240 | 12.3 | 5.5 | 3.64 | 835 | 21.8 | 6.8 | 4.82 | 1430 | 26.1 | 7.2 | 5.25 | 2025 | 29.3 | 7.1 | 5.08 | 2620 | 31.8 | 7.0 | 4.97 |
| 245 | 12.3 | 5.7 | 3.71 | 840 | 21.9 | 6.8 | 4.80 | 1435 | 26.1 | 7.2 | 5.24 | 2030 | 29.3 | 7.0 | 5.05 | 2625 | 31.4 | 7.1 | 5.17 |
| 250 | 12.3 | 5.9 | 3.88 | 845 | 21.9 | 6.8 | 4.83 | 1440 | 26.2 | 7.2 | 5.24 | 2035 | 29.3 | 7.1 | 5.07 | 2630 | 31.6 | 7.0 | 5.00 |
| 255 | 12.5 | 5.9 | 3.85 | 850 | 21.9 | 6.9 | 4.86 | 1445 | 26.3 | 1 | 5.11 | 2040 | 29.3 | 7.1 | 5.13 | 2635 | 31.8 | 6.8 | 4.82 |
| 260 | 12.7 | 5.8 | 3.83 | 855 | 22.0 | 6.8 | 4.80 | 1450 | 26.5 | 7.0 | 4.98 | 2045 | 29.2 | 7.2 | 5.23 | 2640 | 31.7 | 7.0 | 4.98 |
| 265 | 13.2 | 5.5 | 3.54 | 860 | 22.1 | 6.8 | 4.74 | 1455 | 26.4 | 7.1 | 5.07 | 2050 | 29.2 | 7.2 | 5.27 | 2645 | 31.7 | 6.9 | 4.93 |
| 270 | 13.7 | 5.2 | 3.27 | 865 | 22.0 | 6.9 | 4.92 | 1460 | 26.4 | 7.1 | 5.17 | 2055 | 29.3 | 7.2 | 5.21 | 2650 | 31.8 | 6.9 | 4.85 |
| 275 | 13.7 | 5.3 | 3.39 | 870 | 21.9 | 7.1 | 5.11 | 1465 | 26.4 | 7.2 | 5.19 | 2060 | 29.5 | 7.0 | 5.02 | 2655 | 31.8 | 6.9 | 4.85 |
| 280 | 13.7 | 5.4 | 3.50 | 875 | 22.0 | 7.1 | 5.08 | 1470 | 26.4 | 7.2 | 5.22 | 2065 | 29.4 | 7.1 | 5.08 | 2660 | 31.7 | 7.0 | 5.02 |
| 285 | 13.7 | 5.6 | 3.61 | 880 | 22.1 | 7.0 | 5.05 | 1475 | 26.4 | 7.1 | 5.17 | 2070 | 29.4 | 7.1 | 5.10 | 2665 | 32.0 | 6.7 | 4.71 |
| 290 | 13.7 | 5.7 | 3.72 | 885 | 22.1 | 7.0 | 5.06 | 1480 | 26.5 | 7.1 | 5.12 | 2075 | 29.5 | 7.0 | 5.01 | 2670 | 32.0 | 6.7 | 4.67 |
| 295 | 13.8 | 5.8 | 3.77 | 890 | 22.1 | 7.0 | 5.06 | 1485 | 26.5 | 7.1 | 5.14 | 2080 | 29.8 | 6.8 | 4.76 | 2675 | 31.9 | 6.8 | 4.81 |
| 300 | 13.9 | 5.8 | 3.81 | 895 | 22.2 | 7.1 | 5.09 | 1490 | 26.5 | 7.1 | 5.17 | 2085 | 29.7 | 6.9 | 4.89 | 2680 | 31.7 | 7.0 | 5.04 |
| 305 | 14.0 | 5.9 | 3.85 | 900 | 22.2 | 7.1 | 5.12 | 1495 | 26.5 | 7.2 | 5.24 | 2090 | 29.7 | 6.9 | 4.86 | 2685 | 31.9 | 6.8 | 4.83 |
| 310 | 14.1 | 5.9 | 3.88 | 905 | 22.3 | 7.1 | 5.09 | 1500 | 26.5 | 7.2 | 5.31 | 2095 | 29.8 | 6.8 | 4.78 | 2690 | 32.1 | 6.7 | 4.72 |
| 315 | 14.3 | 5.9 | 3.89 | 910 | 22.3 | 7.0 | 5.05 | 1505 | 26.5 | 7.2 | 5.27 | 2100 | 29.9 | 6.8 | 4.75 | 2695 | 32.1 | 6.7 | 4.71 |
| 320 | 14.4 | 5.9 | 3.90 | 915 | 22.4 | 7.0 | 4.99 | 1510 | 26.6 | 7.2 | 5.23 | 2105 | 29.8 | 6.8 | 4.81 | 2700 | 32.0 | 6.8 | 4.81 |
| 325 | 14.5 | 5.9 | 3.92 | 920 | 22.6 | 6.9 | 4.92 | 1515 | 26.6 | 7.2 | 5.30 | 2110 | 29.9 | 6.8 | 4.78 | 2705 | 32.0 | 6.8 | 4.80 |
| 330 | 14.7 | 6.0 | 4.02 | 925 | 22.6 | 6.9 | 4.85 | 1520 | 26.6 | 7.3 | 5.37 | 2120 | 29.9 | 6.8 | 4.71 | 2715 | 32.1 | 6.7 | 4.71 |
| 335 | 15.6 | 6.1 | 4.03 | 930 | 22.7 | 6.8 | 4.82 | 1525 | 26.6 | 7.3 | 5.30 | 2125 | 29.8 | 6.9 | 4.89 | 2725 | 32.4 | 6.5 | 4.47 |
| 340 | 16.6 | 6.1 | 4.16 | 935 | 22.8 | 6.8 | 4.83 | 1530 | 26.6 | 7.4 | 5.44 | 2130 | 29.9 | 6.9 | 4.90 | 2728 | 32.2 | 8.7 | 4.63 |
| 345 | 16.9 | 6.1 | 4.06 | 940 | 22.8 | 6.9 | 4.89 | 1535 | 26.6 | 7.4 | 5.36 | 2135 | 29.8 | 6.9 | 4.94 | 2730 | 31.9 | 7.0 | 5.05 |
| 350 | 16.1 | 6.0 | 3.99 | 945 | 22.8 | 6.9 | 4.87 | 1540 | 26.5 | 7.4 | 5.63 | 2140 | 29.8 | 7.1 | 5.08</td | | | | |

Cable loss
Cable Coaxial, GORE A2P01POL118, 2.3 m, model:GORE-3, HL 0589
+ Cable Coaxial, ANDREW PSWJ4, 6m, model: ANDREW-6, HL 1004

| No. | Frequency, MHz | Cable loss, dB | Tolerance (Specification), dB | Measurement uncertainty, dB |
|-----|-------------------|-------------------|-------------------------------------|-----------------------------------|
| 1 | 30 | 0.33 | | |
| 2 | 50 | 0.40 | | |
| 3 | 100 | 0.57 | | |
| 4 | 300 | 0.97 | | |
| 5 | 500 | 1.25 | | |
| 6 | 800 | 1.59 | | |
| 7 | 1000 | 1.81 | | |
| 8 | 1200 | 1.97 | | |
| 9 | 1400 | 2.15 | | |
| 10 | 1600 | 2.28 | | |
| 11 | 1800 | 2.43 | | |
| 12 | 2000 | 2.61 | | |
| 13 | 2200 | 2.75 | | |
| 14 | 2400 | 2.89 | | |
| 15 | 2600 | 2.97 | | |
| 16 | 2800 | 3.21 | ≤ 6.5 | ±0.12 |
| 17 | 3000 | 3.32 | | |
| 18 | 3300 | 3.47 | | |
| 19 | 3600 | 3.62 | | |
| 20 | 3900 | 3.84 | | |
| 21 | 4200 | 3.92 | | |
| 22 | 4500 | 4.07 | | |
| 23 | 4800 | 4.36 | | |
| 24 | 5100 | 4.62 | | |
| 25 | 5400 | 4.78 | | |
| 26 | 5700 | 5.16 | | |
| 27 | 6000 | 5.67 | | |
| 28 | 6500 | 5.99 | | |

Cable loss
Cable coaxial, 6 m, model: M17/167 MIL-C-17, HL 1502

| Frequency, MHz | Cable loss, dB |
|-------------------|-------------------|
| 0.1 | 0.02 |
| 1 | 0.07 |
| 3 | 0.15 |
| 5 | 0.17 |
| 10 | 0.26 |
| 30 | 0.43 |
| 50 | 0.57 |
| 80 | 0.72 |
| 100 | 0.81 |
| 300 | 1.48 |
| 500 | 2.00 |
| 800 | 2.70 |
| 1000 | 3.09 |

Cable loss
Cable coaxial, 6 m, model: M17/167 MIL-C-17, HL 1503

| Frequency, MHz | Cable loss, dB |
|-------------------|-------------------|
| 0.15 | 0.043 |
| 1 | 0.077 |
| 3 | 0.139 |
| 5 | 0.169 |
| 10 | 0.248 |
| 30 | 0.430 |
| 50 | 0.561 |
| 75 | 0.697 |
| 100 | 0.822 |
| 300 | 1.446 |
| 500 | 1.901 |
| 800 | 2.663 |
| 1000 | 2.829 |
| 1500 | 3.569 |
| 2000 | 4.179 |

Cable loss
Cable M17/167 MIL-C-17, HL 1510

| No. | Frequency, MHz | Cable loss, dB |
|-----|-------------------|-------------------|
| 1 | 0.1 | 0.05 |
| 2 | 1 | 0.09 |
| 3 | 3 | 0.16 |
| 4 | 5 | 0.18 |
| 5 | 10 | 0.27 |
| 6 | 30 | 0.44 |
| 7 | 50 | 0.58 |
| 8 | 80 | 0.69 |
| 9 | 100 | 0.82 |
| 10 | 300 | 1.48 |
| 11 | 500 | 2.01 |
| 12 | 800 | 2.65 |
| 13 | 1000 | 3.12 |

Cable loss
RF cable 3.5 m, Alpha Wire, model RG-214, S/N 149, HL 1553

| No. | Frequency, MHz | Cable loss, dB | Measurement uncertainty, dB |
|-----|-------------------|-------------------|--------------------------------|
| 1 | 1 | 0.01 | ±0.05 |
| 2 | 10 | 0.07 | |
| 3 | 30 | 0.12 | |
| 4 | 50 | 0.22 | |
| 5 | 100 | 0.26 | |
| 6 | 200 | 0.40 | |
| 7 | 300 | 0.52 | |
| 8 | 400 | 0.60 | |
| 9 | 500 | 0.70 | |
| 10 | 600 | 0.77 | |
| 11 | 700 | 0.84 | |
| 12 | 800 | 1.00 | |
| 13 | 900 | 1.00 | |
| 14 | 1000 | 1.05 | |
| 15 | 2000 | 1.70 | |

Cable loss
Cable RF, 2m, model: Sucoflex 104PE, S/N 13094/4PE, HL 1566

| No. | Frequency, MHz | Cable loss, dB | Tolerance, dB | Measurement uncertainty, dB |
|-----|-------------------|-------------------|------------------|--------------------------------|
| 1 | 30 | 0.10 | ≤ 5.0 | ±0.12 |
| 2 | 50 | 0.13 | | |
| 3 | 100 | 0.20 | | |
| 4 | 300 | 0.33 | | |
| 5 | 500 | 0.45 | | |
| 6 | 800 | 0.60 | | |
| 7 | 1000 | 0.65 | | |
| 8 | 1500 | 0.91 | | |
| 9 | 2000 | 1.08 | | |
| 10 | 2500 | 1.19 | | |
| 11 | 3000 | 1.28 | | |
| 12 | 3500 | 1.49 | | |
| 13 | 4000 | 1.63 | | |
| 14 | 4500 | 1.63 | ≤ 5.0 | ±0.17 |
| 15 | 5000 | 1.66 | | |
| 16 | 5500 | 1.88 | | |
| 17 | 6000 | 1.96 | | |
| 18 | 6500 | 1.93 | | |
| 19 | 7000 | 2.07 | | |
| 20 | 7500 | 2.37 | | |
| 21 | 8000 | 2.34 | | |
| 22 | 8500 | 2.64 | | |
| 23 | 9000 | 2.68 | | |
| 24 | 9500 | 2.64 | | |
| 25 | 10000 | 2.70 | | |
| 26 | 10500 | 2.84 | | |
| 27 | 11000 | 2.88 | | |
| 28 | 11500 | 3.19 | | |
| 29 | 12000 | 3.15 | ≤ 5.0 | ±0.26 |
| 30 | 12500 | 3.20 | | |
| 31 | 13000 | 3.22 | | |
| 32 | 13500 | 3.47 | | |
| 33 | 14000 | 3.41 | | |
| 34 | 14500 | 3.59 | | |
| 35 | 15000 | 3.79 | | |
| 36 | 15500 | 4.24 | | |
| 37 | 16000 | 4.12 | | |
| 38 | 16500 | 4.46 | | |
| 39 | 17000 | 4.50 | | |
| 40 | 17500 | 4.49 | | |
| 41 | 18000 | 4.45 | | |

Cable loss
Cable 18 GHz, 6.5 m, blue, model: NPS-1803A-6500-NPS, S/N T4974, HL 1947

| Frequency, GHz | Cable loss, dB |
|-------------------|-------------------|
| 0.03 | 0.30 |
| 0.05 | 0.38 |
| 0.10 | 0.53 |
| 0.20 | 0.74 |
| 0.30 | 0.91 |
| 0.40 | 1.05 |
| 0.50 | 1.18 |
| 0.60 | 1.29 |
| 0.70 | 1.40 |
| 0.80 | 1.50 |
| 0.90 | 1.59 |
| 1.00 | 1.68 |
| 1.10 | 1.77 |
| 1.20 | 1.86 |
| 1.30 | 1.94 |
| 1.40 | 2.01 |
| 1.50 | 2.08 |
| 1.60 | 2.16 |
| 1.70 | 2.22 |
| 1.80 | 2.29 |
| 1.90 | 2.36 |
| 2.00 | 2.42 |
| 2.10 | 2.48 |
| 2.20 | 2.54 |
| 2.30 | 2.60 |
| 2.40 | 2.66 |
| 2.50 | 2.71 |
| 2.60 | 2.77 |
| 2.70 | 2.83 |
| 2.80 | 2.89 |
| 2.90 | 2.95 |
| 3.10 | 3.06 |
| 3.30 | 3.17 |
| 3.50 | 3.28 |
| 3.70 | 3.39 |
| 3.90 | 3.51 |
| 4.10 | 3.62 |
| 4.30 | 3.76 |
| 4.50 | 3.87 |
| 4.70 | 4.01 |
| 4.90 | 4.10 |
| 5.10 | 4.21 |
| 5.30 | 4.31 |
| 5.50 | 4.43 |
| 5.70 | 4.56 |
| 5.90 | 4.71 |

| Frequency, GHz | Cable loss, dB |
|-------------------|-------------------|
| 6.10 | 4.87 |
| 6.30 | 4.95 |
| 6.50 | 4.94 |
| 6.70 | 4.88 |
| 6.90 | 4.87 |
| 7.10 | 4.83 |
| 7.30 | 4.85 |
| 7.50 | 4.86 |
| 7.70 | 4.91 |
| 7.90 | 4.96 |
| 8.10 | 5.03 |
| 8.30 | 5.08 |
| 8.50 | 5.13 |
| 8.70 | 5.21 |
| 8.90 | 5.22 |
| 9.10 | 5.34 |
| 9.30 | 5.35 |
| 9.50 | 5.52 |
| 9.70 | 5.51 |
| 9.90 | 5.66 |
| 10.10 | 5.70 |
| 10.30 | 5.78 |
| 10.50 | 5.79 |
| 10.70 | 5.82 |
| 10.90 | 5.86 |
| 11.10 | 5.94 |
| 11.30 | 6.06 |
| 11.50 | 6.21 |
| 11.70 | 6.44 |
| 11.90 | 6.61 |
| 12.10 | 6.76 |
| 12.40 | 6.68 |
| 13.00 | 6.66 |
| 13.50 | 6.81 |
| 14.00 | 6.90 |
| 14.50 | 6.90 |
| 15.00 | 6.97 |
| 15.50 | 7.17 |
| 16.00 | 7.28 |
| 16.50 | 7.27 |
| 17.00 | 7.38 |
| 17.50 | 7.68 |
| 18.00 | 7.92 |

Cable loss
RF cable 8 m, model RG-214, HL 2009

| No. | Frequency, MHz | Cable loss, dB | Tolerance (Specification), dB | Measurement uncertainty, dB |
|-----|-------------------|-------------------|----------------------------------|--------------------------------|
| 1 | 1 | 0.10 | NA | ± 0.12 |
| 2 | 10 | 0.14 | | |
| 3 | 30 | 0.25 | | |
| 4 | 50 | 0.34 | | |
| 5 | 100 | 0.53 | | |
| 6 | 300 | 0.99 | | |
| 7 | 500 | 1.31 | | |
| 8 | 800 | 1.73 | | |
| 9 | 1000 | 1.98 | | |
| 10 | 1100 | 2.11 | | |
| 11 | 1200 | 2.21 | | |
| 12 | 1300 | 2.35 | | |
| 13 | 1400 | 2.46 | | |
| 14 | 1500 | 2.55 | | |
| 15 | 1600 | 2.68 | | |
| 16 | 1700 | 2.78 | | |
| 17 | 1800 | 2.88 | | |
| 18 | 1900 | 2.98 | | |
| 19 | 2000 | 3.09 | | |

Cable loss
Cable 40 GHz, 0.8 m, blue, model: KPS-1503A-800-KPS, S/N W4907, HL 2254

| Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 0.03 | 0.04 | 5.10 | 0.80 | 15.00 | 1.49 |
| 0.05 | 0.07 | 5.30 | 0.83 | 15.50 | 1.49 |
| 0.10 | 0.09 | 5.50 | 0.83 | 16.00 | 1.46 |
| 0.20 | 0.15 | 5.70 | 0.84 | 16.50 | 1.47 |
| 0.30 | 0.19 | 5.90 | 0.87 | 17.00 | 1.50 |
| 0.40 | 0.25 | 6.10 | 0.86 | 17.50 | 1.57 |
| 0.50 | 0.29 | 6.30 | 0.89 | 18.00 | 1.63 |
| 0.60 | 0.33 | 6.50 | 0.90 | 18.50 | 1.57 |
| 0.70 | 0.37 | 6.70 | 0.89 | 19.00 | 1.63 |
| 0.80 | 0.41 | 6.90 | 0.93 | 19.50 | 1.65 |
| 0.90 | 0.44 | 7.10 | 0.92 | 20.00 | 1.64 |
| 1.00 | 0.45 | 7.30 | 0.95 | 20.50 | 1.75 |
| 1.10 | 0.48 | 7.50 | 0.96 | 21.00 | 1.72 |
| 1.20 | 0.51 | 7.70 | 0.97 | 21.50 | 1.78 |
| 1.30 | 0.53 | 7.90 | 1.01 | 22.00 | 1.76 |
| 1.40 | 0.54 | 8.10 | 1.00 | 22.50 | 1.72 |
| 1.50 | 0.57 | 8.30 | 1.05 | 23.00 | 1.83 |
| 1.60 | 0.59 | 8.50 | 1.04 | 23.50 | 1.80 |
| 1.70 | 0.04 | 8.70 | 1.07 | 24.00 | 1.90 |
| 1.80 | 0.07 | 8.90 | 1.11 | 24.50 | 1.81 |
| 1.90 | 0.09 | 9.10 | 1.09 | 25.00 | 1.98 |
| 2.00 | 0.15 | 9.30 | 1.14 | 25.50 | 1.91 |
| 2.10 | 0.19 | 9.50 | 1.12 | 26.00 | 2.02 |
| 2.20 | 0.25 | 9.70 | 1.15 | 26.50 | 1.92 |
| 2.30 | 0.29 | 9.90 | 1.16 | 27.00 | 1.97 |
| 2.40 | 0.33 | 10.10 | 1.16 | 28.00 | 2.02 |
| 2.50 | 0.37 | 10.30 | 1.19 | 29.00 | 1.95 |
| 2.60 | 0.41 | 10.50 | 1.14 | 30.00 | 1.94 |
| 2.70 | 0.44 | 10.70 | 1.19 | 31.00 | 2.11 |
| 2.80 | 0.45 | 10.90 | 1.17 | 32.00 | 2.17 |
| 2.90 | 0.48 | 11.10 | 1.13 | 33.00 | 2.27 |
| 3.10 | 0.61 | 11.30 | 1.20 | 34.00 | 2.27 |
| 3.30 | 0.64 | 11.50 | 1.13 | 35.00 | 2.29 |
| 3.50 | 0.65 | 11.70 | 1.20 | 36.00 | 2.35 |
| 3.70 | 0.68 | 11.90 | 1.18 | 37.00 | 2.37 |
| 3.90 | 0.69 | 12.10 | 1.14 | 38.00 | 2.40 |
| 4.10 | 0.71 | 12.40 | 1.19 | 39.00 | 2.57 |
| 4.30 | 0.73 | 13.00 | 1.34 | 40.00 | 2.36 |
| 4.50 | 0.75 | 13.50 | 1.33 | | |
| 4.70 | 0.77 | 14.00 | 1.48 | | |
| 4.90 | 0.79 | 14.50 | 1.45 | | |

Cable loss
Cable coaxial, Gore, 18 GHz, 0.6 m, SMA - SMA, model Right Angle, S/N 91P67960
HL 2866

| Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 10 | 0.03 | 5750 | 0.56 | 12000 | 0.77 |
| 30 | 0.02 | 6000 | 0.60 | 12250 | 0.68 |
| 100 | 0.02 | 6250 | 0.54 | 12500 | 0.67 |
| 250 | 0.10 | 6500 | 0.60 | 12750 | 0.71 |
| 500 | 0.15 | 6750 | 0.56 | 13000 | 0.80 |
| 750 | 0.11 | 7000 | 0.63 | 13250 | 0.75 |
| 1000 | 0.13 | 7250 | 0.59 | 13500 | 0.66 |
| 1250 | 0.14 | 7500 | 0.62 | 13750 | 0.68 |
| 1500 | 0.16 | 7750 | 0.63 | 14000 | 0.69 |
| 1750 | 0.20 | 8000 | 0.60 | 14250 | 0.69 |
| 2000 | 0.26 | 8250 | 0.59 | 14500 | 0.62 |
| 2250 | 0.26 | 8500 | 0.57 | 14750 | 0.71 |
| 2500 | 0.32 | 8750 | 0.54 | 15000 | 0.73 |
| 2750 | 0.35 | 9000 | 0.53 | 15250 | 0.64 |
| 3000 | 0.45 | 9250 | 0.54 | 15500 | 0.62 |
| 3250 | 0.51 | 9500 | 0.55 | 15750 | 0.76 |
| 3500 | 0.63 | 9750 | 0.54 | 16000 | 0.92 |
| 3750 | 0.56 | 10000 | 0.58 | 16250 | 0.86 |
| 4000 | 0.52 | 10250 | 0.63 | 16500 | 0.84 |
| 4250 | 0.49 | 10500 | 0.73 | 16750 | 0.86 |
| 4500 | 0.47 | 10750 | 0.77 | 17000 | 1.02 |
| 4750 | 0.42 | 11000 | 0.81 | 17250 | 1.02 |
| 5000 | 0.42 | 11250 | 0.84 | 17500 | 0.91 |
| 5250 | 0.47 | 11500 | 0.87 | 17750 | 0.91 |
| 5500 | 0.56 | 11750 | 0.84 | 18000 | 1.07 |