

TEST REPORT

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

FOR:

Airspan Networks (Israel) Ltd.
Indoor Unit (external antenna)
Model:IDR 2.4

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1 Applicant information

Client name: Airspan Networks (Israel) Ltd.
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Telephone: +972 3977 7444
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E-mail: zlevi@airspan.com
Contact name: Mr. Zion Levi

2 Equipment under test attributes

Product name: Indoor Unit (external antenna)
Product type: IDR
Model(s): IDR 2.4
Serial number: 063A37FFFF
Receipt date: 9/9/2004

3 Manufacturer information

Manufacturer name: Airspan Networks (Israel) Ltd.
Address: 1, Harava street, "Unitronics" building, POB 199, Airport City, 70100, Israel
Telephone: +972 3977 7444
Fax: +972 3977 7400
E-Mail: zlevi@airspan.com
Contact name: Mr. Zion Levi

4 Test details





Project ID: 16078
Location: Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started: 9/9/2004
Test completed: 9/19/2004
Test specification(s): FCC part 15 subpart C, §15.247(c); §15.207, subpart B, §15.107, §15.109
Test suite: FCC_15.247_FHSS_with_RF_connector (5/4/2004 10:54:02 AM, modified)

5 Tests summary

| Test | Status |
|---|--------------|
| Transmitter characteristics | |
| Section 15.247(a)(1), Minimum frequency channel separation | Pass |
| Section 15.247(a)(1), Minimum bandwidth | Not required |
| Section 15.247(a)(1), Minimum number of hopping channels | Not required |
| Section 15.247(b), Peak output power | Pass |
| Section 15.247(d), Peak power density | Pass |
| Section 15.247(f), Average time of occupancy | Pass |
| Section 15.247(c), Radiated spurious emissions | Pass |
| Section 15.207(a), Conducted emission | 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. The 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.

| | Name and Title | Date | Signature |
|---------------------|---|--------------------|---|
| Tested by: | Mr. M. Lerman, test engineer | September 19, 2004 |  |
| Reviewed by: | Mrs. M. Cherniavsky, certification engineer | November 17, 2004 |  |
| | Mr. M. Nikishin, EMC group leader | November 17, 2004 |  |
| Approved by: | Mr. A. Usoskin, C.E.O. | November 18, 2004 |  |

6 EUT description

6.1 General information

An indoor radio adapter, IDR 2400 MHz, is a part of a WipLL broadband access system. The system provides a radio link between an end-user (a subscriber) and a network itself to give high-speed data access. The EUT is a hybrid system transceiver (8FSK digital modulation with frequency hopping, data rate 3 Mbps and 4 Mbps), operating in 2400 MHz to 2483.5 MHz range and powered by mains. The IDR is installed inside the subscriber's premises, typically mounted on a wall, desktop, or pole. The IDR is connected to a third-party 17 dBi gain panel or 12 dBi omnidirectional external antenna, which is typically mounted outside to provide line-of-site with the base station.

6.2 EUT modules

| Description | Manufacturer | Model number | Serial number |
|--------------|--------------|--------------|---------------|
| Transceiver | AirSpan | IDR hybrid | 063A37FFFF |
| Power supply | YCL | ADE-1721 | 90227036920 |
| Antenna | TELTECH | TA2308 | 40946.1 |
| Antenna | TELTECH | TA2350-2 | 40947.1 |

6.3 Ports and lines

| Port type | Port description | Connected | | Connector type | Qty. | Cable type | Cable length | Indoor / outdoor |
|-----------|------------------|-----------|---------------|----------------|------|------------|--------------|------------------|
| | | From | To | | | | | |
| IDR | | | | | | | | |
| Signal | Ethernet | EUT | LAPTOP | RJ45 | 1 | UTP | 1m* | Indoor |
| Signal | Management | EUT | Not connected | RJ11 | NA | NA | NA | NA |
| Signal | RF | EUT | ANTENNA | TNC | 1 | COAX | 1m* | Outdoor |
| Power | DC power | EUT | PS | 6-pin jack | 1 | Power | 1.5m | Indoor |
| Power | AC mains | PS | AC mains | IEC 320 | 1 | Power | 1.5m | Indoor |
| LAPTOP | | | | | | | | |
| Signal | Keyboard | LAPTOP | Keyboard | PS/2 | 1 | Shielded | 1.5m | Indoor |
| Signal | RS-232 | LAPTOP | Mouse | D-Type 9 | 1 | Shielded | 1.5m | Indoor |
| Signal | LPT | LAPTOP | Printer | D-Type 25 | 1 | Shielded | 15m | Indoor |
| Power | DC power | LAPTOP | PS | 3-pin jack | 1 | Power | 1.5m | Indoor |
| Power | AC mains | PS | AC mains | IEC 320 | 1 | Power | 1.5m | Indoor |

*- Can be longer than 30m

6.4 Support and test equipment

| Description | Manufacturer | Model number | Serial number |
|-------------|--------------|--------------|---------------------------|
| Laptop | DELL | Latitude | TW-0791UH-12800-OCS-2939 |
| P.S. | DELL | ADP-70EB | TUA-09364U-17971-09P-JQLA |
| Mouse | Logitech | M-M30 | 811209 |
| Keyboard | BTC | 9198 | 300152177 |
| Printer | EPSON | LX-810 | 44B1127035 |

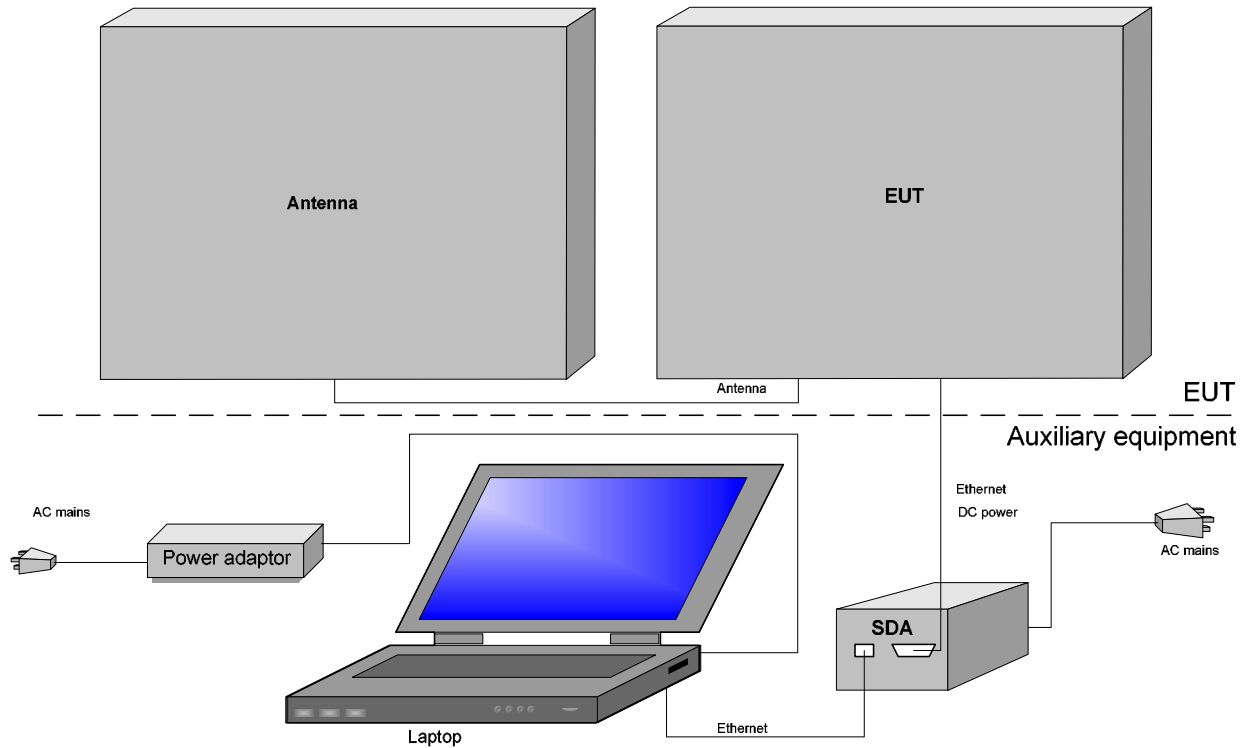
6.5 Operating frequencies

| Source | Frequency, MHz | | | |
|-----------------|----------------|-----------|-------------|--------|
| Digital portion | (clock) | 48 | 25 | 20 |
| Receiver | 6 (BASEBAND) | 350 (LO1) | 2133.5(LO2) | 2483.5 |
| Transmitter | 6 (BASEBAND) | 350 (LO1) | 2133.5(LO2) | 2483.5 |
| CPU | | 500 | | |
| SDRAM | | 133 | | |
| PCI | | 33 | | |

6.6 Changes made in the EUT

No changes were implemented.

6.7 Test configuration



| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.247(b)1, Peak output power | |
| Test procedure: | | Public notice DA 00-705, Section 15.247(b) | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

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

7.1 Peak output power test

7.1.1 General

This test was performed to measure the peak output power at RF antenna connector. Specification test limits are given in Table 7.3.1. The test results are provided in Table 7.3.2 and associated plots.

Table 7.1.1 Peak output power limits

| Assigned frequency range, MHz | Maximum peak output power | |
|-------------------------------|---------------------------|-----|
| | W | dBm |
| 2400 – 2483.5 | 1 | 30 |

NOTE: If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated values by the amount in dB that the directional gain of antenna exceeds 6 dBi.

The panel antenna gain is 17 dBi, the peak output power limit is $30 - (17 - 6) = 19$ dBm;

The omnidirectional antenna gain is 12 dBi, the peak output power limit is $30 - (12 - 6) = 24$ dBm

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

7.1.2.2 The EUT was adjusted to produce maximum available for end user RF output power.

7.1.2.3 The peak output power was measured with spectrum analyzer as provided in Table 7.3.2 and associated plots.

Figure 7.1.1 Peak output power test setup



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(b)1, Peak output power | | |
| Test procedure: | Public notice DA 00-705, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.1.2 Peak output power test results

OPERATING FREQUENCY RANGE: 2403 – 2481 MHz
DETECTOR USED: Peak
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
HOPPING FUNCTION: Disabled

| Carrier frequency, MHz | Power meter reading, dBm | External attenuation, dB | RF power, dBm | Cable loss, dB | RF output power, dBm | Limit, dBm | Margin, dB | Verdict |
|------------------------|--------------------------|--------------------------|---------------|----------------|----------------------|------------|------------|---------|
| 2403 | -30.0 | 50.5 | 20.50 | 4.4 | 16.1 | 19 | 2.90 | Pass |
| 2450 | -27.33 | 50.5 | 23.17 | 4.4 | 18.77 | 19 | 0.23 | Pass |
| 2481 | -27.17 | 50.5 | 23.33 | 4.4 | 18.93 | 19 | 0.07 | Pass |

The device equipped by 100 feet length cable, BELDEN 9905, with 4.4 dB cable loss.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|---------|--|--|--|
| HL 0661 | HL 1562 | HL 2014 | HL 2227 | HL 2400 | | | |
|---------|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

| | | | |
|----------------------------|-------------------------------|---|------------------------------|
| Test specification: | | Section 15.247(a)1, Carrier frequency separation | |
| Test procedure: | | Public notice DA 00-705, Section 15.247(b) | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

7.2 Carrier frequency separation

7.2.1 General

This test was performed to measure frequency separation between the peaks of adjacent channels. Specification test limits are given in Table 7.2.1.

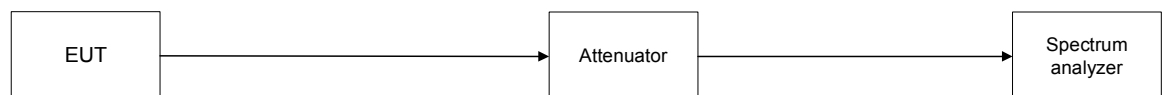
Table 7.2.1 Carrier frequency separation limits

| Assigned frequency range, MHz | Carrier frequency separation |
|-------------------------------|--|
| 2400.0 – 2483.5 | 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater |

7.2.2 Test procedure

- 7.2.2.1** The EUT was set up as shown in Figure 7.2.1, energized with frequency hopping function enabled and its proper operation was checked.
- 7.2.2.2** The spectrum analyzer span was set to capture the carrier frequency and both of adjacent channels, the lower and the higher. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.2.2.3** The spectrum analyzer was set in max hold mode and allowed trace to stabilize.
- 7.2.2.4** The frequency separation between the peaks of adjacent channels was measured as provided in Table 7.2.2 and associated plots.

Figure 7.2.1 Carrier frequency separation test setup



| | | | |
|----------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(a)1, Carrier frequency separation | | |
| Test procedure: | Public notice DA 00-705, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.2.2 Carrier frequency separation test results

OPERATING FREQUENCY RANGE: 2403 – 2481 MHz
 MODULATION: 8FSK
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 100 kHz
 FREQUENCY HOPPING: Enabled
 20 dB BANDWIDTH: 980 kHz

| Carrier frequency separation, kHz | Limit, kHz | Margin* | Verdict |
|-----------------------------------|------------|---------|---------|
| 1000 | 980 | 20 | Pass |

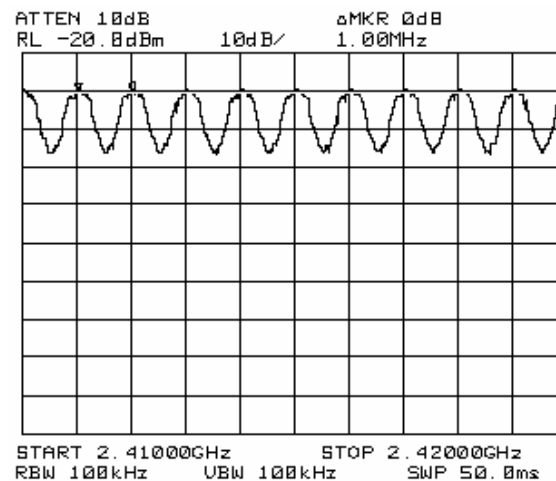
* - Margin = Carrier frequency separation – specification limit.

Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|--|--|--|--|--|--|
| HL 0057 | HL 1424 | | | | | | |
|---------|---------|--|--|--|--|--|--|

Full description is given in Appendix A.

Plot 7.2.1 Carrier frequency separation



| | | | |
|-----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.247(d), Peak power density | |
| Test procedure: | | FR Vol. 62, page 26243, Section 15.247(d) | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

7.3 Peak spectral power density

7.3.1 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 7.3.1.

Table 7.3.1 Peak spectral power density limits

| Assigned frequency range, MHz | Measurement bandwidth, kHz | Peak spectral power density, dBm |
|----------------------------------|-------------------------------|-------------------------------------|
| 2400.0 – 2483.5 | 3.0 | 8.0 |

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 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. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.

7.3.2.4 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 7.3.2 and associated plots.

Figure 7.3.1 Peak spectral power density test setup



| | | | |
|-----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.247(d), Peak power density | |
| Test procedure: | | FR Vol. 62, page 26243, Section 15.247(d) | |
| Test mode: | | Verdict: PASS | |
| Date & Time: | | | |
| 7/5/2004 4:03:01 PM | | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.3.2 Peak spectral power density test results

OPERATING FREQUENCY RANGE: 2403 – 2481 MHz
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 1.0, 2.0, 3.0 and 1.33, 4.0 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: For 3.0 Mbps:
 23.3 dBm at low carrier frequency
 23.3 dBm at mid carrier frequency
 23.3 dBm at high carrier frequency
 For 1.33 Mbps:
 23.2 dBm at low carrier frequency
 23.2 dBm at mid carrier frequency
 23.2 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 |
|--|--------------------------------|--------------------------|----------------|----------------------------------|------------|-------------|---------|
| 3.0 Mbps data rate (the worst case from 1.0, 2.0 and 3.0 Mbps which correspond to 1.0 Msymbol per second) | | | | | | | |
| 2402.0 | 5.0 | Included | Included | 5.0 | 8.0 | -3.0 | Pass |
| 2441.0 | 5.3 | Included | Included | 5.3 | 8.0 | -2.7 | Pass |
| 2480.0 | 5.0 | Included | Included | 5.0 | 8.0 | -3.0 | Pass |
| 1.33 Mbps data rate (the worst case from 1.33, and 4.0 Mbps which correspond to 1.33 Msymbol per second) | | | | | | | |
| 2403.0 | 2.0 | Included | Included | 2.0 | 8.0 | -6.0 | Pass |
| 2441.0 | 1.3 | Included | Included | 1.3 | 8.0 | -6.7 | Pass |
| 2477.0 | 1.3 | Included | Included | 1.3 | 8.0 | -6.7 | Pass |

* - Margin = Peak power density – specification limit.

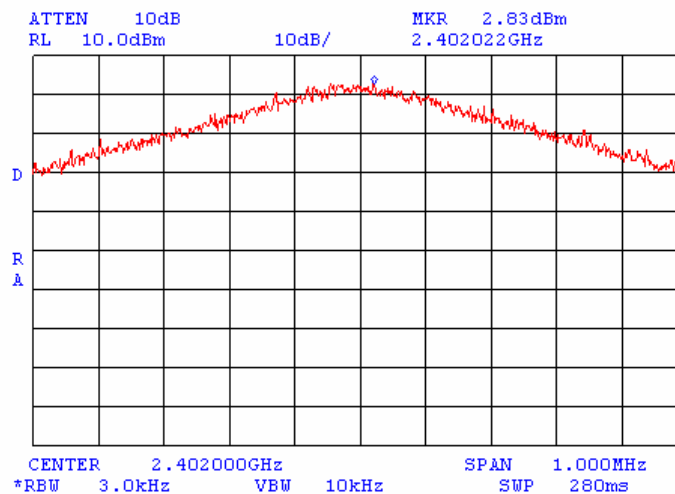
Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|---------|--|--|--|--|
| HL 1424 | HL 1651 | HL 2254 | HL 2524 | | | | |
|---------|---------|---------|---------|--|--|--|--|

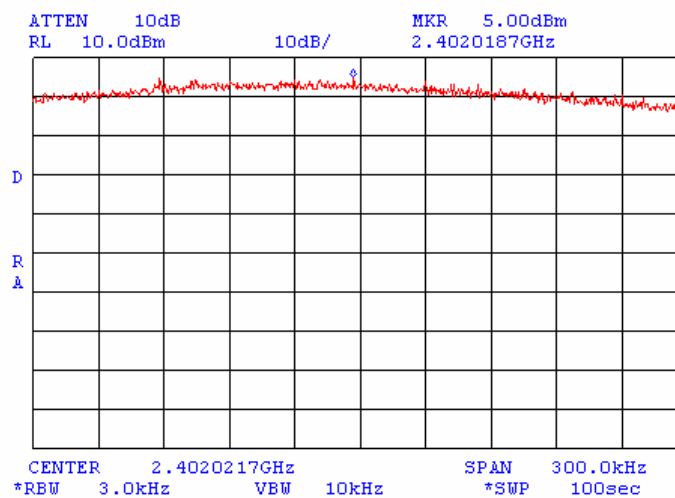
Full description is given in Appendix A.

| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.1 Peak spectral power density at low frequency within 6 dB band. 3.0 Mbps data rate.

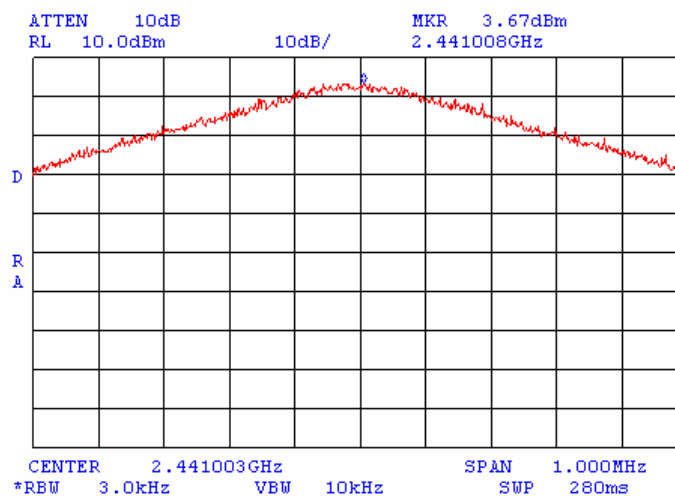


Plot 7.3.2 Peak spectral power density at low frequency zoomed at the peak. 3.0 Mbps data rate.

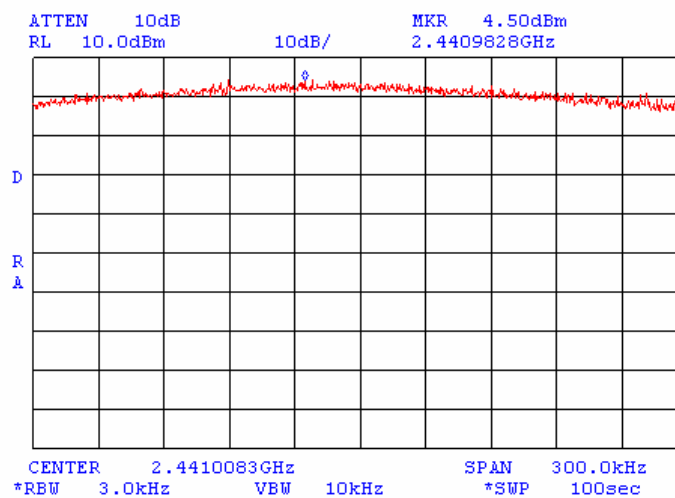


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.3 Peak spectral power density at mid frequency within 6 dB band. 1.0 Mbps data rate.

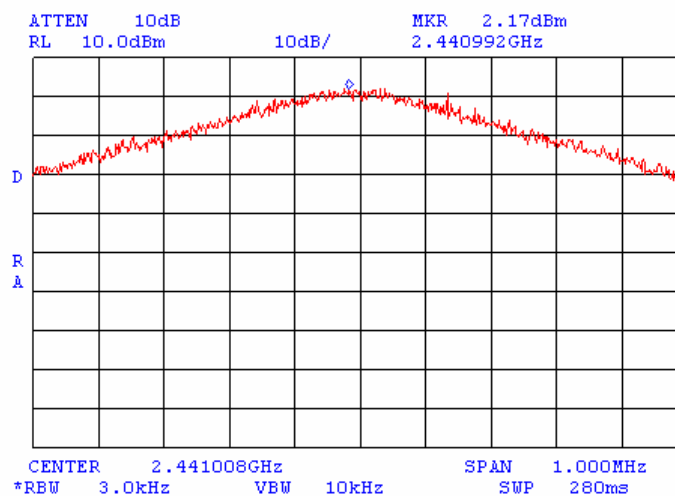


Plot 7.3.4 Peak spectral power density at mid frequency zoomed at the peak. 1.0 Mbps data rate.

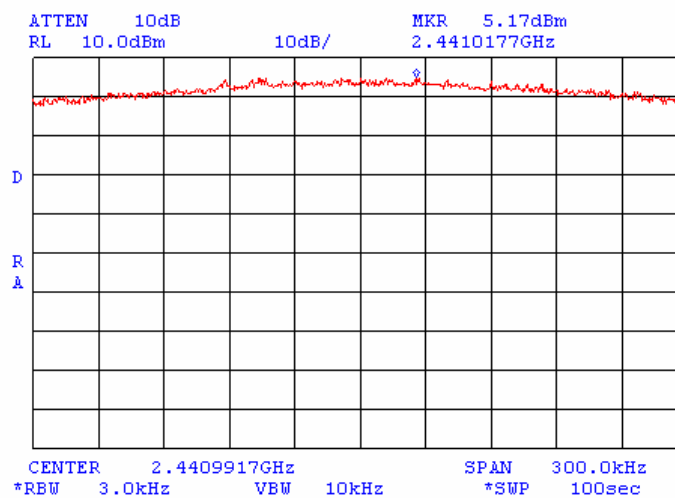


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.5 Peak spectral power density at mid frequency within 6 dB band. 2.0 Mbps data rate.

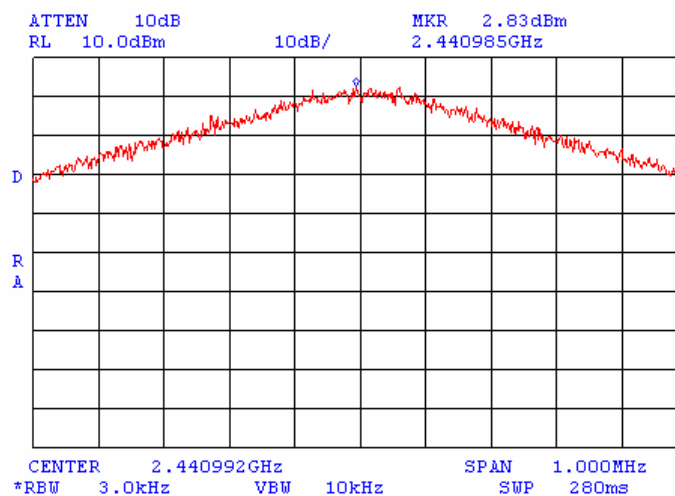


Plot 7.3.6 Peak spectral power density at mid frequency zoomed at the peak. 2.0 Mbps data rate.

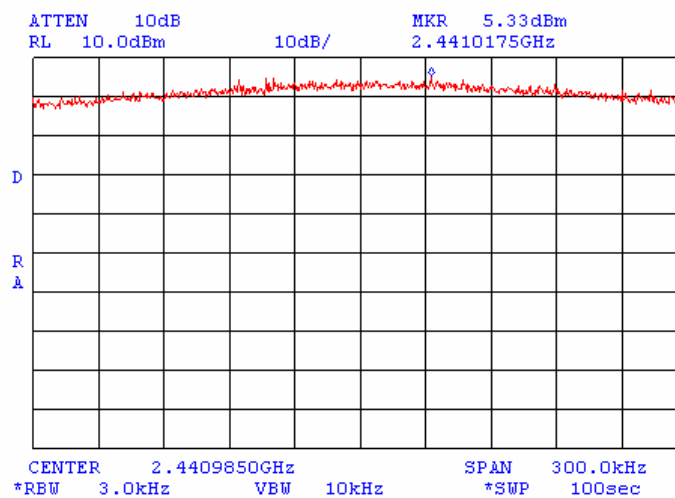


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.7 Peak spectral power density at mid frequency within 6 dB band. 3.0 Mbps data rate.

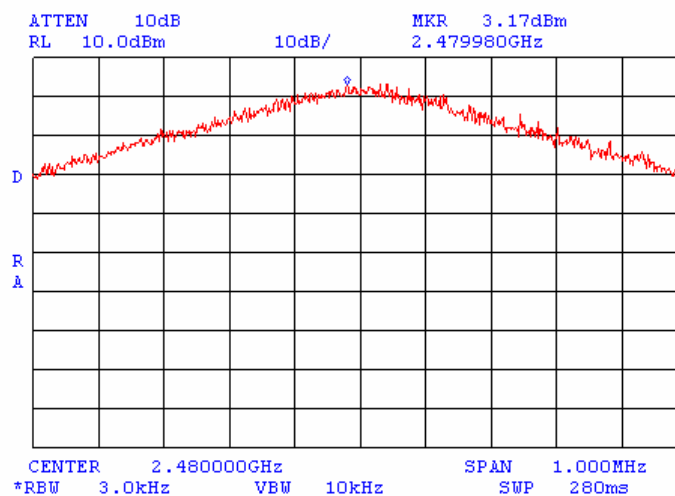


Plot 7.3.8 Peak spectral power density at mid frequency zoomed at the peak. 3.0 Mbps data rate.

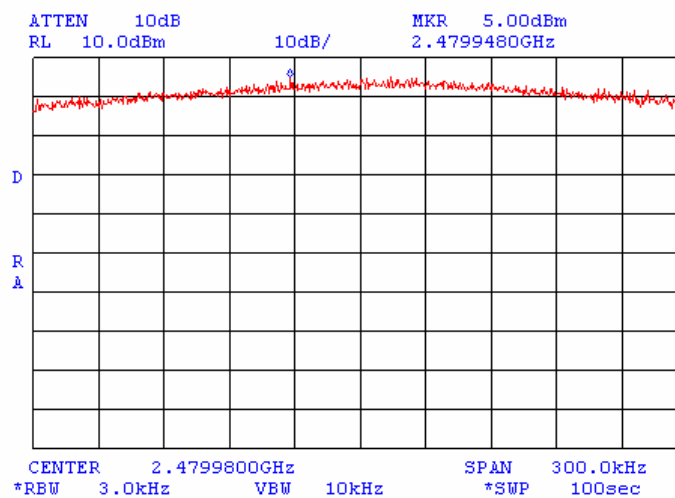


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.9 Peak spectral power density at high frequency within 6 dB band. 3.0 Mbps data rate.

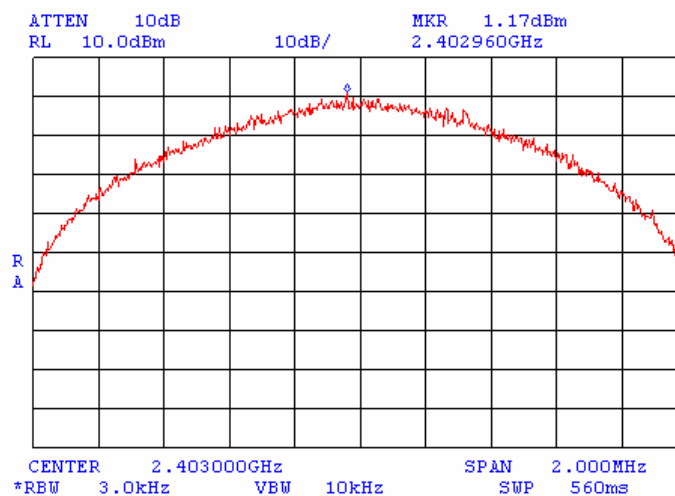


Plot 7.3.10 Peak spectral power density at high frequency zoomed at the peak. 3.0 Mbps data rate.

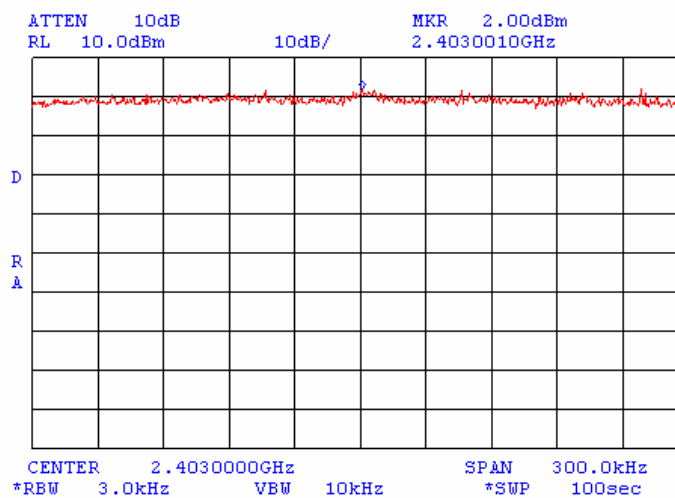


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.11 Peak spectral power density at low frequency within 6 dB band. 1.33 Mbps data rate.

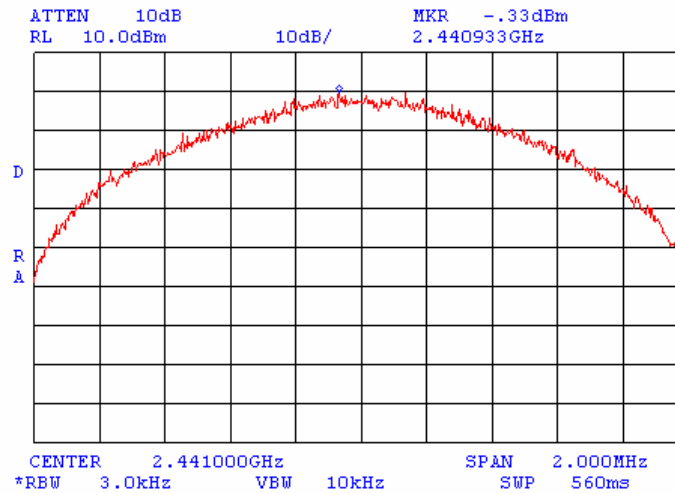


Plot 7.3.12 Peak spectral power density at low frequency zoomed at the peak. 1.33 Mbps data rate.

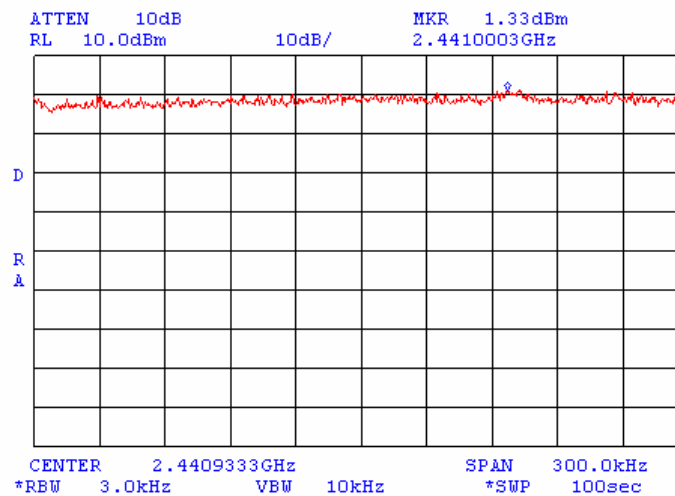


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.13 Peak spectral power density at mid frequency within 6 dB band. 1.33 Mbps data rate.

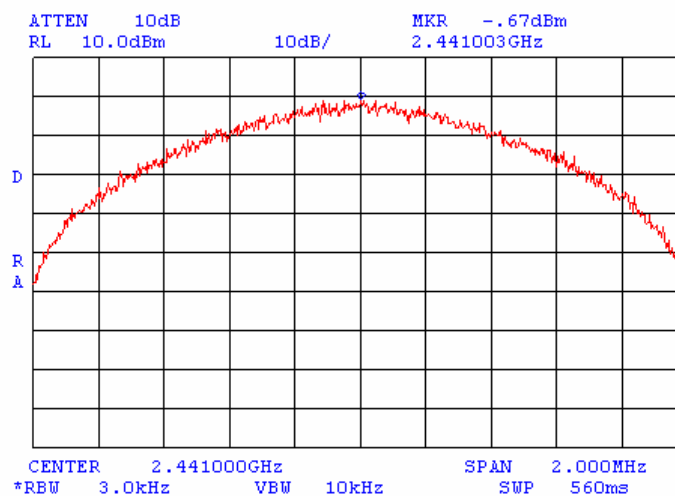


Plot 7.3.14 Peak spectral power density at mid frequency zoomed at the peak. 1.33 Mbps data rate.

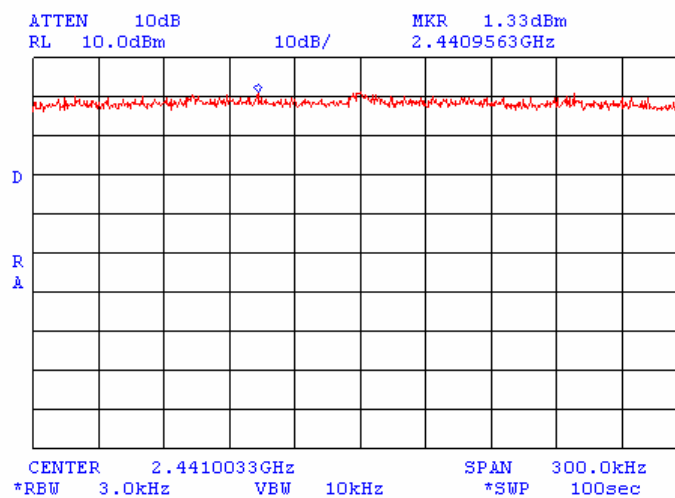


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.15 Peak spectral power density at mid frequency within 6 dB band. 4.0 Mbps data rate.

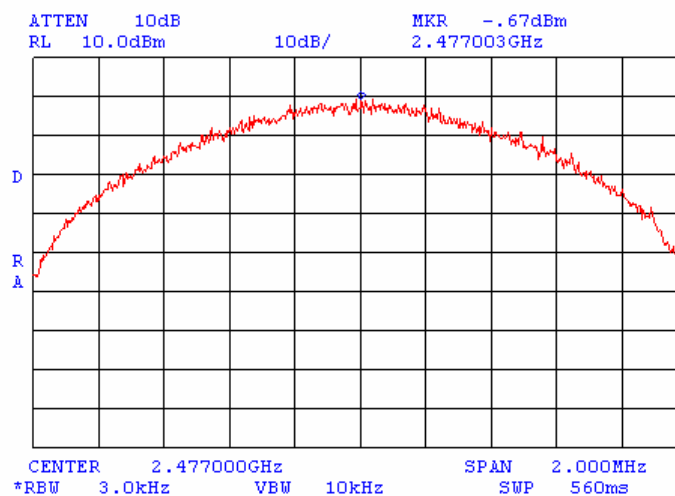


Plot 7.3.16 Peak spectral power density at mid frequency zoomed at the peak. 4.0 Mbps data rate.

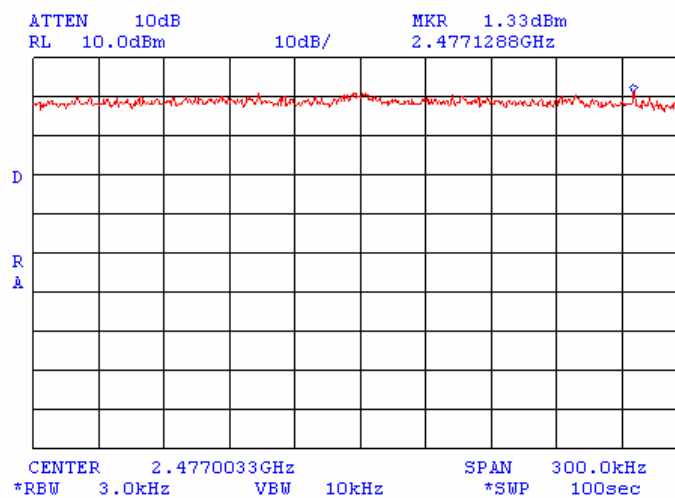


| | | | |
|-----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.247(d), Peak power density | | |
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 7/5/2004 4:03:01 PM | | |
| Temperature: 25,4 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.3.17 Peak spectral power density at high frequency within 6 dB band. 1.33 Mbps data rate.



Plot 7.3.18 Peak spectral power density at high frequency zoomed at the peak. 1.33 Mbps data rate.



| | | | |
|----------------------------|-------------------------------|---|------------------------------|
| Test specification: | | Section 15.247(a)(1)(iii), Average time of occupancy | |
| Test procedure: | | Public notice DA 00-705 | |
| Test mode: | | Compliance | Verdict: PASS |
| Date & Time: | | 9/19/2004 4:03:01 PM | |
| Temperature: 25 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

7.4 Average time of occupancy

7.4.1 General

This test was performed to calculate the average time of occupancy (dwell time) on any frequency channel of the EUT. Specification test limits are given in Table 7.4.1.

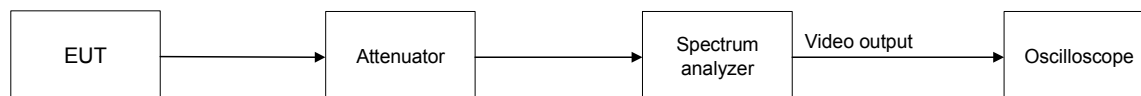
Table 7.4.1 Average time of occupancy limits

| Assigned frequency range, MHz | Maximum average time of occupancy, s | Investigated period, s | Number of hopping frequencies |
|-------------------------------|--------------------------------------|------------------------|-------------------------------|
| 2400.0 – 2483.5 | 0.4 | $0.4 \times N$ | $N (\geq 15)$ |

7.4.2 Test procedure

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1 , energized with frequency hopping function enabled and its proper operation was checked.
- 7.4.2.2 The spectrum analyzer span was set to zero centered on a hopping channel.
- 7.4.2.3 The single transmission duration and period were measured with oscilloscope.
- 7.4.2.4 The average time of occupancy was calculated as the single transmission time multiplied by the investigated period and divided by the single transmission period.
- 7.4.2.5 The test was repeated at each data rate and modulation type as provided in Table 7.4.2 and associated plots.

Figure 7.4.1 Average time of occupancy test setup



| | | | | | |
|----------------------------|--|---|--|--------------------------------|------------------------------|
| Test specification: | | Section 15.247(a)(1)(iii), Average time of occupancy | | | |
| Test procedure: | | Public notice DA 00-705 | | | |
| Test mode: | | Compliance | | Verdict: PASS | |
| Date & Time: | | 9/19/2004 4:03:01 PM | | | |
| Temperature: 25 °C | | Air Pressure: 1006 hPa | | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | | | |

Table 7.4.2 Average time of occupancy test results

OPERATING FREQUENCY RANGE: 2403 – 2481 MHz
MODULATION: FSK
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1 MHz
VIDEO BANDWIDTH: 3 MHz
NUMBER OF HOPPING FREQUENCIES: 79
INVESTIGATED PERIOD: 31.6 s
FREQUENCY HOPPING: Enabled

| Single transmission duration, ms | Single transmission period, s | Average time of occupancy*, s | Limit, s | Margin, s** | Verdict |
|----------------------------------|-------------------------------|-------------------------------|----------|-------------|---------|
| 25.3 | 3.950 | 0.202 | 0.4 | 0.198 | Pass |

* - Average time of occupancy = (Single transmission duration × Investigated period) / Single transmission period.

** - Margin = Average time of occupancy – specification limit.

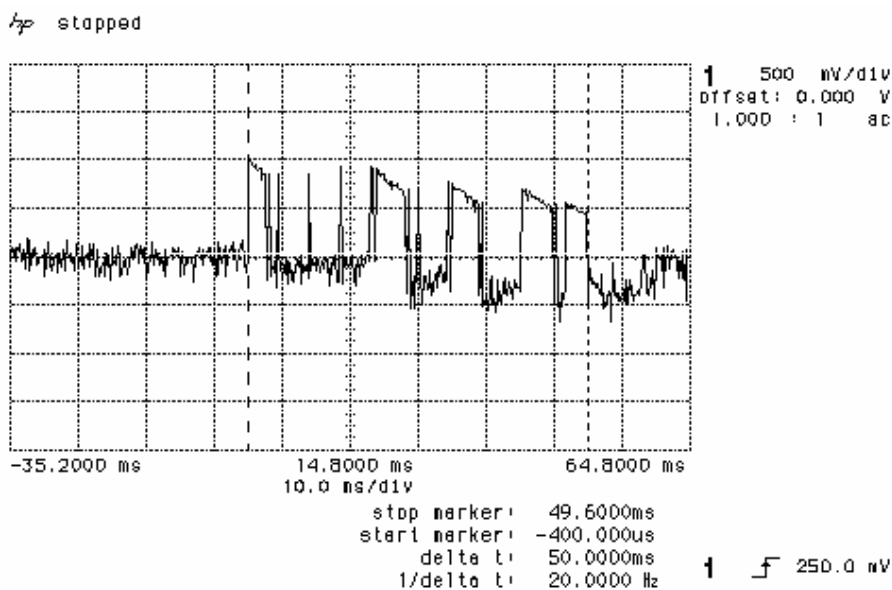
Reference numbers of test equipment used

| | | | | | | | |
|---------|---------|---------|--|--|--|--|--|
| HL 0057 | HL 0483 | HL 1424 | | | | | |
|---------|---------|---------|--|--|--|--|--|

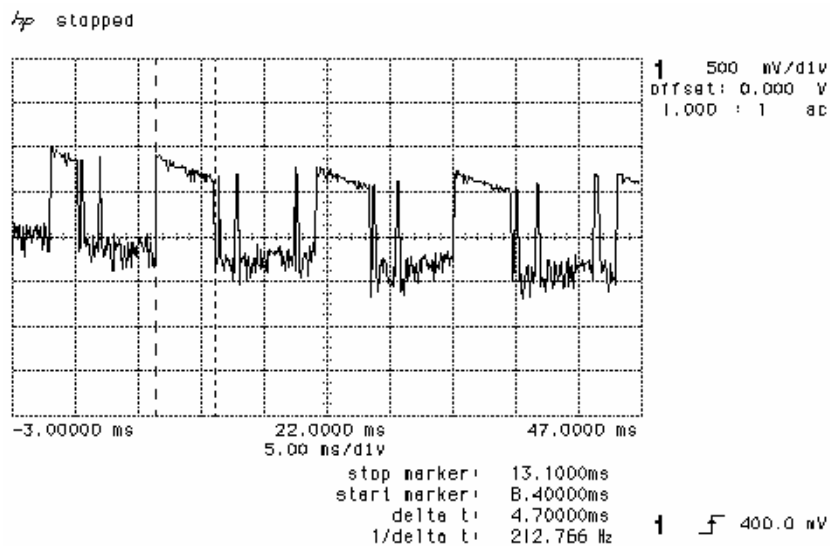
Full description is given in Appendix A.

| | | | | | |
|----------------------------|--|---|--|--------------------------------|------------------------------|
| Test specification: | | Section 15.247(a)(1)(iii), Average time of occupancy | | | |
| Test procedure: | | Public notice DA 00-705 | | | |
| Test mode: | | Compliance | | Verdict: PASS | |
| Date & Time: | | 9/19/2004 4:03:01 PM | | | |
| Temperature: 25 °C | | Air Pressure: 1006 hPa | | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | | | |

Plot 7.4.1 Single transmission duration measurement

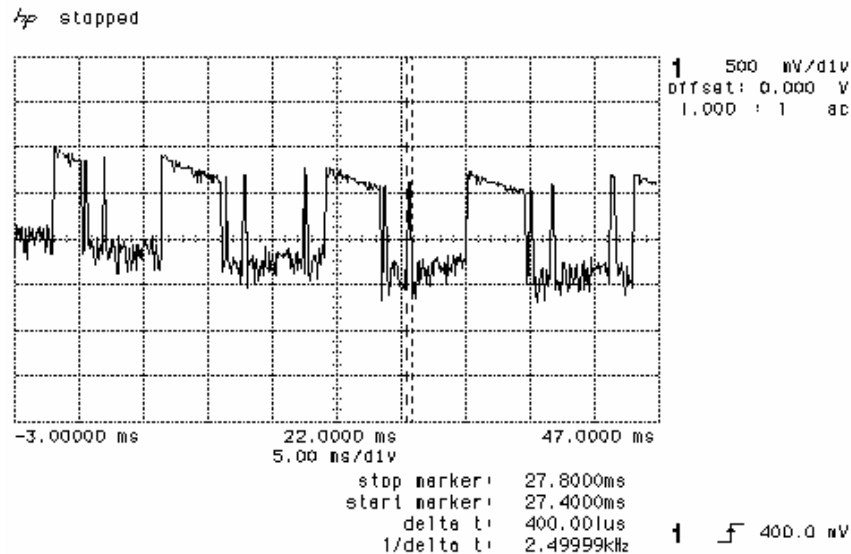


Plot 7.4.2 Single transmission duration measurement



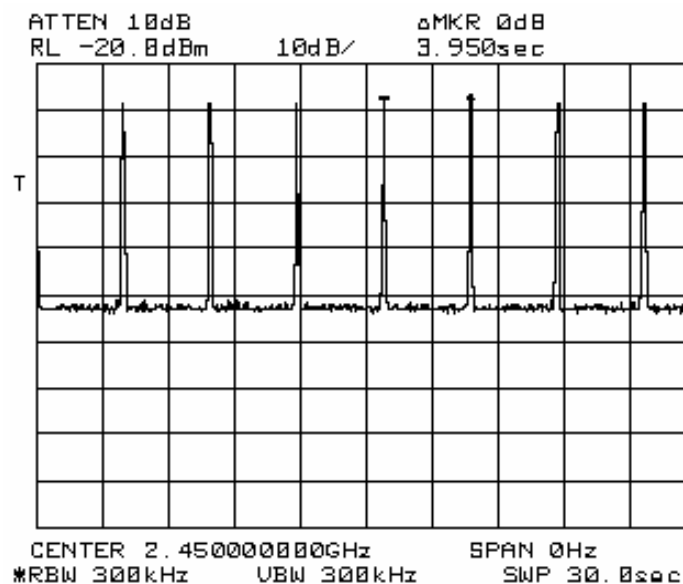
| | | | |
|----------------------------|-------------------------------|---|------------------------------|
| Test specification: | | Section 15.247(a)(1)(iii), Average time of occupancy | |
| Test procedure: | | Public notice DA 00-705 | |
| Test mode: | | Compliance | Verdict: PASS |
| Date & Time: | | 9/19/2004 4:03:01 PM | |
| Temperature: 25 °C | Air Pressure: 1006 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Plot 7.4.3 Single transmission duration measurement



$$T_{on} = 2.5 + 4.7 \times 4 + 0.4 \times 10 = 25.3 \text{ ms}$$

Plot 7.4.4 Single transmission period



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

7.5 Field strength of spurious emissions

7.5.1 General

This test was performed to measure field strength of spurious emissions from the EUT utilizing panel or omnidirectional antennas. Specification test limits are given in Table 7.5.1.

Table 7.5.1 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 – 0.490* | NA | 128.5 – 93.8** | NA | 20.0 |
| 0.490 – 1.705* | | 73.8 – 63.0** | | |
| 1.705 – 30.0* | | 69.5** | | |
| 30 – 88 | | 40.0 | | |
| 88 – 216 | | 43.5 | | |
| 216 – 960 | | 46.0 | | |
| 960 - 1000 | | 54.0 | | |
| Above 1000 | 74.0 | NA | 54.0 | |

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

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

where S_1 and S_2 – 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.

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

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and the performance check was conducted.

7.5.2.2 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.

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

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

7.5.3.1 The EUT was set up as shown in Figure 7.5.2, energized and the performance check was conducted.

7.5.3.2 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.

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

| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

Figure 7.5.1 Setup for spurious emission field strength measurements below 30 MHz

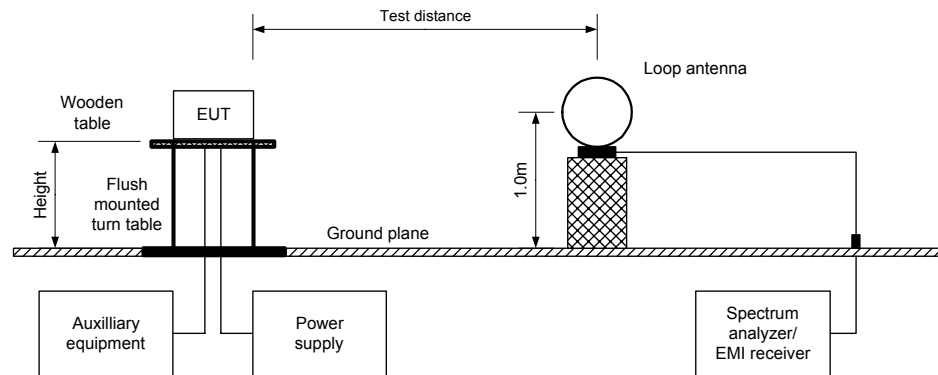
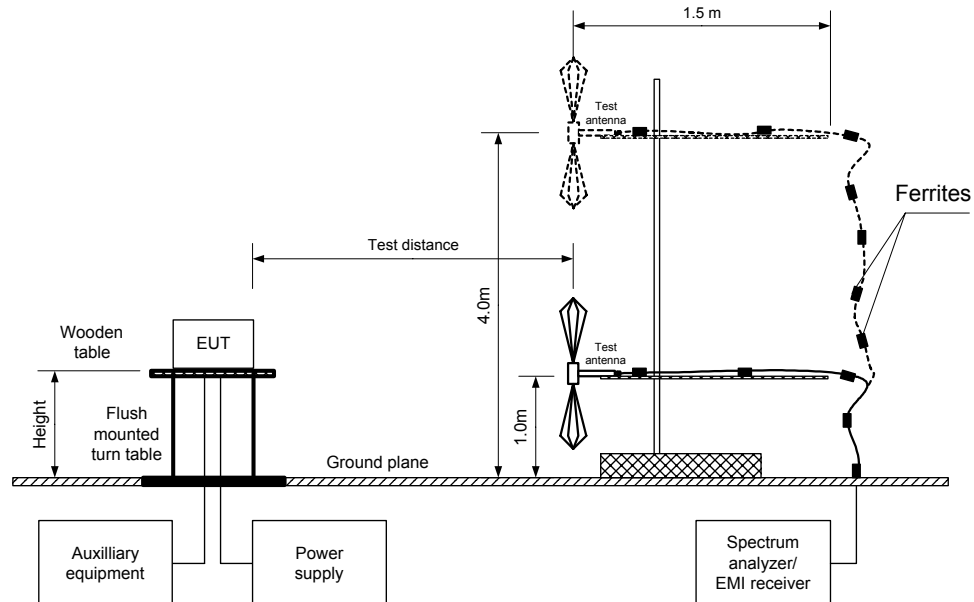


Figure 7.5.2 Setup for spurious emission field strength measurements above 30 MHz



| | | | |
|--|-------------------------------|---|------------------------------|
| Test specification: | | Section 15.247(c), Radiated spurious emissions | |
| Test procedure: | | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | |
| Test mode: | | Verdict: PASS | |
| Date & Time: 9/19/2004 8:16:33 AM | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

Table 7.5.2 Field strength of spurious emissions above 1 GHz within restricted bands

EUT with PANEL ANTENNA

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 - 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: 8FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 3 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide
 FREQUENCY HOPPING: Disabled

| Frequency, MHz | Antenna | | Azimuth, degrees* | Peak field strength(VBW=3 MHz) | | | Average field strength(VBW=10 Hz) | | | | Verdict |
|------------------------|--------------|--------------|----------------------|--------------------------------|--------------------|-----------------|-----------------------------------|-------------------------|--------------------|------------------|---------|
| | Polarization | Height, m | | Measured, dB(μV/m) | Limit, dB(μV/m) | Margin, dB** | Measured, dB(μV/m) | Calculated, dB(μV/m) | Limit, dB(μV/m) | Margin, dB*** | |
| Low carrier frequency | | | | | | | | | | | |
| 1055.043 | H | 1.4 | 60 | 42.53 | 74.00 | -31.47 | 37.18 | 37.18 | 54.00 | -16.82 | Pass |
| 1152.050 | H | 1.1 | 356 | 46.31 | 74.00 | -27.69 | 43.01 | 43.01 | 54.00 | -11.45 | |
| 1200.050 | H | 1.1 | 0 | 46.78 | 74.00 | -27.22 | 43.53 | 43.53 | 54.00 | -11.07 | |
| 1248.045 | H | 1.0 | 330 | 43.75 | 74.00 | -30.25 | 39.54 | 39.54 | 54.00 | -15.50 | |
| 1392.012 | H | 1.3 | 57 | 40.91 | 74.00 | -33.09 | 33.60 | 33.60 | 54.00 | -23.40 | |
| 1439.997 | H | 1.3 | 343 | 40.37 | 74.00 | -33.63 | 33.22 | 33.22 | 54.00 | -24.04 | |
| 1487.998 | H | 1.3 | 360 | 41.96 | 74.00 | -32.04 | 35.91 | 35.91 | 54.00 | -20.47 | |
| 1702.050 | H | 1.7 | 205 | 45.51 | 74.00 | -28.49 | 40.14 | 40.14 | 54.00 | -15.20 | |
| Mid carrier frequency | | | | | | | | | | | |
| 1152.030 | H | 1.2 | 289 | 48.28 | 74.00 | -25.72 | 45.68 | 45.68 | 54.00 | -8.51 | Pass |
| 1200.000 | H | 1.1 | 272 | 46.66 | 74.00 | -27.34 | 43.40 | 43.40 | 54.00 | -11.19 | |
| 1344.040 | H | 1.1 | 70 | 42.17 | 74.00 | -31.83 | 36.37 | 36.37 | 54.00 | -19.78 | |
| 1392.060 | H | 1.0 | 40 | 43.51 | 74.00 | -30.49 | 38.67 | 38.67 | 54.00 | -16.61 | |
| 1440.050 | H | 1.0 | 335 | 44.06 | 74.00 | -29.94 | 39.33 | 39.33 | 54.00 | -16.29 | |
| 1488.000 | H | 1.0 | 33 | 44.11 | 74.00 | -29.89 | 39.50 | 39.50 | 54.00 | -15.84 | |
| 1706.600 | V | 1.0 | 175 | 46.35 | 74.00 | -27.65 | 34.67 | 34.67 | 54.00 | -25.10 | |
| High carrier frequency | | | | | | | | | | | |
| 1152.025 | H | 1.2 | 330 | 46.09 | 74.00 | -27.91 | 43.00 | 43.00 | 54.00 | -11.45 | Pass |
| 1200.040 | H | 1.2 | 335 | 47.02 | 74.00 | -26.98 | 43.65 | 43.65 | 54.00 | -10.97 | |
| 1704.000 | V | 1.0 | 232 | 45.36 | 74.00 | -28.64 | 37.01 | 37.01 | 54.00 | -23.88 | |

*- 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.

Average factor is 0 due to duty cycle, which is 100%

| | | | | |
|-------------------------------|---|--------------------------------|------------------------------|--|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | | |
| Test mode: | Compliance | Verdict: PASS | | |
| Date & Time: | 9/19/2004 8:16:33 AM | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC | |
| Remarks: Panel Antenna | | | | |

Table 7.5.3 Field strength of spurious emissions below 1 GHz within restricted bands

EUT with PANEL ANTENNA

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
 TEST DISTANCE: 3 m
 MODULATION: 8FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 3 Mbps
 DUTY CYCLE: 100 %
 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)
 Biconical (30 MHz – 200 MHz)
 Log periodic (200 MHz – 1000 MHz)
 Biconilog (30 MHz – 1000 MHz)
 FREQUENCY HOPPING: Disabled

| Frequency, MHz | | Peak emission, dB(μV/m) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|------------------------|-------|-----------------------------|-----------------|-------------|---|----------------------|-------------------|--------------------------------|---------|
| | | Measured emission, dB(μV/m) | Limit, dB(μV/m) | Margin, dB* | | | | | |
| Low carrier frequency | | | | | | | | | |
| 167.5225 | 39.17 | 37.19 | 43.50 | -6.31 | H | 2.3 | 0 | Pass | |
| 333.4975 | 38.74 | 35.82 | 46.00 | -10.18 | H | 1.0 | 228 | | |
| 400.1970 | 41.21 | 38.08 | 46.00 | -7.92 | H | 1.0 | 265 | | |
| Mid carrier frequency | | | | | | | | | |
| 167.5165 | 40.79 | 38.57 | 43.50 | -4.93 | V | 1.0 | 304 | Pass | |
| 400.2004 | 38.20 | 34.31 | 46.00 | -11.69 | H | 1.0 | 243 | | |
| High carrier frequency | | | | | | | | | |
| 167.5237 | 43.91 | 41.90 | 43.50 | -1.60 | H | 2.0 | 173 | Pass | |
| 240.0300 | 37.41 | 35.65 | 46.00 | -10.35 | H | 1.0 | 73 | | |

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

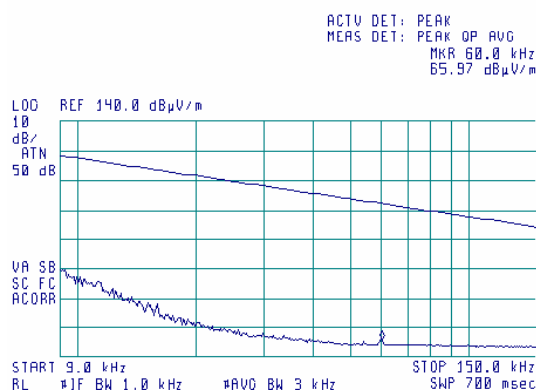
| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0025 | HL 0446 | HL 0465 | HL 0521 | HL 0589 | HL 0592 | HL 0593 | HL 0594 |
| HL 0604 | HL 0768 | HL 0769 | HL 0770 | HL 1424 | HL 1942 | HL 1947 | HL 1984 |
| HL 2009 | HL 2117 | HL 2260 | HL 2261 | HL 2387 | HL 2499 | | |

Full description is given in Appendix A.

| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

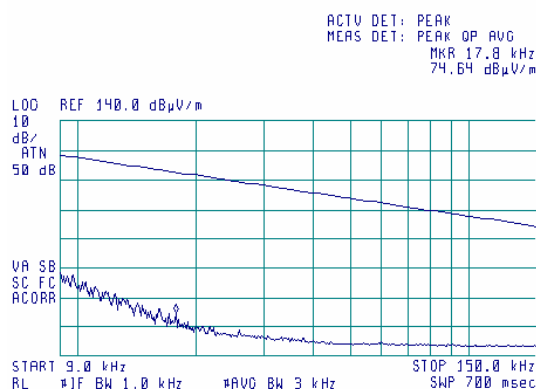
Plot 7.5.1 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

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



Plot 7.5.2 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

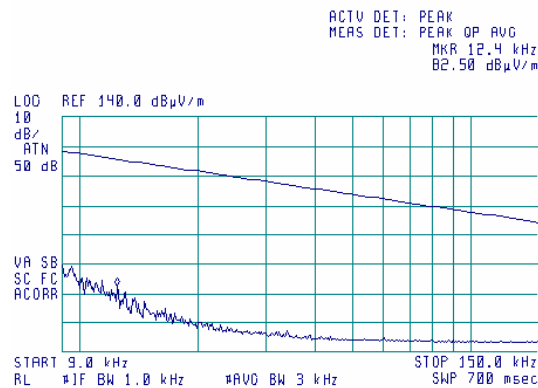
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

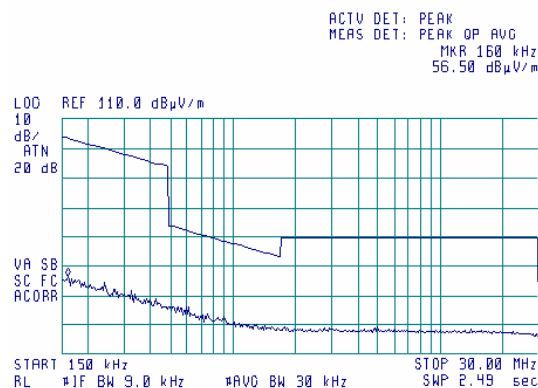
Plot 7.5.3 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

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



Plot 7.5.4 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

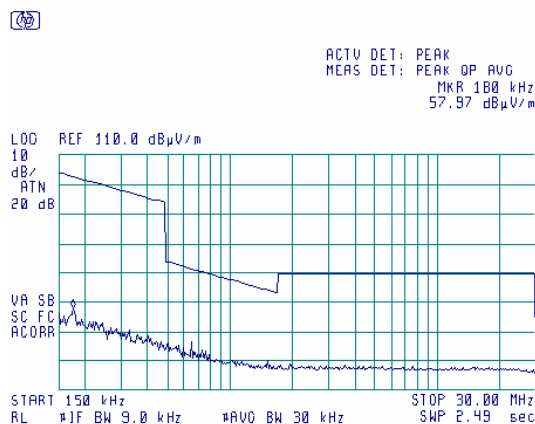
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

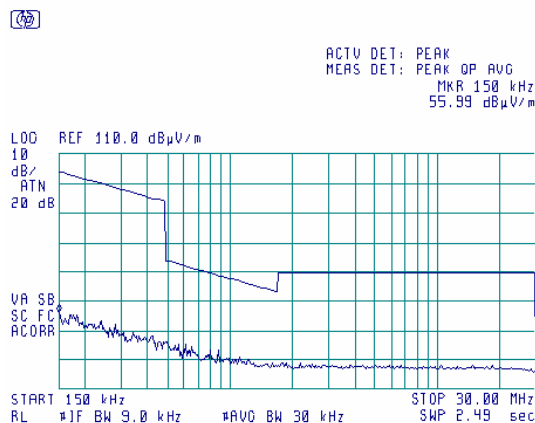
Plot 7.5.5 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

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



Plot 7.5.6 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

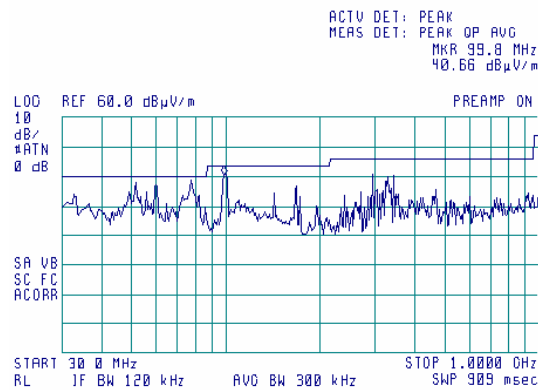
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

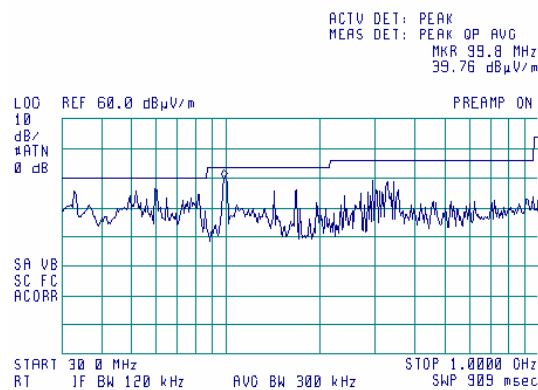
Plot 7.5.7 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

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



Plot 7.5.8 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

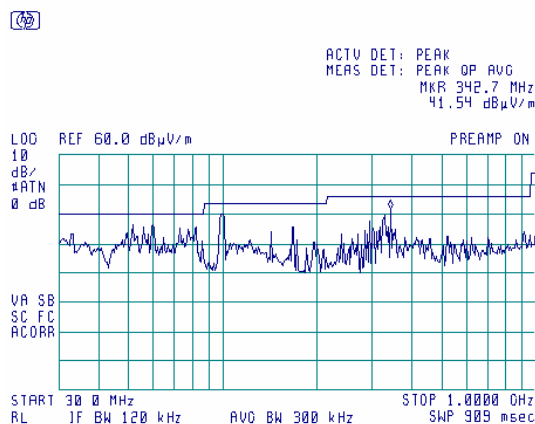
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

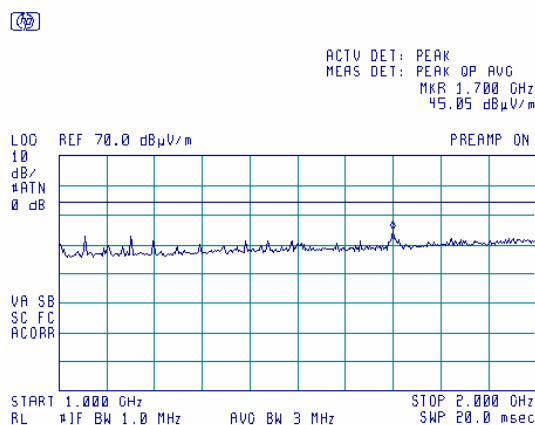
Plot 7.5.9 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

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



Plot 7.5.10 Radiated emission measurements from 1000 to 2000 MHz at the low carrier frequency

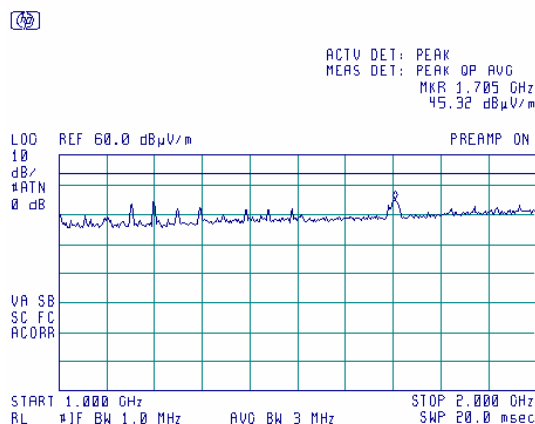
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

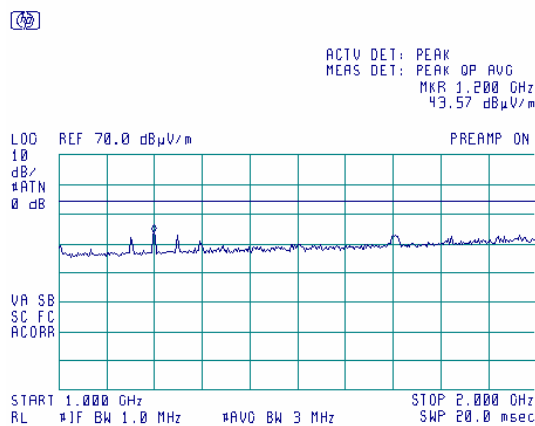
Plot 7.5.11 Radiated emission measurements from 1000 to 2000 MHz at the mid carrier frequency

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



Plot 7.5.12 Radiated emission measurements from 1000 to 2000 MHz at the high carrier frequency

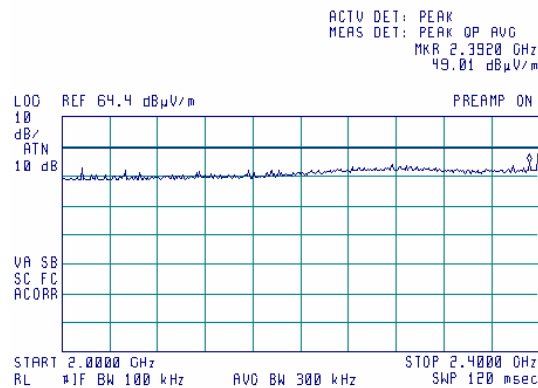
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

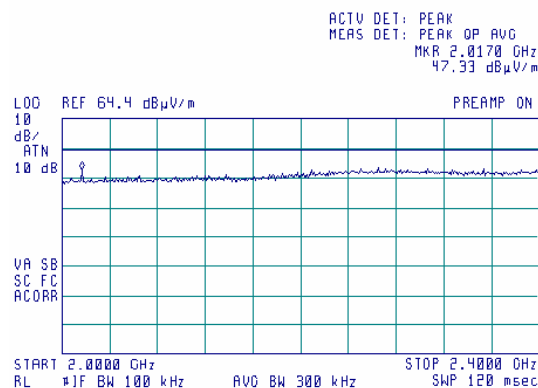
Plot 7.5.13 Radiated emission measurements from 2000 to 2400 MHz at the low carrier frequency

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



Plot 7.5.14 Radiated emission measurements from 2000 to 2400 MHz at the mid carrier frequency

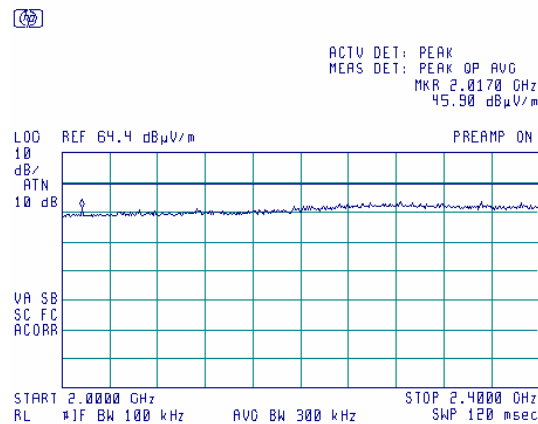
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

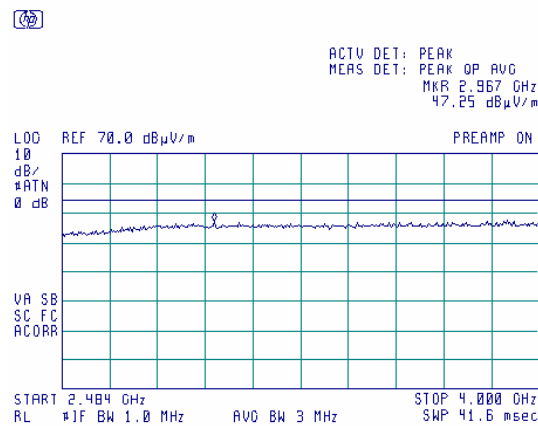
Plot 7.5.15 Radiated emission measurements from 2000 to 2400 MHz at the high carrier frequency

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



Plot 7.5.16 Radiated emission measurements from 2483.5 to 4000 MHz at the low carrier frequency

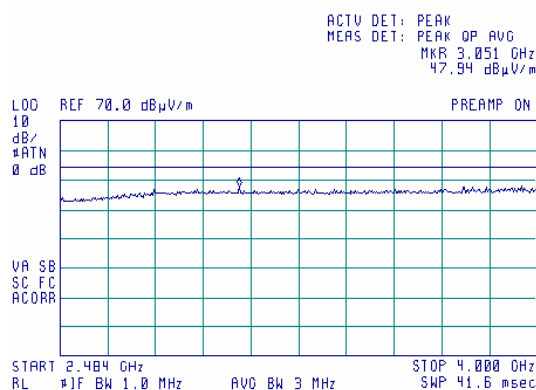
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

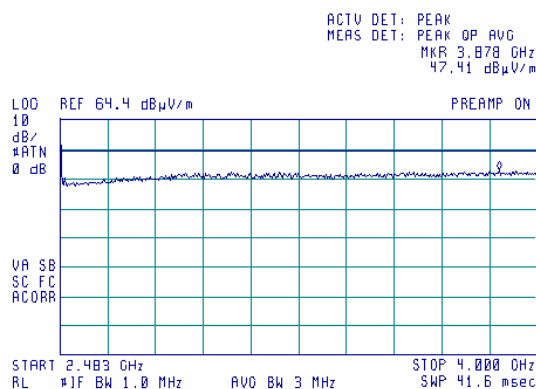
Plot 7.5.17 Radiated emission measurements from 2483.5 to 4000 MHz at the mid carrier frequency

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



Plot 7.5.18 Radiated emission measurements from 2483.5 to 4000 MHz at the high carrier frequency

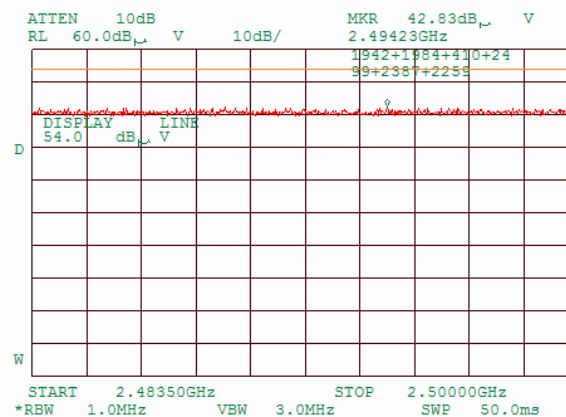
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

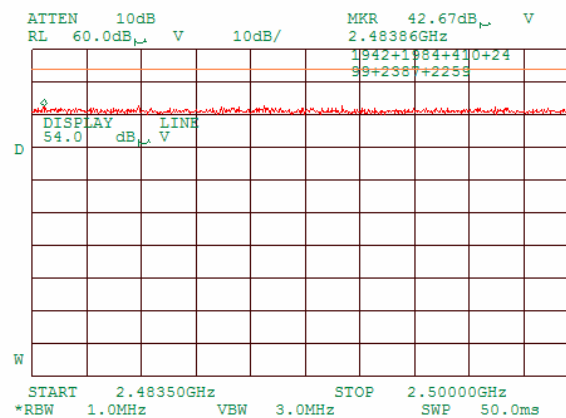
Plot 7.5.19 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 3 Mbps, 1.0 Msymbol per sec



Plot 7.5.20 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

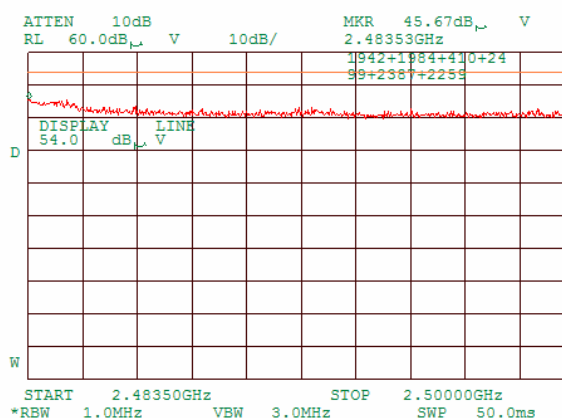
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 3 Mbps, 1.0 Msymbol per sec



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

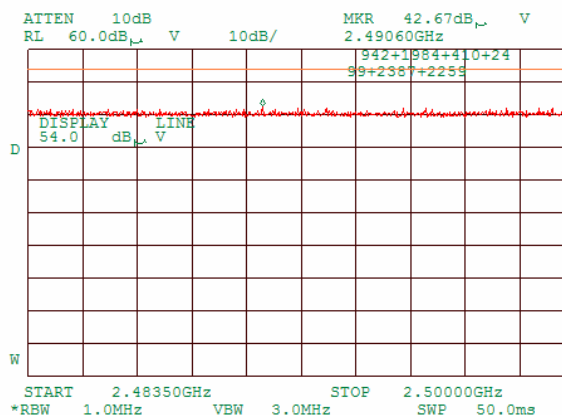
Plot 7.5.21 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 3 Mbps, 1.0 Msymbol per sec



Plot 7.5.22 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

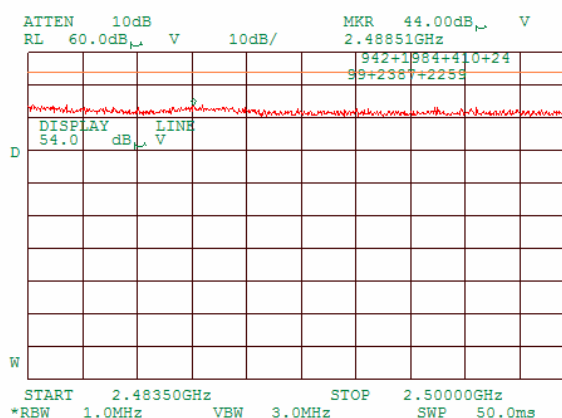
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 4 Mbps, 1.33 Msymbol per sec



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

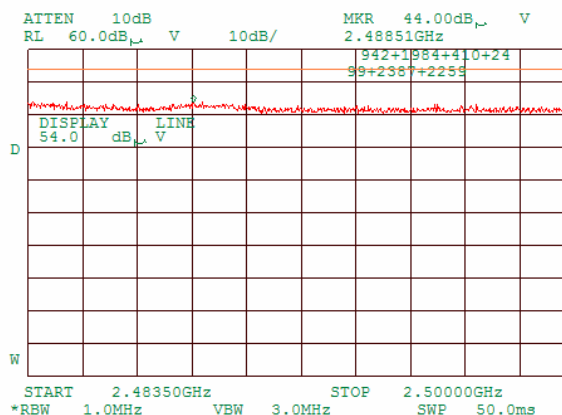
Plot 7.5.23 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 4 Mbps, 1.33 Msymbol per sec



Plot 7.5.24 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

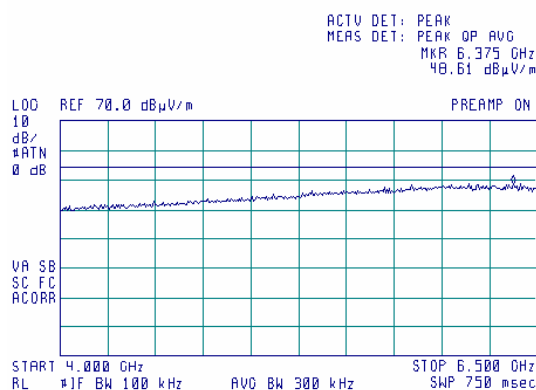
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 4 Mbps, 1.33 Msymbol per sec



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

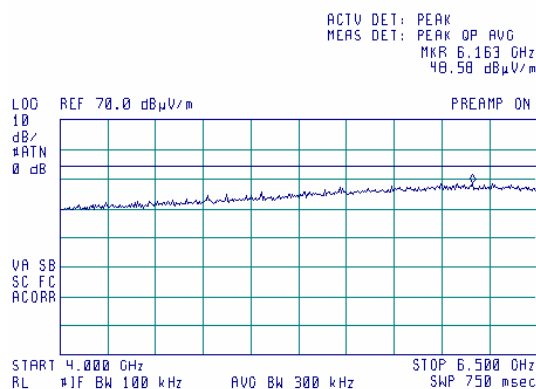
Plot 7.5.25 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency

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



Plot 7.5.26 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency

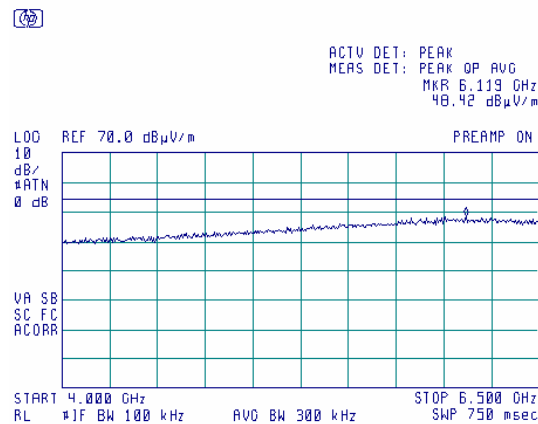
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

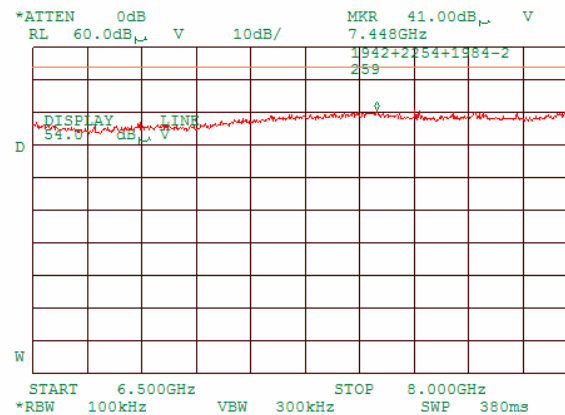
Plot 7.5.27 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency

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



Plot 7.5.28 Radiated emission measurements from 6500 to 8000 MHz at the low carrier frequency

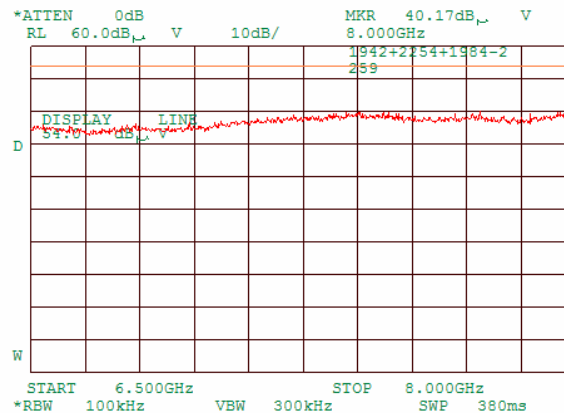
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

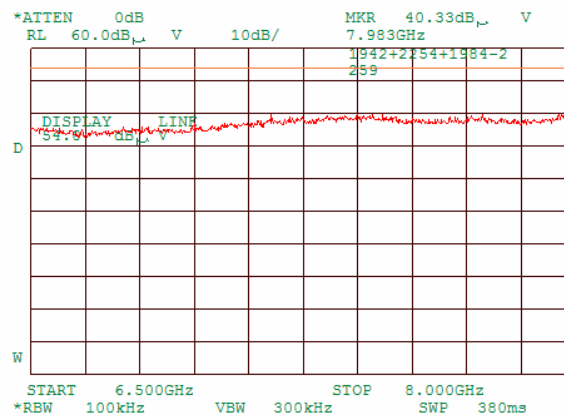
Plot 7.5.29 Radiated emission measurements from 6500 to 8000 MHz at the mid carrier frequency

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



Plot 7.5.30 Radiated emission measurements from 6500 to 8000 MHz at the high carrier frequency

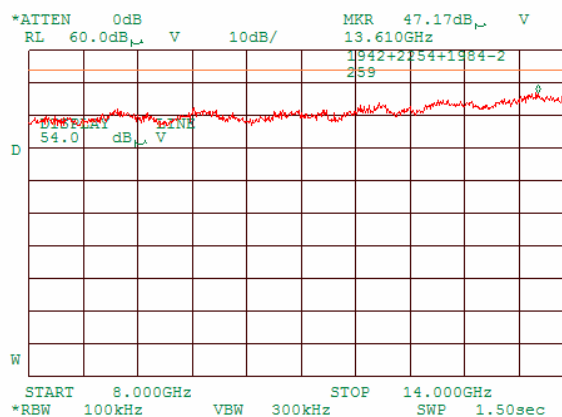
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

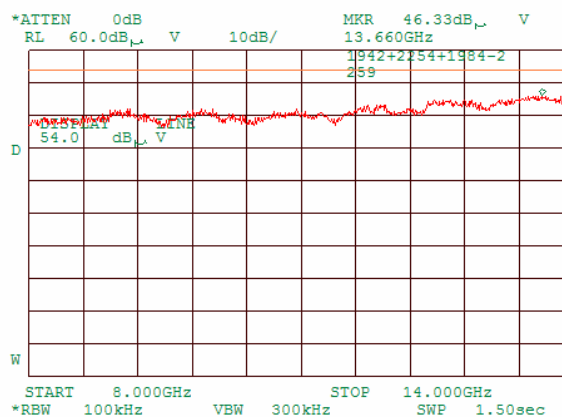
Plot 7.5.31 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency

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



Plot 7.5.32 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency

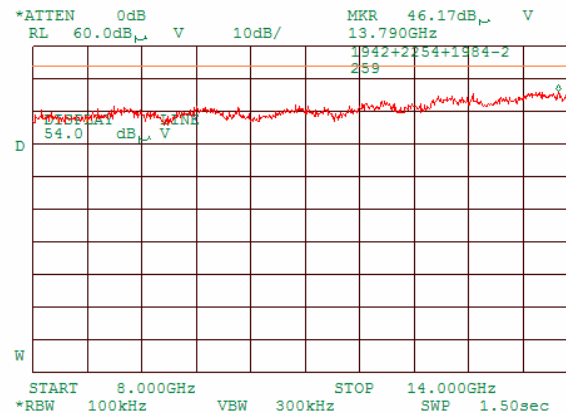
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

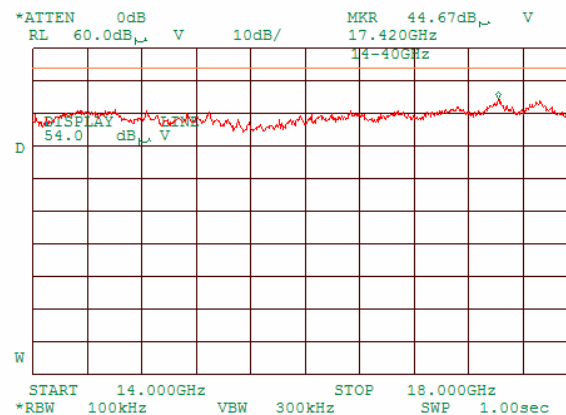
Plot 7.5.33 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency

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



Plot 7.5.34 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

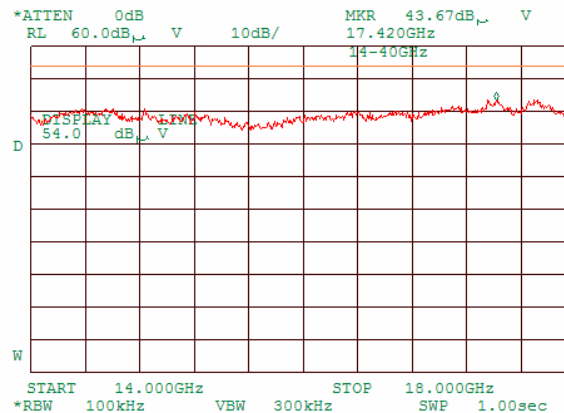
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

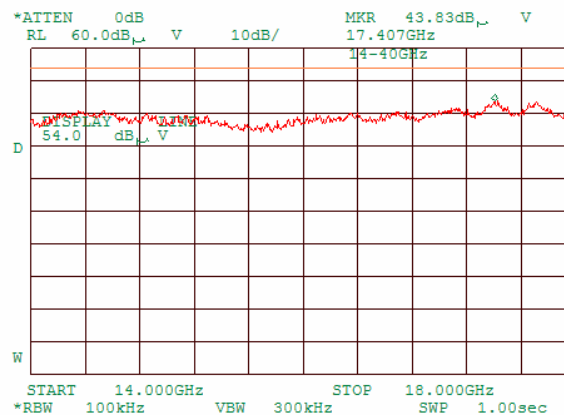
Plot 7.5.35 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency

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



Plot 7.5.36 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

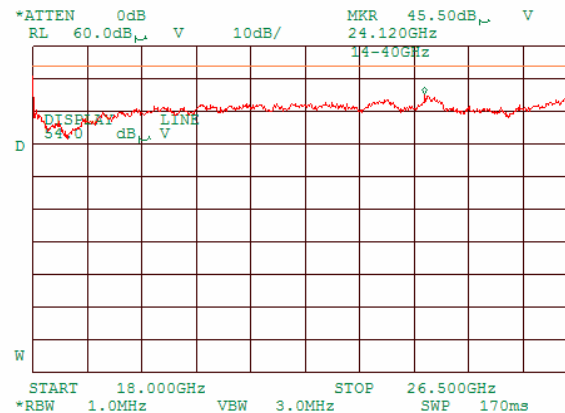
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

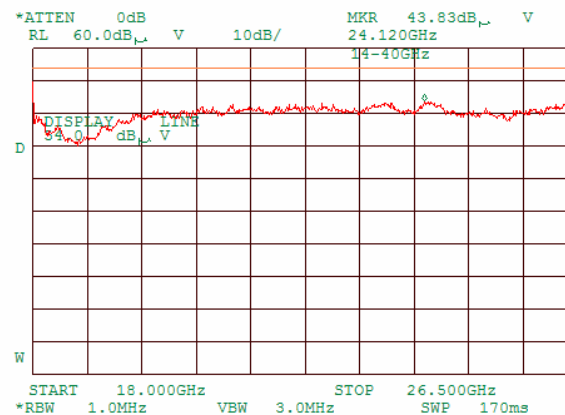
Plot 7.5.37 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

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



Plot 7.5.38 Radiated emission measurements from 18000 to 26500 MHz at the mid carrier frequency

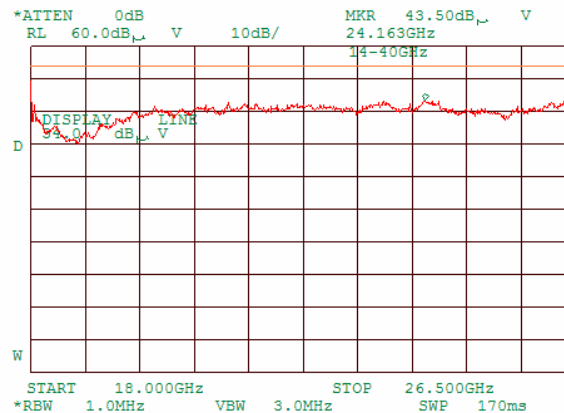
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|-------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: PASS | |
| Date & Time: | 9/19/2004 8:16:33 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Panel Antenna | | | |

Plot 7.5.39 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

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



| | | | | |
|------------------------------|---|--------------------------------|------------------------------|--|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | | |
| Test mode: | Compliance | Verdict: PASS | | |
| Date & Time: | 9/19/2004 8:18:41 AM | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC | |
| Remarks: Omni Antenna | | | | |

Table 7.5.4 Field strength of spurious emissions above 1 GHz within restricted bands

EUT with OMNIDIRECTIONAL ANTENNA

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 - 25000 MHz
 TEST DISTANCE: 3 m
 MODULATION: 8FSK
 BIT RATE: 3 Mbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide
 FREQUENCY HOPPING: Disabled

| Frequency | | | | Dispersed | | | | | | | |
|------------------------|--------------|-----------|-------------------|--------------------------------|-----------------|--------------|-----------------------------------|----------------------|-----------------|---------------|---------|
| Frequency, MHz | Antenna | | Azimuth, degrees* | Peak field strength(VBW=3 MHz) | | | Average field strength(VBW=10 Hz) | | | | Verdict |
| | Polarization | Height, m | | Measured, dB(μV/m) | Limit, dB(μV/m) | Margin, dB** | Measured, dB(μV/m) | Calculated, dB(μV/m) | Limit, dB(μV/m) | Margin, dB*** | |
| Low carrier frequency | | | | | | | | | | | |
| 1151.994 | H | 1.1 | 23 | 43.34 | 74 | -30.66 | 38.84 | 38.84 | 54 | -15.16 | Pass |
| 1200.000 | H | 1 | 291 | 44.36 | 74 | -29.64 | 39.69 | 39.69 | 54 | -14.31 | |
| 1706.500 | V | 1.3 | 360 | 43.82 | 74 | -30.18 | 30.28 | 30.28 | 54 | -23.72 | |
| Mid carrier frequency | | | | | | | | | | | |
| 1151.994 | H | 1.1 | 43 | 44.82 | 74 | -29.18 | 41.59 | 41.59 | 54 | -12.41 | Pass |
| 1200.000 | H | 1.2 | 70 | 45.94 | 74 | -28.06 | 42.58 | 42.58 | 54 | -11.42 | |
| 1440.100 | H | 1 | 0 | 41.32 | 74 | -32.68 | 32.78 | 32.78 | 54 | -21.22 | |
| 1706.295 | V | 1 | 280 | 45.89 | 74 | -28.11 | 31.45 | 31.45 | 54 | -22.55 | |
| High carrier frequency | | | | | | | | | | | |
| 1151.994 | H | 1.1 | 80 | 42.4 | 74 | -31.6 | 41.56 | 41.56 | 54 | -12.44 | Pass |
| 1200.100 | H | 1.1 | 108 | 47.16 | 74 | -26.84 | 42.87 | 42.87 | 54 | -11.13 | |
| 1439.999 | H | 1 | 360 | 41.99 | 74 | -32.01 | 32.02 | 32.02 | 54 | -21.98 | |
| 1708.000 | V | 1.4 | 296 | 44.77 | 74 | -29.23 | 29.56 | 29.56 | 54 | -24.44 | |

*- 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.

Average factor is 0 due to duty cycle, which is 100%

| | | | | |
|-----------------------|---|-------------------------|-----------------------|--|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | | |
| Test mode: | Compliance | Verdict: PASS | | |
| Date & Time: | 9/19/2004 8:18:41 AM | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC | |
| Remarks: Omni Antenna | | | | |

Table 7.5.5 Field strength of spurious emissions below 1 GHz within restricted bands

EUT with OMNIDIRECTIONAL ANTENNA

| | |
|------------------------------------|--|
| ASSIGNED FREQUENCY: | 2400 – 2483.5 MHz |
| INVESTIGATED FREQUENCY RANGE: | 0.009 – 1000 MHz |
| TEST DISTANCE: | 3 m |
| MODULATION: | 8FSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 3 Mbps |
| DUTY CYCLE: | 100 % |
| 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) Biconical (30 MHz – 200 MHz) Log periodic (200 MHz – 1000 MHz) Biconilog (30 MHz – 1000 MHz) |
| FREQUENCY HOPPING: | Disabled |

| Frequency, MHz | | Peak emission, dB(μV/m) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|------------------------|-------|-----------------------------|-----------------|-------------|---|----------------------|-------------------|--------------------------------|---------|
| | | Measured emission, dB(μV/m) | Limit, dB(μV/m) | Margin, dB* | | | | | |
| Low carrier frequency | | | | | | | | | |
| 167.5225 | 39.17 | 37.19 | 43.50 | -6.31 | H | 2.3 | 0 | Pass | |
| 333.4975 | 38.74 | 35.82 | 46.00 | -10.18 | H | 1.0 | 228 | | |
| 400.1970 | 41.21 | 38.08 | 46.00 | -7.92 | H | 1.0 | 265 | | |
| Mid carrier frequency | | | | | | | | | |
| 167.5165 | 40.79 | 38.57 | 43.50 | -4.93 | V | 1.0 | 304 | Pass | |
| 400.2004 | 38.20 | 34.31 | 46.00 | -11.69 | H | 1.0 | 243 | | |
| High carrier frequency | | | | | | | | | |
| 167.5237 | 43.91 | 41.90 | 43.50 | -1.60 | H | 2.0 | 173 | Pass | |
| 240.0300 | 37.41 | 35.65 | 46.00 | -10.35 | H | 1.0 | 73 | | |

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

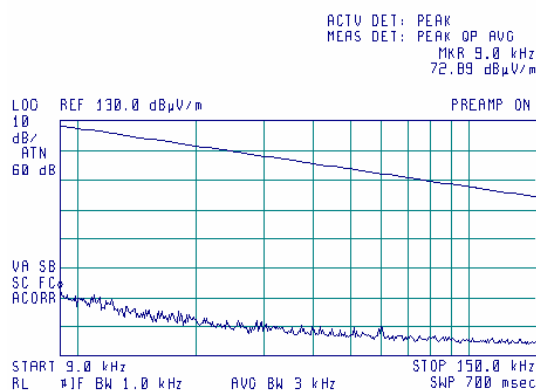
| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0025 | HL 0446 | HL 0465 | HL 0521 | HL 0589 | HL 0592 | HL 0593 | HL 0594 |
| HL 0604 | HL 0768 | HL 0769 | HL 0770 | HL 1424 | HL 1942 | HL 1947 | HL 1984 |
| HL 2009 | HL 2117 | HL 2260 | HL 2261 | HL 2387 | HL 2499 | | |

Full description is given in Appendix A.

| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

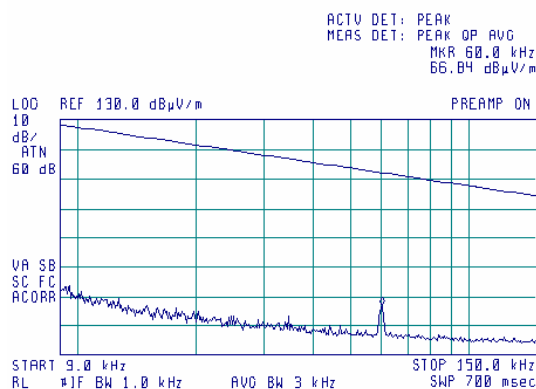
Plot 7.5.40 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

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



Plot 7.5.41 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

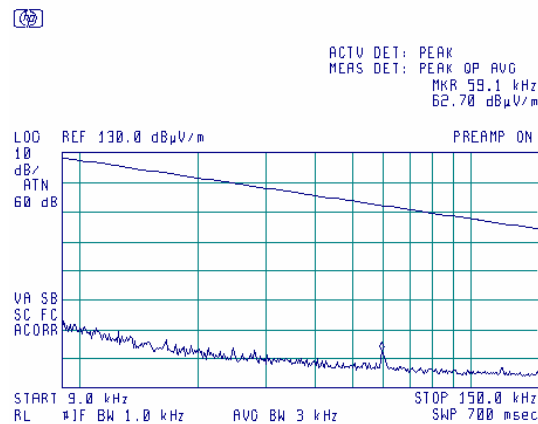
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

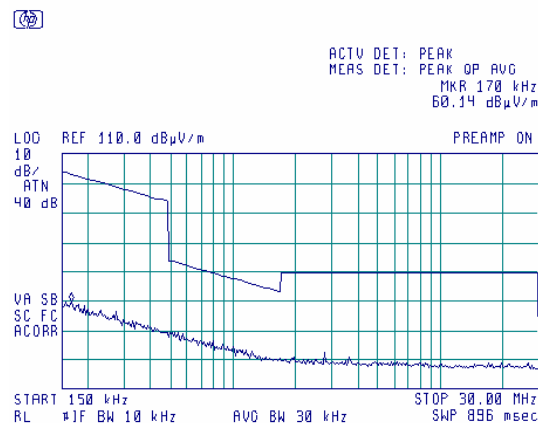
Plot 7.5.42 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

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



Plot 7.5.43 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

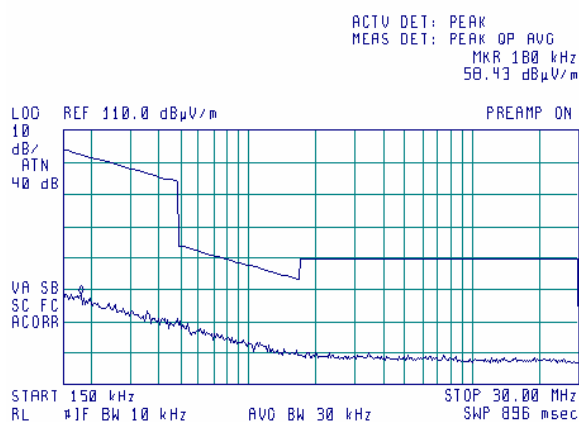
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

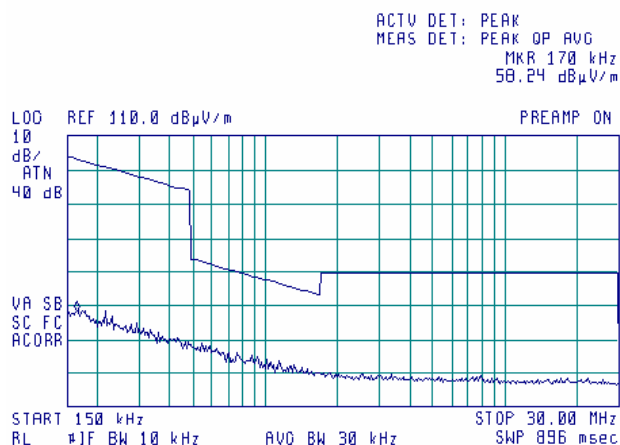
Plot 7.5.44 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

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



Plot 7.5.45 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

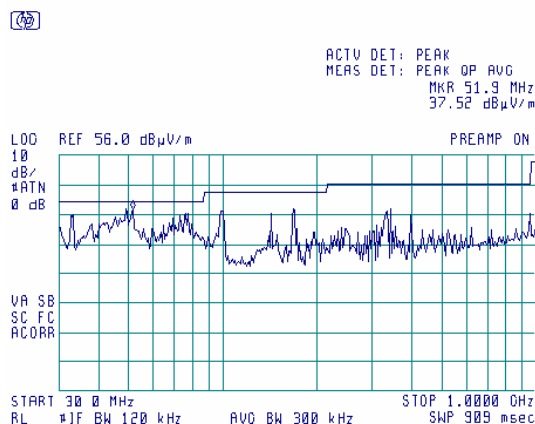
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

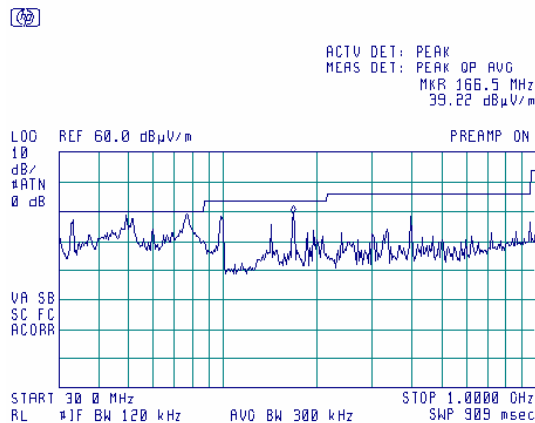
Plot 7.5.46 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

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



Plot 7.5.47 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

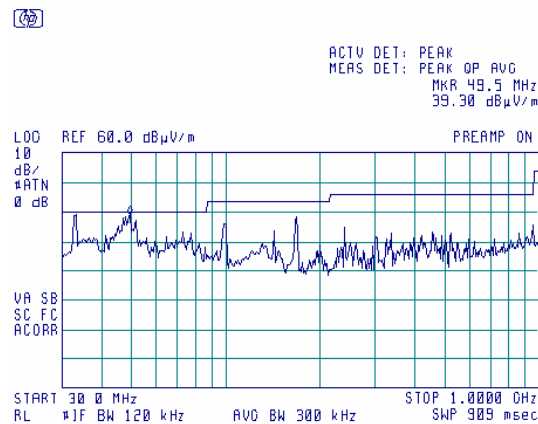
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

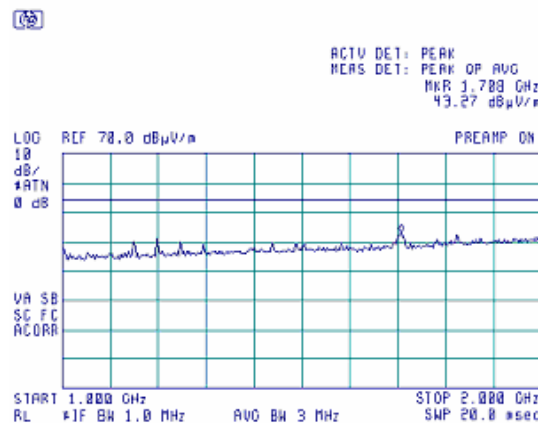
Plot 7.5.48 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

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



Plot 7.5.49 Radiated emission measurements from 1000 to 2000 MHz at the low carrier frequency

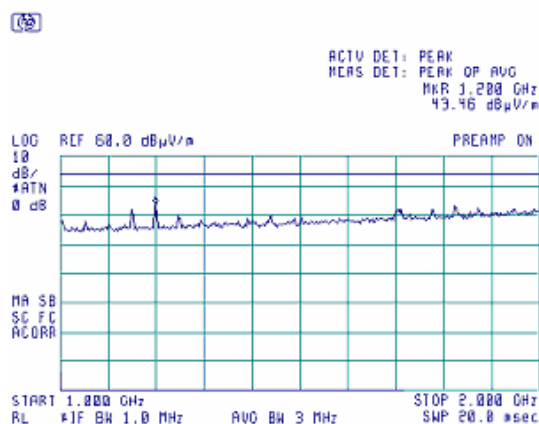
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

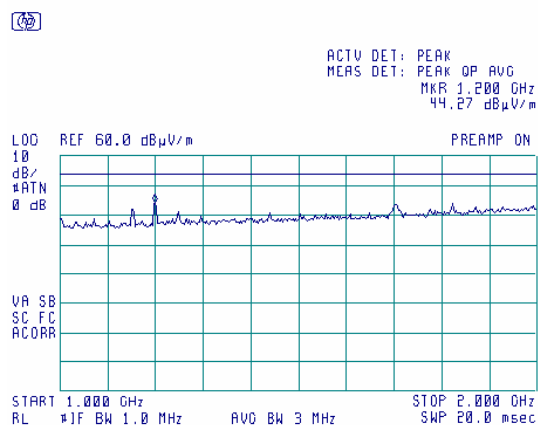
Plot 7.5.50 Radiated emission measurements from 1000 to 2000 MHz at the mid carrier frequency

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



Plot 7.5.51 Radiated emission measurements from 1000 to 2000 MHz at the high carrier frequency

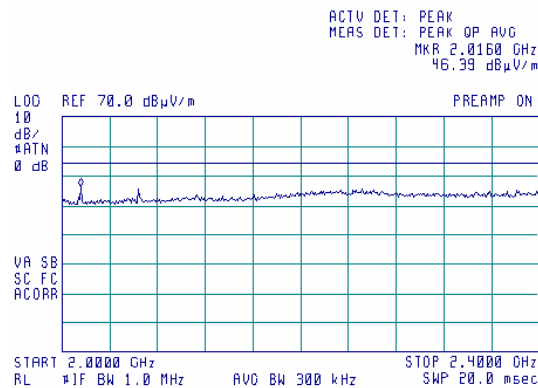
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

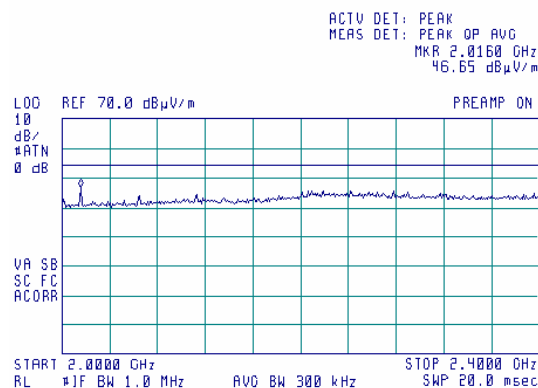
Plot 7.5.52 Radiated emission measurements from 2000 to 2400 MHz at the low carrier frequency

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



Plot 7.5.53 Radiated emission measurements from 2000 to 2400 MHz at the mid carrier frequency

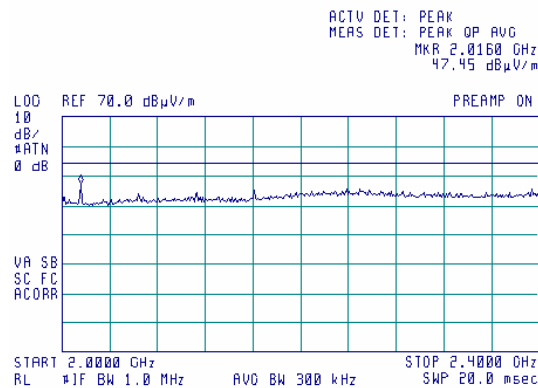
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

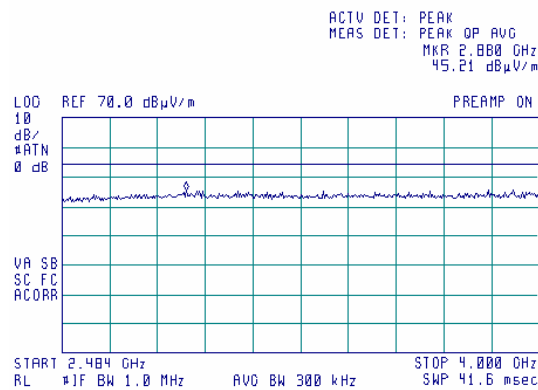
Plot 7.5.54 Radiated emission measurements from 2000 to 2400 MHz at the high carrier frequency

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



Plot 7.5.55 Radiated emission measurements from 2483.5 to 4000 MHz at the low carrier frequency

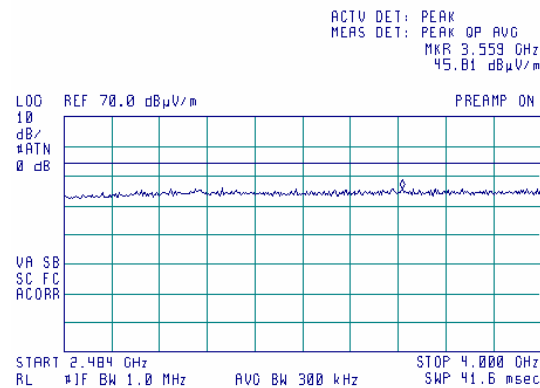
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

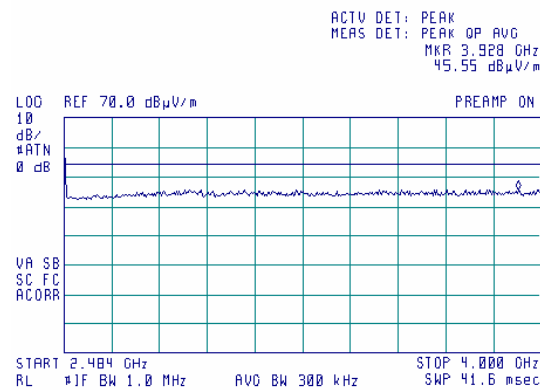
Plot 7.5.56 Radiated emission measurements from 2483.5 to 4000 MHz at the mid carrier frequency

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



Plot 7.5.57 Radiated emission measurements from 2483.5 to 4000 MHz at the high carrier frequency

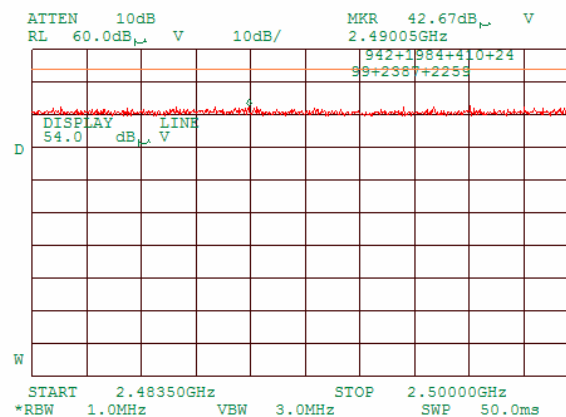
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

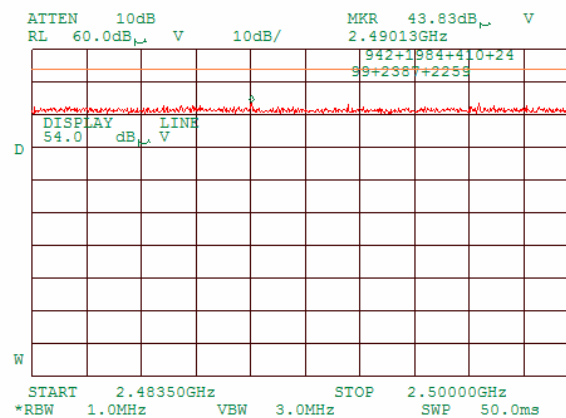
Plot 7.5.58 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 3 Mbps, 1.0 Msymbol per sec



Plot 7.5.59 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

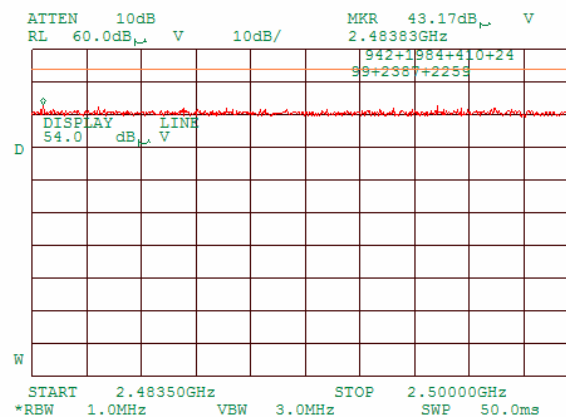
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 3 Mbps, 1.0 Msymbol per sec



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

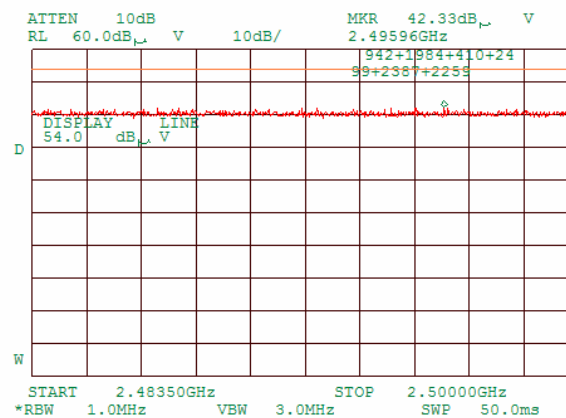
Plot 7.5.60 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 3 Mbps, 1.0 Msymbol per sec



Plot 7.5.61 Radiated emission measurements from 2483.5 to 2500 MHz at the low carrier frequency

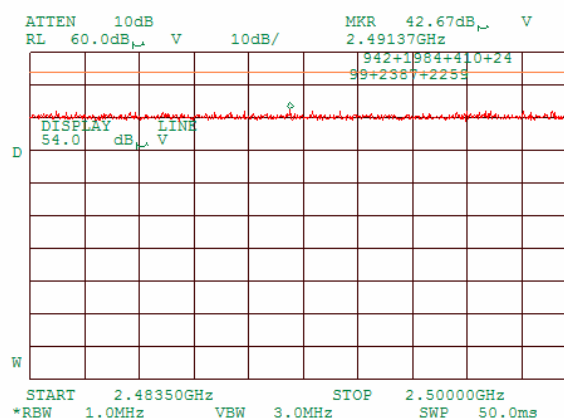
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 4 Mbps, 1.33 Msymbol per sec



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

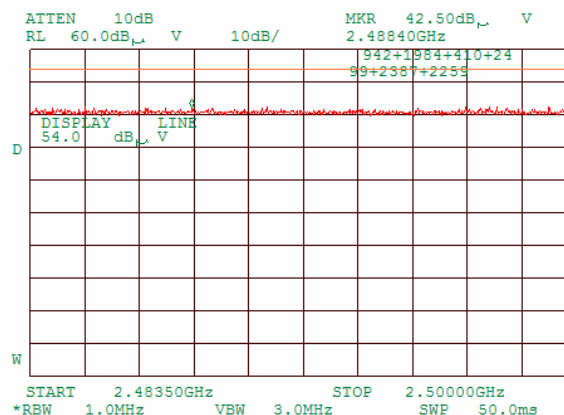
Plot 7.5.62 Radiated emission measurements from 2483.5 to 2500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 4 Mbps, 1.33 Msymbol per sec



Plot 7.5.63 Radiated emission measurements from 2483.5 to 2500 MHz at the high carrier frequency

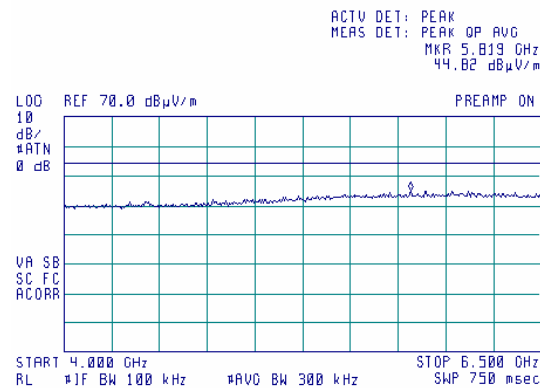
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DATA RATE: 4 Mbps, 1.33 Msymbol per sec



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

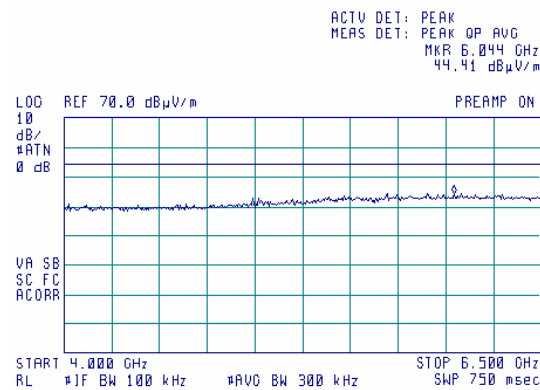
Plot 7.5.64 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency

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



Plot 7.5.65 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency

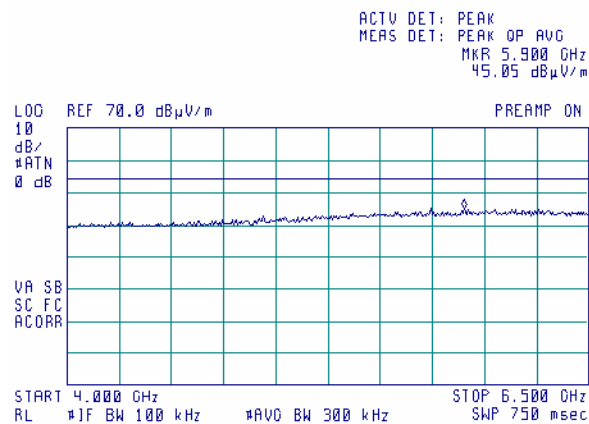
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

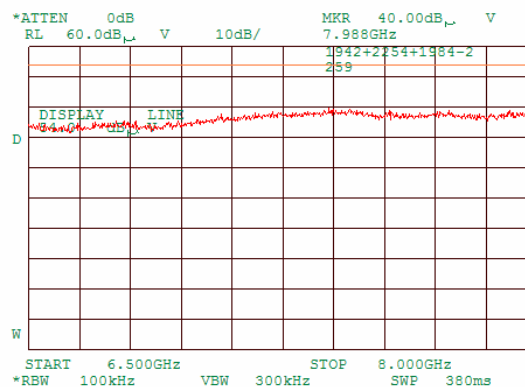
Plot 7.5.66 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency

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



Plot 7.5.67 Radiated emission measurements from 6500 to 8000 MHz at the low carrier frequency

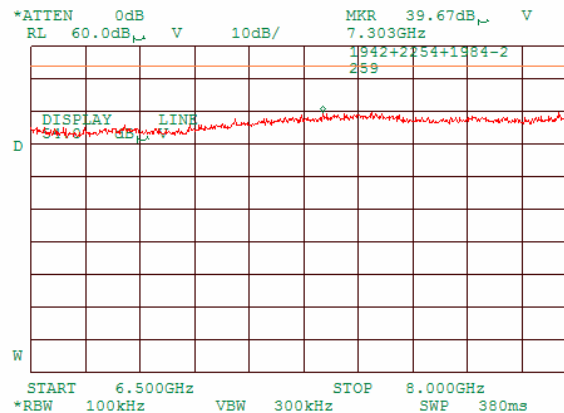
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

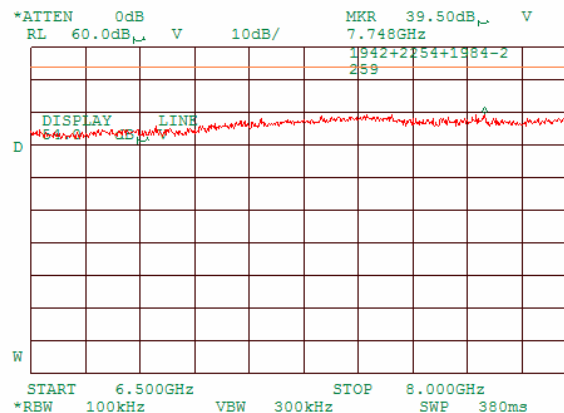
Plot 7.5.68 Radiated emission measurements from 6500 to 8000 MHz at the mid carrier frequency

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



Plot 7.5.69 Radiated emission measurements from 6500 to 8000 MHz at the high carrier frequency

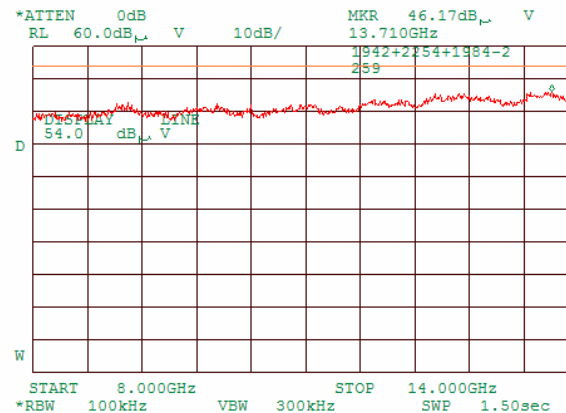
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

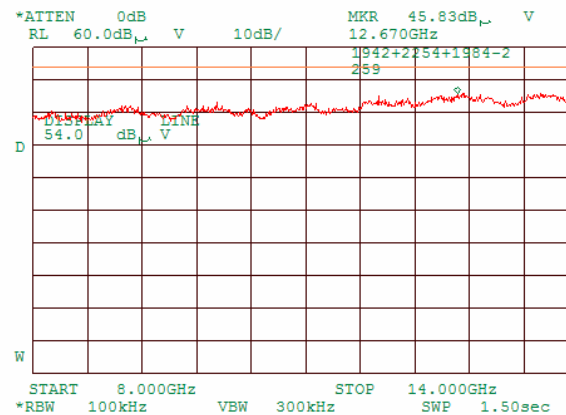
Plot 7.5.70 Radiated emission measurements from 8000 to 14000 MHz at the low carrier frequency

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



Plot 7.5.71 Radiated emission measurements from 8000 to 14000 MHz at the mid carrier frequency

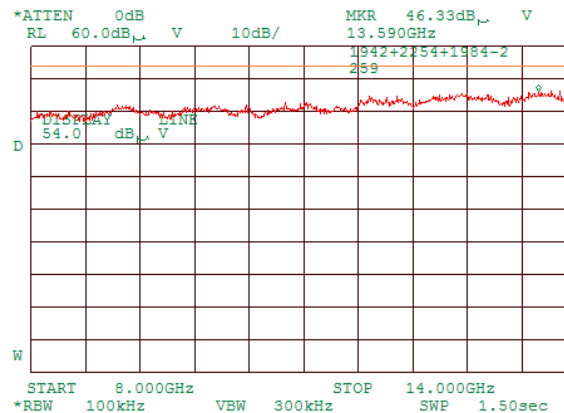
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

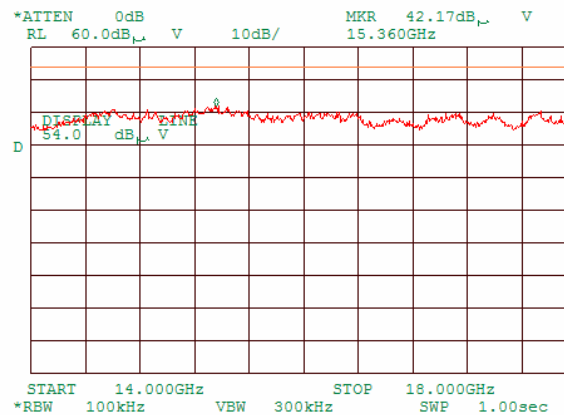
Plot 7.5.72 Radiated emission measurements from 8000 to 14000 MHz at the high carrier frequency

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



Plot 7.5.73 Radiated emission measurements from 14000 to 18000 MHz at the low carrier frequency

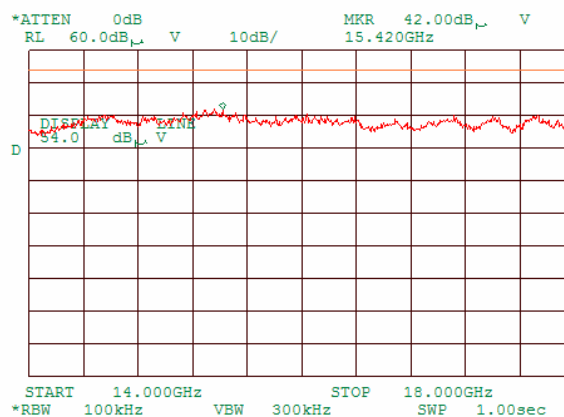
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

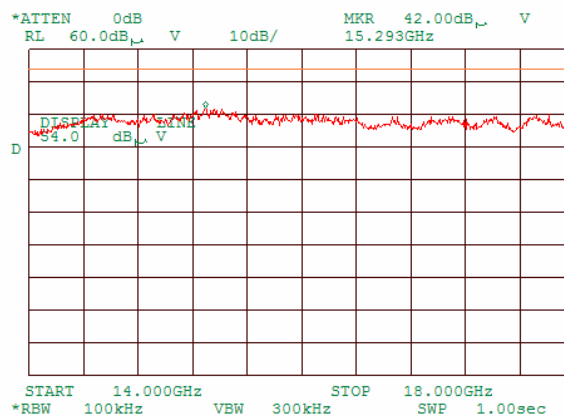
Plot 7.5.74 Radiated emission measurements from 14000 to 18000 MHz at the mid carrier frequency

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



Plot 7.5.75 Radiated emission measurements from 14000 to 18000 MHz at the high carrier frequency

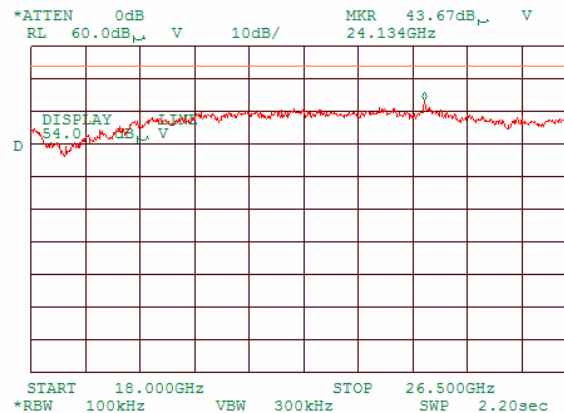
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

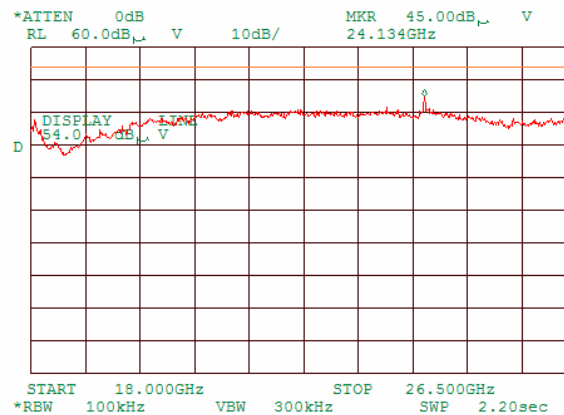
Plot 7.5.76 Radiated emission measurements from 18000 to 26500 MHz at the low carrier frequency

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



Plot 7.5.77 Radiated emission measurements from 18000 to 26500 MHz at the mid carrier frequency

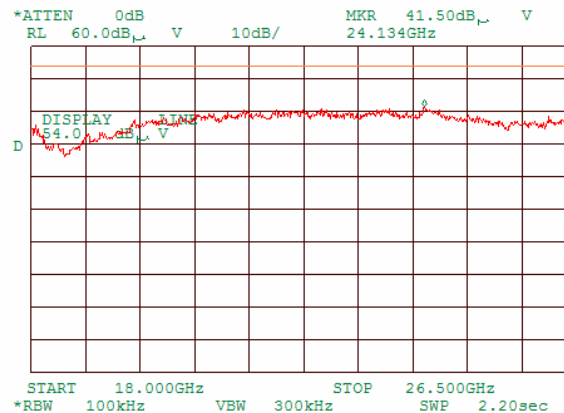
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| | | | |
|------------------------------|---|--------------------------------|------------------------------|
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
| Test procedure: | Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/19/2004 8:18:41 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: Omni Antenna | | | |

Plot 7.5.78 Radiated emission measurements from 18000 to 26500 MHz at the high carrier frequency

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



| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.207(a), Conducted emission | |
| Test procedure: | | ANSI C63.4, Section 13.1.3 | |
| Test mode: | | Compliance | Verdict: PASS |
| Date & Time: | | 9/13/2004 11:31:54 AM | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

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

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.

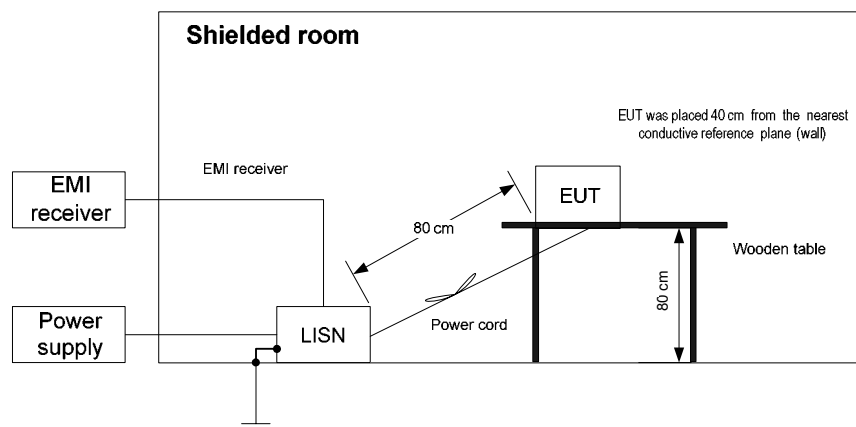
7.6.2 Test procedure

7.6.2.1 The EUT was set up as shown in Figure 7.6.1 and associated photographs, 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.

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: | 9/13/2004 11:31:54 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 7.6.2 Conducted emission test results

LINE: EUT 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* | | |
| 0.158956 | 54.04 | 53.29 | 65.56 | -12.27 | 42.34 | 55.56 | -13.22 | L1 | Pass |
| 0.265327 | 41.51 | 40.54 | 61.32 | -20.78 | 33.33 | 51.32 | -17.99 | | |
| 0.372090 | 36.28 | 35.06 | 58.50 | -23.44 | 30.56 | 48.50 | -17.94 | | |
| 4.393944 | 37.39 | 35.97 | 56.00 | -20.03 | 32.95 | 46.00 | -13.05 | | |
| 6.478387 | 36.40 | 33.90 | 60.00 | -26.10 | 28.97 | 50.00 | -21.03 | | |
| 10.988815 | 33.10 | 33.42 | 60.00 | -26.58 | 30.51 | 50.00 | -19.49 | L2 | Pass |
| 0.159742 | 53.70 | 53.08 | 65.52 | -12.44 | 41.32 | 55.52 | -14.20 | | |
| 0.212421 | 45.02 | 44.23 | 63.18 | -18.95 | 33.50 | 53.18 | -19.68 | | |
| 0.903152 | 34.64 | 32.59 | 56.00 | -23.41 | 28.18 | 46.00 | -17.82 | | |
| 4.516801 | 38.73 | 31.27 | 56.00 | -24.73 | 27.65 | 46.00 | -18.35 | | |
| 6.860432 | 35.16 | 31.49 | 60.00 | -28.51 | 25.35 | 50.00 | -24.65 | | |
| 11.282927 | 33.55 | 31.31 | 60.00 | -28.69 | 28.05 | 50.00 | -21.95 | | |

LINE: Laptop AC mains

| 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* | | |
| 0.169360 | 51.06 | 48.96 | 65.06 | -16.10 | 45.88 | 55.06 | -9.18 | L1 | Pass |
| 0.225823 | 47.56 | 47.69 | 62.66 | -14.97 | 41.40 | 52.66 | -11.26 | | |
| 0.507617 | 37.67 | 39.13 | 56.00 | -16.87 | 35.45 | 46.00 | -10.55 | | |
| 1.185472 | 34.24 | 34.54 | 56.00 | -21.46 | 33.03 | 46.00 | -12.97 | | |
| 1.976136 | 35.01 | 35.59 | 56.00 | -20.41 | 33.80 | 46.00 | -12.20 | | |
| 4.347159 | 40.69 | 38.41 | 56.00 | -17.59 | 34.24 | 46.00 | -11.76 | L2 | Pass |
| 0.167835 | 52.70 | 53.52 | 65.13 | -11.61 | 44.36 | 55.13 | -10.77 | | |
| 0.224362 | 49.47 | 47.42 | 62.72 | -15.30 | 44.95 | 52.72 | -7.77 | | |
| 0.284712 | 42.87 | 40.90 | 60.74 | -19.84 | 37.75 | 50.74 | -12.99 | | |
| 0.507526 | 38.85 | 37.64 | 56.00 | -18.36 | 38.84 | 46.00 | -7.16 | | |
| 1.920654 | 36.35 | 31.42 | 56.00 | -24.58 | 32.45 | 46.00 | -13.55 | | |
| 4.291621 | 38.15 | 36.25 | 56.00 | -19.75 | 31.54 | 46.00 | -14.46 | | |

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

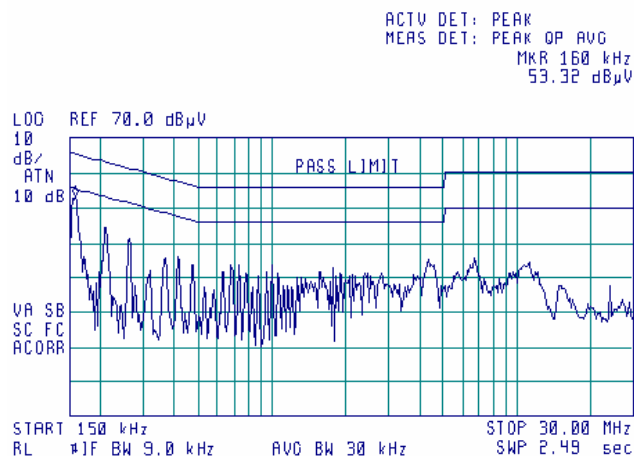
| | | | | | | | |
|---------|---------|---------|---------|---------|--|--|--|
| HL 0163 | HL 0787 | HL 1430 | HL 1502 | HL 1510 | | | |
|---------|---------|---------|---------|---------|--|--|--|

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: | PASS |
| Date & Time: | 9/13/2004 11:31:54 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

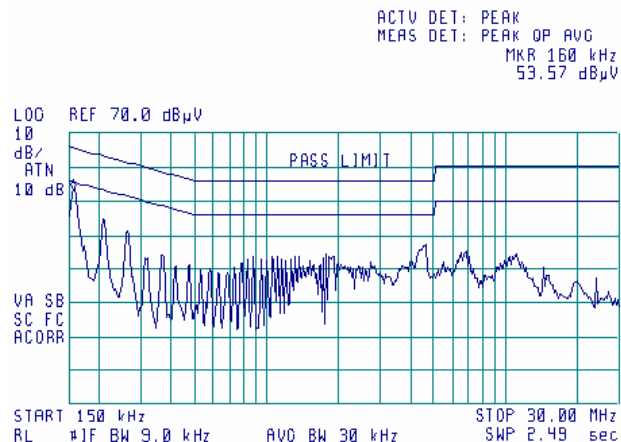
Plot 7.6.1 Conducted emission measurements at EUT AC mains

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



Plot 7.6.2 Conducted emission measurements at EUT AC mains

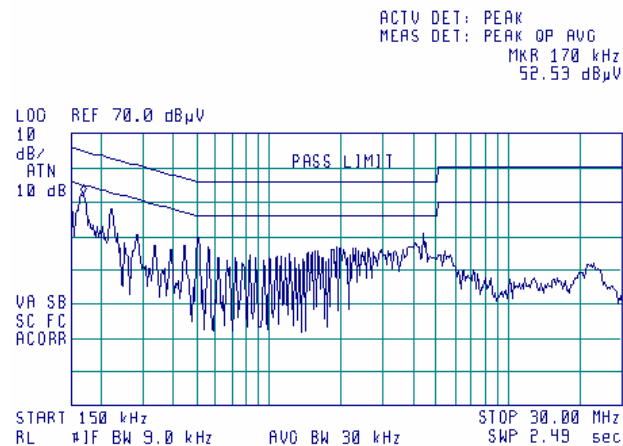
LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.207(a), Conducted emission | | |
| Test procedure: | ANSI C63.4, Section 13.1.3 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/13/2004 11:31:54 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

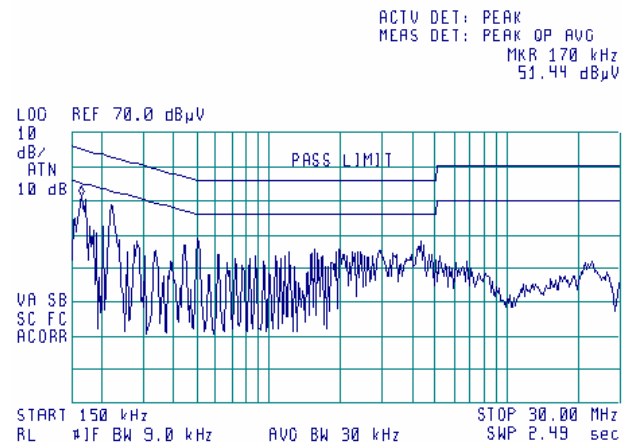
Plot 7.6.3 Conducted emission measurements at Laptop AC mains

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



Plot 7.6.4 Conducted emission measurements at Laptop AC mains

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



| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| 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: | PASS |
| Date & Time: | 9/13/2004 11:33:22 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

8 Unintentional emissions 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 power port. Specification test limits are given in Table 8.1.1. The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Table 8.1.1 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.

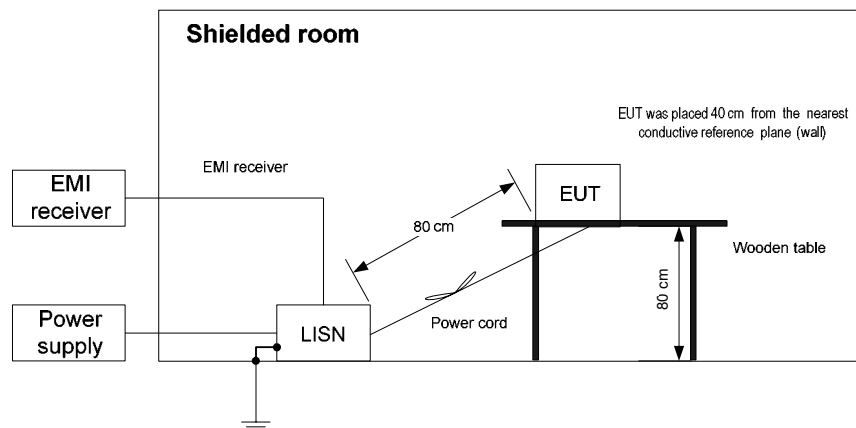
8.1.2 Test procedure

8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photographs, 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.

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: | | PASS | |
| Date & Time: | 9/13/2004 11:33:22 AM | | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC | | |
| Remarks: | | | | | |

Table 8.1.2 Conducted emission test results

LINE: EUT AC mains
 EUT OPERATING MODE: Receive
 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* | | |
| 0.158956 | 54.04 | 53.29 | 65.56 | -12.27 | 42.34 | 55.56 | -13.22 | L1 | Pass |
| 0.265327 | 41.51 | 40.54 | 61.32 | -20.78 | 33.33 | 51.32 | -17.99 | | |
| 0.372090 | 36.28 | 35.06 | 58.50 | -23.44 | 30.56 | 48.50 | -17.94 | | |
| 4.393944 | 37.39 | 35.97 | 56.00 | -20.03 | 32.95 | 46.00 | -13.05 | | |
| 6.478387 | 36.40 | 33.90 | 60.00 | -26.10 | 28.97 | 50.00 | -21.03 | | |
| 10.988815 | 33.10 | 33.42 | 60.00 | -26.58 | 30.51 | 50.00 | -19.49 | L2 | Pass |
| 0.159742 | 53.70 | 53.08 | 65.52 | -12.44 | 41.32 | 55.52 | -14.20 | | |
| 0.212421 | 45.02 | 44.23 | 63.18 | -18.95 | 33.50 | 53.18 | -19.68 | | |
| 0.903152 | 34.64 | 32.59 | 56.00 | -23.41 | 28.18 | 46.00 | -17.82 | | |
| 4.516801 | 38.73 | 31.27 | 56.00 | -24.73 | 27.65 | 46.00 | -18.35 | | |
| 6.860432 | 35.16 | 31.49 | 60.00 | -28.51 | 25.35 | 50.00 | -24.65 | | |
| 11.282927 | 33.55 | 31.31 | 60.00 | -28.69 | 28.05 | 50.00 | -21.95 | | |

LINE: Laptop AC mains

| 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* | | |
| 0.169360 | 51.06 | 48.96 | 65.06 | -16.10 | 45.88 | 55.06 | -9.18 | L1 | Pass |
| 0.225823 | 47.56 | 47.69 | 62.66 | -14.97 | 41.40 | 52.66 | -11.26 | | |
| 0.507617 | 37.67 | 39.13 | 56.00 | -16.87 | 35.45 | 46.00 | -10.55 | | |
| 1.185472 | 34.24 | 34.54 | 56.00 | -21.46 | 33.03 | 46.00 | -12.97 | | |
| 1.976136 | 35.01 | 35.59 | 56.00 | -20.41 | 33.80 | 46.00 | -12.20 | | |
| 4.347159 | 40.69 | 38.41 | 56.00 | -17.59 | 34.24 | 46.00 | -11.76 | L2 | Pass |
| 0.167835 | 52.70 | 53.52 | 65.13 | -11.61 | 44.36 | 55.13 | -10.77 | | |
| 0.224362 | 49.47 | 47.42 | 62.72 | -15.30 | 44.95 | 52.72 | -7.77 | | |
| 0.284712 | 42.87 | 40.90 | 60.74 | -19.84 | 37.75 | 50.74 | -12.99 | | |
| 0.507526 | 38.85 | 37.64 | 56.00 | -18.36 | 38.84 | 46.00 | -7.16 | | |
| 1.920654 | 36.35 | 31.42 | 56.00 | -24.58 | 32.45 | 46.00 | -13.55 | | |
| 4.291621 | 38.15 | 36.25 | 56.00 | -19.75 | 31.54 | 46.00 | -14.46 | | |

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

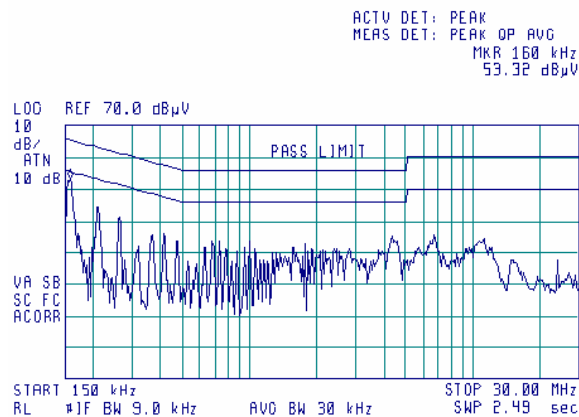
| | | | | | | | |
|---------|---------|---------|---------|---------|--|--|--|
| HL 0163 | HL 0787 | HL 1430 | HL 1502 | HL 1510 | | | |
|---------|---------|---------|---------|---------|--|--|--|

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: | PASS |
| Date & Time: | 9/13/2004 11:33:22 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

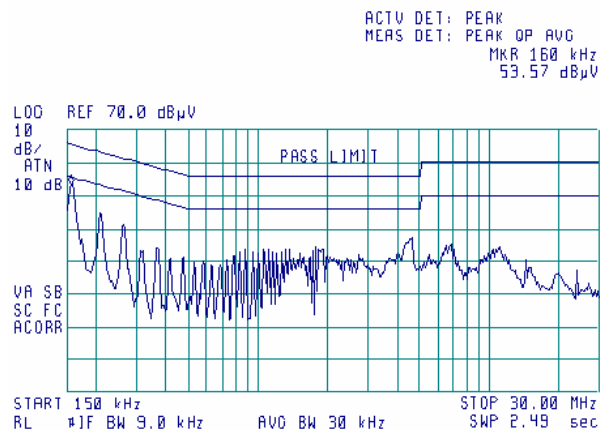
Plot 8.1.1 Conducted emission measurements at EUT AC mains

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



Plot 8.1.2 Conducted emission measurements at EUT AC mains

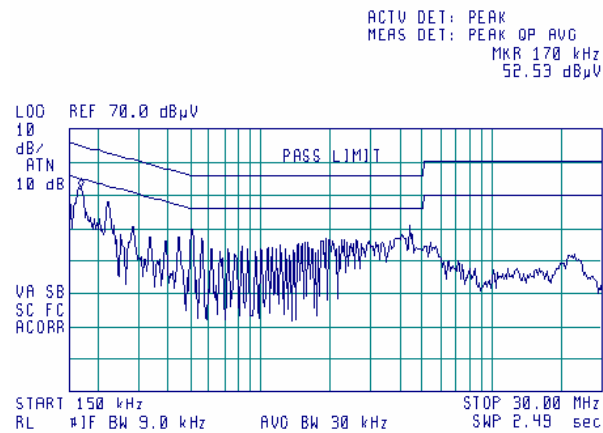
LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| 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: | PASS |
| Date & Time: | 9/13/2004 11:33:22 AM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

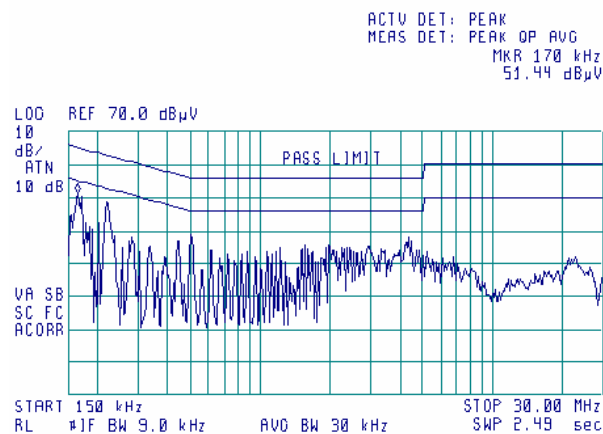
Plot 8.1.3 Conducted emission measurements at Laptop AC mains

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



Plot 8.1.4 Conducted emission measurements at Laptop AC mains

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



| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.109, Radiated emission | |
| Test procedure: | | ANSI C63.4, Sections 11.6 and 12.1.4 | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| 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(μV/m) | | Class A limit, dB(μV/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 and associated photograph/s, 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 8.2.2 and shown in the associated plots.

8.2.3 Test procedure for measurements at OATS

8.2.3.1 The EUT was set up as shown in Figure 8.2.1 and associated photograph/s, energized and the performance check was conducted.

8.2.3.2 Preliminary measurements were performed in the anechoic chamber at 3 m test distance. The specified frequency range was investigated with biconical and log periodic antennas connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

8.2.3.3 The EUT was set up as shown in Figure 8.2.2, energized and the performance check was conducted.

8.2.3.4 Final measurements were performed at the open area test site at 10 m test distance. The EUT wires and cables were arranged to produce maximum emission as it was found during preliminary measurements. The frequencies yield the worst test results (the lowest margins) during preliminary testing were 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 and its polarization was changed from vertical to horizontal. At frequencies where high ambient noise was encountered, the final measurements were taken in the anechoic chamber at 3 m distance.

8.2.3.5 The worst test results (the lowest margins) were recorded in Table 8.2.2 and shown in the associated plots.

| | | | |
|--|-------------------------------|--------------------------------|------------------------------|
| Test specification: Section 15.109, Radiated emission | | | |
| Test procedure: ANSI C63.4, Sections 11.6 and 12.1.4 | | | |
| Test mode: Compliance | | Verdict: PASS | |
| Date & Time: 9/14/2004 6:03:57 PM | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

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

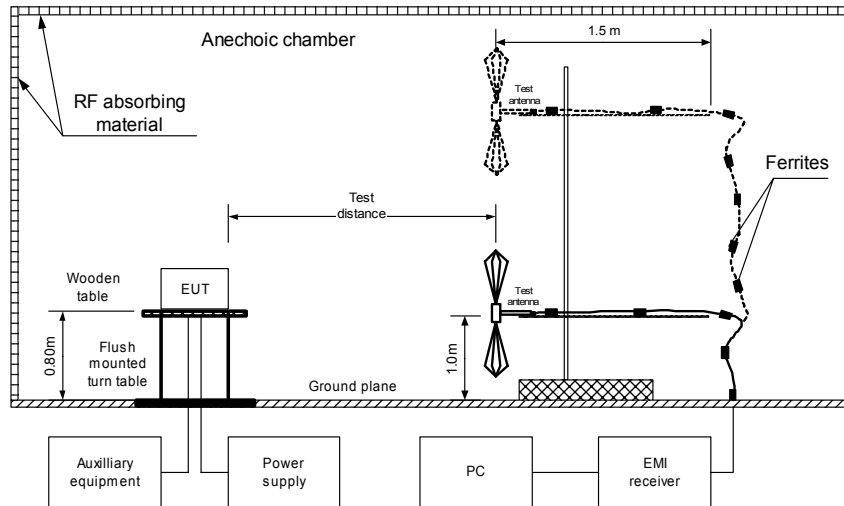
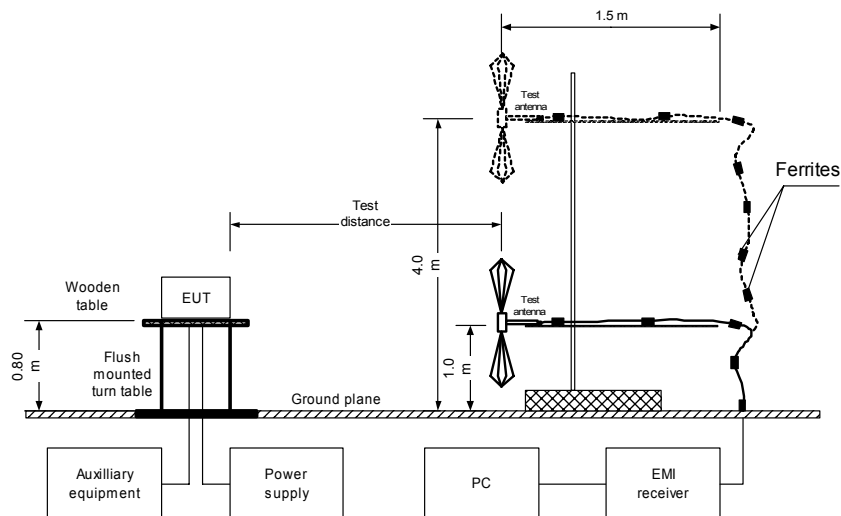


Figure 8.2.2 Setup for radiated emission measurements at OATS, table-top equipment



| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.109, Radiated emission | |
| Test procedure: | | ANSI C63.4, Sections 11.6 and 12.1.4 | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

Table 8.2.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive
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(μV/m) | Average | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|----------------|-------|-----------------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|---------|
| | | Measured emission, dB(μV/m) | Limit, dB(μV/m) | Margin, dB* | | | | |
| LOW | | | | | | | | |
| 49.650000 | 40.12 | 36.72 | 40.00 | -7.44 | V | 1.0 | 224 | Pass |
| 51.825000 | 40.69 | 37.61 | 40.00 | -3.88 | V | 1.1 | 190 | |
| 60.462500 | 39.06 | 35.46 | 40.00 | -5.88 | V | 1.0 | 277 | |
| 82.055000 | 37.06 | 33.21 | 40.00 | -9.18 | V | 1.0 | 282 | |
| 100.033750 | 38.53 | 36.21 | 43.50 | -11.77 | V | 1.0 | 306 | |
| 167.507500 | 42.56 | 40.46 | 43.50 | -8.16 | H | 1.8 | 98 | |
| MID | | | | | | | | |
| 33.518840 | 37.20 | 34.30 | 40.00 | -5.70 | V | 1.0 | 358 | Pass |
| 60.450000 | 37.82 | 34.48 | 40.00 | -5.52 | V | 1.0 | 297 | |
| 100.013750 | 42.74 | 40.78 | 43.50 | -2.72 | V | 1.0 | 304 | |
| 144.032500 | 39.26 | 37.82 | 43.50 | -5.68 | H | 2.5 | 138 | |
| 167.525000 | 38.66 | 36.32 | 43.50 | -7.18 | H | 2.0 | 91 | |
| 195.773500 | 34.37 | 29.93 | 43.50 | -13.57 | H | 1.4 | 120 | |
| 300.500000 | 34.36 | 28.12 | 46.00 | -17.88 | H | 1.0 | 106 | |
| HIGH | | | | | | | | |
| 33.518840 | 37.20 | 35.10 | 40.00 | -4.90 | V | 1.0 | 38 | Pass |
| 60.450000 | 37.82 | 36.07 | 40.00 | -3.93 | V | 1.1 | 55 | |
| 100.013750 | 42.74 | 41.69 | 43.50 | -1.81 | V | 1.0 | 4 | |
| 144.032500 | 39.26 | 39.01 | 43.50 | -4.49 | H | 2.5 | 238 | |
| 167.507500 | 42.56 | 41.81 | 43.50 | -1.69 | H | 1.7 | 198 | |
| 195.773500 | 34.37 | 31.72 | 43.50 | -11.78 | H | 1.3 | 220 | |
| 300.500000 | 34.36 | 28.61 | 46.00 | -17.39 | H | 1.1 | 306 | |

| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.109, Radiated emission | |
| Test procedure: | | ANSI C63.4, Sections 11.6 and 12.1.4 | |
| Test mode: | | Verdict: PASS | |
| Date & Time: | | | |
| 9/14/2004 6:03:57 PM | | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 14 GHz
RESOLUTION BANDWIDTH: 1000 kHz

| Resolution Bandwidth: 100 kHz | | | | | | | | |
|-------------------------------|-------------------------|-----------------------------|-----------------|-------------|----------------------|-------------------|--------------------------------|---------|
| Frequency, MHz | Peak emission, dB(μV/m) | Average | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
| | | Measured emission, dB(μV/m) | Limit, dB(μV/m) | Margin, dB* | | | | |
| LOW | | | | | | | | |
| 1.152.010 | 50.98 | 50.01 | 54.00 | -3.99 | H | 1.1 | 350 | Pass |
| 1200.015 | 50.33 | 47.63 | 54.00 | -6.75 | H | 1.1 | 64 | |
| 2015.996 | 44.85 | 44.20 | 54.00 | -9.99 | H | 1.0 | 91 | |
| MID | | | | | | | | |
| 1152.030 | 48.28 | 45.68 | 54.00 | -8.51 | H | 1.2 | 289 | Pass |
| 1200.000 | 46.66 | 43.40 | 54.00 | -11.19 | H | 1.1 | 272 | |
| 1488.000 | 44.11 | 39.50 | 54.00 | -15.84 | H | 1.0 | 33 | |
| HIGH | | | | | | | | |
| 1152.009 | 50.97 | 50.21 | 54.00 | -3.86 | H | 1.2 | 57 | Pass |
| 1200.007 | 48.53 | 47.41 | 54.00 | -6.95 | H | 1.2 | 0 | |
| 2016.011 | 47.15 | 45.71 | 54.00 | -8.72 | H | 1 | 105 | |

*- Margin = Measured emission - specification limit.

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

Reference numbers of test equipment used

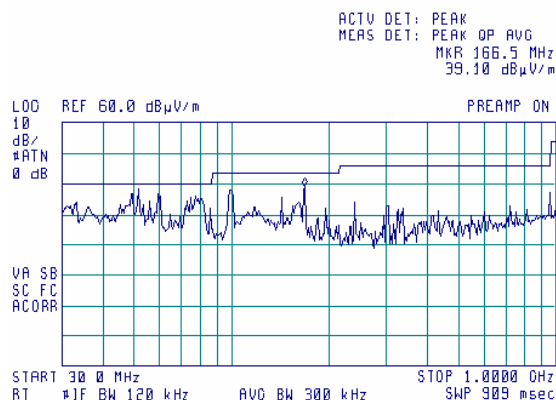
| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0446 | HL 0465 | HL 0521 | HL 0589 | HL 0592 | HL 0593 | HL 0594 | HL 0604 |
| HL 1424 | HL 1942 | HL 1947 | HL 1984 | HL 1989 | HL 2009 | HL 2254 | HL 2259 |
| HL 2261 | HL 2399 | | | | | | |

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: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

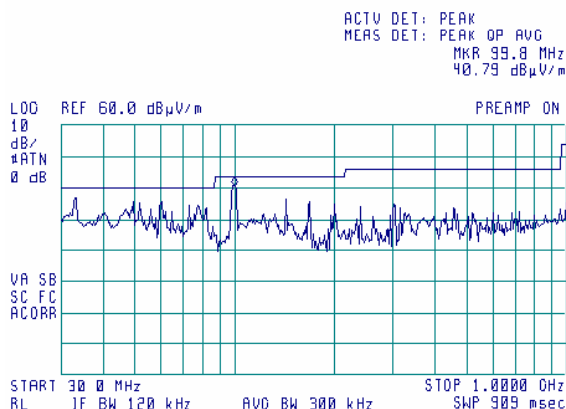
Plot 8.2.1 Radiated emission measurements in 30- 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: LOW



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

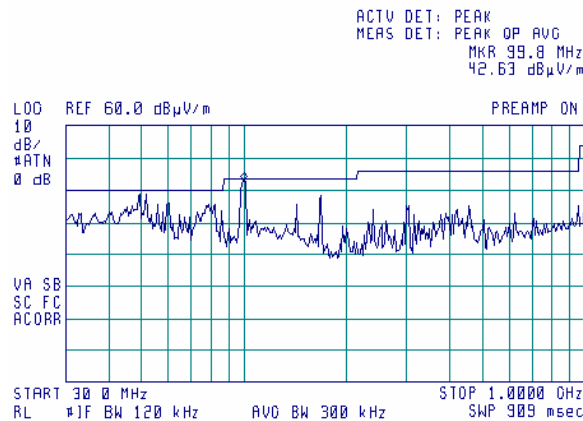
TEST SITE: Anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: MID



| | | | |
|----------------------------|-------------------------------|--|------------------------------|
| Test specification: | | Section 15.109, Radiated emission | |
| Test procedure: | | ANSI C63.4, Sections 11.6 and 12.1.4 | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

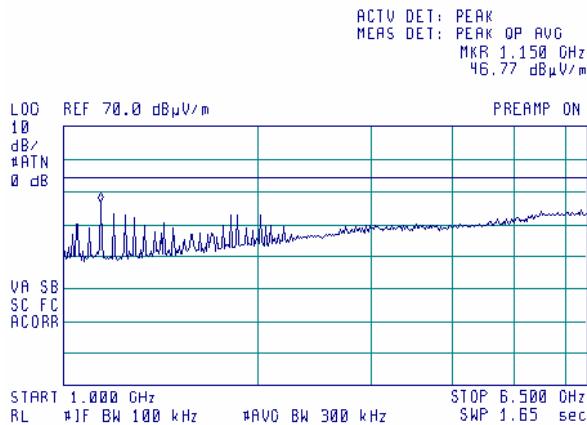
Plot 8.2.3 Radiated emission measurements in 30- 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: HIGH



Plot 8.2.4 Radiated emission measurements 1000 – 6500 MHz, vertical and horizontal antenna polarization

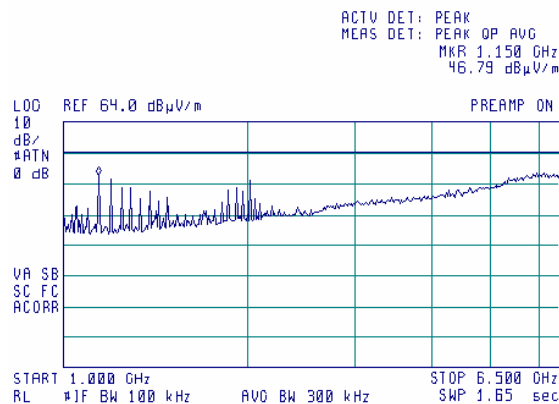
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: LOW



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

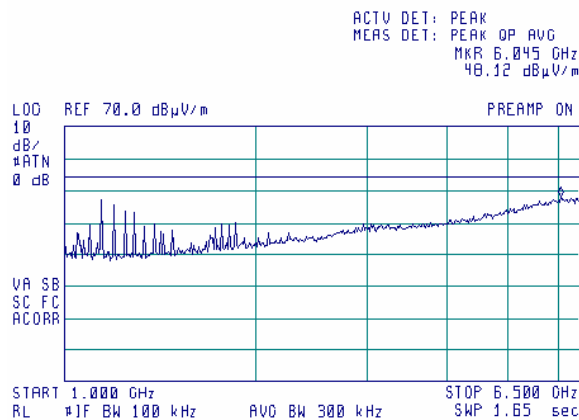
Plot 8.2.5 Radiated emission measurements 1000 – 6500 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: MID



Plot 8.2.6 Radiated emission measurements 1000 – 6500 MHz, vertical and horizontal antenna polarization

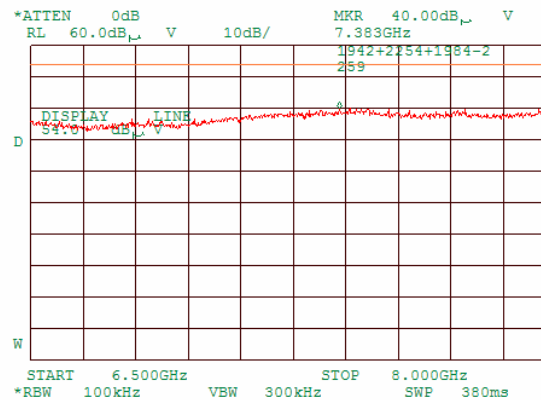
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: HIGH



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

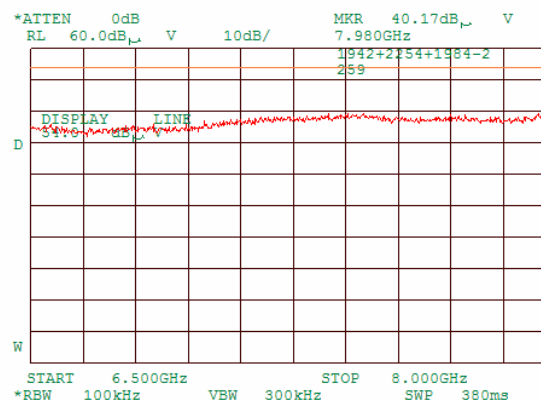
Plot 8.2.7 Radiated emission measurements 6500 – 8000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: LOW



Plot 8.2.8 Radiated emission measurements 6500 – 8000 MHz, vertical and horizontal antenna polarization

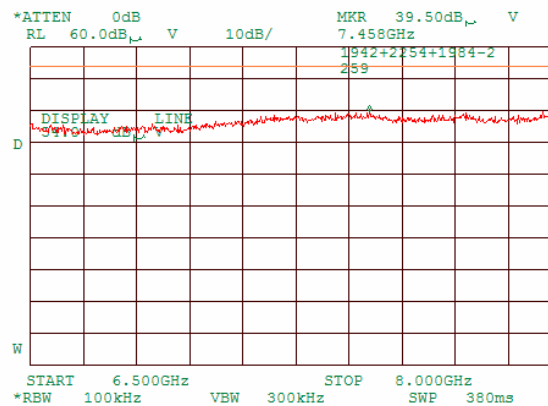
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: MID



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

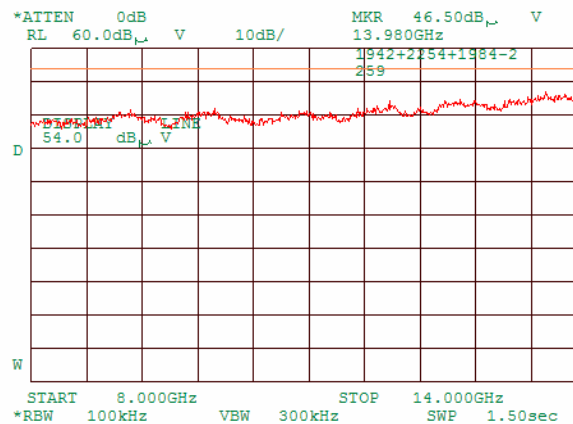
Plot 8.2.9 Radiated emission measurements 6500 – 8000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: HIGH



Plot 8.2.10 Radiated emission measurements 8000 – 14000 MHz, vertical and horizontal antenna polarization

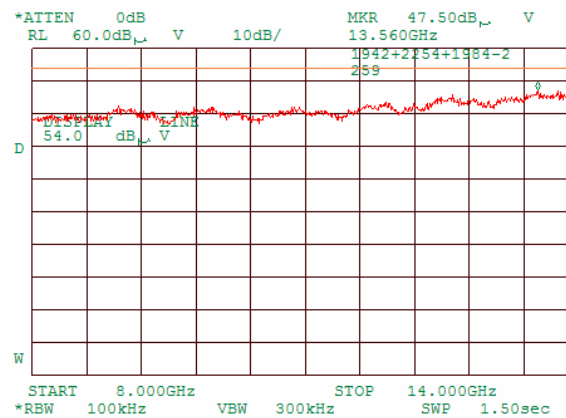
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: LOW



| | | | |
|----------------------------|--|--------------------------------|------------------------------|
| Test specification: | Section 15.109, Radiated emission | | |
| Test procedure: | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 9/14/2004 6:03:57 PM | | |
| Temperature: 23 °C | Air Pressure: 1009 hPa | Relative Humidity: 39 % | Power Supply: 120 VAC |
| Remarks: | | | |

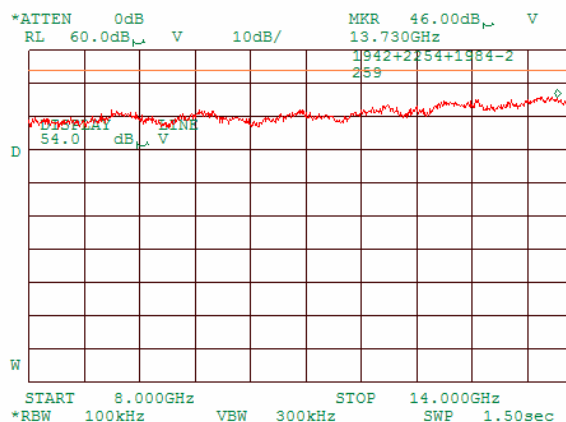
Plot 8.2.11 Radiated emission measurements 8000 – 14000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: MID



Plot 8.2.12 Radiated emission measurements 8000 – 14000 MHz, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive
FREQUENCY: HIGH



9 APPENDIX A Test equipment and ancillaries used for tests

| HL No. | Description | Manufacturer information | | | Due Calibr. Month/Year |
|--------|---|----------------------------------|----------------------|-------------------------------|------------------------|
| | | Name | Model No. | Serial No. | |
| 0025 | Analyzer, Spectrum, 10 kHz - 23 GHz / 140 GHz | Anritsu | MS-710C | 5837 | 25-Oct-05 |
| 0057 | Attenuator, 50 Ohm, 2 W, 0 - 18 GHz, 50 dB | Hewlett Packard | 8492A | 129 | 03-Mar-05 |
| 0163 | LISN FCC/VDE/MIL-STD | Electro-Metrics | ANS 25/2 | 1314 | 01-Oct-05 |
| 0446 | Antenna, Loop active, 10kHz-30MHz | EMCO | 6502 | 2857 | 28-Jun-05 |
| 0465 | Anechoic Chamber 9(L) x 6,5(W) x 5,5(H) m | HL | AC - 1 | 023 | 10-Oct-05 |
| 0483 | Oscilloscope, Digitizing, 100 MHz | Hewlett Packard | 54501A | 2833A01325 | 10-Oct-05 |
| 0521 | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-2.9 GHz | Hewlett Packard | 8546A | 3617A 00319, 3448A00253 | 10-Oct-05 |
| 0589 | Cable Coaxial, GORE A2P01POL118, 2.3 m | HL | GORE-3 | 176 | 10-Oct-05 |
| 0592 | Position Controller | HL | L2-SR3000 (HL CRL-3) | 100 | 18-May-05 |
| 0593 | Antenna Mast, 1-4 m Pneumatic | Madgesh | AM-F1 | 101 | 03-Feb-05 |
| 0594 | Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic | HL | TT-WDC1 | 102 | 27-Jan-05 |
| 0604 | Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz | EMCO | 3141 | 9611-1011 | 27-Jan-05 |
| 0661 | Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm | Hewlett Packard | 83640B | 3614A00266 | 14-Sep-05 |
| 0768 | Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, K-band, Gain - 25 dB | Quinstar Technology | QWH-4200-BA | 110 | 14-Sep-05 |
| 0769 | Antenna Standard Gain Horn, 26.5-40 GHz, WR28, Ka band, Gain 25 dB | Quinstar Technology | QWH-2800-BA | 112 | 14-Sep-05 |
| 0770 | Antenna Standard Gain Horn, 40-60 GHz WR-19, U-band Gain - 25 dB | Quinstar Technology | QWH-1900-AA | 118 | 14-Sep-05 |
| 0787 | Transient Limiter | Hewlett Packard | 11947A | 3107A01877 | 21-Jul-05 |
| 1424 | Spectrum Analyzer, 30 Hz- 40 GHz | Agilent Technologies (HP) | 8564EC | 3946A00219 | 30-Aug-05 |
| 1430 | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432 | Agilent Technologies (HP) | 8542E | 3807A00262 ,3705A0021 7 | 01-Sep-05 |
| 1502 | Cable RF, 6 m | Belden | M17/167 MIL-C-17 | 1502 | 21-Jul-05 |
| 1510 | Cable RF, 8 m | Belden | M17/167 MIL-C-17 | 1510 | 21-Jul-05 |
| 1562 | Oscilloscope 100 MHz, DMM | Tektronix | THS720A | B039444 | 20-Sep-05 |
| 1651 | Attenuators Set (2, 3, 5, 20 dB), DC-18 GHz | M/A-COM | 2082 | 1651 | 21-Jul-05 |
| 1942 | Cable 18GHz, 4 m, blue | Rhophase Microwave Limited | SPS-1803A-4000-NPS | T4658 | 17-Oct-05 |
| 1947 | Cable 18GHz, 6.5 m, blue | Rhophase Microwave Limited | NPS-1803A-6500-NPS | T4974 | 17-Oct-05 |
| 1984 | Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type | EMC Test Systems | 3115 | 9911-5964 | 21-Jul-05 |
| 1989 | Adapter, 18 - 26.5 GHz, WR-42/SMA | Continental Microwave & Tool Co. | WR-42/SMA | 1989 | 30-Aug-05 |
| 2009 | Cable RF, 8 m | Alpha Wire | RG-214 | C-56 | 30-Aug-05 |

| HL No. | Description | Manufacturer information | | | Due Calibr. Month/Year |
|--------|--|----------------------------|--------------------|------------|------------------------|
| | | Name | Model No. | Serial No. | |
| 2014 | Attenuator, Manual Step, 0-99/1 dB, 0-4 GHz, 2 W | Weinschel | AC9004-99-11 | 16924 | 30-Aug-05 |
| 2117 | Waveguide mixer 40 to 60 GHz | Tektronix | WM 490U | BO12794 | 30-Aug-05 |
| 2227 | Crystal Detector 0.01-18 GHz | Hewlett Packard | 8472A | NA | 14-Oct-05 |
| 2254 | Cable 40GHz, 0.8 m, blue | Rhophase Microwave Limited | KPS-1503A-800-KPS | W4907 | 14-Oct-05 |
| 2259 | Amplifier Low Noise 2-20 GHz | Sophia Wireless | LNA0220-C | 0223 | 14-Oct-05 |
| 2260 | Amplifier Low Noise 14-33 GHz | Sophia Wireless | LNA28-B | 0233 | 14-Oct-05 |
| 2261 | Amplifier Low Noise 33-40 GHz | Sophia Wireless | LNA38-B | 0234 | 14-Oct-05 |
| 2387 | Filter Bandpass, 8-14 GHz | HL | FBP8-14 | 2387 | 14-Oct-05 |
| 2399 | Cable 40GHz, 1.5 m, blue | Rhophase Microwave Limited | KPS-1503A-1500-KPS | X2945 | 14-Oct-05 |
| 2400 | Cable 40GHz, 1.5 m, green | Rhophase Microwave Limited | KPS-1503A-1500-KPS | X2946 | 14-Oct-05 |
| 2499 | Quadruplexer 1-12 GHz (1-2 GHz; 2-4GHz;4-8 GHz; 8-12GHz) | Elettronica S.p.A. - Roma | UE 84 | D/00239 | 14-Oct-05 |
| 2524 | Attenuator, 10 dB, DC-18 GHz | Midwest Microwave | 263-10 | 2524 | 14-Oct-05 |

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 Vertical polarization | Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB |

The test equipment has been calibrated according to its recommended procedures and is within the manufacturer's published limit of error. The standards and instruments used in the calibration system conform to the present requirements of ISO/IEC 17025 (or alternately ANSI/NCSL Z540-1).

The laboratory calibrates its measurement standards by a third party (traceable to NIST, USA) on a regular basis according to equipment manufacturer requirements. The Hermon Labs EMC measurements uncertainty is given in the table above.

Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX C Test facility 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).

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e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

| | |
|--------------------------------|--|
| FCC 47CFR part 15: 2004 | Radio Frequency Devices. |
| Public notice DA 00- 705: 2000 | Filing and measurement guidelines for frequency hopping spread spectrum systems. |
| ANSI C63.2: 1996 | American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications. |
| ANSI C63.4: 2001 | 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 |
| A/m | ampere per meter |
| 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 |
| DTS | digital transmission system |
| EIRP | equivalent isotropically radiated power |
| ERP | effective radiated power |
| EUT | equipment under test |
| F | frequency |
| FHSS | frequency hopping spread spectrum |
| GHz | gigahertz |
| GND | ground |
| H | height |
| HL | Hermon laboratories |
| Hz | hertz |
| ITE | information technology equipment |
| k | kilo |
| kHz | kilohertz |
| LISN | line impedance stabilization network |
| 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 |
| PCB | printed circuit board |
| PM | pulse modulation |
| PS | power supply |
| ppm | part per million (10^{-6}) |
| QP | quasi-peak |
| RE | radiated emission |
| RF | radio frequency |
| rms | root mean square |
| Rx | receive |
| s | second |
| T | temperature |
| Tx | transmit |
| V | volt |
| VA | volt-ampere |

14 APPENDIX F Test equipment correction factors

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

| Frequency, MHz | Correction factor, dB | Frequency, MHz | Correction factor, dB |
|-------------------|--------------------------|-------------------|--------------------------|
| 0.01 | 4.7 | 3.0 | 0.1 |
| 0.02 | 2.1 | 4.0 | 0.1 |
| 0.03 | 1.1 | 5.0 | 0.1 |
| 0.04 | 0.7 | 6.0 | 0.1 |
| 0.05 | 0.5 | 10.0 | 0.1 |
| 0.1 | 0.2 | 12.0 | 0.1 |
| 0.2 | 0.1 | 16.0 | 0.1 |
| 0.4 | 0.1 | 18.0 | 0.1 |
| 0.6 | 0.1 | 20.0 | 0.1 |
| 0.8 | 0.1 | 25.0 | 0.1 |
| 1.0 | 0.1 | 28.0 | 0.1 |
| 2.0 | 0.1 | 30.0 | 0.1 |

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
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.112, HL 0768, 0769, 0770

| Frequency min, GHz | Frequency max, GHz | Antenna factor, dB(1/m) |
|-----------------------|-----------------------|----------------------------|
| 18.000 | 26.500 | 32.01 |
| 26.500 | 40.000 | 35.48 |
| 40.000 | 60.000 | 39.03 |
| 60.000 | 90.000 | 42.55 |
| 90.000 | 140.000 | 46.23 |
| 140.000 | 220.000 | 50.11 |

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, serial number 1011

| Frequency, MHz | Antenna factor, dB(1/m) | Frequency, MHz | Antenna factor, dB(1/m) | Frequency, MHz | Antenna factor, dB(1/m) |
|-------------------|----------------------------|-------------------|----------------------------|-------------------|----------------------------|
| 26 | 7.8 | 560 | 19.8 | 1300 | 27.0 |
| 28 | 7.8 | 580 | 20.6 | 1320 | 27.8 |
| 30 | 7.8 | 600 | 21.3 | 1340 | 28.3 |
| 40 | 7.2 | 620 | 21.5 | 1360 | 28.2 |
| 60 | 7.1 | 640 | 21.2 | 1380 | 27.9 |
| 70 | 8.5 | 660 | 21.4 | 1400 | 27.9 |
| 80 | 9.4 | 680 | 21.9 | 1420 | 27.9 |
| 90 | 9.8 | 700 | 22.2 | 1440 | 27.8 |
| 100 | 9.7 | 720 | 22.2 | 1460 | 27.8 |
| 110 | 9.3 | 740 | 22.1 | 1480 | 28.0 |
| 120 | 8.8 | 760 | 22.3 | 1500 | 28.5 |
| 130 | 8.7 | 780 | 22.6 | 1520 | 28.9 |
| 140 | 9.2 | 800 | 22.7 | 1540 | 29.6 |
| 150 | 9.8 | 820 | 22.9 | 1560 | 29.8 |
| 160 | 10.2 | 840 | 23.1 | 1580 | 29.6 |
| 170 | 10.4 | 860 | 23.4 | 1600 | 29.5 |
| 180 | 10.4 | 880 | 23.8 | 1620 | 29.3 |
| 190 | 10.3 | 900 | 24.1 | 1640 | 29.2 |
| 200 | 10.6 | 920 | 24.1 | 1660 | 29.4 |
| 220 | 11.6 | 940 | 24.0 | 1680 | 29.6 |
| 240 | 12.4 | 960 | 24.1 | 1700 | 29.8 |
| 260 | 12.8 | 980 | 24.5 | 1720 | 30.3 |
| 280 | 13.7 | 1000 | 24.9 | 1740 | 30.8 |
| 300 | 14.7 | 1020 | 25.0 | 1760 | 31.1 |
| 320 | 15.2 | 1040 | 25.2 | 1780 | 31.0 |
| 340 | 15.4 | 1060 | 25.4 | 1800 | 30.9 |
| 360 | 16.1 | 1080 | 25.6 | 1820 | 30.7 |
| 380 | 16.4 | 1100 | 25.7 | 1840 | 30.6 |
| 400 | 16.6 | 1120 | 26.0 | 1860 | 30.6 |
| 420 | 16.7 | 1140 | 26.4 | 1880 | 30.6 |
| 440 | 17.0 | 1160 | 27.0 | 1900 | 30.6 |
| 460 | 17.7 | 1180 | 27.0 | 1920 | 30.7 |
| 480 | 18.1 | 1200 | 26.7 | 1940 | 30.9 |
| 500 | 18.5 | 1220 | 26.5 | 1960 | 31.2 |
| 520 | 19.1 | 1240 | 26.5 | 1980 | 31.6 |
| 540 | 19.5 | 1260 | 26.5 | 2000 | 32.0 |
| | | 1280 | 26.6 | | |

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, HL1984

| 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).

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 | ≤ 6.5 | ± 0.12 |
| 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 | | ± 0.17 |
| 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 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
Cable 18 GHz, 4 m, blue, model: SPS-1803A-4000-NPS, S/N T4658, HL 1942

| Frequency, GHz | Cable loss, dB |
|-------------------|-------------------|
| 0.03 | 0.21 |
| 0.05 | 0.26 |
| 0.10 | 0.36 |
| 0.20 | 0.50 |
| 0.30 | 0.61 |
| 0.40 | 0.70 |
| 0.50 | 0.78 |
| 0.60 | 0.85 |
| 0.70 | 0.93 |
| 0.80 | 0.99 |
| 0.90 | 1.04 |
| 1.00 | 1.10 |
| 1.10 | 1.16 |
| 1.20 | 1.22 |
| 1.30 | 1.26 |
| 1.40 | 1.31 |
| 1.50 | 1.35 |
| 1.60 | 1.41 |
| 1.70 | 1.45 |
| 1.80 | 1.49 |
| 1.90 | 1.53 |
| 2.00 | 1.57 |
| 2.10 | 1.61 |
| 2.20 | 1.65 |
| 2.30 | 1.69 |
| 2.40 | 1.72 |
| 2.50 | 1.76 |
| 2.60 | 1.79 |
| 2.70 | 1.83 |
| 2.80 | 1.87 |
| 2.90 | 1.90 |
| 3.10 | 1.97 |
| 3.30 | 2.04 |
| 3.50 | 2.11 |
| 3.70 | 2.18 |
| 3.90 | 2.24 |
| 4.10 | 2.31 |
| 4.30 | 2.38 |
| 4.50 | 2.43 |
| 4.70 | 2.53 |
| 4.90 | 2.53 |
| 5.10 | 2.63 |
| 5.30 | 2.65 |
| 5.50 | 2.72 |
| 5.70 | 2.76 |
| 5.90 | 2.79 |

| Frequency, GHz | Cable loss, dB |
|-------------------|-------------------|
| 6.10 | 2.88 |
| 6.30 | 2.90 |
| 6.50 | 2.97 |
| 6.70 | 3.02 |
| 6.90 | 3.04 |
| 7.10 | 3.07 |
| 7.30 | 3.12 |
| 7.50 | 3.13 |
| 7.70 | 3.19 |
| 7.90 | 3.24 |
| 8.10 | 3.30 |
| 8.30 | 3.36 |
| 8.50 | 3.45 |
| 8.70 | 3.41 |
| 8.90 | 3.45 |
| 9.10 | 3.42 |
| 9.30 | 3.55 |
| 9.50 | 3.48 |
| 9.70 | 3.58 |
| 9.90 | 3.61 |
| 10.10 | 3.66 |
| 10.30 | 3.68 |
| 10.50 | 3.70 |
| 10.70 | 3.70 |
| 10.90 | 3.75 |
| 11.10 | 3.78 |
| 11.30 | 3.86 |
| 11.50 | 3.98 |
| 11.70 | 4.10 |
| 11.90 | 4.12 |
| 12.10 | 4.09 |
| 12.40 | 4.13 |
| 13.00 | 4.23 |
| 13.50 | 4.35 |
| 14.00 | 4.40 |
| 14.50 | 4.44 |
| 15.00 | 4.57 |
| 15.50 | 4.66 |
| 16.00 | 4.64 |
| 16.50 | 4.66 |
| 17.00 | 4.75 |
| 17.50 | 4.85 |
| 18.00 | 4.93 |

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, 40GHz, 1.5 m, Blue, Rhopase Microwave Limited, model: KPS-1503A-1500-KPS, HL 2399

| Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 0.03 | 0.07 | 6.5 | 1.57 | 15.50 | 2.50 |
| 0.05 | 0.10 | 6.7 | 1.60 | 16.00 | 2.51 |
| 0.1 | 0.16 | 6.9 | 1.55 | 16.50 | 2.58 |
| 0.2 | 0.26 | 7.1 | 1.65 | 17.00 | 2.65 |
| 0.3 | 0.33 | 7.3 | 1.65 | 17.50 | 2.73 |
| 0.5 | 0.38 | 7.5 | 1.70 | 18.00 | 2.74 |
| 0.7 | 0.41 | 7.7 | 1.71 | 18.50 | 2.67 |
| 0.9 | 0.58 | 7.9 | 1.73 | 19.00 | 2.67 |
| 1.1 | 0.64 | 8.1 | 1.79 | 19.50 | 2.74 |
| 1.3 | 0.70 | 8.3 | 1.81 | 20.00 | 2.69 |
| 1.5 | 0.75 | 8.5 | 1.84 | 20.50 | 2.80 |
| 1.7 | 0.79 | 8.7 | 1.85 | 21.00 | 2.82 |
| 1.9 | 0.83 | 8.9 | 1.90 | 21.50 | 2.87 |
| 2.1 | 0.88 | 9.1 | 1.95 | 22.00 | 2.87 |
| 2.3 | 0.93 | 9.3 | 1.93 | 22.50 | 2.92 |
| 2.5 | 0.97 | 9.5 | 1.98 | 23.50 | 3.04 |
| 2.7 | 1.01 | 9.7 | 1.96 | 24.00 | 3.05 |
| 2.9 | 1.04 | 9.9 | 2.03 | 24.50 | 3.03 |
| 3.1 | 1.08 | 10.1 | 1.99 | 25.00 | 3.11 |
| 3.3 | 1.14 | 10.30 | 2.02 | 25.50 | 3.10 |
| 3.5 | 1.17 | 10.50 | 2.02 | 26.00 | 3.17 |
| 3.7 | 1.21 | 10.70 | 2.02 | 26.50 | 3.11 |
| 3.9 | 1.24 | 10.90 | 2.08 | 27.00 | 3.16 |
| 4.1 | 1.26 | 11.10 | 2.02 | 28.00 | 3.19 |
| 4.3 | 1.26 | 11.30 | 2.09 | 29.00 | 3.19 |
| 4.5 | 1.29 | 11.50 | 2.05 | 30.00 | 3.30 |
| 4.7 | 1.34 | 11.70 | 2.11 | 31.00 | 3.31 |
| 4.9 | 1.34 | 11.90 | 2.11 | 32.00 | 3.35 |
| 5.1 | 1.40 | 12.10 | 2.12 | 33.00 | 3.46 |
| 5.3 | 1.43 | 12.40 | 2.17 | 34.00 | 3.45 |
| 5.5 | 1.45 | 13.00 | 2.29 | 35.00 | 3.49 |
| 5.7 | 1.47 | 13.50 | 2.31 | 36.00 | 3.54 |
| 5.9 | 1.40 | 14.00 | 2.43 | 37.00 | 3.62 |
| 6.1 | 1.53 | 14.50 | 2.43 | 39.00 | 3.69 |
| 6.3 | 1.55 | 15.00 | 2.46 | 40.00 | 3.75 |

Cable loss

Cable coaxial, 40GHz, 1.5 m, green, Rhophase Microwave Limited, model: KPS-1503A-1500-KPS, HL 2400

| Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB | Frequency, GHz | Cable loss, dB |
|----------------|----------------|----------------|----------------|----------------|----------------|
| 0.03 | 0.06 | 6.5 | 1.46 | 15.50 | 2.34 |
| 0.05 | 0.08 | 6.7 | 1.49 | 16.00 | 2.34 |
| 0.1 | 0.15 | 6.9 | 1.50 | 16.50 | 2.40 |
| 0.2 | 0.23 | 7.1 | 1.51 | 17.00 | 2.46 |
| 0.3 | 0.29 | 7.3 | 1.55 | 17.50 | 2.54 |
| 0.5 | 0.37 | 7.5 | 1.56 | 18.00 | 2.61 |
| 0.7 | 0.46 | 7.7 | 1.58 | 18.50 | 2.59 |
| 0.9 | 0.53 | 7.9 | 1.60 | 19.00 | 2.59 |
| 1.1 | 0.58 | 8.1 | 1.61 | 19.50 | 2.67 |
| 1.3 | 0.65 | 8.3 | 1.68 | 20.00 | 2.62 |
| 1.5 | 0.66 | 8.5 | 1.68 | 20.50 | 2.73 |
| 1.7 | 0.72 | 8.7 | 1.75 | 21.00 | 2.71 |
| 1.9 | 0.76 | 8.9 | 1.74 | 21.50 | 2.78 |
| 2.1 | 0.79 | 9.1 | 1.81 | 22.00 | 2.83 |
| 2.3 | 0.85 | 9.3 | 1.79 | 22.50 | 2.81 |
| 2.5 | 0.90 | 9.5 | 1.86 | 23.50 | 2.91 |
| 2.7 | 0.91 | 9.7 | 1.85 | 24.00 | 2.97 |
| 2.9 | 0.97 | 9.9 | 1.87 | 24.50 | 2.98 |
| 3.1 | 0.97 | 10.1 | 1.88 | 25.00 | 2.97 |
| 3.3 | 1.03 | 10.30 | 1.82 | 25.50 | 3.03 |
| 3.5 | 1.06 | 10.50 | 1.92 | 26.00 | 3.04 |
| 3.7 | 1.10 | 10.70 | 1.86 | 26.50 | 3.11 |
| 3.9 | 1.13 | 10.90 | 1.96 | 27.00 | 2.97 |
| 4.1 | 1.16 | 11.10 | 1.90 | 28.00 | 3.15 |
| 4.3 | 1.18 | 11.30 | 1.99 | 29.00 | 3.07 |
| 4.5 | 1.21 | 11.50 | 1.95 | 30.00 | 3.13 |
| 4.7 | 1.23 | 11.70 | 2.00 | 31.00 | 3.13 |
| 4.9 | 1.26 | 11.90 | 2.01 | 32.00 | 3.18 |
| 5.1 | 1.28 | 12.10 | 1.99 | 33.00 | 3.31 |
| 5.3 | 1.31 | 12.40 | 2.06 | 34.00 | 3.32 |
| 5.5 | 1.32 | 13.00 | 2.11 | 35.00 | 3.37 |
| 5.7 | 1.36 | 13.50 | 2.17 | 36.00 | 3.36 |
| 5.9 | 1.37 | 14.00 | 2.36 | 37.00 | 3.46 |
| 6.1 | 1.38 | 14.50 | 2.32 | 39.00 | 3.49 |
| 6.3 | 1.44 | 15.00 | 2.30 | 40.00 | 3.52 |