HERMON LABORATORIES

ACCREDITED
839.01
Electrical

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# TEST REPORT

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

**FOR:**

## Telematics Wireless Ltd.

## Water meter (Low cost repeater)

## Model: LCR

# Table of contents

## 1 Applicant information

| | |
|---|---|
| **Client name:** | Telematics Wireless Ltd. |
| **Address:** | 26 Hamelaha street, POB 1911, Holon, 58117, Israel |
| **Telephone:** | +972 3557 5767 |
| **Fax:** | +972 3557 5703 |
| **E-mail:** | slavas@telematics-wireless.com |
| **Contact name:** | Mr. Slava Snitkovsky |

## 2 Equipment under test attributes

| | |
|---|---|
| **Product name:** | Water meter (Low cost repeater) |
| **Product type:** | Transceiver |
| **Model(s):** | LCR |
| **Serial number:** | 1236 |
| **Hardware version:** | B |
| **Software release:** | A023 |
| **Receipt date** | 1/8/2007 |

## 3 Manufacturer information

| | |
|---|---|
| **Manufacturer name:** | Telematics Wireless Ltd. |
| **Address:** | 26 Hamelaha street, POB 1911, Holon, 58117, Israel |
| **Telephone:** | +972 3557 5767 |
| **Fax:** | +972 3557 5703 |
| **E-Mail:** | slavas@telematics-wireless.com |
| **Contact name:** | Mr. Slava Snitkovsky |

## 4 Test details

| | |
|---|---|
| **Project ID:** | 17651 |
| **Location:** | Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel |
| **Test started:** | 1/8/2007 |
| **Test completed:** | 5/18/2007 |
| **Test specification(s):** | FCC 15.247_DTS _with RF antenna connector |
| **Test suite:** | FCC 15.247_DTS _with RF antenna connector (11/19/2006) |

# 5 Tests summary

| Test | Status |
|---|---|
| **Transmitter characteristics** | |
| Section 15.247(a)2, 6 dB bandwidth | Pass |
| Section 15.247(b)3, Peak output power | Pass |
| Section 15.247(b)5, RF exposure | Pass, the exhibit to the application of certification is provided |
| Section 15.247(c), Conducted spurious emissions | Pass |
| Section 15.247(c), Radiated spurious emissions | Pass |
| Section 15.247(d), Peak power density | Pass |
| Section 15.207(a), Conducted emission | Not required |
| Section 15.203, Antenna requirement | Pass |
| **Unintentional emissions** | |
| Section 15.107, Conducted emission at AC power port | Not required |
| 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. A. Adelberg, test engineer | May 18, 2007 |  |
| **Reviewed by:** | Mrs. M. Cherniavsky, certification engineer | May 31, 2007 |  |
| **Approved by:** | Mr. M. Nikishin, EMC and Radio group leader | June 3, 2007 |  |

# 6 EUT description

## 6.1 General information

The EUT is a water meter reader transciever operating in 902-928 MHz assigned band. It includes a microcontroller and simple digital logic, which control the operational modes of the unit. The EUT is powered by internal 3.6 V battery.

## 6.2 Operating frequencies

| Source | Frequency, MHz | |
|---|---|---|
| Transmitter | 905.44-923.55 | NA |
| Receiver | 916.468 (RF) | 927 (LO) |
| Digital portion | 0.032 (clock) | 14.487 (clock) |

## 6.3 Changes made in the EUT

No changes were implemented.

## 6.4 Transmitter characteristics

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Type of equipment** | | | | | | | | | |
| | Stand-alone (Equipment with or without its own control provisions) | | | | | | | | |
| X | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) | | | | | | | | |
| | Plug-in card (Equipment intended for a variety of host systems) | | | | | | | | |
| **Intended use** | | **Condition of use** | | | | | | | |
| | fixed | Always at a distance more than 2 m from all people | | | | | | | |
| X | mobile | Always at a distance more than 20 cm from all people | | | | | | | |
| | portable | May operate at a distance closer than 20 cm to human body | | | | | | | |
| **Assigned frequency range** | | 902 - 928 MHz | | | | | | | |
| **Operating frequency range** | | 905.44 – 923.55 MHz | | | | | | | |
| **RF channel spacing** | | 3.62 MHz | | | | | | | |
| **Maximum rated output power** | | At transmitter 50 Ω RF output connector | | | | | 14.6 dBm (FSK)<br>16.8 dBm (PSK) | | |
| | | Effective radiated power (for equipment with no RF connector) | | | | | | | |
| **Is transmitter output power variable?** | | X | No | | | | | | |
| | | | Yes | | continuous variable | | | | |
| | | | | | stepped variable with stepsize | | dB | | |
| | | | | | minimum RF power | | dBm | | |
| | | | | | maximum RF power | | dBm | | |
| **Antenna connection** | | | | | | | | | |
| unique coupling | | X | standard connector<br>TNC | integral | | with temporary RF connector<br>without temporary RF connector | | | |
| **Antenna/s technical characteristics** | | | | | | | | | |
| Type | | Manufacturer | | Model number | | Gain | | | |
| External | | Telematics Wireless | | Short | | 3 dBi | | | |
| **Transmitter 99% power bandwidth** | | 2 MHz (PSK modulated), 560 kHz (FSK modulated) | | | | | | | |
| **Transmitter aggregate data rate/s** | | 60 kBps (PSK and FSK modulated) | | | | | | | |
| **Transmitter aggregate symbol (baud) rate/s** | | 0.9 Msymbols (MBaud) per second (PSK modulated) | | | | | | | |
| **Type of modulation** | | PSK, FSK | | | | | | | |
| **Modulating test signal (baseband)** | | PRBS | | | | | | | |
| **Maximum transmitter duty cycle in normal use** | | 1.2 % | | | | | | | |
| **Transmitter duty cycle supplied for test** | | 5.2 % | | **Tx ON time** | 4.1 msec | | **Period** | 79.12 msec | |
| **Transmitter power source** | | | | | | | | | |
| X | Battery | **Nominal rated voltage** | 3.6 VDC | Battery type | Lithium | | | | |
| | DC | **Nominal rated voltage** | VDC | | | | | | |
| | AC mains | **Nominal rated voltage** | VAC | Frequency | Hz | | | | |
| **Common power source for transmitter and receiver** | | | | X | yes | | no | | |

| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(a)2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:31:53 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

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

## 7.1 Minimum 6 dB bandwidth

### 7.1.1 General

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

**Table 7.1.1 The 6 dB bandwidth limits**

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

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

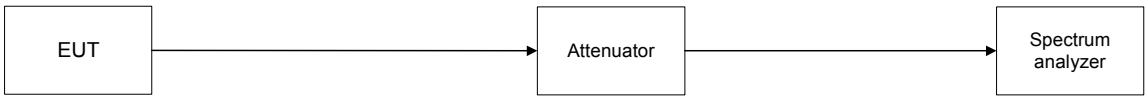
### 7.1.2 Test procedure

**7.1.2.1** The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

**7.1.2.2** The EUT was set to transmit modulated carrier.

**7.1.2.3** The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plot.

**Figure 7.1.1 The 6 dB bandwidth test setup**



| **Test specification:** | **Section 15.247(a)2, 6 dB bandwidth** | | |
|---|---|---|---|
| **Test procedure:** | FR Vol.62, page 26243, Section 15.247(a)2 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date & Time:** | 5/3/2007 2:31:53 PM | | |
| **Temperature:** 25ºC | **Air Pressure:** 1007 hPa | **Relative Humidity:** 42% | **Power Supply:** 3.6 V DC |
| **Remarks:** | | | |

**Table 7.1.2 The 6 dB bandwidth test results**

ASSIGNED FREQUENCY BAND: 902 – 928 MHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc
MODULATION: PSK / FSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kbps

| Carrier frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz | Verdict |
|---|---|---|---|---|
| **PSK modulation** | | | | |
| Low frequency | | | | |
| 905.4375 | 1005 | 500 | 505 | Pass |
| Mid frequency | | | | |
| 916.3000 | 1005 | 500 | 505 | Pass |
| High frequency | | | | |
| 923.5462 | 1005 | 500 | 505 | Pass |
| **FSK modulation** | | | | |
| Low frequency | | | | |
| 905.4375 | 975 | 500 | 475 | Pass |
| Mid frequency | | | | |
| 916.3000 | 919 | 500 | 419 | Pass |
| High frequency | | | | |
| 923.5462 | 874 | 500 | 374 | Pass |

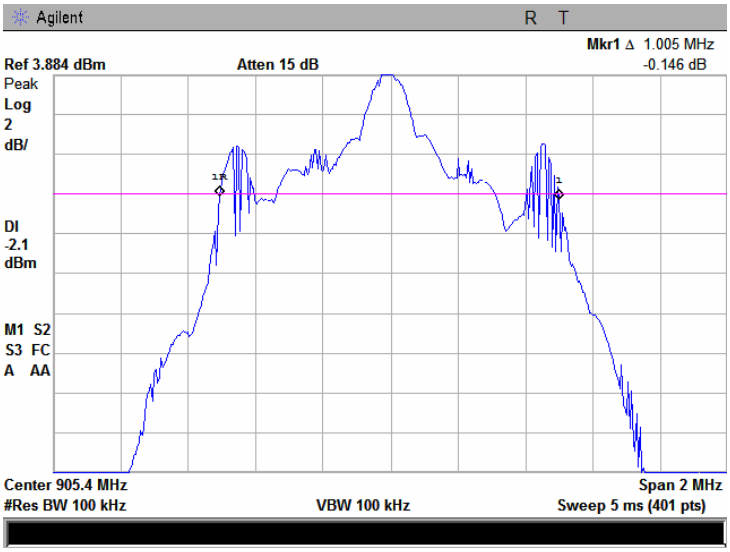
**Reference numbers of test equipment used**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HL 1650 | HL 2254 | HL 2780 | | | | | | |

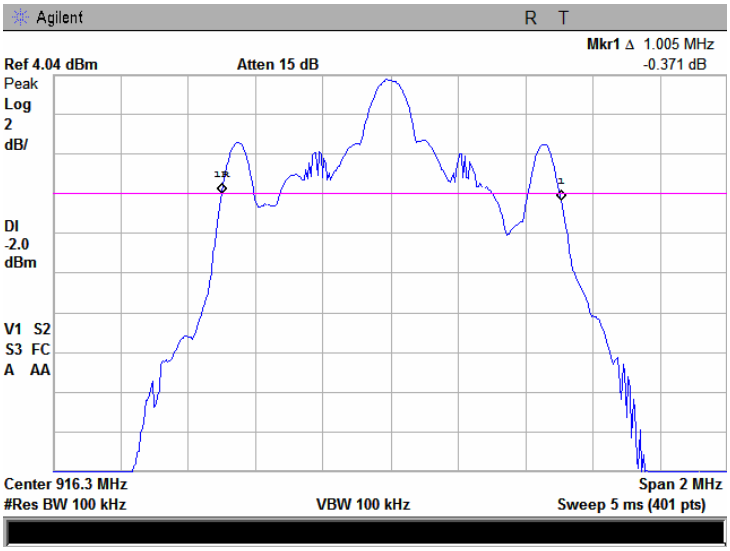
Full description is given in Appendix A.

| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(a)2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:31:53 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.1.1 The 6 dB bandwidth test result at low frequency, with PSK modulation**

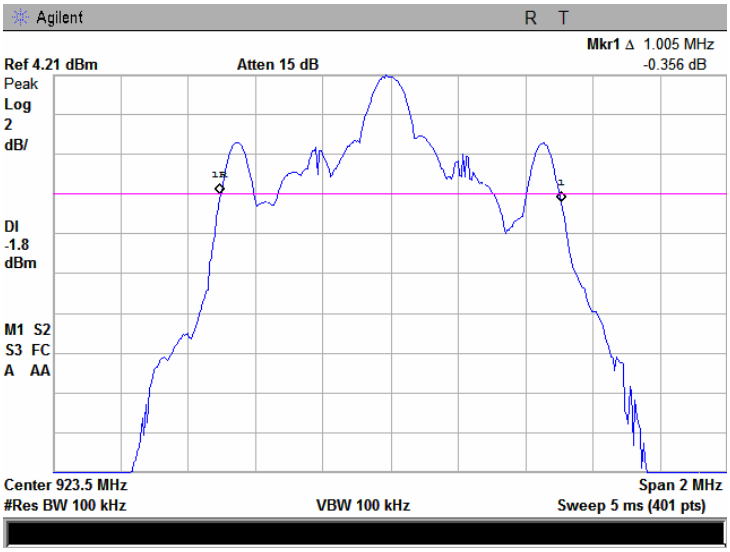



**Plot 7.1.2 The 6 dB bandwidth test result at mid frequency, with PSK modulation**

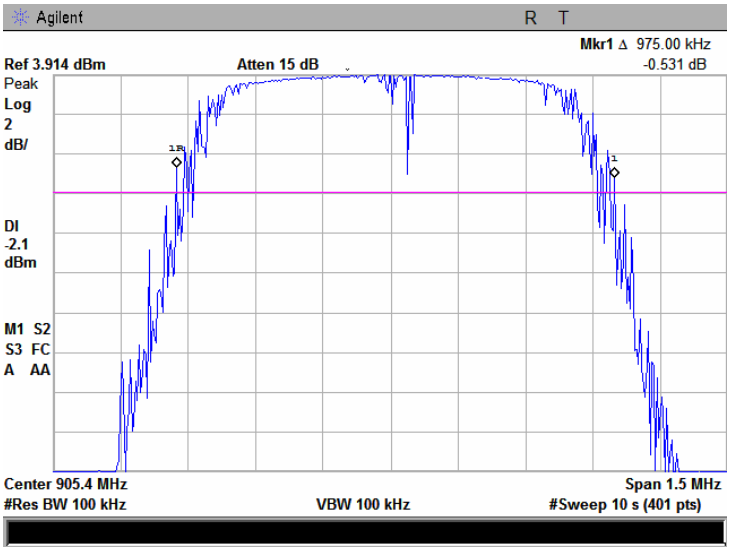


| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(a)2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:31:53 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.1.3 The 6 dB bandwidth test result at high frequency, with PSK modulation**

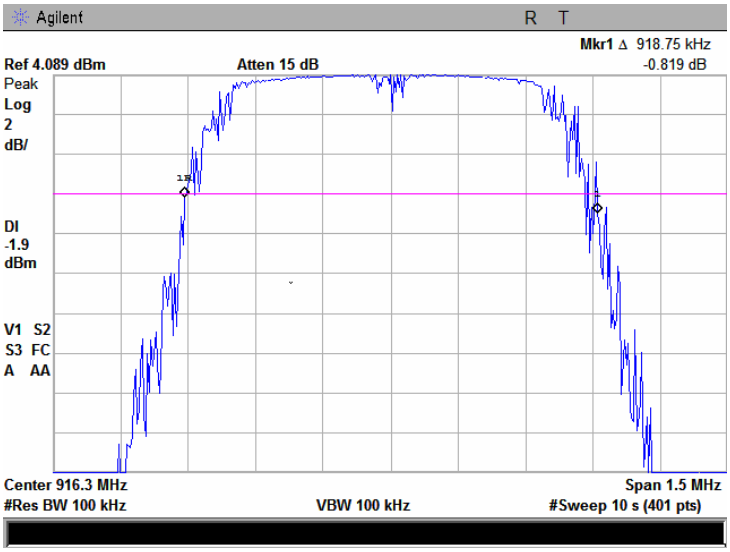



**Plot 7.1.4 The 6 dB bandwidth test result at low frequency, with FSK modulation**

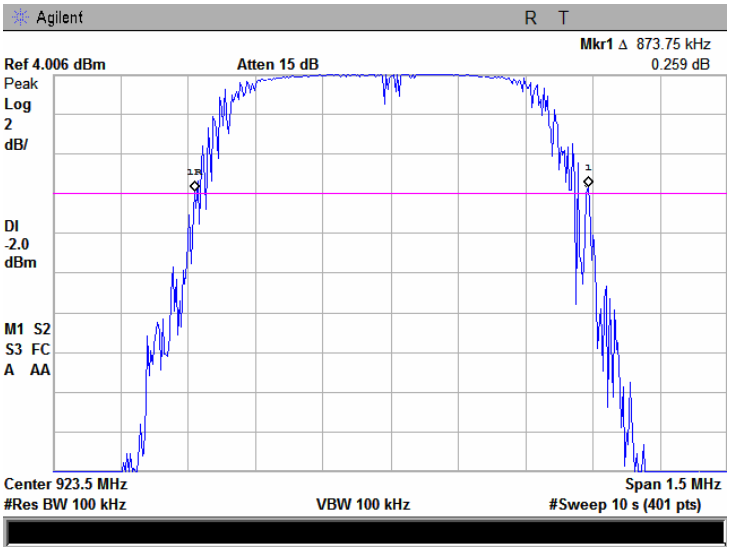


| Test specification: | Section 15.247(a)2, 6 dB bandwidth | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(a)2 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:31:53 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.1.5 The 6 dB bandwidth test result at mid frequency, with FSK modulation**




**Plot 7.1.6 The 6 dB bandwidth test result at high frequency, with FSK modulation**



| Test specification: | Section 15.247(b)3, Peak output power | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:38:43 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

## 7.2 Peak output power

### 7.2.1 General

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

**Table 7.2.1 Peak output power limits**

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

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

by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;

without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;

by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

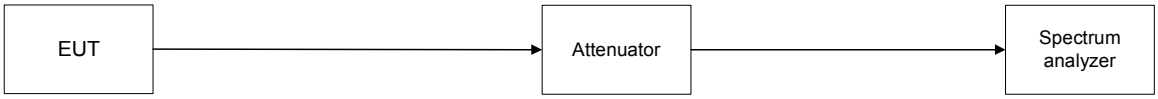
### 7.2.2 Test procedure

**7.2.2.1** The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

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

**7.2.2.3** The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the maximum peak output power was measured as provided in Table 7.2.2 and associated plots.

**Figure 7.2.1 Peak output power test setup**



| Test specification: | Section 15.247(b)3, Peak output power | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:38:43 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Table 7.2.2 Peak output power test results**

ASSIGNED FREQUENCY: 902 – 928 MHz
MODULATION: PSK / FSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
EUT 6 dB BANDWIDTH: 1 MHz
RESOLUTION BANDWIDTH: 3 MHz
VIDEO BANDWIDTH: 3 MHz

| Carrier frequency, MHz | Spectrum analyzer reading, dBm | External attenuation, dB | Cable loss, dB | Peak output power, dBm | Limit, dBm | Margin*, dB | Verdict |
|---|---|---|---|---|---|---|---|
| **PSK modulation** | | | | | | | |
| 905.4375 | 6.500 | 10.00 | Included | 16.500 | 30.000 | -13.500 | Pass |
| 916.3000 | 6.646 | 10.00 | Included | 16.646 | 30.000 | -13.354 | Pass |
| 923.5462 | 6.797 | 10.00 | Included | 16.797 | 30.000 | -13.203 | Pass |
| **FSK modulation** | | | | | | | |
| 905.4375 | 4.471 | 10.00 | Included | 14.471 | 30.000 | -15.529 | Pass |
| 916.3000 | 4.505 | 10.00 | Included | 14.505 | 30.000 | -15.495 | Pass |
| 923.5462 | 4.573 | 10.00 | Included | 14.573 | 30.000 | -15.427 | Pass |

* - Margin = Peak output power – specification limit.

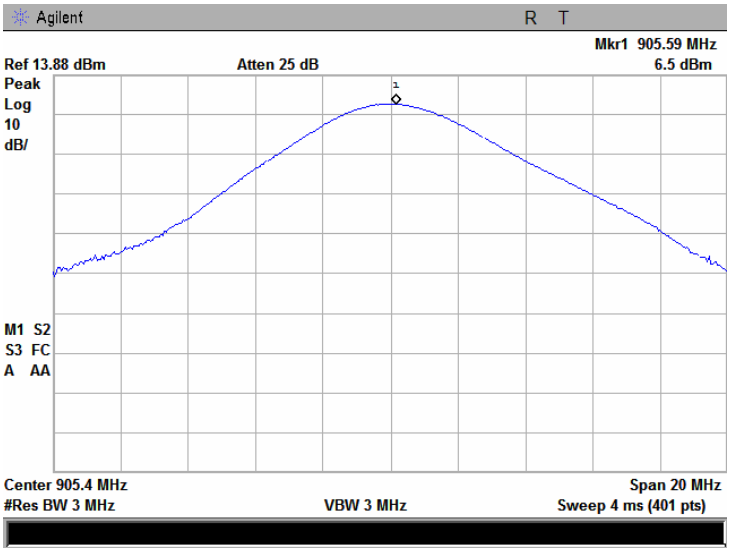
**Reference numbers of test equipment used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 1650 | HL 2254 | HL 2780 | | | | | |

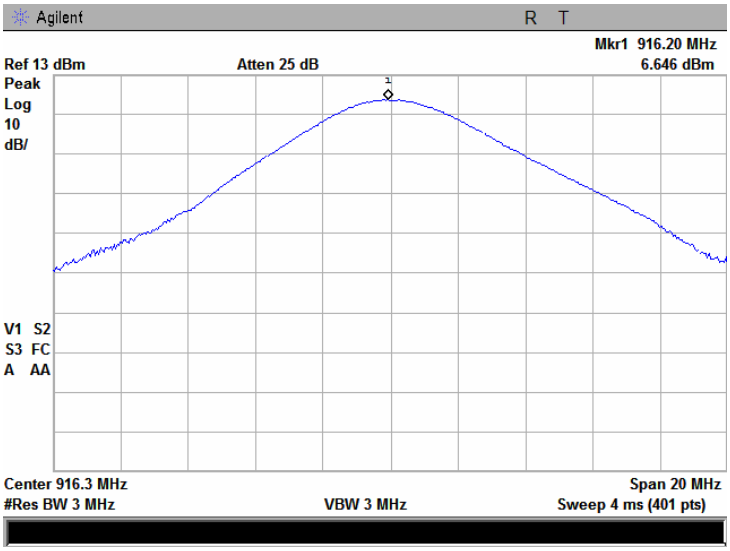
Full description is given in Appendix A.

| Test specification: | Section 15.247(b)3, Peak output power | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:38:43 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.2.1 Peak output power at low frequency, with PSK modulation**

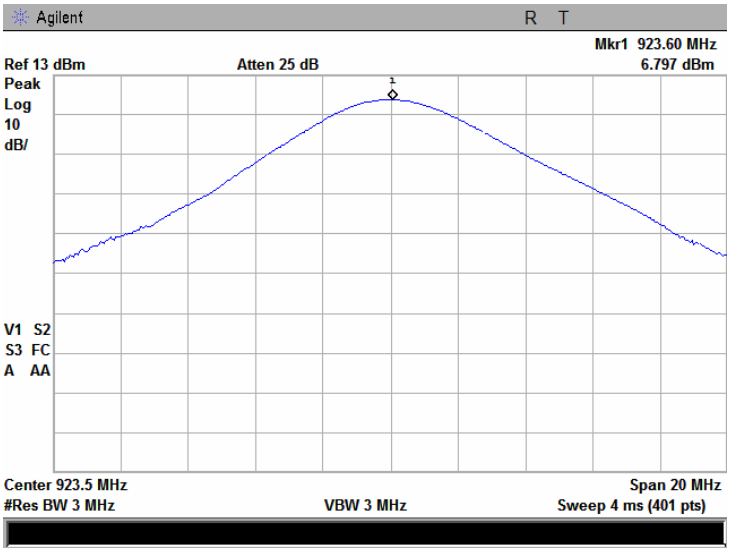



**Plot 7.2.2 Peak output power at mid frequency, with PSK modulation**

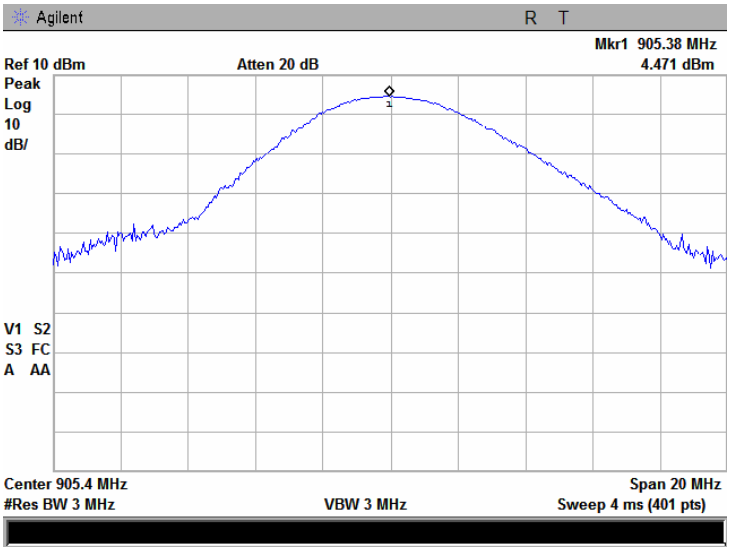


| Test specification: | Section 15.247(b)3, Peak output power | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:38:43 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.2.3 Peak output power at high frequency, with PSK modulation**

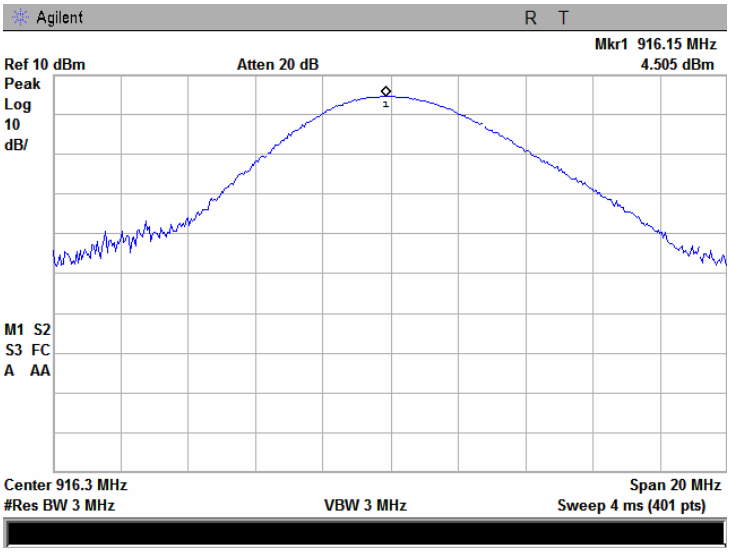



**Plot 7.2.4 Peak output power at low frequency, with FSK modulation**

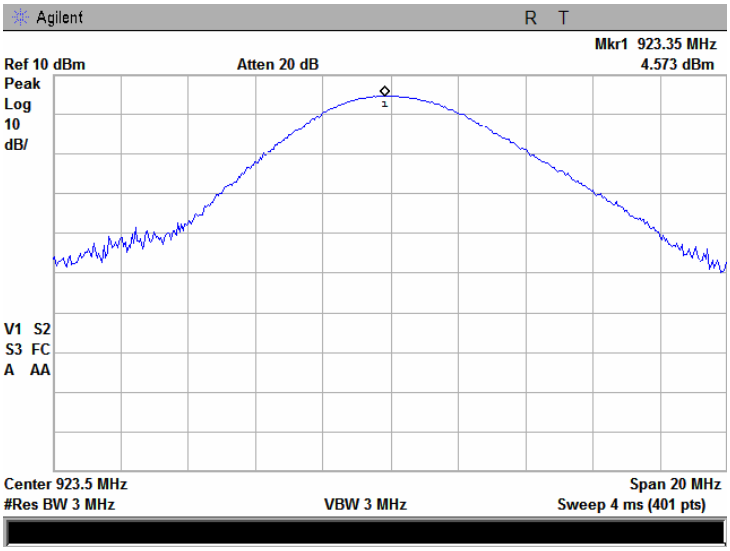


| Test specification: | Section 15.247(b)3, Peak output power | | |
|---|---|---|---|
| Test procedure: | FR Vol.62, page 26243, Section 15.247(b) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:38:43 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.2.5 Peak output power at mid frequency, with FSK modulation**




**Plot 7.2.6 Peak output power at high frequency, with FSK modulation**



| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

## 7.3 Spurious emissions at RF antenna connector

### 7.3.1 General

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

**Table 7.3.1 Spurious emission limits**

| Frequency*, MHz | Attenuation below carrier*, dBc |
|---|---|
| 0.009 – 10$^{th}$ harmonic | 20.0 |

* - The above limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.
** - Spurious emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

### 7.3.2 Test procedure

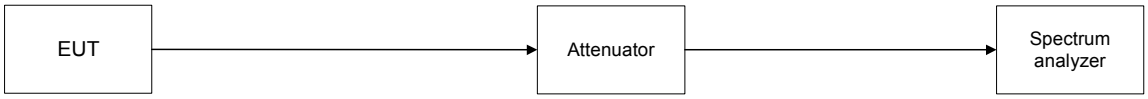
**7.3.2.1** The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

**7.3.2.2** The EUT was adjusted to produce maximum available to end user RF output power.

**7.3.2.3** The highest emission level within the authorized band was measured.

**7.3.2.4** The spurious emission was measured with spectrum analyzer as provided in Table 7.3.2 and associated plots and referenced to the highest emission level measured within the authorized band.

**Figure 7.3.1 Spurious emission test setup**



| **Test specification:** | **Section 15.247(c), Conducted spurious emissions** | | |
|---|---|---|---|
| **Test procedure:** | FR Vol. 62, page 26243, Section 15.247(c) | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date & Time:** | 5/7/2007 11:48:08 AM | | |
| **Temperature:** 26ºC | **Air Pressure:** 1012 hPa | **Relative Humidity:** 37% | **Power Supply:** 3.6 V DC |
| **Remarks:** | | | |

**Table 7.3.2 Spurious emission test results**

| | |
|---|---|
| ASSIGNED FREQUENCY RANGE: | 902 – 928 MHz |
| INVESTIGATED FREQUENCY RANGE: | 0.009 – 10000 MHz |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 100 kHz |
| VIDEO BANDWIDTH: | 300 kHz |
| MODULATION: | FSK / PSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 60 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |

| Frequency, MHz | Spurious emission, dBm | Emission at carrier, dBm | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|---|---|---|---|---|---|---|
| All emissions were found more than 20 dB below the limit | | | | | | Pass |

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

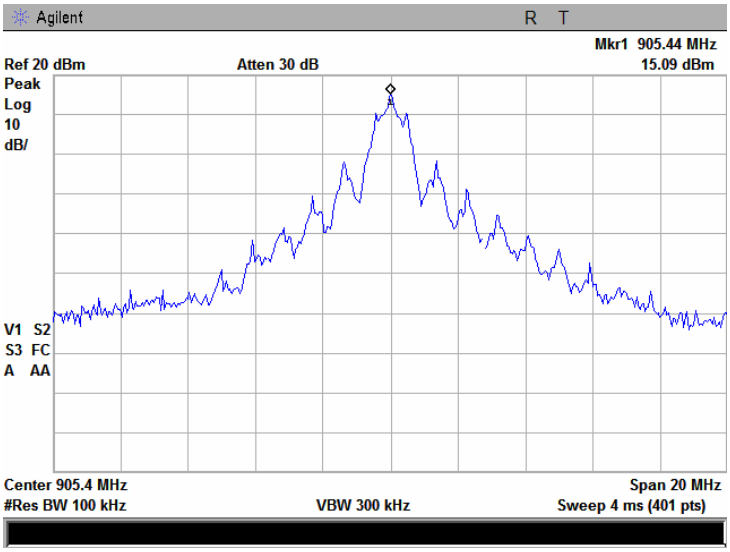
**Reference numbers of test equipment used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 1650 | HL 2254 | HL 2780 | | | | | |

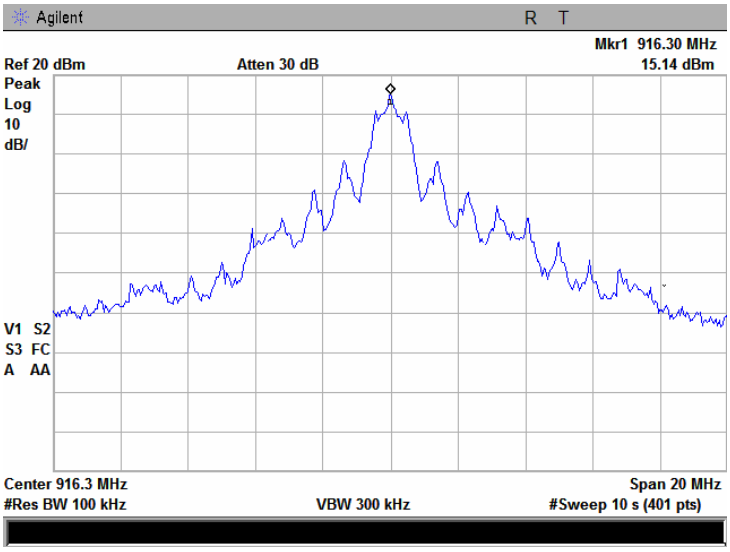
Full description is given in Appendix A.

| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.1 The highest emission level within the assigned band at low carrier frequency with PSK modulation**

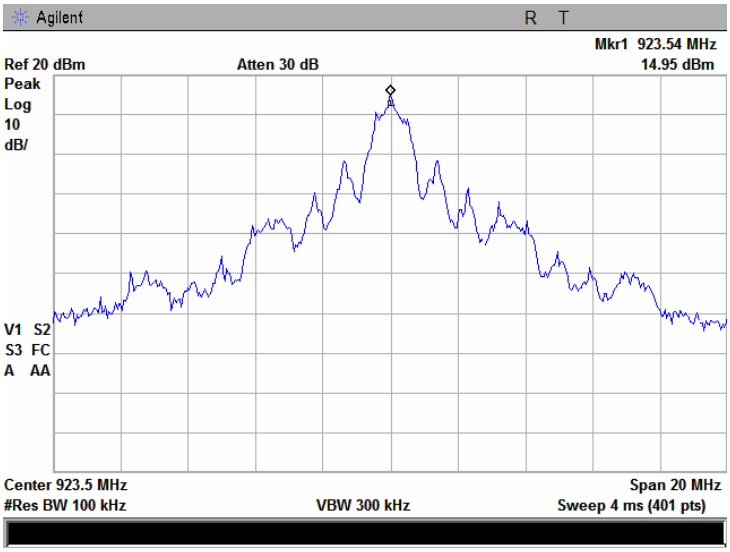



**Plot 7.3.2 The highest emission level within the assigned band at mid carrier frequency with PSK modulation**

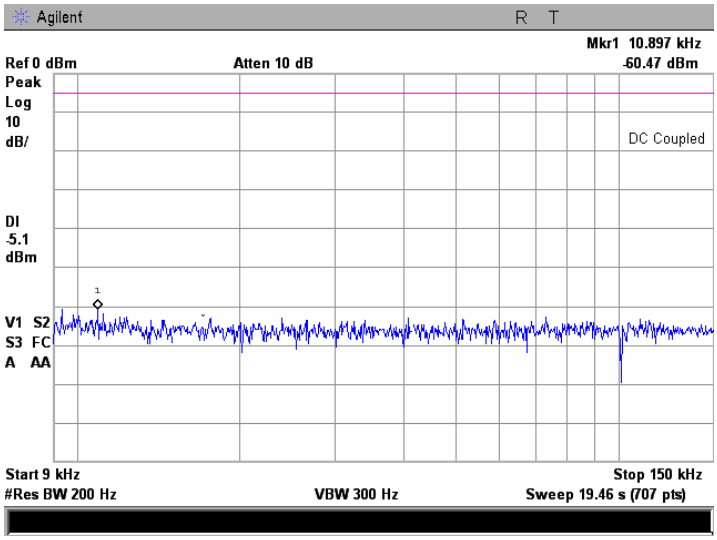


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.3 The highest emission level within the assigned band at high carrier frequency with PSK modulation**

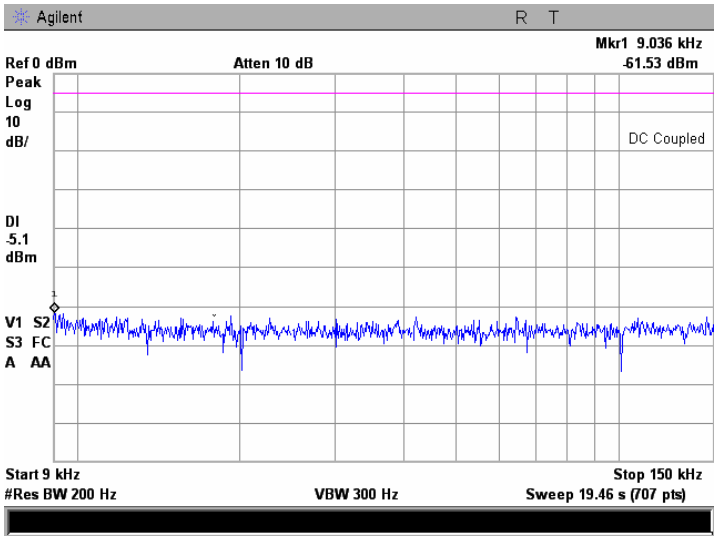



**Plot 7.3.4 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency with PSK modulation**

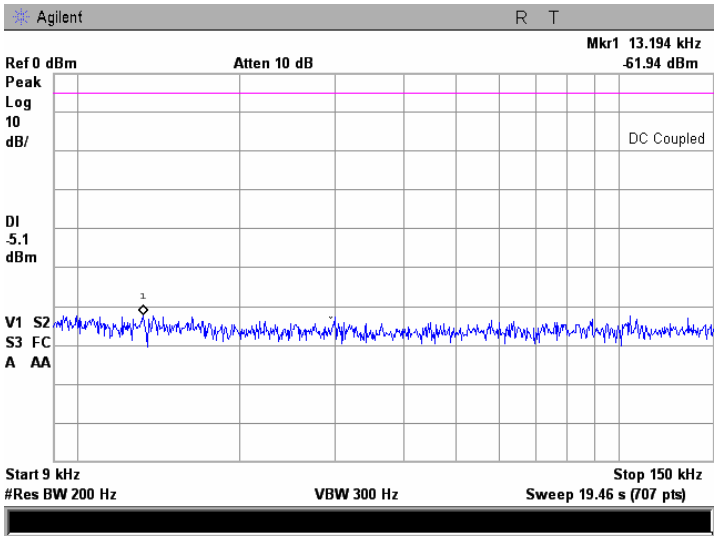


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.5 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency with PSK modulation**

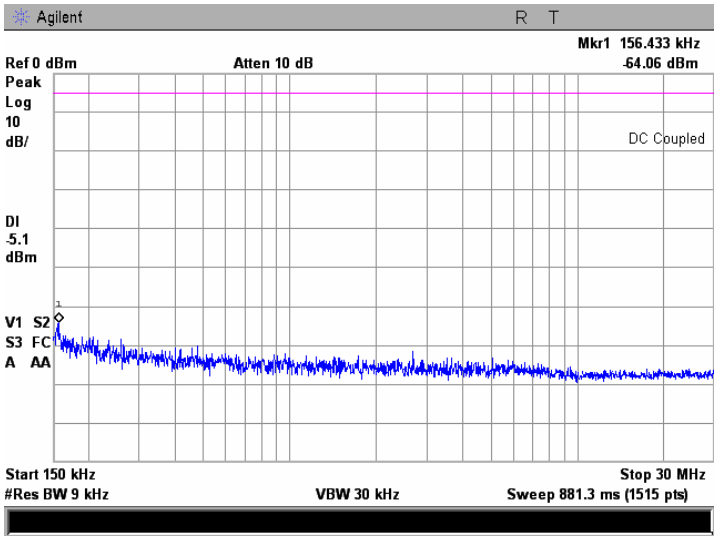



**Plot 7.3.6 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency with PSK modulation**

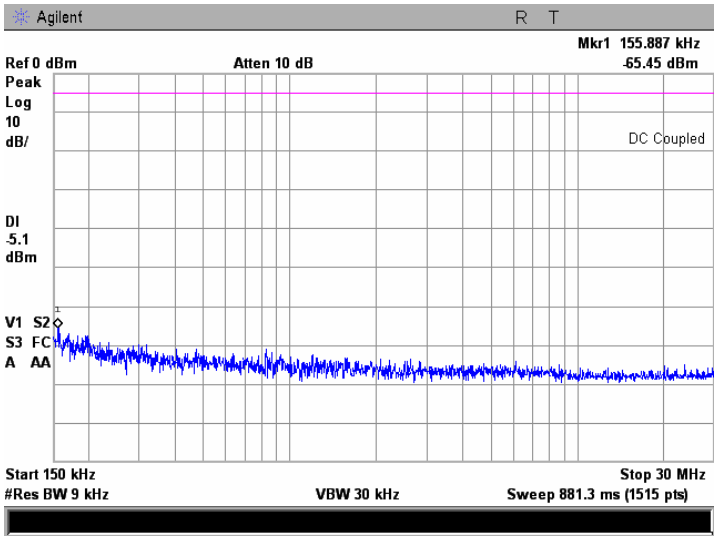


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.7 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency with PSK modulation**

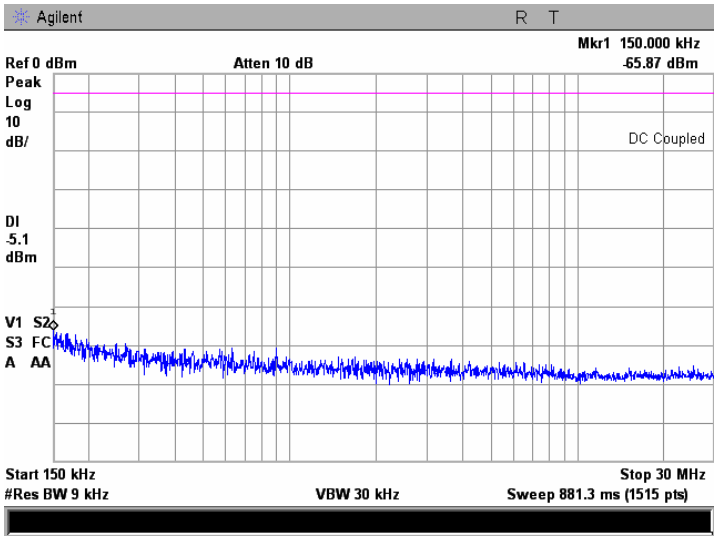



**Plot 7.3.8 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency with PSK modulation**

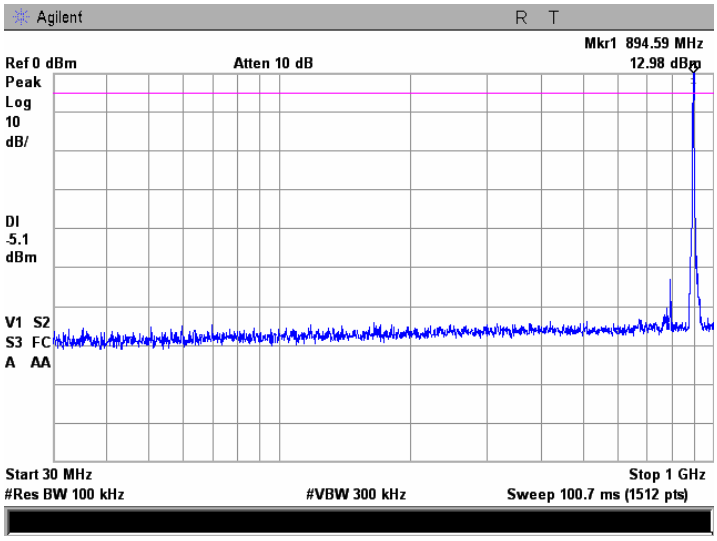


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.9 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency with PSK modulation**



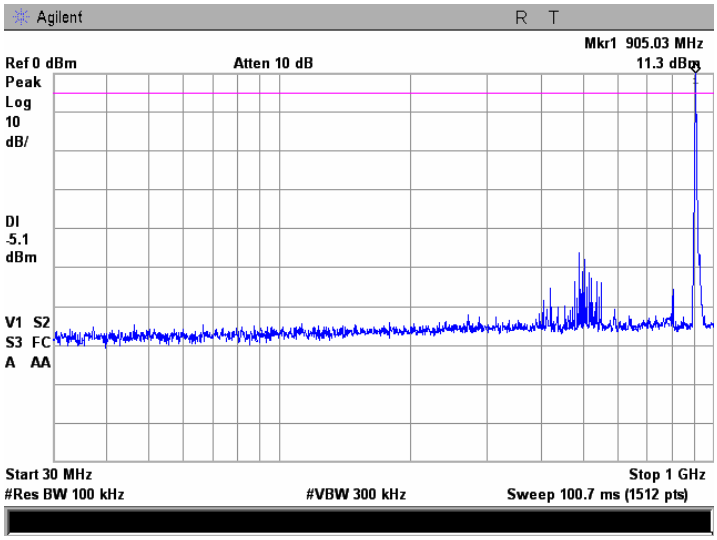

**Plot 7.3.10 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency with PSK modulation**




Note: Due to large span used, frequency appears off. Actual frequency of fundamental is 905.4375 MHz

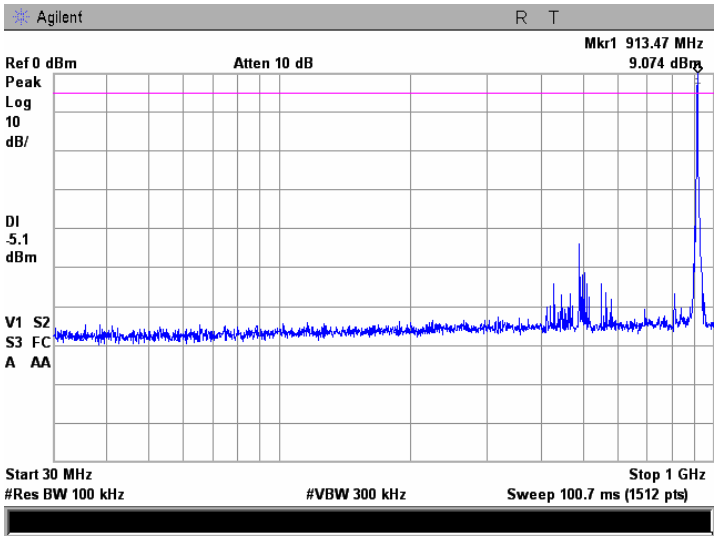
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.11 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency with PSK modulation**




Note: Due to large span used, frequency appears off. Actual frequency of fundamental is 916.300 MHz

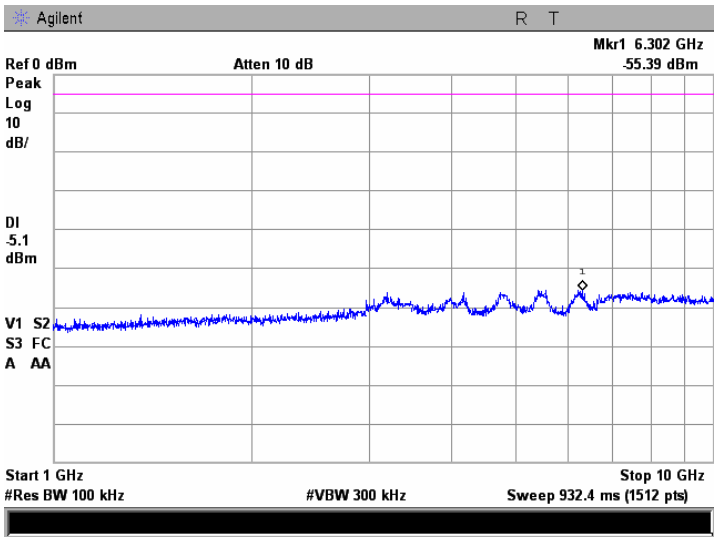
**Plot 7.3.12 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency with PSK modulation**



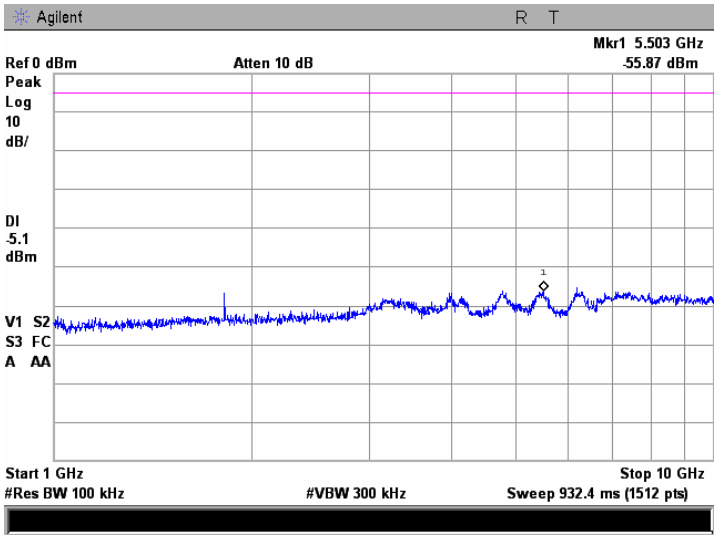

Note: Due to large span used, frequency appears off. Actual frequency of fundamental is 923.5462 MHz.

| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.13 Spurious emission measurements in 1000 - 10000 MHz range at low carrier frequency with PSK modulation**

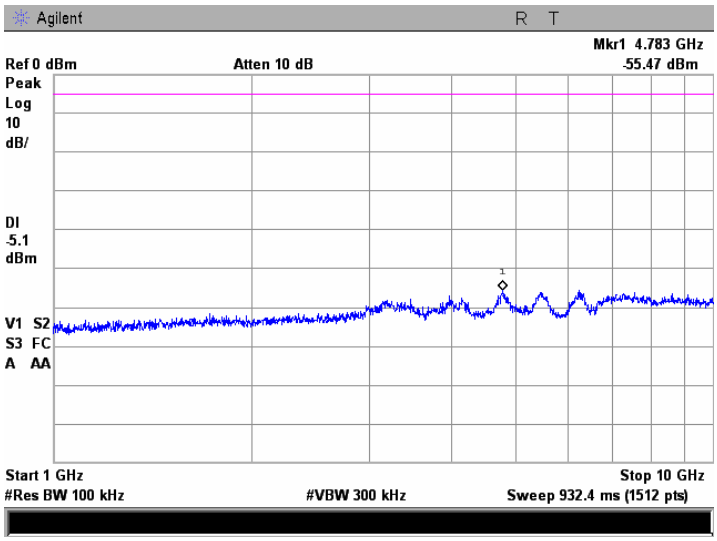



**Plot 7.3.14 Spurious emission measurements in 1000 - 10000 MHz range at mid carrier frequency with PSK modulation**

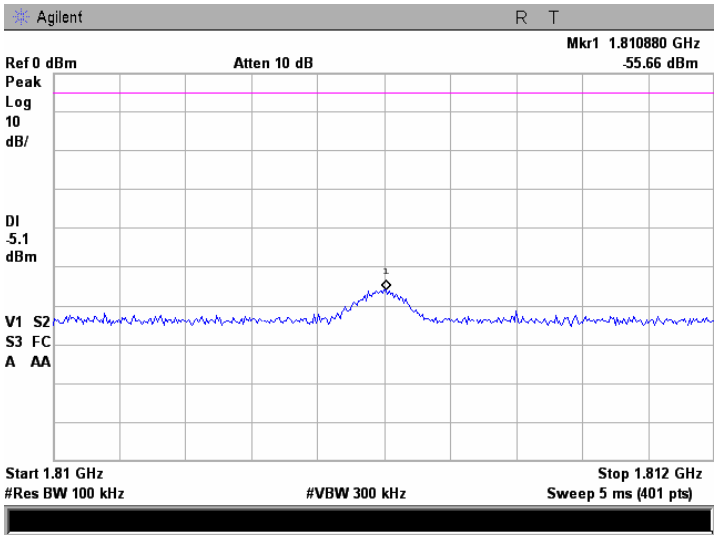


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.15 Spurious emission measurements in 1000 - 10000 MHz range at high carrier frequency with PSK modulation**

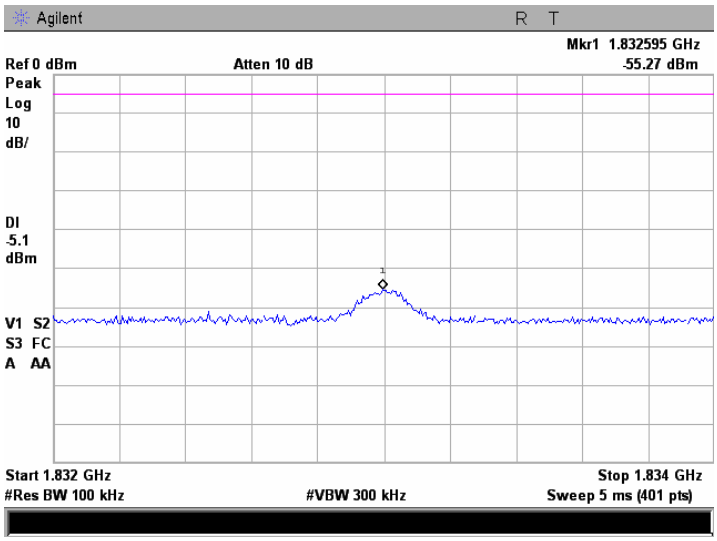



**Plot 7.3.16 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency with PSK modulation**

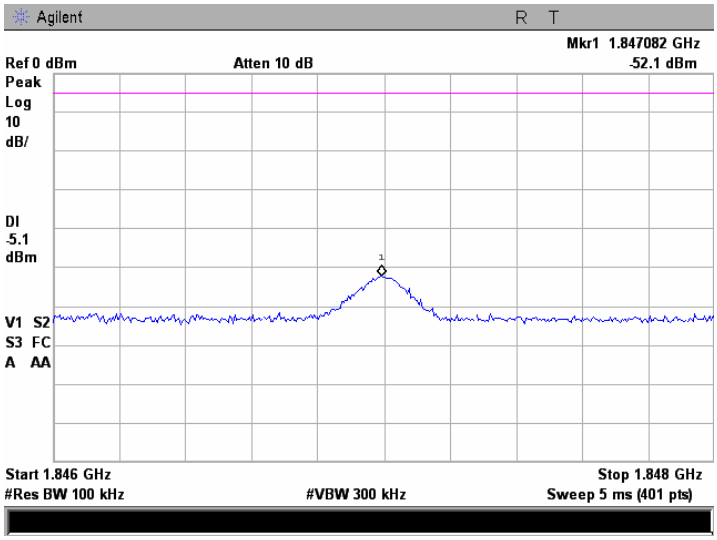


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.17 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency with PSK modulation**

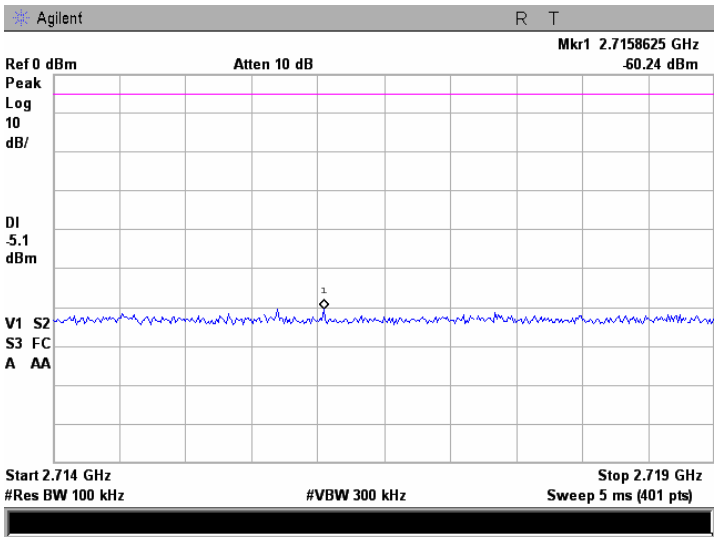



**Plot 7.3.18 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency with PSK modulation**

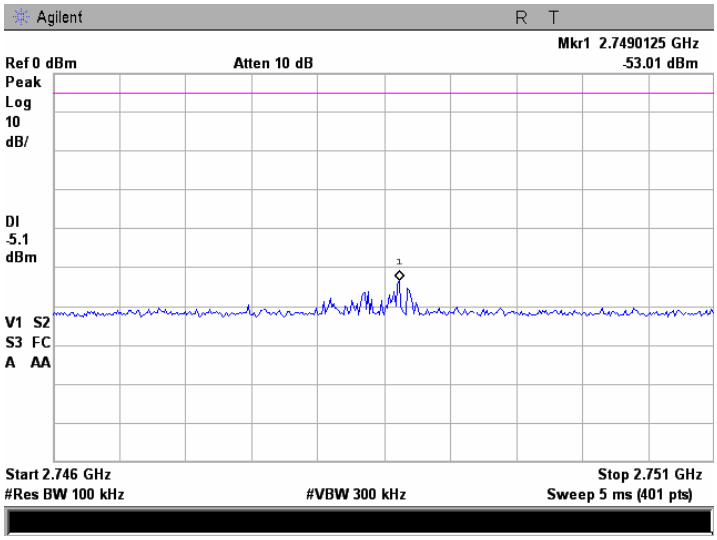


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.19 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency with PSK modulation**

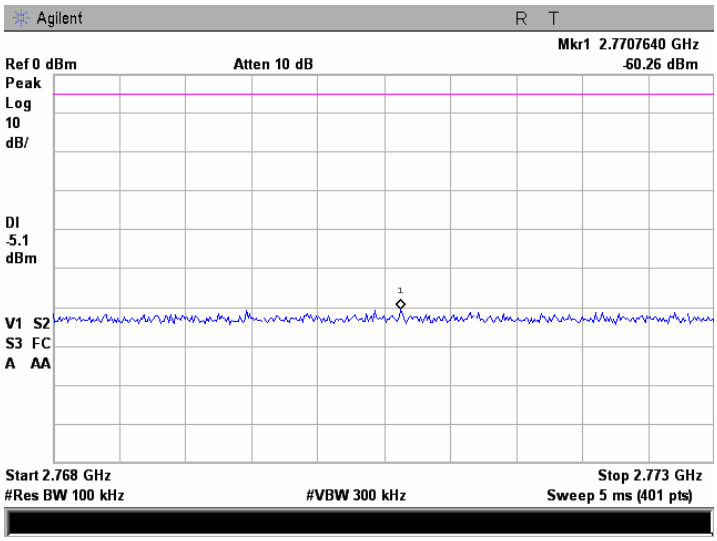



**Plot 7.3.20 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency with PSK modulation**

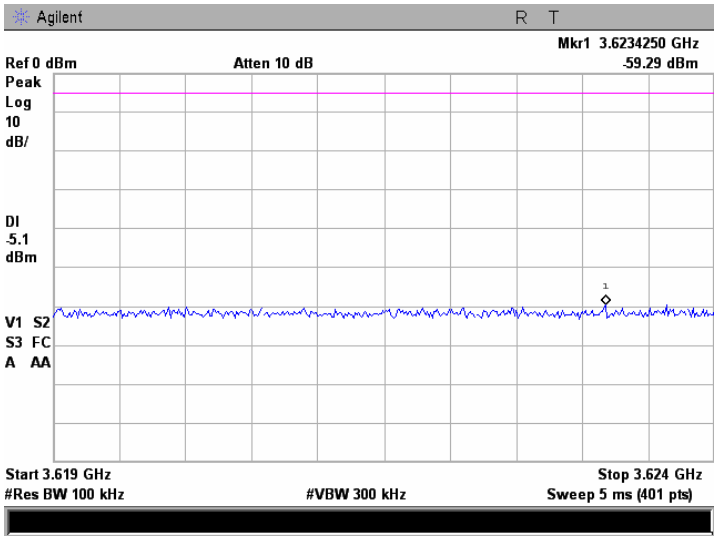


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.21 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency with PSK modulation**

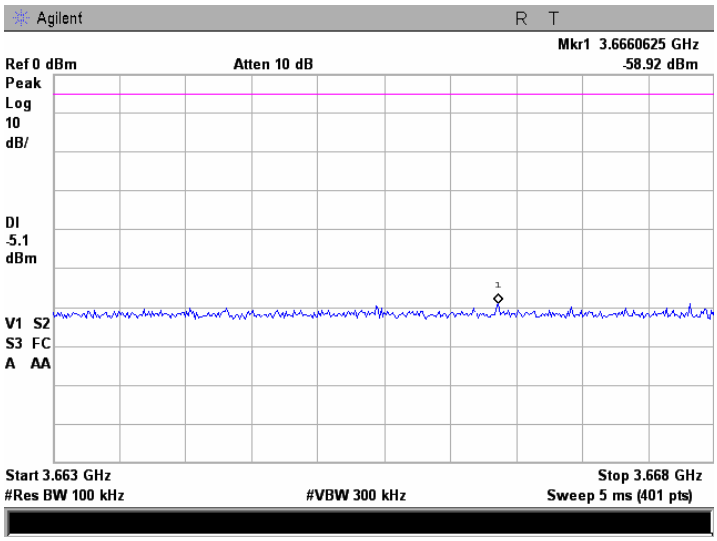



**Plot 7.3.22 Conducted spurious emission measurements at the 4th harmonic of low carrier frequency with PSK modulation**

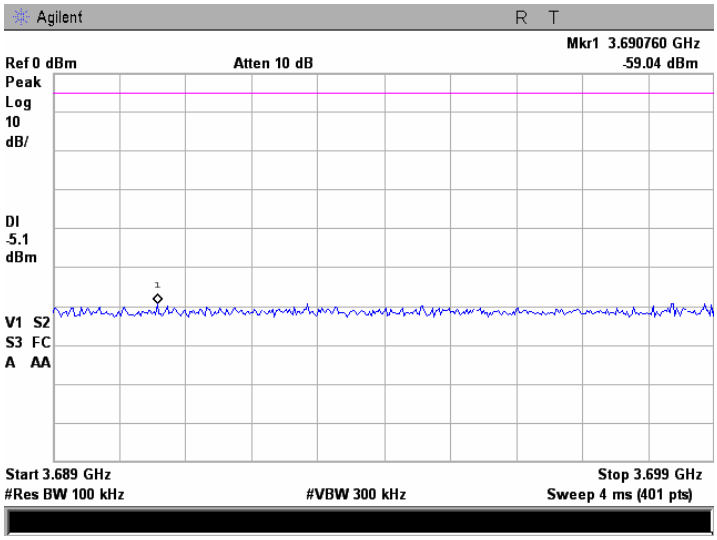


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.23 Conducted spurious emission measurements at the 4th harmonic of mid carrier frequency with PSK modulation**

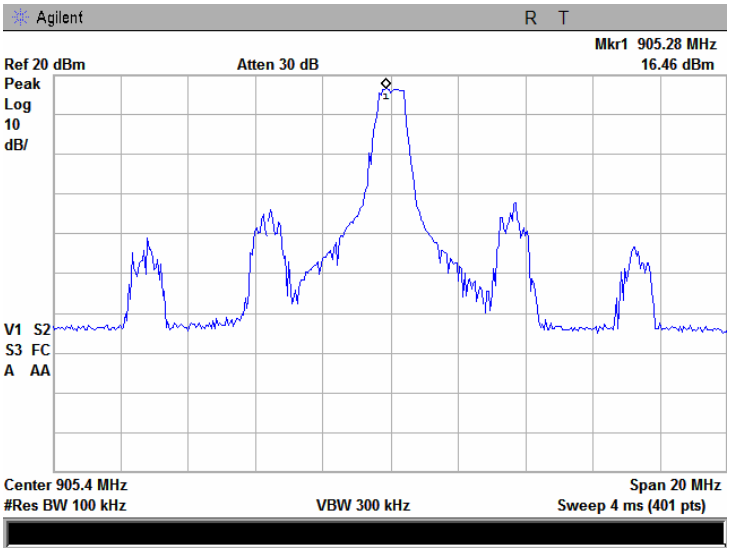



**Plot 7.3.24 Conducted spurious emission measurements at the 4th harmonic of high carrier frequency with PSK modulation**

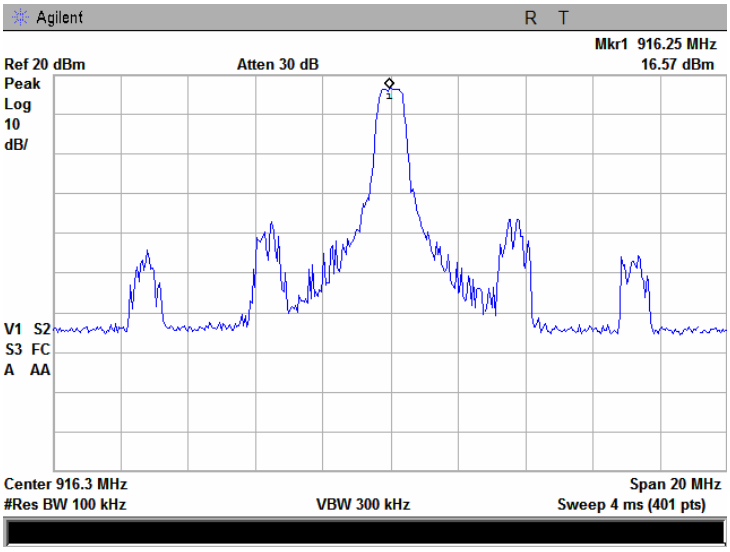


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.25 The highest emission level within the assigned band at low carrier frequency with FSK modulation**

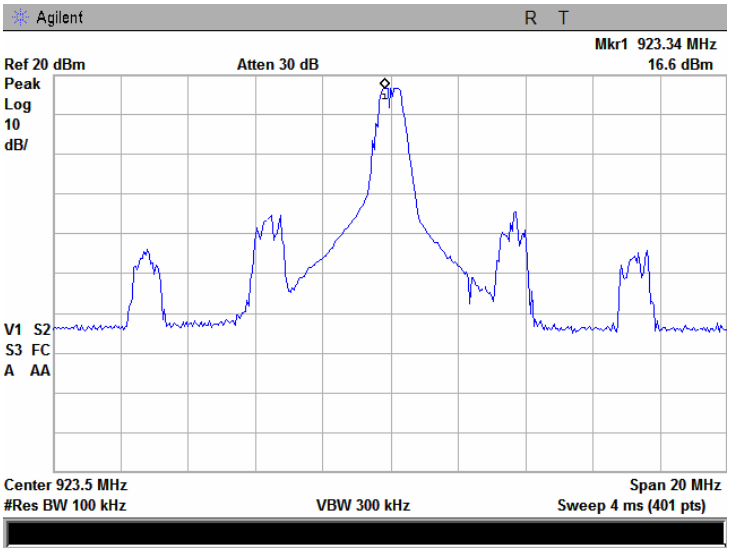



**Plot 7.3.26 The highest emission level within the assigned band at mid carrier frequency with FSK modulation**

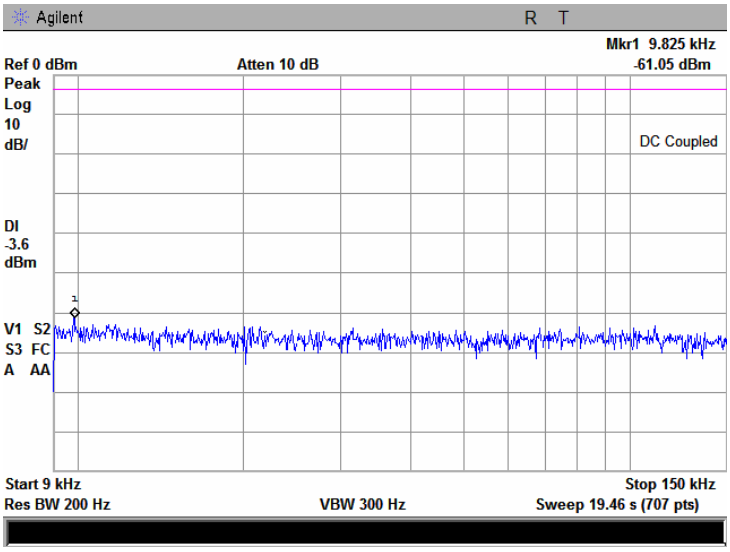


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.27 The highest emission level within the assigned band at high carrier frequency with FSK modulation**

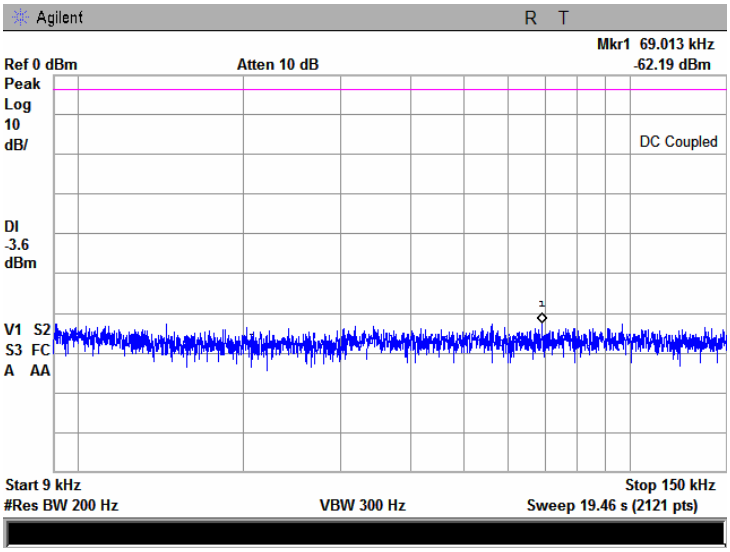



**Plot 7.3.28 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency with FSK modulation**

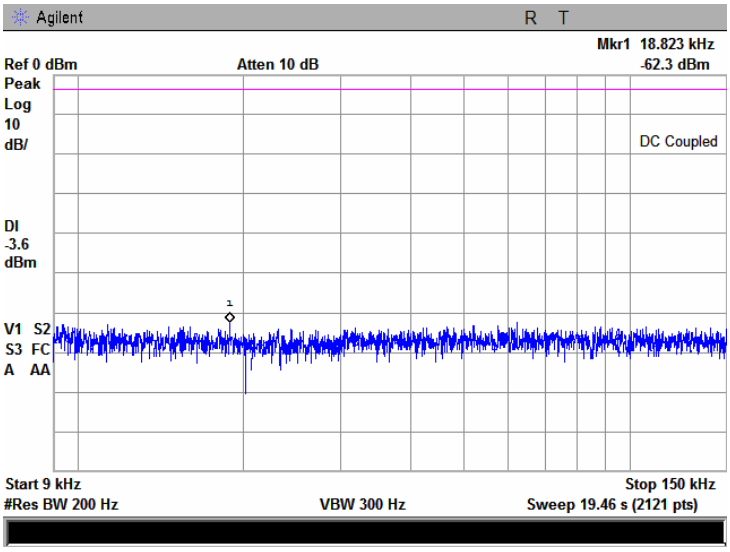


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.29 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency with FSK modulation**

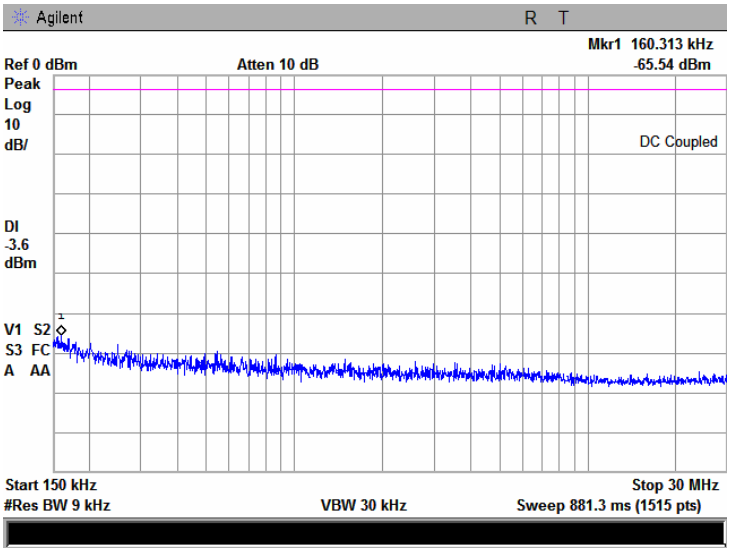



**Plot 7.3.30 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency with FSK modulation**

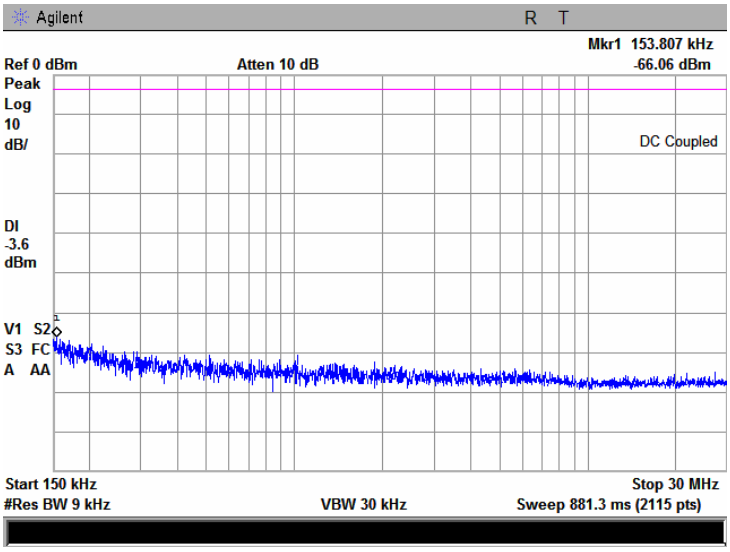


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.31 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency with FSK modulation**

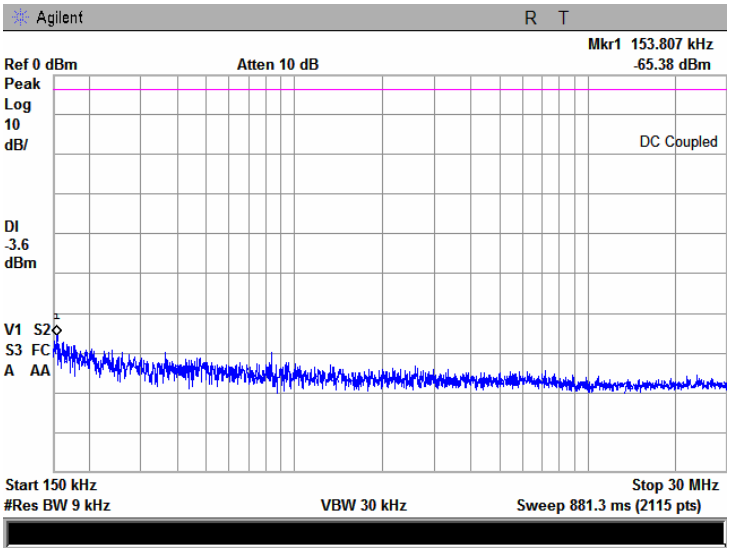



**Plot 7.3.32 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency with FSK modulation**

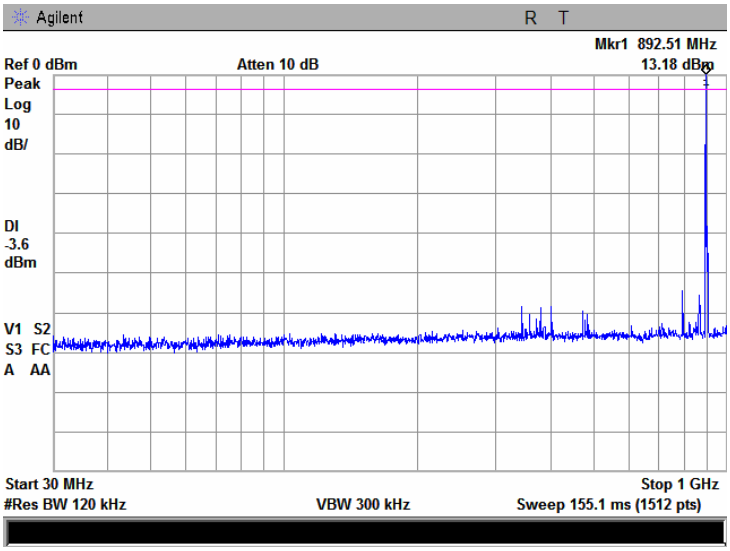


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.33 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency with FSK modulation**



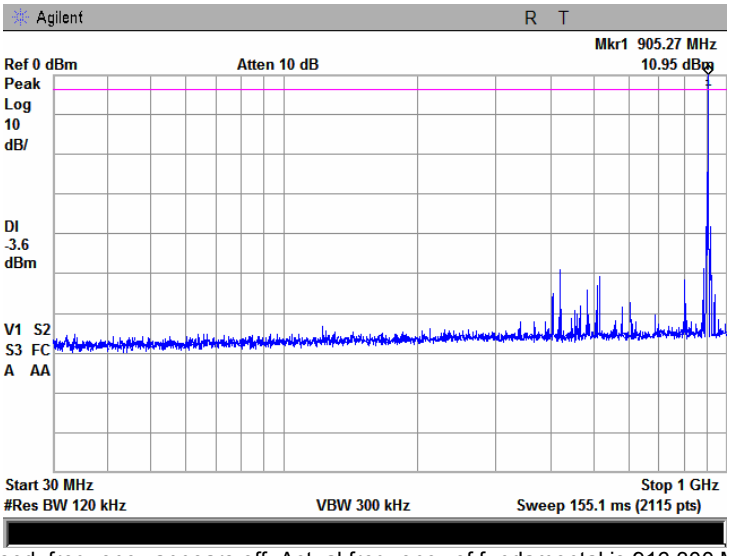

**Plot 7.3.34 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency with FSK modulation**




Note: Due to large span used, frequency appears off. Actual frequency of fundamental is 905.4375 MHz

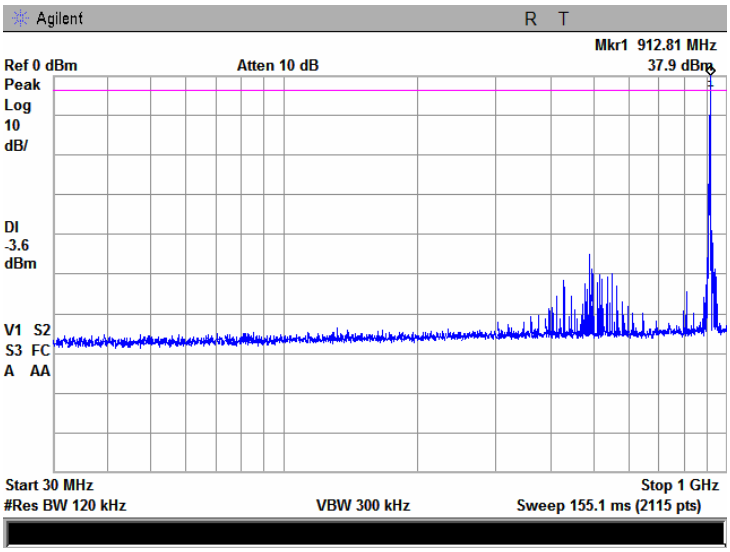
| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.35 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency with FSK modulation**




Note: Due to large span used, frequency appears off. Actual frequency of fundamental is 916.300 MHz

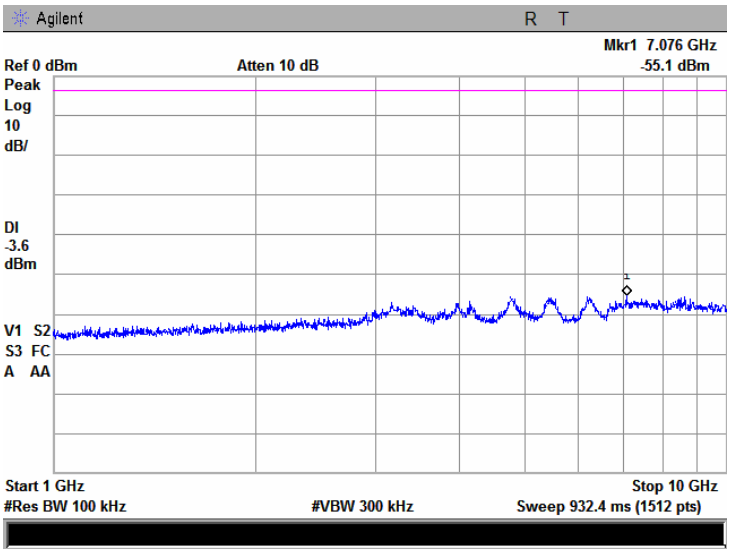
**Plot 7.3.36 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency with FSK modulation**



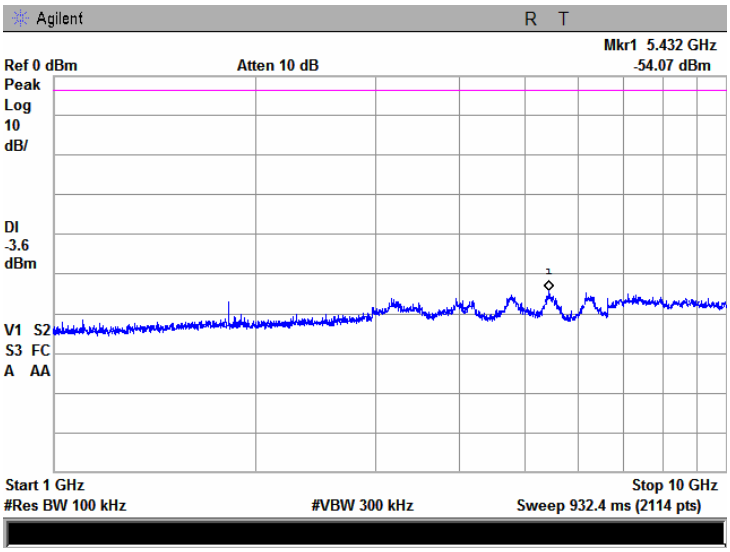

Note: Due to large span used, frequency appears off. Actual frequency of fundamental is 923.5462 MHz

| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.37 Spurious emission measurements in 1000 - 10000 MHz range at low carrier frequency with FSK modulation**

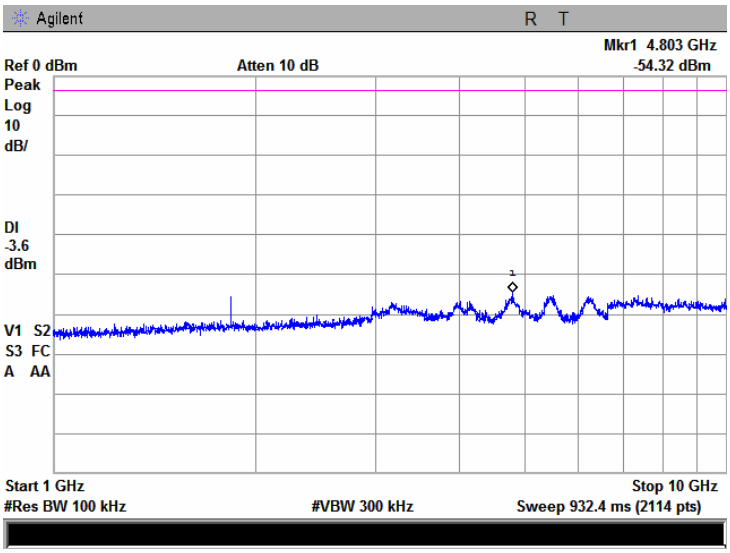



**Plot 7.3.38 Spurious emission measurements in 1000 - 10000 MHz range at mid carrier frequency with FSK modulation**

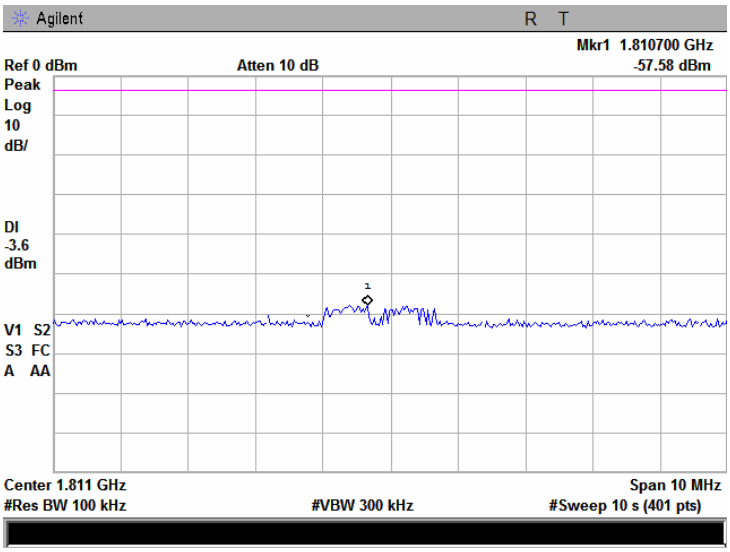


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.39 Spurious emission measurements in 1000 - 10000 MHz range at high carrier frequency with FSK modulation**

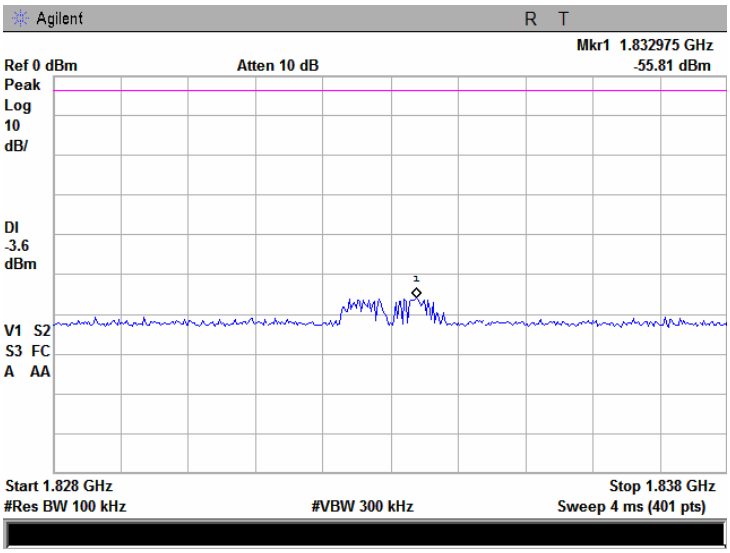



**Plot 7.3.40 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency with FSK modulation**

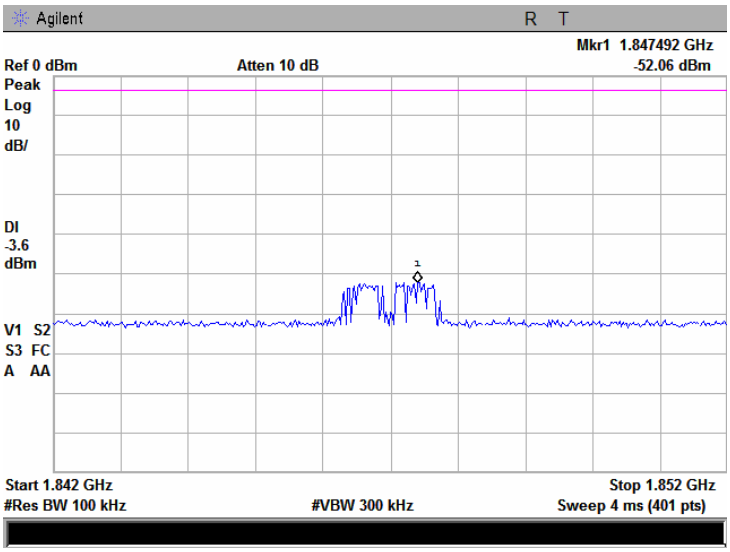


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.41 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency with FSK modulation**

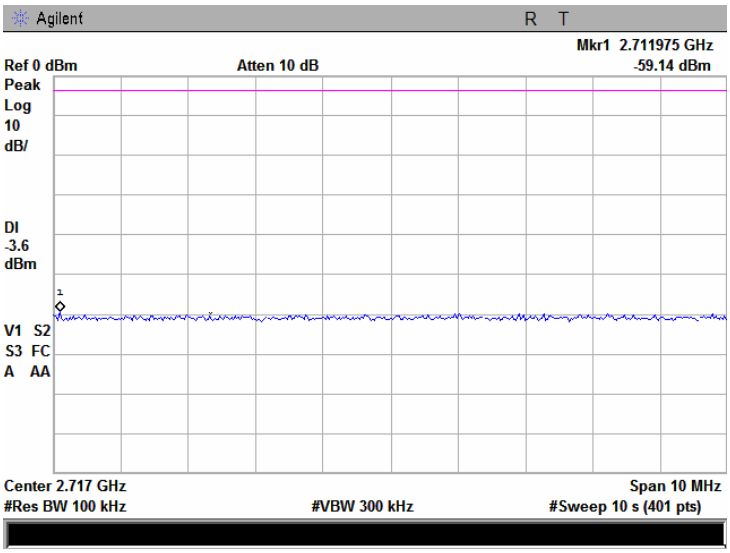



**Plot 7.3.42 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency with FSK modulation**

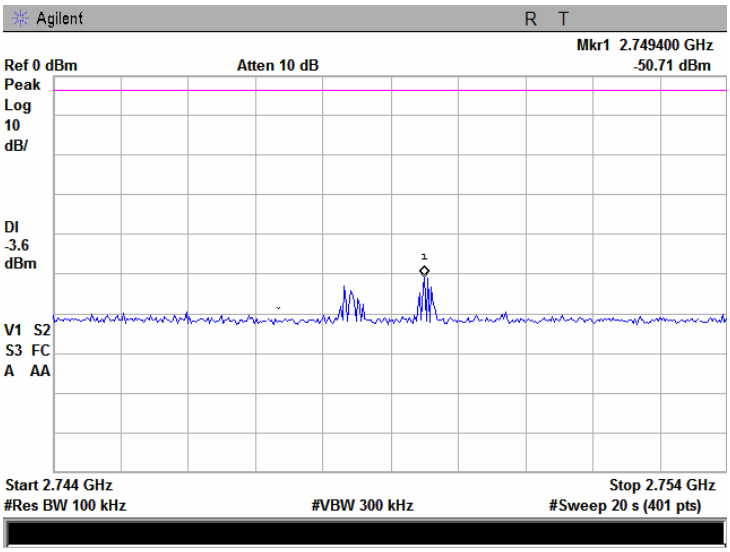


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.43 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency with FSK modulation**

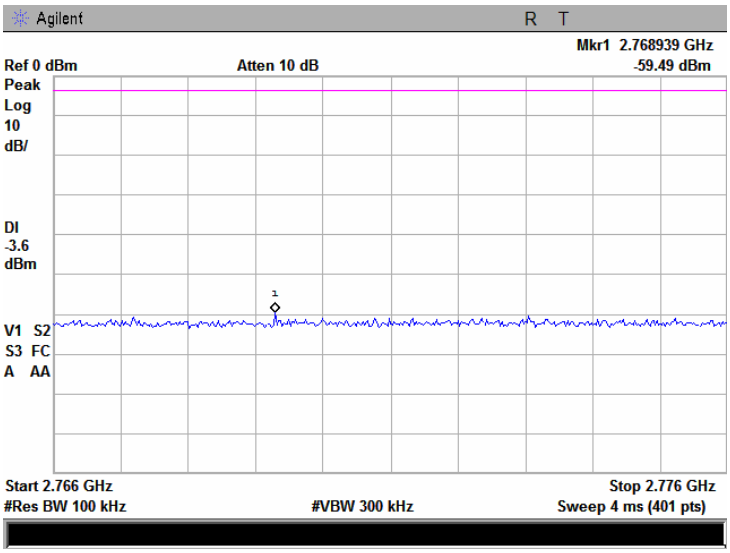



**Plot 7.3.44 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency with FSK modulation**

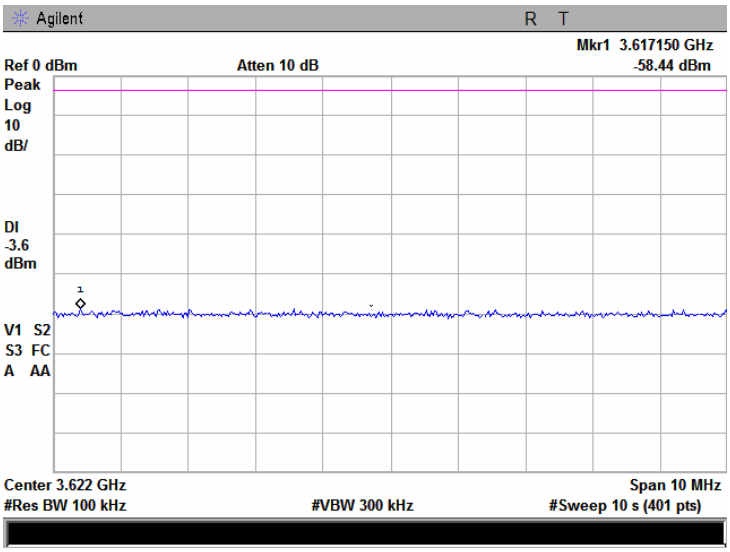


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.45 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency with FSK modulation**

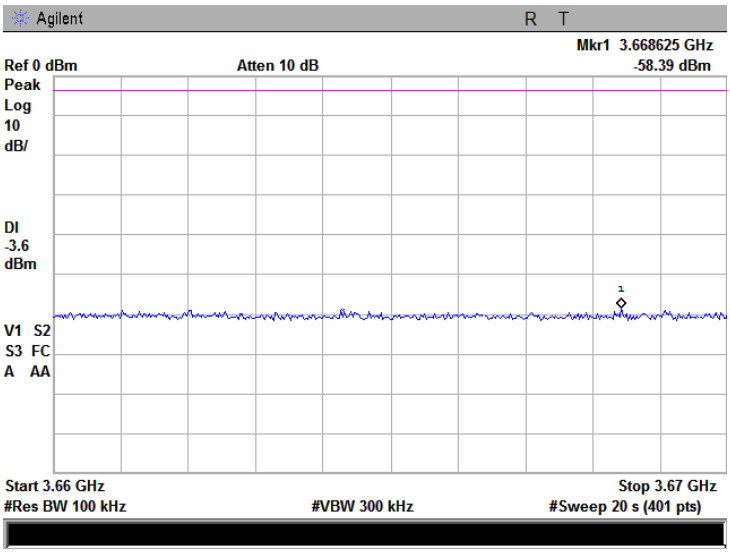



**Plot 7.3.46 Conducted spurious emission measurements at the 4th harmonic of low carrier frequency with FSK modulation**

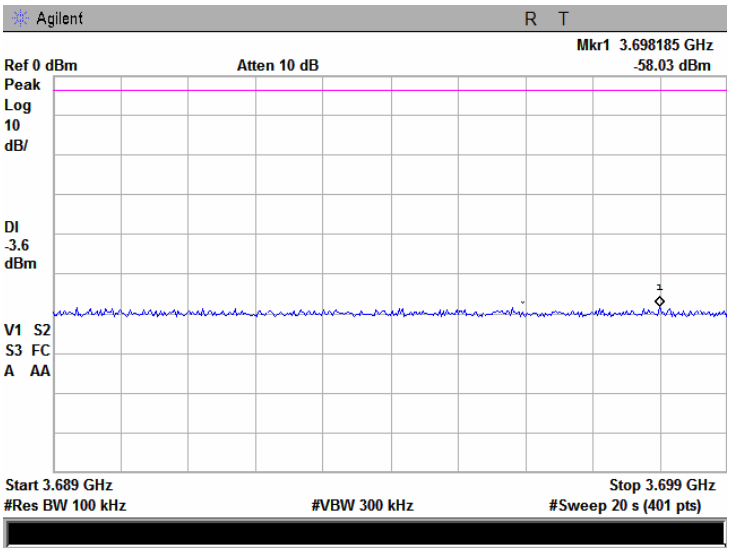


| Test specification: | Section 15.247(c), Conducted spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 11:48:08 AM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.3.47 Conducted spurious emission measurements at the 4th harmonic of mid carrier frequency with FSK modulation**




**Plot 7.3.48 Conducted spurious emission measurements at the 4th harmonic of high carrier frequency with FSK modulation**



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

## 7.4 Field strength of spurious emissions

### 7.4.1 General

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

**Table 7.4.1 Radiated spurious emissions limits**

| Frequency, MHz | Field strength at 3 m within restricted bands, dB(µV/m)* | | | Attenuation of field strength of spurious versus carrier outside restricted bands, dBc*** |
|---|---|---|---|---|
| | Peak | Quasi Peak | Average | |
| 0.009 – 0.090 | 148.5 – 128.5 | NA | 128.5 – 108.5** | 20.0 |
| 0.090 – 0.110 | NA | 108.5 – 106.8** | NA | |
| 0.110 – 0.490 | 126.8 – 113.8 | NA | 106.8 – 93.8** | |
| 0.490 – 1.705 | NA | 73.8 – 63.0** | NA | |
| 1.705 – 30.0* | | 69.5 | | |
| 30 – 88 | | 40.0 | | |
| 88 – 216 | | 43.5 | | |
| 216 – 960 | | 46.0 | | |
| 960 - 1000 | | 54.0 | | |
| 1000 – 10$^{th}$harmonic | 74.0 | NA | 54.0 | |

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

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

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.

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

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

**7.4.2.2** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated $360^0$ and the measuring antenna was rotated around its vertical axis.

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

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

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

**7.4.3.2** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated $360^0$, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

**7.4.3.3** 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: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

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

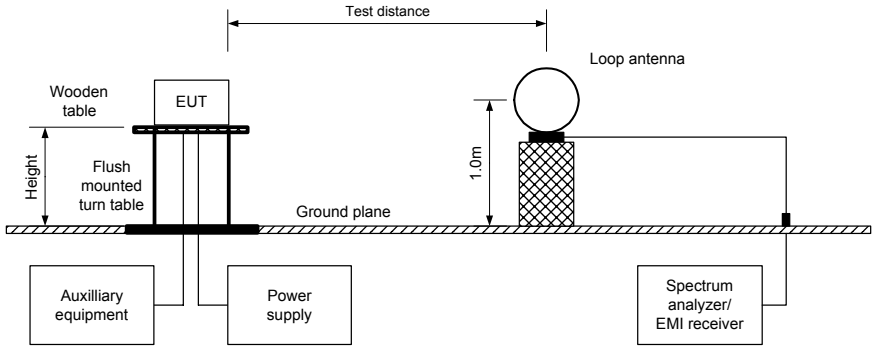
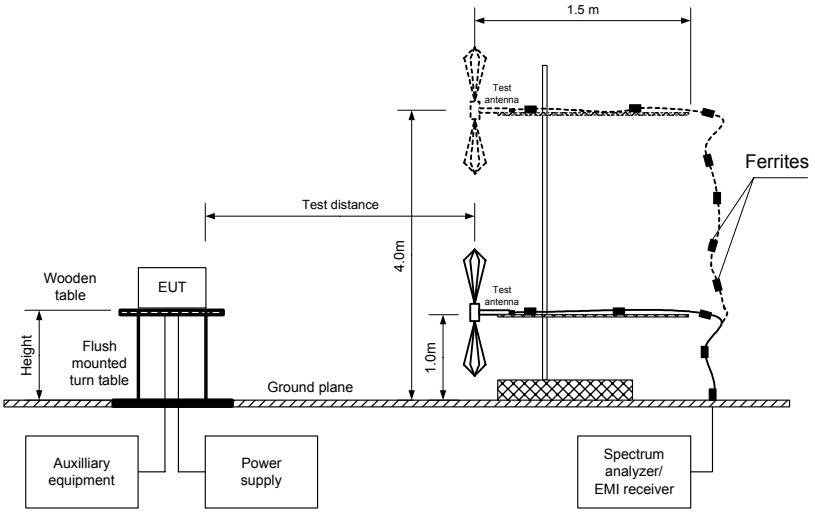



**Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz**



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Table 7.4.2 Field strength of emissions outside restricted bands**

| | |
|---|---|
| ASSIGNED FREQUENCY BAND: | 902 – 928 MHz |
| INVESTIGATED FREQUENCY RANGE: | 0.009 - 10000 MHz |
| TEST DISTANCE: | 3 m |
| MODULATION: | FSK / PSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 60 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 100 kHz |
| VIDEO BANDWIDTH: | 300 kHz |
| TEST ANTENNA TYPE: | Active loop (9 kHz – 30 MHz)<br>Biconilog (30 MHz – 1000 MHz)<br>Double ridged guide (above 1000 MHz) |

| Frequency, MHz | Field strength of spurious, dB(µV/m) | Antenna polarization | Antenna height, m | Azimuth, degrees* | Field strength of carrier, dB(µV/m) | Attenuation below carrier, dBc | Limit, dBc | Margin, dB** | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| Outside restricted band emissions were tested conducted | | | | | | | | | NA |

***- EUT front panel refers to 0 degrees position of turntable.**
****- Margin = Attenuation below carrier – specification limit.**

**Table 7.4.3 Field strength of spurious emissions below 1 GHz within restricted bands**

| | |
|---|---|
| ASSIGNED FREQUENCY: | 902 – 928 MHz |
| INVESTIGATED FREQUENCY RANGE: | 0.009 – 1000 MHz |
| TEST DISTANCE: | 3 m |
| MODULATION: | FSK / PSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 60 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| RESOLUTION BANDWIDTH: | 0.2 kHz (9 kHz – 150 kHz)<br>9.0 kHz (150 kHz – 30 MHz)<br>120 kHz (30 MHz – 1000 MHz) |
| VIDEO BANDWIDTH: | > Resolution bandwidth |
| TEST ANTENNA TYPE: | Active loop (9 kHz – 30 MHz)<br>Biconilog (30 MHz – 1000 MHz) |

| 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* | | | | |
| No emissions were found | | | | | | | | Pass |

***- Margin = Measured emission - specification limit.**

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

| **Test specification:** | **Section 15.247(c), Radiated spurious emissions** | | |
|---|---|---|---|
| **Test procedure:** | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date & Time:** | 5/7/2007 1:48:03 PM | | |
| **Temperature:** 26ºC | **Air Pressure:** 1012 hPa | **Relative Humidity:** 37% | **Power Supply:** 3.6 V DC |
| **Remarks:** | | | |

**Table 7.4.4 Field strength of spurious emissions above 1 GHz within restricted bands**

| | |
|---|---|
| ASSIGNED FREQUENCY BAND: | 902 – 928 MHz |
| INVESTIGATED FREQUENCY RANGE: | 1000 - 10000 MHz |
| TEST DISTANCE: | 3 m |
| MODULATION: | FSK / PSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 60 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 1000 kHz |
| TEST ANTENNA TYPE: | Double ridged guide |

| Frequency, MHz | Antenna | | Azimuth, degrees* | Peak field strength(VBW=3 MHz) | | | Average field strength(VBW=1 kHz) | | | | 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*** | |
| **PSK modulation** | | | | | | | | | | | |
| **Low carrier frequency** | | | | | | | | | | | |
| 1810.875 | V | 1.1 | 197 | 68.41 | 74.00 | -5.59 | 59.55 | 37.83 | 54.00 | -16.17 | Pass |
| 2716.345 | V | 1.0 | 271 | 63.83 | 74.00 | -10.17 | 47.50 | 25.78 | 54.00 | -28.22 | |
| 3622.000 | V | 1.0 | 113 | 58.66 | 74.00 | -15.34 | 45.42 | 23.70 | 54.00 | -30.30 | |
| 5432.663 | V | 1.0 | 190 | 60.42 | 74.00 | -13.58 | 49.18 | 27.46 | 54.00 | -26.54 | |
| 7243.325 | V | 1.0 | 112 | 55.77 | 74.00 | -18.23 | 44.33 | 22.61 | 54.00 | -31.39 | |
| 8149.100 | V | 1.0 | 187 | 55.36 | 74.00 | -18.64 | 41.90 | 20.18 | 54.00 | -33.82 | |
| **Mid carrier frequency** | | | | | | | | | | | |
| 1832.575 | V | 1.0 | 218 | 64.86 | 74.00 | -9.14 | 58.34 | 36.62 | 54.00 | -17.38 | Pass |
| 2748.725 | V | 1.0 | 289 | 71.65 | 74.00 | -2.35 | 43.45 | 21.73 | 54.00 | -32.27 | |
| 3664.900 | V | 1.0 | 100 | 63.02 | 74.00 | -10.98 | 43.07 | 21.35 | 54.00 | -32.65 | |
| 4581.550 | V | 1.2 | 281 | 69.84 | 74.00 | -4.16 | 36.43 | 14.71 | 54.00 | -39.29 | |
| 7329.875 | V | 1.0 | 198 | 61.07 | 74.00 | -12.93 | 40.58 | 18.86 | 54.00 | -35.14 | |
| 8246.500 | V | 1.0 | 168 | 73.44 | 74.00 | -0.56 | 55.19 | 33.47 | 54.00 | -20.53 | |
| 9162.350 | V | 1.0 | 228 | 68.56 | 74.00 | -5.44 | 40.76 | 19.04 | 54.00 | -34.96 | |
| **High carrier frequency** | | | | | | | | | | | |
| 1847.050 | V | 1.0 | 200 | 66.34 | 74.00 | -7.66 | 63.19 | 41.47 | 54.00 | -12.53 | Pass |
| 2770.070 | V | 1.0 | 299 | 63.20 | 74.00 | -10.80 | 43.29 | 21.57 | 54.00 | -32.43 | |
| 3694.200 | V | 1.2 | 122 | 54.78 | 74.00 | -19.22 | 42.12 | 20.40 | 54.00 | -33.60 | |
| 8312.000 | V | 1.0 | 319 | 59.36 | 74.00 | -14.64 | 41.23 | 19.51 | 54.00 | -34.49 | |
| **FSK modulation** | | | | | | | | | | | |
| **Carrier frequency** | | | | | | | | | | | |
| 1832.125 | V | 1.0 | 281 | 65.36 | 74.00 | -8.64 | 55.44 | 33.72 | 54.00 | -20.28 | Pass |
| 2749.375 | V | 1.0 | 177 | 69.74 | 74.00 | -4.26 | 50.13 | 28.41 | 54.00 | -25.59 | |
| 3664.450 | V | 1.1 | 265 | 70.54 | 74.00 | -3.46 | 40.23 | 18.51 | 54.00 | -35.49 | |
| 4582.250 | V | 1.0 | 112 | 70.89 | 74.00 | -3.11 | 37.04 | 15.32 | 54.00 | -38.68 | |
| 7331.850 | V | 1.0 | 275 | 67.75 | 74.00 | -6.25 | 42.60 | 20.88 | 54.00 | -33.12 | |
| 8244.750 | V | 1.0 | 289 | 73.02 | 74.00 | -0.98 | 56.22 | 34.50 | 54.00 | -19.50 | |
| 9162.375 | V | 1.0 | 231 | 68.47 | 74.00 | -5.53 | 40.76 | 40.76 | 54.00 | -13.24 | |

*****- 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.

| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Table 7.4.5 Average factor calculation**

| Transmission pulse | | Average factor, dB |
|---|---|---|
| Duration, ms | Period, ms | |
| 4.1 | 79.12 | -21.72 |

*- Average factor was calculated as follows $Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$

$$Average\ factor = 20 \times \log_{10}\left(\frac{4.1}{100} \times 2\right) = -21.72dB$$

**Table 7.4.6 Restricted bands**

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

**Reference numbers of test equipment used**

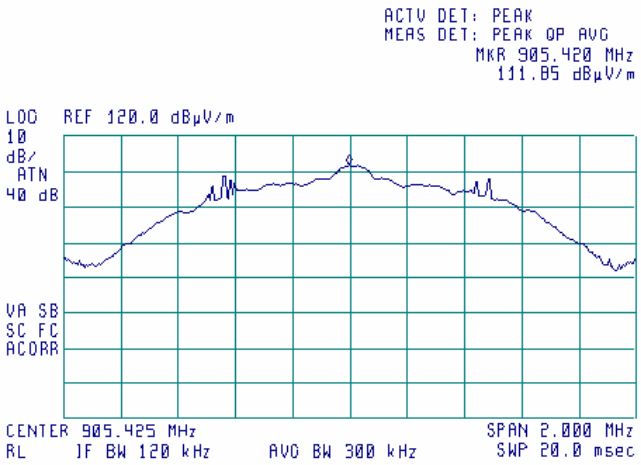
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 0287 | HL 0446 | HL 0465 | HL 0521 | HL 0569 | HL 0589 | HL 0593 | HL 0594 |
| HL 0604 | HL 0784 | HL 0813 | HL 1424 | HL 1430 | HL 1552 | HL 1848 | HL 1947 |
| HL 1984 | HL 2009 | | | | | | |

Full description is given in Appendix A.

| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

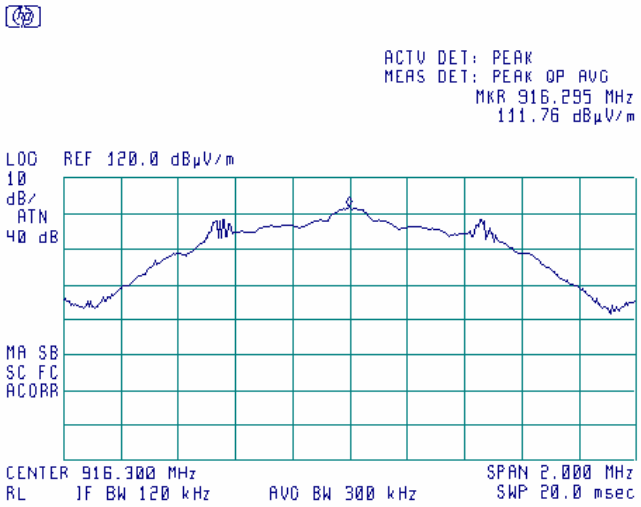
**Plot 7.4.1 Radiated emission measurements at the low carrier frequency with PSK modulation**

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




**Plot 7.4.2 Radiated emission measurements at the mid carrier frequency with PSK modulation**

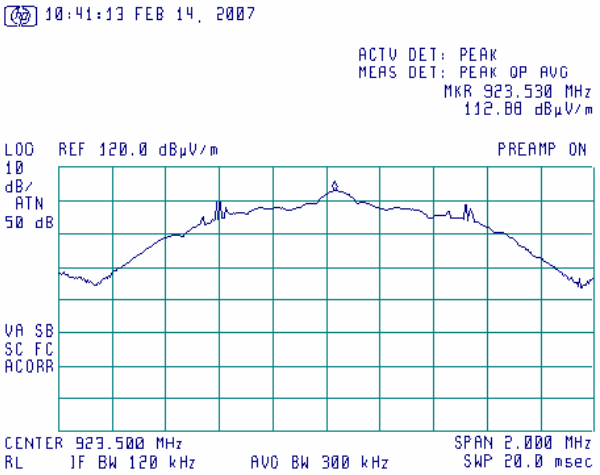
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

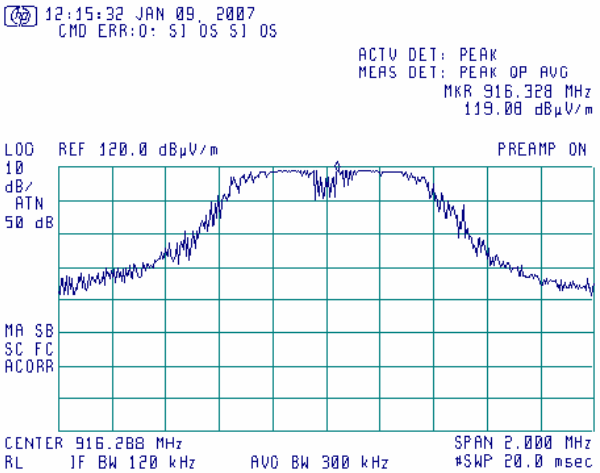
**Plot 7.4.3 Radiated emission measurements at the high carrier frequency with PSK modulation**

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




**Plot 7.4.4 Radiated emission measurements at the mid carrier frequency with FSK modulation**

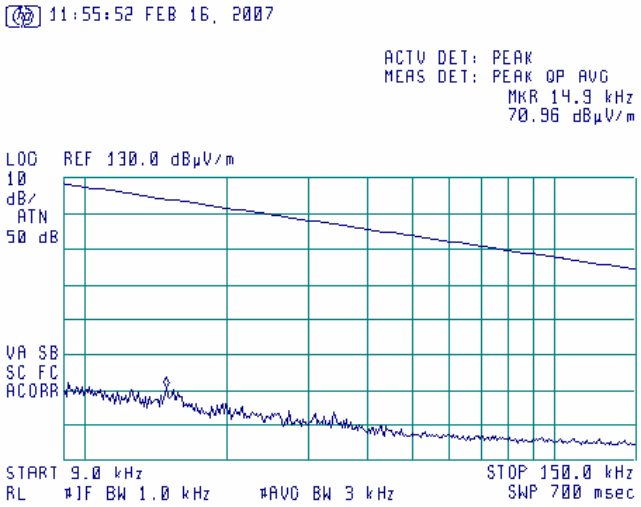
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

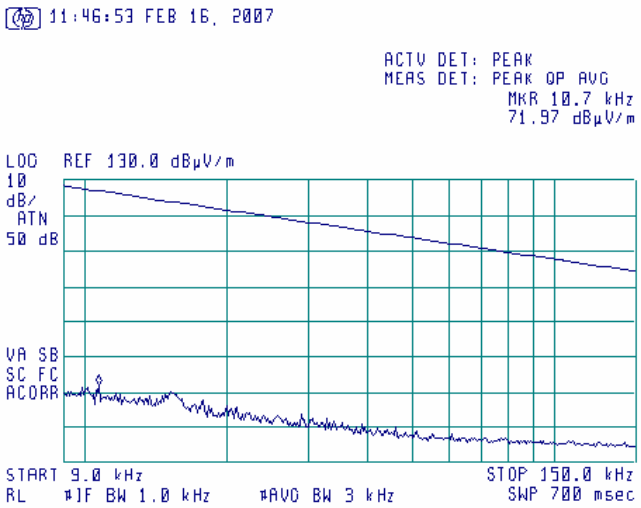
**Plot 7.4.5 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency with PSK modulation**

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




**Plot 7.4.6 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency with PSK modulation**

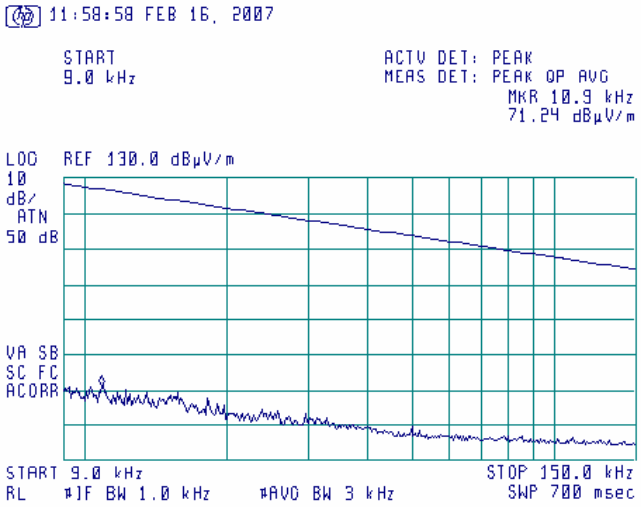
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

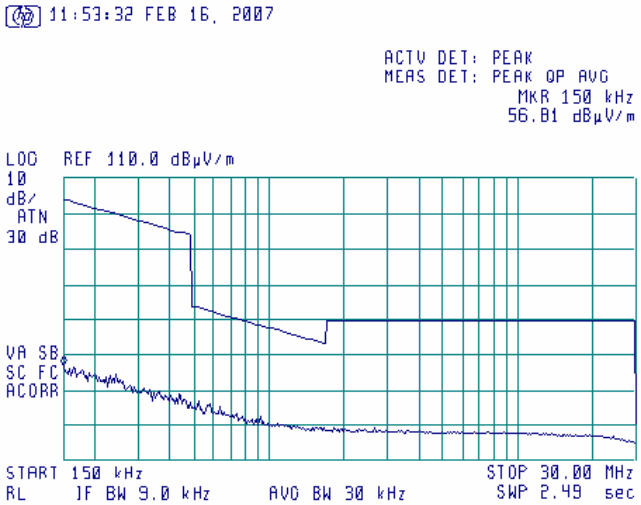
**Plot 7.4.7 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency with PSK modulation**

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




**Plot 7.4.8 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency with PSK modulation**

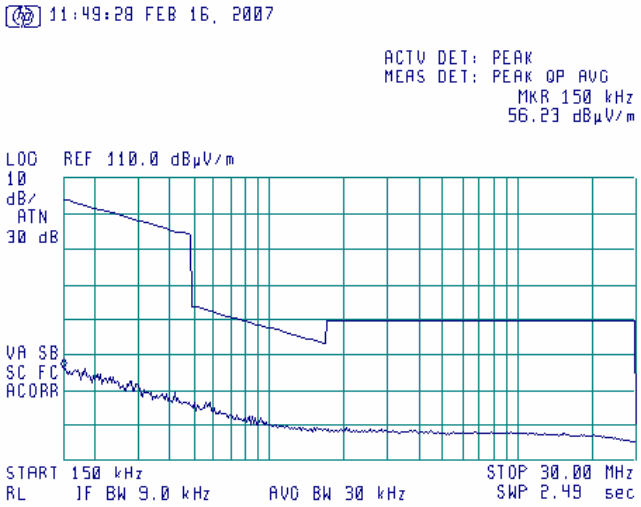
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

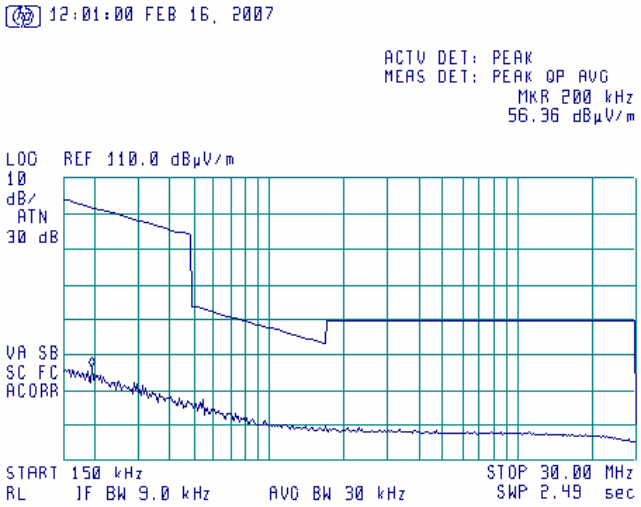
**Plot 7.4.9 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency with PSK modulation**

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




**Plot 7.4.10 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency with PSK modulation**

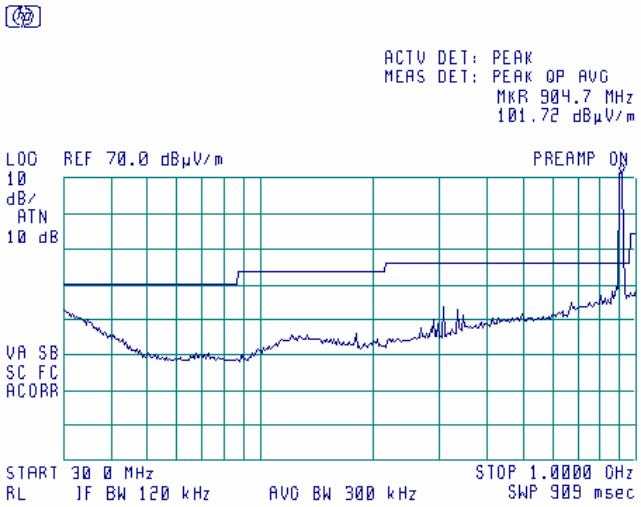
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

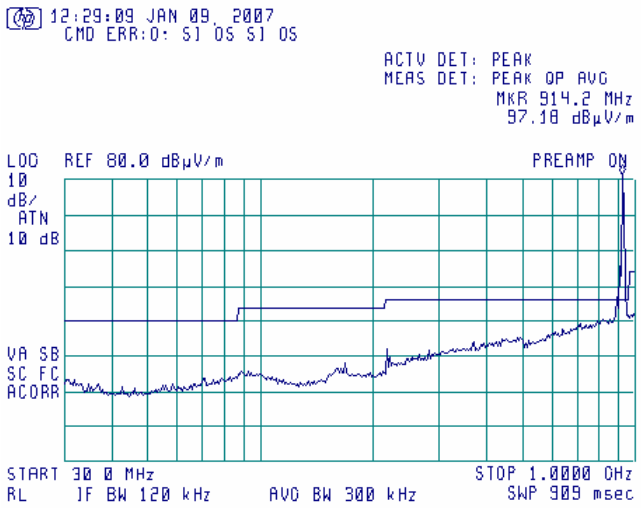
**Plot 7.4.11 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency with PSK modulation**

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




**Plot 7.4.12 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency with PSK modulation**

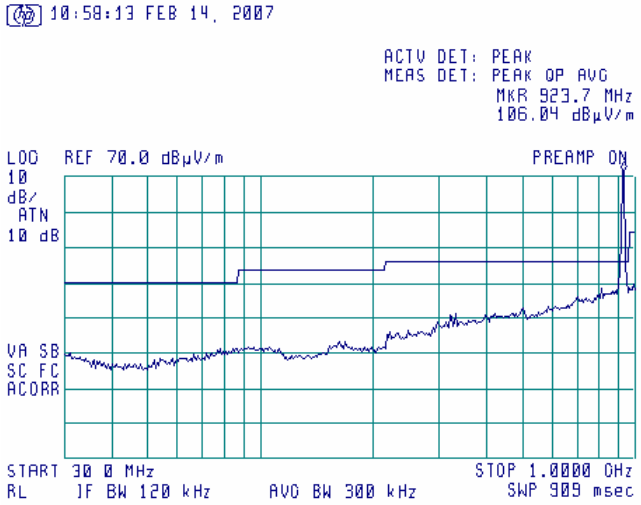
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

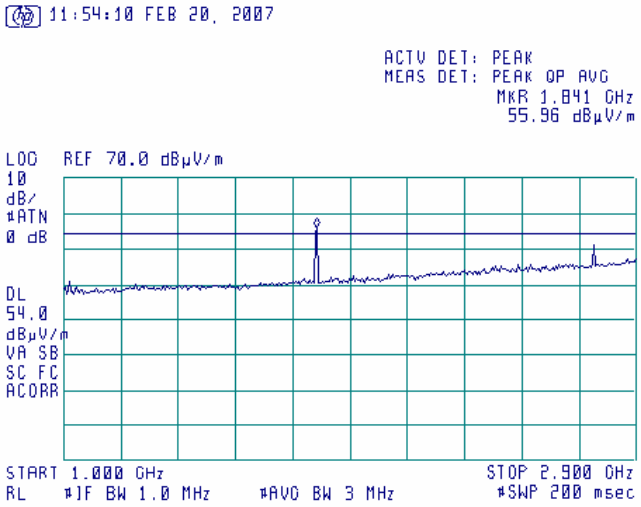
**Plot 7.4.13 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency with PSK modulation**

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




**Plot 7.4.14 Radiated emission measurements from 1000 to 2900 MHz at the low carrier frequency with PSK modulation**

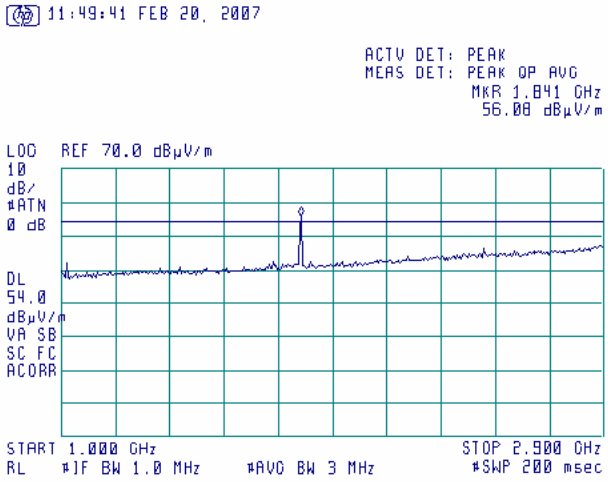
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

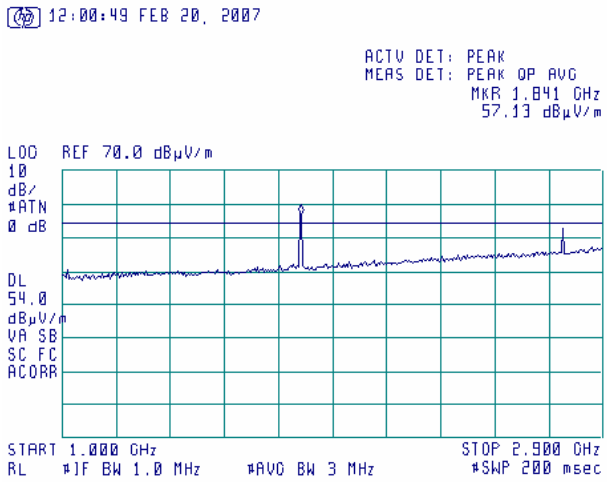
**Plot 7.4.15 Radiated emission measurements from 1000 to 2900 MHz at the mid carrier frequency with PSK modulation**

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




**Plot 7.4.16 Radiated emission measurements from 1000 to 2900 MHz at the high carrier frequency with PSK modulation**

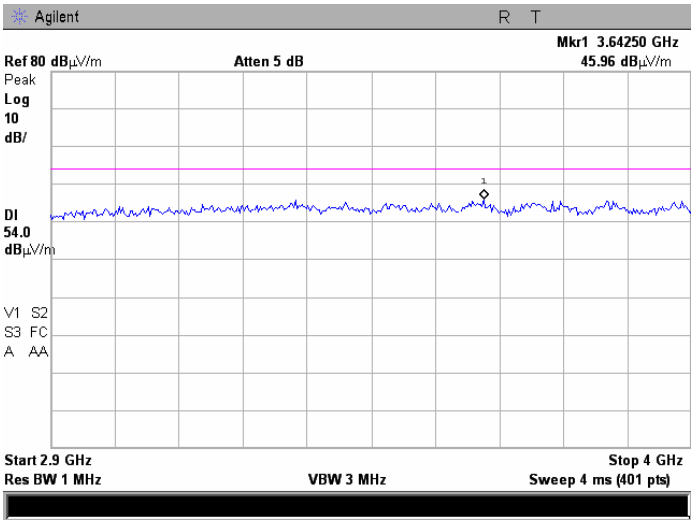
TEST SITE: anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

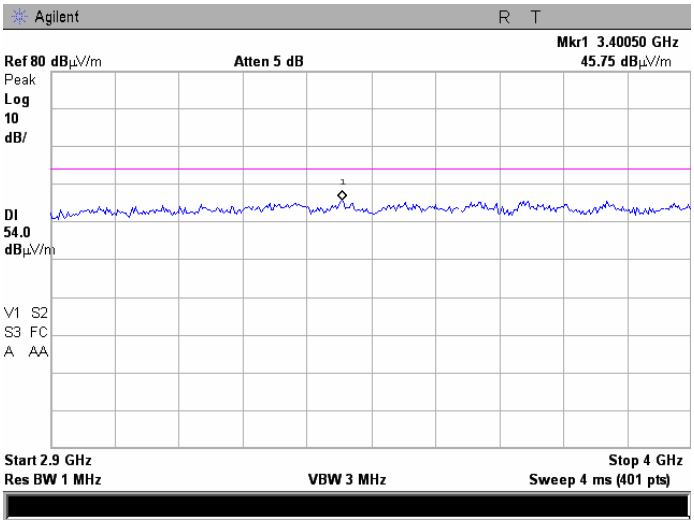
**Plot 7.4.17 Radiated emission measurements from 2900 to 4000 MHz at the low carrier frequency with PSK modulation**

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




**Plot 7.4.18 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency with PSK modulation**

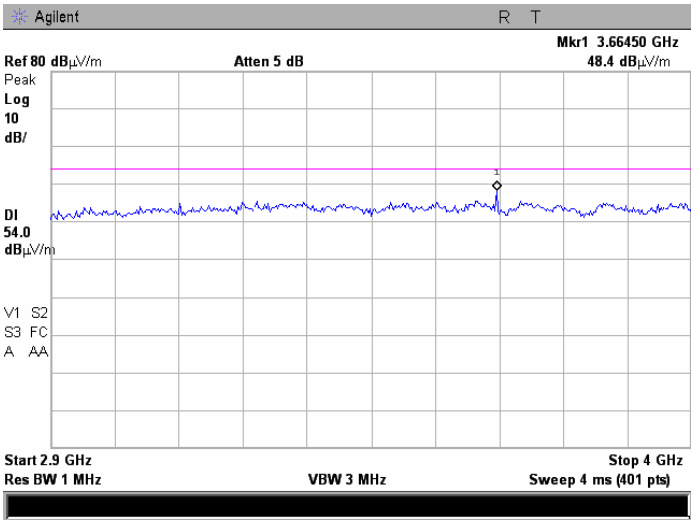
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

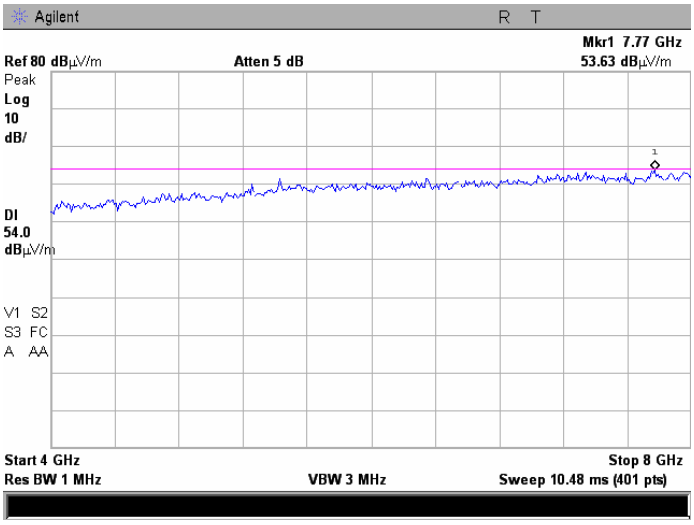
**Plot 7.4.19 Radiated emission measurements from 2900 to 4000 MHz at the high carrier frequency with PSK modulation**

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




**Plot 7.4.20 Radiated emission measurements from 4000 to 8000 MHz at the low carrier frequency with PSK modulation**

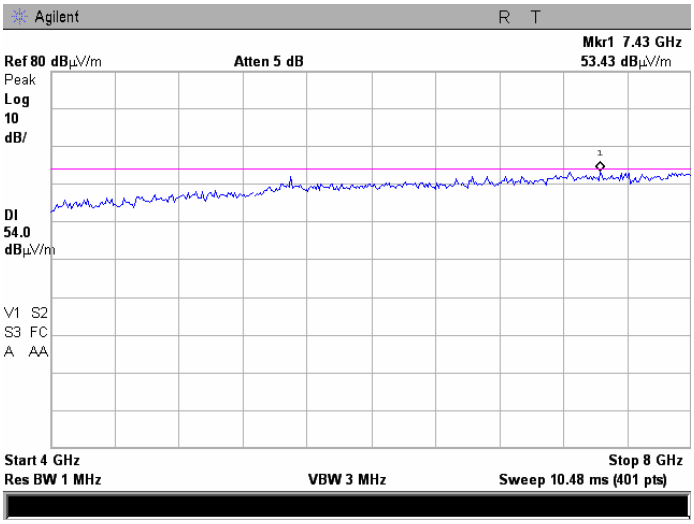
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

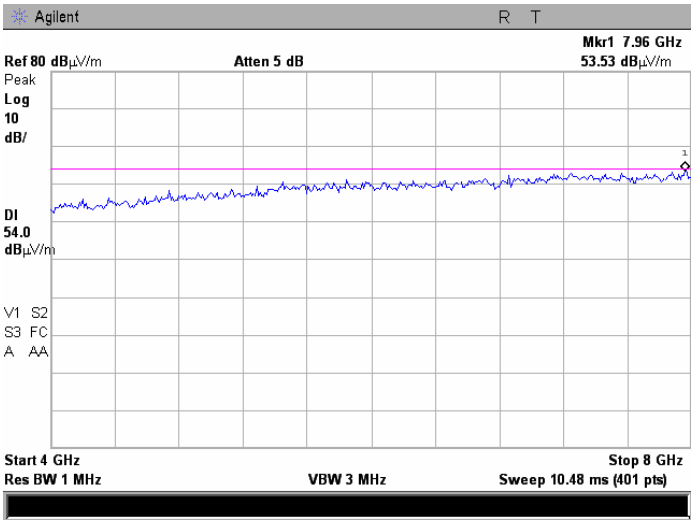
**Plot 7.4.21 Radiated emission measurements from 4000 to 8000 MHz at the mid carrier frequency with PSK modulation**

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




**Plot 7.4.22 Radiated emission measurements from 4000 to 8000 MHz at the high carrier frequency with PSK modulation**

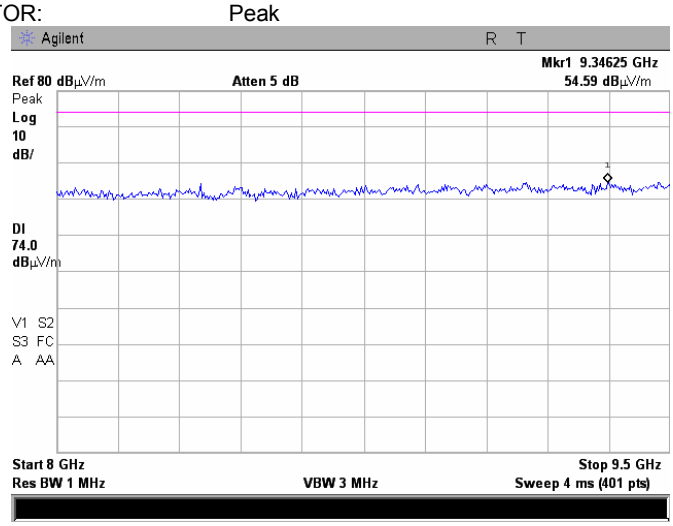
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

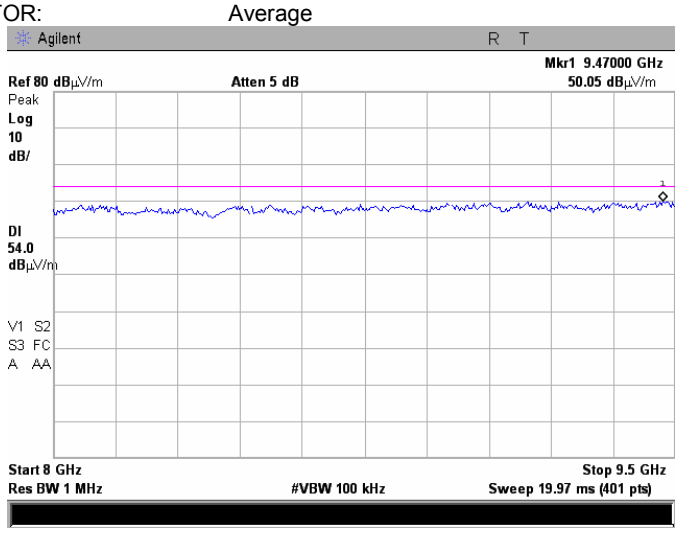
**Plot 7.4.23 Radiated emission measurements from 8000 to 9500 MHz at the low carrier frequency with PSK modulation**

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




**Plot 7.4.24 Radiated emission measurements from 8000 to 9500 MHz at the low carrier frequency with PSK modulation**

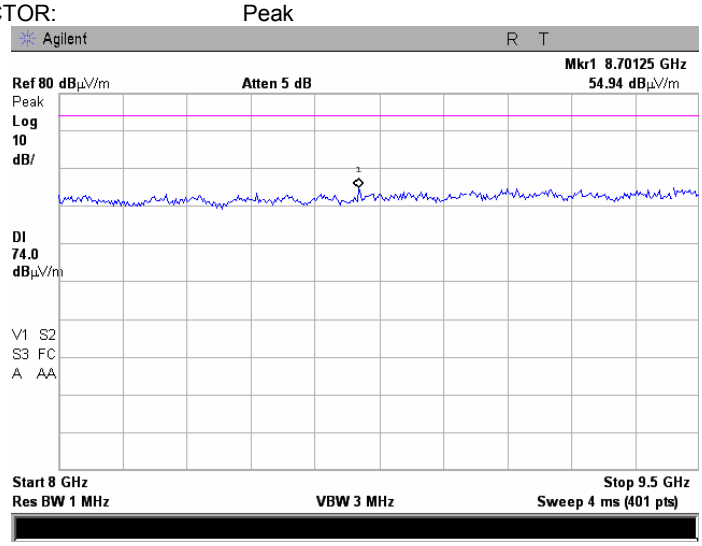
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

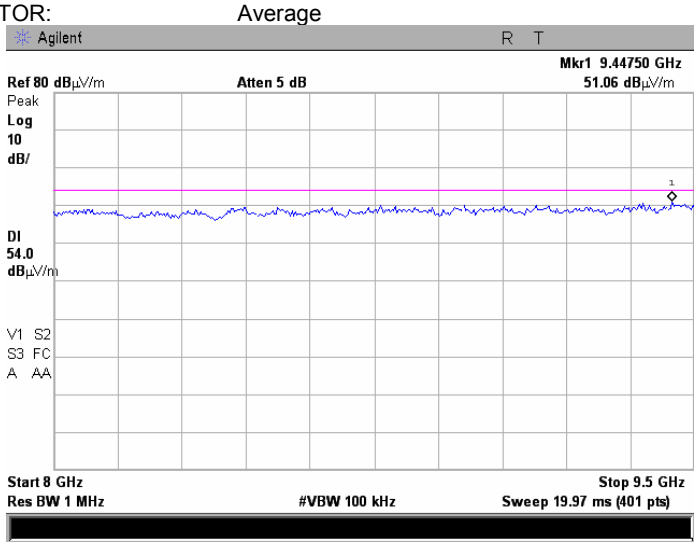
**Plot 7.4.25 Radiated emission measurements from 8000 to 9500 MHz at the mid carrier frequency with PSK modulation**

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




**Plot 7.4.26 Radiated emission measurements from 8000 to 9500 MHz at the mid carrier frequency with PSK modulation**

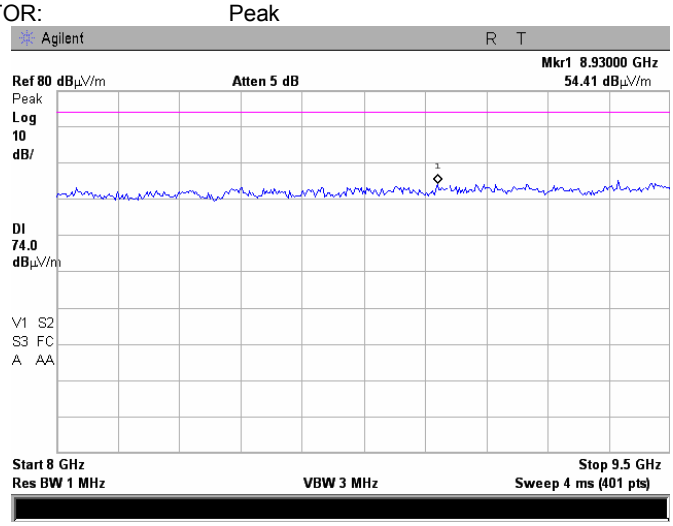
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

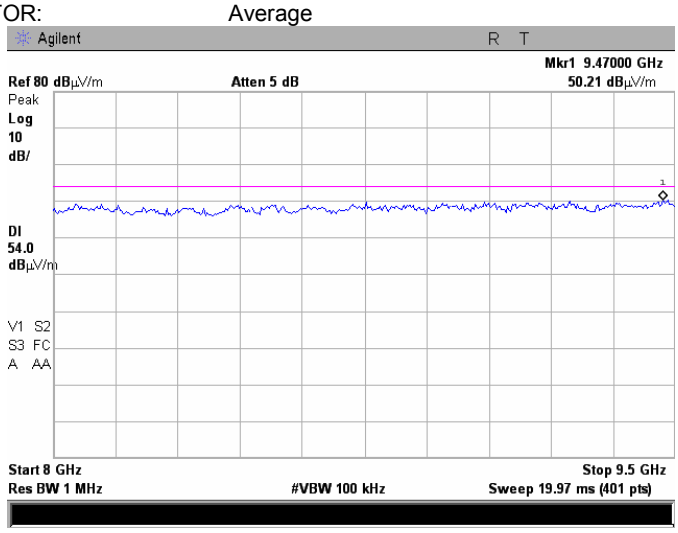
**Plot 7.4.27 Radiated emission measurements from 8000 to 9500 MHz at the high carrier frequency with PSK modulation**

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




**Plot 7.4.28 Radiated emission measurements from 8000 to 9500 MHz at the high carrier frequency with PSK modulation**

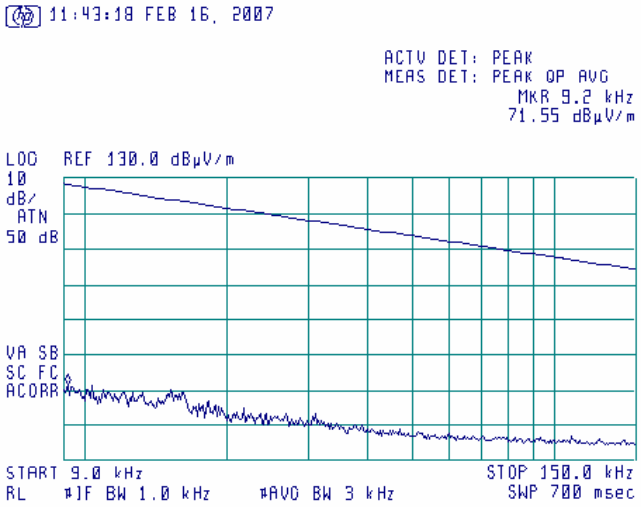
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

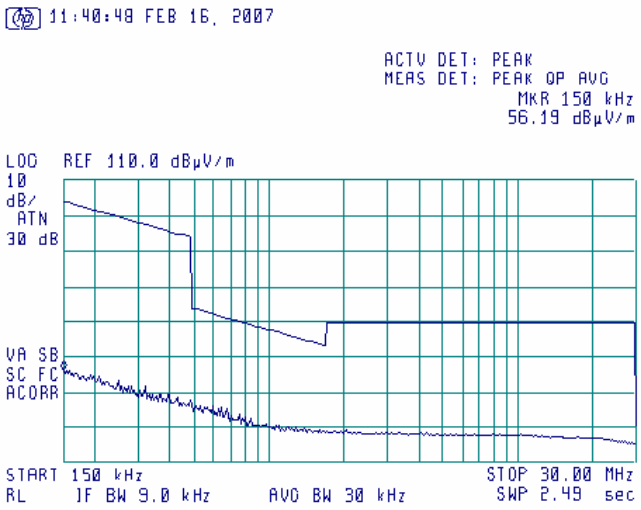
**Plot 7.4.29 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency with FSK modulation**

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




**Plot 7.4.30 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency with FSK modulation**

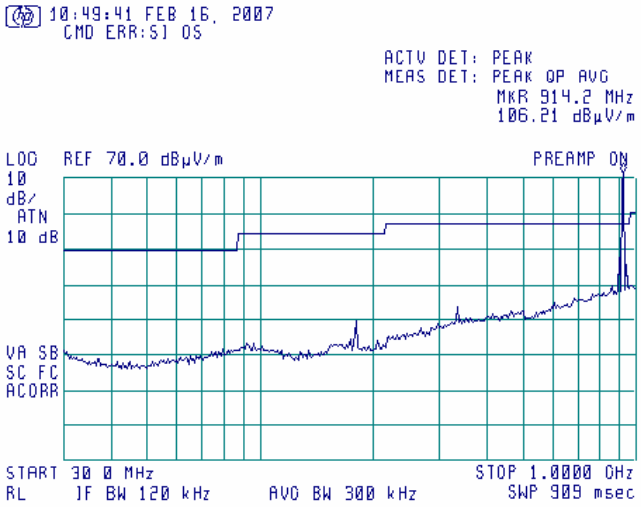
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

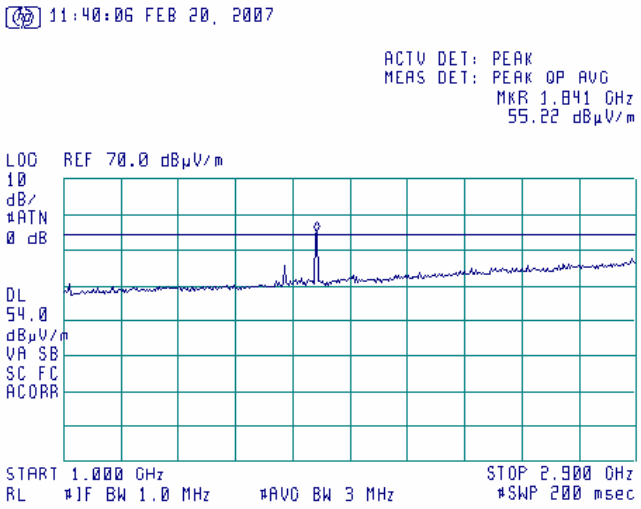
**Plot 7.4.31 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency with FSK modulation**

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




**Plot 7.4.32 Radiated emission measurements from 1000 to 2900 MHz at the mid carrier frequency with FSK modulation**

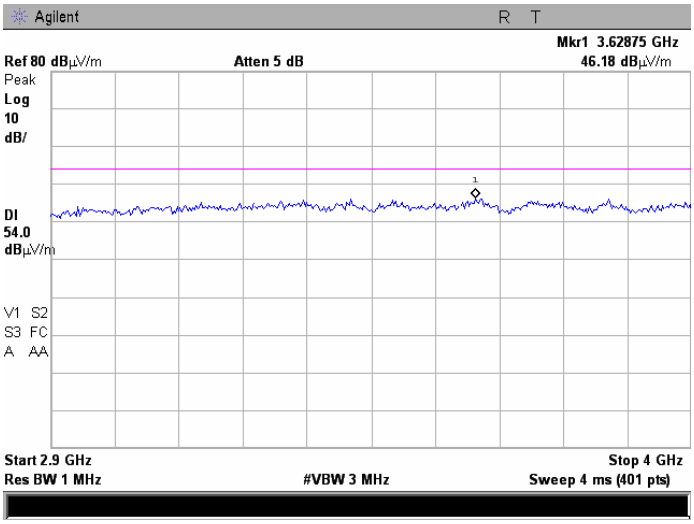
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

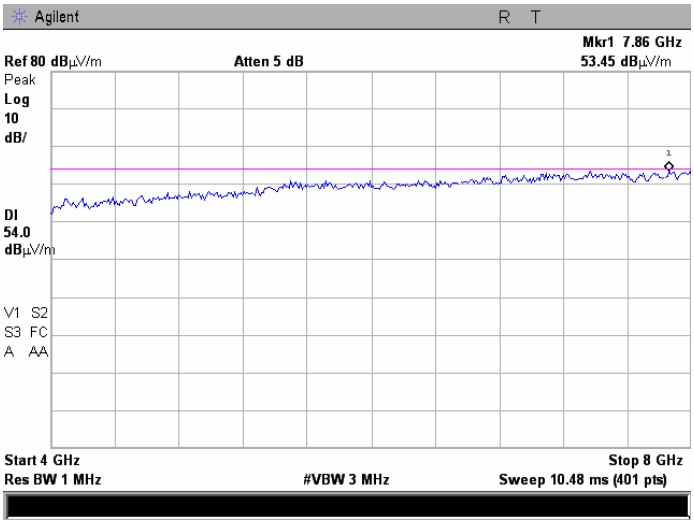
**Plot 7.4.33 Radiated emission measurements from 2900 to 4000 MHz at the mid carrier frequency with FSK modulation**

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




**Plot 7.4.34 Radiated emission measurements from 4000 to 8000 MHz at the mid carrier frequency with FSK modulation**

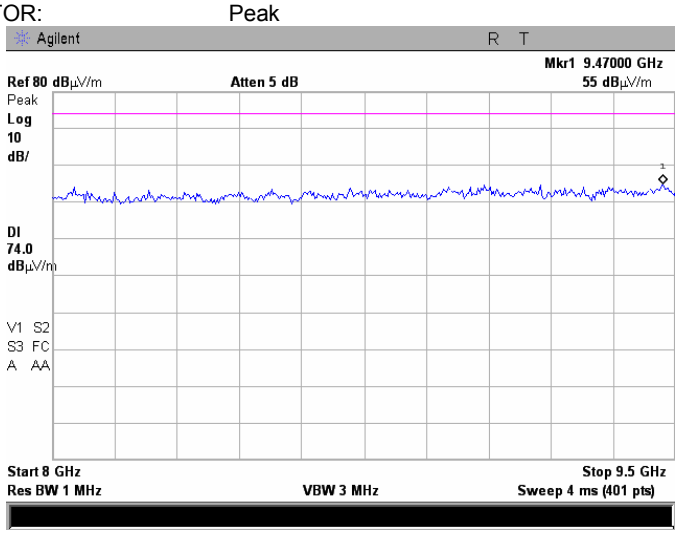
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

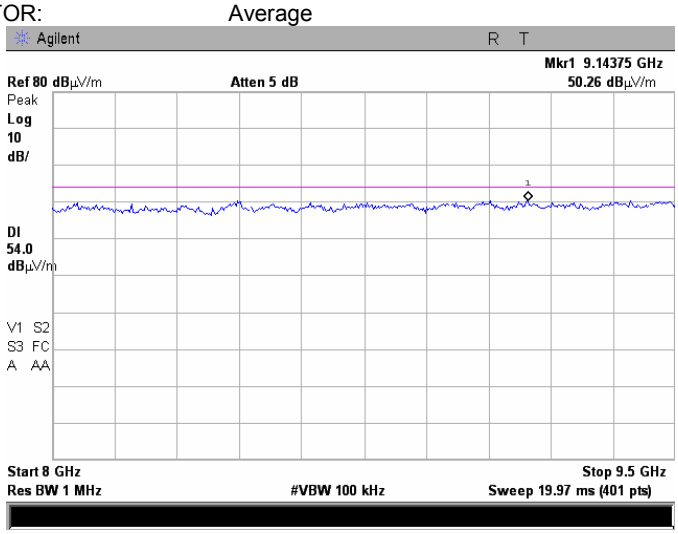
**Plot 7.4.35 Radiated emission measurements from 8000 to 9500 MHz at the mid carrier frequency with FSK modulation**

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




**Plot 7.4.36 Radiated emission measurements from 8000 to 9500 MHz at the mid carrier frequency with FSK modulation**

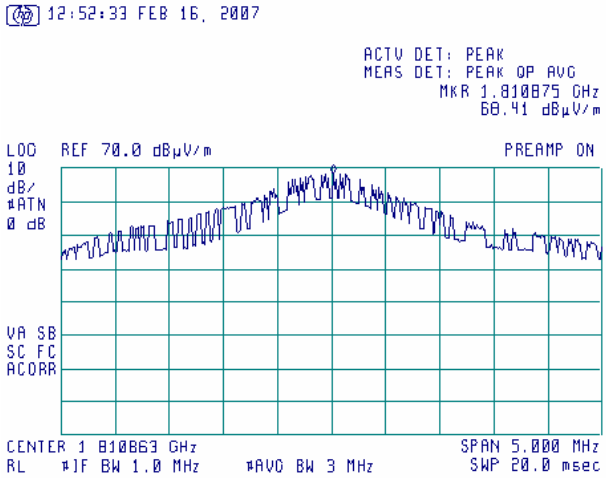
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

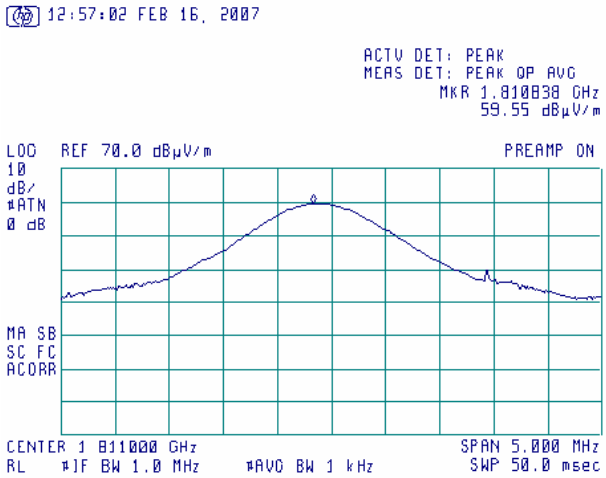
**Plot 7.4.37 Radiated emission measurements at the second harmonic of low carrier frequency with PSK modulation**

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




**Plot 7.4.38 Radiated emission measurements at the second harmonic of low carrier frequency with PSK modulation**

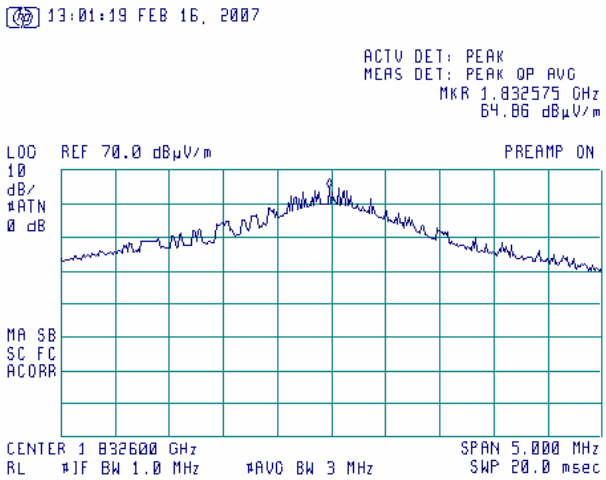
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

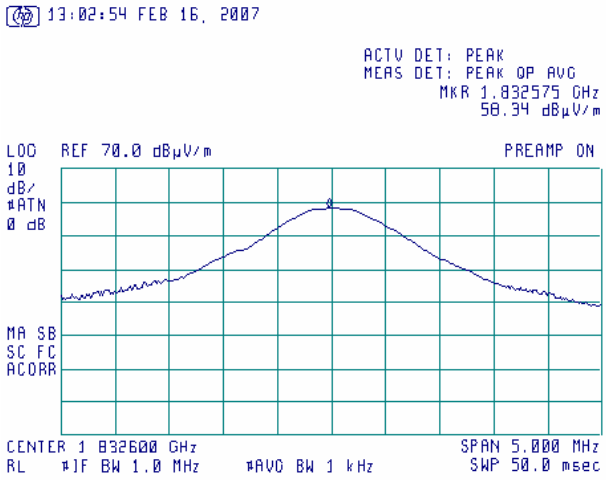
**Plot 7.4.39 Radiated emission measurements at the second harmonic of mid carrier frequency with PSK modulation**

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




**Plot 7.4.40 Radiated emission measurements at the second harmonic of mid carrier frequency with PSK modulation**

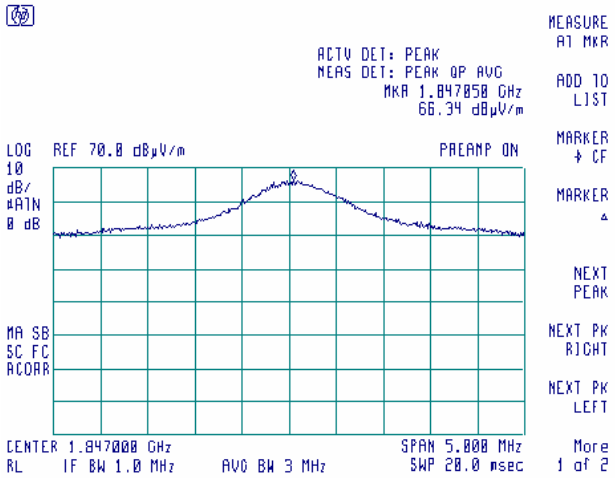
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

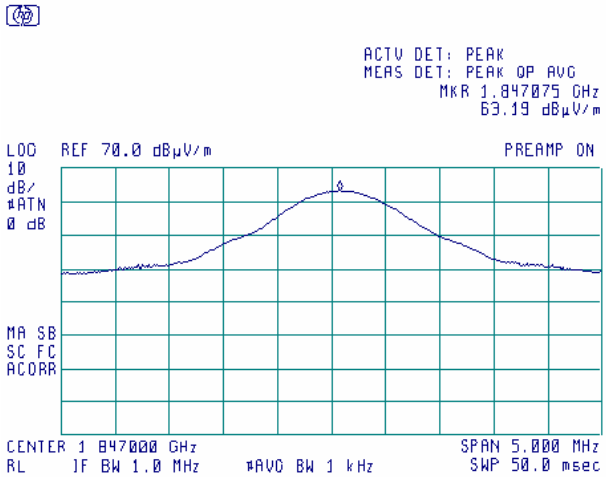
**Plot 7.4.41 Radiated emission measurements at the second harmonic of high carrier frequency with PSK modulation**

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




**Plot 7.4.42 Radiated emission measurements at the second harmonic of high carrier frequency with PSK modulation**

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



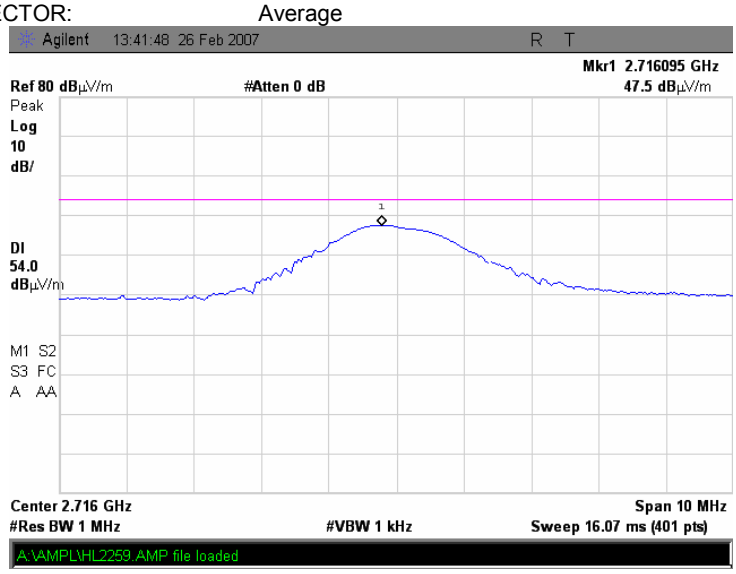
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.43 Radiated emission measurements at the third harmonic of low carrier frequency with PSK modulation**

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


**Plot 7.4.44 Radiated emission measurements at the third harmonic of low carrier frequency with PSK modulation**

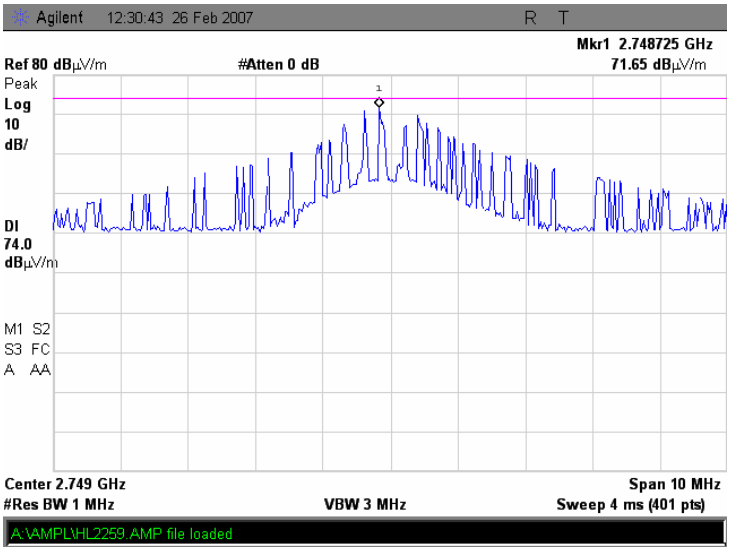
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

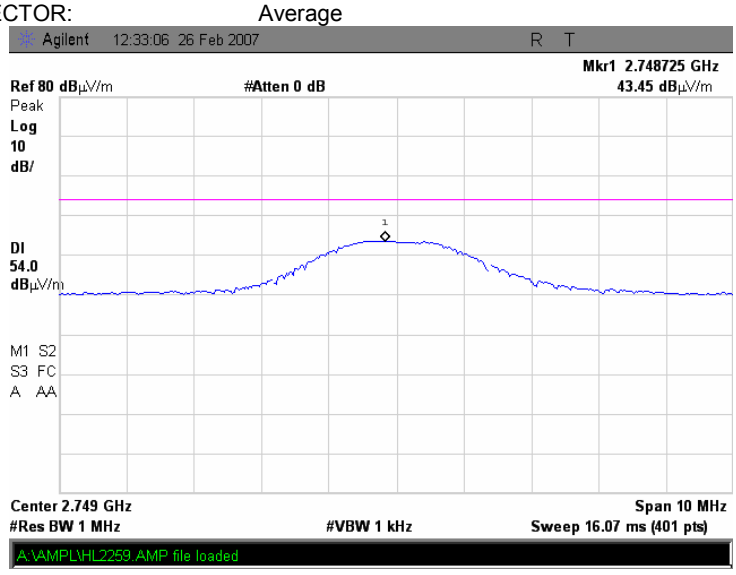
**Plot 7.4.45 Radiated emission measurements at the third harmonic of mid carrier frequency with PSK modulation**

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




**Plot 7.4.46 Radiated emission measurements at the third harmonic of mid carrier frequency with PSK modulation**

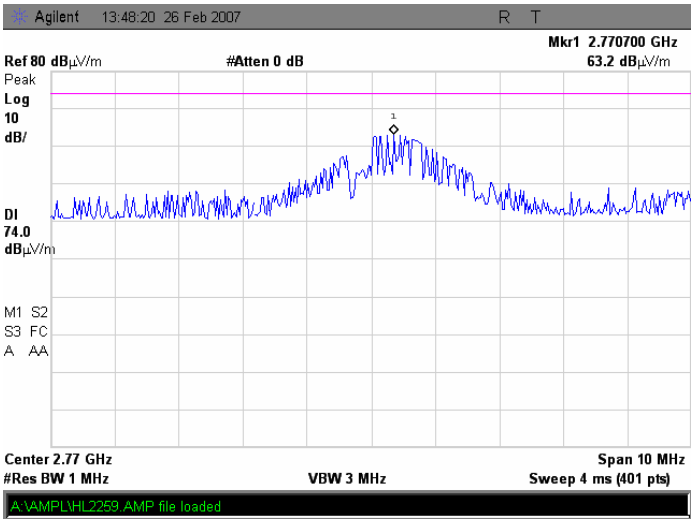
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

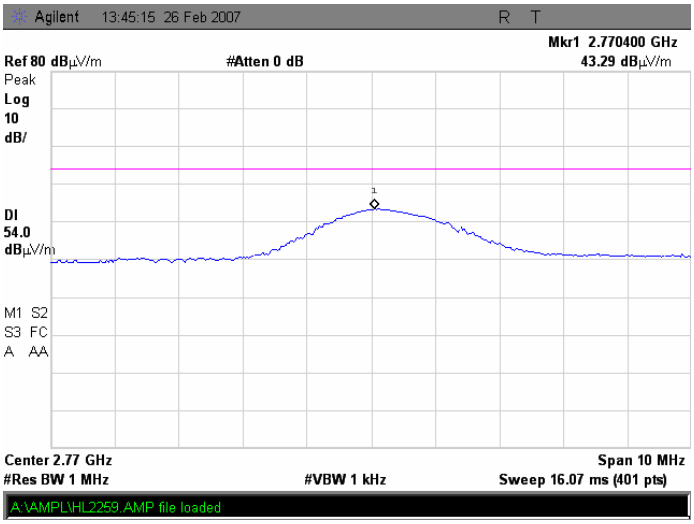
**Plot 7.4.47 Radiated emission measurements at the third harmonic of high carrier frequency with PSK modulation**

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




**Plot 7.4.48 Radiated emission measurements at the third harmonic of high carrier frequency with PSK modulation**

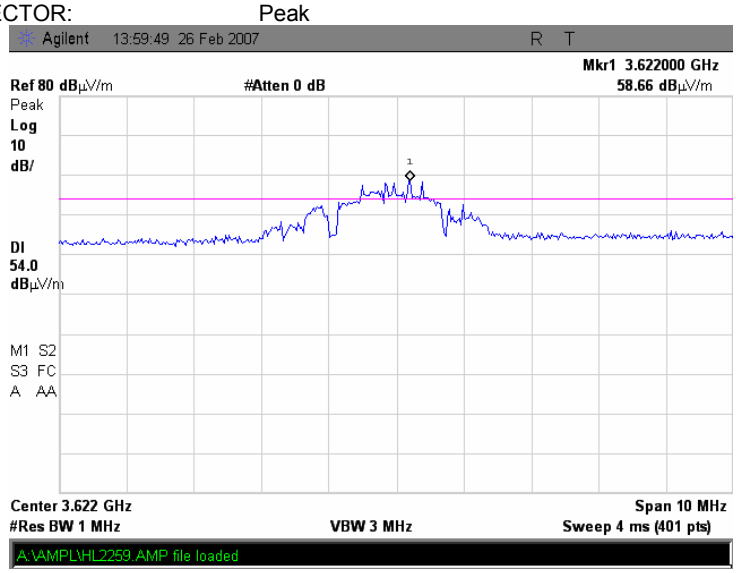
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

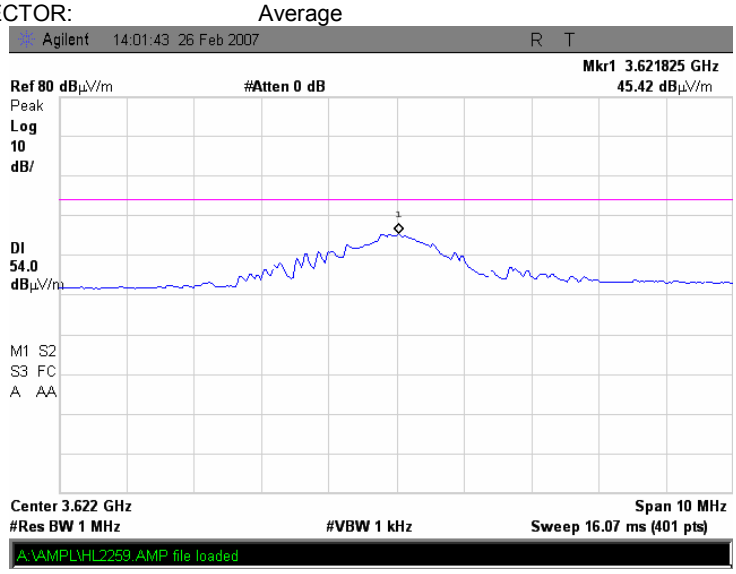
**Plot 7.4.49 Radiated emission measurements at the forth harmonic of low carrier frequency with PSK modulation**

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




**Plot 7.4.50 Radiated emission measurements at the forth harmonic of low carrier frequency with PSK modulation**

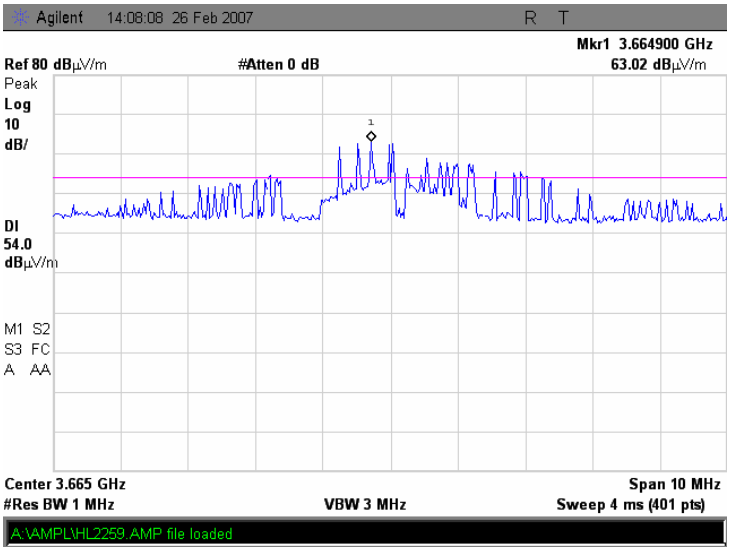
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

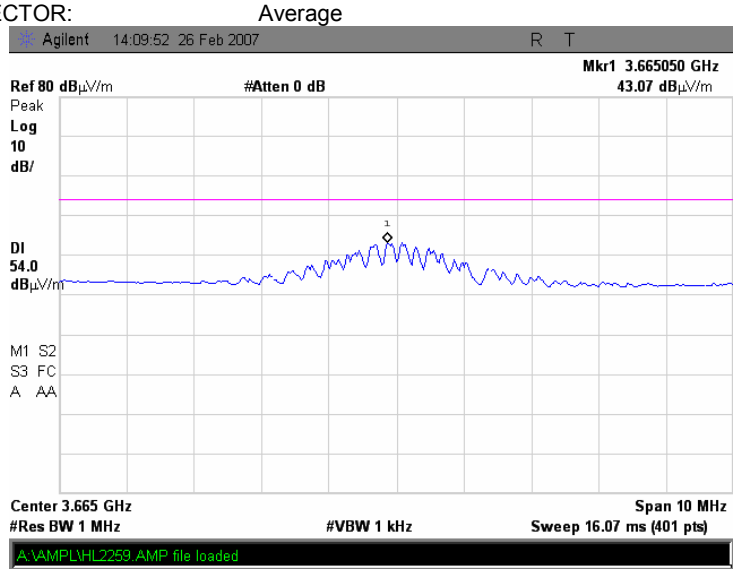
**Plot 7.4.51 Radiated emission measurements at the forth harmonic of mid carrier frequency with PSK modulation**

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




**Plot 7.4.52 Radiated emission measurements at the forth harmonic of mid carrier frequency with PSK modulation**

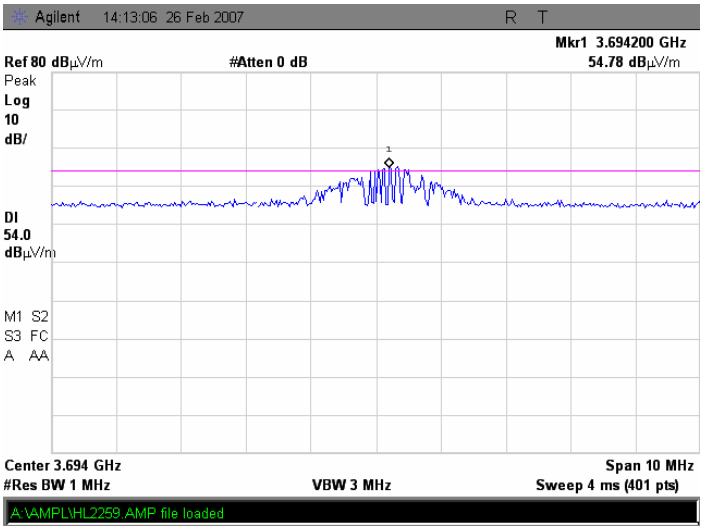
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.53 Radiated emission measurements at the forth harmonic of high carrier frequency with PSK modulation**

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




**Plot 7.4.54 Radiated emission measurements at the forth harmonic of high carrier frequency with PSK modulation**

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

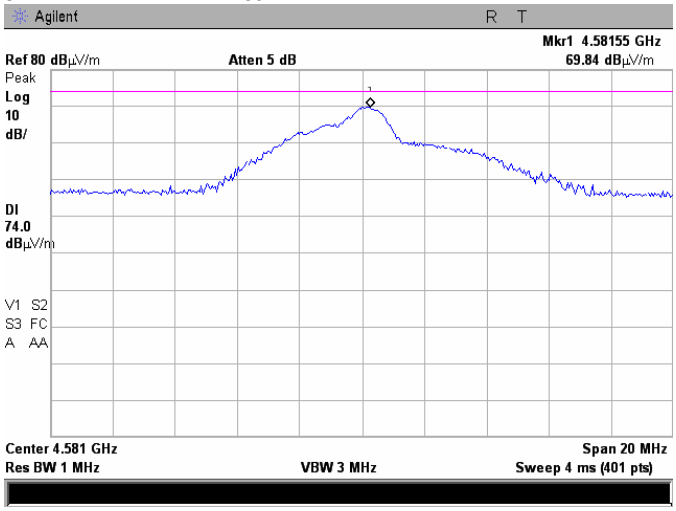
| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.55 Radiated emission measurements at the fifth harmonic of low carrier frequency with PSK modulation**

No emission was found

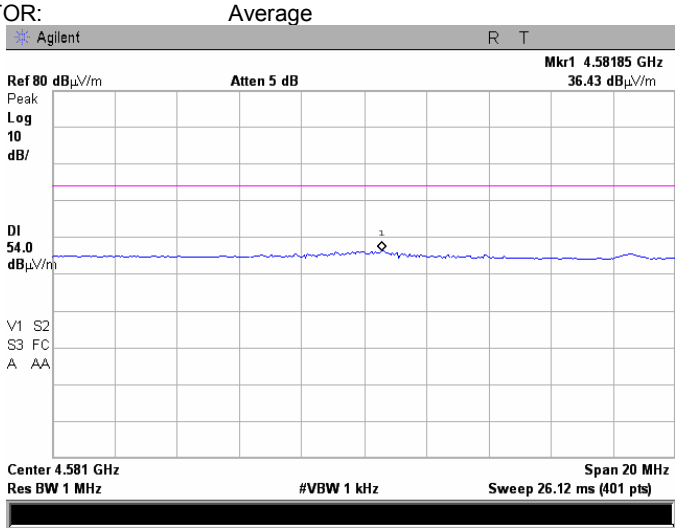
**Plot 7.4.56 Radiated emission measurements at the fifth harmonic of mid carrier frequency with PSK modulation**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR: Peak




**Plot 7.4.57 Radiated emission measurements at the fifth harmonic of mid carrier frequency with PSK modulation**

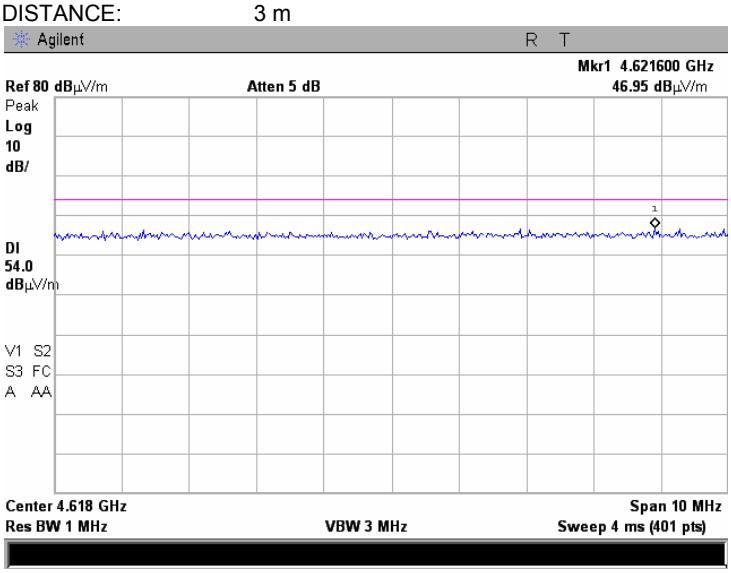
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.58 Radiated emission measurements at the fifth harmonic of high carrier frequency with PSK modulation**

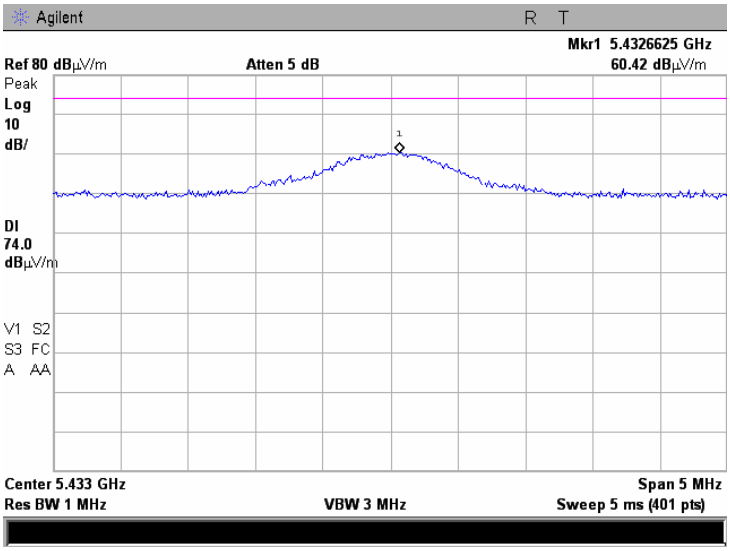
TEST SITE: OATS
TEST DISTANCE: 3 m



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

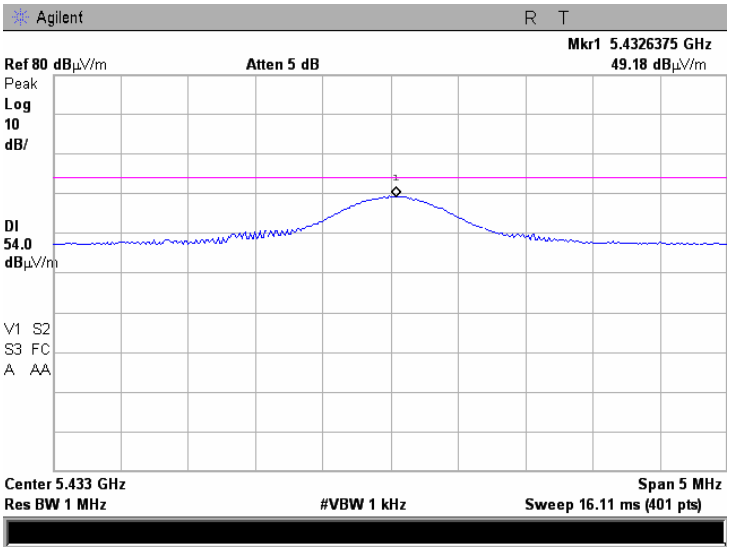
**Plot 7.4.59 Radiated emission measurements at the sixth harmonic of low carrier frequency with PSK modulation**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR: Peak




**Plot 7.4.60 Radiated emission measurements at the sixth harmonic of low carrier frequency with PSK modulation**

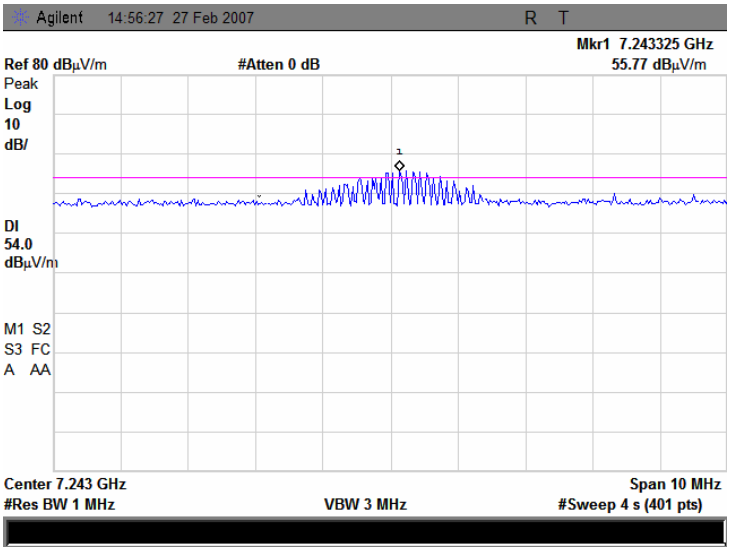
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

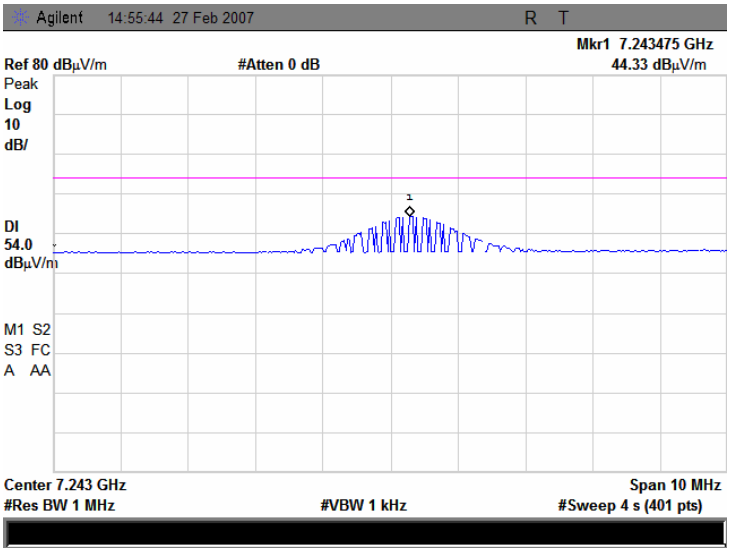
**Plot 7.4.61 Radiated emission measurements at the eighth harmonic of low carrier frequency with PSK modulation**

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




**Plot 7.4.62 Radiated emission measurements at the eighth harmonic of low carrier frequency with PSK modulation**

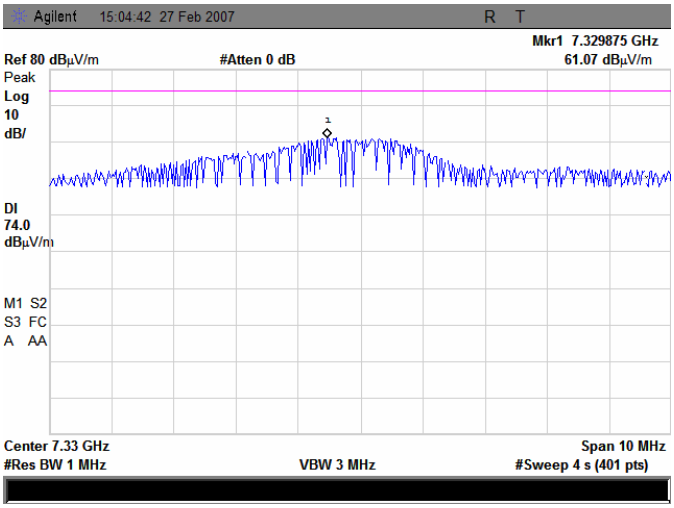
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

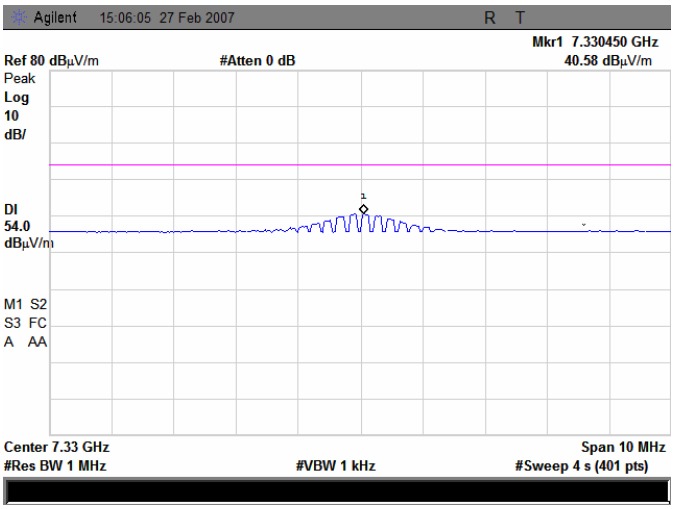
**Plot 7.4.63 Radiated emission measurements at the eighth harmonic of mid carrier frequency with PSK modulation**

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




**Plot 7.4.64 Radiated emission measurements at the eighth harmonic of mid carrier frequency with PSK modulation**

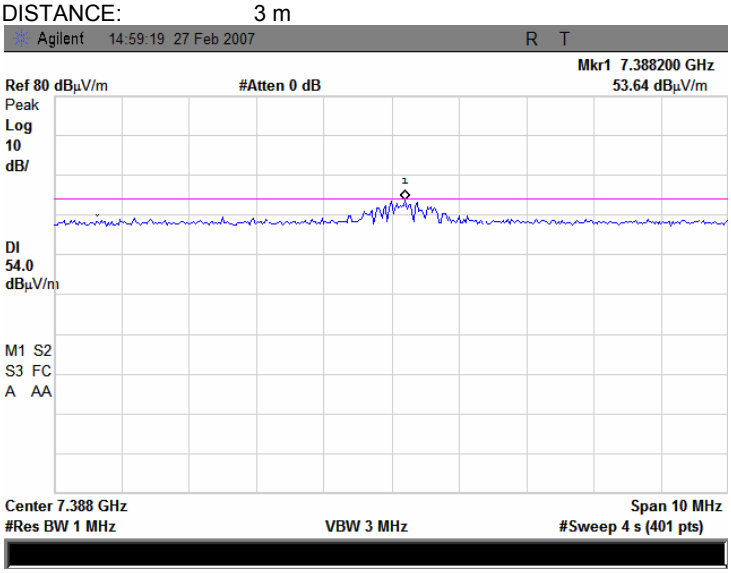
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.65 Radiated emission measurements at the eighth harmonic of high carrier frequency with PSK modulation**

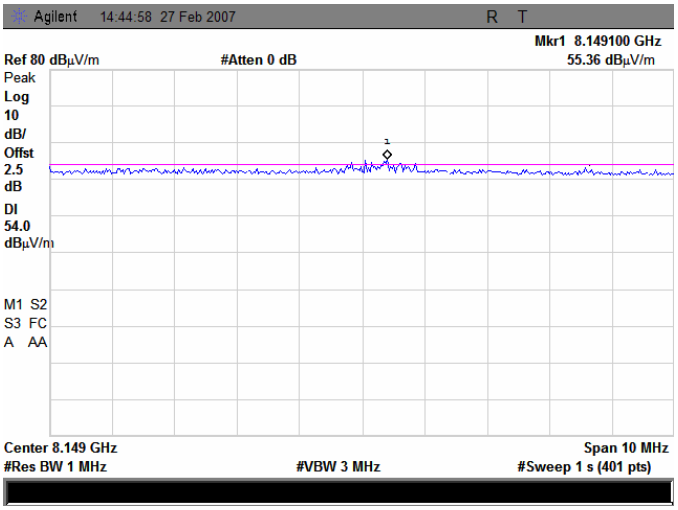
TEST SITE: OATS
TEST DISTANCE: 3 m



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

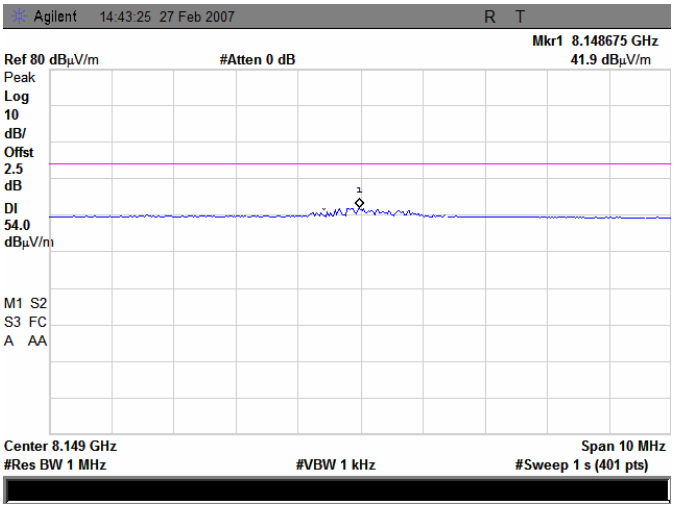
**Plot 7.4.66 Radiated emission measurements at the ninth harmonic of low carrier frequency with PSK modulation**

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




**Plot 7.4.67 Radiated emission measurements at the ninth harmonic of low carrier frequency with PSK modulation**

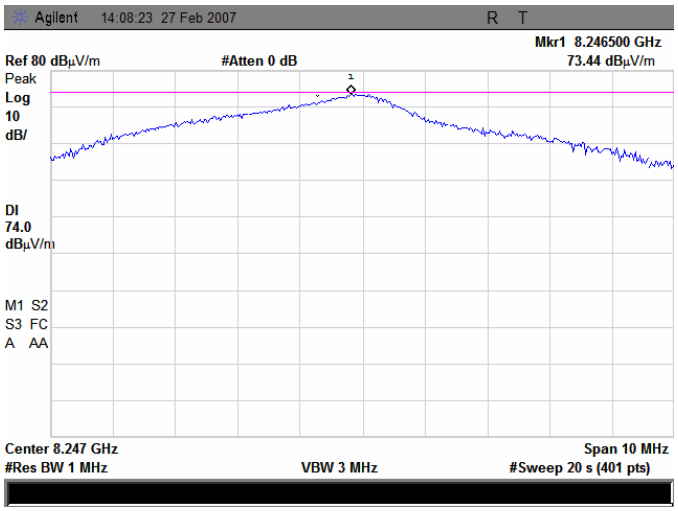
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

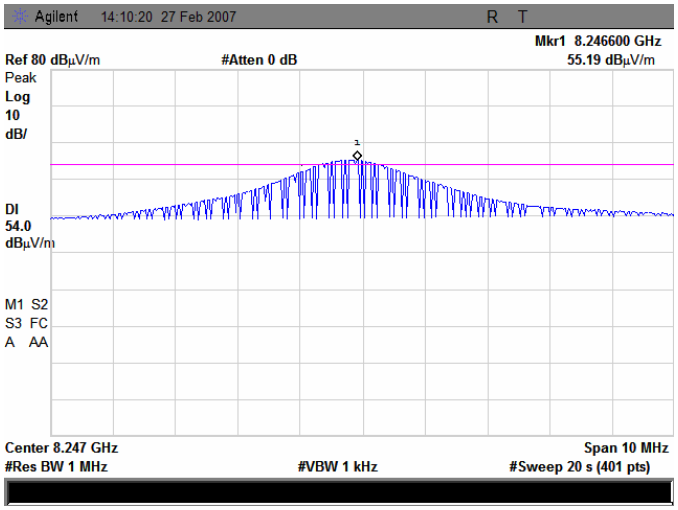
**Plot 7.4.68 Radiated emission measurements at the ninth harmonic of mid carrier frequency with PSK modulation**

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




**Plot 7.4.69 Radiated emission measurements at the ninth harmonic of mid carrier frequency with PSK modulation**

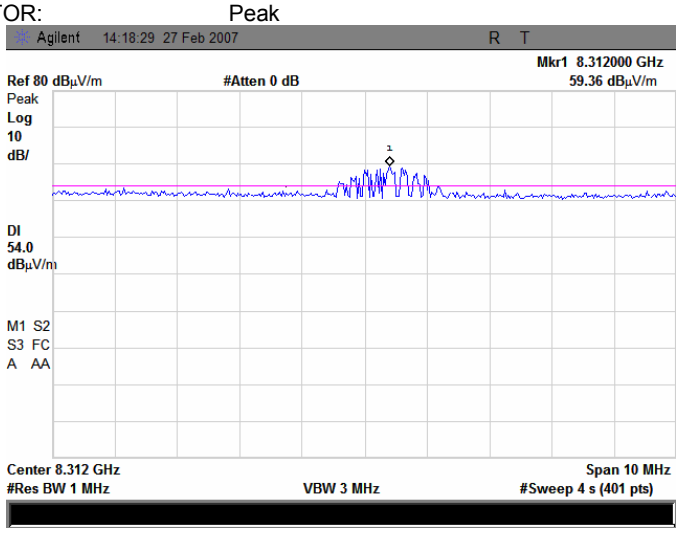
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

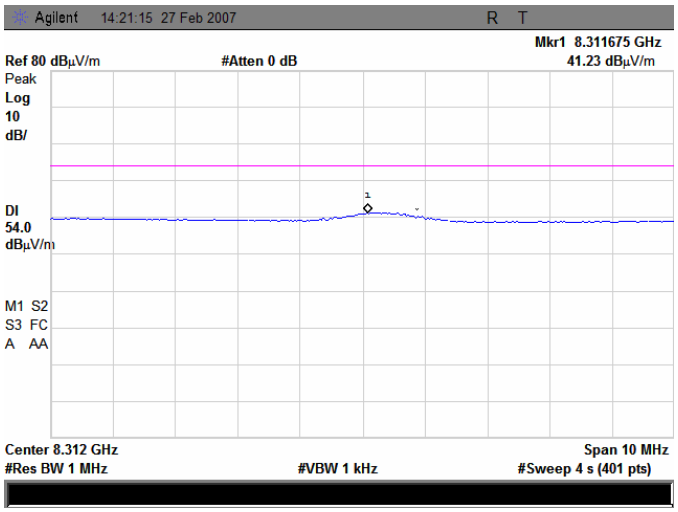
**Plot 7.4.70 Radiated emission measurements at the ninth harmonic of high carrier frequency with PSK modulation**

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




**Plot 7.4.71 Radiated emission measurements at the ninth harmonic of high carrier frequency with PSK modulation**

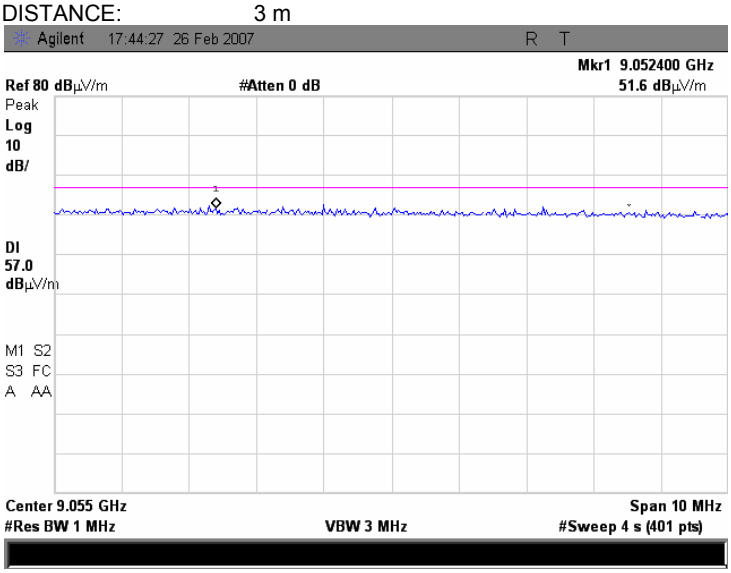
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.72 Radiated emission measurements at the tenth harmonic of low carrier frequency with PSK modulation**

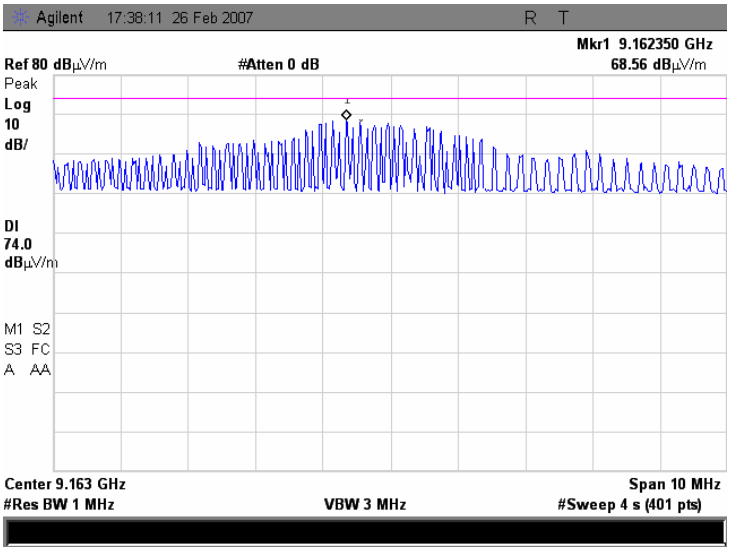
TEST SITE: OATS
TEST DISTANCE: 3 m



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

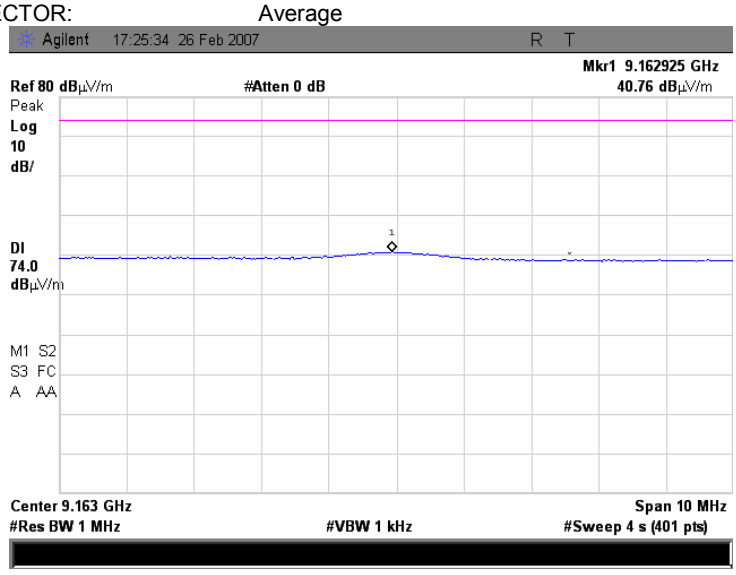
**Plot 7.4.73 Radiated emission measurements at the tenth harmonic of mid carrier frequency with PSK modulation**

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




**Plot 7.4.74 Radiated emission measurements at the tenth harmonic of mid carrier frequency with PSK modulation**

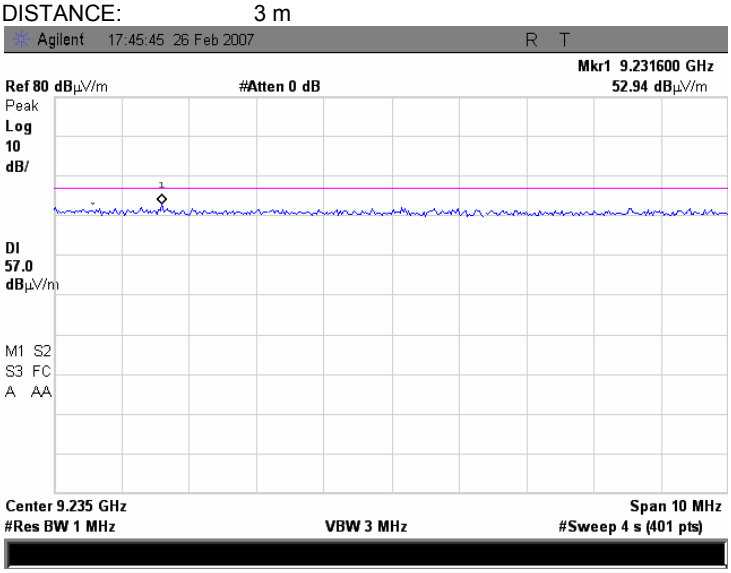
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.75 Radiated emission measurements at the tenth harmonic of high carrier frequency with PSK modulation**

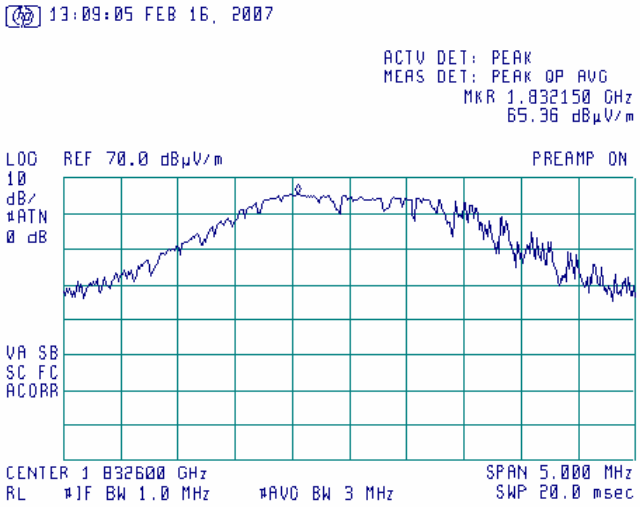
TEST SITE: OATS
TEST DISTANCE: 3 m



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

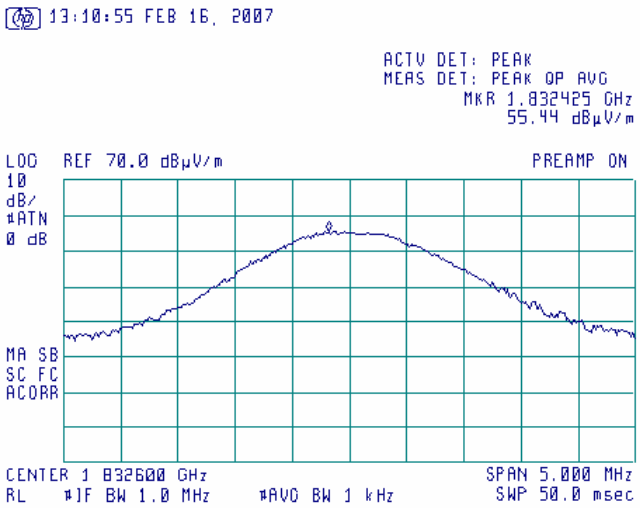
**Plot 7.4.76 Radiated emission measurements at the second harmonic of mid carrier frequency with FSK modulation**

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




**Plot 7.4.77 Radiated emission measurements at the second harmonic of mid carrier frequency with FSK modulation**

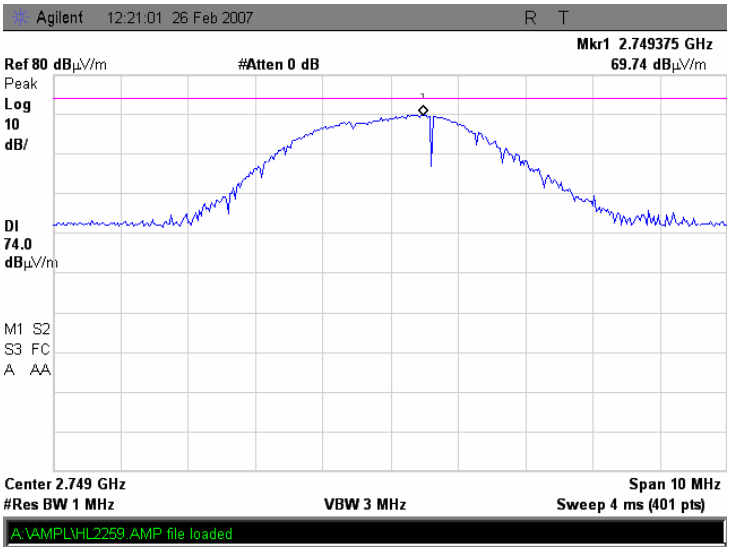
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

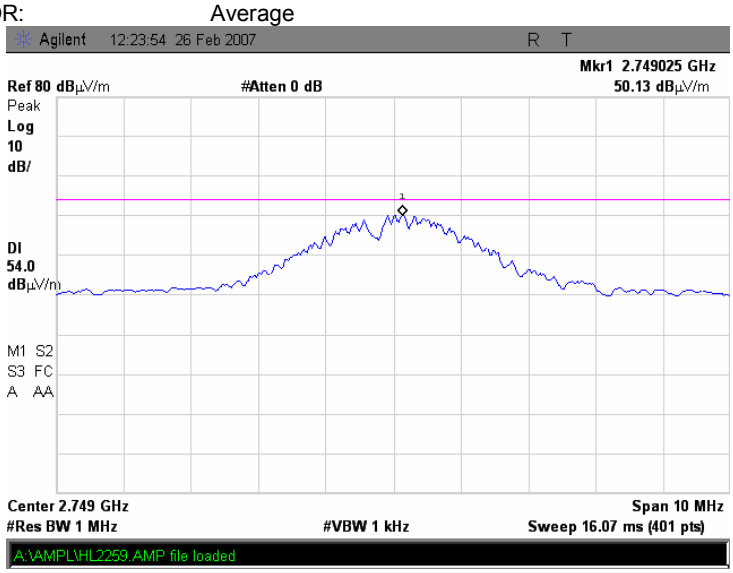
**Plot 7.4.78 Radiated emission measurements at the third harmonic of mid carrier frequency with FSK modulation**

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




**Plot 7.4.79 Radiated emission measurements at the third harmonic of mid carrier frequency with FSK modulation**

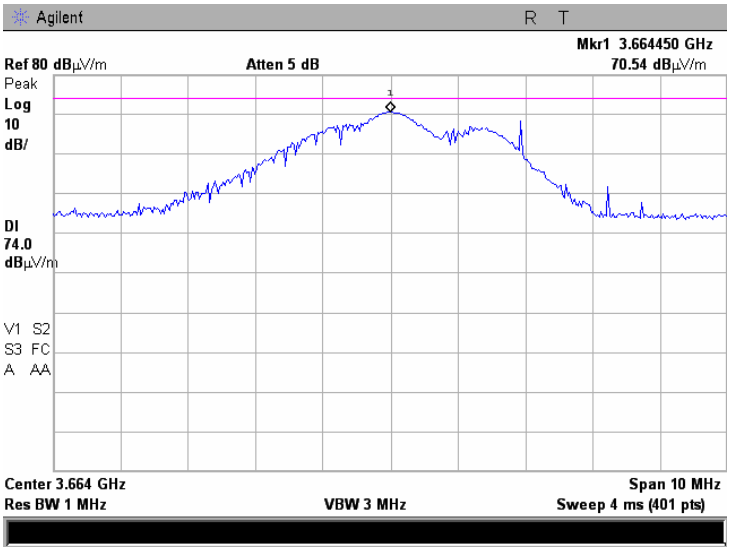
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

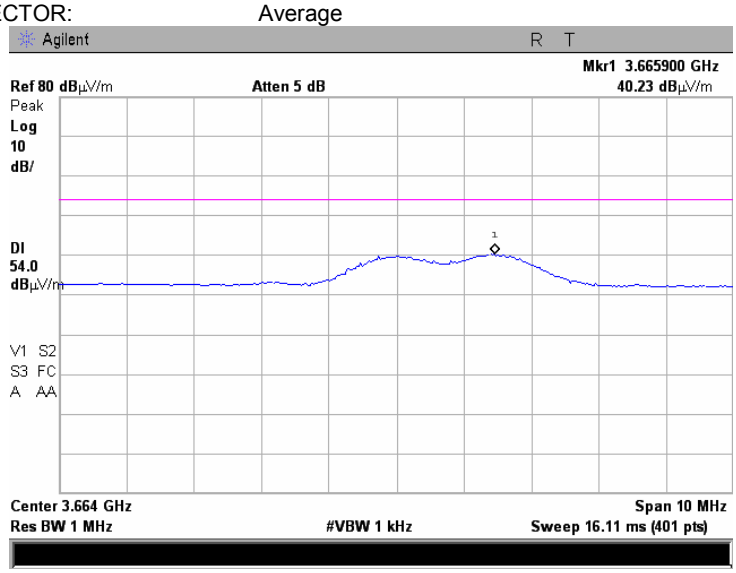
**Plot 7.4.80 Radiated emission measurements at the forth harmonic of mid carrier frequency with FSK modulation**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR: Peak




**Plot 7.4.81 Radiated emission measurements at the forth harmonic of mid carrier frequency with FSK modulation**

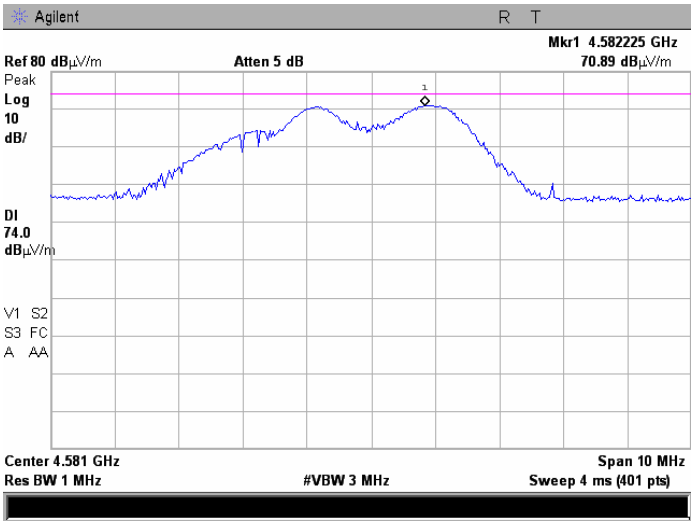
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

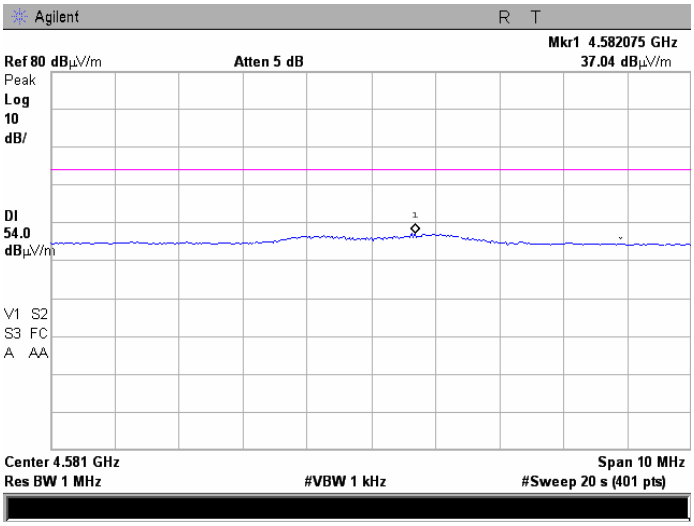
**Plot 7.4.82 Radiated emission measurements at the fifth harmonic of mid carrier frequency with FSK modulation**

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




**Plot 7.4.83 Radiated emission measurements at the fifth harmonic of mid carrier frequency with FSK modulation**

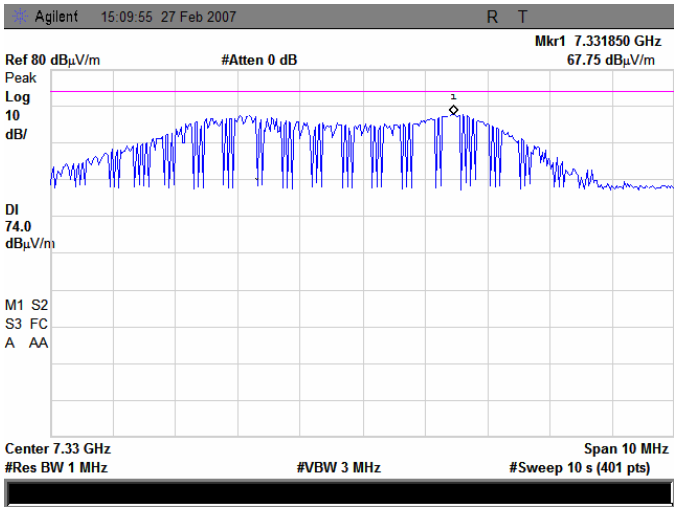
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

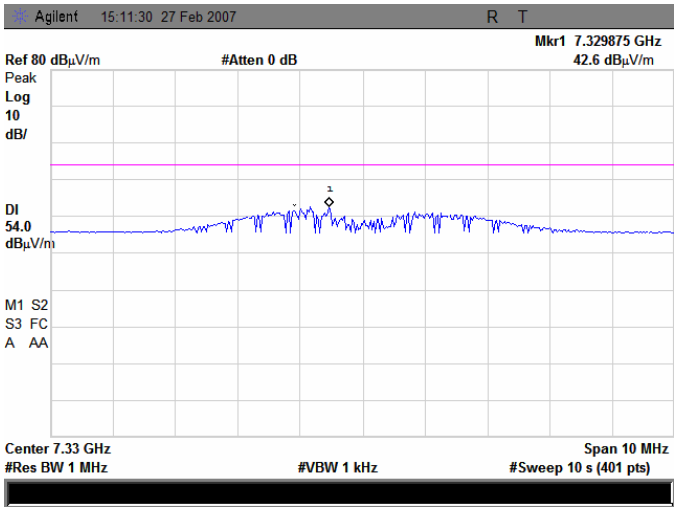
**Plot 7.4.84 Radiated emission measurements at the eighth harmonic of mid carrier frequency with FSK modulation**

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




**Plot 7.4.85 Radiated emission measurements at the eighth harmonic of mid carrier frequency with FSK modulation**

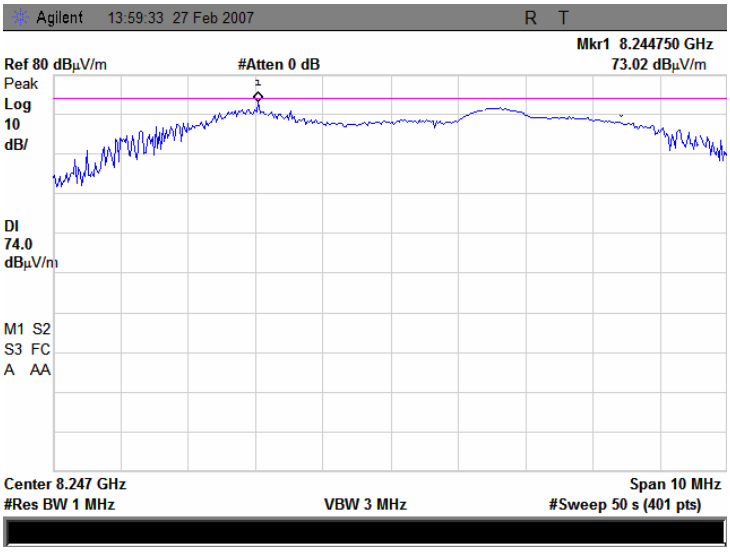
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

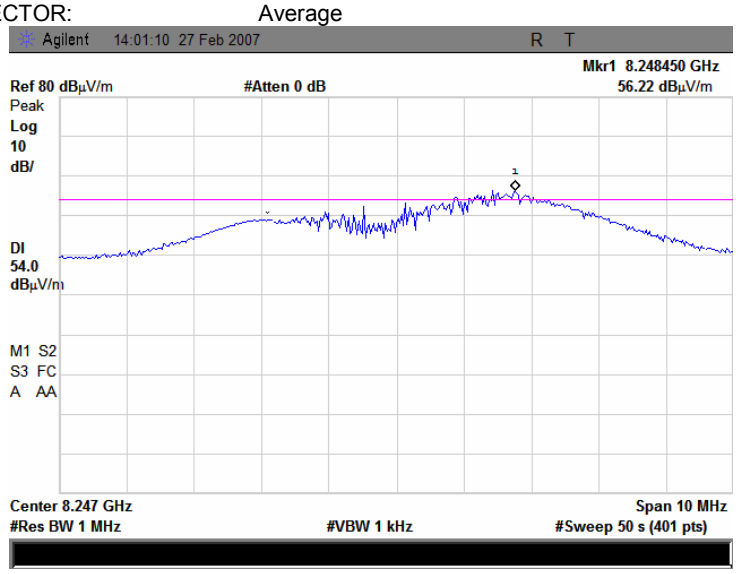
**Plot 7.4.86 Radiated emission measurements at the ninth harmonic of mid carrier frequency with FSK modulation**

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




**Plot 7.4.87 Radiated emission measurements at the ninth harmonic of mid carrier frequency with FSK modulation**

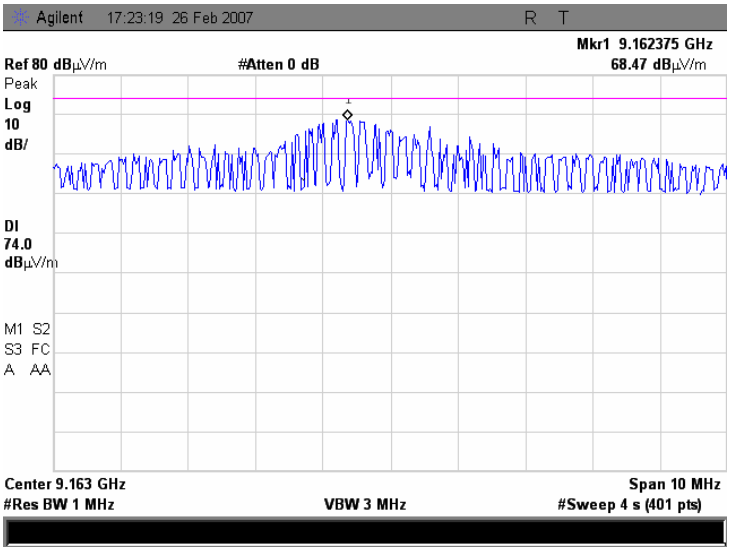
TEST SITE: OATS
TEST DISTANCE: 3 m
DETECTOR: Average



| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

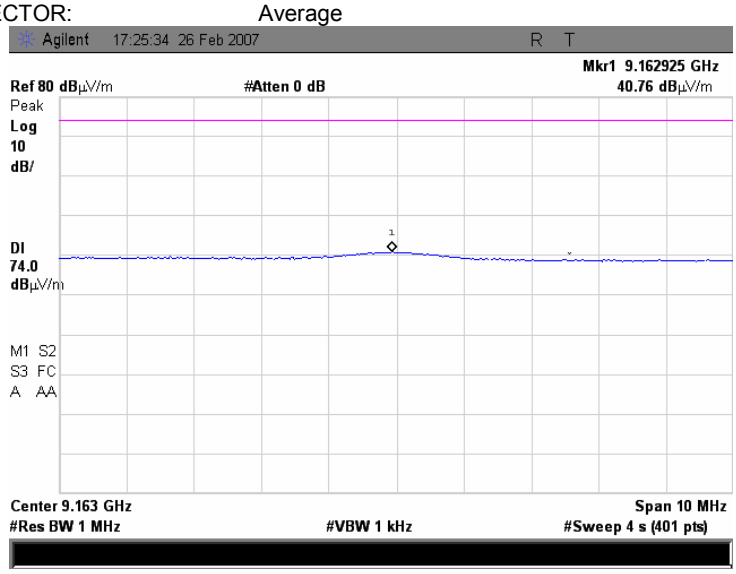
**Plot 7.4.88 Radiated emission measurements at the tenth harmonic of mid carrier frequency with FSK modulation**

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



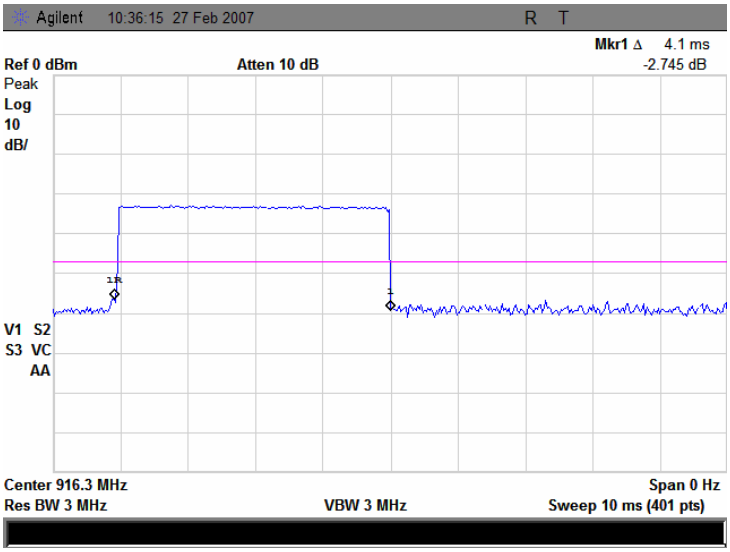

**Plot 7.4.89 Radiated emission measurements at the tenth harmonic of mid carrier frequency with FSK modulation**

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

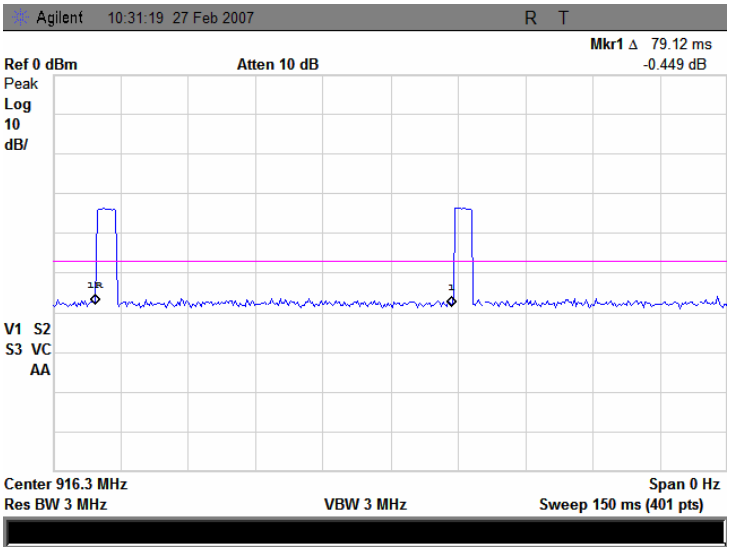


| Test specification: | Section 15.247(c), Radiated spurious emissions | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4 | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/7/2007 1:48:03 PM | | |
| Temperature: 26ºC | Air Pressure: 1012 hPa | Relative Humidity: 37% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.4.90 Transmission pulse duration**




**Plot 7.4.91 Transmission pulse period**



| 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: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

## 7.5 Peak spectral power density

### 7.5.1 General

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

**Table 7.5.1 Peak spectral power density limits**

| Assigned frequency range, MHz | Measurement bandwidth, kHz | Peak spectral power density, dBm |
|---|---|---|
| 902 – 928 | 3.0 | 8.0 |

### 7.5.2 Test procedure

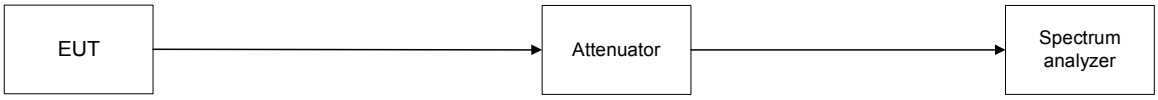
**7.5.2.1** The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.

**7.5.2.2** The EUT was adjusted to produce maximum available to end user RF output power.

**7.5.2.3** The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. 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.

**7.5.2.4** The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.5.2 and associated plots.

**Figure 7.5.1 Peak spectral power density test setup**



| 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: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Table 7.5.2 Peak spectral power density test results**

| | |
|---|---|
| ASSIGNED FREQUENCY: | 902 – 928 MHz |
| MODULATION: | PSK / FSK |
| MODULATING SIGNAL: | PRBS |
| BIT RATE: | 60 kbps |
| TRANSMITTER OUTPUT POWER SETTINGS: | Maximum |
| TRANSMITTER OUTPUT POWER: | 16.5 dBm at low carrier frequency |
| PSK MODULATION | 16.6 dBm at mid carrier frequency |
| | 16.8 dBm at high carrier frequency |
| TRANSMITTER OUTPUT POWER: | 14.4 dBm at low carrier frequency |
| FSK MODULATION | 14.5 dBm at mid carrier frequency |
| | 14.6 dBm at high carrier frequency |
| DETECTOR USED: | Peak |
| RESOLUTION BANDWIDTH: | 3 kHz |
| VIDEO BANDWIDTH: | 10 kHz |

| Carrier frequency, MHz | Spectrum analyzer reading, dBm/3 kHz | External attenuation, dB | Cable loss, dB | Peak power density, dB(mW/3 kHz) | Limit, dBm | Margin*, dB | Verdict |
|---|---|---|---|---|---|---|---|
| **PSK modulation** | | | | | | | |
| 905.4375 | -6.727 | 10.00 | Included | 3.273 | 8.000 | -4.727 | Pass |
| 916.3000 | -6.661 | 10.00 | Included | 3.339 | 8.000 | -4.661 | Pass |
| 923.5462 | -6.597 | 10.00 | Included | 3.403 | 8.000 | -4.597 | Pass |

* - Margin = Peak power density – specification limit.
** - Peak power density [dB(mW/3 kHz)] = Spectrum analyzer reading [dBm/3 kHz] + External attenuation [dB]

| Carrier frequency, MHz | Spectrum analyzer reading, dBm/1Hz | External attenuation, dB | Cable loss, dB | Peak power density, dB(mW/3 kHz)** | Limit, dBm | Margin*, dB | Verdict |
|---|---|---|---|---|---|---|---|
| **FSK modulation** | | | | | | | |
| 905.4375 | -43.98 | 10.00 | Included | 1.02 | 8.000 | -6.98 | Pass |
| 916.3000 | -43.90 | 10.00 | Included | 1.10 | 8.000 | -6.90 | Pass |
| 923.5462 | -43.69 | 10.00 | Included | 1.31 | 8.000 | -6.69 | Pass |

* - Margin = Peak power density – specification limit.
** - Peak power density [dB(mW/3 kHz)] = Spectrum analyzer reading [dB(mW/Hz] + 35 [dB] + External attenuation [dB]

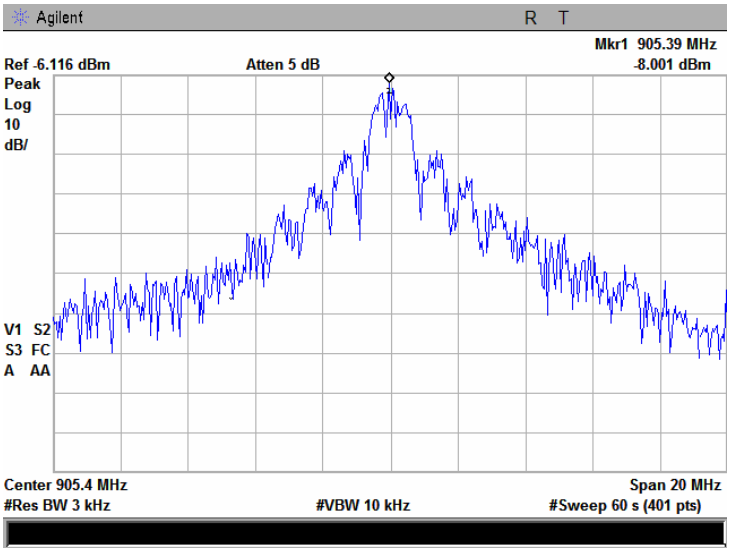
**Reference numbers of test equipment used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 1650 | HL 2254 | HL 2780 | | | | | |

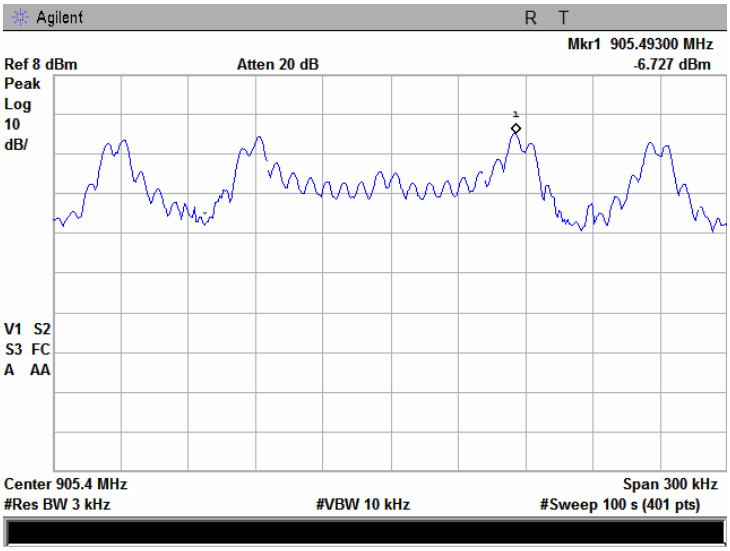
Full description is given in Appendix A.

| 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: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.5.1 Peak spectral power density at low frequency within 6 dB band with PSK modulation**

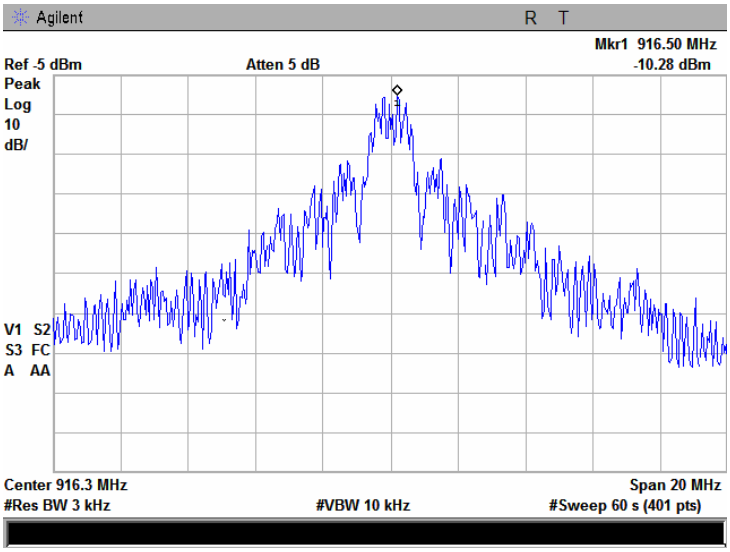



**Plot 7.5.2 Peak spectral power density at low frequency zoomed at the peak with PSK modulation**

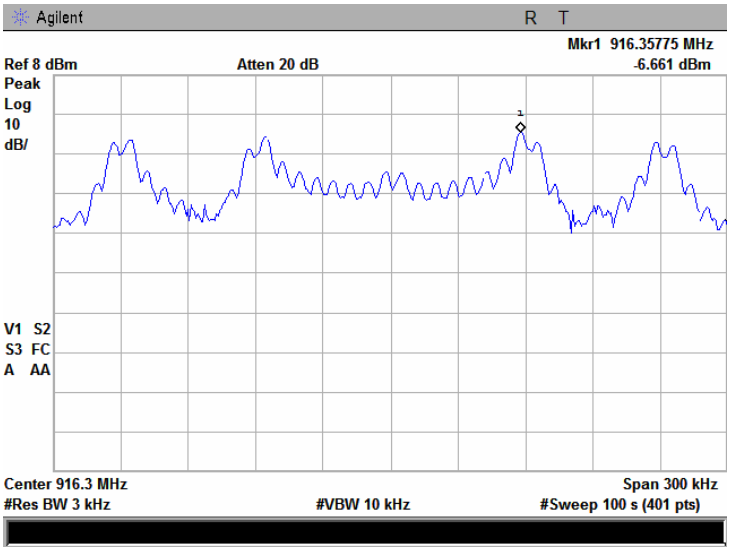


| Test specification: | Section 15.247(d), Peak power density | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.5.3 Peak spectral power density at mid frequency within 6 dB band with PSK modulation**

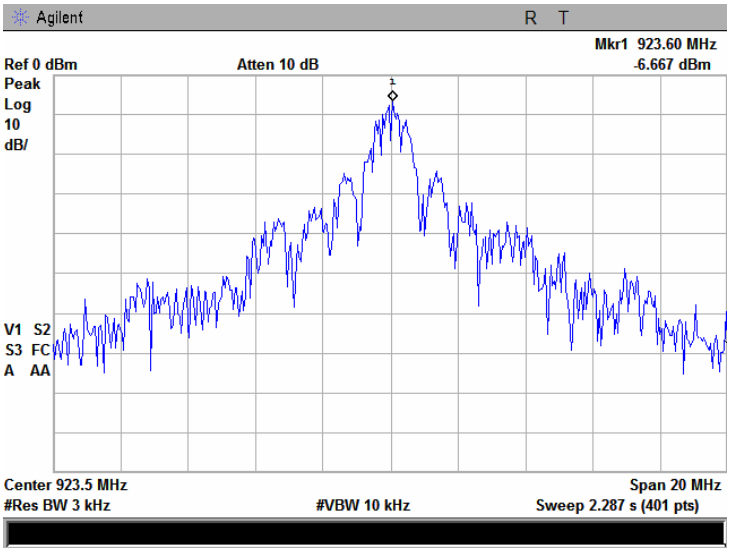



**Plot 7.5.4 Peak spectral power density at mid frequency zoomed at the peak with PSK modulation**

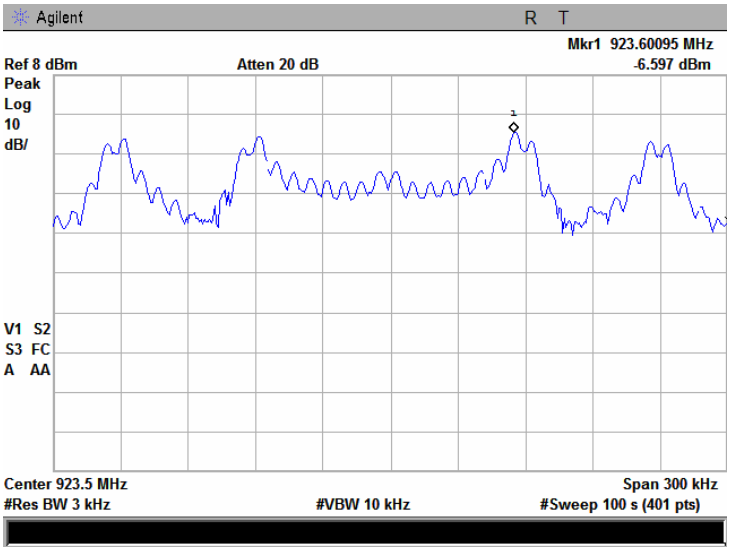


| Test specification: | Section 15.247(d), Peak power density | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.5.5 Peak spectral power density at high frequency within 6 dB band with PSK modulation**

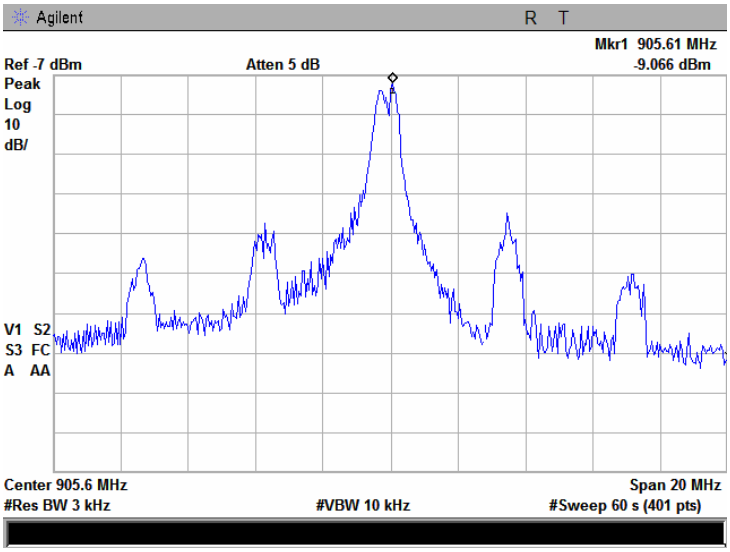



**Plot 7.5.6 Peak spectral power density at high frequency zoomed at the peak with PSK modulation**



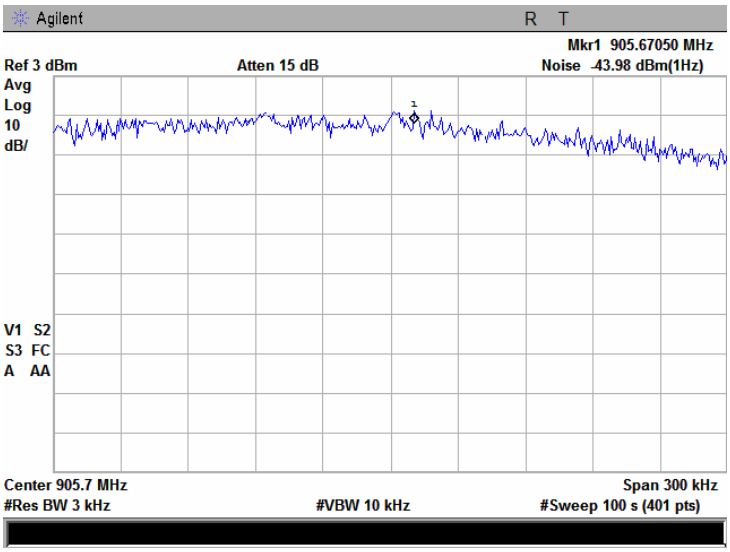
| Test specification: | Section 15.247(d), Peak power density | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.5.7 Peak spectral power density at low frequency within 6 dB band with FSK modulation**



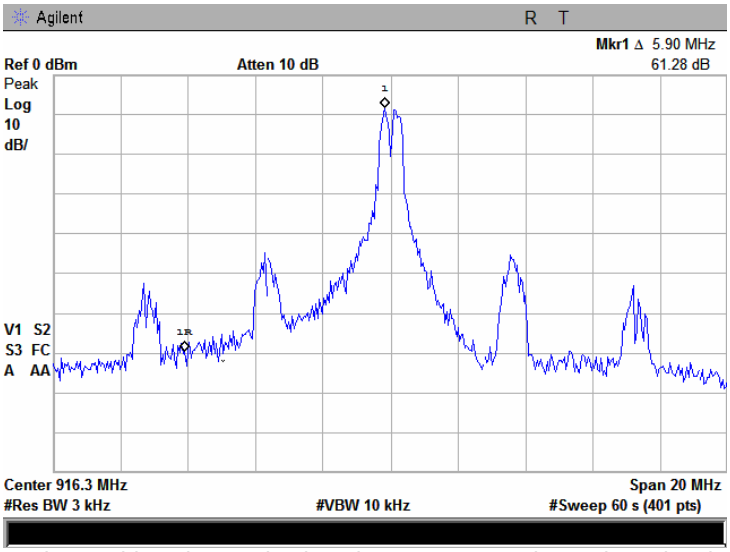

Note: the spectrum line spacing could not be resolved on the spectrum analyzer; the noise density function was used on spectrum analyzer to measure the noise power density normalized to a 1 Hz noise power bandwidth. Addition of 35 dB for correction to 3 kHz needed.

**Plot 7.5.8 Peak spectral power density at low frequency zoomed at the peak with FSK modulation**



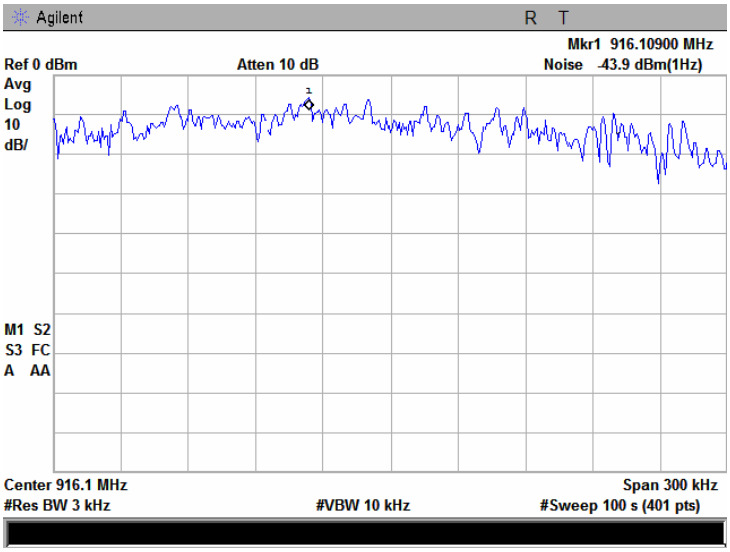
| Test specification: | Section 15.247(d), Peak power density | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.5.9 Peak spectral power density at mid frequency within 6 dB band with FSK modulation**



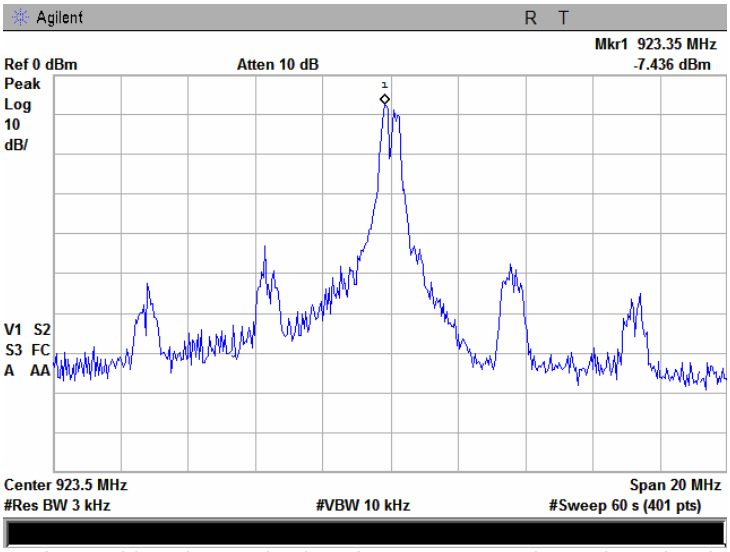

Note: the spectrum line spacing could not be resolved on the spectrum analyzer; the noise density function was used on spectrum analyzer to measure the noise power density normalized to a 1 Hz noise power bandwidth. Addition of 35 dB for correction to 3 kHz needed.

**Plot 7.5.10 Peak spectral power density at mid frequency zoomed at the peak with FSK modulation**



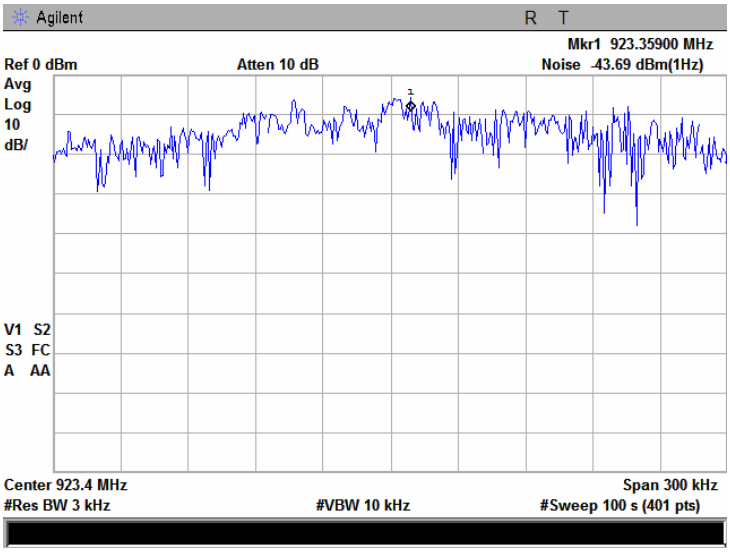
| Test specification: | Section 15.247(d), Peak power density | | |
|---|---|---|---|
| Test procedure: | FR Vol. 62, page 26243, Section 15.247(d) | | |
| Test mode: | Compliance | Verdict: | PASS |
| Date & Time: | 5/3/2007 2:42:24 PM | | |
| Temperature: 25ºC | Air Pressure: 1007 hPa | Relative Humidity: 42% | Power Supply: 3.6 V DC |
| Remarks: | | | |

**Plot 7.5.11 Peak spectral power density at high frequency within 6 dB band with FSK modulation**




Note: the spectrum line spacing could not be resolved on the spectrum analyzer; the noise density function was used on spectrum analyzer to measure the noise power density normalized to a 1 Hz noise power bandwidth. Addition of 35 dB for correction to 3 kHz needed.

**Plot 7.5.12 Peak spectral power density at high frequency zoomed at the peak with FSK modulation**



| **Test specification:** | **Section 15.203, Antenna requirement** | | |
|---|---|---|---|
| **Test procedure:** | Visual inspection | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date & Time:** | 5/18/2007 9:14:07 AM | | |
| **Temperature:** 24ºC | **Air Pressure:** 1011 hPa | **Relative Humidity:** 48% | **Power Supply:** 3.6 V DC |
| **Remarks:** | | | |

## 7.6 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.
The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.6.1.

**Table 7.6.1 Antenna requirements**

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

**Photograph 7.6.1 Antenna assembly**

| 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: | 2/20/2007 10:52:15 AM | | |
| Temperature: 21ºC | Air Pressure: 1008 hPa | Relative Humidity: 45% | Power Supply: 3.6 V DC |
| Remarks: | | | |

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

## 8.1 Radiated emission measurements

### 8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1.

**Table 8.1.1 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: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where $S_1$ and $S_2$ – standard defined and test distance respectively in meters.

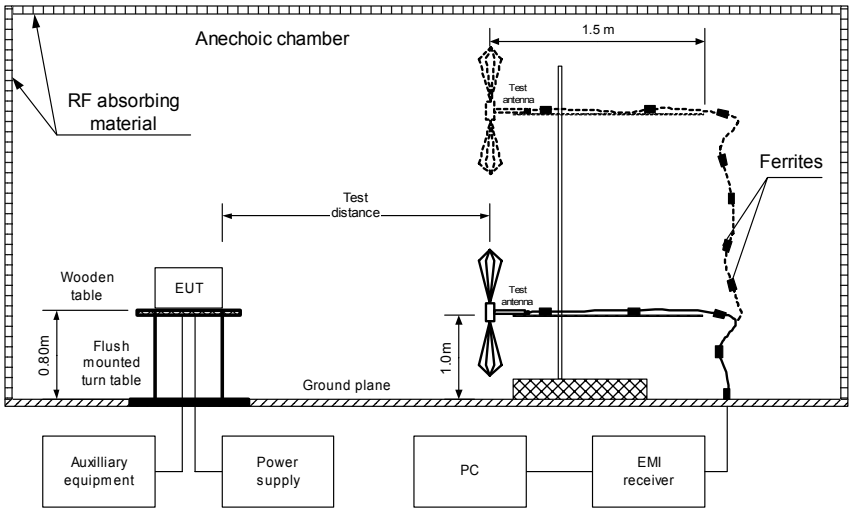
### 8.1.2 Test procedure for measurements in semi-anechoic chamber

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

**8.1.2.2** The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated $360^0$, 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.

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

**Figure 8.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment**



| **Test specification:** | **Section 15.109, Radiated emission** | | |
|---|---|---|---|
| **Test procedure:** | ANSI C63.4, Sections 11.6 and 12.1.4 | | |
| **Test mode:** | Compliance | **Verdict:** | PASS |
| **Date & Time:** | 2/20/2007 10:52:15 AM | | |
| **Temperature:** 21ºC | **Air Pressure:** 1008 hPa | **Relative Humidity:** 45% | **Power Supply:** 3.6 V DC |
| **Remarks:** | | | |

**Table 8.1.2 Radiated emission test results**

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Stand-by
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) | Quasi-peak | | | Antenna polarization | Antenna height, m | Turn-table position**, degrees | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | Measured emission, dB(µV/m) | Limit, dB(µV/m) | Margin, dB* | | | | |
| No spurious were found | | | | | | | | Pass |

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 -5000MHz
RESOLUTION BANDWIDTH: 1000 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* | | | | |
| No spurious were found | | | | | | | | Pass |

*****- Margin = Measured emission - specification limit.
******- EUT front panel refer to 0 degrees position of turntable.

**Reference numbers of test equipment used**

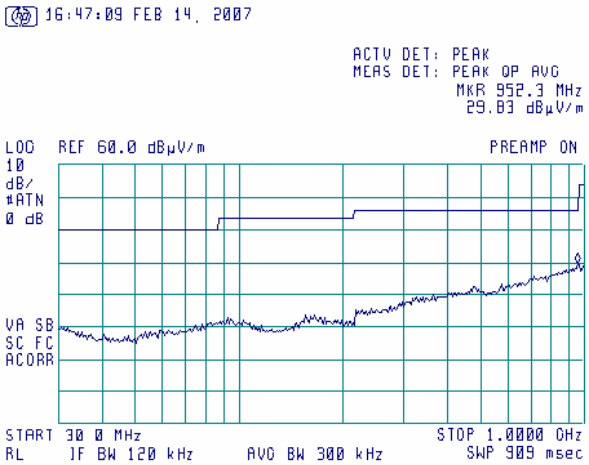
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HL 0465 | HL 0521 | HL 0589 | HL 0604 | HL 1947 | HL 2009 | HL 2432 | |

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: | 2/20/2007 10:52:15 AM | | |
| Temperature: 21ºC | Air Pressure: 1008 hPa | Relative Humidity: 45% | Power Supply: 3.6 V DC |
| Remarks: | | | |

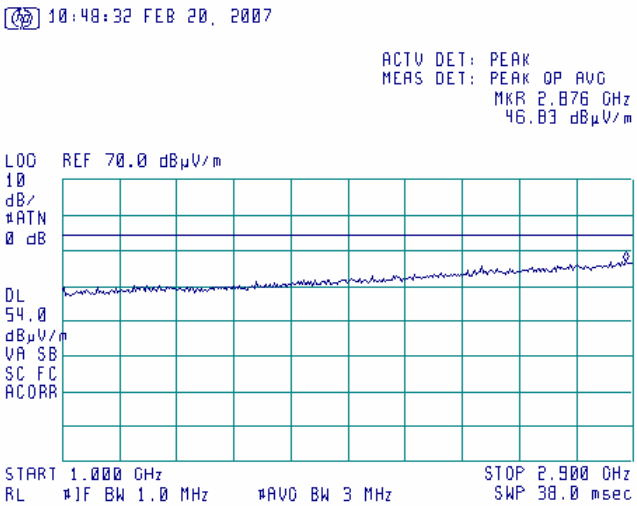
**Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical & horizontal antenna polarization**

| | |
|---|---|
| TEST SITE: | Semi anechoic chamber |
| LIMIT: | Class B |
| TEST DISTANCE: | 3 m |
| EUT OPERATING MODE: | Stand-by |




**Plot 8.1.2 Radiated emission measurements in 1000 – 2900 MHz range, vertical & horizontal antenna polarization**

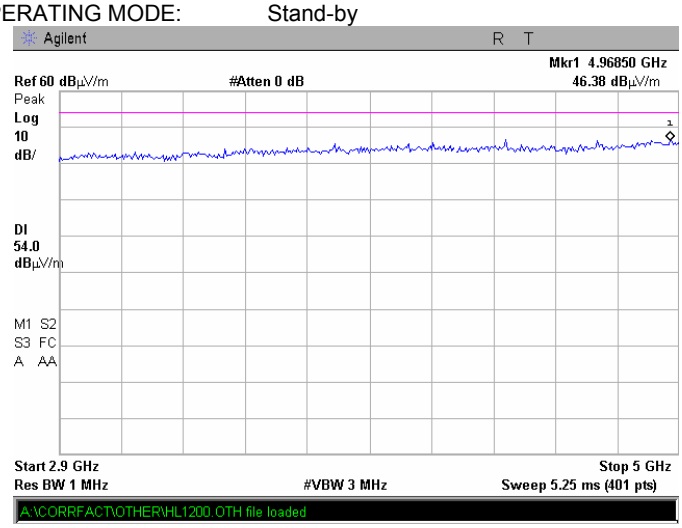
| | |
|---|---|
| TEST SITE: | Semi anechoic chamber |
| LIMIT: | Class B |
| TEST DISTANCE: | 3 m |
| EUT OPERATING MODE: | Stand-by |



| **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:** | 2/20/2007 10:52:15 AM | | |
| **Temperature:** 21ºC | **Air Pressure:** 1008 hPa | **Relative Humidity:** 45% | **Power Supply:** 3.6 V DC |
| **Remarks:** | | | |

**Plot 8.1.3 Radiated emission measurements in 2900 – 5000 MHz range, vertical & horizontal antenna polarization**

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Stand-by



# 9 APPENDIX A Test equipment and ancillaries used for tests

| HL No | Description | Manufacturer | Model | Ser. No. | Last Cal. | Due Cal. |
|---|---|---|---|---|---|---|
| 0287 | Turntable, Motorized Diameter, 2 m (OATS) | HL | TMD-2 | 042 | 11-Nov-06 | 11-Nov-07 |
| 0446 | Antenna, Loop, Active, 10 kHz - 30 MHz | EMCO | 6502 | 2857 | 28-Jun-06 | 28-Jun-07 |
| 0465 | Anechoic Chamber 9(L) x 6.5(W) x 5.5(H) m | HL | AC - 1 | 023 | 23-Aug-05 | 23-Aug-08 |
| 0521 | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz | Hewlett Packard | 8546A | 3617A 00319, 3448A002 53 | 26-Sep-06 | 26-Sep-07 |
| 0569 | Antenna, Log Periodic, 200 - 1000 MHz | Electro-Metrics | LPA 25/30 | 1953 | 10-Jan-07 | 10-Jan-08 |
| 0589 | Cable Coaxial, GORE A2P01POL118, 2.3 m | HL | GORE-3 | 176 | 02-Dec-06 | 02-Dec-07 |
| 0593 | Antenna Mast, 1-4 m Pneumatic | Madgesh | AM-F1 | 101 | 02-Feb-07 | 02-Feb-08 |
| 0594 | Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic | HL | TT-WDC1 | 102 | 26-Jan-07 | 26-Jan-08 |
| 0604 | Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz | EMCO | 3141 | 9611-1011 | 10-Jan-07 | 10-Jan-08 |
| 0784 | Antenna X-WING BILOG, 20 MHz - 2 GHz | Schaffner-Chase EMC | CBL6140 A | 1120 | 10-Jan-07 | 10-Jan-08 |
| 0813 | Cable Coax, RG-214, 12 m, N-type connectors | HL | C214-12 | 149 | 02-Dec-06 | 02-Dec-07 |
| 1424 | Spectrum Analyzer, 30 Hz- 40 GHz | Agilent Technologies | 8564EC | 3946A002 19 | 30-Aug-06 | 30-Aug-07 |
| 1430 | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432 | Agilent Technologies | 8542E | 3807A002 62,3705A0 0217 | 01-Sep-06 | 01-Sep-07 |
| 1552 | Cable RF, 8 m | Alpha Wire | RG-214 | 1552 | 02-Dec-06 | 02-Dec-07 |
| 1650 | Attenuators Set (2, 3, 5, 20 dB), DC-18 GHz | M/A-COM | 2082 | 1650 | 03-Jan-07 | 03-Jan-08 |
| 1848 | Antenna mast 4m/6m with polarity control | Sh. I. Machines | AM-5 | 1 | 02-Feb-07 | 02-Feb-08 |
| 1947 | Cable 18GHz, 6.5 m, blue | Rhophase Microwave Limited | NPS-1803A-6500-NPS | T4974 | 17-Oct-06 | 17-Oct-07 |
| 1984 | Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W | EMC Test Systems | 3115 | 9911-5964 | 03-Mar-07 | 03-Mar-08 |
| 2009 | Cable RF, 8 m | Alpha Wire | RG-214 | C-56 | 20-May-07 | 20-May-08 |
| 2254 | Cable 40GHz, 0.8 m, blue | Rhophase Microwave Limited | KPS-1503A-800-KPS | W4907 | 20-Jun-06 | 20-Jun-07 |
| 2432 | Antenna, Double-Ridged Waveguide Horn 1-18 GHz | EMC Test Systems | 3115 | 00027177 | 03-Mar-07 | 03-Mar-08 |
| 2780 | EMC analyzer, 100 Hz to 26.5 GHz | Agilent Technologies | E7405A | MY451024 6 | 11-Jun-06 | 11-Jun-07 |

# 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<br>12.4 GHz to 40 GHz: ± 2.3 dB |
| Conducted emissions at RF antenna connector | 9 kHz to 2.9 GHz: ± 2.6 dB<br>2.9 GHz to 6.46 GHz: ± 3.5 dB<br>6.46 GHz to 13.2 GHz: ± 4.3 dB<br>13.2 GHz to 22.0 GHz: ± 5.0 dB<br>22.0 GHz to 26.8 GHz: ± 5.5 dB<br>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<br>150 kHz to 30 MHz: ± 3.8 dB |
| Radiated emissions at 3 m measuring distance<br>Horizontal polarization<br><br><br>Vertical polarization | <br>Biconilog antenna: ± 5.3 dB<br>Biconical antenna: ± 5.0 dB<br>Log periodic antenna: ± 5.3 dB<br>Double ridged horn antenna: ± 5.3 dB<br>Biconilog antenna: ± 6.0 dB<br>Biconical antenna: ± 5.7 dB<br>Log periodic antenna: ± 6.0 dB<br>Double ridged horn antenna: ± 6.0 dB |

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

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

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

# 11 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility. Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47) and by Industry Canada for electromagnetic emissions (file numbers IC 2186-1 for OATS and IC 2186-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), assessed by TNO Certification EP&S (Netherlands) for a number of EMC, telecommunications, environmental, safety standards, and by AMTAC (UK) for safety of medical devices. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01) and approved by Israel Ministry of environmental protection, radiation hazards department (Permit number 1158).

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Person for contact: Mr. Alex Usoskin, CEO.

# 12 APPENDIX D Specification references

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

# 13 APPENDIX E Test equipment correction factors

**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(μV) to convert it into field intensity in dB(μV/m).

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

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

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

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

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

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

**Antenna factor**
**Biconilog antenna**
**CHASE Model CBL6140A**
**Serial no: 1120, HL 0784**

| Frequency, MHz | Antenna factor, dB |
|---|---|
| 30.0 | 4.3 |
| 35.0 | 7.3 |
| 40.0 | 8.8 |
| 45.0 | 9.3 |
| 50.0 | 9.6 |
| 60.0 | 9.9 |
| 70.0 | 9.2 |
| 80.0 | 7.6 |
| 90.0 | 7.6 |
| 100.0 | 8.8 |
| 120.0 | 7.2 |
| 125.0 | 7.5 |
| 140.0 | 7.7 |
| 150.0 | 7.9 |
| 160.0 | 11.4 |
| 175.0 | 8.6 |
| 180.0 | 8.8 |
| 200.0 | 9.8 |
| 250.0 | 12.5 |
| 300.0 | 12.2 |
| 350.0 | 14.8 |
| 400.0 | 16.1 |
| 450.0 | 16.5 |
| 500.0 | 17.6 |
| 550.0 | 18.3 |
| 600.0 | 18.5 |
| 650.0 | 19.8 |
| 700.0 | 20.1 |
| 750.0 | 20.8 |
| 800.0 | 21.2 |
| 850.0 | 22.0 |
| 900.0 | 22.2 |
| 950.0 | 23.2 |
| 1000.0 | 23.8 |

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

**Antenna factor**
**Double-ridged guide horn antenna**
**Model 3115, serial number: 00027177, HL 2432**

| Frequency, MHz | Antenna factor. dB(1/m) |
|---|---|
| 1000.0 | 24.7 |
| 1500.0 | 25.7 |
| 2000.0 | 27.8 |
| 2500.0 | 28.9 |
| 3000.0 | 30.7 |
| 3500.0 | 31.8 |
| 4000.0 | 33.0 |
| 4500.0 | 32.8 |
| 5000.0 | 34.2 |
| 5500.0 | 34.9 |
| 6000.0 | 35.2 |
| 6500.0 | 35.4 |
| 7000.0 | 36.3 |
| 7500.0 | 37.3 |
| 8000.0 | 37.5 |
| 8500.0 | 38.0 |
| 9000.0 | 38.3 |
| 9500.0 | 38.3 |
| 10000.0 | 38.7 |
| 10500.0 | 38.7 |
| 11000.0 | 38.9 |
| 11500.0 | 39.5 |
| 12000.0 | 39.5 |
| 12500.0 | 39.4 |
| 13000.0 | 40.5 |
| 13500.0 | 40.8 |
| 14000.0 | 41.5 |
| 14500.0 | 41.3 |
| 15000.0 | 40.2 |
| 15500.0 | 38.7 |
| 16000.0 | 38.5 |
| 16500.0 | 39.8 |
| 17000.0 | 41.9 |
| 17500.0 | 45.8 |
| 18000.0 | 49.1 |

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

**Cable loss**
**Cable RG-214, HL 0813**

| No. | Frequency, MHz | Cable loss, dB |
|---|---|---|
| 1 | 10 | 0.15 |
| 2 | 20 | 0.40 |
| 3 | 30 | 0.51 |
| 4 | 40 | 0.61 |
| 5 | 50 | 0.68 |
| 6 | 60 | 0.76 |
| 7 | 70 | 0.80 |
| 8 | 80 | 0.92 |
| 9 | 90 | 0.96 |
| 10 | 100 | 0.99 |
| 11 | 200 | 1.60 |
| 12 | 300 | 1.85 |
| 13 | 400 | 2.25 |
| 14 | 500 | 2.43 |
| 15 | 600 | 2.80 |
| 16 | 700 | 3.14 |
| 17 | 800 | 3.34 |
| 18 | 900 | 3.75 |
| 19 | 1000 | 4.05 |
| 20 | 1200 | 4.41 |
| 21 | 1400 | 4.81 |
| 22 | 1600 | 5.18 |
| 23 | 1800 | 5.58 |
| 24 | 2000 | 6.09 |
| 25 | 2500 | 7.27 |
| 26 | 2900 | 8.01 |

**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 | | |
| 18 | 3300 | 3.47 | | |
| 19 | 3600 | 3.62 | | |
| 20 | 3900 | 3.84 | | |
| 21 | 4200 | 3.92 | | ±0.17 |
| 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**
**RF cable 8 m, model RG-214, HL 1552**

| No. | Frequency, MHz | Cable loss, dB | Measurement uncertainty, dB | Notes |
|---|---|---|---|---|
| 1 | 0.010 | 0.01 | ±0.05 | |
| 2 | 0.1 | 0.01 | | |
| 3 | 1 | 0.03 | | |
| 4 | 10 | 0.12 | | |
| 5 | 20 | 0.23 | | |
| 6 | 30 | 0.30 | | |
| 7 | 40 | 0.32 | | |
| 8 | 50 | 0.34 | | |
| 9 | 60 | 0.39 | | |
| 10 | 70 | 0.43 | | |
| 11 | 80 | 0.48 | | |
| 12 | 90 | 0.50 | | |
| 13 | 100 | 0.55 | | |
| 14 | 200 | 0.78 | | |
| 15 | 300 | 1.04 | | |
| 16 | 400 | 1.16 | | |
| 17 | 500 | 1.33 | | |
| 18 | 600 | 1.51 | | |
| 19 | 700 | 1.65 | | |
| 20 | 800 | 1.77 | | |
| 21 | 900 | 1.92 | | |
| 22 | 1000 | 2.04 | | |
| 23 | 1200 | 2.26 | | |
| 24 | 1400 | 2.49 | | |
| 25 | 1600 | 2.74 | | |
| 26 | 1800 | 2.94 | | |
| 27 | 2000 | 3.18 | | |
| 28 | 2500 | 3.65 | | |
| 29 | 2900 | 4.08 | | |

**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 | | |

# 14 APPENDIX F Abbreviations and acronyms

| | |
|---|---|
| A | ampere |
| AC | alternating current |
| AM | amplitude modulation |
| AVRG | average (detector) |
| bps | bit per second |
| cm | centimeter |
| dB | decibel |
| dBm | decibel referred to one milliwatt |
| dB(μV) | decibel referred to one microvolt |
| dB(μV/m) | decibel referred to one microvolt per meter |
| dB(μA) | decibel referred to one microampere |
| DC | direct current |
| EMC | electromagnetic compatibility |
| EUT | equipment under test |
| GHz | gigahertz |
| GND | ground |
| H | height |
| HL | Hermon laboratories |
| Hz | hertz |
| k | kilo |
| kbps | kilobit per second |
| kHz | kilohertz |
| L | length |
| m | meter |
| MHz | megahertz |
| min | minute |
| mm | millimeter |
| ms | millisecond |
| μs | microsecond |
| NA | not applicable |
| NB | narrow band |
| OATS | open area test site |
| Ω | Ohm |
| QP | quasi-peak |
| RE | radiated emission |
| RF | radio frequency |
| rms | root mean square |
| s | second |
| V | volt |
| W | width |