

## PARTIAL TEST REPORT

ACCORDING TO: FCC part 27: 2005

FCC part 15: 2005 subpart B

FOR:

**Vyyo Ltd.**

**Wireless modem**

**Model:V284+A**

This report is in conformity with ISO/ IEC 17025. The A2LA logo endorsement applies only to the test methods and the standards that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested.  
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## 1 Applicant information

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## 2 Equipment under test attributes

**Product name:** Wireless modem  
**Operating frequency range:** 776.1 – 776.9 MHz  
**Model:** V284+A  
**Serial number:** 1348527  
**Hardware version:** 602  
**Software release:** 1.2.10  
**Receipt date:** 2/27/2006

## 3 Manufacturer information

**Manufacturer name:** VYYO Ltd.  
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## 4 Test details

**Project ID:** 16694  
**Location:** Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel  
**Test started:** 2/27/2006  
**Test completed:** 3/8/2006  
**Test specifications:** FCC part 27:2005  
FCC part 15: 2005 subpart B

## 5 Tests summary

| Test                                                                | Status |
|---------------------------------------------------------------------|--------|
| <b>Transmitter characteristics</b>                                  |        |
| Section 27.50(b)(2), Peak output power at RF antenna connector      | Pass   |
| Section 2.1091, RF radiation exposure evaluation                    | Pass   |
| Section 27.53(d)(3), Spurious emissions RF antenna connector        | Pass   |
| Section 27.53(d)(3), Radiated spurious emissions                    | Pass   |
| Section 27.53(e), Radiated spurious emissions in 1559-1610 MHz band | Pass   |
| Section 27.54, Frequency stability                                  | Pass   |
| Section 2.1049, Occupied bandwidth                                  | Pass   |
| <b>Unintentional emissions</b>                                      |        |
| Section 15.107, Conducted emission at AC power port                 | Pass   |
| Section 15.109, Radiated emission                                   | Pass   |
| Section 15.111, Antenna power conducted measurements for receiver   | Pass   |

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

|                     | Name and Title                              | Date           | Signature                                                                             |
|---------------------|---------------------------------------------|----------------|---------------------------------------------------------------------------------------|
| <b>Tested by:</b>   | Mr. A. Adelberg, test engineer              | March 8, 2006  |  |
| <b>Reviewed by:</b> | Mrs. M. Cherniavsky, certification engineer | March 26, 2006 |  |
| <b>Approved by:</b> | Mr. M. Nikishin, EMC and Radio group leader | March 28, 2006 |  |

## 6 EUT description

### 6.1 General information

The EUT is a broadband wireless data modem used by cable and wireless operators to deliver telephony services (T1/E1) and high-speed data connections to business and residential subscribers. The EUT operates within 776.1 to 776.9 MHz band and is powered from AC mains through a power adaptor.

### 6.2 Ports and lines

| Port type | Port description | Connected     |               | Connector type | Qty. | Cable type  | Cable length | Indoor / outdoor |
|-----------|------------------|---------------|---------------|----------------|------|-------------|--------------|------------------|
|           |                  | From          | To            |                |      |             |              |                  |
| Power     | AC mains         | Power adaptor | AC mains      | IEC 60320      | 1    | Unshielded  | 1.5 m        | Indoor           |
| Power     | VDC              | EUT           | Power adaptor | DC jack        | 1    | Unshielded  | 1.5 m        | Indoor           |
| Signal    | Ethernet         | EUT           | Laptop        | RJ 45          | 1    | FTP Cat.5   | 1.5 m        | Indoor           |
| Signal    | Antenna          | EUT           | Attenuator    | F-type         | 1    | Coax 75 Ohm | 12.0 m       | Outdoor          |
| Power     | AC mains         | Power adaptor | AC mains      | IEC 60320      | 1    | Unshielded  | 1.5 m        | Indoor           |
| Power     | VDC              | Laptop        | Power adaptor | DC jack        | 1    | Unshielded  | 1.5 m        | Indoor           |
| Signal    | Mouse            | Laptop        | Mouse         | PS2            | 1    | Unshielded  | 2 m          | Indoor           |
| Signal    | Parallel         | Laptop        | Printer       | D type 25      | 1    | Shielded    | 2 m          | Indoor           |
| Signal    | RS232            | Laptop        | Open circuit  | D type 9       | 1    | Unshielded  | 1.5 m        | Indoor           |

### 6.3 Support and test equipment

| Description                       | Manufacturer | Model number  | Serial number |
|-----------------------------------|--------------|---------------|---------------|
| Wireless modem termination system | Vyvo         | V3000         | 5036408       |
| Up converter (256 QAM)            | Wavecom      | UC4040D       | 216450        |
| Down converter                    | Vyvo         | XTB VHF       | 1348529       |
| External laptop                   | IBM          | ThinkPad 600x | 5573MWV02/99  |
| Power adaptor for external laptop | IBM          | 02K6654       | 4062298       |
| Laptop                            | IBM          | 600E          | 5528WAP       |
| Mouse                             | Microsoft    | Mouse 2.1A    | 03306271      |
| Printer                           | Epson        | LX-810        | 44B1127035    |
| Power adaptor for EUT             | DVE          | DSA-0151A     | 3604          |
| Power adaptor for laptop          | IBM          | 02K6654       | 150HN9        |

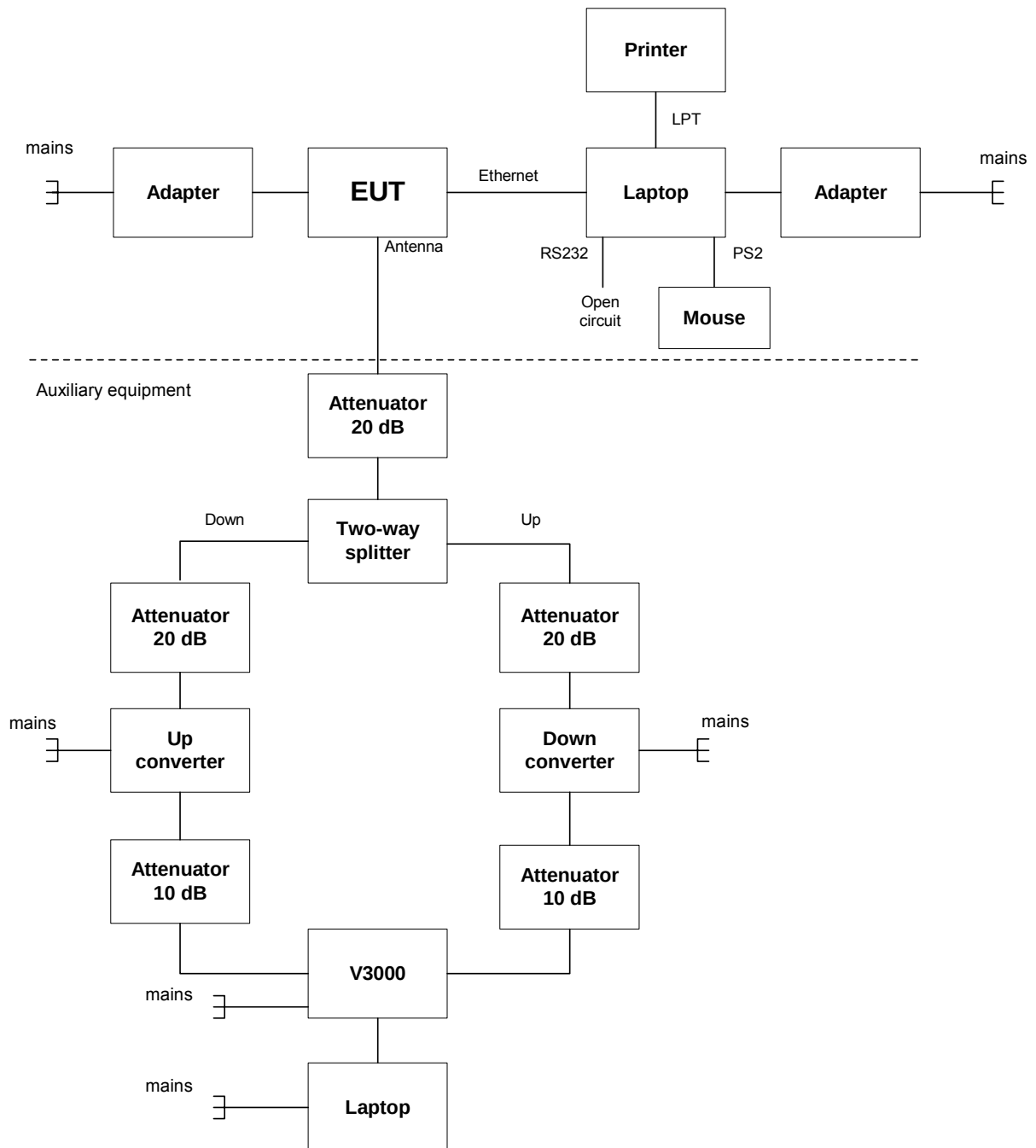
### 6.4 Operating frequencies

| Source      | Frequency, MHz |           |                    |
|-------------|----------------|-----------|--------------------|
| Receiver    | 702.0 (LO)     | 44.0 (IF) | 746.1 – 746.9 (Rx) |
| Transmitter | 10.0 (VCTXO)   | 44.0 (IF) | 776.1- 776.9 (Tx)  |

### 6.5 Changes made in the EUT

No changes were implemented.

## 6.6 Test configuration



## 6.7 Transmitter characteristics

|                                                         |                                                                                                          |                                                               |                          |                                |                                |           |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------|--------------------------------|--------------------------------|-----------|
| <b>Type of equipment</b>                                |                                                                                                          |                                                               |                          |                                |                                |           |
| X                                                       | Stand-alone (Equipment with or without its own control provisions)                                       |                                                               |                          |                                |                                |           |
|                                                         | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) |                                                               |                          |                                |                                |           |
|                                                         | Plug-in card (Equipment intended for a variety of host systems)                                          |                                                               |                          |                                |                                |           |
| <b>Intended use</b>                                     |                                                                                                          | <b>Condition of use</b>                                       |                          |                                |                                |           |
|                                                         | 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     |                          |                                |                                |           |
| <b>Assigned frequency range</b>                         |                                                                                                          | 776.0 – 777.0 MHz                                             |                          |                                |                                |           |
| <b>Operating frequency range</b>                        |                                                                                                          | 776.1 – 776.9 MHz                                             |                          |                                |                                |           |
| <b>Maximum rated output power</b>                       |                                                                                                          | At transmitter 50 Ω RF output connector                       |                          |                                |                                | 27.7 dBm  |
|                                                         |                                                                                                          | Effective radiated power (for equipment with no RF connector) |                          |                                |                                | NA        |
| <b>Is transmitter output power variable?</b>            |                                                                                                          | No                                                            |                          |                                |                                |           |
|                                                         |                                                                                                          | X                                                             | Yes                      | continuous variable            |                                |           |
|                                                         |                                                                                                          |                                                               |                          | X                              | stepped variable with stepsize | 0.25 dB   |
|                                                         |                                                                                                          |                                                               |                          | minimum RF power               |                                | -17.0 dBm |
|                                                         |                                                                                                          | maximum RF power                                              |                          | +27.6 dBm                      |                                |           |
| <b>Antenna connection</b>                               |                                                                                                          |                                                               |                          |                                |                                |           |
| unique coupling                                         | X                                                                                                        | standard F-type connector                                     | integral                 | with temporary RF connector    |                                |           |
|                                                         |                                                                                                          |                                                               |                          | without temporary RF connector |                                |           |
| <b>Antenna/s technical characteristics</b>              |                                                                                                          |                                                               |                          |                                |                                |           |
| Type                                                    | Manufacturer                                                                                             |                                                               | Model number             |                                | Gain                           |           |
| Yagi                                                    | Shenglu                                                                                                  |                                                               | TDJ-700B12G13.5          |                                | 13.5 dBi                       |           |
| <b>Transmitter 99% power bandwidth</b>                  |                                                                                                          | 200 / 325 / 400kHz                                            |                          |                                |                                |           |
| <b>Type of multiplexing</b>                             |                                                                                                          | TDMA                                                          |                          |                                |                                |           |
| <b>Modulating test signal (baseband)</b>                |                                                                                                          | PRBS                                                          |                          |                                |                                |           |
| <b>Maximum transmitter duty cycle in normal use</b>     |                                                                                                          | 50 %                                                          |                          |                                |                                |           |
| <b>Transmitter duty cycle supplied for test</b>         |                                                                                                          | 50 %                                                          |                          |                                |                                |           |
| <b>Transmitter power source</b>                         |                                                                                                          |                                                               |                          |                                |                                |           |
|                                                         | Battery                                                                                                  | Nominal rated voltage                                         | VDC                      | Battery type                   |                                |           |
|                                                         | DC                                                                                                       | Nominal rated voltage                                         | VDC                      |                                |                                |           |
| X                                                       | AC mains                                                                                                 | Nominal rated voltage                                         | 120 VAC                  | Frequency                      | 60 Hz                          |           |
| <b>Common power source for transmitter and receiver</b> |                                                                                                          |                                                               |                          | X                              | yes                            | no        |
| <b>Type of modulation</b>                               | <b>Modulation states (constellation)</b>                                                                 | <b>RF channel spacing</b>                                     | <b>Frequency channel</b> |                                |                                |           |
|                                                         |                                                                                                          |                                                               | <b>Low</b>               | <b>Mid</b>                     | <b>High</b>                    |           |
| QAM                                                     | 16                                                                                                       | 200 kHz                                                       | 776.1                    | 776.5                          | 776.9                          |           |
| QPSK                                                    | 4                                                                                                        | 200 kHz                                                       | 776.1                    | 776.5                          | 776.9                          |           |
| QAM                                                     | 16                                                                                                       | 325 kHz                                                       | 776.1625                 | 776.5                          | 776.8375                       |           |
| QPSK                                                    | 4                                                                                                        | 325 kHz                                                       | 776.1625                 | 776.5                          | 776.8375                       |           |
| QAM                                                     | 16                                                                                                       | 400 kHz                                                       | 776.2                    | 776.5                          | 776.8                          |           |
| QPSK                                                    | 4                                                                                                        | 400 kHz                                                       | 776.2                    | 776.5                          | 776.8                          |           |

|                            |                                                                       |                                |                              |
|----------------------------|-----------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.50(b)(2), Peak output power at RF antenna connector</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-A, Section 2.2.1                  |                                |                              |
| <b>Test mode:</b>          | Compliance                                                            | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 2/28/2006                                                             |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1006 hPa                                         | <b>Relative Humidity:</b> 44 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                       |                                |                              |

## 7 Transmitter characteristics

### 7.1 Peak output power test

#### 7.1.1 General

This test was performed to measure the peak output power at RF antenna connector. Specification test limits are given in Table 7.1.1. The test results are provided in Table 7.1.2 and the associated plots.

**Table 7.1.1 Peak output power limits**

| Assigned frequency range, MHz | Maximum peak output power* |       |
|-------------------------------|----------------------------|-------|
|                               | dBm                        | W     |
| 776.0 – 777.0                 | 33.45                      | 2.213 |

\* The peak output power limit was calculated by subtracting of antenna gain in dBd from maximum allowed ERP 44.8 dBm (30 W):

$$44.8 \text{ dBm} - (13.5 \text{ dBi} - 2.15 \text{ dB}) = 33.45 \text{ dBm}$$

#### 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 adjusted to produce maximum available to the end user RF output power.

**7.1.2.3** The peak output power was measured with thermocouple power meter to obtain RMS values as provided in Table 7.1.2.

**Figure 7.1.1 Peak output power test setup**





|                            |                                                                       |                                |                              |
|----------------------------|-----------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.50(b)(2), Peak output power at RF antenna connector</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-A, Section 2.2.1                  |                                |                              |
| <b>Test mode:</b>          | Compliance                                                            | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 2/28/2006                                                             |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1006 hPa                                         | <b>Relative Humidity:</b> 44 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                       |                                |                              |

Table 7.1.2 Peak output power test results

ASSIGNED FREQUENCY RANGE: 776.0 – 777.0 MHz  
DETECTOR USED: RMS  
MODULATING SIGNAL: PRBS  
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Carrier frequency, MHz                       | Power meter reading, dBm | Antenna gain, dBi | Cable loss, dB | RF output power, dBm | Limit, dBm | Margin, dB | Verdict |
|----------------------------------------------|--------------------------|-------------------|----------------|----------------------|------------|------------|---------|
| Modulation: 16QAM, 200 kHz Channel bandwidth |                          |                   |                |                      |            |            |         |
| 776.1000                                     | -2.43                    | 0.00              | 29.60          | 27.17                | 33.45      | -6.28      | Pass    |
| 776.5000                                     | -2.56                    | 0.00              | 29.60          | 27.04                | 33.45      | -6.41      | Pass    |
| 776.9000                                     | -2.52                    | 0.00              | 29.60          | 27.08                | 33.45      | -6.37      | Pass    |
| Modulation: QPSK, 200 kHz Channel bandwidth  |                          |                   |                |                      |            |            |         |
| 776.1000                                     | -2.05                    | 0.00              | 29.60          | 27.55                | 33.45      | -5.90      | Pass    |
| 776.5000                                     | -1.98                    | 0.00              | 29.60          | 27.62                | 33.45      | -5.83      | Pass    |
| 776.9000                                     | -2.05                    | 0.00              | 29.60          | 27.55                | 33.45      | -5.90      | Pass    |
| Modulation: 16QAM, 325 kHz Channel bandwidth |                          |                   |                |                      |            |            |         |
| 776.1625                                     | -2.41                    | 0.00              | 29.60          | 27.19                | 33.45      | -6.26      | Pass    |
| 776.5000                                     | -2.40                    | 0.00              | 29.60          | 27.20                | 33.45      | -6.25      | Pass    |
| 776.8375                                     | -2.41                    | 0.00              | 29.60          | 27.19                | 33.45      | -6.26      | Pass    |
| Modulation: QPSK, 325 kHz Channel bandwidth  |                          |                   |                |                      |            |            |         |
| 776.1625                                     | -1.93                    | 0.00              | 29.60          | 27.67                | 33.45      | -5.78      | Pass    |
| 776.5000                                     | -1.94                    | 0.00              | 29.60          | 27.66                | 33.45      | -5.79      | Pass    |
| 776.8375                                     | -1.94                    | 0.00              | 29.60          | 27.66                | 33.45      | -5.79      | Pass    |
| Modulation: 16QAM, 400 kHz Channel bandwidth |                          |                   |                |                      |            |            |         |
| 776.2000                                     | -2.37                    | 0.00              | 29.60          | 27.23                | 33.45      | -6.22      | Pass    |
| 776.5000                                     | -2.38                    | 0.00              | 29.60          | 27.22                | 33.45      | -6.23      | Pass    |
| 776.8000                                     | -2.38                    | 0.00              | 29.60          | 27.22                | 33.45      | -6.23      | Pass    |
| Modulation: QPSK, 400 kHz Channel bandwidth  |                          |                   |                |                      |            |            |         |
| 776.2000                                     | -1.92                    | 0.00              | 29.60          | 27.68                | 33.45      | -5.77      | Pass    |
| 776.5000                                     | -1.91                    | 0.00              | 29.60          | 27.69                | 33.45      | -5.76      | Pass    |
| 776.8000                                     | -1.93                    | 0.00              | 29.60          | 27.67                | 33.45      | -5.78      | Pass    |

## Reference numbers of test equipment used

|         |         |         |  |  |  |  |  |
|---------|---------|---------|--|--|--|--|--|
| HL 0190 | HL 1097 | HL 1523 |  |  |  |  |  |
|---------|---------|---------|--|--|--|--|--|

Full description is given in Appendix A.

|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 2.1091, RF radiation exposure evaluation</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 1.1307(b)                               |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                           | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

## 7.2 RF exposure

### 7.2.1 General

This test was performed to determine the minimum safe distance between the transmitter antenna and human to avoid public exposure in excess of limits for general population (uncontrolled exposure). Specification test limits are given in Table 7.2.1.

Table 7.2.1 RF exposure limits

| Frequency range, MHz | Power density*     |                  | Electric field strength**, V/m |
|----------------------|--------------------|------------------|--------------------------------|
|                      | mW/cm <sup>2</sup> | W/m <sup>2</sup> |                                |
| 776.1                | 0.52               | 5.2              | 44.2                           |
| 776.9                | 0.52               | 5.2              | 44.2                           |

\* - Power density limit within 300 - 1500 MHz was calculated according to the following equation:  $S = F / 1500$ , where S is power density in mW/cm<sup>2</sup> and F is frequency in MHz

\*\* - Electric field strength limit was calculated from power density as follows:  $E = \sqrt{S \times 120 \times \pi}$ , where E is electric field strength in V/m and S is power density in W/m<sup>2</sup>

### 7.2.2 Test procedure

7.2.2.1 The EUT, connected to the antenna providing the maximum directional gain, was set up as shown in .

7.2.2.2 The E-field probe was pointed to the EUT antenna zero azimuth at a 3 m distance, the maximum field strength reading was recorded in Table 7.2.2.

7.2.2.3 The E-field probe was slowly moved toward the EUT until E-field equivalent to the maximum permitted power density was measured.

7.2.2.4 The obtained antenna to probe distance was recorded in Table 7.2.2 as a minimum separation distance.

7.2.2.5 The test was repeated at the rest of test distances according to Table 7.2.2.

Table 7.2.2 Maximum permissible exposure (MPE) measurement

| Test distance, m | Field strength, V/m | Equivalent power density, mW/cm <sup>2</sup> | Limit, mW/cm <sup>2</sup> | Margin, mW/cm <sup>2</sup> | Verdict |
|------------------|---------------------|----------------------------------------------|---------------------------|----------------------------|---------|
| 3.0              | 2.62                | 0.001821                                     | 0.52                      | -0.518179                  | Pass    |
| 2.5              | 2.91                | 0.002246                                     | 0.52                      | -0.517754                  | Pass    |
| 2.0              | 3.20                | 0.002716                                     | 0.52                      | -0.517284                  | Pass    |
| 1.5              | 2.35                | 0.001465                                     | 0.52                      | -0.518535                  | Pass    |
| 1.0              | 3.17                | 0.002666                                     | 0.52                      | -0.517334                  | Pass    |
| 0.5              | 3.50                | 0.003249                                     | 0.52                      | -0.516751                  | Pass    |
| 0.3              | 4.50                | 0.005371                                     | 0.52                      | -0.514629                  | Pass    |
| 0.2              | 4.34                | 0.004996                                     | 0.52                      | -0.515004                  | Pass    |
| 0.1              | 6.20                | 0.010197                                     | 0.52                      | -0.509803                  | Pass    |
| 0.05             | 7.81                | 0.016180                                     | 0.52                      | -0.503820                  | Pass    |

\* - Equivalent power density was calculated from electric field strength as follows:  $S = 0.1 \times E^2 / (120 \times \pi)$ , where E is electric field strength in V/m and S is power density in mW/cm<sup>2</sup>

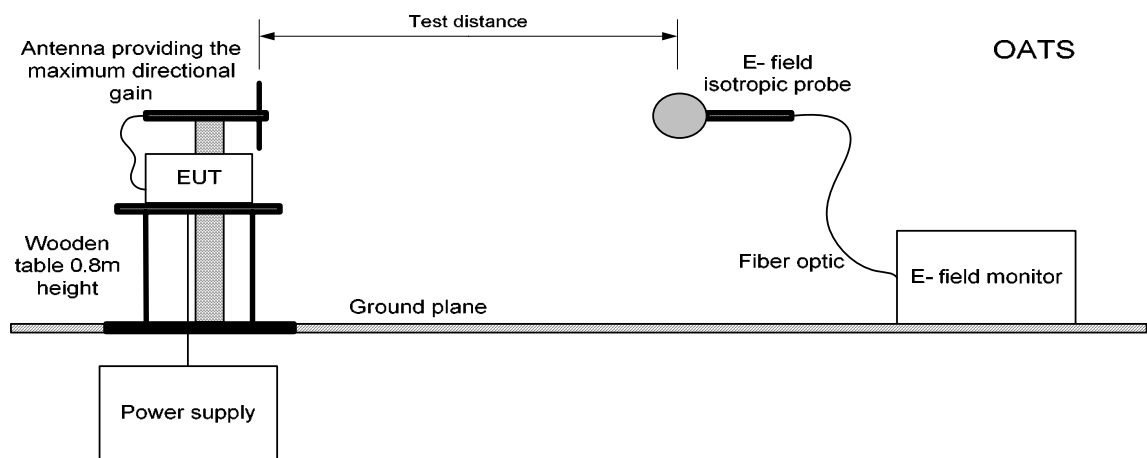
### Reference numbers of test equipment used

|         |         |  |  |  |  |  |  |
|---------|---------|--|--|--|--|--|--|
| HL 0613 | HL 1629 |  |  |  |  |  |  |
|---------|---------|--|--|--|--|--|--|

Full description is given in Appendix A.

|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 2.1091, RF radiation exposure evaluation</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 1.1307(b)                               |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                           | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

Figure 7.2.1 Maximum permissible exposure (MPE) measurement setup



|                            |                                                                        |                                |                              |
|----------------------------|------------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Spurious emissions at RF antenna connector</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13         |                                |                              |
| <b>Test mode:</b>          | Compliance                                                             | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                                              |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                                          | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                        |                                |                              |

## 7.3 Spurious emissions at RF antenna connector test

### 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. The test results are provided in Table 7.3.2 and associated plots.

**Table 7.3.1 Spurious emission limits**

| Frequency, MHz*                   | Attenuation below carrier, dBc | Spurious emissions, dBm |
|-----------------------------------|--------------------------------|-------------------------|
| 0.009 – 10 <sup>th</sup> harmonic | 43+10logP*                     | -13                     |

\* - P is transmitter output power in Watts.

### 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 for end user RF output power.

**7.3.2.3** The spurious emission was measured with spectrum analyzer as provided in Table 7.3.2 and associated plots.

**Figure 7.3.1 Spurious emission test setup**



|                            |                                                                        |                                |                              |
|----------------------------|------------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Spurious emissions at RF antenna connector</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13         |                                |                              |
| <b>Test mode:</b>          | Compliance                                                             | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                                              |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                                          | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                        |                                |                              |

**Table 7.3.2 Spurious emission test results**

ASSIGNED FREQUENCY RANGE: 776.0 – 777.0 MHz  
 RF CHANNEL SPACING: 200 kHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 – 8000 MHz  
 DETECTOR USED: Peak  
 VIDEO BANDWIDTH: ≥ Resolution bandwidth  
 MODULATION: 16QAM and QPSK  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Frequency, MHz                                  | Bit rate, Mbps | RBW, kHz | Spurious emission, dBm | Limit, dBm | Margin, dB* | Verdict |
|-------------------------------------------------|----------------|----------|------------------------|------------|-------------|---------|
| <b>Low channel</b>                              |                |          |                        |            |             |         |
| All emissions found more than 20 dB below limit |                |          |                        |            |             | Pass    |
| <b>Mid channel</b>                              |                |          |                        |            |             |         |
| All emissions found more than 20 dB below limit |                |          |                        |            |             | Pass    |
| <b>High channel</b>                             |                |          |                        |            |             |         |
| All emissions found more than 20 dB below limit |                |          |                        |            |             | Pass    |

\*- Margin = Spurious emission – specification limit.

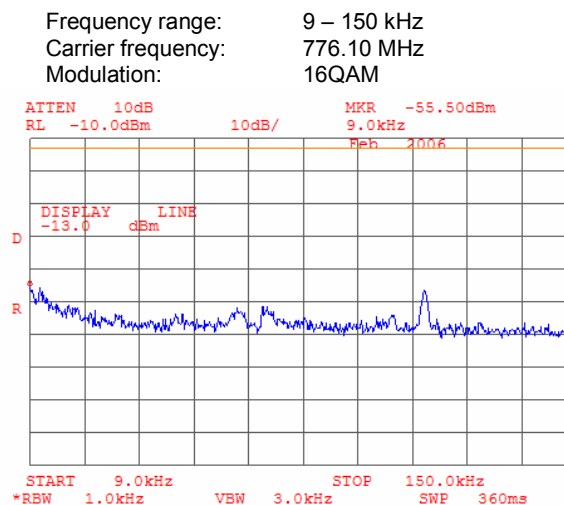
**Reference numbers of test equipment used**

|         |         |         |         |         |         |  |  |
|---------|---------|---------|---------|---------|---------|--|--|
| HL 1097 | HL 1424 | HL 1455 | HL 1488 | HL 1653 | HL 1942 |  |  |
|---------|---------|---------|---------|---------|---------|--|--|

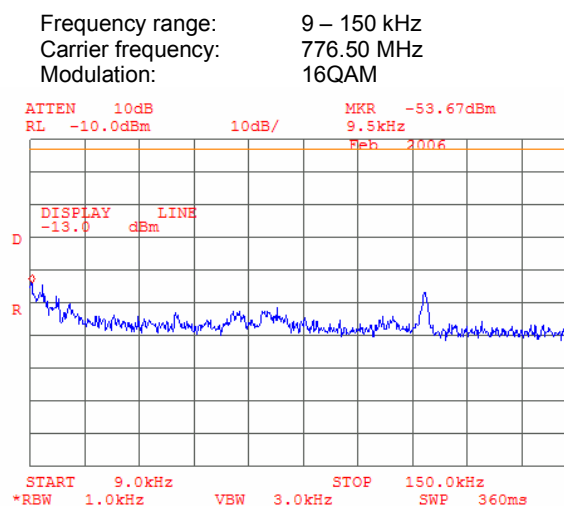
Full description is given in Appendix A.

|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.1 Spurious emission measurements at RF antenna connector, low channel

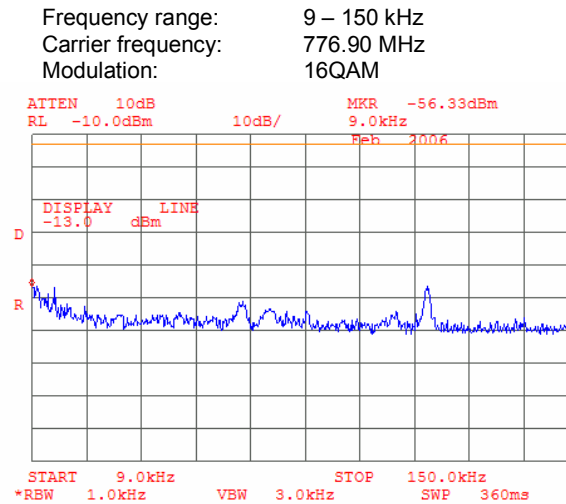


Plot 7.3.2 Spurious emission measurements at RF antenna connector, mid channel

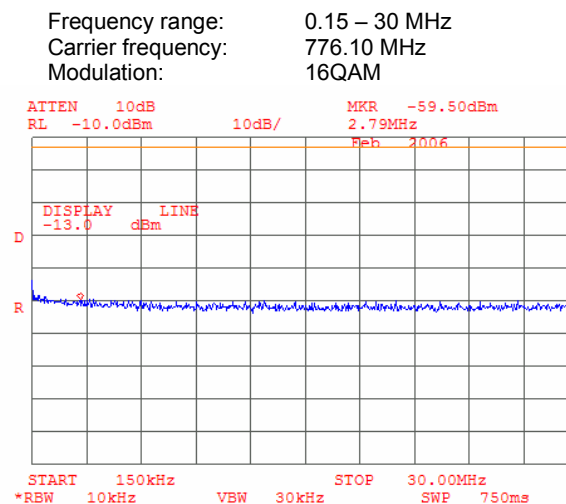


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.3 Spurious emission measurements at RF antenna connector, high channel

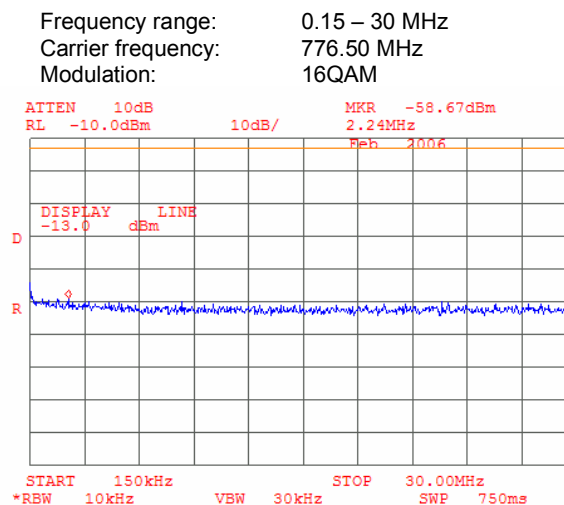


Plot 7.3.4 Spurious emission measurements at RF antenna connector, low channel

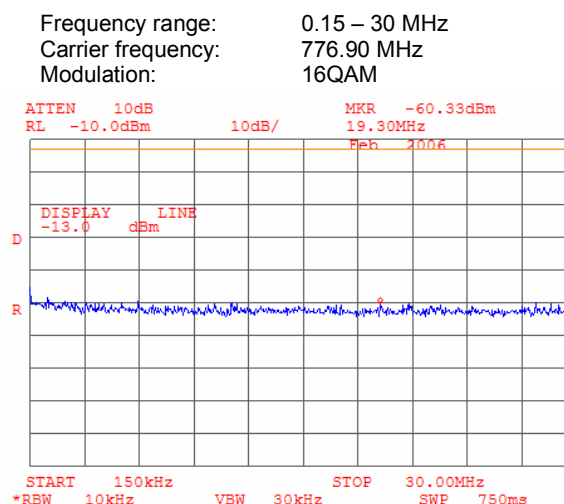


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.5 Spurious emission measurements at RF antenna connector, mid channel



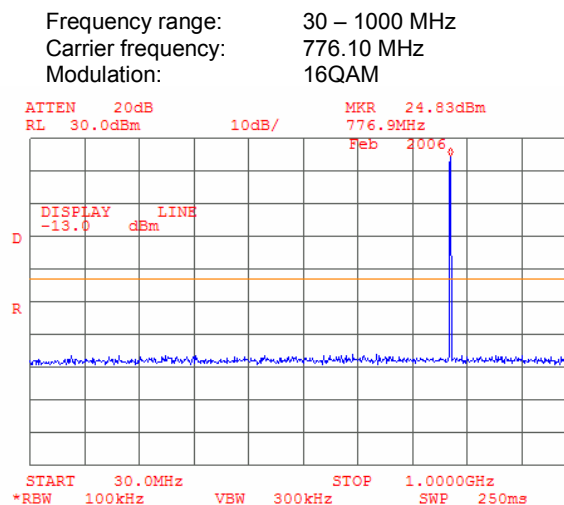
Plot 7.3.6 Spurious emission measurements at RF antenna connector, high channel



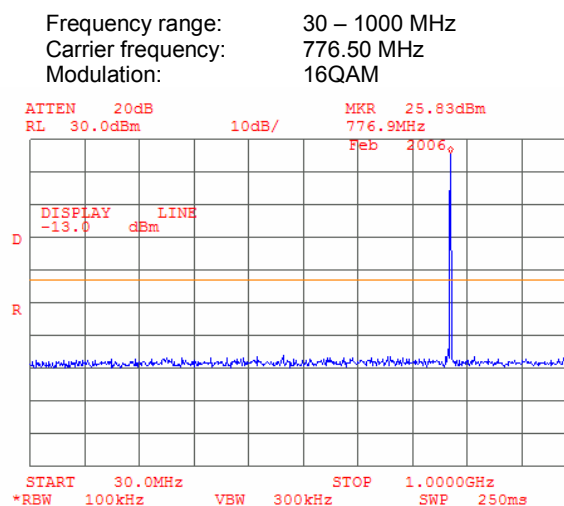


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.7 Spurious emission measurements at RF antenna connector, low channel

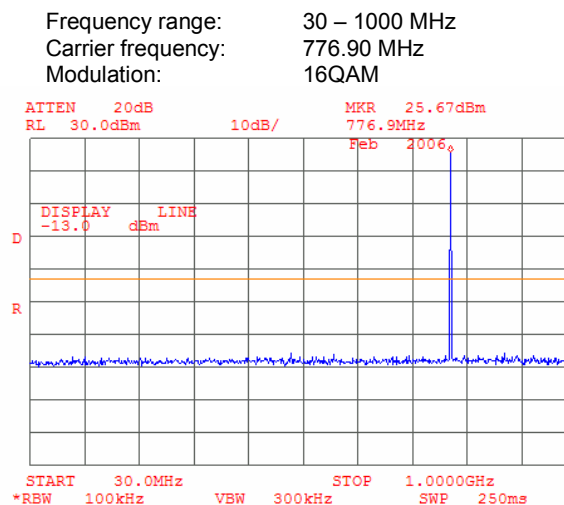


Plot 7.3.8 Spurious emission measurements at RF antenna connector, mid channel

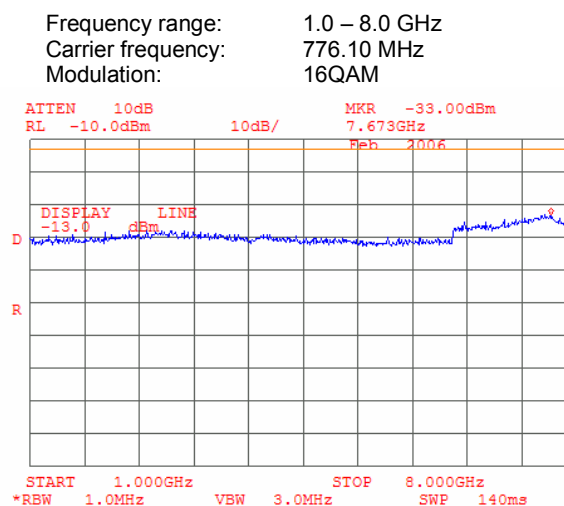


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.9 Spurious emission measurements at RF antenna connector, high channel

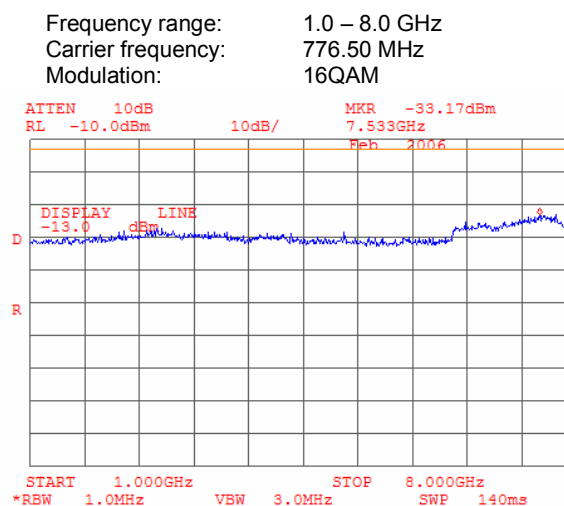


Plot 7.3.10 Spurious emission measurements at RF antenna connector, low channel

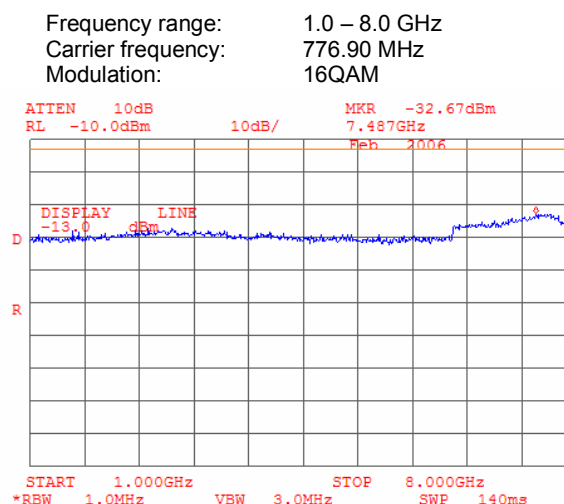


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.11 Spurious emission measurements at RF antenna connector, mid channel

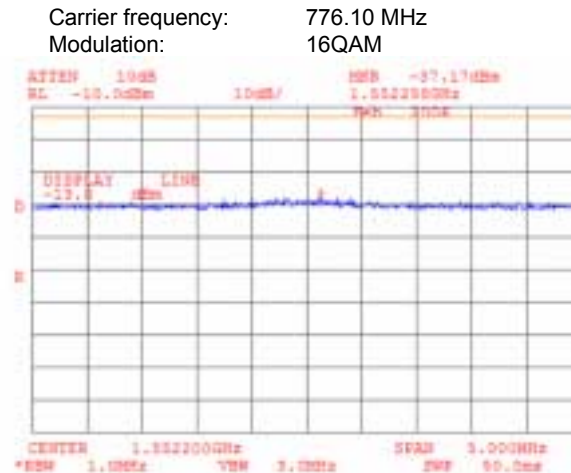


Plot 7.3.12 Spurious emission measurements at RF antenna connector, high channel

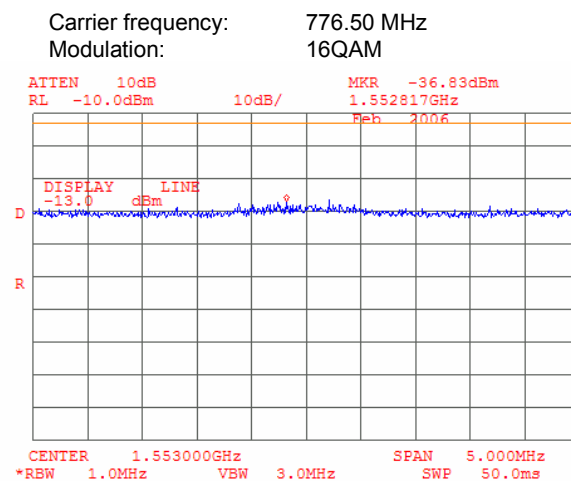


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.13 Spurious emission measurements at RF antenna connector, the 2<sup>nd</sup> harmonic of the low channel

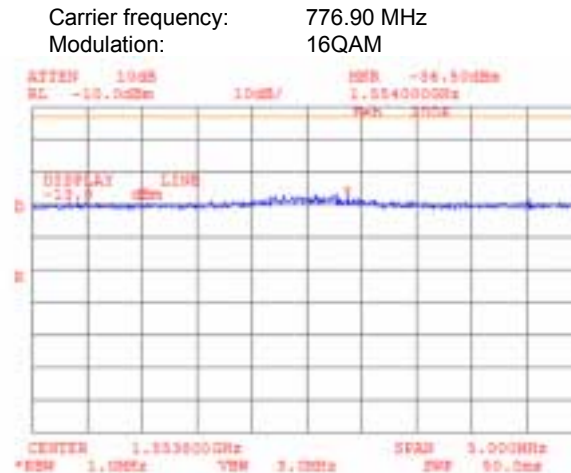


Plot 7.3.14 Spurious emission measurements at RF antenna connector, the 2<sup>nd</sup> harmonic of the mid channel

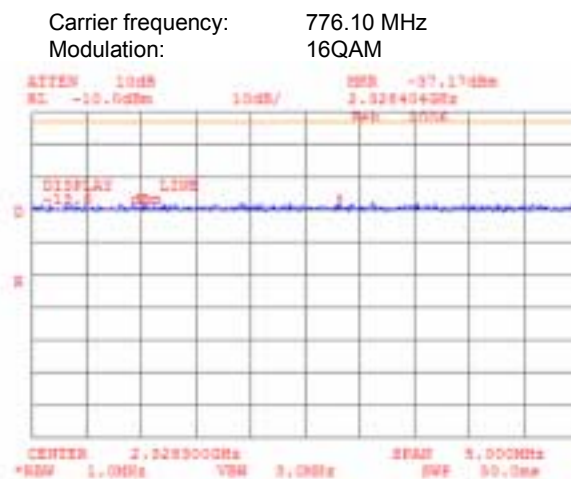


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.15 Spurious emission measurements at RF antenna connector, the 2<sup>nd</sup> harmonic of the high channel

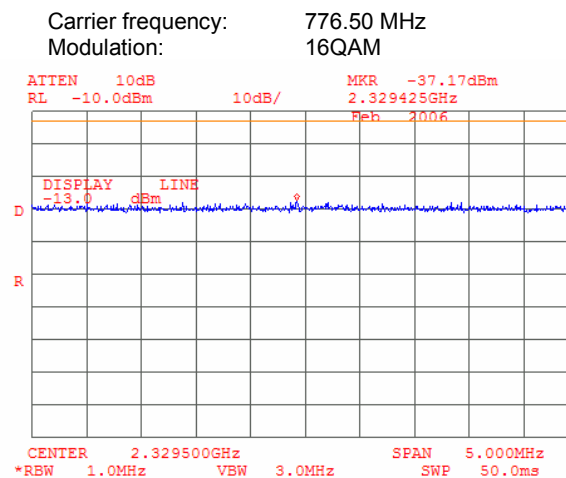


Plot 7.3.16 Spurious emission measurements at RF antenna connector, the 3<sup>rd</sup> harmonic of the low channel

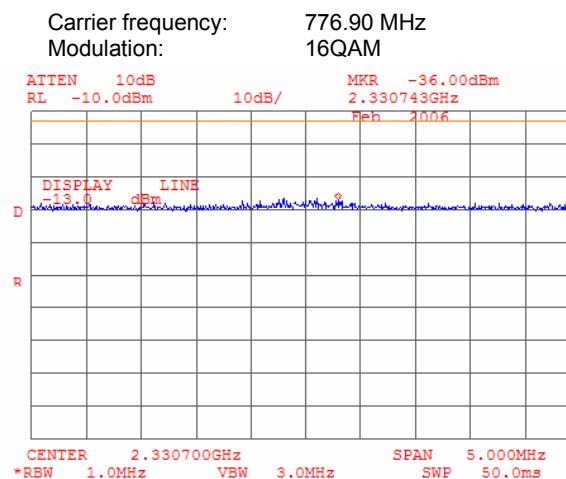


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.17 Spurious emission measurements at RF antenna connector, the 3<sup>rd</sup> harmonic of the mid channel

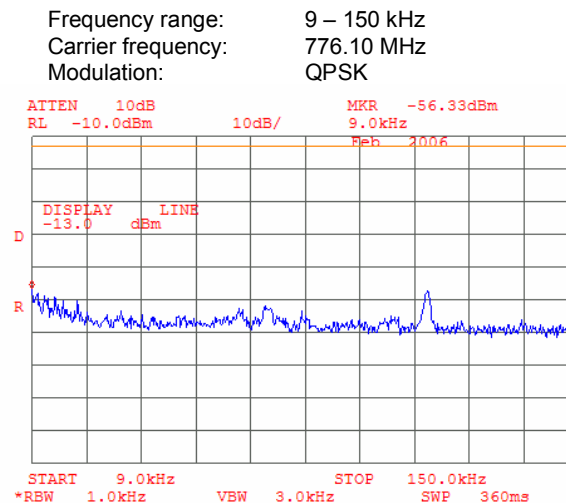


Plot 7.3.18 Spurious emission measurements at RF antenna connector, the 3<sup>rd</sup> harmonic of the high channel

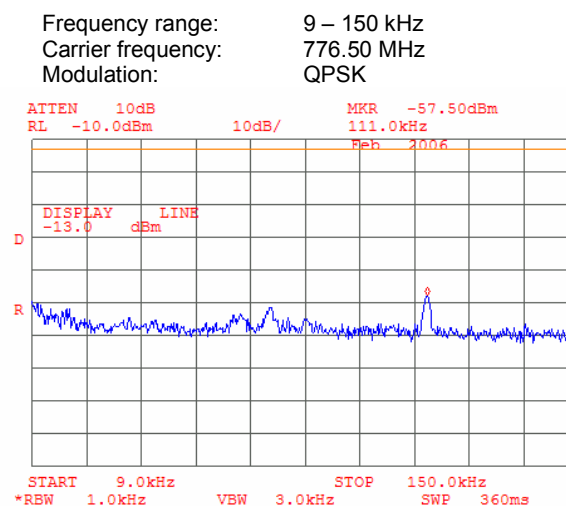


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.19 Spurious emission measurements at RF antenna connector, low channel

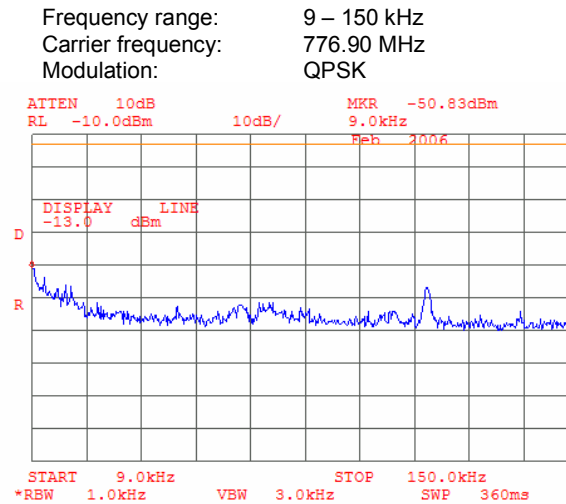


Plot 7.3.20 Spurious emission measurements at RF antenna connector, mid channel

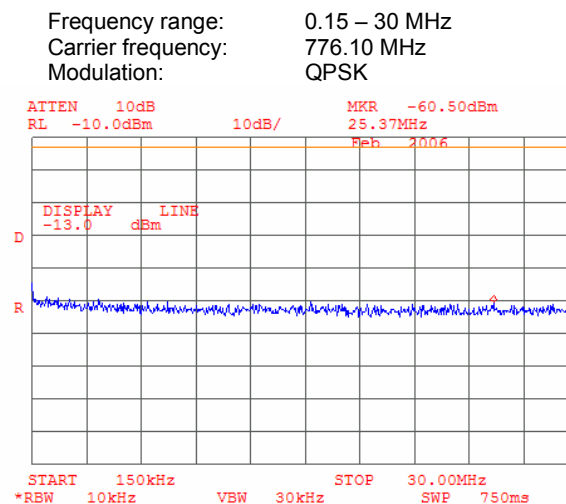


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.21 Spurious emission measurements at RF antenna connector, high channel



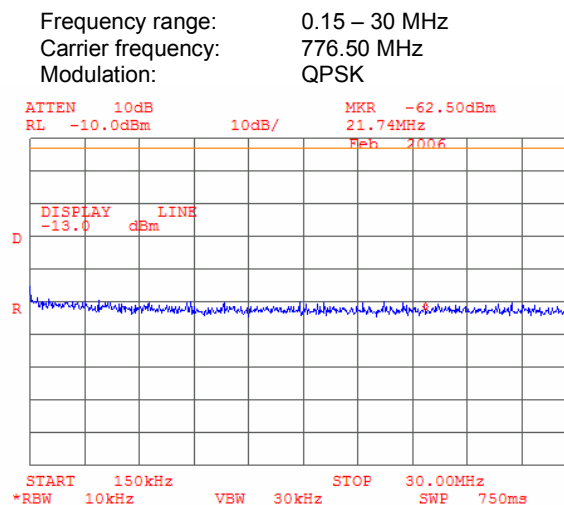
Plot 7.3.22 Spurious emission measurements at RF antenna connector, low channel



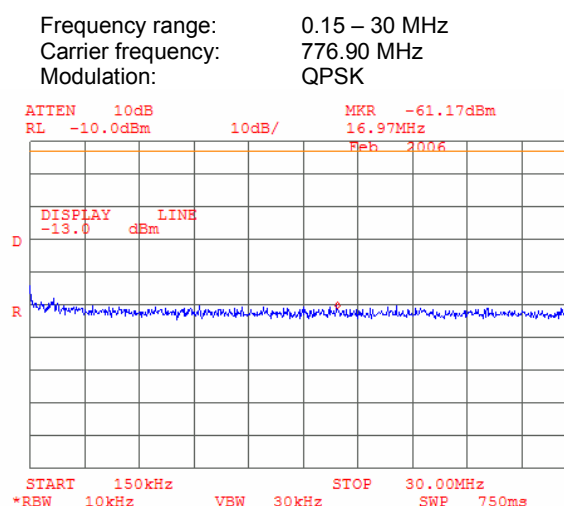


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.23 Spurious emission measurements at RF antenna connector, mid channel

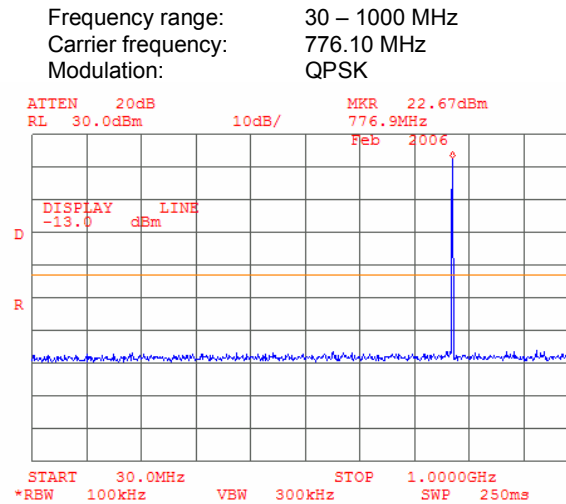


Plot 7.3.24 Spurious emission measurements at RF antenna connector, high channel

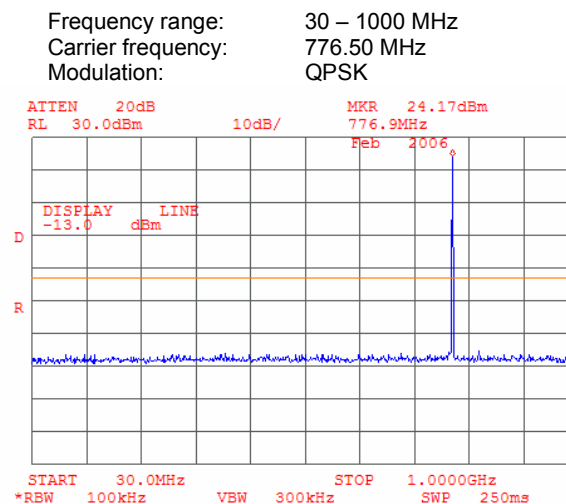


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.25 Spurious emission measurements at RF antenna connector, low channel

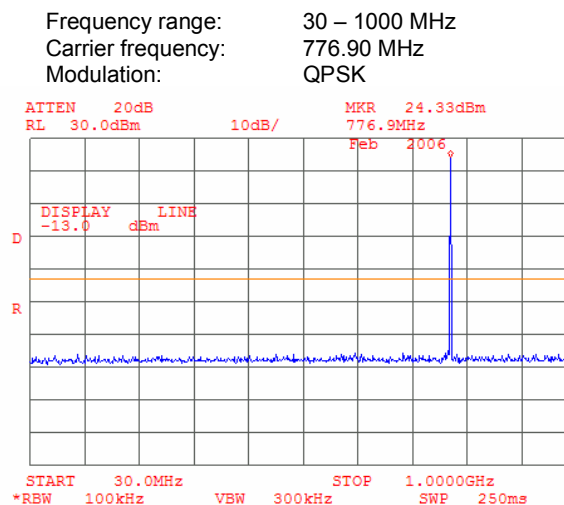


Plot 7.3.26 Spurious emission measurements at RF antenna connector, mid channel

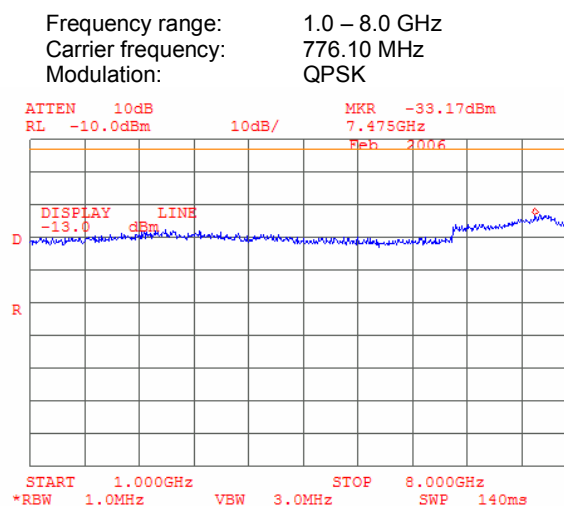


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.27 Spurious emission measurements at RF antenna connector, high channel

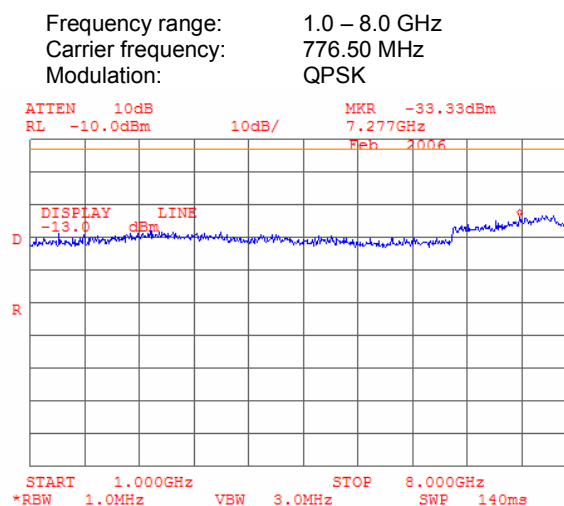


Plot 7.3.28 Spurious emission measurements at RF antenna connector, low channel

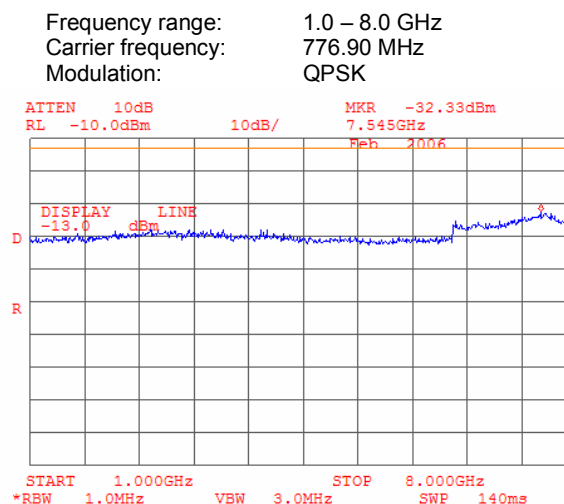


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.29 Spurious emission measurements at RF antenna connector, mid channel

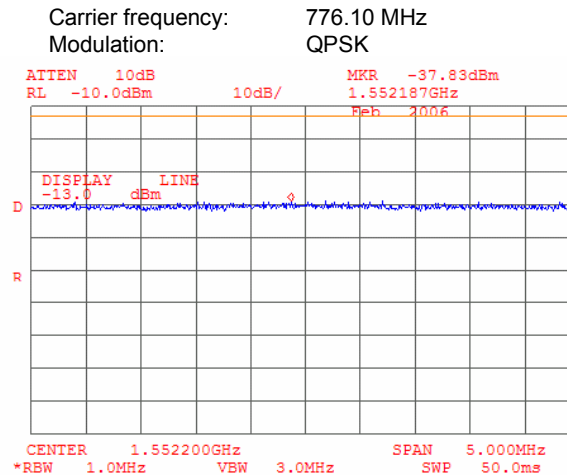


Plot 7.3.30 Spurious emission measurements at RF antenna connector, high channel

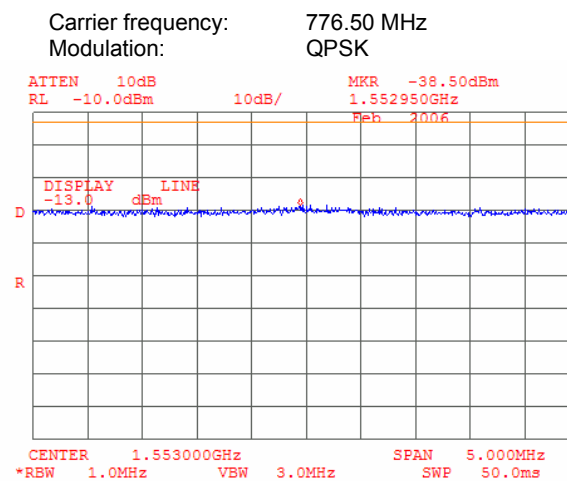


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.31 Spurious emission measurements at RF antenna connector, the 2<sup>nd</sup> harmonic of the low channel

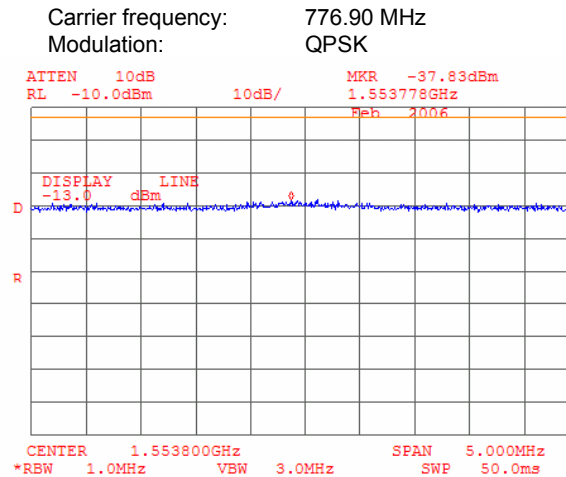


Plot 7.3.32 Spurious emission measurements at RF antenna connector, the 2<sup>nd</sup> harmonic of the mid channel

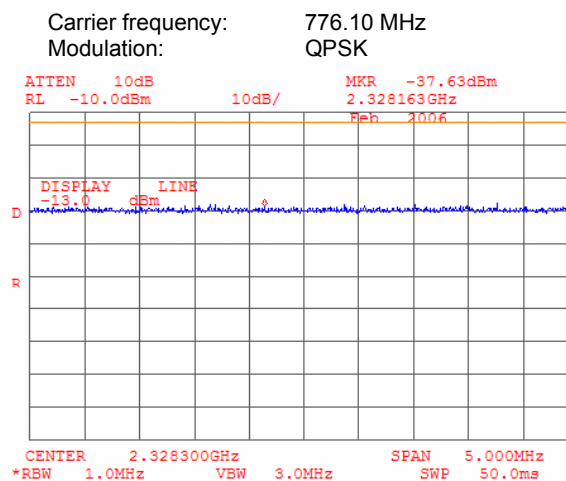


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.33 Spurious emission measurements at RF antenna connector, the 2<sup>nd</sup> harmonic of the high channel

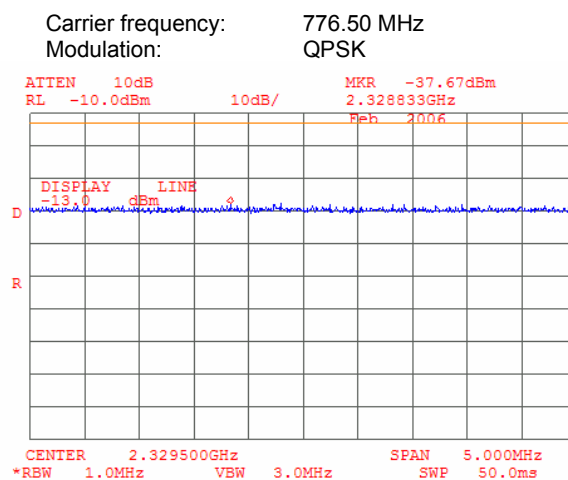


Plot 7.3.34 Spurious emission measurements at RF antenna connector, the 3<sup>rd</sup> harmonic of the low channel

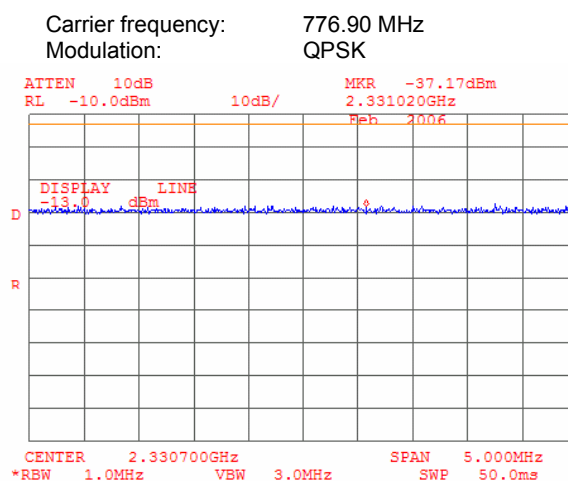


|                     |                                                                 |                         |                       |
|---------------------|-----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Spurious emissions at RF antenna connector |                         |                       |
| Test procedure:     | 47 CFR, Sections 2.1047, 2.1051, TIA/EIA-603-A, Section 2.2.13  |                         |                       |
| Test mode:          | Compliance                                                      | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                       |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                          | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                                 |                         |                       |

Plot 7.3.35 Spurious emission measurements at RF antenna connector, the 3<sup>rd</sup> harmonic of the mid channel



Plot 7.3.36 Spurious emission measurements at RF antenna connector, the 3<sup>rd</sup> harmonic of the high channel



|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

## 7.4 Radiated spurious emission measurements

### 7.4.1 General

This test was performed to measure radiated spurious emissions from the EUT enclosure with antenna connector terminated with 50 Ohm dummy load. Specification test limits are given in Table 7.4.1.

**Table 7.4.1 Radiated spurious emission test limits**

| Frequency, MHz*                   | Attenuation below carrier, dBc | Spurious emissions, dBm | Equivalent field strength limit @ 3m, dB(μV/m)** |
|-----------------------------------|--------------------------------|-------------------------|--------------------------------------------------|
| 0.009 – 10 <sup>th</sup> harmonic | 43+10logP*                     | -13                     | 84.4                                             |

\* - P is transmitter output power in Watts.

\*\* - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows:  
 $E = \sqrt{30 \times P \times 1.64} / r$ , where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters.

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

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

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

**7.4.2.3** The test results were recorded in Table 7.4.2 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 EUT performance was checked.

**7.4.3.2** The specified frequency range was investigated with antennas connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

**7.4.3.3** The worst test results with respect to the limits were recorded in Table 7.4.2 and shown in the associated plots.



|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

Figure 7.4.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz range

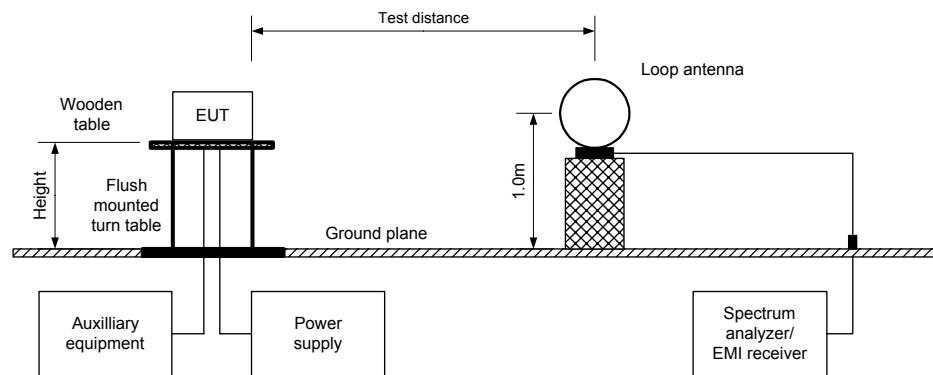
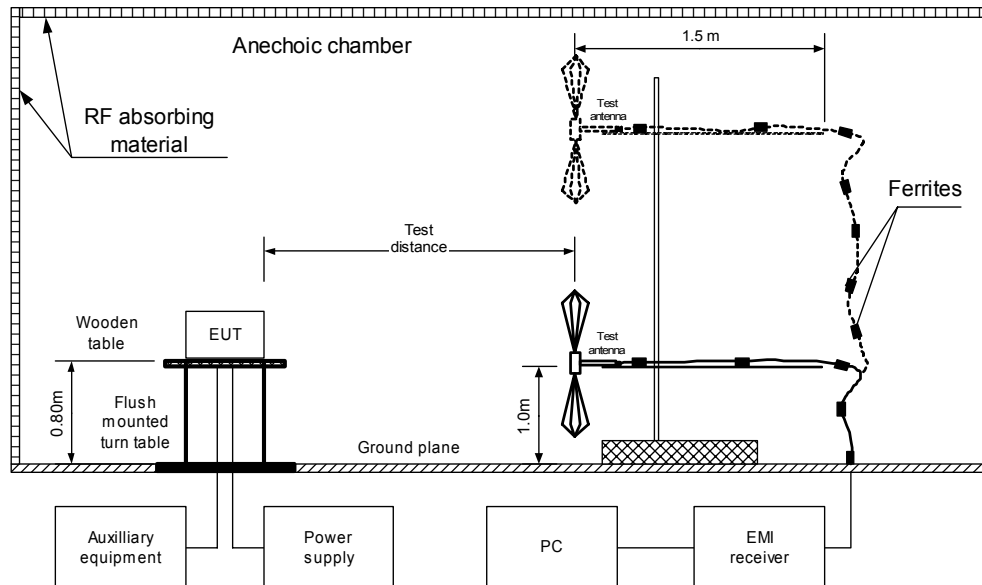


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz



|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

**Table 7.4.2 Spurious emission field strength test results**

ASSIGNED FREQUENCY RANGE: 776.0 – 777.0 MHz  
 TEST DISTANCE: 3 m  
 EUT HEIGHT: 0.8 m  
 INVESTIGATED FREQUENCY RANGE: 0.009 – 8000 MHz  
 DETECTOR USED: Peak  
 VIDEO BANDWIDTH: ≥ Resolution bandwidth  
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)  
 Biconilog (30 MHz – 1000 MHz)  
 Double ridged guide (above 1000 MHz)  
 MODULATION: 16QAM  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Frequency,<br>MHz                                        | Antenna<br>polarization | RBW,<br>kHz | Field strength,<br>dB(μV/m) | Limit,<br>dB(μV/m) | Margin,<br>dB* | Verdict |
|----------------------------------------------------------|-------------------------|-------------|-----------------------------|--------------------|----------------|---------|
| All found emissions were more than 20 dB below the limit |                         |             |                             |                    |                | Pass    |

\*- Margin = Field strength of spurious – calculated field strength limit.

**Reference numbers of test equipment used**

|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0446 | HL 0465 | HL 0521 | HL 0589 | HL 0604 | HL 1004 | HL 1200 | HL 1424 |
| HL 1942 | HL 1947 | HL 1984 | HL 2009 | HL 2109 |         |         |         |

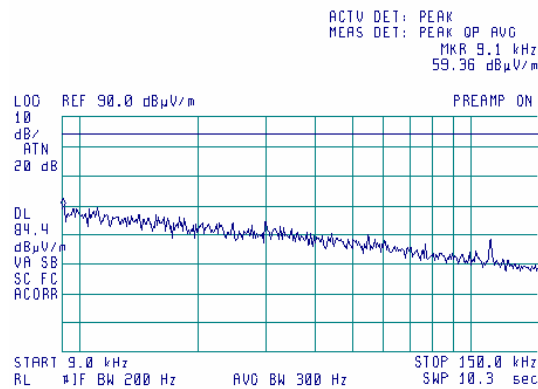
Full description is given in Appendix A.

|                     |                                                       |                         |                       |
|---------------------|-------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Radiated spurious emissions      |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12 |                         |                       |
| Test mode:          | Compliance                                            | Verdict:                | PASS                  |
| Date:               | 3/02/2006                                             |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1008 hPa                                | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                       |                         |                       |

Plot 7.4.1 Radiated emission measurements in 9 - 150 kHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: QPSK

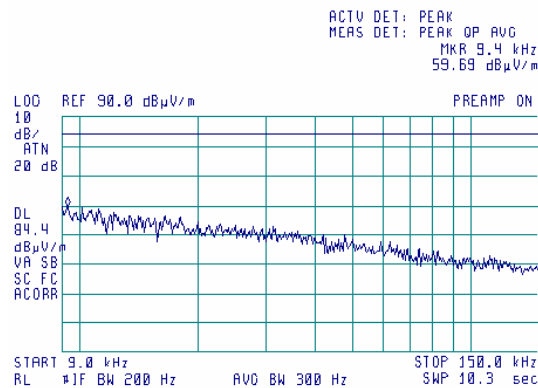
15:01:00 MAR 02, 2006



Plot 7.4.2 Radiated emission measurements in 9 - 150 kHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

14:55:20 MAR 02, 2006

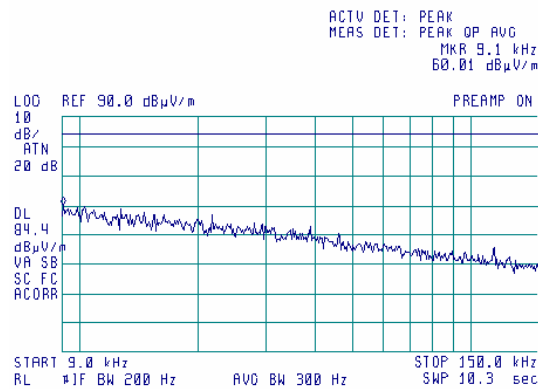


|                     |                                                       |                         |                       |
|---------------------|-------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Radiated spurious emissions      |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12 |                         |                       |
| Test mode:          | Compliance                                            | Verdict:                | PASS                  |
| Date:               | 3/02/2006                                             |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1008 hPa                                | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                       |                         |                       |

Plot 7.4.3 Radiated emission measurements in 9 - 150 kHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: QPSK

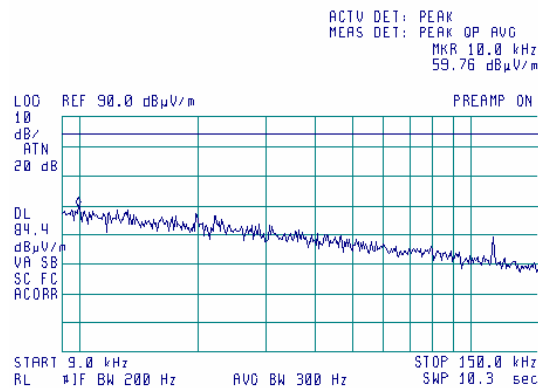
15:21:30 MAR 02, 2006



Plot 7.4.4 Radiated emission measurements in 9 - 150 kHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

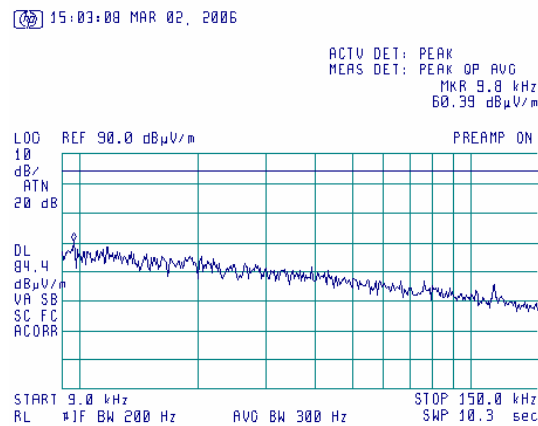
15:12:27 MAR 02, 2006



|                     |                                                       |                         |                       |
|---------------------|-------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Radiated spurious emissions      |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12 |                         |                       |
| Test mode:          | Compliance                                            | Verdict:                | PASS                  |
| Date:               | 3/02/2006                                             |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1008 hPa                                | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                       |                         |                       |

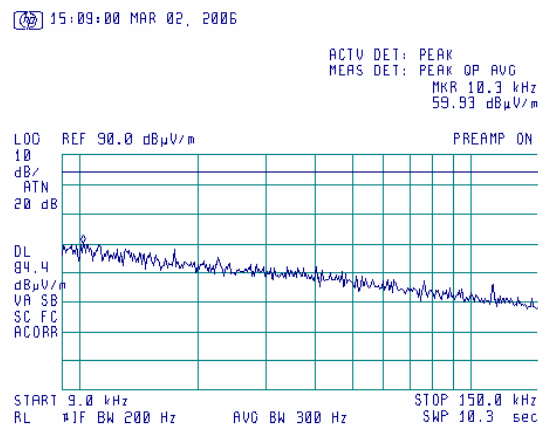
Plot 7.4.5 Radiated emission measurements in 9 - 150 kHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: QPSK



Plot 7.4.6 Radiated emission measurements in 9 - 150 kHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

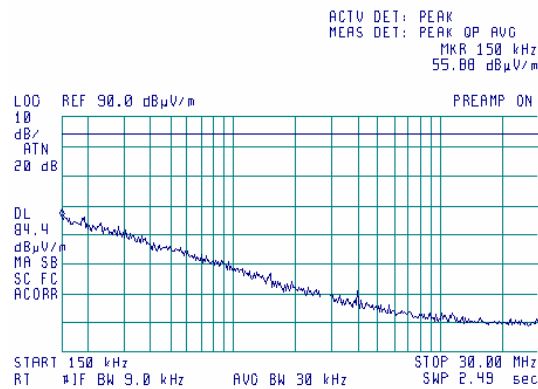


|                     |                                                       |                         |                       |
|---------------------|-------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Radiated spurious emissions      |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12 |                         |                       |
| Test mode:          | Compliance                                            | Verdict:                | PASS                  |
| Date:               | 3/02/2006                                             |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1008 hPa                                | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                       |                         |                       |

Plot 7.4.7 Radiated emission measurements in 0.15 - 30 MHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: QPSK

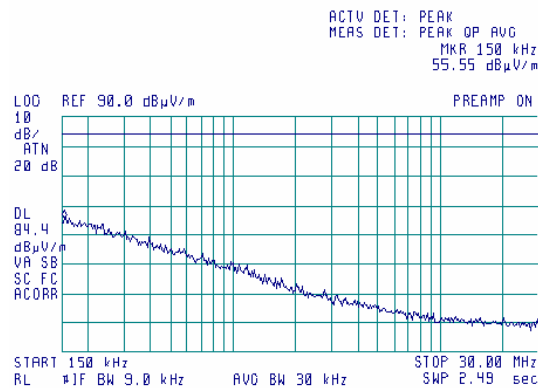
14:59:01 MAR 02, 2006



Plot 7.4.8 Radiated emission measurements in 0.15 - 30 MHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

14:57:34 MAR 02, 2006

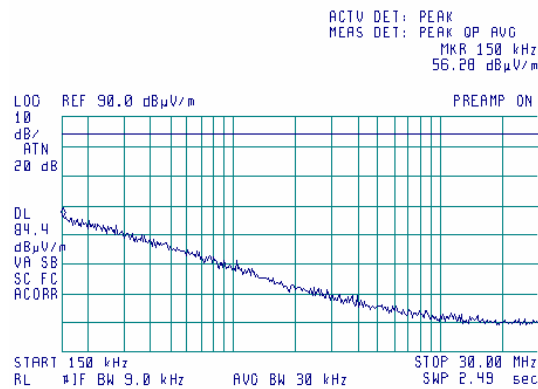


|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

**Plot 7.4.9 Radiated emission measurements in 0.15 - 30 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: QPSK

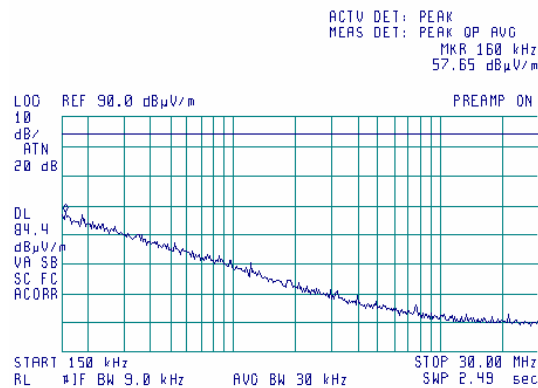
15:19:12 MAR 02, 2006



**Plot 7.4.10 Radiated emission measurements in 0.15 - 30 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

15:16:25 MAR 02, 2006

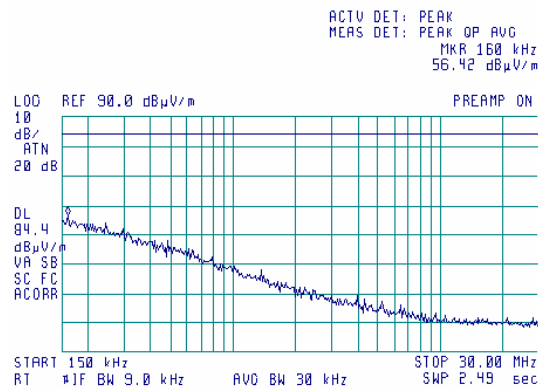


|                     |                                                       |                         |                       |
|---------------------|-------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Radiated spurious emissions      |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12 |                         |                       |
| Test mode:          | Compliance                                            | Verdict:                | PASS                  |
| Date:               | 3/02/2006                                             |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1008 hPa                                | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                       |                         |                       |

Plot 7.4.11 Radiated emission measurements in 0.15 - 30 MHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: QPSK

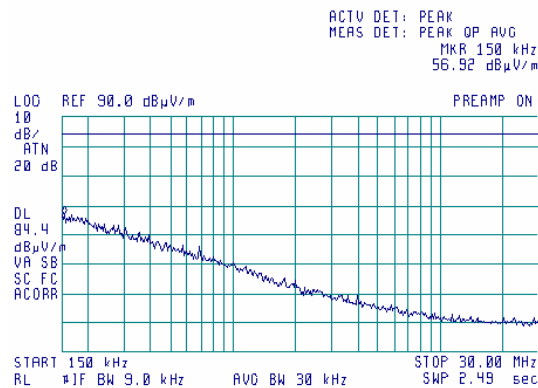
15:04:21 MAR 02, 2006



Plot 7.4.12 Radiated emission measurements in 0.15 - 30 MHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

15:06:35 MAR 02, 2006



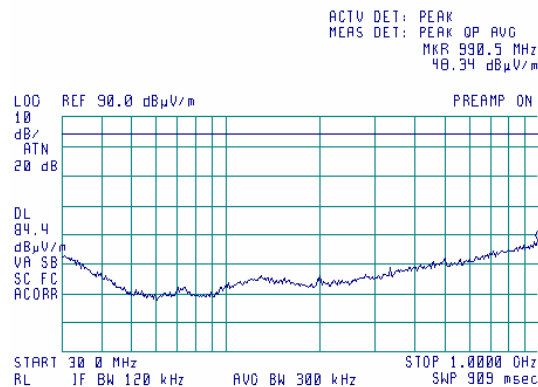


|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

**Plot 7.4.13 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK

14:37:04 MAR 02, 2006

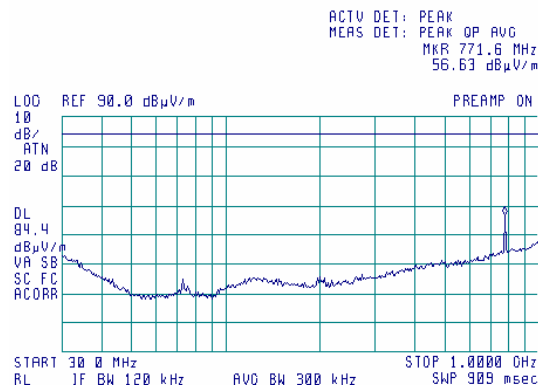


Note: 776.075 MHz – intentional radiation of RF module

**Plot 7.4.14 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

14:44:47 MAR 02, 2006



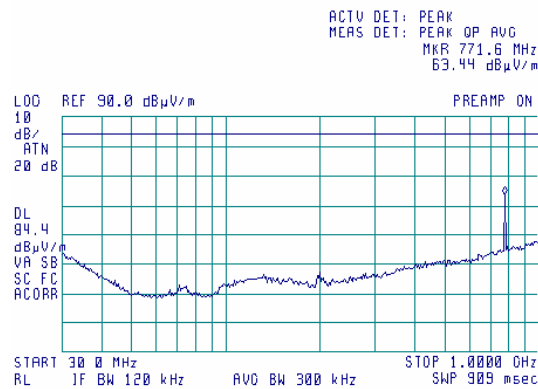
Note: 776.075 MHz – intentional radiation of RF module

|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

**Plot 7.4.15 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK

13:12:32 MAR 02, 2006

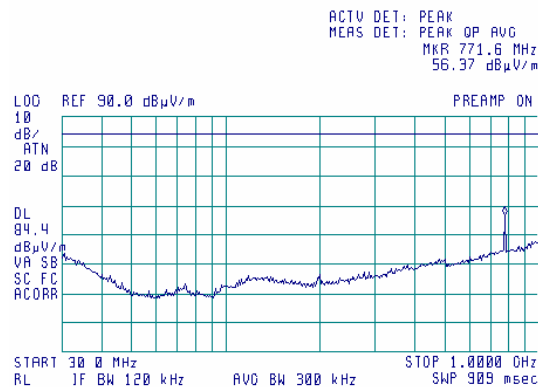


Note: 776.5 MHz – intentional radiation of RF module

**Plot 7.4.16 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

14:19:57 MAR 02, 2006



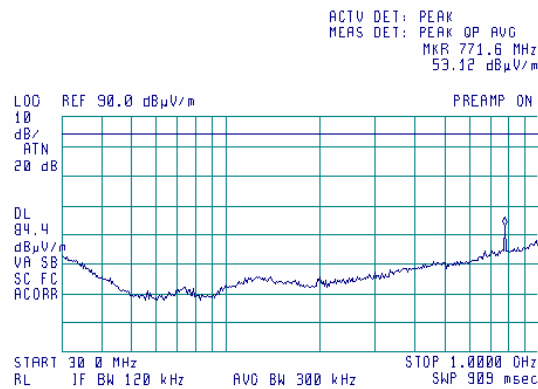
Note: 776.5 MHz – intentional radiation of RF module

|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

**Plot 7.4.17 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK

14:32:39 MAR 02, 2006

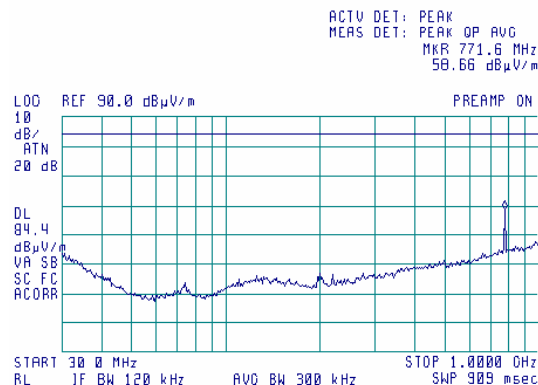


Note: 776.925 MHz – intentional radiation of RF module

**Plot 7.4.18 Radiated emission measurements in 30 - 1000 MHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

14:23:42 MAR 02, 2006



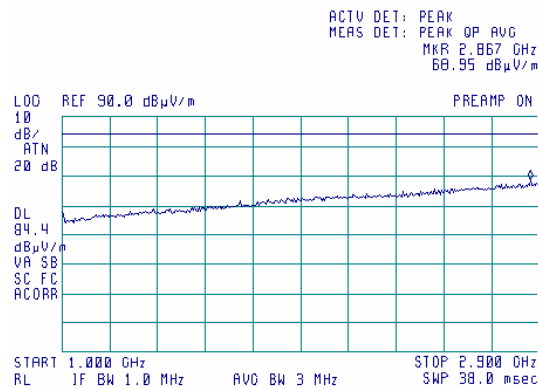
Note: 776.925 MHz – intentional radiation of RF module

|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

**Plot 7.4.19 Radiated emission measurements in 1 – 2.9 GHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK

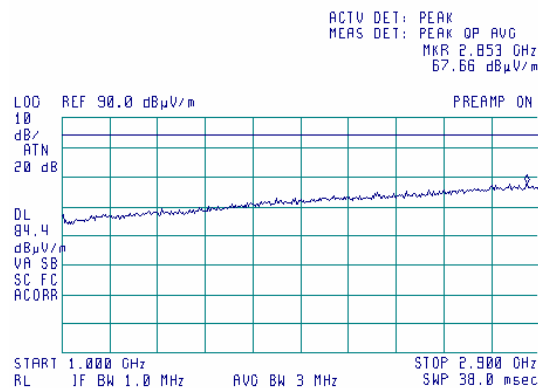
14:39:47 MAR 02, 2006



**Plot 7.4.20 Radiated emission measurements in 1 – 2.9 GHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

14:42:12 MAR 02, 2006

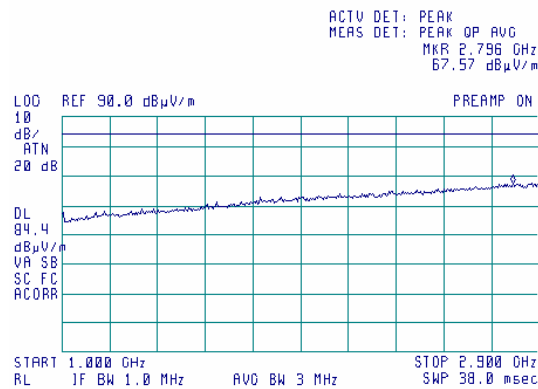


|                     |                                                       |                         |                       |
|---------------------|-------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(d)(3), Radiated spurious emissions      |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12 |                         |                       |
| Test mode:          | Compliance                                            | Verdict:                | PASS                  |
| Date:               | 3/02/2006                                             |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1008 hPa                                | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                       |                         |                       |

Plot 7.4.21 Radiated emission measurements in 1 – 2.9 GHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK

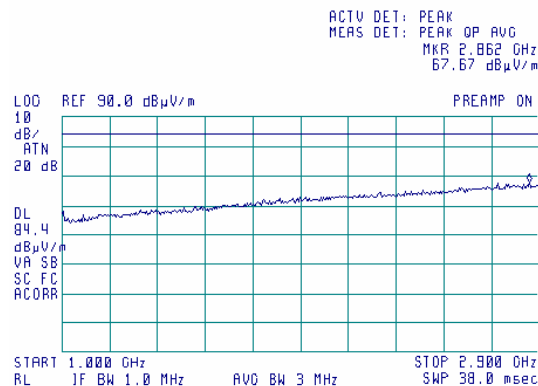
13:18:04 MAR 02, 2006



Plot 7.4.22 Radiated emission measurements in 1 – 2.9 GHz range

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

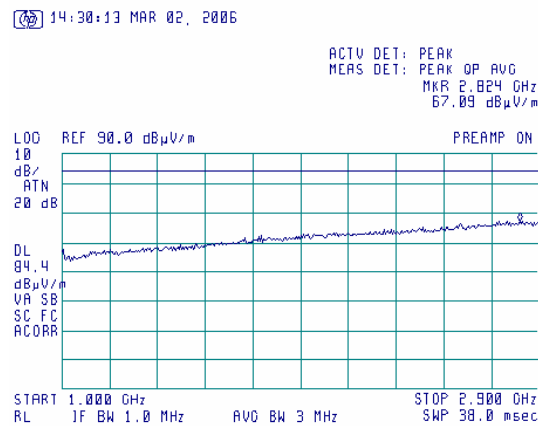
14:12:00 MAR 02, 2006



|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

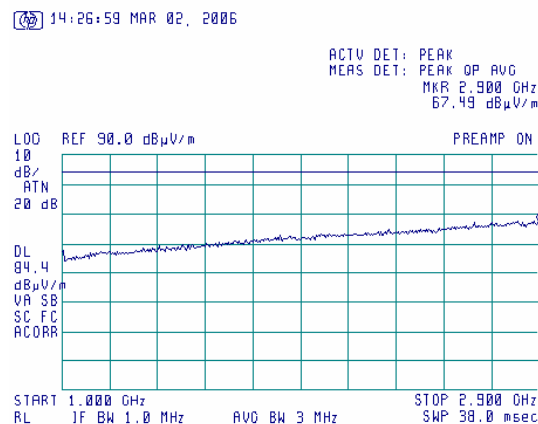
**Plot 7.4.23 Radiated emission measurements in 1 – 2.9 GHz range**

TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK



**Plot 7.4.24 Radiated emission measurements in 1 – 2.9 GHz range**

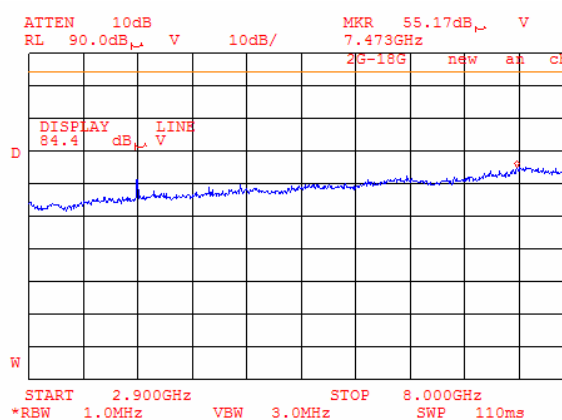
TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM



|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

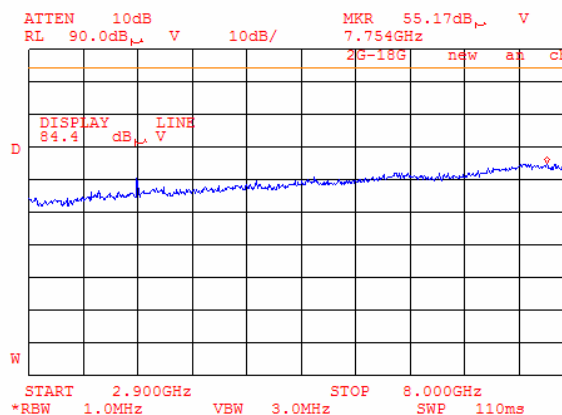
**Plot 7.4.25 Radiated emission measurements in 2.9 – 8.0 GHz range**

TEST SITE: Anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK



**Plot 7.4.26 Radiated emission measurements in 2.9 – 8.0 GHz range**

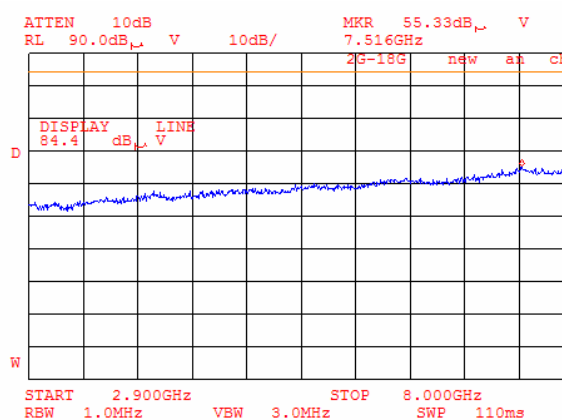
TEST SITE: Anechoic chamber  
CARRIER FREQUENCY: Low  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM



|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

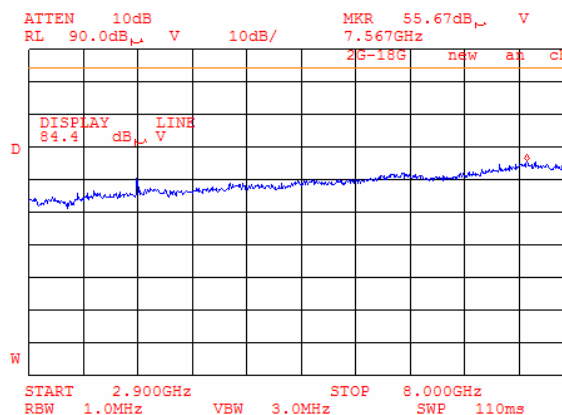
**Plot 7.4.27 Radiated emission measurements in 2.9 – 8.0 GHz range**

TEST SITE: Anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK



**Plot 7.4.28 Radiated emission measurements in 2.9 – 8.0 GHz range**

TEST SITE: Anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM

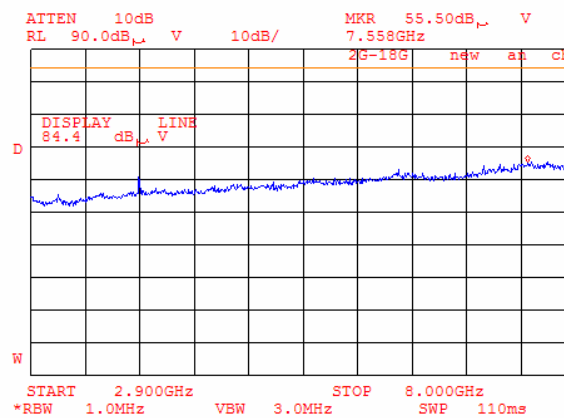




|                            |                                                         |                                |                              |
|----------------------------|---------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(d)(3), Radiated spurious emissions</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1053, TIA/EIA-603-A, Section 2.2.12   |                                |                              |
| <b>Test mode:</b>          | Compliance                                              | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                               |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                           | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                         |                                |                              |

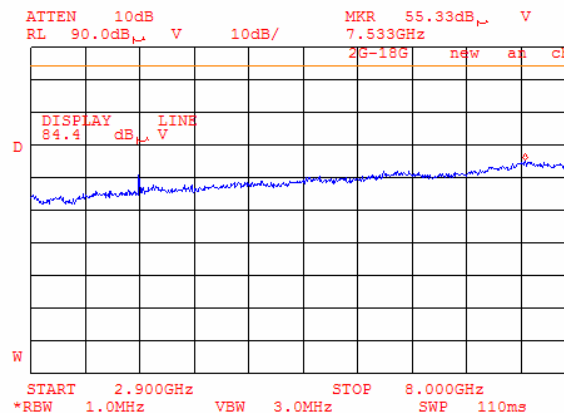
**Plot 7.4.29 Radiated emission measurements in 2.9 – 8.0 GHz range**

TEST SITE: Anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: QPSK



**Plot 7.4.30 Radiated emission measurements in 2.9 – 8.0 GHz range**

TEST SITE: Anechoic chamber  
CARRIER FREQUENCY: High  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m  
MODULATION: 16QAM



|                            |                                                                       |                                |                              |
|----------------------------|-----------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(e), Radiated emissions in the 1559-1610 MHz band</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.5 and 12.1.3                                  |                                |                              |
| <b>Test mode:</b>          | Compliance                                                            | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/06/2006                                                             |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                                         | <b>Relative Humidity:</b> 48 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                       |                                |                              |

## 7.5 Radiated spurious emission measurements in 1559-1610 MHz band

### 7.5.1 General

This test was performed to measure radiated spurious emissions from the EUT enclosure with antenna. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Radiated spurious emission test limits

| Frequency, MHz | EIRP of spurious emissions, dBW/MHz | Spurious emissions, dBm | Equivalent field strength limit @ 3m, dB( $\mu$ V/m) |
|----------------|-------------------------------------|-------------------------|------------------------------------------------------|
| 1559 - 1610    | -80                                 | -50                     | 45.23                                                |

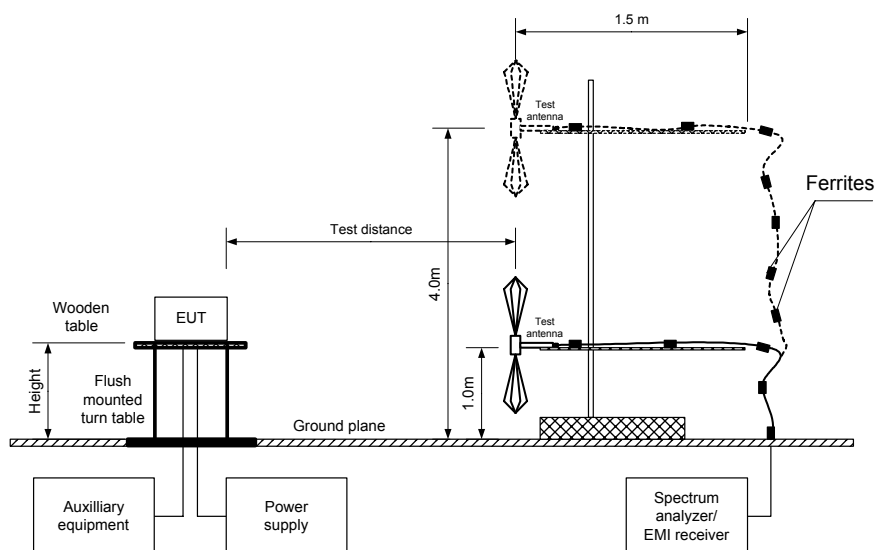
### 7.5.2 Test procedure for spurious emission field strength measurements above 30 MHz

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

7.5.2.2 The specified frequency range was investigated with antennas connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360° and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

7.5.2.3 The worst test results with respect to the limits were recorded in Table 7.5.2 and shown in the associated plots.

Figure 7.5.1 Setup for spurious emission field strength measurements



|                            |                                                                       |                                |                              |
|----------------------------|-----------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.53(e), Radiated emissions in the 1559-1610 MHz band</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.5 and 12.1.3                                  |                                |                              |
| <b>Test mode:</b>          | Compliance                                                            | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/06/2006                                                             |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                                         | <b>Relative Humidity:</b> 48 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                       |                                |                              |

**Table 7.5.2 Spurious emission field strength test results**

ASSIGNED FREQUENCY RANGE: 776.0 – 777.0 MHz  
 TEST SITE: OATS  
 TEST DISTANCE: 3 m  
 EUT HEIGHT: 0.8 m  
 INVESTIGATED FREQUENCY RANGE: 1559 – 1610 MHz  
 DETECTOR USED: Peak  
 VIDEO BANDWIDTH: ≥ Resolution bandwidth  
 TEST ANTENNA TYPE: Double ridged guide  
 MODULATION: QPSK and 16QAM  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Frequency,<br>MHz       | Antenna<br>polarization | RBW,<br>kHz | Field strength,<br>dB(μV/m) | Limit,<br>dB(μV/m) | Margin,<br>dB* | Verdict |
|-------------------------|-------------------------|-------------|-----------------------------|--------------------|----------------|---------|
| No emissions were found |                         |             |                             |                    |                | Pass    |

\*- Margin = Field strength of spurious – calculated field strength limit.

**Reference numbers of test equipment used**

|         |         |         |         |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|
| HL 1365 | HL 1430 | HL 1947 | HL 1984 |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|

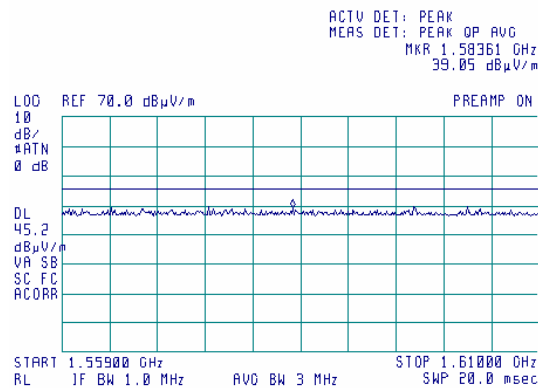
Full description is given in Appendix A.

|                     |                                                                |                         |                       |
|---------------------|----------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 27.53(e), Radiated emissions in the 1559-1610 MHz band |                         |                       |
| Test procedure:     | ANSI C63.4, Sections 11.5 and 12.1.3                           |                         |                       |
| Test mode:          | Compliance                                                     | Verdict:                | PASS                  |
| Date:               | 3/06/2006                                                      |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                         | Relative Humidity: 48 % | Power Supply: 120 VAC |
| Remarks:            |                                                                |                         |                       |

Plot 7.5.1 Radiated emission measurements in 1559 - 1610 MHz range

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

13:32:28 MAR 06, 2006



|                            |                                                      |                                |                              |
|----------------------------|------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.54, Frequency stability</b>            |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055, TIA/EIA-603-A, Section 2.2.2 |                                |                              |
| <b>Test mode:</b>          | Compliance                                           | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                            |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                        | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                      |                                |                              |

## 7.6 Frequency stability test

### 7.6.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.6.1. The test results are provided in Tables 7.6.2, 7.6.3 and shown in the associated plots.

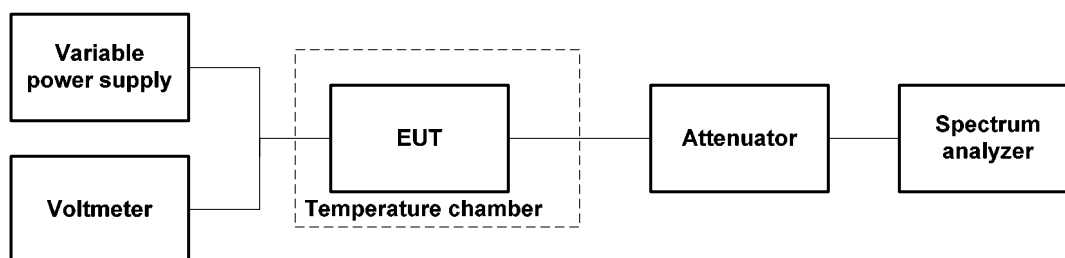
**Table 7.6.1 Frequency stability limits**

| Assigned frequency, MHz | Maximum allowed frequency displacement                                            |
|-------------------------|-----------------------------------------------------------------------------------|
| 776.0 – 777.0           | 26 dBc points including frequency tolerance shall remain within the assigned band |

### 7.6.2 Test procedure

- 7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and its proper operation was checked.
- 7.6.2.2 The EUT power was turned off. Temperature within test chamber was set to +30°C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.
- 7.6.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.
- 7.6.2.4 The above procedure was repeated at 0°C and at the lowest test temperature.
- 7.6.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.
- 7.6.2.6 Frequency displacement was calculated as provided in Table 7.6.2 and Table 7.6.3.

**Figure 7.6.1 Frequency stability test setup**



|                            |                                                      |                                |                              |
|----------------------------|------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.54, Frequency stability</b>            |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055, TIA/EIA-603-A, Section 2.2.2 |                                |                              |
| <b>Test mode:</b>          | Compliance                                           | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                            |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                        | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                      |                                |                              |

Table 7.6.2 Frequency stability test results

ASSIGNED FREQUENCY RANGE: 776.0 – 777.0 MHz  
NOMINAL POWER VOLTAGE: 120 VAC (102 VAC - 138 VAC)  
TEMPERATURE STABILIZATION PERIOD: 20 min  
POWER DURING TEMPERATURE TRANSITION: Off  
RESOLUTION BANDWIDTH: 300 Hz  
VIDEO BANDWIDTH: 300 Hz  
FREQUENCY SPAN: 10.0 kHz  
SPECTRUM ANALYZER MODE: Counter  
MODULATION: Unmodulated

| T, °C                     | Voltage, V | Frequency, MHz |                     |                     |                     |                     |                     |                      | Max frequency drift, Hz |          |
|---------------------------|------------|----------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|-------------------------|----------|
|                           |            | Start up       | 1 <sup>st</sup> min | 2 <sup>nd</sup> min | 3 <sup>rd</sup> min | 4 <sup>th</sup> min | 5 <sup>th</sup> min | 10 <sup>th</sup> min | Positive                | Negative |
| Low frequency, 776.1 MHz  |            |                |                     |                     |                     |                     |                     |                      |                         |          |
| -30                       | nominal    | 776.099761     | 776.099761          | 776.099759          | 776.099760          | 776.099755          | 776.099749          | 776.099728           | 0                       | -573     |
| -20                       | nominal    | 776.099753     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.099776           | 0                       | -548     |
| -10                       | nominal    | 776.100201     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.099988           | 0                       | -313     |
| 0                         | nominal    | 776.100406     | 776.100403          | 776.100400          | 776.100390          | 776.100384          | 776.100377          | 776.100329           | 105                     | 0        |
| 10                        | nominal    | 776.100419     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.100440           | 139                     | 0        |
| 20                        | 15%        | 776.100364     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.100331           | 63                      | 0        |
| 20                        | nominal    | 776.100328     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.100301*          | 27                      | 0        |
| 20                        | -15%       | 776.100352     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.100340           | 51                      | 0        |
| 30                        | nominal    | 776.100094     | 776.100096          | 776.100097          | 776.100101          | 776.100111          | 776.100139          | 776.100152           | 0                       | -207     |
| 40                        | nominal    | 776.100135     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.100126           | 0                       | -175     |
| 50                        | nominal    | 776.099871     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.099791           | 0                       | -510     |
| High frequency, 776.9 MHz |            |                |                     |                     |                     |                     |                     |                      |                         |          |
| -30                       | nominal    | 776.899729     | 776.899726          | 776.899717          | 776.899711          | 776.899703          | 776.899692          | 776.899652           | 0                       | -504     |
| -20                       | nominal    | 776.899837     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.899761           | 0                       | -395     |
| -10                       | nominal    | 776.899990     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.899932           | 0                       | -224     |
| 0                         | nominal    | 776.900332     | 776.900327          | 776.900319          | 776.900313          | 776.900310          | 776.900307          | 776.900292           | 176                     | 0        |
| 10                        | nominal    | 776.900450     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.900453           | 297                     | 0        |
| 20                        | 15%        | 776.900159     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.900171           | 15                      | 0        |
| 20                        | nominal    | 776.900150     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.900156*          | 0                       | -6       |
| 20                        | -15%       | 776.900174     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.900192           | 36                      | 0        |
| 30                        | nominal    | 776.900157     | 776.900155          | 776.900153          | 776.900152          | 776.900151          | 776.900152          | 776.900159           | 3                       | -5       |
| 40                        | nominal    | 776.900160     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.900139           | 4                       | -17      |
| 50                        | nominal    | 776.900161     | NA                  | NA                  | NA                  | NA                  | NA                  | 776.899899           | 5                       | -257     |

\* - Reference frequency

|                            |                                                      |                                |                              |
|----------------------------|------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.54, Frequency stability</b>            |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055, TIA/EIA-603-A, Section 2.2.2 |                                |                              |
| <b>Test mode:</b>          | Compliance                                           | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                            |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                        | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                      |                                |                              |

Table 7.6.3 Transmitter operating range including frequency drift

| Assigned frequency band, MHz     | Measured 26 dBc point, MHz | Frequency drift, Hz |          | 26 dBc point including frequency tolerance, MHz | Verdict |
|----------------------------------|----------------------------|---------------------|----------|-------------------------------------------------|---------|
|                                  |                            | Negative            | Positive |                                                 |         |
| QPSK, channel bandwidth 200 kHz  |                            |                     |          |                                                 |         |
| 776.0 – 777.0                    | 776.0081 – 776.9919        | -573                | 297      | 776.007552 – 776.992172                         | Pass    |
| 16QAM, channel bandwidth 200 kHz |                            |                     |          |                                                 |         |
| 776.0 – 777.0                    | 776.0081 – 776.9919        | -573                | 297      | 776.007552 – 776.992172                         | Pass    |
| QPSK, channel bandwidth 325 kHz  |                            |                     |          |                                                 |         |
| 776.0 – 777.0                    | 776.0100 – 776.9925        | -573                | 297      | 776.009427 – 776.992797                         | Pass    |
| 16QAM, channel bandwidth 325 kHz |                            |                     |          |                                                 |         |
| 776.0 – 777.0                    | 776.0100 – 776.9925        | -573                | 297      | 776.009427 – 776.992797                         | Pass    |
| QPSK, channel bandwidth 400 kHz  |                            |                     |          |                                                 |         |
| 776.0 – 777.0                    | 776.0150 – 776.9775        | -573                | 297      | 776.014427 - 776.977797                         | Pass    |
| QPSK, channel bandwidth 400 kHz  |                            |                     |          |                                                 |         |
| 776.0 – 777.0                    | 776.0125 – 776.9800        | -573                | 297      | 776.011927 - 776.978297                         | Pass    |

Reference numbers of test equipment used

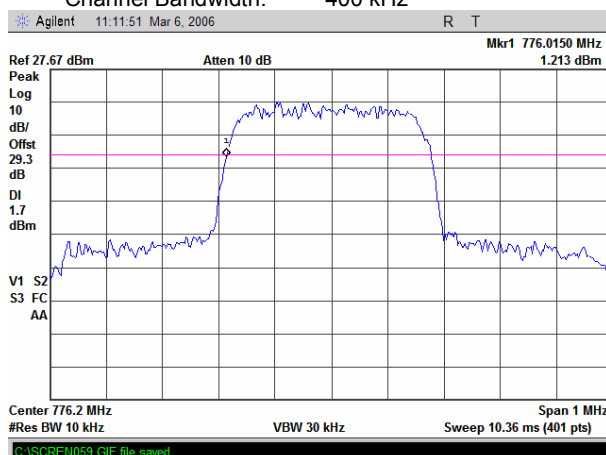
|         |         |         |         |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|
| HL 0493 | HL 1206 | HL 1653 | HL 2868 |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|

Full description is given in Appendix A.

|                            |                                                      |                                |                              |
|----------------------------|------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.54, Frequency stability</b>            |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055, TIA/EIA-603-A, Section 2.2.2 |                                |                              |
| <b>Test mode:</b>          | Compliance                                           | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                            |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                        | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                      |                                |                              |

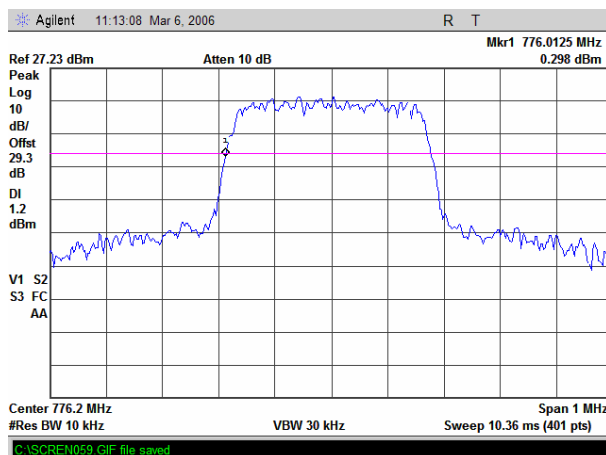
**Plot 7.6.1 Band edge emission at low frequency, QPSK**

Band edge: Left  
Channel Bandwidth: 400 kHz



**Plot 7.6.2 Band edge emission at low frequency, 16QAM**

Band edge: Left  
Channel Bandwidth: 400 kHz

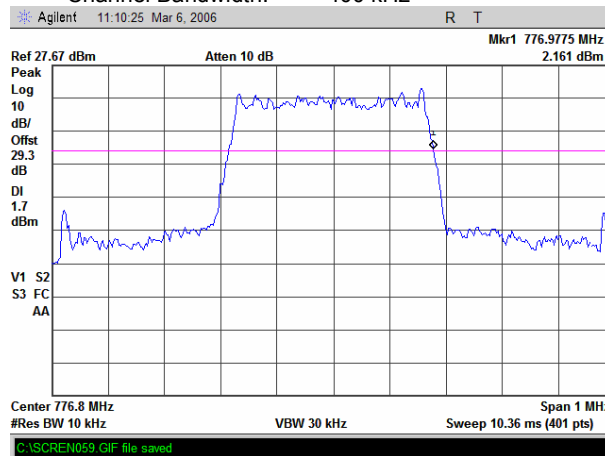




|                            |                                                      |                                |                              |
|----------------------------|------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 27.54, Frequency stability</b>            |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055, TIA/EIA-603-A, Section 2.2.2 |                                |                              |
| <b>Test mode:</b>          | Compliance                                           | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/02/2006                                            |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1008 hPa                        | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                      |                                |                              |

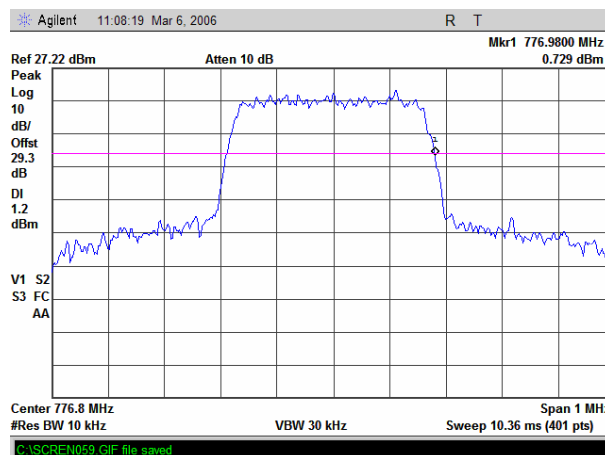
**Plot 7.6.3 Band edge emission at high frequency, QPSK**

Band edge: Right  
Channel Bandwidth: 400 kHz



**Plot 7.6.4 Band edge emission at high frequency, 16QAM**

Band edge: Right  
Channel Bandwidth: 400 kHz



|                            |                                           |                                |                              |
|----------------------------|-------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 2.1049, Occupied bandwidth</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                                |                              |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 2/28/2006                                 |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa             | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                           |                                |                              |

## 7.7 Occupied bandwidth test

### 7.7.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.7.1.

**Table 7.7.1 Occupied bandwidth limits**

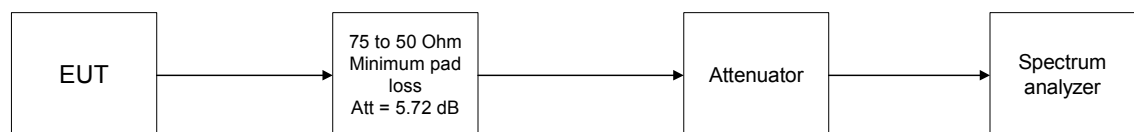
| Assigned frequency, MHz | Modulation envelope reference points*, dBc |
|-------------------------|--------------------------------------------|
| 776.0 – 777.0           | 26                                         |

\* - Modulation envelope reference points provided in terms of attenuation below unmodulated carrier.

### 7.7.2 Test procedure

- 7.7.2.1** The EUT was set up as shown in Figure 7.7.1, energized and its proper operation was checked.
- 7.7.2.2** The EUT was set to transmit unmodulated carrier and reference peak power level was measured.
- 7.7.2.3** The EUT was set to transmit modulated carrier.
- 7.7.2.4** The transmitter occupied bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.7.2 and associated plots.

**Figure 7.7.1 Occupied bandwidth test setup**



|                            |                                           |                                |                              |
|----------------------------|-------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 2.1049, Occupied bandwidth</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                                |                              |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 2/28/2006                                 |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa             | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                           |                                |                              |

Table 7.7.2 Occupied bandwidth test results

DETECTOR USED: Peak hold  
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc  
MODULATING SIGNAL: PRBS

| Carrier frequency, MHz            | Occupied bandwidth, kHz | Limit, kHz | Margin, kHz |
|-----------------------------------|-------------------------|------------|-------------|
| <b>Modulation: QPSK, 200 kHz</b>  |                         |            |             |
| 776.1000                          | 183.75                  | 200        | -16.25      |
| 776.5000                          | 182.50                  | 200        | -17.50      |
| 776.9000                          | 183.75                  | 200        | -16.25      |
| <b>Modulation: 16QAM, 200 kHz</b> |                         |            |             |
| 776.1000                          | 183.75                  | 200        | -16.25      |
| 776.5000                          | 183.75                  | 200        | -16.25      |
| 776.9000                          | 183.75                  | 200        | -16.25      |
| <b>Modulation: QPSK, 325 kHz</b>  |                         |            |             |
| 776.1625                          | 305.00                  | 325        | -20.00      |
| 776.5000                          | 307.50                  | 325        | -17.50      |
| 776.8375                          | 310.00                  | 325        | -15.00      |
| <b>Modulation: 16QAM, 325 kHz</b> |                         |            |             |
| 776.1625                          | 305.00                  | 325        | -20.00      |
| 776.5000                          | 307.50                  | 325        | -17.50      |
| 776.8375                          | 310.00                  | 325        | -15.00      |
| <b>Modulation: QPSK, 400 kHz</b>  |                         |            |             |
| 776.2000                          | 360.00                  | 400        | -40.00      |
| 776.5000                          | 372.50                  | 400        | -27.50      |
| 776.8000                          | 367.50                  | 400        | -32.50      |
| <b>Modulation: 16QAM, 400 kHz</b> |                         |            |             |
| 776.2000                          | 357.50                  | 400        | -42.50      |
| 776.5000                          | 372.50                  | 400        | -27.50      |
| 776.8000                          | 365.00                  | 400        | -35.00      |

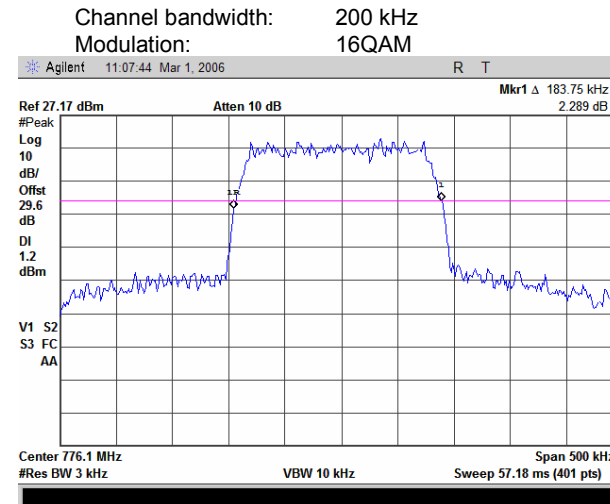
## Reference numbers of test equipment used

|         |         |         |  |  |  |  |  |
|---------|---------|---------|--|--|--|--|--|
| HL 1424 | HL 1650 | HL 2524 |  |  |  |  |  |
|---------|---------|---------|--|--|--|--|--|

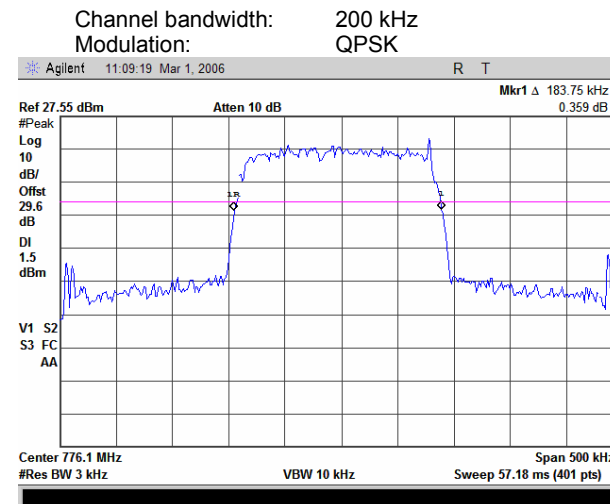
Full description is given in Appendix A.

|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.1 Occupied bandwidth test results low frequency

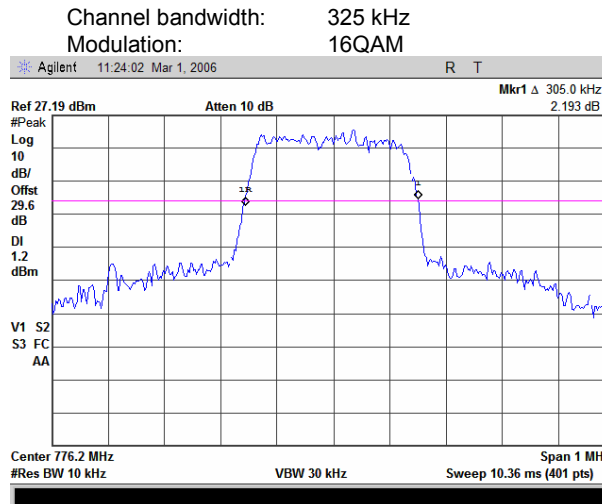


Plot 7.7.2 Occupied bandwidth test results at low frequency

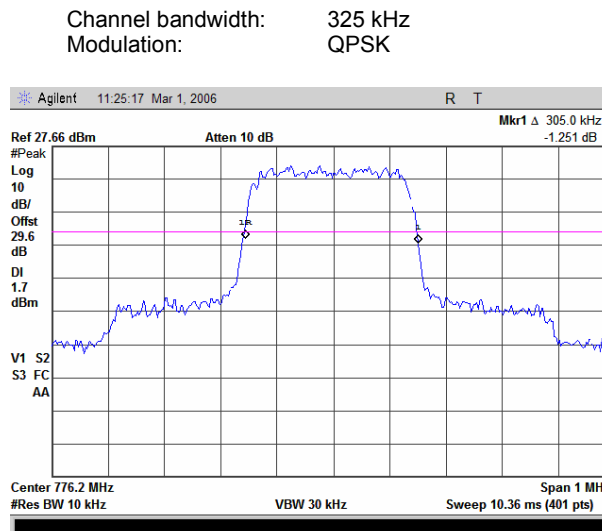


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.3 Occupied bandwidth test results at low frequency

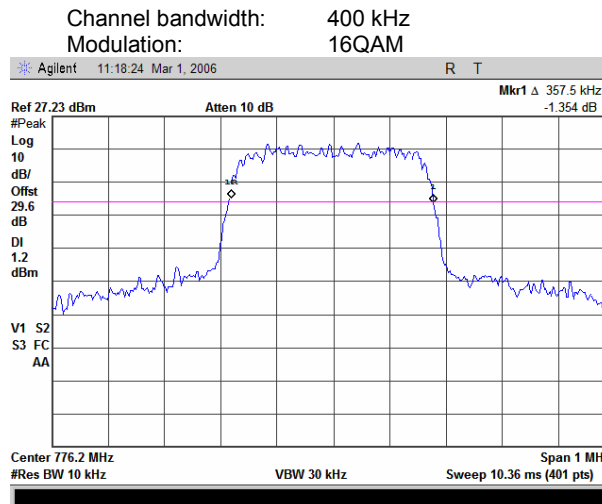


Plot 7.7.4 Occupied bandwidth test results at low frequency

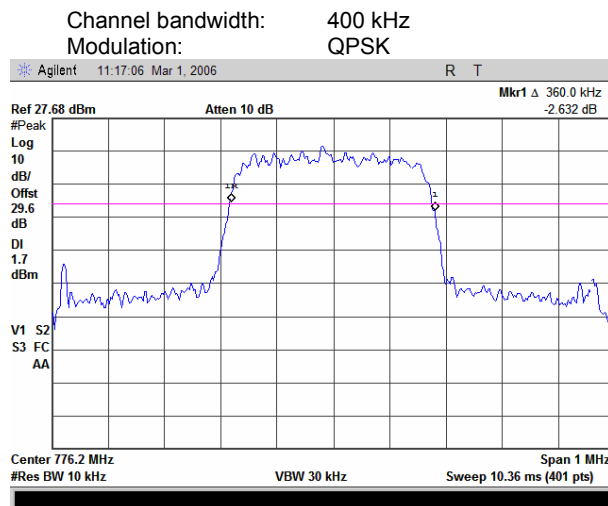


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.5 Occupied bandwidth test results at low frequency

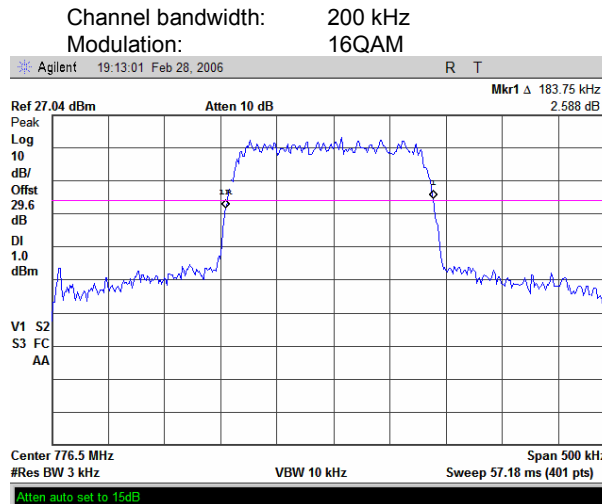


Plot 7.7.6 Occupied bandwidth test results at low frequency

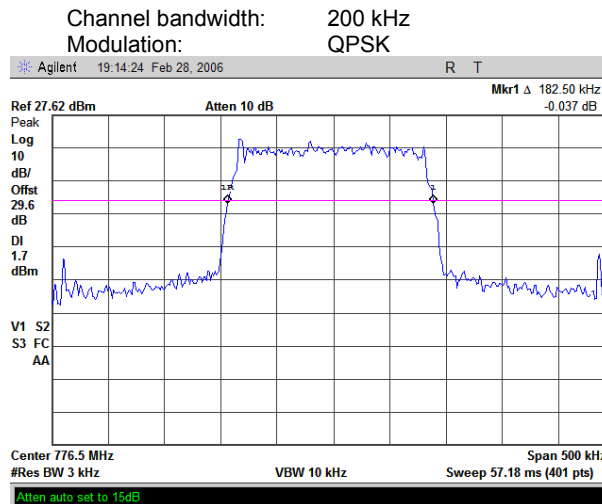


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.7 Occupied bandwidth test results at mid frequency

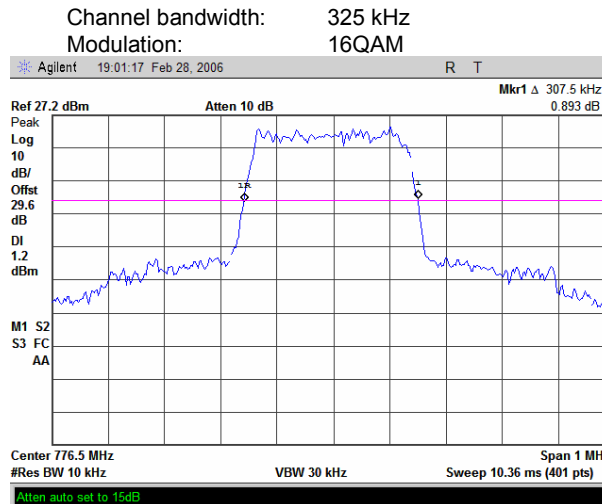


Plot 7.7.8 Occupied bandwidth test results at mid frequency

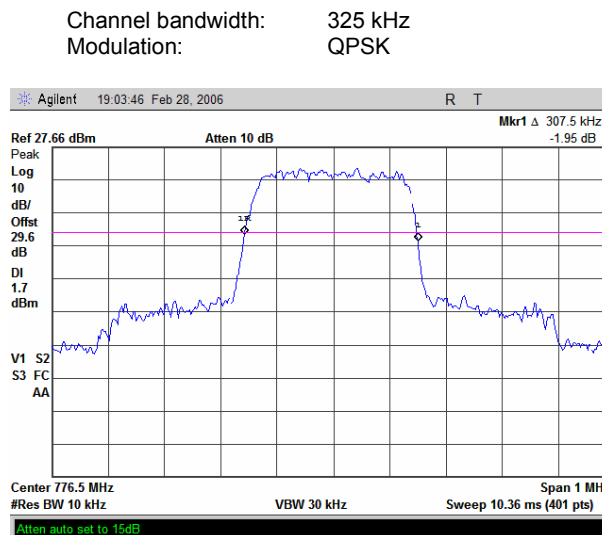


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.9 Occupied bandwidth test results at mid frequency



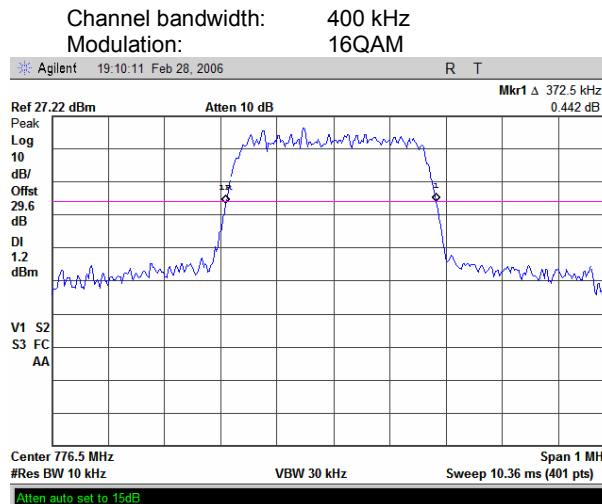
Plot 7.7.10 Occupied bandwidth test results at mid frequency



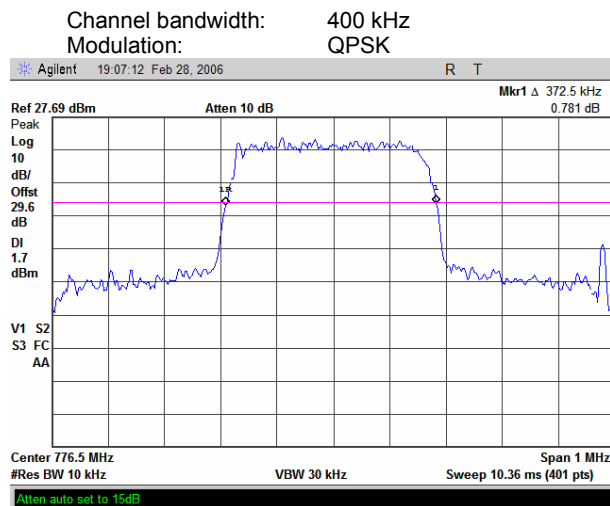


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.11 Occupied bandwidth test results at mid frequency

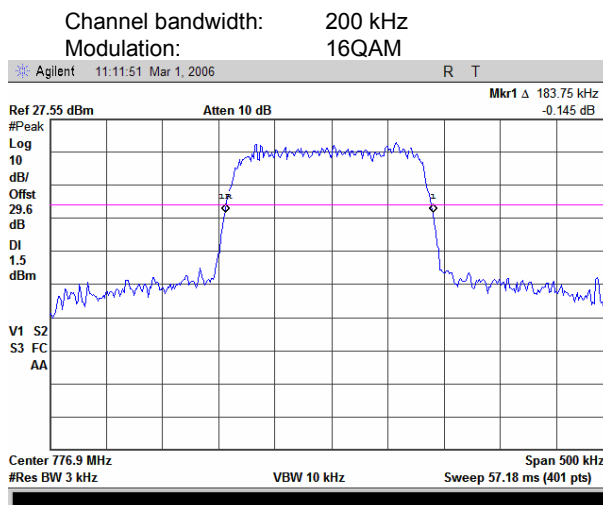


Plot 7.7.12 Occupied bandwidth test results at mid frequency

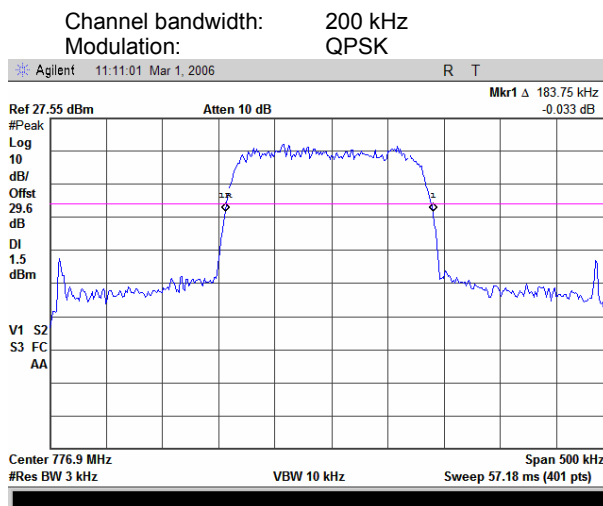


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.13 Occupied bandwidth test results at high frequency

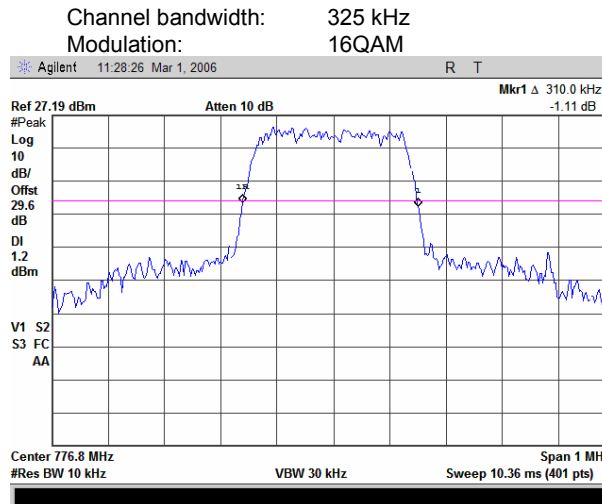


Plot 7.7.14 Occupied bandwidth test results at high frequency

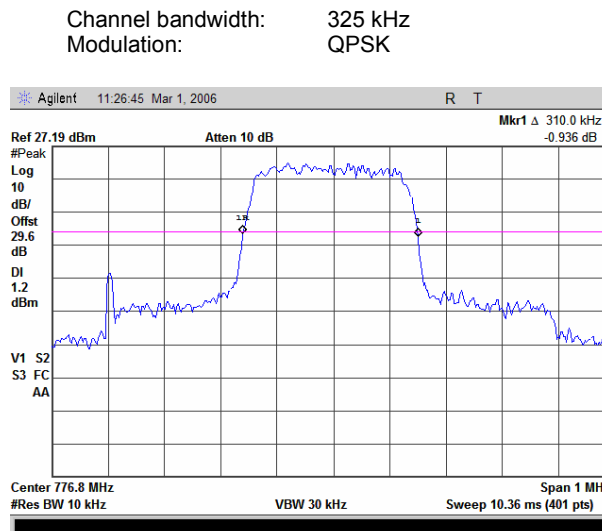


|                     |                                    |                         |                       |
|---------------------|------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 2.1049, Occupied bandwidth |                         |                       |
| Test procedure:     | 47 CFR, Section 2.1049             |                         |                       |
| Test mode:          | Compliance                         | Verdict:                | PASS                  |
| Date:               | 2/28/2006                          |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa             | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                    |                         |                       |

Plot 7.7.15 Occupied bandwidth test results at high frequency

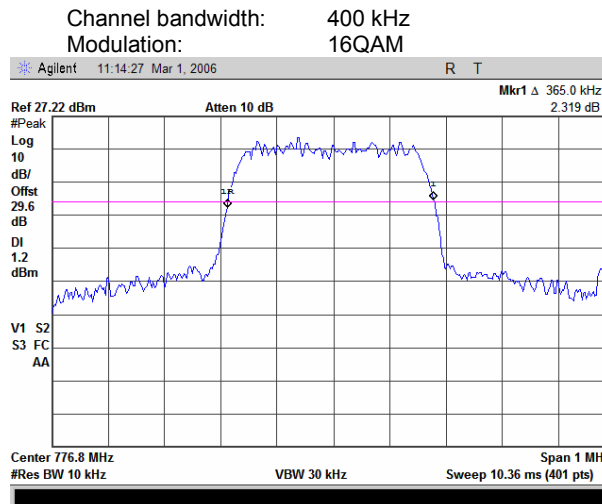


Plot 7.7.16 Occupied bandwidth test results at high frequency

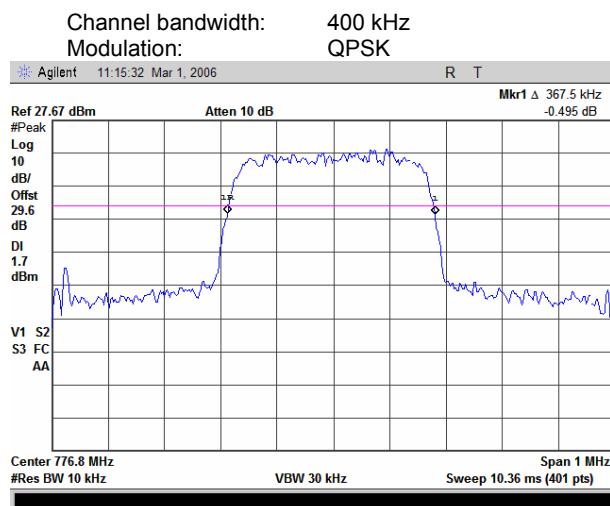


|                            |                                           |                                |                              |
|----------------------------|-------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 2.1049, Occupied bandwidth</b> |                                |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                                |                              |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 2/28/2006                                 |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa             | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                           |                                |                              |

Plot 7.7.17 Occupied bandwidth test results at high frequency



Plot 7.7.18 Occupied bandwidth test results at high frequency



|                            |                                                                     |                                |                              |
|----------------------------|---------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.107, Conducted emission at AC power port, Class B</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.5 and 12.1.3                                |                                |                              |
| <b>Test mode:</b>          | Compliance                                                          | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                                           |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                                       | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                     |                                |                              |

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

### 8.1 Conducted emissions

#### 8.1.1 General

This test was performed to measure common mode conducted emissions at the mains power port. The specification test limits are given in Table 8.1.1. The worst test results with respect to the limits were recorded in Table 8.1.2 and shown in the associated plots.

Table 8.1.1 Limits for conducted emissions

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

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

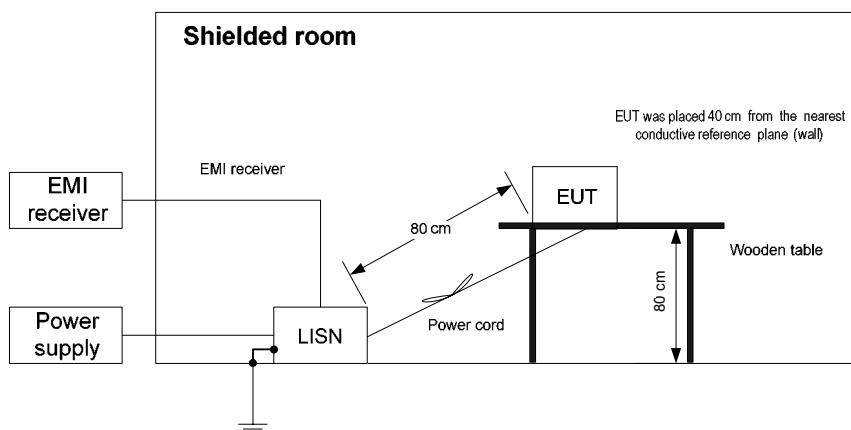
#### 8.1.2 Test procedure

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

8.1.2.2 The measurements were performed at the EUT power terminals with the LISN, connected to the EMI receiver in the frequency range referred to in Table 8.1.2. The unused coaxial connector of the LISN was terminated with 50 Ohm.

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

Figure 8.1.1 Setup for conducted emission measurements at the mains power port, table-top EUT



|                            |                                                                     |                                |                              |
|----------------------------|---------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.107, Conducted emission at AC power port, Class B</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.5 and 12.1.3                                |                                |                              |
| <b>Test mode:</b>          | Compliance                                                          | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                                           |                                |                              |
| <b>Temperature: 21 °C</b>  | <b>Air Pressure: 1010 hPa</b>                                       | <b>Relative Humidity: 46 %</b> | <b>Power Supply: 120 VAC</b> |
| <b>Remarks:</b>            |                                                                     |                                |                              |

**Table 8.1.2 Conducted emission test results**

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

| Frequency,<br>MHz        | Peak<br>emission,<br>dB(μV) | Quasi-peak                      |                  |                | Average                         |                  |                | Line ID | Verdict |
|--------------------------|-----------------------------|---------------------------------|------------------|----------------|---------------------------------|------------------|----------------|---------|---------|
|                          |                             | Measured<br>emission,<br>dB(μV) | Limit,<br>dB(μV) | Margin,<br>dB* | Measured<br>emission,<br>dB(μV) | Limit,<br>dB(μV) | Margin,<br>dB* |         |         |
| Standby / Receive, modem |                             |                                 |                  |                |                                 |                  |                |         |         |
| 0.152727                 | 57.41                       | 56.65                           | 65.87            | -9.22          | 45.83                           | 55.87            | -10.04         | L1      | Pass    |
| 0.293164                 | 43.68                       | 42.00                           | 60.48            | -18.48         | 29.56                           | 50.48            | -20.92         |         |         |
| 1.175221                 | 43.89                       | 42.12                           | 56.00            | -13.88         | 27.58                           | 46.00            | -18.42         |         |         |
| 1.372325                 | 41.69                       | 40.15                           | 56.00            | -15.85         | 22.52                           | 46.00            | -23.48         |         |         |
| 1.838811                 | 42.39                       | 40.05                           | 56.00            | -15.95         | 16.20                           | 46.00            | -29.80         |         |         |
| 3.602978                 | 41.67                       | 38.81                           | 56.00            | -17.19         | 21.38                           | 46.00            | -24.62         | L2      | Pass    |
| 0.153086                 | 56.85                       | 55.76                           | 65.85            | -10.09         | 42.98                           | 55.85            | -12.87         |         |         |
| 0.293217                 | 42.89                       | 41.71                           | 60.48            | -18.77         | 25.76                           | 50.48            | -24.72         |         |         |
| 0.592780                 | 36.56                       | 35.10                           | 56.00            | -20.90         | 22.67                           | 46.00            | -23.33         |         |         |
| 1.200452                 | 41.35                       | 39.43                           | 56.00            | -16.57         | 24.35                           | 46.00            | -21.65         |         |         |
| 1.365525                 | 36.47                       | 33.21                           | 56.00            | -22.79         | 19.04                           | 46.00            | -26.96         | L2      | Pass    |
| 3.424183                 | 32.84                       | 32.17                           | 56.00            | -23.83         | 12.73                           | 46.00            | -33.27         |         |         |
| Transmit, modem          |                             |                                 |                  |                |                                 |                  |                |         |         |
| 0.153047                 | 57.32                       | 56.49                           | 65.85            | -9.36          | 45.40                           | 55.85            | -10.45         | L1      | Pass    |
| 0.293032                 | 44.08                       | 41.87                           | 60.48            | -18.61         | 27.17                           | 50.48            | -23.31         |         |         |
| 1.195320                 | 43.69                       | 42.07                           | 56.00            | -13.93         | 27.24                           | 46.00            | -18.76         |         |         |
| 1.615914                 | 42.56                       | 39.06                           | 56.00            | -16.94         | 20.81                           | 46.00            | -25.19         |         |         |
| 1.833174                 | 43.25                       | 40.68                           | 56.00            | -15.32         | 24.42                           | 46.00            | -21.58         |         |         |
| 3.525614                 | 41.96                       | 38.79                           | 56.00            | -17.21         | 22.24                           | 46.00            | -23.76         | L2      | Pass    |
| 0.152908                 | 56.82                       | 56.00                           | 65.86            | -9.86          | 42.94                           | 55.86            | -12.92         |         |         |
| 0.293698                 | 42.74                       | 41.46                           | 60.46            | -19.00         | 27.15                           | 50.46            | -23.31         |         |         |
| 0.594479                 | 36.88                       | 35.45                           | 56.00            | -20.55         | 26.14                           | 46.00            | -19.86         |         |         |
| 0.762269                 | 36.84                       | 34.48                           | 56.00            | -21.52         | 22.01                           | 46.00            | -23.99         |         |         |
| 1.032667                 | 37.64                       | 35.90                           | 56.00            | -20.10         | 21.84                           | 46.00            | -24.16         | L2      | Pass    |
| 1.215128                 | 41.66                       | 39.11                           | 56.00            | -16.89         | 23.44                           | 46.00            | -22.56         |         |         |
| Transmit, laptop         |                             |                                 |                  |                |                                 |                  |                |         |         |
| 0.158472                 | 56.95                       | 50.00                           | 65.59            | -15.59         | 19.45                           | 55.59            | -36.14         | L1      | Pass    |
| 0.186628                 | 54.91                       | 46.93                           | 64.21            | -17.28         | 35.92                           | 54.21            | -18.29         |         |         |
| 0.194932                 | 54.14                       | 46.40                           | 63.85            | -17.45         | 34.47                           | 53.85            | -19.38         |         |         |
| 0.227115                 | 51.12                       | 43.59                           | 62.61            | -19.02         | 13.12                           | 52.61            | -39.49         |         |         |
| 0.700357                 | 43.06                       | 36.15                           | 56.00            | -19.85         | 34.02                           | 46.00            | -11.98         |         |         |
| 1.214099                 | 38.44                       | 34.80                           | 56.00            | -21.20         | 27.23                           | 46.00            | -18.77         | L2      | Pass    |
| 0.156380                 | 55.87                       | 47.84                           | 65.69            | -17.85         | 17.48                           | 55.69            | -38.21         |         |         |
| 0.187385                 | 53.58                       | 44.08                           | 64.18            | -20.10         | 35.10                           | 54.18            | -19.08         |         |         |
| 0.195662                 | 52.56                       | 42.94                           | 63.82            | -20.88         | 29.83                           | 53.82            | -23.99         |         |         |
| 0.235495                 | 47.48                       | 38.79                           | 62.29            | -23.50         | 8.82                            | 52.29            | -43.47         |         |         |
| 0.320576                 | 45.24                       | 37.78                           | 59.72            | -21.94         | 33.14                           | 49.72            | -16.58         | L2      | Pass    |
| 0.573655                 | 41.49                       | 37.00                           | 56.00            | -19.00         | 34.72                           | 46.00            | -11.28         |         |         |

\*- Margin = Measured emission - specification limit.

**Reference numbers of test equipment used**

|         |         |         |         |         |         |  |  |
|---------|---------|---------|---------|---------|---------|--|--|
| HL 0163 | HL 0447 | HL 0787 | HL 1430 | HL 1502 | HL 1510 |  |  |
|---------|---------|---------|---------|---------|---------|--|--|

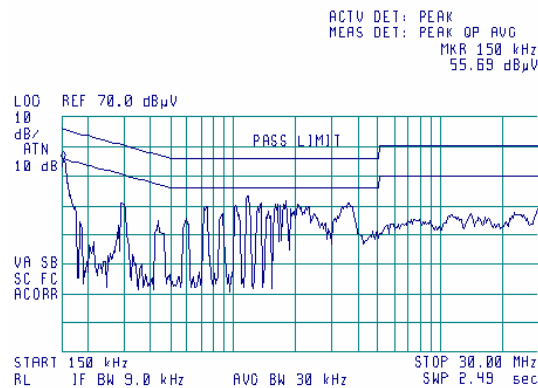
Full description is given in Appendix A.

|                     |                                                              |                         |                       |
|---------------------|--------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 15.107, Conducted emission at AC power port, Class B |                         |                       |
| Test procedure:     | ANSI C63.4, Sections 11.5 and 12.1.3                         |                         |                       |
| Test mode:          | Compliance                                                   | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                    |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                       | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                              |                         |                       |

Plot 8.1.1 Conducted emission measurements on the modem AC lines

LINE: L1  
EUT OPERATING MODE: Receive / Standby  
LIMIT: QUASI-PEAK, AVERAGE  
DETECTOR: PEAK

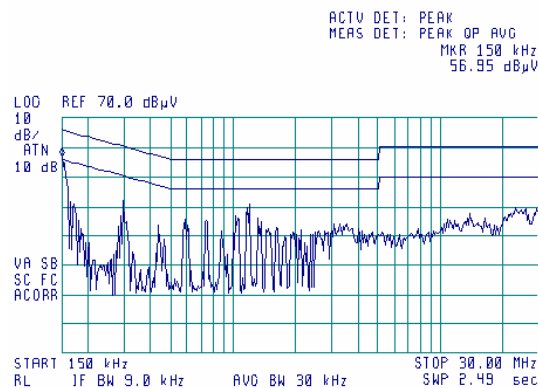
16:02:46 MAR 05, 2006



Plot 8.1.2 Conducted emission measurements on the modem AC lines

LINE: L2  
EUT OPERATING MODE: Receive / Standby  
LIMIT: QUASI-PEAK, AVERAGE  
DETECTOR: PEAK

16:11:00 MAR 05, 2006

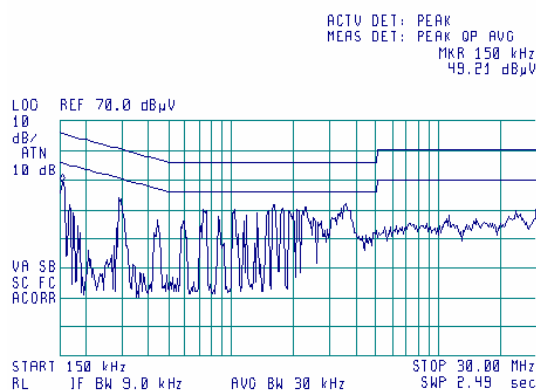


|                     |                                                              |                         |                       |
|---------------------|--------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 15.107, Conducted emission at AC power port, Class B |                         |                       |
| Test procedure:     | ANSI C63.4, Sections 11.5 and 12.1.3                         |                         |                       |
| Test mode:          | Compliance                                                   | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                    |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                       | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                              |                         |                       |

Plot 8.1.3 Conducted emission measurements on the modem AC lines

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

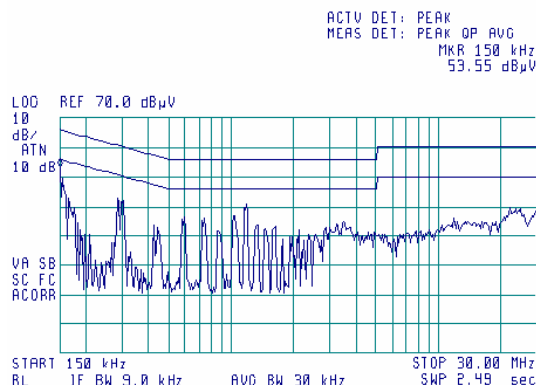
16:26:59 MAR 05, 2006



Plot 8.1.4 Conducted emission measurements on the modem AC lines

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

16:19:31 MAR 05, 2006



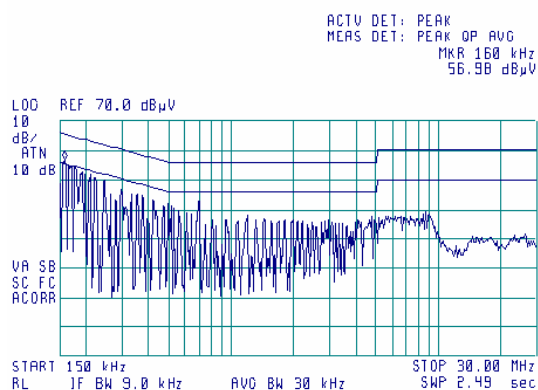


|                     |                                                              |                         |                       |
|---------------------|--------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 15.107, Conducted emission at AC power port, Class B |                         |                       |
| Test procedure:     | ANSI C63.4, Sections 11.5 and 12.1.3                         |                         |                       |
| Test mode:          | Compliance                                                   | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                                    |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                                       | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                                              |                         |                       |

Plot 8.1.5 Conducted emission measurements on the laptop AC lines

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

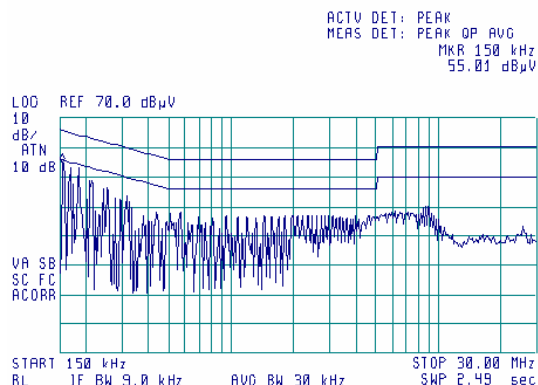
16:40:42 MAR 05, 2006



Plot 8.1.6 Conducted emission measurements on the laptop AC lines

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

16:49:36 MAR 05, 2006



|                            |                                                   |                                |                              |
|----------------------------|---------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, Radiated emission, Class B</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.6 and 12.1.4              |                                |                              |
| <b>Test mode:</b>          | Compliance                                        | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                         |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                     | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                   |                                |                              |

## 8.2 Radiated emission measurements

### 8.2.1 General

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

**Table 8.2.1 Radiated emission test limits**

| Frequency,<br>MHz | Class B limit,<br>dB(μV/m) |              |
|-------------------|----------------------------|--------------|
|                   | 10 m distance              | 3 m distance |
| 30 - 88           | 29.5*                      | 40.0         |
| 88 - 216          | 33.0*                      | 43.5         |
| 216 - 960         | 35.5*                      | 46.0         |
| Above 960         | 43.5*                      | 54.0         |

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

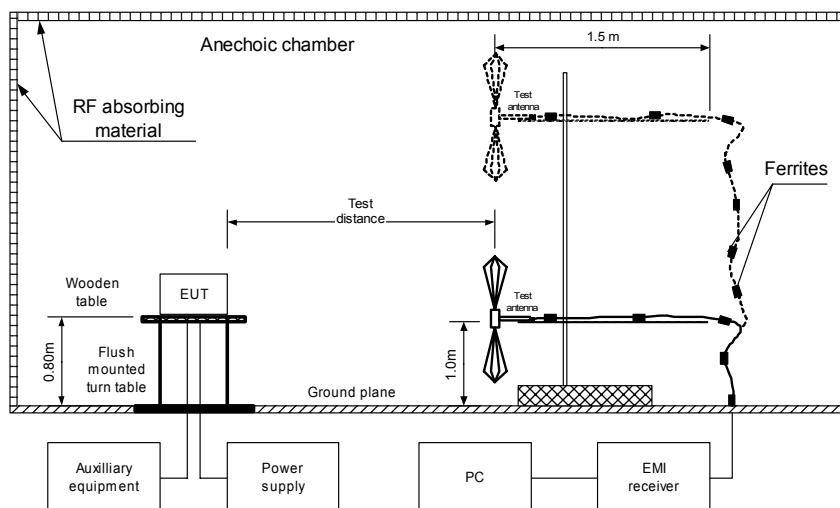
### 8.2.2 Test procedure

**8.2.2.1** The EUT was set up as shown in Figure 8.2.1, energized and the EUT performance was checked.

**8.2.2.2** The measurements were performed in the anechoic chamber at 3 m test distance. The specified frequency range was investigated with the antenna connected to the EMI receiver. To find the highest emission the turntable was rotated 360° and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal polarizations. The EUT cables position was varied to maximize emission.

**8.2.2.3** The worst test results with respect to the limits were recorded in Table 8.2.2 and shown in the associated plots.

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



|                            |                                                   |                                |                              |
|----------------------------|---------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, Radiated emission, Class B</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.6 and 12.1.4              |                                |                              |
| <b>Test mode:</b>          | Compliance                                        | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                         |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                     | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                   |                                |                              |

**Table 8.2.2 Radiated emission test results**

EUT SET UP: TABLE-TOP  
EUT OPERATING MODE: Receive / Standby  
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* |                      |                   |                                |         |
| 199.975000     | 26.63                   | 21.84                       | 43.5            | -21.66      | Horizontal           | 2.8               | 54                             | Pass    |
| 266.562500     | 33.13                   | 23.58                       | 46.0            | -22.42      | Horizontal           | 1.9               | 139                            |         |
| 326.114632     | 33.28                   | 29.97                       | 46.0            | -16.03      | Vertical             | 1.0               | 26                             |         |
| 333.250000     | 25.82                   | 20.89                       | 46.0            | -25.11      | Horizontal           | 3.4               | 97                             |         |
| 391.350000     | 31.40                   | 26.92                       | 46.0            | -19.08      | Vertical             | 1.0               | 202                            |         |
| 733.242500     | 35.96                   | 31.98                       | 46.0            | -14.02      | Horizontal           | 1.3               | 5                              |         |

DETECTORS USED: PEAK / AVERAGE  
FREQUENCY RANGE: 1000 MHz – 4000 MHz  
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* |                      |                   |                                |         |
| 1133.00000     | 49.77                   | 30.09                       | 54.00           | -23.91      | Vertical             | 1.0               | 130                            | Pass    |
| 1200.00000     | 44.58                   | 28.21                       | 54.00           | -25.79      | Horizontal           | 1.0               | 221                            | Pass    |

\*- Margin = Measured emission - specification limit.

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

**Reference numbers of test equipment used**

|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0784 | HL 0816 | HL 1365 | HL 1425 | HL 1430 | HL 1552 | HL 1553 | HL 1566 |
| HL 1567 | HL 1941 | HL 1947 | HL 1984 | HL 1984 | HL 2697 |         |         |

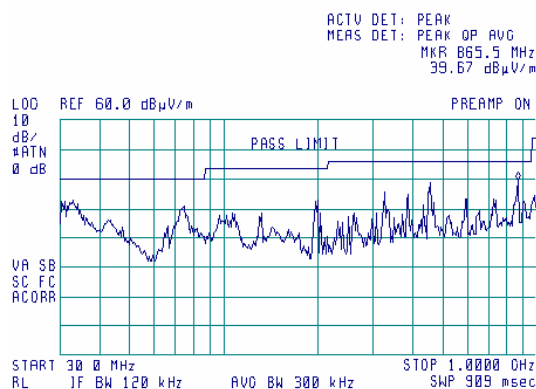
Full description is given in Appendix A.

|                     |                                            |                         |                       |
|---------------------|--------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 15.109, Radiated emission, Class B |                         |                       |
| Test procedure:     | ANSI C63.4, Sections 11.6 and 12.1.4       |                         |                       |
| Test mode:          | Compliance                                 | Verdict:                | PASS                  |
| Date:               | 3/05/2006                                  |                         |                       |
| Temperature: 21 °C  | Air Pressure: 1010 hPa                     | Relative Humidity: 46 % | Power Supply: 120 VAC |
| Remarks:            |                                            |                         |                       |

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

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive / Standby

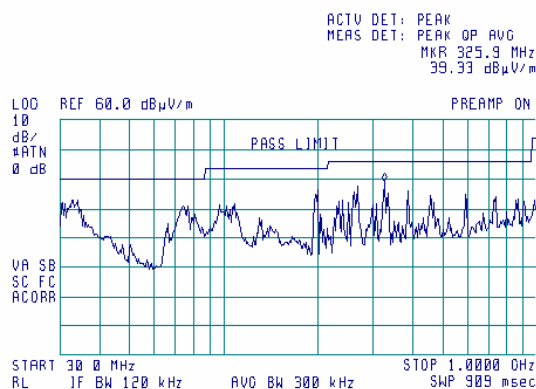
11:01:57 MAR 02, 2006



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

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive / Standby

11:06:00 MAR 02, 2006

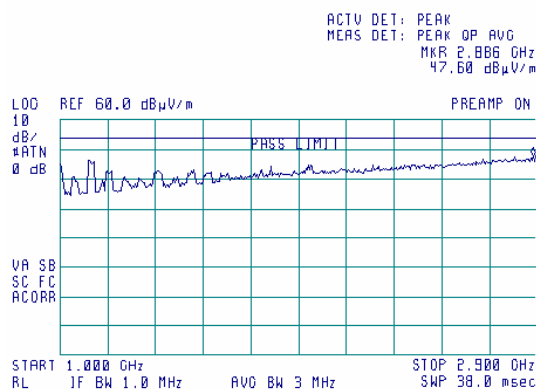


|                            |                                                   |                                |                              |
|----------------------------|---------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, Radiated emission, Class B</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.6 and 12.1.4              |                                |                              |
| <b>Test mode:</b>          | Compliance                                        | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                         |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                     | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                   |                                |                              |

**Plot 8.2.3 Radiated emission measurements in 1.0 – 2.9 GHz range, vertical antenna polarization**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive / Standby

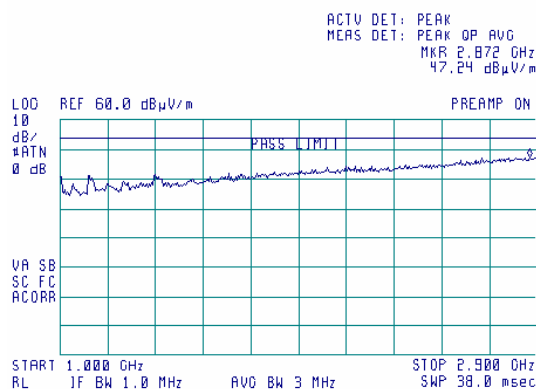
12:17:46 MAR 02, 2006



**Plot 8.2.4 Radiated emission measurements in 1.0 – 2.9 GHz range, horizontal antenna polarization**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive / Standby

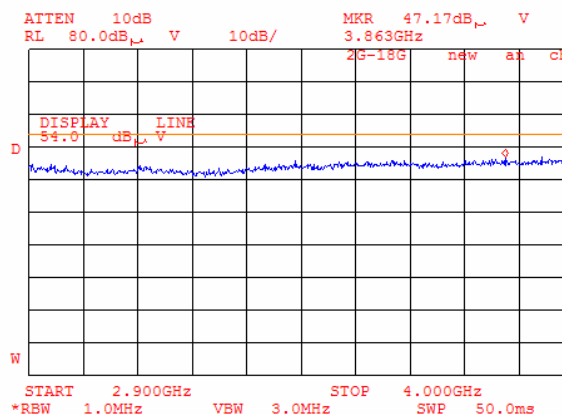
12:15:27 MAR 02, 2006



|                            |                                                   |                                |                              |
|----------------------------|---------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, Radiated emission, Class B</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.6 and 12.1.4              |                                |                              |
| <b>Test mode:</b>          | Compliance                                        | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 3/05/2006                                         |                                |                              |
| <b>Temperature:</b> 21 °C  | <b>Air Pressure:</b> 1010 hPa                     | <b>Relative Humidity:</b> 46 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                   |                                |                              |

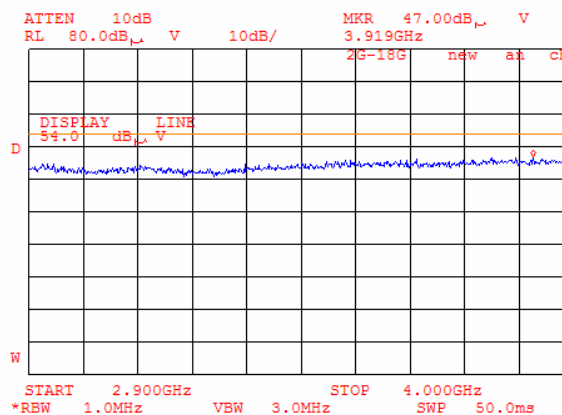
**Plot 8.2.5 Radiated emission measurements in 2.9 – 4.0 GHz range, vertical antenna polarization**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive / Standby



**Plot 8.2.6 Radiated emission measurements in 2.9 – 4.0GHz range, horizontal antenna polarization**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m  
EUT OPERATING MODE: Receive / Standby



|                            |                                                                    |                                |                              |
|----------------------------|--------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.111, Conducted emission at receiver antenna port</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Section 12.1.5                                         |                                |                              |
| <b>Test mode:</b>          | Compliance                                                         | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 11/25/2004                                                         |                                |                              |
| <b>Temperature:</b> 29 °C  | <b>Air Pressure:</b> 1012 hPa                                      | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                    |                                |                              |

### 8.3 Antenna power conducted measurements for receiver

#### 8.3.1 General

This test was performed to measure spurious emissions at RF antenna connector of receiver operated within 30 to 960 MHz band which was tested for compliance with radiated emission limits with the antenna port connected to resistive termination. The specification test limits are given in Table 8.3.1.

**Table 8.3.1 Spurious emission limits**

| Frequency, MHz                     | EUT type                 | Power of spurious |       |
|------------------------------------|--------------------------|-------------------|-------|
|                                    |                          | nW                | dBm   |
| 30 MHz – 2 <sup>nd</sup> harmonic* | Superheterodyne receiver | 2.0               | -57.0 |

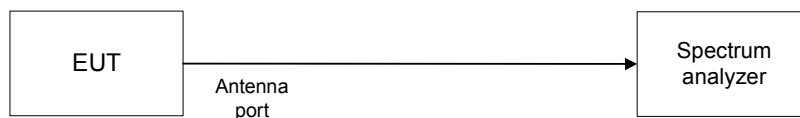
\* - harmonic of the local oscillator frequency.

#### 8.3.2 Test procedure

**8.3.2.1** The EUT was set up as shown in Figure 8.3.1, energized and its proper operation was checked.

**8.3.2.2** The spurious emission was measured with spectrum analyzer as provided in Table 8.3.2 and associated plots.

**Figure 8.3.1 Spurious emission test setup**



|                            |                                                                    |                                |                              |
|----------------------------|--------------------------------------------------------------------|--------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 15.111, Conducted emission at receiver antenna port</b> |                                |                              |
| <b>Test procedure:</b>     | ANSI C63.4, Section 12.1.5                                         |                                |                              |
| <b>Test mode:</b>          | Compliance                                                         | <b>Verdict:</b>                | <b>PASS</b>                  |
| <b>Date:</b>               | 11/25/2004                                                         |                                |                              |
| <b>Temperature:</b> 29 °C  | <b>Air Pressure:</b> 1012 hPa                                      | <b>Relative Humidity:</b> 36 % | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |                                                                    |                                |                              |

**Table 8.3.2 Spurious emission test results**

INVESTIGATED FREQUENCY RANGE: 30 – 1500 MHz  
 RECEIVER TYPE: Superheterodyne  
 EUT OPERATING MODE: Receive  
 DETECTOR USED: Peak  
 RESOLUTION BANDWIDTH: 1000 kHz  
 VIDEO BANDWIDTH: 3000 kHz

| Frequency, MHz | Spurious emission, dBm | Limit, dBm | Margin, dB | Verdict |
|----------------|------------------------|------------|------------|---------|
| 793.1          | -72.5                  | -57.0      | -15.5      | Pass    |

**Reference numbers of test equipment used**

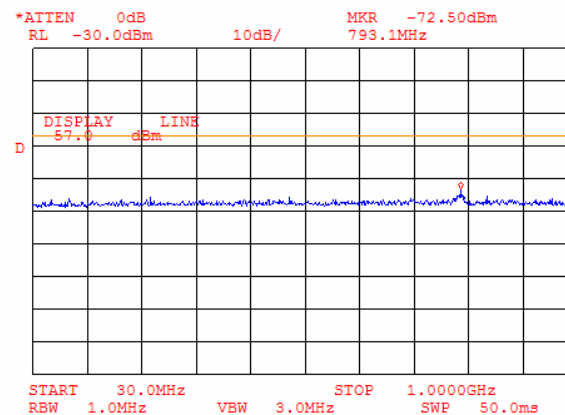
|         |         |  |  |  |  |  |  |
|---------|---------|--|--|--|--|--|--|
| HL 1424 | HL 2399 |  |  |  |  |  |  |
|---------|---------|--|--|--|--|--|--|

Full description is given in Appendix A.

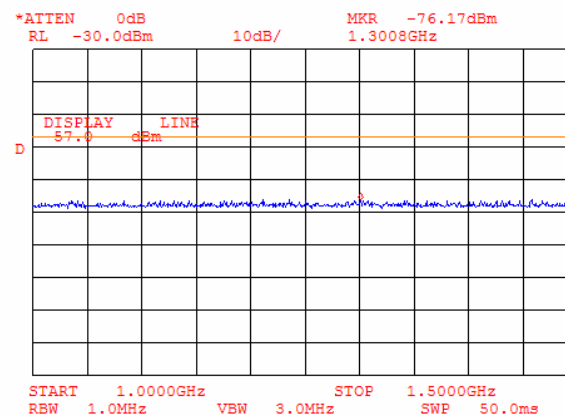


|                     |                                                             |                         |                       |
|---------------------|-------------------------------------------------------------|-------------------------|-----------------------|
| Test specification: | Section 15.111, Conducted emission at receiver antenna port |                         |                       |
| Test procedure:     | ANSI C63.4, Section 12.1.5                                  |                         |                       |
| Test mode:          | Compliance                                                  | Verdict:                | PASS                  |
| Date:               | 11/25/2004                                                  |                         |                       |
| Temperature: 29 °C  | Air Pressure: 1012 hPa                                      | Relative Humidity: 36 % | Power Supply: 120 VAC |
| Remarks:            |                                                             |                         |                       |

Plot 8.3.1 Spurious emission measurements in 30 to 1000 MHz range



Plot 8.3.2 Spurious emission measurements in 1000 to 1500 MHz range



## 9 APPENDIX A Test equipment and ancillaries used for tests

| HL No | Description                                                           | Manufacturer              | Model                   | Ser. No.                      | Last Cal. | Due Cal.  |
|-------|-----------------------------------------------------------------------|---------------------------|-------------------------|-------------------------------|-----------|-----------|
| 0163  | LISN FCC/VDE/MIL-STD                                                  | Electro-Metrics           | ANS 25/2                | 1314                          | 01-Oct-05 | 01-Oct-06 |
| 0190  | Power Meter, RF, -20 +10 dBm, 10 MHz - 10 GHz                         | Hewlett Packard           | 432A                    | 1507A14742                    | 17-Feb-06 | 17-Feb-07 |
| 0446  | Antenna, Loop active, 10kHz-30MHz                                     | EMCO                      | 6502                    | 2857                          | 28-Jun-05 | 28-Jun-06 |
| 0447  | LISN, 16/2, 300V RMS                                                  | HL                        | LISN 16 - 1             | 066                           | 03-Nov-05 | 03-Nov-06 |
| 0465  | Anechoic Chamber<br>9(L) x 6.5(W) x 5.5(H) m                          | HL                        | AC - 1                  | 023                           | 10-Oct-05 | 10-Oct-06 |
| 0493  | Oven temperature -45...175 deg C                                      | Thermotron                | S-1.2<br>Mini-Max       | 14016                         | 10-Oct-05 | 10-Oct-06 |
| 0521  | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz | Hewlett Packard           | 8546A                   | 3617A<br>00319,<br>3448A00253 | 10-Oct-05 | 10-Oct-06 |
| 0589  | Cable Coaxial, GORE A2P01POL118, 2.3 m                                | HL                        | GORE-3                  | 176                           | 10-Oct-05 | 10-Oct-06 |
| 0592  | Position Controller                                                   | HL                        | L2-SR3000<br>(HL CRL-3) | 100                           | 18-May-05 | 18-May-06 |
| 0593  | Antenna Mast, 1-4 m Pneumatic                                         | Madgesh                   | AM-F1                   | 101                           | 03-Feb-06 | 03-Feb-07 |
| 0594  | Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic         | HL                        | TT-WDC1                 | 102                           | 27-Jan-06 | 27-Jan-07 |
| 0604  | Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz                | EMCO                      | 3141                    | 9611-1011                     | 10-Oct-05 | 10-Oct-06 |
| 0613  | Sensor Electric Field 10 kHz-1.0 GHz, 1-300 V/m (probe), w/charger    | Amplifier Research        | FP2000                  | 18677                         | 10-Oct-05 | 10-Oct-06 |
| 0784  | Antenna X-WING BILOG<br>20 MHz - 2 GHz                                | Schaffner-Chase EMC       | CBL6140A                | 1120                          | 10-Oct-05 | 10-Oct-06 |
| 0787  | Transient Limiter                                                     | Hewlett Packard           | 11947A                  | 3107A01877                    | 10-Oct-05 | 10-Oct-06 |
| 0816  | Cable Coax RG-214 ,8 m, N-type connectors                             | HL                        | C214-8                  | 152                           | 10-Oct-05 | 10-Oct-06 |
| 1004  | Cable Coaxial , ANDREW PSWJ4 , 6m                                     | HL                        | ANDREW -6               | 163                           | 10-Oct-05 | 10-Oct-06 |
| 1097  | Attenuator, 50 Ohm, 5 W, DC to 8 GHz, 20 dB                           | Midwest Microwave         | 0793-20-NN-07           | 1097                          | 10-Oct-05 | 10-Oct-06 |
| 1200  | Quadruplexer 1-12 GHz (1-2 GHz; 2-4GHz;4-8 GHz; 8-12GHz)              | Elettronica S.p.A. - Roma | UE 84                   | D/00240                       | 10-Oct-05 | 10-Oct-06 |
| 1206  | One phase voltage regulator, 2kVA, 0-250V                             | HL                        | TDGC-2                  | 142                           | 04-Jun-05 | 04-Jun-06 |
| 1365  | Cable Coaxial, S-FLC 12-50, 5 m                                       | HL                        | C214-5                  | 1365                          | 04-Jun-05 | 04-Jun-06 |
| 1424  | Spectrum Analyzer, 30 Hz- 40 GHz                                      | Agilent Technologies (HP) | 8564EC                  | 3946A00219                    | 04-Jun-05 | 04-Jun-06 |
| 1425  | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427                 | Agilent Technologies (HP) | 8542E                   | 3710A00222,<br>3705A00204     | 04-Jun-05 | 04-Jun-06 |
| 1430  | EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432                 | Agilent Technologies (HP) | 8542E                   | 3807A00262,3705A00217         | 04-Jun-05 | 04-Jun-06 |

| HL No | Description                                                    | Manufacturer                                    | Model               | Ser. No.    | Last Cal.  | Due Cal.   |
|-------|----------------------------------------------------------------|-------------------------------------------------|---------------------|-------------|------------|------------|
| 1455  | Cable, 1 m                                                     | Harbour Industries                              | MIL 17/60-RG142     | 1455        | 11-Sep-05  | 11-Sep-06  |
| 1488  | Power Divider 0.5 - 18 GHz                                     | Omni Spectra                                    | 2090-6204-00        |             | 11-Sep-05  | 11-Sep-06  |
| 1502  | Cable RF, 6 m                                                  | Belden                                          | M17/167 MIL-C-17    | 1502        | 11-Sep-05  | 11-Sep-06  |
| 1510  | Cable RF, 8 m                                                  | Belden                                          | M17/167 MIL-C-17    | 1510        | 11-Sep-05  | 11-Sep-06  |
| 1523  | Cable RF, 2.3 m                                                | Telequis                                        | MIL-C-17F-RG 058 CU | 1523        | 11-Sep-05  | 11-Sep-06  |
| 1552  | Cable RF, 8 m                                                  | Alpha Wire                                      | RG-214              | 1552        | 11-Sep-05  | 11-Sep-06  |
| 1553  | Cable RF, 3.5 m                                                | Alpha Wire                                      | RG-214              | 1553        | 11-Sep-05  | 11-Sep-06  |
| 1566  | Cable RF, 2 m                                                  | Huber-Suhner                                    | Sucoflex 104PE      | 13094/4PE   | 11-Sep-05  | 11-Sep-06  |
| 1567  | Cable RF, 2 m                                                  | Huber-Suhner                                    | Sucoflex 104PE      | 13095/4PE   | 11-Sep-05  | 11-Sep-06  |
| 1629  | Isotropic Field Monitor                                        | Amplifier Research                              | FM2000              | 23308       | 13-Feb-06  | 13-Feb-07  |
| 1650  | Attenuators Set (2, 3, 5, 20 dB), DC-18 GHz                    | M/A-COM                                         | 2082                | 1650        | 13-Feb-06  | 13-Feb-07  |
| 1653  | Analyzer EMC 9 kHz - 1.5 GHz                                   | Agilent Technologies (HP)                       | E7401A              | US394402 81 | 13-Feb-06  | 13-Feb-07  |
| 1941  | Cable 18GHz, 4 m, green                                        | Rhophase Microwave Limited                      | SPS-1803A-4000-NPS  | T4657       | 13-Feb-06  | 13-Feb-07  |
| 1942  | Cable 18GHz, 4 m, blue                                         | Rhophase Microwave Limited                      | SPS-1803A-4000-NPS  | T4658       | 13-Feb-06  | 13-Feb-07  |
| 1947  | Cable 18GHz, 6.5 m, blue                                       | Rhophase Microwave Limited                      | NPS-1803A-6500-NPS  | T4974       | 13-Feb-06  | 13-Feb-07  |
| 1984  | Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type | EMC Test Systems                                | 3115                | 9911-5964   | 22-Mar-06  | 22-Mar-07  |
| 2009  | Cable RF, 8 m                                                  | Alpha Wire                                      | RG-214              | C-56        | 13-Feb-06  | 13-Feb-07  |
| 2109  | Anechoic Chamber 6(L) x 5.5(W) x 2.95(H) m                     | HL                                              | AC-2                | 2109        | 12-Dec-05  | 12-Dec-06  |
| 2399  | Cable 40GHz, 1.5 m, blue                                       | Rhophase Microwave Limited                      | KPS-1503A-1500-KPS  | X2946       | 24-Jun-05  | 24-Jun-06  |
| 2524  | Attenuator, 10 dB, DC-18 GHz                                   | Midwest Microwave                               | 263-10              | 2524        | 03-Jan-06  | 03-Jan-07  |
| 2697  | Antenna, 30 MHz - 3.0 GHz,                                     | Sunol Sciences Corp. Pleasanton, California USA | JB3                 | A022805     | 10-Mar-06  | 10-Mar-07  |
| 2868  | Cable, 18 GHz, 1.1 m, SMA - SMA, Right Angle                   | Gore                                            | NA                  | 91P72071    | 16-Febr-06 | 16-Febr-07 |

## 10 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

| Test description                                                        | Expanded uncertainty                                                                                                                                                                                |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transmitter tests</b>                                                |                                                                                                                                                                                                     |
| Carrier power conducted at antenna connector                            | ± 1.7 dB                                                                                                                                                                                            |
| Carrier power radiated (substitution method)                            | ± 4.5 dB                                                                                                                                                                                            |
| Occupied bandwidth                                                      | ±8%                                                                                                                                                                                                 |
| 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 |
| Spurious emissions radiated 30 MHz – 40 GHz (substitution method)       | ± 4.5 dB                                                                                                                                                                                            |
| Frequency stability                                                     | ± 168 Hz (0.56 ppm)                                                                                                                                                                                 |
| <b>Unintentional radiator tests</b>                                     |                                                                                                                                                                                                     |
| 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 | 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                                                                |
| Vertical polarization                                                   | 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                                                                |

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

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

## 11 APPENDIX C Test facility description

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

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## 12 APPENDIX D Specification references

|                               |                                                                                                                                                                      |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 47CFR part 27: 2005           | Miscellaneous wireless communications services                                                                                                                       |
| 47CFR part 1: 2005            | Practice and procedure                                                                                                                                               |
| 47CFR part 2: 2005            | Frequency allocations and radio treaty matters; general rules and regulations                                                                                        |
| 47CFR part 15 subpart B: 2005 | Radio Frequency Devices                                                                                                                                              |
| 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. |
| ANSI/TIA/EIA-603-A:2001       | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards                                                                                  |

## 13 APPENDIX E Abbreviations and acronyms

|          |                                             |
|----------|---------------------------------------------|
| A        | ampere                                      |
| AC       | alternating current                         |
| A/m      | ampere per meter                            |
| AM       | amplitude modulation                        |
| AVRG     | average (detector)                          |
| cm       | centimeter                                  |
| dB       | decibel                                     |
| dBm      | decibel referred to one milliwatt           |
| dB(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                              |
| EIRP     | equivalent isotropically radiated power     |
| ERP      | effective radiated power                    |
| EUT      | equipment under test                        |
| F        | frequency                                   |
| GHz      | gigahertz                                   |
| GND      | ground                                      |
| H        | height                                      |
| HL       | Hermon laboratories                         |
| Hz       | hertz                                       |
| ITE      | information technology equipment            |
| k        | kilo                                        |
| kHz      | kilohertz                                   |
| LISN     | line impedance stabilization network        |
| LO       | local oscillator                            |
| m        | meter                                       |
| MHz      | megahertz                                   |
| min      | minute                                      |
| mm       | millimeter                                  |
| ms       | millisecond                                 |
| μs       | microsecond                                 |
| NA       | not applicable                              |
| OATS     | open area test site                         |
| Ω        | Ohm                                         |
| QP       | quasi-peak                                  |
| PCB      | printed circuit board                       |
| PM       | pulse modulation                            |
| PS       | power supply                                |
| RE       | radiated emission                           |
| RF       | radio frequency                             |
| rms      | root mean square                            |
| Rx       | receive                                     |
| s        | second                                      |
| T        | temperature                                 |
| Tx       | transmit                                    |
| V        | volt                                        |

## 14 APPENDIX F Test equipment correction factors

Correction factor  
Line impedance stabilization network  
Model LISN 16 - 1  
Hermon Laboratories

| Frequency,<br>MHz | Correction factor,<br>dB |
|-------------------|--------------------------|
| 0.01              | 5.0                      |
| 0.02              | 2.2                      |
| 0.03              | 1.1                      |
| 0.04              | 0.7                      |
| 0.05              | 0.5                      |
| 0.1               | 0.2                      |
| 0.2               | 0.1                      |
| 0.4               | 0.1                      |
| 0.6               | 0.1                      |
| 0.8               | 0.1                      |
| 1                 | 0.1                      |
| 2                 | 0.1                      |
| 3                 | 0.1                      |
| 4                 | 0.1                      |
| 6                 | 0.2                      |
| 10                | 0.3                      |
| 12                | 0.4                      |
| 16                | 0.5                      |
| 18                | 0.6                      |
| 20                | 0.7                      |
| 25                | 0.9                      |
| 28                | 1.2                      |
| 30                | 1.3                      |

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

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

| Frequency,<br>MHz | Correction factor,<br>dB |
|-------------------|--------------------------|
| 0.01              | 4.7                      |
| 0.02              | 2.1                      |
| 0.03              | 1.1                      |
| 0.04              | 0.7                      |
| 0.05              | 0.5                      |
| 0.1               | 0.2                      |
| 0.2               | 0.1                      |
| 0.4               | 0.1                      |
| 0.6               | 0.1                      |
| 0.8               | 0.1                      |
| 1                 | 0.1                      |
| 2                 | 0.1                      |
| 3                 | 0.1                      |
| 4                 | 0.1                      |
| 6                 | 0.1                      |
| 10                | 0.1                      |
| 12                | 0.1                      |
| 16                | 0.1                      |
| 18                | 0.1                      |
| 20                | 0.1                      |
| 25                | 0.1                      |
| 28                | 0.1                      |
| 30                | 0.1                      |

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



**Antenna Factor**  
**Active Loop Antenna**  
**EMC Test Systems, model 6502, serial number 2857, HL 0446**

| Frequency,<br>MHz | Magnetic Antenna Factor,<br>dB(S/m) | Electric Antenna Factor,<br>dB(1/m) |
|-------------------|-------------------------------------|-------------------------------------|
| 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                               | 9.7                                 |
| 0.750             | -41.9                               | 9.6                                 |
| 1.000             | -41.4                               | 10.1                                |
| 2.000             | -41.5                               | 10.0                                |
| 3.000             | -41.4                               | 10.1                                |
| 4.000             | -41.4                               | 10.1                                |
| 5.000             | -41.5                               | 10.0                                |
| 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(S/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field intensity in dB( $\mu$ A/m).  
Antenna factor in dB(1/m) is to be added to receiver meter reading in dB( $\mu$ V) to convert it into field intensity in dB( $\mu$ V/m).

### Antenna factor

Biconilog antenna EMCO, model 3141, serial number 1011, HL 0604

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

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

**Antenna factor**  
**Double-ridged wave guide horn antenna**  
**EMC Test Systems, model 3115, serial no: 9911-5964, HL 1984**

| Frequency,<br>MHz | Antenna gain,<br>dBi | Antenna factor.<br>dB(1/m) |
|-------------------|----------------------|----------------------------|
| 1000.0            | 5.8                  | 24.5                       |
| 1500.0            | 9.0                  | 24.8                       |
| 2000.0            | 8.6                  | 27.7                       |
| 2500.0            | 9.5                  | 28.7                       |
| 3000.0            | 8.9                  | 30.8                       |
| 3500.0            | 8.2                  | 32.9                       |
| 4000.0            | 9.6                  | 32.7                       |
| 4500.0            | 11.2                 | 32.1                       |
| 5000.0            | 10.6                 | 33.6                       |
| 5500.0            | 9.8                  | 35.3                       |
| 6000.0            | 10.1                 | 35.7                       |
| 6500.0            | 10.7                 | 35.8                       |
| 7000.0            | 10.9                 | 36.2                       |
| 7500.0            | 10.5                 | 37.2                       |
| 8000.0            | 11.1                 | 37.2                       |
| 8500.0            | 10.8                 | 38.1                       |
| 9000.0            | 10.7                 | 38.6                       |
| 9500.0            | 11.5                 | 38.3                       |
| 10000.0           | 11.8                 | 38.4                       |
| 10500.0           | 12.3                 | 38.3                       |
| 11000.0           | 12.3                 | 38.8                       |
| 11500.0           | 11.5                 | 39.9                       |
| 12000.0           | 12.2                 | 39.6                       |
| 12500.0           | 12.6                 | 39.5                       |
| 13000.0           | 12.0                 | 40.5                       |
| 13500.0           | 11.7                 | 41.1                       |
| 14000.0           | 11.7                 | 41.5                       |
| 14500.0           | 12.7                 | 40.8                       |
| 15000.0           | 14.2                 | 39.5                       |
| 15500.0           | 16.0                 | 38.1                       |
| 16000.0           | 16.2                 | 38.1                       |
| 16500.0           | 14.5                 | 40.1                       |
| 17000.0           | 12.2                 | 42.6                       |
| 17500.0           | 9.7                  | 45.4                       |
| 18000.0           | 6.6                  | 48.7                       |

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

Antenna calibration  
Sunol Sciences Inc., model JB3, serial number A022805

| Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain | Frequency, MHz | ACF, dB | Gain, dBi | Num gain |
|----------------|---------|-----------|----------|----------------|---------|-----------|----------|----------------|---------|-----------|----------|----------------|---------|-----------|----------|----------------|---------|-----------|----------|
| 30             | 22.2    | -22.5     | 0.01     | 520            | 19.7    | 6.3       | 4.27     | 1215           | 24.9    | 7.0       | 5.05     | 1810           | 28.3    | 7.1       | 5.08     | 2405           | 30.9    | 6.9       | 4.93     |
| 35             | 18.5    | -17.4     | 0.02     | 525            | 19.7    | 6.5       | 4.42     | 1220           | 24.9    | 7.0       | 4.99     | 1815           | 28.5    | 6.9       | 4.91     | 2410           | 30.9    | 6.9       | 4.89     |
| 40             | 14.7    | -12.5     | 0.06     | 530            | 19.6    | 6.6       | 4.57     | 1225           | 25.1    | 6.9       | 4.91     | 1820           | 28.6    | 6.8       | 4.74     | 2415           | 31.0    | 6.9       | 4.85     |
| 45             | 11.3    | -8.1      | 0.16     | 535            | 19.7    | 6.5       | 4.48     | 1230           | 25.2    | 6.8       | 4.92     | 1825           | 28.7    | 6.8       | 4.76     | 2420           | 31.0    | 6.8       | 4.82     |
| 45             | 11.3    | -8.1      | 0.16     | 640            | 19.9    | 6.4       | 4.40     | 1235           | 25.1    | 7.0       | 4.96     | 1830           | 28.7    | 6.8       | 4.76     | 2425           | 31.1    | 6.8       | 4.81     |
| 50             | 8.9     | -4.7      | 0.34     | 645            | 19.9    | 6.5       | 4.45     | 1240           | 25.0    | 7.1       | 5.09     | 1835           | 28.7    | 6.7       | 4.72     | 2430           | 31.0    | 6.9       | 4.87     |
| 55             | 7.9     | -2.8      | 0.52     | 650            | 19.9    | 6.5       | 4.51     | 1245           | 25.0    | 7.1       | 5.12     | 1840           | 28.8    | 6.7       | 4.69     | 2435           | 31.0    | 6.9       | 4.88     |
| 60             | 7.8     | -2.1      | 0.62     | 655            | 19.9    | 6.6       | 4.60     | 1250           | 25.0    | 7.1       | 5.15     | 1845           | 28.6    | 6.9       | 4.90     | 2440           | 31.2    | 6.8       | 4.74     |
| 65             | 8.5     | -2.0      | 0.63     | 660            | 19.9    | 6.7       | 4.69     | 1255           | 25.0    | 7.2       | 5.25     | 1850           | 28.4    | 7.1       | 5.12     | 2445           | 31.1    | 6.9       | 4.91     |
| 70             | 9.0     | -1.9      | 0.64     | 665            | 19.9    | 6.7       | 4.70     | 1260           | 24.9    | 7.3       | 5.36     | 1855           | 28.5    | 7.0       | 5.07     | 2450           | 31.0    | 7.0       | 4.96     |
| 75             | 8.8     | -1.1      | 0.78     | 670            | 20.0    | 6.7       | 4.71     | 1265           | 25.0    | 7.3       | 5.31     | 1860           | 28.6    | 7.0       | 5.01     | 2455           | 31.0    | 7.0       | 5.01     |
| 80             | 8.4     | -0.2      | 0.97     | 675            | 20.1    | 6.7       | 4.71     | 1270           | 25.1    | 7.2       | 5.26     | 1865           | 28.5    | 7.1       | 5.17     | 2460           | 30.9    | 7.2       | 5.19     |
| 85             | 8.0     | 0.8       | 1.20     | 680            | 20.1    | 6.7       | 4.71     | 1275           | 25.3    | 7.0       | 5.05     | 1870           | 28.4    | 7.3       | 5.33     | 2465           | 31.1    | 6.9       | 4.95     |
| 90             | 8.2     | 1.1       | 1.22     | 685            | 20.1    | 6.8       | 4.79     | 1280           | 25.5    | 6.8       | 4.94     | 1875           | 28.5    | 7.2       | 5.28     | 2470           | 31.3    | 6.8       | 4.76     |
| 95             | 9.2     | 0.5       | 1.13     | 690            | 20.1    | 6.9       | 4.88     | 1285           | 25.4    | 7.0       | 4.97     | 1880           | 28.5    | 7.2       | 5.22     | 2475           | 31.4    | 6.7       | 4.69     |
| 100            | 10.6    | -0.4      | 0.92     | 695            | 20.2    | 6.8       | 4.82     | 1290           | 25.3    | 7.1       | 5.10     | 1885           | 28.5    | 7.2       | 5.22     | 2480           | 31.3    | 6.8       | 4.79     |
| 105            | 11.7    | -1.1      | 0.78     | 700            | 20.3    | 6.8       | 4.76     | 1295           | 25.3    | 7.2       | 5.22     | 1890           | 28.6    | 7.2       | 5.21     | 2485           | 31.1    | 7.0       | 5.00     |
| 110            | 12.6    | -1.6      | 0.70     | 705            | 20.4    | 6.8       | 4.75     | 1300           | 25.2    | 7.3       | 5.33     | 1895           | 28.6    | 7.2       | 5.24     | 2490           | 31.1    | 7.0       | 4.99     |
| 115            | 13.3    | -1.9      | 0.85     | 710            | 20.5    | 6.8       | 4.75     | 1305           | 25.6    | 7.0       | 5.21     | 1900           | 28.6    | 7.2       | 5.27     | 2495           | 31.2    | 7.0       | 4.99     |
| 120            | 13.9    | -2.1      | 0.62     | 715            | 20.5    | 6.8       | 4.80     | 1310           | 25.5    | 7.1       | 5.09     | 1905           | 28.5    | 7.3       | 5.36     | 2500           | 30.9    | 7.2       | 5.27     |
| 125            | 14.2    | -2.0      | 0.63     | 720            | 20.5    | 6.9       | 4.85     | 1315           | 25.4    | 7.2       | 5.23     | 1910           | 28.5    | 7.4       | 5.45     | 2505           | 31.1    | 7.1       | 5.15     |
| 130            | 14.2    | -1.7      | 0.68     | 725            | 20.6    | 6.8       | 4.81     | 1320           | 25.3    | 7.3       | 5.36     | 1915           | 28.5    | 7.3       | 5.38     | 2510           | 31.0    | 7.2       | 5.22     |
| 135            | 13.8    | -1.0      | 0.79     | 730            | 20.7    | 6.8       | 4.77     | 1325           | 25.5    | 7.2       | 5.21     | 1920           | 28.6    | 7.3       | 5.31     | 2515           | 31.0    | 7.2       | 5.26     |
| 140            | 13.4    | 0.3       | 0.94     | 735            | 20.9    | 6.7       | 4.65     | 1330           | 25.6    | 7.0       | 5.08     | 1925           | 28.6    | 7.3       | 5.36     | 2520           | 31.2    | 7.0       | 5.05     |
| 145            | 13.1    | 0.3       | 1.08     | 740            | 21.0    | 6.8       | 4.83     | 1335           | 25.7    | 7.1       | 5.07     | 1930           | 28.6    | 7.3       | 5.39     | 2525           | 30.8    | 7.4       | 5.54     |
| 150            | 12.9    | 0.8       | 1.21     | 745            | 21.0    | 6.8       | 4.59     | 1340           | 25.7    | 7.1       | 5.09     | 1935           | 28.5    | 7.4       | 5.54     | 2530           | 31.0    | 7.3       | 5.37     |
| 155            | 12.7    | 1.3       | 1.34     | 750            | 21.0    | 6.7       | 4.64     | 1345           | 25.7    | 7.1       | 5.13     | 1940           | 28.4    | 7.6       | 5.70     | 2535           | 31.2    | 7.0       | 5.08     |
| 160            | 12.7    | 1.6       | 1.44     | 755            | 21.0    | 6.8       | 4.74     | 1350           | 25.7    | 7.1       | 5.17     | 1945           | 28.5    | 7.5       | 5.59     | 2540           | 31.2    | 7.1       | 5.09     |
| 165            | 12.5    | 2.0       | 1.59     | 760            | 21.0    | 6.8       | 4.63     | 1355           | 25.8    | 7.0       | 5.12     | 1950           | 28.5    | 7.5       | 5.48     | 2545           | 31.0    | 7.3       | 4.43     |
| 170            | 12.2    | 2.6       | 1.83     | 765            | 21.1    | 6.8       | 4.73     | 1360           | 25.9    | 6.9       | 4.95     | 1955           | 28.6    | 7.5       | 5.57     | 2550           | 31.0    | 7.3       | 5.39     |
| 175            | 11.8    | 3.3       | 2.13     | 770            | 21.3    | 6.7       | 4.64     | 1365           | 26.0    | 6.9       | 4.95     | 1960           | 28.6    | 7.5       | 5.65     | 2555           | 31.1    | 7.2       | 5.30     |
| 180            | 11.6    | 3.7       | 2.36     | 775            | 21.3    | 6.7       | 4.68     | 1370           | 26.0    | 7.0       | 4.96     | 1965           | 28.7    | 7.4       | 5.47     | 2560           | 31.0    | 7.4       | 5.47     |
| 185            | 11.5    | 4.0       | 2.54     | 780            | 21.3    | 6.7       | 4.72     | 1375           | 26.0    | 7.0       | 5.01     | 1970           | 28.9    | 7.2       | 5.29     | 2565           | 30.8    | 7.6       | 5.70     |
| 190            | 11.6    | 4.2       | 2.61     | 785            | 21.3    | 6.7       | 4.75     | 1380           | 26.0    | 7.2       | 5.08     | 1975           | 28.9    | 7.2       | 5.27     | 2570           | 31.1    | 7.3       | 5.37     |
| 195            | 12.1    | 3.9       | 2.47     | 790            | 21.3    | 6.8       | 4.82     | 1385           | 26.0    | 7.0       | 4.99     | 1980           | 29.0    | 7.1       | 5.16     | 2575           | 31.5    | 7.0       | 4.96     |
| 200            | 13.1    | 3.2       | 2.07     | 795            | 21.4    | 6.8       | 4.79     | 1390           | 26.1    | 6.9       | 4.92     | 1985           | 29.1    | 7.1       | 5.11     | 2580           | 31.6    | 6.9       | 4.87     |
| 205            | 12.0    | 4.4       | 2.76     | 800            | 21.5    | 6.8       | 4.77     | 1395           | 26.2    | 6.9       | 4.94     | 1990           | 29.1    | 7.0       | 5.06     | 2585           | 31.8    | 6.8       | 4.79     |
| 210            | 11.0    | 5.6       | 3.66     | 805            | 21.6    | 6.7       | 4.71     | 1400           | 26.2    | 7.0       | 4.96     | 1995           | 29.1    | 7.1       | 5.09     | 2590           | 31.6    | 6.9       | 4.88     |
| 215            | 11.3    | 5.8       | 3.59     | 810            | 21.7    | 6.7       | 4.65     | 1405           | 26.1    | 7.0       | 5.02     | 2000           | 29.1    | 7.1       | 5.11     | 2595           | 31.5    | 7.0       | 4.97     |
| 220            | 11.6    | 5.5       | 3.32     | 815            | 21.7    | 6.7       | 4.72     | 1410           | 26.1    | 7.1       | 5.09     | 2005           | 29.1    | 7.1       | 5.16     | 2600           | 31.6    | 6.9       | 4.86     |
| 225            | 11.7    | 5.5       | 3.55     | 820            | 21.7    | 6.8       | 4.80     | 1415           | 26.2    | 7.0       | 5.02     | 2010           | 29.1    | 7.1       | 5.15     | 2605           | 31.3    | 7.2       | 5.30     |
| 230            | 11.9    | 5.5       | 3.57     | 825            | 21.7    | 6.8       | 4.82     | 1420           | 26.3    | 7.0       | 4.96     | 2015           | 29.2    | 7.1       | 5.13     | 2610           | 31.4    | 7.1       | 5.15     |
| 235            | 12.1    | 5.5       | 3.56     | 830            | 21.7    | 6.9       | 4.85     | 1425           | 26.2    | 7.1       | 5.10     | 2020           | 29.2    | 7.1       | 5.18     | 2615           | 31.7    | 6.9       | 4.88     |
| 240            | 12.3    | 5.5       | 3.54     | 835            | 21.8    | 6.8       | 4.82     | 1430           | 26.1    | 7.2       | 5.25     | 2025           | 29.3    | 7.1       | 5.08     | 2620           | 31.6    | 7.0       | 4.97     |
| 245            | 12.3    | 5.7       | 3.71     | 840            | 21.9    | 6.8       | 4.80     | 1435           | 26.1    | 7.2       | 5.24     | 2030           | 29.3    | 7.0       | 5.05     | 2625           | 31.4    | 7.1       | 5.17     |
| 250            | 12.3    | 5.9       | 3.88     | 845            | 21.9    | 6.8       | 4.83     | 1440           | 26.2    | 7.2       | 5.24     | 2035           | 29.3    | 7.1       | 5.07     | 2630           | 31.6    | 7.0       | 5.00     |
| 255            | 12.7    | 5.8       | 3.83     | 850            | 22.0    | 6.8       | 4.80     | 1450           | 26.5    | 7.0       | 4.98     | 2045           | 29.2    | 7.2       | 5.23     | 2640           | 31.7    | 7.0       | 4.98     |
| 260            | 13.7    | 5.2       | 3.27     | 855            | 22.0    | 6.9       | 4.92     | 1460           | 26.4    | 7.1       | 5.17     | 2055           | 29.3    | 7.2       | 5.21     | 2650           | 31.8    | 6.9       | 4.85     |
| 275            | 13.7    | 5.3       | 3.39     | 870            | 21.9    | 7.1       | 5.11     | 1465           | 26.4    | 7.2       | 5.19     | 2060           | 29.5    | 7.0       | 5.02     | 2655           | 31.8    | 6.9       | 4.85     |
| 280            | 13.7    | 5.4       | 3.50     | 875            | 22.0    | 7.1       | 5.08     | 1470           | 26.4    | 7.2       | 5.22     | 2065           | 29.4    | 7.1       | 5.08     | 2660           | 31.7    | 7.0       | 5.02     |
| 285            | 13.7    | 5.6       | 3.61     | 880            | 22.1    | 7.0       | 5.05     | 1475           | 26.4    | 7.1       | 5.17     | 2070           | 29.4    | 7.1       | 5.10     | 2665           | 32.0    | 6.7       | 4.71     |
| 290            | 13.7    | 5.7       | 3.72     | 885            | 22.1    | 7.0       | 5.06     | 1480           | 26.5    | 7.1       | 5.12     | 2075           | 29.5    | 7.0       | 5.01     | 2670           | 32.0    | 6.7       | 4.67     |
| 295            | 13.8    | 5.8       | 3.77     | 890            | 22.1    | 7.0       | 5.06     | 1485           | 26.5    | 7.1       | 5.14     | 2080           | 29.8    | 6.8       | 4.76     | 2675           | 31.9    | 6.8       | 4.81     |
| 300            | 13.9    | 5.8       | 3.81     | 895            | 22.2    | 7.1       | 5.09     | 1490           | 26.5    | 7.1       | 5.17     | 2085           | 29.7    | 6.9       | 4.89     | 2680           | 31.7    | 7.0       | 5.04     |
| 305            | 14.0    | 5.9       | 3.85     | 900            | 22.2    | 7.1       | 5.12     | 1495           | 26.5    | 7.2       | 5.24     | 2090           | 29.7    | 6.9       | 4.86     | 2685           | 31.9    | 6.8       | 4.83     |
| 310            | 14.1    | 5.9       | 3.88     | 905            | 22.3    | 7.1       | 5.09     | 1500           | 26.5    | 7.2       | 5.31     | 2095           | 29.8    | 6.8       | 4.78     | 2690           | 32.1    | 6.7       | 4.72     |
| 315            | 14.3    | 5.9       | 3.89     | 910            | 22.3    | 7.0       | 5.05     | 1505           | 26.5    | 7.2       | 5.27     | 2100           | 29.9    | 6.8       | 4.75     | 2695           | 32.1    | 6.7       | 4.71     |
| 320            | 14.4    | 5.9       | 3.90     | 915            | 22.4    | 7.0       | 4.99     | 1510           | 26.6    | 7.2       | 5.23     | 2105           | 29.8    | 6.8       | 4.81     | 2700           | 32.0    | 6.8       | 4.81     |
| 325            | 14.5    | 5.9       | 3.92     | 920            | 22.6    | 6.9       | 4.92     | 1515           | 26.6    | 7.2       | 5.30     | 2110           | 29.9    | 6.8       | 4.78     | 2705           | 32.0    | 6.8       | 4.80     |
| 330            | 14.6    | 5.9       | 3.93     | 925            | 22.7    | 6.9       | 4.85     | 1520           | 26.5    | 7.3       | 5.38     | 2115           | 29.9    | 6.8       | 4.76     | 2710           | 32.1    | 6.8       | 4.79     |
| 335            | 14.7    | 6.0       | 4.02     | 930            | 22.8    | 6.8       | 4.77     | 1525           | 26.6    | 7.3       | 5.37     | 2120           | 29.9    | 6.8       | 4.84     | 2715           | 32.1    | 6.7       | 4.71     |
| 340            | 14.7    | 6.2       | 4.12     | 935            | 22.8    | 6.8       | 4.83     | 1530           | 26.6    | 7.3       | 5.36     | 2125           | 29.9    | 6.9       | 4.89     | 2720           | 32.4    | 6.5       | 4.47     |
| 345            | 14.9    | 6.1       | 4.06     | 940            | 22.8    | 6.9       | 4.89     | 1535           | 26.6    | 7.4       | 5.44     | 2130           | 29.9    | 6.9       | 4.90     | 2725           | 32.2    | 6.7       | 4.63     |
| 350            | 15.1    | 6.0       | 3.98     | 945            | 22.8    | 6.9       | 4.87     | 1540           | 26.5    | 7.3       | 5.33     | 2135           | 29.8    | 6.9       | 4.94     | 2730           | 31.9    | 7.0       | 5.05     |
| 355            | 15.6    | 5.8       | 3.78     | 950            | 23.0    | 6.8       | 4.81     | 1550           | 26.5    | 7.5       | 5.63     | 2145           | 29.9    | 6.9       | 4.92     | 2740           | 31.6    | 7.1       | 5.46     |
| 365            | 15.5    | 5.9       | 3.89     | 960            | 23.1    | 6.8       | 4.77     | 1555           | 26.7    | 7.3       | 5.39     | 2150           | 29.9    | 7.0       | 4.98     | 2745           | 31.9    | 7.0       | 5.06     |
| 370            | 15.5    | 6.0       | 4.01     | 965            | 23.1    | 6.7       | 4.73     | 1560           | 26.9    | 7.1       | 5.16     | 2155           | 29.8    | 7.1       | 5.10     | 2750           | 32.0    | 6.9       | 4.94     |
| 375            | 15.6    | 6.1       | 4.03     | 970            | 23.2    | 6.7       | 4.69     | 1565           | 26.9    | 7.2       | 5.23     | 2160           | 29.8    | 7.1       | 5.09     | 2755           | 32.0    | 7.0       | 5.08     |
|                |         |           |          |                |         |           |          |                |         |           |          |                |         |           |          |                |         |           |          |

**Cable loss**

Cable coaxial, GORE A2P01POL118, 2.3 m, model GORE-3, serial number 176, HL 0589

+ Cable coaxial, ANDREW PSWJ4, 6 m, model: ANDREW-6, serial number 163, HL 1004

| No. | Frequency,<br>MHz | Cable loss,<br>dB | Tolerance<br>(Specification),<br>dB | Measurement<br>uncertainty,<br>dB |
|-----|-------------------|-------------------|-------------------------------------|-----------------------------------|
| 1   | 30                | 0.33              | ≤ 6.5                               | ±0.12                             |
| 2   | 50                | 0.40              |                                     |                                   |
| 3   | 100               | 0.57              |                                     |                                   |
| 4   | 300               | 0.97              |                                     |                                   |
| 5   | 500               | 1.25              |                                     |                                   |
| 6   | 800               | 1.59              |                                     |                                   |
| 7   | 1000              | 1.81              |                                     |                                   |
| 8   | 1200              | 1.97              |                                     |                                   |
| 9   | 1400              | 2.15              |                                     |                                   |
| 10  | 1600              | 2.28              |                                     |                                   |
| 11  | 1800              | 2.43              |                                     |                                   |
| 12  | 2000              | 2.61              |                                     |                                   |
| 13  | 2200              | 2.75              |                                     |                                   |
| 14  | 2400              | 2.89              |                                     |                                   |
| 15  | 2600              | 2.97              |                                     |                                   |
| 16  | 2800              | 3.21              | ≤ 6.5                               | ±0.12                             |
| 17  | 3000              | 3.32              |                                     | ±0.17                             |
| 18  | 3300              | 3.47              |                                     |                                   |
| 19  | 3600              | 3.62              |                                     |                                   |
| 20  | 3900              | 3.84              |                                     |                                   |
| 21  | 4200              | 3.92              |                                     |                                   |
| 22  | 4500              | 4.07              |                                     |                                   |
| 23  | 4800              | 4.36              |                                     |                                   |
| 24  | 5100              | 4.62              |                                     |                                   |
| 25  | 5400              | 4.78              |                                     |                                   |
| 26  | 5700              | 5.16              |                                     |                                   |
| 27  | 6000              | 5.67              |                                     |                                   |
| 28  | 6500              | 5.99              |                                     |                                   |

**Cable loss**  
**RF cable 8 m, model RG-214-8m, HL 1552**

| No. | Frequency,<br>MHz | Cable loss,<br>dB | Measurement uncertainty,<br>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**  
**RF cable 3.5 m, Alpha Wire, model RG-214, S/N 149, HL 1553**

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



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

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

**Cable loss**  
**Cable RF, 2 m, model: Sucoflex 104PE, s/n 13095/4PE, HL 1567**

| No. | Frequency,<br>MHz | Cable loss,<br>dB |
|-----|-------------------|-------------------|
| 1   | 30                | 0.09              |
| 2   | 50                | 0.15              |
| 3   | 100               | 0.23              |
| 4   | 300               | 0.31              |
| 5   | 500               | 0.46              |
| 6   | 800               | 0.63              |
| 7   | 1000              | 0.67              |
| 8   | 1500              | 0.89              |
| 9   | 2000              | 1.05              |
| 10  | 2500              | 1.18              |
| 11  | 300               | 1.26              |
| 12  | 5300              | 1.51              |
| 13  | 4000              | 1.66              |
| 14  | 4500              | 1.61              |
| 15  | 5000              | 1.67              |
| 16  | 5500              | 1.91              |
| 17  | 6000              | 1.98              |
| 18  | 6500              | 1.91              |
| 19  | 7000              | 2.04              |
| 20  | 7500              | 2.36              |
| 21  | 8000              | 2.36              |
| 22  | 8500              | 2.61              |
| 23  | 9000              | 2.69              |
| 24  | 9500              | 2.62              |
| 25  | 10000             | 2.73              |
| 26  | 10500             | 2.83              |
| 27  | 11000             | 2.84              |
| 28  | 11500             | 3.22              |
| 29  | 12000             | 3.17              |
| 30  | 12500             | 3.17              |
| 31  | 13000             | 3.18              |
| 32  | 13500             | 3.49              |
| 33  | 14000             | 3.43              |
| 34  | 14500             | 3.57              |
| 35  | 15000             | 3.76              |
| 36  | 15500             | 4.20              |
| 37  | 16000             | 4.10              |
| 38  | 16500             | 4.49              |
| 39  | 17000             | 4.53              |
| 40  | 17500             | 4.46              |
| 41  | 18000             | 4.47              |

**Cable loss**  
**Cable 18 GHz, 4 m, green, model: SPS-1803A-4000-NPS, S/N T4657, HL 1941**

| Frequency,<br>GHz | Cable loss,<br>dB |
|-------------------|-------------------|
| 0.03              | 0.39              |
| 0.05              | 0.49              |
| 0.1               | 0.68              |
| 0.2               | 0.95              |
| 0.3               | 1.30              |
| 0.5               | 1.58              |
| 0.7               | 1.84              |
| 0.9               | 2.08              |
| 1.1               | 2.28              |
| 1.3               | 2.56              |
| 1.5               | 2.91              |
| 1.7               | 2.95              |
| 1.9               | 3.17              |
| 2.1               | 3.22              |
| 2.3               | 3.25              |
| 2.5               | 3.39              |
| 2.7               | 3.51              |
| 2.9               | 3.67              |
| 3.1               | 3.81              |
| 3.3               | 3.92              |
| 3.5               | 4.05              |
| 3.7               | 4.14              |
| 3.9               | 4.30              |
| 4.1               | 4.44              |
| 4.3               | 4.55              |
| 4.5               | 4.68              |
| 4.7               | 4.75              |
| 4.9               | 4.84              |
| 5.1               | 4.86              |
| 5.3               | 4.89              |
| 5.5               | 5.00              |
| 5.7               | 5.05              |
| 5.9               | 5.19              |
| 6.1               | 5.28              |
| 7.7               | 5.58              |

| Frequency,<br>GHz | Cable loss,<br>dB |
|-------------------|-------------------|
| 7.9               | 5.63              |
| 8.1               | 5.67              |
| 8.3               | 5.70              |
| 8.5               | 5.74              |
| 8.7               | 5.78              |
| 8.9               | 5.84              |
| 9.1               | 5.89              |
| 9.3               | 5.94              |
| 9.5               | 6.02              |
| 9.7               | 6.10              |
| 9.9               | 6.12              |
| 10.1              | 6.09              |
| 10.3              | 6.03              |
| 10.5              | 6.01              |
| 10.7              | 6.05              |
| 10.9              | 6.08              |
| 11.1              | 6.10              |
| 11.3              | 6.18              |
| 11.5              | 6.23              |
| 11.7              | 6.20              |
| 11.9              | 6.16              |
| 12.1              | 6.18              |
| 12.4              | 6.33              |
| 13.0              | 6.51              |
| 13.5              | 6.51              |
| 14.0              | 6.75              |
| 14.5              | 6.82              |
| 15.0              | 6.93              |
| 15.5              | 7.16              |
| 16.0              | 7.10              |
| 16.5              | 7.18              |
| 17.0              | 7.67              |
| 17.5              | 7.71              |
| 18.0              | 7.61              |

**Cable loss**  
**Cable 18 GHz, 4 m, blue, model SPS-1803A-4000-NPS, serial number T4658, HL 1942**

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

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

**Cable loss**

**Cable 18 GHz, 6.5 m, blue, model NPS-1803A-6500-NPS, serial number T4974, HL 1947**

| Frequency,<br>GHz | Insertion loss,<br>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,<br>GHz | Insertion loss,<br>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, serial number C-56, HL 2009**

| No. | Frequency,<br>MHz | Cable loss,<br>dB | Tolerance (Specification),<br>dB | Measurement uncertainty,<br>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 coaxial, 6 m, model: M17/167 MIL-C-17, HL 1502**

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

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

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

**Cable loss**

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

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



**Cable loss**  
**Cable coaxial, Gore, 18 GHz, 1.1 m, SMA - SMA, model Right Angle,**  
**HL 2868**

| Frequency,<br>GHz | Cable loss,<br>dB | Frequency,<br>GHz | Cable loss,<br>dB | Frequency,<br>GHz | Cable loss,<br>dB |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 10                | 0.06              | 5750              | 0.82              | 12000             | 1.27              |
| 30                | 0.06              | 6000              | 0.84              | 12250             | 1.28              |
| 100               | 0.09              | 6250              | 0.85              | 12500             | 1.30              |
| 250               | 0.17              | 6500              | 0.89              | 12750             | 1.32              |
| 500               | 0.22              | 6750              | 0.90              | 13000             | 1.36              |
| 750               | 0.27              | 7000              | 0.96              | 13250             | 1.35              |
| 1000              | 0.30              | 7250              | 0.95              | 13500             | 1.36              |
| 1250              | 0.35              | 7500              | 0.97              | 13750             | 1.35              |
| 1500              | 0.37              | 7750              | 0.98              | 14000             | 1.39              |
| 1750              | 0.43              | 8000              | 0.98              | 14250             | 1.40              |
| 2000              | 0.46              | 8250              | 1.01              | 14500             | 1.36              |
| 2250              | 0.49              | 8500              | 1.03              | 14750             | 1.43              |
| 2500              | 0.52              | 8750              | 1.03              | 15000             | 1.35              |
| 2750              | 0.56              | 9000              | 1.06              | 15250             | 1.42              |
| 3000              | 0.59              | 9250              | 1.09              | 15500             | 1.34              |
| 3250              | 0.61              | 9500              | 1.09              | 15750             | 1.48              |
| 3500              | 0.64              | 9750              | 1.12              | 16000             | 1.52              |
| 3750              | 0.66              | 10000             | 1.14              | 16250             | 1.55              |
| 4000              | 0.67              | 10250             | 1.15              | 16500             | 1.61              |
| 4250              | 0.71              | 10500             | 1.17              | 16750             | 1.58              |
| 4500              | 0.73              | 10750             | 1.18              | 17000             | 1.71              |
| 4750              | 0.74              | 11000             | 1.20              | 17250             | 1.68              |
| 5000              | 0.75              | 11250             | 1.21              | 17500             | 1.76              |
| 5250              | 0.78              | 11500             | 1.23              | 17750             | 1.74              |
| 5500              | 0.80              | 11750             | 1.24              | 18000             | 1.76              |