

# TEST REPORT

ACCORDING TO: FCC CFR 47 PART 90 subpart Z and part 15 subpart B

FOR:

**Airspan Networks (Israel) Ltd.  
Terminal station  
Model: EasyST 3.7 GHz TDD**

This report is in conformity with ISO/IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations 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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**Contact name:** Mr. Zion Levi

## 2 Equipment under test attributes

**Product name:** Terminal station  
**Product type:** Transceiver  
**Model(s):** EasyST 3.7 GHz TDD  
**Receipt date** 12/26/2007

## 3 Manufacturer information

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

## 4 Test details

**Project ID:** 18414  
**Location:** Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel  
**Test started:** 12/26/2007  
**Test completed:** 4/02/2008  
**Test specification(s):** 47CFR part 90 subpart Z; part 15 subpart B, class B

## 5 Tests summary

| Test   | Status  |
|--|---|
| <b>Transmitter characteristics</b>   |   |
| Section 90.205, 90.1321 Maximum output power and peak power spectral density | Pass  |
| Section 90.209, Occupied bandwidth   | Pass  |
| Section 90.210 (b), Emission mask  | Pass  |
| Section 90.1323, Conducted spurious emissions                                | Pass  |
| Section 90.1323, Radiated spurious emissions                                 | Pass  |
| Section 90.213, Frequency stability  | Pass  |
| Section 2.1091, 90.1335, RF radiation exposure evaluation                    | Pass, exhibit attached to the Application for certification |
| <b>Unintentional emissions</b>   |   |
| Section 15.107, Conducted emission at AC power port                          | Pass  |
| Section 15.109, Radiated emission  | Pass  |

The results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

This test report replaces the previously issued test report identified by Doc ID: AIRRAD\_FCC.18414

|              | Name and Title                              | Date          | Signature   |
|--------------|---|---------------|---|
| Tested by:   | Mr. S. Samokha, test engineer               | April 2, 2008 |  |
| Reviewed by: | Mrs. M. Cherniavsky, certification engineer | April 3, 2008 |  |
| Approved by: | Mr. M. Nikishin, EMC and Radio group leader | April 3, 2008 |  |

## 6 EUT description

### 6.1 General information

The EUT, subscriber premises radio, EasyST 3.7GHz TDD Int., is part of a WiMAX broadband fixed cellular wireless access system. The system provides a radio link between an end-user (a subscriber) and a network to give high-speed data access. The EasyST's transceiver/receiver (up to 64QAM modulation, data rate up to 37 Mbps) uses OFDM and operating in TDD duplexing mode.

### 6.2 Ports and lines

| Port type | Port description | Connected |                    | Connector type | Qty. | Cable type | Cable length |
|-----------|------------------|-----------|--------------------|----------------|------|------------|--------------|
|           |                  | From      | To                 |                |      |            |              |
| Power     | DC power         | EUT       | Adapter            | DC jack        | 1    | unshielded | 1.5 m        |
| Signal    | Ethernet         | EUT       | Laptop             | RJ-45          | 1    | unshielded | 1 m          |
| RF        | Antenna          | EUT       | 50 Ohm termination | MCX            | 1    | NA         | NA           |

### 6.3 Support and test equipment

| Description       | Manufacturer | Model number  | Serial number |
|-------------------|--------------|---------------|---------------|
| AC/DC adapter     | Fuhuna       | UE15WCP       | UE050112HKW1A |
| Laptop            | Dell         | Latitude D400 | NA            |
| Adapter to laptop | Dell         | AA20031       | 93640         |

### 6.4 Operating frequencies

| Source      | Frequency, MHz |
|-------------|----------------|
| Transmitter | 3650 – 3700    |

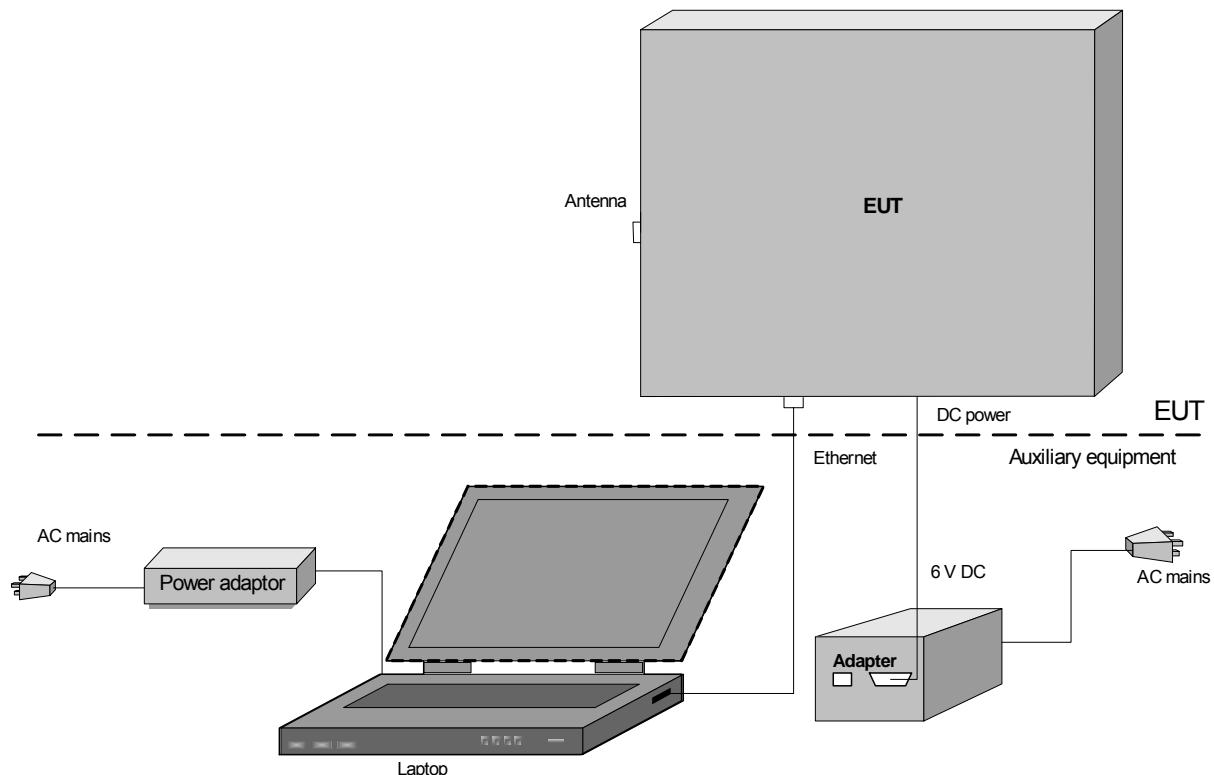
### 6.5 Changes made in the EUT

No changes were implemented.

## 6.6 Transmitter characteristics

| Type of equipment                                |  |   |                                |   |  |  |  |
|--|--|---|--------------------------------|---|--|--|--|
| V  | Stand-alone (Equipment with or without its own control provisions)   |   |                                |   |  |  |  |
|  | Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)   |   |                                |   |  |  |  |
|  | Plug-in card (Equipment intended for a variety of host systems)  |   |                                |   |  |  |  |
| Intended use                                     | Condition of use   |   |                                |   |  |  |  |
| fixed  | Always at a distance more than 2 m from all people   |   |                                |   |  |  |  |
| V  | mobile   | Always at a distance more than 20 cm from all people      |                                |   |  |  |  |
|  | portable   | May operate at a distance closer than 20 cm to human body |                                |   |  |  |  |
| Assigned frequency range                         | 3650 – 3700 MHz  |   |                                |   |  |  |  |
| Operating frequency range                        | 3655 – 3695 MHz  |   |                                |   |  |  |  |
| RF channel spacing                               | 5 MHz  |   |                                |   |  |  |  |
| Maximum rated output power                       | At transmitter 50 Ω RF output connector  |   |                                | 18.3 dBm  |  |  |  |
| Is transmitter output power variable?            | No   |   |                                |   |  |  |  |
|  | V  | Yes   | continuous variable            |   |  |  |  |
|  |  |   | stepped variable with stepsize | 1 dB  |  |  |  |
|  |  |   | minimum RF power               | -30 dBm   |  |  |  |
|  |  |   | maximum RF power               | 18.3 dBm  |  |  |  |
| Antenna connection                               |  |   |                                |   |  |  |  |
| unique coupling                                  | V  | standard connector  | Integral                       | V with temporary RF connector<br>without temporary RF connector |  |  |  |
| Antenna/s technical characteristics              |  |   |                                |   |  |  |  |
| Type   | Manufacturer   |   | Model number                   | Gain  |  |  |  |
| External   | SmartAnt Telecom Co.,Ltd.  |   | ALA06-120110                   | 7.5 dBi   |  |  |  |
| Transmitter 99% power bandwidth                  | 5 MHz, 10 MHz  |   |                                |   |  |  |  |
| Transmitter aggregate data rate/s                | 5 MHz BW: BPSK – 2.095 MBps, QPSK - 4.19 MBps, 16QAM – 12.565 MBps, 64QAM – 18.85 MBps<br>10 MHz BW: BPSK - 4.19 MBps, QPSK-8.38 MBps, 16QAM - 25.13 MBps, 64QAM - 37.7 MBps |   |                                |   |  |  |  |
| Type of modulation                               | BPSK, QPSK, 16QAM, 64QAM   |   |                                |   |  |  |  |
| Type of multiplexing                             | OFDM   |   |                                |   |  |  |  |
| Modulating test signal (baseband)                | PRBS   |   |                                |   |  |  |  |
| Maximum transmitter duty cycle in normal use     | 90%  |   |                                |   |  |  |  |
| Transmitter power source                         |  |   |                                |   |  |  |  |
|  | Nominal rated voltage  |   | Battery type                   |   |  |  |  |
| DC   | Nominal rated voltage  |   |                                |   |  |  |  |
| V  | AC mains   | Nominal rated voltage                                     | 120 V                          | Frequency 60 Hz   |  |  |  |
| Common power source for transmitter and receiver | V  | yes   | no                             |   |  |  |  |

## 6.7 Test configuration



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/30/2007   |                               |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa                        | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

## 7 Transmitter tests according to 47CFR part 90 requirements

### 7.1 Peak output power and power spectral density tests

#### 7.1.1 General

This test was performed to measure the peak output power and power spectral density at RF antenna connector. Specification test limits are given in Table 7.1.1.

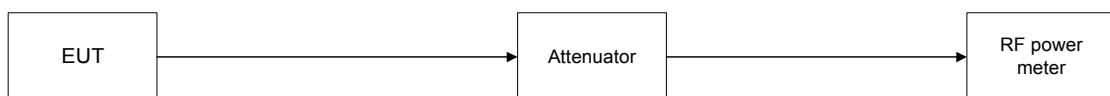
**Table 7.1.1 Peak output power and spectral density limits**

| Assigned frequency range, MHz | Channel bandwidth, MHz | EIRP |       | Power spectral density, dBm/MHz |
|-------------------------------|------------------------|------|-------|---------------------------------|
|                               |                        | mW   | dBm   |                                 |
| 3650.0 – 3700.0               | 5                      | 200  | 23.00 | 16                              |
|                               | 10                     | 400  | 26.00 |                                 |

#### 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 power meter as provided in Table 7.1.2, Table 7.1.4, and associated plots. The power spectral density was measured with power meter as provided in Table 7.1.3, Table 7.1.5 and associated plots.

**Figure 7.1.1 Peak output power test setup**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Table 7.1.2 Peak output power test results for 5 MHz channel bandwidth**

ASSIGNED FREQUENCY RANGE:

3650.0 – 3700.0 MHz

DETECTOR USED:

Power meter

MODULATION:

BPSK, QPSK, 16QAM, 64QAM

MODULATING SIGNAL:

PRBS

TRANSMITTER OUTPUT POWER SETTINGS:

Maximum

| Carrier frequency, MHz      | Power meter reading, dBm | External attenuation, dB | Cable loss, dB | RF output power*, dBm | Limit, dBm | Margin, dB | Verdict |
|-----------------------------|--------------------------|--------------------------|----------------|-----------------------|------------|------------|---------|
| 64QAM, Bit Rate: 18.85Mbps  |                          |                          |                |                       |            |            |         |
| 3655.0                      | 15.44                    | included                 | included       | 22.94                 | 23.00      | -0.06      | Pass    |
| 3675.0                      | 14.93                    | included                 | included       | 22.43                 | 23.00      | -0.57      | Pass    |
| 3695.0                      | 14.61                    | included                 | included       | 22.11                 | 23.00      | -0.89      | Pass    |
| 16QAM, Bit Rate: 12.565Mbps |                          |                          |                |                       |            |            |         |
| 3655.0                      | 15.29                    | included                 | included       | 22.79                 | 23.00      | -0.21      | Pass    |
| 3675.0                      | 15.00                    | included                 | included       | 22.50                 | 23.00      | -0.50      | Pass    |
| 3695.0                      | 14.55                    | included                 | included       | 22.05                 | 23.00      | -0.95      | Pass    |
| QPSK, Bit Rate: 4.19 Mbps   |                          |                          |                |                       |            |            |         |
| 33655.0                     | 15.35                    | included                 | included       | 22.85                 | 23.00      | -0.15      | Pass    |
| 3675.0                      | 14.90                    | included                 | included       | 22.40                 | 23.00      | -0.60      | Pass    |
| 3695.0                      | 14.59                    | included                 | included       | 22.09                 | 23.00      | -0.91      | Pass    |
| BPSK, Bit Rate: 2.095Mbps   |                          |                          |                |                       |            |            |         |
| 3655.0                      | 15.30                    | included                 | included       | 22.80                 | 23.00      | -0.20      | Pass    |
| 3675.0                      | 14.96                    | included                 | included       | 22.44                 | 23.00      | -0.56      | Pass    |
| 3695.0                      | 14.57                    | included                 | included       | 22.07                 | 23.00      | -0.97      | Pass    |

\* - RF Output Power = Power Meter Reading + Antenna Gain (7.5 dBi)

**Reference numbers of test equipment used**

|         |         |         |         |         |  |  |  |
|---------|---------|---------|---------|---------|--|--|--|
| HL 2780 | HL 2951 | HL 3301 | HL 3436 | HL 3439 |  |  |  |
|---------|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

Table 7.1.3 Power spectral density test results for 5 MHz channel bandwidth

ASSIGNED FREQUENCY RANGE: 3650.0 – 3700.0 MHz  
 DETECTOR USED: Peak  
 RESOLUTION BANDWIDTH: 1000 kHz  
 VIDEO BANDWIDTH: 3000 kHz  
 MODULATION: BPSK, 4QAM, 16QAM, 64QAM  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Carrier frequency, MHz       | Spectrum analyzer reading, dBm/Hz | Attenuation, dB | Cable loss, dB | Power density*, dBm/MHz | Limit, dBm/MHz | Margin, dB | Verdict |
|------------------------------|-----------------------------------|-----------------|----------------|-------------------------|----------------|------------|---------|
| 64QAM, Bit Rate: 18.85 Mbps  |                                   |                 |                |                         |                |            |         |
| 3655.0                       | 6.807                             | included        | included       | 14.307                  | 16             | -1.693     | Pass    |
| 3675.0                       | 6.663                             | included        | included       | 14.163                  | 16             | -1.837     | Pass    |
| 3695.0                       | 6.371                             | included        | included       | 13.871                  | 16             | -2.129     | Pass    |
| 16QAM, Bit Rate: 12.565 Mbps |                                   |                 |                |                         |                |            |         |
| 3655.0                       | 6.918                             | included        | included       | 14.418                  | 16             | -1.582     | Pass    |
| 3675.0                       | 6.658                             | included        | included       | 14.158                  | 16             | -1.842     | Pass    |
| 3695.0                       | 6.386                             | included        | included       | 13.886                  | 16             | -2.114     | Pass    |
| QPSK, Bit Rate: 4.19 Mbps    |                                   |                 |                |                         |                |            |         |
| 3655.0                       | 6.930                             | included        | included       | 14.430                  | 16             | -1.570     | Pass    |
| 3675.0                       | 6.675                             | included        | included       | 14.175                  | 16             | -1.825     | Pass    |
| 3695.0                       | 6.347                             | included        | included       | 13.847                  | 16             | -2.153     | Pass    |
| BPSK, Bit Rate: 2.095 Mbps   |                                   |                 |                |                         |                |            |         |
| 3655.0                       | 6.922                             | included        | included       | 14.422                  | 16             | -1.578     | Pass    |
| 3675.0                       | 6.609                             | included        | included       | 14.109                  | 16             | -1.891     | Pass    |
| 3695.0                       | 6.334                             | included        | included       | 13.834                  | 16             | -2.166     | Pass    |

\* - Power density = Spectrum analyzer reading + integration factor + Antenna Gain (7.5 dBi)

Note: Additional alternative measurement settings used for peak power spectral density at low and high carrier frequencies at minimum and maximum data rates

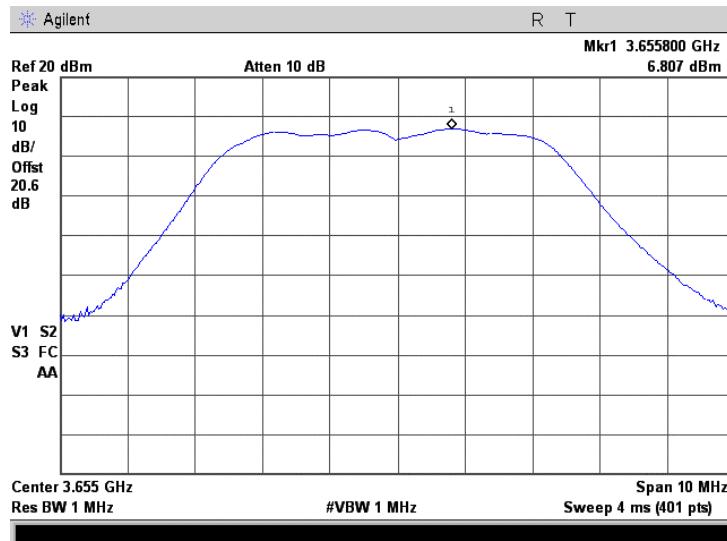
#### Reference numbers of test equipment used

|         |         |         |         |         |  |  |  |
|---------|---------|---------|---------|---------|--|--|--|
| HL 2780 | HL 2951 | HL 3301 | HL 3436 | HL 3439 |  |  |  |
|---------|---------|---------|---------|---------|--|--|--|

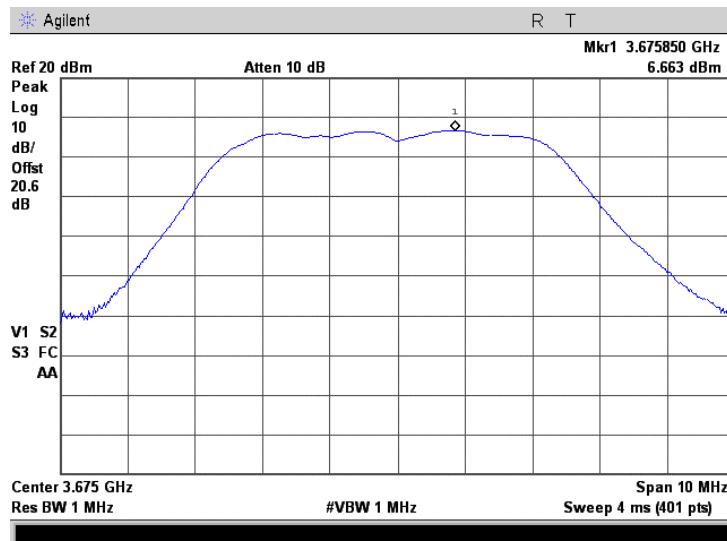
Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.1.1 Peak output power density test results at low frequency, 64QAM, Bit Rate: 18.85 Mbps**

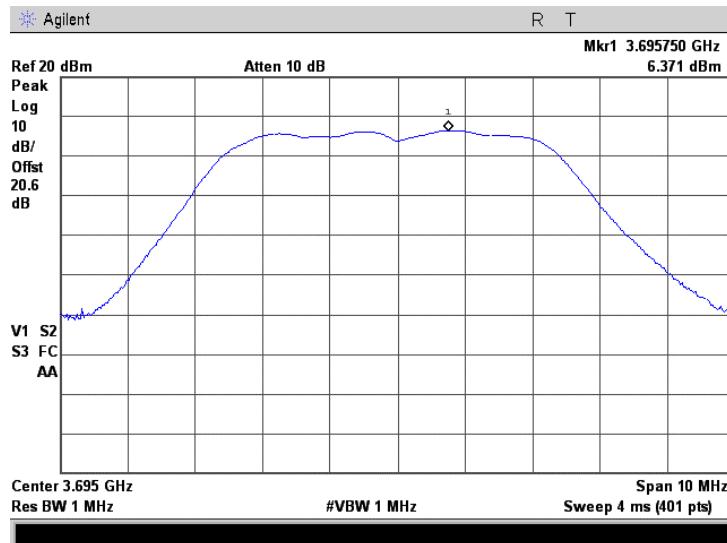


**Plot 7.1.2 Peak output power density test results at mid frequency, 64QAM, Bit Rate: 18.85 Mbps**

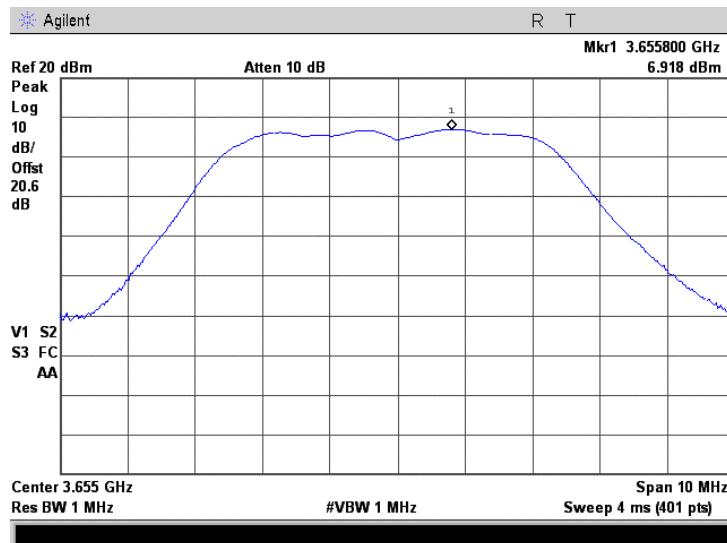


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.1.3 Peak output power density test results at high frequency, 64QAM Bit Rate: 18.85 Mbps**

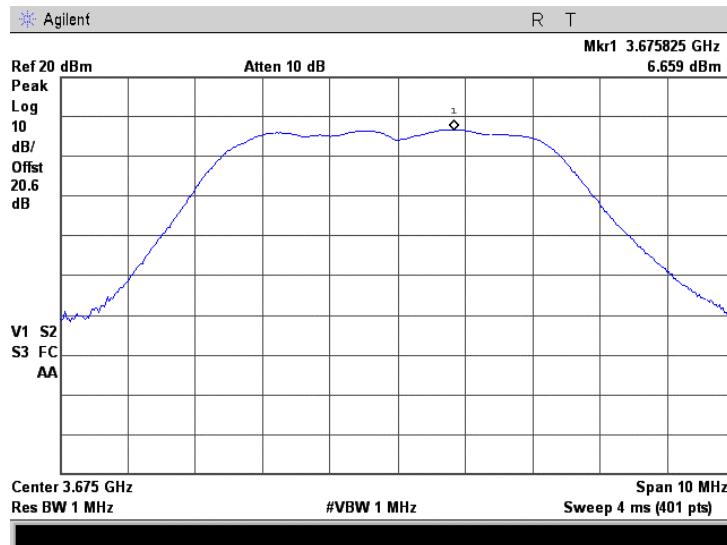


**Plot 7.1.4 Peak output power density test results at low frequency, 16QAM Bit Rate: 2.565 Mbps**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.1.5 Peak output power density test results at mid frequency, 16QAM Bit Rate: 12.565 Mbps**

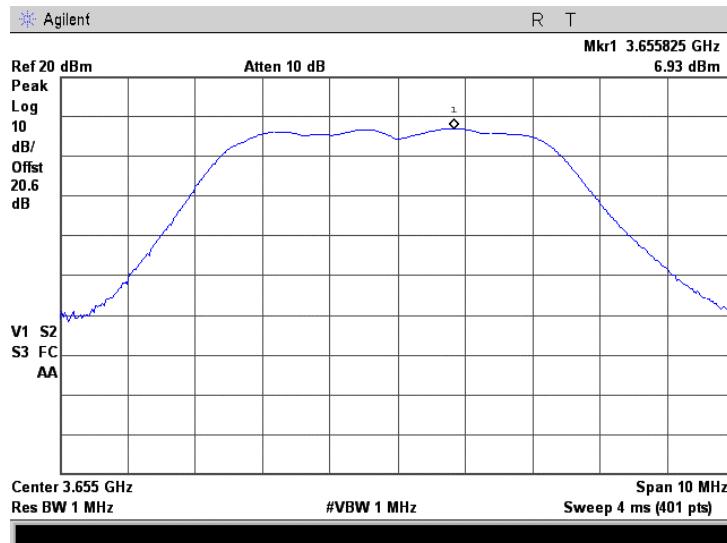


**Plot 7.1.6 Peak output power density test results at high frequency, 16QAM Bit Rate: 12.565 Mbps**

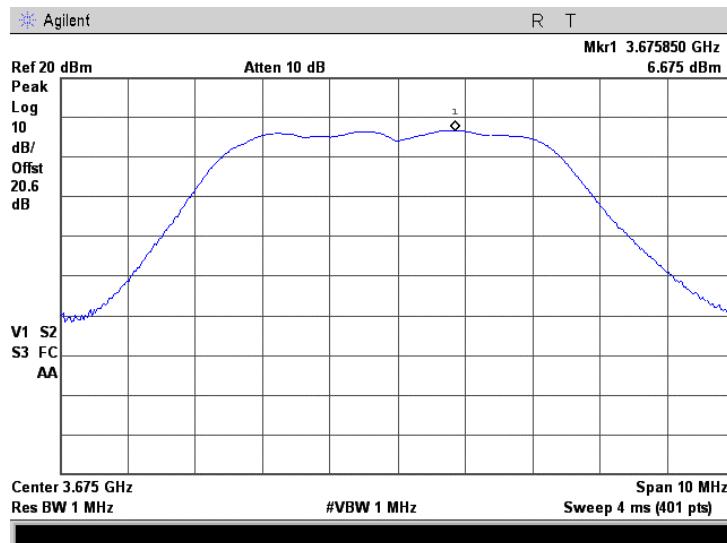


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.1.7 Peak output power density test results at low frequency, QPSK Bit Rate: 4.19 Mbps**

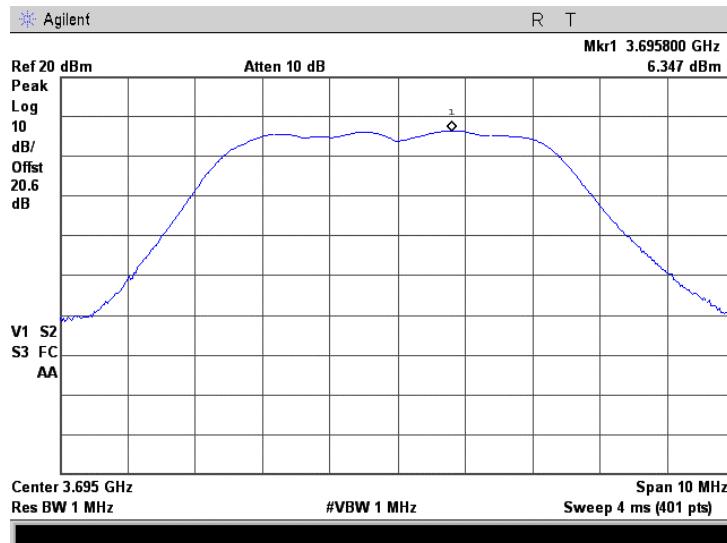


**Plot 7.1.8 Peak output power density test results at mid frequency, QPSK Bit Rate: 4.19 Mbps**

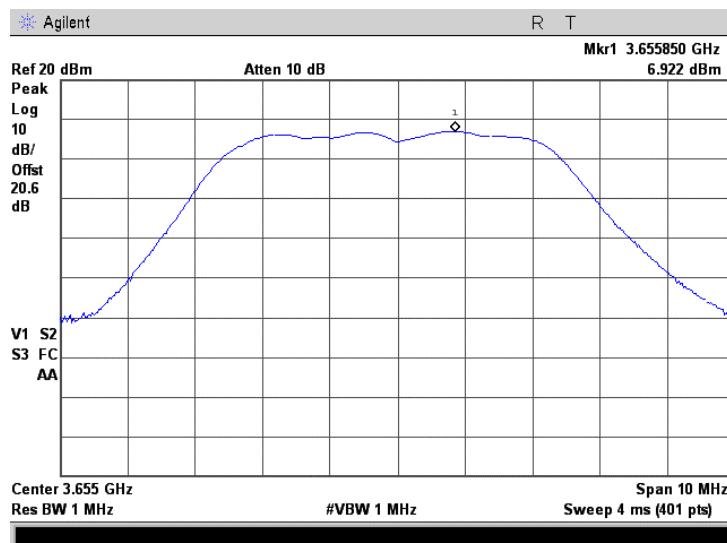


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.1.9 Peak output power density test results at high frequency, QPSK Bit Rate: 4.19 Mbps**

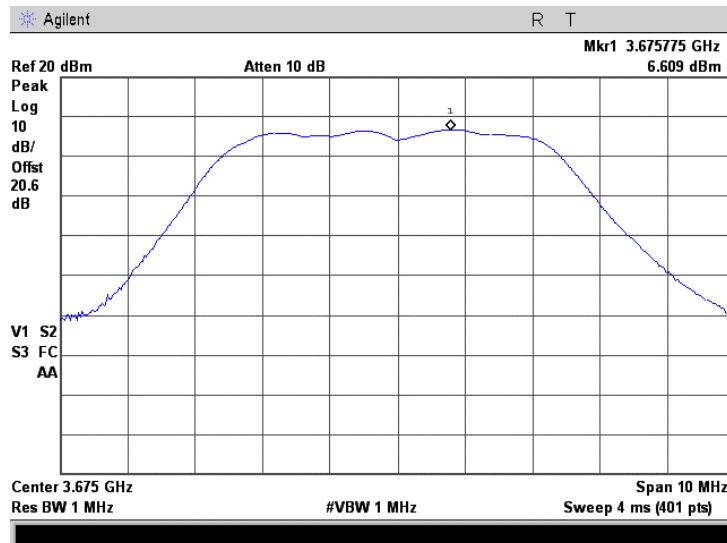


**Plot 7.1.10 Peak output power density test results at low frequency, BPSK, Bit Rate: 2.095 Mbps**

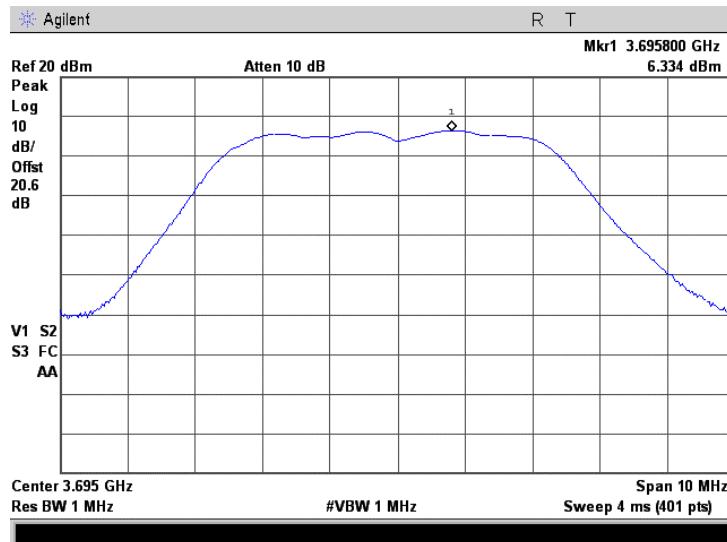


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

Plot 7.1.11 Peak output power density test results at mid frequency, BPSK Bit Rate: 2.095 Mbps



Plot 7.1.12 Peak output power density test results at high frequency, BPSK Bit Rate: 2.095 Mbps



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Table 7.1.4 Peak output power test results for 10 MHz channel bandwidth**

ASSIGNED FREQUENCY RANGE: 3650.0 – 3700.0 MHz  
 DETECTOR USED: Power meter  
 MODULATION: BPSK, QPSK, 16QAM, 64QAM  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Carrier frequency, MHz     | Power meter reading, dBm | External attenuation, dB | Cable loss, dB | RF output power*, dBm | Limit, dBm | Margin, dB | Verdict |
|----------------------------|--------------------------|--------------------------|----------------|-----------------------|------------|------------|---------|
| 64QAM, Bit Rate: 37.7Mbps  |                          |                          |                |                       |            |            |         |
| 3655.0                     | 18.31                    | included                 | included       | 25.81                 | 26         | -0.19      | Pass    |
| 3675.0                     | 18.10                    | included                 | included       | 25.60                 | 26         | -0.40      | Pass    |
| 3695.0                     | 17.71                    | included                 | included       | 25.21                 | 26         | -0.79      | Pass    |
| 16QAM, Bit Rate: 25.13Mbps |                          |                          |                |                       |            |            |         |
| 3655.0                     | 18.16                    | included                 | included       | 25.66                 | 26         | -0.34      | Pass    |
| 3675.0                     | 18.12                    | included                 | included       | 25.62                 | 26         | -0.38      | Pass    |
| 3695.0                     | 17.80                    | included                 | included       | 25.30                 | 26         | -0.70      | Pass    |
| QPSK, Bit Rate: 8.38 Mbps  |                          |                          |                |                       |            |            |         |
| 3655.0                     | 18.11                    | included                 | included       | 25.61                 | 26         | -0.39      | Pass    |
| 3675.0                     | 17.78                    | included                 | included       | 25.28                 | 26         | -0.72      | Pass    |
| 3695.0                     | 17.34                    | included                 | included       | 24.84                 | 26         | -1.16      | Pass    |
| BPSK, Bit Rate: 4.19 Mbps  |                          |                          |                |                       |            |            |         |
| 3655.0                     | 18.20                    | included                 | included       | 25.20                 | 26         | -0.80      | Pass    |
| 3675.0                     | 17.78                    | included                 | included       | 25.28                 | 26         | -0.72      | Pass    |
| 3695.0                     | 17.39                    | included                 | included       | 24.89                 | 26         | -1.11      | Pass    |

\* - Output Power = Power Meter Reading + Antenna Gain 7.5 dBi

**Reference numbers of test equipment used**

|         |         |         |         |  |  |  |
|---------|---------|---------|---------|--|--|--|
| HL 2780 | HL 2951 | HL 3301 | HL 3439 |  |  |  |
|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Table 7.1.5 Power spectral density test results for 10 MHz channel bandwidth**

ASSIGNED FREQUENCY RANGE: 3650.0 – 3700.0 MHz  
 DETECTOR USED: Peak  
 RESOLUTION BANDWIDTH: 1000 kHz  
 VIDEO BANDWIDTH: 3000 kHz  
 MODULATION: BPSK, 4QAM, 16QAM, 64QAM  
 MODULATING SIGNAL: PRBS  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Carrier frequency, MHz      | Spectrum analyzer reading, dBm/Hz | Attenuation and cable loss, dB | Cable loss, dB | Power density*, dBm/MHz | Limit, dBm/MHz | Margin, dB | Verdict |
|-----------------------------|-----------------------------------|--------------------------------|----------------|-------------------------|----------------|------------|---------|
| 64QAM, Bit Rate: 37.7 Mbps  |                                   |                                |                |                         |                |            |         |
| 3655.0                      | 5.802                             | included                       | included       | 13.302                  | 16             | -2.698     | Pass    |
| 3675.0                      | 5.649                             | included                       | included       | 13.149                  | 16             | -2.851     | Pass    |
| 3695.0                      | 5.398                             | included                       | included       | 12.898                  | 16             | -3.102     | Pass    |
| 16QAM, Bit Rate: 25.13 Mbps |                                   |                                |                |                         |                |            |         |
| 3655.0                      | 6.055                             | included                       | included       | 13.555                  | 16             | -2.445     | Pass    |
| 3675.0                      | 5.793                             | included                       | included       | 13.293                  | 16             | -2.707     | Pass    |
| 3695.0                      | 5.395                             | included                       | included       | 12.895                  | 16             | -3.105     | Pass    |
| QPSK, Bit Rate: 8.38 Mbps   |                                   |                                |                |                         |                |            |         |
| 3655.0                      | 5.722                             | included                       | included       | 13.222                  | 16             | -2.778     | Pass    |
| 3675.0                      | 5.468                             | included                       | included       | 12.968                  | 16             | -3.032     | Pass    |
| 3695.0                      | 5.116                             | included                       | included       | 12.616                  | 16             | -3.384     | Pass    |
| BPSK, Bit Rate: 4.19 Mbps   |                                   |                                |                |                         |                |            |         |
| 3655.0                      | 5.739                             | included                       | included       | 13.239                  | 16             | -2.761     | Pass    |
| 3675.0                      | 5.488                             | included                       | included       | 12.988                  | 16             | -3.012     | Pass    |
| 3695.0                      | 5.161                             | included                       | included       | 12.661                  | 16             | -3.339     | Pass    |

\* - Power density = Spectrum analyzer reading + Integration factor + Antenna Gain

Note: Additional alternative measurement settings used for peak power spectral density at low and high carrier frequencies at minimum and maximum data rates

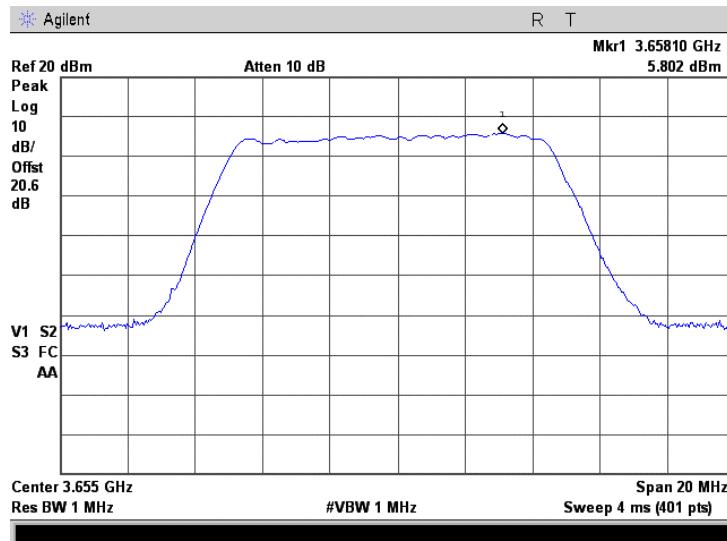
**Reference numbers of test equipment used**

|         |         |         |         |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|
| HL 2780 | HL 2951 | HL 3301 | HL 3439 |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|

Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.1.13 Peak output power density test results at low frequency, 64QAM, Bit Rate: 37.7 Mbps**

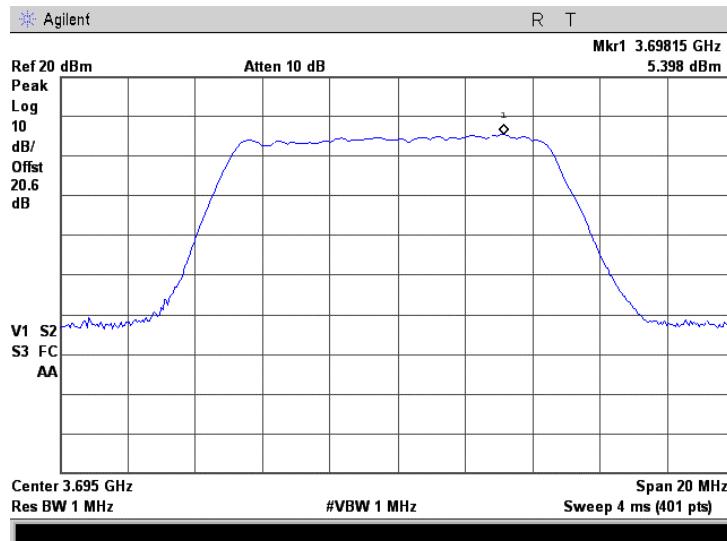


**Plot 7.1.14 Peak output power density test results at mid frequency, 64QAM, Bit Rate: 37.7 Mbps**

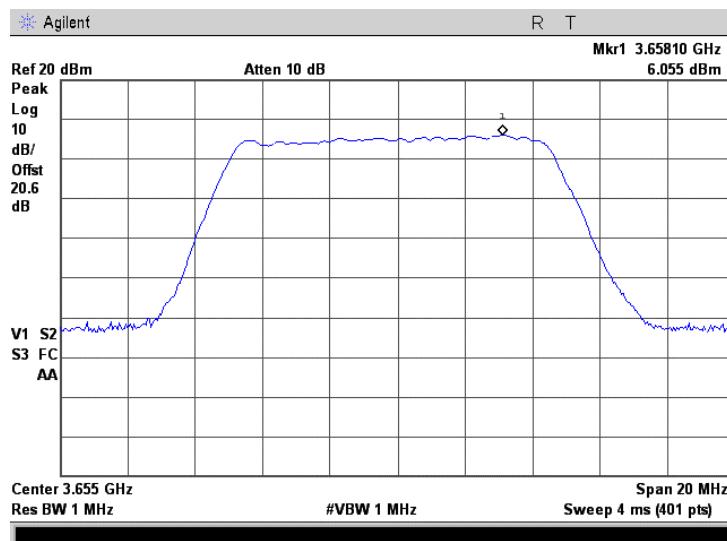


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.1.15 Peak output power density test results at high frequency, 64QAM Bit Rate: 37.7 Mbps**



**Plot 7.1.16 Peak output power density test results at low frequency, 16QAM Bit Rate: 25.13 Mbps**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.1.17 Peak output power density test results at mid frequency, 16QAM Bit Rate: 25.13 Mbps**



**Plot 7.1.18 Peak output power density test results at high frequency, 16QAM Bit Rate: 25.13 Mbps**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.1.19 Peak output power density test results at low frequency, QPSK Bit Rate: 8.38 Mbps**

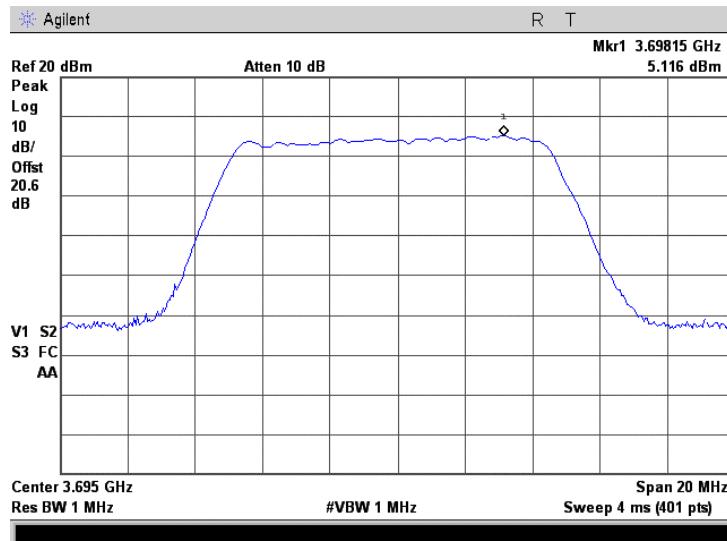


**Plot 7.1.20 Peak output power density test results at mid frequency, QPSK Bit Rate: 8.38 Mbps**

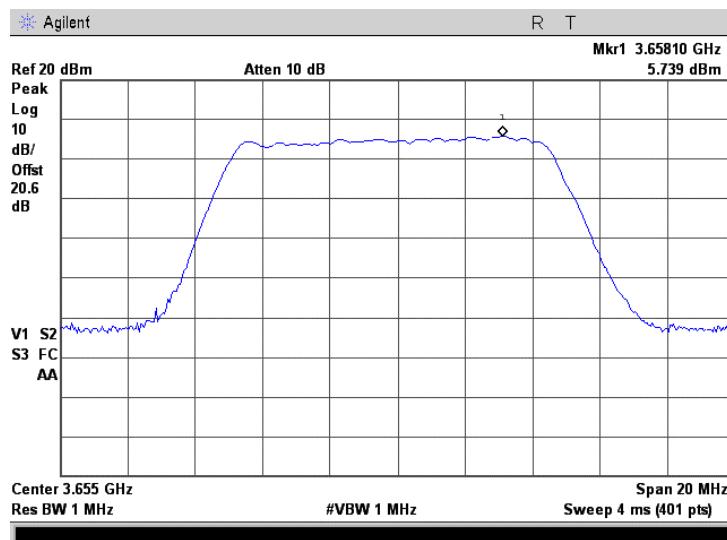


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.1.21 Peak output power density test results at high frequency, QPSK Bit Rate: 8.38 Mbps**

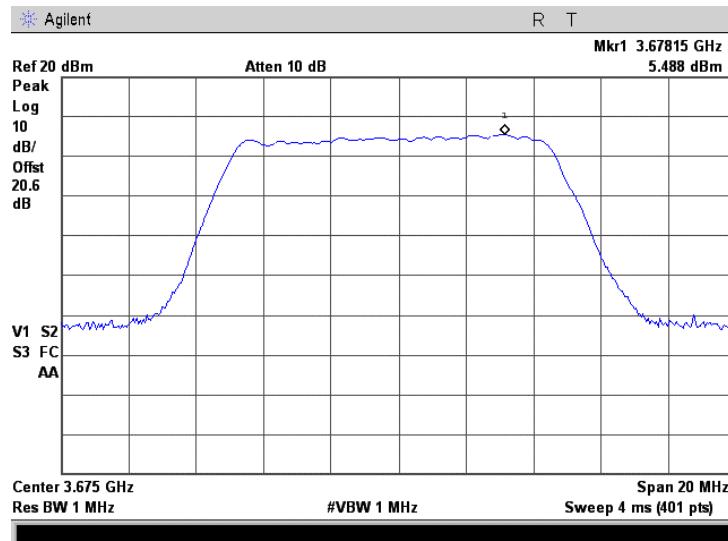


**Plot 7.1.22 Peak output power density test results at low frequency, BPSK, Bit Rate: 4.19 Mbps**

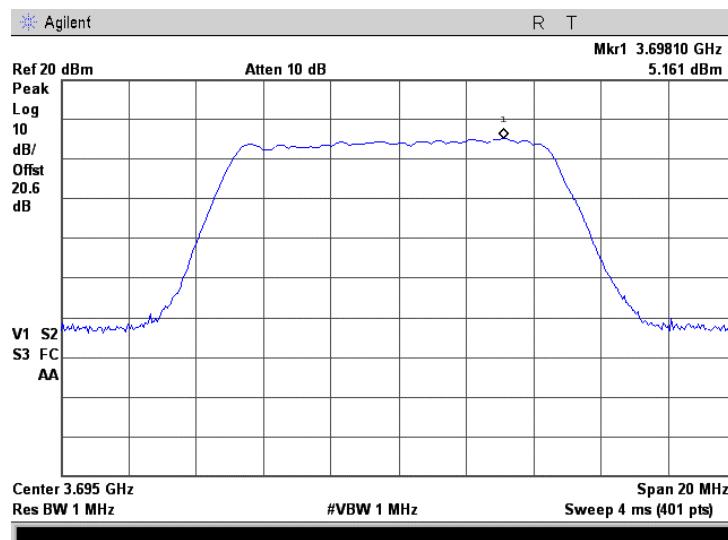


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1321, Maximum output power</b>         |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/02/2008  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1012 hPa                        | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.1.23 Peak output power density test results at mid frequency, BPSK Bit Rate: 4.19 Mbps**



**Plot 7.1.24 Peak output power density test results at high frequency, BPSK Bit Rate: 4.19 Mbps**



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

## 7.2 Occupied bandwidth test

### 7.2.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Occupied bandwidth limits

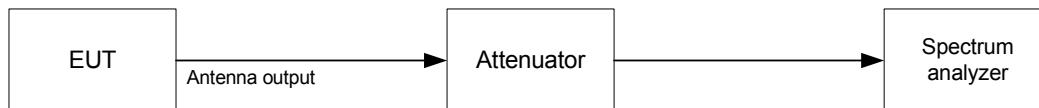
| Assigned frequency, MHz | Modulation envelope reference points*, dBc | Channel bandwidth, MHz | Maximum allowed bandwidth, MHz |
|-------------------------|--|------------------------|--------------------------------|
| 3650.0-3700.0           | 26   | 5                      | 5                              |
|                         |  | 10                     | 10                             |

\* - Modulation envelope reference points are provided in terms of attenuation below the maximum peak output power of carrier.

### 7.2.2 Test procedure

- 7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.
- 7.2.2.2 Maximum peak output power of carrier was taken as the reference level.
- 7.2.2.3 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.2.2, Table 7.2.3 and the associated plots.

Figure 7.2.1 Occupied bandwidth test setup



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/30/2007                                |                               |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |   |                               |                               |

**Table 7.2.2 Occupied bandwidth test results for 5 MHz channel bandwidth**

RESOLUTION BANDWIDTH: 100 kHz\*

VIDEO BANDWIDTH: 300 kHz

MODULATION ENVELOPE REFERENCE POINTS: 26 dBc

MODULATING SIGNAL: PRBS

| Carrier frequency, MHz           | Occupied bandwidth, MHz | Limit, MHz | Margin, MHz | Verdict |
|----------------------------------|-------------------------|------------|-------------|---------|
| <b>64QAM, Bit Rate 18.85Mbps</b> |                         |            |             |         |
| 3655.0                           | 4.760                   | 5          | -0.240      | Pass    |
| 3675.0                           | 4.795                   | 5          | -0.205      | Pass    |
| 3695.0                           | 4.760                   | 5          | -0.240      | Pass    |
| <b>BPSK , Bit Rate 2.095Mbps</b> |                         |            |             |         |
| 3655.0                           | 4.760                   | 5          | -0.240      | Pass    |
| 3675.0                           | 4.760                   | 5          | -0.240      | Pass    |
| 3695.0                           | 4.743                   | 5          | -0.257      | Pass    |

\* - RBW  $\geq$  1% of OBW; 1 % of 5 MHz is 50 kHz, hence, RBW=100 kHz was chosen for the measurements.

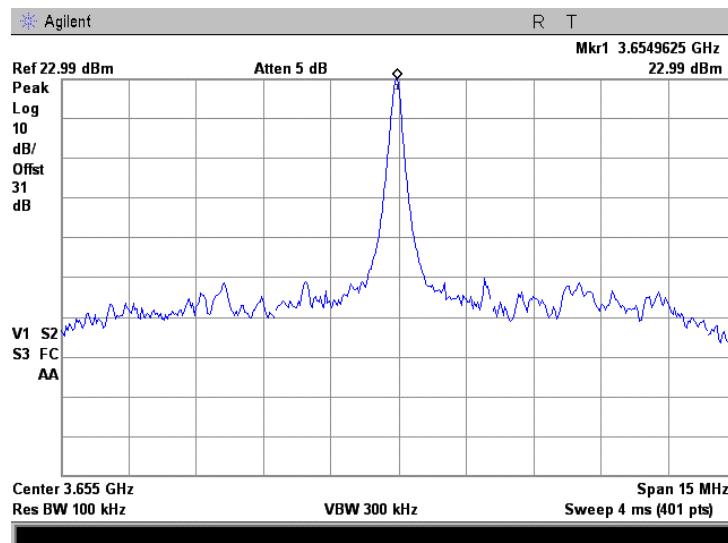
**Reference numbers of test equipment used**

|         |         |         |         |  |  |  |
|---------|---------|---------|---------|--|--|--|
| HL 2909 | HL 2912 | HL 3173 | HL 3179 |  |  |  |
|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

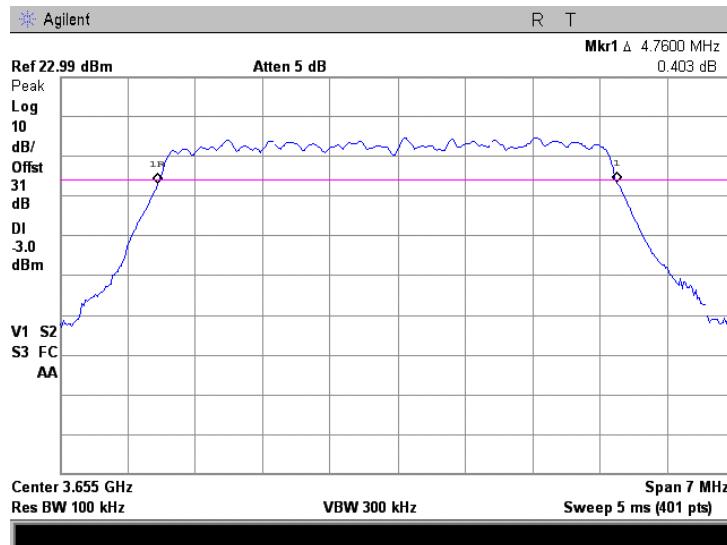
|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |   |                               |                               |

**Plot 7.2.1 Unmodulated signal for reference level**

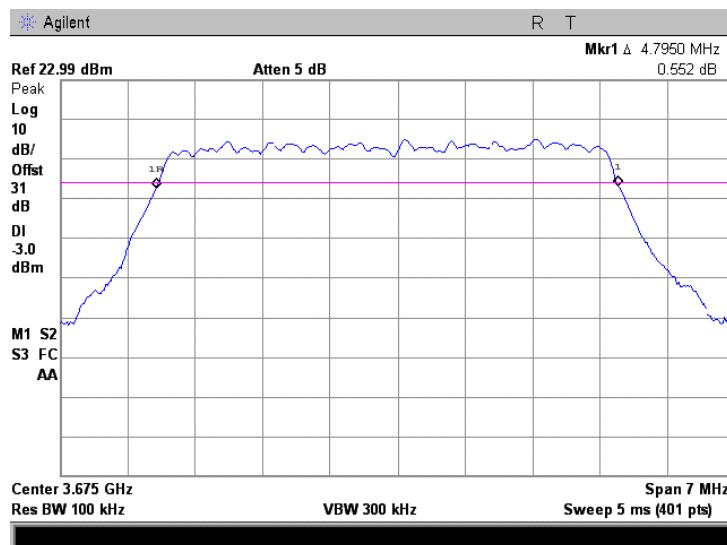


|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |   |                               |                               |

**Plot 7.2.2 Occupied bandwidth test result at low frequency, 64QAM, rate 18.85 Mbps**

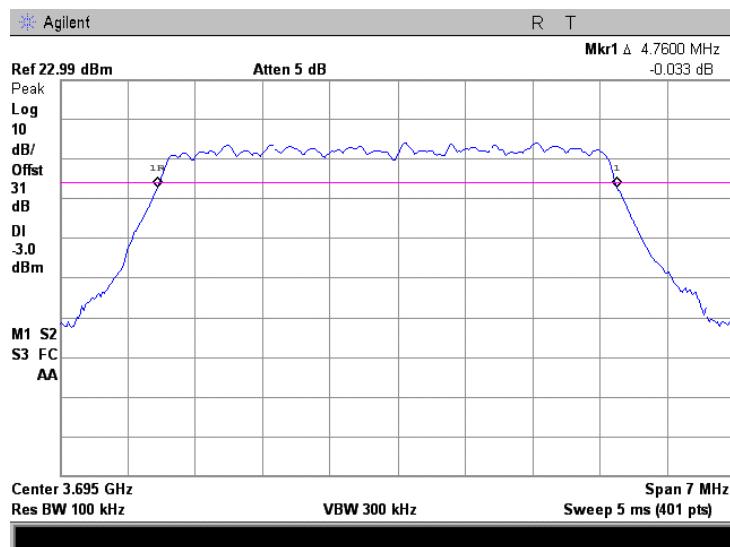


**Plot 7.2.3 Occupied bandwidth test result at mid frequency, 64QAM, rate 18.85 Mbps**



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |   |                               |                               |

Plot 7.2.4 Occupied bandwidth test result at high frequency, 64QAM, rate 18.85 Mbps

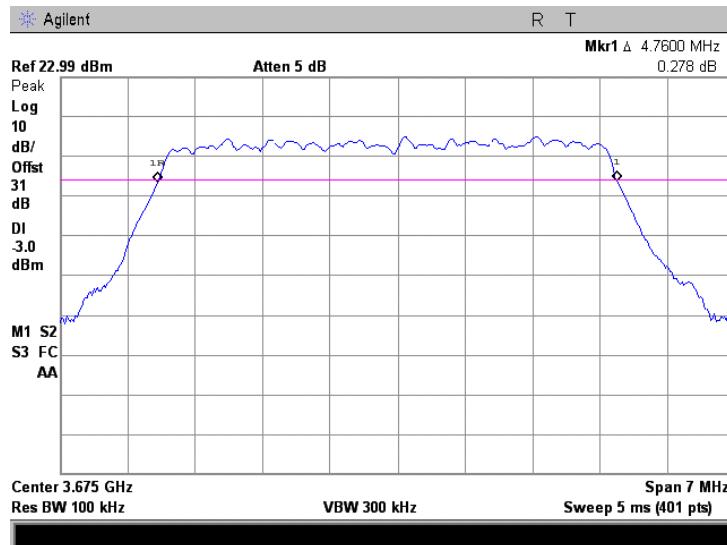


Plot 7.2.5 Occupied bandwidth test result at low frequency, BPSK, rate 2.095 Mbps



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |   |                               |                               |

**Plot 7.2.6 Occupied bandwidth test result at mid frequency, BPSK, rate 2.095 Mbps**



**Plot 7.2.7 Occupied bandwidth test result at high frequency, BPSK, rate 2.095 Mbps**



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |   |                               |                               |

**Table 7.2.3 Occupied bandwidth test results 10 MHz channel bandwidth**

RESOLUTION BANDWIDTH: 100 kHz\*

VIDEO BANDWIDTH: 300 kHz

MODULATION ENVELOPE REFERENCE POINTS: 26 dBc

MODULATING SIGNAL: PRBS

| Carrier frequency, MHz          | Occupied bandwidth, MHz | Limit, MHz | Margin, MHz | Verdict |
|---------------------------------|-------------------------|------------|-------------|---------|
| <b>64QAM, Bit Rate 37.7Mbps</b> |                         |            |             |         |
| 3655.0                          | 9.2625                  | 10         | -0.7375     | Pass    |
| 3675.0                          | 9.2625                  | 10         | -0.7375     | Pass    |
| 3695.0                          | 9.2625                  | 10         | -0.7375     | Pass    |
| <b>BPSK, Bit Rate 4.19Mbps</b>  |                         |            |             |         |
| 3655.0                          | 9.2250                  | 10         | -0.7750     | Pass    |
| 3675.0                          | 9.2250                  | 10         | -0.7750     | Pass    |
| 3695.0                          | 9.2625                  | 10         | -0.7375     | Pass    |

\* - RBW  $\geq$  1% of OBW; 1 % of 10 MHz is 100 kHz, hence, RBW=100 kHz was chosen for measurements

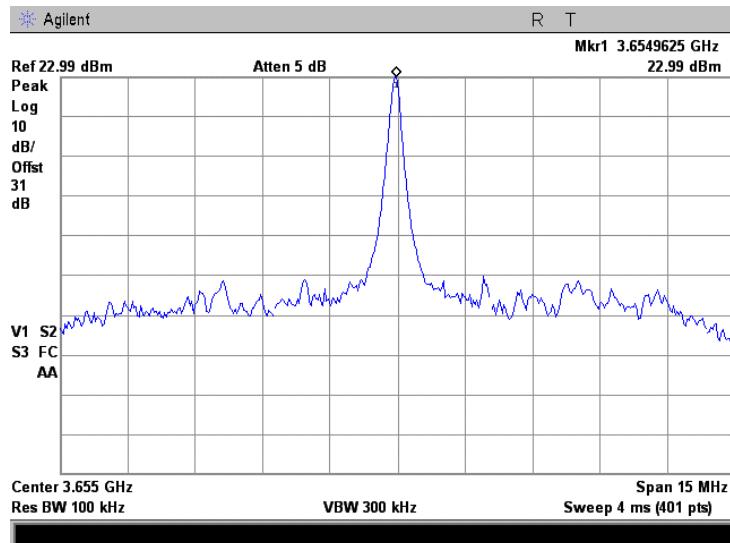
**Reference numbers of test equipment used**

|         |         |         |         |  |  |  |
|---------|---------|---------|---------|--|--|--|
| HL 2909 | HL 2912 | HL 3173 | HL 3179 |  |  |  |
|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

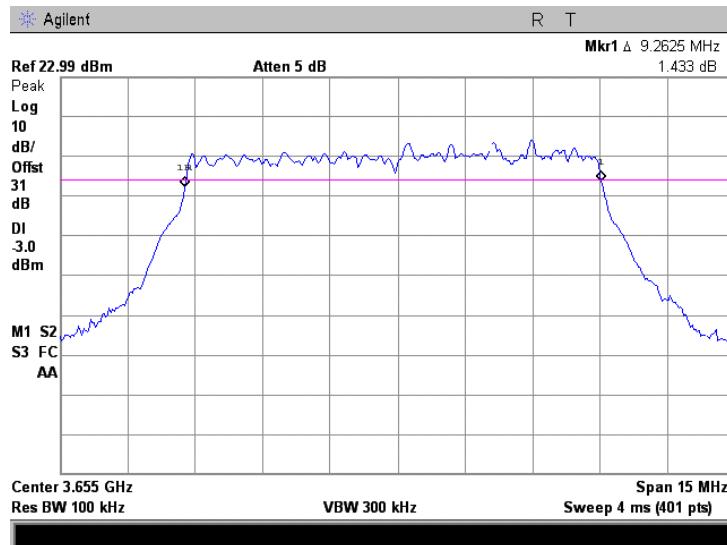
|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |   |                               |                               |

**Plot 7.2.8 Unmodulated signal for reference level**

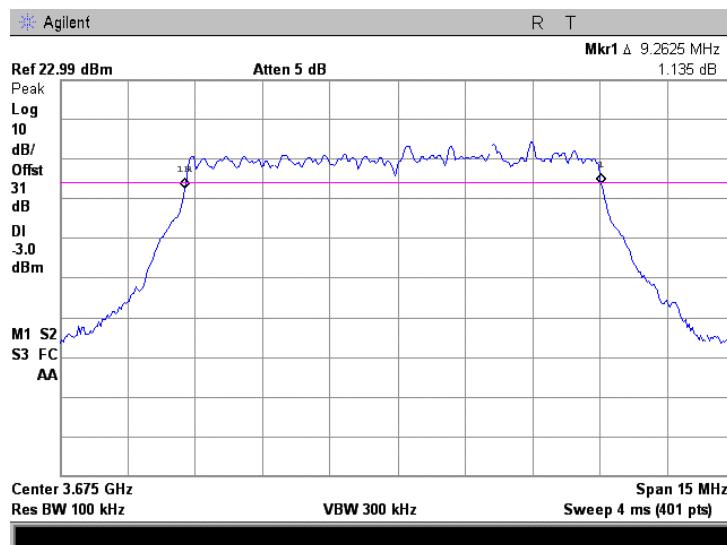


|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |   |                               |                               |

**Plot 7.2.9 Occupied bandwidth test result at low frequency, 64QAM, rate 37.7 Mbps**

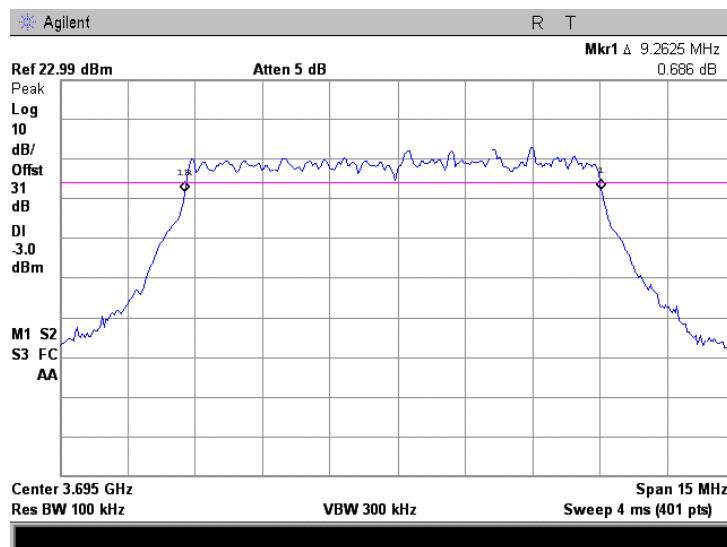


**Plot 7.2.10 Occupied bandwidth test result at mid frequency, 64QAM, rate 37.7 Mbps**

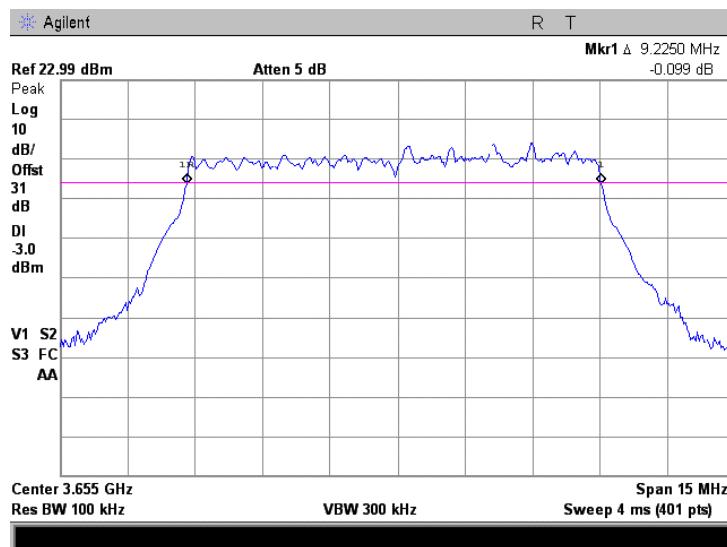


|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |   |                               |                               |

**Plot 7.2.11 Occupied bandwidth test result at high frequency, 64QAM, rate 37.7 Mbps**

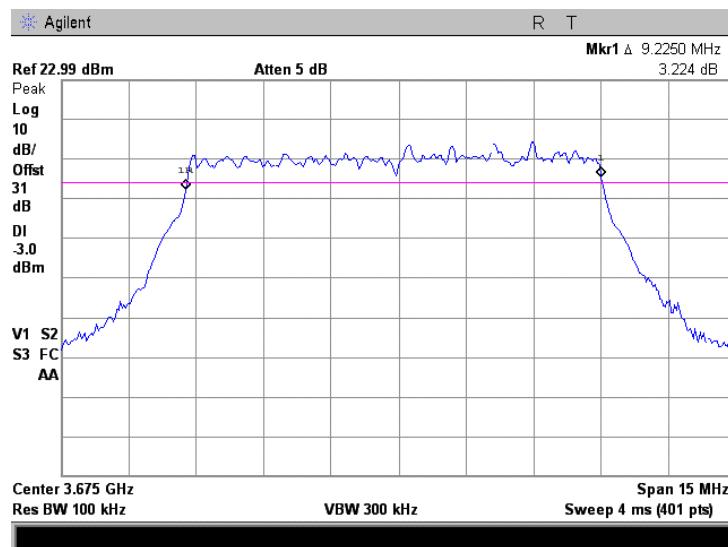


**Plot 7.2.12 Occupied bandwidth test result at low frequency, BPSK, rate 4.19 Mbps**



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.209, Occupied bandwidth</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1049                    |                               |                               |
| <b>Test mode:</b>          | Compliance                                | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007                                | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa             | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |   |                               |                               |

**Plot 7.2.13 Occupied bandwidth test result at mid frequency, BPSK, rate 4.19 Mbps**



**Plot 7.2.14 Occupied bandwidth test result at high frequency, BPSK, rate 4.19 Mbps**



|                            |  |                           |          |
|----------------------------|--|---------------------------|----------|
| <b>Test specification:</b> | <b>Section 90.210 (b), Emission mask</b>                                     |                           |          |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                           |          |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>           | PASS     |
| <b>Date:</b>               | 12/30/2007   | <b>Relative Humidity:</b> | 36%      |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Power Supply:</b>      | 120 V AC |
| <b>Remarks:</b>            |  |                           |          |

### 7.3 Emission mask test

#### 7.3.1 General

This test was performed to measure emission mask at RF antenna connector. Specification test limits are given in Table 7.3.1, Table 7.3.3.

#### 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 emission mask was measured with spectrum analyzer as provided in the associated plots. The test results are provided in Table 7.3.2, Table 7.3.4.

**Figure 7.3.1 Emission mask test setup**



|                            |  |                           |          |
|----------------------------|--|---------------------------|----------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                           |          |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                           |          |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>           | PASS     |
| <b>Date:</b>               | 12/30/2007   | <b>Relative Humidity:</b> | 36%      |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Power Supply:</b>      | 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                           |          |

**Table 7.3.1 Emission mask limits for 5 MHz channel bandwidth**

| Frequency displacement from carrier              | Attenuation below carrier, dBc |
|--|--------------------------------|
| <b>Emission mask B (Channel bandwidth 5 MHz)</b> |                                |
| 0 – 2.5 MHz                                      | 0                              |
| 2.5 – 5.0 MHz                                    | 25                             |
| 5.0 – 12.5 MHz                                   | 35                             |
| More than** 12.5 MHz                             | 43 + 10 log(P)                 |

\* - F – frequency in MHz removed from center

\*\* - emission mask includes carrier modulation envelope within  $\pm 150$  % of the authorized bandwidth; the frequency range removed beyond  $\pm 150$  % of the authorized bandwidth from carrier was investigated as spurious emission

**Table 7.3.2 Emission mask test results for 5 MHz channel bandwidth**

| Carrier frequency, MHz | Limit           | Verdict |
|------------------------|-----------------|---------|
| 3655.0                 |                 |         |
| 3675.0                 | Emission mask B |         |
| 3695.0                 |                 | Pass    |

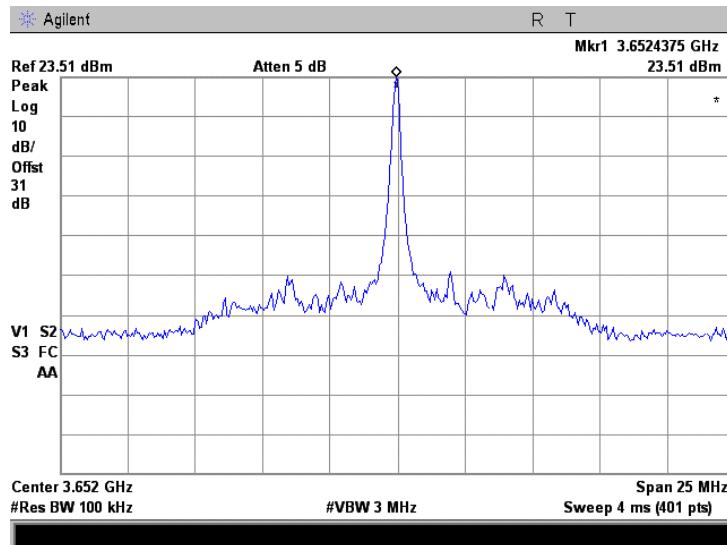
The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth

**Reference numbers of test equipment used**

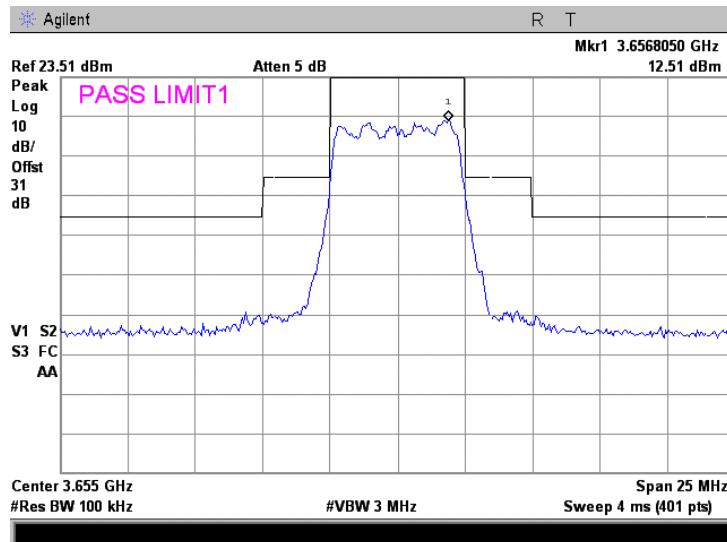
|  |         |         |         |  |  |  |
|--|---------|---------|---------|--|--|--|
| HL 2909                                  | HL 2912 | HL 3173 | HL 3179 |  |  |  |
| Full description is given in Appendix A. |         |         |         |  |  |  |

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.3.1 Emission mask for 5 MHz channel bandwidth**

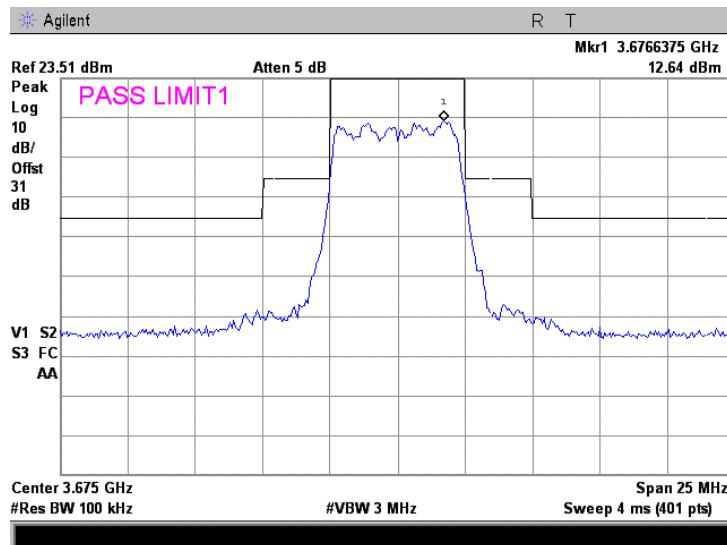


**Plot 7.3.2 Emission mask test results at low carrier frequency, 64QAM rate 18.85 Mbps**

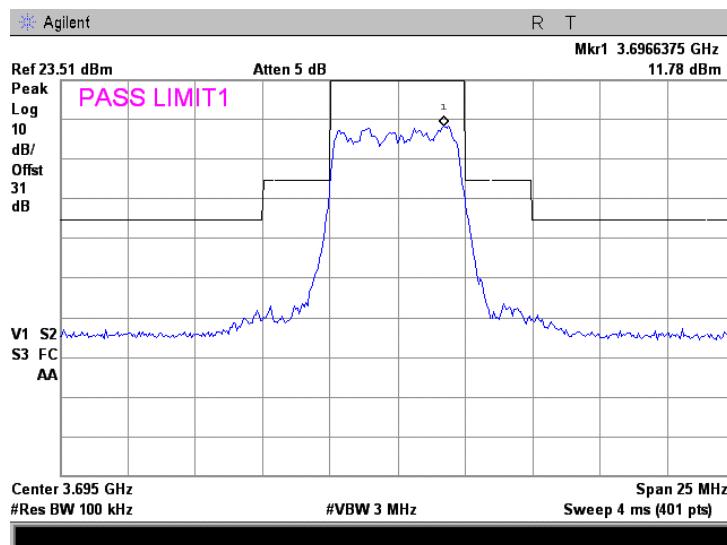


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.3.3 Emission mask test results at mid carrier frequency, 64QAM rate 18.85 Mbps**

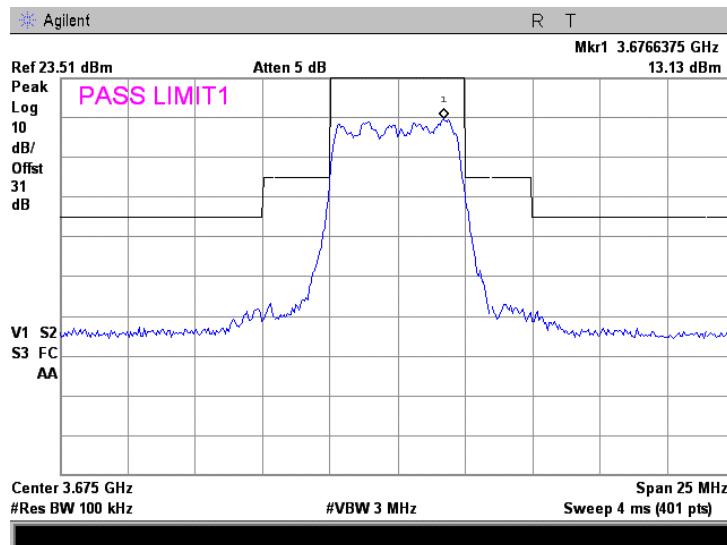


**Plot 7.3.4 Emission mask test results at high carrier frequency, 64QAM rate 18.85 Mbps**

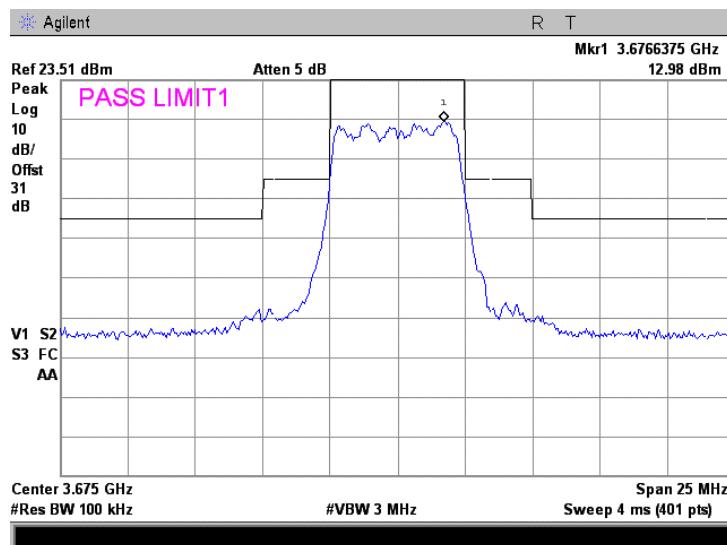


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

Plot 7.3.5 Emission mask test results at mid carrier frequency, 16QAM rate 12.565 Mbps

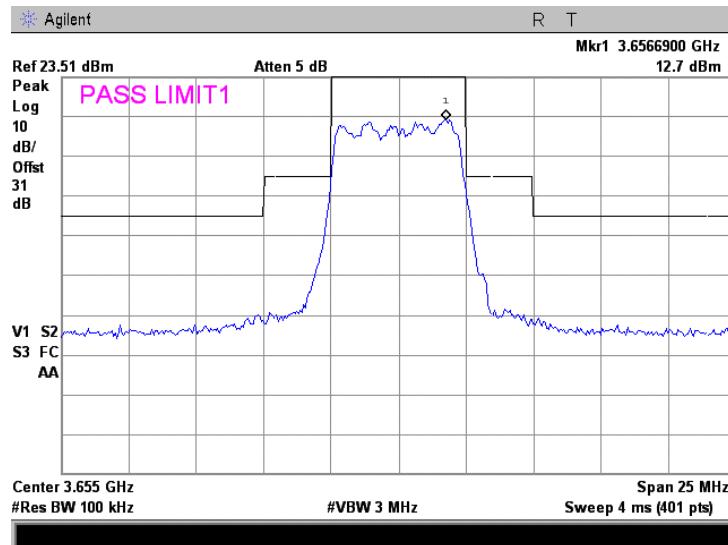


Plot 7.3.6 Emission mask test results at mid carrier frequency, QPSK rate 4.19 Mbps

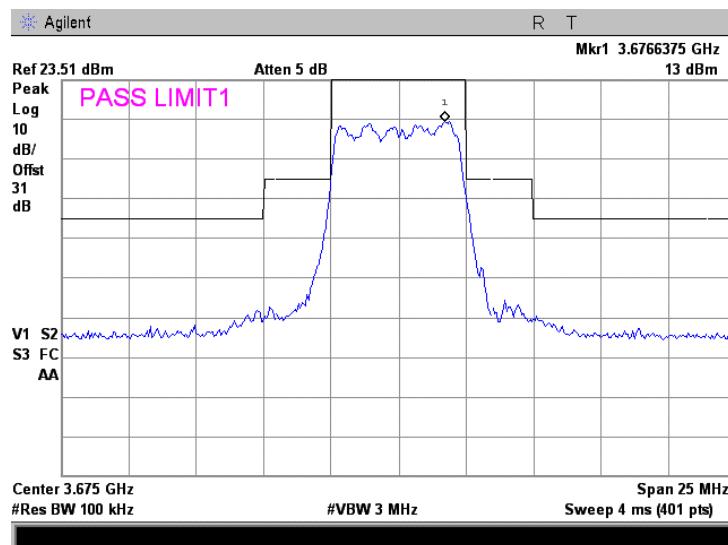


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.3.7 Emission mask test results at low carrier frequency, BPSK rate 2.095 Mbps**

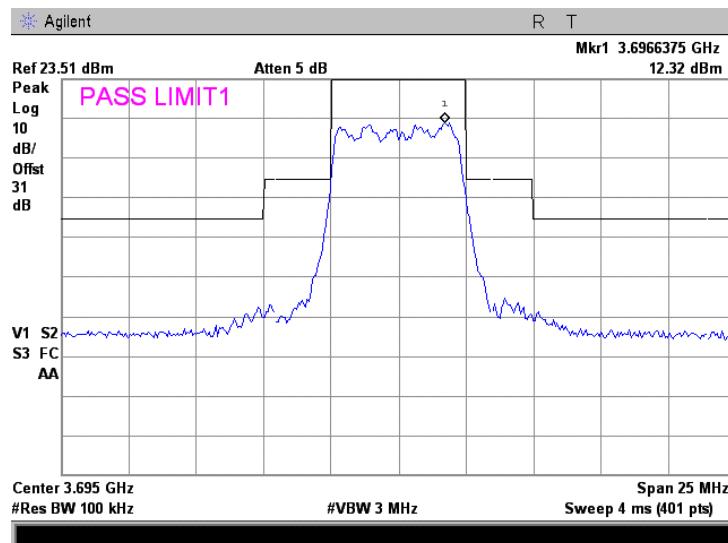


**Plot 7.3.8 Emission mask test results at mid carrier frequency, BPSK rate 2.095 Mbps**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 5 MHz CBW  |  |                               |                               |

**Plot 7.3.9 Emission mask test results at high carrier frequency, BPSK rate 2.095 Mbps**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Table 7.3.3 Emission mask limits for 10 MHz channel bandwidth**

| Frequency displacement from carrier              | Attenuation below carrier, dBc |
|--|--------------------------------|
| <b>Emission mask B(Channel bandwidth 10 MHz)</b> |                                |
| 0 – 5 MHz  | 0                              |
| 5 – 10 MHz                                       | 25                             |
| 10.0 – 25 MHz                                    | 35                             |
| More than** 25 MHz                               | 43 + 10 log(P)                 |

\* - F – frequency in MHz removed from center

\*\* - emission mask includes carrier modulation envelope within  $\pm 150$  % of the authorized bandwidth; the frequency range removed beyond  $\pm 150$  % of the authorized bandwidth from carrier was investigated as spurious emission

**Table 7.3.4 Emission mask test results for 10 MHz channel bandwidth**

| Carrier frequency, MHz | Limit           | Verdict |
|------------------------|-----------------|---------|
| 3655.0                 |                 |         |
| 3675.0                 | Emission mask B |         |
| 3695.0                 |                 | Pass    |

The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth.

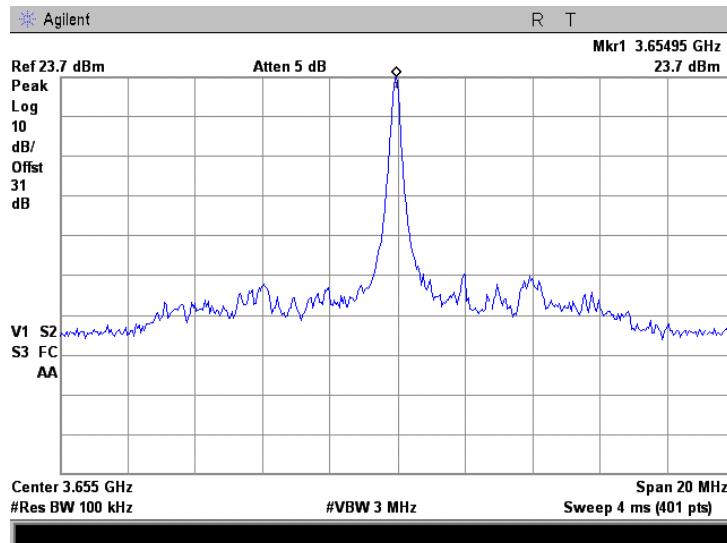
**Reference numbers of test equipment used**

|         |         |         |         |  |  |  |
|---------|---------|---------|---------|--|--|--|
| HL 2909 | HL 2912 | HL 3173 | HL 3179 |  |  |  |
|---------|---------|---------|---------|--|--|--|

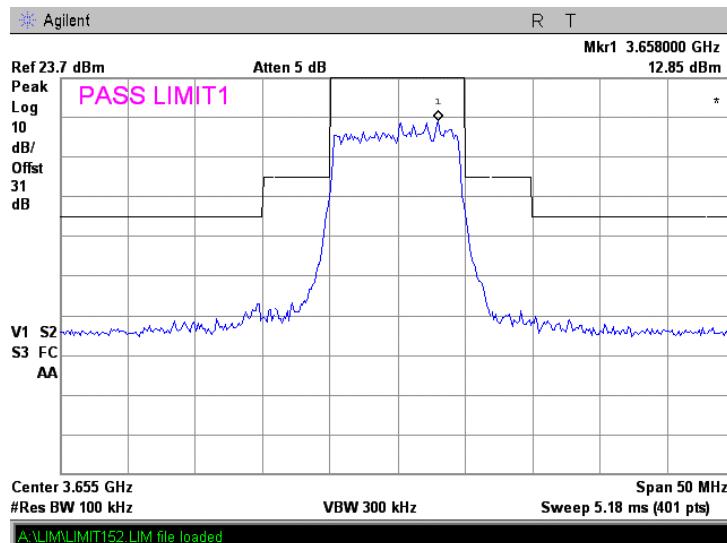
Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

Plot 7.3.10 Emission mask for 10 MHz channel bandwidth

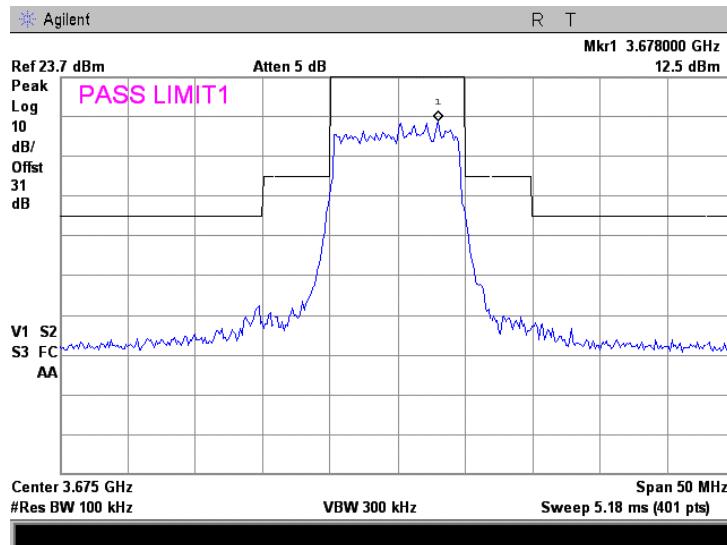


Plot 7.3.11 Emission mask test results at low carrier frequency, 64QAM rate 37.7 Mbps

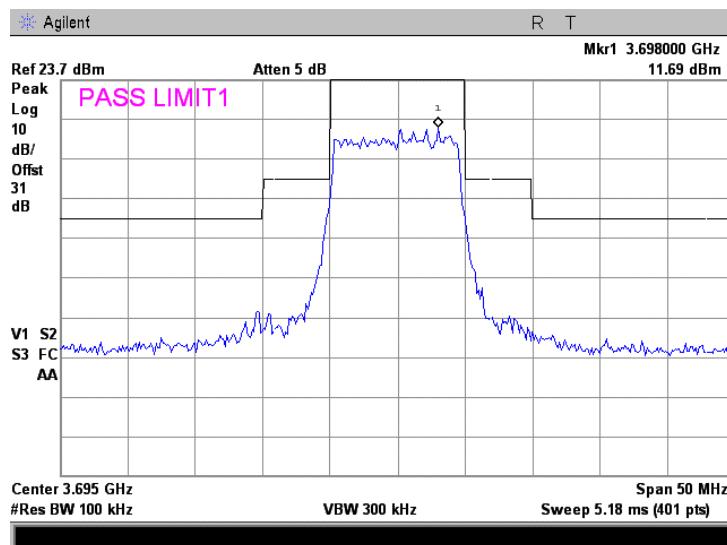


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

Plot 7.3.12 Emission mask test results at mid carrier frequency, 64QAM, rate 37.7 Mbps

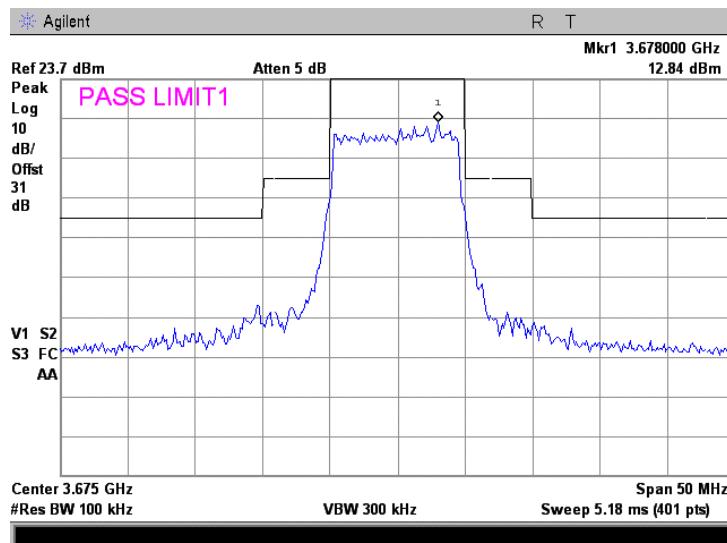


Plot 7.3.13 Emission mask test results at high carrier frequency, 64QAM, rate 37.7 Mbps

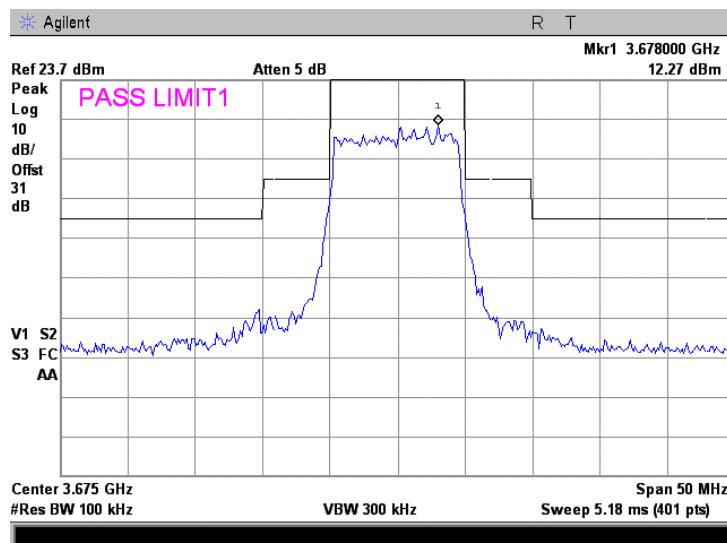


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

Plot 7.3.14 Emission mask test results at mid carrier frequency, 16QAM rate 25.13 Mbps

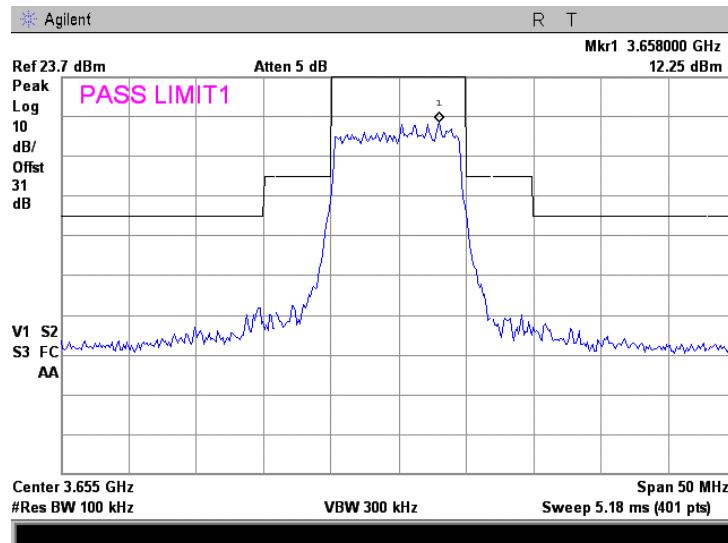


Plot 7.3.15 Emission mask test results at mid carrier frequency, QPSK rate 8.38 Mbps

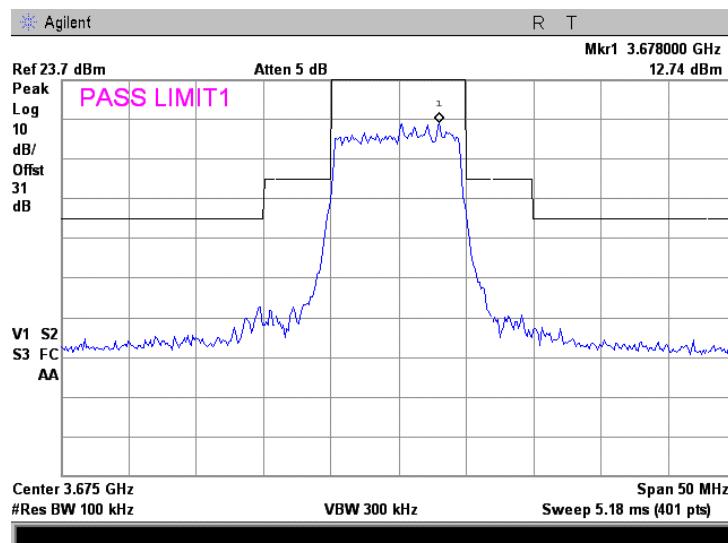


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

Plot 7.3.16 Emission mask test results at low carrier frequency, BPSK rate 4.19 Mbps

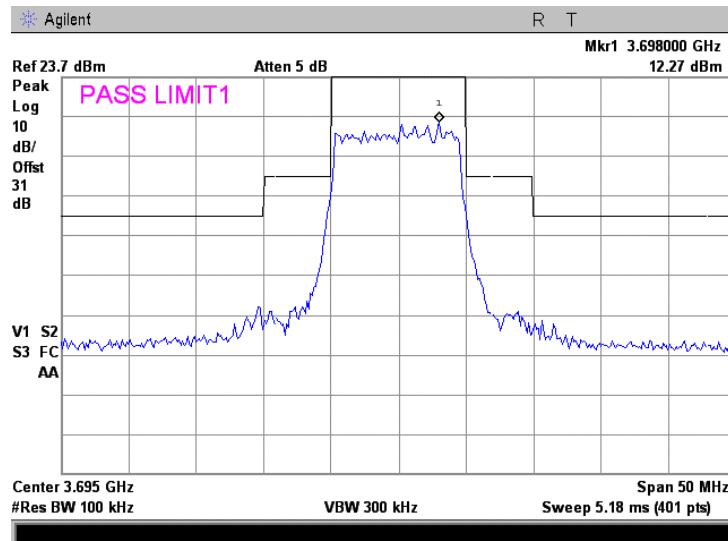


Plot 7.3.17 Emission mask test results at mid carrier frequency, BPSK rate 4.19 Mbps



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.210, Emission mask</b>   |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051, 2.1047 and 90.210(b); TIA/EIA-603-C, Section 2.2.13 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/30/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa  | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b> 10 MHz CBW |  |                               |                               |

**Plot 7.3.18 Emission mask test results at high carrier frequency, BPSK rate 4.19 Mbps**



|                            |  |                           |          |
|----------------------------|--|---------------------------|----------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                           |          |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                           |          |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>           | PASS     |
| <b>Date:</b>               | 12/26/2007   | <b>Relative Humidity:</b> | 45%      |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Power Supply:</b>      | 120 V AC |
| <b>Remarks:</b>            |  |                           |          |

## 7.4 Spurious emissions at RF antenna connector test

### 7.4.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.4.1.

**Table 7.4.1 Spurious emission limits**

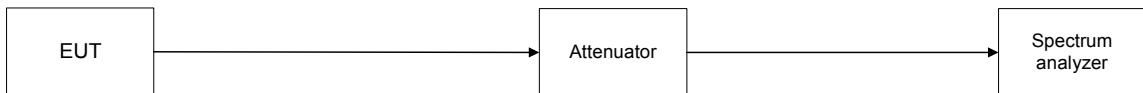
| Frequency, MHz                     | ERP of spurious, dBm   |  |     |
|------------------------------------|------------------------|--|-----|
| 0.009 – 10 <sup>th</sup> harmonic* | Low carrier frequency  |  | -13 |
|                                    | Mid carrier frequency  |  | -13 |
|                                    | High carrier frequency |  | -13 |

\* - spurious emission limits do not apply to the in band emission within  $\pm 150\%$  of the authorized bandwidth from the carrier; investigated in course of emission mask testing

### 7.4.2 Test procedure

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.
- 7.4.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
- 7.4.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.4.2 and associated plots.

**Figure 7.4.1 Spurious emission test setup**



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/26/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Table 7.4.2 Spurious emission test results**

OPERATING FREQUENCY RANGE: 3655.0 – 3695.0 MHz  
 INVESTIGATED FREQUENCY RANGE: 0.009 – 40000 MHz  
 DETECTOR USED: Peak  
 VIDEO BANDWIDTH: 30 kHz  
 MODULATING SIGNAL: PRBS  
 BIT RATE: 2.095 Mbps  
 CHANNEL BANDWIDTH: 5 MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Frequency, MHz                           | SA reading, dBm | Attenuator, dB | Cable loss, dB | RBW, kHz | Spurious emission, dBm | Attenuation below carrier, dBc | Limit, dBc | Margin, dB* | Verdict |
|--|-----------------|----------------|----------------|----------|------------------------|--------------------------------|------------|-------------|---------|
| <b>Low carrier frequency 3655.0 MHz</b>  |                 |                |                |          |                        |                                |            |             |         |
|  |                 |                |                |          | No spurious were found |                                |            |             | Pass    |
| <b>Mid carrier frequency 3675.0 MHz</b>  |                 |                |                |          |                        |                                |            |             |         |
|  |                 |                |                |          | No spurious were found |                                |            |             | Pass    |
| <b>High carrier frequency 3695.0 MHz</b> |                 |                |                |          |                        |                                |            |             |         |
|  |                 |                |                |          | No spurious were found |                                |            |             | Pass    |

\*- Margin = Spurious emission – specification limit.

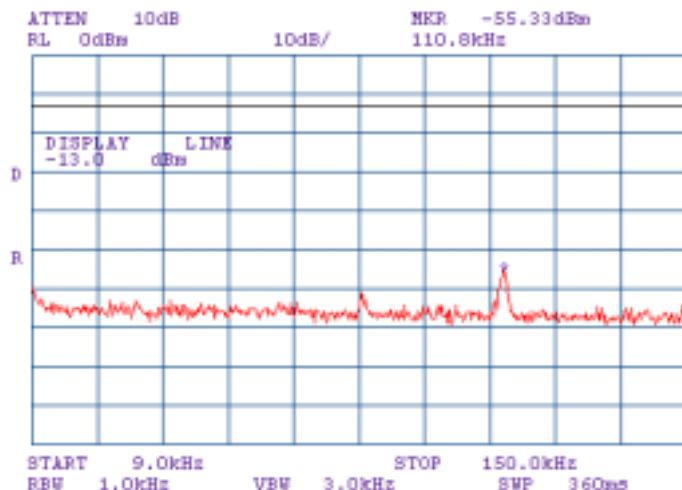
**Reference numbers of test equipment used**

|         |         |  |  |  |  |  |  |
|---------|---------|--|--|--|--|--|--|
| HL 2399 | HL 2780 |  |  |  |  |  |  |
|---------|---------|--|--|--|--|--|--|

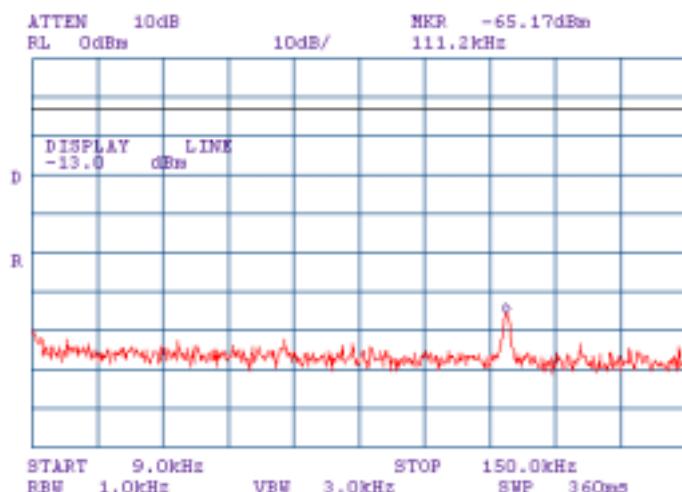
Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/26/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency**

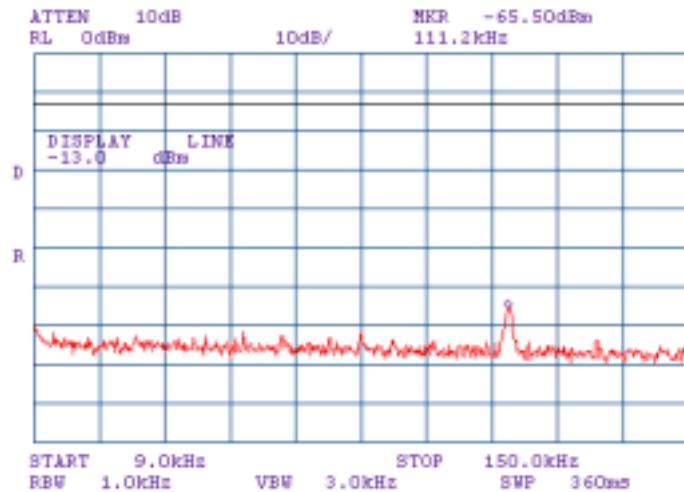


**Plot 7.4.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency**

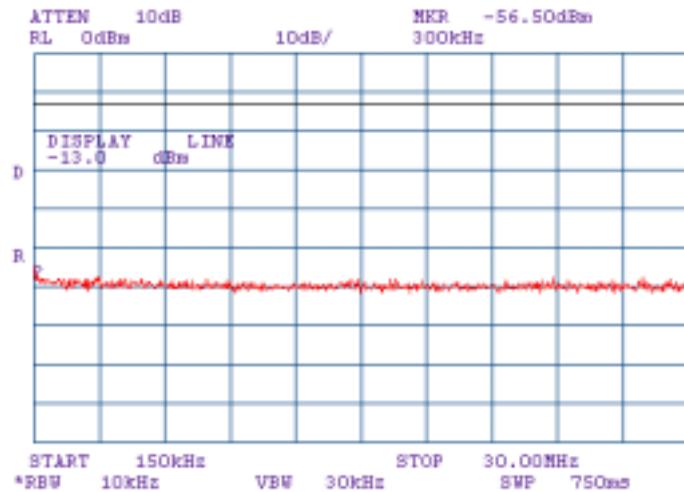


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/26/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency**

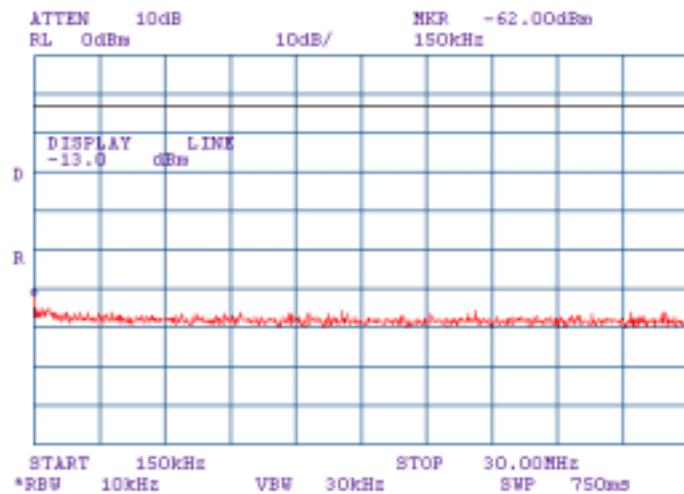


**Plot 7.4.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency**

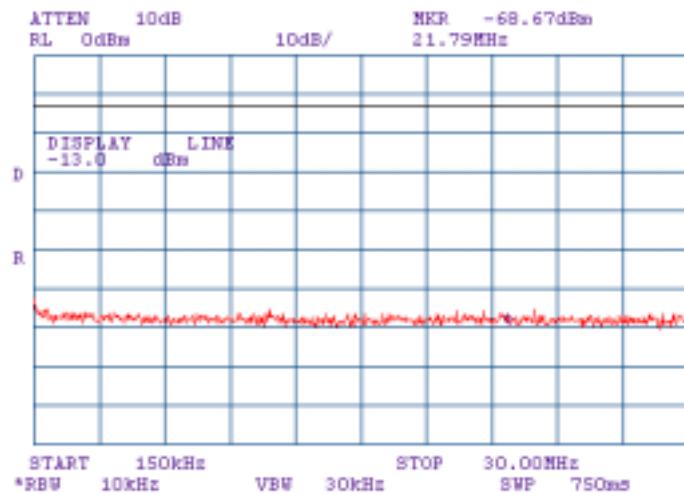


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/26/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.5 Spurious emission measurements in 0.15 - 30.0 MHz range at mid carrier frequency**

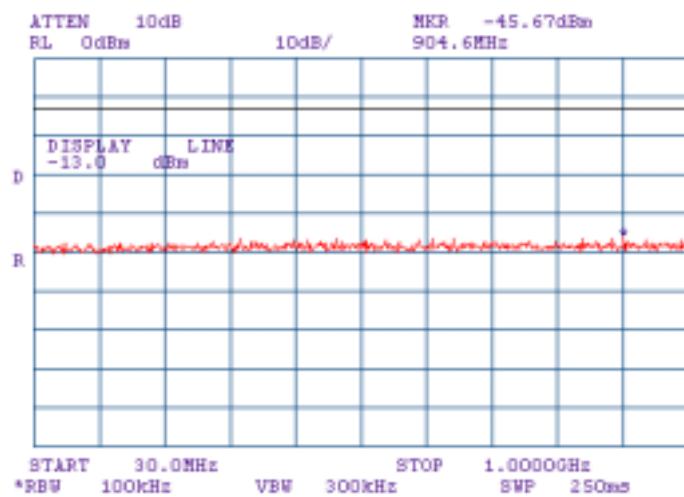


**Plot 7.4.6 Spurious emission measurements in 0.15 – 30.0 MHz range at high carrier frequency**

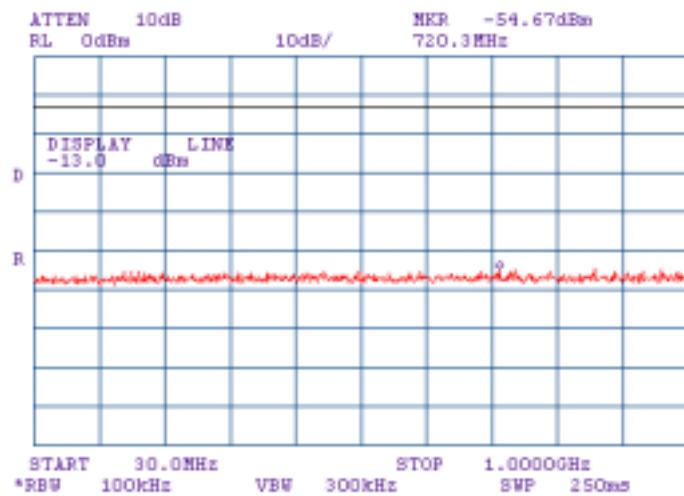


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.7 Spurious emission measurements in 30.0 - 1000 MHz range at low carrier frequency**

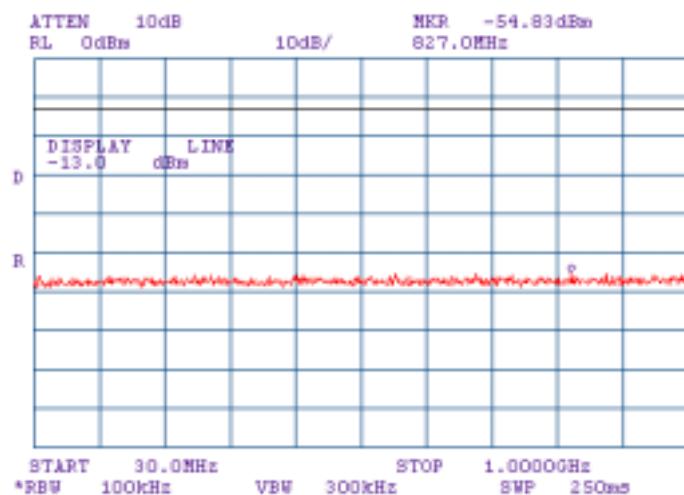


**Plot 7.4.8 Spurious emission measurements in 30.0 - 1000 MHz range at mid carrier frequency**



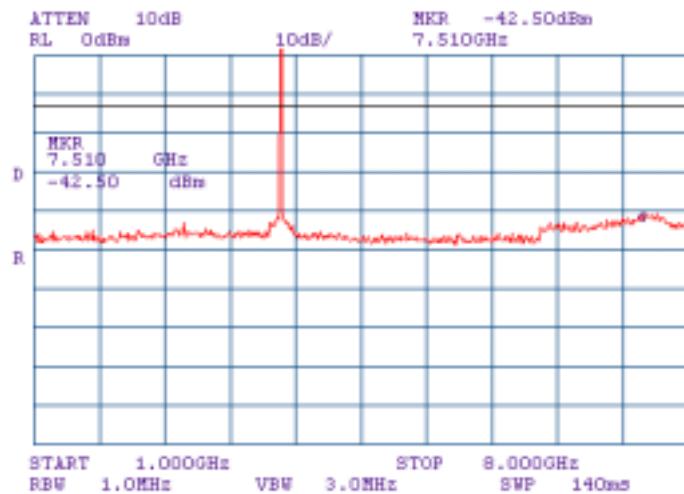
|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

Plot 7.4.9 Spurious emission measurements in 30.0 - 1000 MHz range at high carrier frequency

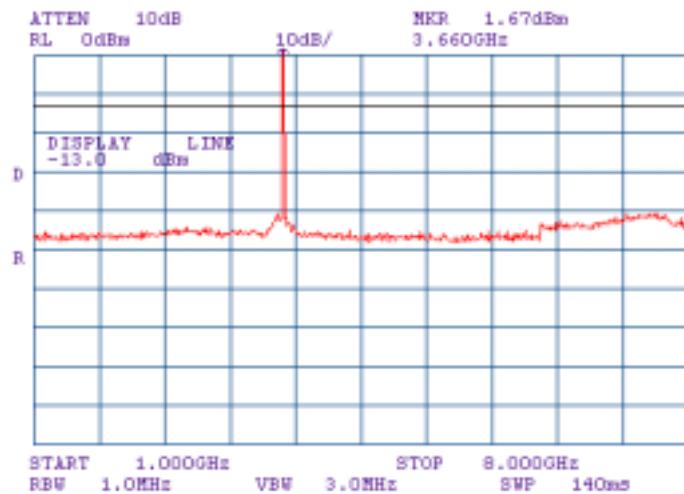


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

Plot 7.4.10 Spurious emission measurements in 1000 - 8000 MHz range at low carrier frequency

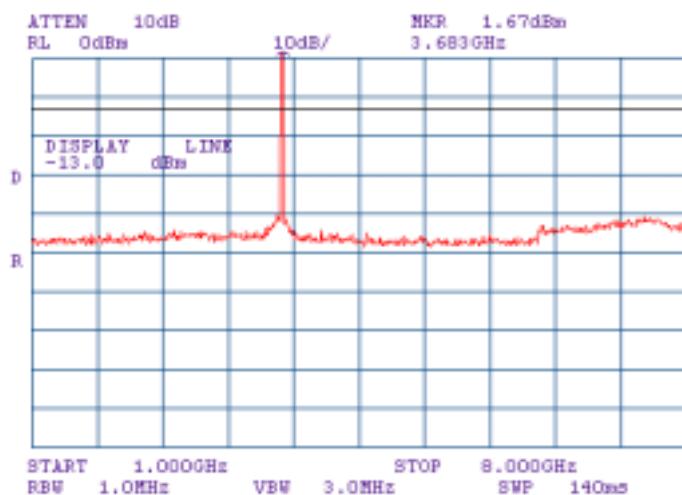


Plot 7.4.11 Spurious emission measurements in 1000 - 8000 MHz range at mid carrier frequency

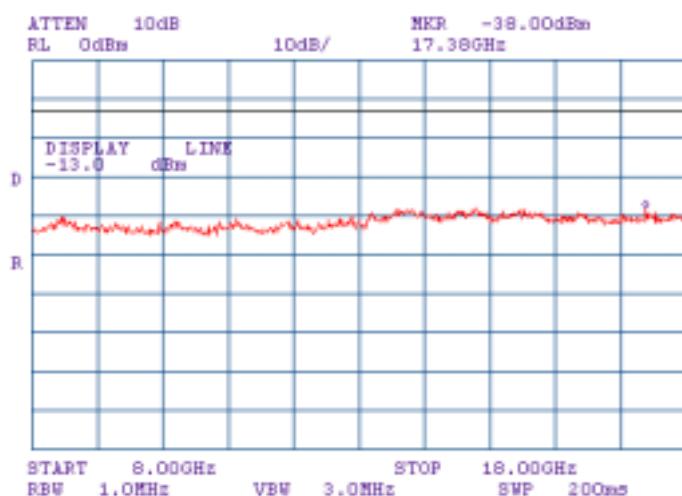


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

Plot 7.4.12 Spurious emission measurements in 1000 - 8000 MHz range at high carrier frequency

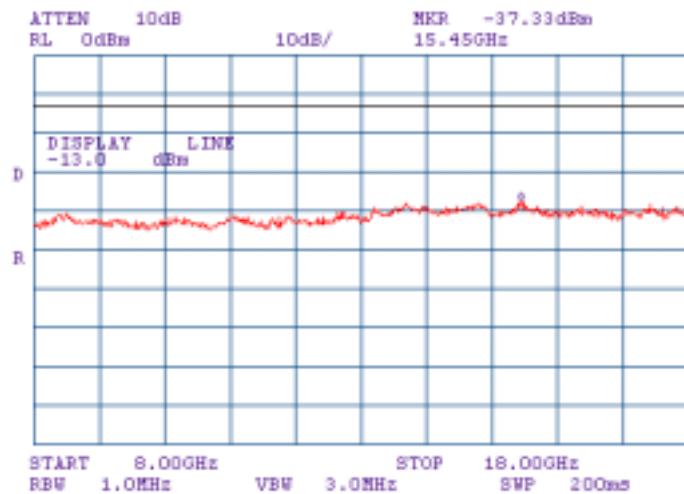


Plot 7.4.13 Spurious emission measurements in 8000 - 18000 MHz range at low carrier frequency

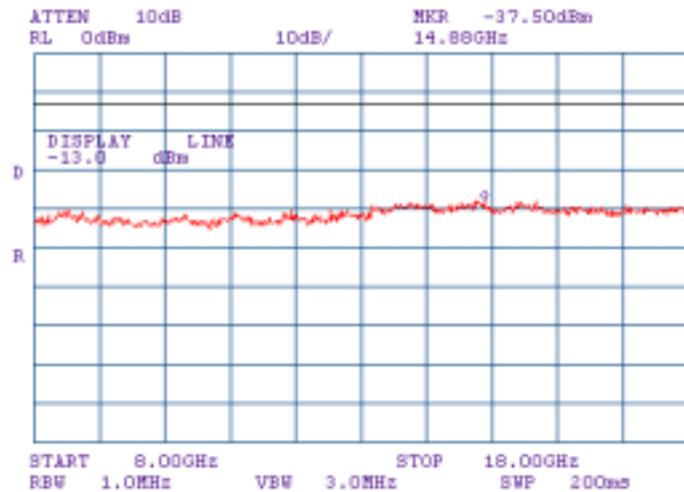


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | <b>PASS</b>                   |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.14 Spurious emission measurements in 8000 - 18000 MHz range at mid carrier frequency**

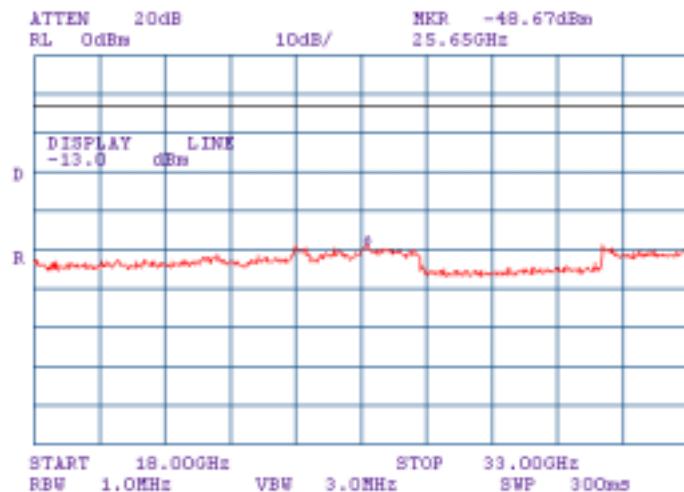


**Plot 7.4.15 Spurious emission measurements in 8000 - 18000 MHz range at high carrier frequency**

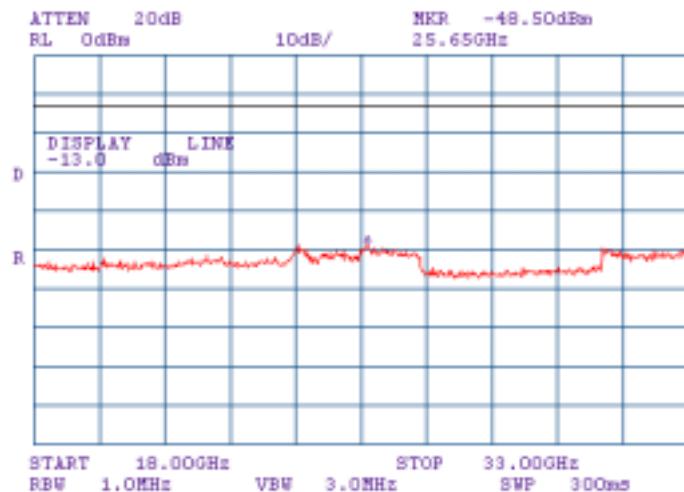


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/26/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

Plot 7.4.16 Spurious emission measurements in 18000 - 33000 MHz range at low carrier frequency

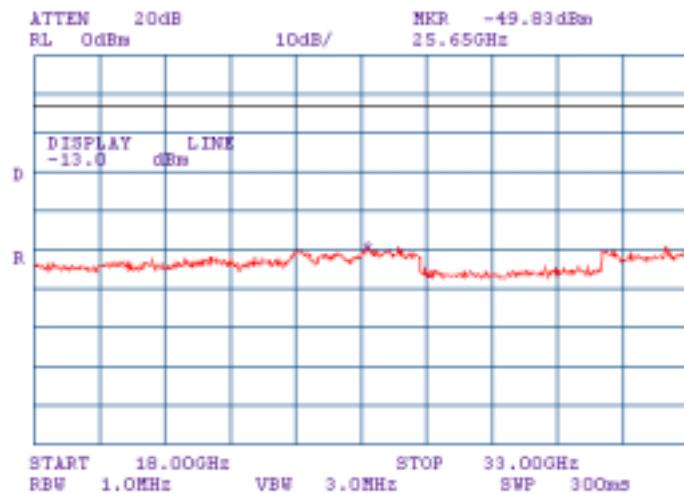


Plot 7.4.17 Spurious emission measurements in 18000 - 33000 MHz range at mid carrier frequency

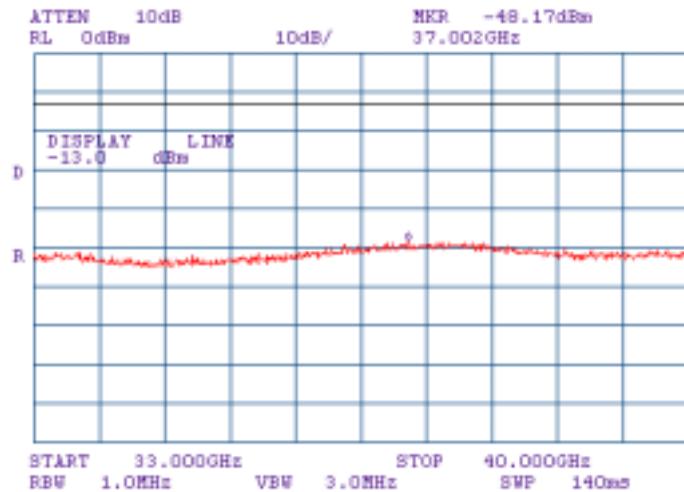


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | <b>PASS</b>                   |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.18 Spurious emission measurements in 18000 - 33000 MHz range at high carrier frequency**

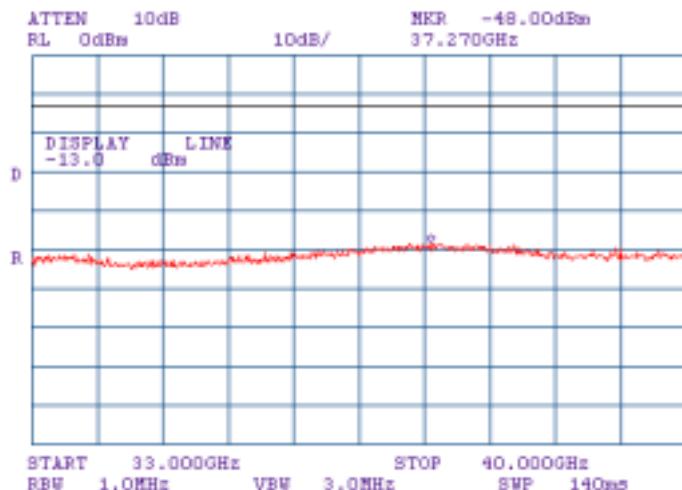


**Plot 7.4.19 Spurious emission measurements in 33000 - 40000 MHz range at low carrier frequency**

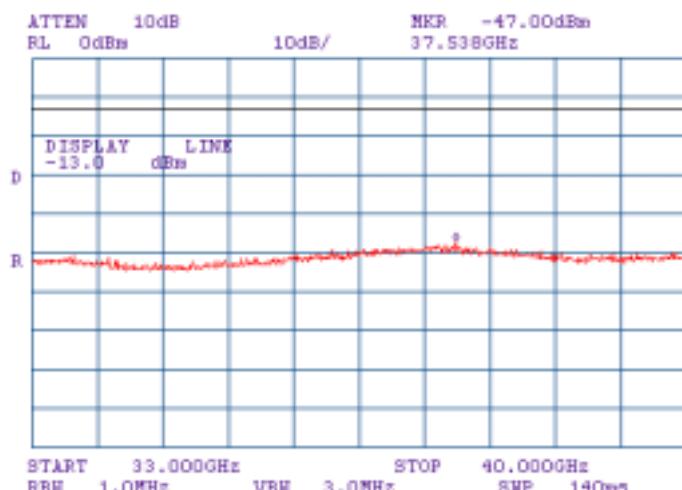


|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Conducted spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1051 and 90.1323                  |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | <b>PASS</b>                   |
| <b>Date:</b>               | 12/26/2007   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1010 hPa                        | <b>Relative Humidity:</b> 45% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 7.4.20 Spurious emission measurements in 33000 - 40000 MHz range at mid carrier frequency**



**Plot 7.4.21 Spurious emission measurements in 33000 - 40000 MHz range at high carrier frequency**



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

## 7.5 Radiated spurious emission measurements

### 7.5.1 General

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

Table 7.5.1 Radiated spurious emission test limits

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

\* - Excluding the in band emission within  $\pm 250$  % of the authorized bandwidth from the carrier

\*\* - 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

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

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

7.5.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360<sup>0</sup> and the measuring antenna was rotated around its vertical axis.

7.5.2.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

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

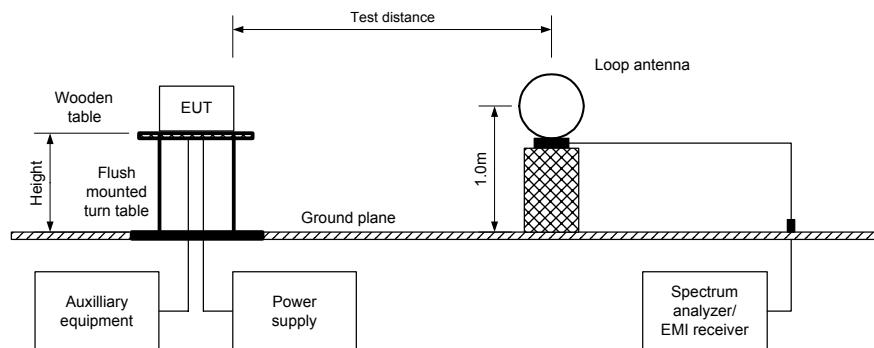
7.5.3.1 The EUT was set up as shown in Figure 7.5.2, energized and the performance check was conducted.

7.5.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360<sup>0</sup> and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

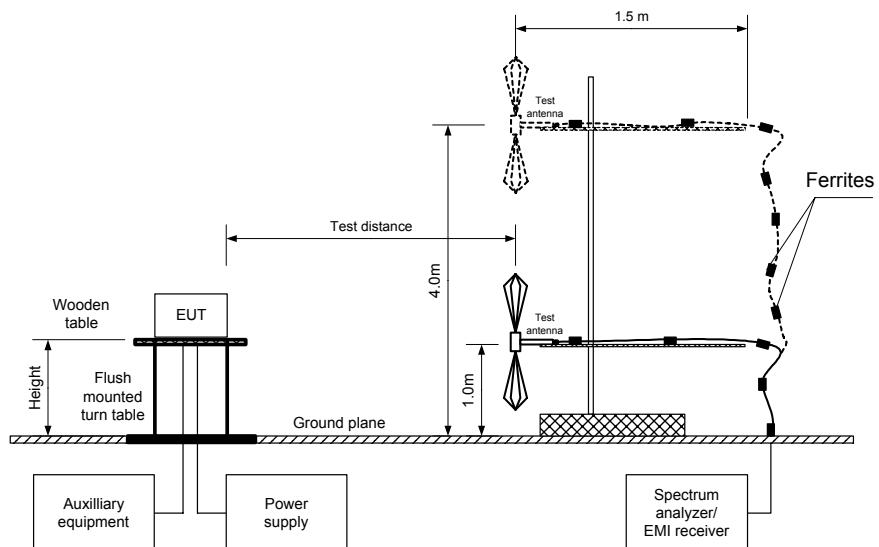
7.5.3.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

**Figure 7.5.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band**



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



|                            |   |                           |          |
|----------------------------|---|---------------------------|----------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                           |          |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                           |          |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>           | PASS     |
| <b>Date:</b>               | 1/13/2008   | <b>Relative Humidity:</b> | 48%      |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Power Supply:</b>      | 120 V AC |
| <b>Remarks:</b>            |   |                           |          |

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

OPERATING FREQUENCY RANGE: 3655.0 – 3695.0 MHz  
 TEST DISTANCE: 3 m  
 TEST SITE: Semi anechoic chamber / OATS  
 EUT HEIGHT: 0.8 m  
 INVESTIGATED FREQUENCY RANGE: 0.009 – 40000 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: BPSK  
 BIT RATE: 2.095 Mbps  
 CHANNEL BANDWIDTH: 5 MHz  
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

| Frequency, MHz                           | Field strength, dB(µV/m) | Limit, dB(µV/m) | Margin, dB* | RBW, kHz | Antenna polarization | Antenna height, m | Turn-table position**, degrees |
|--|--------------------------|-----------------|-------------|----------|----------------------|-------------------|--------------------------------|
| <b>Low carrier frequency 3655.0 MHz</b>  |                          |                 |             |          |                      |                   |                                |
| No spurious emissions were found         |                          |                 |             |          |                      |                   |                                |
| <b>Mid carrier frequency 3675.0 MHz</b>  |                          |                 |             |          |                      |                   |                                |
| No spurious emissions were found         |                          |                 |             |          |                      |                   |                                |
| <b>High carrier frequency 3695.0 MHz</b> |                          |                 |             |          |                      |                   |                                |
| No spurious emissions were found         |                          |                 |             |          |                      |                   |                                |

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

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

**Reference numbers of test equipment used**

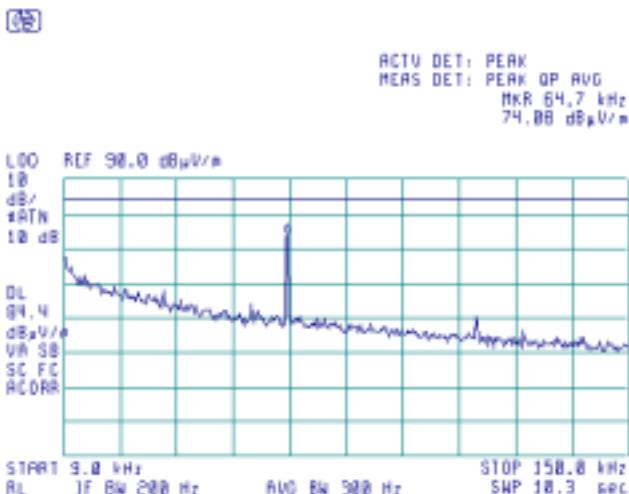
|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| HL 0446 | HL 0521 | HL 0589 | HL 0604 | HL 0768 | HL 0769 | HL 1424 | HL 1947 |
| HL 2254 | HL 2259 | HL 2260 | HL 2261 | HL 2432 |         |         |         |

Full description is given in Appendix A.

|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

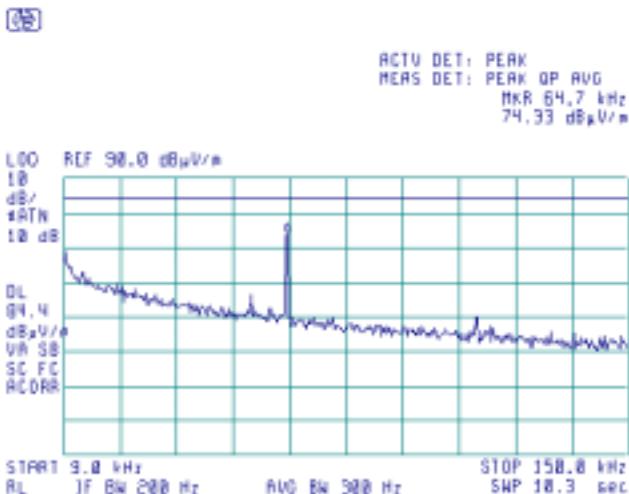
Plot 7.5.1 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.5.2 Radiated emission measurements in 9 - 150 kHz range

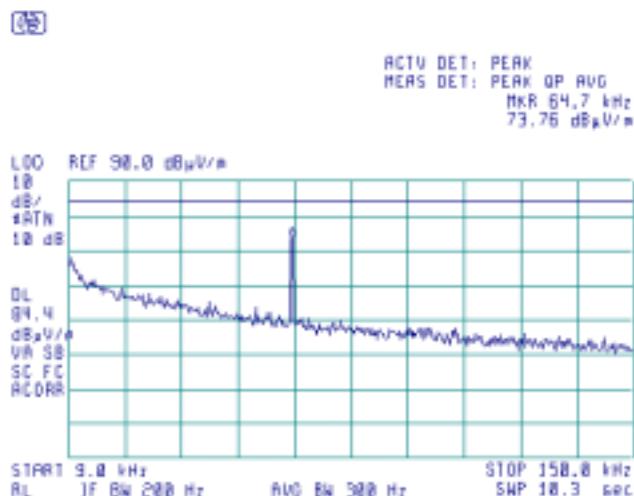
TEST SITE: Semi anechoic chamber  
 CARRIER FREQUENCY: Mid  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



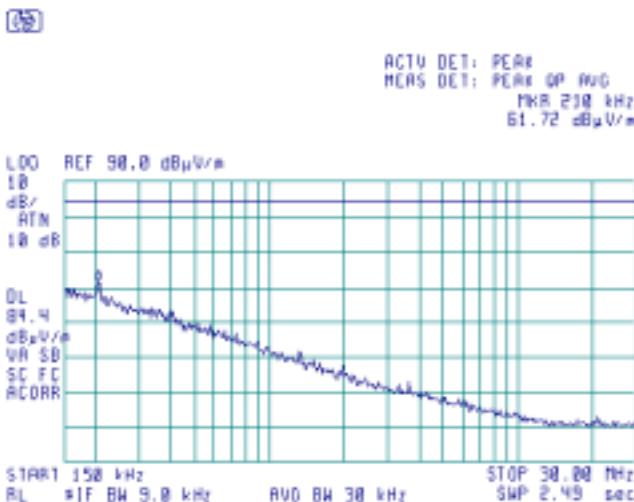
|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

**Plot 7.5.3 Radiated emission measurements in 9 - 150 kHz range**

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


**Plot 7.5.4 Radiated emission measurements in 0.15 - 30 MHz range**

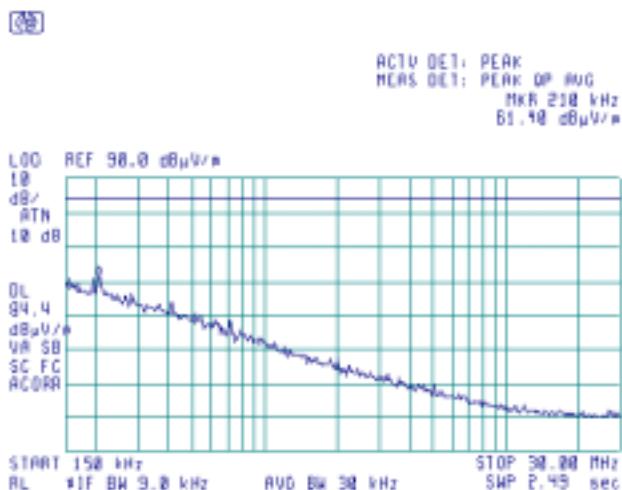
TEST SITE: Semi anechoic chamber  
 CARRIER FREQUENCY: Low  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



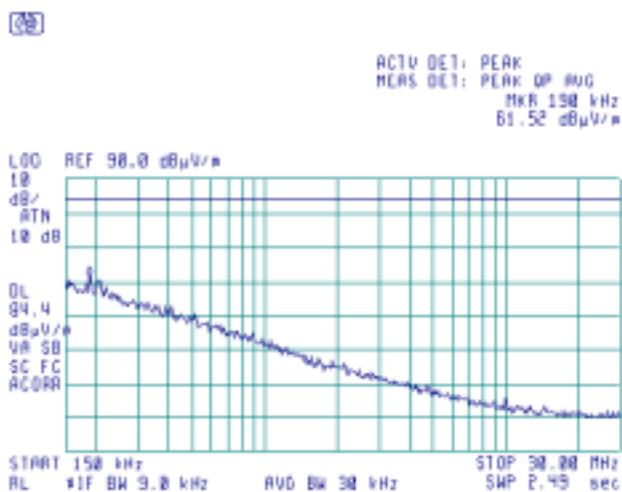
|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

**Plot 7.5.5 Radiated emission measurements in 0.15 - 30 MHz range**

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


**Plot 7.5.6 Radiated emission measurements in 0.15 - 30 MHz range**

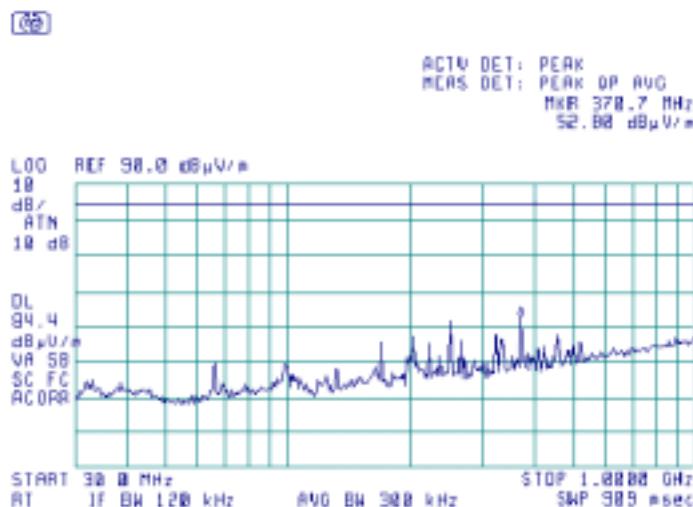
TEST SITE: Semi anechoic chamber  
 CARRIER FREQUENCY: High  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 1/13/2008   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

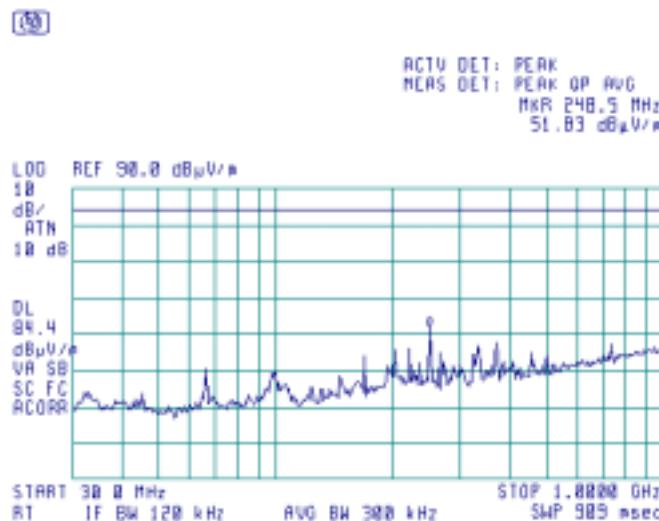
**Plot 7.5.7 Radiated emission measurements in 30 - 1000 MHz range**

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



**Plot 7.5.8 Radiated emission measurements in 30 - 1000 MHz range**

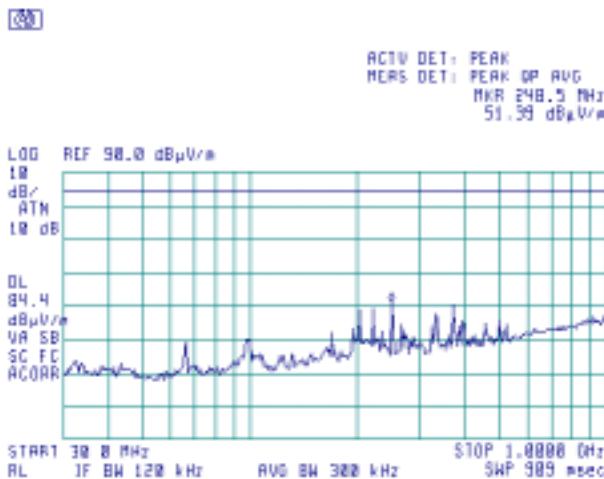
TEST SITE: Semi anechoic chamber  
CARRIER FREQUENCY: Mid  
ANTENNA POLARIZATION: Vertical and Horizontal  
TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

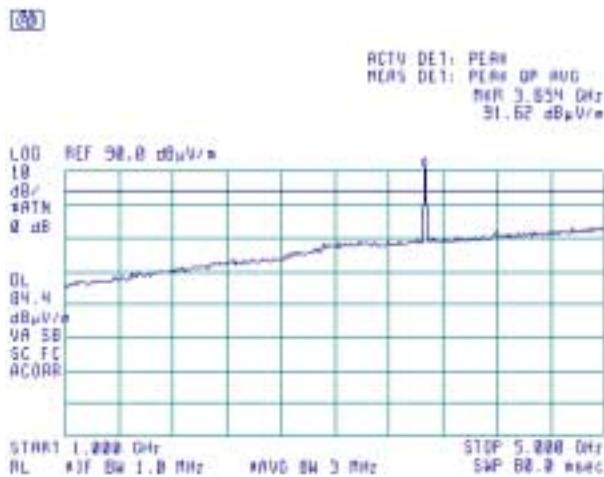
**Plot 7.5.9 Radiated emission measurements in 30 - 1000 MHz range**

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



**Plot 7.5.10 Radiated emission measurements in 1000 – 5000 MHz range**

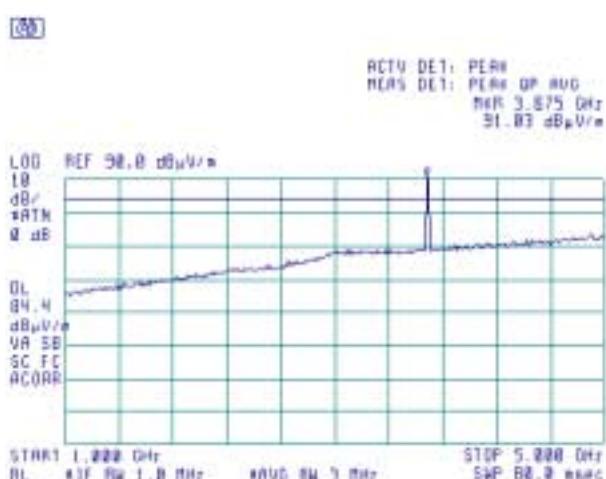
TEST SITE: Semi anechoic chamber  
 CARRIER FREQUENCY: Low  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

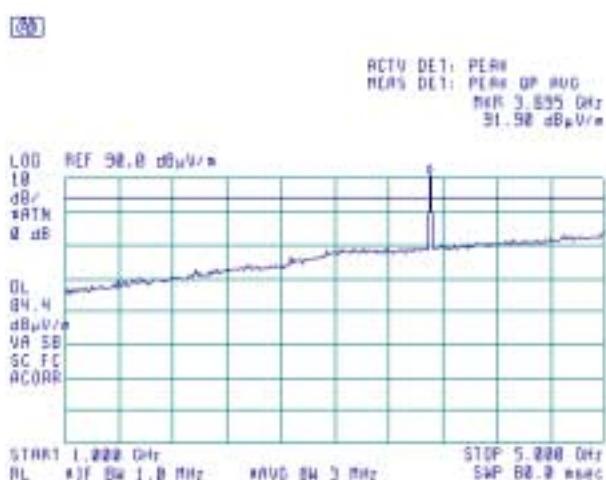
**Plot 7.5.11 Radiated emission measurements in 1000 – 5000 MHz range**

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



**Plot 7.5.12 Radiated emission measurements in 1000 – 5000 MHz range**

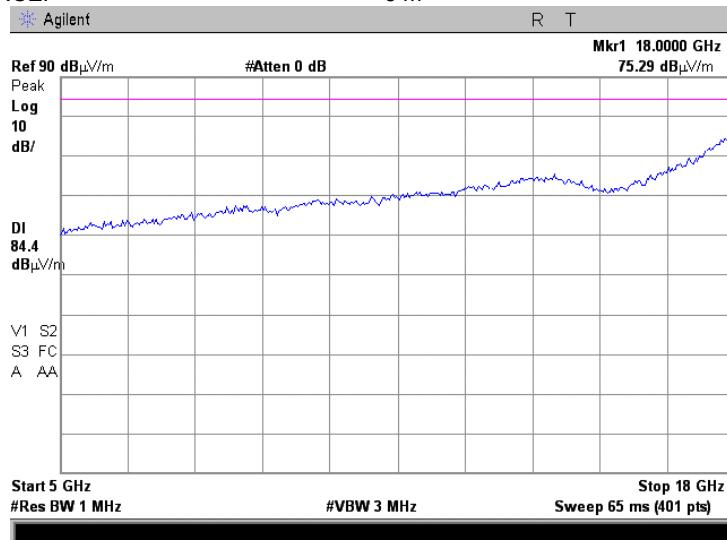
TEST SITE: Semi anechoic chamber  
 CARRIER FREQUENCY: High  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

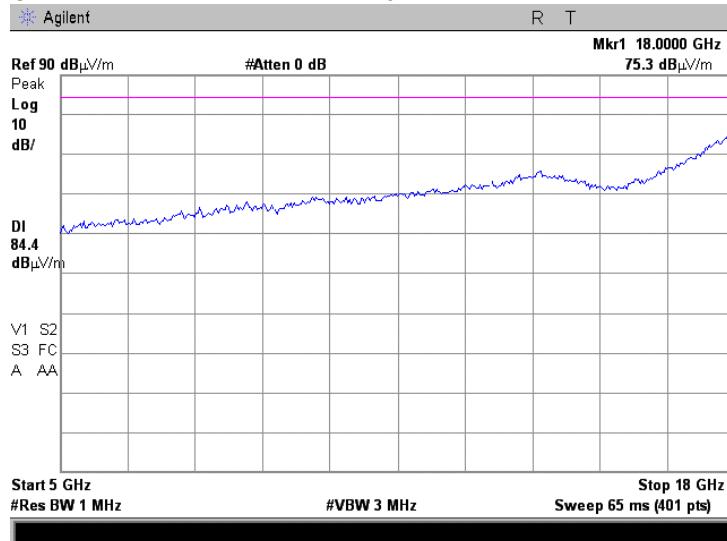
**Plot 7.5.13 Radiated emission measurements in 5000 – 18000 MHz range**

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



**Plot 7.5.14 Radiated emission measurements in 5000 – 18000 MHz range**

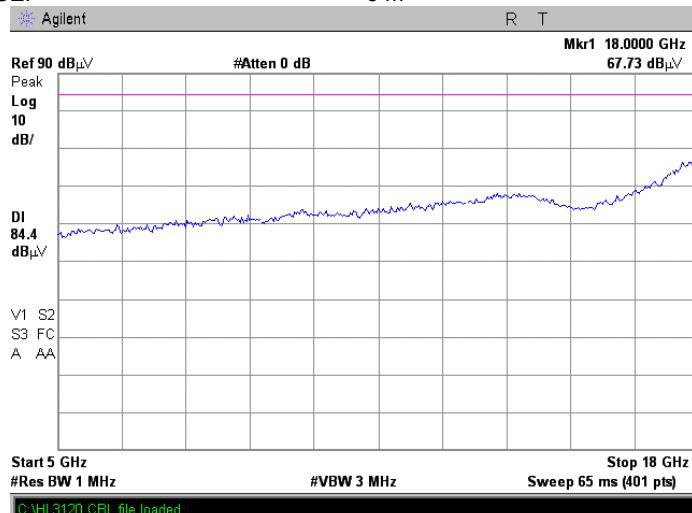
TEST SITE: Semi anechoic chamber  
 CARRIER FREQUENCY: Mid  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b> PASS          |                               |
| <b>Date:</b>               | 1/13/2008   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

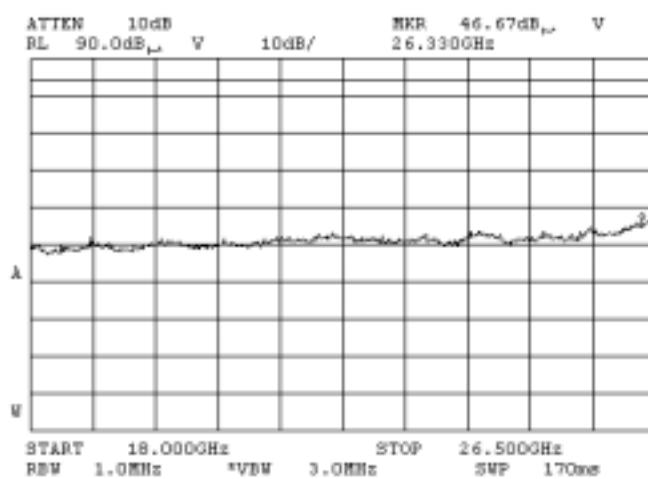
**Plot 7.5.15 Radiated emission measurements in 5000 – 18000 MHz range**

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



**Plot 7.5.16 Radiated emission measurements in 18000 – 26500 MHz range**

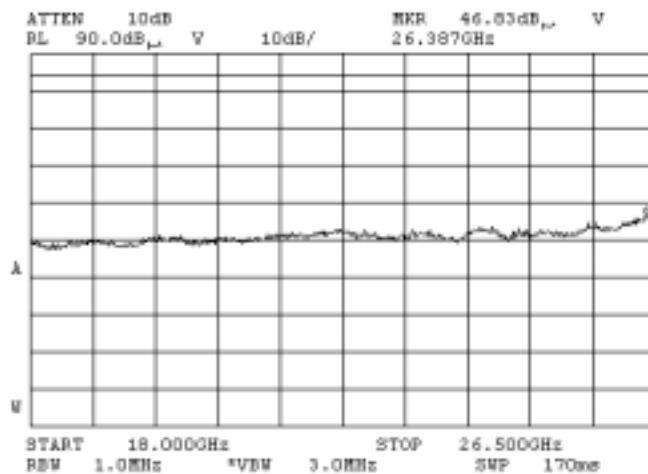
TEST SITE: OATS  
 CARRIER FREQUENCY: Low  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               | <b>PASS</b>                   |
| <b>Date:</b>               | 1/13/2008   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

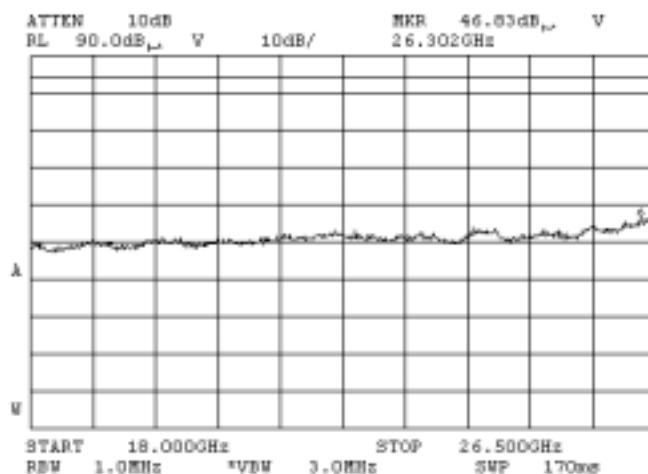
**Plot 7.5.17 Radiated emission measurements in 18000 – 26500 MHz range**

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



**Plot 7.5.18 Radiated emission measurements in 18000 – 26500 MHz range**

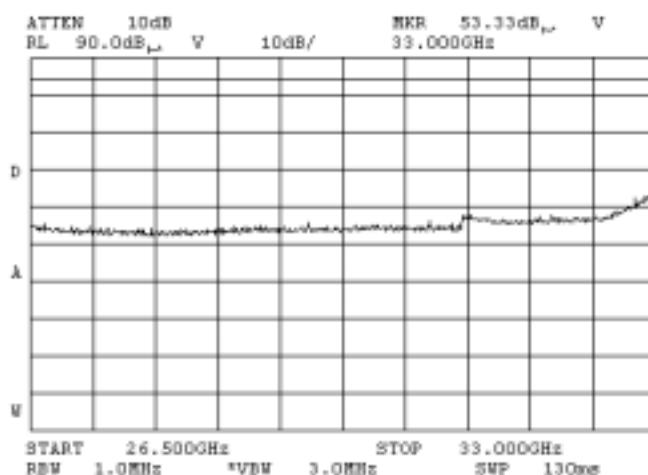
TEST SITE: OATS  
 CARRIER FREQUENCY: High  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 1/13/2008   |                               |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

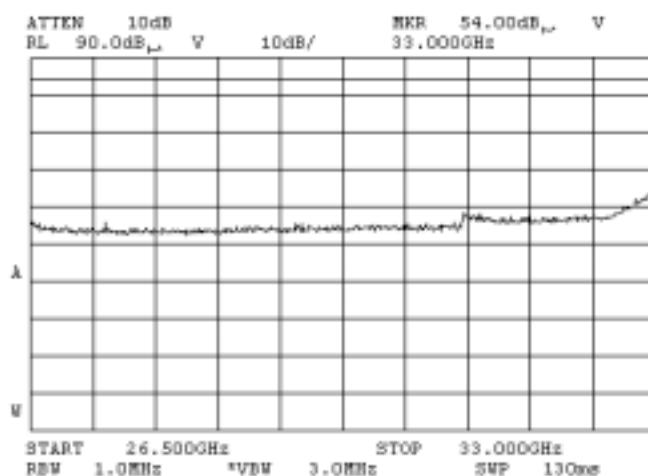
**Plot 7.5.19 Radiated emission measurements in 26500-33000 MHz range**

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



**Plot 7.5.20 Radiated emission measurements in 26500-33000 MHz range**

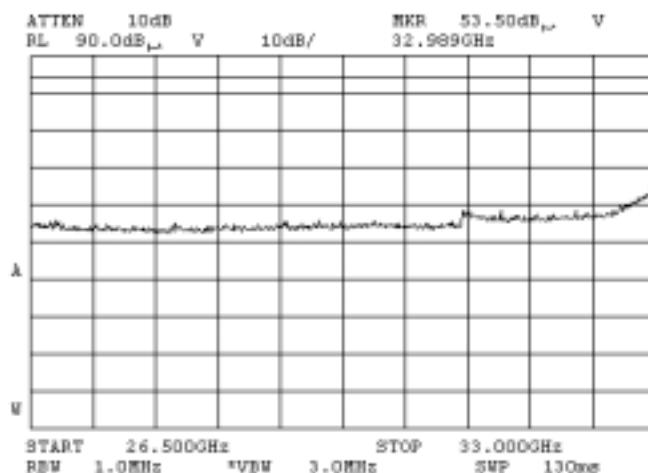
TEST SITE: OATS  
 CARRIER FREQUENCY: Mid  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

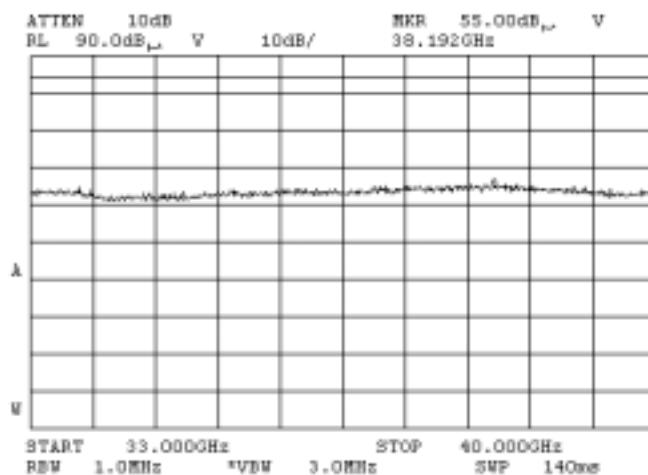
**Plot 7.5.21 Radiated emission measurements in 26500-33000 MHz range**

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



**Plot 7.5.22 Radiated emission measurements in 33000-40000 MHz range**

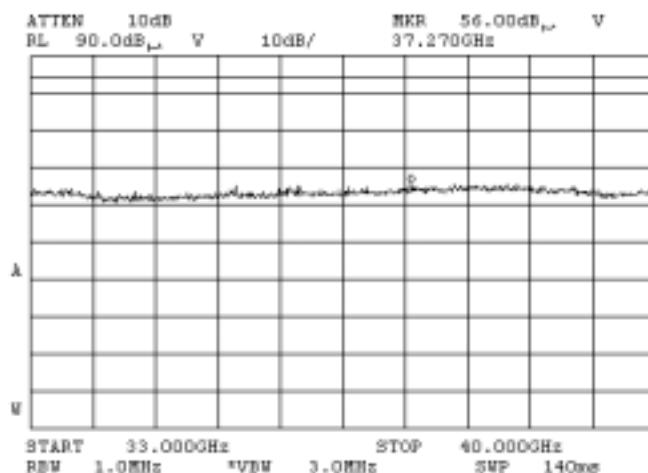
TEST SITE: OATS  
 CARRIER FREQUENCY: Low  
 ANTENNA POLARIZATION: Vertical and Horizontal  
 TEST DISTANCE: 3 m



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 90.1323, Radiated spurious emissions</b> |                               |                               |
| <b>Test procedure:</b>     | 47 CFR, Sections 2.1053 and 90. 1323                |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 1/13/2008   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 21°C   | <b>Air Pressure:</b> 1008 hPa                       | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

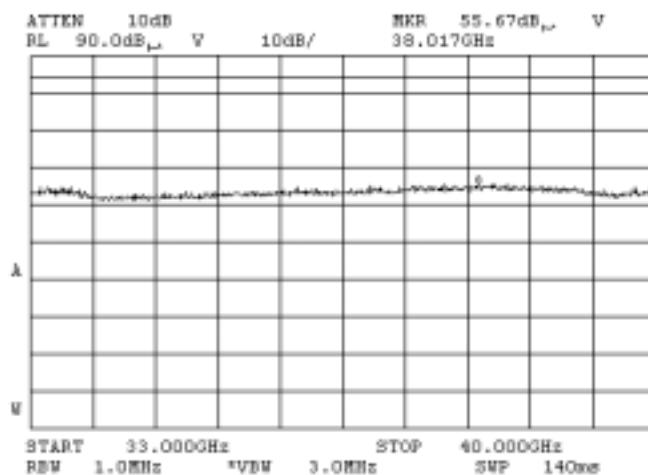
**Plot 7.5.23 Radiated emission measurements in 33000-40000 MHz range**

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



**Plot 7.5.24 Radiated emission measurements in 33000-40000 MHz range**

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



|                            |   |                               |                              |
|----------------------------|---|-------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 90.213, Frequency stability</b>          |                               |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2 |                               |                              |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               | PASS                         |
| <b>Date:</b>               | 12/30/2007  |                               |                              |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 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.

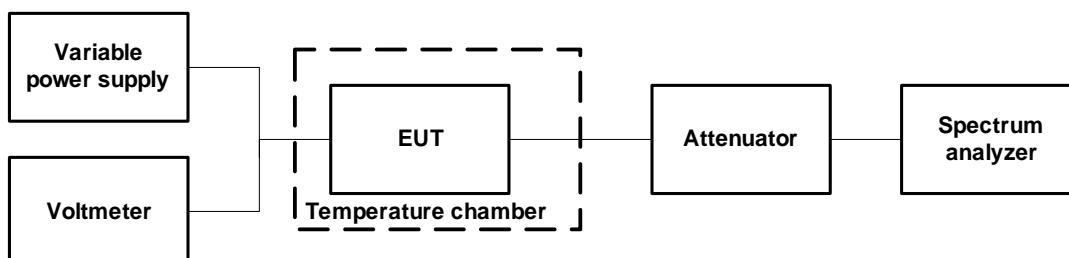
Table 7.6.1 Frequency stability limits

| Operating frequency, MHz | Maximum allowed frequency displacement |       |
|--------------------------|--|-------|
|                          | ppm                                    | Hz    |
| 3655.000                 |  | 73100 |
| 3675.000                 | 20                                     | 73500 |
| 3695.000                 |  | 73900 |

### 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 and compared with the limit as provided in Table 7.6.2.

Figure 7.6.1 Frequency stability test setup



|                            |   |                               |                              |
|----------------------------|---|-------------------------------|------------------------------|
| <b>Test specification:</b> | <b>Section 90.213, Frequency stability</b>          |                               |                              |
| <b>Test procedure:</b>     | 47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2 |                               |                              |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                              |
| <b>Date:</b>               | 12/30/2007  | <b>PASS</b>                   |                              |
| <b>Temperature:</b> 24°C   | <b>Air Pressure:</b> 1018 hPa                       | <b>Relative Humidity:</b> 36% | <b>Power Supply:</b> 120 VAC |
| <b>Remarks:</b>            |   |                               |                              |

Table 7.6.2 Frequency stability test results

OPERATING FREQUENCY RANGE: 3655.0 – 3695.0 MHz  
 NOMINAL POWER VOLTAGE: 120 VAC  
 TEMPERATURE STABILIZATION PERIOD: 20 min  
 POWER DURING TEMPERATURE TRANSITION: Off  
 SPECTRUM ANALYZER MODE: peak  
 RESOLUTION BANDWIDTH: 1000 Hz  
 VIDEO BANDWIDTH: 3000 Hz  
 MODULATION: Unmodulated

| - , %                            | Voltage V | Frequency, MHz |                     |                     |                     |                     |                     |                      | Max frequency drift, Hz |          | Limit, Hz | Margin, Hz | Verdict |
|----------------------------------|-----------|----------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|-------------------------|----------|-----------|------------|---------|
|                                  |           | 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 |           |            |         |
| <b>Low frequency 3655.0 MHz</b>  |           |                |                     |                     |                     |                     |                     |                      |                         |          |           |            |         |
| -30                              | nominal   | 3654.937427    | 3654.937787         | 3654.938312         | 3654.93872          | 3654.93903          | 3654.93942          | 3654.940130          | 0                       | -7625    | 73100     | -65475     | Pass    |
| -20                              | nominal   | 3654.940276    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.942127          | 0                       | -4776    |           | -68324     | Pass    |
| -10                              | nominal   | 3654.941591    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.943585          | 0                       | -3461    |           | -69639     | Pass    |
| 0                                | nominal   | 3654.943151    | 3654.943665         | 3654.943913         | 3654.94411          | 3654.94330          | 3654.94343          | 3654.944676          | 0                       | -1901    |           | -71199     | Pass    |
| 10                               | nominal   | 3654.945176    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.945144          | 124                     | 0        |           | -72976     | Pass    |
| 20                               | 15%       | 3654.945301    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.946937          | 1885                    | 0        |           | -71215     | Pass    |
| 20                               | nominal   | 3654.944544    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.945052*         | 0                       | -508     |           | -72592     | Pass    |
| 20                               | -15%      | 3654.945537    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.946005          | 953                     | 0        |           | -72147     | Pass    |
| 30                               | nominal   | 3654.944613    | 3654.944664         | 3654.944692         | 3654.94473          | 3654.94475          | 3654.94479          | 3654.944844          | 0                       | -439     |           | -72661     | Pass    |
| 40                               | nominal   | 3654.944743    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.945864          | 812                     | -309     |           | -72288     | Pass    |
| 50                               | nominal   | 3654.945602    | NA                  | NA                  | NA                  | NA                  | NA                  | 3654.948699          | 3647                    | 0        |           | -69453     | Pass    |
| <b>Mid frequency 3675.0 MHz</b>  |           |                |                     |                     |                     |                     |                     |                      |                         |          |           |            |         |
| -30                              | nominal   | 3674.938639    | 3674.939103         | 3674.939336         | 3674.93950          | 3674.93968          | 3674.93973          | 3674.939991          | 0                       | -5955    | 73500     | -67545     | Pass    |
| -20                              | nominal   | 3674.941421    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.941919          | 0                       | -3173    |           | -70327     | Pass    |
| -10                              | nominal   | 3674.942501    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.943332          | 0                       | -2093    |           | -71407     | Pass    |
| 0                                | nominal   | 3674.943873    | 3674.944205         | 3674.944245         | 3674.94431          | 3674.94433          | 3674.94435          | 3674.944381          | 0                       | -721     |           | -72779     | Pass    |
| 10                               | nominal   | 3674.944665    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.944618          | 71                      | 0        |           | -73429     | Pass    |
| 20                               | 15%       | 3674.945551    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.947127          | 2533                    | 0        |           | -70967     | Pass    |
| 20                               | nominal   | 3674.944250    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.944594          | 0                       | -344     |           | -73156     | Pass    |
| 20                               | -15%      | 3674.945161    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.945509          | 915                     | 0        |           | -72585     | Pass    |
| 30                               | nominal   | 3674.944357    | 3674.944266         | 3674.944235         | 3674.94421          | 3674.94422          | 3674.94424          | 3674.944406          | 0                       | -375     |           | -73125     | Pass    |
| 40                               | nominal   | 3674.944908    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.945230          | 636                     | 0        |           | -72864     | Pass    |
| 50                               | nominal   | 3674.947495    | NA                  | NA                  | NA                  | NA                  | NA                  | 3674.948903          | 4309                    | 0        |           | -69191     | Pass    |
| <b>High frequency 3695.0 MHz</b> |           |                |                     |                     |                     |                     |                     |                      |                         |          |           |            |         |
| -30                              | nominal   | 3694.937968    | 3694.938542         | 3694.938799         | 3694.93912          | 3694.93915          | 3694.93931          | 3694.939538          | 0                       | -6768    | 73900     | -67132     | Pass    |
| -20                              | nominal   | 3694.940761    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.941270          | 0                       | -3975    |           | -69925     | Pass    |
| -10                              | nominal   | 3694.942485    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.940939          | 0                       | -3797    |           | -70103     | Pass    |
| 0                                | nominal   | 3694.942698    | 3694.942988         | 3694.943281         | 3694.94350          | 3694.94365          | 3694.94378          | 3694.943352          | 0                       | -2038    |           | -71862     | Pass    |
| 10                               | nominal   | 3694.944158    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.944199          | 0                       | -578     |           | -73322     | Pass    |
| 20                               | 15%       | 3694.944100    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.943751          | 0                       | -985     |           | -72915     | Pass    |
| 20                               | nominal   | 3694.943821    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.944736          | 0                       | -915     |           | -72985     | Pass    |
| 20                               | -15%      | 3694.944276    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.944885          | 149                     | -460     |           | -73440     | Pass    |
| 30                               | nominal   | 3694.943873    | 3694.943828         | 3694.943819         | 3694.94382          | 3694.94384          | 3694.94386          | 3694.944006          | 0                       | -917     |           | -72983     | Pass    |
| 40                               | nominal   | 3694.945003    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.945440          | 704                     | 0        |           | -73196     | Pass    |
| 50                               | nominal   | 3694.946713    | NA                  | NA                  | NA                  | NA                  | NA                  | 3694.948479          | 3743                    | 0        |           | -70157     | Pass    |

\* - Reference frequency

## Reference numbers of test equipment used

|         |         |         |  |  |  |  |  |  |
|---------|---------|---------|--|--|--|--|--|--|
| HL 0377 | HL 2909 | HL 3000 |  |  |  |  |  |  |
|---------|---------|---------|--|--|--|--|--|--|

Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.107 class B, Conducted emission</b>    |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Section 13.1.3; Sections 11.5 and 12.1.3 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/31/2007   |                               |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1011 hPa                        | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

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

### 8.1 Conducted emissions

#### 8.1.1 General

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

Table 8.1.1 Limits for conducted emissions

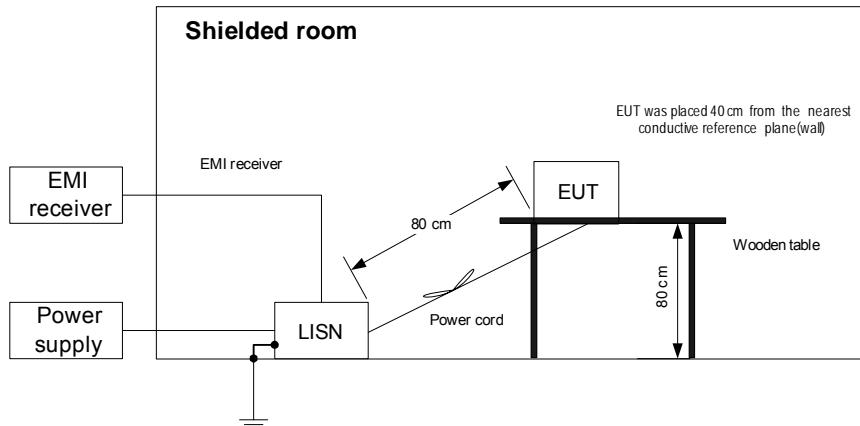
| Frequency,<br>MHz | Class B limit, dB( $\mu$ V) |          |
|-------------------|-----------------------------|----------|
|                   | QP                          | AVRG     |
| 0.15 - 0.5        | 66 - 56*                    | 56 - 46* |
| 0.5 - 5.0         | 56                          | 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 performance check was conducted.
- 8.1.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 8.1.2, Table 8.1.3, Table 8.1.4. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.
- 8.1.2.3 The position of the device cables was varied to determine maximum emission level.
- 8.1.2.4 The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

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



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.107 class B, Conducted emission</b>    |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Section 13.1.3; Sections 11.5 and 12.1.3 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/31/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1011 hPa                        | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Table 8.1.2 Conducted emission test results on the EUT power lines**

LINE: AC mains  
 LIMIT: Class B  
 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* |         |         |
| 0.184613          | 48.29                       | 46.55                           | 64.31            | -17.76         | 37.18                           | 54.31            | -17.13         | L1      | Pass    |
| 0.245640          | 47.36                       | 46.68                           | 61.92            | -15.24         | 36.50                           | 51.92            | -15.42         |         |         |
| 0.246325          | 47.46                       | 46.73                           | 61.90            | -15.17         | 36.59                           | 51.90            | -15.31         |         |         |
| 0.555975          | 46.51                       | 44.71                           | 56.00            | -11.29         | 32.40                           | 46.00            | -13.60         |         |         |
| 0.616138          | 51.19                       | 47.14                           | 56.00            | -8.86          | 37.67                           | 46.00            | -8.33          |         |         |
| 8.923650          | 45.52                       | 43.53                           | 60.00            | -16.47         | 33.29                           | 50.00            | -16.71         |         |         |
| 0.184650          | 52.90                       | 51.85                           | 64.31            | -12.46         | 46.27                           | 54.31            | -8.04          | L2      | Pass    |
| 0.246325          | 51.44                       | 50.62                           | 61.90            | -11.28         | 44.89                           | 51.90            | -7.01          |         |         |
| 0.278250          | 48.67                       | 47.74                           | 60.93            | -13.19         | 41.43                           | 50.93            | -9.50          |         |         |
| 0.306850          | 48.77                       | 46.50                           | 60.07            | -13.57         | 40.86                           | 50.07            | -9.21          |         |         |
| 0.555325          | 51.40                       | 48.40                           | 56.00            | -7.60          | 39.00                           | 46.00            | -7.00          |         |         |
| 0.615300          | 54.11                       | 52.87                           | 56.00            | -3.13          | 45.81                           | 46.00            | -0.19          |         |         |

\*- Margin = Measured emission - specification limit.

**Reference numbers of test equipment used**

|         |         |         |         |         |  |  |
|---------|---------|---------|---------|---------|--|--|
| HL 0447 | HL 0521 | HL 0787 | HL 1503 | HL 1510 |  |  |
|---------|---------|---------|---------|---------|--|--|

Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.107 class B, Conducted emission</b>    |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Section 13.1.3; Sections 11.5 and 12.1.3 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/31/2007   | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1011 hPa                        | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Table 8.1.3 Conducted emission test results on the laptop power lines**

LINE: AC mains  
 LIMIT: Class B  
 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* |         |         |
| 0.15 - 30         |                             | All emissions were found at least 20 dB below the specified limit |                  |                |                                 |                  |                | L1      | Pass    |
| 0.15 - 30         |                             | All emissions were found at least 20 dB below the specified limit |                  |                |                                 |                  |                | L2      | Pass    |

**Reference numbers of test equipment used**

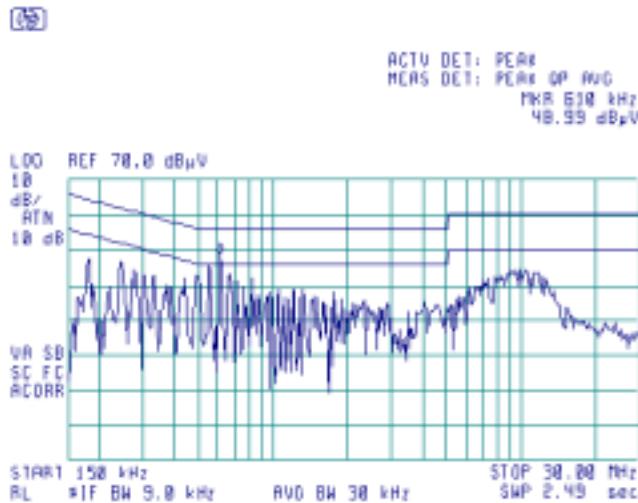
|         |         |         |         |         |  |  |  |
|---------|---------|---------|---------|---------|--|--|--|
| HL 0521 | HL 0787 | HL 1503 | HL 1510 | HL 2888 |  |  |  |
|---------|---------|---------|---------|---------|--|--|--|

Full description is given in Appendix A.

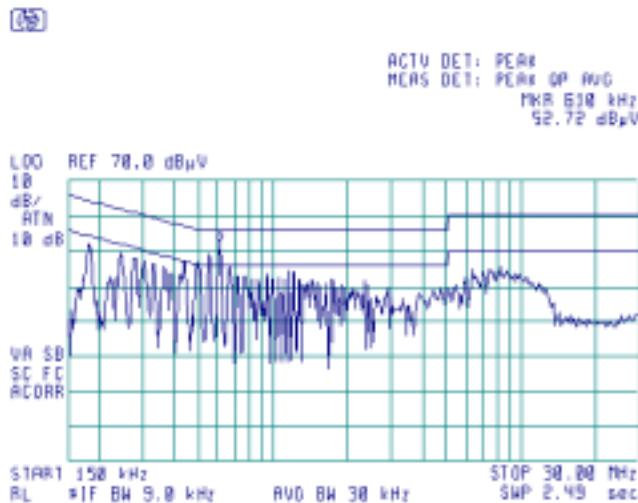
|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.107 class B, Conducted emission</b>    |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Section 13.1.3; Sections 11.5 and 12.1.3 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/31/2007   |                               |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1011 hPa                        | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Plot 8.1.1 Conducted emission measurements on the EUT power lines**

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


**Plot 8.1.2 Conducted emission measurements on the EUT power lines**

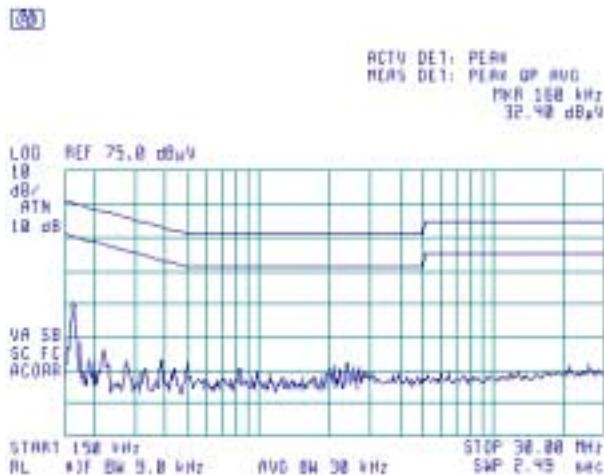
LINE: L2  
 LIMIT: Class B - QUASI-PEAK, AVERAGE  
 EUT OPERATING MODE: Receive / Stand-by  
 DETECTOR: PEAK



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.107 class B, Conducted emission</b>    |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Section 13.1.3; Sections 11.5 and 12.1.3 |                               |                               |
| <b>Test mode:</b>          | Compliance   | <b>Verdict:</b>               | PASS                          |
| <b>Date:</b>               | 12/31/2007   |                               |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1011 hPa                        | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

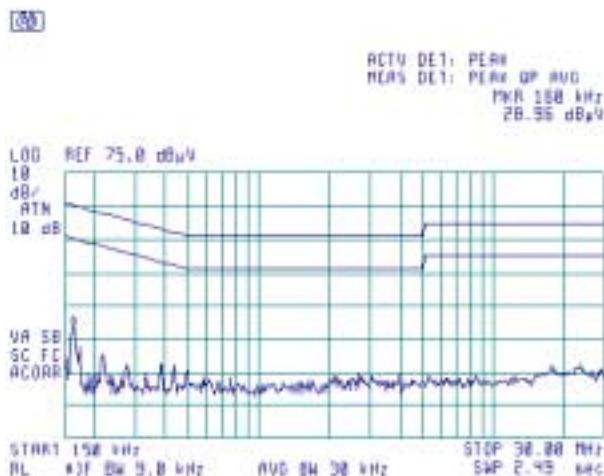
**Plot 8.1.3 Conducted emission measurements on the laptop power lines**

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



**Plot 8.1.4 Conducted emission measurements on the laptop power lines**

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



|                            |   |                               |                               |
|----------------------------|---|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, class B, Radiated emission</b> |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.6 and 12.1.4              |                               |                               |
| <b>Test mode:</b>          | Compliance  | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 12/31/2007  | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1011 hPa                     | <b>Relative Humidity:</b> 48% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |   |                               |                               |

## 8.2 Radiated emission measurements

### 8.2.1 General

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

Table 8.2.1 Radiated emission test limits

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

\* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows:  $\text{Lim}_{S2} = \text{Lim}_{S1} + 20 \log (S_1/S_2)$ , where  $S_1$  and  $S_2$  – standard defined and test distance respectively in meters.

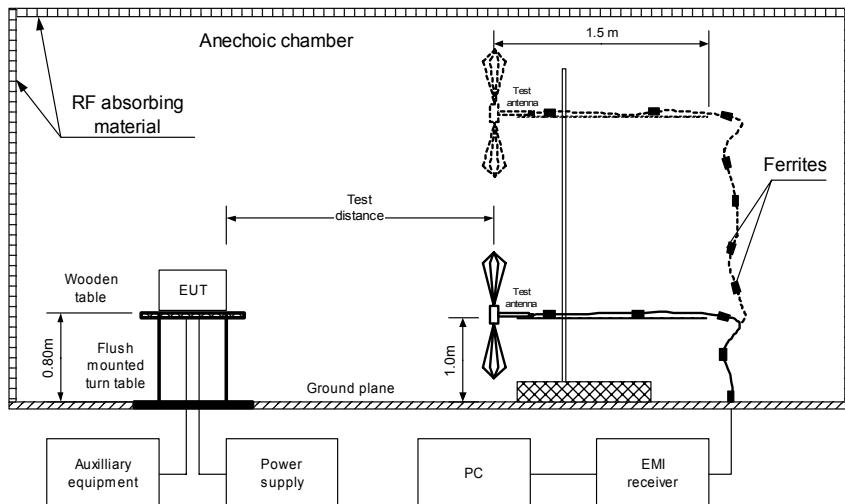
### 8.2.2 Test procedure for measurements in semi-anechoic chamber

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

8.2.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

8.2.2.3 The worst test results (the lowest margins) were recorded in Table 8.2.2, Table 8.2.3 and shown in the associated plots.

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



|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, Radiated emission</b> |                               |                               |
| <b>Test procedure:</b>     | ANSI C63.4, Sections 11.6 and 12.1.4     |                               |                               |
| <b>Test mode:</b>          | Compliance                               | <b>Verdict:</b>               |                               |
| <b>Date:</b>               | 4/3/2006                                 | <b>PASS</b>                   |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1009 hPa            | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

**Table 8.2.2 Radiated emission test results**

EUT SET UP: TABLE-TOP  
 TEST SITE: SEMI ANECHOIC CHAMBER  
 TEST DISTANCE: 3 m  
 LIMIT: Class B  
 DETECTORS USED: PEAK / QUASI-PEAK  
 FREQUENCY RANGE: 30 MHz – 1000 MHz  
 RESOLUTION BANDWIDTH: 120 kHz

| Frequency,<br>MHz | Peak<br>emission,<br>dB( $\mu$ V/m) | Average                                 |                          |                | Antenna<br>polarization | Antenna<br>height,<br>m | Turn-table<br>position**,<br>degrees | Verdict |
|-------------------|-------------------------------------|---|--------------------------|----------------|-------------------------|-------------------------|--------------------------------------|---------|
|                   |                                     | Measured<br>emission,<br>dB( $\mu$ V/m) | Limit,<br>dB( $\mu$ V/m) | Margin,<br>dB* |                         |                         |                                      |         |
| 129.086250        | 33.65                               | 28.53                                   | 43.50                    | -14.97         | V                       | 1.1                     | 170                                  | PASS    |
| 258.045500        | 38.31                               | 29.90                                   | 46.00                    | -16.10         | H                       | 1.0                     | 090                                  |         |
| 301.966500        | 36.79                               | 34.56                                   | 46.00                    | -11.44         | H                       | 1.2                     | 330                                  |         |
| 389.020500        | 37.65                               | 30.20                                   | 46.00                    | -15.80         | V                       | 1.1                     | 355                                  |         |
| 543.535000        | 37.19                               | 35.61                                   | 46.00                    | -10.39         | H                       | 1.0                     | 050                                  |         |
| 644.902500        | 35.91                               | 29.73                                   | 46.00                    | -16.27         | V                       | 1.0                     | 360                                  |         |

\*- Margin = Measured emission - specification limit.

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

**Reference numbers of test equipment used**

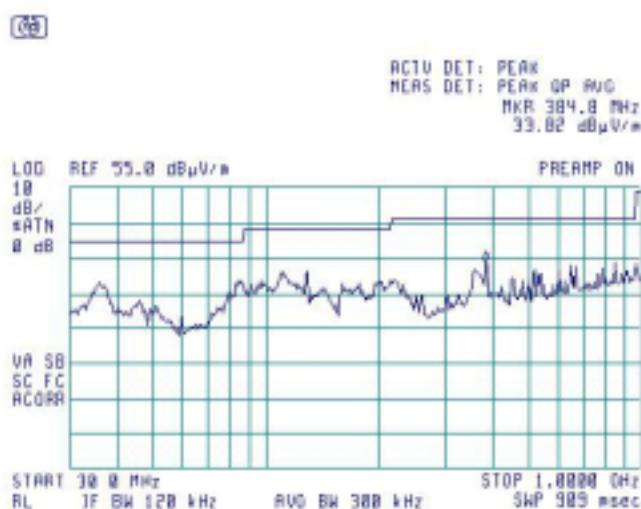
|         |         |         |         |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|
| HL 0521 | HL 0604 | HL 0589 | HL 1947 |  |  |  |  |
|---------|---------|---------|---------|--|--|--|--|

Full description is given in Appendix A.

|                            |  |                               |                               |
|----------------------------|--|-------------------------------|-------------------------------|
| <b>Test specification:</b> | <b>Section 15.109, Radiated emission</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>               | 4/3/2006                                 |                               |                               |
| <b>Temperature:</b> 22°C   | <b>Air Pressure:</b> 1009 hPa            | <b>Relative Humidity:</b> 42% | <b>Power Supply:</b> 120 V AC |
| <b>Remarks:</b>            |  |                               |                               |

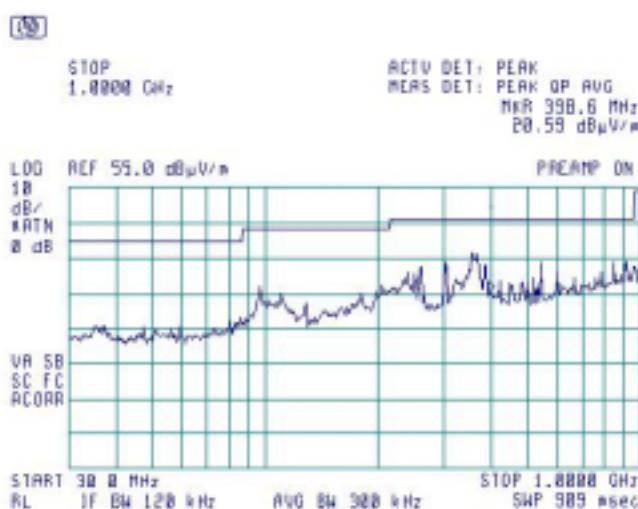
**Plot 8.2.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization**

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m



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

TEST SITE: Semi anechoic chamber  
TEST DISTANCE: 3 m



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

| HL No | Description   | Manufacturer               | Model              | Ser. No.                 | Last Cal. | Due Cal.  |
|-------|---|----------------------------|--------------------|--------------------------|-----------|-----------|
| 0377  | Counter, Universal, 100MHz  | Hewlett Packard Co         | 5328A              | 1712A030 35              | 01-Jan-08 | 01-Jan-09 |
| 0446  | Antenna, Loop, Active, 10 kHz - 30 MHz  | EMCO                       | 6502               | 2857                     | 28-Jun-07 | 28-Jun-08 |
| 0447  | LISN, 16/2, 300V RMS, 50 Ohm/50 uH + 5 Ohm, STD CISPR 16-1                    | HL                         | LISN 16 - 1        | 066                      | 03-Nov-07 | 03-Nov-08 |
| 0521  | EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz         | Hewlett Packard Co         | 8546A              | 3617A 00319, 3448A002 53 | 28-Aug-07 | 28-Aug-08 |
| 0589  | Cable Coaxial, GORE A2P01POL118, 2.3 m  | HL                         | GORE-3             | 176                      | 02-Dec-07 | 02-Dec-08 |
| 0604  | Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz                       | EMCO                       | 3141               | 9611-1011                | 10-Jan-08 | 10-Jan-09 |
| 0768  | Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain                    | Quinstar Technology        | QWH-4200-BA        | 110                      | 08-Dec-06 | 08-Dec-08 |
| 0769  | Antenna Standard Gain Horn, 26.5-40 GHz, WR28, 25 dB gain                     | Quinstar Technology        | QWH-2800-BA        | 112                      | 08-Dec-06 | 08-Dec-08 |
| 0787  | Transient Limiter 9 kHz-200 MHz   | Hewlett Packard Co         | 11947A             | 3107A018 77              | 21-Nov-07 | 21-Nov-08 |
| 1424  | Spectrum Analyzer, 30 Hz- 40 GHz  | Agilent Technologies       | 8564EC             | 3946A002 19              | 28-Aug-07 | 28-Aug-08 |
| 1503  | Cable RF, 6 m, BNC/BNC  | Belden                     | M17/167 MIL-C-17   | 1503                     | 11-Sep-07 | 11-Sep-08 |
| 1510  | Cable RF, 8 m, BNC/BNC  | Belden                     | M17/167 MIL-C-17   | 1510                     | 01-Jan-08 | 01-Jan-09 |
| 1947  | Cable 18GHz, 6.5 m, blue  | Rhophase Microwave Limited | NPS-1803A-6500-NPS | T4974                    | 05-Oct-07 | 05-Oct-08 |
| 2254  | Cable 40GHz, 0.8 m, blue  | Rhophase Microwave Limited | KPS-1503A-800-KPS  | W4907                    | 17-Jun-07 | 17-Jun-08 |
| 2259  | Amplifier Low Noise 2-20 GHz  | Sophia Wireless            | LNA0220-C          | 0223                     | 05-Nov-07 | 05-Nov-08 |
| 2260  | Amplifier Low Noise 14-33 GHz   | Sophia Wireless            | LNA28-B            | 0233                     | 05-Nov-07 | 05-Nov-08 |
| 2261  | Amplifier Low Noise 33-40 GHz   | Sophia Wireless            | LNA38-B            | 0234                     | 05-Nov-07 | 05-Nov-08 |
| 2399  | Cable 40GHz, 1.5 m, blue  | Rhophase Microwave Limited | KPS-1503A-1500-KPS | X2945                    | 01-Jan-08 | 01-Jan-09 |
| 2432  | Antenna, Double-Ridged Waveguide Horn 1-18 GHz                                | EMC Test Systems           | 3115               | 00027177                 | 03-Mar-07 | 03-Mar-08 |
| 2780  | EMC analyzer, 100 Hz to 26.5 GHz  | Agilent Technologies       | E7405A             | MY451024 6               | 11-Jun-07 | 11-Jun-08 |
| 2869  | Cable, 18 GHz, 1.2 m, SMA - SMA, Right Angle                                  | Gore                       | NA                 | 91P72073                 | 11-Feb-07 | 11-Feb-08 |
| 2888  | LISN Two-line V-Network 50 Ohm / 50 uH + 5 Ohm, 16A, MIL STD 461E, CISPR 16-1 | Rolf Heine                 | NNB-2/16Z          | 02/10018                 | 29-Mar-07 | 29-Mar-08 |
| 2909  | Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz                                  | Agilent Technologies       | E4407B             | MY414447 62              | 07-May-07 | 07-May-08 |
| 2912  | Cable 18 GHz, 1.5 m, SMA-SMA  | Gore                       | NA                 | 91P72067                 | 11-Feb-07 | 11-Feb-08 |
| 2951  | Cable, RF, 18 GHz, 0.9 m, SMA-SMA   | Gore                       | 0020014            | 2951                     | 5-Oct-07  | 5-Oct-08  |

| HL No | Description  | Manufacturer         | Model     | Ser. No.    | Last Cal. | Due Cal.  |
|-------|--|----------------------|-----------|-------------|-----------|-----------|
| 3000  | Cable RF 7.5 m BNC-BNC                                       | Paige Electric Corp. | RG 58 A/U | 3000        | 11-Sep-07 | 11-Sep-08 |
| 3173  | Attenuator, N-type, 10 dB, DC to 18 GHz, 5 W                 | Mini-Circuits        | BW-N10W5+ | 0708        | 07-May-07 | 07-May-08 |
| 3179  | Attenuator, N-type, 20 dB, DC to 18 GHz, 5 W                 | Mini-Circuits        | BW-N20W5+ | 0651        | 07-May-07 | 07-May-08 |
| 3301  | Power Meter, P-series, 50 MHz to 40 GHz                      | Agilent Technologies | N1911A    | MY451010 57 | 27-Jul-07 | 27-Jul-08 |
| 3302  | Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm   | Agilent Technologies | N1922A    | MY452405 86 | 25-Jul-07 | 25-Jul-08 |
| 3436  | Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz | Mini-Circuits        | BW-S10W5+ | 3436        | 09-Mar-08 | 09-Mar-09 |
| 3439  | Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz | Mini-Circuits        | BW-S20W5+ | 3439        | 09-Mar-08 | 09-Mar-09 |

## 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 error  | 30 – 300 MHz: ± 50.5 Hz (1.68 ppm)<br>300 – 1000 MHz: ± 168 Hz (0.56 ppm)  |
| Transient frequency behaviour  | 187 Hz<br>± 13.9 %   |
| Duty cycle, timing (Tx ON / OFF) and average factor measurements                                     | ± 1.0 %  |
| <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<br><br>Vertical 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<br>Biconilog antenna: ± 6.0 dB<br>Biconical antenna: ± 5.7 dB<br>Log periodic antenna: ± 6.0 dB<br>Double ridged horn antenna: ± 6.0 dB |

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

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

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

## 11 APPENDIX C Test 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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Person for contact: Mr. Alex Usoskin, CEO.

## 12 APPENDIX D Specification references

|                         |  |
|-------------------------|--|
| 47CFR part 90: 2006     | Private land mobile radio services   |
| 47CFR part 1: 2006      | Practice and procedure   |
| 47CFR part 2: 2006      | Frequency allocations and radio treaty matters; general rules and regulations  |
| 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-C:2004 | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards  |

## 13 APPENDIX E Test equipment correction factors

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

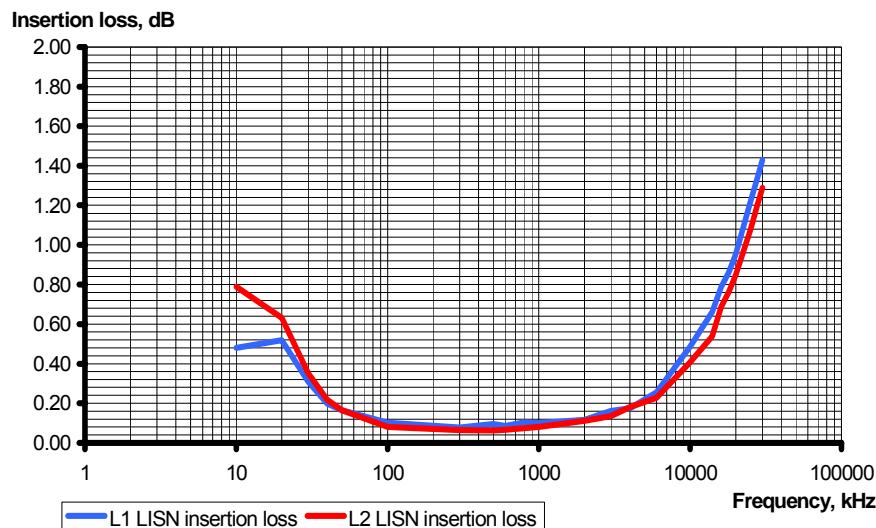
| Frequency, kHz | Correction factor, dB |
|----------------|-----------------------|
| 10             | 4.9                   |
| 15             | 2.86                  |
| 20             | 1.83                  |
| 25             | 1.25                  |
| 30             | 0.91                  |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

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

**Correction factor**  
**Line impedance stabilization network**  
**Model NNB-2/16Z, Rolf Heine, HL 2888**

| Frequency, kHz | Insertion loss, dB |      | Measurement Uncertainty, dB |
|----------------|--------------------|------|-----------------------------|
|                | L1                 | N    |                             |
| 10             | 0.48               | 0.79 |                             |
| 20             | 0.52               | 0.63 |                             |
| 30             | 0.31               | 0.35 |                             |
| 40             | 0.20               | 0.22 |                             |
| 50             | 0.16               | 0.17 |                             |
| 100            | 0.10               | 0.08 |                             |
| 300            | 0.08               | 0.06 |                             |
| 500            | 0.10               | 0.06 |                             |
| 600            | 0.09               | 0.07 |                             |
| 800            | 0.10               | 0.07 |                             |
| 1000           | 0.10               | 0.08 |                             |
| 2000           | 0.12               | 0.11 |                             |
| 3000           | 0.16               | 0.14 |                             |
| 4000           | 0.17               | 0.18 |                             |
| 6000           | 0.26               | 0.23 |                             |
| 10000          | 0.49               | 0.41 |                             |
| 14000          | 0.66               | 0.54 |                             |
| 16000          | 0.79               | 0.69 |                             |
| 18000          | 0.86               | 0.76 |                             |
| 20000          | 0.96               | 0.85 |                             |
| 25000          | 1.22               | 1.08 |                             |
| 28000          | 1.35               | 1.21 |                             |
| 30000          | 1.43               | 1.29 |                             |

±0.6



**Antenna Factor**  
**Active Loop Antenna**  
**EMC Test Systems, model 6502, S/N 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**  
**Standard gain horn antenna**  
**Quinstar Technology**  
**Model QWH, Ser.No.112, HL 0768, 0769**

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

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

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

**Antenna factor**  
**Double-ridged guide horn antenna**  
**Model 3115, serial number: 00027177, HL2432**

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

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

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

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

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

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

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

| No. | Frequency,<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 18 GHz, 6.5 m, blue, model: NPS-1803A-6500-NPS, S/N T4974, HL 1947**

| Frequency,<br>GHz | Cable 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 | Cable 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**  
**Cable 40 GHz, 0.8 m, blue, model: KPS-1503A-800-KPS, S/N W4907, HL 2254**

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

**Cable loss**  
**Cable coaxial, 40GHz, 1.5 m, Blue, Rhophase 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, S/N 91P72071**  
**HL 2869**

| Frequency,<br>MHz | Cable loss,<br>dB | Frequency,<br>MHz | Cable loss,<br>dB | Frequency,<br>MHz | Cable loss,<br>dB |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 10                | 0.06              | 5750              | 0.87              | 12000             | 1.30              |
| 30                | 0.06              | 6000              | 0.87              | 12250             | 1.33              |
| 100               | 0.10              | 6250              | 0.89              | 12500             | 1.35              |
| 250               | 0.18              | 6500              | 0.92              | 12750             | 1.36              |
| 500               | 0.25              | 6750              | 0.94              | 13000             | 1.38              |
| 750               | 0.27              | 7000              | 0.98              | 13250             | 1.41              |
| 1000              | 0.34              | 7250              | 0.99              | 13500             | 1.39              |
| 1250              | 0.35              | 7500              | 1.02              | 13750             | 1.41              |
| 1500              | 0.42              | 7750              | 1.03              | 14000             | 1.42              |
| 1750              | 0.44              | 8000              | 1.04              | 14250             | 1.46              |
| 2000              | 0.49              | 8250              | 1.04              | 14500             | 1.39              |
| 2250              | 0.52              | 8500              | 1.08              | 14750             | 1.46              |
| 2500              | 0.55              | 8750              | 1.08              | 15000             | 1.40              |
| 2750              | 0.59              | 9000              | 1.12              | 15250             | 1.47              |
| 3000              | 0.61              | 9250              | 1.12              | 15500             | 1.36              |
| 3250              | 0.64              | 9500              | 1.15              | 15750             | 1.49              |
| 3500              | 0.67              | 9750              | 1.14              | 16000             | 1.51              |
| 3750              | 0.69              | 10000             | 1.19              | 16250             | 1.60              |
| 4000              | 0.70              | 10250             | 1.20              | 16500             | 1.56              |
| 4250              | 0.74              | 10500             | 1.23              | 16750             | 1.66              |
| 4500              | 0.76              | 10750             | 1.24              | 17000             | 1.71              |
| 4750              | 0.77              | 11000             | 1.24              | 17250             | 1.78              |
| 5000              | 0.79              | 11250             | 1.25              | 17500             | 1.75              |
| 5250              | 0.82              | 11500             | 1.28              | 17750             | 1.77              |
| 5500              | 0.84              | 11750             | 1.29              | 18000             | 1.86              |

**Cable loss**  
**Cable coaxial, Gore, 18 GHz, 1.5 m, SMA-SMA, S/N 91P72067**  
**HL 2912**

| Frequency,<br>MHz | Cable loss,<br>dB | Frequency,<br>MHz | Cable loss,<br>dB | Frequency,<br>MHz | Cable loss,<br>dB |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 10                | 0.07              | 5750              | 1.56              | 12000             | 2.23              |
| 30                | 0.10              | 6000              | 1.48              | 12250             | 2.14              |
| 100               | 0.17              | 6250              | 1.55              | 12500             | 2.19              |
| 250               | 0.28              | 6500              | 1.52              | 12750             | 2.14              |
| 500               | 0.43              | 6750              | 1.57              | 13000             | 2.24              |
| 750               | 0.52              | 7000              | 1.59              | 13250             | 2.19              |
| 1000              | 0.59              | 7250              | 1.64              | 13500             | 2.24              |
| 1250              | 0.66              | 7500              | 1.66              | 13750             | 2.14              |
| 1500              | 0.72              | 7750              | 1.78              | 14000             | 2.29              |
| 1750              | 0.81              | 8000              | 1.87              | 14250             | 2.41              |
| 2000              | 0.82              | 8250              | 1.78              | 14500             | 2.48              |
| 2250              | 0.94              | 8500              | 1.79              | 14750             | 2.31              |
| 2500              | 0.94              | 8750              | 1.88              | 15000             | 2.45              |
| 2750              | 0.99              | 9000              | 2.01              | 15250             | 2.55              |
| 3000              | 1.03              | 9250              | 1.90              | 15500             | 2.75              |
| 3250              | 1.15              | 9500              | 1.90              | 15750             | 2.75              |
| 3500              | 1.13              | 9750              | 1.90              | 16000             | 2.68              |
| 3750              | 1.17              | 10000             | 2.03              | 16250             | 2.73              |
| 4000              | 1.19              | 10250             | 2.04              | 16500             | 2.82              |
| 4250              | 1.31              | 10500             | 2.26              | 16750             | 2.79              |
| 4500              | 1.24              | 10750             | 2.09              | 17000             | 2.87              |
| 4750              | 1.30              | 11000             | 2.05              | 17250             | 2.80              |
| 5000              | 1.31              | 11250             | 2.15              | 17500             | 2.90              |
| 5250              | 1.41              | 11500             | 2.34              | 17750             | 2.82              |
| 5500              | 1.41              | 11750             | 2.34              | 18000             | 2.90              |

## 14 APPENDIX F Abbreviations and acronyms

|                |   |
|----------------|---|
| A              | ampere                                      |
| AC             | alternating current                         |
| A/m            | ampere per meter                            |
| AM             | amplitude modulation                        |
| AVRG           | average (detector)                          |
| BB             | broad band                                  |
| cm             | centimeter                                  |
| dB             | decibel                                     |
| dBm            | decibel referred to one milliwatt           |
| dB( $\mu$ V)   | decibel referred to one microvolt           |
| dB( $\mu$ V/m) | decibel referred to one microvolt per meter |
| dB( $\mu$ A)   | decibel referred to one microampere         |
| dB $\Omega$    | decibel referred to one Ohm                 |
| 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                                 |
| $\mu$ s        | microsecond                                 |
| NA             | not applicable                              |
| NB             | narrow band                                 |
| NT             | not tested                                  |
| OATS           | open area test site                         |
| $\Omega$       | 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  |
| VA             | volt-ampere                                 |