HERMON LABORATORIES

839.01
Electrical

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TEST REPORT

ACCORDING TO: FCC 47 CFR part 27

FOR:

Ruggedcom Inc.

Subscriber unit operating in 2496 - 2690 MHz

Models: WIN5125-AC, WIN5125-DC, WIN5225

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1 Applicant information

Client name:	Ruggedcom Inc.
Address:	300 Applewood Crescent, Unit 1, Concord, Ontario L4K 5C7, Canada
Telephone:	(905) 856-5288
Fax:	(905) 856-1995
E-mail:	DudiMagen@ruggedcom.com
Contact name:	Mr. Dudi Magen

2 Equipment under test attributes

Product name:	Subscriber unit operating in 2496 – 2690 MHz
Product type:	Transciever
Model(s):	WIN5125-AC
Serial number:	21343808107
Hardware version:	Rev 01
Software release:	4.1.4612.18
Receipt date	8/1/2010

3 Manufacturer information

Manufacturer name:	RuggedWireless Ltd.
Address:	32 Maskit Street, P.O.Box 12412, Herzeliya 46733, Israel
Telephone:	+972 9951 9556
Fax:	+972 9951 9557
E-Mail:	DudiMagen@ruggedcom.com
Contact name:	Mr. Dudi Magen

4 Test details

Project ID:	21080
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	8/1/2010
Test completed:	8/16/2010
Test specification(s):	FCC 47 CFR part 27

5 Tests summary

Test	Status
Transmitter characteristics	
Section 27.50(h), Peak output power at RF antenna connector	Pass
Section 2.1091, 27.52, RF safety	Pass, exhibit provided in Application for certification
Section 27.53(m)(2), (4), Spurious emissions at RF antenna connector	Pass
Section 27.53(m)(2), (4), Band edge emissions at RF antenna connector	Pass
Section 27.53(m)(2), (4), Radiated spurious emissions	Pass
Section 27.54, Frequency stability	Pass
Section 2.1049, Occupied bandwidth	Pass

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

	Name and Title	Date	Signature
Tested by:	Mr. S. Samokha, test engineer	August 10, 2010	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	August 17, 2010	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	August 27, 2010	

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6 EUT description

6.1 General information

The EUT, WIN5125/WIN5225, is a subscriber unit of WiMAX system, installed at the customer premises. It comprises an Outdoor Unit (ODU) that includes modem, radio, data processing and management components, serving as an efficient platform for a wide range of services. It provides a wireless connection to the base station. Data is fed to the EUT through the RJ-45 port. The EUT is sending the data via wireless connection to the base station.
The difference between WIN5125 and WIN5225 is the antenna connectors. The **WIN5225** has internal (on-mechanic) antenna, and it is powered by WIN1010 power adapter unit (48VDC). WIN5125 has external N-Type connectors for antennas. The WIN5125 has 2 sub-models, WIN5125-AC and WIN5125-DC.
WIN5125-AC is powered by WIN1010 power adapter unit (48VDC), and the **WIN5125-DC** is powered by car's 12V battery. The "Mobile subscriber unit" is installed in car (vehicular environment);"Fixed subscriber unit" is installed on roofs, towers, etc.

6.2 EUT modules and sub-assemblies

Description	Manufacturer	Model or P/N	Hardware rev.	Serial number
Subscriber	RuggedWireless Ltd.	WIN5125-AC	Rev 01	21343808107
Subscriber	RuggedWireless Ltd.	WIN5125-DC	Rev 01	21343808006
PoE power supply	RuggedWireless Ltd.	WIN1010	Rev 1	A30802183371

6.3 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length, m
Fixed subscriber unit						
Power	AC power	Win 1010 power adapter	AC mains	1	Unshielded	1.5
Signal	DC+Ethernet	Win 1010 power adapter	CPE	1	Shielded	100
RF	Antenna	CPE	Antenna	2	Coax	1.6
Mobile subscriber unit						
Power	DC power	12 VDC	CPE	1	Unshielded	5
Signal	Ethernet	CPE	Laptop	1	Shielded	100
RF	Antenna	CPE	Antenna	2	Coax	1.6

6.4 Support and test equipment

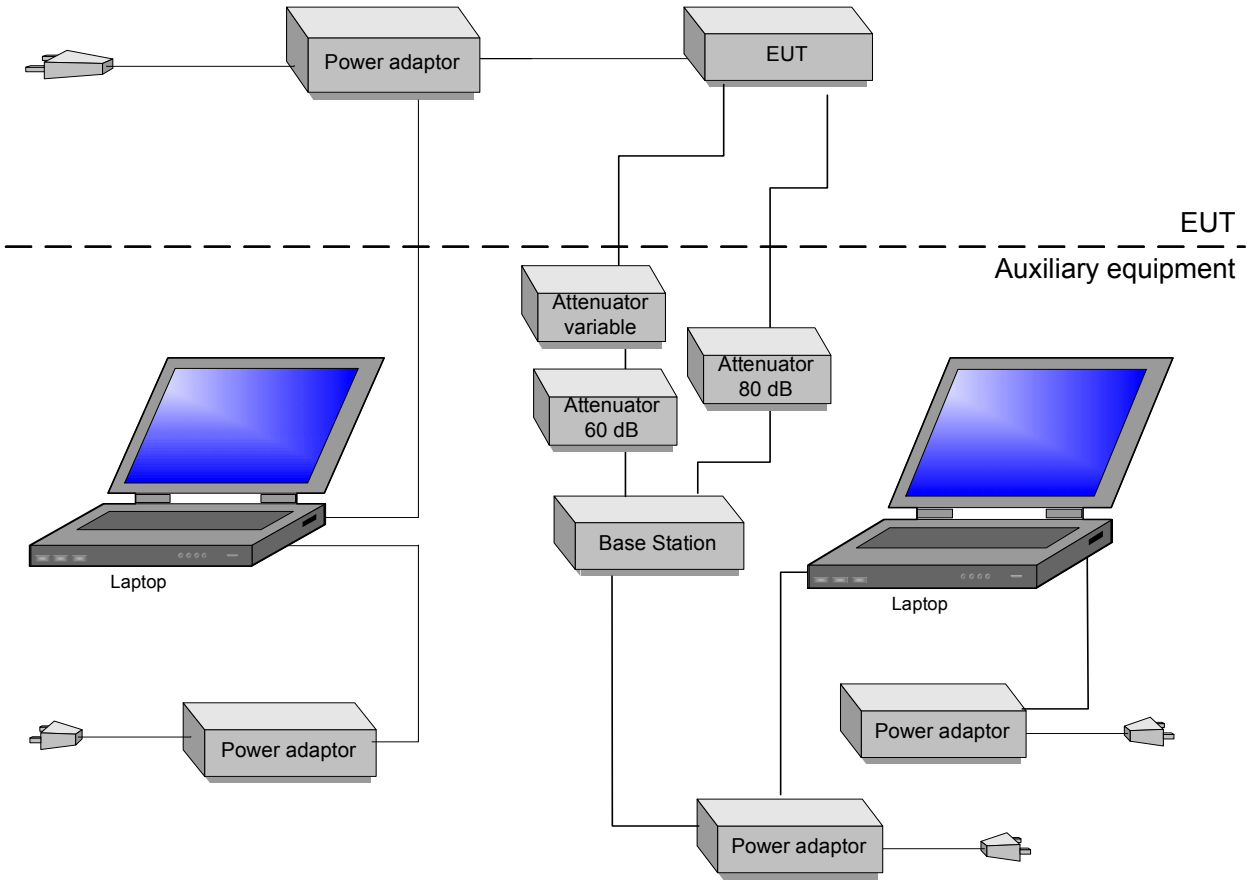
Description	Manufacturer	Model number	Serial number
Laptop	LENOVO	ThinkPad R61	L3-F7833 07/11
AC/DC Adaptor	LENOVO	92P1157	S29P1158Z1ZD2H81EA22
Laptop	DELL	Insirion 1520	(01)07898349890825
AC/DC Adaptor	DELL	DA90PSFS-00	CN-0XD757-48661-751-7JZ9

6.5 Changes made in the EUT

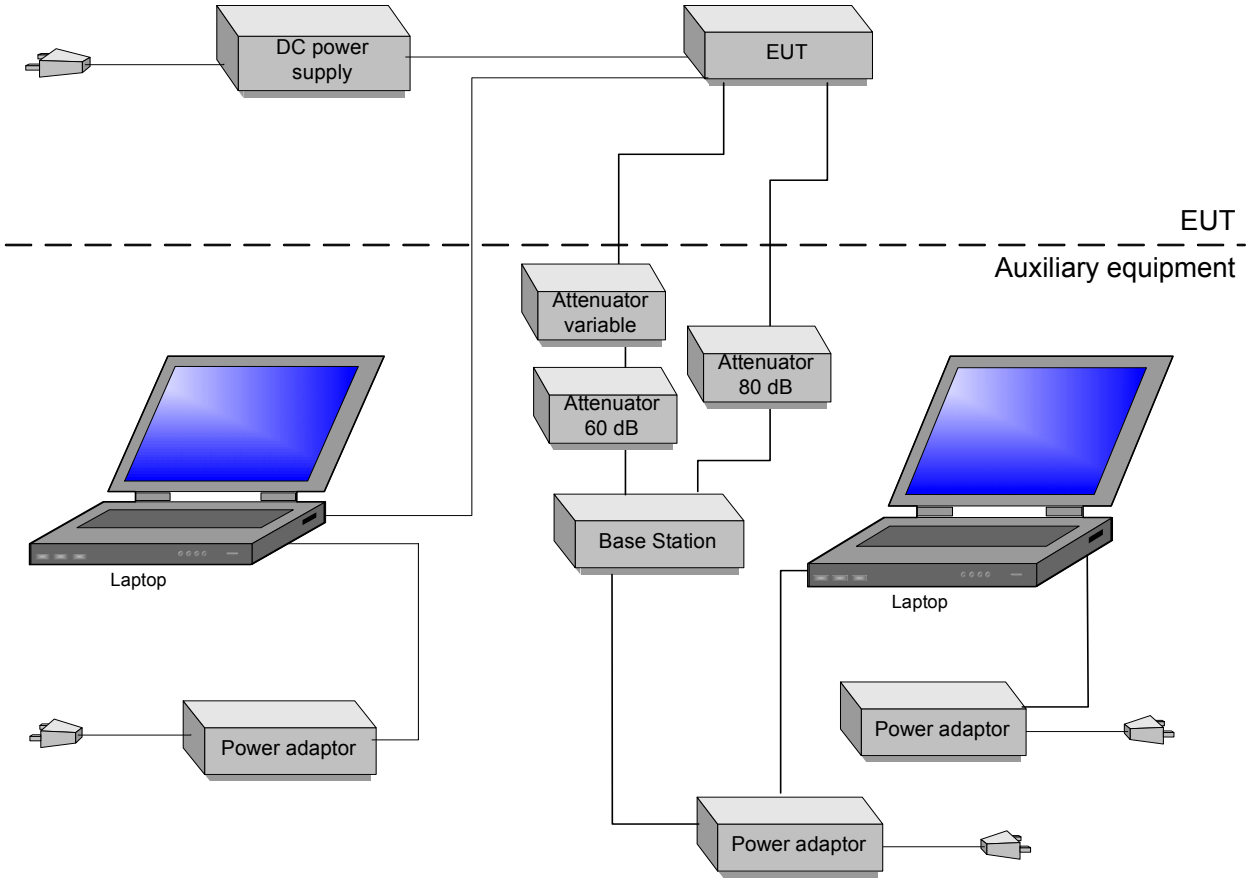
No changes were performed in the EUT.

6.6 Test configuration

6.6.1 Fixed subscriber unit measurements



6.6.2 Mobile subscriber unit measurements



6.7 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		2496 – 2690 MHz					
Operating frequency range		2498.5 – 2687.5 MHz					
RF channel bandwidth		5 MHz, 7 MHz, 10 MHz					
Maximum rated output power		At transmitter 50 Ω RF output connector				25 dBm	
Is transmitter output power variable?			No				
		V	Yes		continuous variable		
				V	stepped variable with stepsize	0.5 dB	
				minimum RF power		10 dBm	
				maximum EIRP power		dBm	
Antenna connection							
unique coupling	**V** standard connector		Integral	with temporary RF connector			
				without temporary RF connector			

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Dual polarization broadband sector panel	MTI	MT-344048/ND	18 dBi
Omnidirectional	Ace antenna	AWMO-6-0T	6 dBi

Transmitter 99% power bandwidth	5 MHz, 7 MHz, 10 MHz
Transmitter aggregate data rate/s	5 MHz BW: QPSK - 4.19 MBps, 16QAM – 12.565 MBps, 64QAM – 18.85 MBps 7 MHz BW: QPSK - 4.19 MBps, 16QAM – 12.565 MBps, 64QAM – 18.85 MBps 10 MHz BW: QPSK - 8.38 MBps, 16QAM – 25.13 MBps, 64QAM – 37.7 MBps
Type of modulation	QPSK, 16QAM, 64QAM
Type of multiplexing	OFDM
Modulating test signal (baseband)	PRBS
Maximum transmitter duty cycle in normal use	34%

Transmitter power source					
		Nominal rated voltage		Battery type	
V	DC	**Nominal rated voltage**	12 VDC (mobile unit); 48 VDC via power adapter from mains (fixed subscriber unit)		
	AC mains	**Nominal rated voltage**		Frequency	
Common power source for transmitter and receiver			**V** yes		no

Test specification:	**Section 27.50(h), Peak output power**		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/1/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 48 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

7 Transmitter tests according to 47CFR part 27 requirements

7.1 Peak output power test

7.1.1 General

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

Table 7.1.1 Peak output power limits

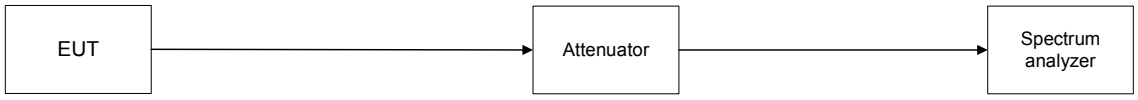
Assigned frequency range, MHz	Maximum output power*	
	W	dBm
2496.0 – 2690.0	2.0	33.0

* Note: conducted power for user stations.

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 spectrum analyzer as provided in Table 7.1.2 and the associated plots.

Figure 7.1.1 Peak output power test setup



Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/1/2010		
Temperature: 23.4 ºC	Air Pressure: 1005 hPa	Relative Humidity: 48 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Table 7.1.2 Peak output power test results

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Power meter (Power Average during the burst)
RESOLUTION BANDWIDTH: NA
VIDEO BANDWIDTH: NA
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
MAXIMUM ANTENNA GAIN: 18 dBi
EBW: 5 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	RF output power, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 4.19 Mbps							
2498.50	25.08	Included	Included	25.08	33.0	-7.92	Pass
2593.00	24.29	Included	Included	24.29	33.0	-8.71	Pass
2687.50	24.87	Included	Included	24.87	33.0	-8.13	Pass
16QAM 12.565 Mbps							
2498.50	25.02	Included	Included	25.02	33.0	-7.98	Pass
2593.00	25.19	Included	Included	25.19	33.0	-7.81	Pass
2687.50	24.80	Included	Included	24.80	33.0	-8.20	Pass
64QAM 18.85 Mbps							
2498.50	25.13	Included	Included	25.13	33.0	-7.87	Pass
2593.00	24.30	Included	Included	24.30	33.0	-8.70	Pass
2687.50	24.96	Included	Included	24.96	33.0	-8.04	Pass

* - RF output power, dBm = Power meter reading, dBm

EBW: 7 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	RF output power, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 4.19 Mbps							
2499.50	24.35	Included	Included	24.35	33.0	-8.65	Pass
2593.00	24.81	Included	Included	24.81	33.0	-8.19	Pass
2686.50	24.36	Included	Included	24.36	33.0	-8.64	Pass
16QAM 12.565 Mbps							
2499.50	24.51	Included	Included	24.51	33.0	-8.49	Pass
2593.00	24.73	Included	Included	24.73	33.0	-8.27	Pass
2686.50	24.34	Included	Included	24.34	33.0	-8.66	Pass
64QAM 18.85 Mbps							
2499.50	24.55	Included	Included	24.55	33.0	-8.45	Pass
2593.00	24.73	Included	Included	24.73	33.0	-8.27	Pass
2686.50	24.46	Included	Included	24.46	33.0	-8.54	Pass

* - - RF output power, dBm = Power meter reading, dBm

Test specification:	**Section 27.50(h), Peak output power**		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/1/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 48 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.1.2 Peak output power test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Power meter (Power Average during the burst)
RESOLUTION BANDWIDTH: NA
VIDEO BANDWIDTH: NA
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
MAXIMUM ANTENNA GAIN: 18 dBi

EBW: 10 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	RF output power, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 8.38 Mbps							
2501.00	24.65	Included	Included	24.65	33.0	-8.35	Pass
2596.00	24.78	Included	Included	24.78	33.0	-8.22	Pass
2685.00	24.41	Included	Included	24.41	33.0	-8.59	Pass
16QAM 25.13 Mbps							
2501.00	24.54	Included	Included	24.54	33.0	-8.46	Pass
2596.00	24.03	Included	Included	24.03	33.0	-8.97	Pass
2685.00	24.33	Included	Included	24.33	33.0	-8.67	Pass
64QAM 37.7 Mbps							
2501.00	24.64	Included	Included	24.64	33.0	-8.36	Pass
2596.00	23.51	Included	Included	23.51	33.0	-9.49	Pass
2685.00	24.40	Included	Included	24.40	33.0	-8.60	Pass

* - - RF output power, dBm = Power meter reading, dBm

Reference numbers of test equipment used

HL 3301	HL 3302	HL 3439	HL 3442				

Full description is given in Appendix A.

Test specification:	**Section 27.50(h), Peak output power**		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/1/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 48 %	**Power Supply:** 12 VDC
Remarks: Mobile subscriber unit			

7.2 Peak output power test

7.2.1 General

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

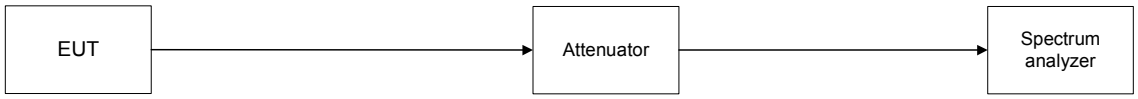
Table 7.2.1 Peak output power limits

Assigned frequency range, MHz	Maximum peak output power	
	W	dBm
2496.0 – 2690.0	2.0	33.0

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.
7.2.2.2 The EUT was adjusted to produce maximum available to the end user RF output power.
7.2.2.3 The peak output power was measured with spectrum analyzer as provided in Table 7.2.2 and the associated plots.

Figure 7.2.1 Peak output power test setup



Test specification:	**Section 27.50(h), Peak output power**		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/1/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 48 %	**Power Supply:** 12 VDC
Remarks: Mobile subscriber unit			

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Power meter (Power Average during the burst)
RESOLUTION BANDWIDTH: NA
VIDEO BANDWIDTH: NA
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
MAXIMUM ANTENNA GAIN: 6 dBi

EBW: 5 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	EIRP, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 4.19 Mbps							
2498.50	25.08	Included	Included	31.08	33.0	-1.92	Pass
2593.00	24.29	Included	Included	30.29	33.0	-2.71	Pass
2687.50	24.87	Included	Included	30.87	33.0	-2.13	Pass
16QAM 12.565 Mbps							
2498.50	25.02	Included	Included	31.02	33.0	-1.98	Pass
2593.00	25.19	Included	Included	31.19	33.0	-1.81	Pass
2687.50	24.80	Included	Included	30.80	33.0	-2.20	Pass
64QAM 18.85 Mbps							
2498.50	25.13	Included	Included	31.13	33.0	-1.87	Pass
2593.00	24.30	Included	Included	30.30	33.0	-2.70	Pass
2687.50	24.96	Included	Included	30.96	33.0	-2.04	Pass

* - RF output power, dBm = Power meter reading, dBm

EBW: 7 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	EIRP, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 4.19 Mbps							
2499.50	24.35	Included	Included	30.35	33.0	-2.65	Pass
2593.00	24.81	Included	Included	30.81	33.0	-2.19	Pass
2686.50	24.36	Included	Included	30.36	33.0	-2.64	Pass
16QAM 12.565 Mbps							
2499.50	24.51	Included	Included	30.51	33.0	-2.49	Pass
2593.00	24.73	Included	Included	30.73	33.0	-2.27	Pass
2686.50	24.34	Included	Included	30.34	33.0	-2.66	Pass
64QAM 18.85 Mbps							
2499.50	24.55	Included	Included	30.55	33.0	-2.45	Pass
2593.00	24.73	Included	Included	30.73	33.0	-2.27	Pass
2686.50	24.46	Included	Included	30.46	33.0	-2.54	Pass

* - - RF output power, dBm = Power meter reading, dBm

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/1/2010		
Temperature: 23.4 ºC	Air Pressure: 1005 hPa	Relative Humidity: 48 %	Power Supply: 12 VDC
Remarks: Mobile subscriber unit			

Table 7.2.2 Peak output power test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Power meter (Power Average during the burst)
RESOLUTION BANDWIDTH: NA
VIDEO BANDWIDTH: NA
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
MAXIMUM ANTENNA GAIN: 6 dBi

EBW: 10 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	EIRP, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 8.38 Mbps							
2501.00	24.65	Included	Included	30.65	33.0	-2.35	Pass
2596.00	24.78	Included	Included	30.78	33.0	-2.22	Pass
2685.00	24.41	Included	Included	30.41	33.0	-2.59	Pass
16QAM 25.13 Mbps							
2501.00	24.54	Included	Included	30.54	33.0	-2.46	Pass
2596.00	24.03	Included	Included	30.03	33.0	-2.97	Pass
2685.00	24.33	Included	Included	30.33	33.0	-2.67	Pass
64QAM 37.7 Mbps							
2501.00	24.64	Included	Included	30.64	33.0	-2.36	Pass
2596.00	23.51	Included	Included	29.51	33.0	-3.49	Pass
2685.00	24.40	Included	Included	30.40	33.0	-2.60	Pass

* - - RF output power, dBm = Power meter reading, dBm

Reference numbers of test equipment used

HL 3301	HL 3302	HL 3439	HL 3442				

Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

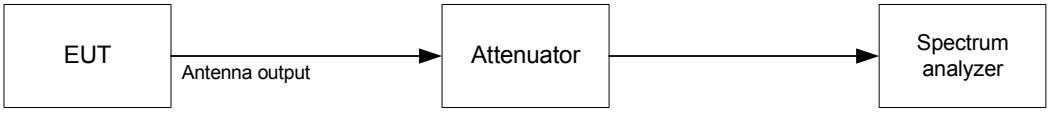
Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, kHz
2496.00 – 2690.0	26	NA

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

7.3.2 Test procedure

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.
7.3.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.
7.3.2.3 The EUT was set to transmit the normally modulated carrier.
7.3.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup



Test specification:	**Section 2.1049, Occupied bandwidth**		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 44 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 51 kHz
VIDEO BANDWIDTH: 150 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
EBW: 5 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 4.19 Mbps				
2498.50	4690.0	NA	NA	Pass
2593.00	4711.0	NA	NA	Pass
2687.50	4592.0	NA	NA	Pass
16QAM 12.565 Mbps				
2498.50	4662.0	NA	NA	Pass
2593.00	4690.0	NA	NA	Pass
2687.50	1648.0	NA	NA	Pass
64QAM 18.85 Mbps				
2498.50	4851.0	NA	NA	Pass
2593.00	4781.0	NA	NA	Pass
2687.50	4704.0	NA	NA	Pass

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 75 kHz
VIDEO BANDWIDTH: 220 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
EBW: 7 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 4.19 Mbps				
2499.50	6880.0	NA	NA	Pass
2593.00	6870.0	NA	NA	Pass
2686.50	6870.0	NA	NA	Pass
16QAM 12.565 Mbps				
2499.50	6880.0	NA	NA	Pass
2593.00	6890.0	NA	NA	Pass
2686.50	6870.0	NA	NA	Pass
64QAM 18.85 Mbps				
2499.50	6770.0	NA	NA	Pass
2593.00	6800.0	NA	NA	Pass
2686.50	6930.0	NA	NA	Pass

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Table 7.3.2 Occupied bandwidth test results (continued)

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
EBW: 10 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 8.38 Mbps				
2501.00	9672.0	NA	NA	Pass
2593.00	9612.0	NA	NA	Pass
2685.00	9552.0	NA	NA	Pass
16QAM 25.13 Mbps				
2501.00	9672.0	NA	NA	Pass
2593.00	9672.0	NA	NA	Pass
2685.00	9564.0	NA	NA	Pass
64QAM 37.7 Mbps				
2501.00	9732.0	NA	NA	Pass
2593.00	9828.0	NA	NA	Pass
2685.00	9660.0	NA	NA	Pass

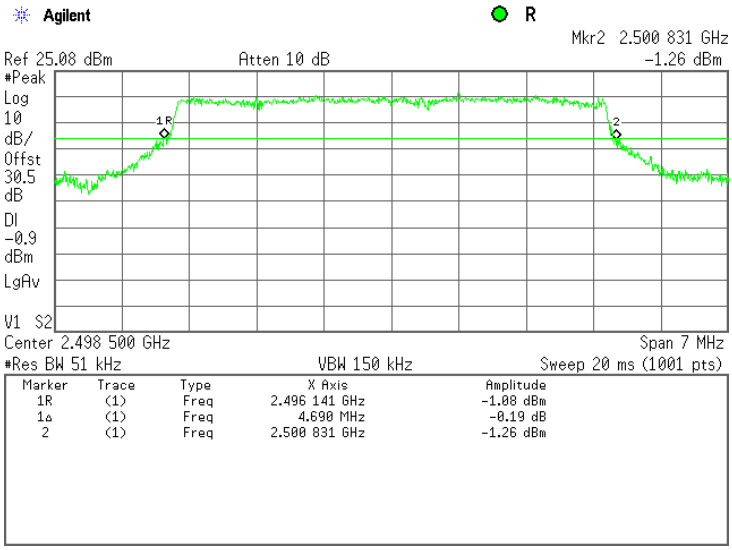
Reference numbers of test equipment used

HL 2951	HL 3782	HL 3787	HL 3818	HL 3868			

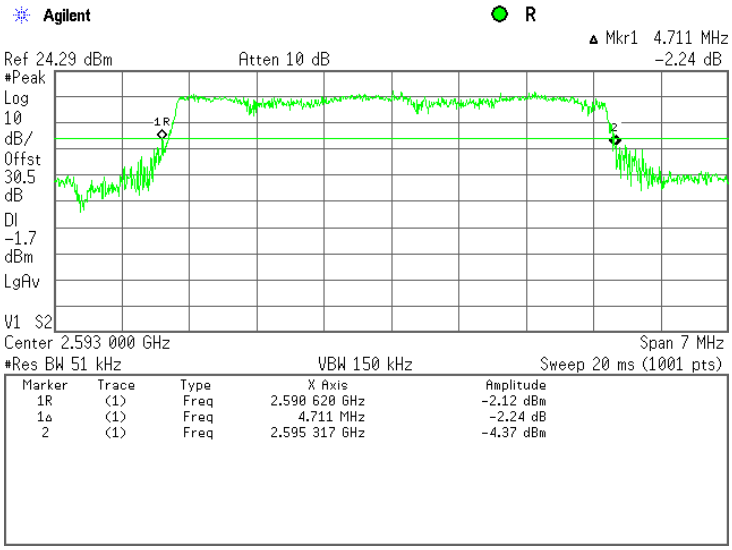
Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.1 Occupied bandwidth test results at low frequency, QPSK, 5 MHz EBW

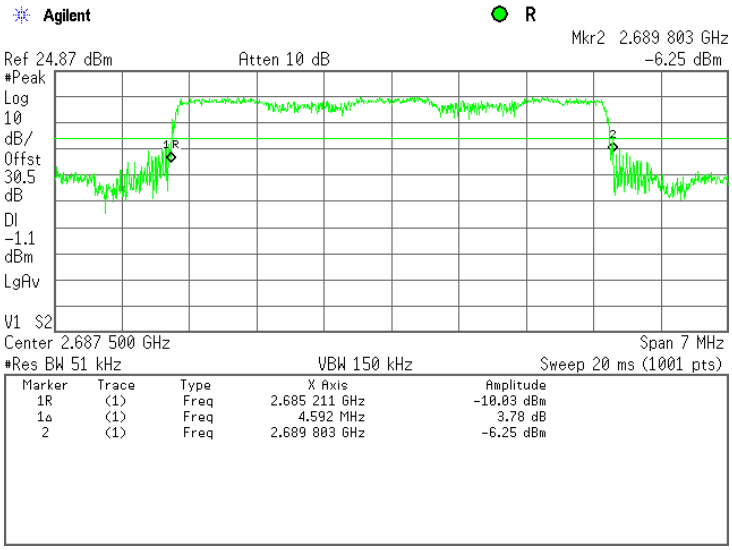


Plot 7.3.2 Occupied bandwidth test results at mid frequency, QPSK, 5 MHz EBW



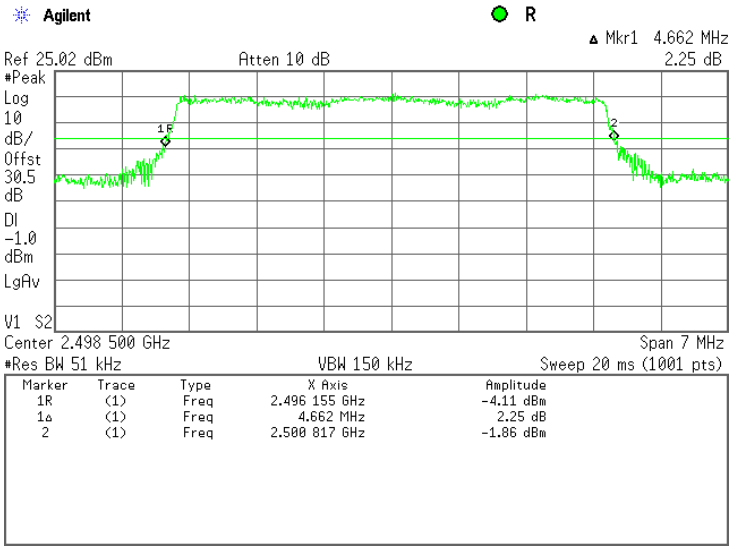
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.3 Occupied bandwidth test results at high frequency, QPSK, 5 MHz EBW

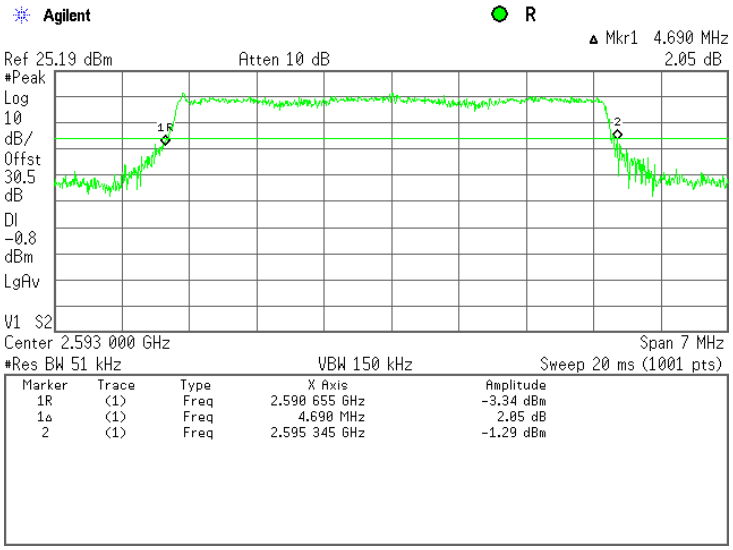


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.4 Occupied bandwidth test results at low frequency, 16QAM, 5 MHz EBW

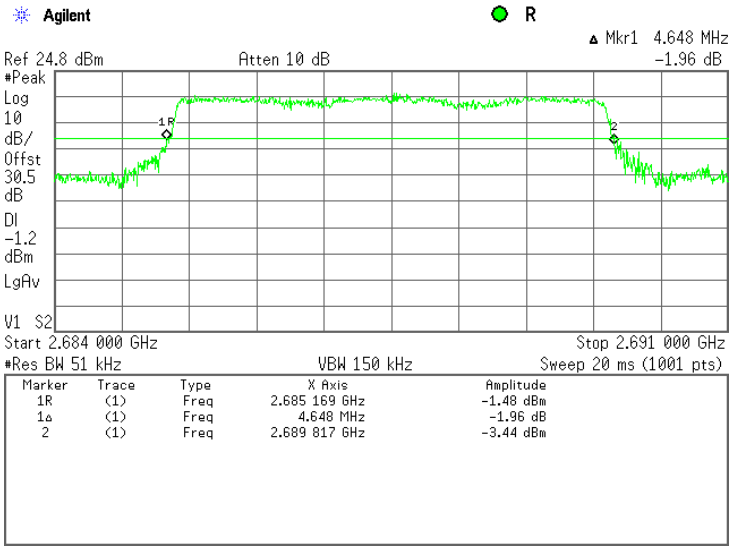


Plot 7.3.5 Occupied bandwidth test results at mid frequency, 16QAM, 5 MHz EBW

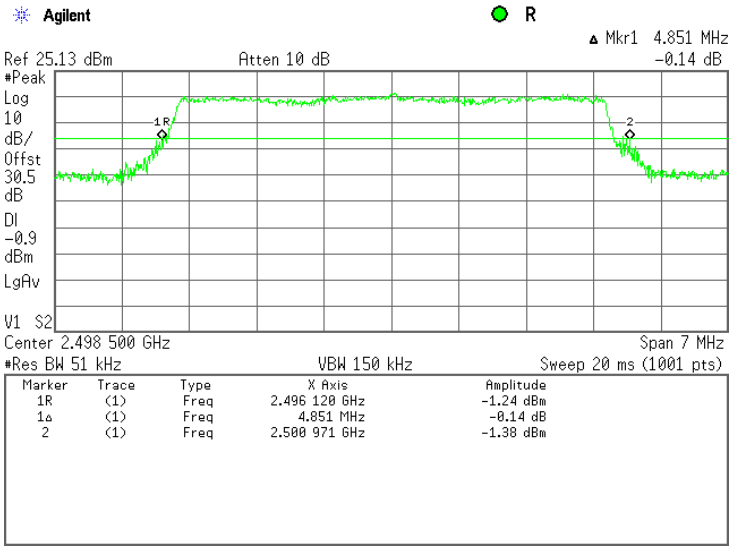


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.6 Occupied bandwidth test results at high frequency, 16QAM, 5 MHz EBW

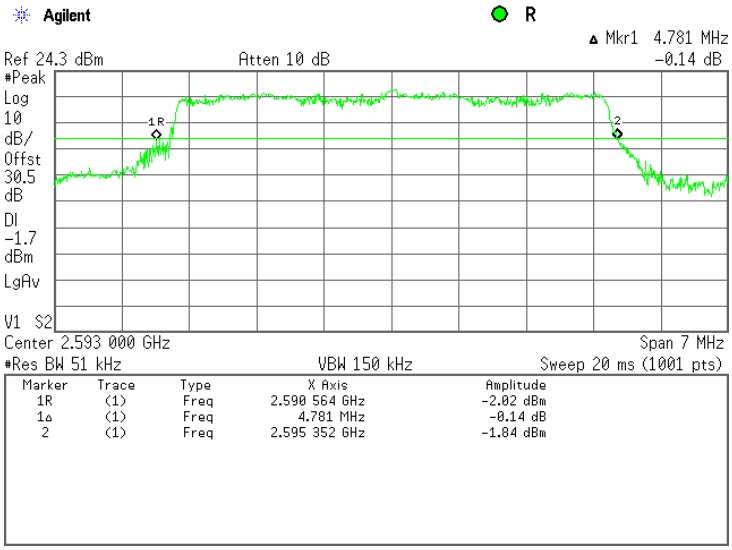


Plot 7.3.7 Occupied bandwidth test results at low frequency, 64QAM, 5 MHz EBW

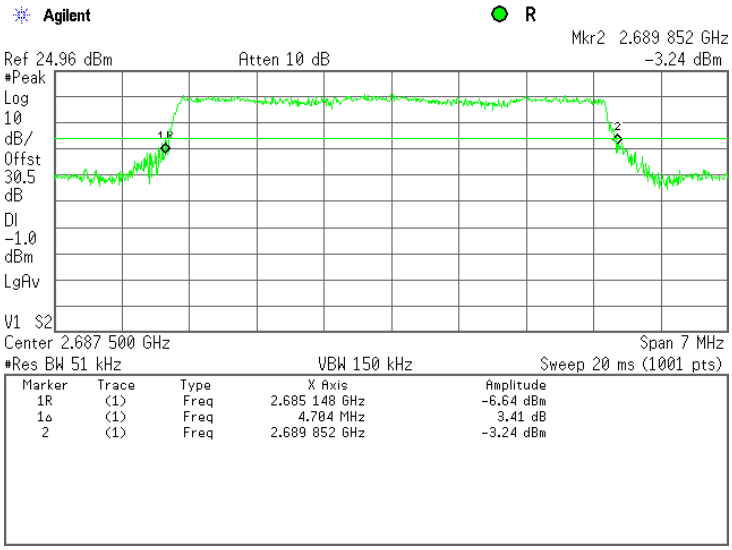


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.8 Occupied bandwidth test results at mid frequency, 64QAM, 5 MHz EBW

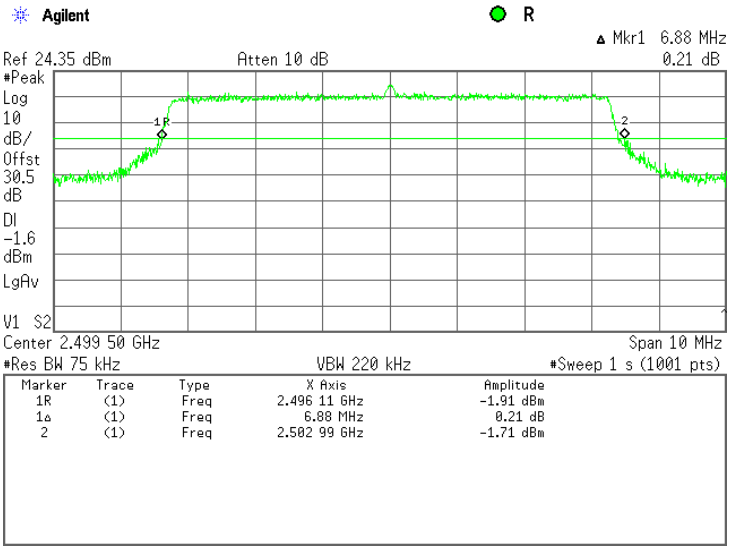


Plot 7.3.9 Occupied bandwidth test results at high frequency, 64QAM, 5 MHz EBW

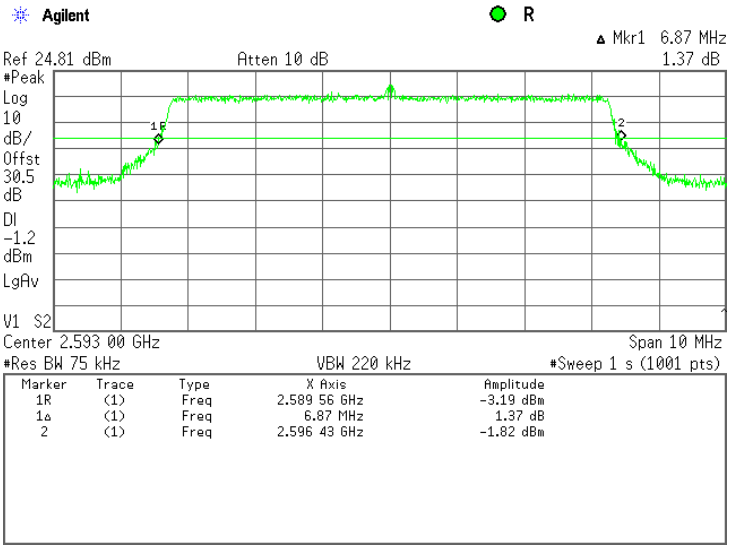


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.10 Occupied bandwidth test results at low frequency, QPSK, 7MHz EBW

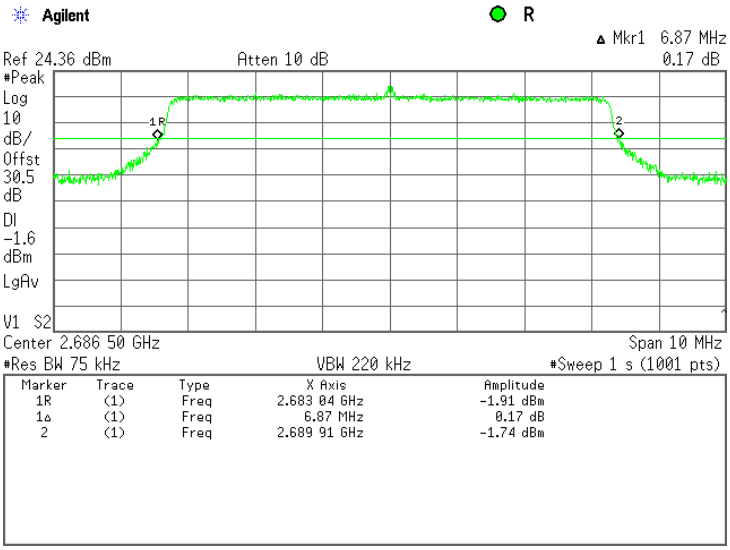


Plot 7.3.11 Occupied bandwidth test results at mid frequency, QPSK, 7MHz EBW

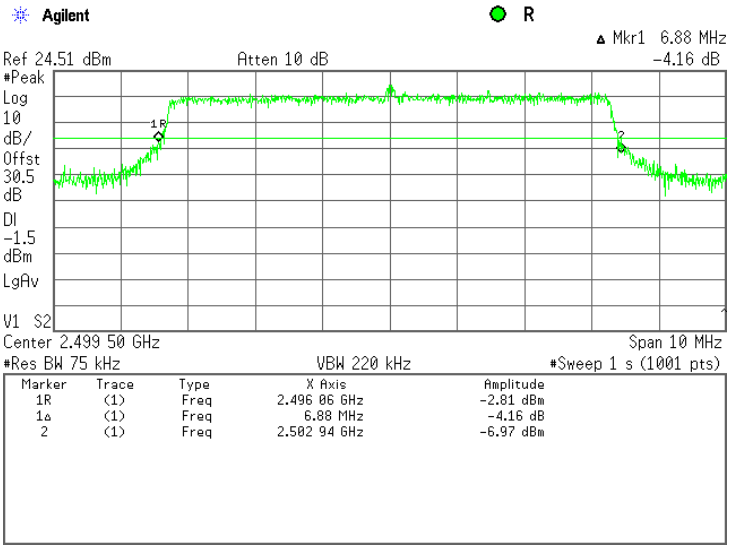


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.12 Occupied bandwidth test results at high frequency, QPSK, 7MHz EBW

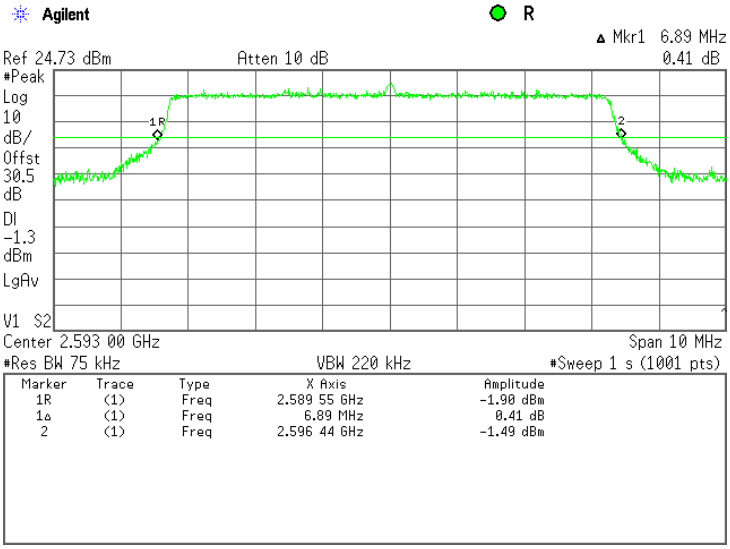


Plot 7.3.13 Occupied bandwidth test results at low frequency, 16QAM, 7MHz EBW

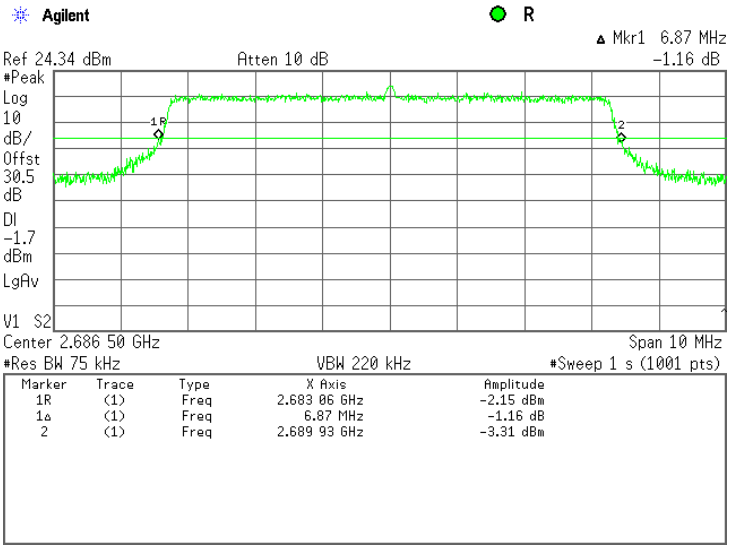


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.14 Occupied bandwidth test results at mid frequency, 16QAM, 7MHz EBW

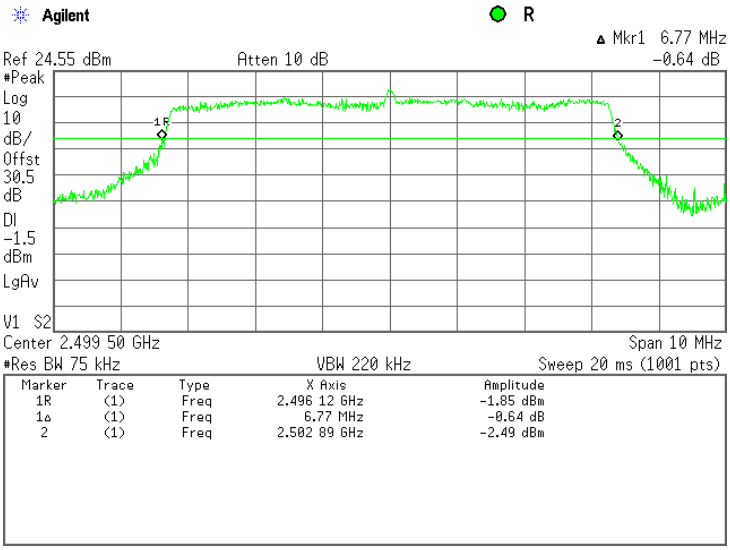


Plot 7.3.15 Occupied bandwidth test results at high frequency, 16QAM, 7MHz EBW

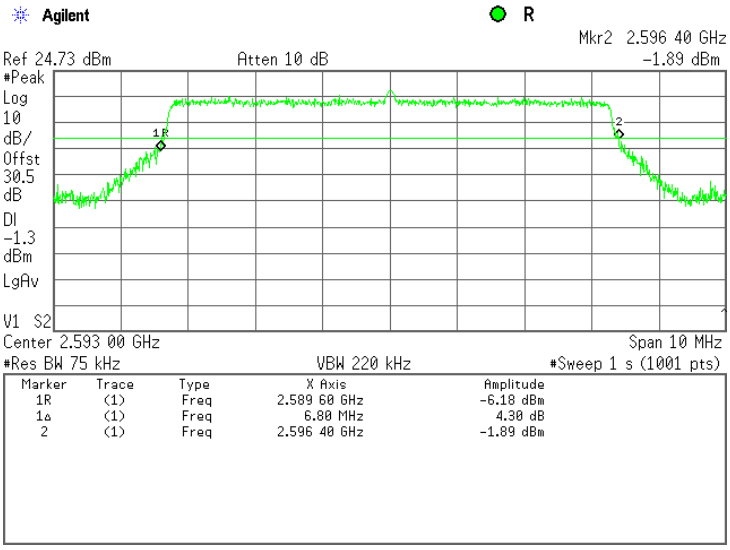


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.16 Occupied bandwidth test results at low frequency, 64QAM, 7MHz EBW

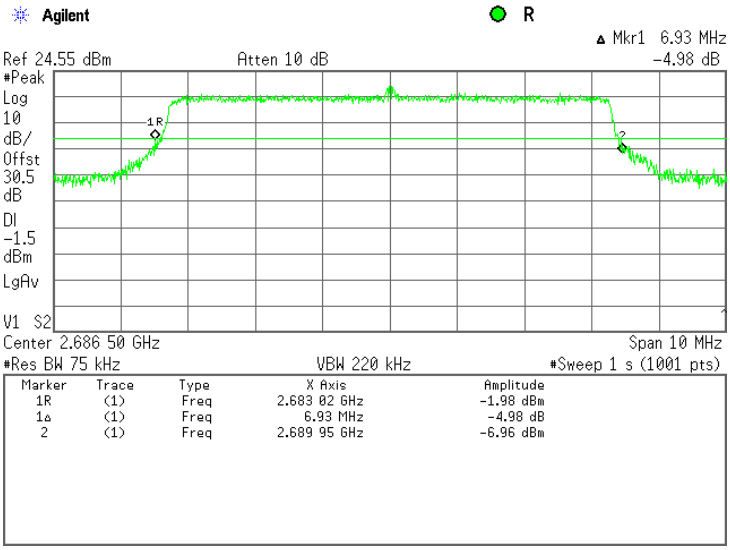


Plot 7.3.17 Occupied bandwidth test results at mid frequency, 64QAM, 7MHz EBW

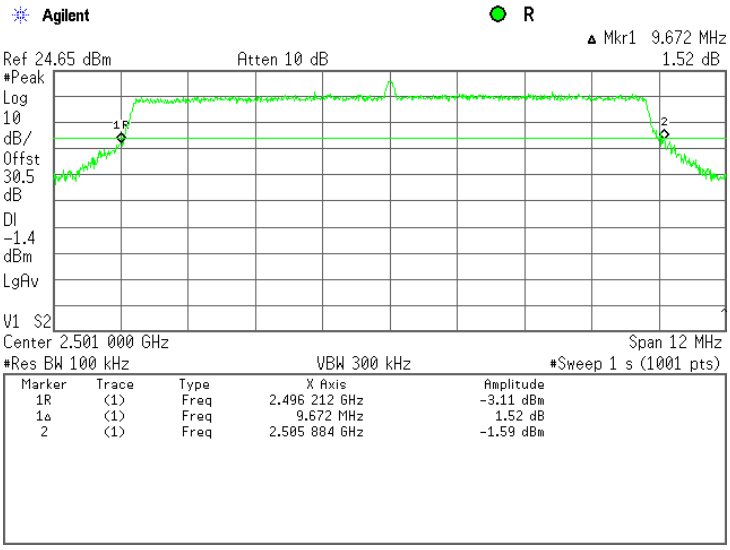


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.18 Occupied bandwidth test results at high frequency, 64QAM, 7MHz EBW

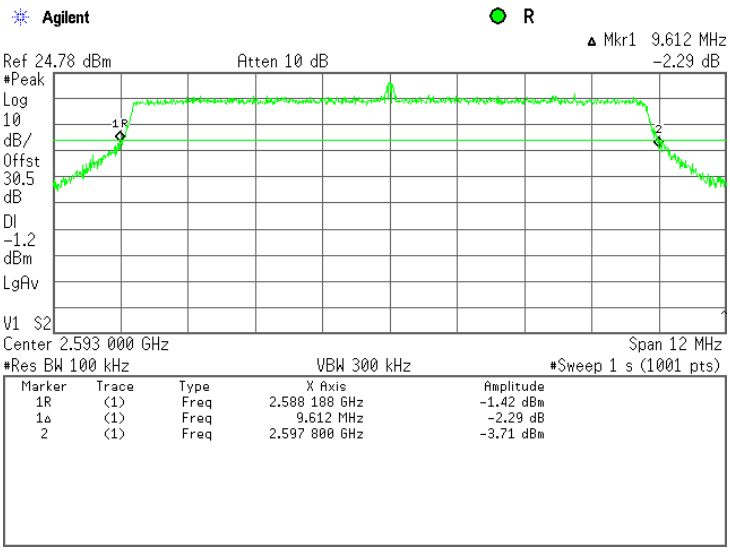


Plot 7.3.19 Occupied bandwidth test results at low frequency, QPSK, 10 MHz EBW

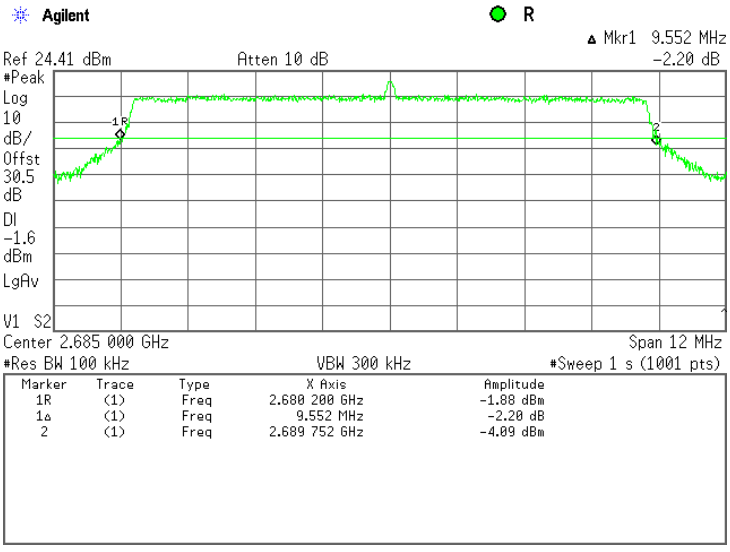


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.20 Occupied bandwidth test results at mid frequency, QPSK, 10 MHz EBW

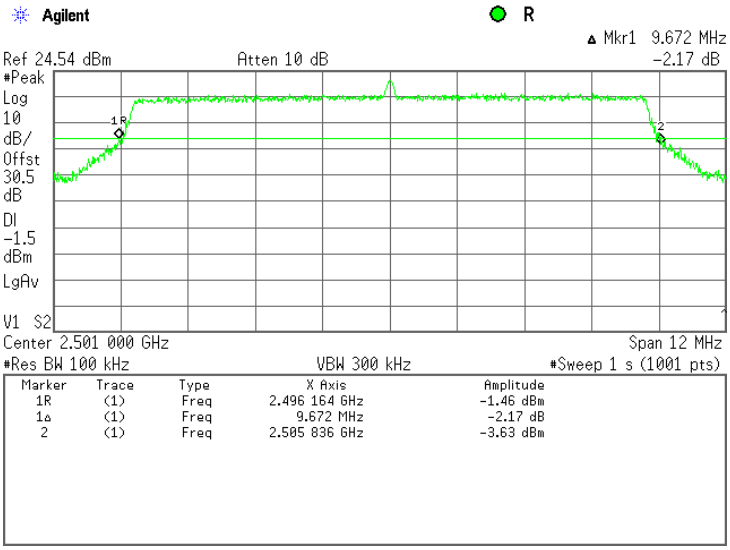


Plot 7.3.21 Occupied bandwidth test results at high frequency, QPSK, 10 MHz EBW

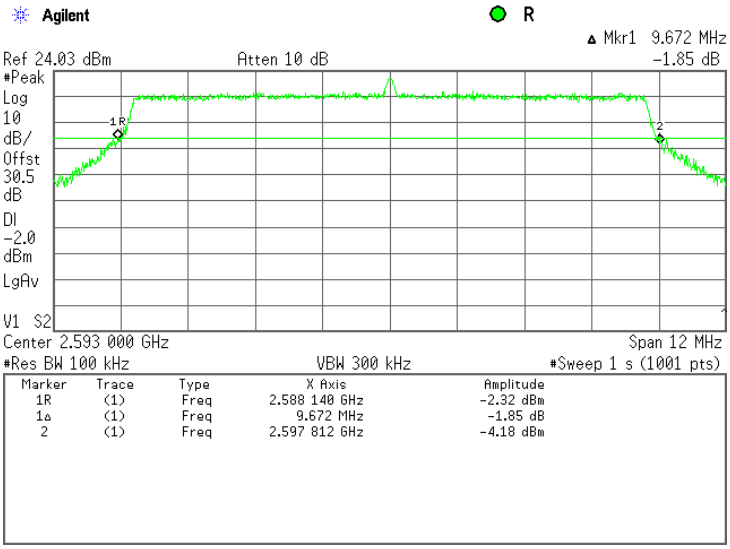


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.22 Occupied bandwidth test results at low frequency, 16QAM, 10 MHz EBW

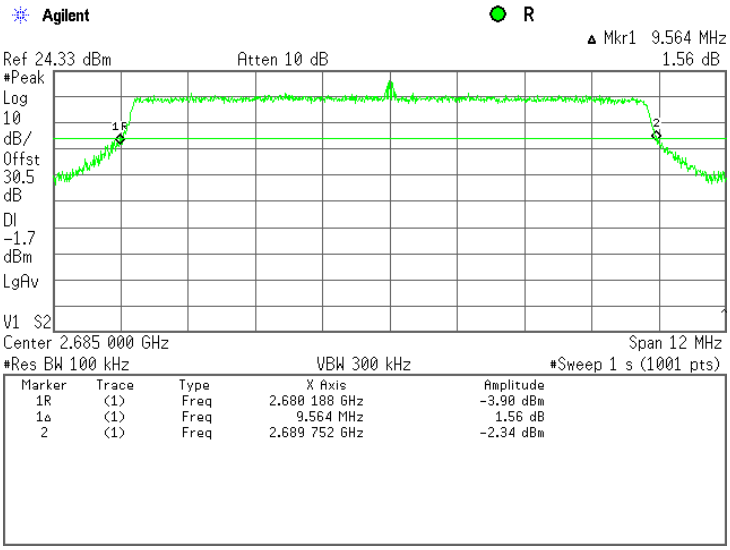


Plot 7.3.23 Occupied bandwidth test results at mid frequency, 16QAM, 10 MHz EBW

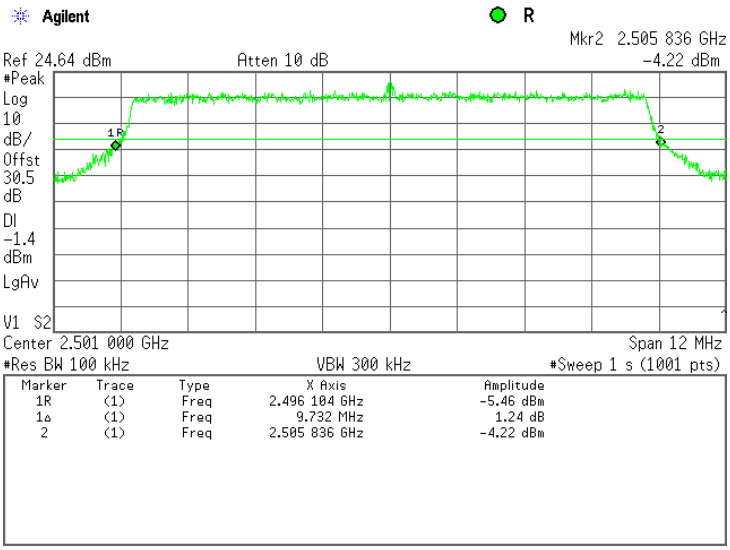


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.24 Occupied bandwidth test results at high frequency, 16QAM, 10 MHz EBW

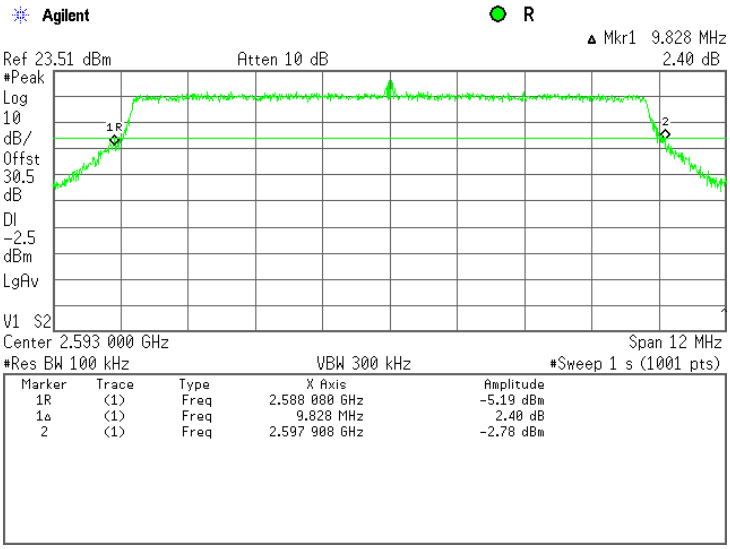


Plot 7.3.25 Occupied bandwidth test results at low frequency, 64QAM, 10 MHz EBW

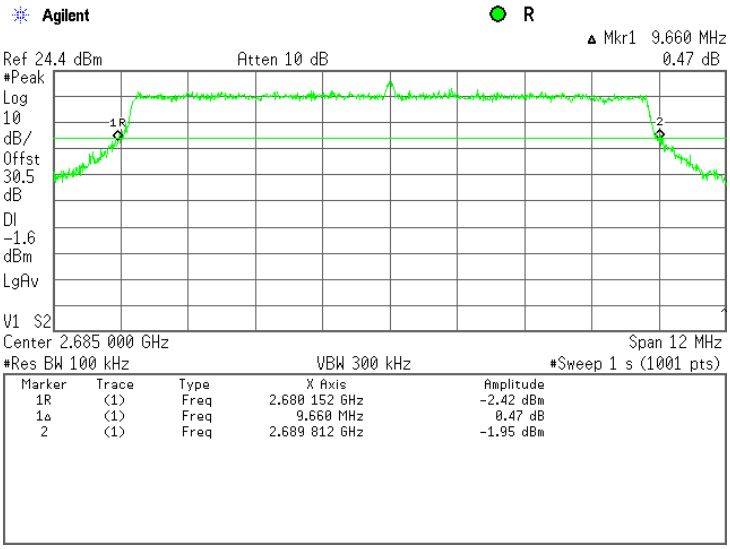


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.3.26 Occupied bandwidth test results at mid frequency, 64QAM, 10 MHz EBW



Plot 7.3.27 Occupied bandwidth test results at high frequency, 64QAM, 10 MHz EBW



Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

7.4 Occupied bandwidth test

7.4.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, kHz
2496.00 – 2690.0	26	NA

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

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure7.4.1, energized and its proper operation was checked.
7.4.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.
7.4.2.3 The EUT was set to transmit the normally modulated carrier.
7.4.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.4.2 and the associated plots.

Figure 7.4.1 Occupied bandwidth test setup

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Table 7.4.2 Occupied bandwidth test results

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 51 kHz
VIDEO BANDWIDTH: 150 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
EBW: 5 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 4.19 Mbps				
2498.50	4690.0	NA	NA	Pass
2593.00	4711.0	NA	NA	Pass
2687.50	4592.0	NA	NA	Pass
16QAM 12.565 Mbps				
2498.50	4662.0	NA	NA	Pass
2593.00	4690.0	NA	NA	Pass
2687.50	1648.0	NA	NA	Pass
64QAM 18.85 Mbps				
2498.50	4851.0	NA	NA	Pass
2593.00	4781.0	NA	NA	Pass
2687.50	4704.0	NA	NA	Pass

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 75 kHz
VIDEO BANDWIDTH: 220 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
EBW: 7 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 4.19 Mbps				
2499.50	6880.0	NA	NA	Pass
2593.00	6870.0	NA	NA	Pass
2686.50	6870.0	NA	NA	Pass
16QAM 12.565 Mbps				
2499.50	6880.0	NA	NA	Pass
2593.00	6890.0	NA	NA	Pass
2686.50	6870.0	NA	NA	Pass
64QAM 18.85 Mbps				
2499.50	6770.0	NA	NA	Pass
2593.00	6800.0	NA	NA	Pass
2686.50	6930.0	NA	NA	Pass

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Table 7.4.2 Occupied bandwidth test results (continued)

DETECTOR USED:	Peak hold
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
MODULATION ENVELOPE REFERENCE POINTS:	26 dBc
MODULATING SIGNAL:	PRBS
EBW:	10 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 8.38 Mbps				
2501.00	9672.0	NA	NA	Pass
2593.00	9612.0	NA	NA	Pass
2685.00	9552.0	NA	NA	Pass
16QAM 25.13 Mbps				
2501.00	9672.0	NA	NA	Pass
2593.00	9672.0	NA	NA	Pass
2685.00	9564.0	NA	NA	Pass
64QAM 37.7 Mbps				
2501.00	9732.0	NA	NA	Pass
2593.00	9828.0	NA	NA	Pass
2685.00	9660.0	NA	NA	Pass

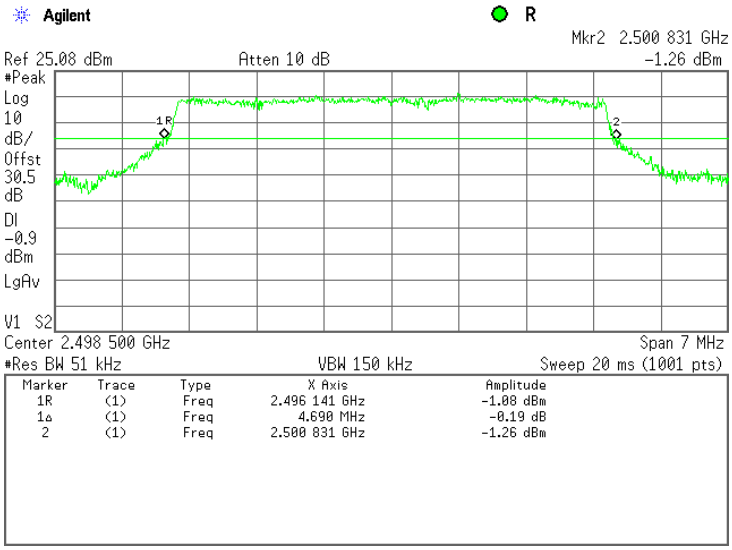
Reference numbers of test equipment used

HL 2951	HL 3782	HL 3787	HL 3818	HL 3868			

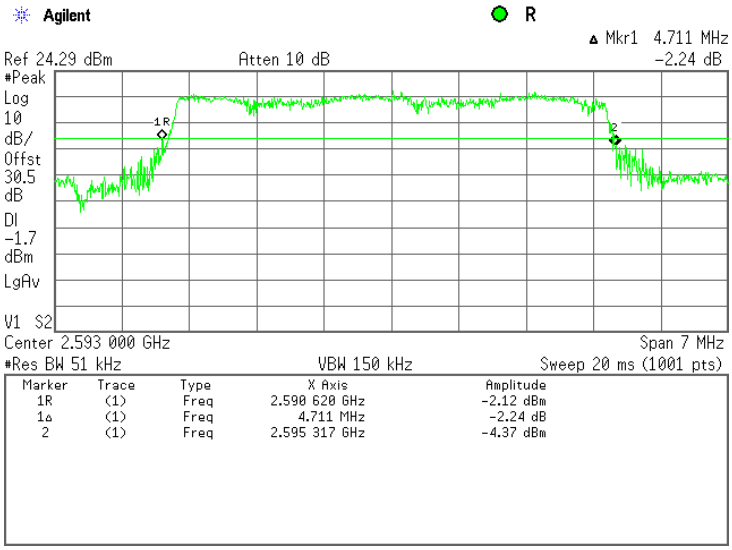
Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.1 Occupied bandwidth test results at low frequency, QPSK, 5 MHz EBW

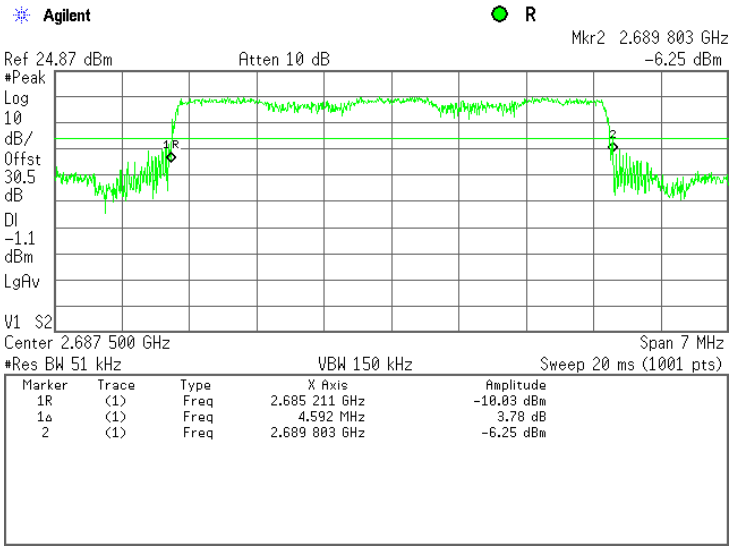


Plot 7.4.2 Occupied bandwidth test results at mid frequency, QPSK, 5 MHz EBW



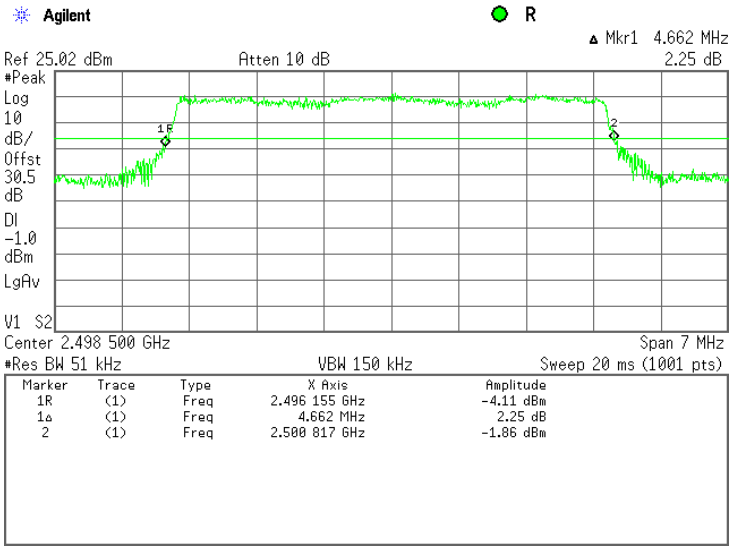
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.3 Occupied bandwidth test results at high frequency, QPSK, 5 MHz EBW

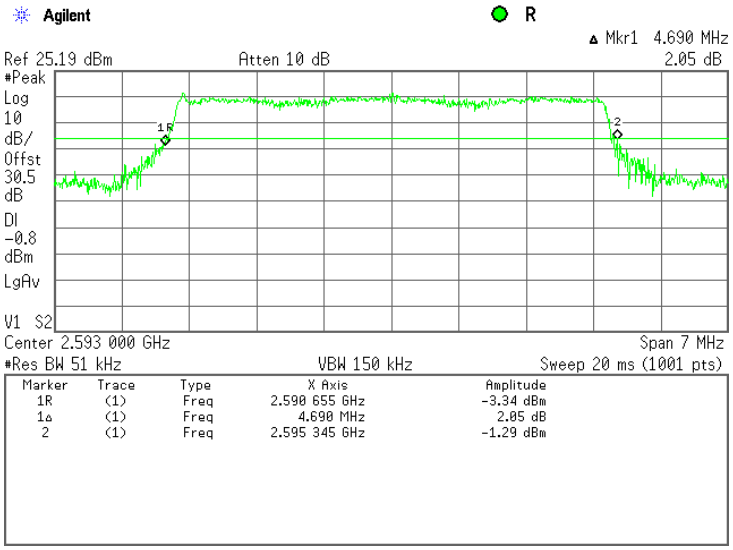


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.4 Occupied bandwidth test results at low frequency, 16QAM, 5 MHz EBW

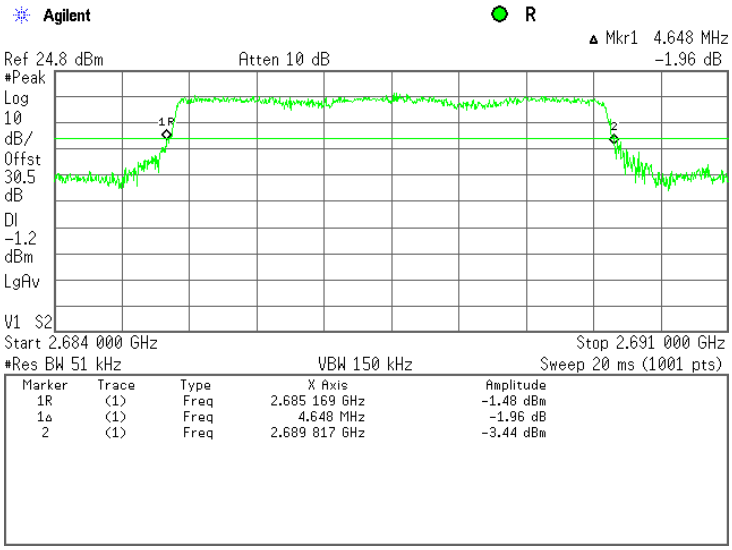


Plot 7.4.5 Occupied bandwidth test results at mid frequency, 16QAM, 5 MHz EBW

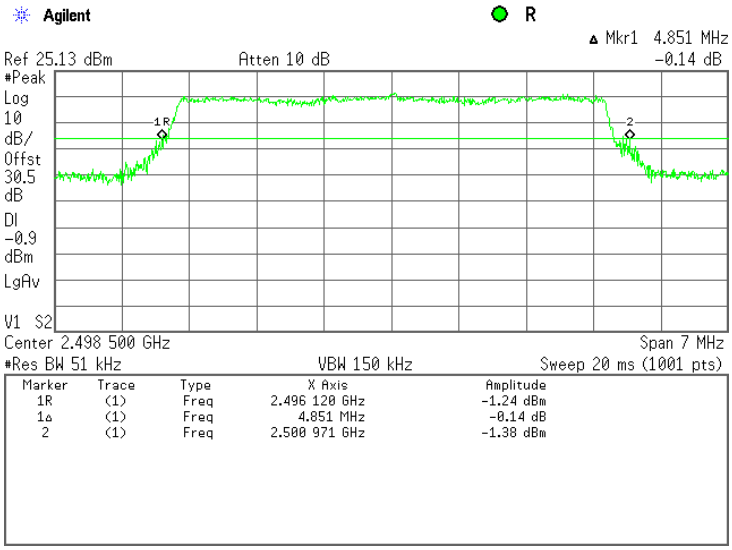


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.6 Occupied bandwidth test results at high frequency, 16QAM, 5 MHz EBW

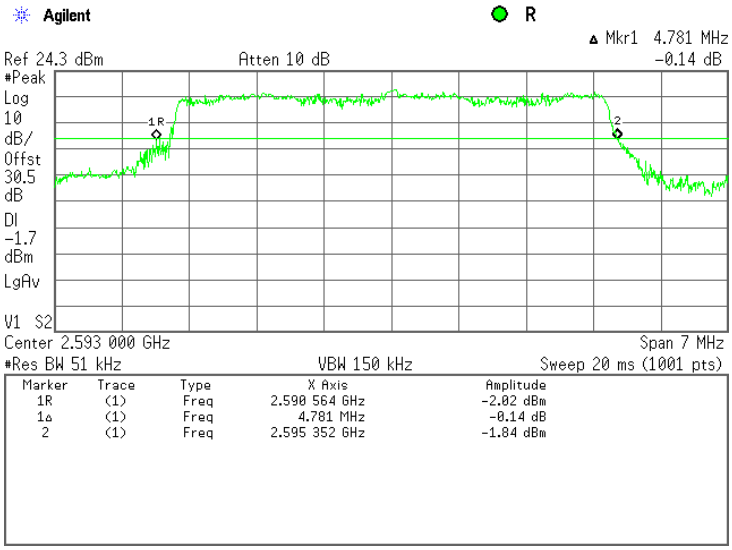


Plot 7.4.7 Occupied bandwidth test results at low frequency, 64QAM, 5 MHz EBW

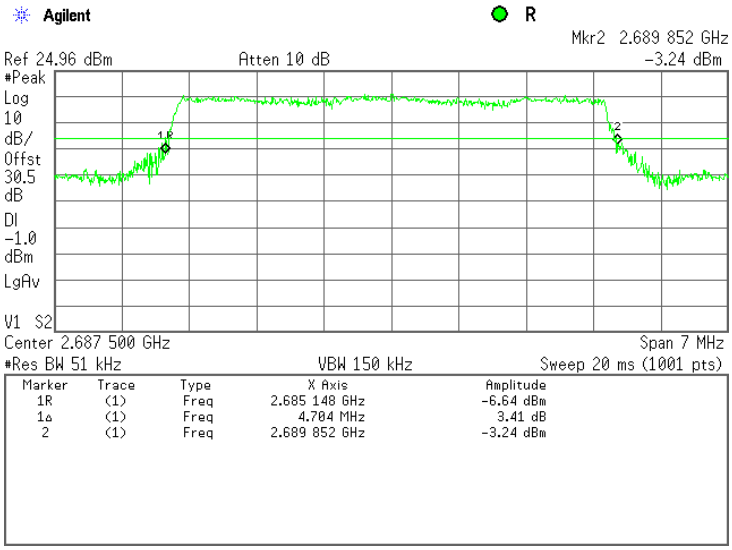


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.8 Occupied bandwidth test results at mid frequency, 64QAM, 5 MHz EBW

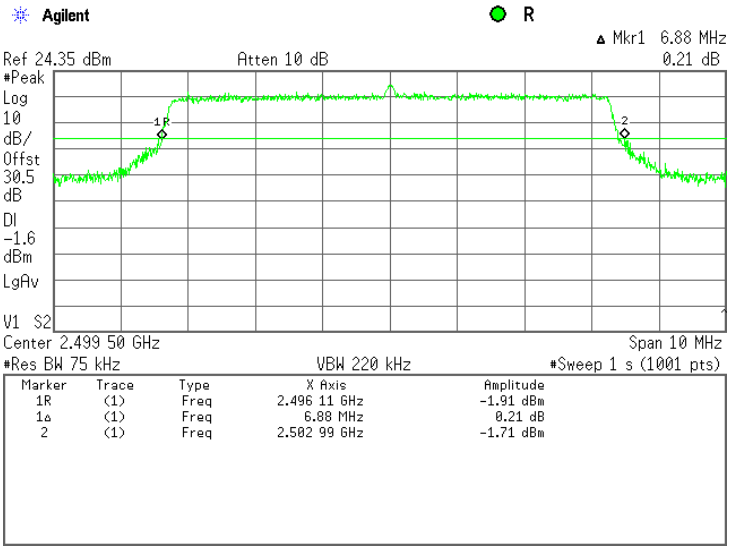


Plot 7.4.9 Occupied bandwidth test results at high frequency, 64QAM, 5 MHz EBW

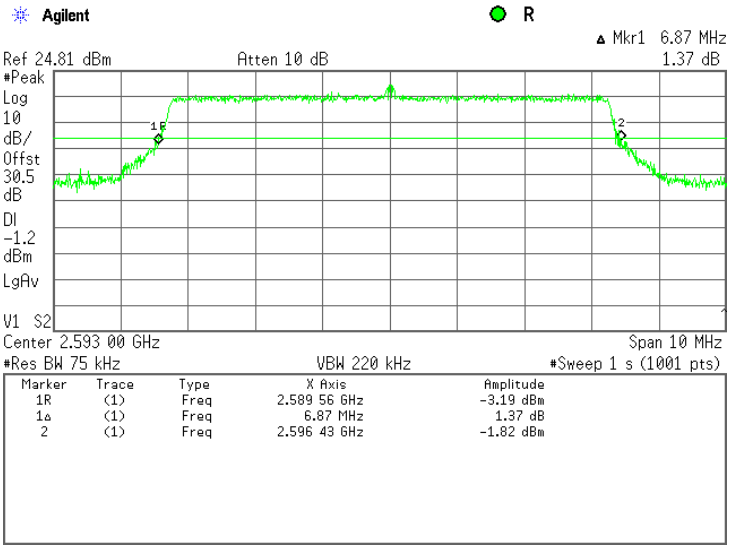


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.10 Occupied bandwidth test results at low frequency, QPSK, 7MHz EBW

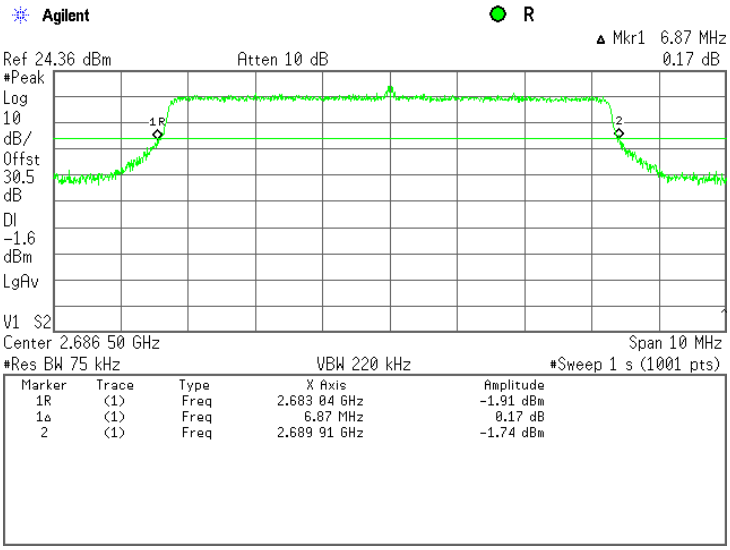


Plot 7.4.11 Occupied bandwidth test results at mid frequency, QPSK, 7MHz EBW

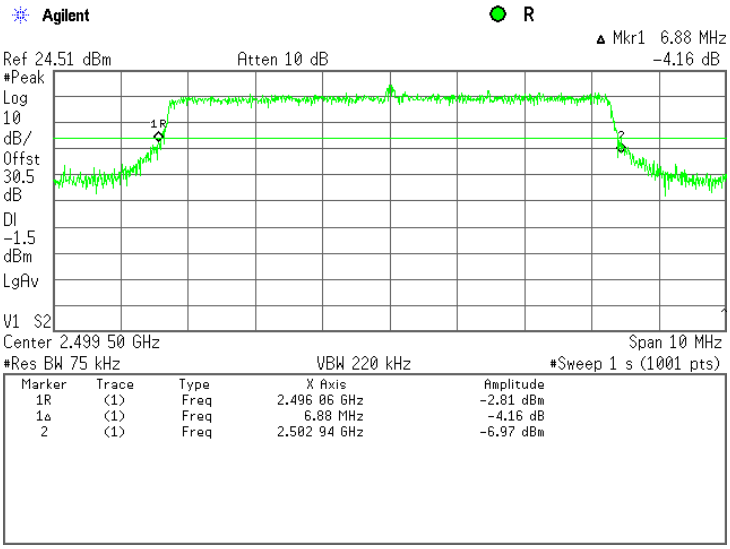


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.12 Occupied bandwidth test results at high frequency, QPSK, 7MHz EBW

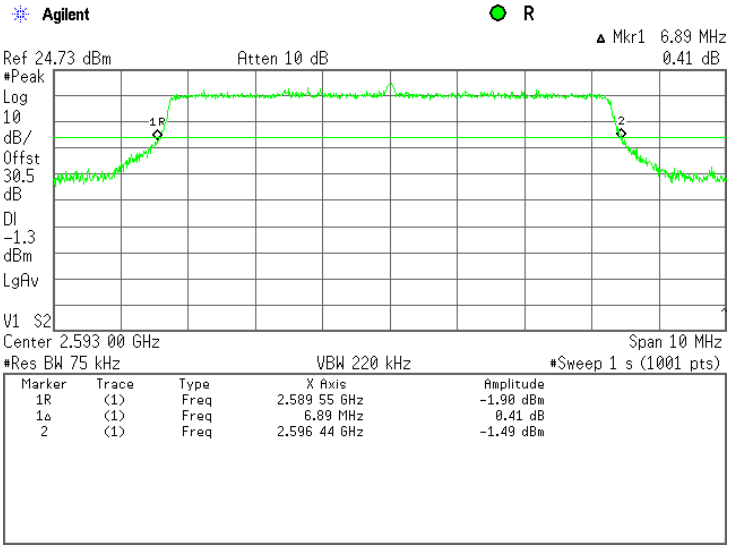


Plot 7.4.13 Occupied bandwidth test results at low frequency, 16QAM, 7MHz EBW

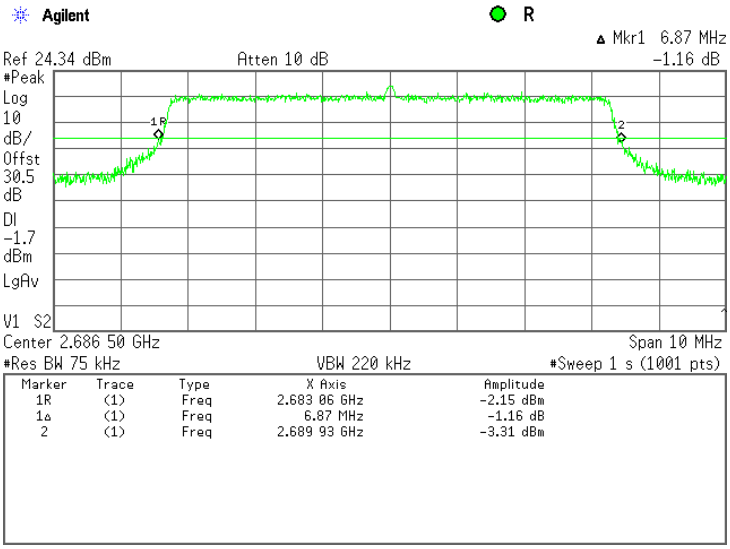


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.14 Occupied bandwidth test results at mid frequency, 16QAM, 7MHz EBW

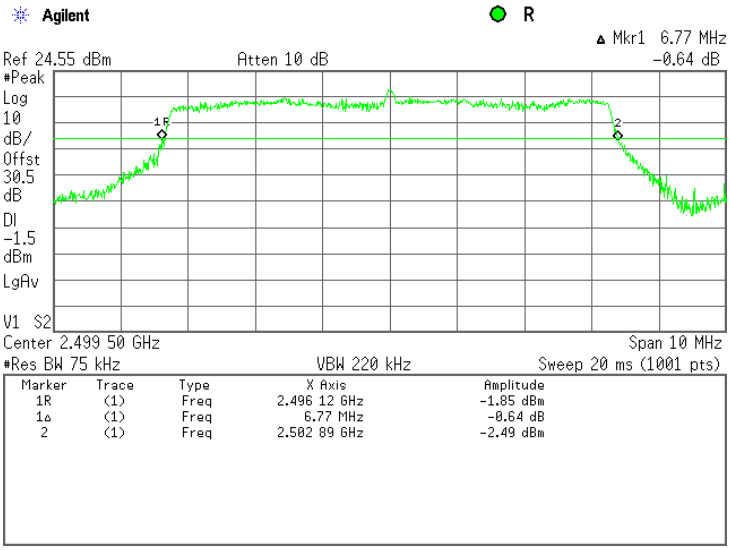


Plot 7.4.15 Occupied bandwidth test results at high frequency, 16QAM, 7MHz EBW

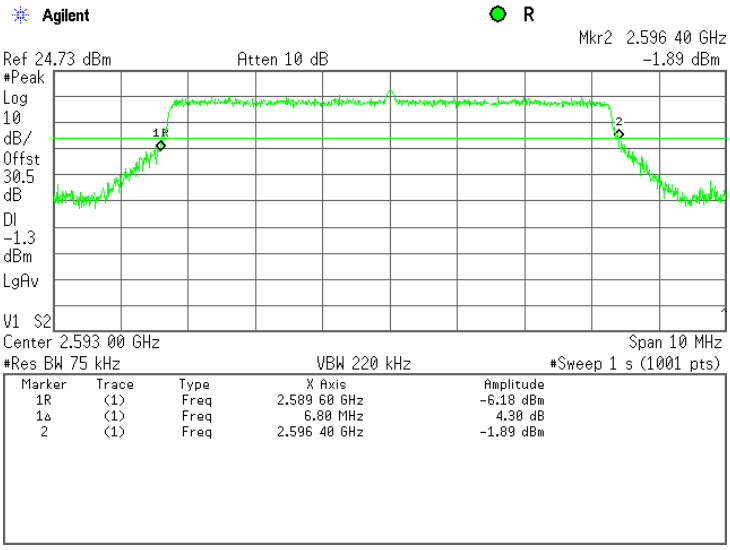


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.16 Occupied bandwidth test results at low frequency, 64QAM, 7MHz EBW

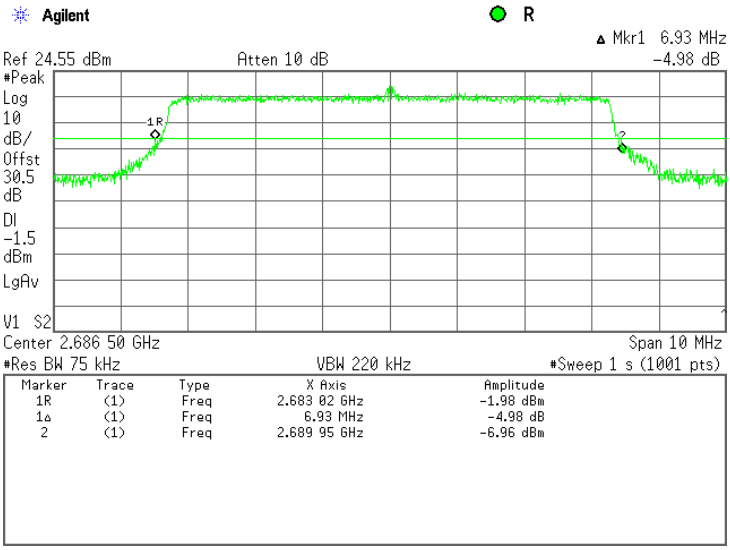


Plot 7.4.17 Occupied bandwidth test results at mid frequency, 64QAM, 7MHz EBW

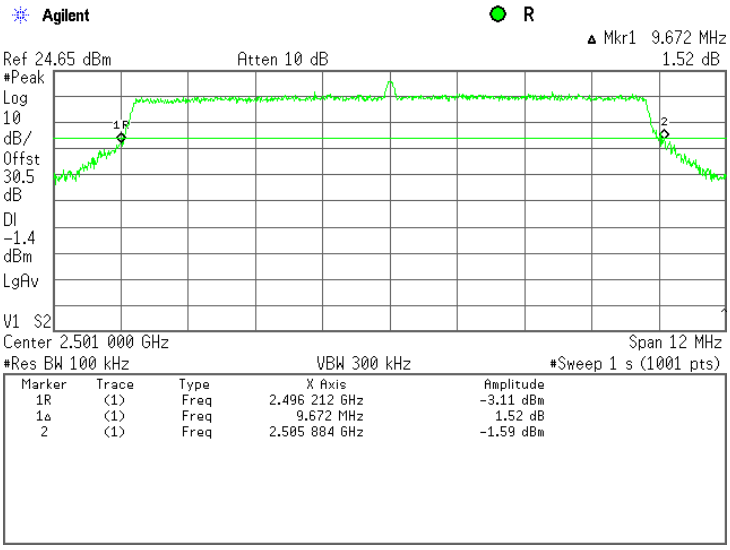


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.18 Occupied bandwidth test results at high frequency, 64QAM, 7MHz EBW

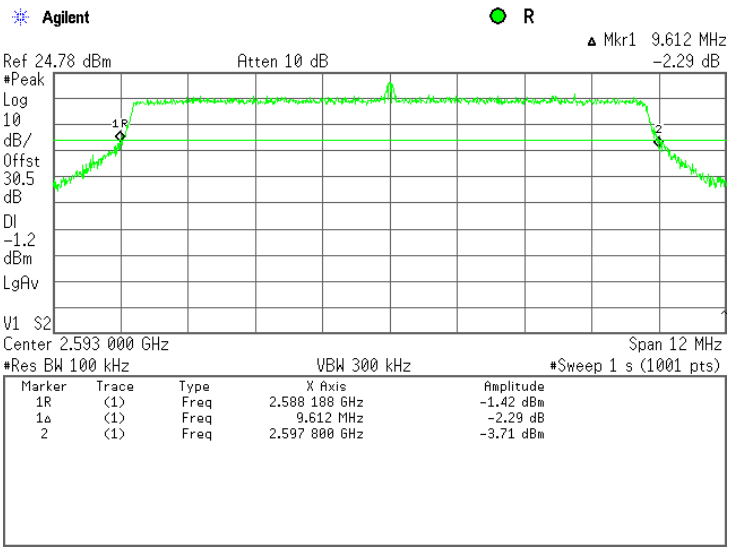


Plot 7.4.19 Occupied bandwidth test results at low frequency, QPSK, 10 MHz EBW

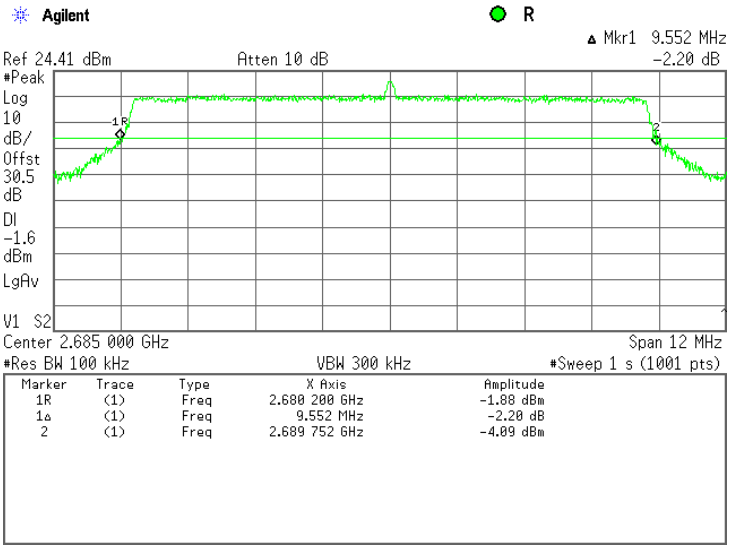


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.20 Occupied bandwidth test results at mid frequency, QPSK, 10 MHz EBW

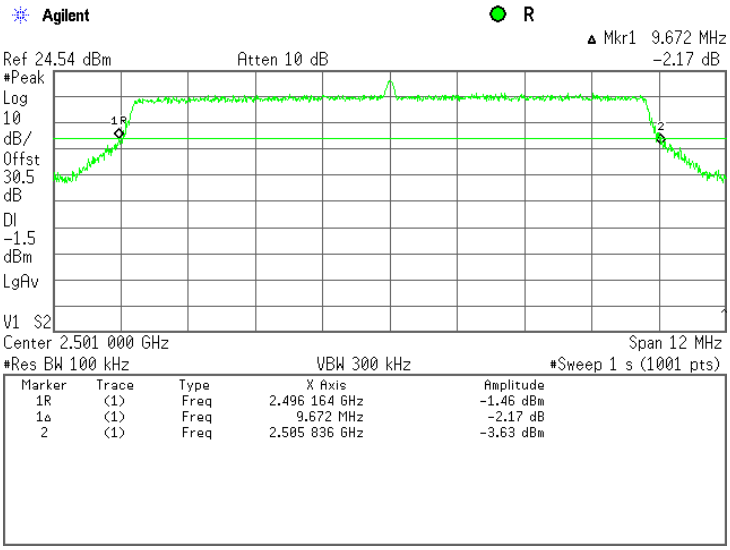


Plot 7.4.21 Occupied bandwidth test results at high frequency, QPSK, 10 MHz EBW

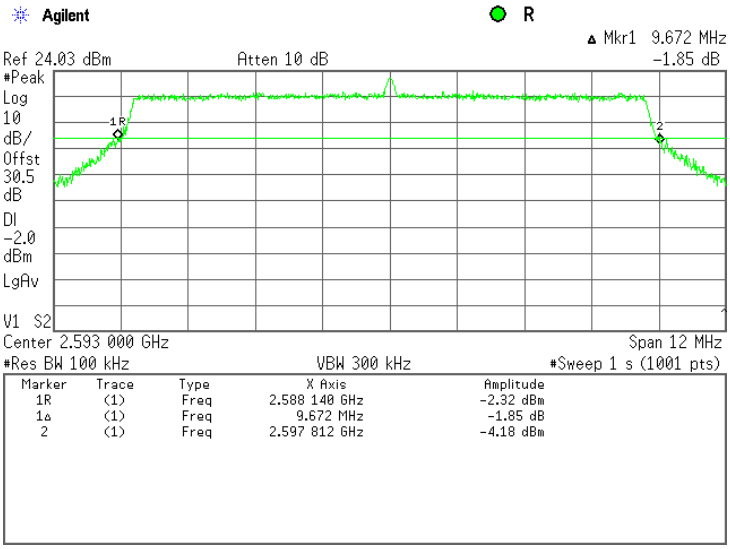


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.22 Occupied bandwidth test results at low frequency, 16QAM, 10 MHz EBW

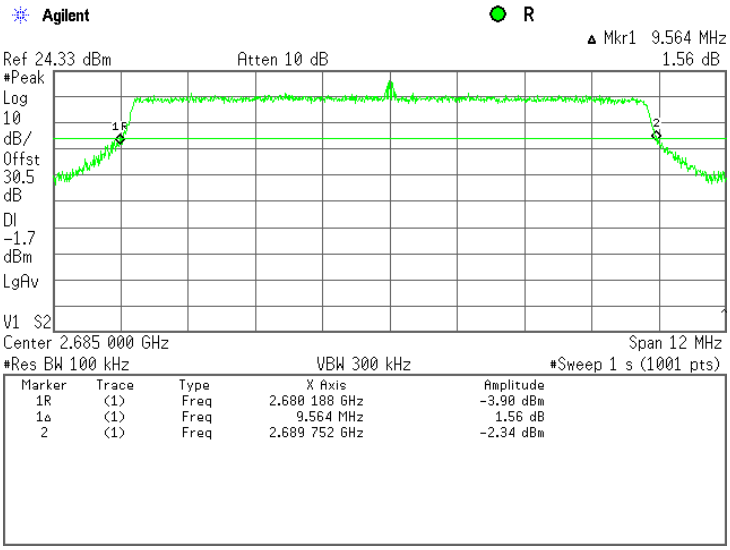


Plot 7.4.23 Occupied bandwidth test results at mid frequency, 16QAM, 10 MHz EBW

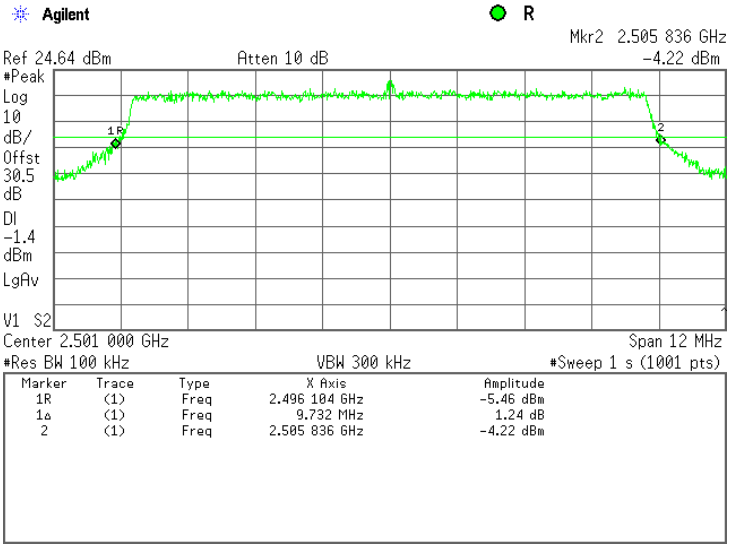


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.24 Occupied bandwidth test results at high frequency, 16QAM, 10 MHz EBW

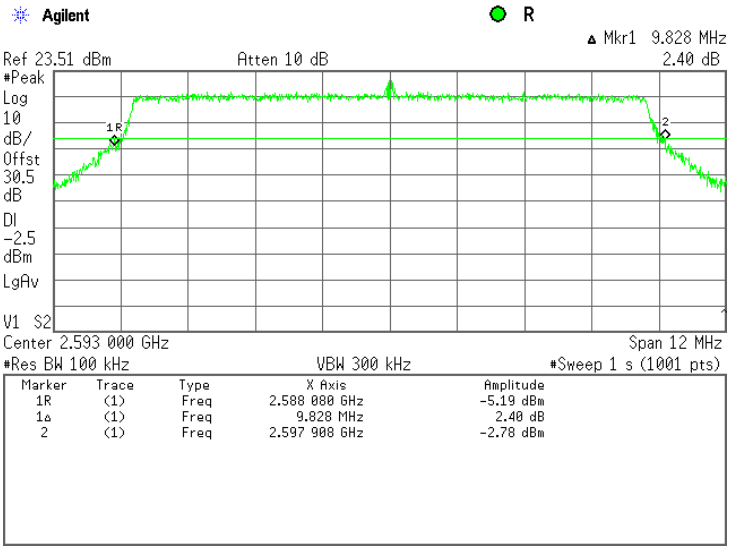


Plot 7.4.25 Occupied bandwidth test results at low frequency, 64QAM, 10 MHz EBW

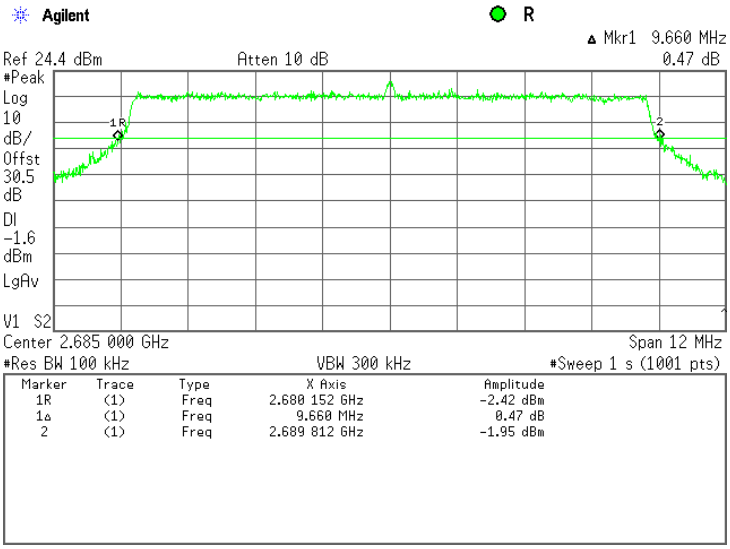


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	8/2/2010		
Temperature: 23.2 ºC	Air Pressure: 1005 hPa	Relative Humidity: 44 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.4.26 Occupied bandwidth test results at mid frequency, 64QAM, 10 MHz EBW



Plot 7.4.27 Occupied bandwidth test results at high frequency, 64QAM, 10 MHz EBW



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

7.5 Emission mask test

7.5.1 General

This test was performed to measure emission mask at RF antenna connector. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Emission mask limits

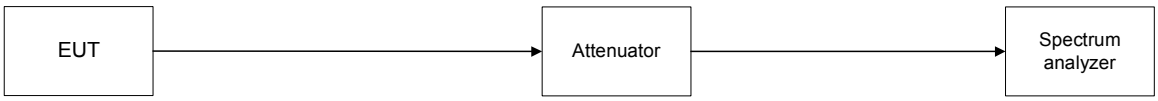
Channel, MHz	Frequency range, MHz	Attenuation below carrier, dBc
Channel bandwidth 5 MHz		
2498.50	2490.0 – 2496.0 & 2501.0 – 2507.0	43 + 10*Log (P*)
2593.00	2584.5 - 2590.5 & 2595.5 – 2601.5	43 + 10*Log (P*)
2687.50	2679.0 – 2685.0 & 2690.0 – 2696.0	43 + 10*Log (P*)
Channel bandwidth 7 MHz		
2499.50	2490.0 – 2496.0 & 2503.0 – 2509.0	43 + 10*Log (P*)
2593.00	2583.5 - 2589.5 & 2596.5 – 2602.5	43 + 10*Log (P*)
2686.50	2677.0 – 2683.0 & 2690.0 – 2696.0	43 + 10*Log (P*)
Channel bandwidth 10 MHz		
2501.00	2490.0 – 2496.0 & 2506.0 – 2512.0	43 + 10*Log (P*)
2593.00	2582.0 – 2588.0 & 2598.0 – 2604.0	43 + 10*Log (P*)
2685.00	2674.0 – 2680.0 & 2690.0 – 2696.0	43 + 10*Log (P*)

* - P is transmitter output power in Watts

7.5.2 Test procedure

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.
7.5.2.2 The emission mask was measured with spectrum analyzer as provided in the associated plots.
7.5.2.3 The worst case results are were provided in Table 7.5.2 and shown in the associated plots.

Figure 7.5.1 Emission mask test setup



Test specification:	**Section 27.53(m)(2), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.5.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2498.5-2687.5 MHz for EBW 5MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: QPSK

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
5 MHz EBW						
Low carrier frequency 2498.5 MHz, QPSK (Output power = 22.08 dBm)						
2.5-3.5	-14.74	-14.82	100	1000	-13.00	Pass
3.5-4.5	-18.69	-18.16				
4.5-5.5	-21.68	-21.33				
5.5-6.5	-25.38	-25.19				
6.5-7.5	-29.09	-29.08				
7.5-8.5	-32.50	-32.30				
Mid carrier frequency 2593.0 MHz, QPSK (Output power = 21.67 dBm)						
2.5-3.5	-17.25	-16.49	100	1000	-13.00	Pass
3.5-4.5	-21.34	-21.12				
4.5-5.5	-25.13	-23.00				
5.5-6.5	-28.42	-27.12				
6.5-7.5	-32.18	-31.09				
7.5-8.5	-35.05	-34.38				
High carrier frequency 2687.5 MHz, QPSK (Output power = 21.21 dBm)						
2.5-3.5	-15.42	-16.47	100	1000	-13.00	Pass
3.5-4.5	-20.15	-20.82				
4.5-5.5	-23.31	-23.63				
5.5-6.5	-28.02	-27.95				
6.5-7.5	-32.54	-32.02				
7.5-8.5	-35.50	-34.89				

Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Table 7.5.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2499.5-2686.5 MHz for EBW 7MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: QPSK

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
7 MHz EBW						
Low carrier frequency 2499.5 MHz, QPSK (Output power = 20.45 dBm)						
3.5-4.5	-17.10	-21.70	100	1000	-13.00	Pass
4.5-5.5	-20.94	-22.89				
5.5-6.5	-22.79	-25.04				
6.5-7.5	-24.69	-26.70				
7.5-8.5	-26.98	-29.05				
8.5-9.5	-30.05	-31.78				
Mid carrier frequency 2593.0 MHz, QPSK (Output power = 20.44 dBm)						
3.5-4.5	-20.35	-20.84	100	1000	-13.00	Pass
4.5-5.5	-25.18	-22.84				
5.5-6.5	-27.26	-25.16				
6.5-7.5	-28.80	-27.04				
7.5-8.5	-31.35	-29.33				
8.5-9.5	-34.09	-31.86				
High carrier frequency 2686.5 MHz, QPSK (Output power = 20.11 dBm)						
3.5-4.5	-18.04	-21.99	100	1000	-13.00	Pass
4.5-5.5	-21.73	-24.86				
5.5-6.5	-24.27	-26.82				
6.5-7.5	-26.64	-28.19				
7.5-8.5	-28.82	-31.37				
8.5-9.5	-31.69	-33.43				

Test specification:	**Section 27.53(m)(2), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.5.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2501.0-2685.0 MHz for EBW 10MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: QPSK

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
10 MHz EBW						
Low carrier frequency 2501.0 MHz, QPSK (Output power = 20.82 dBm)						
5 - 6	-21.00	-20.66	110	1000	-13.00	Pass
6 - 7	-23.70	-23.38				
7 - 8	-24.5	-23.79				
8 - 9	-25.96	-24.95				
9 - 10	-27.42	-26.48				
10 - 11	-28.72	-28.06				
Mid carrier frequency 2593.0 MHz, QPSK (Output power = 21.59 dBm)						
5 - 6	-21.86	-21.04	110	1000	-13.00	Pass
6 - 7	-25.65	-24.25				
7 - 8	-26.44	-25.39				
8 - 9	-26.83	-26.59				
9 - 10	-28.84	-28.65				
10 - 11	-30.61	-31.31				
Mid carrier frequency 2685.0 MHz, QPSK (Output power = 21.37 dBm)						
5 - 6	-20.25	-20.21	110	1000	-13.00	Pass
6 - 7	-22.36	-22.40				
7 - 8	-23.76	-23.48				
8 - 9	-25.35	-24.98				
9 - 10	-27.08	-26.71				
10 - 11	-29.03	-28.53				

Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Table 7.5.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2498.5-2687.5 MHz for EBW 5MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: 64QAM

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
5 MHz EBW						
Low carrier frequency 2498.5 MHz, 64QAM (Output power = 22.28 dBm)						
2.5-3.5	-15.65	-16.67	100	1000	-13.00	Pass
3.5-4.5	-20.21	-19.24				
4.5-5.5	-22.82	-22.64				
5.5-6.5	-26.85	-26.56				
6.5-7.5	-30.65	-30.59				
7.5-8.5	-34.72	-35.71				
Mid carrier frequency 2593.0 MHz, 64QAM (Output power = 21.17 dBm)						
2.5-3.5	-15.69	-18.72	100	1000	-13.00	Pass
3.5-4.5	-21.17	-22.53				
4.5-5.5	-24.46	-25.70				
5.5-6.5	-28.48	-28.64				
6.5-7.5	-31.52	-32.17				
7.5-8.5	-34.81	-35.20				
High carrier frequency 2687.5 MHz, 64QAM (Output power = 21.79 dBm)						
2.5-3.5	-15.12	-16.93	100	1000	-13.00	Pass
3.5-4.5	-19.43	-21.11				
4.5-5.5	-22.70	-24.74				
5.5-6.5	-27.61	-30.43				
6.5-7.5	-31.82	-34.06				
7.5-8.5	-35.76	-37.56				

Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Table 7.5.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2499.5-2686.5 MHz for EBW 7MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: 64QAM

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
7 MHz EBW						
Low carrier frequency 2499.5 MHz, 64QAM (Output power = 20.84 dBm)						
3.5-4.5	-16.92	-20.10	100	1000	-13.00	Pass
4.5-5.5	-21.28	-22.73				
5.5-6.5	-24.07	-24.50				
6.5-7.5	-26.10	-26.97				
7.5-8.5	-27.53	-28.98				
8.5-9.5	-30.44	-31.35				
Mid carrier frequency 2593.0 MHz, 64QAM (Output power = 20.77 dBm)						
3.5-4.5	-19.50	-20.10	100	1000	-13.00	Pass
4.5-5.5	-24.73	-22.82				
5.5-6.5	-26.53	-24.65				
6.5-7.5	-28.31	-26.58				
7.5-8.5	-30.24	-28.93				
8.5-9.5	-32.71	-31.56				
High carrier frequency 2686.5 MHz, 64QAM (Output power = 20.84dBm)						
3.5-4.5	-17.75	-19.19	100	1000	-13.00	Pass
4.5-5.5	-22.02	-21.64				
5.5-6.5	-24.04	-23.65				
6.5-7.5	-26.19	-26.06				
7.5-8.5	-28.68	-28.72				
8.5-9.5	-31.62	-31.51				

Test specification:	**Section 27.53(m)(2), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.5.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2501.0-2685.0 MHz for EBW 10MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: 64QAM

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
10 MHz EBW						
Low carrier frequency 2501.0 MHz, 64QAM (Output power = 20.46 dBm)						
5 - 6	-21.47	-20.96	100	1000	-13.00	Pass
6 - 7	-24.16	-23.00				
7 - 8	-25.93	-23.39				
8 - 9	-26.55	-24.62				
9 - 10	-27.91	-26.31				
10 - 11	-30.15	-27.30				
Mid carrier frequency 2593.0 MHz, 64QAM (Output power = 20.14 dBm)						
5 - 6	-23.10	-22.33	100	1000	-13.00	Pass
6 - 7	-26.96	-26.13				
7 - 8	-28.17	-27.59				
8 - 9	-29.80	-28.56				
9 - 10	-30.87	-29.75				
10 - 11	-33.69	-31.77				
Mid carrier frequency 2685.0 MHz, 64QAM (Output power = 20.49 dBm)						
5 - 6	-20.99	-20.76	100	1000	-13.00	Pass
6 - 7	-24.89	-23.23				
7 - 8	-25.67	-24.44				
8 - 9	-27.58	-25.96				
9 - 10	-29.34	-27.85				
10 - 11	-30.83	-29.60				

Reference numbers of test equipment used

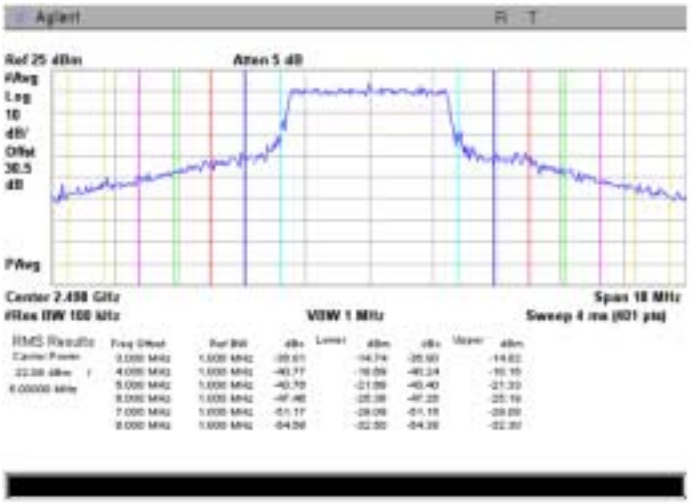
HL 2909	HL 2951	HL 3782	HL 3787	HL 3868	HL			

Full description is given in Appendix A.

Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

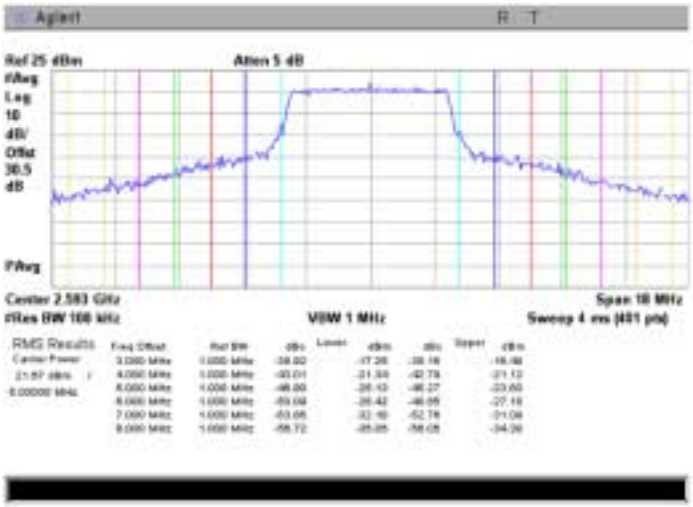
Plot 7.5.1 Emission mask test results at low carrier frequency, 5 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.2 Emission mask test results at mid carrier frequency, 5 MHz EBW

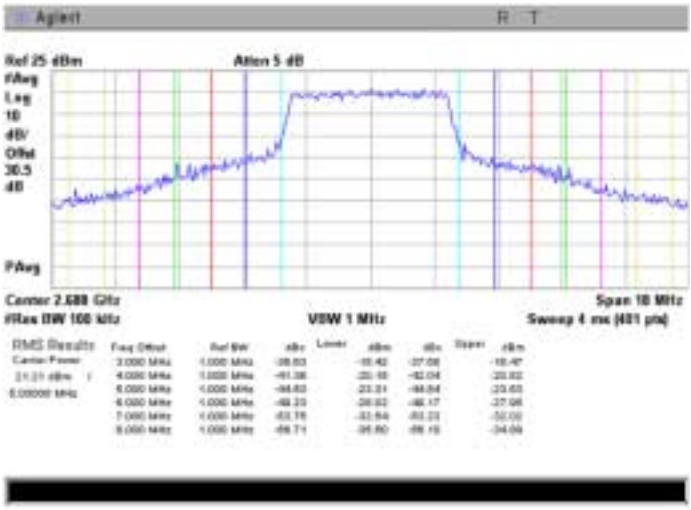
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

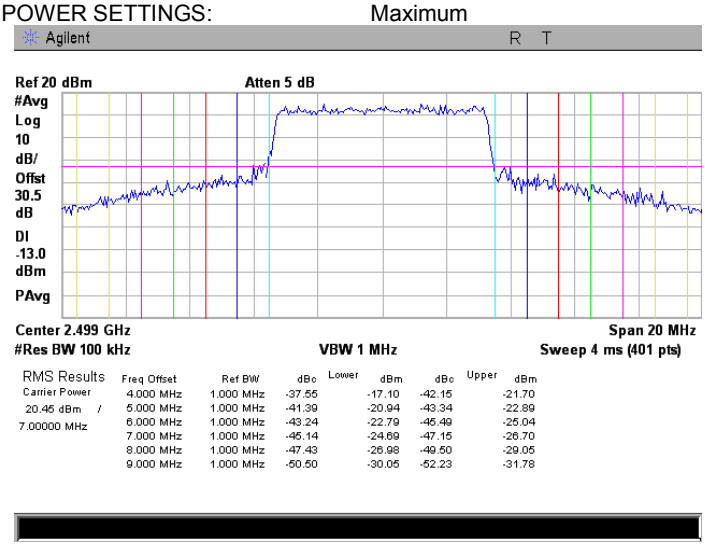
Plot 7.5.3 Emission mask test results at high carrier frequency, 5 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.4 Emission mask test results at low carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

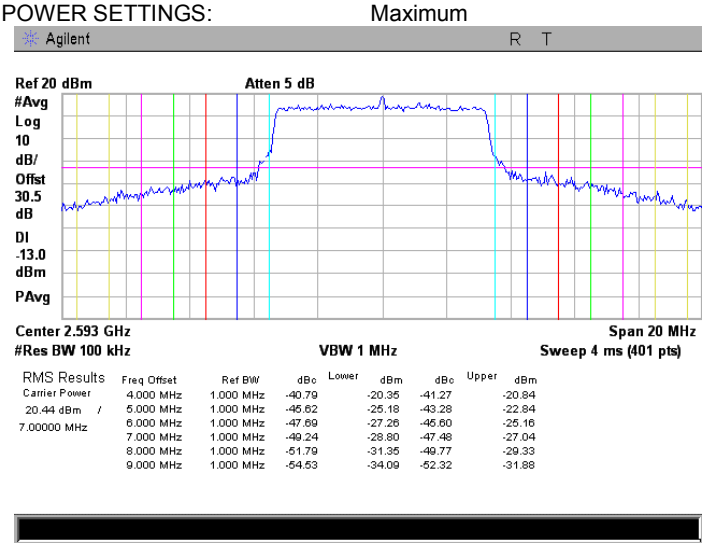


Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
4.000 MHz	1.000 MHz	-37.55	-17.10	-42.15	-21.70
5.000 MHz	1.000 MHz	-41.39	-20.94	-43.34	-22.89
6.000 MHz	1.000 MHz	-43.24	-22.79	-45.49	-25.04
7.000 MHz	1.000 MHz	-45.14	-24.69	-47.15	-26.70
8.000 MHz	1.000 MHz	-47.43	-26.98	-49.50	-29.05
9.000 MHz	1.000 MHz	-50.50	-30.05	-52.23	-31.78

Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

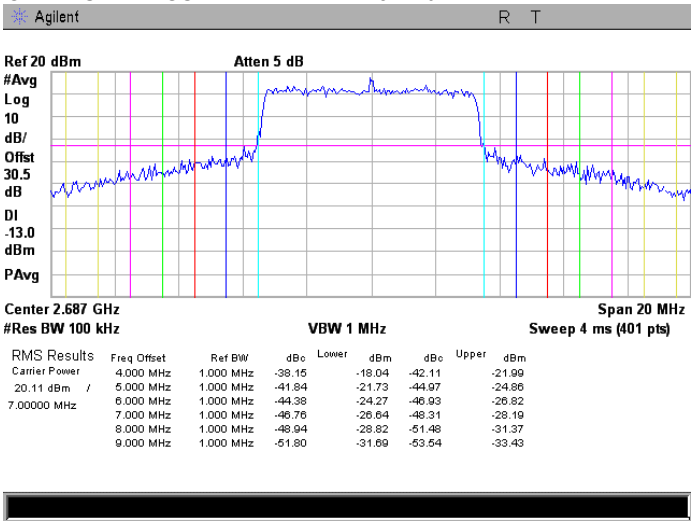
Plot 7.5.5 Emission mask test results at mid carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.6 Emission mask test results at high carrier frequency, 7 MHz EBW

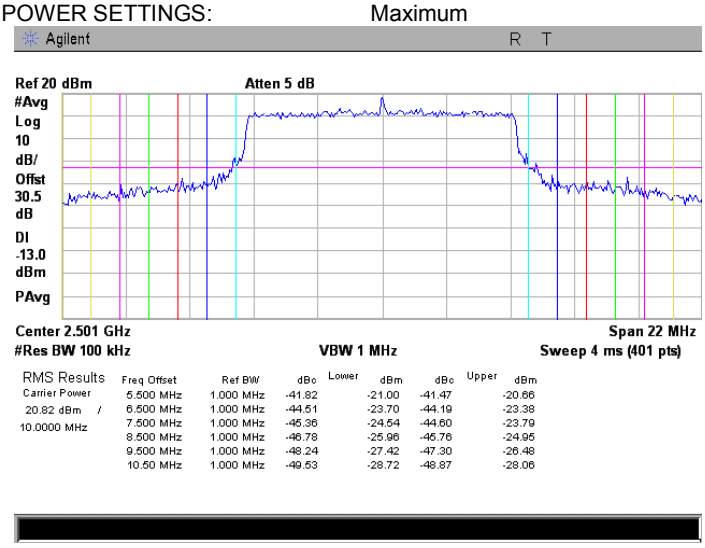
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

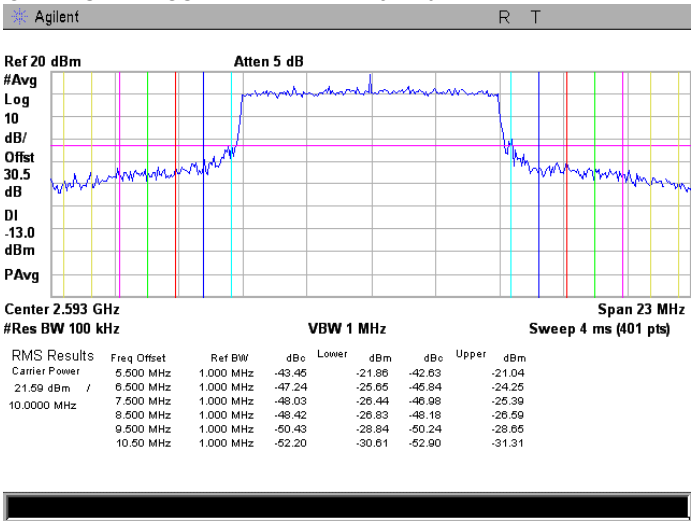
Plot 7.5.7 Emission mask test results at low carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.8 Emission mask test results at mid carrier frequency, 10 MHz EBW

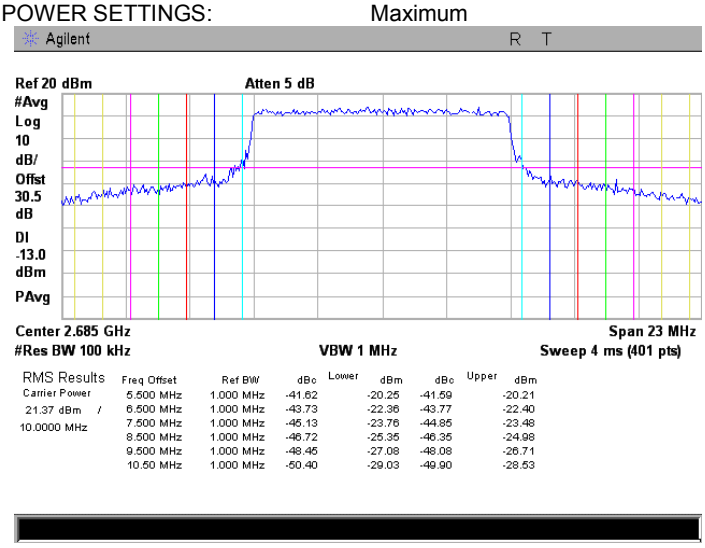
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

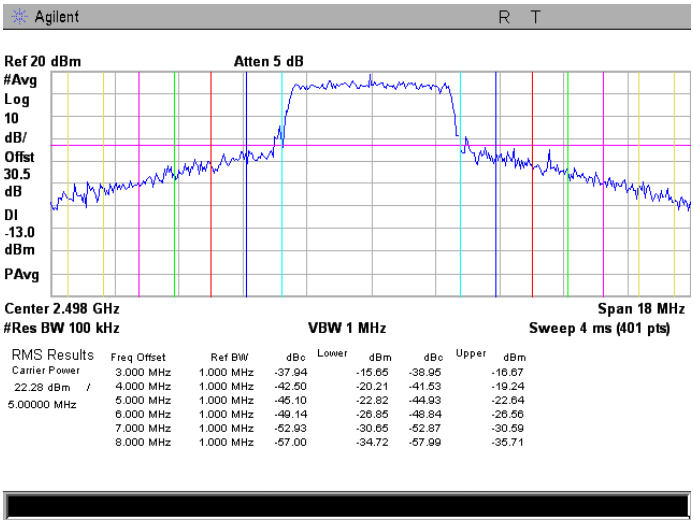
Plot 7.5.9 Emission mask test results at high carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.10 Emission mask test results at low carrier frequency, 5 MHz EBW

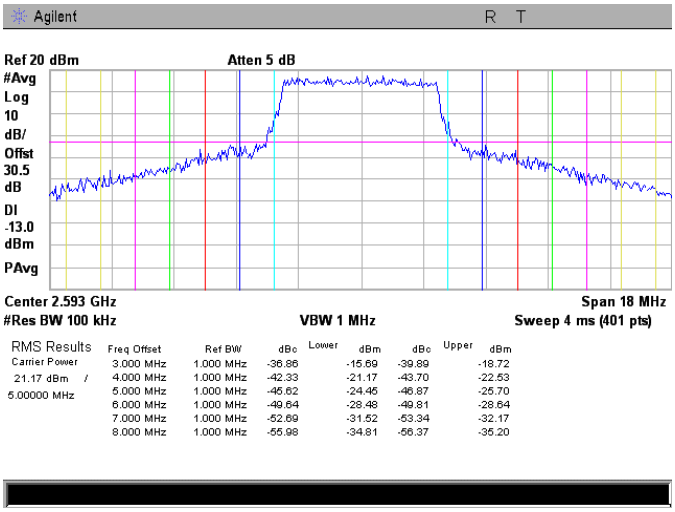
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

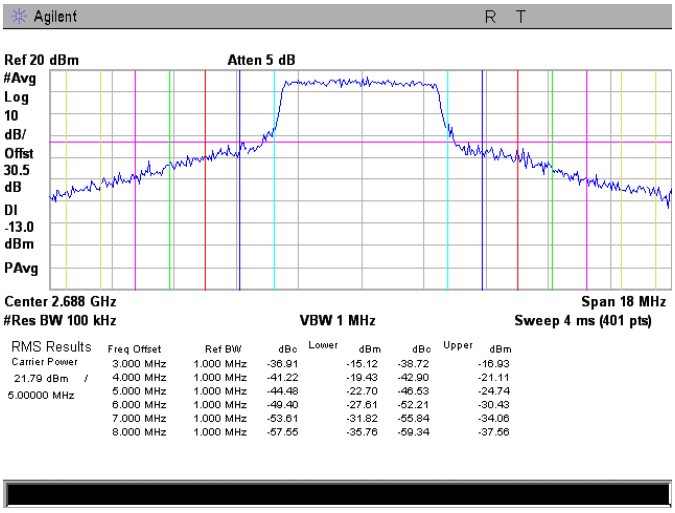
Plot 7.5.11 Emission mask test results at mid carrier frequency, 5 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.12 Emission mask test results at high carrier frequency, 5 MHz EBW

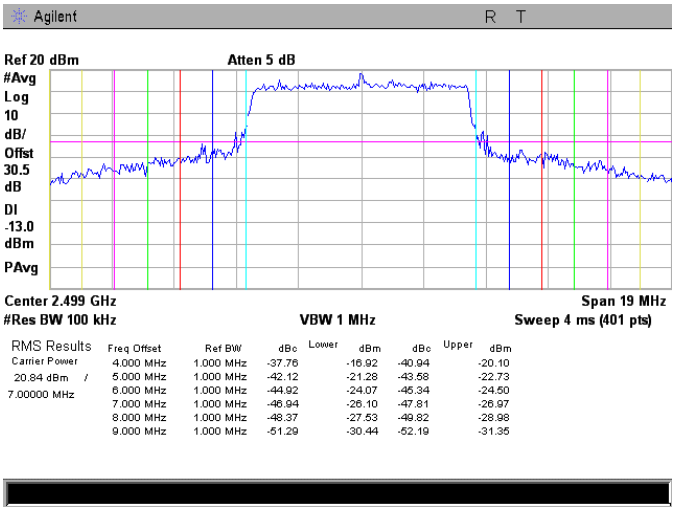
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

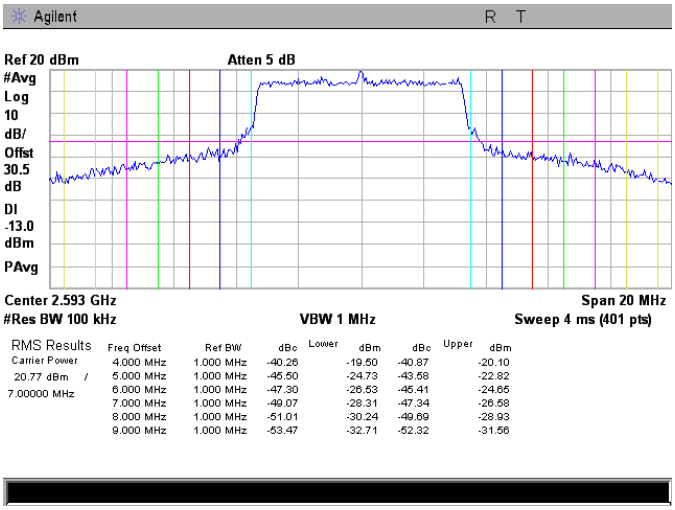
Plot 7.5.13 Emission mask test results at low carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.14 Emission mask test results at mid carrier frequency, 7 MHz EBW

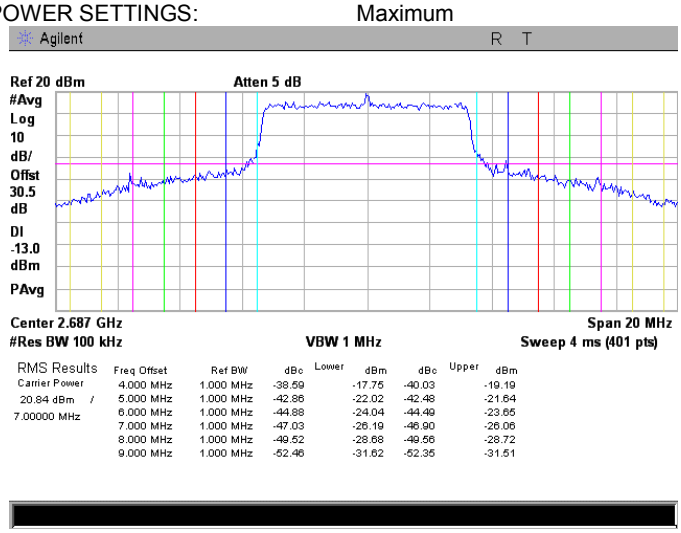
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

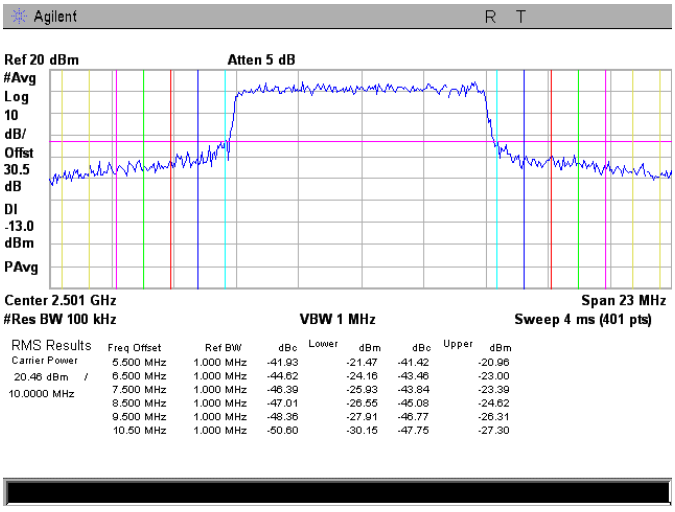
Plot 7.5.15 Emission mask test results at high carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.16 Emission mask test results at low carrier frequency, 10 MHz EBW

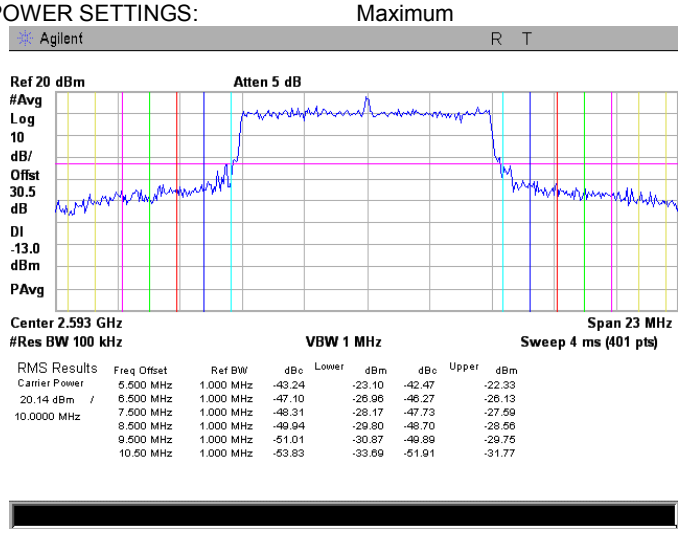
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

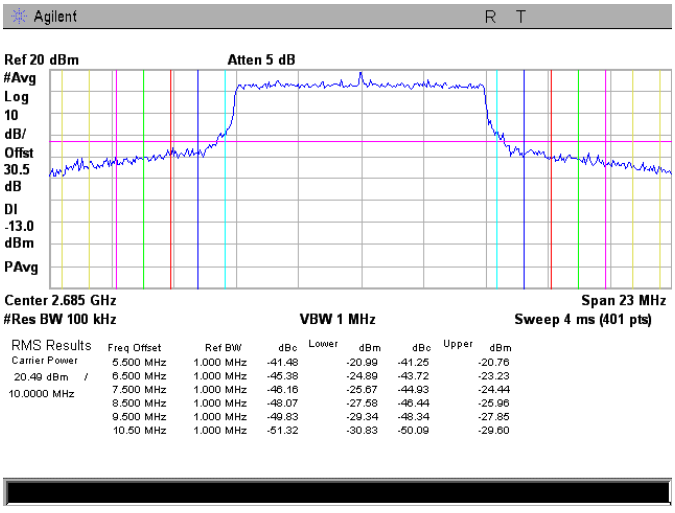
Plot 7.5.17 Emission mask test results at mid carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.5.18 Emission mask test results at high carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

7.6 Emission mask test

7.6.1 General

This test was performed to measure emission mask at RF antenna connector. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Spurious emission limits

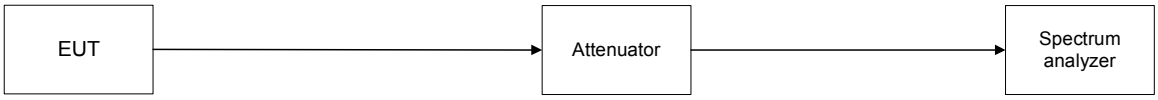
Channel, MHz	Frequency range, MHz	Attenuation below carrier, dBc
Channel bandwidth 5 MHz		
2498.5	2490.0 – 2491.0 & 2506.0 – 2507.0	55 + 10*Log (P*)
	2491.0 – 2496.0 & 2501.0 – 2506.0	43 + 10*Log (P*)
2593.0	2584.5 - 2585.5 & 2600.5 – 2601.5	55 + 10*Log (P*)
	2585.5 - 2590.5 & 2595.5 – 2600.5	43 + 10*Log (P*)
2687.5	2679.0 – 2680.0 & 2695.0 – 2696.0	55 + 10*Log (P*)
	2680.0 – 2685.0 & 2690.0 – 2695.0	43 + 10*Log (P*)
Channel bandwidth 5 MHz		
2499.5	2490.0 – 2491.0 & 2508.0 – 2509.0	55 + 10*Log (P*)
	2491.0 – 2496.0 & 2503.0 – 2508.0	43 + 10*Log (P*)
2593.0	2583.5 - 2584.5 & 2601.5 – 2602.5	55 + 10*Log (P*)
	2584.5 - 2589.5 & 2596.5 – 2601.5	43 + 10*Log (P*)
2686.5	2677.0 – 2678.0 & 2695.0 – 2696.0	55 + 10*Log (P*)
	2678.0 – 2683.0 & 2690.0 – 2695.0	43 + 10*Log (P*)
Channel bandwidth 10 MHz		
2501.0	2490.0 – 2491.0 & 2511.0 – 2512.0	55 + 10*Log (P*)
	2491.0 – 2496.0 & 2506.0 – 2511.0	43 + 10*Log (P*)
2593.0	2582.0 – 2583.0 & 2603.0 – 2604.0	55 + 10*Log (P*)
	2583.0 – 2588.0 & 2598.0 – 2603.0	43 + 10*Log (P*)
2685.0	2674.0 – 2675.0 & 2695.0 – 2696.0	55 + 10*Log (P*)
	2675.0 – 2680.0 & 2690.0 – 2695.0	43 + 10*Log (P*)

* - P is transmitter output power in Watts

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 emission mask was measured with spectrum analyzer as provided in the associated plots.
7.6.2.3 The worst case results are were provided in Table 7.6.2 and shown in the associated plots.

Figure 7.6.1 Emission mask test setup



Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.6.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2498.5-2687.5 MHz for EBW 5MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: QPSK

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
5 MHz EBW						
Low carrier frequency 2498.5 MHz, QPSK (Output power = 22.08 dBm)						
2.5-3.5	-14.74	-14.82	100	1000	-13.00	Pass
3.5-4.5	-18.69	-18.16				
4.5-5.5	-21.68	-21.33				
5.5-6.5	-25.38	-25.19				
6.5-7.5	-29.09	-29.08				
7.5-8.5	-32.50	-32.30	100	1000	-25.00	Pass
Mid carrier frequency 2593.0 MHz, QPSK (Output power = 21.67 dBm)						
2.5-3.5	-17.25	-16.49	100	1000	-13.00	Pass
3.5-4.5	-21.34	-21.12				
4.5-5.5	-25.13	-23.00				
5.5-6.5	-28.42	-27.12				
6.5-7.5	-32.18	-31.09				
7.5-8.5	-35.05	-34.38	100	1000	-25.00	Pass
High carrier frequency 2687.5 MHz, QPSK (Output power = 21.21 dBm)						
2.5-3.5	-15.42	-16.47	100	1000	-13.00	Pass
3.5-4.5	-20.15	-20.82				
4.5-5.5	-23.31	-23.63				
5.5-6.5	-28.02	-27.95				
6.5-7.5	-32.54	-32.02				
7.5-8.5	-35.50	-34.89	100	1000	-25.00	Pass

Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.6.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2499.5-2686.5 MHz for EBW 7MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: QPSK

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
7 MHz EBW						
Low carrier frequency 2499.5 MHz, QPSK (Output power = 20.45 dBm)						
3.5-4.5	-17.10	-21.70	100	1000	-13.00	Pass
4.5-5.5	-20.94	-22.89				
5.5-6.5	-22.79	-25.04				
6.5-7.5	-24.69	-26.70				
7.5-8.5	-26.98	-29.05				
8.5-9.5	-30.05	-31.78	100	1000	-25.00	Pass
Mid carrier frequency 2593.0 MHz, QPSK (Output power = 20.44 dBm)						
3.5-4.5	-20.35	-20.84	100	1000	-13.00	Pass
4.5-5.5	-25.18	-22.84				
5.5-6.5	-27.26	-25.16				
6.5-7.5	-28.80	-27.04				
7.5-8.5	-31.35	-29.33				
8.5-9.5	-34.09	-31.86	100	1000	-25.00	Pass
High carrier frequency 2686.5 MHz, QPSK (Output power = 20.11 dBm)						
3.5-4.5	-18.04	-21.99	100	1000	-13.00	Pass
4.5-5.5	-21.73	-24.86				
5.5-6.5	-24.27	-26.82				
6.5-7.5	-26.64	-28.19				
7.5-8.5	-28.82	-31.37				
8.5-9.5	-31.69	-33.43	100	1000	-25.00	Pass

Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.6.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2501.0-2685.0 MHz for EBW 10MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: QPSK

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
10 MHz EBW						
Low carrier frequency 2501.0 MHz, QPSK (Output power = 20.82 dBm)						
5 - 6	-21.00	-20.66				
6 - 7	-23.70	-23.38				
7 - 8	-24.5	-23.79	110	1000	-13.00	Pass
8 - 9	-25.96	-24.95				
9 - 10	-27.42	-26.48				
10 - 11	-28.72	-28.06	100	1000	-25.00	Pass
Mid carrier frequency 2593.0 MHz, QPSK (Output power = 21.59 dBm)						
5 - 6	-21.86	-21.04				
6 - 7	-25.65	-24.25				
7 - 8	-26.44	-25.39	110	1000	-13.00	Pass
8 - 9	-26.83	-26.59				
9 - 10	-28.84	-28.65				
10 - 11	-30.61	-31.31	100	1000	-25.00	Pass
Mid carrier frequency 2685.0 MHz, QPSK (Output power = 21.37 dBm)						
5 - 6	-20.25	-20.21				
6 - 7	-22.36	-22.40				
7 - 8	-23.76	-23.48	110	1000	-13.00	Pass
8 - 9	-25.35	-24.98				
9 - 10	-27.08	-26.71				
10 - 11	-29.03	-28.53	100	1000	-25.00	Pass

Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.6.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2498.5-2687.5 MHz for EBW 5MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: 64QAM

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
5 MHz EBW						
Low carrier frequency 2498.5 MHz, 64QAM (Output power = 22.28 dBm)						
2.5-3.5	-15.65	-16.67				
3.5-4.5	-20.21	-19.24				
4.5-5.5	-22.82	-22.64	100	1000	-13.00	Pass
5.5-6.5	-26.85	-26.56				
6.5-7.5	-30.65	-30.59				
7.5-8.5	-34.72	-35.71	100	1000	-25.00	Pass
Mid carrier frequency 2593.0 MHz, 64QAM (Output power = 21.17 dBm)						
2.5-3.5	-15.69	-18.72				
3.5-4.5	-21.17	-22.53				
4.5-5.5	-24.46	-25.70	100	1000	-13.00	Pass
5.5-6.5	-28.48	-28.64				
6.5-7.5	-31.52	-32.17				
7.5-8.5	-34.81	-35.20	100	1000	-25.00	Pass
High carrier frequency 2687.5 MHz, 64QAM (Output power = 21.79 dBm)						
2.5-3.5	-15.12	-16.93				
3.5-4.5	-19.43	-21.11				
4.5-5.5	-22.70	-24.74	100	1000	-13.00	Pass
5.5-6.5	-27.61	-30.43				
6.5-7.5	-31.82	-34.06				
7.5-8.5	-35.76	-37.56	100	1000	-25.00	Pass

Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.6.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2499.5-2686.5 MHz for EBW 7MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: 64QAM

Frequency offset, ± MHz	SA reading, dBc low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
7 MHz EBW						
Low carrier frequency 2499.5 MHz, 64QAM (Output power = 20.84 dBm)						
3.5-4.5	-16.92	-20.10	100	1000	-13.00	Pass
4.5-5.5	-21.28	-22.73				
5.5-6.5	-24.07	-24.50				
6.5-7.5	-26.10	-26.97				
7.5-8.5	-27.53	-28.98				
8.5-9.5	-30.44	-31.35	100	1000	-25.00	Pass
Mid carrier frequency 2593.0 MHz, 64QAM (Output power = 20.77 dBm)						
3.5-4.5	-19.50	-20.10	100	1000	-13.00	Pass
4.5-5.5	-24.73	-22.82				
5.5-6.5	-26.53	-24.65				
6.5-7.5	-28.31	-26.58				
7.5-8.5	-30.24	-28.93				
8.5-9.5	-32.71	-31.56	100	1000	-25.00	Pass
High carrier frequency 2686.5 MHz, 64QAM (Output power = 20.84dBm)						
3.5-4.5	-17.75	-19.19	100	1000	-13.00	Pass
4.5-5.5	-22.02	-21.64				
5.5-6.5	-24.04	-23.65				
6.5-7.5	-26.19	-26.06				
7.5-8.5	-28.68	-28.72				
8.5-9.5	-31.62	-31.51	100	1000	-25.00	Pass

Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 42 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.6.2 Spurious emission test results (continued)

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 2501.0-2685.0 MHz for EBW 10MHz
RBW: 1 % of EBW
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
MODULATION: 64QAM

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBc high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
10 MHz EBW						
Low carrier frequency 2501 MHz, 64QAM (Output power = 20.46 dBm)						
5 - 6	-21.47	-20.96	100	1000	-13.00	Pass
6 - 7	-24.16	-23.00				
7 - 8	-25.93	-23.39				
8 - 9	-26.55	-24.62				
9 - 10	-27.91	-26.31				
10 - 11	-30.15	-27.30	100	1000	-25.00	Pass
Mid carrier frequency 2593.0 MHz, 64QAM (Output power = 20.14 dBm)						
5 - 6	-23.10	-22.33	100	1000	-13.00	Pass
6 - 7	-26.96	-26.13				
7 - 8	-28.17	-27.59				
8 - 9	-29.80	-28.56				
9 - 10	-30.87	-29.75				
10 - 11	-33.69	-31.77	100	1000	-25.00	Pass
Mid carrier frequency 2685 MHz, 64QAM (Output power = 20.49 dBm)						
5 - 6	-20.99	-20.76	100	1000	-13.00	Pass
6 - 7	-24.89	-23.23				
7 - 8	-25.67	-24.44				
8 - 9	-27.58	-25.96				
9 - 10	-29.34	-27.85				
10 - 11	-30.83	-29.60	100	1000	-25.00	Pass

Reference numbers of test equipment used

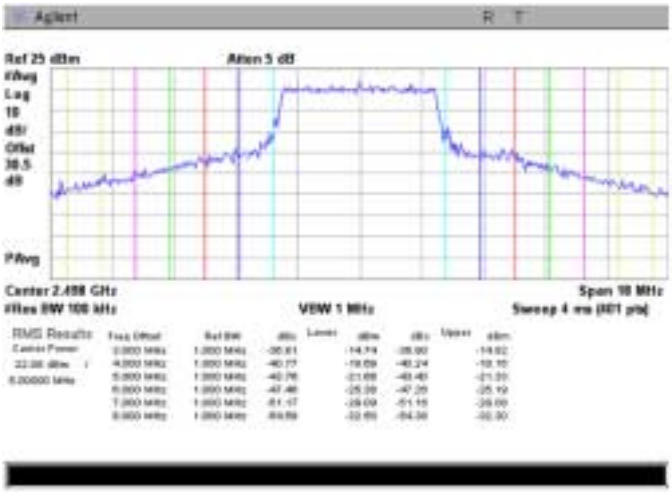
HL 2909	HL 2951	HL 3782	HL 3787	HL 3868				

Full description is given in Appendix A.

Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

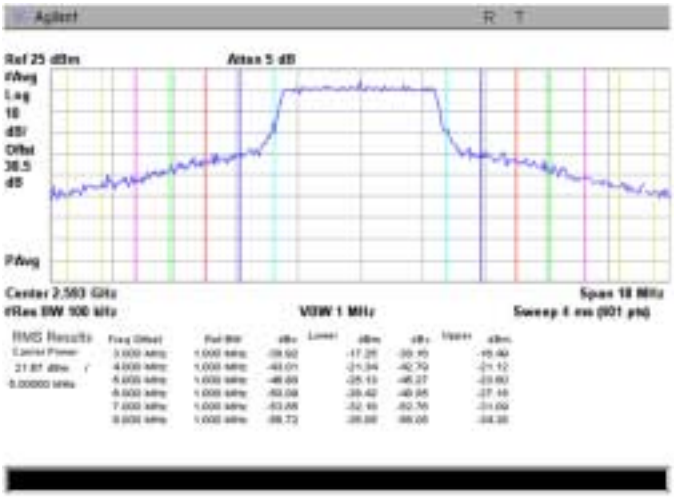
Plot 7.6.1 Emission mask test results at low carrier frequency, 5 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.2 Emission mask test results at mid carrier frequency, 5 MHz EBW

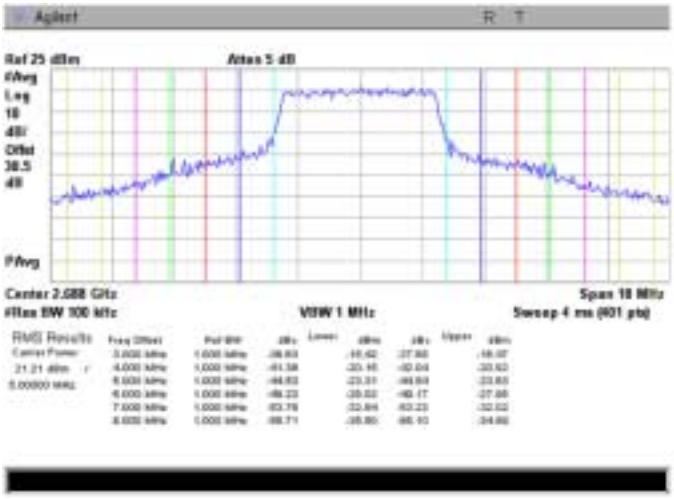
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

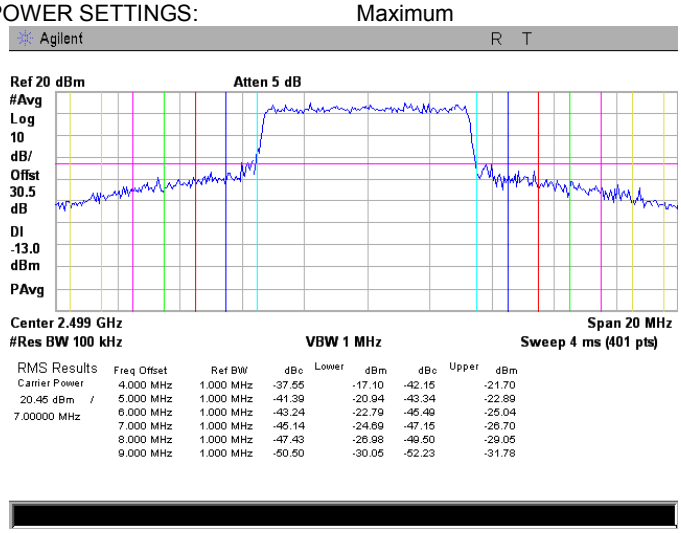
Plot 7.6.3 Emission mask test results at high carrier frequency, 5 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.4 Emission mask test results at low carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

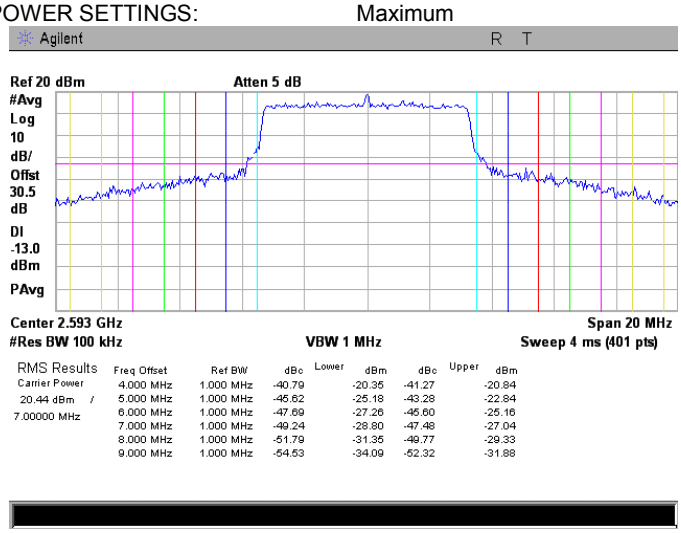


Freq Offset	Ref BW	dBc	Lower	dBm	dBc	Upper	dBm
4.000 MHz	1.000 MHz	-37.55		-17.10	-42.15		-21.70
5.000 MHz	1.000 MHz	-41.39		-20.94	-43.34		-22.89
6.000 MHz	1.000 MHz	-43.24		-22.79	-45.49		-25.04
7.000 MHz	1.000 MHz	-45.14		-24.69	-47.15		-26.70
8.000 MHz	1.000 MHz	-47.43		-26.98	-49.50		-29.05
9.000 MHz	1.000 MHz	-50.50		-30.05	-52.23		-31.78

Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

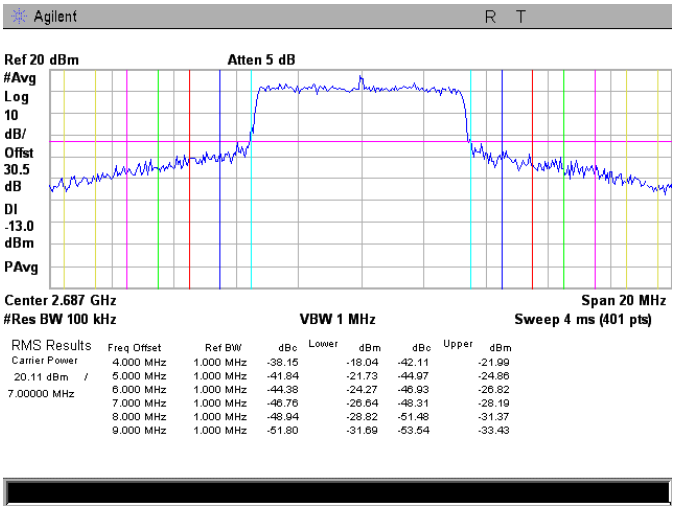
Plot 7.6.5 Emission mask test results at mid carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.6 Emission mask test results at high carrier frequency, 7 MHz EBW

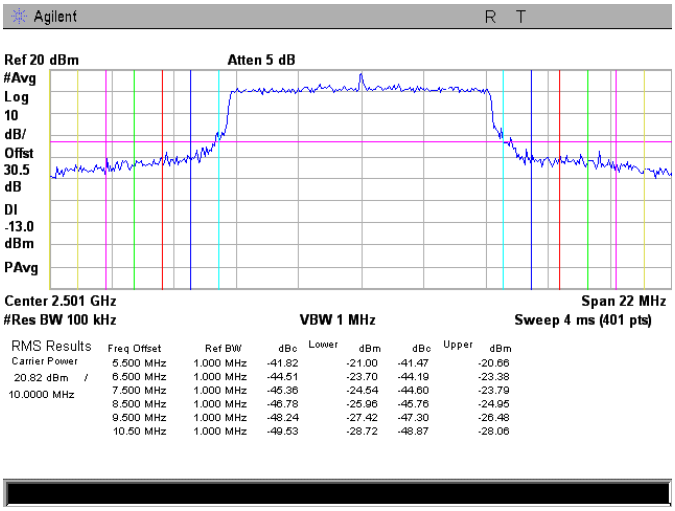
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

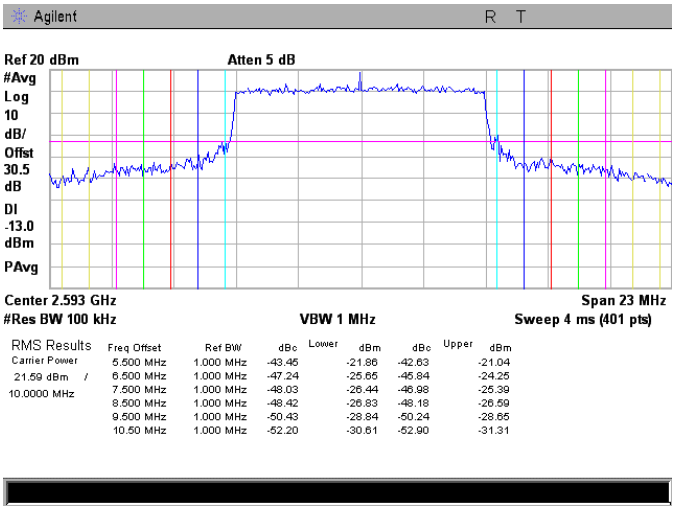
Plot 7.6.7 Emission mask test results at low carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.8 Emission mask test results at mid carrier frequency, 10 MHz EBW

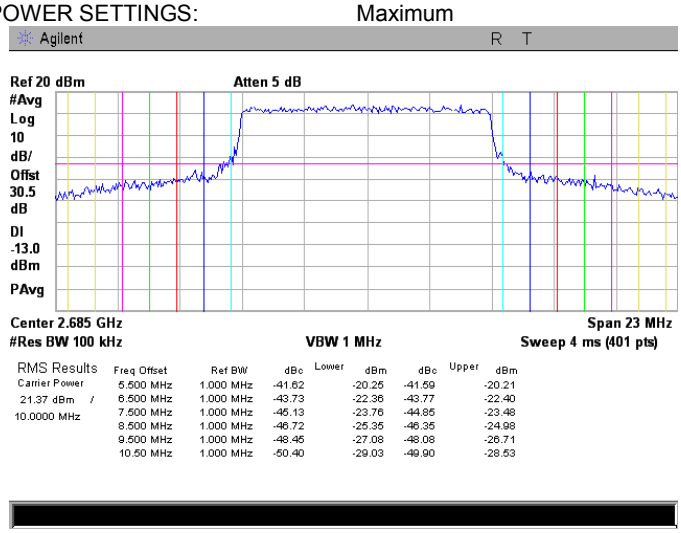
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

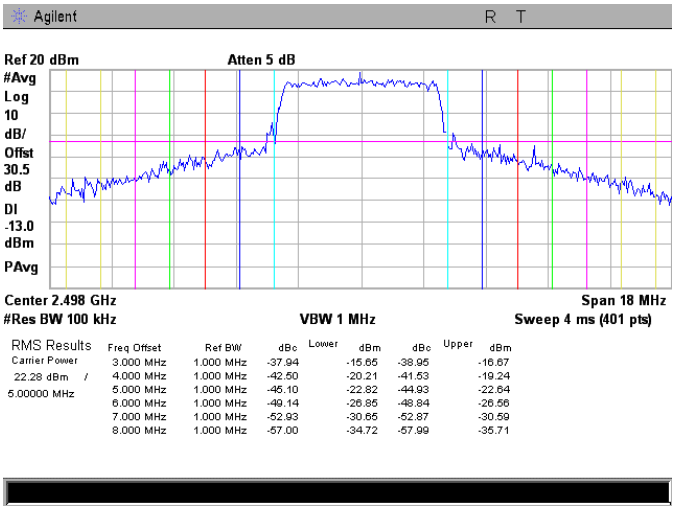
Plot 7.6.9 Emission mask test results at high carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.10 Emission mask test results at low carrier frequency, 5 MHz EBW

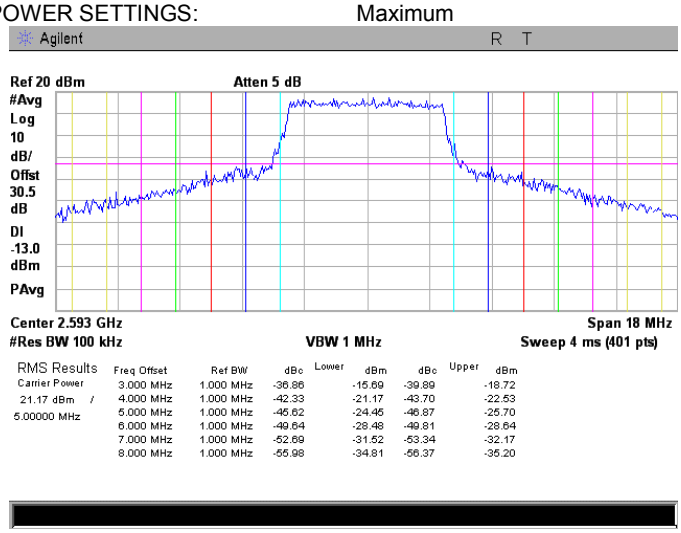
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

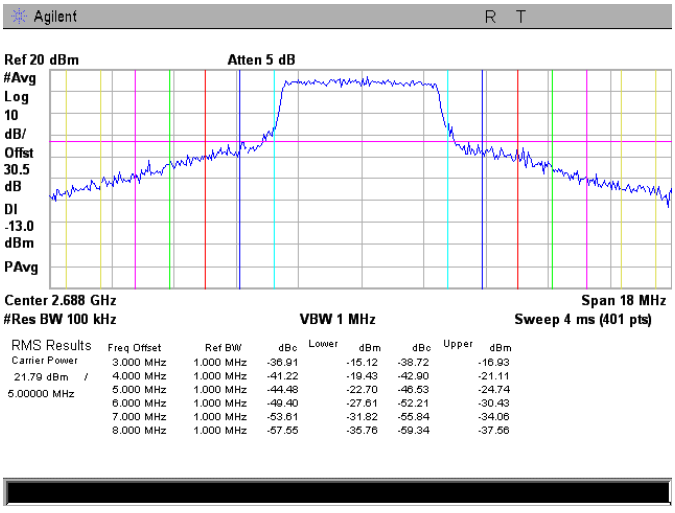
Plot 7.6.11 Emission mask test results at mid carrier frequency, 5 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.12 Emission mask test results at high carrier frequency, 5 MHz EBW

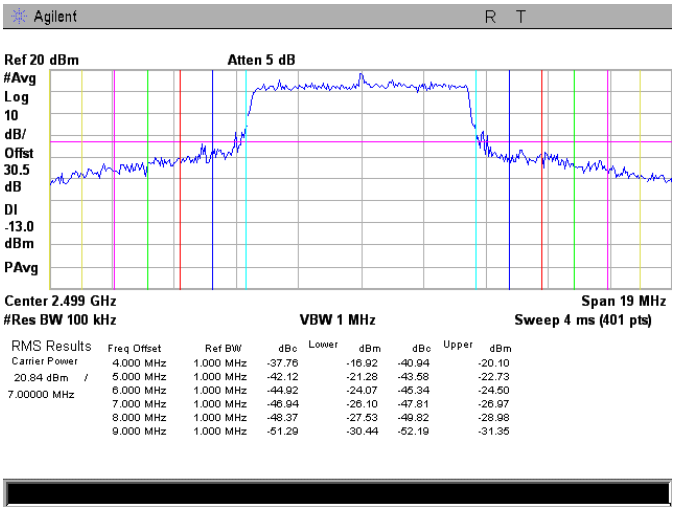
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

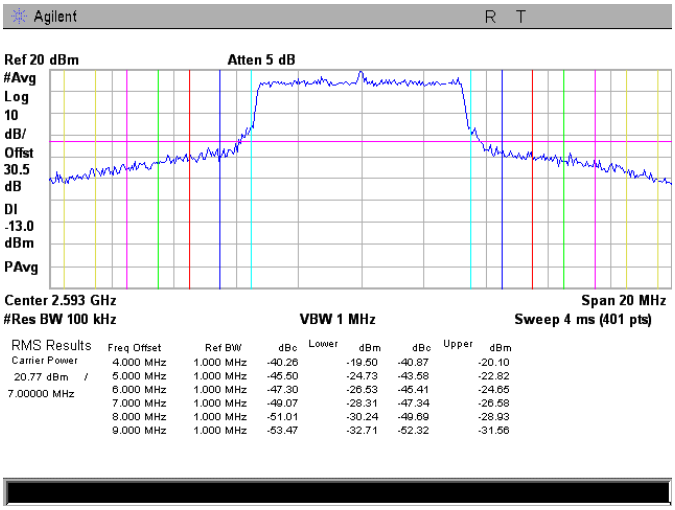
Plot 7.6.13 Emission mask test results at low carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.14 Emission mask test results at mid carrier frequency, 7 MHz EBW

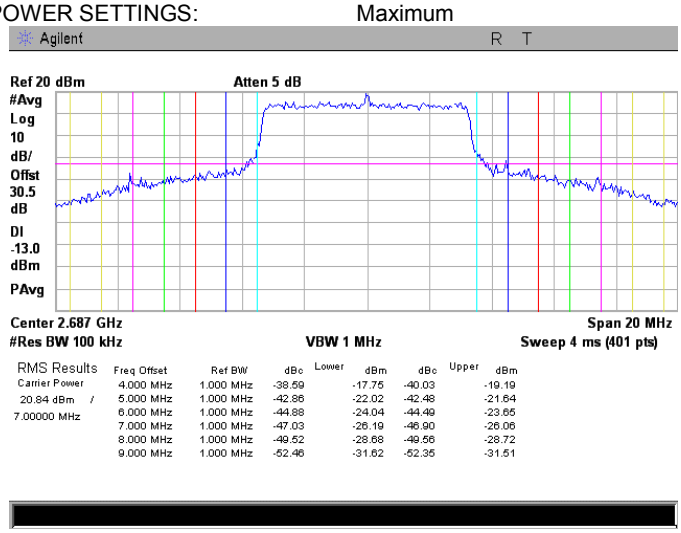
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

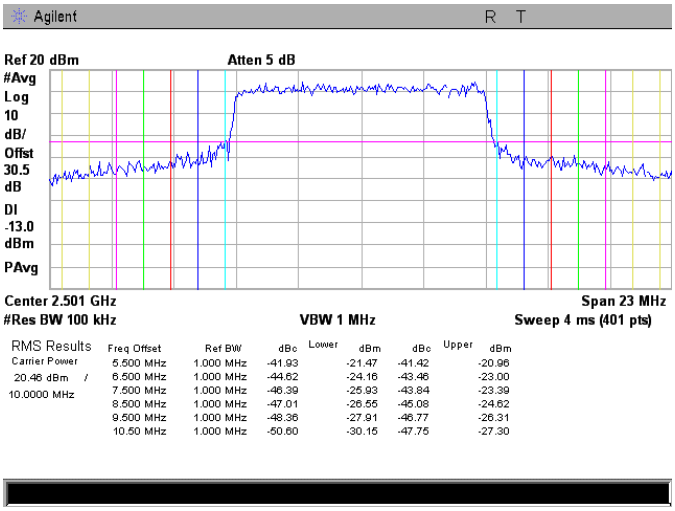
Plot 7.6.15 Emission mask test results at high carrier frequency, 7 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.16 Emission mask test results at low carrier frequency, 10 MHz EBW

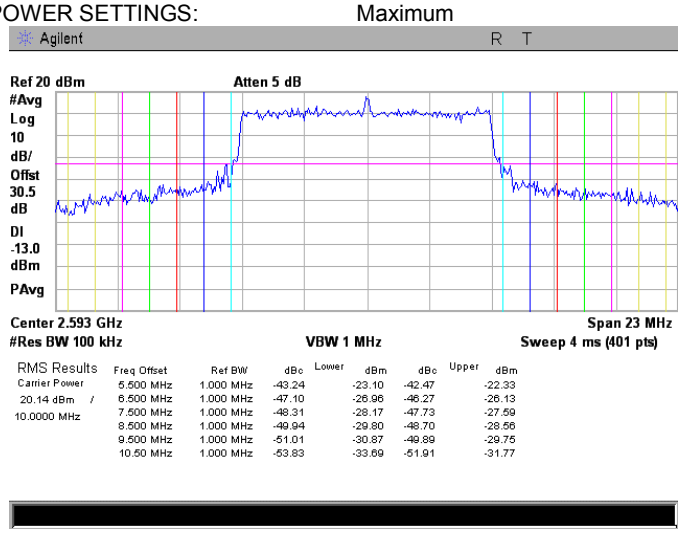
ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 24.6 ºC	Air Pressure: 1003 hPa	Relative Humidity: 42 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

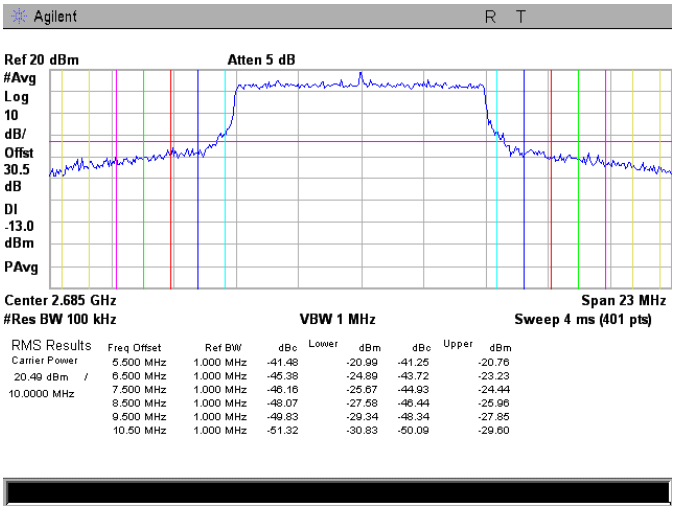
Plot 7.6.17 Emission mask test results at mid carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Plot 7.6.18 Emission mask test results at high carrier frequency, 10 MHz EBW

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
DETECTOR USED: Average
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

7.7 Radiated spurious emission measurements

7.7.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.7.1.

Table 7.7.1 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 – 10th harmonic*	43+10logP**	-13	84.4

* - Excluding the in band emission within ± 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×P×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

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

7.7.2.1 The EUT was set up as shown in Figure 7.7.1, energized and the performance check was conducted.
7.7.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.
7.7.2.3 The worst test results (the lowest margins) were recorded in Table 7.7.2 and shown in the associated plots.

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

7.7.3.1 The EUT was set up as shown in Figure 7.7.2, energized and the performance check was conducted.
7.7.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.
7.7.3.3 The worst test results (the lowest margins) were recorded in Table 7.7.2 and shown in the associated plots.

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Figure 7.7.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

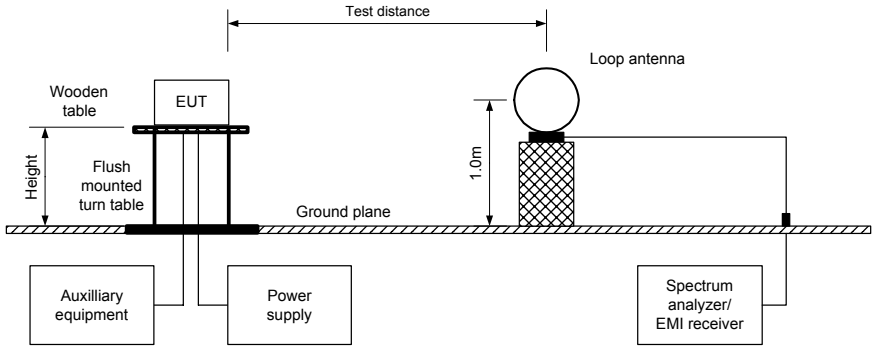
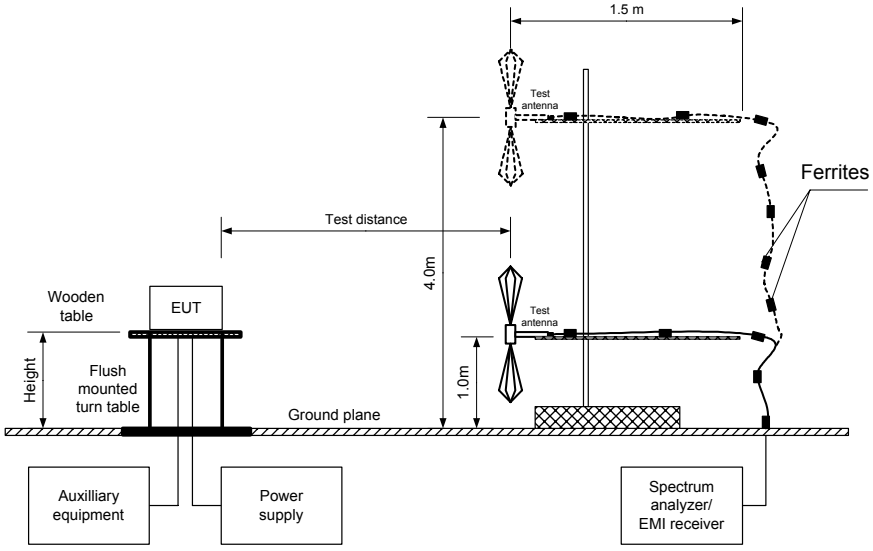


Figure 7.7.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 27.53(m)(2), Radiated spurious emissions**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	**Air Pressure:** 1006 hPa	**Relative Humidity:** 41 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.7.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	2496.0 – 2690.0 MHz
TEST DISTANCE:	3 m
TEST SITE:	Anechoic chamber / OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 27000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconical (30 MHz – 200 MHz) Log periodic (200 MHz – 1000 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4.19 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum (SEE NOTE 1)

Frequency, MHz	Field strength, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
Low carrier frequency 2498.5 MHz								
All emissions were found at least 20 dB below the specified limit								Pass
Mid carrier frequency 2593.0 MHz								
All emissions were found at least 20 dB below the specified limit								Pass
High carrier frequency 2687.5 MHz								
All emissions were found at least 20 dB below the specified limit								Pass

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.
*****-** NOTE1: The 5 MHz EBW was chosen as configuration that produces the maximum power density.

Reference numbers of test equipment used

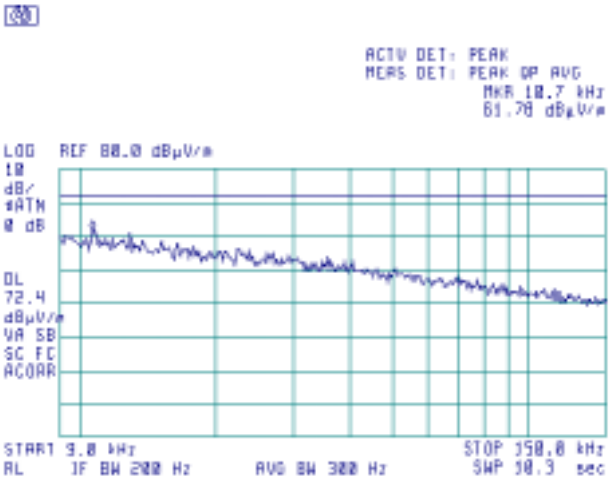
HL 0446	HL 0521	HL 0604	HL 0768	HL 0769	HL 1424	HL 1984	HL 2870
HL 2871	HL 2909	HL 3384	HL 3534	HL 3535	HL 3616	HL 3901	

Full description is given in Appendix A.

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.1 Radiated emission measurements in 9 - 150 kHz range

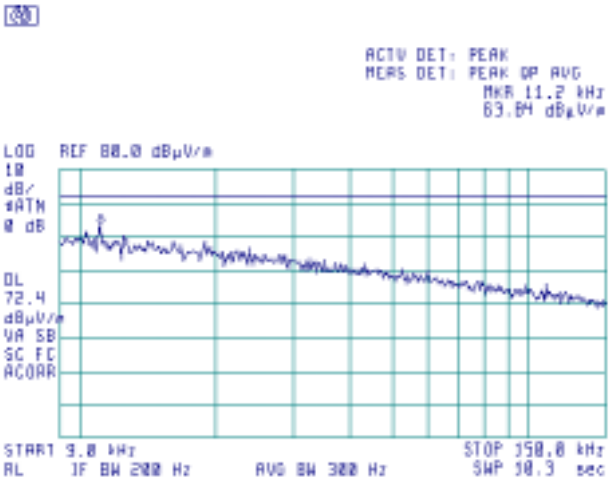
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.2 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

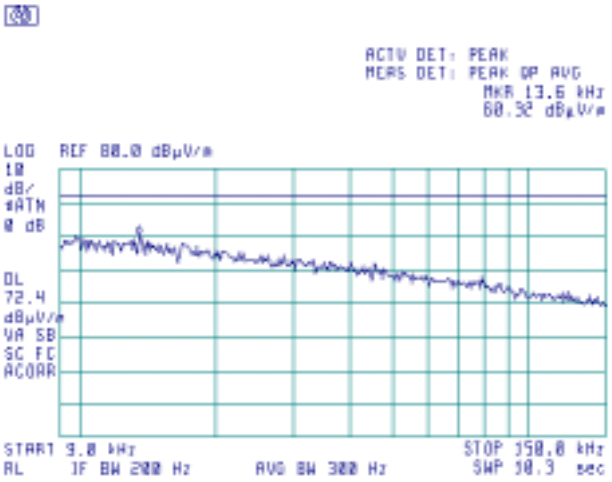


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.3 Radiated emission measurements in 9 - 150 kHz range

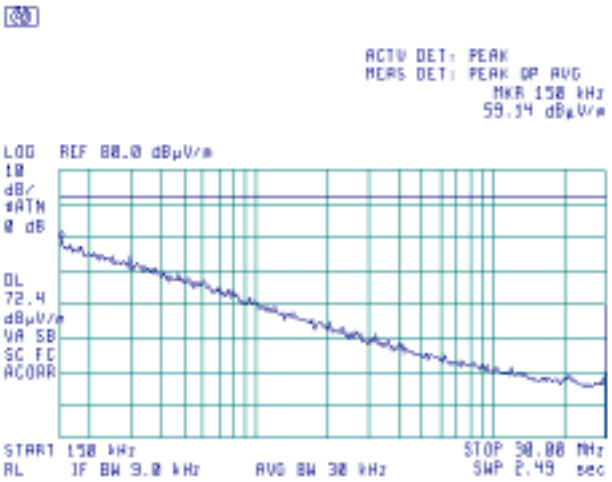
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.4 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

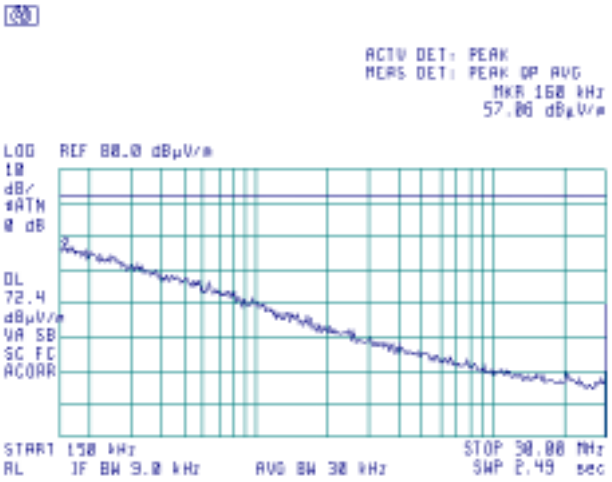


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.5 Radiated emission measurements in 0.15 - 30 MHz range

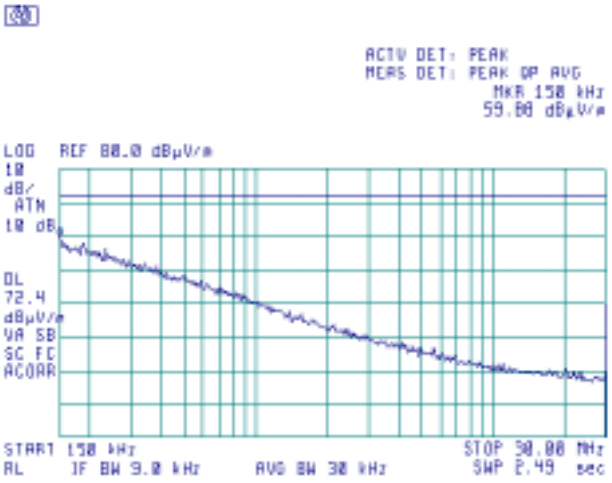
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.6 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

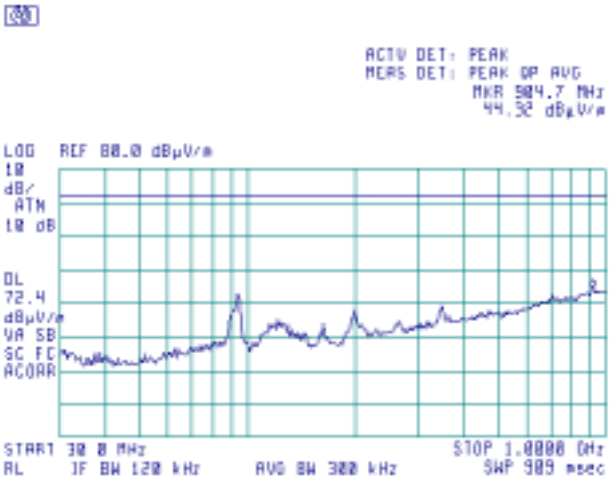


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.7 Radiated emission measurements in 30 - 1000 MHz range

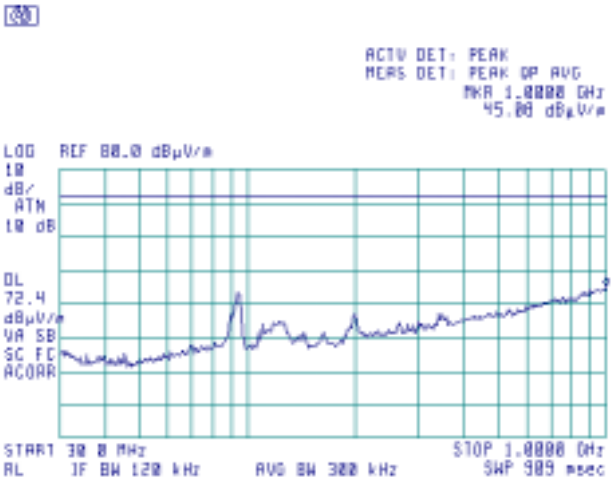
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.8 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

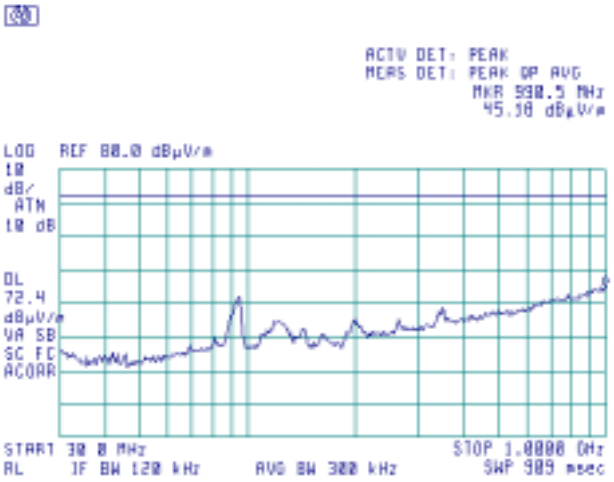


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.9 Radiated emission measurements in 30 - 1000 MHz range

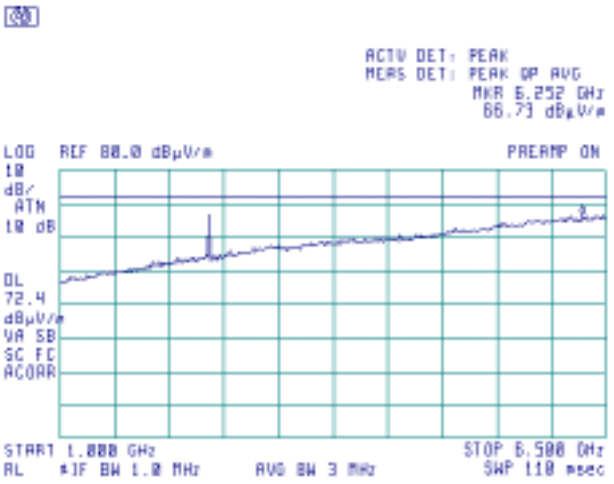
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.10 Radiated emission measurements in 1000 – 6500 MHz range

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

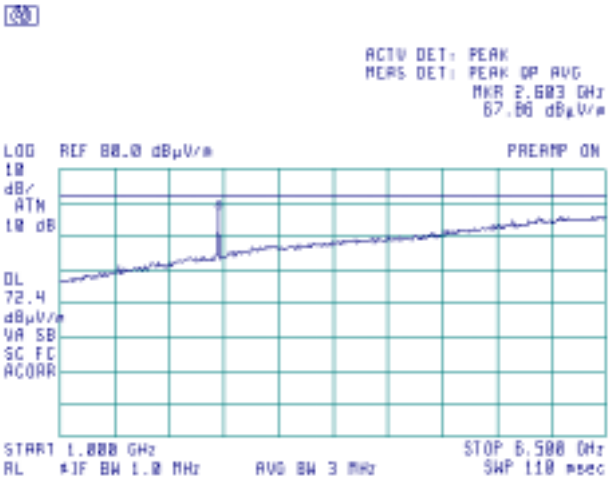


Note: Applied limit is 84.4 dBuV; Low channel carrier – 2498.5 MHz

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.11 Radiated emission measurements in 1000 – 6500 MHz range

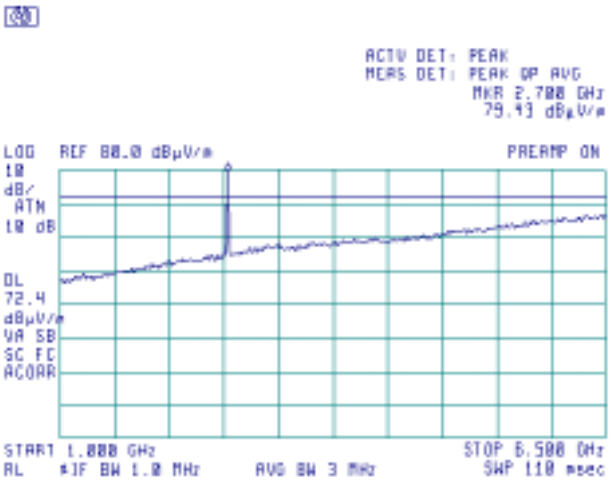
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV; Mid channel carrier – 2593.0 MHz

Plot 7.7.12 Radiated emission measurements in 1000 – 6500 MHz range

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

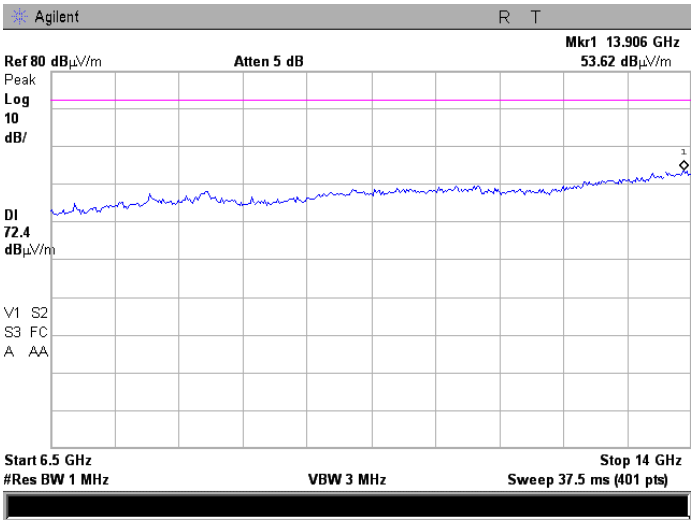


Note: Applied limit is 84.4 dBuV; High channel carrier – 2687.5 MHz

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.13 Radiated emission measurements in 6500 - 14000 MHz range

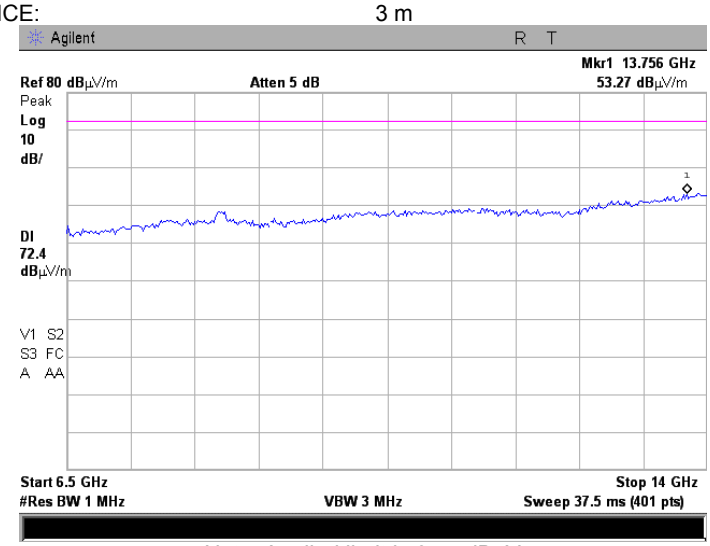
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Low
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.14 Radiated emission measurements in 6500 - 14000 MHz range

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

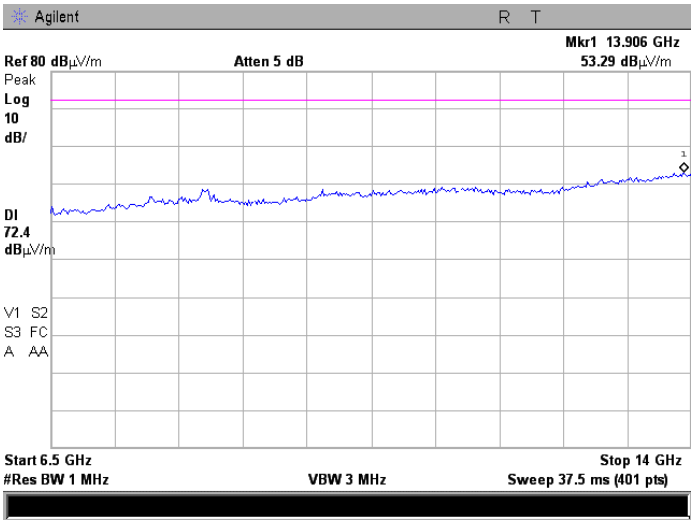


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.15 Radiated emission measurements in 6500 - 14000 MHz range

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

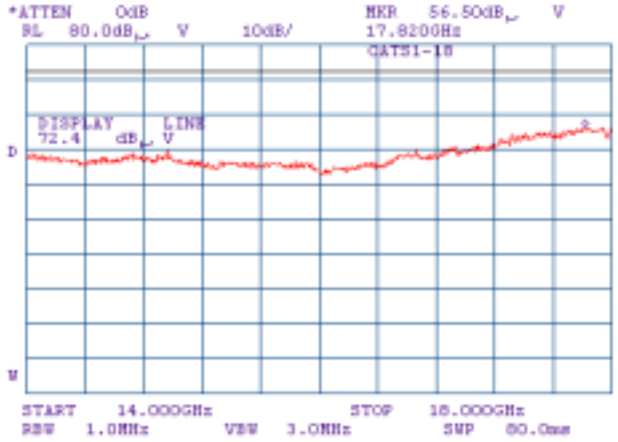


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.16 Radiated emission measurements in 14000 - 18000 MHz range

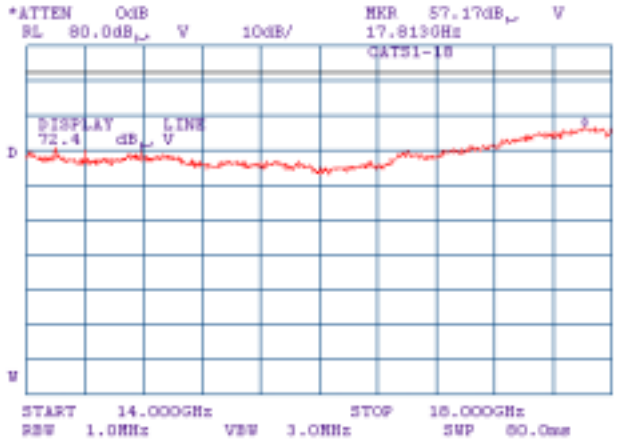
TEST SITE:	OATS
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.17 Radiated emission measurements in 14000 - 18000 MHz range

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

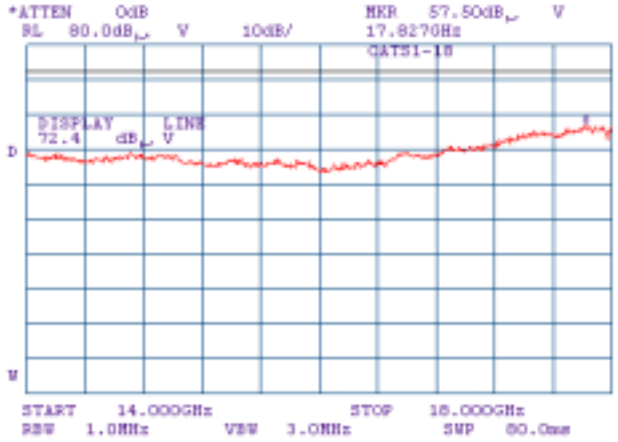


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.18 Radiated emission measurements in 14000 - 18000 MHz range

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

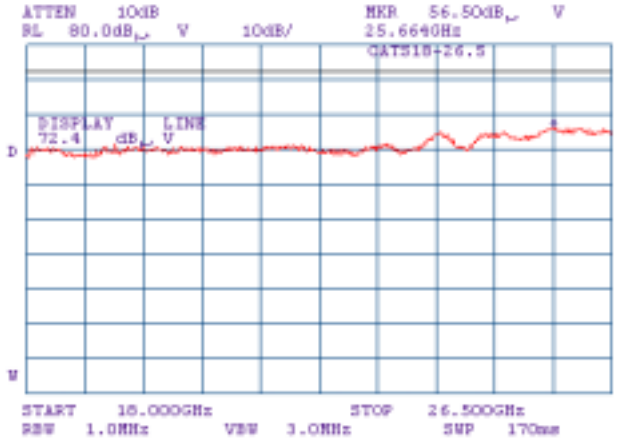


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.19 Radiated emission measurements in 18000 – 26500 MHz range

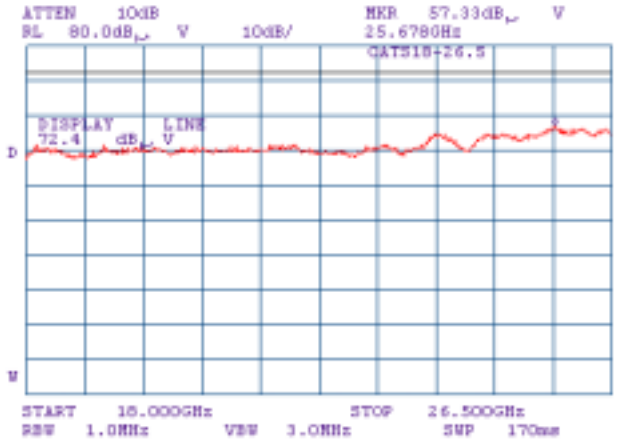
TEST SITE:	OATS
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.20 Radiated emission measurements in 18000 – 26500 MHz range

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

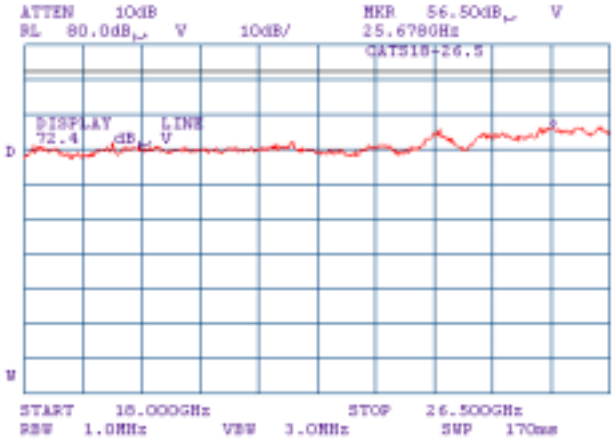


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.21 Radiated emission measurements in 18000 – 26500 MHz range

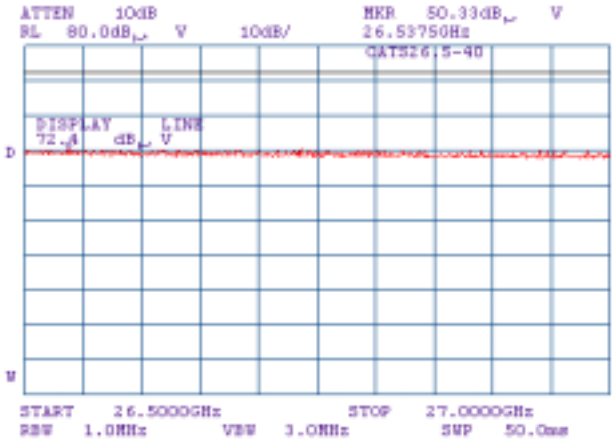
TEST SITE:	OATS
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.22 Radiated emission measurements in 26500 – 27000 MHz range

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

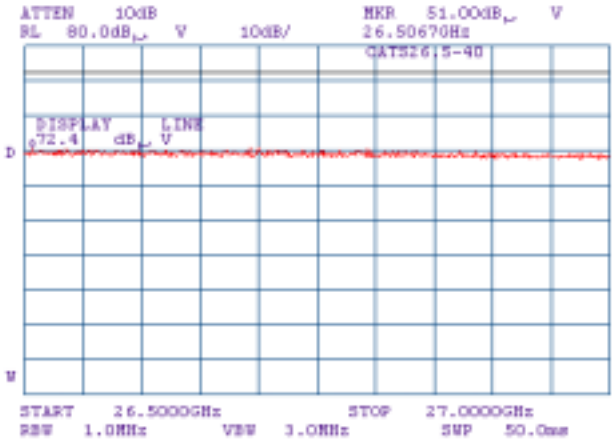


Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.7.23 Radiated emission measurements in 26500 – 27000 MHz range

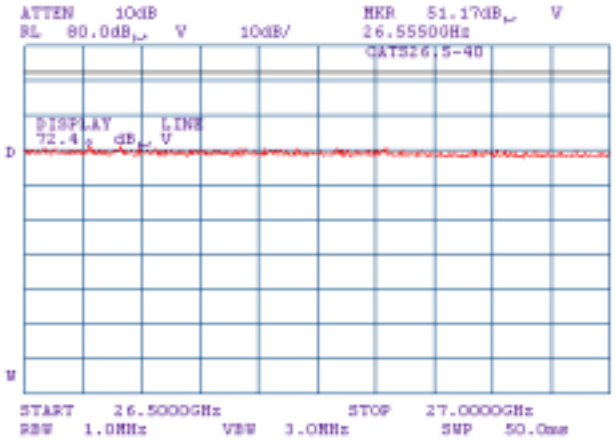
TEST SITE:	OATS
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Note: Applied limit is 84.4 dBuV

Plot 7.7.24 Radiated emission measurements in 26500 – 27000 MHz range

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



Note: Applied limit is 84.4 dBuV

Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

7.8 Radiated spurious emission measurements

7.8.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.8.1.

Table 7.8.1 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 – 10th harmonic*	55+10logP**	-25	72.4

* - Excluding the in band emission within ± 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×P×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

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

7.8.2.1 The EUT was set up as shown in Figure 7.8.1, energized and the performance check was conducted.
7.8.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.
7.8.2.3 The worst test results (the lowest margins) were recorded in Table 7.8.2 and shown in the associated plots.

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

7.8.3.1 The EUT was set up as shown in Figure 7.8.2, energized and the performance check was conducted.
7.8.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.
7.8.3.3 The worst test results (the lowest margins) were recorded in Table 7.8.2 and shown in the associated plots.

Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Figure 7.8.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

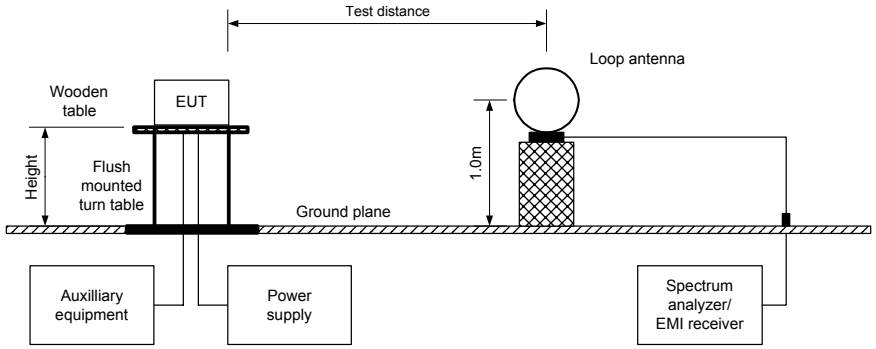
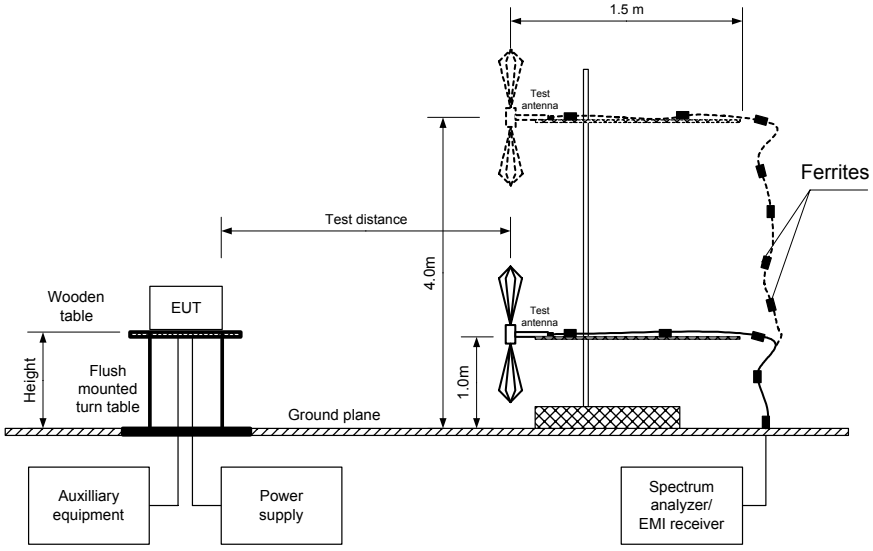


Figure 7.8.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 27.53(m)(4), Radiated spurious emissions**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	**Air Pressure:** 1006 hPa	**Relative Humidity:** 41 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.8.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	2496.0 – 2690.0 MHz
TEST DISTANCE:	3 m
TEST SITE:	Anechoic chamber / OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 27000 MHz
DETECTOR USED:	Peak
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconical (30 MHz – 200 MHz) Log periodic (200 MHz – 1000 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4.19 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum (SEE NOTE 1)

Frequency, MHz	Field strength, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
Low carrier frequency 2498.5 MHz								
All emissions were found at least 20 dB below the specified limit								Pass
Mid carrier frequency 2593.0 MHz								
All emissions were found at least 20 dB below the specified limit								Pass
High carrier frequency 2687.5 MHz								
All emissions were found at least 20 dB below the specified limit								Pass

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.
*****-** NOTE1: The 5 MHz EBW was chosen as configuration that produces the maximum power density.

Reference numbers of test equipment used

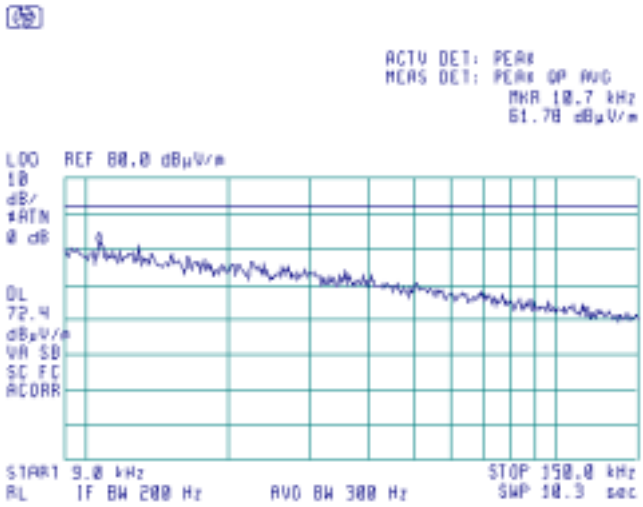
HL 0446	HL 0521	HL 0604	HL 0768	HL 0769	HL 1424	HL 1984	HL 2870
HL 2871	HL 2909	HL 3384	HL 3534	HL 3535	HL 3616	HL 3901	

Full description is given in Appendix A.

Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

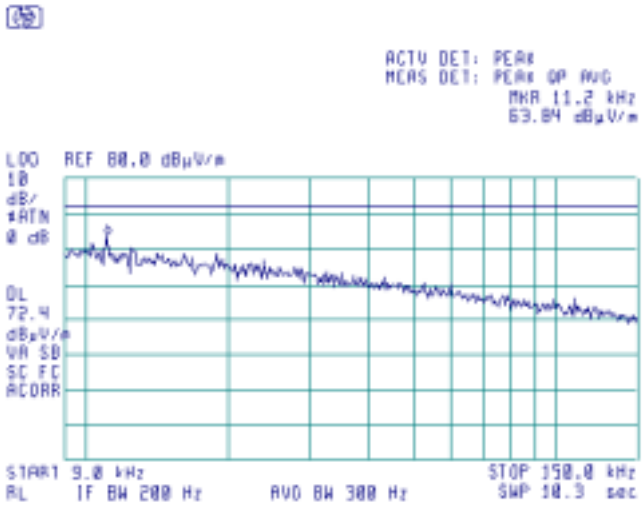
Plot 7.8.1 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.8.2 Radiated emission measurements in 9 - 150 kHz range

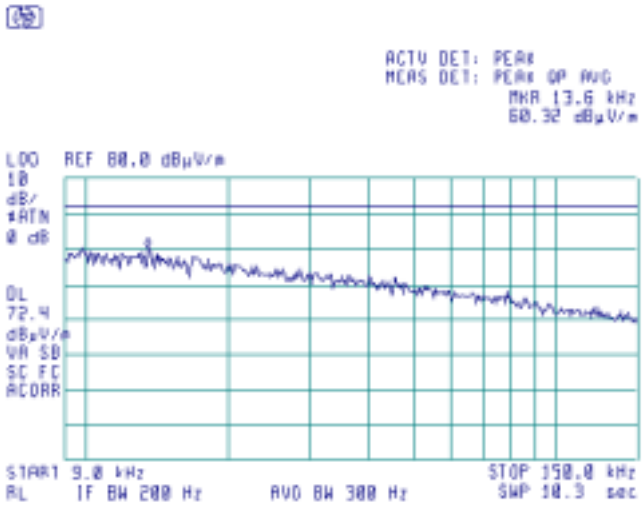
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	**Section 27.53(m)(4), Radiated spurious emissions**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	**Air Pressure:** 1006 hPa	**Relative Humidity:** 41 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

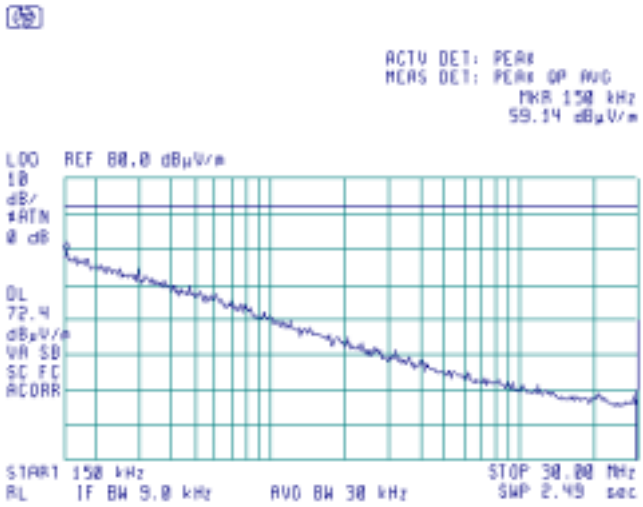
Plot 7.8.3 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.8.4 Radiated emission measurements in 0.15 - 30 MHz range

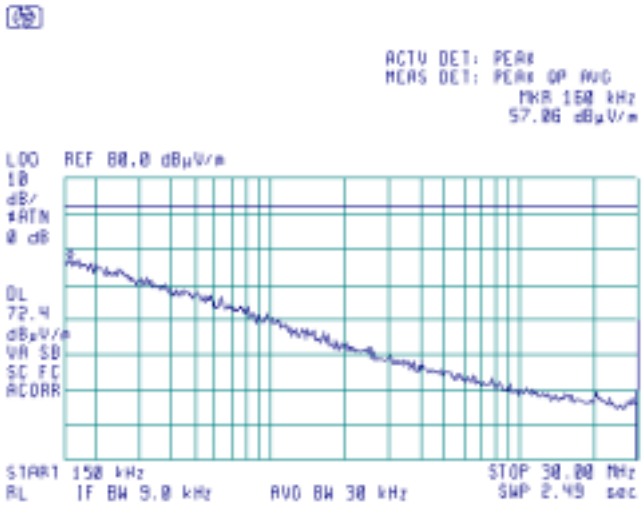
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

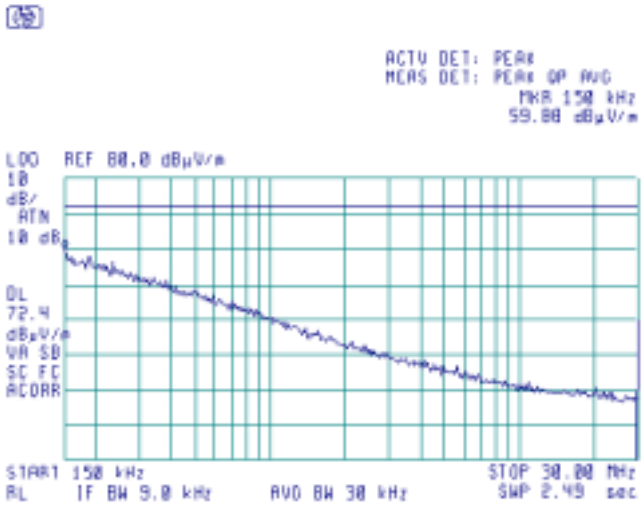
Plot 7.8.5 Radiated emission measurements in 0.15 - 30 MHz range

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



Plot 7.8.6 Radiated emission measurements in 0.15 - 30 MHz range

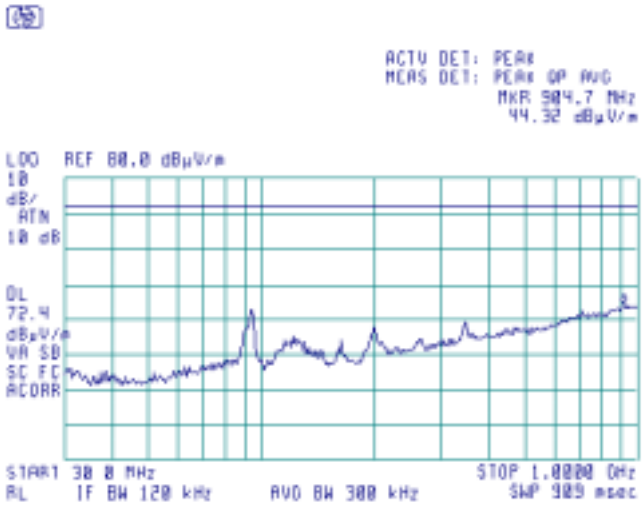
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

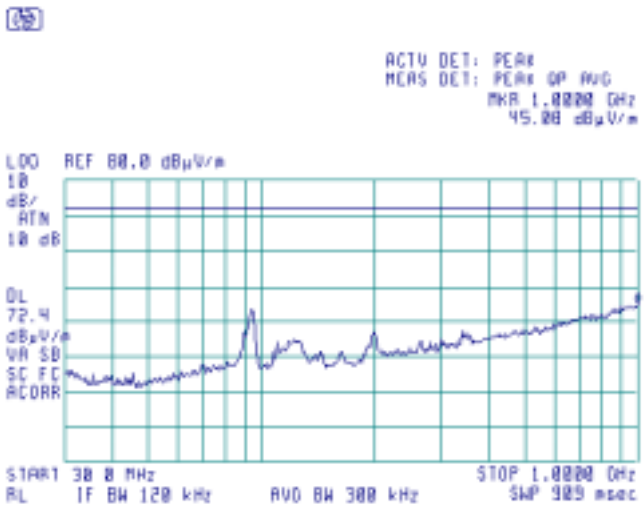
Plot 7.8.7 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.8.8 Radiated emission measurements in 30 - 1000 MHz range

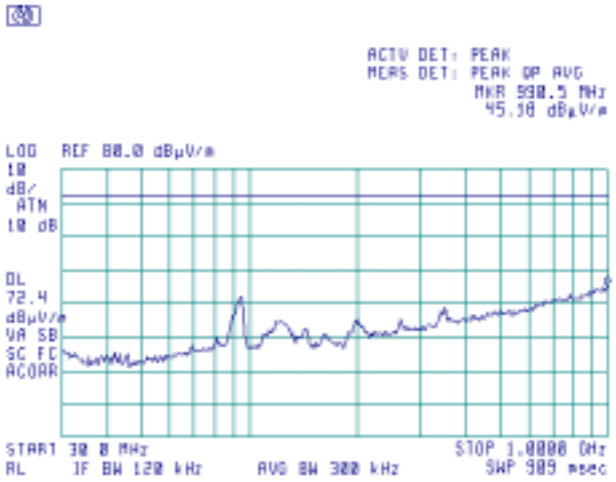
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

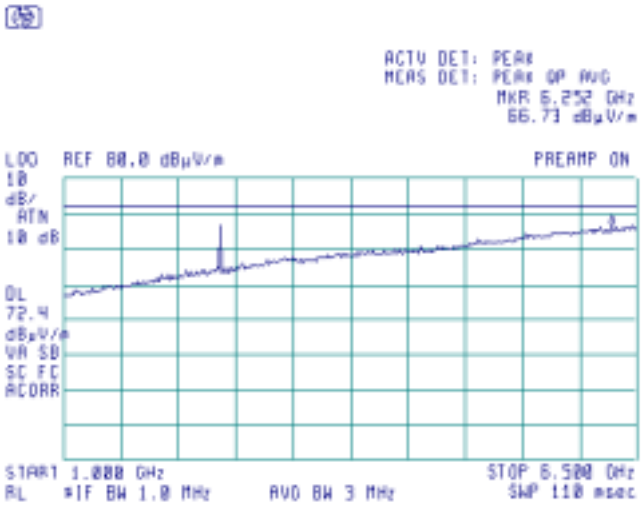
Plot 7.8.9 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.8.10 Radiated emission measurements in 1000 – 6500 MHz range

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

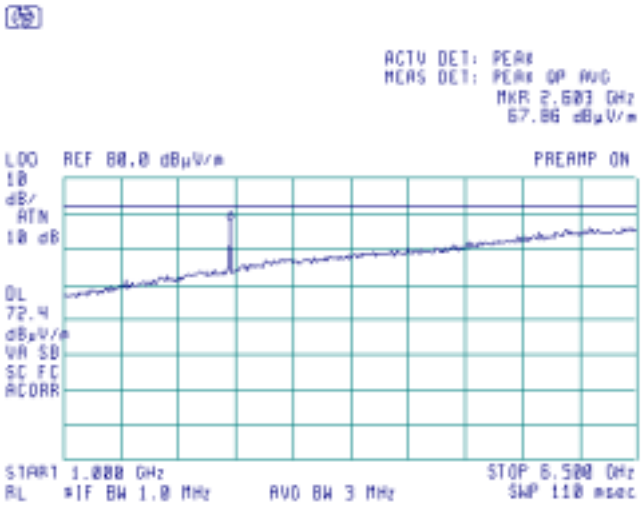


Low channel carrier – 2498.5 MHz

Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.8.11 Radiated emission measurements in 1000 – 6500 MHz range

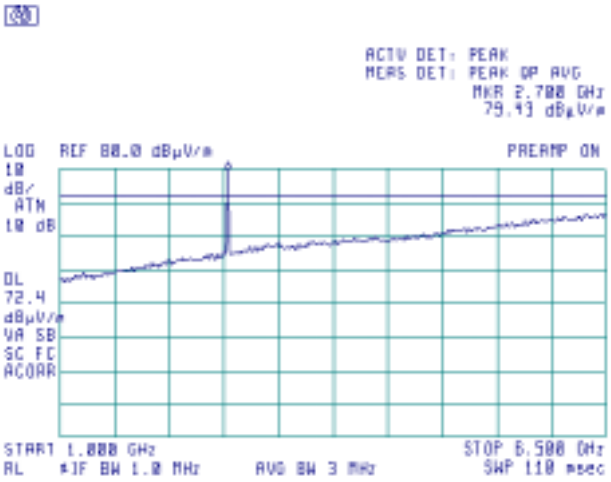
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Mid channel carrier – 2593.0 MHz

Plot 7.8.12 Radiated emission measurements in 1000 – 6500 MHz range

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

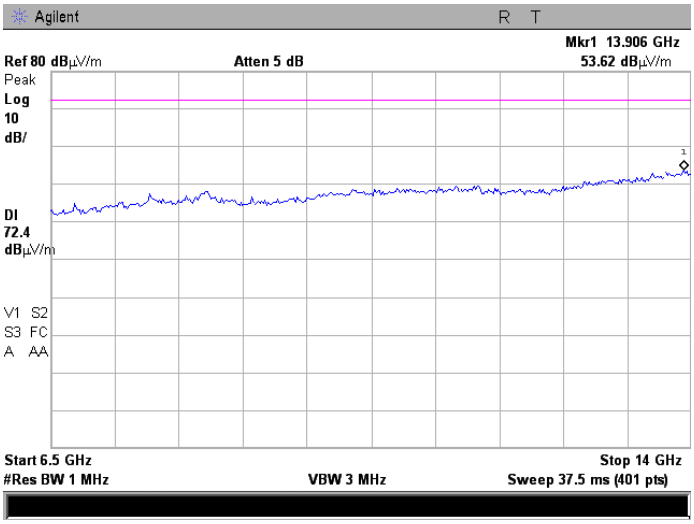


High channel carrier – 2687.5 MHz

Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

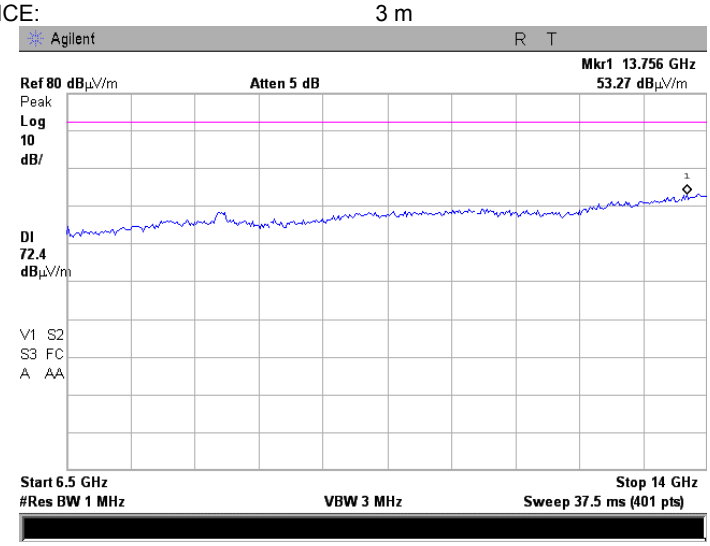
Plot 7.8.13 Radiated emission measurements in 6500 - 14000 MHz range

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



Plot 7.8.14 Radiated emission measurements in 6500 - 14000 MHz range

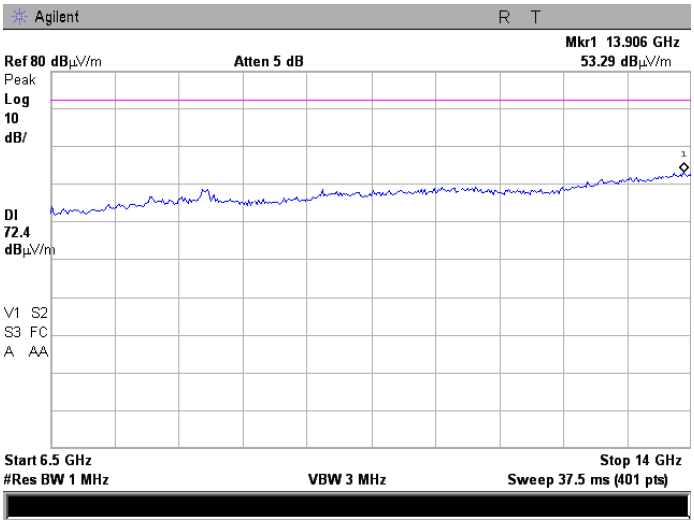
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.8.15 Radiated emission measurements in 6500 - 14000 MHz range

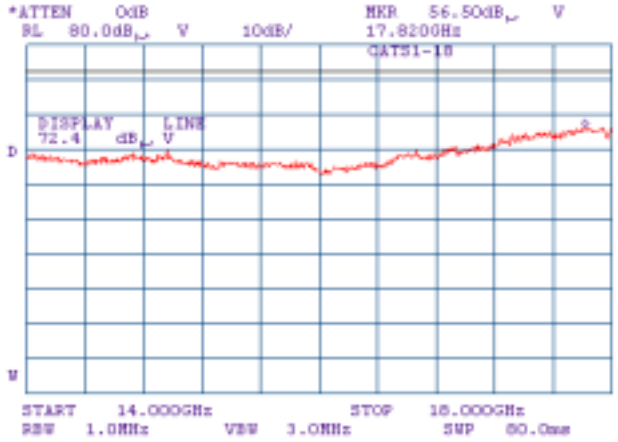
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

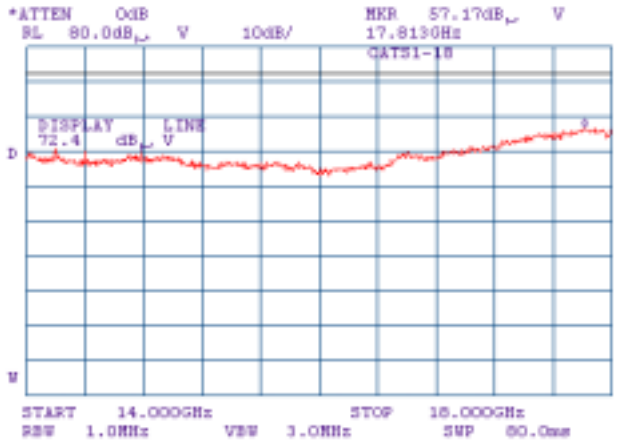
Plot 7.8.16 Radiated emission measurements in 14000 - 18000 MHz range

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



Plot 7.8.17 Radiated emission measurements in 14000 - 18000 MHz range

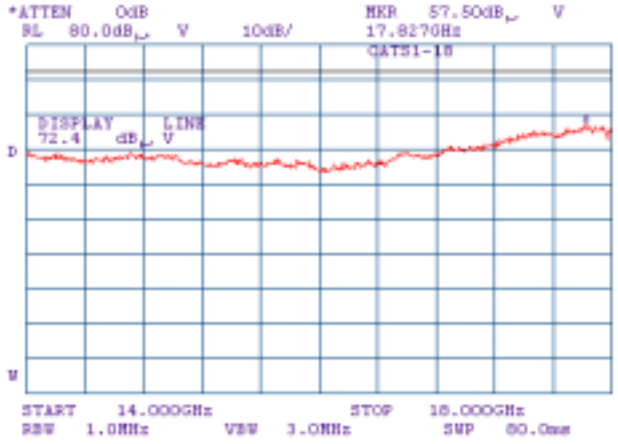
TEST SITE:	OATS
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.8.18 Radiated emission measurements in 14000 - 18000 MHz range

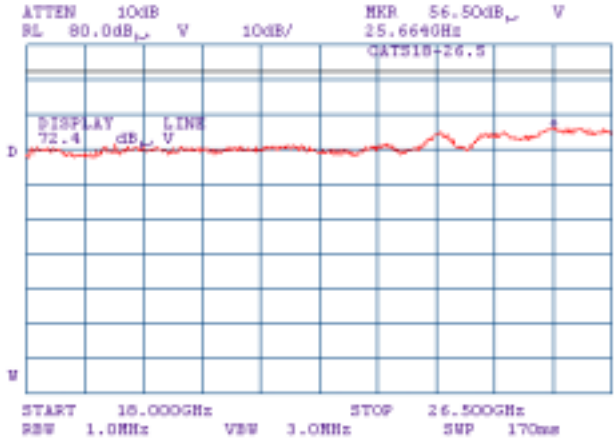
TEST SITE:	OATS
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

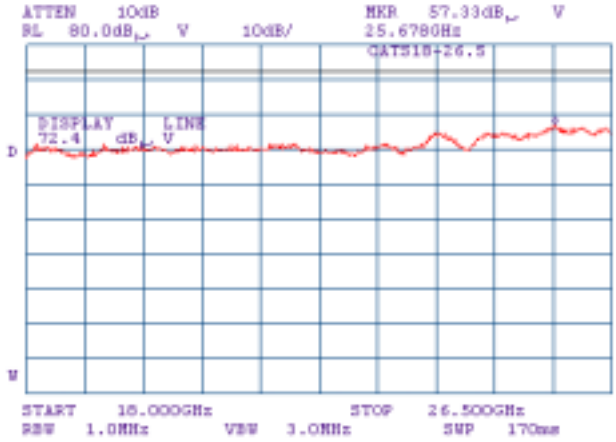
Plot 7.8.19 Radiated emission measurements in 18000 – 26500 MHz range

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



Plot 7.8.20 Radiated emission measurements in 18000 – 26500 MHz range

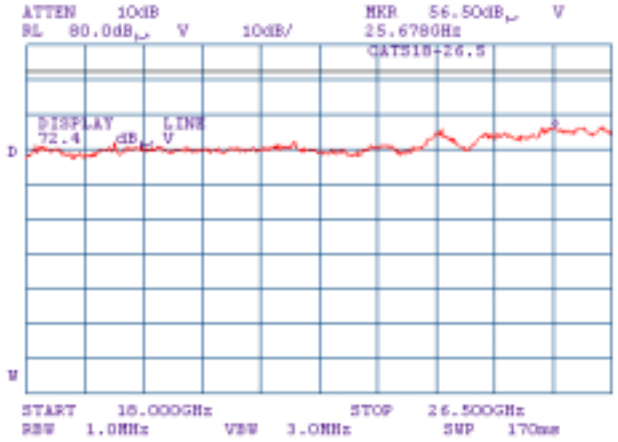
TEST SITE:	OATS
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

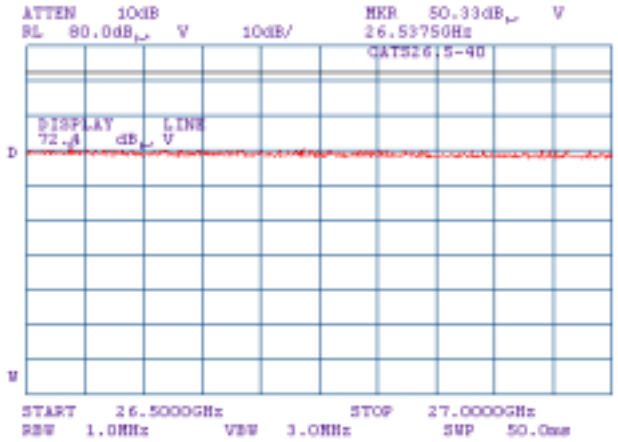
Plot 7.8.21 Radiated emission measurements in 18000 – 26500 MHz range

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



Plot 7.8.22 Radiated emission measurements in 26500 – 27000 MHz range

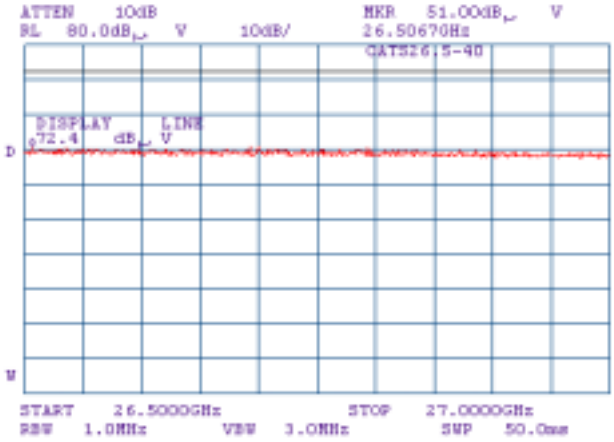
TEST SITE:	OATS
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(4), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/10/2010		
Temperature: 25.6 ºC	Air Pressure: 1006 hPa	Relative Humidity: 41 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

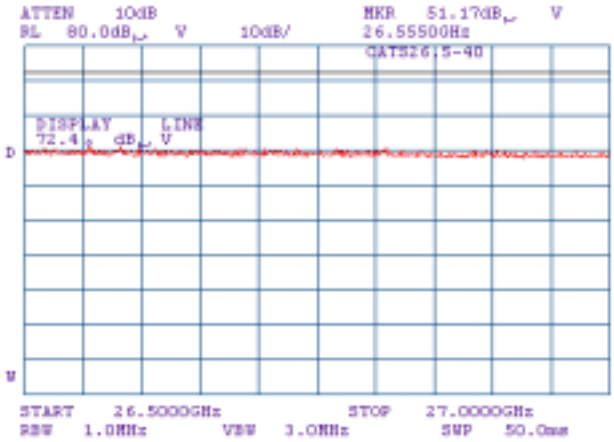
Plot 7.8.23 Radiated emission measurements in 26500 – 27000 MHz range

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



Plot 7.8.24 Radiated emission measurements in 26500 – 27000 MHz range

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



Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

7.9 Spurious emissions at RF antenna connector test

7.9.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.9.1.

Table 7.9.1 Spurious emission limits

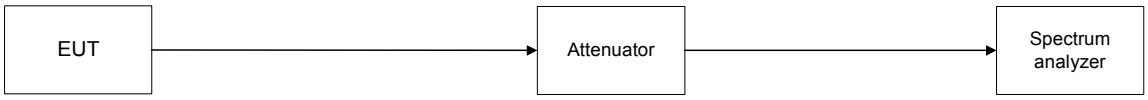
Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm
0.009 – 10th harmonic*	55+10logP**	-25.0

* - spurious emission limits do not apply to the in band emission within ± 250 % of the authorized bandwidth from the carrier; investigated in course of emission mask testing
** - P is transmitter output power in Watts

7.9.2 Test procedure

7.9.2.1 The EUT was set up as shown in Figure 7.9.1, energized and its proper operation was checked.
7.9.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.9.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.9.2 and the associated plots.

Figure 7.9.1 Spurious emission test setup



Test specification:	**Section 27.53(m)(4), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 43 %	**Power Supply:** 12VDC
Remarks: Mobile subscriber unit			

Table 7.9.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 27000 MHz except:
2490.0 – 2507.0 MHz for low channel
2584.5 – 2601.5 for mid channel
2679.0 – 2696.0 MHz for high channel)
See NOTE 2
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: QPSK
MODULATING SIGNAL: PRBS
BIT RATE: 4.19 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Low carrier frequency								
7495.70	-32.81	Included	Included	1000	-32.81	-25.0	-7.81	Pass
Mid carrier frequency								
7779.80	-36.07	Included	Included	1000	-36.07	-25.0	-11.07	Pass
High carrier frequency								
8061.55	-41.32	Included	Included	1000	-41.32	-25.0	-16.32	Pass

*****- Margin = Spurious emission – specification limit.
NOTE 1: Spurious emissions test was performed at 5 MHz EBW with 16QAM modulation as configuration that produces maximum output power spectral density.
NOTE 2: For band edge emissions please see "Emission at the band edges" test report.

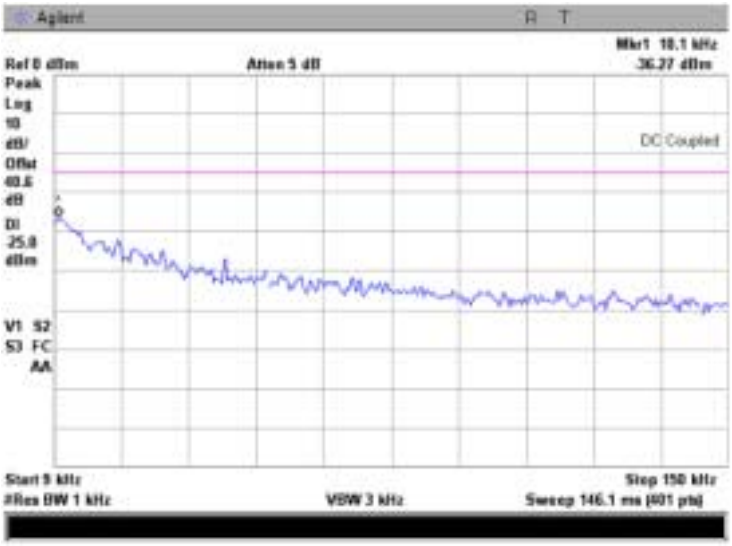
Reference numbers of test equipment used

HL 0675	HL 1906	HL 2214	HL 2909	HL 2952	HL 3455	HL 3559	HL 3768
HL 3787	HL 3868						HL

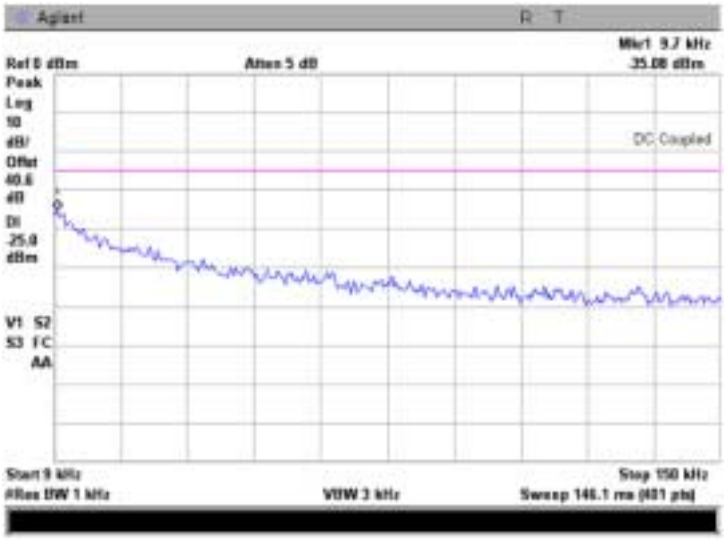
Full description is given in Appendix A.

Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

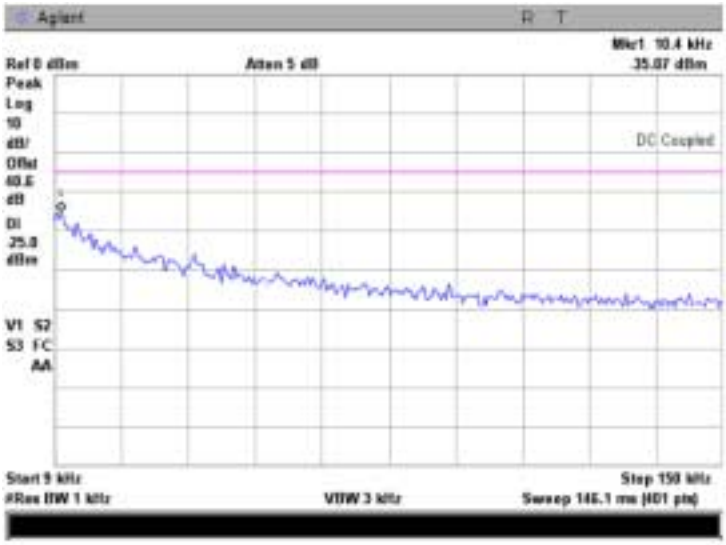


Plot 7.9.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

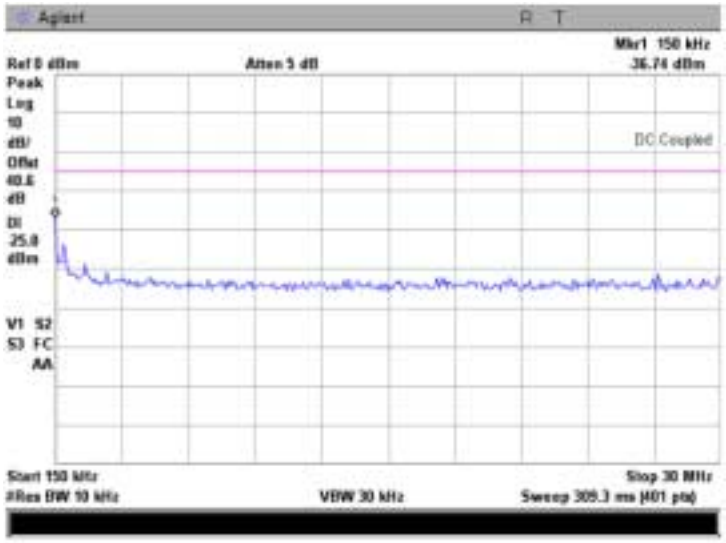


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

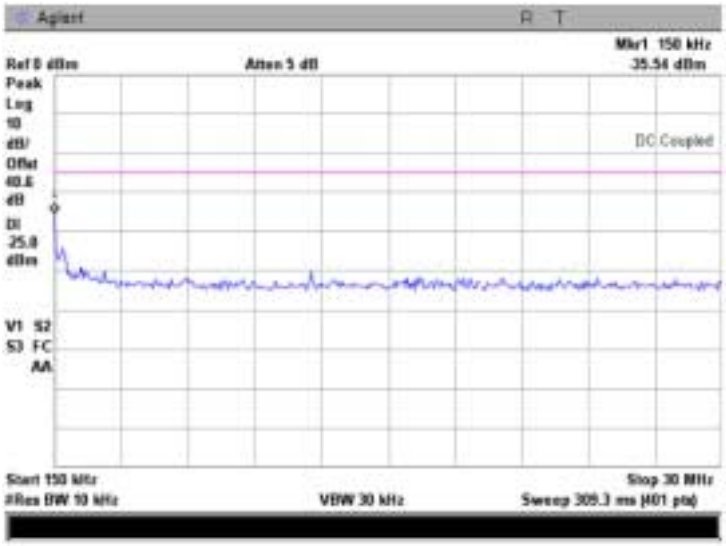


Plot 7.9.4 Spurious emission measurements in 0.150 - 30.0 MHz range at low carrier frequency

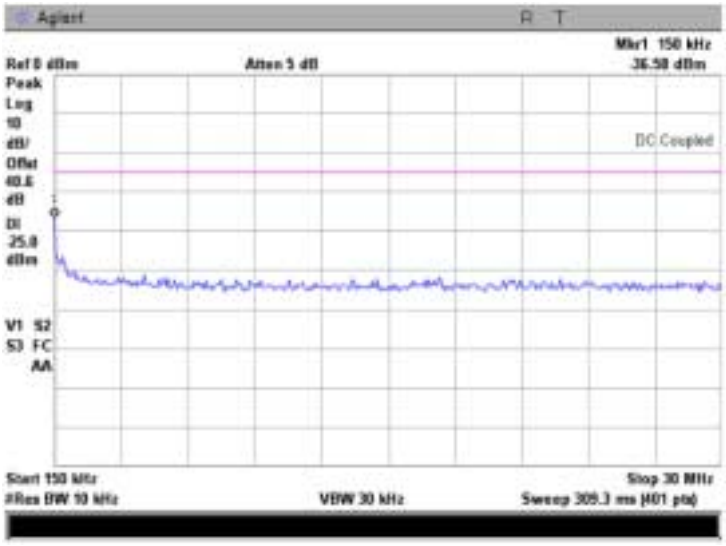


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.5 Spurious emission measurements in 0.150 - 30.0 MHz range at mid carrier frequency

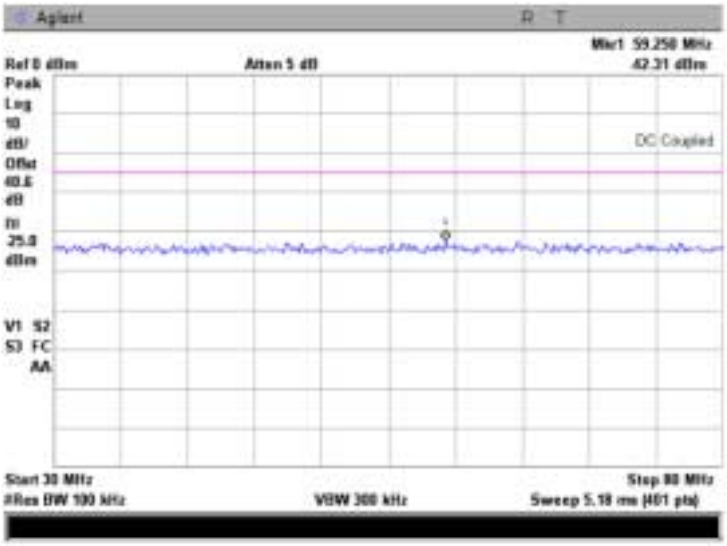


Plot 7.9.6 Spurious emission measurements in 0.150 – 30.0 MHz range at high carrier frequency

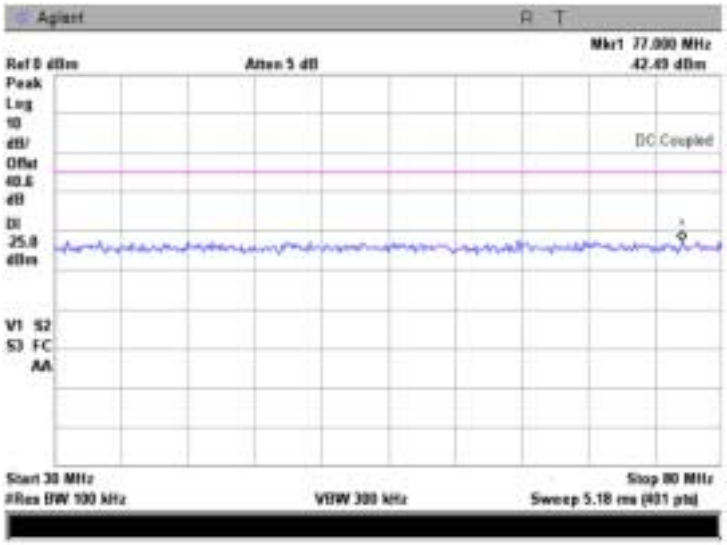


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.7 Spurious emission measurements in 30.0 – 80.0 MHz range at low carrier frequency

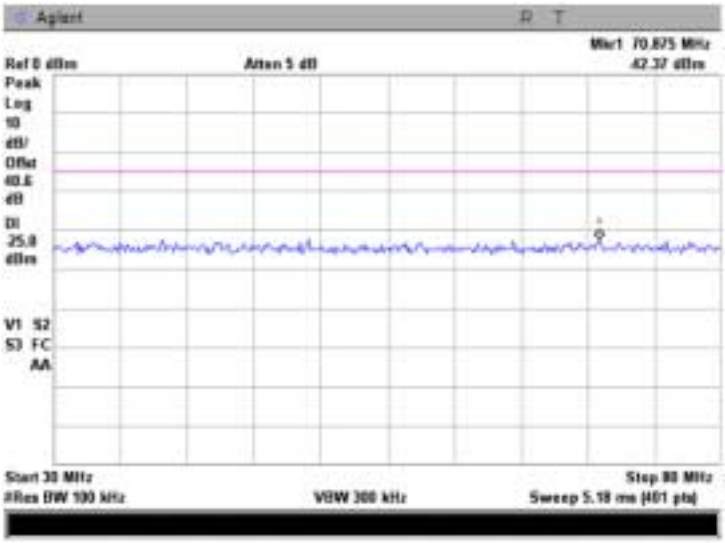


Plot 7.9.8 Spurious emission measurements in 30.0 – 80.0 MHz range at mid carrier frequency

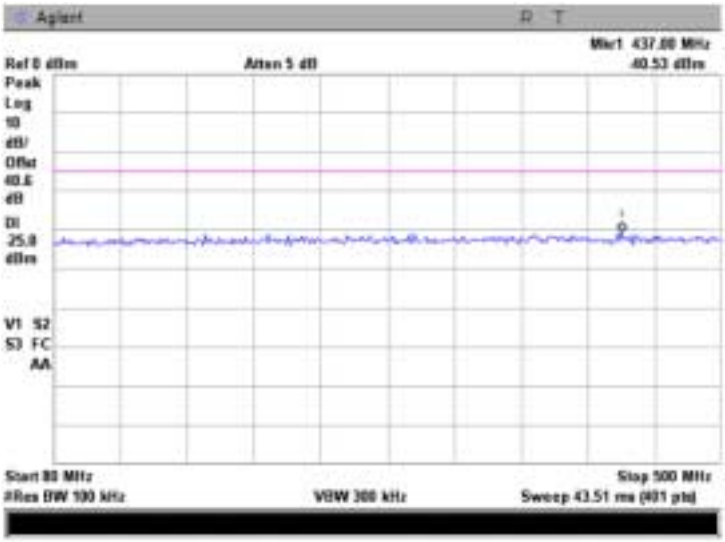


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.9 Spurious emission measurements in 30.0 – 80.0 MHz range at high carrier frequency

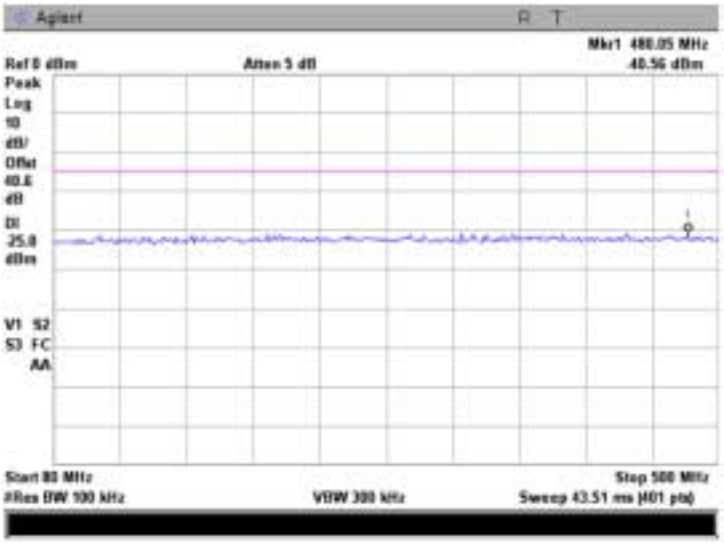


Plot 7.9.10 Spurious emission measurements in 80.0 - 500 MHz range at low carrier frequency

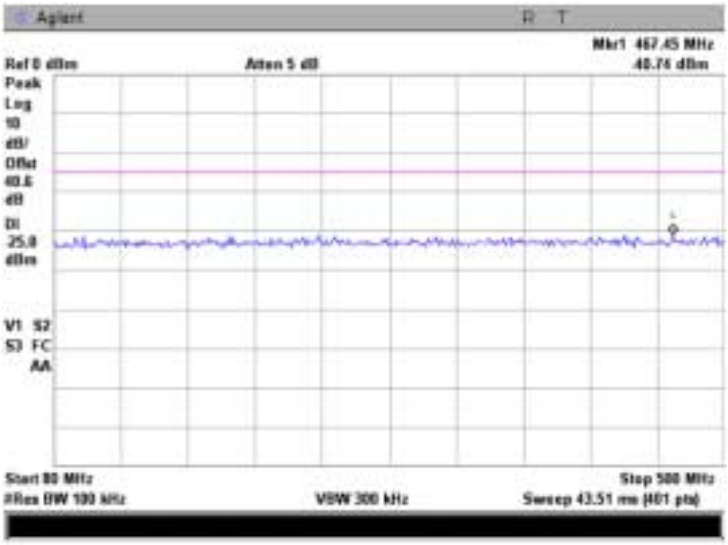


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.11 Spurious emission measurements in 80.0 - 500 MHz range at mid carrier frequency

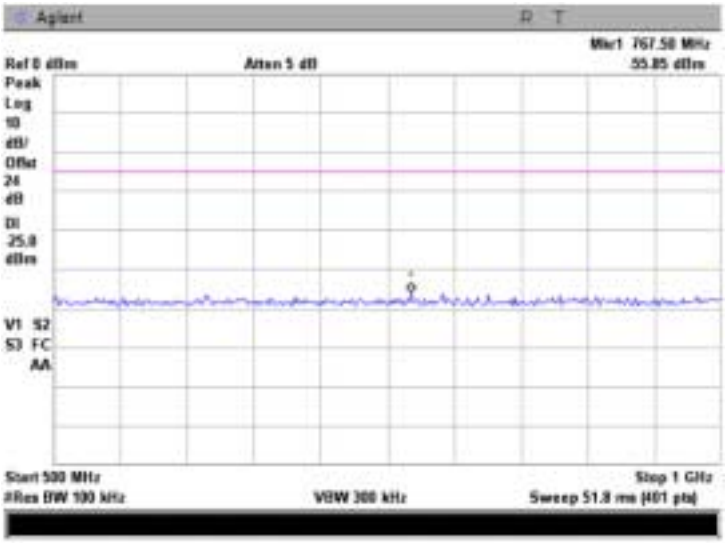


Plot 7.9.12 Spurious emission measurements in 80.0 - 500 MHz range at high carrier frequency

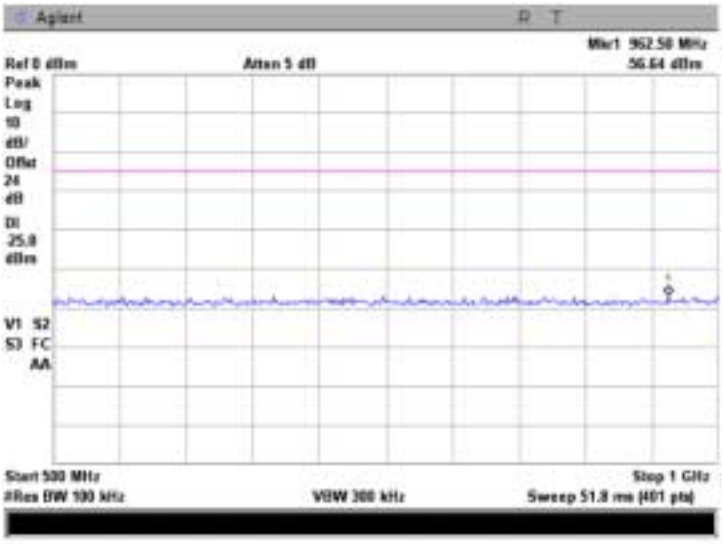


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.13 Spurious emission measurements in 500- 1000 MHz range at low carrier frequency

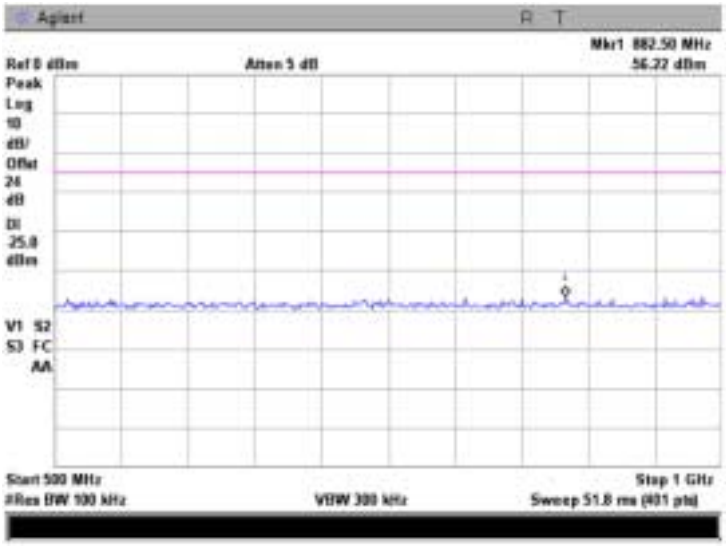


Plot 7.9.14 Spurious emission measurements in 500- 1000 MHz range at mid carrier frequency

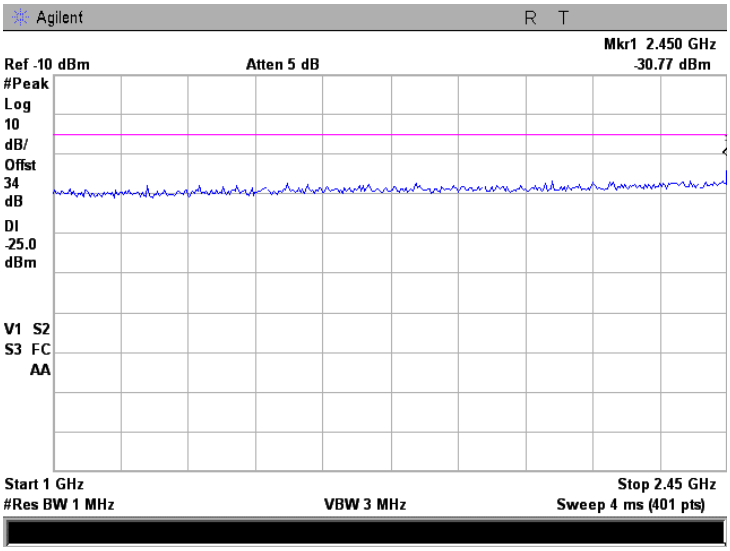


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.15 Spurious emission measurements in 500- 1000 MHz range at high carrier frequency

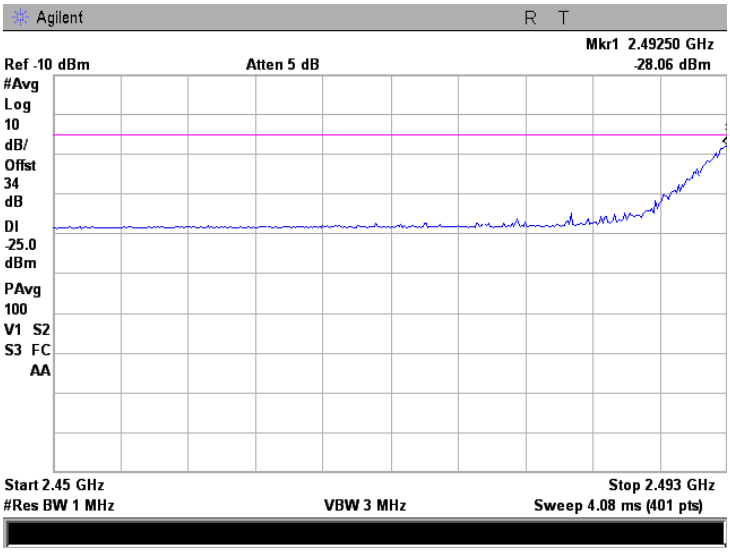


Plot 7.9.16 Spurious emission measurements in 1000 - 2450 MHz range at low carrier frequency

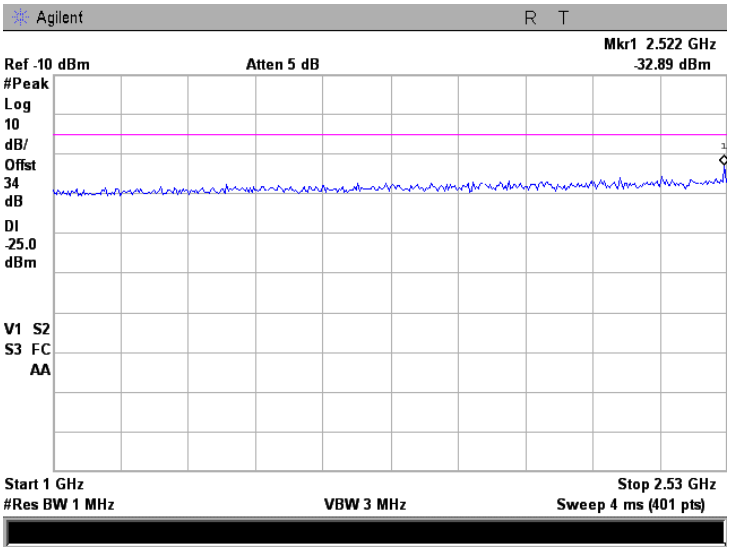


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.17 Spurious emission measurements in 2450 – 2493 MHz range at low carrier frequency

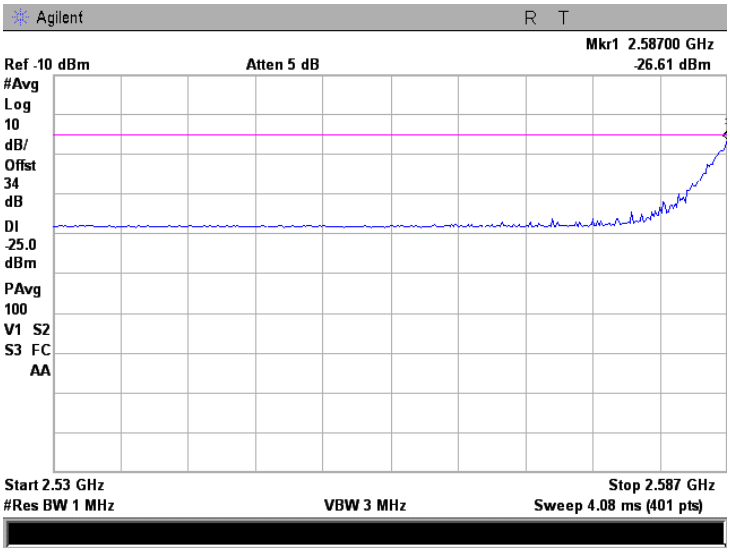


Plot 7.9.18 Spurious emission measurements in 1000 – 2530 MHz at mid carrier frequency

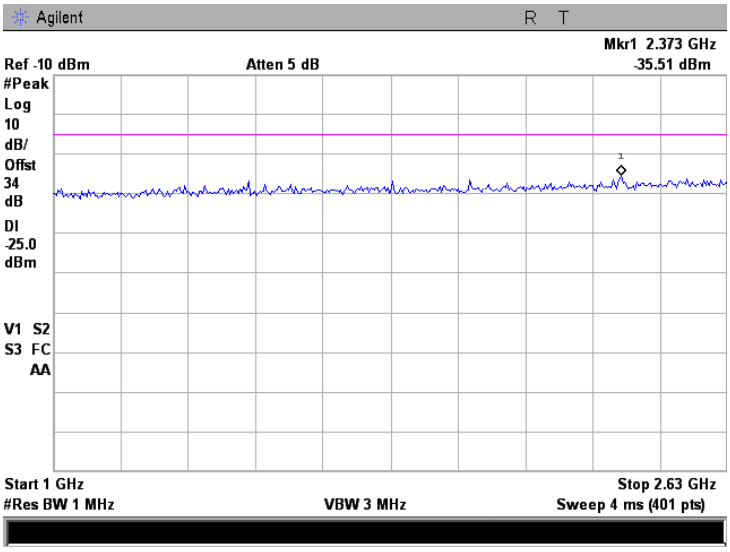


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.19 Spurious emission measurements in 2530 – 2587 MHz at mid carrier frequency

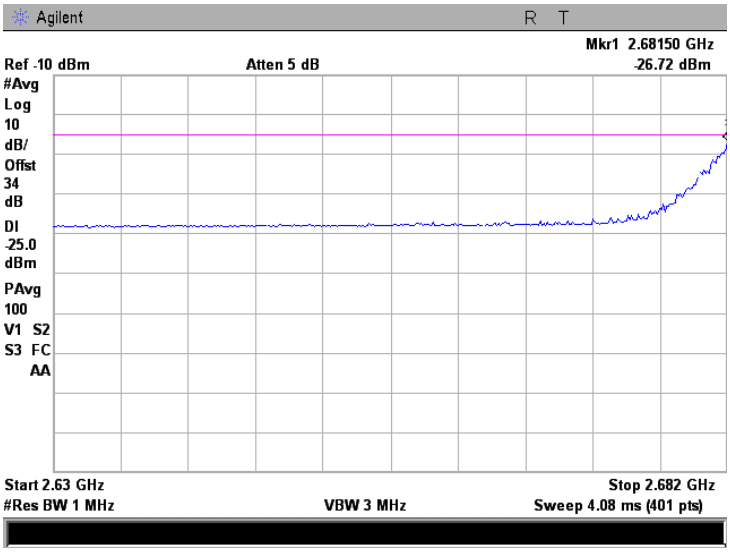


Plot 7.9.20 Spurious emission measurements in 1000 – 2630 MHz at high carrier frequency

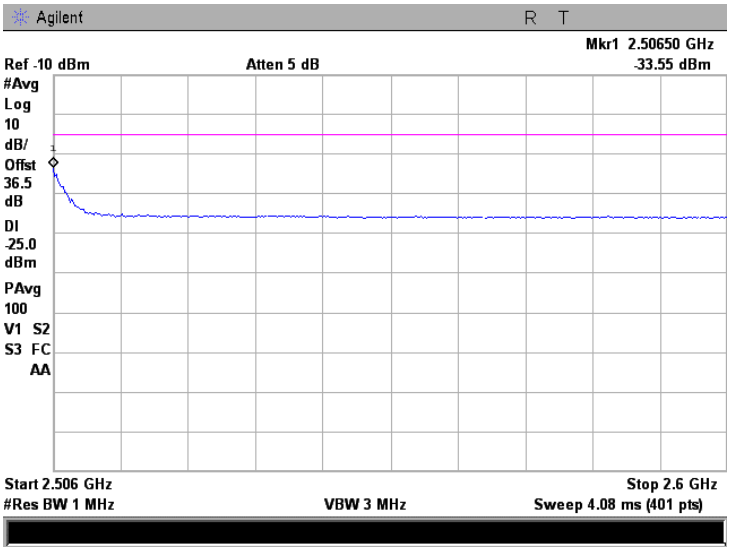


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.21 Spurious emission measurements in 2630– 2682 MHz at high carrier frequency

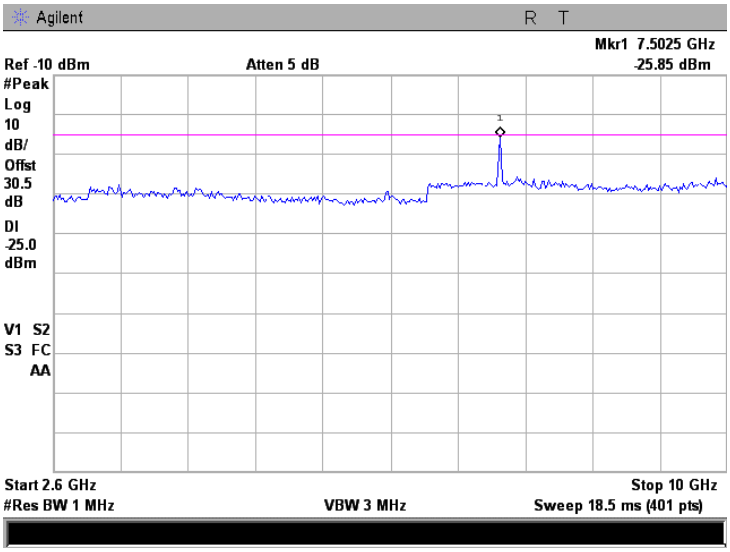


Plot 7.9.22 Spurious emission measurements in 2507 – 2600 MHz range at low carrier frequency

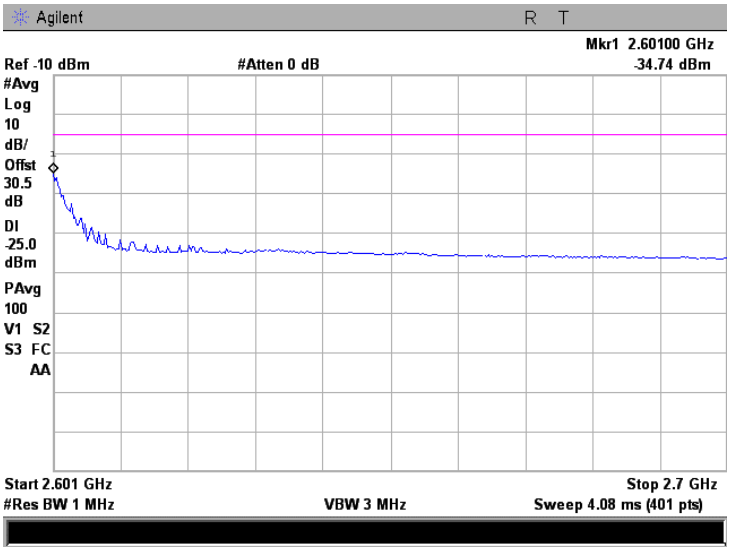


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.23 Spurious emission measurements in 2600 – 10000 MHz range at low carrier frequency

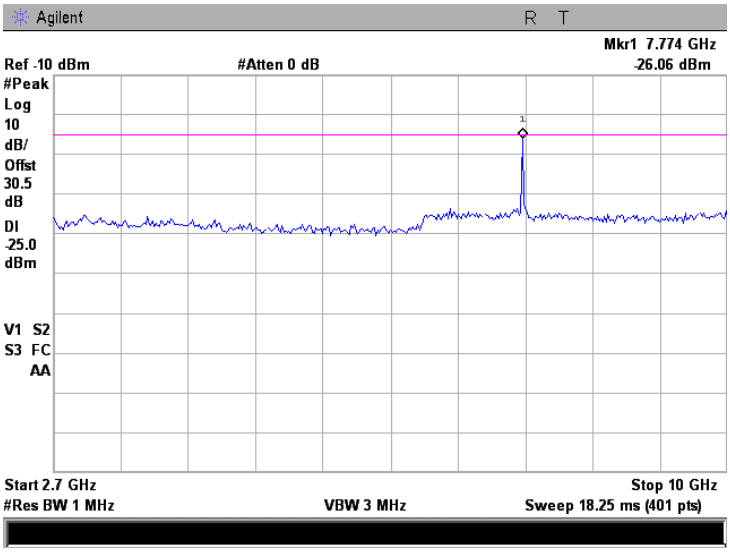


Plot 7.9.24 Spurious emission measurements in 2601 – 2700 MHz at mid carrier frequency

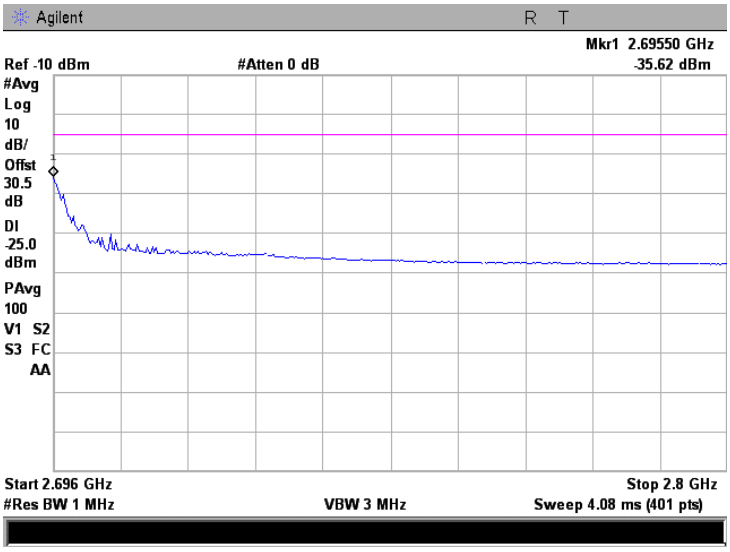


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.25 Spurious emission measurements in 2700 – 10000 MHz at mid carrier frequency

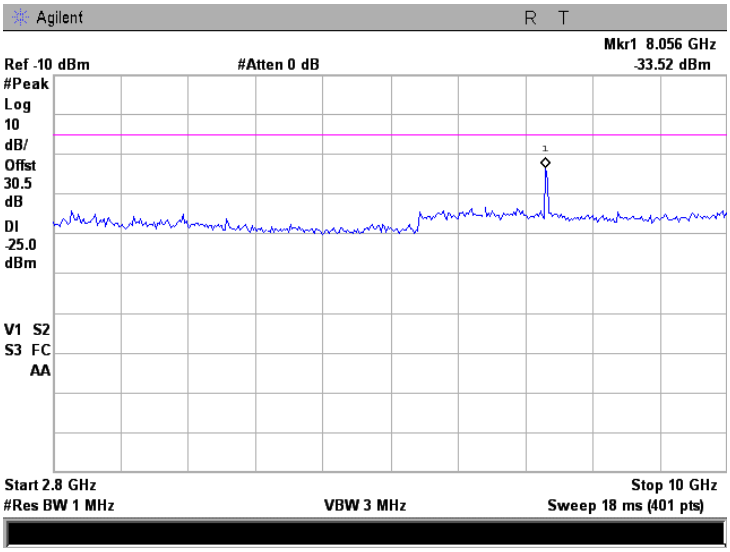


Plot 7.9.26 Spurious emission measurements in 2696 – 2800.0 MHz at high carrier frequency

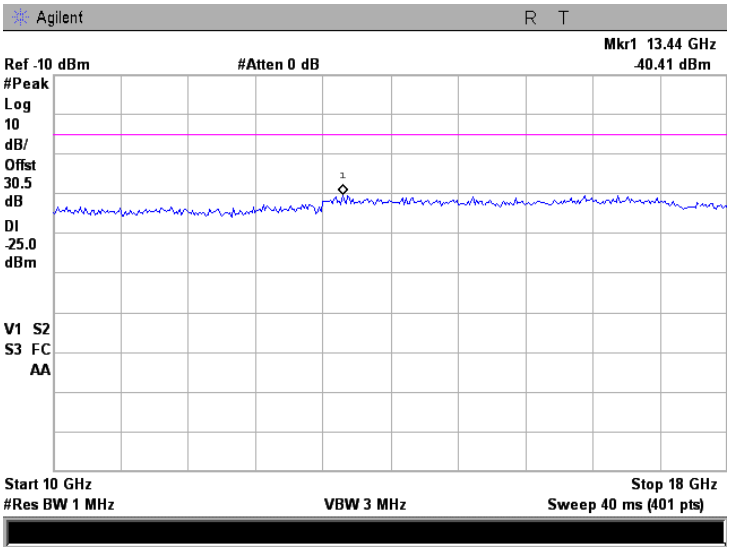


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.27 Spurious emission measurements in 2800 – 10000 MHz at high carrier frequency

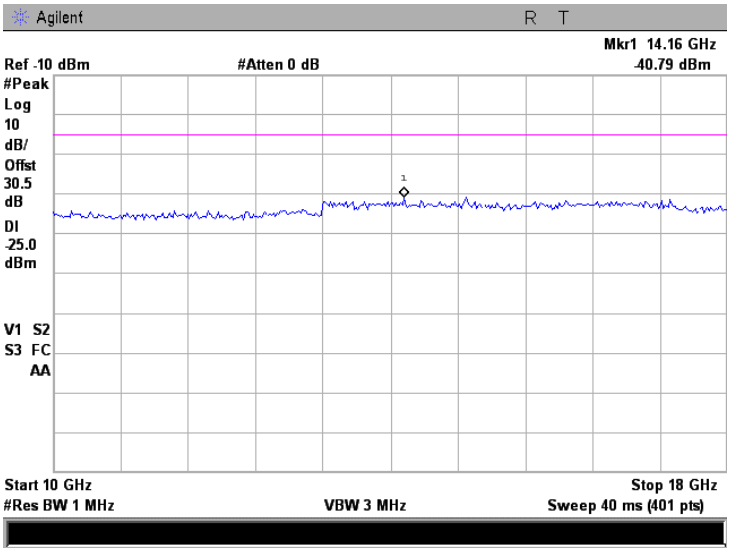


Plot 7.9.28 Spurious emission measurements in 10000 – 18000 MHz range at low carrier frequency

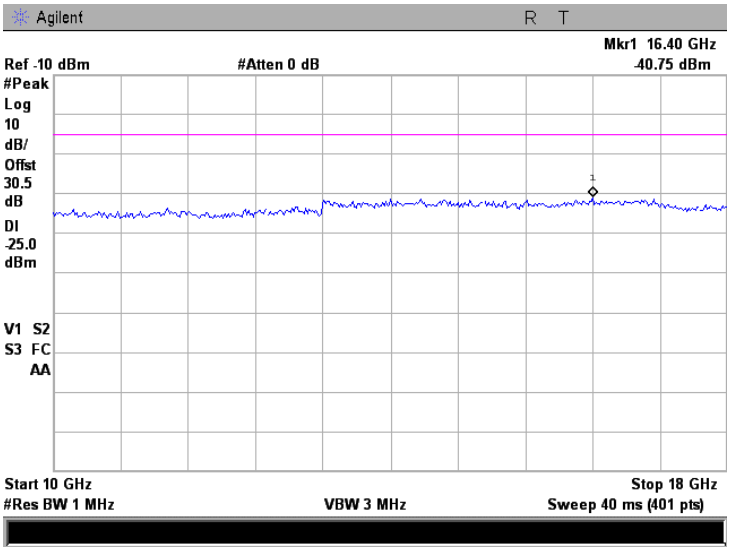


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.29 Spurious emission measurements in 10000 – 18000 MHz at mid carrier frequency

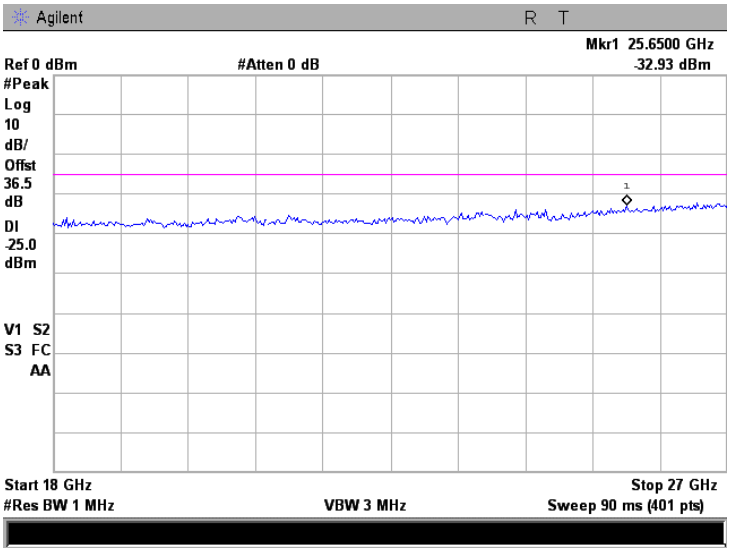


Plot 7.9.30 Spurious emission measurements in 10000 – 18000 MHz at high carrier frequency

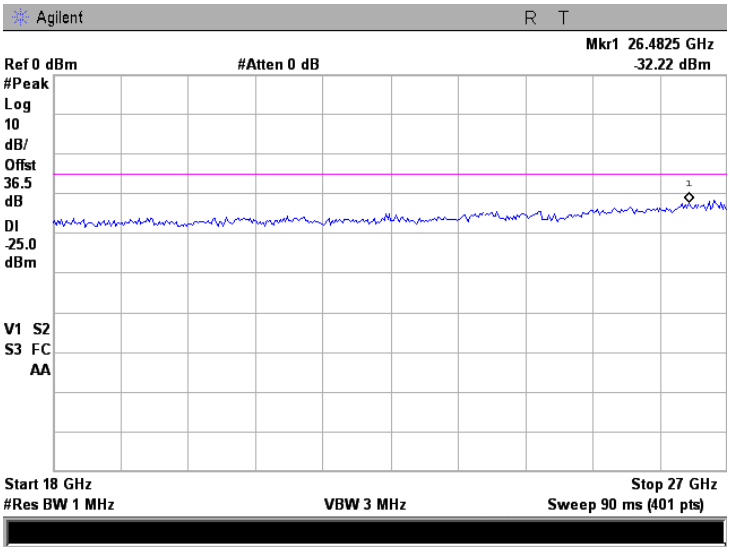


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.31 Spurious emission measurements in 18000 – 27000 MHz range at low carrier frequency

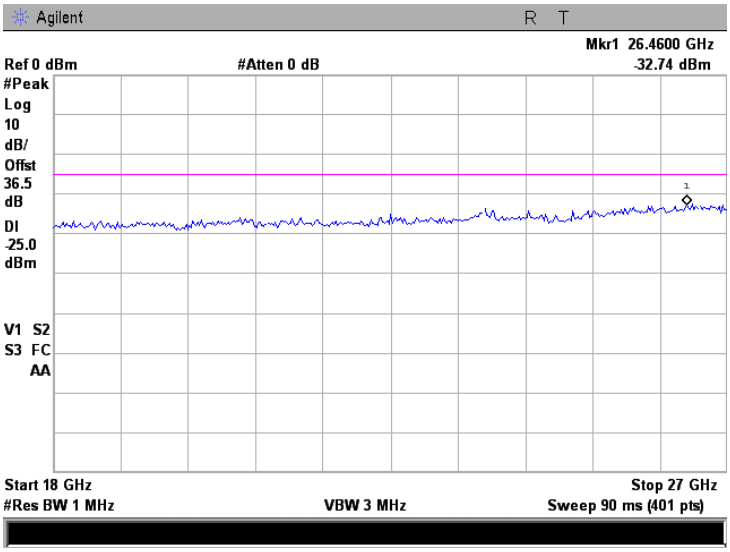


Plot 7.9.32 Spurious emission measurements in 18000 – 27000 MHz at mid carrier frequency



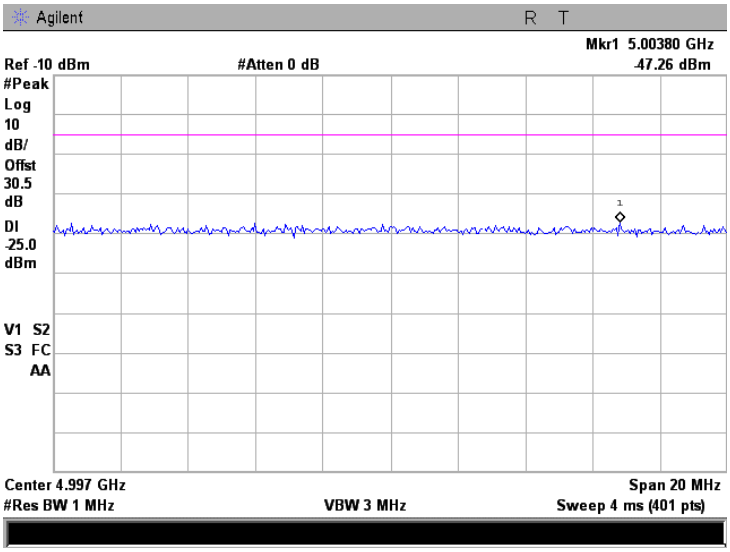
Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.33 Spurious emission measurements in 18000 – 27000 MHz at high carrier frequency

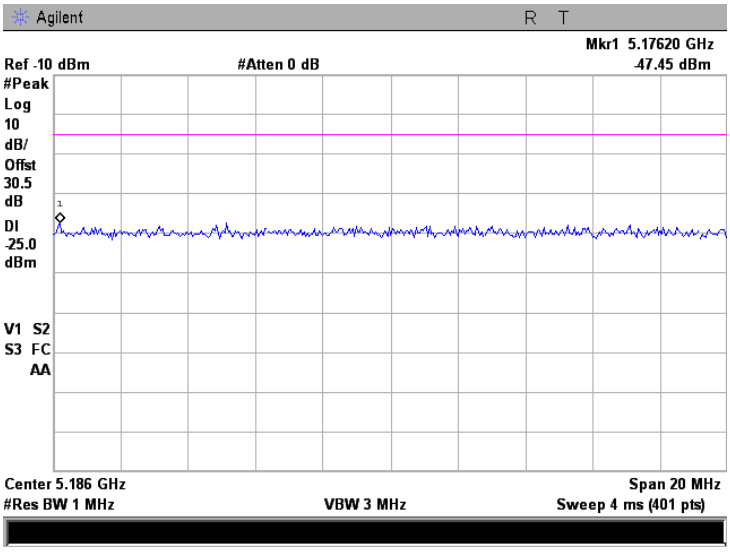


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.34 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency

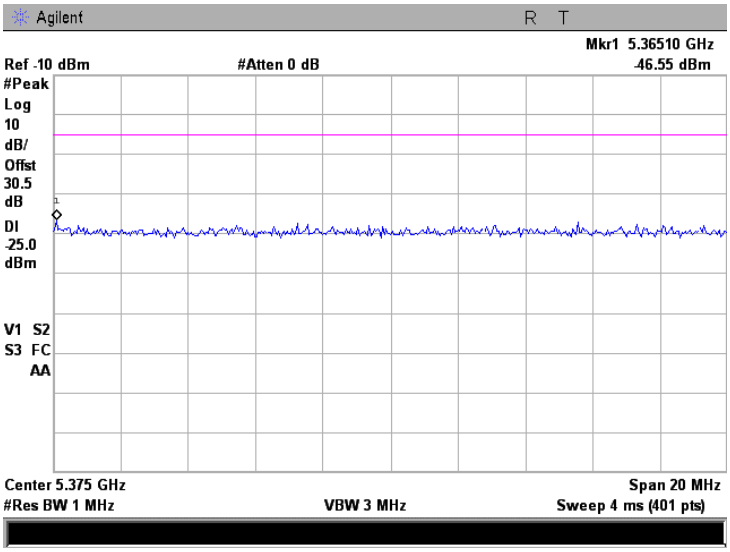


Plot 7.9.35 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency

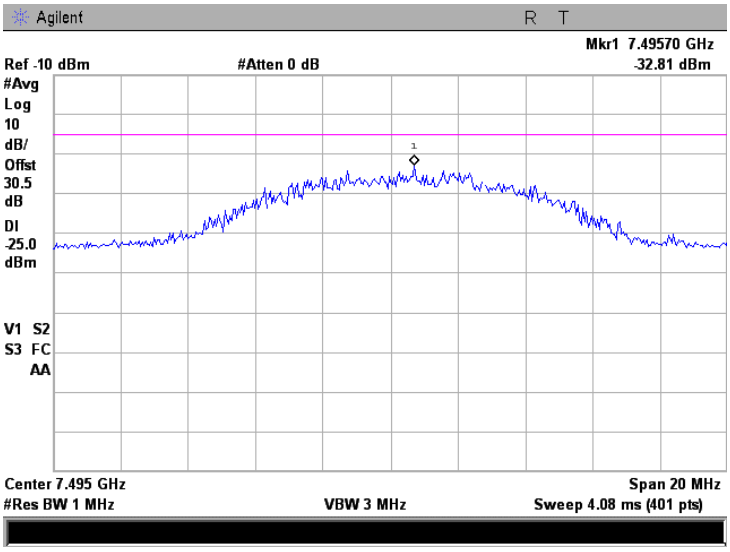


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.36 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency

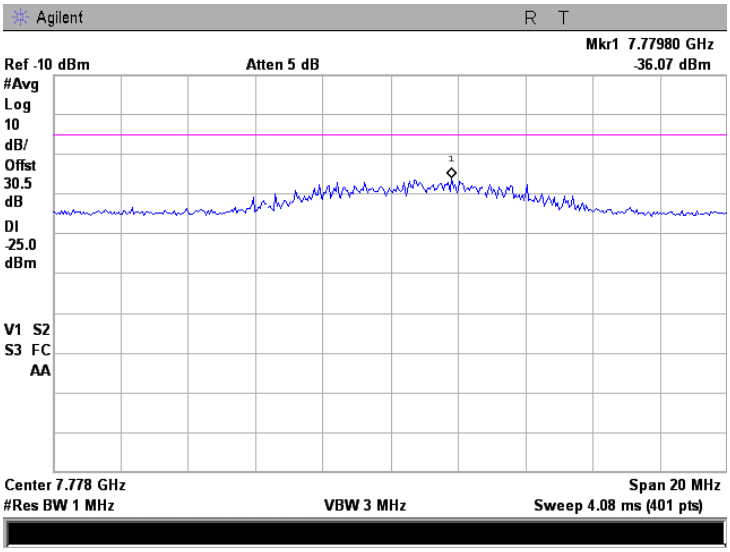


Plot 7.9.37 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency

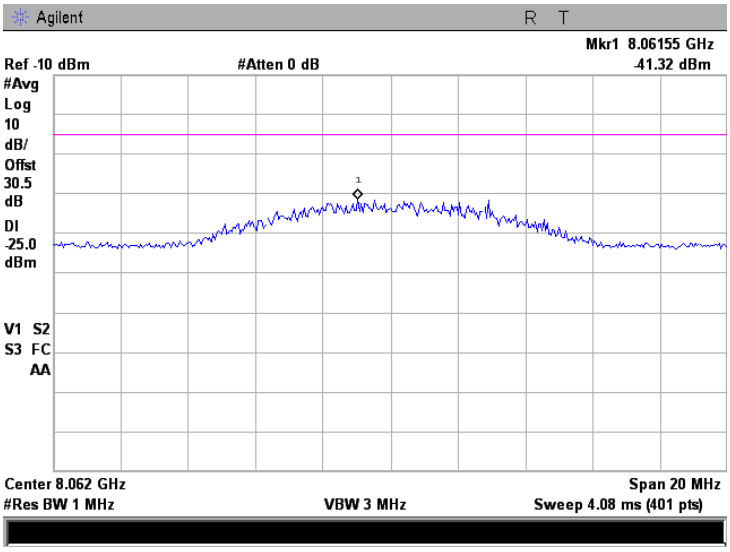


Test specification:	Section 27.53(m)(4), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(4)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 12VDC
Remarks: Mobile subscriber unit			

Plot 7.9.38 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency



Plot 7.9.39 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

7.10 Spurious emissions at RF antenna connector test

7.10.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.10.1.

Table 7.10.1 Spurious emission limits

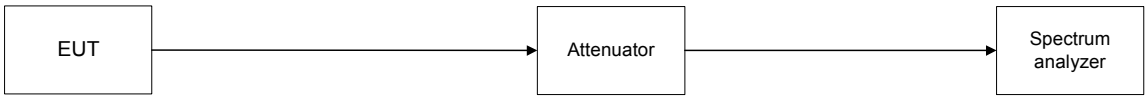
Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm
0.009 – 10th harmonic*	43+10logP**	-13.0

* - spurious emission limits do not apply to the in band emission within ± 250 % of the authorized bandwidth from the carrier; investigated in course of emission mask testing
** - P is transmitter output power in Watts

7.10.2 Test procedure

7.10.2.1 The EUT was set up as shown in Figure 7.10.1, energized and its proper operation was checked.
7.10.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.10.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.10.2 and the associated plots.

Figure 7.10.1 Spurious emission test setup



Test specification:	**Section 27.53(m)(2), Conducted spurious emissions at the band edges**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 43 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Table 7.10.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2496.0 – 2690.0 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 27000 MHz except:
2490.0 – 2507.0 MHz for low channel
2584.5 – 2601.5 for mid channel
2679.0 – 2696.0 MHz for high channel)
See NOTE 2
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: QPSK
MODULATING SIGNAL: PRBS
BIT RATE: 4.19 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum (see Note 1)

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Low carrier frequency								
7495.08	-22.50	Included	Included	1000	-22.50	-13.0	-9.50	Pass
Mid carrier frequency								
7778.08	-23.67	Included	Included	1000	-23.67	-13.0	-10.67	Pass
High carrier frequency								
8065.92	-28.83	Included	Included	1000	-28.83	-13.0	-15.83	Pass

*****- Margin = Spurious emission – specification limit.
NOTE 1: Spurious emissions test was performed at 5 MHz EBW with QPSK modulation as configuration that produces maximum output power spectral density.
NOTE 2: For band edge emissions please see "Emission at the band edges" test report.

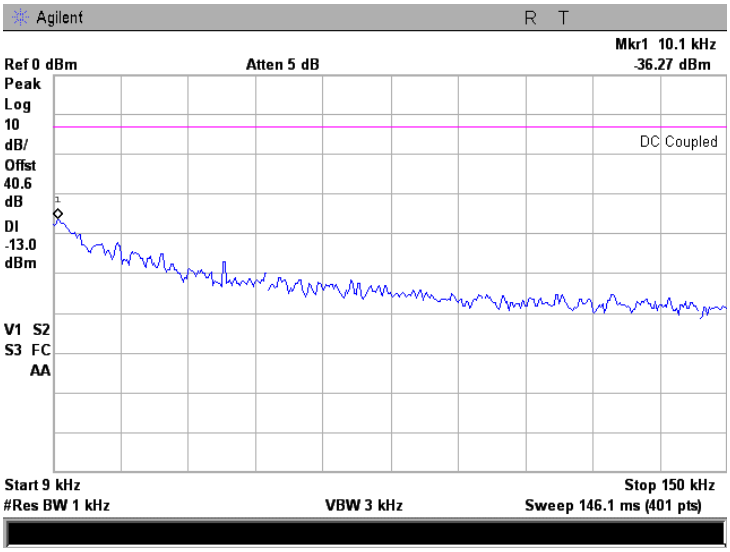
Reference numbers of test equipment used

HL 0675	HL 1424	HL 1906	HL 2214	HL 2909	HL 2952	HL 3455	HL 3559
HL 3768	HL 3787	HL 3868					

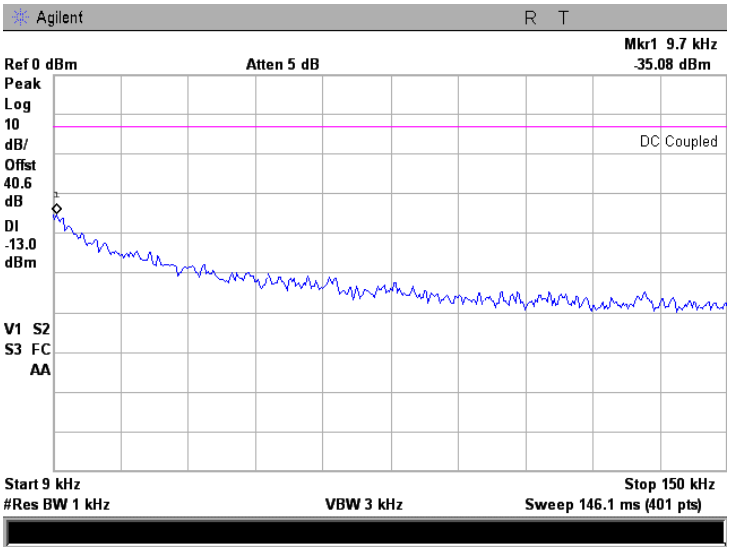
Full description is given in Appendix A.

Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

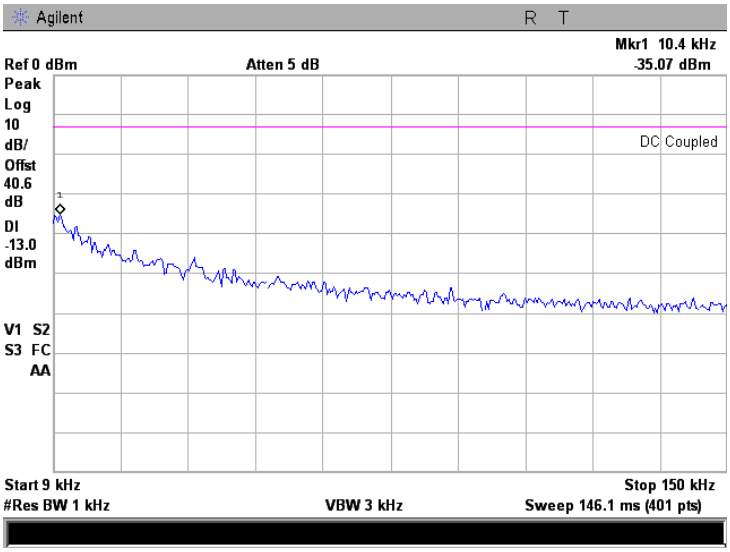


Plot 7.10.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

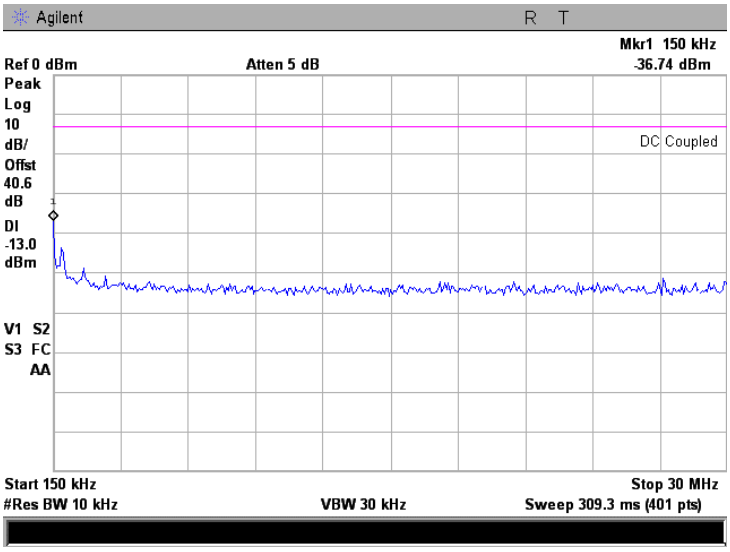


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

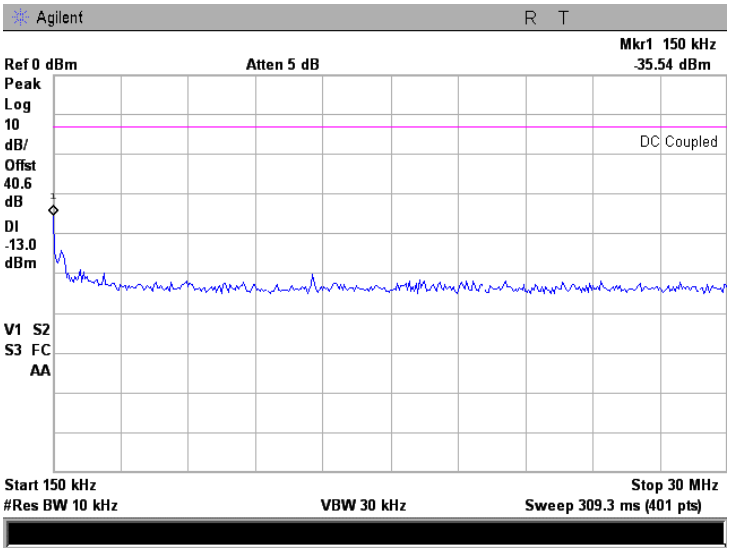


Plot 7.10.4 Spurious emission measurements in 0.150 - 30.0 MHz range at low carrier frequency

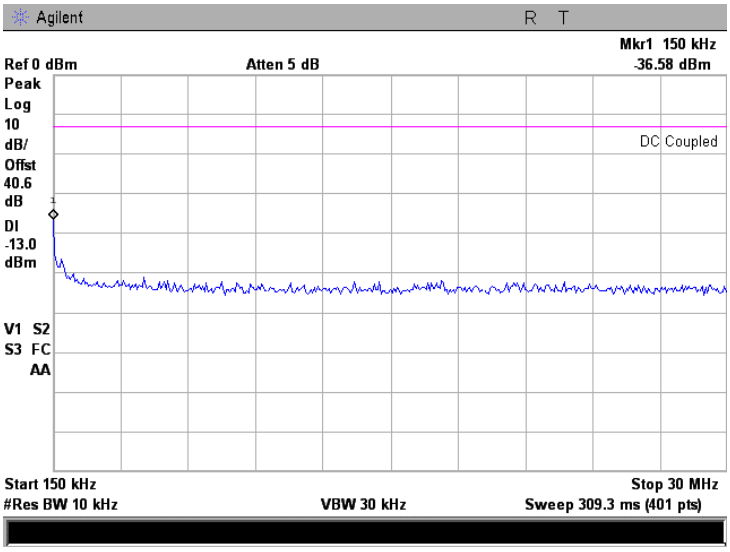


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.5 Spurious emission measurements in 0.150 - 30.0 MHz range at mid carrier frequency

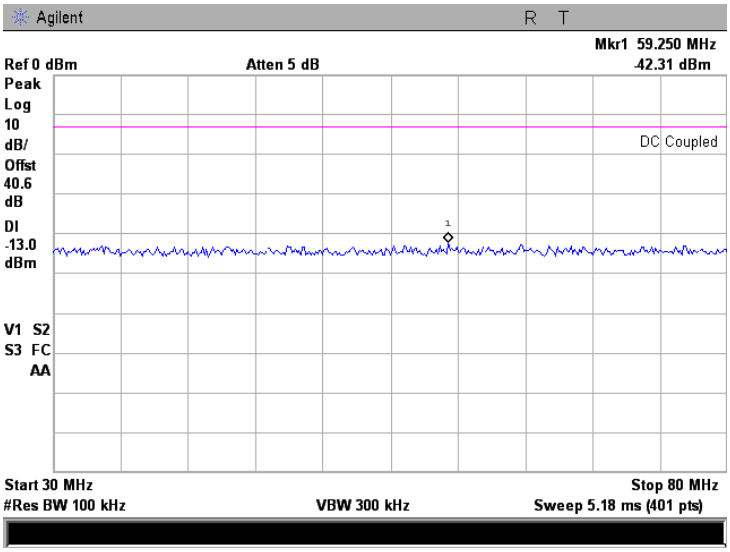


Plot 7.10.6 Spurious emission measurements in 0.150 – 30.0 MHz range at high carrier frequency

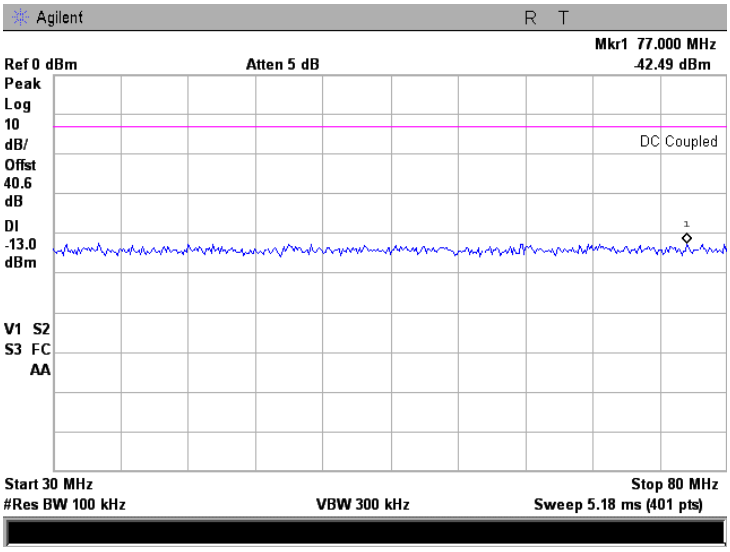


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.7 Spurious emission measurements in 30.0 – 80.0 MHz range at low carrier frequency

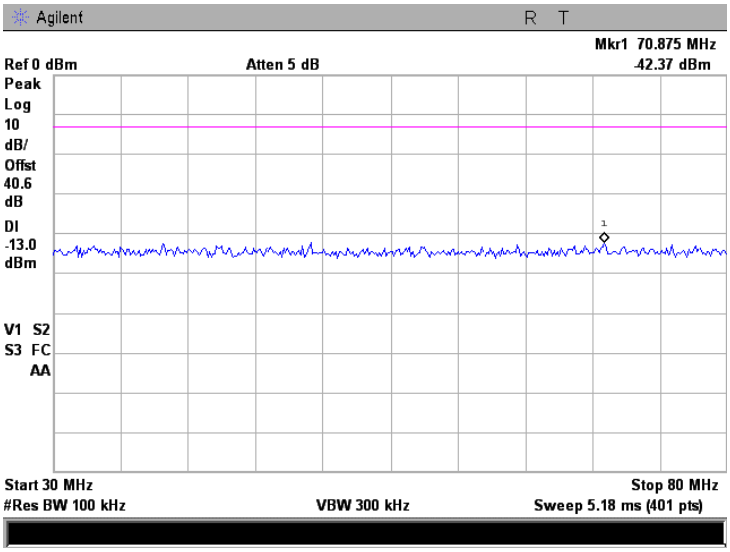


Plot 7.10.8 Spurious emission measurements in 30.0 – 80.0 MHz range at mid carrier frequency

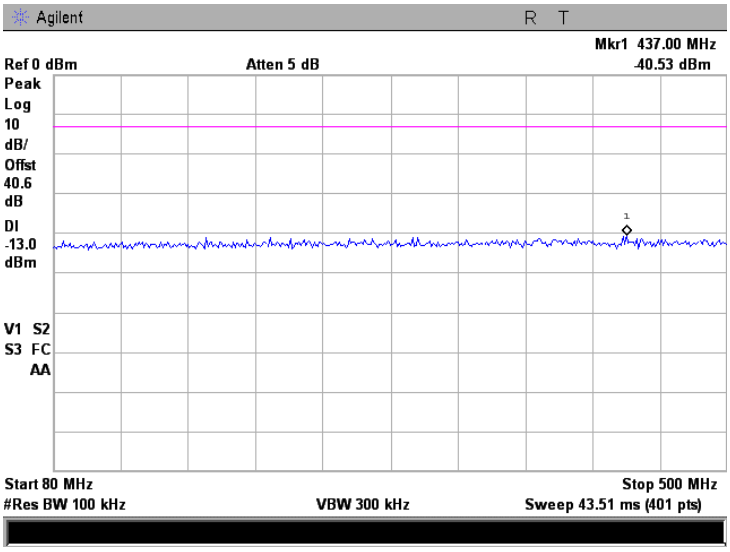


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.9 Spurious emission measurements in 30.0 – 80.0 MHz range at high carrier frequency

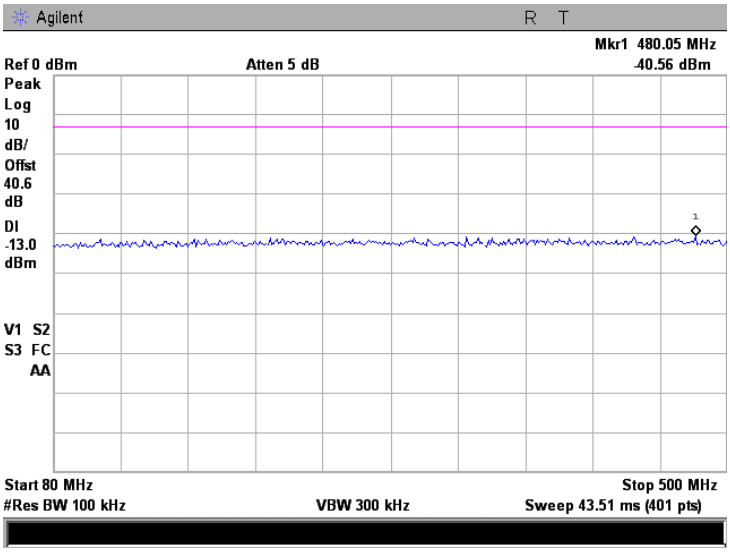


Plot 7.10.10 Spurious emission measurements in 80.0 - 500 MHz range at low carrier frequency

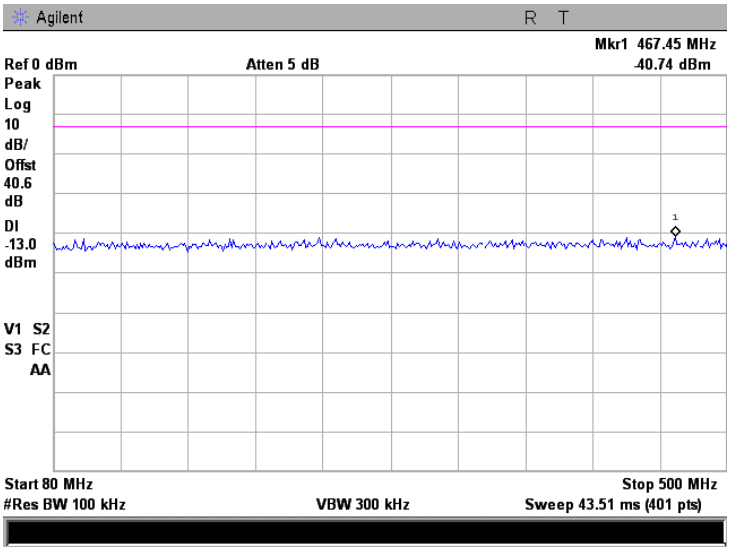


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.11 Spurious emission measurements in 80.0 - 500 MHz range at mid carrier frequency

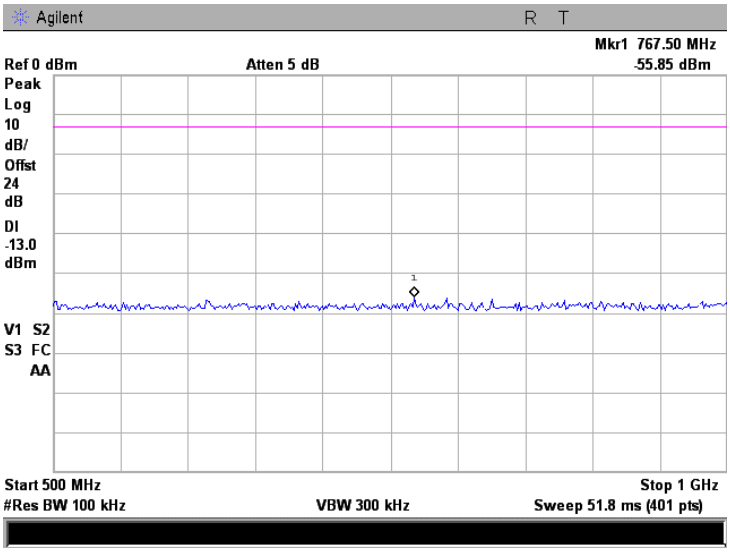


Plot 7.10.12 Spurious emission measurements in 80.0 - 500 MHz range at high carrier frequency

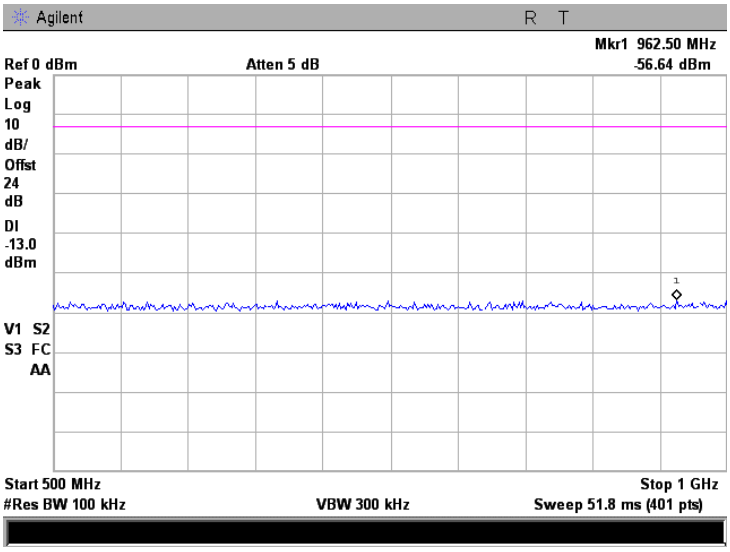


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.13 Spurious emission measurements in 500- 1000 MHz range at low carrier frequency

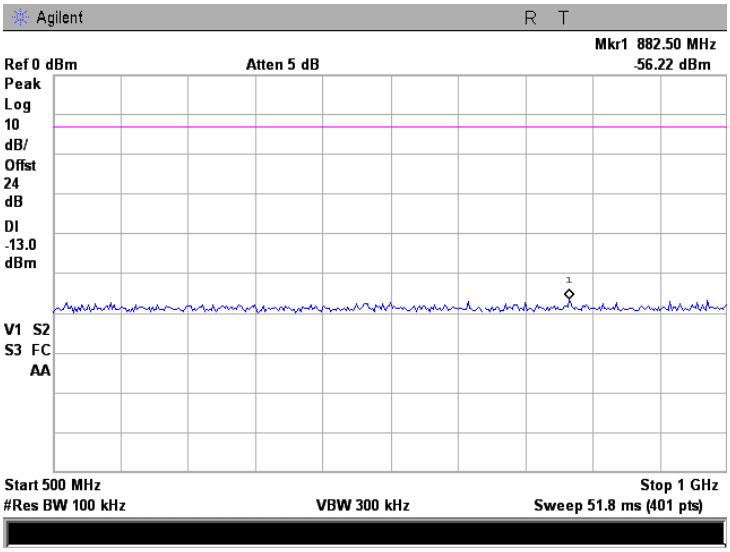


Plot 7.10.14 Spurious emission measurements in 500- 1000 MHz range at mid carrier frequency

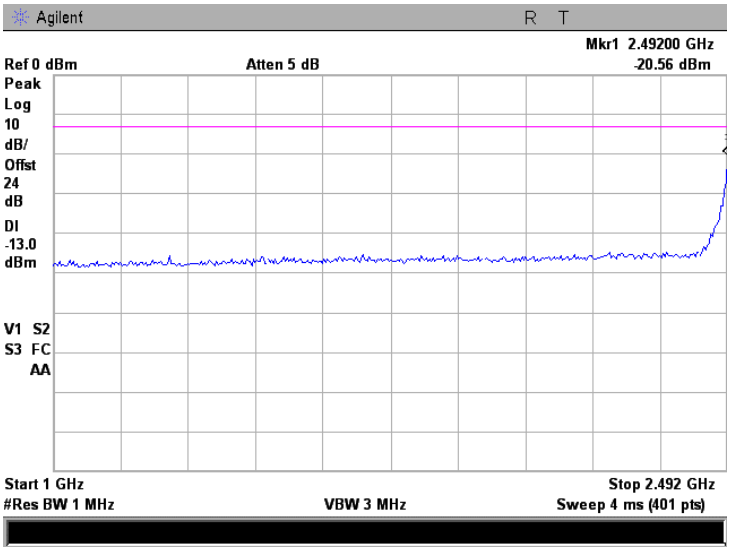


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.15 Spurious emission measurements in 500- 1000 MHz range at high carrier frequency

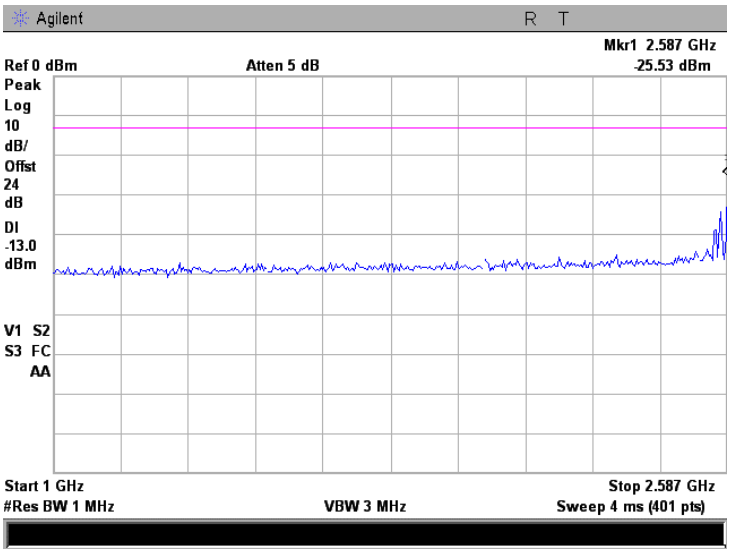


Plot 7.10.16 Spurious emission measurements in 1000 - 2492 MHz range at low carrier frequency

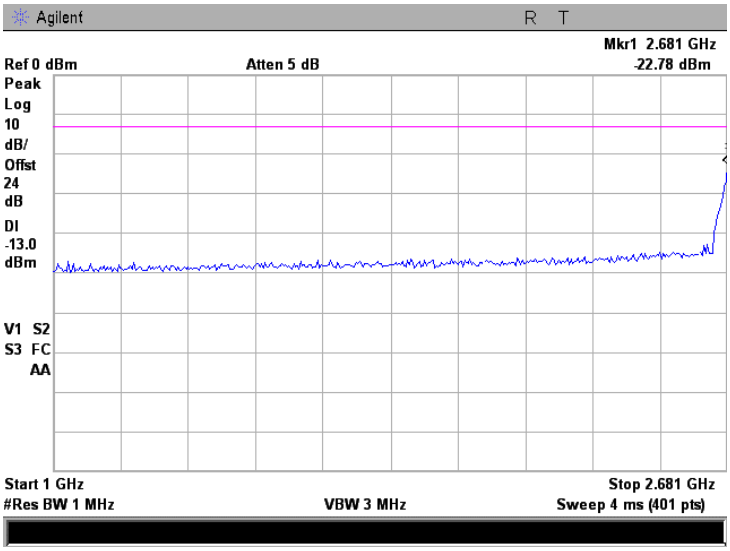


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.17 Spurious emission measurements in 1000 – 2587 MHz at mid carrier frequency

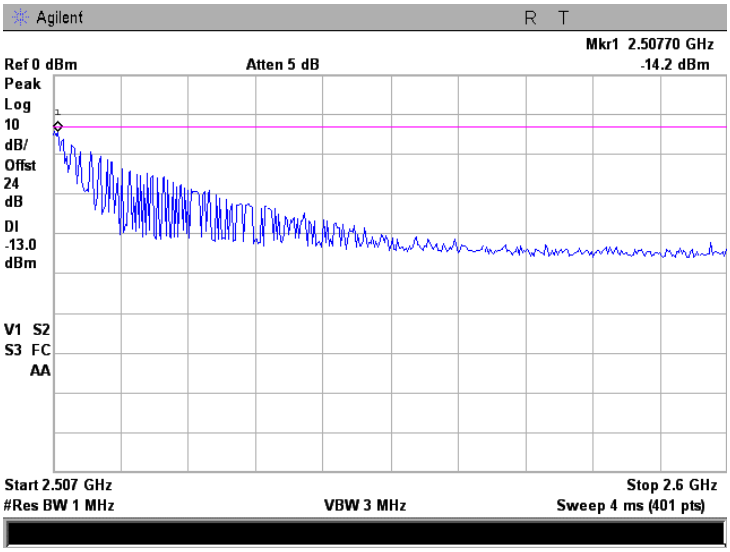


Plot 7.10.18 Spurious emission measurements in 1000 – 2681.0 MHz at high carrier frequency

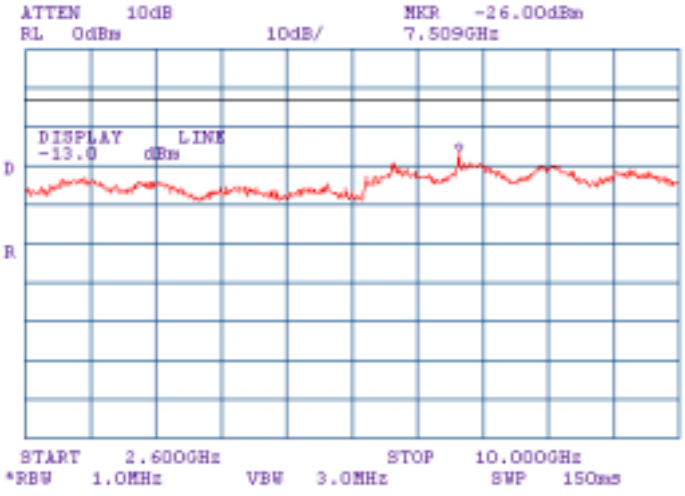


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.19 Spurious emission measurements in 2507 – 2600 MHz range at low carrier frequency

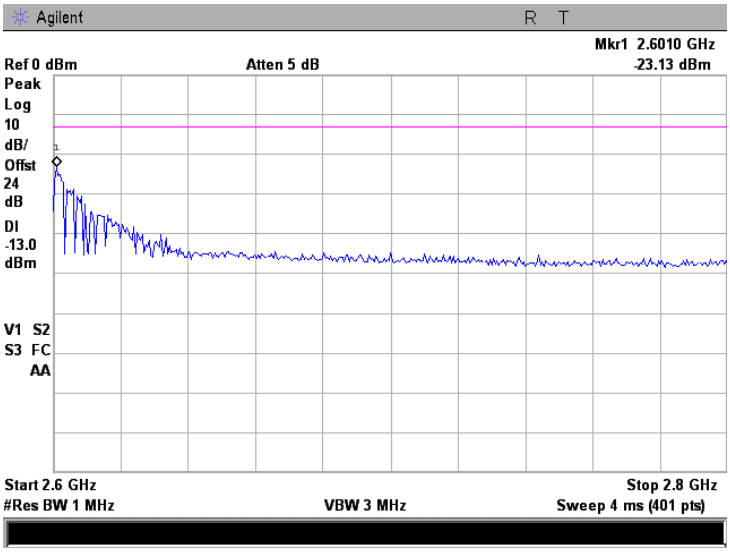


Plot 7.10.20 Spurious emission measurements in 2600 – 10000 MHz range at low carrier frequency

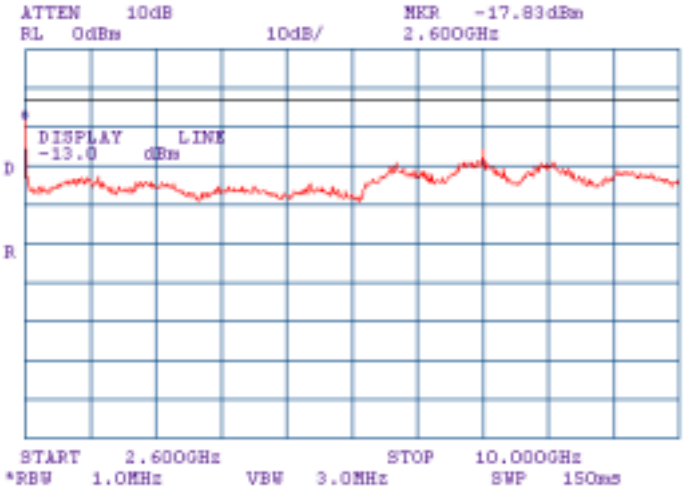


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.21 Spurious emission measurements in 2600 – 2800 MHz at mid carrier frequency

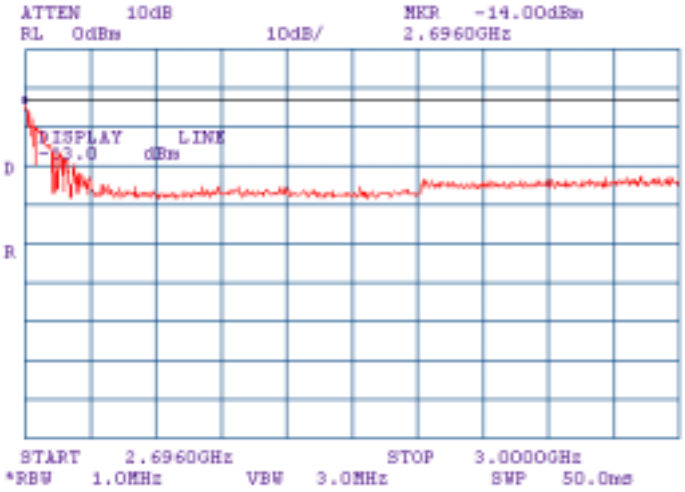


Plot 7.10.22 Spurious emission measurements in 2600 – 10000 MHz at mid carrier frequency

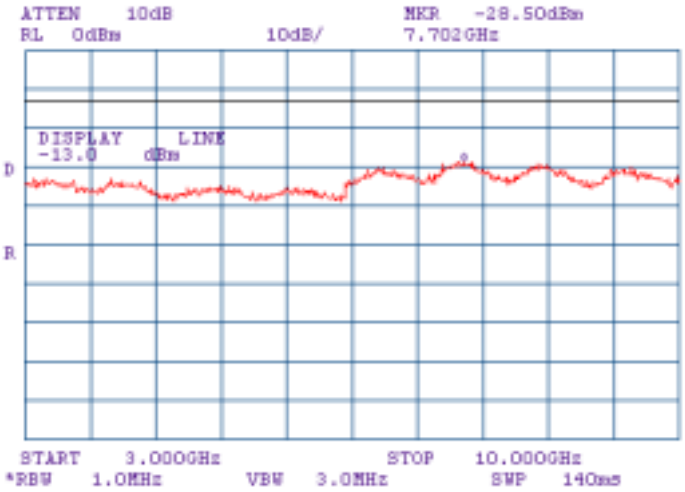


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.23 Spurious emission measurements in 2694 – 3000.0 MHz at high carrier frequency

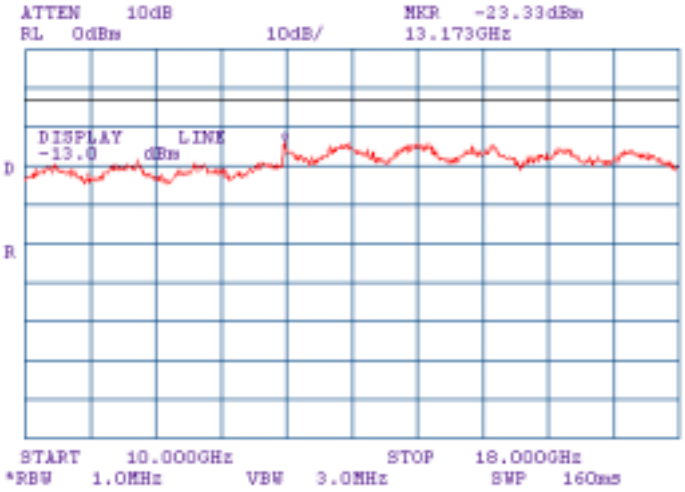


Plot 7.10.24 Spurious emission measurements in 3000 – 10000 MHz at high carrier frequency

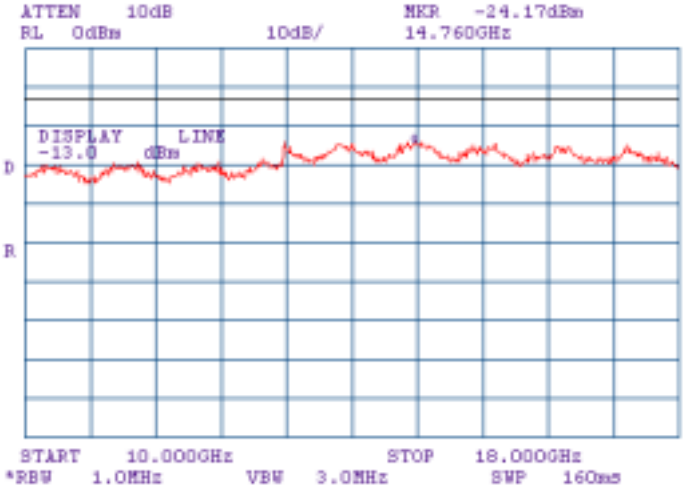


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.25 Spurious emission measurements in 10000 – 18000 MHz range at low carrier frequency

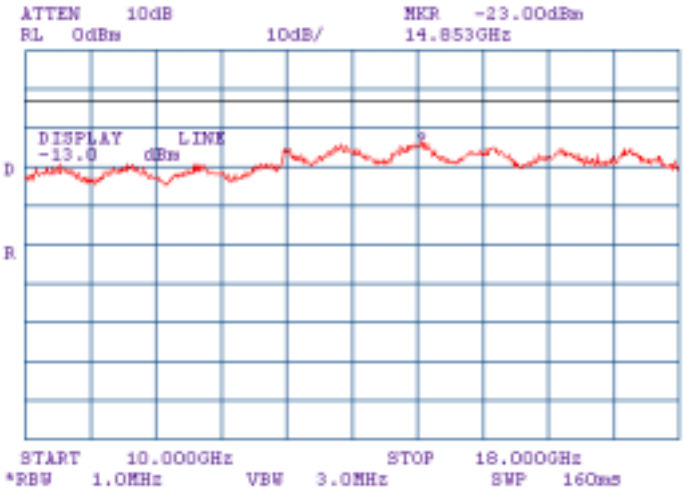


Plot 7.10.26 Spurious emission measurements in 10000 – 18000 MHz at mid carrier frequency

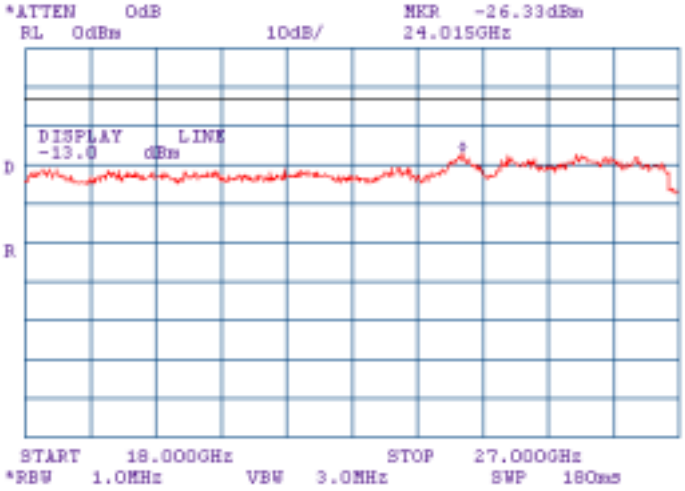


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.27 Spurious emission measurements in 10000 – 18000 MHz at high carrier frequency

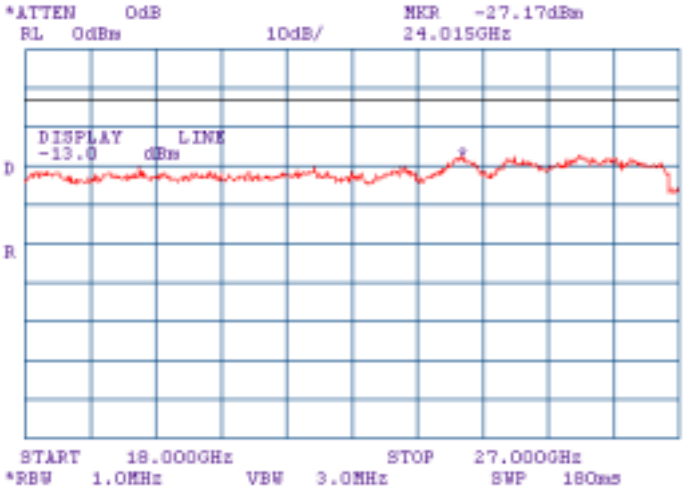


Plot 7.10.28 Spurious emission measurements in 18000 – 27000 MHz range at low carrier frequency

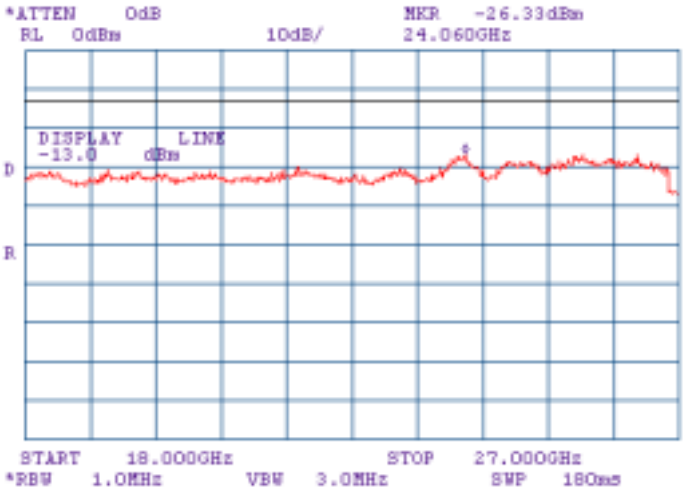


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.29 Spurious emission measurements in 18000 – 27000 MHz at mid carrier frequency

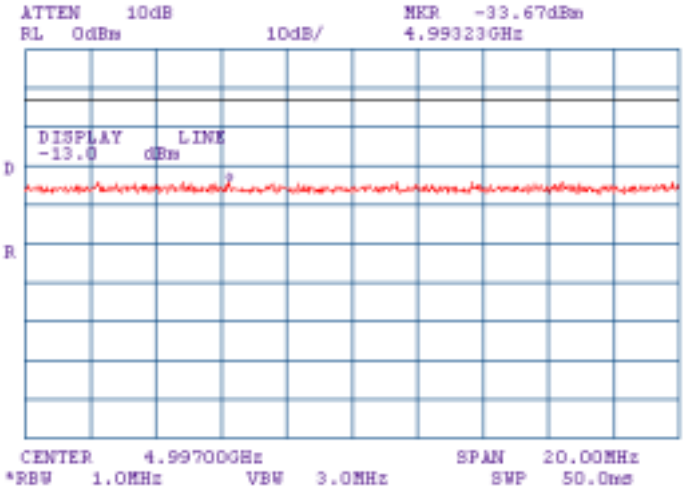


Plot 7.10.30 Spurious emission measurements in 18000 – 27000 MHz at high carrier frequency

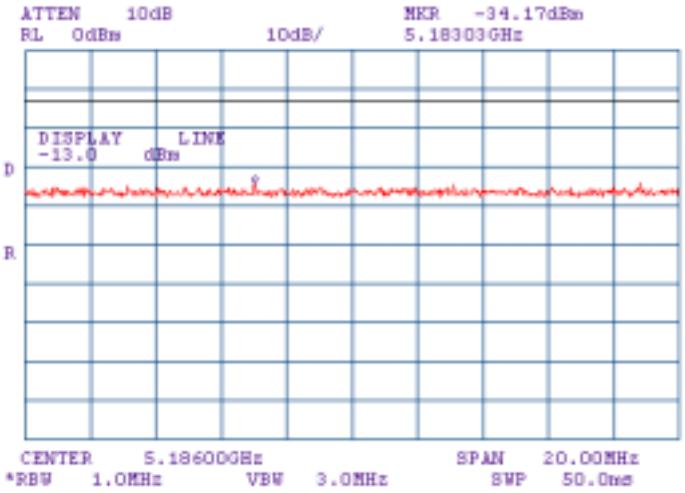


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.31 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequency

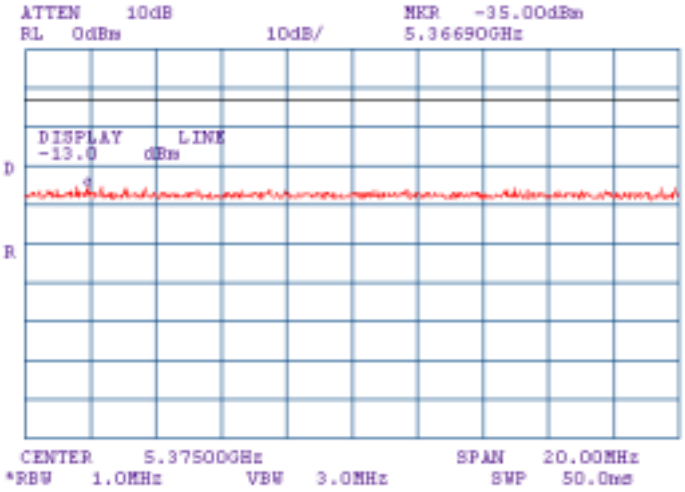


Plot 7.10.32 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency

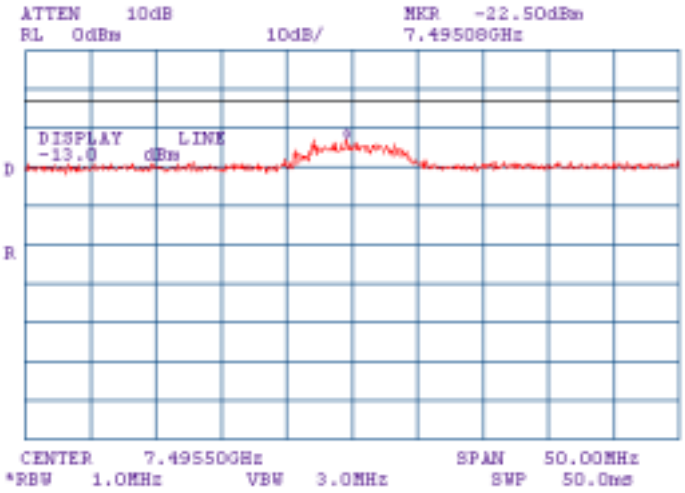


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.33 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequency

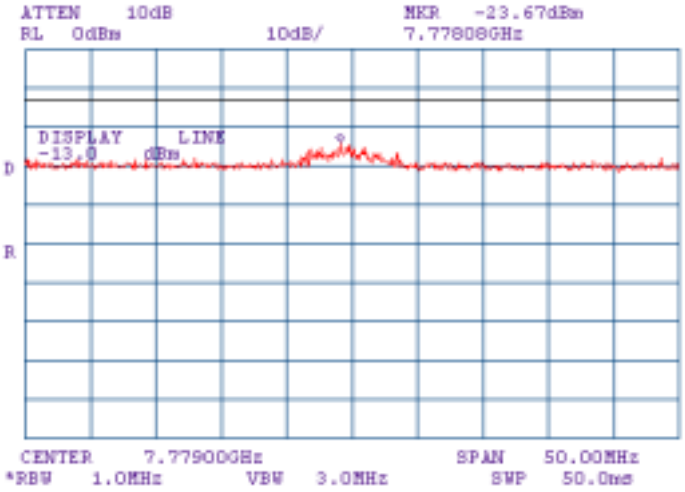


Plot 7.10.34 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency

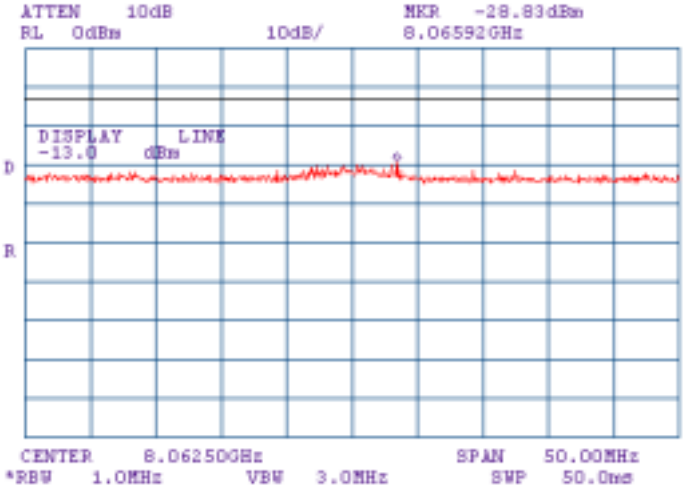


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.35 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequency

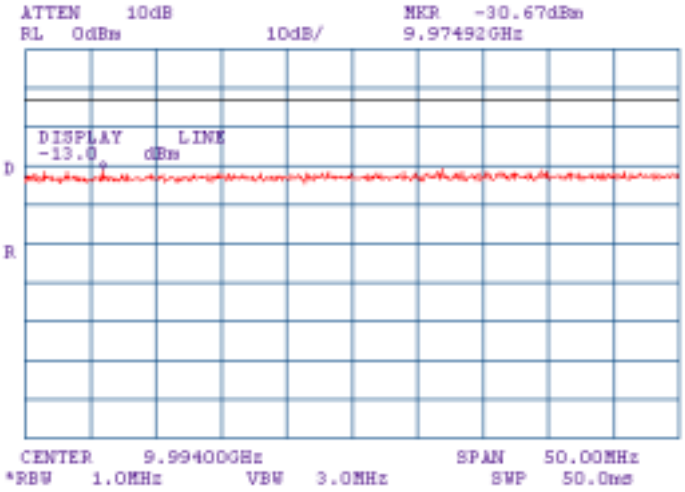


Plot 7.10.36 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency

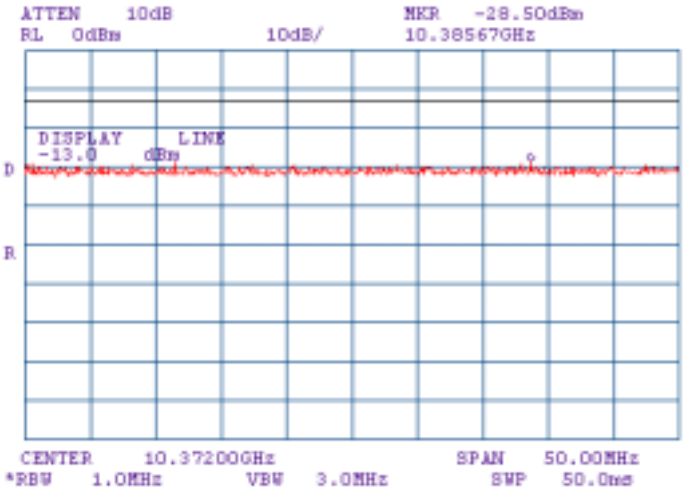


Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	Air Pressure: 1003 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.37 Conducted spurious emission measurements at the 4th harmonic of low carrier frequency

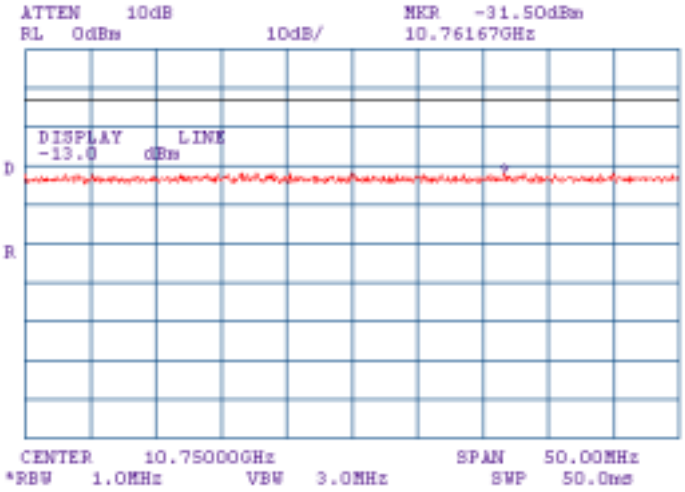


Plot 7.10.38 Conducted spurious emission measurements at the 4th harmonic of mid carrier frequency



Test specification:	Section 27.53(m)(2), Conducted spurious emissions at the band edges		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/3/2010		
Temperature: 23.4 ºC	**Air Pressure:** 1003 hPa	**Relative Humidity:** 43 %	**Power Supply:** 48VDC
Remarks: Fixed subscriber unit			

Plot 7.10.39 Conducted spurious emission measurements at the 4th harmonic of high carrier frequency



Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date:	8/5/2010		
Temperature: 25.7 ºC	Air Pressure: 1005 hPa	Relative Humidity: 34 %	Power Supply: 48VDC
Remarks: Mobile subscriber unit and Fixed subscriber unit			

7.11 Frequency stability test

7.11.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.11.1.

Table 7.11.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement
2496.0 – 2690.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

7.11.2 Test procedure

7.11.2.1 The EUT was set up as shown in Figure 7.11.1, energized and its proper operation was checked.

7.11.2.2 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.

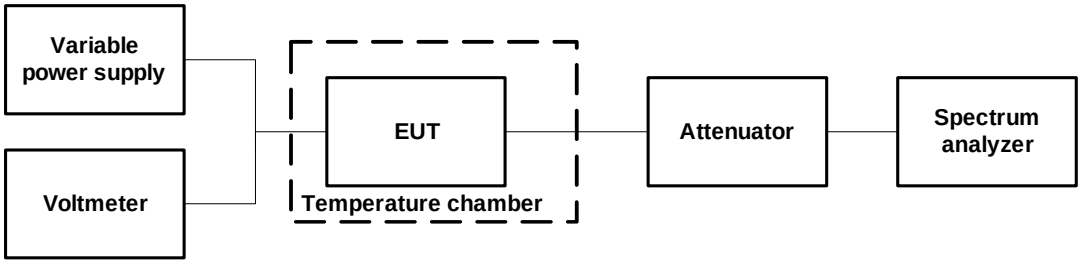
7.11.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

7.11.2.4 The above procedure was repeated at 0˚C and at the lowest test temperature.

7.11.2.5 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.

7.11.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.11.2 to Table 7.11.4.

Figure 7.11.1 Frequency stability test setup



Test specification:	**Section 27.54, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date:	8/5/2010		
Temperature: 25.7 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 34 %	**Power Supply:** 48VDC
Remarks: Mobile subscriber unit and Fixed subscriber unit			

Table 7.11.2 Frequency stability test results

OPERATING FREQUENCY:	2496 – 2690 MHz
NOMINAL POWER VOLTAGE:	120 VAC
TEMPERATURE STABILIZATION PERIOD:	20 min
POWER DURING TEMPERATURE TRANSITION:	Off
SPECTRUM ANALYZER MODE:	Counter
RESOLUTION BANDWIDTH:	100 Hz
VIDEO BANDWIDTH:	300 Hz

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift Hz	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative
Low carrier frequency 2498.50 MHz										
-30	nominal	2498.498791	2498.498825	2498.498817	2498.498808	2498.498794	2498.498758	2498.498721	0.00	-756.00
-20	nominal	2498.497937	NA	NA	NA	NA	NA	2498.497961	0.00	-1540.00
-10	nominal	2498.498002	NA	NA	NA	NA	NA	2498.498333	0.00	-1475.00
0	nominal	2498.498738	2498.498756	2498.498761	2498.498768	2498.498771	2498.498768	2498.498756	0.00	-739.00
10	nominal	2498.499056	NA	NA	NA	NA	NA	2498.499331	0.00	-421.00
20	15%	2498.499487	NA	NA	NA	NA	NA	2498.499506	29.00	0.00
20	nominal	2498.499485	NA	NA	NA	NA	NA	2498.499477	8.00	0.00
20	-15%	2498.499517	NA	NA	NA	NA	NA	2498.499500	40.00	0.00
30	nominal	2498.499567	2498.499568	2498.499572	2498.499566	2498.499567	2498.499568	2498.499571	95.00	0.00
40	nominal	2498.499388	NA	NA	NA	NA	NA	2498.499325	0.00	-152.00
50	nominal	2498.499073	2498.499078	2498.499089	2498.499086	2498.499082	2498.499079	2498.499074	0.00	-404.00
Mid carrier frequency 2593.00 MHz										
-30	nominal	2592.998681	2592.998689	2592.998687	2592.998693	2592.998672	2592.998664	2592.998662	0.00	-816.00
-20	nominal	2592.997904	NA	NA	NA	NA	NA	2592.997894	0.00	-1584.00
-10	nominal	2592.998253	NA	NA	NA	NA	NA	2592.998274	0.00	-1225.00
0	nominal	2592.998712	2592.998731	2592.998717	2592.998721	2592.998712	2592.998728	2592.998741	0.00	-766.00
10	nominal	2592.999297	NA	NA	NA	NA	NA	2592.999293	0.00	-185.00
20	15%	2592.999472	NA	NA	NA	NA	NA	2592.999484	6.00	-6.00
20	nominal	2592.999450	NA	NA	NA	NA	NA	2592.999478	0.00	-28.00
20	-15%	2592.999485	NA	NA	NA	NA	NA	2592.999506	28.00	0.00
30	nominal	2592.999551	2592.999556	2592.999559	2592.999559	2592.999566	2592.999557	2592.999545	88.00	0.00
40	nominal	2592.999307	NA	NA	NA	NA	NA	2592.999286	0.00	-192.00
50	nominal	2592.999065	2592.999066	2592.999070	2592.999062	2592.999055	2592.999058	2592.999052	0.00	-426.00
High carrier frequency 2687.50 MHz										
-30	nominal	2687.498648	2687.498642	2687.498638	2687.498627	2687.498641	2687.498628	2687.498614	0.00	-857.00
-20	nominal	2687.497448	NA	NA	NA	NA	NA	2687.497871	0.00	-2023.00
-10	nominal	2687.498215	NA	NA	NA	NA	NA	2687.498229	0.00	-1256.00
0	nominal	2687.498406	2687.498528	2687.498572	2687.498634	2687.498646	2687.498663	2687.498689	0.00	-1065.00
10	nominal	2687.499252	NA	NA	NA	NA	NA	2687.499284	0.00	-219.00
20	15%	2687.499447	NA	NA	NA	NA	NA	2687.499508	37.00	-24.00
20	nominal	2687.499454	NA	NA	NA	NA	NA	2687.499471	0.00	-17.00
20	-15%	2687.499514	NA	NA	NA	NA	NA	2687.499602	131.00	0.00
30	nominal	2687.499575	2687.499584	2687.499583	2687.499577	2687.499568	2687.499564	2687.499552	113.00	0.00
40	nominal	2687.499272	NA	NA	NA	NA	NA	2687.499265	0.00	-206.00
50	nominal	2687.499084	2687.499082	2687.499073	2687.499072	2687.499066	2687.499058	2687.499034	0.00	-437.00

* - Reference frequency (T, ºC = 30ºC, V = nominal, after 10^t minutes)

Table 7.11.3 Maximum frequency displacement

Channel	Maximum frequency displacement			
	ppm		Hz	
	Negative	Positive	Negative	Positive
Low (2498.5 MHz)	0.62	0.04	1540	95
Mid (2593.0 MHz)	0.61	0.03	1584	88
High (2687.5 MHz)	0.75	0.05	2023	131

Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date:	8/5/2010		
Temperature: 25.7 ºC	Air Pressure: 1005 hPa	Relative Humidity: 34 %	Power Supply: 48VDC
Remarks: Mobile subscriber unit and Fixed subscriber unit			

Table 7.11.4 Transmission occupied bandwidth with frequency drift test results

Lower measured* band edge, MHz	Upper measured* band edge, MHz	Lower calculated** band edge, MHz	Upper calculated** band edge, MHz	Lower specified band edge, MHz	Upper specified band edge, MHz	Lower Margin***, MHz	Upper Margin***, MHz	Verdict
5 MHz BW								
QPSK								
2496.141	2500.831	2496.140905	2500.832540	2496.0	2501.0	0.140905	-0.167460	Pass
2590.620	2595.317	2590.619912	2595.318584	2590.5	2595.5	0.119912	-0.181416	Pass
2685.211	2689.803	2685.210869	2689.805023	2685.0	2690.0	0.210869	-0.194977	Pass
16QAM								
2496.155	2500.817	2496.154905	2500.818540	2496.0	2501.0	0.154905	-0.181460	Pass
2590.655	2595.345	2590.654912	2595.346584	2590.5	2595.5	0.154912	-0.153416	Pass
2685.169	2689.817	2685.168869	2689.819023	2685.0	2690.0	0.168869	-0.180977	Pass
64QAM								
2496.120	2500.971	2496.119905	2500.972540	2496.0	2501.0	0.119905	-0.027460	Pass
2590.564	2595.352	2590.563912	2595.353584	2590.5	2595.5	0.063912	-0.146416	Pass
2685.148	2689.852	2685.147869	2689.854023	2685.0	2690.0	0.147869	-0.145977	Pass
7 MHz BW								
QPSK								
2496.110	2502.990	2496.109905	2502.991540	2496.0	2503.0	0.109905	-0.008460	Pass
2589.560	2596.430	2589.559912	2596.431584	2589.5	2596.5	0.059912	-0.068416	Pass
2683.040	2689.910	2683.039869	2689.912023	2683.0	2690.0	0.039869	-0.087977	Pass
16QAM								
2496.060	2502.940	2496.059905	2502.941540	2496.0	2503.0	0.059905	-0.058460	Pass
2589.550	2596.440	2589.549912	2596.441584	2589.5	2596.5	0.049912	-0.058416	Pass
2683.060	2689.930	2683.059869	2689.932023	2683.0	2690.0	0.059869	-0.067977	Pass
64QAM								
2496.120	2502.890	2496.119905	2502.891540	2496.0	2503.0	0.119905	-0.108460	Pass
2589.600	2596.400	2589.599912	2596.401584	2589.5	2596.5	0.099912	-0.098416	Pass
2683.020	2689.950	2683.019869	2689.952023	2683.0	2690.0	0.019869	-0.047977	Pass
10 MHz BW								
QPSK								
2496.212	2505.884	2496.211905	2505.882460	2496.0	2506.0	0.211905	-0.117540	Pass
2588.188	2597.8	2588.187912	2597.798416	2588.0	2598.0	0.187912	-0.201584	Pass
2680.2	2689.752	2680.199869	2689.749977	2680.0	2690.0	0.199869	-0.250023	Pass
16QAM								
2496.164	2505.836	2496.163905	2505.834460	2496.0	2506.0	0.163905	-0.165540	Pass
2588.14	2597.812	2588.139912	2597.810416	2588.0	2598.0	0.139912	-0.189584	Pass
2680.188	2689.752	2680.187869	2689.749977	2680.0	2690.0	0.187869	-0.250023	Pass
64QAM								
2496.104	2505.836	2496.103905	2505.834460	2496.0	2506.0	0.103905	-0.165540	Pass
2588.08	2597.908	2588.079912	2597.906416	2588.0	2598.0	0.079912	-0.093584	Pass
2680.152	2689.812	2680.151869	2689.809977	2680.0	2690.0	0.151869	-0.190023	Pass

* - measured under normal test conditions at 26 dBc points
** - Measured band edge with proper drift addition (maximum measured drift)
*** - Margin = Calculated band edge – specified band edge

Reference numbers of test equipment used

HL 2951	HL 3782	HL 3787	HL 3818	HL 3868			

Full description is given in Appendix A.

8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	29-Jun-10	29-Jun-11
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	27-Aug-09	27-Aug-10
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-10	11-Jan-11
0675	Coupler Directional, high power, 0.01 - 250 MHz, 500 W	WERLATONE	C5100	5788	03-Feb-10	03-Feb-11
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	23-Dec-08	23-Dec-11
0769	Antenna Standard Gain Horn, 26.5-40 GHz, WR28, 25 dB gain	Quinstar Technology	QWH-2800-BA	112	23-Dec-08	23-Dec-11
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies	8564EC	3946A002 19	28-Aug-09	28-Aug-10
1906	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	1906	01-Dec-08	01-Dec-10
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	11-Jun-10	11-Jun-11
2214	Directional Coupler 1.7-26.5 GHz	Krytar	2616	31354	31-Aug-09	31-Aug-10
2870	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	2870	04-Aug-10	04-Aug-11
2871	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-8155-00	2871	15-Sep-09	15-Sep-10
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	07-May-10	07-May-11
2951	Cable, RF, 18 GHz, 0.9 m, SMA-SMA	Gore	10020014	NA	05-Oct-09	05-Oct-10
2952	Cable, RF, 18 GHz, 1.2 m, SMA-SMA	Gore	10020014	NA	05-Oct-09	05-Oct-10
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY451010 57	14-Dec-09	14-Dec-10
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY452405 86	14-Dec-09	14-Dec-10
3384	Microwave Cable Assembly, 26.5 GHz, 1.0 m, N type/N type	Suhner Sucoflex	104EA	3384	01-Dec-09	01-Dec-10
3439	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	07-Mar-10	07-Mar-11
3442	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	07-Mar-10	07-Mar-11
3455	Medium Power Fixed Coaxial Attenuator DC to 40 GHz, 20 dB, 5 W	Aeroflex / Weinschel	75A-20-12	1182	25-Mar-10	25-Mar-11
3534	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040 -J0	111590010 02	06-Dec-09	06-Dec-10
3535	Amplifier, low noise, 18 to 40 GHz	Quinstar Technology	QLJ-18404537 -J0	111590030 01	06-Dec-09	06-Dec-10
3559	Cable 40 GHz, SMA-SMA, 0.95 m, Blue	Gore	PHASEFL EX	03771245	13-Jun-10	13-Jun-11
3616	Cable RF, 6.5 m, N type-N type, DC-6.5 GHz	Suhner Switzerland	Rg 214/U	NA	27-May-10	27-May-11
3768	Attenuator, N-type, 20 dB, DC to 18 GHz, 5 W	Mini-Circuits	BW-N20W5+	NA	31-Aug-09	31-Aug-10

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
3782	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	07-Dec-09	07-Dec-10
3787	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	07-Dec-09	07-Dec-10
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	25-Sep-09	25-Sep-10
3868	Directional coupler, 2 GHz to 8 GHz, 10 dB, SMA Female	Narda	4203-10	06978	14-Dec-09	14-Dec-10
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1225/2A	07-Feb-10	07-Feb-11

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
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 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz ± 13.9 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %

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.

10 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.
Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file numbers IC 2186A-1 for OATS, IC 2186A-2 for anechoic chamber, IC 2186A-3 for full-anechoic chamber for RE measurements above 1 GHz), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-27 for full-anechoic chamber for RE measurements above 1 GHz, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. 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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11 APPENDIX D Specification references

FCC 47CFR part 27: 2009	Miscellaneous wireless communications services
FCC 47CFR part 1: 2009	Practice and procedure
FCC 47CFR part 2: 2009	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

12 APPENDIX E Test equipment correction factors

Antenna Factor
Active Loop Antenna
EMC Test Systems, model 6502, S/N 2857, HL 0446

Frequency, MHz	Magnetic Antenna Factor, dB(S/m)	Electric Antenna Factor, 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(μV) to convert it into field intensity in dB(μA/m).
Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

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

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

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

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

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

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

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

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

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

Cable loss
Cable coaxial, Huber-Suhner, 18 GHz, 6.4 m, SMA - SMA, model 198-9155-00, HL 2870

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	5750	2.49	12000	3.71
30	0.17	6000	2.53	12250	3.81
100	0.32	6250	2.58	12500	3.84
250	0.49	6500	2.64	12750	3.88
500	0.70	6750	2.69	13000	3.92
750	0.86	7000	2.75	13250	3.96
1000	1.00	7250	2.80	13500	3.98
1250	1.11	7500	2.87	13750	4.01
1500	1.23	7750	2.93	14000	4.03
1750	1.34	8000	2.94	14250	4.09
2000	1.41	8250	3.00	14500	4.08
2250	1.51	8500	3.04	14750	4.10
2500	1.59	8750	3.08	15000	4.15
2750	1.68	9000	3.14	15250	4.22
3000	1.76	9250	3.16	15500	4.31
3250	1.83	9500	3.22	15750	4.42
3500	1.91	9750	3.26	16000	4.48
3750	1.97	10000	3.36	16250	4.54
4000	2.05	10250	3.41	16500	4.56
4250	2.11	10500	3.46	16750	4.57
4500	2.18	10750	3.50	17000	4.59
4750	2.24	11000	3.54	17250	4.66
5000	2.30	11250	3.58	17500	4.70
5250	2.36	11500	3.63	17750	4.76
5500	2.43	11750	3.66	18000	4.72

Cable loss
Cable coaxial, Huber-Suhner, 18 GHz, 6.4 m, SMA - SMA, model 198-8155-00, HL 2871

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.12	5750	2.34	12000	3.55
30	0.14	6000	2.39	12250	3.61
100	0.27	6250	2.46	12500	3.67
250	0.45	6500	2.52	12750	3.74
500	0.63	6750	2.58	13000	3.79
750	0.76	7000	2.64	13250	3.82
1000	0.89	7250	2.68	13500	3.83
1250	1.01	7500	2.73	13750	3.83
1500	1.12	7750	2.78	14000	3.88
1750	1.23	8000	2.83	14250	3.93
2000	1.32	8250	2.88	14500	3.96
2250	1.41	8500	2.94	14750	4.01
2500	1.49	8750	2.97	15000	4.00
2750	1.58	9000	3.02	15250	4.01
3000	1.66	9250	3.07	15500	4.00
3250	1.73	9500	3.13	15750	4.13
3500	1.80	9750	3.18	16000	4.22
3750	1.87	10000	3.21	16250	4.29
4000	1.93	10250	3.26	16500	4.29
4250	2.01	10500	3.30	16750	4.32
4500	2.06	10750	3.36	17000	4.37
4750	2.12	11000	3.39	17250	4.45
5000	2.17	11250	3.44	17500	4.49
5250	2.24	11500	3.48	17750	4.53
5500	2.29	11750	3.52	18000	4.55

Cable loss
Cable coaxial, Gore, 18 GHz, 0.9 m, SMA-SMA, S/N 10020014
HL 2951

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.07	5750	0.77	12000	1.23
30	0.06	6000	0.78	12250	1.25
100	0.09	6250	0.81	12500	1.26
250	0.15	6500	0.83	12750	1.26
500	0.21	6750	0.84	13000	1.30
750	0.27	7000	0.85	13250	1.30
1000	0.31	7250	0.88	13500	1.30
1250	0.36	7500	0.88	13750	1.29
1500	0.38	7750	0.93	14000	1.23
1750	0.42	8000	0.92	14250	1.32
2000	0.44	8250	0.94	14500	1.27
2250	0.47	8500	0.99	14750	1.27
2500	0.50	8750	0.97	15000	1.34
2750	0.52	9000	1.01	15250	1.36
3000	0.54	9250	1.05	15500	1.35
3250	0.57	9500	1.08	15750	1.36
3500	0.58	9750	1.10	16000	1.43
3750	0.61	10000	1.09	16250	1.38
4000	0.63	10250	1.09	16500	1.42
4250	0.66	10500	1.07	16750	1.49
4500	0.68	10750	1.10	17000	1.53
4750	0.70	11000	1.09	17250	1.59
5000	0.71	11250	1.09	17500	1.65
5250	0.74	11500	1.13	17750	1.82
5500	0.77	11750	1.12	18000	2.09

Cable loss
Cable coaxial, Gore, 18 GHz, 1.2 m, SMA-SMA, S/N 10020014
HL 2952

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.03	5750	0.97	12000	1.50
30	0.05	6000	1.01	12250	1.45
100	0.11	6250	1.03	12500	1.48
250	0.19	6500	1.06	12750	1.57
500	0.26	6750	1.08	13000	1.51
750	0.32	7000	1.10	13250	1.64
1000	0.38	7250	1.13	13500	1.60
1250	0.43	7500	1.13	13750	1.63
1500	0.47	7750	1.21	14000	1.59
1750	0.53	8000	1.20	14250	1.66
2000	0.55	8250	1.24	14500	1.60
2250	0.59	8500	1.29	14750	1.65
2500	0.63	8750	1.23	15000	1.72
2750	0.66	9000	1.27	15250	1.68
3000	0.69	9250	1.27	15500	1.73
3250	0.72	9500	1.29	15750	1.70
3500	0.75	9750	1.30	16000	1.82
3750	0.78	10000	1.38	16250	1.79
4000	0.82	10250	1.44	16500	1.81
4250	0.84	10500	1.47	16750	1.91
4500	0.86	10750	1.45	17000	1.92
4750	0.90	11000	1.50	17250	1.98
5000	0.91	11250	1.46	17500	2.05
5250	0.94	11500	1.47	17750	2.04
5500	0.96	11750	1.44	18000	2.05

Cable loss
Cable coaxial, GORE, PHASEFLEX, 40 GHz, 0.95 m, SMA-SMA, S/N 03771245
HL 3559

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss,dB
30	0.08	10000	0.96	20500	1.59	31000	2.24
100	0.10	10500	0.99	21000	1.63	31500	2.71
500	0.22	11000	1.02	21500	1.70	32000	2.47
1000	0.32	11500	1.07	22000	1.71	32500	2.37
1500	0.40	12000	1.13	22500	1.60	33000	2.35
2000	0.41	12500	1.16	23000	1.58	33500	2.34
2500	0.44	13000	1.26	23500	1.64	34000	2.31
3000	0.53	13500	1.26	24000	1.68	34500	2.43
3500	0.54	14000	1.22	24500	1.79	35000	2.45
4000	0.62	14500	1.26	25000	1.86	35500	2.48
4500	0.62	15000	1.27	25500	1.77	36000	3.60
5000	0.67	15500	1.29	26000	1.78	36500	2.62
5500	0.70	16000	1.39	26500	1.83	37000	2.45
6000	0.72	16500	1.50	27000	1.87	37500	2.47
6500	0.76	17000	1.49	27500	1.97	38000	2.38
7000	0.83	17500	1.37	28000	2.69	38500	2.41
7500	0.85	18000	1.40	28500	1.94	39000	2.56
8000	0.89	18500	1.41	29000	2.02	39500	2.71
8500	0.91	19000	1.48	29500	2.05	40000	2.69
9000	0.95	19500	1.61	30000	2.11		
9500	0.96	20000	1.59	30500	2.11		

Cable loss
Cable coaxial, RG-214/U, N type-N type, 6.5 m
Suhner Switzerland, HL 3616

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.13	1750	2.66	3550	4.44	5350	6.08
30	0.25	1800	2.72	3600	4.46	5400	6.12
50	0.32	1850	2.78	3650	4.59	5450	6.17
100	0.48	1900	2.81	3700	4.60	5500	6.25
150	0.60	1950	2.86	3750	4.72	5550	6.31
200	0.71	2000	2.94	3800	4.72	5600	6.35
250	0.81	2050	2.97	3850	4.86	5650	6.41
300	0.91	2100	3.01	3900	4.85	5700	6.50
350	1.00	2150	3.06	3950	4.99	5750	6.52
400	1.07	2200	3.11	4000	4.90	5800	6.57
450	1.14	2250	3.16	4050	5.04	5850	6.61
500	1.23	2300	3.21	4100	5.01	5900	6.71
550	1.30	2350	3.26	4150	5.10	5950	6.70
600	1.37	2400	3.31	4200	5.08	6000	6.75
650	1.44	2450	3.35	4250	5.18	6050	6.74
700	1.50	2500	3.39	4300	5.14	6100	6.84
750	1.58	2550	3.46	4350	5.22	6150	6.87
800	1.64	2600	3.48	4400	5.21	6200	6.93
850	1.69	2650	3.55	4450	5.29	6250	6.96
900	1.77	2700	3.59	4500	5.31	6300	7.02
950	1.79	2750	3.66	4550	5.39	6350	7.04
1000	1.87	2800	3.68	4600	5.41	6400	7.10
1050	1.92	2850	3.75	4650	5.49	6450	7.11
1100	1.98	2900	3.79	4700	5.52	6500	7.19
1150	2.05	2950	3.86	4750	5.60		
1200	2.09	3000	3.89	4800	5.64		
1250	2.15	3050	3.94	4850	5.73		
1300	2.21	3100	3.98	4900	5.70		
1350	2.27	3150	4.03	4950	5.73		
1400	2.33	3200	4.06	5000	5.75		
1450	2.38	3250	4.12	5050	5.83		
1500	2.44	3300	4.14	5100	5.82		
1550	2.48	3350	4.22	5150	5.91		
1600	2.52	3400	4.24	5200	5.92		
1650	2.56	3450	4.31	5250	5.98		
1700	2.62	3500	4.35	5300	6.01		

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
CBW	channel bandwidth
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
DC	direct current
EBW	emission bandwidth
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
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
Ω	Ohm
QP	quasi-peak
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

END OF DOCUMENT