HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

Hermon Laboratories Ltd.
Harakevet Industrial Zone, Binyamina 30500,
Israel
Tel. +972-4-6288001
Fax. +972-4-6288277
E-mail: mail@hermonlabs.com

TEST REPORT

ACCORDING TO: FCC 47CFR part 27

FOR:

Airspan Networks Inc.

Base station

Model: MacroMAXe 2510L 2.496-2.570G

Table of contents

1 Applicant information

Client name:	Airspan Networks Inc.
Address:	777 Yamato Rd, Suite 310, Boca Raton 33431, Florida, USA
Telephone:	+1 561 893 8686
Fax:	+1 561 893 8671
E-mail:	zlevi@airspan.com
Contact name:	Mr. Zion Levi

2 Equipment under test attributes

Product name:	Base station
Model(s):	MacroMAXe 2510L 2.496-2.570G
Serial number:	51C1A815169C
Hardware version:	A6
Software release:	13_9_50_032
Receipt date	1/17/2011

3 Manufacturer information

Manufacturer name:	Airspan Networks Inc.
Address:	777 Yamato Rd, Suite 310, Boca Raton 33431, Florida, USA
Telephone:	+1 561 893 8686
Fax:	+1 561 893 8671
E-Mail:	zlevi@airspan.com
Contact name:	Mr. Zion Levi

4 Test details

Project ID:	21633
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	1/17/2011
Test completed:	2/01/2011
Test specification(s):	FCC 47CFR part 27

5 Tests summary

Test	Status
Transmitter characteristics	
Section 27.50(h), Peak output power at RF antenna connector	Pass
Section 27.50(h)(4), Spectral power density	Pass
Section 2.1091, 27.52, RF safety	Pass, exhibit provided in Application for certification
Section 27.53(m)(2), Spurious emissions at RF antenna connector	Pass
Section 27.53(m)(2), Band edge emissions at RF antenna connector	Pass
Section 27.53(m)(2), 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	February 1, 2011	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	February 2, 2011	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	February 20, 2011	

6 EUT description

6.1 General information

A base station radio, MacroMAXe 2510L 2.496-2.570G, is a part of a WiMAX broadband fixed cellular wireless access system. The system provides a radio link between an end-user (a subscriber) and a network to give high-speed data access. The MacroMAXe's transceiver/receiver (up to 64 QAM modulation, data rate up to 46 Mbps) uses OFDM and operating in TDD duplexing mode, equipped with a 18 dBi external antenna.
The MacroMAXe is installed outdoors and typically is mounted on a pole. The Subscriber transmits and receives traffic to and from the base station respectively. The transceiver provides subscribers with "always-on" Internet, high speed data only, or data and voice (VoIP) services and is configured with a unique base station reference number, preventing the ProST Subscriber from relocating to another subscriber premises without authorization.

6.2 Ports and lines

Port type	Port description	Conn. from	Conn. to	Qty.	Cable type	Cable length	Indoor / outdoor
Power	DC power	DC power supply	EUT	1	Unshielded	10	Outdoor
Signal	Ethernet	ETH2 port	ETH3 port	1	Shielded	1.5	Outdoor
Signal	Ethernet	ETH1 port	PC laptop	1	Shielded	10	Outdoor
Signal	Antenna	EUT	GPS external antenna	1	Coax	5	Outdoor
RF	Antenna	EUT	Termination 50 Ohm	4	Coax	NA	Outdoor
Signal	RS-232	EUT	Laptop	1	Unshielded	2	For maintance only

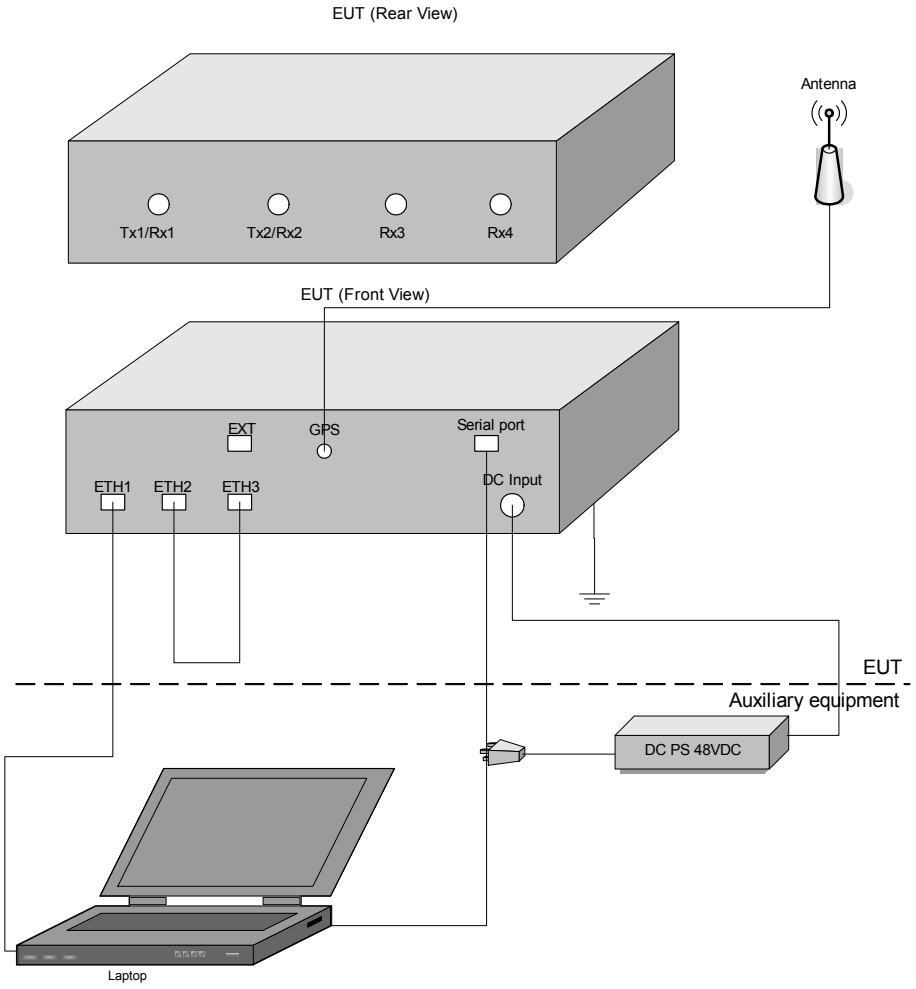
6.3 Support and test equipment

Description	Manufacturer	Model number	Serial number
DC power supply	Horizon Electronics	DHR3655D	767469
Laptop	IBM	X31	99-TXWYC
GPS Antenna	Trimble	P/N 57861-00	01880177

6.4 Changes made in EUT

No changes were implemented.

6.5 Test configuration



6.6 Transmitter characteristics

Type of equipment						
V	Stand-alone (Equipment with or without its own control provisions)					
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)					
	Plug-in card (Equipment intended for a variety of host systems)					
Intended use		**Condition of use**				
V	fixed	Always at a distance more than 2 m from all people				
	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		2500.0 – 2572.0 MHz				
Operating frequency range		2503.0 – 2569.0 MHz for 3.5 MHz OBW and 5 MHz OBW 2506.0 – 2566.0 MHz for 7 MHz OBW and 10 MHz OBW				
RF channel spacing		3.5, 5, 7, 10 MHz				
Maximum rated output power		At transmitter 50 Ω RF output connector (aggregate power of both RF chains)				43.22 dBm – 3.5 MHz OBW 43.12 dBm – 5 MHz OBW 43.19 dBm – 7 MHz OBW 43.16 dBm – 10 MHz OBW
		EIRP density dBm / 100 kHz (aggregate power of both RF chains) with maximum declared antenna gain				46.75 dBm – 3.5 MHz OBW 45.44 dBm – 5 MHz OBW 44.16 dBm – 7 MHz OBW 42.58 dBm – 10 MHz OBW
Is transmitter output power variable?			No			
		V	Yes		continuous variable	
				V	stepped variable with stepsize	0.5 dB
				minimum RF power		0 dBm
				maximum RF power		43.22 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 Polarized 65° Sector Antenna, Fixed Tilt	Alpha Wireless	AW3007	18 dBi
Dual Polarized 90° Sector Antenna, Fixed Tilt	Alpha Wireless	AW3008	17 dBi

Transmitter aggregate data rate/s, Mbps			
Transmitter 99% power bandwidth	Type of modulation		
	QPSK	16QAM	64QAM
3.5 MHz	4	9	14
5 MHz	7	14	23
7 MHz	8	17	28
10 MHz	13	27	46

Type of multiplexing	OFDMA/TDD
Modulating test signal (baseband)	PRBS
Maximum transmitter duty cycle in normal use	75%

Transmitter power source			
V	DC	Nominal rated voltage	48 VDC via DC power supply

Common power source for transmitter and receiver	V	yes	no

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

7 Transmitter tests according to 47CFR part 27

7.1 Occupied bandwidth test

7.1.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.1.1

Table 7.1.1 Occupied bandwidth limits

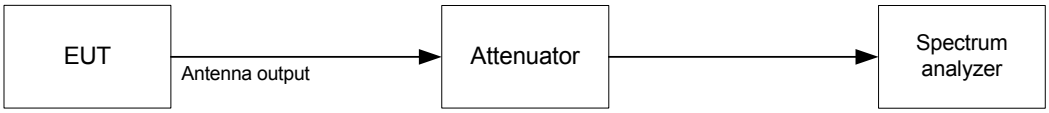
Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, kHz
2500.0 – 2572.0	26	NA

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

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.
7.1.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.
7.1.2.3 The EUT was set to transmit the normally modulated carrier.
7.1.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.1.2 and the associated plots.

Figure 7.1.1 Occupied bandwidth test setup



Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.1.2 Occupied bandwidth test results

DETECTOR USED: Average
RESOLUTION BANDWIDTH: 36 kHz
VIDEO BANDWIDTH: 150 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
EBW: 3.5 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
QPSK 4 Mbps				
2503.000	3348.0	NA	NA	Pass
2533.000	3348.0	NA	NA	Pass
2569.000	3342.0	NA	NA	Pass
64QAM 14 Mbps				
2503.000	3342.0	NA	NA	Pass
2533.000	3342.0	NA	NA	Pass
2569.000	3342.0	NA	NA	Pass

DETECTOR USED: Average
RESOLUTION BANDWIDTH: 51 kHz
VIDEO BANDWIDTH: 300 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 7 Mbps				
2503.000	4719.0	NA	NA	Pass
2533.000	4718.0	NA	NA	Pass
2569.000	4718.0	NA	NA	Pass
64QAM 23 Mbps				
2503.000	4718.0	NA	NA	Pass
2533.000	4717.0	NA	NA	Pass
2569.000	4717.0	NA	NA	Pass

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.1.2 Occupied bandwidth test results (continued)

DETECTOR USED: Average
RESOLUTION BANDWIDTH: 75 kHz
VIDEO BANDWIDTH: 300 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 8 Mbps				
2506.000	6712.0	NA	NA	Pass
2536.000	6711.0	NA	NA	Pass
2566.000	6714.0	NA	NA	Pass
64QAM 28 Mbps				
2506.000	6713.0	NA	NA	Pass
2536.000	6714.0	NA	NA	Pass
2566.000	6714.0	NA	NA	Pass

DETECTOR USED: Average
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 3000 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 13 Mbps				
2506.000	9411.0	NA	NA	Pass
2536.000	9411.0	NA	NA	Pass
2566.000	9411.0	NA	NA	Pass
64QAM 46 Mbps				
2506.000	9373.0	NA	NA	Pass
2536.000	9373.0	NA	NA	Pass
2566.000	9372.0	NA	NA	Pass

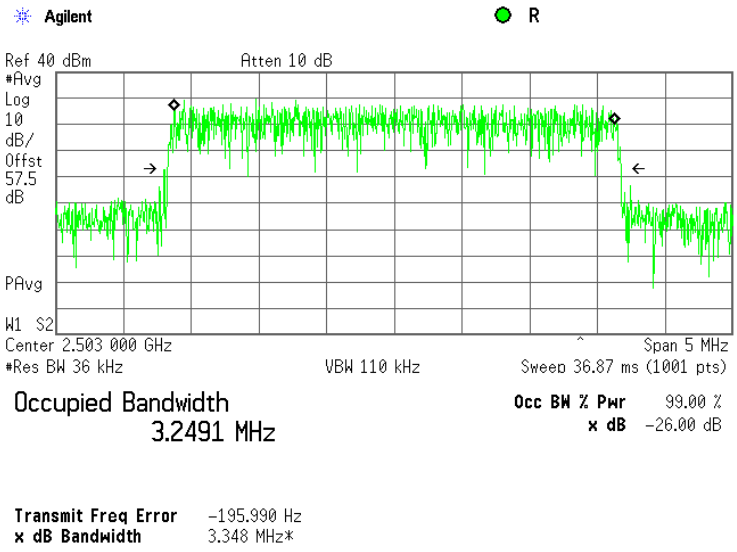
Reference numbers of test equipment used

HL 1906	HL 2013	HL 2953	HL 3301	HL 3302	HL 3472	HL 3474	HL 3818

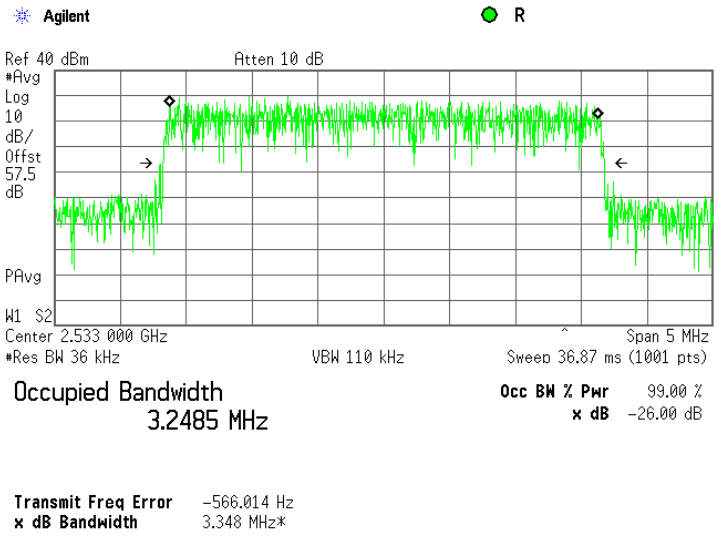
Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.1 Occupied bandwidth test results at low frequency, 3.5 MHz EBW, QPSK

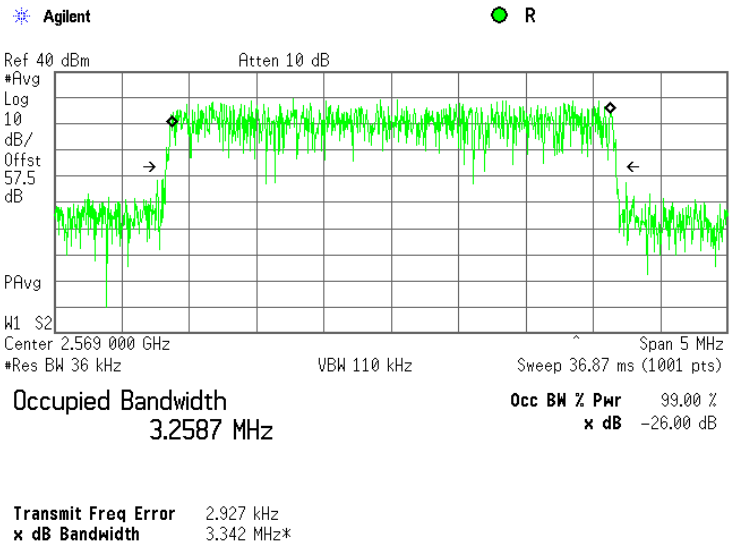


Plot 7.1.2 Occupied bandwidth test results at mid frequency, 3.5 MHz EBW, QPSK

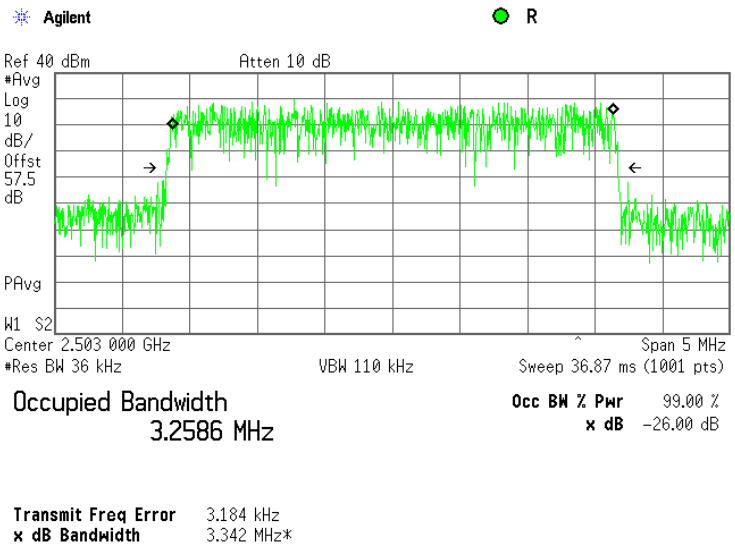


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.3 Occupied bandwidth test results at high frequency, 3.5 MHz EBW, QPSK

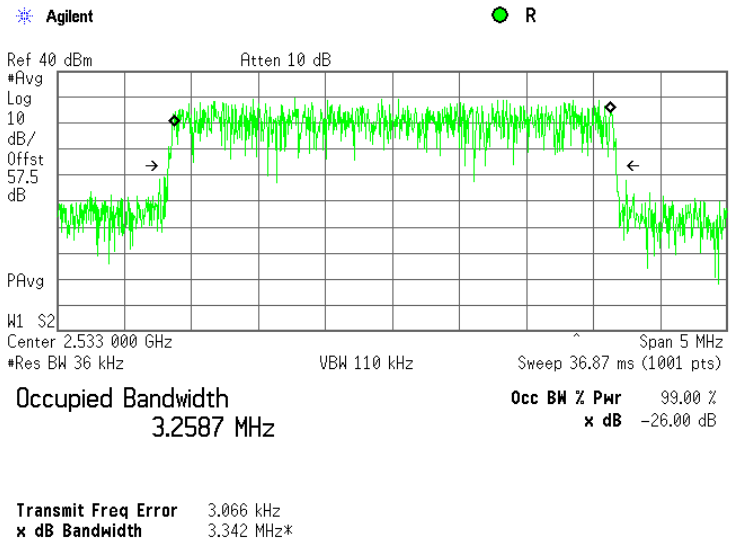


Plot 7.1.4 Occupied bandwidth test results at low frequency, 3.5 MHz EBW, 64QAM

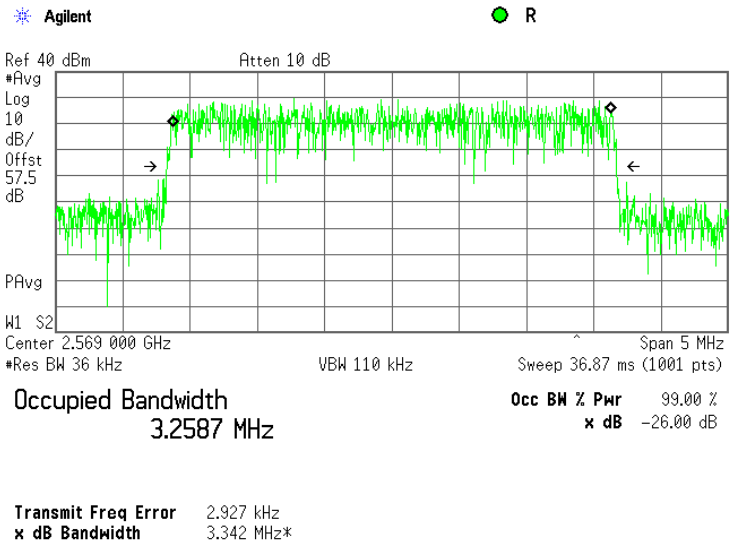


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.5 Occupied bandwidth test results at mid frequency, 3.5 MHz EBW, 64QAM

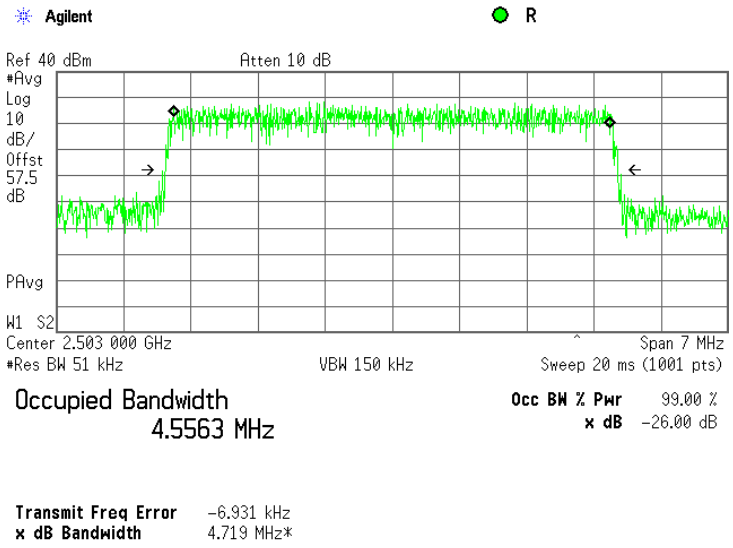


Plot 7.1.6 Occupied bandwidth test results at high frequency, 3.5 MHz EBW, 64QAM

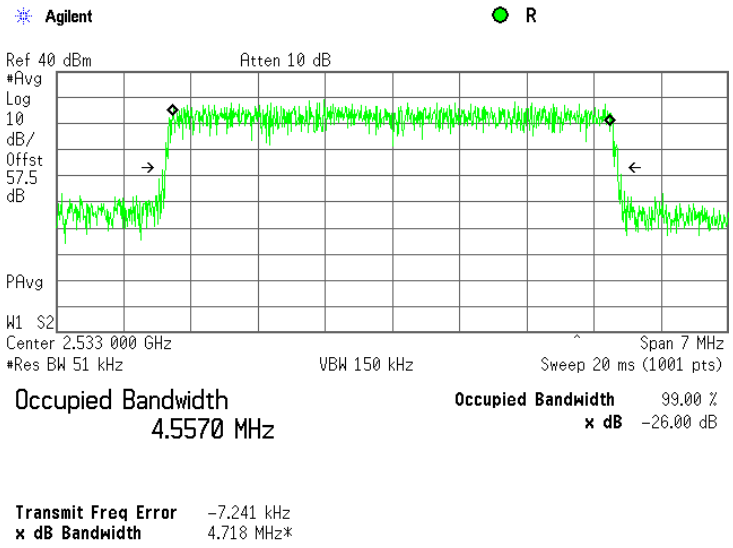


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.7 Occupied bandwidth test results at low frequency, 5 MHz EBW, QPSK

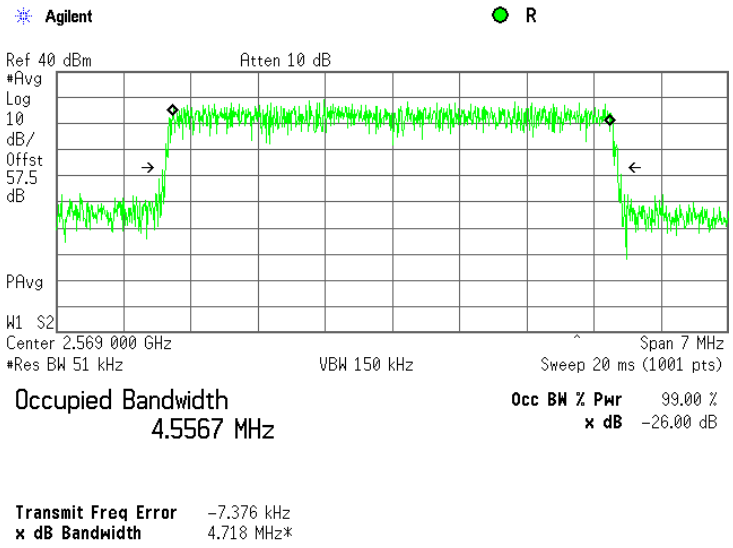


Plot 7.1.8 Occupied bandwidth test results at mid frequency, 5 MHz EBW, QPSK

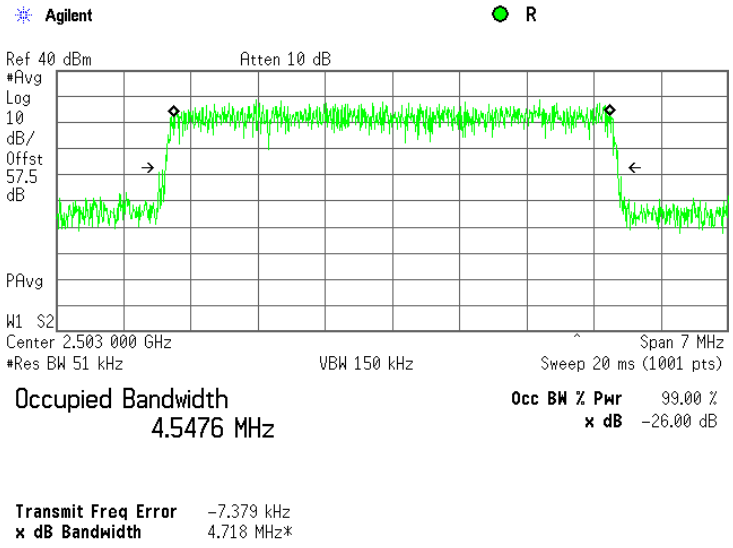


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.9 Occupied bandwidth test results at high frequency, 5 MHz EBW, QPSK

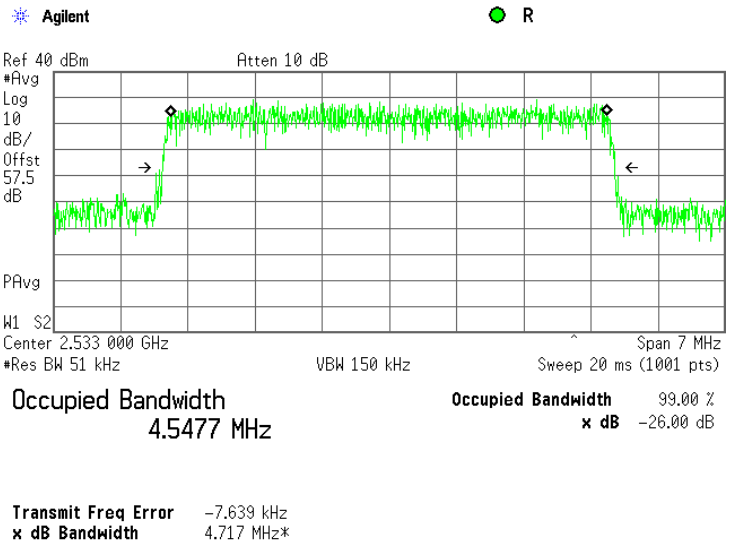


Plot 7.1.10 Occupied bandwidth test results at low frequency, 5 MHz EBW, 64QAM

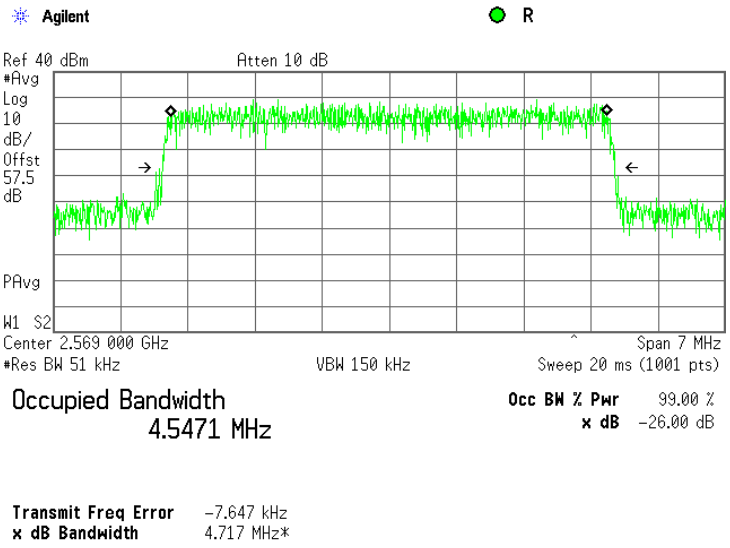


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.11 Occupied bandwidth test results at mid frequency, 5 MHz EBW, 64QAM

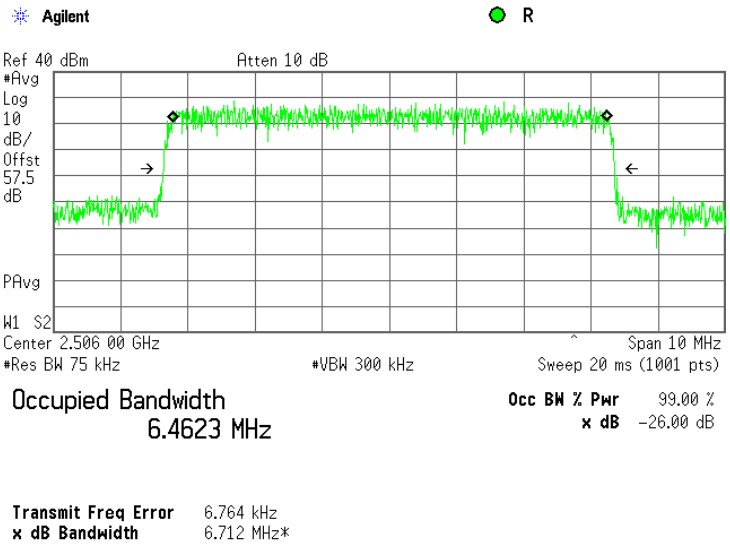


Plot 7.1.12 Occupied bandwidth test results at high frequency, 5 MHz EBW, 64QAM

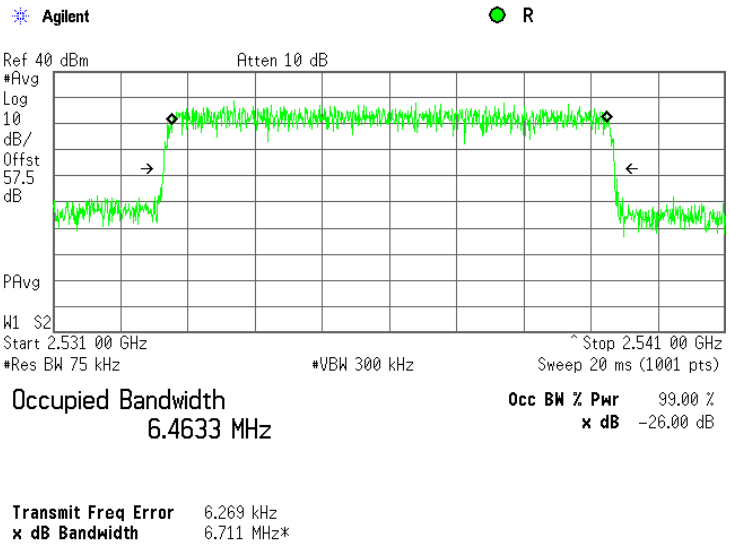


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.13 Occupied bandwidth test results at low frequency, 7 MHz EBW, QPSK

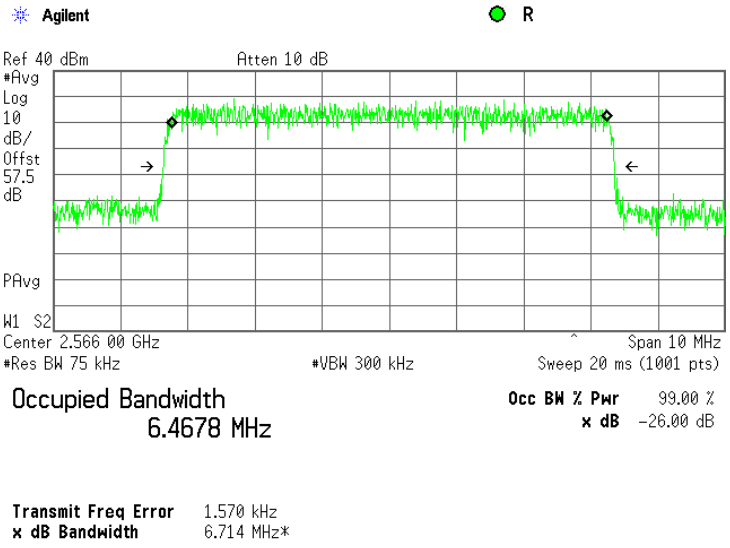


Plot 7.1.14 Occupied bandwidth test results at mid frequency, 7 MHz EBW, QPSK

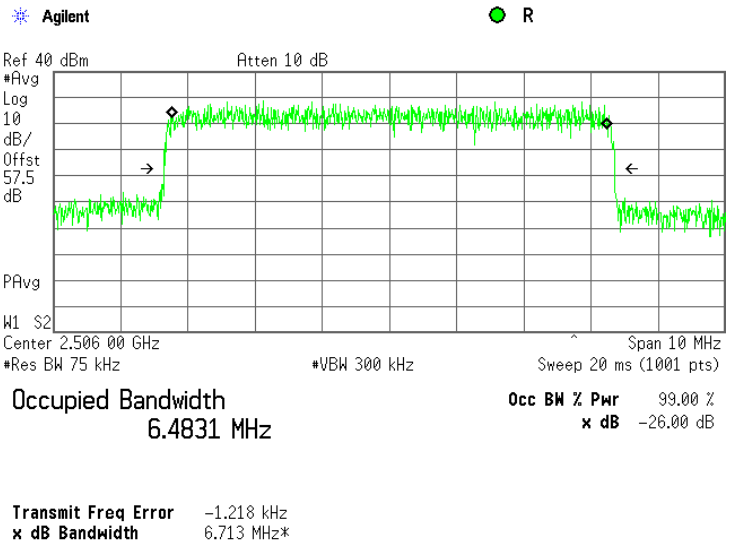


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.15 Occupied bandwidth test results at high frequency, 7 MHz EBW, QPSK

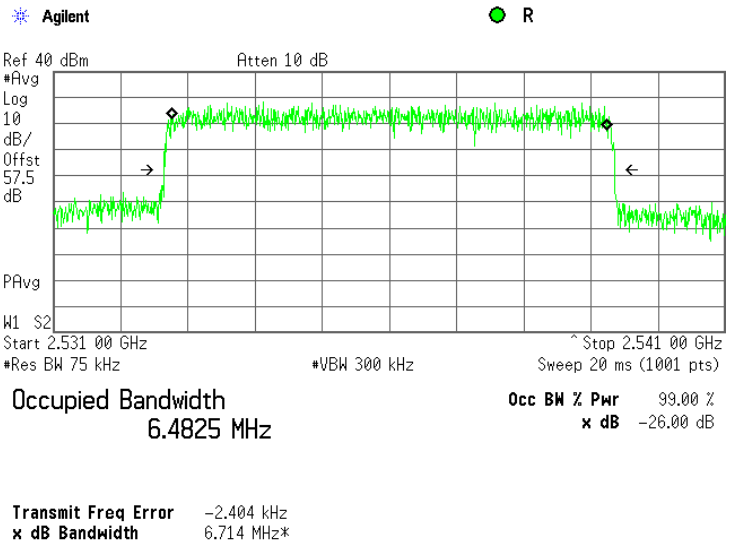


Plot 7.1.16 Occupied bandwidth test results at low frequency, 7 MHz EBW, 64QAM

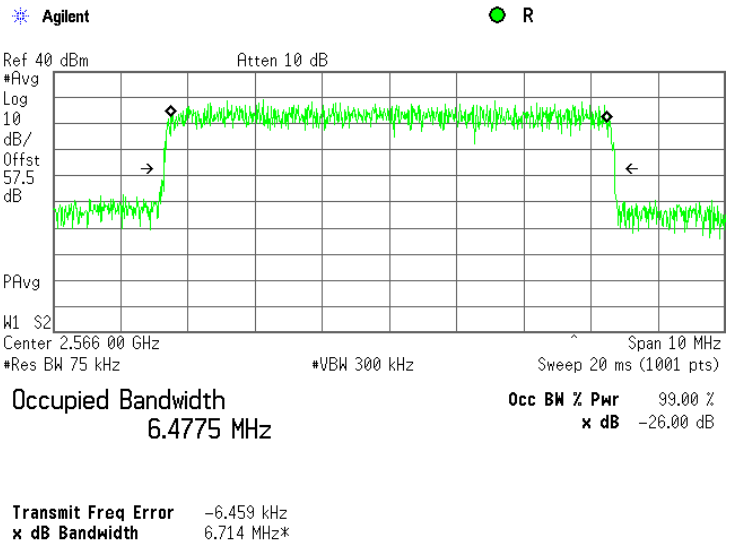


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.17 Occupied bandwidth test results at mid frequency, 7 MHz EBW, 64QAM

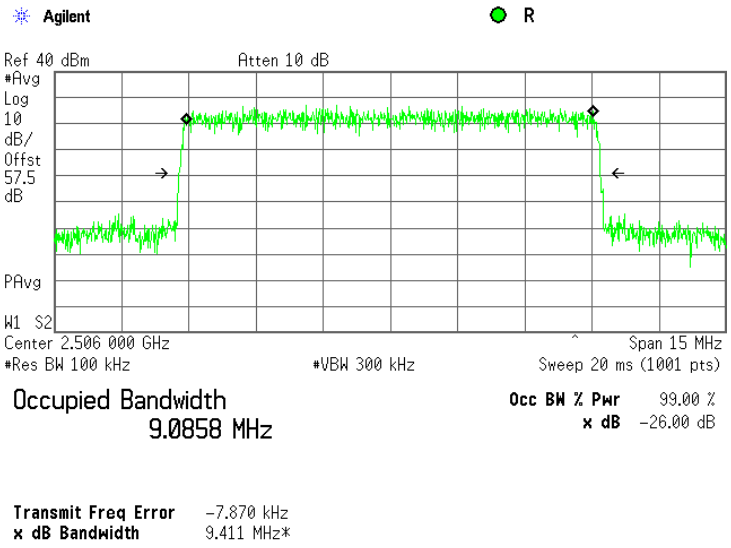


Plot 7.1.18 Occupied bandwidth test results at high frequency, 7 MHz EBW, 64QAM

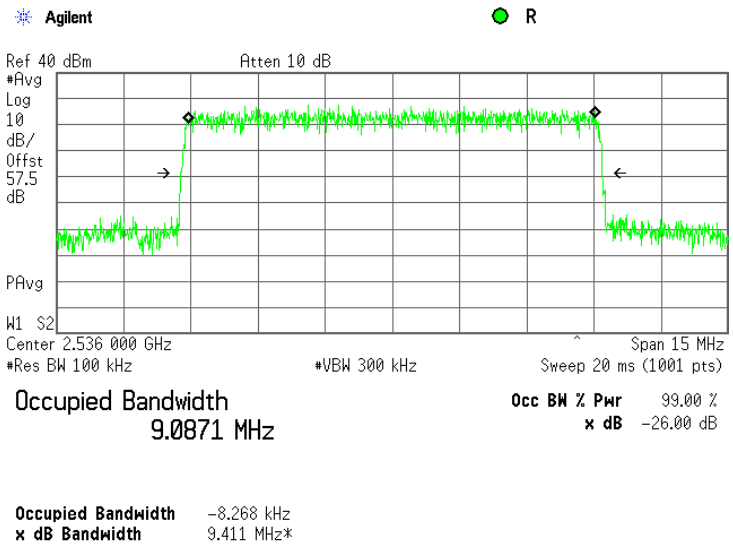


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.19 Occupied bandwidth test results at low frequency, 10 MHz EBW, QPSK

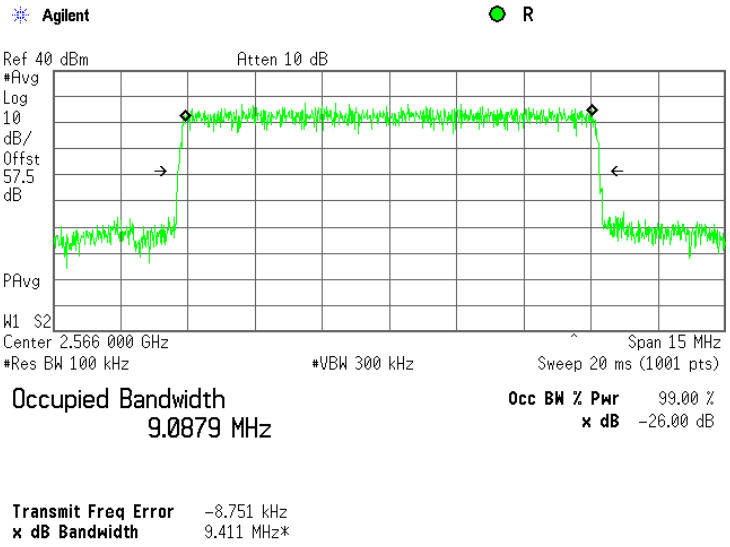


Plot 7.1.20 Occupied bandwidth test results at mid frequency, 10 MHz EBW, QPSK

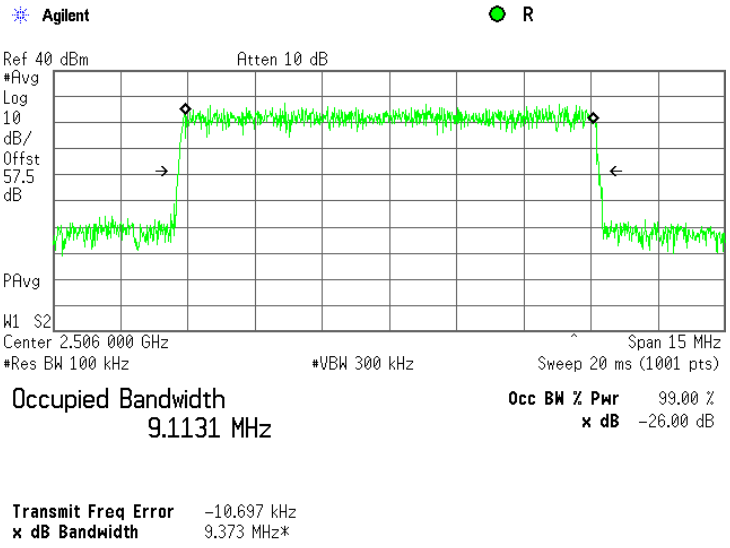


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.21 Occupied bandwidth test results at high frequency, 10 MHz EBW, QPSK

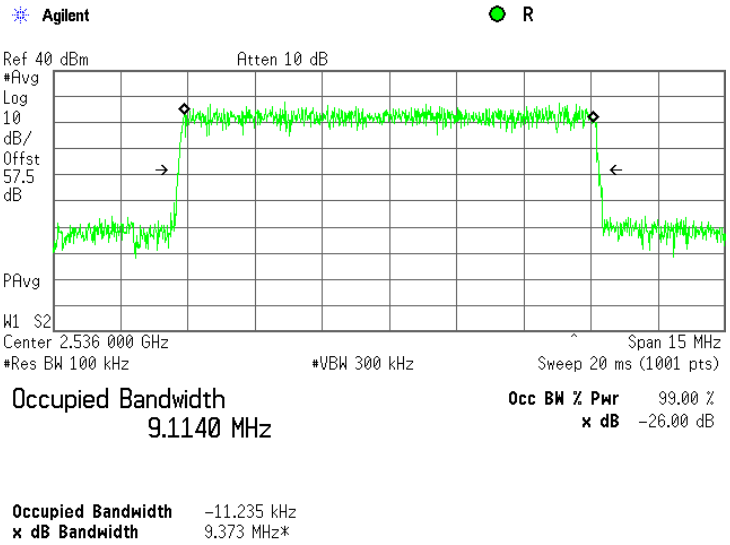


Plot 7.1.22 Occupied bandwidth test results at low frequency, 10 MHz EBW, 64QAM

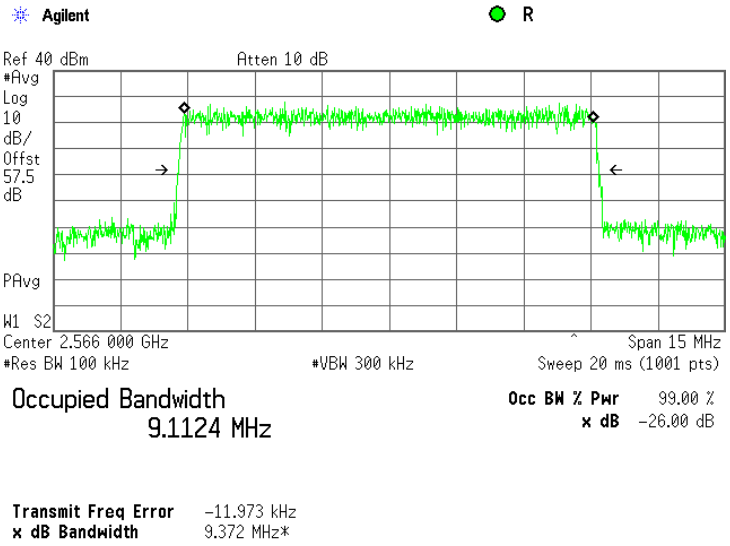


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.3 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.1.23 Occupied bandwidth test results at mid frequency, 10 MHz EBW, 64QAM



Plot 7.1.24 Occupied bandwidth test results at high frequency, 10 MHz EBW, 64QAM



Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

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 dBm
2500.0 – 2572.0	63+10log(X/Y)+10log(360/beamwidth)
	Maximum peak power density dBm/100 kHz
	EIRP+10log(0.1/Y)

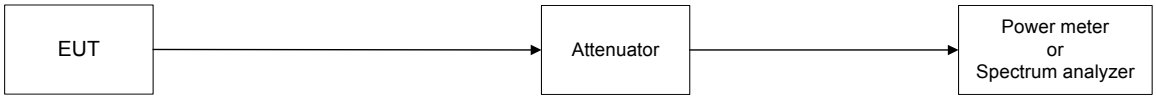
*- X is the actual channel width in MHz, Y is either

1) 6 MHz if prior to transition or the station is in the MBS following transition or
2) 5.5 MHz if the station is in the LBS and UBS following transition, and
3) beamwidth is the total horizontal plane beam width of the individual transmitting antenna for the station or any sector measured at the half-power points.

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 to Table 7.2.5.
7.2.2.4 The power spectral density was measured with spectrum analyzer as provided in Table 7.2.6 to Table 7.2.9 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:	1/25/2011		
Temperature: 23.2 ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 45 %	**Power Supply:** 48VDC
Remarks:			

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DUTY CYCLE: 59%
EBW: 3.5 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
MAXIMUM ANTENNA GAIN: 18 dBi

Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 4 Mbps								
2503.0	40.25	39.44	42.87	18.0	60.87	67.89	-7.02	Pass
2533.0	39.78	39.71	42.76	18.0	60.76	67.89	-7.14	Pass
2569.0	40.34	40.06	43.21	18.0	61.21	67.89	-6.68	Pass
64QAM 14 Mbps								
2503.0	40.27	39.41	42.87	18.0	60.89	67.89	-7.01	Pass
2533.0	39.78	39.71	42.76	18.0	60.76	67.89	-7.14	Pass
2569.0	40.37	40.05	43.22	18.0	61.24	67.89	-6.65	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

MAXIMUM ANTENNA GAIN: 17 dBi

Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 4 Mbps								
2503.0	40.25	39.44	42.87	17.0	59.87	66.48	-6.60	Pass
2533.0	39.78	39.71	42.76	17.0	59.76	66.48	-6.72	Pass
2569.0	40.34	40.06	43.21	17.0	60.21	66.48	-6.27	Pass
64QAM 14 Mbps								
2503.0	40.27	39.41	42.87	17.0	59.89	66.48	-6.59	Pass
2533.0	39.78	39.71	42.76	17.0	59.76	66.48	-6.72	Pass
2569.0	40.37	40.05	43.22	17.0	60.24	66.48	-6.24	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.3 Peak output power test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DUTY CYCLE: 59%
EBW: 5 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
MAXIMUM ANTENNA GAIN: 18 dBi

Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 7 Mbps								
2503.0	40.26	39.58	42.94	18.0	60.94	69.39	-8.44	Pass
2533.0	39.83	40.37	43.12	18.0	61.13	69.39	-8.25	Pass
2569.0	39.79	40.13	42.97	18.0	60.97	69.39	-8.41	Pass
64QAM 23 Mbps								
2503.0	40.27	39.64	42.98	18.0	60.99	69.39	-8.39	Pass
2533.0	39.88	39.84	42.87	18.0	60.87	69.39	-8.51	Pass
2569.0	39.83	40.17	43.01	18.0	61.03	69.39	-8.36	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

MAXIMUM ANTENNA GAIN: 17 dBi

Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 7 Mbps								
2503.0	40.26	39.58	42.94	17.0	59.94	67.98	-8.03	Pass
2533.0	39.83	40.37	43.12	17.0	60.13	67.98	-7.84	Pass
2569.0	39.79	40.13	42.97	17.0	59.97	67.98	-8.00	Pass
64QAM 23 Mbps								
2503.0	40.27	39.64	42.98	17.0	59.99	67.98	-7.98	Pass
2533.0	39.88	39.84	42.87	17.0	59.87	67.98	-8.11	Pass
2569.0	39.83	40.17	43.01	17.0	60.03	67.98	-7.95	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.4 Peak output power test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DUTY CYCLE: 59%
EBW: 7 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
MAXIMUM ANTENNA GAIN: 18 dBi

- Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 8 Mbps								
2506.0	39.92	39.86	42.90	18.0	60.90	67.91	-7.01	Pass
2536.0	40.13	39.45	42.81	18.0	60.83	67.91	-7.08	Pass
2566.0	39.49	39.72	42.62	18.0	60.62	67.91	-7.29	Pass
64QAM 28 Mbps								
2506.0	39.99	39.95	42.98	18.0	61.00	67.91	-6.91	Pass
2536.0	40.17	40.19	43.19	18.0	61.19	67.91	-6.72	Pass
2566.0	40.08	39.81	42.96	18.0	60.97	67.91	-6.93	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

MAXIMUM ANTENNA GAIN: 17 dBi

- Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 8 Mbps								
2506.0	39.92	39.86	42.90	17.0	59.90	66.50	-6.60	Pass
2536.0	40.13	39.45	42.81	17.0	59.83	66.50	-6.67	Pass
2566.0	39.49	39.72	42.62	17.0	59.62	66.50	-6.88	Pass
64QAM 28 Mbps								
2506.0	39.99	39.95	42.98	17.0	60.00	66.50	-6.50	Pass
2536.0	40.17	40.19	43.19	17.0	60.19	66.50	-6.31	Pass
2566.0	40.08	39.81	42.96	17.0	59.97	66.50	-6.53	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.5 Peak output power test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DUTY CYCLE: 59%
EBW: 10 MHz
MAXIMUM ANTENNA GAIN: 18 dBi

- Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 13 Mbps								
2506.0	39.92	39.79	42.87	18.0	60.87	69.36	-8.49	Pass
2536.0	40.13	40.06	43.11	18.0	61.12	69.36	-8.24	Pass
2566.0	40.01	40.29	43.16	18.0	61.16	69.36	-8.19	Pass
64QAM 46 Mbps								
2506.0	39.92	39.75	42.85	18.0	60.86	69.36	-8.50	Pass
2536.0	40.10	40.02	43.07	18.0	61.07	69.36	-8.29	Pass
2566.0	39.98	39.89	42.95	18.0	60.96	69.36	-8.40	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

MAXIMUM ANTENNA GAIN: 17 dBi

- Carrier frequency, MHz	Power Meter reading RF#1, dBm	Power Meter reading RF#2, dBm	Total RF power**, dBm	Antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin, dB	Verdict
QPSK 13 Mbps								
2506.0	39.92	39.79	42.87	17.0	60.00	66.50	-6.50	Pass
2536.0	40.13	40.06	43.11	17.0	60.19	66.50	-6.31	Pass
2566.0	40.01	40.29	43.16	17.0	59.97	66.50	-6.53	Pass
64QAM 46 Mbps								
2506.0	39.92	39.75	42.85	17.0	59.86	67.95	-8.09	Pass
2536.0	40.10	40.02	43.07	17.0	60.07	67.95	-7.88	Pass
2566.0	39.98	39.89	42.95	17.0	59.96	67.95	-7.99	Pass

* - EIRP total, dBm = Total RF power**, dBm + Antenna Gain, dBi
** - Total RF power , dBm = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}

Reference numbers of test equipment used

HL 3001	HL 3002	HL 3768					

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:	1/25/2011		
Temperature: 23.2 ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 45 %	**Power Supply:** 48VDC
Remarks:			

Table 7.2.6 Power spectral density test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average with time-gated function
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 1000 kHz
MODULATING SIGNAL: PRBS
CHANNEL BANDWIDTH: 3.5 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
DUTY CYCLE: 59%
MAXIMUM ANTENNA GAIN: 18 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 4 Mbps								
2503.0	25.06	24.58	27.84	18.0	45.84	50.11	-4.27	Pass
2533.0	25.48	25.36	28.43	18.0	46.43	50.11	-3.68	Pass
2569.0	24.85	26.46	28.74	18.0	46.74	50.11	-3.37	Pass
64QAM 14 Mbps								
2503.0	25.02	24.64	27.84	18.0	45.86	50.11	-4.25	Pass
2533.0	25.47	25.45	28.47	18.0	46.47	50.11	-3.64	Pass
2569.0	24.79	26.50	28.74	18.0	46.75	50.11	-3.36	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

MAXIMUM ANTENNA GAIN: 17 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 4 Mbps								
2503.0	25.06	24.58	27.84	17.0	44.84	48.70	-3.86	Pass
2533.0	25.48	25.36	28.43	17.0	45.43	48.70	-3.27	Pass
2569.0	24.85	26.46	28.74	17.0	45.74	48.70	-2.96	Pass
64QAM 14 Mbps								
2503.0	25.02	24.64	27.84	17.0	44.86	48.70	-3.84	Pass
2533.0	25.47	25.45	28.47	17.0	45.47	48.70	-3.23	Pass
2569.0	24.79	26.50	28.74	17.0	45.75	48.70	-2.94	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.7 Power spectral density test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average with time-gated function
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 1000 kHz
MODULATING SIGNAL: PRBS
CHANNEL BANDWIDTH: 5 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
DUTY CYCLE: 59%
MAXIMUM ANTENNA GAIN: 18 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 7 Mbps								
2503.0	23.49	23.17	26.34	18.0	44.34	51.60	-7.26	Pass
2533.0	23.85	23.01	26.46	18.0	44.48	51.60	-7.13	Pass
2569.0	23.50	24.27	26.91	18.0	44.91	51.60	-6.69	Pass
64QAM 23 Mbps								
2503.0	23.97	23.61	26.80	18.0	44.82	51.60	-6.78	Pass
2533.0	24.27	23.57	26.94	18.0	44.94	51.60	-6.66	Pass
2569.0	24.20	24.62	27.43	18.0	45.44	51.60	-6.16	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

MAXIMUM ANTENNA GAIN: 17 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 7 Mbps								
2503.0	23.49	23.17	26.34	17.0	43.34	50.20	-6.85	Pass
2533.0	23.85	23.01	26.46	17.0	43.48	50.19	-6.72	Pass
2569.0	23.50	24.27	26.91	17.0	43.91	50.19	-6.28	Pass
64QAM 23 Mbps								
2503.0	23.97	23.61	26.80	17.0	43.82	50.20	-6.38	Pass
2533.0	24.27	23.57	26.94	17.0	43.94	50.19	-6.25	Pass
2569.0	24.20	24.62	27.43	17.0	44.44	50.19	-5.75	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

Test specification:	**Section 27.50(h), Peak output power**		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 45 %	**Power Supply:** 48VDC
Remarks:			

Table 7.2.8 Power spectral density test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average with time-gated function
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 1000 kHz
MODULATING SIGNAL: PRBS
CHANNEL BANDWIDTH: 7 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
DUTY CYCLE: 59%
MAXIMUM ANTENNA GAIN: 18 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 8 Mbps								
2506.0	22.27	21.43	24.88	18.00	42.88	47.11	-4.23	Pass
2536.0	22.05	22.09	25.08	18.00	43.10	47.11	-4.02	Pass
2566.0	22.01	22.93	25.50	18.00	43.50	47.12	-3.61	Pass
64QAM 28 Mbps								
2506.0	22.85	21.97	25.44	18.00	43.46	47.11	-3.66	Pass
2536.0	22.64	22.77	25.72	18.00	43.72	47.11	-3.40	Pass
2566.0	22.61	23.61	26.15	18.00	44.16	47.12	-2.95	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

MAXIMUM ANTENNA GAIN: 17 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 8 Mbps								
2506.0	22.27	21.43	24.88	17.0	41.88	45.71	-3.82	Pass
2536.0	22.05	22.09	25.08	17.0	42.10	45.70	-3.61	Pass
2566.0	22.01	22.93	25.50	17.0	42.50	45.71	-3.20	Pass
64QAM 28 Mbps								
2506.0	22.85	21.97	25.44	17.0	42.46	45.71	-3.25	Pass
2536.0	22.64	22.77	25.72	17.0	42.72	45.70	-2.99	Pass
2566.0	22.61	23.61	26.15	17.0	43.16	45.71	-2.54	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

Test specification:	**Section 27.50(h), Peak output power**		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 45 %	**Power Supply:** 48VDC
Remarks:			

Table 7.2.9 Power spectral density test results

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
DETECTOR USED: Average with time-gated function
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATING SIGNAL: PRBS
CHANNEL BANDWIDTH: 10 MHz
TRANSMITTER OUTPUT POWER SETTINGS: 40 dBm
DUTY CYCLE: 59%
MAXIMUM ANTENNA GAIN: 18 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 14 Mbps								
2506.0	21.29	20.53	23.94	18.00	41.94	48.57	-6.63	Pass
2536.0	21.54	20.46	24.04	18.00	42.06	48.57	-6.51	Pass
2566.0	21.00	21.22	24.12	18.00	42.12	48.56	-6.44	Pass
64QAM 46 Mbps								
2506.0	21.65	20.84	24.27	18.00	42.29	48.57	-6.28	Pass
2536.0	21.87	20.93	24.44	18.00	42.44	48.57	-6.13	Pass
2566.0	21.33	21.76	24.56	18.00	42.58	48.56	-5.99	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

MAXIMUM ANTENNA GAIN: 17 dBi

- Carrier frequency, MHz	SA reading, RF #1 dBm/100kHz	SA reading, RF #2 dBm/100kHz	SA reading PSD**, dBm/100kHz	Antenna gain, dBi	Total PSD*, dBm/100kHz	Limit***, dBm	Margin, dB	Verdict
QPSK 14 Mbps								
2506.0	21.29	20.53	23.94	17.0	40.94	47.16	-6.22	Pass
2536.0	21.54	20.46	24.04	17.0	41.06	47.16	-6.10	Pass
2566.0	21.00	21.22	24.12	17.0	41.12	47.16	-6.03	Pass
64QAM 46 Mbps								
2506.0	21.65	20.84	24.27	17.0	41.29	47.16	-5.87	Pass
2536.0	21.87	20.93	24.44	17.0	41.44	47.16	-5.72	Pass
2566.0	21.33	21.76	24.56	17.0	41.58	47.16	-5.58	Pass

* - Total PSD, dBm/100kHz = SA reading***, dBm/100kHz + Antenna Gain, dBi
** - SA reading, dBm/100kHz = 10 log{10^[P(dBm,RF#1)/10]+ 10^([P(dBm, RF#2)/10]}
*** - See table 1.1.12

Reference numbers of test equipment used

HL 2953	HL 3437	HL 3442	HL 3818				

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:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.10 Post transition frequency channels assignment

Channel	Channel BW, MHz	Peak power limit, dBm	Power density limit, dBm/100kHz
3.5 MHz Single Channel			
2503.0 MHz: EBS Ch. A1	3342.0	63+10log(OBW/6.0)+10log(360/beamwidth)	EIRP+10log(0.1/6.0)
2533.0 MHz: EBS Ch. B3	3342.0	63+10log(OBW/6.0)+10log(360/beamwidth)	EIRP+10log(0.1/6.0)
2569.0 MHz: EBS Ch. D2	3342.0	63+10log(OBW/6.0)+10log(360/beamwidth)	EIRP+10log(0.1/6.0)
5 MHz Single Channel			
2503.0 MHz: EBS Ch. A1	4718.0	63+10log(OBW/6.0)+10log(360/beamwidth)	EIRP+10log(0.1/6.0)
2533.0 MHz: EBS Ch. B3	4717.0	63+10log(OBW/6.0)+10log(360/beamwidth)	EIRP+10log(0.1/6.0)
2569.0 MHz: EBS Ch. D2	4717.0	63+10log(OBW/6.0)+10log(360/beamwidth)	EIRP+10log(0.1/6.0)
7 MHz Dual Channel			
2506.0 MHz: EBS Ch. A1+ EBS Ch. B1	6712.0	63+10log(OBW/12.0)+10log(360/beamwidth)	EIRP+10log(0.1/12.0)
2536.0 MHz EBS Ch. B3+ EBS Ch. A4	6711.0	63+10log(OBW/12.0)+10log(360/beamwidth)	EIRP+10log(0.1/12.0)
2566.0 MHz EBS Ch. C2+ EBS Ch. D2	6714.0	63+10log(OBW/12.0)+10log(360/beamwidth)	EIRP+10log(0.1/12.0)
10 MHz Dual Channel			
2506.0 MHz: EBS Ch. A1+ EBS Ch. B1	9373.0	63+10log(OBW/12.0)+10log(360/beamwidth)	EIRP+10log(0.1/12.0)
2536.0 MHz EBS Ch. B3+ EBS Ch. A4	9373.0	63+10log(OBW/12.0)+10log(360/beamwidth)	EIRP+10log(0.1/12.0)
2566.0 MHz EBS Ch. C2+ EBS Ch. D2	9372.0	63+10log(OBW/12.0)+10log(360/beamwidth)	EIRP+10log(0.1/12.0)

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.11 EIRP limits

Channel	Channel BW, MHz	Peak power limit, dBm	
		17 dBi, 90º beamwidth	18 dBi, 65º beamwidth
3.5 MHz Single Channel			
2503.0 MHz: EBS Ch. A1	6.0	66.48	67.89
2533.0 MHz: EBS Ch. B3	6.0	66.48	67.89
2569.0 MHz: EBS Ch. D2	6.0	66.48	67.89
5 MHz Single Channel			
2503.0 MHz: EBS Ch. A1	6.0	67.98	69.39
2533.0 MHz: EBS Ch. B3	6.0	67.98	69.39
2569.0 MHz: EBS Ch. D2	6.0	67.98	69.39
7 MHz Dual Channel			
2506.0 MHz: EBS Ch. A1+ EBS Ch. B1	12.0	66.50	67.91
2536.0 MHz EBS Ch. B3+ EBS Ch. A4	12.0	66.50	67.91
2566.0 MHz EBS Ch. C2+ EBS Ch. D2	12.0	66.50	67.91
10 MHz Dual Channel			
2506.0 MHz: EBS Ch. A1+ EBS Ch. B1	12.0	67.95	69.36
2536.0 MHz EBS Ch. B3+ EBS Ch. A4	12.0	67.95	69.36
2566.0 MHz EBS Ch. C2+ EBS Ch. D2	12.0	67.95	69.36

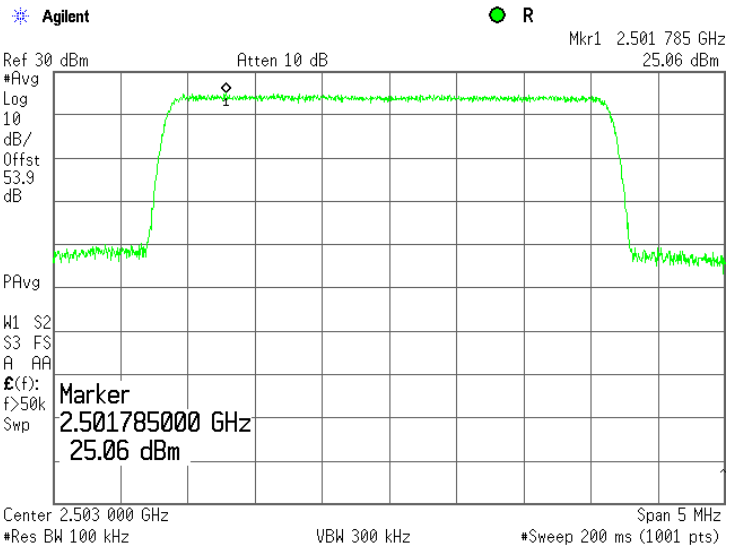
Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Table 7.2.12 Peak power density limits

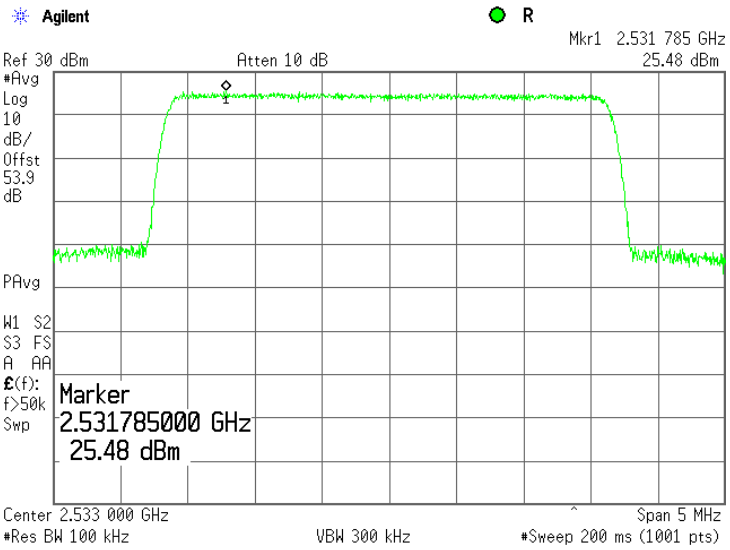
Channel	Channel BW, MHz	Peak power density, dBm/100kHz	
		17 dBi, 90º beamwidth	18 dBi, 65º beamwidth
3.5 MHz Single Channel			
2503.0 MHz: EBS Ch. A1	6.0	48.70	50.11
2533.0 MHz: EBS Ch. B3	6.0	48.70	50.11
2569.0 MHz: EBS Ch. D2	6.0	48.70	50.11
5 MHz Single Channel			
2503.0 MHz: EBS Ch. A1	6.0	50.20	51.60
2533.0 MHz: EBS Ch. B3	6.0	50.19	51.60
2569.0 MHz: EBS Ch. D2	6.0	50.19	51.60
7 MHz Dual Channel			
2506.0 MHz: EBS Ch. A1+ EBS Ch. B1	12.0	45.71	47.11
2536.0 MHz EBS Ch. B3+ EBS Ch. A4	12.0	45.70	47.11
2566.0 MHz EBS Ch. C2+ EBS Ch. D2	12.0	45.71	47.12
10 MHz Dual Channel			
2506.0 MHz: EBS Ch. A1+ EBS Ch. B1	12.0	47.16	48.57
2536.0 MHz EBS Ch. B3+ EBS Ch. A4	12.0	47.16	48.57
2566.0 MHz EBS Ch. C2+ EBS Ch. D2	12.0	47.16	48.56

Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.1 Power spectral density test results at low frequency, QPSK, 3.5 MHz EBW, Antenna 1

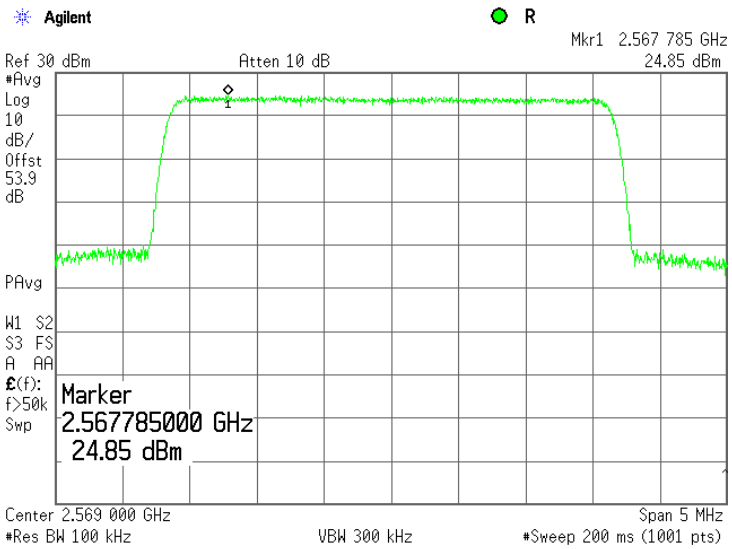


Plot 7.2.2 Power spectral density test results at mid frequency, QPSK, 3.5 MHz EBW, Antenna 1

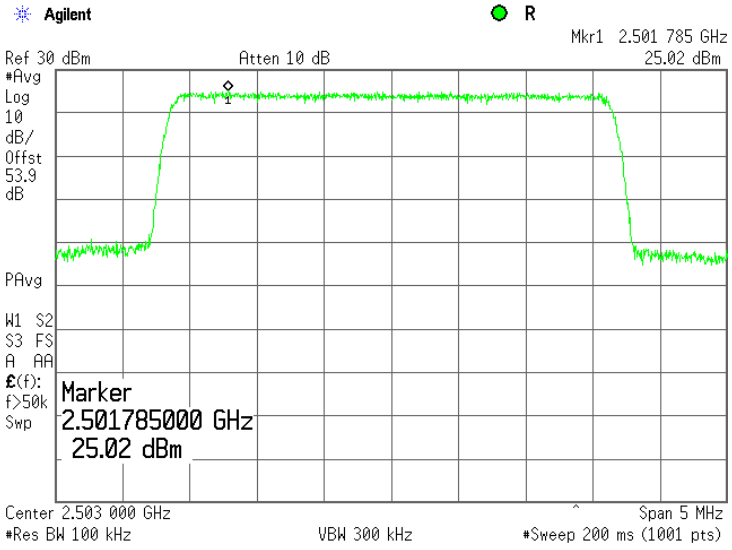


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.3 Power spectral density test results at high frequency, QPSK, 3.5 MHz EBW, Antenna 1

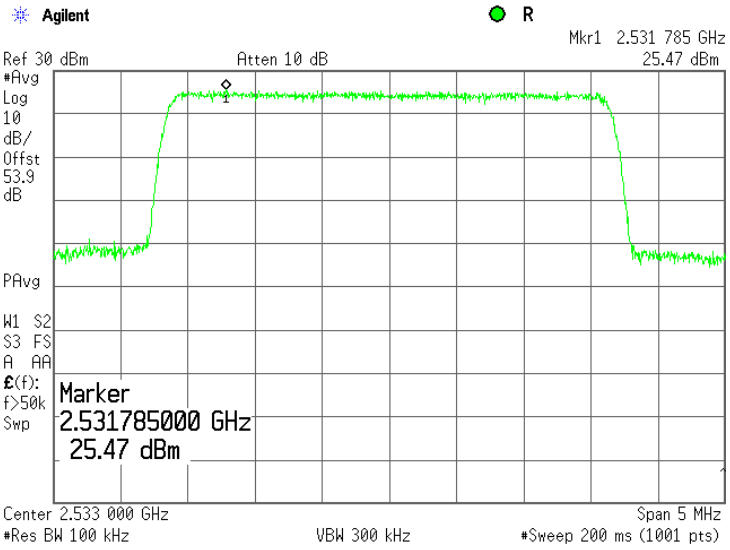


Plot 7.2.4 Power spectral density test results at low frequency, 64QAM, 3.5 MHz EBW, Antenna 1

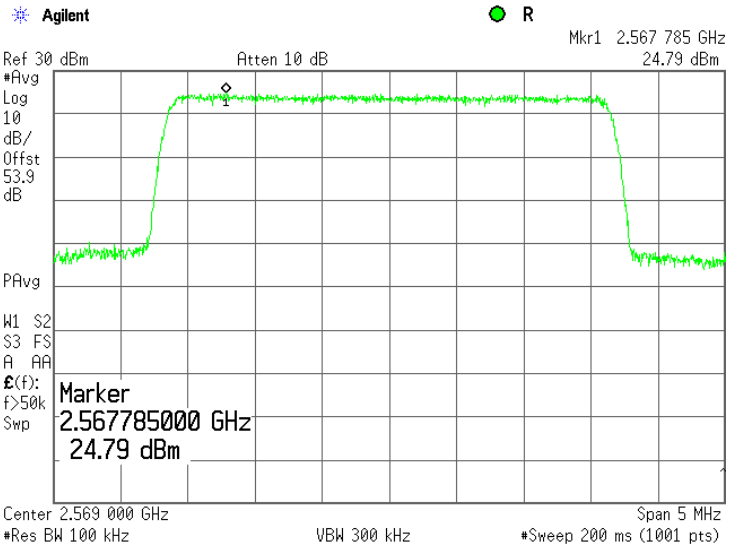


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.5 Power spectral density test results at mid frequency, 64QAM, 3.5 MHz EBW, Antenna 1

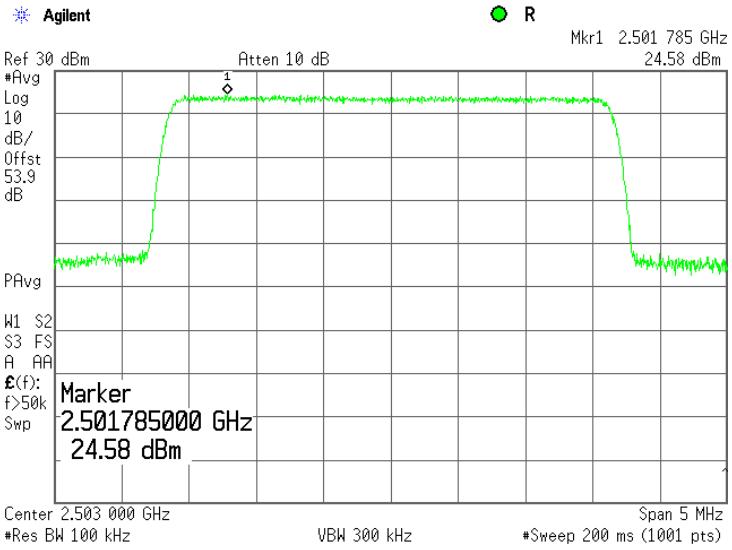


Plot 7.2.6 Power spectral density test results at high frequency, 64QAM, 3.5 MHz EBW, Antenna 1

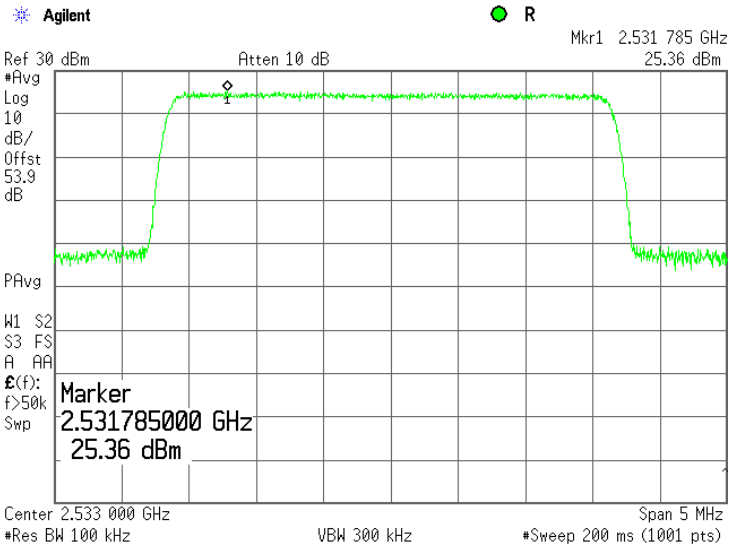


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.7 Power spectral density test results at low frequency, QPSK, 3.5 MHz EBW, Antenna 2

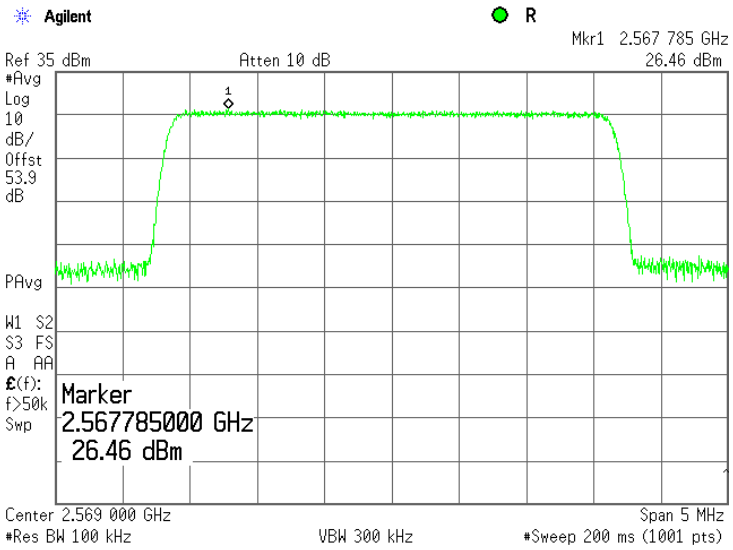


Plot 7.2.8 Power spectral density test results at mid frequency, QPSK, 3.5 MHz EBW, Antenna 2

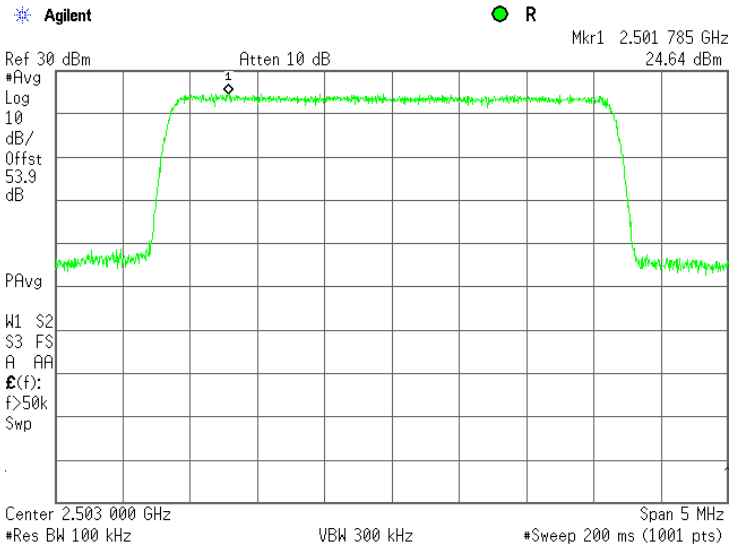


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.9 Power spectral density test results at high frequency, QPSK, 3.5 MHz EBW, Antenna 2

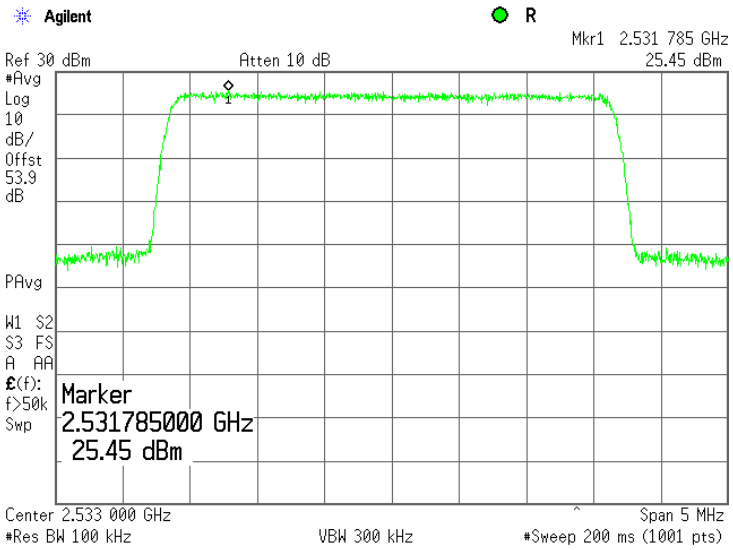


Plot 7.2.10 Power spectral density test results at low frequency, 64QAM, 3.5 MHz EBW, Antenna 2

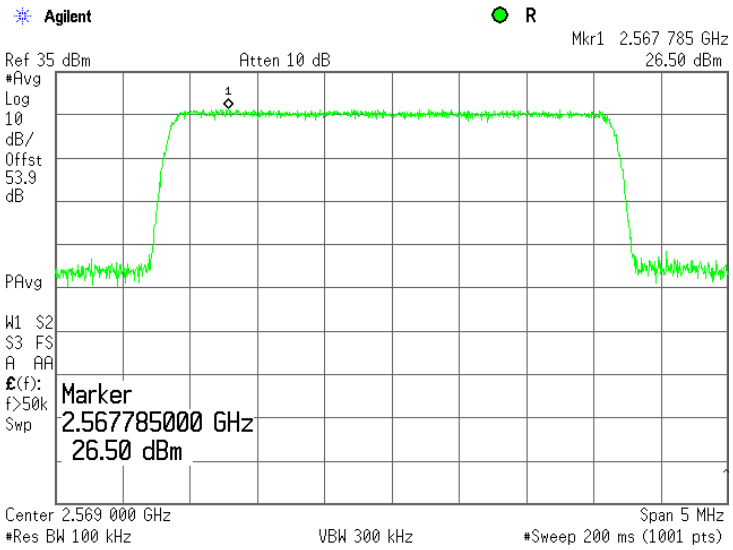


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.11 Power spectral density test results at mid frequency, 64QAM, 3.5 MHz EBW, Antenna 2

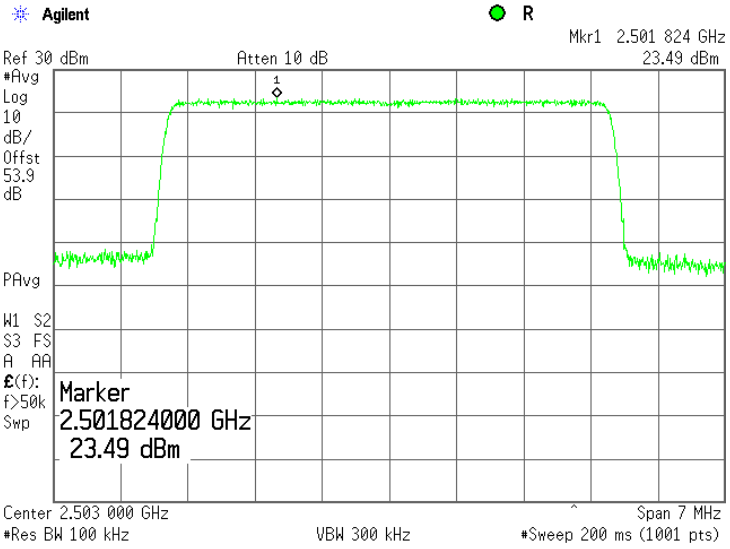


Plot 7.2.12 Power spectral density test results at high frequency, 64QAM, 3.5 MHz EBW, Antenna 2

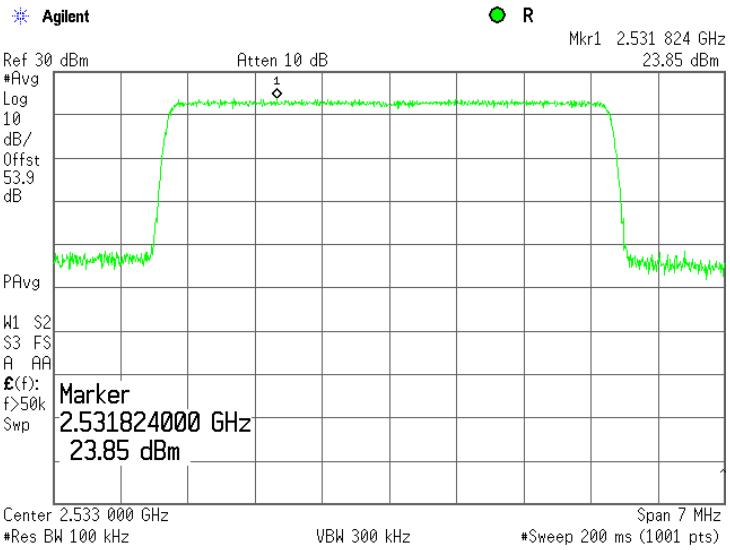


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.13 Power spectral density test results at low frequency, QPSK, 5 MHz EBW, Antenna 1

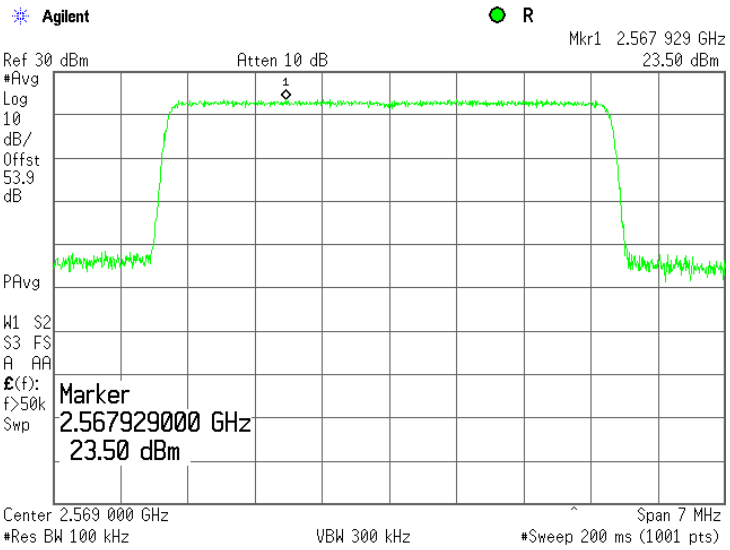


Plot 7.2.14 Power spectral density test results at mid frequency, QPSK, 5 MHz EBW, Antenna 1

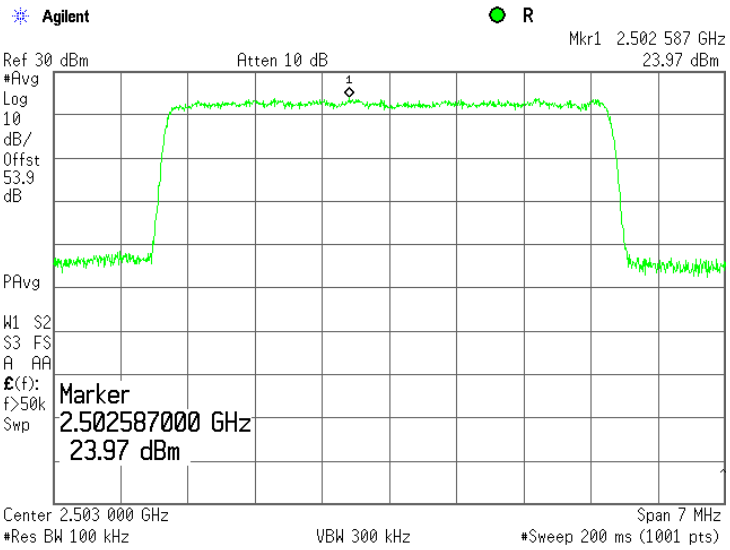


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.15 Power spectral density test results at high frequency, QPSK, 5 MHz EBW, Antenna 1

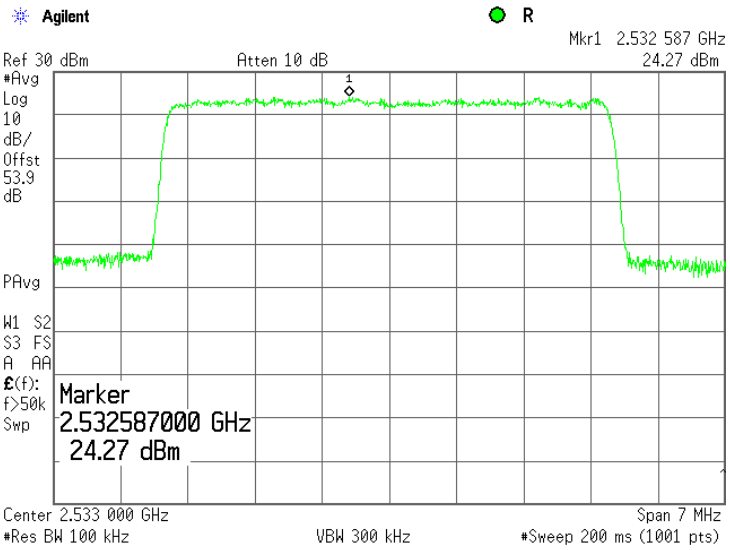


Plot 7.2.16 Power spectral density test results at low frequency, 64QAM, 5 MHz EBW, Antenna 1

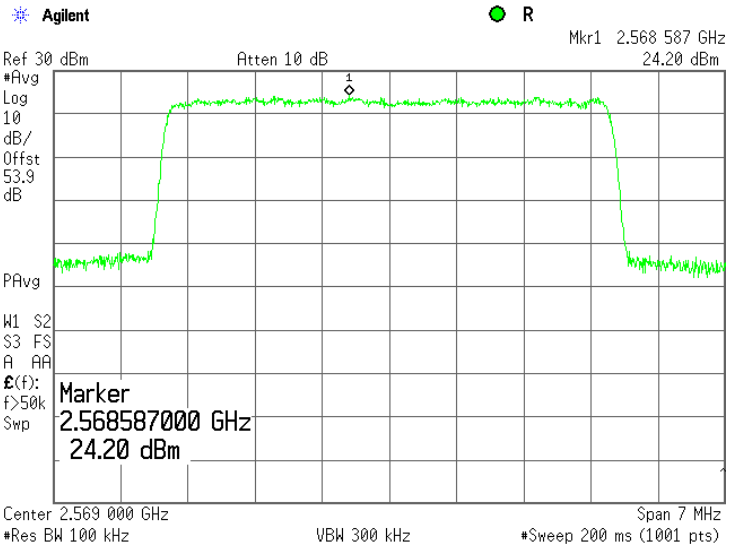


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.17 Power spectral density test results at mid frequency, 64QAM, 5 MHz EBW, Antenna 1

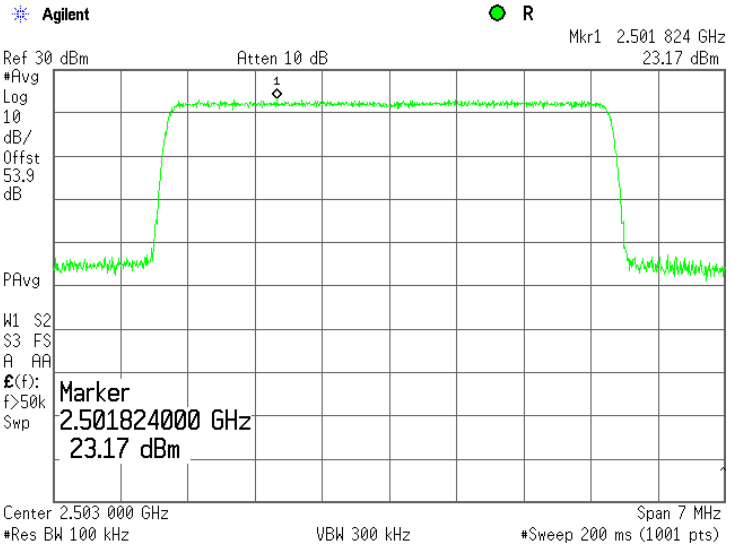


Plot 7.2.18 Power spectral density test results at high frequency, 64QAM, 5 MHz EBW, Antenna 1

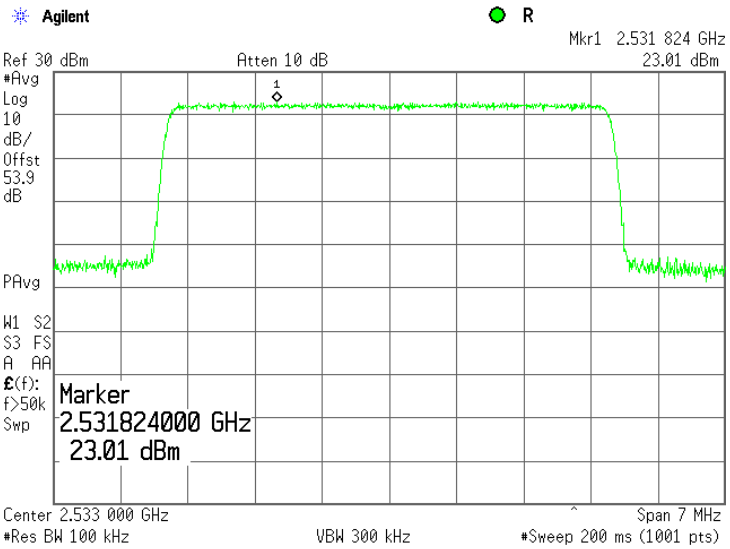


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.19 Power spectral density test results at low frequency, QPSK, 5 MHz EBW, Antenna 2

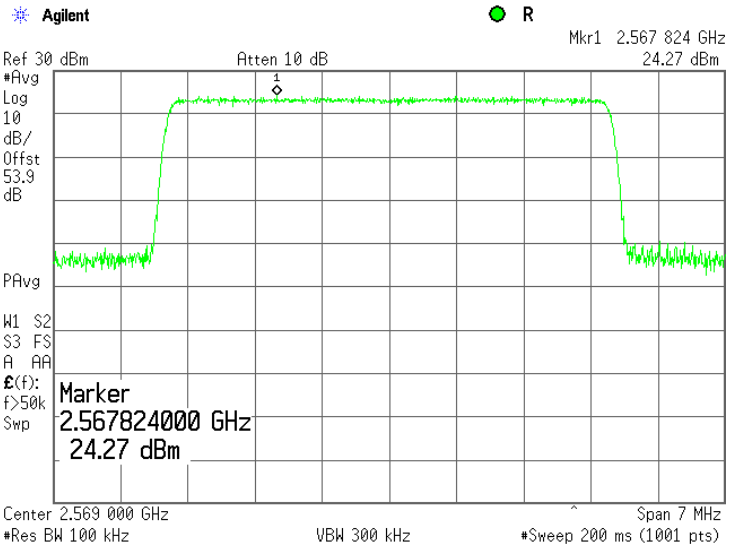


Plot 7.2.20 Power spectral density test results at mid frequency, QPSK, 5 MHz EBW, Antenna 2

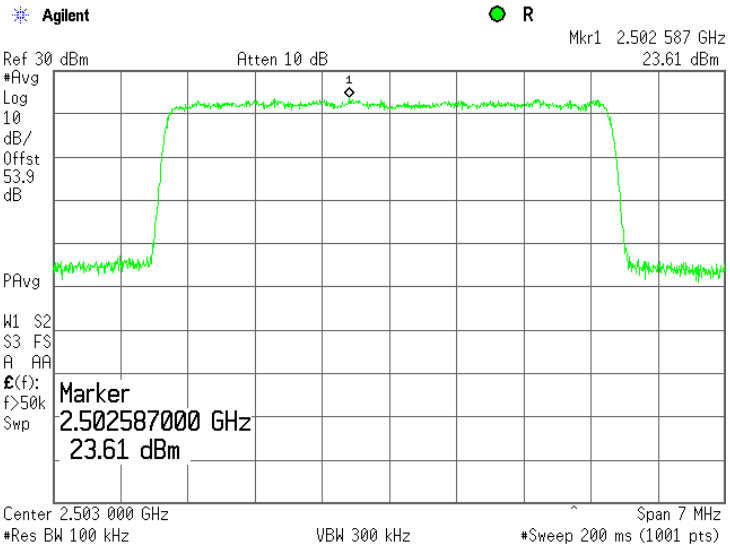


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.21 Power spectral density test results at high frequency, QPSK, 5 MHz EBW, Antenna 2

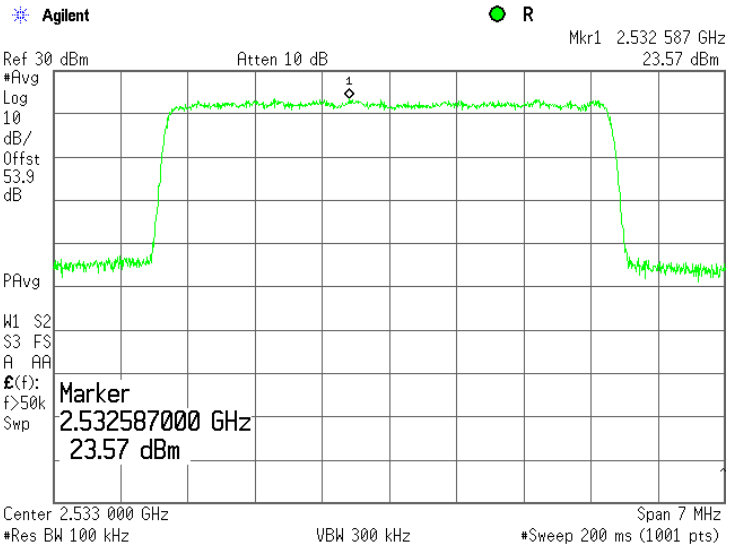


Plot 7.2.22 Power spectral density test results at low frequency, 64QAM, 5 MHz EBW, Antenna 2

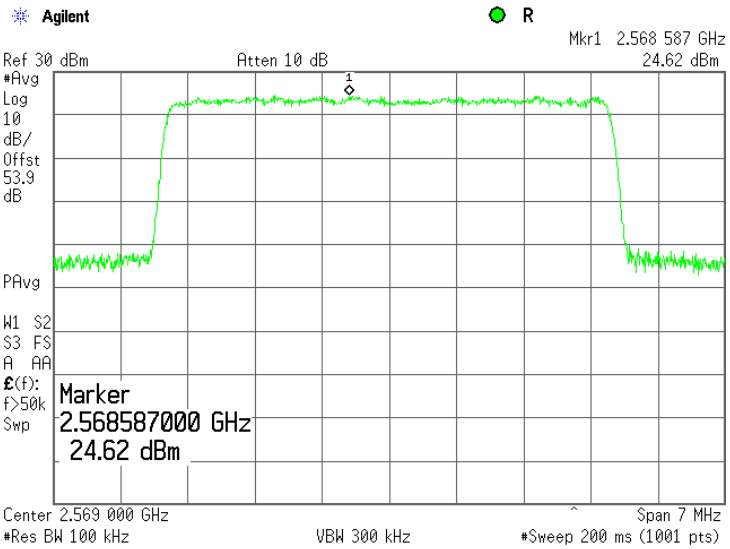


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.23 Power spectral density test results at mid frequency, 64QAM, 5 MHz EBW, Antenna 2

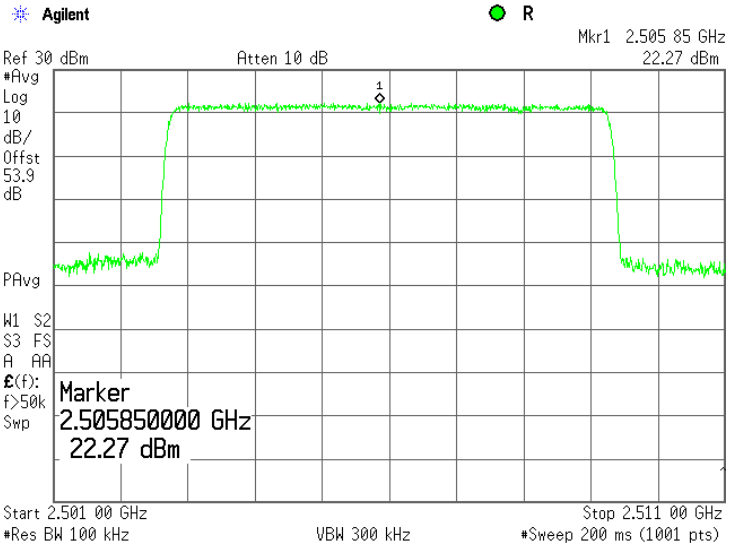


Plot 7.2.24 Power spectral density test results at high frequency, 64QAM, 5 MHz EBW, Antenna 2

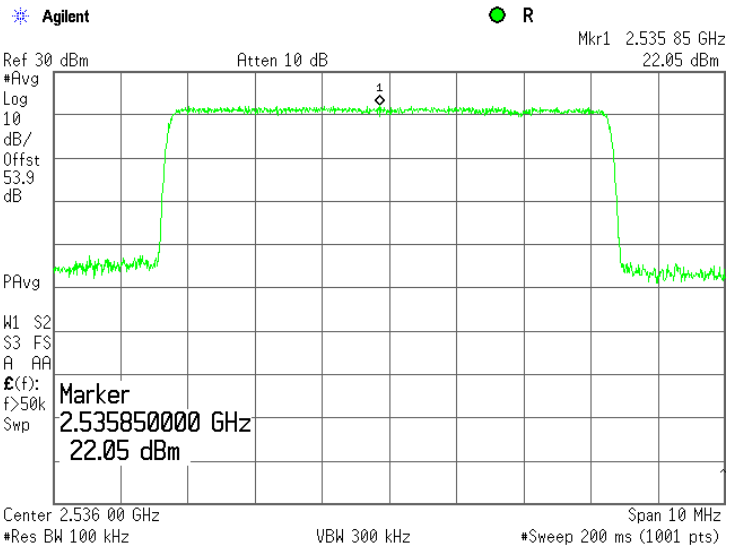


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.25 Power spectral density test results at low frequency, QPSK, 7 MHz EBW, Antenna 1

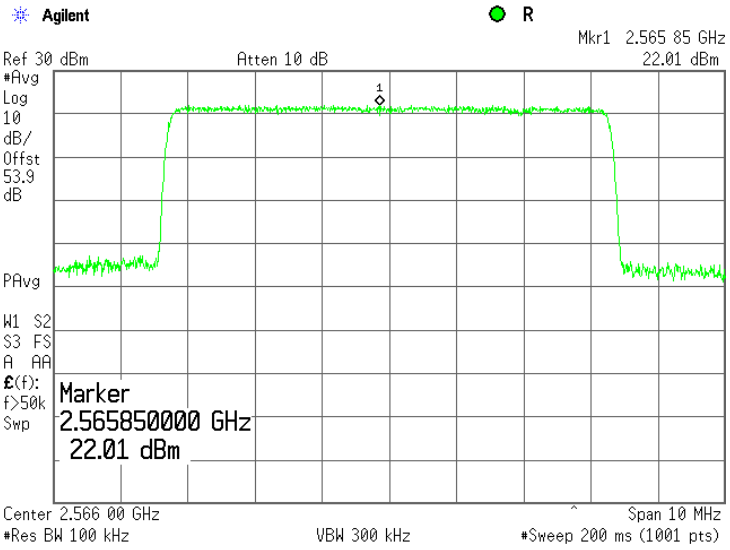


Plot 7.2.26 Power spectral density test results at mid frequency, QPSK, 7 MHz EBW, Antenna 1

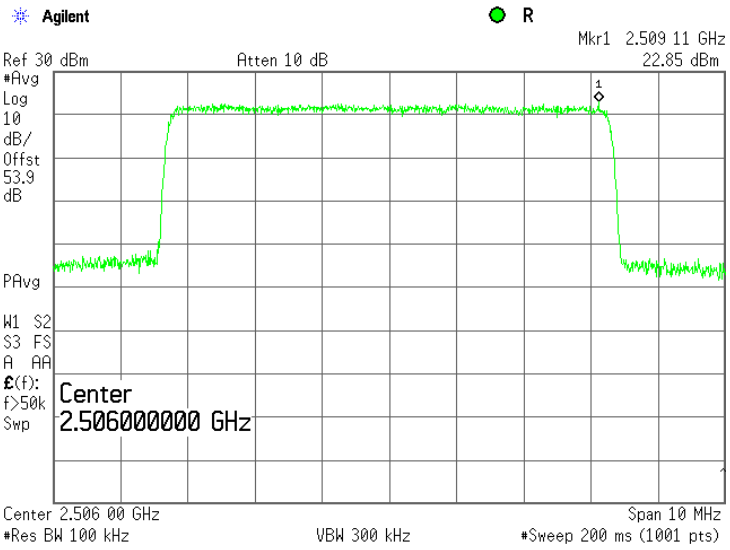


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.27 Power spectral density test results at high frequency, QPSK, 7 MHz EBW, Antenna 1

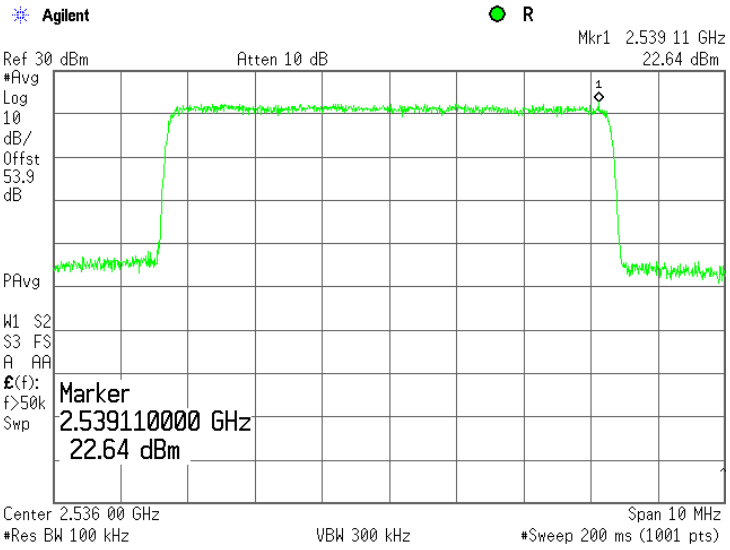


Plot 7.2.28 Power spectral density test results at low frequency, 64QAM, 7 MHz EBW, Antenna 1

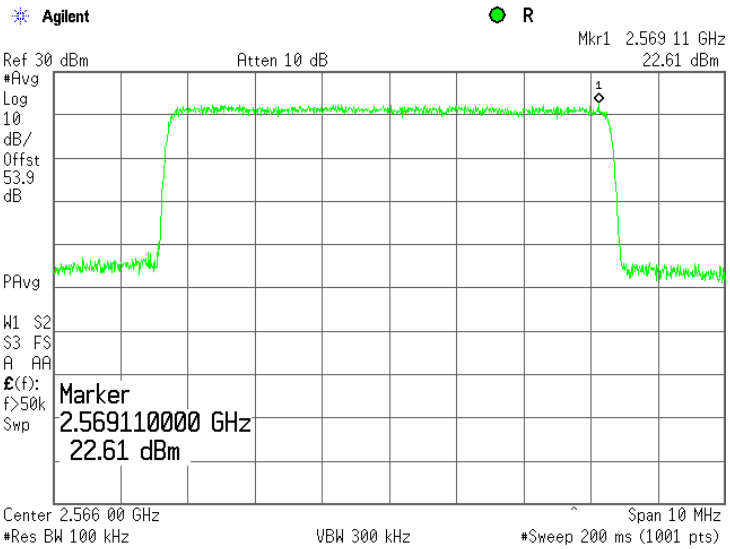


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.29 Power spectral density test results at mid frequency, 64QAM, 7 MHz EBW, Antenna 1

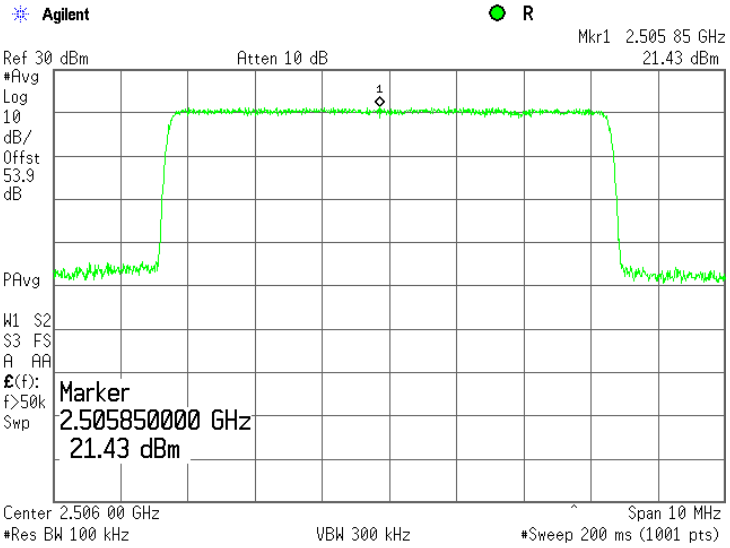


Plot 7.2.30 Power spectral density test results at high frequency, 64QAM, 7 MHz EBW, Antenna 1

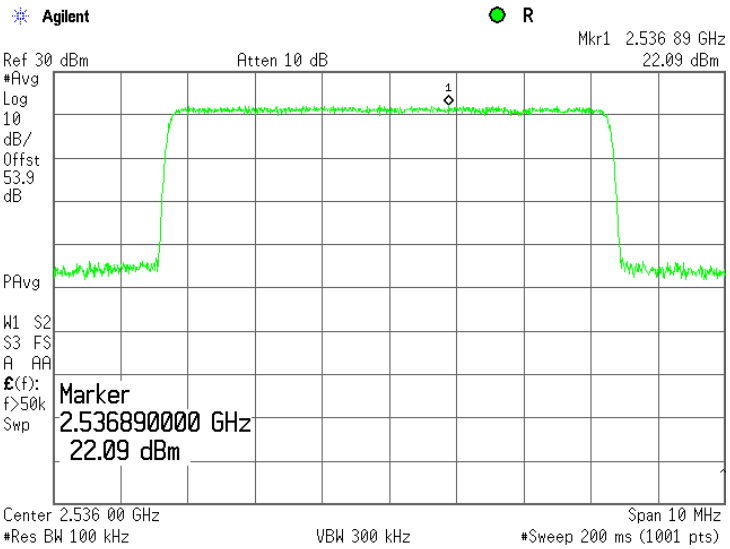


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.31 Power spectral density test results at low frequency, QPSK, 7 MHz EBW, Antenna 2

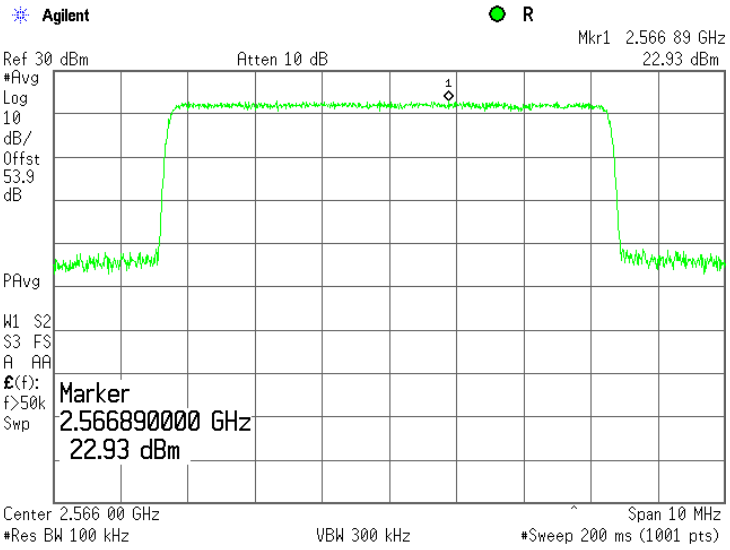


Plot 7.2.32 Power spectral density test results at mid frequency, QPSK, 7 MHz EBW, Antenna 2

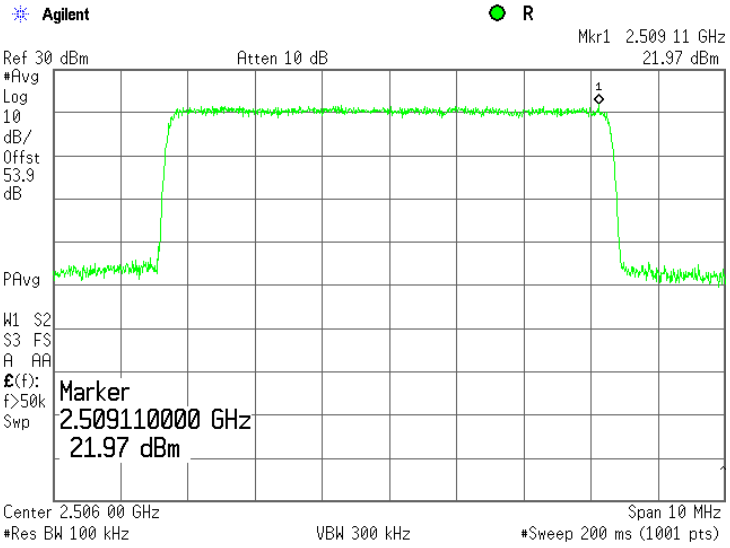


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.33 Power spectral density test results at high frequency, QPSK, 7 MHz EBW, Antenna 2

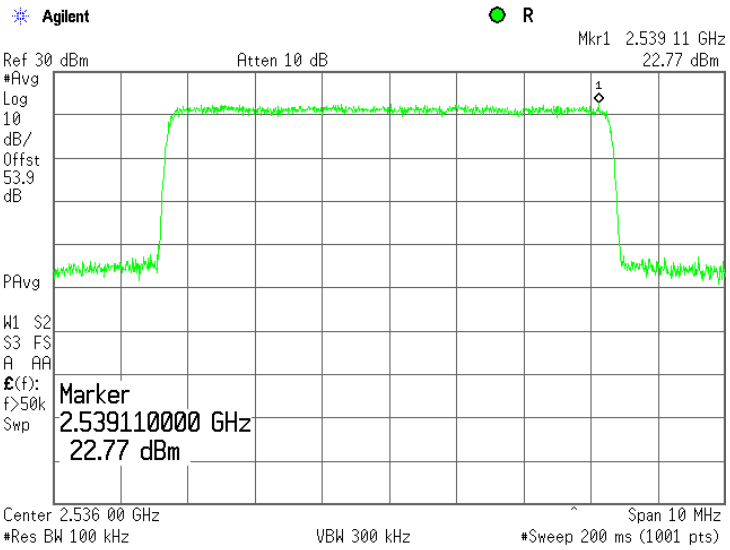


Plot 7.2.34 Power spectral density test results at low frequency, 64QAM, 7 MHz EBW, Antenna 2

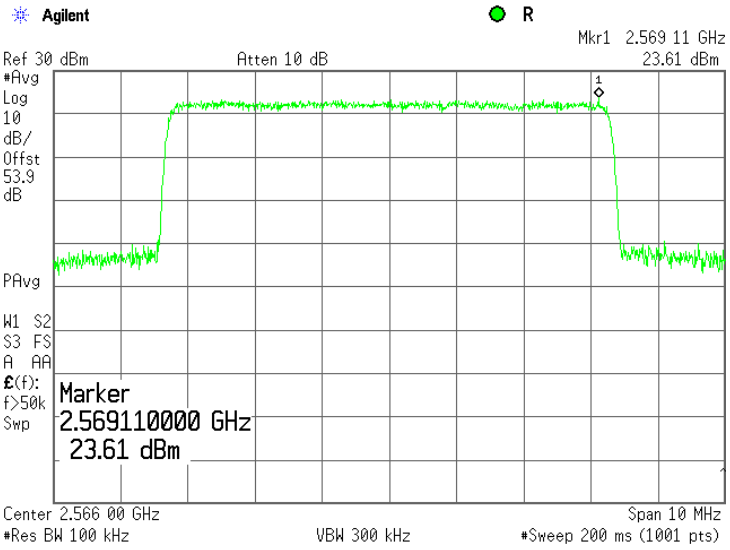


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.35 Power spectral density test results at mid frequency, 64QAM, 7 MHz EBW, Antenna 2

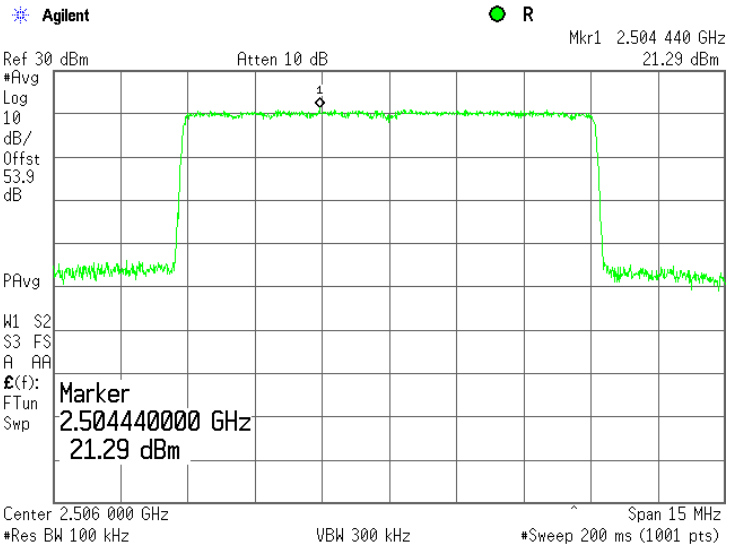


Plot 7.2.36 Power spectral density test results at high frequency, 64QAM, 7 MHz EBW, Antenna 2

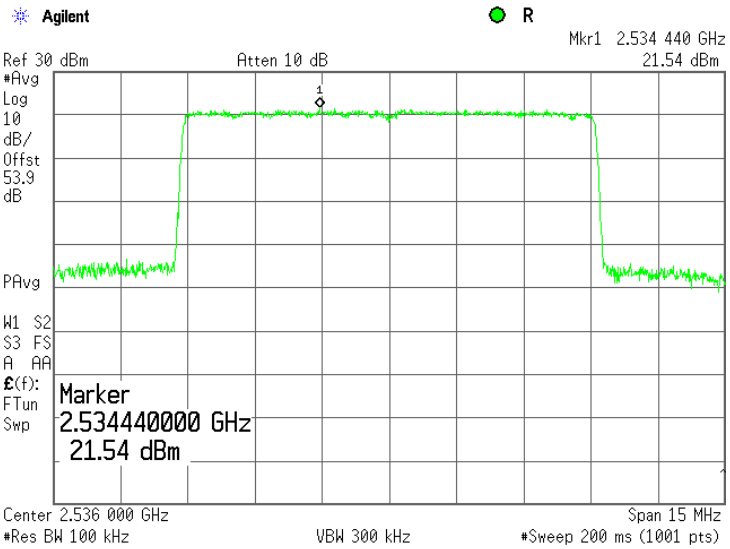


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.37 Power spectral density test results at low frequency, QPSK, 10 MHz EBW, Antenna 1

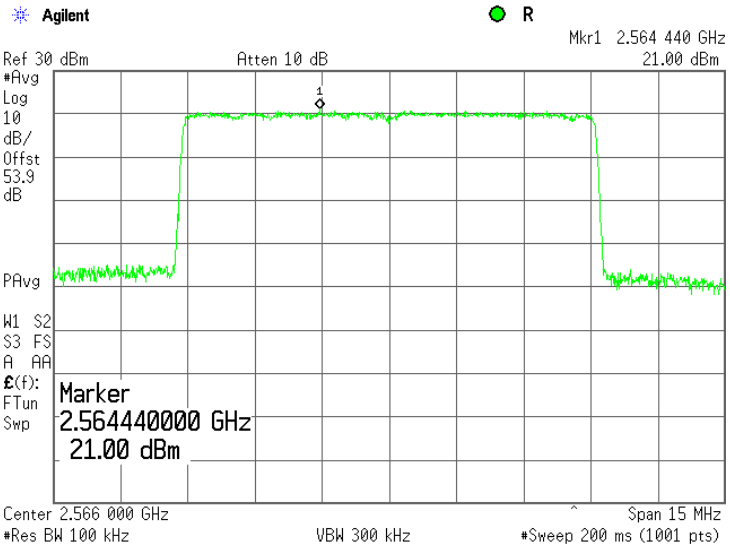


Plot 7.2.38 Power spectral density test results at mid frequency, QPSK, 10 MHz EBW, Antenna 1

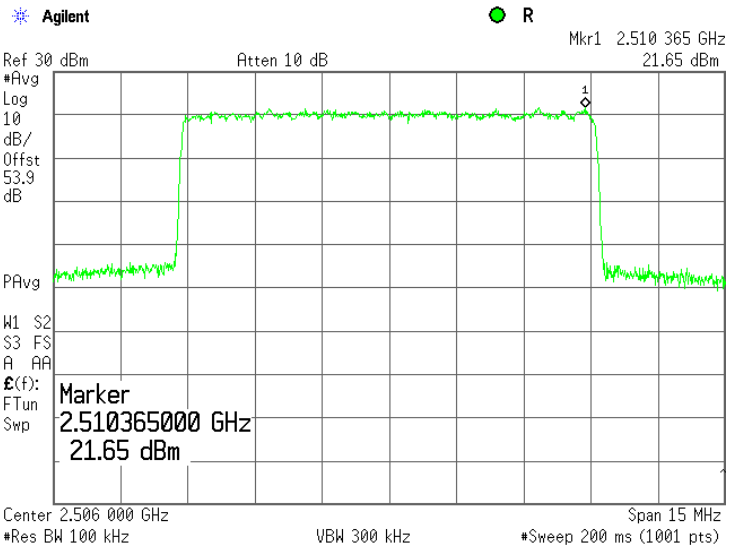


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.39 Power spectral density test results at high frequency, QPSK, 10 MHz EBW, Antenna 1

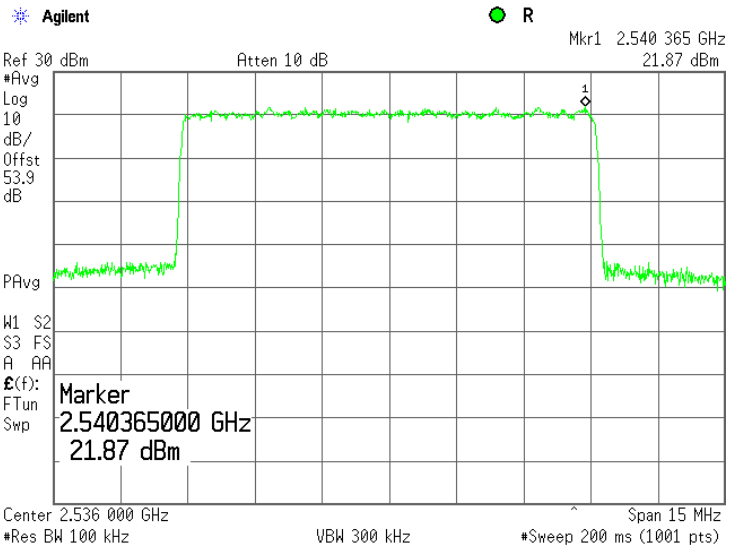


Plot 7.2.40 Power spectral density test results at low frequency, 64QAM, 10 MHz EBW, Antenna 1

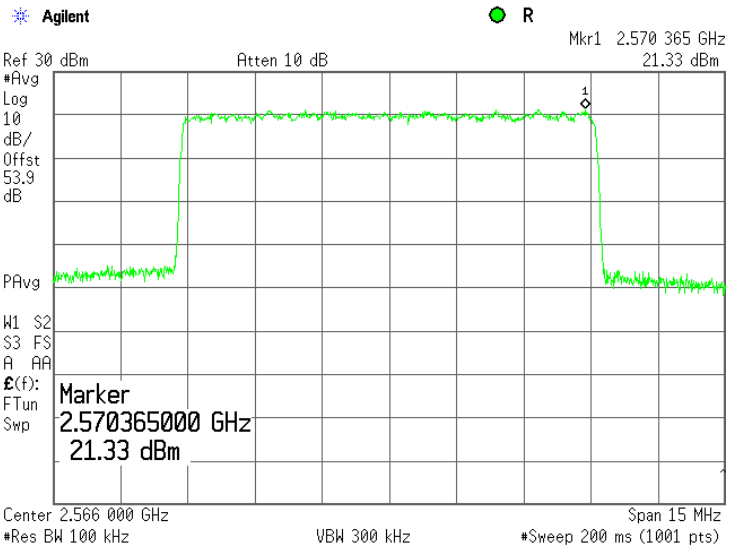


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.41 Power spectral density test results at mid frequency, 64QAM, 10 MHz EBW, Antenna 1

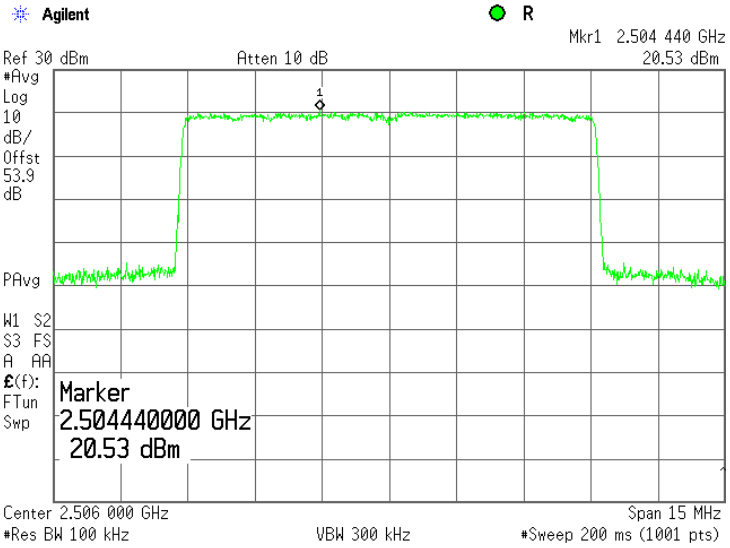


Plot 7.2.42 Power spectral density test results at high frequency, 64QAM, 10 MHz EBW, Antenna 1

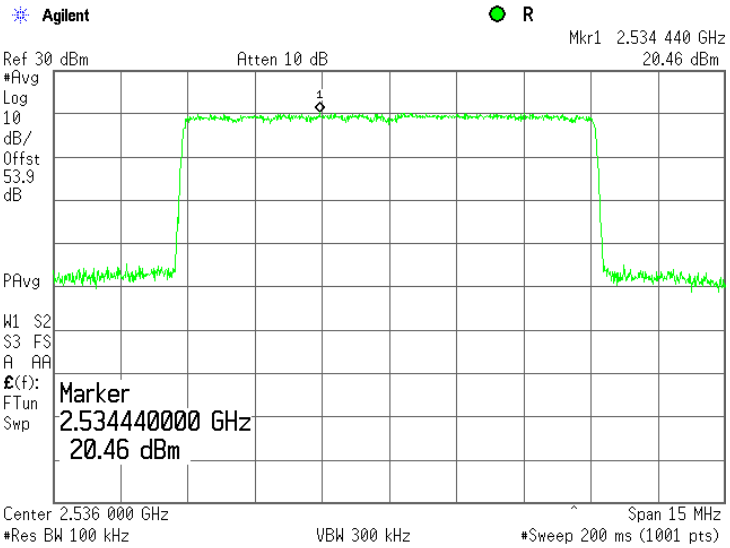


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.43 Power spectral density test results at low frequency, QPSK, 10 MHz EBW, Antenna 2

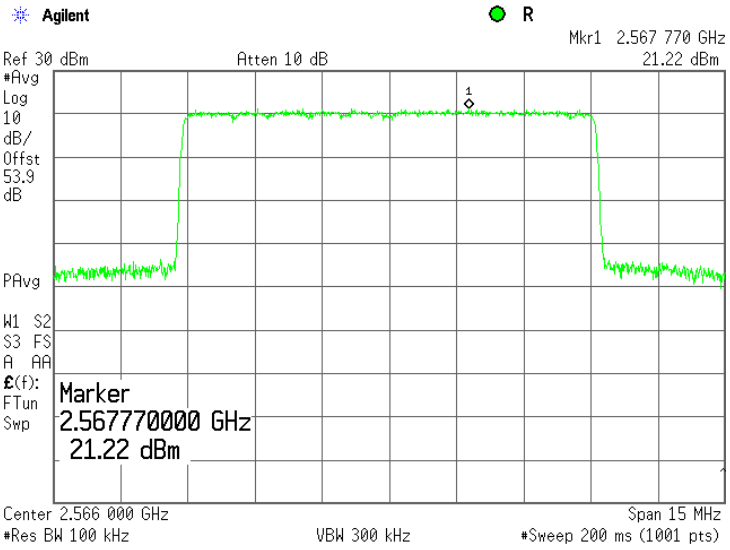


Plot 7.2.44 Power spectral density test results at mid frequency, QPSK, 10 MHz EBW, Antenna 2

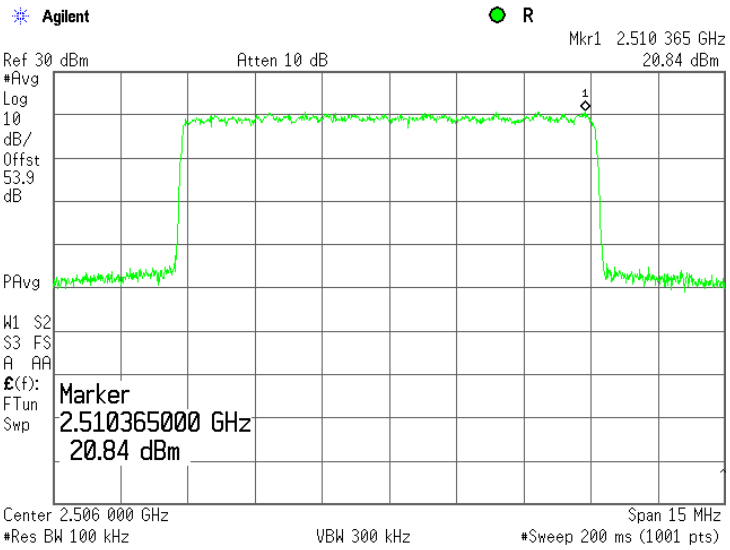


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.45 Power spectral density test results at high frequency, QPSK, 10 MHz EBW, Antenna 2

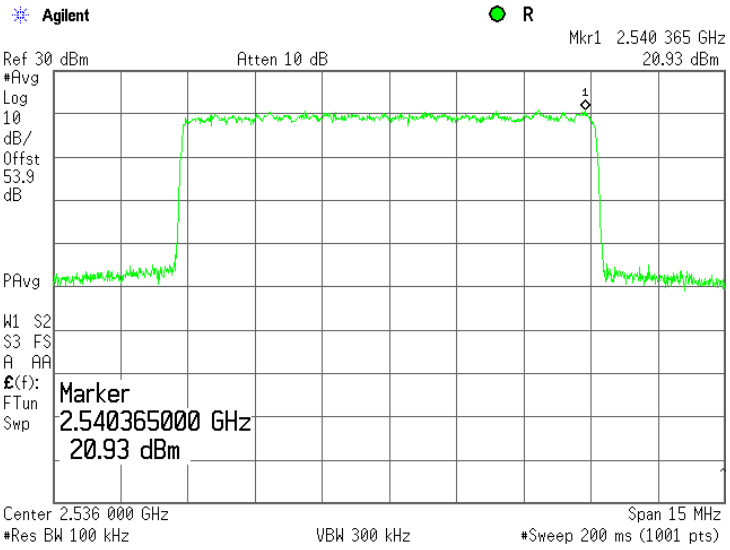


Plot 7.2.46 Power spectral density test results at low frequency, 64QAM, 10 MHz EBW, Antenna 2

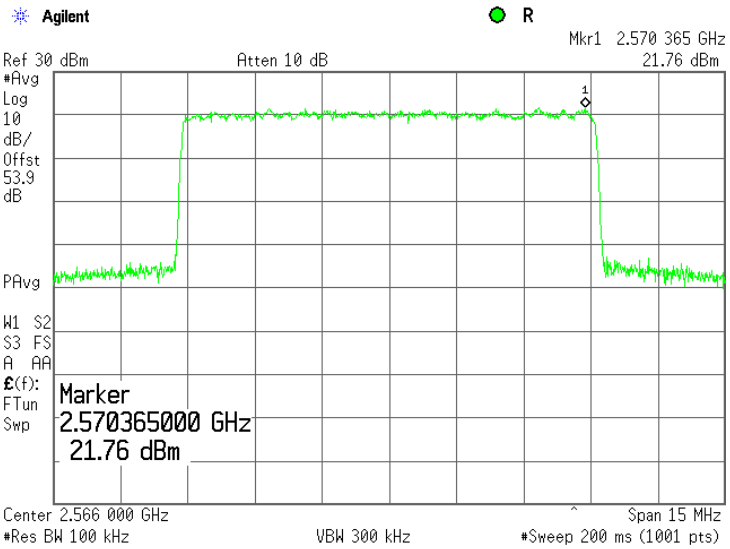


Test specification:	Section 27.50(h), Peak output power		
Test procedure:	Section 27.50(h)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 23.2 ºC	Air Pressure: 1015 hPa	Relative Humidity: 45 %	Power Supply: 48VDC
Remarks:			

Plot 7.2.47 Power spectral density test results at mid frequency, 64QAM, 10 MHz EBW, Antenna 2



Plot 7.2.48 Power spectral density test results at high frequency, 64QAM, 10 MHz EBW, Antenna 2



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

7.3 Conducted spurious emissions at the band edges (emission mask)

7.3.1 General

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

Table 7.3.1 Emission mask limits

Channel	Frequency range	Attenuation below carrier, dBc	Limit, dBm
Channel bandwidth 3.5 MHz			
2503.0	2496.0 – 2500.0 2506.0 – 2510.0	43+ 10*Log (P*)	-13.0
2533.0	2526.0 – 2530.0 2536.0 – 2540.0	43+ 10*Log (P*)	-13.0
2569.0	2562.0 – 2566.0 2572.0 – 2576.0	43+ 10*Log (P*)	-13.0
Channel bandwidth 5 MHz			
2503.0	2496.0 – 2500.0 2506.0 – 2510.0	43+ 10*Log (P*)	-13.0
2533.0	2526.0 – 2530.0 2536.0 – 2540.0	43+ 10*Log (P*)	-13.0
2569.0	2562.0 – 2566.0 2572.0 – 2576.0	43+ 10*Log (P*)	-13.0
Channel bandwidth 7 MHz			
2506.0	2496.0 – 2500.0 2512.0 – 2516.0	43+ 10*Log (P*)	-13.0
2536.0	2526.0 – 2530.0 2542.0 – 2546.0	43+ 10*Log (P*)	-13.0
2569.0	2556.0 – 2560.0 2572.0 – 2576.0	43+ 10*Log (P*)	-13.0
Channel bandwidth 10 MHz			
2506.0	2496.0 – 2500.0 2512.0 – 2516.0	43+ 10*Log (P*)	-13.0
2536.0	2526.0 – 2530.0 2542.0 – 2546.0	43+ 10*Log (P*)	-13.0
2569.0	2556.0 – 2560.0 2572.0 – 2576.0	43+ 10*Log (P*)	-13.0

* - P is transmitter output power in Watts

7.3.2 Test procedure

7.3.2.1 The EUT was set up as shown in Figure 7.3.1 or Figure 7.3.2, energized and its proper operation was checked.
7.3.2.2 The emission mask was measured with spectrum analyzer as provided in the associated plots.
7.3.2.3 The worst case results are provided in the associated tables and shown in the associated plots.

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Figure 7.3.1 Emission mask test setup

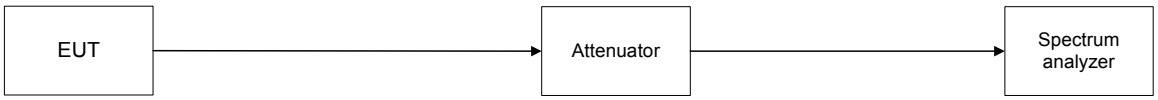
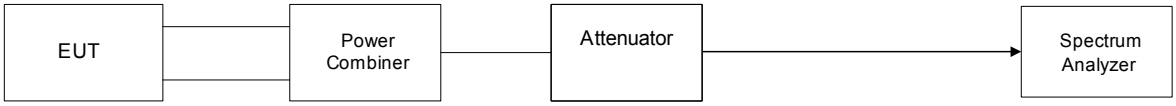


Figure 7.3.2 Emission mask test setup for combined outputs



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.2 Spurious emission at the band edges test results (combined output)

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE: See Table 7.3.1
RBW: 100 kHz
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
MODULATION: QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
3.5MHz EBW						
Low carrier frequency 2503.0 MHz QPSK						
3.5	-18.54	-17.37	100	1000	-13.0	Pass
4.5	-17.14	-21.73	100	1000	-13.0	
5.5	-19.76	-21.44	100	1000	-13.0	
Low carrier frequency 2503.0 MHz 64QAM						
3.5	-18.45	-17.66	100	1000	-13.0	Pass
4.5	-17.80	-22.69	100	1000	-13.0	
5.5	-19.55	-21.54	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz QPSK						
3.5	-17.84	-18.20	100	1000	-13.0	Pass
4.5	-17.92	-21.70	100	1000	-13.0	
5.5	-19.52	-21.65	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz 64QAM						
3.5	-17.79	-18.15	100	1000	-13.0	Pass
4.5	-17.33	-21.00	100	1000	-13.0	
5.5	-19.16	-22.46	100	1000	-13.0	
High carrier frequency 2569.0 MHz QPSK						
3.5	-18.29	-14.91	100	1000	-13.0	Pass
4.5	-17.06	-20.13	100	1000	-13.0	
5.5	-19.25	-22.07	100	1000	-13.0	
High carrier frequency 2569.0 MHz 64QAM						
3.5	-19.53	-17.18	100	1000	-13.0	Pass
4.5	-18.74	-21.87	100	1000	-13.0	
5.5	-19.94	-23.04	100	1000	-13.0	

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.3 Spurious emission at the band edges test results (combined output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	See Table 7.31
RBW:	100 kHz
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATING SIGNAL:	PRBS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
MODULATION:	QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm ow range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
5MHz EBW						
Low carrier frequency 2503.0 MHz QPSK						
3.5	-19.87	-14.02	100	1000	-13.0	Pass
4.5	-20.64	-16.24	100	1000	-13.0	
5.5	-20.68	-18.05	100	1000	-13.0	
Low carrier frequency 2503.0 MHz 64QAM						
3.5	-22.06	-13.44	100	1000	-13.0	Pass
4.5	-20.85	-15.89	100	1000	-13.0	
5.5	-20.12	-17.55	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz QPSK						
3.5	-18.94	-13.79	100	1000	-13.0	Pass
4.5	-22.25	-16.04	100	1000	-13.0	
5.5	-21.91	-19.98	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz 64QAM						
3.5	-18.94	-13.79	100	1000	-13.0	Pass
4.5	-22.25	-16.04	100	1000	-13.0	
5.5	-21.91	-19.90	100	1000	-13.0	
High carrier frequency 2569.0 MHz QPSK						
3.5	-18.13	-13.34	100	1000	-13.0	Pass
4.5	-19.23	-15.70	100	1000	-13.0	
5.5	-20.02	-18.30	100	1000	-13.0	
High carrier frequency 2569.0 MHz 64QAM						
3.5	-18.21	-13.20	100	1000	-13.0	Pass
4.5	-19.31	-15.25	100	1000	-13.0	
5.5	-20.15	-17.63	100	1000	-13.0	

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.4 Spurious emission at the band edges test results (combined output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	See Table 7.3.1
RBW:	100 kHz
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATING SIGNAL:	PRBS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
MODULATION:	QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
7 MHz EBW						
Low carrier frequency 2506.0 MHz QPSK						
6.5	-19.34	-16.46	100	1000	-13.0	Pass
7.5	-18.49	-18.06	100	1000	-13.0	
8.5	-18.37	-19.50	100	1000	-13.0	
Low carrier frequency 2506.0 MHz 64QAM						
6.5	-18.84	-15.75	100	1000	-13.0	Pass
7.5	-18.49	-17.58	100	1000	-13.0	
8.5	-18.27	-18.86	100	1000	-13.0	
9.5	-20.70	-20.32	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz QPSK						
6.5	-19.06	-17.18	100	1000	-13.0	Pass
7.5	-18.12	-18.57	100	1000	-13.0	
8.5	-17.91	-18.72	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz 64QAM						
6.5	-18.85	-17.80	100	1000	-13.0	Pass
7.5	-18.02	-18.58	100	1000	-13.0	
8.5	-18.17	-19.54	100	1000	-13.0	
9.5	-20.39	-20.74	100	1000	-13.0	
High carrier frequency 2566.0 MHz QPSK						
6.5	-18.53	-16.40	100	1000	-13.0	Pass
7.5	-17.94	-18.01	100	1000	-13.0	
8.5	-18.11	-19.09	100	1000	-13.0	
High carrier frequency 2566.0 MHz 64QAM						
6.5	-18.37	-16.07	100	1000	-13.0	Pass
7.5	-18.13	-17.76	100	1000	-13.0	
8.5	-18.05	-18.75	100	1000	-13.0	
9.5	-20.93	-20.15	100	1000	-13.0	

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.5 Spurious emission at the band edges test results (combined output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	See Table 1.1.1
RBW:	100 kHz
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATING SIGNAL:	PRBS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
MODULATION:	QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
10 MHz EBW						
Low carrier frequency 2506.0 MHz QPSK						
6.5	-15.65	-15.28	100	1000	-13.0	Pass
7.5	-18.67	-15.30	100	1000	-13.0	
8.5	-20.19	-15.69	100	1000	-13.0	
9.5	-19.64	-17.63	100	1000	-13.0	
Low carrier frequency 2506.0 MHz 64QAM						
6.5	-15.57	-15.55	100	1000	-13.0	Pass
7.5	-17.60	-15.40	100	1000	-13.0	
8.5	-20.83	-15.90	100	1000	-13.0	
9.5	-20.01	-18.32	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz QPSK						
6.5	-16.16	-15.41	100	1000	-13.0	Pass
7.5	-19.63	-15.30	100	1000	-13.0	
8.5	-21.55	-15.38	100	1000	-13.0	
9.5	-21.61	-17.70	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz 64QAM						
6.5	-16.38	-15.01	100	1000	-13.0	Pass
7.5	-19.12	-14.48	100	1000	-13.0	
8.5	-21.52	-14.95	100	1000	-13.0	
9.5	-20.19	-17.13	100	1000	-13.0	
High carrier frequency 2566.0 MHz QPSK						
6.5	-17.82	-13.76	100	1000	-13.0	Pass
7.5	-19.17	-13.99	100	1000	-13.0	
8.5	-21.58	-14.54	100	1000	-13.0	
9.5	-21.02	-17.61	100	1000	-13.0	
High carrier frequency 256960 MHz 64QAM						
6.5	-17.18	-13.81	100	1000	-13.0	Pass
7.5	-19.20	-13.86	100	1000	-13.0	
8.5	-20.90	-14.88	100	1000	-13.0	
9.5	-20.82	-17.52	100	1000	-13.0	

Reference numbers of test equipment used

HL 1906	HL 2013	HL 2953	HL 3301	HL 3302	HL 3472	HL 3474	HL 3818

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.6 Spurious emission at the band edges test results (single output)

ASSIGNED FREQUENCY RANGE: 2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE: See Table 7.3.1
RBW: 100 kHz
DETECTOR USED: Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
MODULATION: QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm ow range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
3.5MHz EBW						
Low carrier frequency 2503.0 MHz QPSK						
3.5	-19.49	-20.31	100	1000	-13.0	Pass
4.5	-22.06	-22.59	100	1000	-13.0	
Low carrier frequency 2503.0 MHz 64QAM						
3.5	-19.23	-20.74	100	1000	-13.0	Pass
4.5	-22.02	-22.88	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz QPSK						
3.5	-16.25	-17.77	100	1000	-13.0	Pass
4.5	-20.44	-21.08	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz 64QAM						
3.5	-16.28	-17.57	100	1000	-13.0	Pass
4.5	-20.44	-21.12	100	1000	-13.0	
High carrier frequency 2569.0 MHz QPSK						
3.5	-16.41	-15.23	100	1000	-13.0	Pass
4.5	-22.49	-20.09	100	1000	-13.0	
High carrier frequency 2569.0 MHz 64QAM						
3.5	-19.68	-18.71	100	1000	-13.0	Pass
4.5	-22.86	-21.82	100	1000	-13.0	

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.7 Spurious emission at the band edges test results (single output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	See Table 7.3.1
RBW:	100 kHz
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATING SIGNAL:	PRBS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
MODULATION:	QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm ow range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
5MHz EBW						
Low carrier frequency 2503.0 MHz QPSK						
3.5	-18.93	-14.05	100	1000	-13.0	Pass
4.5	-20.75	-16.98	100	1000	-13.0	
5.5	-22.53	-19.36	100	1000	-13.0	
Low carrier frequency 2503.0 MHz 64QAM						
3.5	-16.53	-14.93	100	1000	-13.0	Pass
4.5	-19.19	-17.21	100	1000	-13.0	
5.5	-22.04	-19.58	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz QPSK						
3.5	-18.66	-13.50	100	1000	-13.0	Pass
4.5	-19.91	-16.82	100	1000	-13.0	
5.5	-22.55	-18.48	100	1000	-13.0	
Mid carrier frequency 2533.0 MHz 64QAM						
3.5	-16.26	-13.60	100	1000	-13.0	Pass
4.5	-19.03	-15.38	100	1000	-13.0	
5.5	-21.15	-19.07	100	1000	-13.0	
High carrier frequency 2569.0 MHz QPSK						
3.5	-17.19	-13.60	100	1000	-13.0	Pass
4.5	-18.81	-16.00	100	1000	-13.0	
5.5	-20.90	-19.49	100	1000	-13.0	
High carrier frequency 2569.0 MHz 64QAM						
3.5	-16.82	-13.18	100	1000	-13.0	Pass
4.5	-18.43	-15.73	100	1000	-13.0	
5.5	-21.11	-19.02	100	1000	-13.0	

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.8 Spurious emission at the band edges test results (single output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	See Table 7.3.1
RBW:	100 kHz
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATING SIGNAL:	PRBS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
MODULATION:	QPSK, 64QAM

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
7 MHz EBW						
Low carrier frequency 2506.0 MHz QPSK (Output power = 39.84 dBm)						
6.5	-15.92	-17.07	100	1000	-13.0	Pass
7.5	-17.43	-21.00	100	1000	-13.0	
8.5	-17.42	-22.00	100	1000	-13.0	
Low carrier frequency 2506.0 MHz 64QAM (Output power = 39.88 dBm)						
6.5	-16.15	-17.39	100	1000	-13.0	Pass
7.5	-18.04	-20.65	100	1000	-13.0	
8.5	-18.21	-22.23	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz QPSK						
6.5	-17.03	-16.15	100	1000	-13.0	Pass
7.5	-18.94	-18.50	100	1000	-13.0	
8.5	-19.51	-19.14	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz 64QAM						
6.5	-15.98	-16.38	100	1000	-13.0	Pass
7.5	-17.83	-17.66	100	1000	-13.0	
8.5	-18.72	-19.42	100	1000	-13.0	
High carrier frequency 2566.0 MHz QPSK						
6.5	-16.03	-14.72	100	1000	-13.0	Pass
7.5	-16.84	-17.74	100	1000	-13.0	
8.5	-16.58	-19.62	100	1000	-13.0	
9.5	-22.03	-20.66	100	1000	-13.0	
High carrier frequency 2566.0 MHz 64QAM						
6.5	-15.79	-14.71	100	1000	-13.0	Pass
7.5	-16.77	-18.22	100	1000	-13.0	
8.5	-17.10	-19.66	100	1000	-13.0	
9.5	-22.28	-20.53	100	1000	-13.0	

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.3.9 Spurious emission at the band edges test results (single output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	See Table 7.3.1
RBW:	100 kHz
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATING SIGNAL:	PRBS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
MODULATION:	QPSK, 64QAM
NOTE:	Continued

Frequency offset, ± MHz	SA reading, dBm low range	SA reading, dBm high range	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
10 MHz EBW						
Low carrier frequency 2506.0 MHz QPSK (Output power = 40.02 dBm)						
6.5	-13.85	-14.40	100	1000	-13.0	Pass
7.5	-15.13	-15.50	100	1000	-13.0	
8.5	-16.56	-17.14	100	1000	-13.0	
9.5	-15.57	-19.17	100	1000	-13.0	
Low carrier frequency 2506.0 MHz 64QAM (Output power = 39.98 dBm)						
6.5	-15.02	-15.51	100	1000	-13.0	Pass
7.5	-15.86	-15.54	100	1000	-13.0	
8.5	-17.23	-16.67	100	1000	-13.0	
9.5	-16.68	-19.84	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz QPSK						
6.5	-14.78	-16.75	100	1000	-13.0	Pass
7.5	-15.47	-17.06	100	1000	-13.0	
8.5	-16.86	-17.55	100	1000	-13.0	
9.5	-16.33	-20.57	100	1000	-13.0	
Mid carrier frequency 2536.0 MHz 64QAM						
6.5	-15.31	-14.41	100	1000	-13.0	Pass
7.5	-16.06	-15.23	100	1000	-13.0	
8.5	-16.42	-16.92	100	1000	-13.0	
9.5	-17.37	-18.30	100	1000	-13.0	
High carrier frequency 2566.0 MHz QPSK						
6.5	-15.81	-15.55	100	1000	-13.0	Pass
7.5	-15.67	-15.38	100	1000	-13.0	
8.5	-16.76	-16.54	100	1000	-13.0	
9.5	-16.60	-18.67	100	1000	-13.0	
High carrier frequency 2566.0 MHz 64QAM						
6.5	-14.68	-15.00	100	1000	-13.0	Pass
7.5	-15.81	-15.08	100	1000	-13.0	
8.5	-16.90	-16.09	100	1000	-13.0	
9.5	-16.57	-18.81	100	1000	-13.0	

Reference numbers of test equipment used

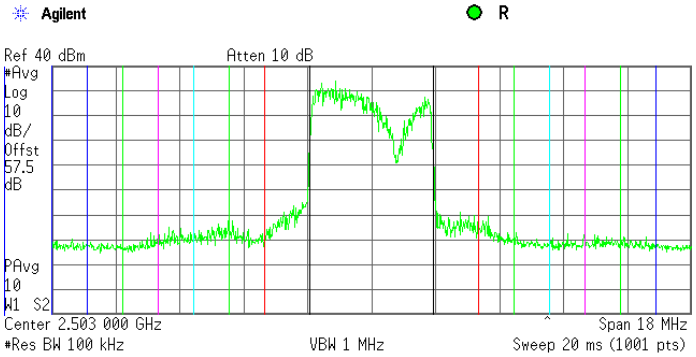
HL 1906	HL 2013	HL 2953	HL 3301	HL 3302	HL 3472	HL 3474	HL 3818

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.1 Emission mask test results at low carrier frequency, 3.5 MHz EBW (combined output)

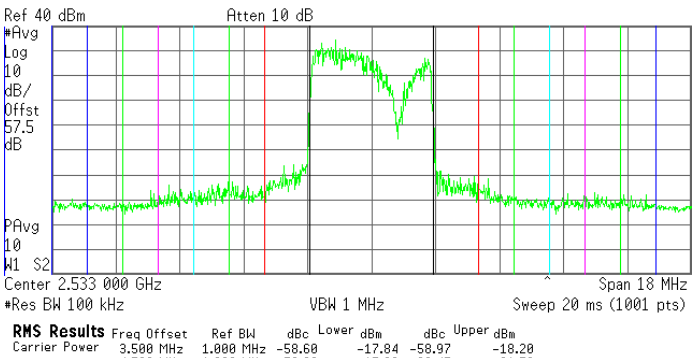
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-59.44	-18.64	-58.17	-17.37
40.80 dBm /	4.500 MHz	1.000 MHz	-57.94	-17.14	-62.53	-21.73
3.50000 MHz	5.500 MHz	1.000 MHz	-60.56	-19.76	-62.24	-21.44
	6.500 MHz	1.000 MHz	-62.89	-22.08	-62.46	-21.65
	7.500 MHz	1.000 MHz	-63.48	-22.68	-63.15	-22.34
	8.500 MHz	1.000 MHz	-63.42	-22.62	-63.93	-23.13

Plot 7.3.2 Emission mask test results at mid carrier frequency, 3.5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

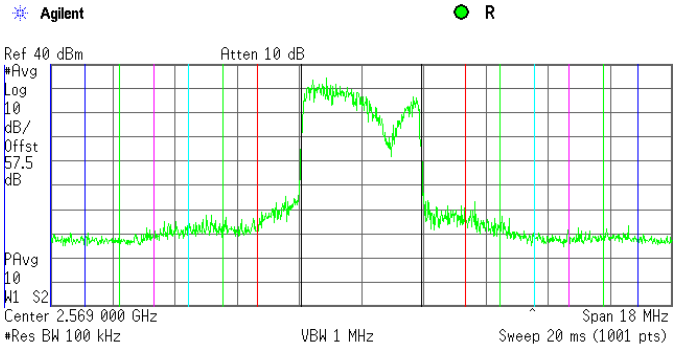


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-58.60	-17.84	-58.97	-18.20
40.77 dBm /	4.500 MHz	1.000 MHz	-58.69	-17.92	-62.47	-21.70
3.50000 MHz	5.500 MHz	1.000 MHz	-60.29	-19.52	-62.42	-21.65
	6.500 MHz	1.000 MHz	-62.87	-22.10	-62.34	-21.57
	7.500 MHz	1.000 MHz	-64.53	-23.76	-62.98	-22.21
	8.500 MHz	1.000 MHz	-63.76	-22.99	-64.56	-23.79

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.3 Emission mask test results at high carrier frequency, 3.5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

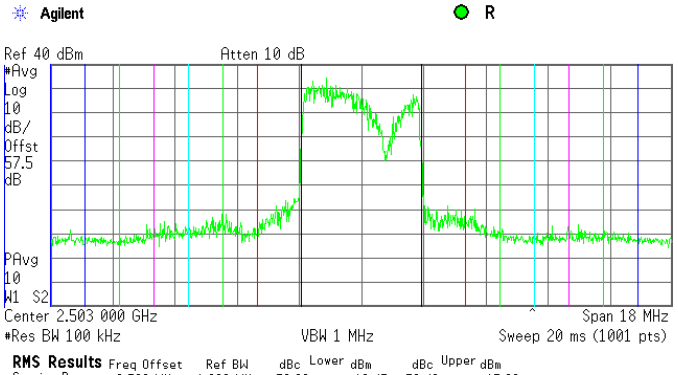


RMS Results

Carrier Power	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
41.39 dBm / 3.50000 MHz	3.500 MHz	1.000 MHz	-59.68	-18.29	-56.30	-14.91
	4.500 MHz	1.000 MHz	-58.44	-17.06	-61.52	-20.13
	5.500 MHz	1.000 MHz	-60.64	-19.25	-63.46	-22.07
	6.500 MHz	1.000 MHz	-63.43	-22.04	-63.74	-22.35
	7.500 MHz	1.000 MHz	-64.83	-23.44	-62.82	-21.43
	8.500 MHz	1.000 MHz	-63.67	-22.29	-64.80	-23.41

Plot 7.3.4 Emission mask test results at low carrier frequency, 3.5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



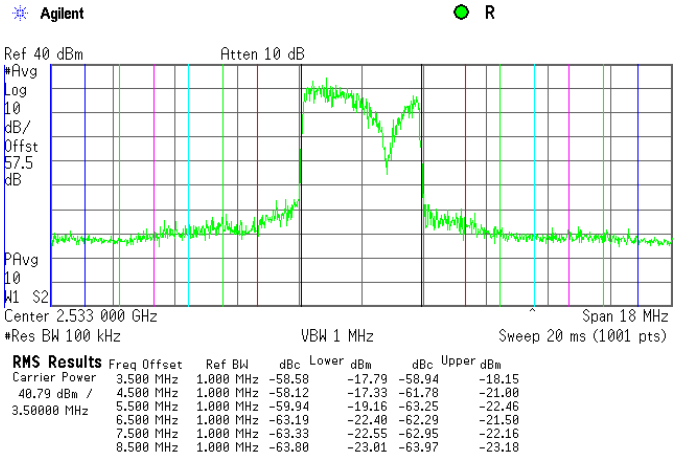
RMS Results

Carrier Power	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
40.78 dBm / 3.50000 MHz	3.500 MHz	1.000 MHz	-59.23	-18.45	-58.43	-17.66
	4.500 MHz	1.000 MHz	-58.58	-17.80	-63.47	-22.69
	5.500 MHz	1.000 MHz	-60.33	-19.55	-62.32	-21.54
	6.500 MHz	1.000 MHz	-62.78	-22.00	-62.07	-21.29
	7.500 MHz	1.000 MHz	-63.57	-22.79	-62.58	-21.81
	8.500 MHz	1.000 MHz	-63.63	-22.85	-63.32	-22.54

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.5 Emission mask test results at mid carrier frequency, 3.5 MHz EBW (combined output)

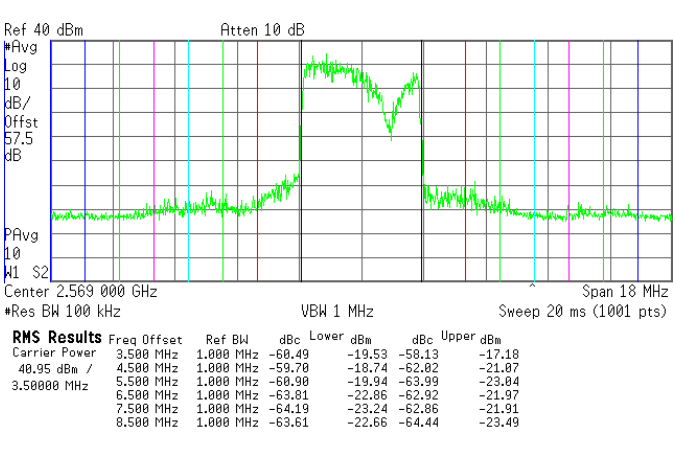
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-58.58	-17.79	-58.94	-18.15
40.79 dBm /	4.500 MHz	1.000 MHz	-58.12	-17.33	-61.78	-21.00
3.50000 MHz	5.500 MHz	1.000 MHz	-59.94	-19.16	-63.25	-22.46
	6.500 MHz	1.000 MHz	-63.19	-22.40	-62.29	-21.50
	7.500 MHz	1.000 MHz	-63.33	-22.55	-62.95	-22.16
	8.500 MHz	1.000 MHz	-63.80	-23.01	-63.97	-23.18

Plot 7.3.6 Emission mask test results at high carrier frequency, 3.5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

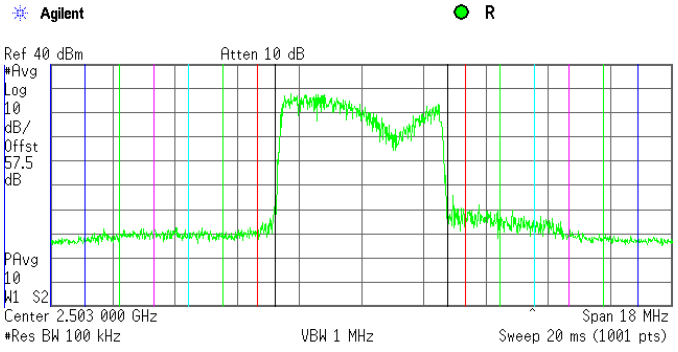


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-60.49	-19.53	-58.13	-17.18
40.95 dBm /	4.500 MHz	1.000 MHz	-59.70	-18.74	-62.02	-21.07
3.50000 MHz	5.500 MHz	1.000 MHz	-60.90	-19.94	-63.99	-23.04
	6.500 MHz	1.000 MHz	-63.81	-22.86	-62.92	-21.97
	7.500 MHz	1.000 MHz	-64.19	-23.24	-62.86	-21.91
	8.500 MHz	1.000 MHz	-63.61	-22.66	-64.44	-23.49

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.7 Emission mask test results at low carrier frequency, 5 MHz EBW (combined output)

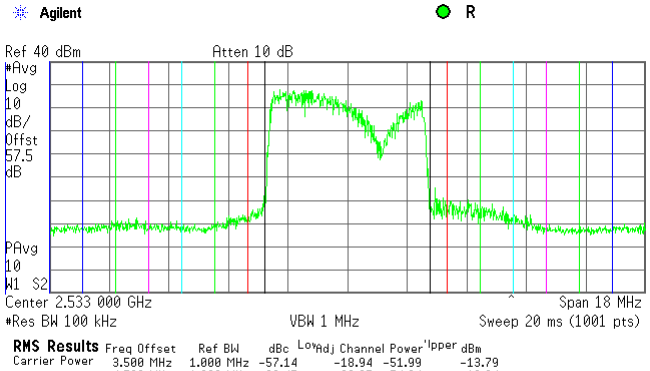
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	7 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-58.25	-19.87	-52.40	-14.02
38.39 dBm /	4.500 MHz	1.000 MHz	-59.02	-20.64	-54.62	-16.24
5.00000 MHz	5.500 MHz	1.000 MHz	-59.06	-20.68	-56.44	-18.05
	6.500 MHz	1.000 MHz	-59.17	-20.78	-59.97	-21.59
	7.500 MHz	1.000 MHz	-60.21	-21.83	-60.80	-22.42
	8.500 MHz	1.000 MHz	-61.50	-23.12	-61.64	-23.26

Plot 7.3.8 Emission mask test results at mid carrier frequency, 5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	7 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

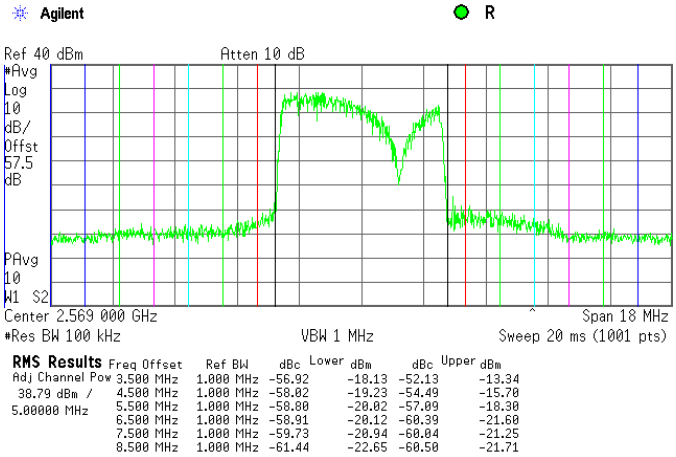


RMS Results	Freq Offset	Ref BW	dBc	Lower Adj Channel Power	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-57.14	-18.94 -51.99	-13.79
38.20 dBm /	4.500 MHz	1.000 MHz	-60.45	-22.25 -54.24	-16.04
5.00000 MHz	5.500 MHz	1.000 MHz	-60.11	-21.91 -58.10	-19.90
	6.500 MHz	1.000 MHz	-59.16	-20.96 -61.71	-23.51
	7.500 MHz	1.000 MHz	-60.30	-22.10 -60.96	-22.76
	8.500 MHz	1.000 MHz	-60.32	-22.12 -60.52	-22.32

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.9 Emission mask test results at high carrier frequency, 5 MHz EBW (combined output)

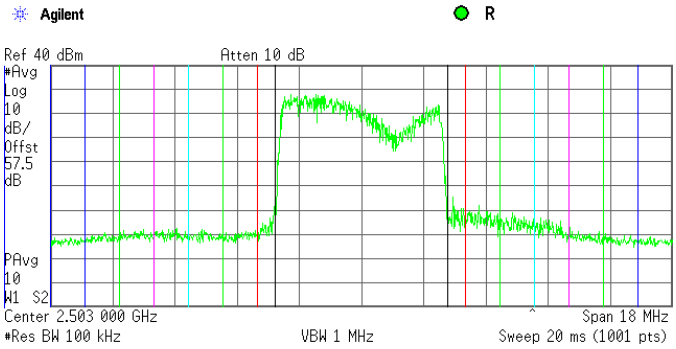
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	7 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Adj Channel Pow	3.500 MHz	1.000 MHz	-56.92	-18.13	-52.13	-13.34
38.79 dBm /	4.500 MHz	1.000 MHz	-58.02	-19.23	-54.49	-15.70
5.00000 MHz	5.500 MHz	1.000 MHz	-58.80	-20.02	-57.09	-18.30
	6.500 MHz	1.000 MHz	-58.91	-20.12	-60.39	-21.60
	7.500 MHz	1.000 MHz	-59.73	-20.94	-60.04	-21.25
	8.500 MHz	1.000 MHz	-61.44	-22.65	-60.50	-21.71

Plot 7.3.10 Emission mask test results at low carrier frequency, 5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	23 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

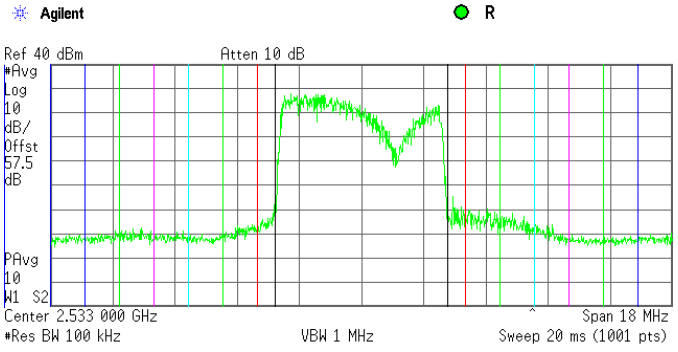


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-60.44	-22.06	-51.82	-13.44
38.38 dBm /	4.500 MHz	1.000 MHz	-59.23	-20.85	-54.27	-15.89
5.00000 MHz	5.500 MHz	1.000 MHz	-58.50	-20.12	-55.93	-17.55
	6.500 MHz	1.000 MHz	-58.92	-20.54	-59.85	-21.47
	7.500 MHz	1.000 MHz	-59.89	-21.51	-61.13	-22.75
	8.500 MHz	1.000 MHz	-61.01	-22.63	-61.80	-23.42

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.11 Emission mask test results at mid carrier frequency, 5 MHz EBW (combined output)

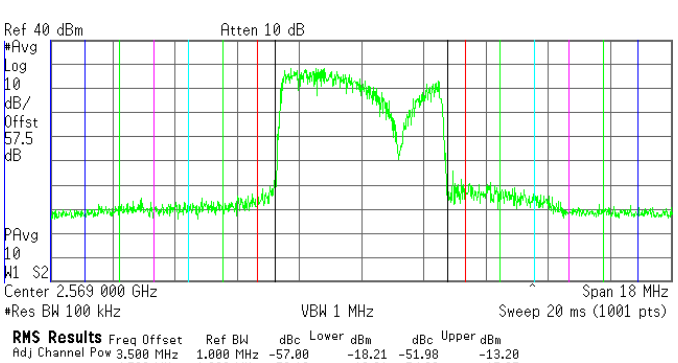
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	23 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-57.14	-18.94	-51.99	-13.79
38.20 dBm /	4.500 MHz	1.000 MHz	-60.45	-22.25	-54.24	-16.04
5.00000 MHz	5.500 MHz	1.000 MHz	-60.11	-21.91	-58.10	-19.90
	6.500 MHz	1.000 MHz	-59.16	-20.96	-61.71	-23.51
	7.500 MHz	1.000 MHz	-60.30	-22.10	-60.96	-22.76
	8.500 MHz	1.000 MHz	-60.32	-22.12	-60.52	-22.32

Plot 7.3.12 Emission mask test results at high carrier frequency 5 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	23 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

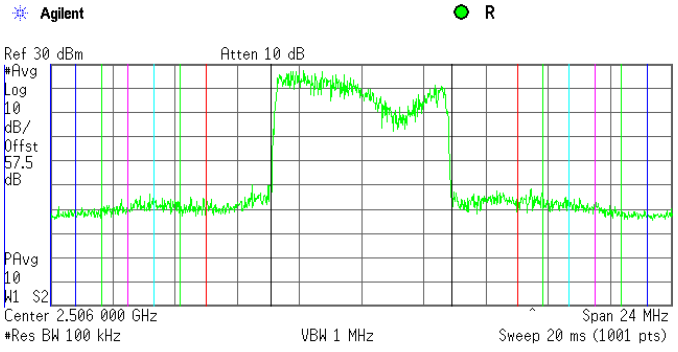


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Adj Channel Pow	3.500 MHz	1.000 MHz	-57.00	-18.21	-51.98	-13.20
38.78 dBm /	4.500 MHz	1.000 MHz	-58.10	-19.31	-54.03	-15.25
5.00000 MHz	5.500 MHz	1.000 MHz	-58.94	-20.15	-56.41	-17.63
	6.500 MHz	1.000 MHz	-58.23	-19.45	-59.90	-21.11
	7.500 MHz	1.000 MHz	-59.53	-20.75	-60.10	-21.32
	8.500 MHz	1.000 MHz	-61.50	-22.71	-60.57	-21.78

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.13 Emission mask test results at low carrier frequency, 7 MHz EBW (combined output)

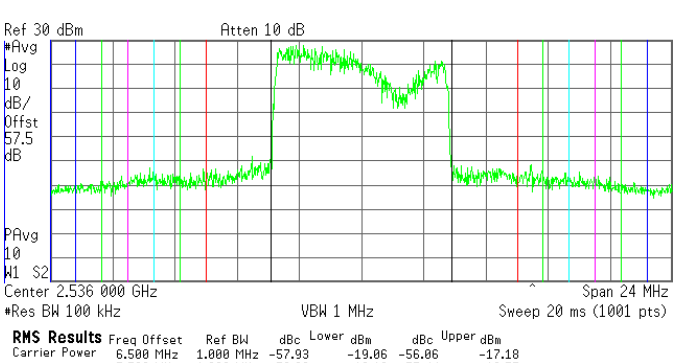
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	8 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Adj Channel Pow	6.500 MHz	1.000 MHz	-57.74	-19.34	-54.86	-16.46
38.40 dBm /	7.500 MHz	1.000 MHz	-56.89	-18.49	-56.46	-18.06
7.00000 MHz	8.500 MHz	1.000 MHz	-56.77	-18.37	-57.90	-19.50
	9.500 MHz	1.000 MHz	-58.47	-20.07	-58.85	-20.45
	10.50 MHz	1.000 MHz	-60.07	-21.67	-60.74	-22.34
	11.50 MHz	1.000 MHz	-60.89	-22.48	-61.38	-22.98

Plot 7.3.14 Emission mask test results at mid carrier frequency, 7 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	8 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

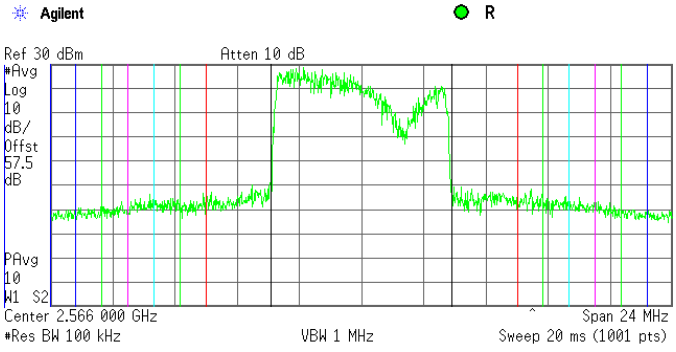


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-57.93	-19.06	-56.06	-17.18
38.87 dBm /	7.500 MHz	1.000 MHz	-56.99	-18.12	-57.44	-18.57
7.00000 MHz	8.500 MHz	1.000 MHz	-56.78	-17.91	-57.59	-18.72
	9.500 MHz	1.000 MHz	-58.72	-19.85	-59.38	-20.50
	10.50 MHz	1.000 MHz	-60.47	-21.59	-60.43	-21.56
	11.50 MHz	1.000 MHz	-60.86	-21.99	-61.82	-22.94

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.15 Emission mask test results at high carrier frequency, 7 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	8 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

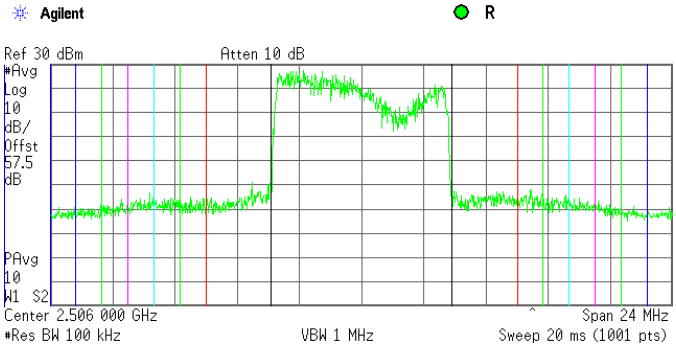


RMS Results

	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power 39.32 dBm / 7.00000 MHz	6.500 MHz	1.000 MHz	-57.85	-18.53	-55.72	-16.40
	7.500 MHz	1.000 MHz	-57.25	-17.94	-57.33	-18.01
	8.500 MHz	1.000 MHz	-57.43	-18.11	-58.40	-19.09
	9.500 MHz	1.000 MHz	-60.15	-20.84	-59.60	-20.29
	10.50 MHz	1.000 MHz	-61.08	-21.76	-61.54	-22.23
	11.50 MHz	1.000 MHz	-61.79	-22.47	-62.58	-23.26

Plot 7.3.16 Emission mask test results at low carrier frequency, 7 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	28 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



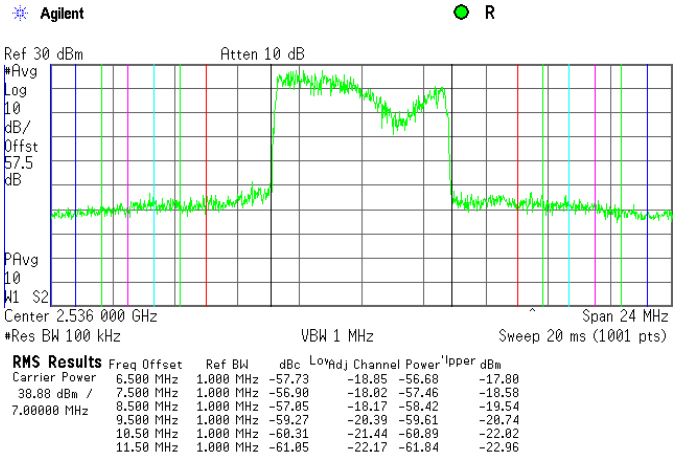
RMS Results

	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Adj Channel Pow 38.40 dBm / 7.00000 MHz	6.500 MHz	1.000 MHz	-57.25	-18.84	-54.16	-15.75
	7.500 MHz	1.000 MHz	-56.89	-18.49	-55.98	-17.58
	8.500 MHz	1.000 MHz	-56.68	-18.27	-57.26	-18.86
	9.500 MHz	1.000 MHz	-59.10	-20.70	-58.72	-20.32
	10.50 MHz	1.000 MHz	-60.57	-22.17	-60.81	-22.40
	11.50 MHz	1.000 MHz	-60.90	-22.49	-61.43	-23.03

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

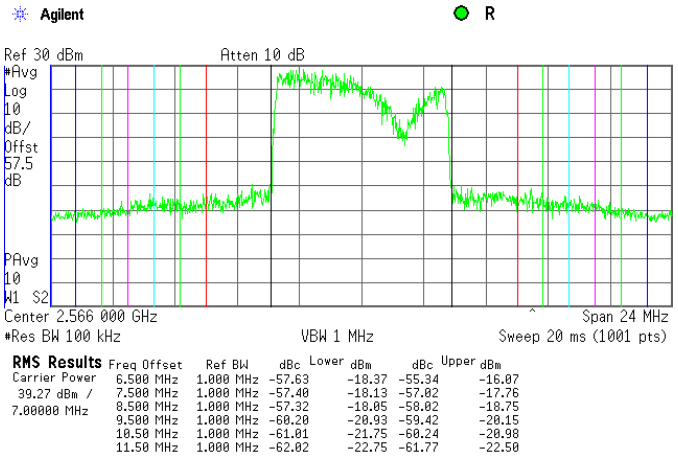
Plot 7.3.17 Emission mask test results at mid carrier frequency, 7 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	28 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Plot 7.3.18 Emission mask test results at high carrier frequency, 10 MHz EBW (combined output)

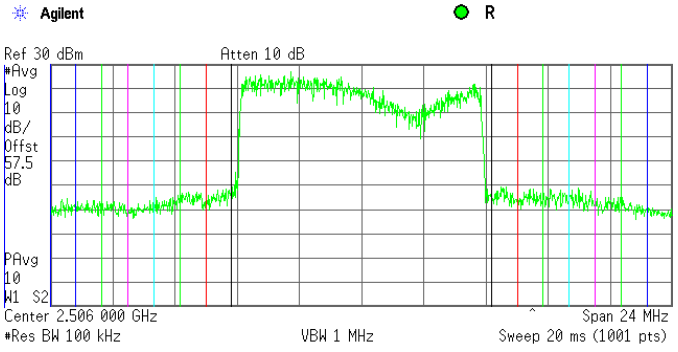
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	28 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.19 Emission mask test results at low carrier frequency, 10 MHz EBW (combined output)

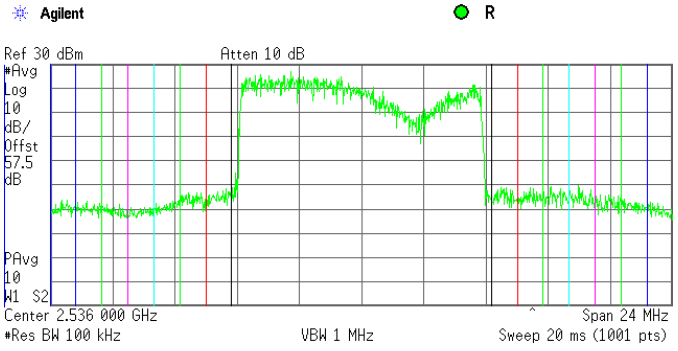
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	13 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-54.57	-15.65	-54.20	-15.28
38.91 dBm /	7.500 MHz	1.000 MHz	-57.58	-18.67	-54.22	-15.30
10.0000 MHz	8.500 MHz	1.000 MHz	-59.10	-20.19	-54.60	-15.69
	9.500 MHz	1.000 MHz	-58.55	-19.64	-56.55	-17.63
	10.50 MHz	1.000 MHz	-58.45	-19.54	-58.32	-19.41
	11.50 MHz	1.000 MHz	-58.18	-19.27	-60.21	-21.29

Plot 7.3.20 Emission mask test results at mid carrier frequency, 10 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	13 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

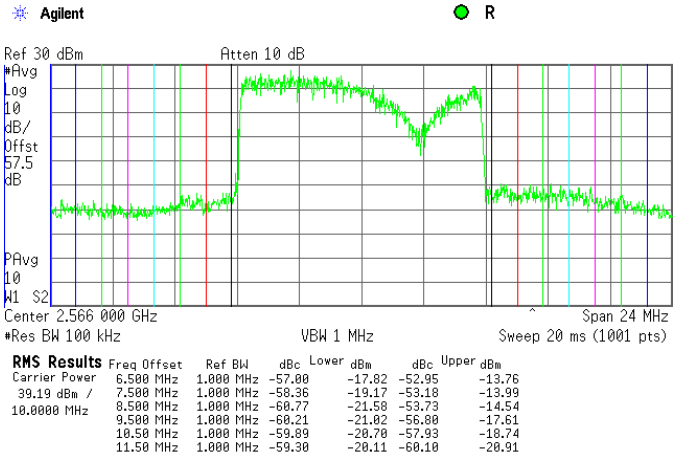


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-54.87	-16.16	-54.13	-15.41
38.71 dBm /	7.500 MHz	1.000 MHz	-58.35	-19.63	-54.01	-15.30
10.0000 MHz	8.500 MHz	1.000 MHz	-60.26	-21.55	-54.10	-15.38
	9.500 MHz	1.000 MHz	-60.32	-21.61	-56.42	-17.70
	10.50 MHz	1.000 MHz	-59.37	-20.65	-57.75	-19.03
	11.50 MHz	1.000 MHz	-58.73	-20.02	-59.99	-21.28

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.21 Emission mask test results at high carrier frequency, 10 MHz EBW (combined output)

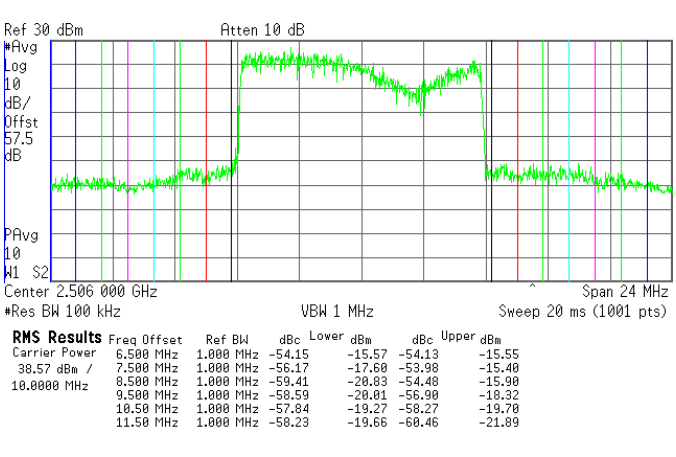
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	13 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-57.00	-17.82	-52.95	-13.76
39.19 dBm /	7.500 MHz	1.000 MHz	-58.36	-19.17	-53.18	-13.99
10.0000 MHz	8.500 MHz	1.000 MHz	-60.77	-21.58	-53.73	-14.54
	9.500 MHz	1.000 MHz	-60.21	-21.02	-56.80	-17.61
	10.50 MHz	1.000 MHz	-59.89	-20.70	-57.93	-18.74
	11.50 MHz	1.000 MHz	-59.30	-20.11	-60.10	-20.91

Plot 7.3.22 Emission mask test results at low carrier frequency, 10 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	46 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

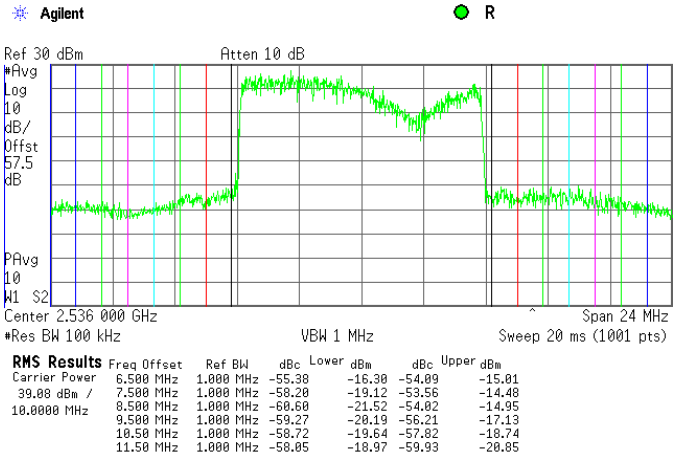


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-54.15	-15.57	-54.13	-15.55
38.57 dBm /	7.500 MHz	1.000 MHz	-56.17	-17.60	-53.98	-15.40
10.0000 MHz	8.500 MHz	1.000 MHz	-59.41	-20.83	-54.48	-15.90
	9.500 MHz	1.000 MHz	-58.59	-20.01	-56.90	-18.32
	10.50 MHz	1.000 MHz	-57.84	-19.27	-58.27	-19.70
	11.50 MHz	1.000 MHz	-58.23	-19.66	-60.46	-21.89

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.23 Emission mask test results at mid carrier frequency, 10 MHz EBW (combined output)

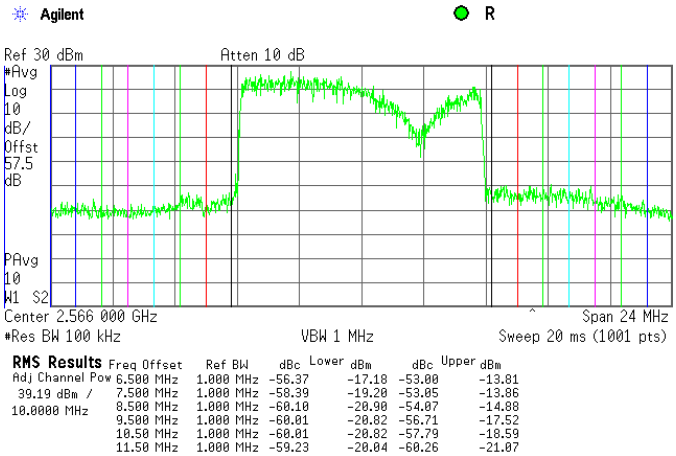
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	46 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-55.38	-16.30	-54.09	-15.01
39.88 dBm /	7.500 MHz	1.000 MHz	-58.20	-19.12	-53.56	-14.48
10.0000 MHz	8.500 MHz	1.000 MHz	-60.60	-21.52	-54.02	-14.95
	9.500 MHz	1.000 MHz	-59.27	-20.19	-56.21	-17.13
	10.50 MHz	1.000 MHz	-58.72	-19.64	-57.82	-18.74
	11.50 MHz	1.000 MHz	-58.05	-18.97	-59.93	-20.85

Plot 7.3.24 Emission mask test results at high carrier frequency, 10 MHz EBW (combined output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	46 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

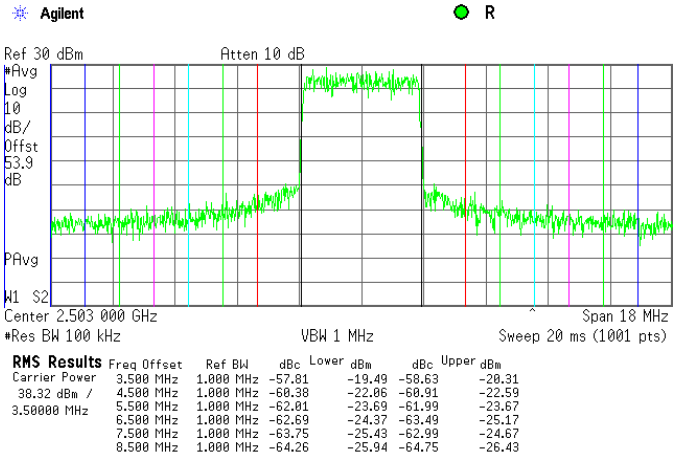


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Adj Channel Pow	6.500 MHz	1.000 MHz	-56.37	-17.18	-53.00	-13.81
39.19 dBm /	7.500 MHz	1.000 MHz	-58.39	-19.20	-53.05	-13.86
10.0000 MHz	8.500 MHz	1.000 MHz	-60.10	-20.90	-54.07	-14.88
	9.500 MHz	1.000 MHz	-60.01	-20.82	-56.71	-17.52
	10.50 MHz	1.000 MHz	-60.01	-20.82	-57.79	-18.59
	11.50 MHz	1.000 MHz	-59.23	-20.04	-60.26	-21.07

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.25 Emission mask test results at low carrier frequency, 3.5 MHz EBW (single output)

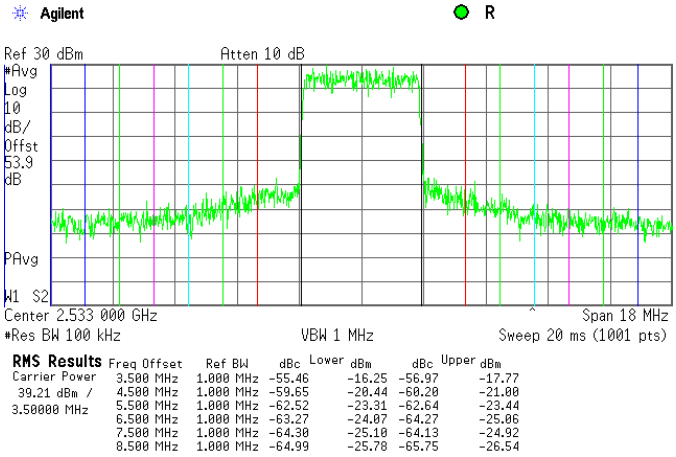
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
3.500 MHz	1.000 MHz	-57.81	-19.49	-58.63	-20.31
4.500 MHz	1.000 MHz	-60.38	-22.06	-60.91	-22.59
5.500 MHz	1.000 MHz	-62.01	-23.69	-61.99	-23.67
6.500 MHz	1.000 MHz	-62.69	-24.37	-63.49	-25.17
7.500 MHz	1.000 MHz	-63.75	-25.43	-62.99	-24.67
8.500 MHz	1.000 MHz	-64.26	-25.94	-64.75	-26.43

Plot 7.3.26 Emission mask test results at mid carrier frequency, 3.5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

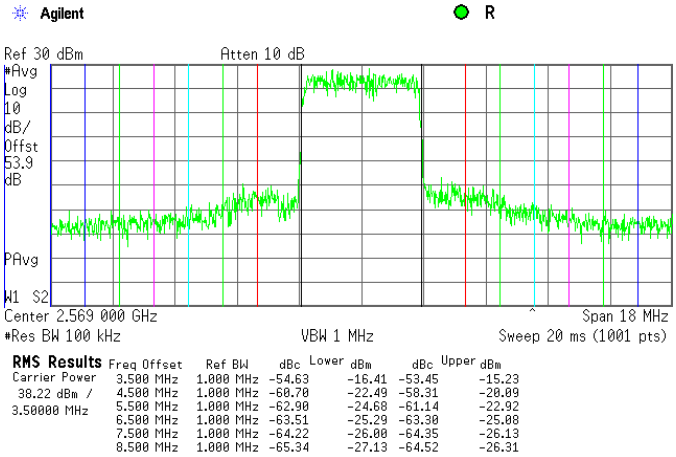


Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
3.500 MHz	1.000 MHz	-55.46	-16.25	-56.97	-17.77
4.500 MHz	1.000 MHz	-59.65	-20.44	-60.20	-21.00
5.500 MHz	1.000 MHz	-62.52	-23.31	-62.64	-23.44
6.500 MHz	1.000 MHz	-63.27	-24.07	-64.27	-25.06
7.500 MHz	1.000 MHz	-64.30	-25.10	-64.13	-24.92
8.500 MHz	1.000 MHz	-64.99	-25.78	-65.75	-26.54

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

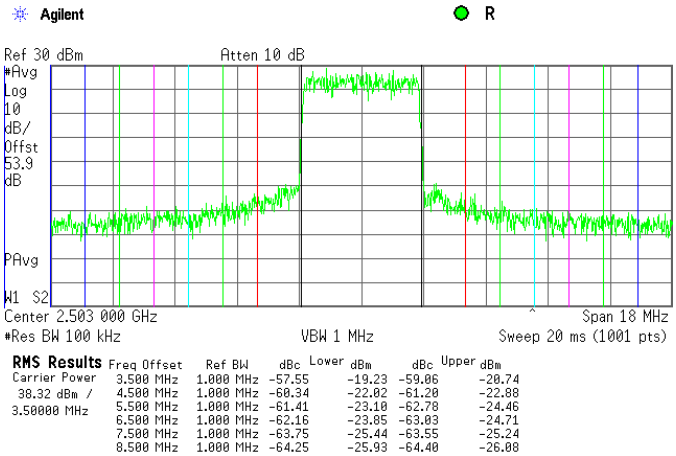
Plot 7.3.27 Emission mask test results at high carrier frequency, 3.5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Plot 7.3.28 Emission mask test results at low carrier frequency, 3.5 MHz EBW (single output)

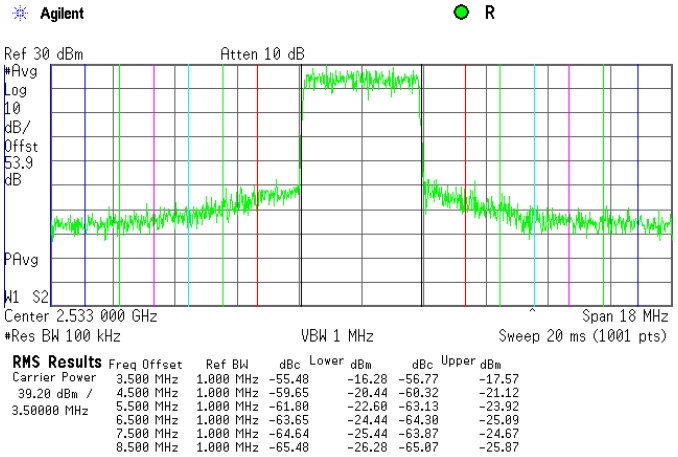
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

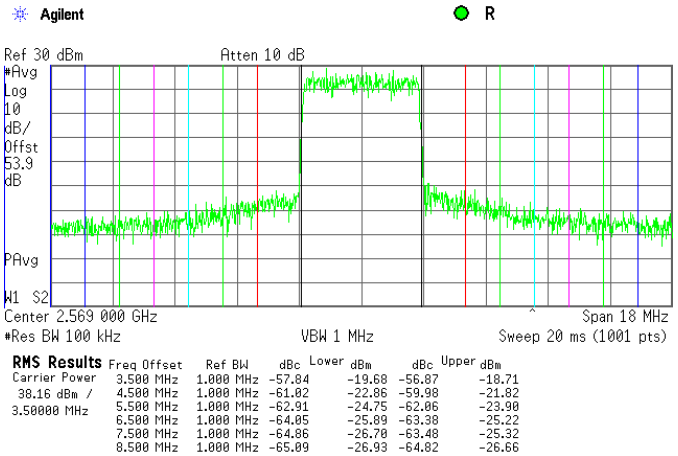
Plot 7.3.29 Emission mask test results at mid carrier frequency, 3.5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Plot 7.3.30 Emission mask test results at high carrier frequency, 3.5 MHz EBW (single output)

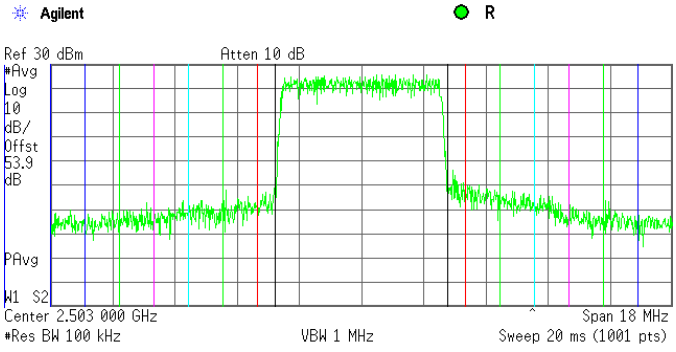
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.31 Emission mask test results at low carrier frequency, 5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	7 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

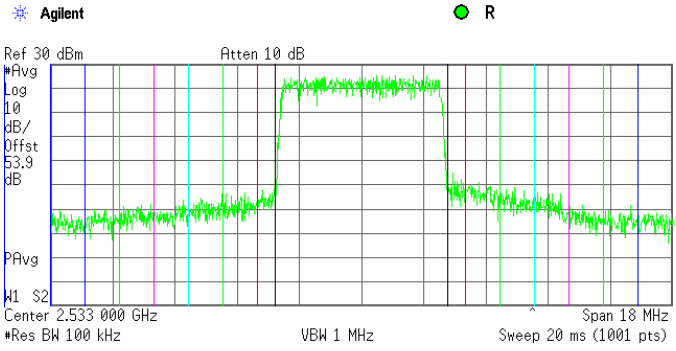


RMS Results

Carrier Power	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
38.44 dBm / 5.00000 MHz	3.500 MHz	1.000 MHz	-57.37	-18.93	-52.49	-14.05
	4.500 MHz	1.000 MHz	-59.19	-20.75	-55.43	-16.98
	5.500 MHz	1.000 MHz	-60.98	-22.53	-57.81	-19.36
	6.500 MHz	1.000 MHz	-62.16	-23.72	-61.82	-23.37
	7.500 MHz	1.000 MHz	-63.71	-25.26	-62.35	-23.91
	8.500 MHz	1.000 MHz	-63.84	-25.40	-63.98	-25.54

Plot 7.3.32 Emission mask test results at mid carrier frequency, 5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	7 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



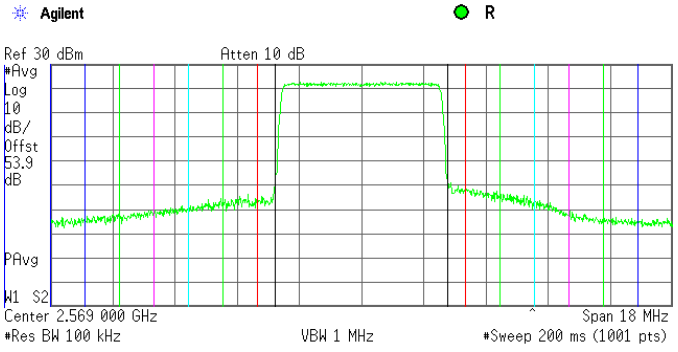
RMS Results

Carrier Power	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
38.06 dBm / 5.00000 MHz	3.500 MHz	1.000 MHz	-56.72	-18.66	-51.55	-13.50
	4.500 MHz	1.000 MHz	-57.97	-19.91	-54.88	-16.82
	5.500 MHz	1.000 MHz	-60.60	-22.55	-56.54	-18.48
	6.500 MHz	1.000 MHz	-60.91	-22.85	-61.65	-23.60
	7.500 MHz	1.000 MHz	-62.54	-24.48	-62.95	-24.89
	8.500 MHz	1.000 MHz	-63.98	-25.92	-63.31	-25.25

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.33 Emission mask test results at high carrier frequency, 5 MHz EBW (single output)

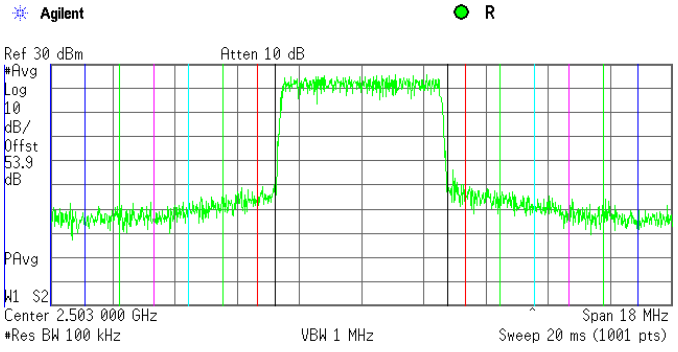
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	7 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-55.35	-17.19	-51.76	-13.60
38.16 dBm /	4.500 MHz	1.000 MHz	-56.97	-18.81	-54.15	-16.00
5.00000 MHz	5.500 MHz	1.000 MHz	-59.05	-20.90	-57.64	-19.49
	6.500 MHz	1.000 MHz	-60.81	-22.65	-62.01	-23.86
	7.500 MHz	1.000 MHz	-62.14	-23.98	-63.37	-25.21
	8.500 MHz	1.000 MHz	-63.43	-25.28	-63.93	-25.78

Plot 7.3.34 Emission mask test results at low carrier frequency, 5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	23 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

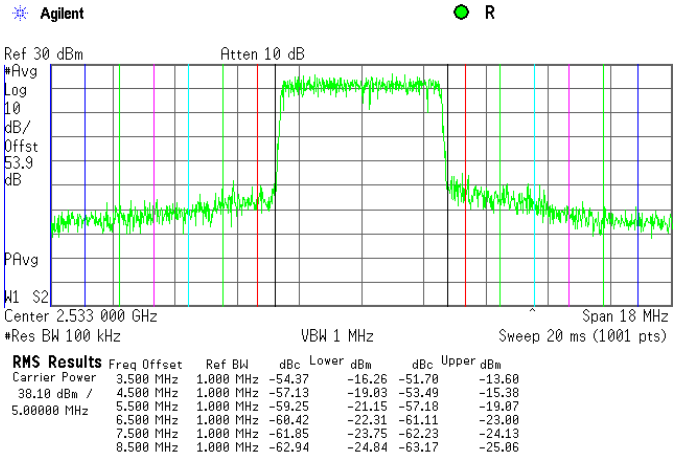


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-54.97	-16.53	-53.38	-14.93
38.44 dBm /	4.500 MHz	1.000 MHz	-57.63	-19.19	-55.65	-17.21
5.00000 MHz	5.500 MHz	1.000 MHz	-60.49	-22.04	-58.02	-19.58
	6.500 MHz	1.000 MHz	-61.11	-22.67	-60.50	-22.05
	7.500 MHz	1.000 MHz	-61.75	-23.31	-61.47	-23.02
	8.500 MHz	1.000 MHz	-62.31	-23.86	-62.35	-23.91

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.35 Emission mask test results at mid carrier frequency, 5 MHz EBW (single output)

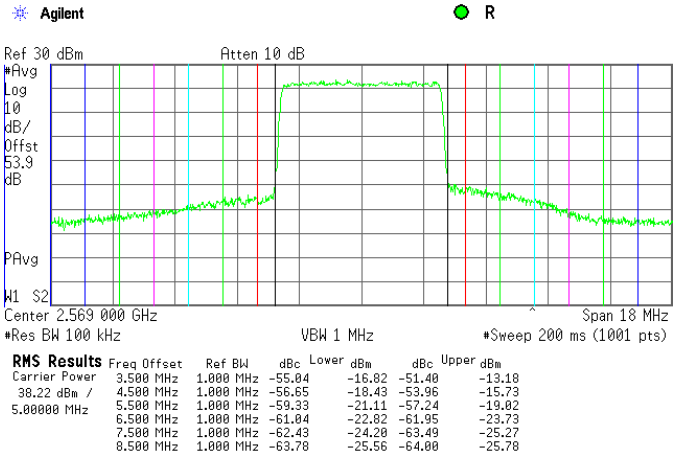
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	23 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-54.37	-16.26	-51.70	-13.60
38.10 dBm /	4.500 MHz	1.000 MHz	-57.13	-19.03	-53.49	-15.38
5.00000 MHz	5.500 MHz	1.000 MHz	-59.25	-21.15	-57.18	-19.07
	6.500 MHz	1.000 MHz	-60.42	-22.31	-61.11	-23.00
	7.500 MHz	1.000 MHz	-61.85	-23.75	-62.23	-24.13
	8.500 MHz	1.000 MHz	-62.94	-24.84	-63.17	-25.06

Plot 7.3.36 Emission mask test results at high carrier frequency 5 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	23 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

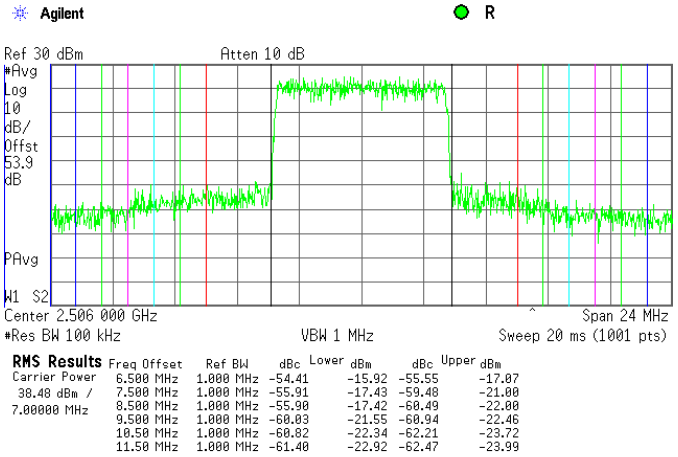


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	3.500 MHz	1.000 MHz	-55.04	-16.82	-51.40	-13.18
38.22 dBm /	4.500 MHz	1.000 MHz	-56.65	-18.43	-53.96	-15.73
5.00000 MHz	5.500 MHz	1.000 MHz	-59.33	-21.11	-57.24	-19.02
	6.500 MHz	1.000 MHz	-61.04	-22.82	-61.95	-23.73
	7.500 MHz	1.000 MHz	-62.43	-24.20	-63.49	-25.27
	8.500 MHz	1.000 MHz	-63.78	-25.56	-64.00	-25.78

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

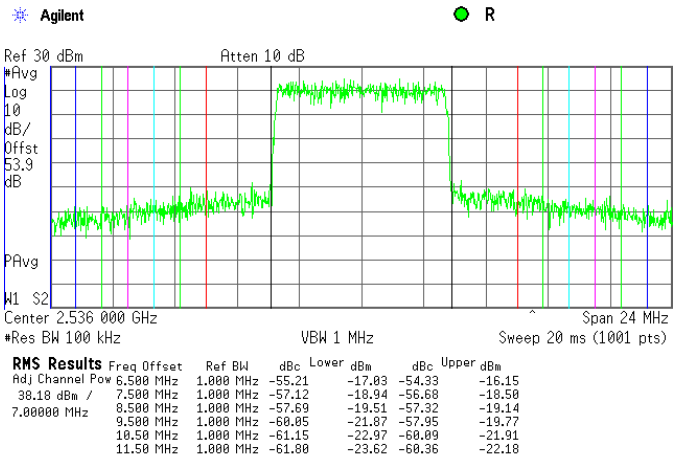
Plot 7.3.37 Emission mask test results at low carrier frequency, 7 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	8 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Plot 7.3.38 Emission mask test results at mid carrier frequency, 7 MHz EBW (single output)

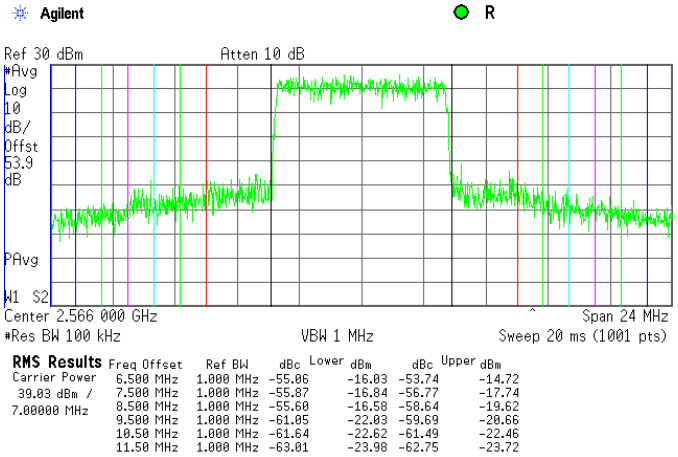
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	8 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.39 Emission mask test results at high carrier frequency, 7 MHz EBW (single output)

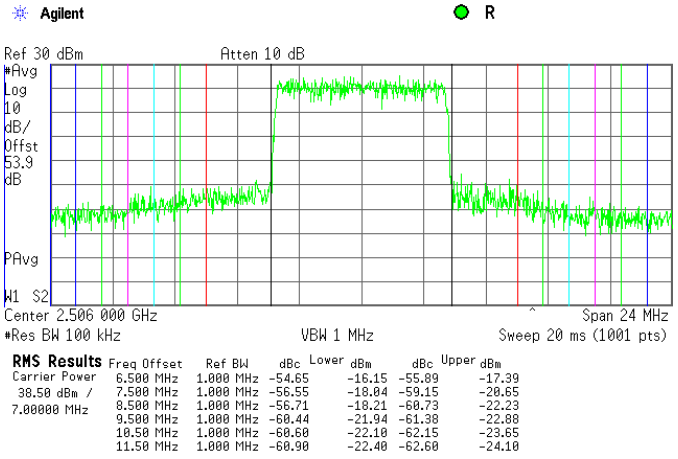
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	8 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
6.500 MHz	1.000 MHz	-55.06	-16.03	-53.74	-14.72
7.500 MHz	1.000 MHz	-55.87	-16.84	-56.77	-17.74
8.500 MHz	1.000 MHz	-55.60	-16.58	-58.64	-19.62
9.500 MHz	1.000 MHz	-61.05	-22.03	-59.69	-20.66
10.50 MHz	1.000 MHz	-61.64	-22.62	-61.49	-22.46
11.50 MHz	1.000 MHz	-63.01	-23.98	-62.75	-23.72

Plot 7.3.40 Emission mask test results at low carrier frequency, 7 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	28 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

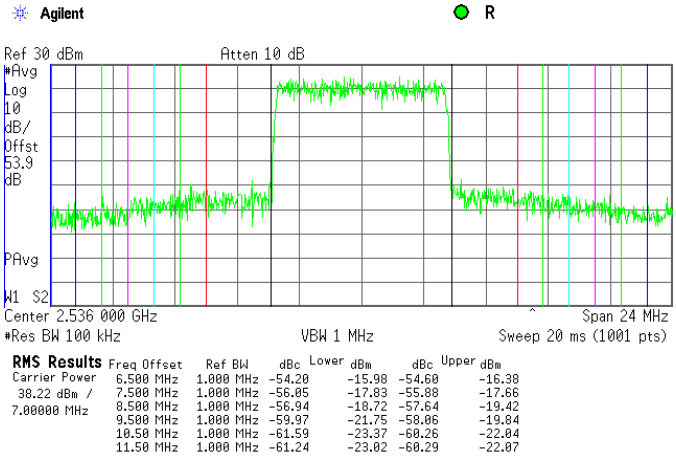


Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
6.500 MHz	1.000 MHz	-54.65	-16.15	-55.89	-17.39
7.500 MHz	1.000 MHz	-56.55	-18.04	-59.15	-20.65
8.500 MHz	1.000 MHz	-56.71	-18.21	-60.73	-22.23
9.500 MHz	1.000 MHz	-60.44	-21.94	-61.38	-22.88
10.50 MHz	1.000 MHz	-60.60	-22.10	-62.15	-23.65
11.50 MHz	1.000 MHz	-60.90	-22.40	-62.60	-24.10

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.41 Emission mask test results at mid carrier frequency, 7 MHz EBW (single output)

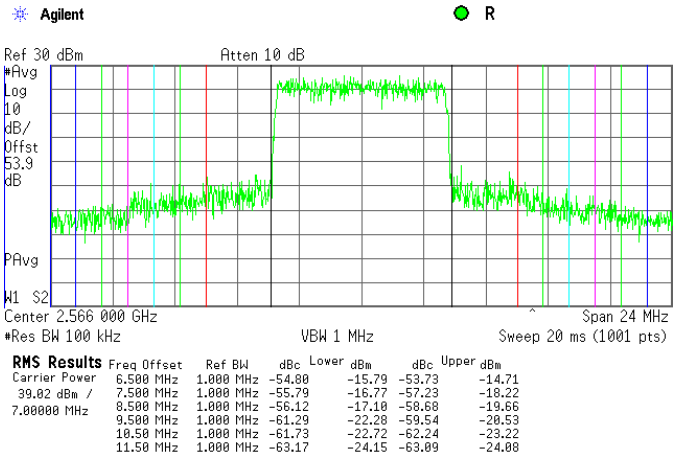
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	28 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-54.20	-15.98	-54.60	-16.38
38.22 dBm /	7.500 MHz	1.000 MHz	-56.05	-17.83	-55.88	-17.66
7.00000 MHz	8.500 MHz	1.000 MHz	-56.94	-18.72	-57.64	-19.42
	9.500 MHz	1.000 MHz	-59.97	-21.75	-58.06	-19.84
	10.50 MHz	1.000 MHz	-61.59	-23.37	-60.26	-22.04
	11.50 MHz	1.000 MHz	-61.24	-23.02	-60.29	-22.07

Plot 7.3.42 Emission mask test results at high carrier frequency, 7 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	28 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum

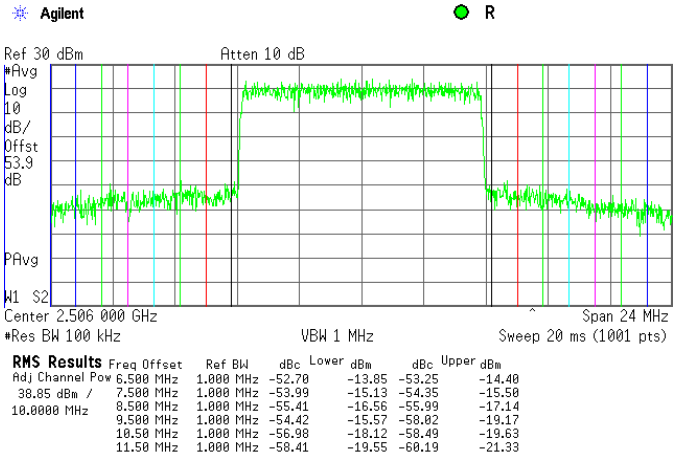


RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-54.80	-15.79	-53.73	-14.71
39.02 dBm /	7.500 MHz	1.000 MHz	-55.79	-16.77	-57.23	-18.22
7.00000 MHz	8.500 MHz	1.000 MHz	-56.12	-17.10	-58.68	-19.66
	9.500 MHz	1.000 MHz	-61.29	-22.28	-59.54	-20.53
	10.50 MHz	1.000 MHz	-61.73	-22.72	-62.24	-23.22
	11.50 MHz	1.000 MHz	-63.17	-24.15	-63.09	-24.08

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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

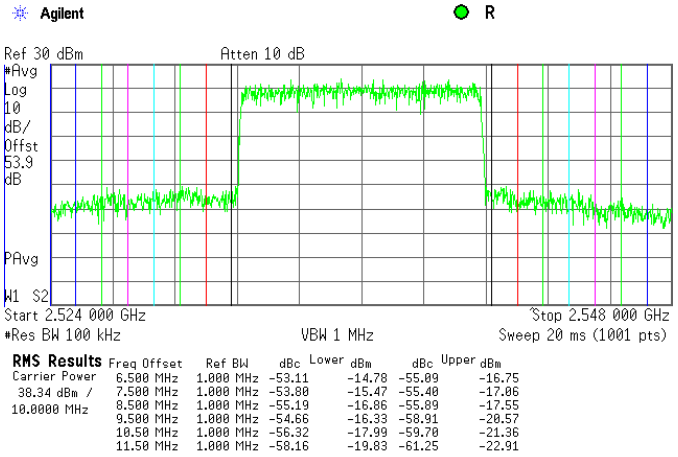
Plot 7.3.43 Emission mask test results at low carrier frequency, 10 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	13 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Plot 7.3.44 Emission mask test results at mid carrier frequency, 10 MHz EBW (single output)

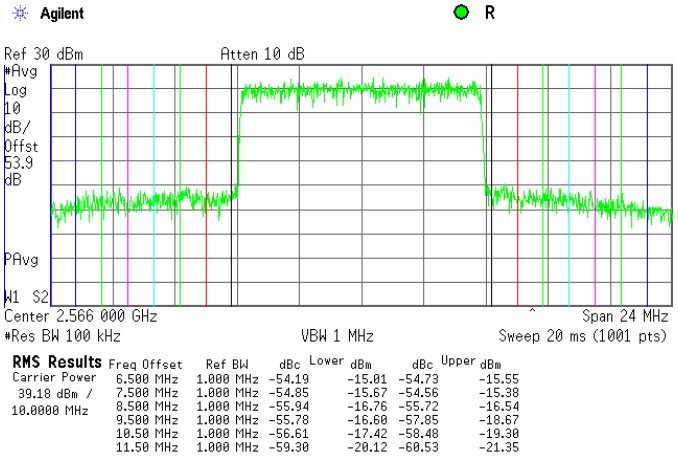
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	13 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

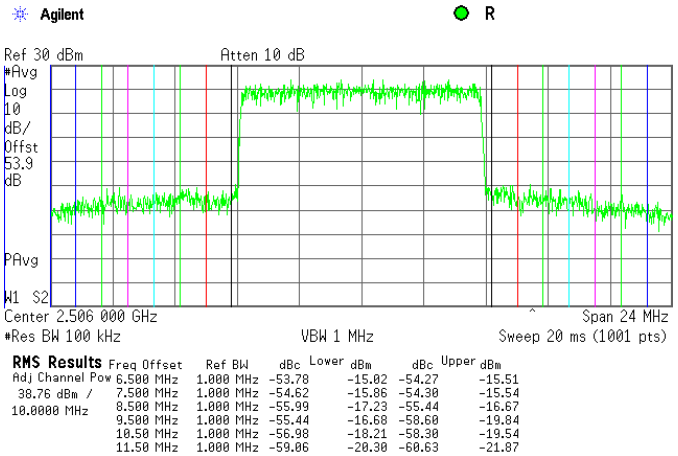
Plot 7.3.45 Emission mask test results at high carrier frequency, 10 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	QPSK
MODULATING SIGNAL:	PRBS
BIT RATE:	13 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



Plot 7.3.46 Emission mask test results at low carrier frequency, 10 MHz EBW (single output)

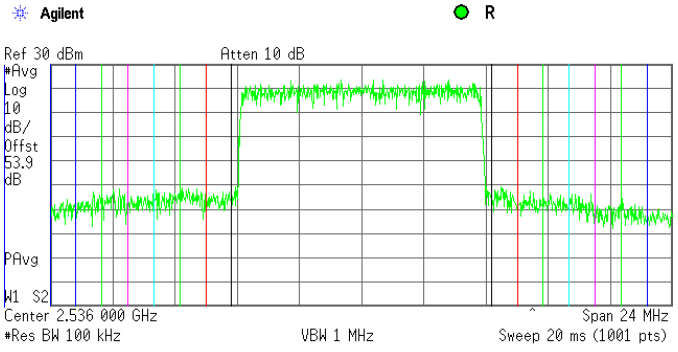
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	46 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



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:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.3.47 Emission mask test results at mid carrier frequency, 10 MHz EBW (single output)

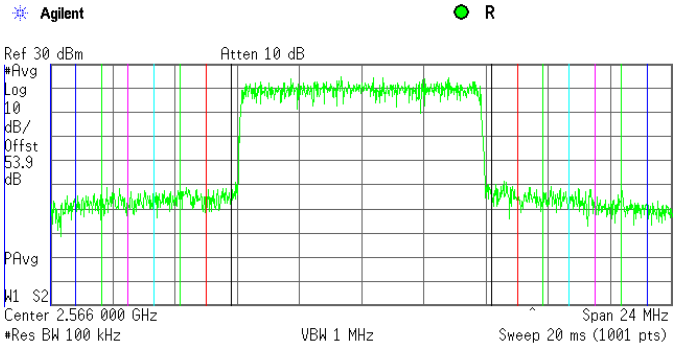
OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	46 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-53.51	-15.24	-55.90	-17.62
38.28 dBm /	7.500 MHz	1.000 MHz	-54.01	-15.73	-56.08	-17.81
10.0000 MHz	8.500 MHz	1.000 MHz	-55.58	-17.30	-56.41	-18.14
	9.500 MHz	1.000 MHz	-55.09	-16.81	-59.67	-21.39
	10.50 MHz	1.000 MHz	-56.34	-18.06	-59.85	-21.58
	11.50 MHz	1.000 MHz	-58.43	-20.15	-61.90	-23.63

Plot 7.3.48 Emission mask test results at high carrier frequency, 10 MHz EBW (single output)

OPERATING FREQUENCY RANGE:	2560.0 – 2632.0 MHz
DETECTOR USED:	Average
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	46 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum



RMS Results	Freq Offset	Ref BW	dBc	Lower dBm	dBc	Upper dBm
Carrier Power	6.500 MHz	1.000 MHz	-54.29	-15.09	-54.90	-15.71
39.20 dBm /	7.500 MHz	1.000 MHz	-54.81	-15.61	-54.53	-15.33
10.0000 MHz	8.500 MHz	1.000 MHz	-55.94	-16.74	-55.30	-16.10
	9.500 MHz	1.000 MHz	-55.89	-16.69	-58.17	-18.97
	10.50 MHz	1.000 MHz	-57.03	-17.83	-58.10	-18.90
	11.50 MHz	1.000 MHz	-58.94	-19.74	-60.17	-20.97

Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

7.4 Radiated spurious emission measurements

7.4.1 General

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

Table 7.4.1 Radiated spurious emission test limits

Frequency, MHz	Attenuation below carrier, dBc	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

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

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.
7.4.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.
7.4.2.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.

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

7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.
7.4.3.2 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.
7.4.3.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 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:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

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

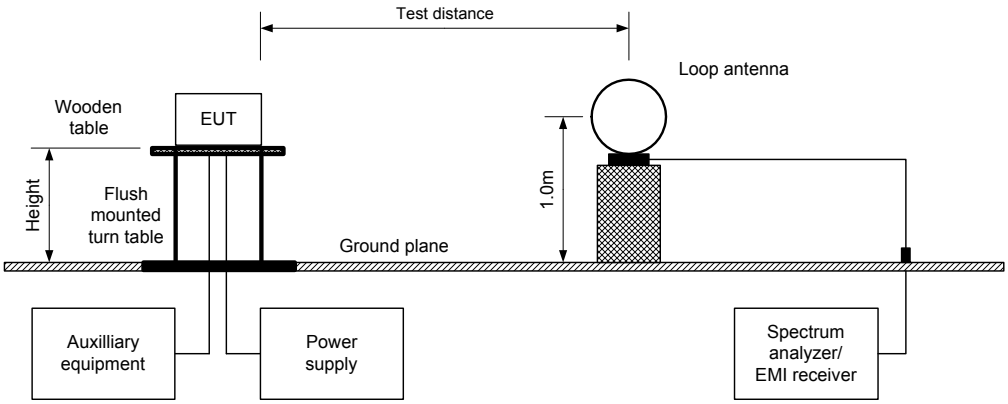
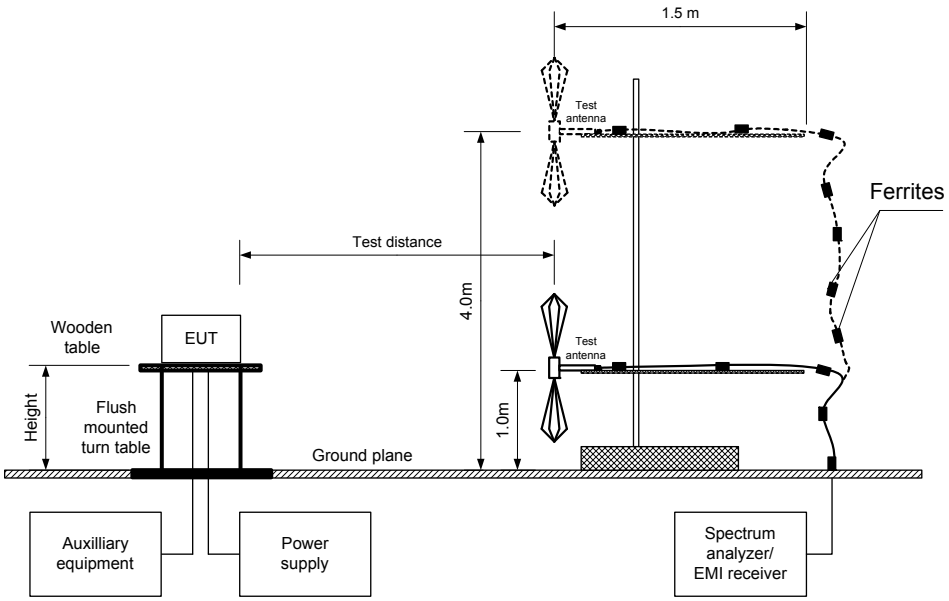


Figure 7.4.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 27.53(m)(2), Radiated spurious emissions**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 51 %	**Power Supply:** 48VDC
Remarks:			

Table 7.4.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE: 2500 - 2572 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 0.8 m
INVESTIGATED FREQUENCY RANGE: 0.009 – 26000 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
Biconilog (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)
MODULATION: QPSK
MODULATING SIGNAL: PRBS
BIT RATE: 4 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Low carrier frequency 2503 MHz							
All spurious were found at least 20 dB below the specified limit							
Mid carrier frequency 2533 MHz							
All spurious were found at least 20 dB below the specified limit							
High carrier frequency 2569 MHz							
All spurious were found at least 20 dB below the specified limit							

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.

Reference numbers of test equipment used

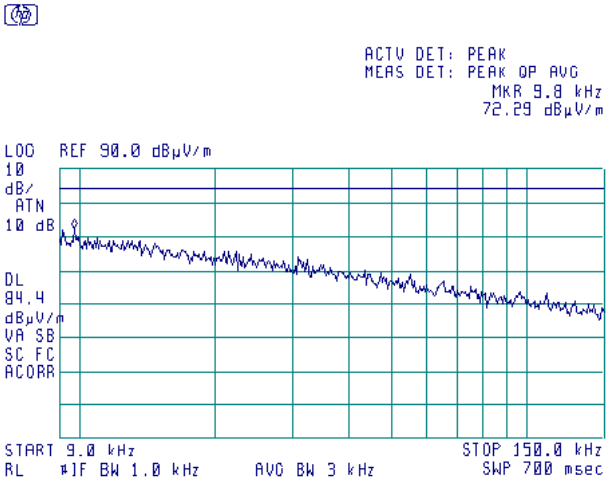
HL 0446	HL 0521	HL 0604	HL 0768	HL 1424	HL 1984	HL 2870	HL 2871
HL 3534	HL 3535	HL 3622					

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:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

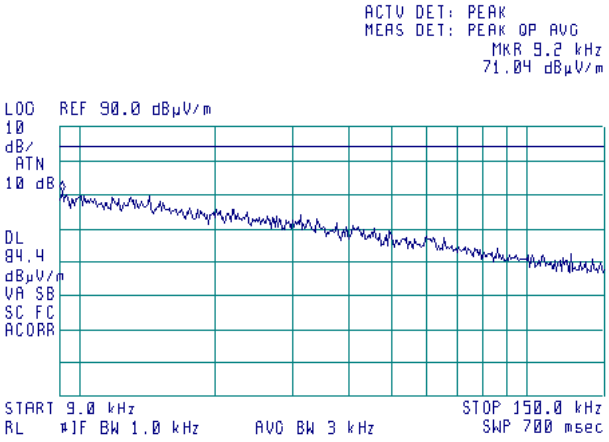
Plot 7.4.1 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.4.2 Radiated emission measurements in 9 - 150 kHz range

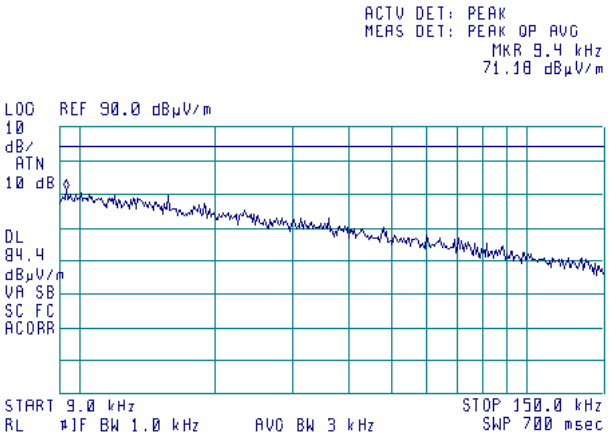
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

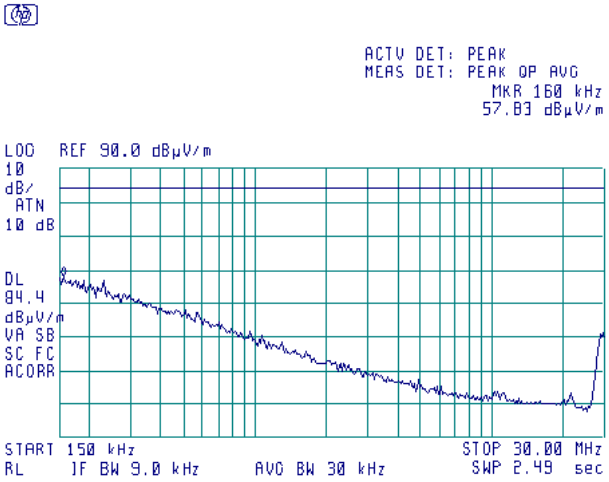
Plot 7.4.3 Radiated emission measurements in 9 - 150 kHz range

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



Plot 7.4.4 Radiated emission measurements in 0.15 - 30 MHz range

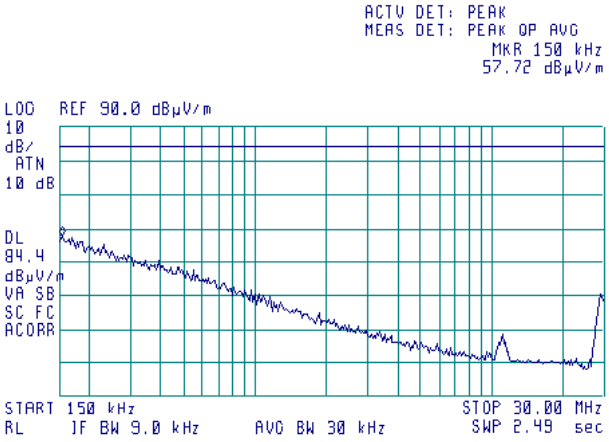
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

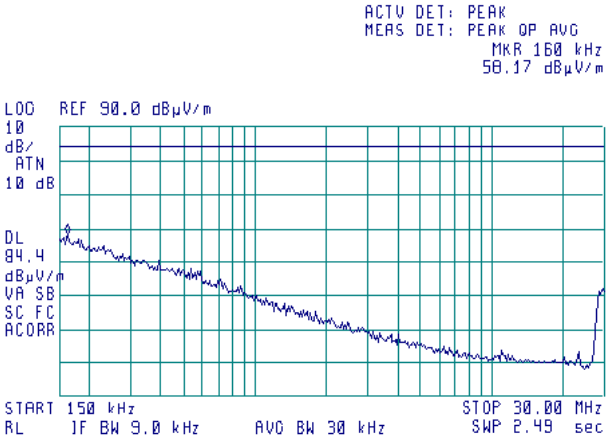
Plot 7.4.5 Radiated emission measurements in 0.15 - 30 MHz range

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



Plot 7.4.6 Radiated emission measurements in 0.15 - 30 MHz range

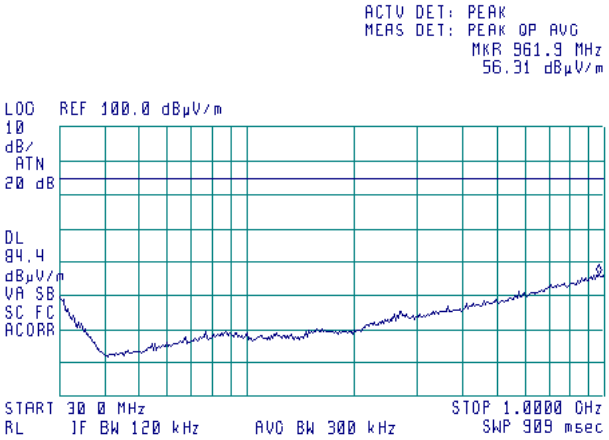
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

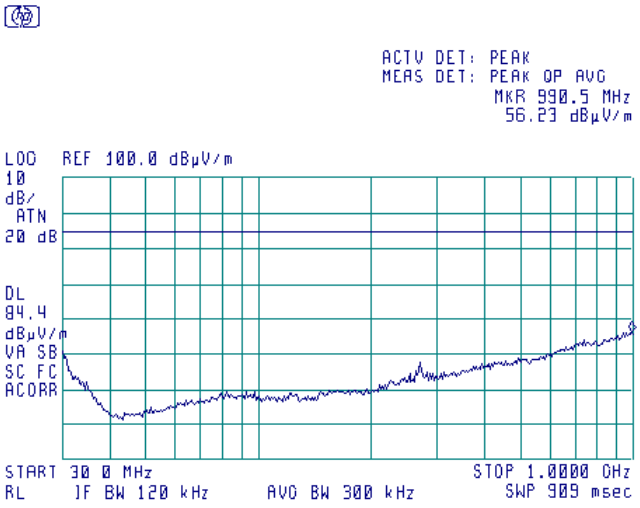
Plot 7.4.7 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.4.8 Radiated emission measurements in 30 - 1000 MHz range

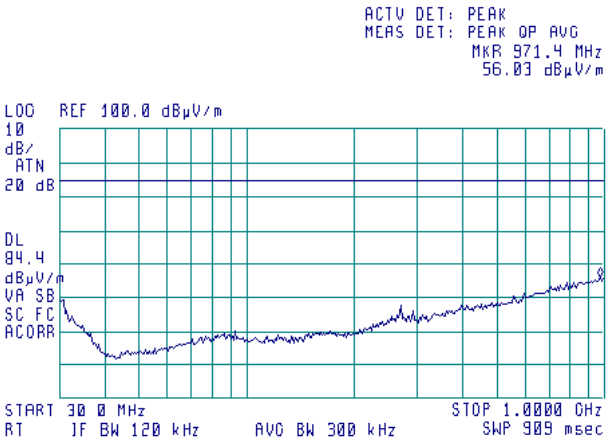
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

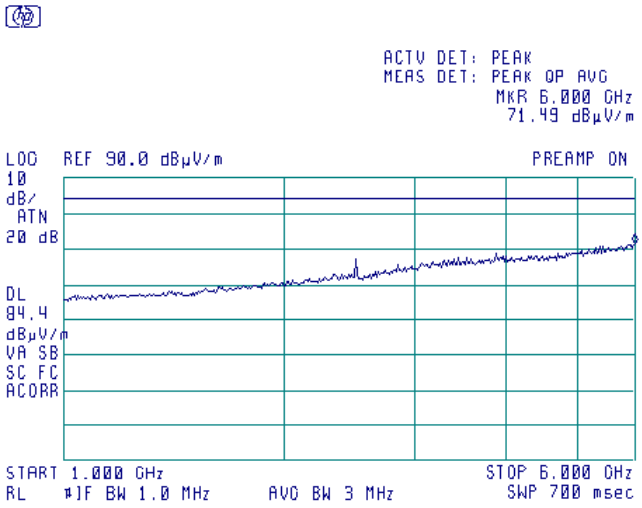
Plot 7.4.9 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.4.10 Radiated emission measurements in 1000 – 6000 MHz range

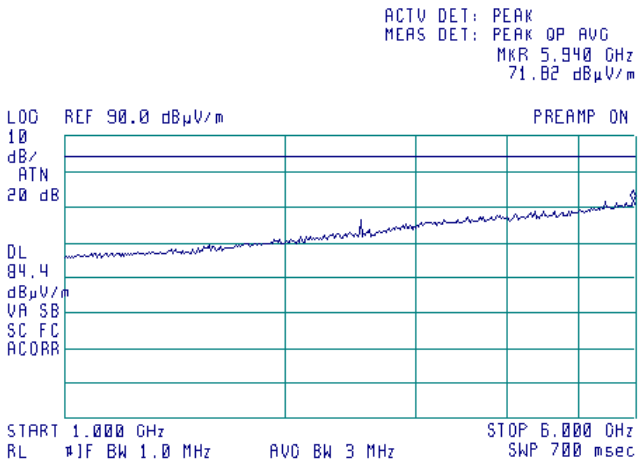
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

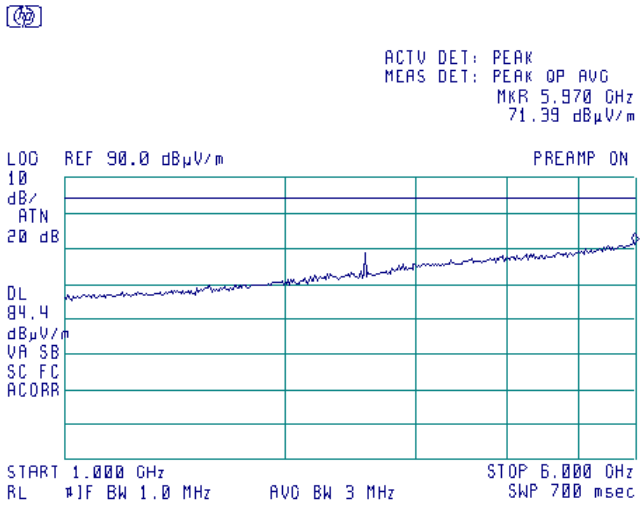
Plot 7.4.11 Radiated emission measurements in 1000 – 6000 MHz range

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



Plot 7.4.12 Radiated emission measurements in 1000 – 6000 MHz range

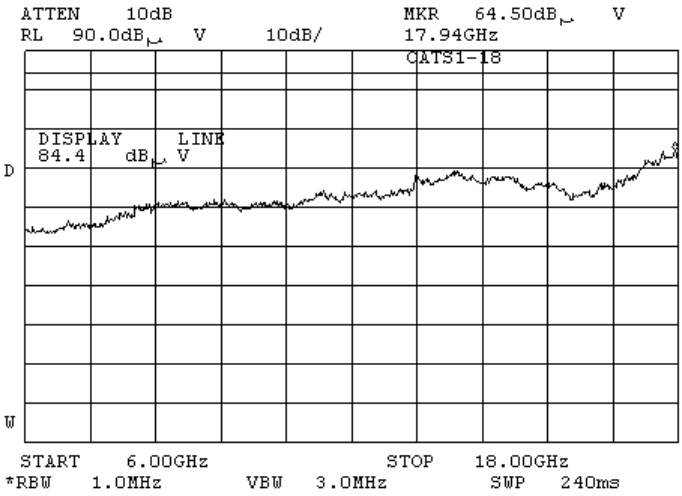
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

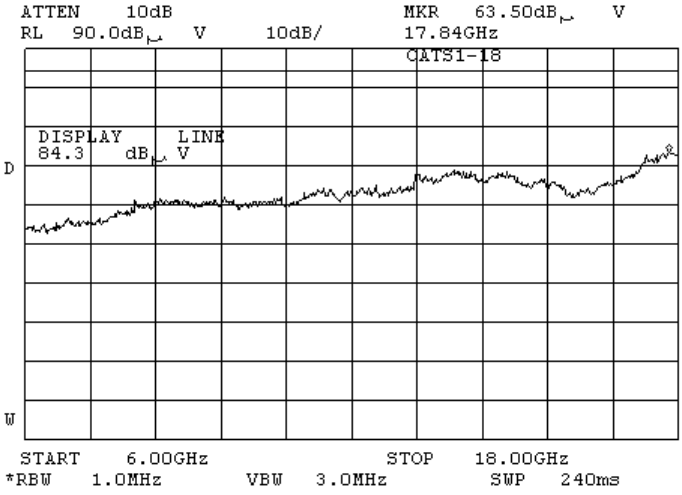
Plot 7.4.13 Radiated emission measurements in 6000 – 18000 MHz range

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



Plot 7.4.14 Radiated emission measurements in 6000 – 18000 MHz range

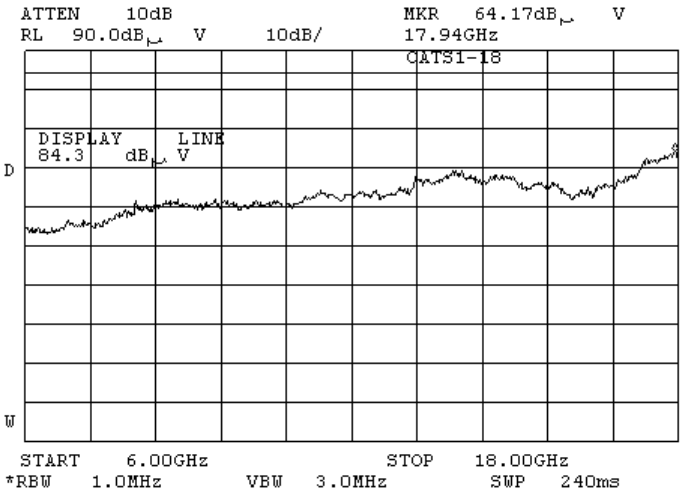
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

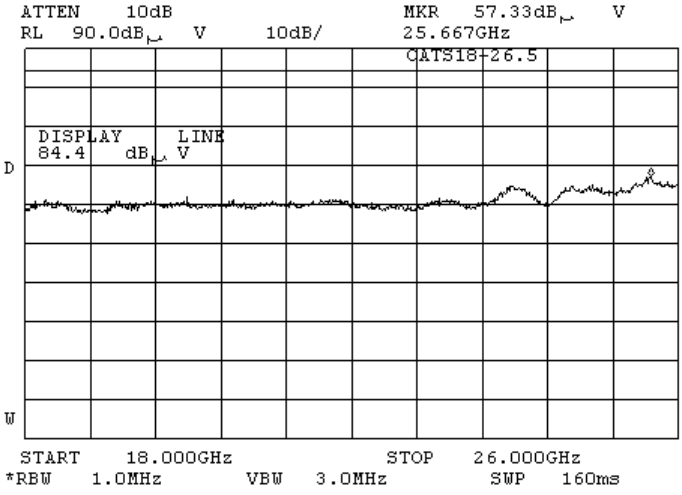
Plot 7.4.15 Radiated emission measurements in 6000 – 18000 MHz range

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



Plot 7.4.16 Radiated emission measurements in 18000 – 26000 MHz range

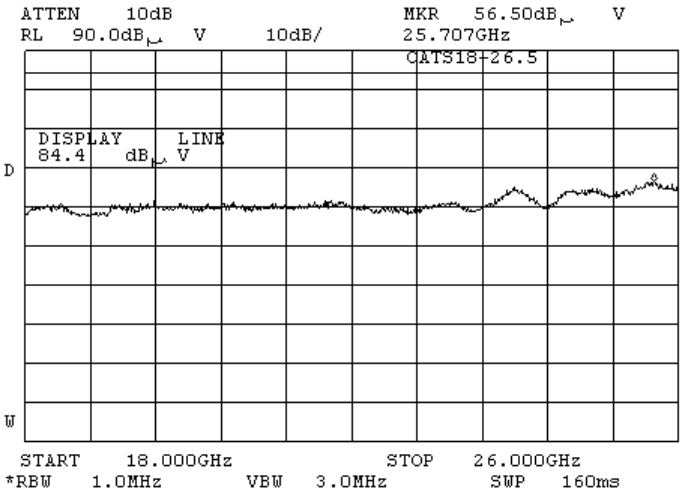
TEST SITE: OATS
CARRIER FREQUENCY: Low
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53(m)(2), Radiated spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/31/2011		
Temperature: 23.2 ºC	Air Pressure: 1011 hPa	Relative Humidity: 51 %	Power Supply: 48VDC
Remarks:			

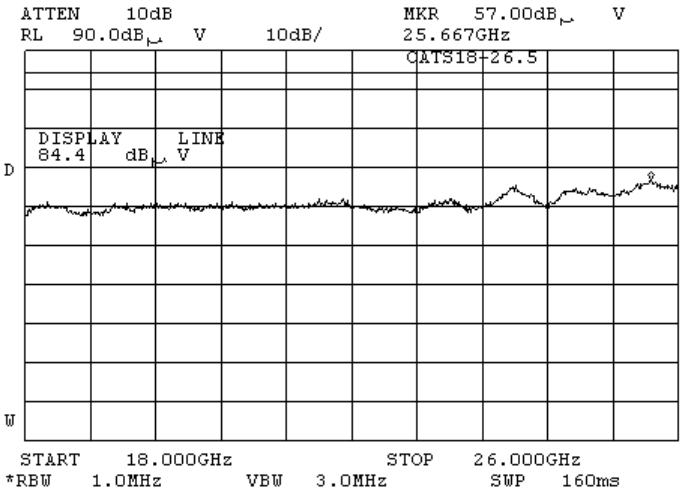
Plot 7.4.17 Radiated emission measurements in 18000 – 26000 MHz range

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



Plot 7.4.18 Radiated emission measurements in 18000 – 26000 MHz range

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



Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

7.5 Spurious emissions at RF antenna connector test

7.5.1 General

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

Table 7.5.1 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

7.5.2 Test procedure

7.5.2.1 The EUT was set up as shown in Figure 7.5.1 or Figure 7.5.2, energized and its proper operation was checked.
7.5.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.5.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.5.2 and the associated plots.

Figure 7.5.1 Spurious emission test setup, single output

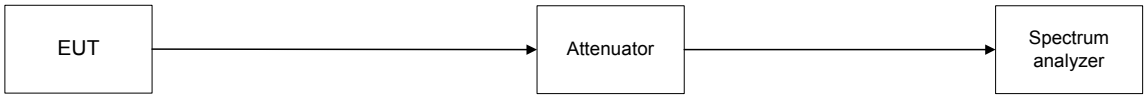
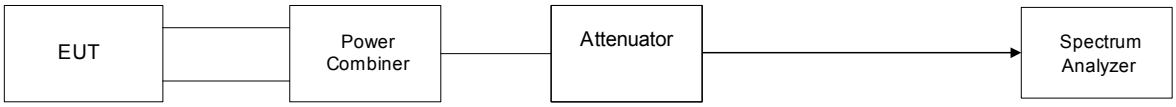


Figure 7.5.2 Spurious emission test setup, combined output



Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Table 7.5.2 Spurious emission test results (combined output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 18000 MHz (except: 2497.0 – 2509.0 MHz for low channel 2527.0 – 2539.0 MHz for mid channel 2563.0 – 2575.0 MHz for high channel) See NOTE 2
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
EBW:	3.5 MHz (See NOTE 1)
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
TRANSMITTER OUTPUT POWER:	42.87 dBm at low frequency 42.76 dBm at mid frequency 43.22 dBm at high frequency

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Low carrier frequency								
No spurious emissions were found								Pass
Mid carrier frequency								
No spurious emissions were found								Pass
High carrier frequency								
No spurious emissions were found								Pass

*****- Margin = Spurious emission – specification limit.

NOTE 1: Spurious emissions test was performed at 3.5 MHz EBW with 64QAM modulation as configuration that produces maximum power spectral density.
NOTE 2: For band edge emissions please see emission mask test report.

Test specification:	**Section 27.53(m)(2), Conducted spurious emissions**		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	**Verdict:**	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	**Air Pressure:** 1015 hPa	**Relative Humidity:** 44 %	**Power Supply:** 48VDC
Remarks:			

Table 7.5.3 Spurious emission test results (single output)

ASSIGNED FREQUENCY RANGE:	2500.0 – 2572.0 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 26000 MHz (except: 2497.0 – 2509.0 MHz for low channel 2527.0 – 2539.0 MHz for mid channel 2563.0 – 2575.0 MHz for high channel) See NOTE 2
DETECTOR USED:	Average
VIDEO BANDWIDTH:	≥ Resolution bandwidth
MODULATION:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	14 Mbps
EBW:	3.5 MHz (See NOTE 1)
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
TRANSMITTER OUTPUT POWER:	42.87 dBm at low frequency 42.76 dBm at mid frequency 43.22 dBm at high frequency

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Low carrier frequency								
No spurious emissions were found								Pass
Mid carrier frequency								
No spurious emissions were found								Pass
High carrier frequency								
No spurious emissions were found								Pass

*****- Margin = Spurious emission – specification limit.

NOTE 1: Spurious emissions test was performed at 3.5 MHz EBW with 64QAM modulation as configuration that produces maximum power spectral density.
NOTE 2: For band edge emissions please see emission mask test report.

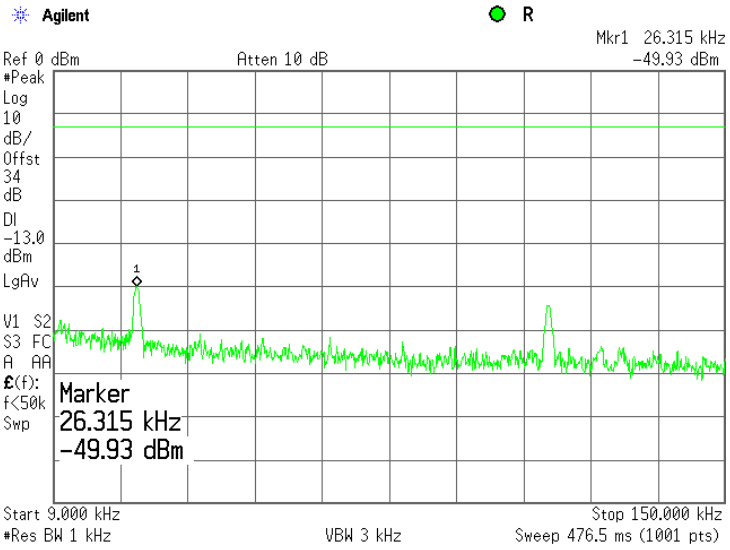
Reference numbers of test equipment used

HL 1906	HL 2015	HL 2953	HL 3206	HL 3322	HL 3433	HL 3434	HL 3472
HL 3474	HL 3559	HL 3787	HL 3818				

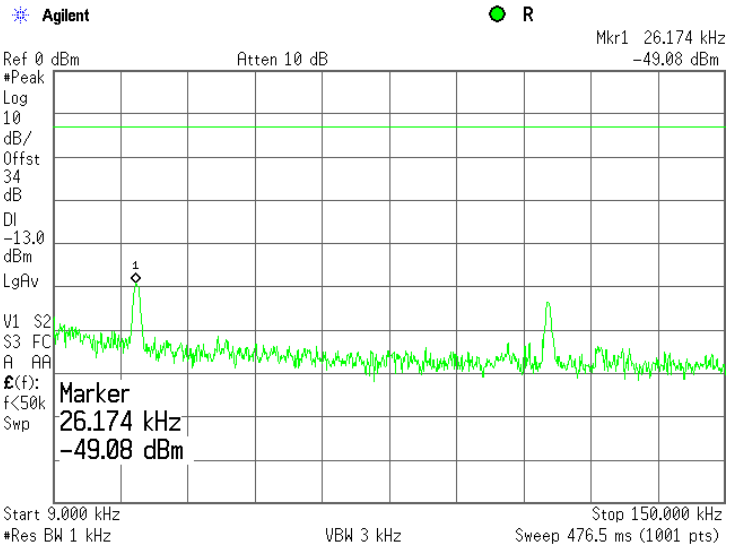
Full description is given in Appendix A.

Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency, single output

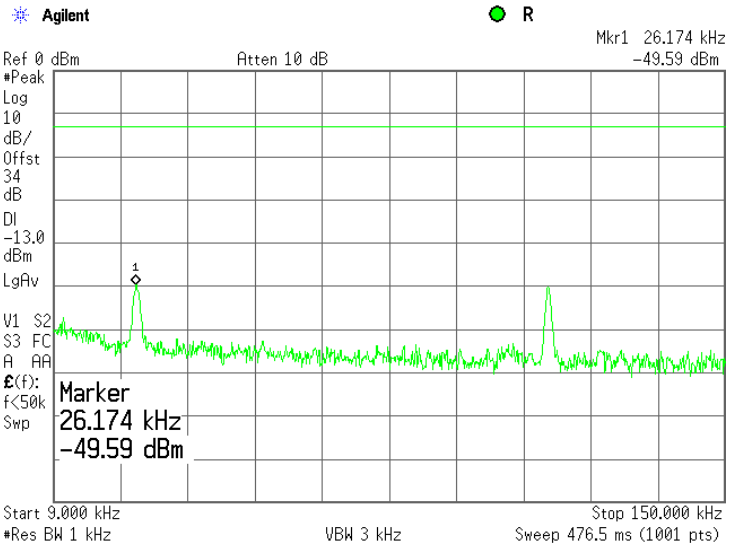


Plot 7.5.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency, single output

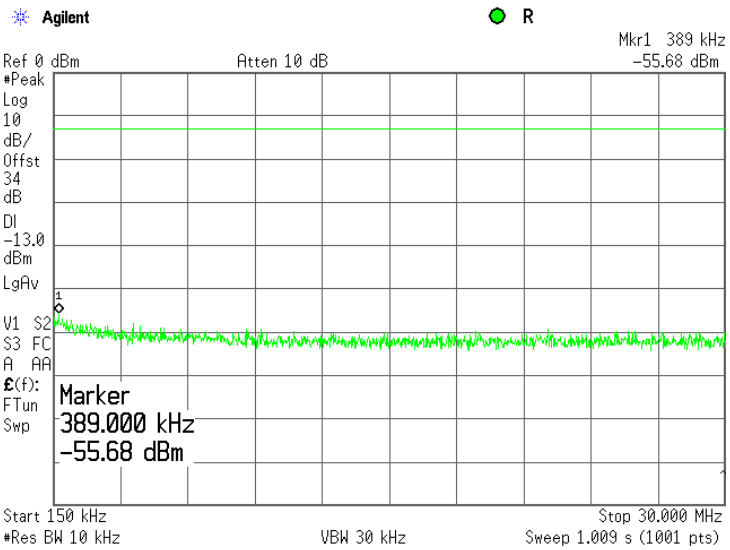


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency, single output

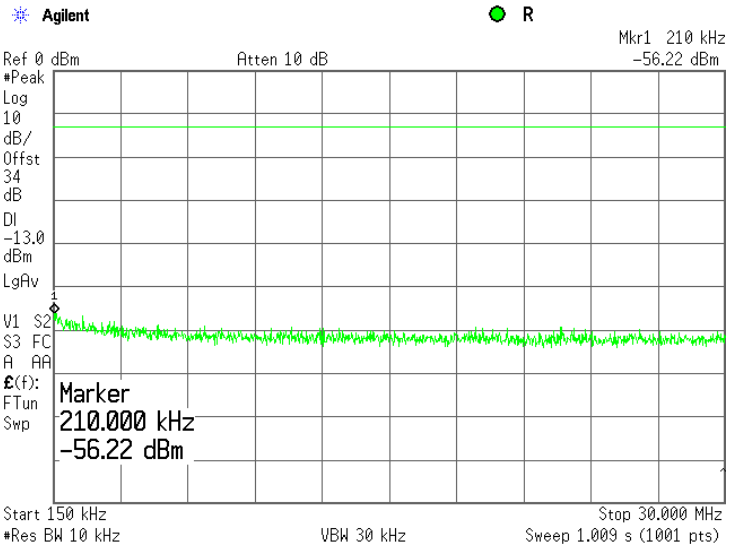


Plot 7.5.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency, single output

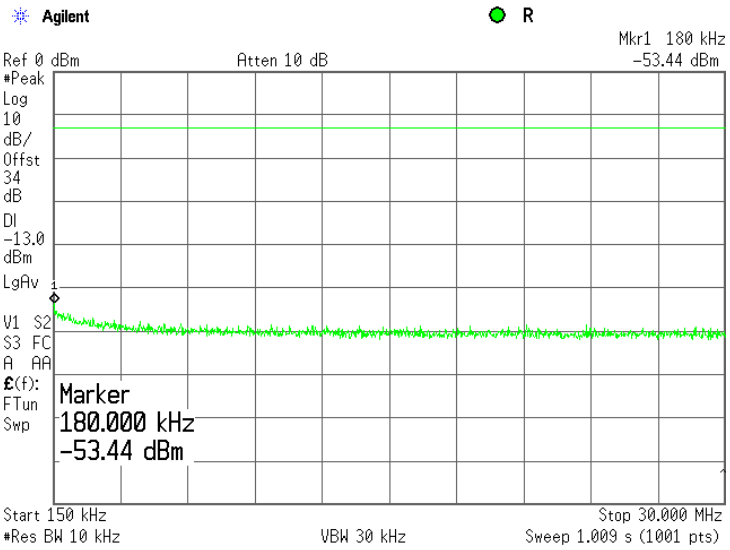


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.5 Spurious emission measurements in 0.15 - 30.0 MHz range at mid carrier frequency, single output

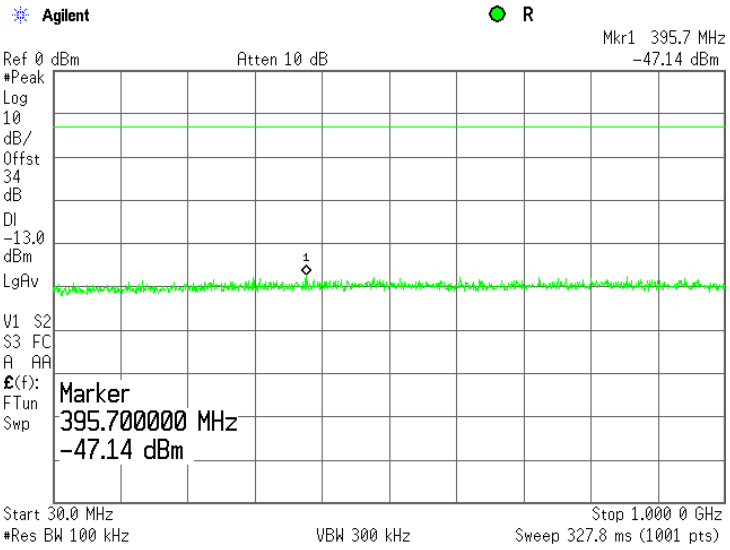


Plot 7.5.6 Spurious emission measurements in 0.15 – 30.0 MHz range at high carrier frequency, single output

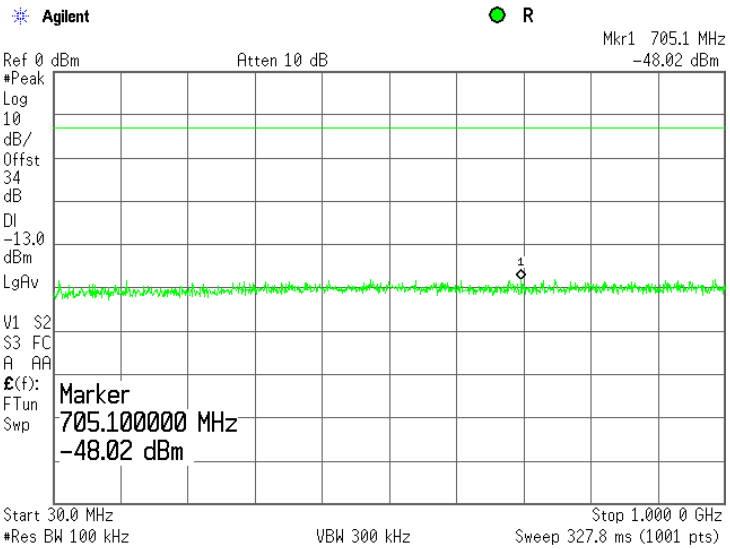


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.7 Spurious emission measurements in 30.0 – 1000.0 MHz range at low carrier frequency, single output

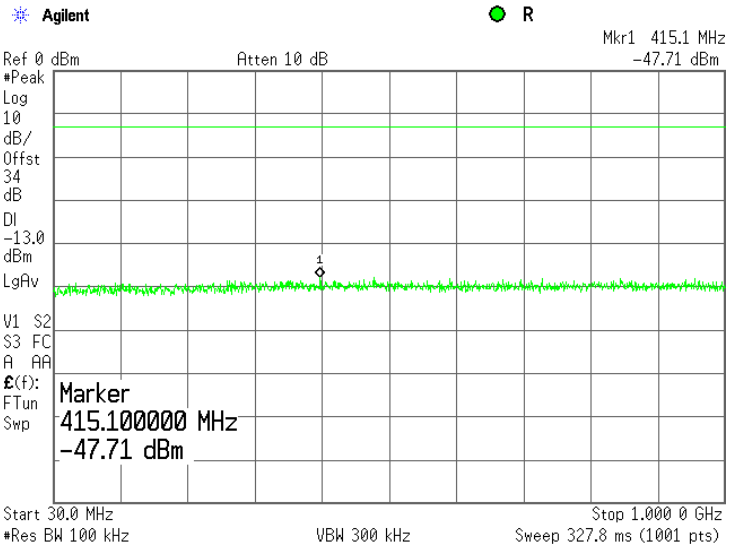


Plot 7.5.8 Spurious emission measurements in 30.0 – 1000.0 MHz range at mid carrier frequency, single output

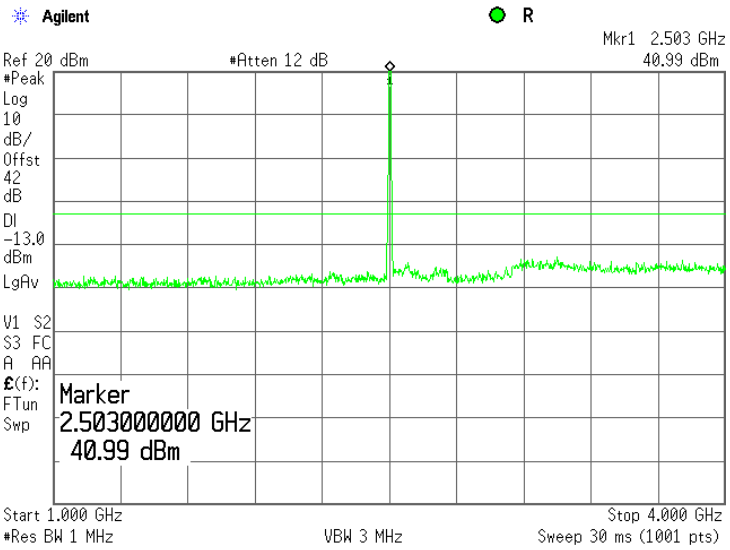


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.9 Spurious emission measurements in 30.0 – 1000.0 MHz range at high carrier frequency, single output

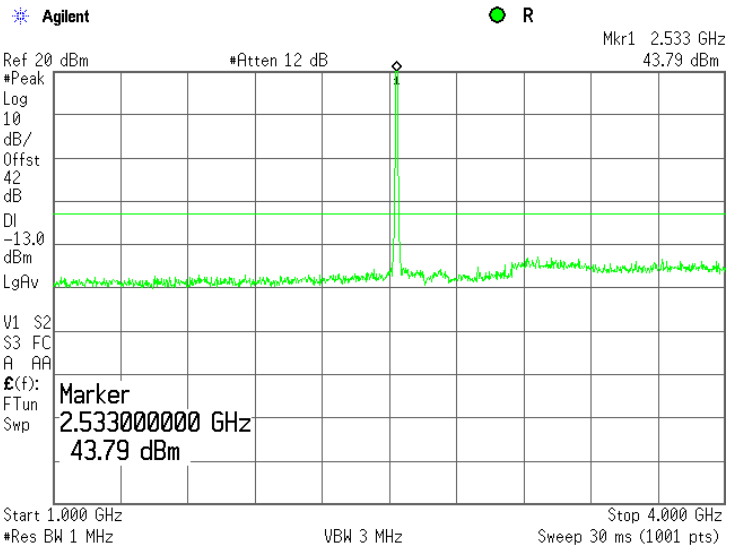


Plot 7.5.10 Spurious emission measurements in 1000.0 – 4000.0 MHz range at low carrier frequency, single output

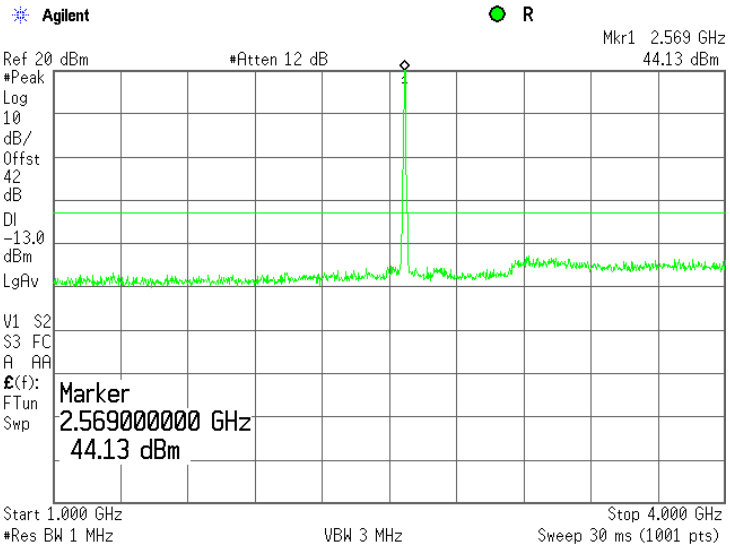


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.11 Spurious emission measurements in 1000.0 – 4000.0 MHz range at mid carrier frequency, single output

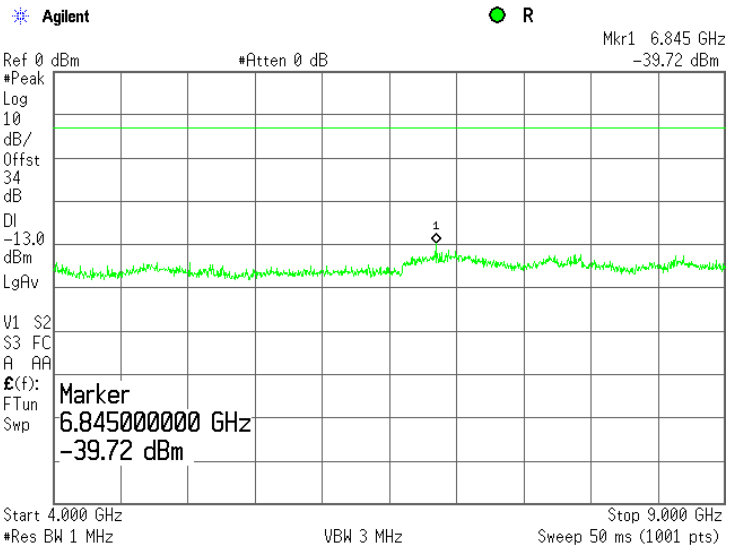


Plot 7.5.12 Spurious emission measurements in 1000.0 – 4000.0 MHz at high carrier frequency, single output

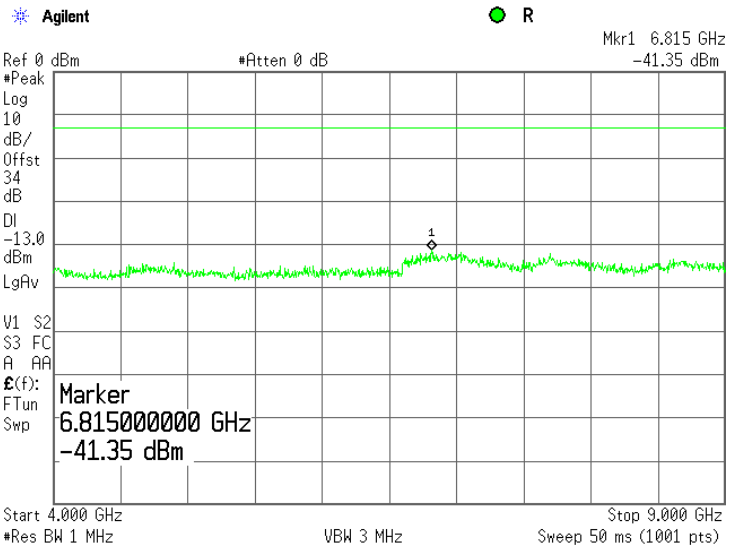


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.13 Spurious emission measurements in 4000 – 9000 MHz range at low carrier frequency, combined outputs

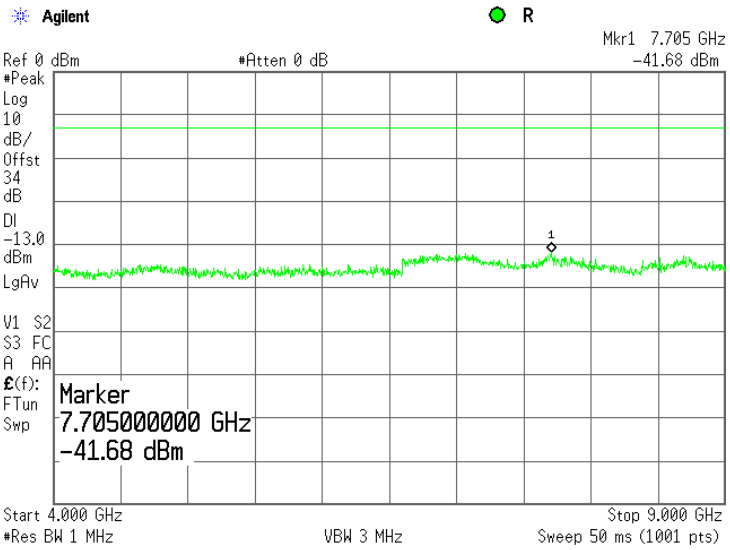


Plot 7.5.14 Spurious emission measurements in 4000 – 9000 MHz range at mid carrier frequency, combined outputs

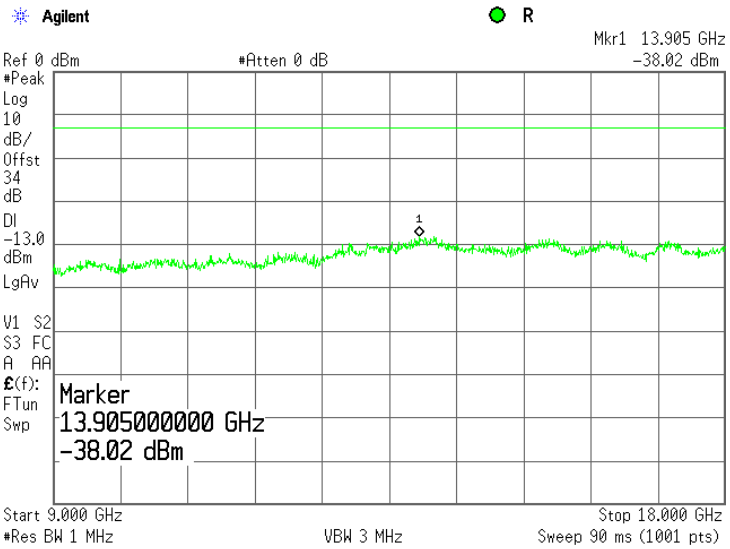


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.15 Spurious emission measurements in 4000 – 9000 MHz range at high carrier frequency, combined outputs

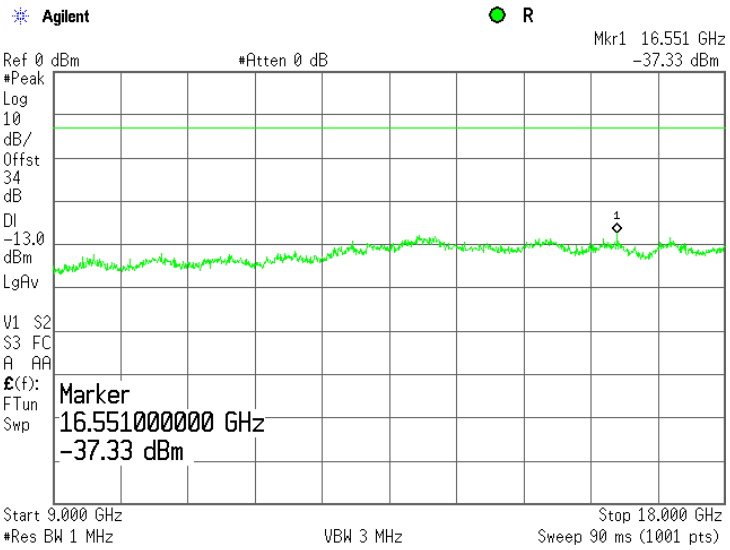


Plot 7.5.16 Spurious emission measurements in 9000 – 18000 MHz range at low carrier frequency, combined outputs

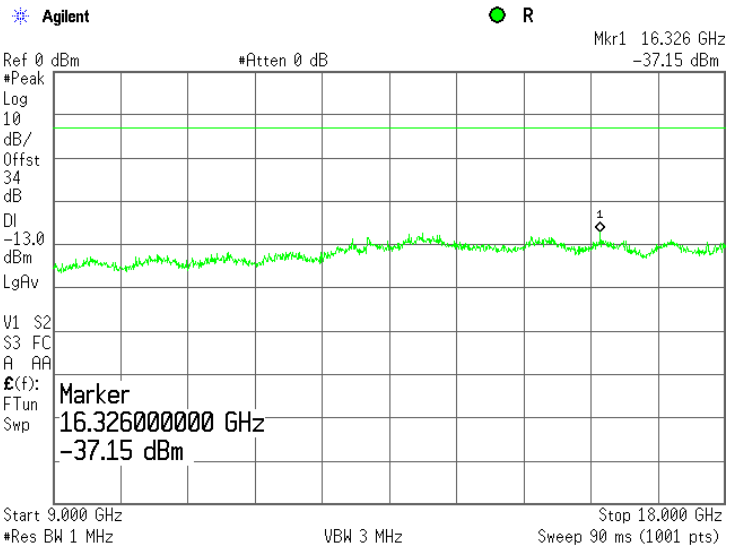


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.17 Spurious emission measurements in 9000 – 18000 MHz range at mid carrier frequency, combined outputs

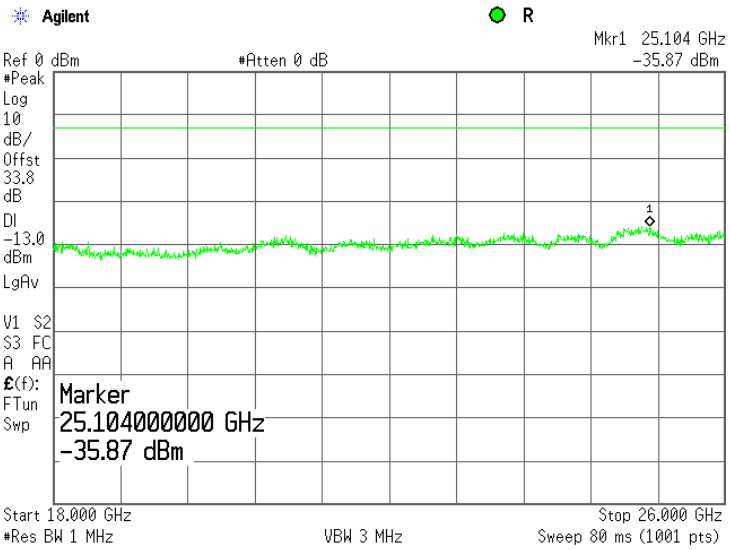


Plot 7.5.18 Spurious emission measurements in 9000 – 18000 MHz range at high carrier frequency, combined outputs

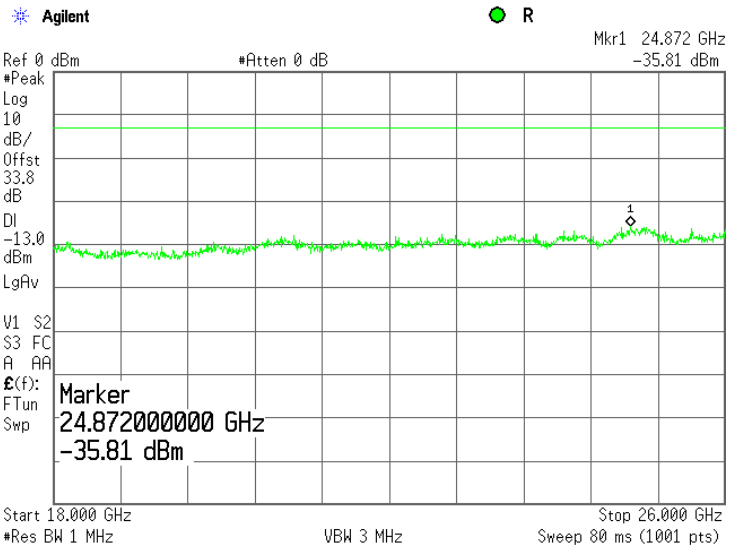


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.19 Spurious emission measurements in 18000 – 26000 MHz range at low carrier frequency, single outputs

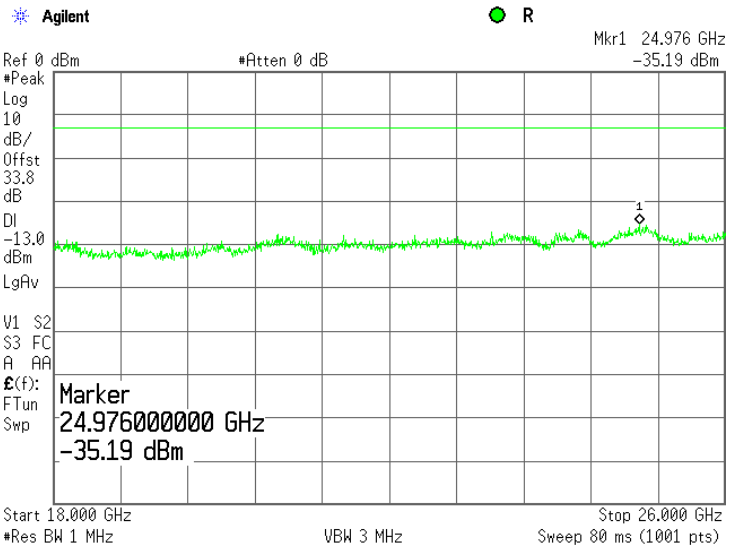


Plot 7.5.20 Spurious emission measurements in 18000 – 26000 MHz range at mid carrier frequency, single outputs

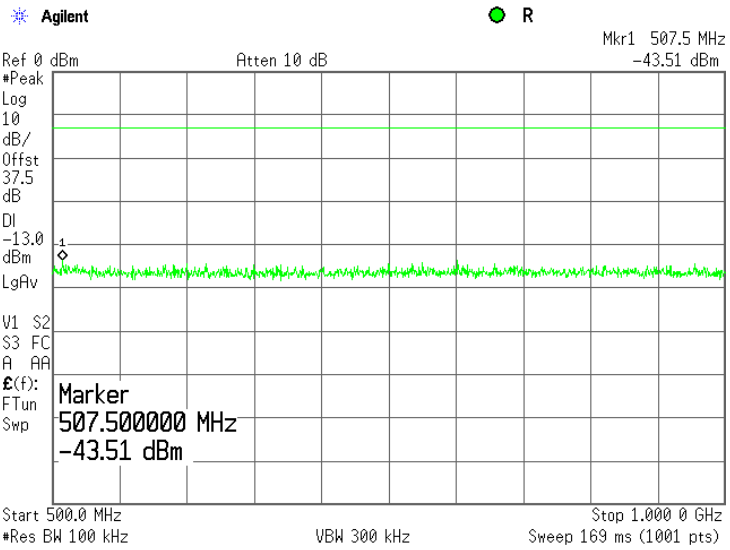


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.21 Spurious emission measurements in 18000 – 26000 MHz range at high carrier frequency, single outputs

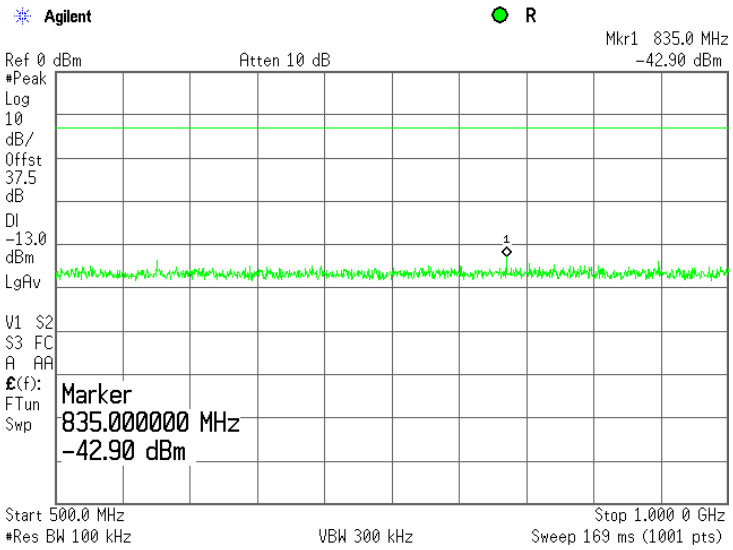


Plot 7.5.22 Spurious emission measurements in 500.0 – 1000.0 MHz range at low carrier frequency, combined outputs

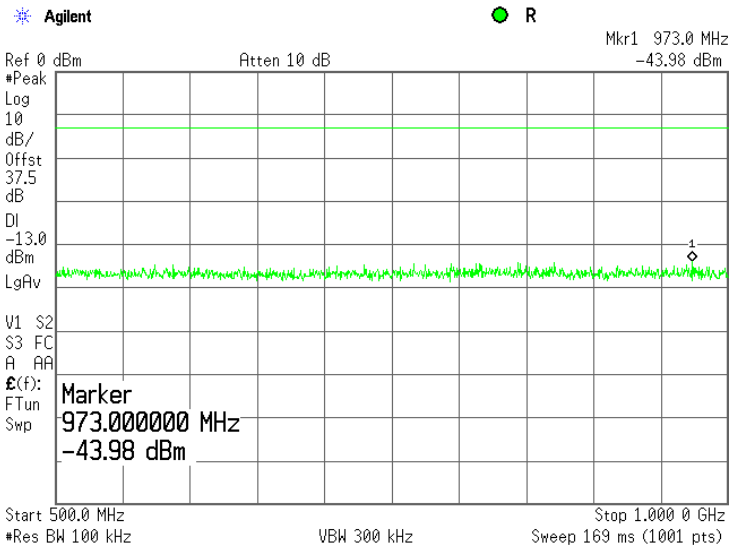


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.23 Spurious emission measurements in 500.0 – 1000.0 MHz range at mid carrier frequency, combined outputs

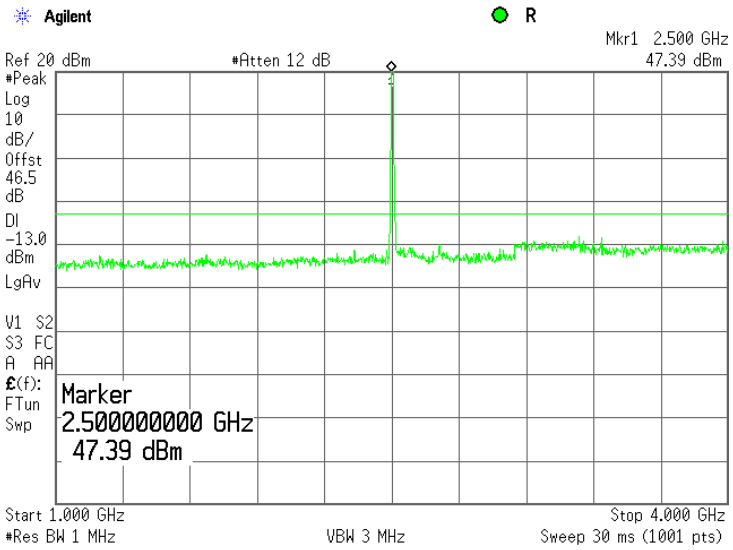


Plot 7.5.24 Spurious emission measurements in 500.0 – 1000.0 MHz range at high carrier frequency, combined outputs

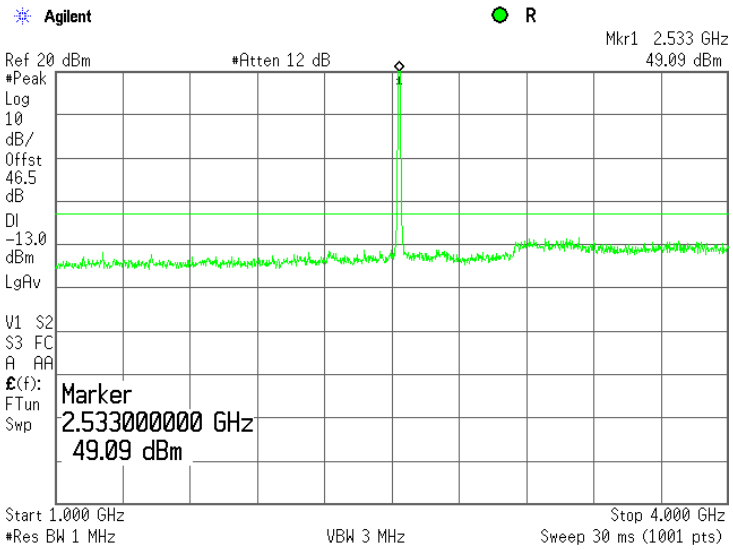


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.25 Spurious emission measurements in 1000.0 – 4000.0 MHz range at low carrier frequency, combined outputs

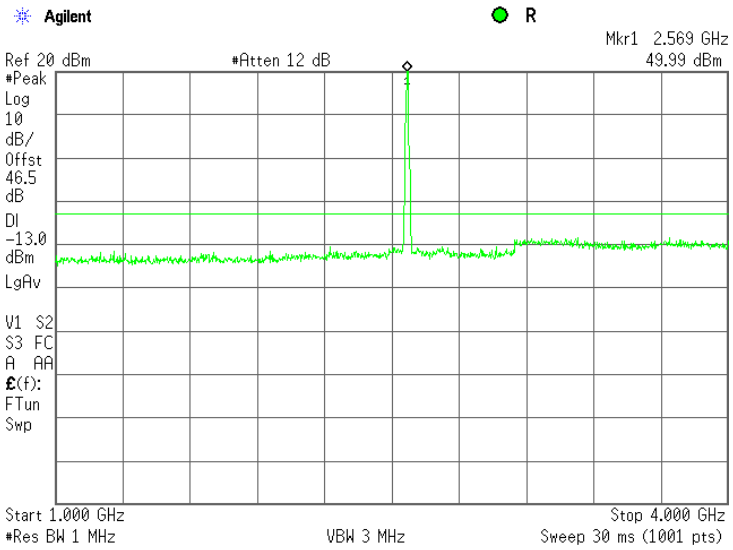


Plot 7.5.26 Spurious emission measurements in 1000.0 – 4000.0 MHz range at mid carrier frequency, combined outputs



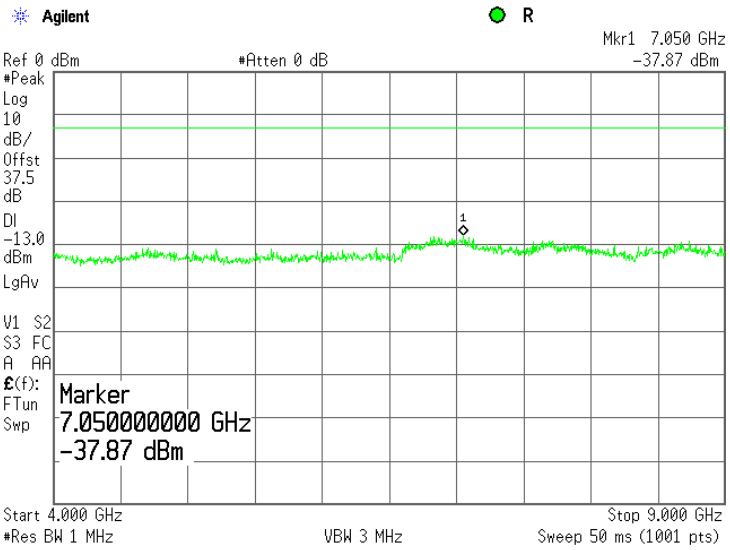
Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.27 Spurious emission measurements in 1000.0 – 4000.0 MHz range at high carrier frequency, combined outputs

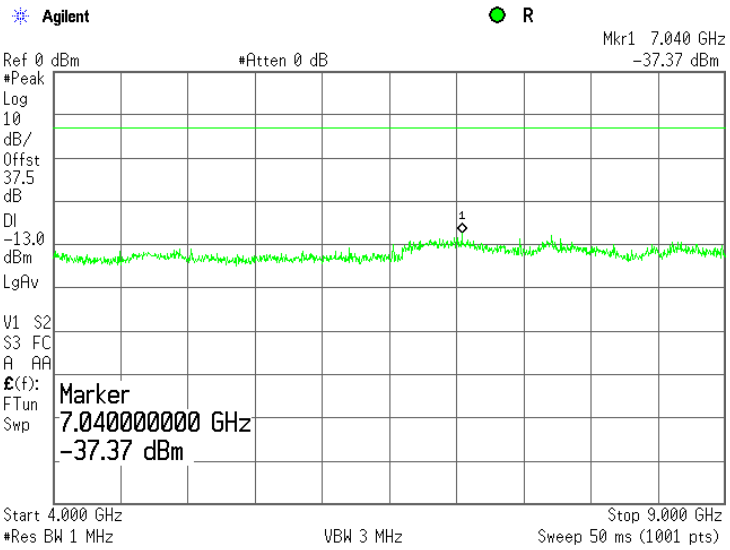


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.28 Spurious emission measurements in 4000 – 9000 MHz range at low carrier frequency, combined outputs

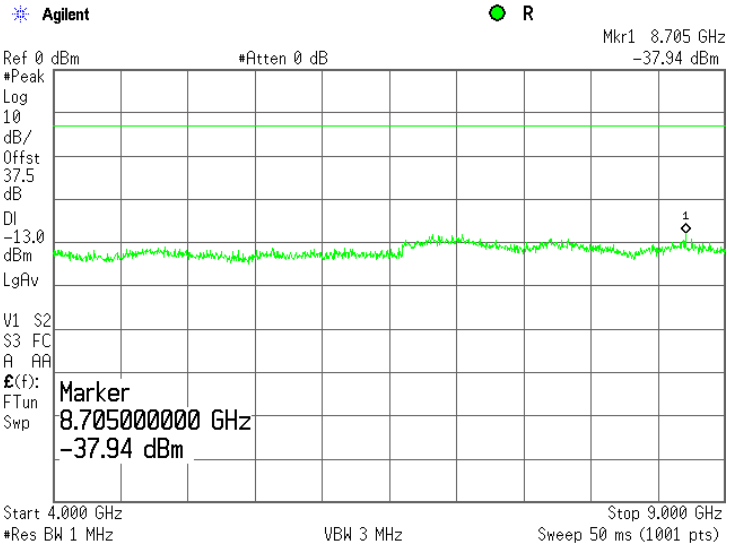


Plot 7.5.29 Spurious emission measurements in 4000 – 9000 MHz range at mid carrier frequency, combined outputs

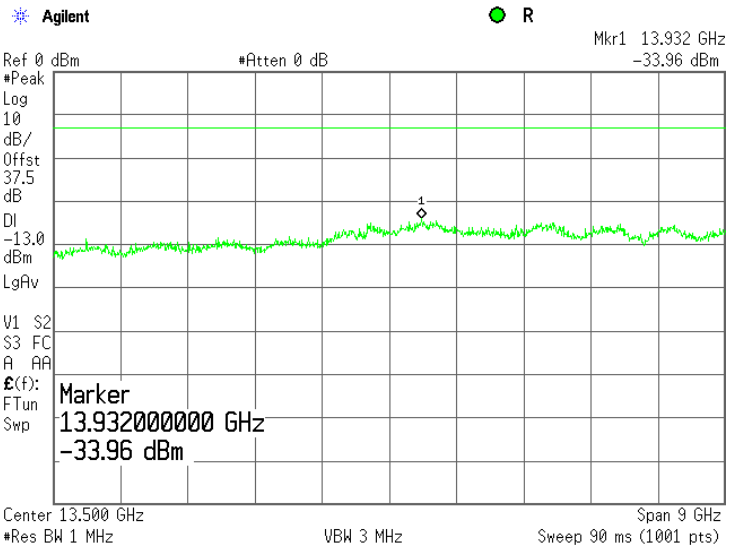


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.30 Spurious emission measurements in 4000 – 9000 MHz range at high carrier frequency, combined outputs

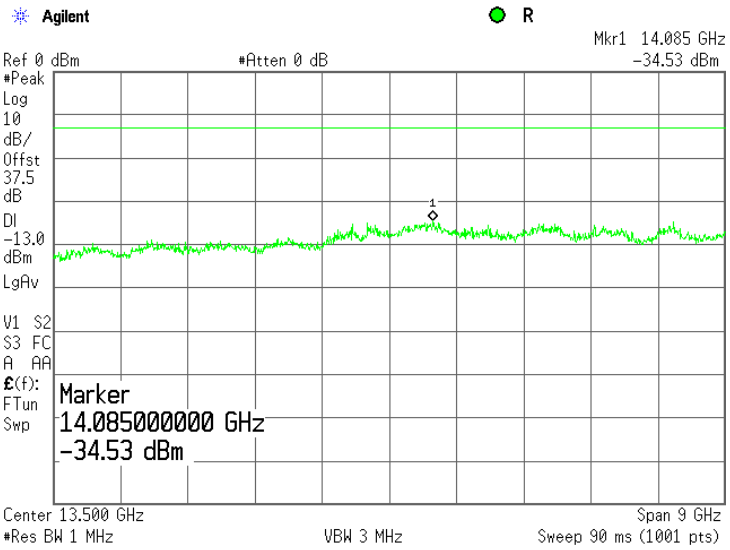


Plot 7.5.31 Spurious emission measurements in 9000 – 18000 MHz range at low carrier frequency, combined outputs

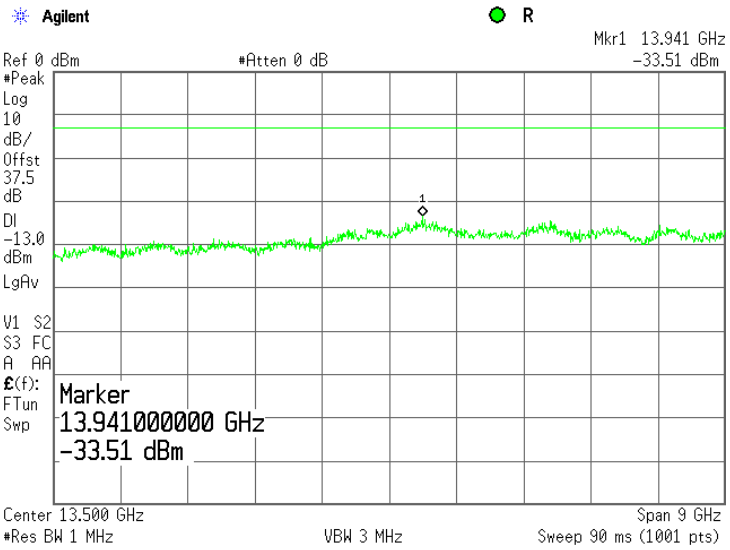


Test specification:	Section 27.53(m)(2), Conducted spurious emissions		
Test procedure:	Section 27.53(m)(2)		
Test mode:	Compliance	Verdict:	PASS
Date:	1/25/2011		
Temperature: 22.4 ºC	Air Pressure: 1015 hPa	Relative Humidity: 44 %	Power Supply: 48VDC
Remarks:			

Plot 7.5.32 Spurious emission measurements in 9000 – 18000 MHz range at mid carrier frequency, combined outputs



Plot 7.5.33 Spurious emission measurements in 9000 – 18000 MHz range at high carrier frequency, combined outputs



Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date:	1/20/2011 - 1/21/2011		
Temperature: 23.2 ºC	Air Pressure: 1019 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks:			

7.6 Frequency stability test

7.6.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement
2500.0 – 2572.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

7.6.2 Test procedure

7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and its proper operation was checked.

7.6.2.2 The EUT power was turned off. Temperature within test chamber was set to +30˚C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

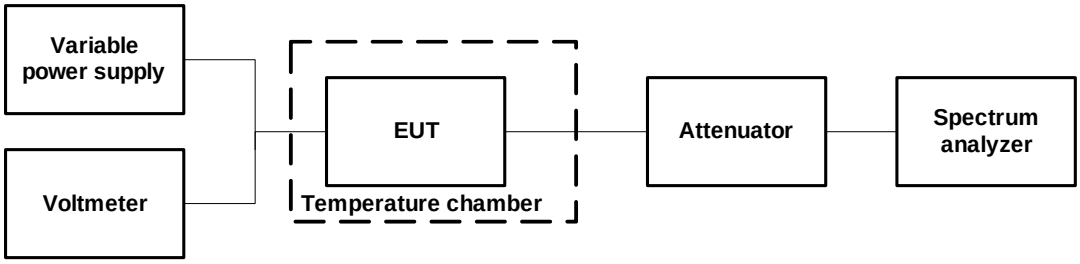
7.6.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

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

7.6.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.

7.6.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.6.2.

Figure 7.6.1 Frequency stability test setup



Test specification:	**Section 27.54, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	**Verdict:**	PASS
Date:	1/20/2011 - 1/21/2011		
Temperature: 23.2 ºC	**Air Pressure:** 1019 hPa	**Relative Humidity:** 43 %	**Power Supply:** 48VDC
Remarks:			

Table 7.6.2 Frequency stability test results

OPERATING FREQUENCY:	2500.0 – 2572.0 MHz
NOMINAL POWER VOLTAGE:	48 VDC
TEMPERATURE STABILIZATION PERIOD:	20 min
POWER DURING TEMPERATURE TRANSITION:	Off
SPECTRUM ANALYZER MODE:	Counter
RESOLUTION BANDWIDTH:	1kHz
VIDEO BANDWIDTH:	3 kHz
MODULATION:	Unmodulated

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 2503.0 MHz										
-30	nominal	2503.000966	2503.000981	2503.000996	2503.001003	2503.001019	2503.001008	2503.001021	808	0
-20	nominal	2502.999927	NA	NA	NA	NA	NA	2503.001001	788	-286
-10	nominal	2503.001039	NA	NA	NA	NA	NA	2503.001095	882	0
0	nominal	2503.000705	2503.000656	2503.000662	2503.000677	2503.000669	2503.000621	2503.000534	492	0
10	nominal	2502.999867	NA	NA	NA	NA	NA	2502.999796	0	-417
20	15%	2503.000318	NA	NA	NA	NA	NA	2503.000100	105	-113
20	nominal	2503.000127	NA	NA	NA	NA	NA	2503.000213	0	-86
20	-15%	2503.000267	NA	NA	NA	NA	NA	2503.000248	54	0
30	nominal	2502.999875	2502.999758	2502.999828	2503.001154	2503.000814	2503.000568	2503.000301	941	-455
40	nominal	2503.000392	NA	NA	NA	NA	NA	2503.000363	179	0
50	nominal	2503.000398	NA	NA	NA	NA	NA	2503.000448	235	0
Mid carrier frequency 2533.0 MHz										
-30	nominal	2533.000696	2533.000749	2533.000763	2533.000797	2533.000832	2533.000835	2533.000928	487	0
-20	nominal	2533.001017	NA	NA	NA	NA	NA	2533.001129	688	0
-10	nominal	2533.002682	NA	NA	NA	NA	NA	2533.001005	2241	0
0	nominal	2533.000562	2533.000526	2533.000505	2533.000508	2533.000511	2533.000495	2533.000465	121	0
10	nominal	2532.999951	NA	NA	NA	NA	NA	2532.999873	0	-568
20	15%	2533.000285	NA	NA	NA	NA	NA	2533.000264	0	-177
20	nominal	2533.000829	NA	NA	NA	NA	NA	2533.000441	388	0
20	-15%	2533.000269	NA	NA	NA	NA	NA	2533.000243	0	-198
30	nominal	2533.000259	2533.000249	2533.000271	2533.000254	2533.000248	2533.000246	2533.000252	0	-195
40	nominal	2533.000339	NA	NA	NA	NA	NA	2533.000373	0	-102
50	nominal	2533.000442	NA	NA	NA	NA	NA	2533.000379	1	-62
High carrier frequency 2569.0 MHz										
-30	nominal	2569.002851	2568.999829	2569.000044	2569.000128	2569.000197	2569.000291	2569.000577	2484	-538
-20	nominal	2569.001141	NA	NA	NA	NA	NA	2569.001168	801	0
-10	nominal	2569.000795	NA	NA	NA	NA	NA	2569.000928	561	0
0	nominal	2569.000457	2569.000441	2569.000444	2569.000413	2569.000442	2569.000416	2569.000428	90	0
10	nominal	2569.000161	NA	NA	NA	NA	NA	2568.999937	0	-430
20	15%	2569.000299	NA	NA	NA	NA	NA	2569.000287	0	-80
20	nominal	2569.000432	NA	NA	NA	NA	NA	2569.000367	65	0
20	-15%	2569.000274	NA	NA	NA	NA	NA	2569.000249	0	-118
30	nominal	2569.000272	2569.000264	2569.000265	2569.000257	2569.000263	2569.000278	2569.000264	0	-110
40	nominal	2569.000447	NA	NA	NA	NA	NA	2569.000364	80	-3
50	nominal	2569.000367	NA	NA	NA	NA	NA	2569.000278	0	-89

* - Reference frequency

Table 7.6.3 Maximum frequency displacement

Channel	Maximum frequency displacement			
	ppm		Hz	
	Negative	Positive	Negative	Positive
Low (2503.0 MHz)	0.18	0.38	455	941
Mid (2533.0 MHz)	0.22	0.88	568	2241
High (2569.0 MHz)	0.21	0.97	538	2484

Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date:	1/20/2011 - 1/21/2011		
Temperature: 23.2 ºC	Air Pressure: 1019 hPa	Relative Humidity: 43 %	Power Supply: 48VDC
Remarks:			

Table 7.6.4 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
3.5 MHz BW								
QPSK								
2501.330000	2504.685000	2501.329545	2504.685941	2500.000000	2506.000000	1.329545	-1.314059	Pass
2531.330000	2534.690000	2531.329432	2534.692241	2530.000000	2536.000000	1.329432	-1.307759	Pass
2567.300000	2570.685000	2567.299462	2570.687484	2566.000000	2572.000000	1.299462	-1.312516	Pass
64QAM								
2501.300000	2504.660000	2501.299545	2504.660941	2500.000000	2506.000000	1.299545	-1.339059	Pass
2531.300000	2534.690000	2531.299432	2534.692241	2530.000000	2536.000000	1.299432	-1.307759	Pass
2567.300000	2570.690000	2567.299462	2570.692484	2566.000000	2572.000000	1.299462	-1.307516	Pass
5 MHz BW								
QPSK								
2500.620000	2505.345000	2500.619545	2505.345941	2500.000000	2506.000000	0.619545	-0.654059	Pass
2530.662000	2535.338000	2530.661432	2535.340241	2530.000000	2536.000000	0.661432	-0.659759	Pass
2566.641000	2571.380000	2566.640462	2571.382484	2566.000000	2572.000000	0.640462	-0.617516	Pass
64QAM								
2500.613000	2505.352000	2500.612545	2505.352941	2500.000000	2506.000000	0.612545	-0.647059	Pass
2530.620000	2535.352000	2530.619432	2535.354241	2530.000000	2536.000000	0.619432	-0.645759	Pass
2566.613000	2571.380000	2566.612462	2571.382484	2566.000000	2572.000000	0.612462	-0.617516	Pass
7 MHz BW								
QPSK								
2502.640000	2509.310000	2502.639545	2509.310941	2500.000000	2512.000000	2.639545	-2.689059	Pass
2532.630000	2539.320000	2532.629432	2539.322241	2530.000000	2542.000000	2.629432	-2.677759	Pass
2562.630000	2569.340000	2562.629462	2569.342484	2560.000000	2572.000000	2.629462	-2.657516	Pass
64QAM								
2502.630000	2509.340000	2502.629545	2509.340941	2500.000000	2512.000000	2.629545	-2.659059	Pass
2532.680000	2539.320000	2532.679432	2539.322241	2530.000000	2542.000000	2.679432	-2.677759	Pass
2562.680000	2569.310000	2562.679462	2569.312484	2560.000000	2572.000000	2.679462	-2.687516	Pass
10 MHz BW								
QPSK								
2501.260000	2510.725000	2501.259545	2510.725941	2500.000000	2512.000000	1.259545	-1.274059	Pass
2531.305000	2540.725000	2531.304432	2540.727241	2530.000000	2542.000000	1.304432	-1.272759	Pass
2561.305000	2570.740000	2561.304462	2570.742484	2560.000000	2572.000000	1.304462	-1.257516	Pass
64QAM								
2501.260000	2510.725000	2501.259545	2510.725941	2500.000000	2512.000000	1.259545	-1.274059	Pass
2531.305000	2540.725000	2531.304432	2540.727241	2530.000000	2542.000000	1.304432	-1.272759	Pass
2561.320000	2570.740000	2561.319462	2570.742484	2560.000000	2572.000000	1.319462	-1.257516	Pass

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

Reference numbers of test equipment used

HL 1456	HL 3787	HL 3818					

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	25-Aug-10	25-Aug-11
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-11	11-Jan-12
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
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies	8564EC	3946A002 19	31-Aug-10	31-Aug-11
1456	Cable, 1 m	Harbour Industries	MIL 17/60-RG142	1456	01-Sep-10	01-Sep-11
1906	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	1906	01-Dec-10	01-Dec-12
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	11-Jun-10	11-Jun-11
2013	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	2013	01-Dec-10	01-Dec-12
2015	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	2015	01-Dec-10	01-Dec-12
2870	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	2870	14-Sep-10	14-Sep-11
2871	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-8155-00	2871	14-Sep-10	14-Sep-11
2953	Cable, RF, 18 GHz, 1.2 m, SMA-SMA	Gore	10020014	NA	04-Oct-10	04-Oct-11
3001	EMC Analyzer, 9 kHz to 3 GHz	Agilent Technologies	E7402A	US394401 80	26-Dec-10	26-Dec-11
3002	Surge coupler/decoupler for telecom lines	Hermon Laboratories	CDN 61000-4-5/8UBSL	3002	30-Dec-10	30-Dec-11
3206	Cable 40 GHz, 0.6 m	Gore	GOR245	05118336	13-Jun-10	13-Jun-11
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY451010 57	13-Dec-10	13-Dec-11
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY452405 86	13-Dec-10	13-Dec-11
3322	Attenuator DC to 22 GHz, 30 dB, 50 W	Aeroflex / Weinschel	86-30-12	448	14-Sep-10	14-Sep-11
3433	Test Cable, DC-18 GHz, 1.5 m, SMA - SMA	Mini-Circuits	CBL-5FT-SMSM+	25679	07-Mar-10	07-Mar-11
3434	Test Cable, DC-18 GHz, 1.5 m, SMA - SMA	Mini-Circuits	CBL-5FT-SMSM+	25683	07-Mar-10	07-Mar-11
3437	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	3437	07-Mar-10	07-Mar-11

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
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
3472	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 1.0 m	Gore	GORE 65474	1003478	09-May-10	09-May-11
3474	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 0.6 m	Gore	GORE 65475	1640102	09-May-10	09-May-11
3534	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040-J0	11159001002	30-Dec-10	30-Dec-11
3535	Amplifier, low noise, 18 to 40 GHz	Quinstar Technology	QLJ-18404537-J0	11159003001	06-Dec-10	06-Dec-11
3559	Cable 40 GHz, SMA-SMA, 0.95 m, Blue	Gore	PHASEFLEX	03771245	13-Jun-10	13-Jun-11
3622	Cable RF, 6.0 m, N type-N type, DC-6.5 GHz	Alpha Wire	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-10	31-Aug-11
3787	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	07-Dec-10	07-Dec-11
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	26-Sep-10	26-Sep-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). The FCC Designation Number is US1003.

Address: P.O. Box 23, Binyamina 30500, Israel.
Telephone: +972 4628 8001
Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

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.

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.110, HL 0768

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

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

Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL1984

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

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

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, 25.5 GHz, 1.2 m, SMA-SMA, S/N 10020014
HL 2953

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	8750	1.28	18000	1.84
30	0.06	9000	1.30	18250	1.91
100	0.12	9250	1.35	18500	1.94
250	0.19	9500	1.34	18750	1.92
500	0.27	9750	1.36	19000	1.95
750	0.34	10000	1.33	19250	2.00
1000	0.40	10250	1.38	19500	1.96
1250	0.45	10500	1.39	19750	2.02
1500	0.50	10750	1.39	20000	1.92
1750	0.54	11000	1.43	20250	2.04
2000	0.57	11250	1.42	20500	2.00
2250	0.60	11500	1.48	20750	2.09
2500	0.64	11750	1.49	21000	2.01
2750	0.67	12000	1.59	21250	2.07
3000	0.70	12250	1.50	21500	2.20
3250	0.74	12500	1.55	21750	2.10
3500	0.76	12750	1.55	22000	2.24
3750	0.80	13000	1.61	22250	2.25
4000	0.83	13250	1.62	22500	2.12
4250	0.85	13500	1.56	22750	2.05
4500	0.87	13750	1.61	23000	2.10
4750	0.91	14000	1.57	23250	2.03
5000	0.92	14250	1.66	23500	2.08
5250	0.96	14500	1.58	23750	2.14
5500	0.99	14750	1.69	24000	2.16
5750	0.99	15000	1.71	24250	2.25
6000	1.03	15250	1.74	24500	2.17
6250	1.05	15500	1.75	24750	2.32
6500	1.07	15750	1.72	25000	2.32
6750	1.08	16000	1.89	25250	2.32
7000	1.12	16250	1.79	25500	2.41
7250	1.13	16500	1.84	25750	2.31
7500	1.15	16750	1.82	26000	2.28
7750	1.20	17000	1.79	26250	2.32
8000	1.20	17250	1.78	26500	2.29
8250	1.23	17500	1.85		
8500	1.27	17750	1.83		

Cable loss
Cable coaxial, GORE-TEX, GOR245, 40 GHz, 0.6 m, SMA-SMA, S/N 05118336
HL 3206

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss,dB	Frequency, MHz	Cable loss,dB
10	0.09	4900	0.85	10000	1.20	15200	1.51	29500	1.94
30	0.09	5000	0.85	10100	1.23	15300	1.56	30000	2.11
50	0.10	5100	0.86	10200	1.24	15400	1.54	30500	2.25
100	0.14	5200	0.87	10300	1.25	15500	1.55	31000	2.23
200	0.18	5300	0.88	10400	1.24	15600	1.50	31500	2.24
300	0.22	5400	0.89	10500	1.20	15700	1.56	32000	2.21
400	0.26	5500	0.90	10600	1.23	15800	1.50	32500	2.19
500	0.29	5600	0.92	10700	1.25	15900	1.58	33000	2.24
600	0.31	5700	0.93	10800	1.28	16000	1.56	33500	2.26
700	0.33	5800	0.93	10900	1.35	16100	1.59	34000	2.25
800	0.35	5900	0.95	11000	1.30	16200	1.57	34500	2.28
900	0.38	6000	0.93	11100	1.31	16300	1.59	35000	2.27
1000	0.39	6100	0.97	11200	1.31	16400	1.57	35500	2.31
1100	0.41	6200	0.95	11300	1.35	16500	1.60	36000	2.36
1200	0.42	6300	0.99	11400	1.32	16600	1.60	36500	2.39
1300	0.45	6400	0.98	11500	1.38	16700	1.63	37000	2.39
1400	0.46	6500	0.99	11600	1.33	16800	1.66	37500	2.41
1500	0.48	6600	0.99	11700	1.37	16900	1.64	38000	2.40
1600	0.49	6700	0.99	11800	1.36	17000	1.66	38500	2.40
1700	0.50	6800	0.99	11900	1.42	17100	1.65	39000	2.54
1800	0.52	6900	1.02	12000	1.34	17200	1.67	39500	2.39
1900	0.53	7000	1.02	12100	1.41	17300	1.66	40000	2.48
2000	0.53	7100	1.06	12200	1.36	17400	1.69		
2100	0.54	7200	1.05	12300	1.40	17500	1.66		
2200	0.55	7300	1.02	12400	1.34	17600	1.69		
2300	0.56	7400	1.03	12500	1.39	17700	1.70		
2400	0.57	7500	1.04	12600	1.40	17800	1.74		
2500	0.59	7600	1.05	12700	1.42	17900	1.67		
2600	0.60	7700	1.10	12800	1.37	18000	1.72		
2700	0.62	7800	1.11	12900	1.39	18500	1.72		
2800	0.62	7900	1.10	13000	1.40	19000	1.78		
2900	0.65	8000	1.10	13100	1.42	19500	1.77		
3000	0.65	8100	1.10	13200	1.41	20000	1.82		
3100	0.66	8200	1.10	13300	1.43	20500	1.82		
3200	0.67	8300	1.16	13400	1.45	21000	1.94		
3300	0.69	8400	1.15	13500	1.45	21500	1.92		
3400	0.70	8500	1.20	13600	1.54	22000	2.07		
3500	0.71	8600	1.19	13700	1.54	22500	1.90		
3600	0.71	8700	1.15	13800	1.49	23000	1.96		
3700	0.73	8800	1.16	13900	1.50	23500	1.88		
3800	0.74	8900	1.19	14000	1.50	24000	1.96		
3900	0.75	9000	1.18	14100	1.52	24500	1.96		
4000	0.76	9100	1.23	14200	1.60	25000	2.10		
4100	0.76	9200	1.20	14300	1.57	25500	2.05		
4200	0.78	9300	1.20	14400	1.57	26000	2.05		
4300	0.79	9400	1.19	14600	1.50	26500	2.05		
4400	0.80	9500	1.23	14700	1.54	27000	1.97		
4500	0.80	9600	1.21	14800	1.51	27500	2.09		
4600	0.82	9700	1.22	14900	1.54	28000	2.10		
4700	0.82	9800	1.20	15000	1.57	28500	2.05		
4800	0.83	9900	1.18	15100	1.56	29000	2.08		

Cable loss
Test Cable, Mini-Circuits, CBL-5FT-SMSM+, SMA-SMA, 18 GHz, 1.5 m, S/N 25679
Mini-Circuits, HL 3433

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10.0	0.06	9000	2.01
100	0.17	9500	2.06
500	0.41	10000	2.05
1000	0.58	10500	2.18
1500	0.72	11000	2.26
2000	0.86	11500	2.28
2500	0.96	12000	2.43
3000	1.04	12500	2.53
3500	1.13	13000	2.52
4000	1.23	13500	2.56
4500	1.31	14000	2.60
5000	1.41	14500	2.59
5500	1.49	15000	2.67
6000	1.55	15500	2.76
6500	1.63	16000	2.86
7000	1.71	16500	2.91
7500	1.78	17000	2.95
8000	1.86	17500	3.02
8500	1.92	18000	3.07

Cable loss
Test Cable, Mini-Circuits, CBL-5FT-SMSM+, SMA-SMA, 18 GHz, 1.5 m, S/N 25683
Mini-Circuits, HL 3434

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10.0	0.06	9000	1.96
100	0.16	9500	2.01
500	0.40	10000	2.01
1000	0.57	10500	2.14
1500	0.72	11000	2.21
2000	0.85	11500	2.24
2500	0.95	12000	2.36
3000	1.03	12500	2.47
3500	1.11	13000	2.46
4000	1.21	13500	2.50
4500	1.29	14000	2.53
5000	1.39	14500	2.53
5500	1.46	15000	2.62
6000	1.52	15500	2.70
6500	1.60	16000	2.80
7000	1.68	16500	2.86
7500	1.75	17000	2.88
8000	1.83	17500	2.94
8500	1.88	18000	3.00

Cable loss
Cable coaxial, Microwave, SMA-SMA, 18 GHz, 1.0 m
Gore, HL 3472

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.01	5000	0.47	10200	0.72	15500	0.75
30	0.03	5100	0.47	10300	0.67	15600	0.89
50	0.04	5200	0.47	10400	0.77	15700	0.82
100	0.04	5300	0.47	10500	0.67	15800	0.89
200	0.08	5400	0.49	10600	0.74	15900	0.89
300	0.11	5500	0.48	10700	0.81	16000	0.93
400	0.11	5600	0.49	10800	0.77	16100	0.90
500	0.12	5700	0.49	10900	0.82	16200	0.92
600	0.14	5800	0.51	11000	0.86	16300	0.90
700	0.15	5900	0.50	11100	0.78	16400	0.94
800	0.16	6000	0.51	11200	0.82	16500	0.93
900	0.18	6100	0.53	11300	0.77	16600	0.95
1000	0.17	6200	0.52	11400	0.84	16700	0.98
1100	0.19	6300	0.53	11500	0.74	16800	1.00
1200	0.22	6400	0.54	11600	0.81	16900	0.94
1300	0.21	6500	0.55	11700	0.73	17000	1.00
1400	0.22	6600	0.54	11800	0.75	17100	0.93
1500	0.23	6700	0.57	11900	0.73	17200	1.00
1600	0.24	6800	0.54	12000	0.75	17300	0.93
1700	0.24	6900	0.58	12100	0.66	17400	0.93
1800	0.25	7000	0.58	12200	0.66	17500	0.96
1900	0.26	7100	0.58	12300	0.72	17600	0.94
2000	0.28	7200	0.61	12400	0.64	17700	0.99
2100	0.27	7300	0.59	12500	0.75	17800	0.97
2200	0.29	7400	0.55	12600	0.67	17900	0.90
2300	0.29	7500	0.63	12700	0.75	18000	0.78
2400	0.30	7600	0.60	12800	0.66		
2500	0.30	7700	0.61	12900	0.81		
2600	0.32	7800	0.64	13000	0.75		
2700	0.32	7900	0.60	13100	0.80		
2800	0.33	8000	0.58	13200	0.80		
2900	0.34	8100	0.61	13300	0.81		
3000	0.34	8200	0.62	13400	0.88		
3100	0.35	8300	0.62	13500	0.82		
3200	0.35	8400	0.68	13600	1.00		
3300	0.36	8500	0.63	13700	0.93		
3400	0.37	8600	0.61	13800	0.86		
3500	0.38	8700	0.63	13900	0.84		
3600	0.38	8800	0.62	14000	1.00		
3700	0.40	8900	0.64	14100	0.86		
3800	0.40	9000	0.62	14200	0.98		
3900	0.40	9100	0.64	14300	0.99		
4000	0.40	9200	0.62	14400	0.82		
4100	0.43	9300	0.62	14600	0.89		
4200	0.43	9400	0.62	14700	0.84		
4300	0.43	9500	0.63	14800	0.90		
4400	0.44	9600	0.64	14900	0.89		
4500	0.45	9700	0.60	15000	0.89		
4600	0.45	9800	0.65	15100	0.86		
4700	0.46	9900	0.60	15200	0.87		
4800	0.46	10000	0.67	15300	0.86		
4900	0.46	10100	0.69	15400	0.87		

Cable loss
Cable coaxial, Microwave, SMA-SMA, 18 GHz, 0.6 m
Gore, HL 3474

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.00	5000	0.44	10200	0.72	15500	0.84
30	0.02	5100	0.44	10300	0.68	15600	0.95
50	0.03	5200	0.44	10400	0.75	15700	0.82
100	0.03	5300	0.44	10500	0.64	15800	0.94
200	0.07	5400	0.46	10600	0.75	15900	0.91
300	0.10	5500	0.45	10700	0.80	16000	0.91
400	0.11	5600	0.46	10800	0.77	16100	0.86
500	0.12	5700	0.47	10900	0.80	16200	0.86
600	0.14	5800	0.48	11000	0.79	16300	0.86
700	0.14	5900	0.48	11100	0.70	16400	0.84
800	0.15	6000	0.49	11200	0.76	16500	0.83
900	0.18	6100	0.51	11300	0.70	16600	0.87
1000	0.17	6200	0.50	11400	0.73	16700	0.90
1100	0.18	6300	0.50	11500	0.67	16800	0.91
1200	0.21	6400	0.51	11600	0.74	16900	0.90
1300	0.20	6500	0.51	11700	0.64	17000	0.97
1400	0.21	6600	0.52	11800	0.68	17100	0.94
1500	0.22	6700	0.54	11900	0.67	17200	1.01
1600	0.23	6800	0.51	12000	0.71	17300	0.97
1700	0.23	6900	0.55	12100	0.64	17400	1.02
1800	0.24	7000	0.54	12200	0.64	17500	1.06
1900	0.25	7100	0.55	12300	0.71	17600	1.01
2000	0.27	7200	0.55	12400	0.62	17700	1.10
2100	0.26	7300	0.54	12500	0.80	17800	1.16
2200	0.28	7400	0.52	12600	0.69	17900	1.12
2300	0.28	7500	0.58	12700	0.85	18000	1.00
2400	0.28	7600	0.56	12800	0.67		
2500	0.29	7700	0.57	12900	0.84		
2600	0.30	7800	0.62	13000	0.76		
2700	0.31	7900	0.57	13100	0.85		
2800	0.32	8000	0.55	13200	0.77		
2900	0.32	8100	0.59	13300	0.82		
3000	0.32	8200	0.59	13400	0.79		
3100	0.33	8300	0.60	13500	0.82		
3200	0.33	8400	0.66	13600	0.91		
3300	0.35	8500	0.60	13700	0.81		
3400	0.35	8600	0.59	13800	0.76		
3500	0.36	8700	0.59	13900	0.75		
3600	0.36	8800	0.58	14000	0.81		
3700	0.37	8900	0.60	14100	0.77		
3800	0.38	9000	0.60	14200	0.89		
3900	0.38	9100	0.60	14300	0.92		
4000	0.38	9200	0.57	14400	0.78		
4100	0.41	9300	0.57	14600	0.85		
4200	0.40	9400	0.58	14700	0.83		
4300	0.41	9500	0.60	14800	0.95		
4400	0.42	9600	0.62	14900	0.89		
4500	0.43	9700	0.58	15000	0.96		
4600	0.42	9800	0.63	15100	0.90		
4700	0.44	9900	0.58	15200	0.96		
4800	0.43	10000	0.67	15300	0.90		
4900	0.44	10100	0.69	15400	0.95		

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 m
Alpha Wire, HL 3622

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.13	2100	2.95	4400	4.99
30	0.24	2200	2.99	4500	5.00
50	0.32	2300	3.11	4600	5.17
100	0.47	2400	3.16	4700	5.18
200	0.70	2500	3.31	4800	5.33
300	0.88	2600	3.36	4900	5.34
400	1.05	2700	3.46	5000	5.50
500	1.21	2800	3.52	5100	5.56
600	1.36	2900	3.65	5200	5.76
700	1.49	3000	3.70	5300	5.76
800	1.63	3100	3.82	5400	5.85
900	1.72	3200	3.88	5500	5.88
1000	1.84	3300	3.99	5600	5.96
1100	1.96	3400	4.08	5700	6.02
1200	2.06	3500	4.19	5800	6.06
1300	2.15	3600	4.28	5900	6.14
1400	2.28	3700	4.42	6000	6.17
1500	2.35	3800	4.40	6100	6.28
1600	2.43	3900	4.51	6200	6.36
1700	2.57	4000	4.62	6300	6.47
1800	2.62	4100	4.70	6400	6.51
1900	2.75	4200	4.78	6500	6.65
2000	2.80	4300	4.83		

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