HERMON LABORATORIES

839.01
Electrical

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TEST REPORT

ACCORDING TO: FCC part 27

FOR:

Airspan Networks (Israel) Ltd.

Base station

Model: MicroMAX 1.4G TDD

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
Product type:	P/N 90803041
Model(s):	MicroMAX 1.4G TDD
Serial number:	922F7610159A
Hardware version:	B1
Software release:	7.5.8.0
Receipt date	2/8/2009

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:	19957
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	2/8/2009
Test completed:	8/24/2009
Test specification(s):	FCC part 27

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5 Tests summary

Test	Status
Transmitter characteristics	
Section 27.50(e)(1), Peak output power at RF antenna connector	Pass
Section 2.1091, 27.52, RF safety	NA, fixed equipment
Section 27.53(j), Spurious emissions at RF antenna connector	Pass
Section 27.53(j), Band edge emissions at RF antenna connector	Pass
Section 27.53(j), 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. L. Markel, test engineer Mr. S. Samokha, test engineer	August 24, 2009	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	September 7, 2009	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	September 8, 2009	

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6 EUT description

6.1 General information

The EUT, base station radio, MicroMAX 1400 MHz TDD, 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 MicroMAX's transceiver/receiver (up to 64 QAM modulation, data rate up to 18 Mbps) uses OFDM and operates in TDD duplexing mode, equipped with a 10 dBi internal or 18 dBi external antenna.

6.2 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length	Indoor / outdoor
Power	DC Power	EUT	SDA (+ DATA)	1	UTP	10	Outdoor
Signal	RS-232	EUT	Laptop	1	UTP	0.2	Outdoor
RF	Antenna	EUT	50 Ohm Termination	1	Shielded	NA	NA

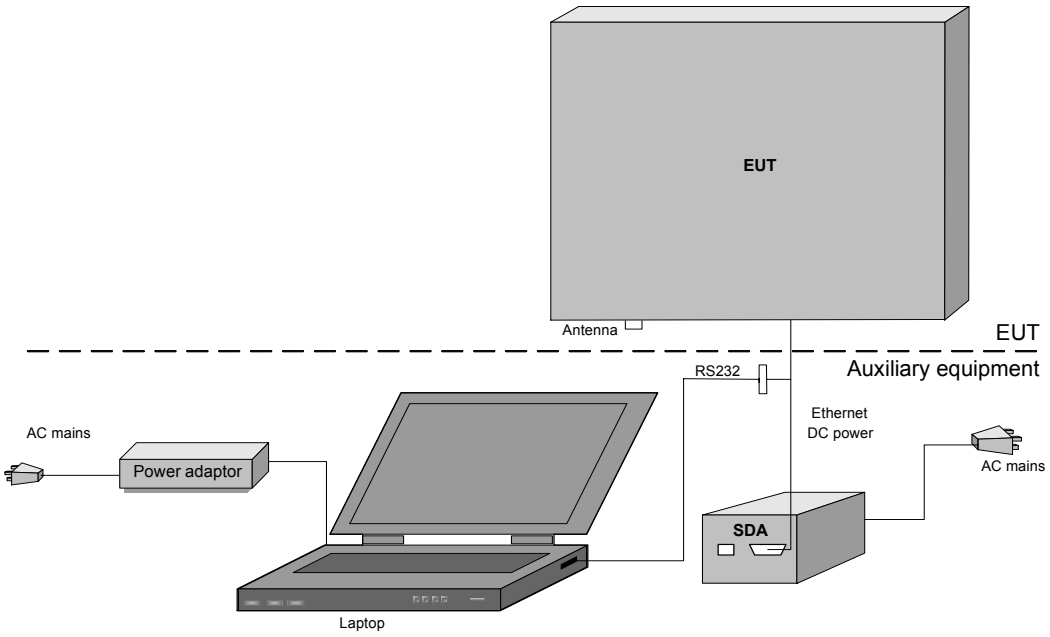
6.3 Support and test equipment

Description	Manufacturer	Model number	Serial number
Laptop	IBM	X31	99-TXWYC
Laptop adaptor	IBM	NA	11S92P1014Z1ZD2N74T2LS
SDA	Airspan	SDA-4S/VL type 2	753D6A0086

6.4 Changes made in the EUT

No changes were implemented in the EUT.

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	1390 – 1392 MHz; 1392 – 1395 MHz; 1432 - 1435 MHz				
Operating frequency	1391 MHz; 1393.5 MHz; 1433.5 MHz				
RF channel spacing	1.5 MHz, 1.75 MHz, 2.5 MHz				
Maximum rated output power	At transmitter 50 Ω RF output connector				28.23 dBm
Is transmitter output power variable?		No			
	V	Yes		continuous variable	
			V	stepped variable with stepsize	0.5 dB
				minimum RF power	-30 dBm
				maximum RF power	28.23 dBm

Antenna connection				
unique coupling	**V** standard connector	Integral	**V**	with temporary RF connector
				without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain (maximum)
Internal	MARS Antennas	MA-WC15-AS10	10 dBi
External	Foshan Sanshui Shing Road Antenna Co., Ltd.	TDJ-SA1500-18-65	18 dBi

Transmitter 99% power bandwidth	**Transmitter aggregate data rate/s, MBps**	**Type of modulation**
1.5 MHz	0.6285	BPSK
	1.2570	QPSK
	3.7695	16QAM
	5.6550	64QAM
1.75 MHz	0.73325	BPSK
	1.46650	QPSK
	4.39775	16QAM
	6.5975	64QAM
2.5 MHz	1.0475	BPSK
	2.095	QPSK
	6.2825	16QAM
	9.425	64QAM

Type of multiplexing	OFDM					
Modulating test signal (baseband)	PRBS					
Maximum transmitter duty cycle in normal use	100%					
Transmitter power source						
		Nominal rated voltage		Battery type		
V	DC	**Nominal rated voltage**	48 VDC via SDA			
	AC mains	**Nominal rated voltage**	120 V	Frequency	60 Hz	
Common power source for transmitter and receiver			**V**	yes		no

Test specification:	Section 27.50(e)(1), Peak output power		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

7 Transmitter tests according to 47CFR part 27 requirements

7.1 Peak output power test

7.1.1 General

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

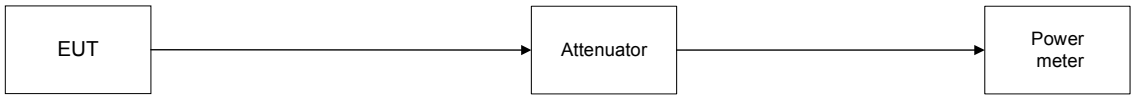
Table 7.1.1 Peak output power limits

Assigned frequency range, MHz	Maximum peak output power	
	W	dBm
1390.0 – 1392.0	2000	63.0
1392.0 – 1395.0	100	50.0
1432.0 – 1435.0	2000	63.0

7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.
7.1.2.2 The EUT was adjusted to produce maximum available to the end user RF output power.
7.1.2.3 The peak output power was measured with a power meter as provided in Table 7.1.2.

Figure 7.1.1 Output power test setup



Test specification:	Section 27.50(e)(1), Peak output power		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.1.2 Output power test results

OPERATING FREQUENCY RANGE: 1390.0 – 1392.0 MHz
DETECTOR USED: Power meter
MODULATING SIGNAL: PRBS
BIT RATE: 0.6285 (BPSK), 5.6550 (64QAM) Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
EBW: 1.5 MHz
ANTENNA GAIN: 18 dBi
DUTY CYCLE: 100 %

Carrier frequency, MHz	Power Meter reading, dBm	External attenuation, dB	Cable loss, dB	RF output power*, EIRP dBm	Limit, EIRP, dBm	Margin, dB	Verdict
BPSK							
1391.0	28.11	Included	Included	46.11	63.0	-16.89	Pass
64QAM							
1391.0	28.23	Included	Included	46.23	63.0	-16.77	Pass

* - RF output power, EIRP (dBm) = Spectrum analyzer reading, dBm + Antenna Gain, dBi

OPERATING FREQUENCY RANGE: 1392.0 – 1395.0 MHz
DETECTOR USED: Power meter
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
ANTENNA GAIN: 18 dBi
DUTY CYCLE: 100 %

Carrier frequency, MHz	Power Meter reading, dBm	External attenuation, dB	Cable loss, dB	RF output power*, EIRP dBm	Limit, EIRP, dBm	Margin, dB	Verdict
EBW 1.5 MHz							
BPSK, Bit Rate 0.6285 Mbps							
1393.5	28.06	Included	Included	46.06	50.0	-3.94	Pass
64QAM, Bit Rate 5.655 Mbps							
1393.5	28.11	Included	Included	46.11	50.0	-3.89	Pass
EBW 1.75 MHz							
BPSK, Bit Rate 0.7332 Mbps							
1393.5	27.35	Included	Included	45.35	50.0	-4.65	Pass
64QAM, Bit Rate 6.5975 Mbps							
1393.5	27.89	Included	Included	45.89	50.0	-4.11	Pass
EBW 2.5 MHz							
BPSK, Bit Rate 1.0475 Mbps							
1393.5	27.34	Included	Included	45.34	50.0	-4.66	Pass
64QAM, Bit Rate 9.425 Mbps							
1393.5	27.26	Included	Included	45.26	50.0	-4.74	Pass

* - RF output power, EIRP (dBm) = Spectrum analyzer reading, dBm + Antenna Gain, dBi

Test specification:	Section 27.50(e)(1), Peak output power		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.1.2 Output power test results (continued)

OPERATING FREQUENCY RANGE: 1432.0 – 1435.0 MHz
DETECTOR USED: Power meter
MODULATING SIGNAL: PRBS
BIT RATE: 0.6285 (BPSK), 5.6550 (64QAM) Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
EBW: 1.5 MHz
ANTENNA GAIN: 18 dBi
DUTY CYCLE: 100 %

Carrier frequency, MHz	Power Meter reading, dBm	External attenuation, dB	Cable loss, dB	RF output power*, EIRP dBm	Limit, EIRP, dBm	Margin, dB	Verdict
BPSK							
1433.5	27.86	Included	Included	45.86	63.0	-17.14	Pass
64QAM							
1433.5	27.63	Included	Included	45.63	63.0	-17.37	Pass

* - RF output power, EIRP (dBm) = Spectrum analyzer reading, dBm + Antenna Gain, dBi

OPERATING FREQUENCY RANGE: 1432.0 – 1435.0 MHz
DETECTOR USED: Power meter
MODULATING SIGNAL: PRBS
BIT RATE: 0.73325 (BPSK), 6.5975 (64QAM) Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
EBW: 1.75 MHz
ANTENNA GAIN: 18 dBi
DUTY CYCLE: 100 %

Carrier frequency, MHz	Power meter reading, dBm	External attenuation, dB	Cable loss, dB	RF output power*, EIRP dBm	Limit, EIRP, dBm	Margin, dB	Verdict
BPSK							
1433.5	27.02	Included	Included	45.02	63.0	-17.98	Pass
64QAM							
1433.5	27.28	Included	Included	45.28	63.0	-17.72	Pass

* - RF output power, EIRP (dBm) = Spectrum analyzer reading, dBm + Antenna Gain, dBi

Test specification:	**Section 27.50(e)(1), Peak output power**		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-C, Section 2.2.1		
Test mode:	Compliance	**Verdict:**	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	**Air Pressure:** 1019 hPa	**Relative Humidity:** 43%	**Power Supply:** 120 V AC
Remarks:			

Table 7.1.2 Output power test results (continued)

OPERATING FREQUENCY RANGE:	1432.0 – 1435.0 MHz
DETECTOR USED:	Power meter
MODULATING SIGNAL:	PRBS
BIT RATE:	1.0475 (BPSK), 9.425 (64QAM) Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
EBW:	2.5 MHz
ANTENNA GAIN:	18 dBi
DUTY CYCLE:	100 %

Carrier frequency, MHz	Power meter reading, dBm	External attenuation, dB	Cable loss, dB	RF output power*, EIRP dBm	Limit, EIRP, dBm	Margin, dB	Verdict
BPSK 2300							
1433.5	26.50	Included	Included	44.50	63.0	-18.50	Pass
64QAM							
1433.5	26.43	Included	Included	44.43	63.0	-18.57	Pass

* - RF output power, EIRP (dBm) = Power meter reading, dBm + Antenna gain, dBi

Reference numbers of test equipment used

HL 3301	HL 3302	HL 3435	HL 3437	HL 3439	HL 3442		

Full description is given in Appendix A.

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

7.2 Occupied bandwidth test

7.2.1 General

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

Table 7.2.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, kHz
1390.0 – 1392.0	26	NA
1392.0 – 1395.0	26	NA
1432.0 – 1435.0	26	NA

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

7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.
7.2.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.
7.2.2.3 The EUT was set to transmit the normally modulated carrier.
7.2.2.4 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.2.2 and the associated plots.

Figure 7.2.1 Occupied bandwidth test setup

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.2.2 Occupied bandwidth test results

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 10 kHz
VIDEO BANDWIDTH: 30 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
BIT RATE: 0.6285 Mbps (BPSK)
5.6550 Mbps (64QAM)
EBW: 1.5 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
BPSK				
1391.0	1480.0	NA	NA	Pass
64QAM				
1391.0	1490.0	NA	NA	Pass

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 30 kHz
VIDEO BANDWIDTH: 100 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
EBW 1.5MHz				
BPSK Bit Rate 0.6285 Mbps				
1393.5	1450.0	NA	NA	Pass
64QAM Bit Rate 5.655 Mbps				
1393.5	1455.0	NA	NA	Pass
EBW 1.75MHz				
BPSK Bit Rate 0.7332 Mbps				
1393.5	1660.0	NA	NA	Pass
64QAM Bit Rate 6.5975 Mbps				
1393.5	1650.0	NA	NA	Pass
EBW 2.5MHz				
BPSK Bit Rate 1.0475 Mbps				
1393.5	2350.0	NA	NA	Pass
64QAM Bit Rate 9.425 Mbps				
1393.5	2355.0	NA	NA	Pass

Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.2.2 Occupied bandwidth test results (continued)

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 30 kHz
VIDEO BANDWIDTH: 100 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
BIT RATE: 0.6285 Mbps (BPSK)
5.6550 Mbps (64QAM)
EBW: 1.5 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
BPSK				
1433.5	1455.0	NA	NA	Pass
64QAM				
1433.5	1470.0	NA	NA	Pass

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 10 kHz
VIDEO BANDWIDTH: 30 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
BIT RATE: 0.73325 Mbps (BPSK)
6.5975 Mbps (64QAM)
EBW: 1.75 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
BPSK				
1433.5	1627.5	NA	NA	Pass
64QAM				
1433.5	1627.5	NA	NA	Pass

DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 30 kHz
VIDEO BANDWIDTH: 100 kHz
MODULATION ENVELOPE REFERENCE POINTS: 26 dBc
MODULATING SIGNAL: PRBS
BIT RATE: 1.0475 Mbps (BPSK)
9.425 Mbps (64QAM)
EBW: 2.5 MHz

Carrier frequency, MHz	Occupied bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
BPSK				
1433.5	2400.0	NA	NA	Pass
64QAM				
1433.5	2470.0	NA	NA	Pass

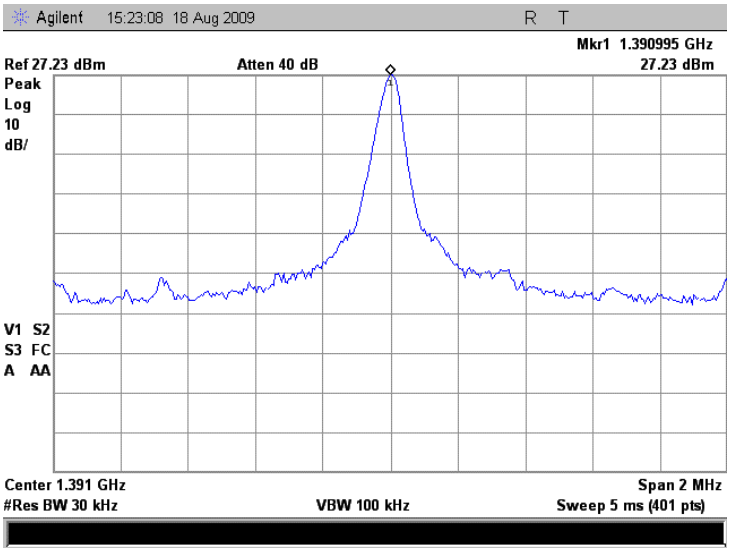
Reference numbers of test equipment used

HL 2867	HL 2909	HL 2968	HL 3437	HL 3439	HL 3442		

Full description is given in Appendix A.

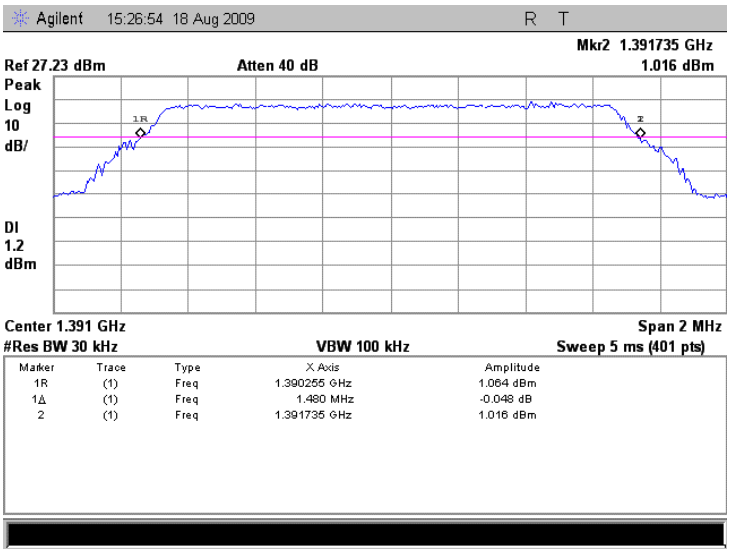
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.1 Occupied bandwidth test result reference level, 1.5 MHz EBW, low frequency

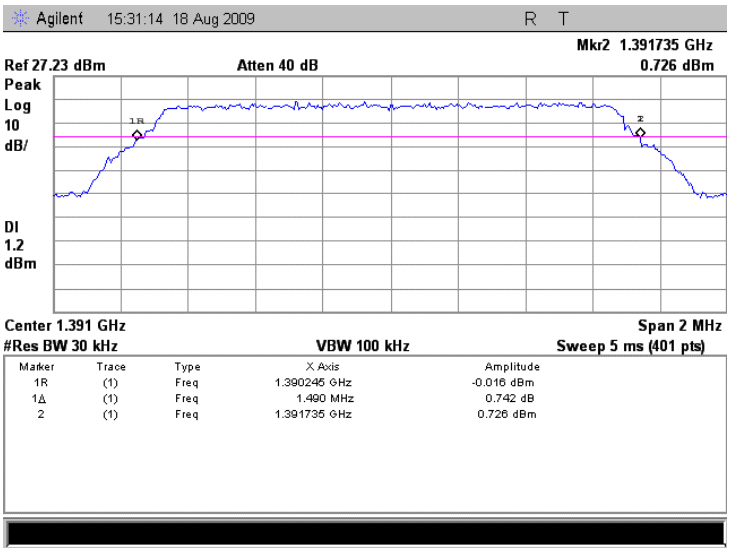


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.2 Occupied bandwidth test result at BPSK, 1.5 MHz EBW, low frequency

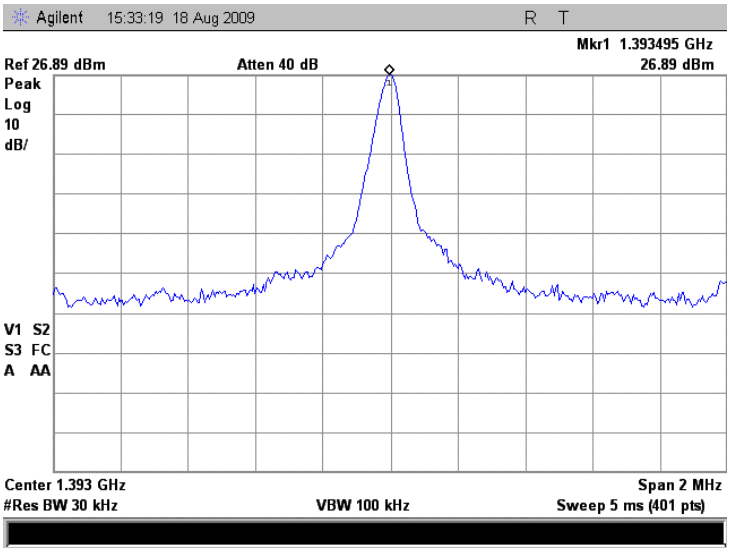


Plot 7.2.3 Occupied bandwidth test result at 64QAM, 1.5 MHz EBW, low frequency



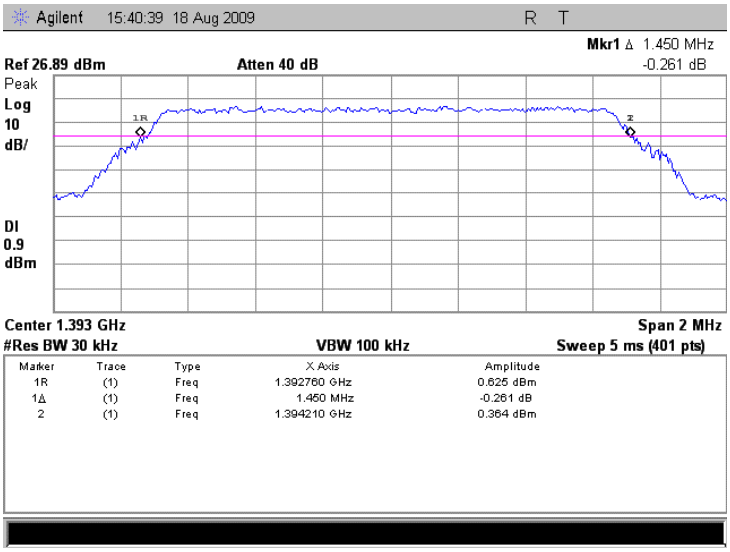
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.4 Occupied bandwidth test result reference level, 1.75 MHz EBW, mid frequency

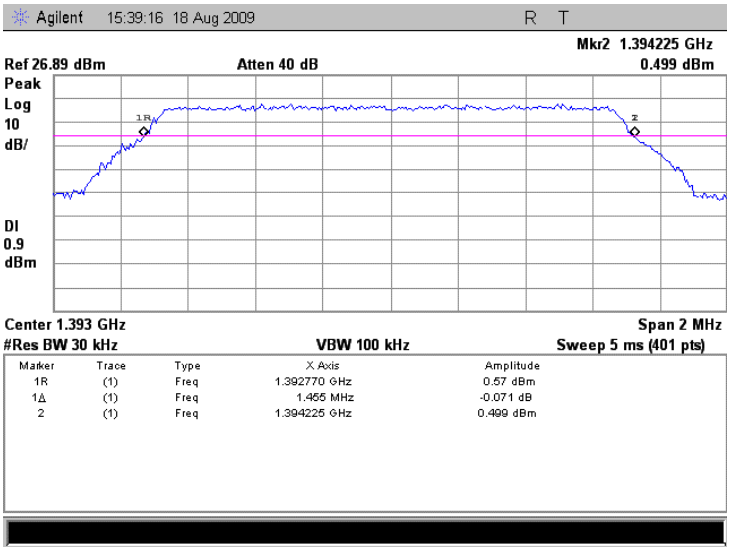


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.5 Occupied bandwidth test result at BPSK, 1.5 MHz EBW, mid frequency

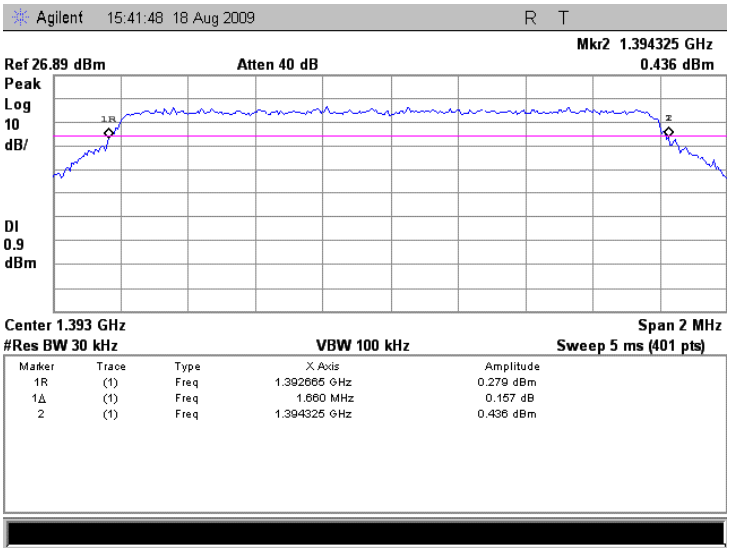


Plot 7.2.6 Occupied bandwidth test result at 64QAM 1.5 MHz EBW, mid frequency

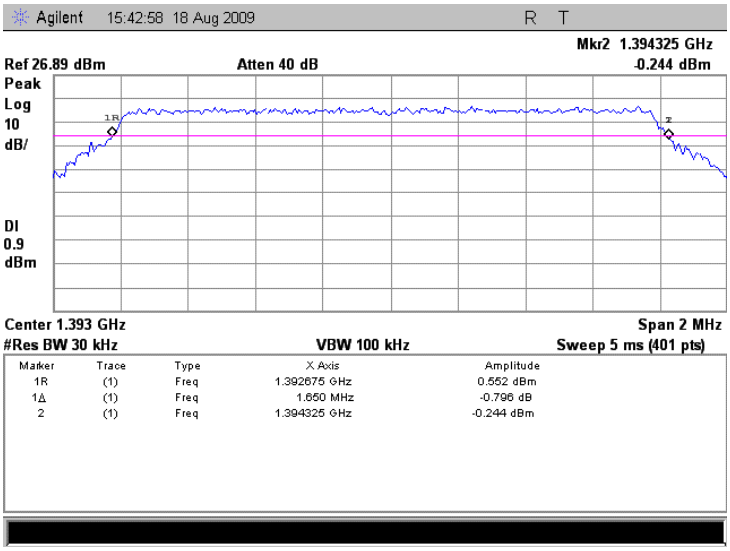


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.7 Occupied bandwidth test result at BPSK, 1.75 MHz EBW, mid frequency

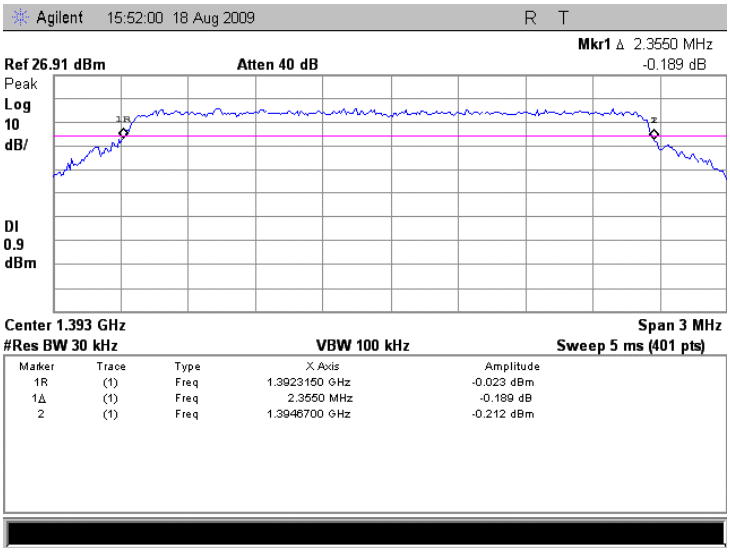


Plot 7.2.8 Occupied bandwidth test result at 64QAM, 1.75 MHz EBW, mid frequency

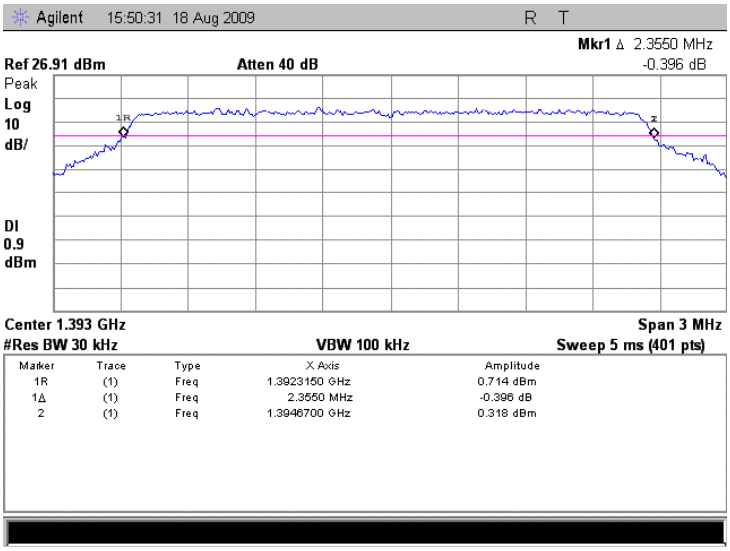


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.9 Occupied bandwidth test result at BPSK, 2.5 MHz EBW, mid frequency

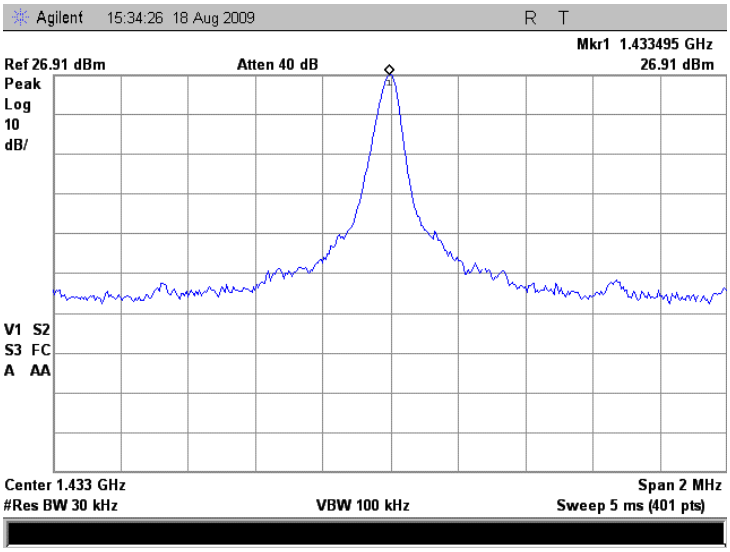


Plot 7.2.10 Occupied bandwidth test result at 64QAM, 2.5 MHz EBW, mid frequency



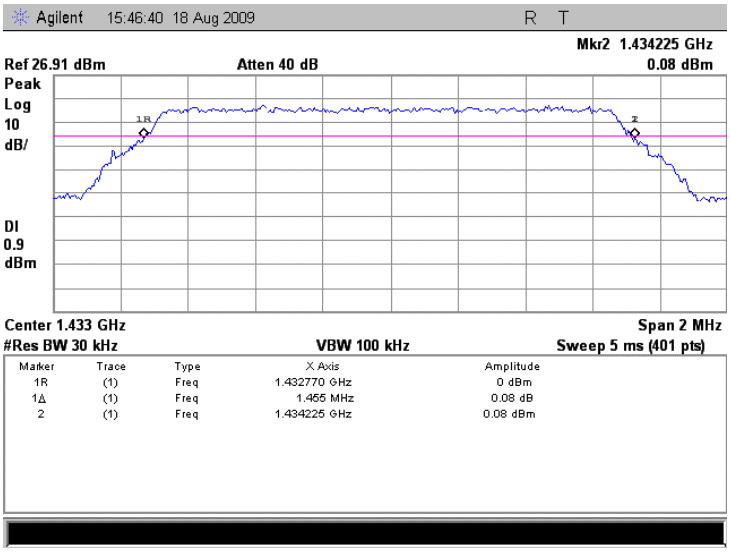
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.11 Occupied bandwidth test result reference level, 1.5 MHz EBW, high frequency

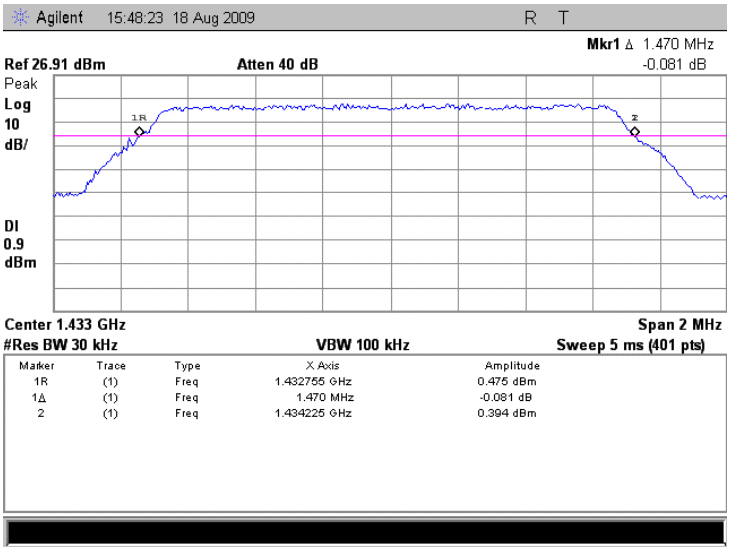


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.12 Occupied bandwidth test result at BPSK, 1.5 MHz EBW, high frequency

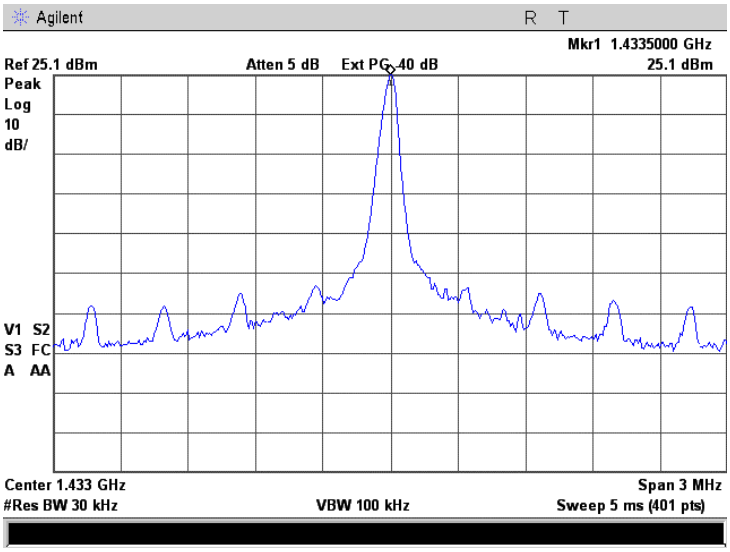


Plot 7.2.13 Occupied bandwidth test result at 64QAM, 1.5 MHz EBW, high frequency



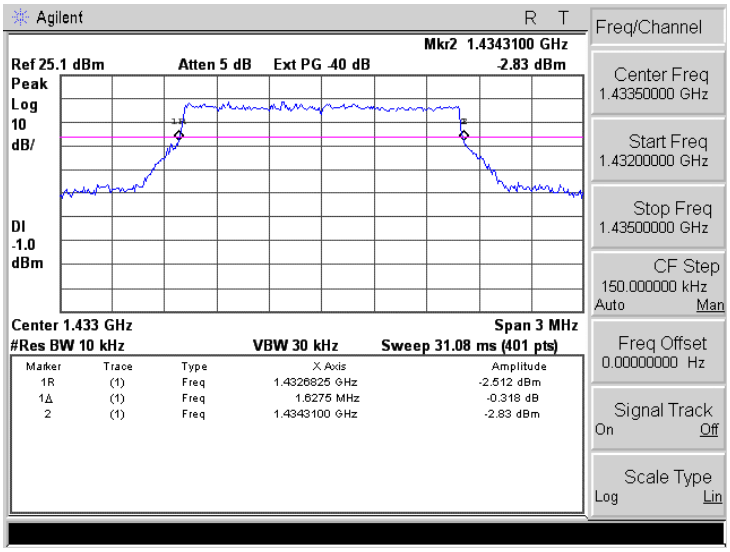
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.14 Occupied bandwidth test result reference level, 1.75 MHz EBW, high frequency

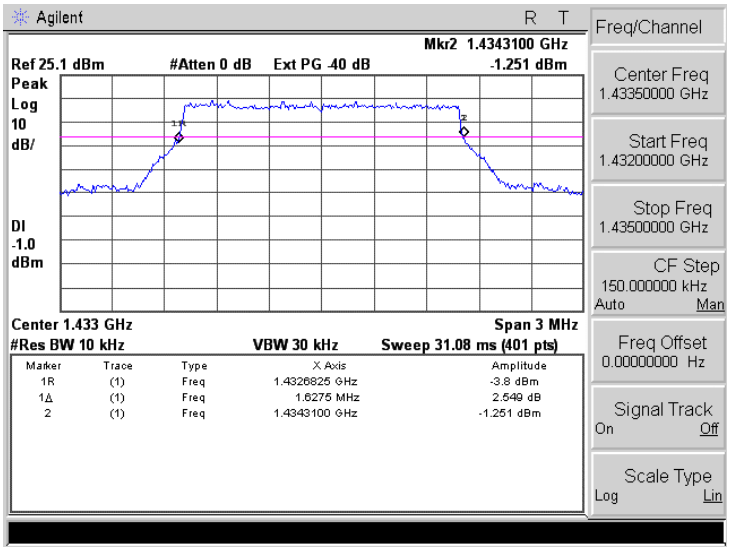


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.15 Occupied bandwidth test result at BPSK modulation, 1.75 MHz EBW, high frequency

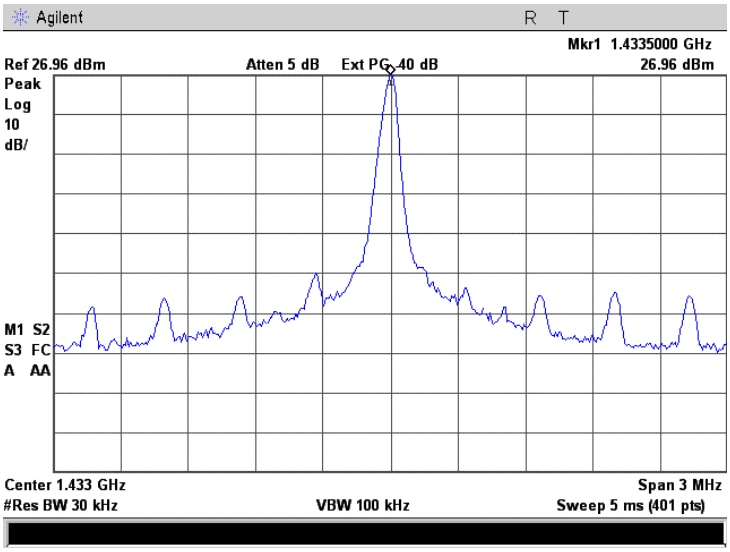


Plot 7.2.16 Occupied bandwidth test result at 64QAM modulation, 1.75 MHz EBW, high frequency



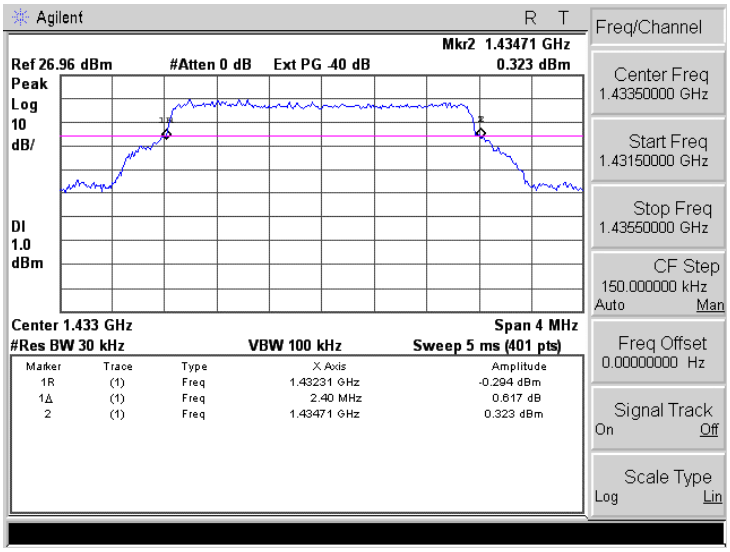
Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.17 Occupied bandwidth test result reference level, 2.5 MHz EBW, high frequency

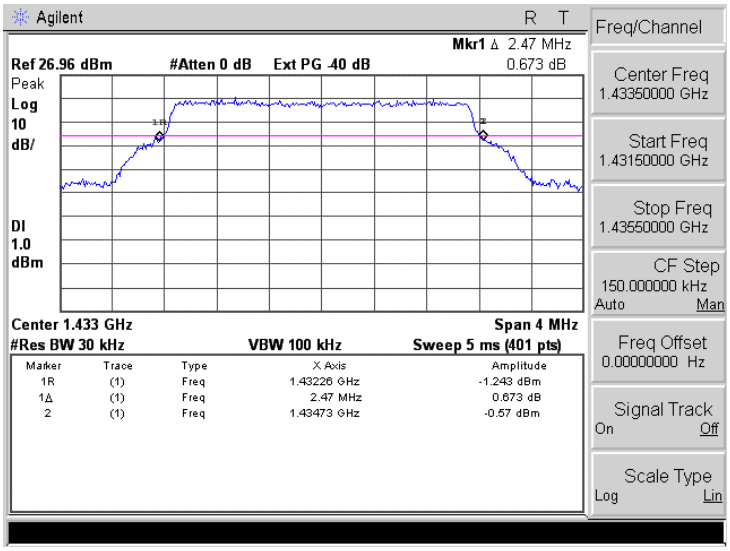


Test specification:	Section 2.1049, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.2.18 Occupied bandwidth test result at BPSK modulation, 2.5 MHz EBW, high frequency



Plot 7.2.19 Occupied bandwidth test result at 64QAM modulation, 2.5 MHz EBW, high frequency



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

7.3 Radiated spurious emission measurements

7.3.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 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

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

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.
7.3.2.2 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.
7.3.2.3 The worst test results (the lowest margins) were recorded in Table 7.3.2, Table 7.3.4 and shown in the associated plots.

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

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, energized and the performance check was conducted.
7.3.3.2 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.
7.3.3.3 The worst test results (the lowest margins) were recorded in Table 7.3.2, Table 7.3.4 and shown in the associated plots.

7.3.4 Test procedure for substitution ERP measurements of spurious

7.3.4.1 The test equipment was set up as shown in Figure 7.3.3 and energized.
7.3.4.2 RF signal generator was set to the frequency of investigated spurious emission and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.
7.3.4.3 The test antenna height was swept from 1 to 4 m to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.
7.3.4.4 The above procedure was performed in both, horizontal and vertical, polarizations of the test and substitution antennas.
7.3.4.5 The ERP of spurious emissions was calculated as a sum of signal generator output power in dBm and antenna gain in dBd reduced by cable loss in dB.
7.3.4.6 The above procedure was repeated at the rest of investigated frequencies.
7.3.4.7 The worst test results (the lowest margins) were recorded in Table 7.3.3, Table 7.3.5 and shown in the associated plots.

Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Figure 7.3.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

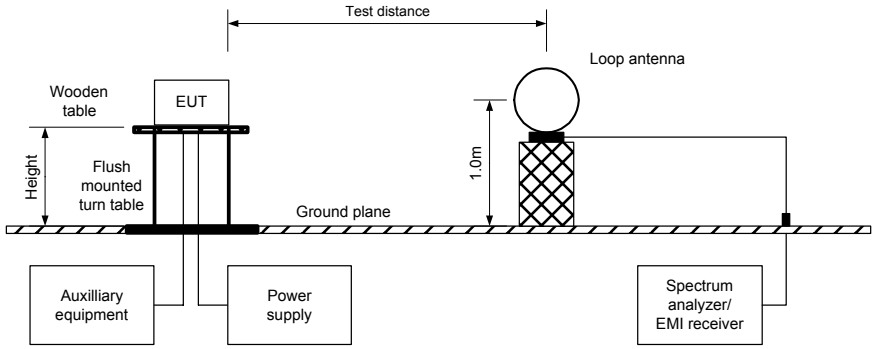
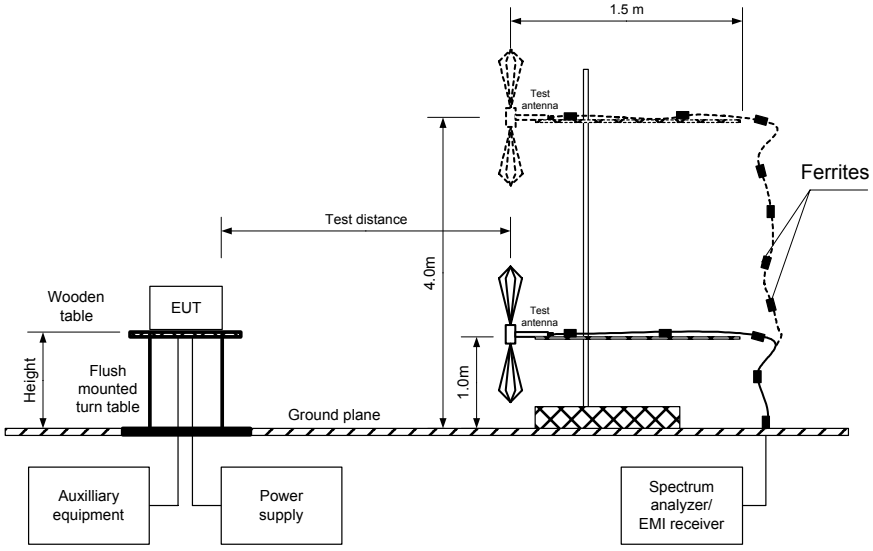
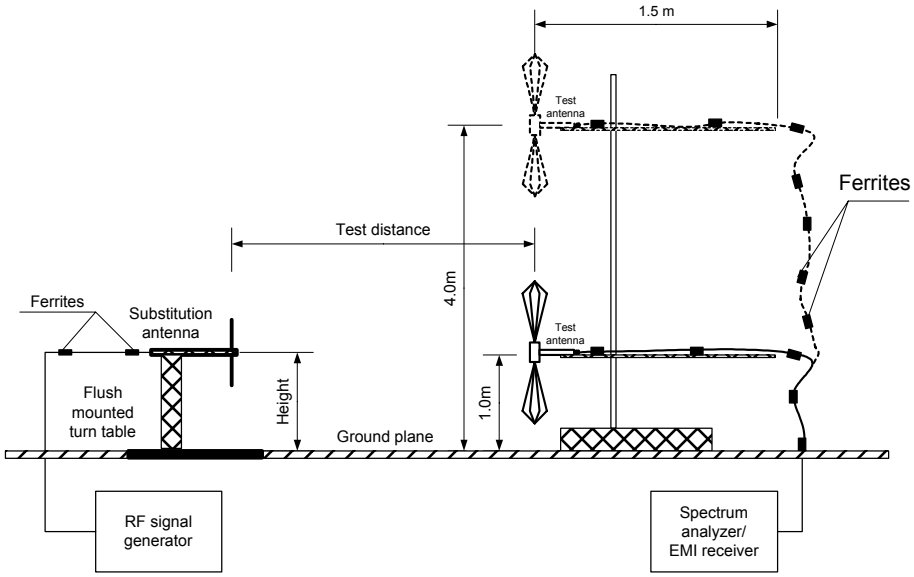


Figure 7.3.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Figure 7.3.3 Setup for substitution ERP measurements of spurious



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.3.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE: 1390.0 – 1392.0 MHz, 1392.0 – 1395.0 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 0.8 m
INVESTIGATED FREQUENCY RANGE: 0.009 – 14500 MHz
DETECTOR USED: Power Average (100 sweeps)
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: 64QAM
MODULATING SIGNAL: PRBS
BIT RATE: 5.655 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
EBW: 1.5 MHz
DUTY CYCLE: 100 %

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Carrier frequency 1391.0 MHz							
2782.10	59.50	84.40	-24.90	1000	Horizontal	1.0	45
5563.85	48.47	84.40	-35.93	1000	Horizontal	1.0	136
Carrier frequency 1393.5 MHz							
2787.18	52.04	84.40	-32.36	1000	Horizontal	1.0	25
5574.10	49.07	84.40	-35.33	1000	Horizontal	1.0	136

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

Table 7.3.3 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE: 1390.0 – 1392.0 MHz, 1392.0 – 1395.0 MHz
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
SUBSTITUTION ANTENNA HEIGHT: 0.8 m
DETECTOR USED: Power Average (100 sweeps)
VIDEO BANDWIDTH: > Resolution bandwidth
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)

Frequency MHz	Field strength dB(μV/m	BW, kH	Antenna polarization	RF generator output, dBm	Ant gain, dBd	Cable loss, dB	ERP, dBm	Limit, dBm	Margin, dB*	Verdict
Carrier frequency 1391.0 MHz										
2782.10	59.50	1000	H	-44.73	7.01	4.12	-41.84	-13.00	-28.84	Pass
5563.85	48.47	1000	V	-51.14	8.11	6.66	-49.70	-13.00	-36.70	Pass
Carrier frequency 1393.5 MHz										
2787.18	52.04	1000	H	-51.62	7.01	4.12	-48.74	-13.00	-35.74	Pass
5574.10	49.07	1000	V	-50.14	8.11	6.66	-48.69	-13.00	-35.69	Pass

*- Margin = Spurious emission – specification limit.
NOTE: Radiated spurious emissions were tested with EUT configured to transmit at 1.5 MHz EBW and 64QAM modulation assuming that this configuration produces maximum RF power density.

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0604	HL 0661	HL 1984	HL 2432	HL 2780	HL 2883
HL 3121	HL 3207	HL 3531	HL 3533	HL 3616	HL 3632		

Full description is given in Appendix A.

Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.3.4 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	1432.0 – 1435.0 MHz
TEST DISTANCE:	3 m
TEST SITE:	OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 14500 MHz
DETECTOR USED:	Power Average (100 sweeps)
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:	64QAM
MODULATING SIGNAL:	PRBS
BIT RATE:	6.5975 Mbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
EBW:	1.75 MHz
DUTY CYCLE:	100 %

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
Carrier frequency 1433.5 MHz							
2866.575	78.07	84.40	-6.33	1000	H	1.2	030
4300.125	68.13	84.40	-16.27	1000	H	1.2	045
5733.925	57.78	84.40	-26.62	1000	V	1.1	070
7168.000	72.27	84.40	-12.13	1000	V	1.1	060

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

Table 7.3.5 Substitution ERP of spurious test results

ASSIGNED FREQUENCY RANGE:	1432.0 – 1435.0 MHz
TEST SITE:	OATS
TEST DISTANCE:	3 m
SUBSTITUTION ANTENNA HEIGHT:	0.8 m
DETECTOR USED:	Power Average (100 sweeps)
VIDEO BANDWIDTH:	> Resolution bandwidth
SUBSTITUTION ANTENNA TYPE:	Tunable dipole (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)

Frequency MHz	Field strength, dB(μV/m)	RBW, kHz	Antenna polarization	RF generator output, dBm	Ant gain dBd	Cable loss dB	ERP, dBm	Limit, dBm	Margin, dB*	Verdict
Carrier frequency 1433.5 MHz										
2866.575	78.07	1000	H	-30.67	7.30	1.22	-24.59	-13	-9.47	Pass
4300.125	68.13	1000	H	-36.72	8.06	1.53	-30.22	-13	-17.22	Pass
5733.925	57.78	1000	V	-47.48	8.46	1.78	-41.83	-13	-27.83	Pass
7168.000	72.27	1000	V	-36.46	8.60	1.95	-29.84	-13	-16.84	Pass

*- Margin = Spurious emission – specification limit.
NOTE: Radiated spurious emissions were tested with EUT configured to transmit at 1.75 MHz EBW and 64QAM modulation assuming that this configuration produces maximum RF power density.

Reference numbers of test equipment used

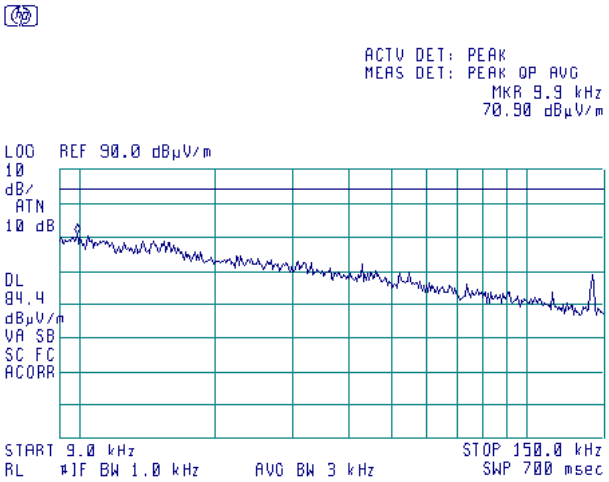
HL 0446	HL 0521	HL 0604	HL 1984	HL 2432	HL 2780	HL 2387	HL 2883
HL 2785	HL 3122	HL 3123	HL 3234	HL 3342	HL 3344	HL 3532	HL 3534

Full description is given in Appendix A.

Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

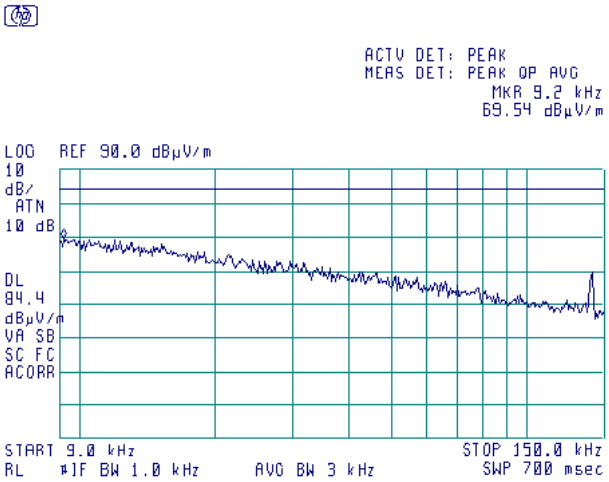
Plot 7.3.1 Radiated emission measurements in 9 - 150 kHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.2 Radiated emission measurements in 9 - 150 kHz range

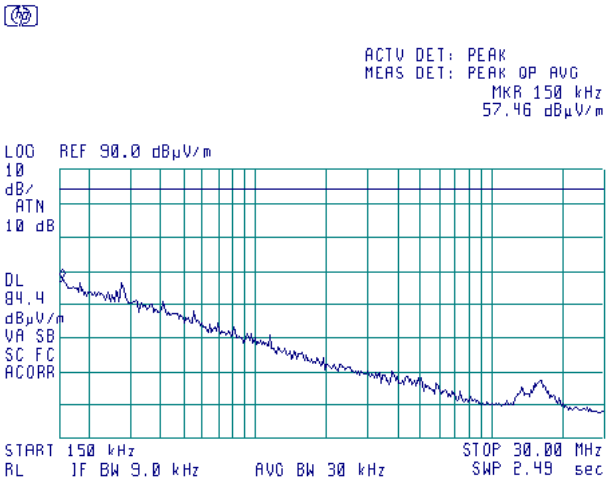
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

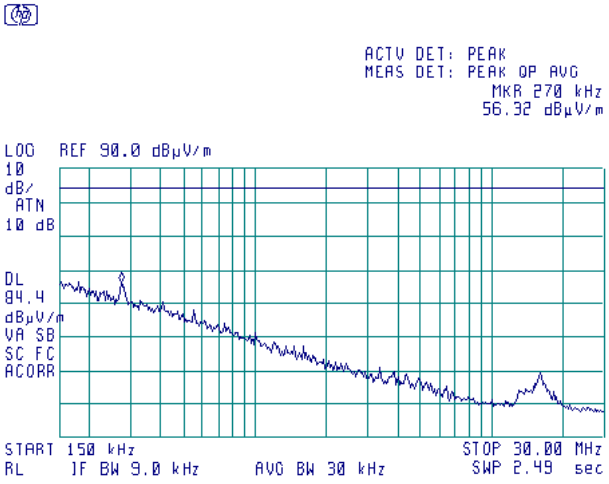
Plot 7.3.3 Radiated emission measurements in 0.15 - 30 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.4 Radiated emission measurements in 0.15 - 30 MHz range

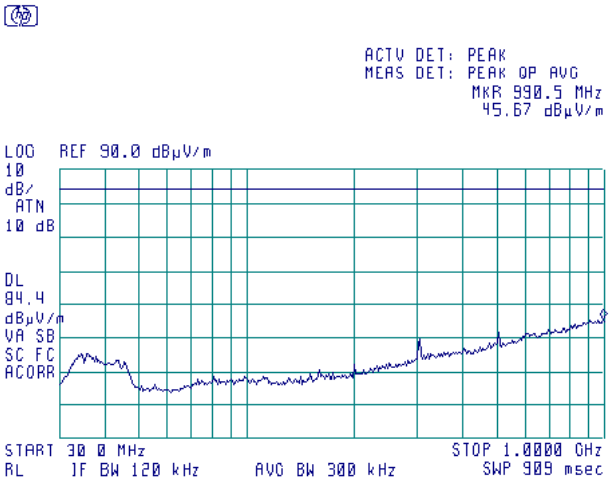
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

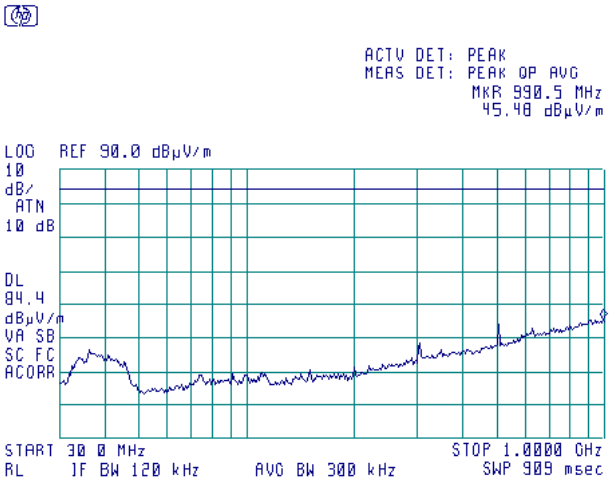
Plot 7.3.5 Radiated emission measurements in 30 - 1000 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.6 Radiated emission measurements in 30 - 1000 MHz range

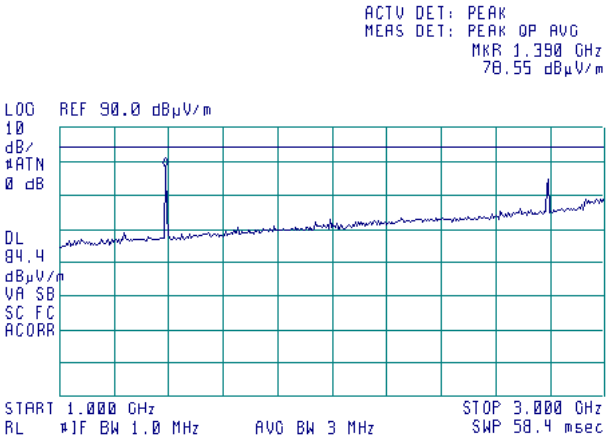
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

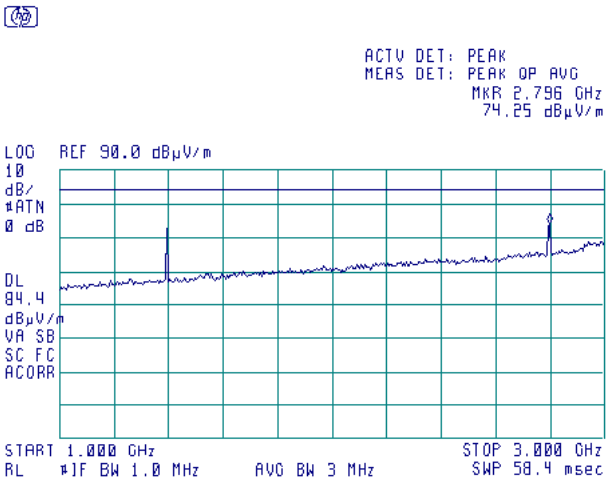
Plot 7.3.7 Radiated emission measurements in 1000 – 3000 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.8 Radiated emission measurements in 1000 – 3000 MHz range

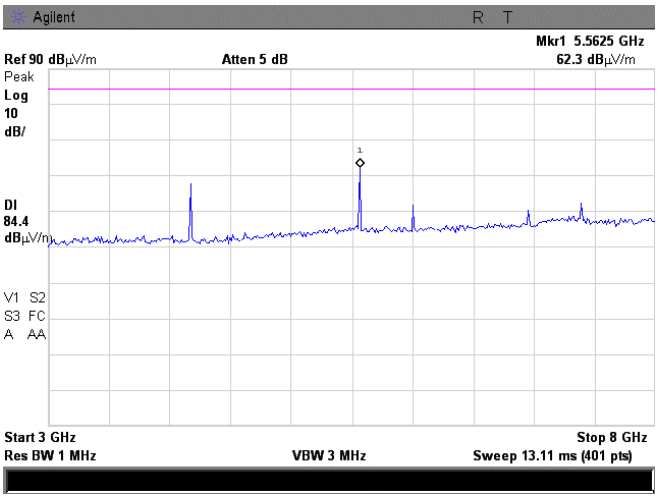
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

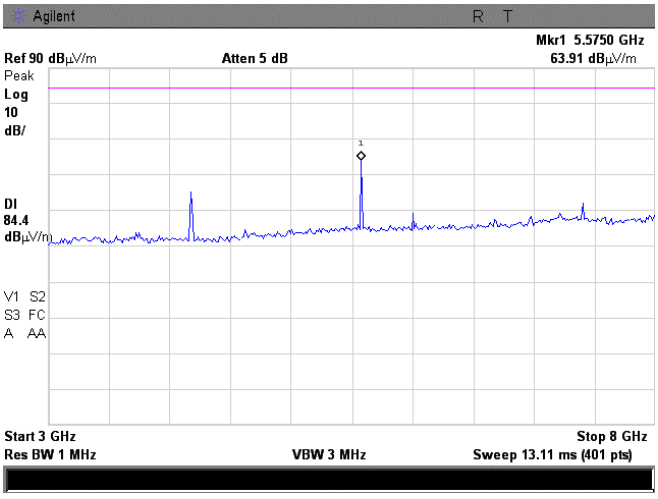
Plot 7.3.9 Radiated emission measurements in 3000 – 8000 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.10 Radiated emission measurements in 3000 – 8000 MHz range

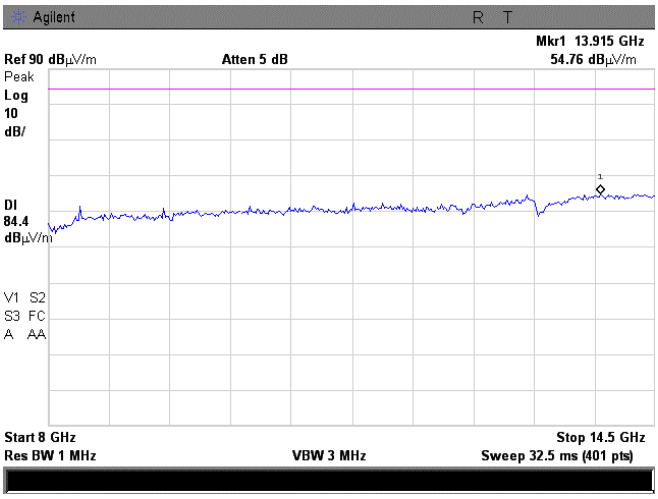
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

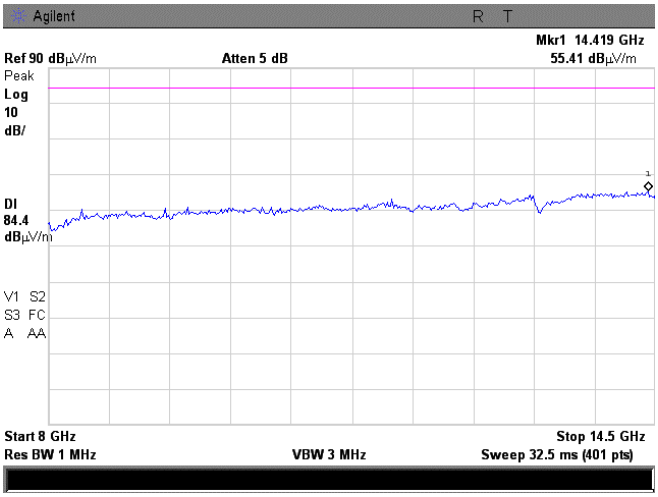
Plot 7.3.11 Radiated emission measurements in 8000 – 14500 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.12 Radiated emission measurements in 8000 – 14500 MHz range

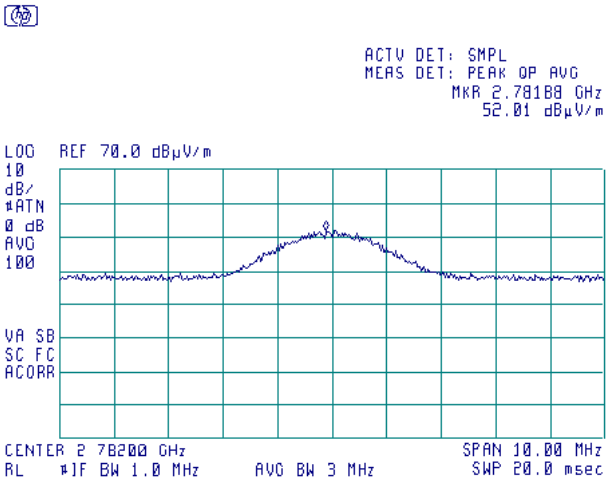
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

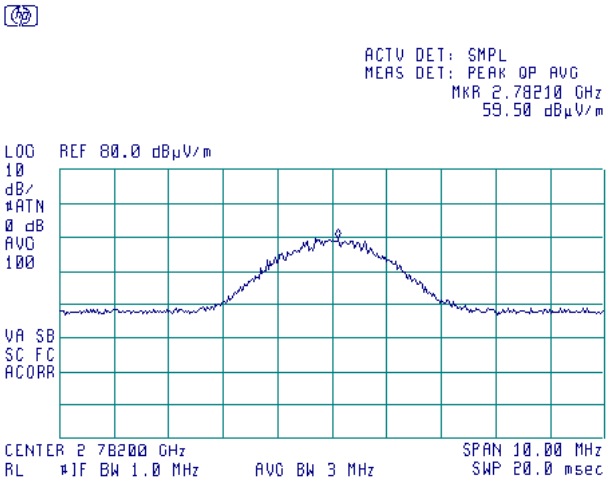
Plot 7.3.13 Radiated emission measurements at the 2nd harmonic

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.14 Radiated emission measurements at the 2nd harmonic

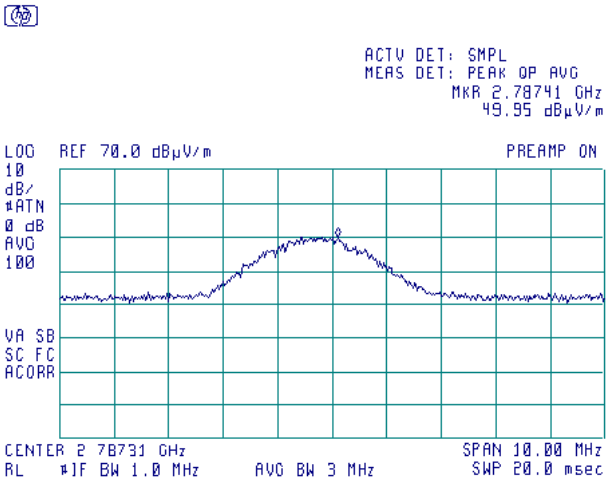
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

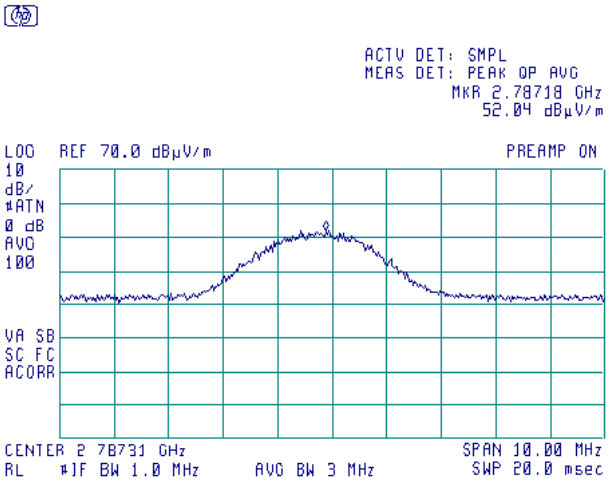
Plot 7.3.15 Radiated emission measurements at the 2nd harmonic

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.16 Radiated emission measurements at the 2nd harmonic

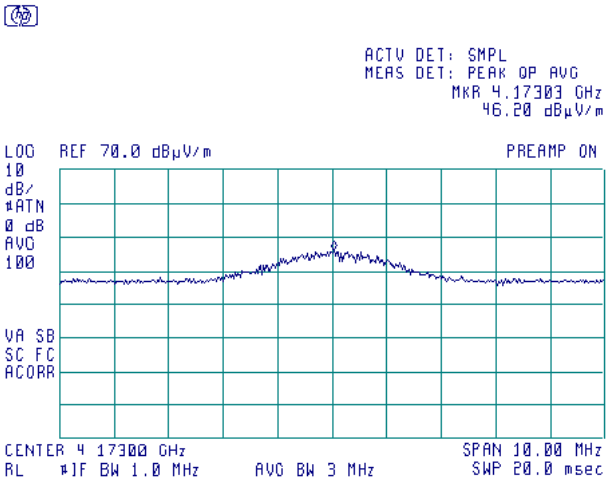
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

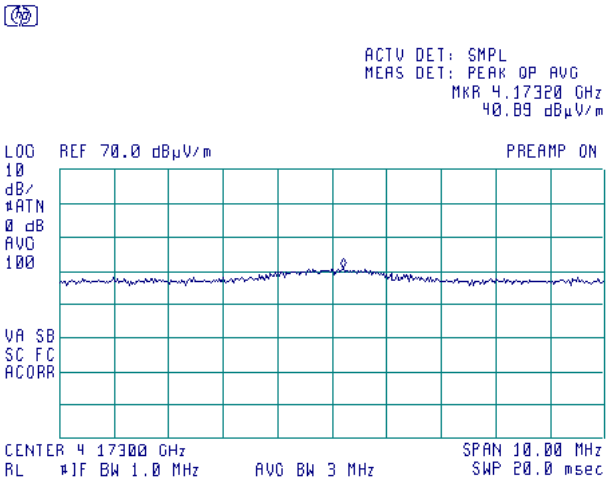
Plot 7.3.17 Radiated emission measurements at the 3rd harmonic

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.18 Radiated emission measurements at the 3rd harmonic

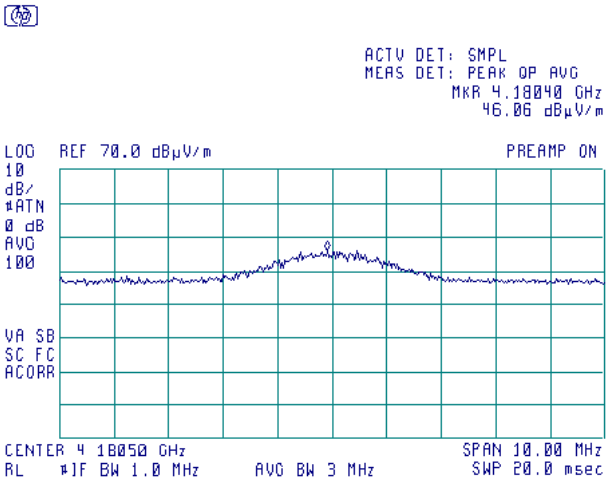
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

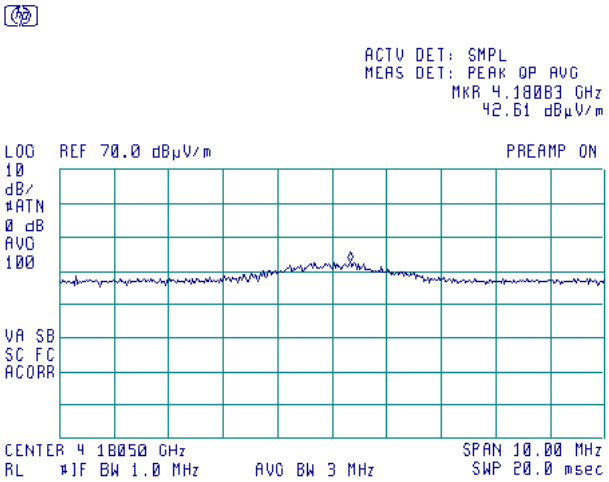
Plot 7.3.19 Radiated emission measurements at the 3rd harmonic

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.20 Radiated emission measurements at the 3rd harmonic

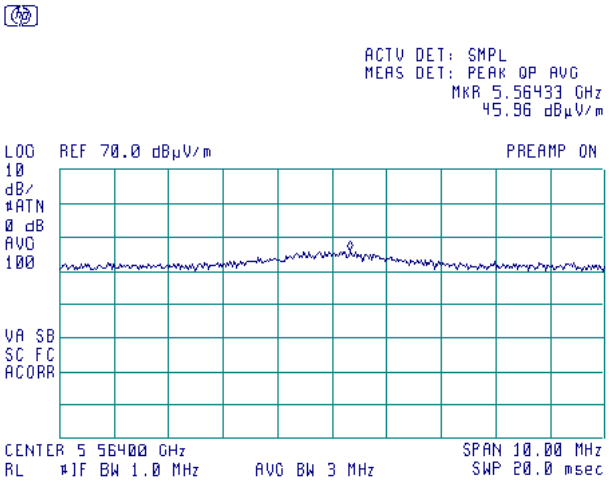
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

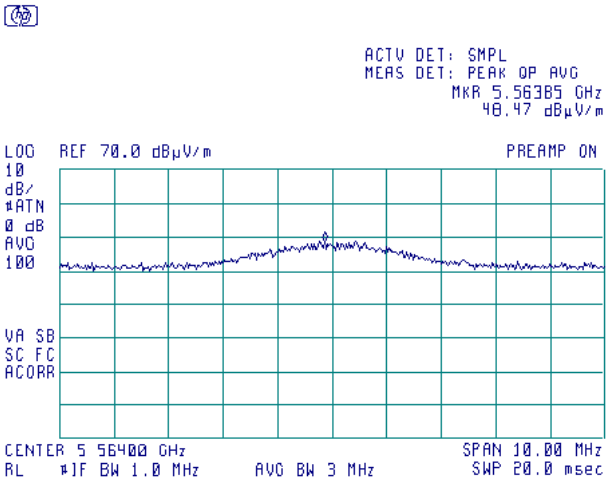
Plot 7.3.21 Radiated emission measurements at the 4th harmonic

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.22 Radiated emission measurements at the 4th harmonic

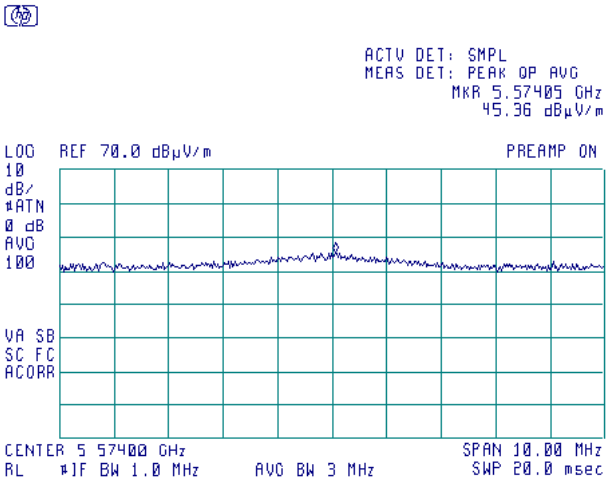
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low 1391.0 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

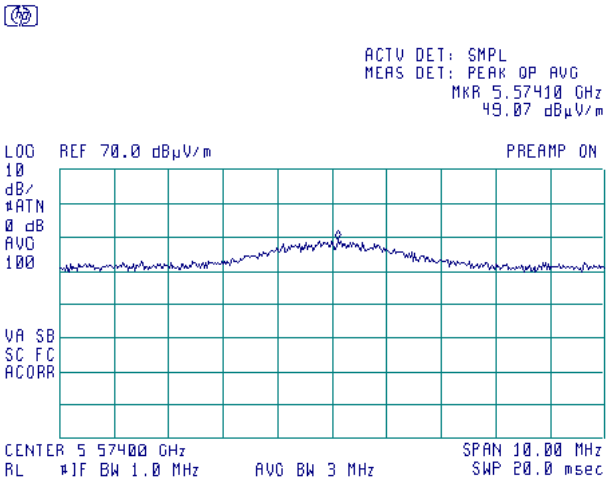
Plot 7.3.23 Radiated emission measurements at the 4th harmonic

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.24 Radiated emission measurements at the 4th harmonic

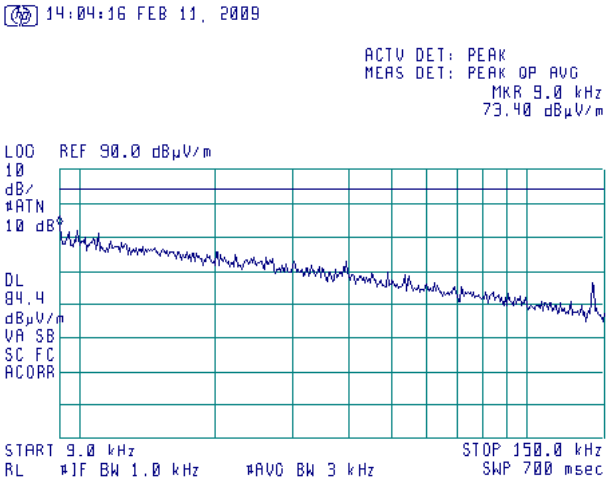
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid 1393.5 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

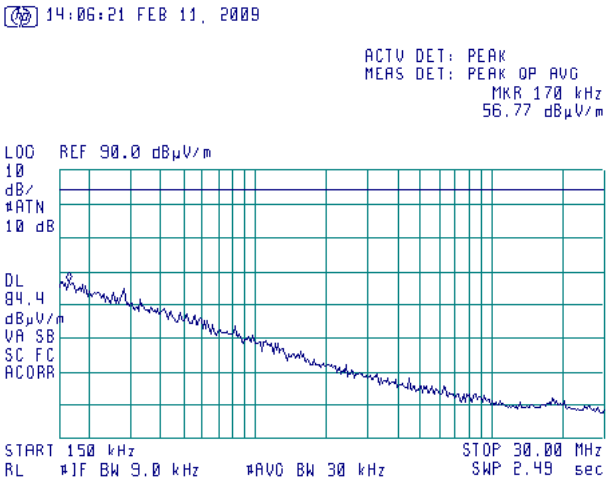
Plot 7.3.25 Radiated emission measurements in 9 - 150 kHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.26 Radiated emission measurements in 0.15 - 30 MHz range

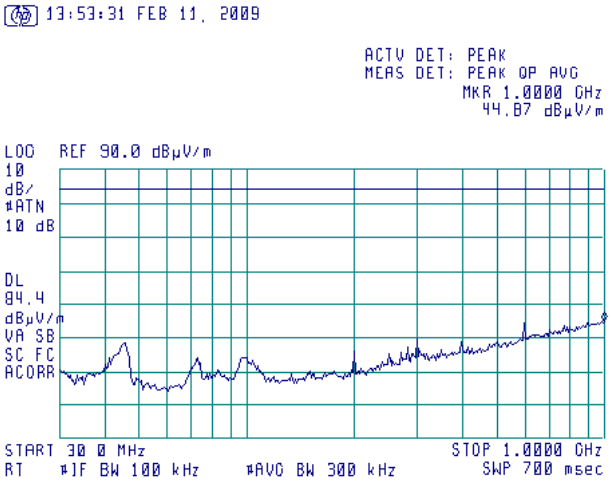
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

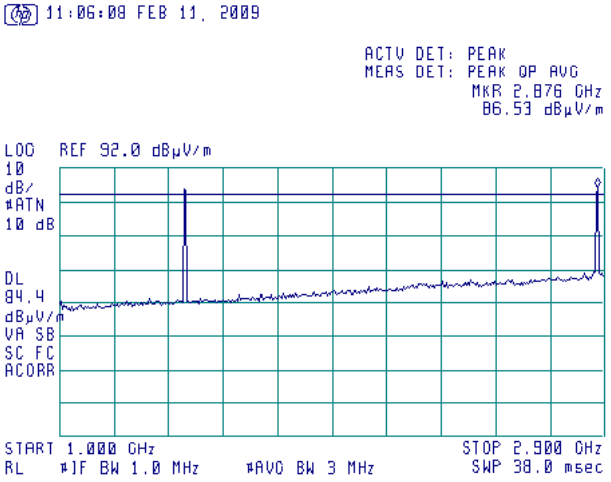
Plot 7.3.27 Radiated emission measurements in 30 - 1000 MHz range

TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Plot 7.3.28 Radiated emission measurements in 1000 – 2900 MHz range

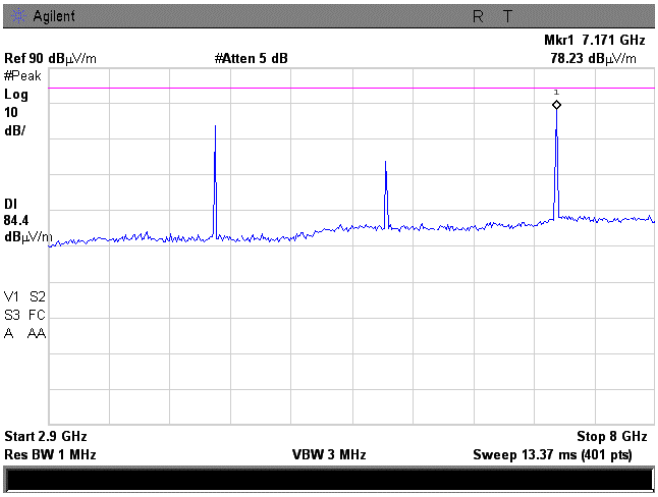
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

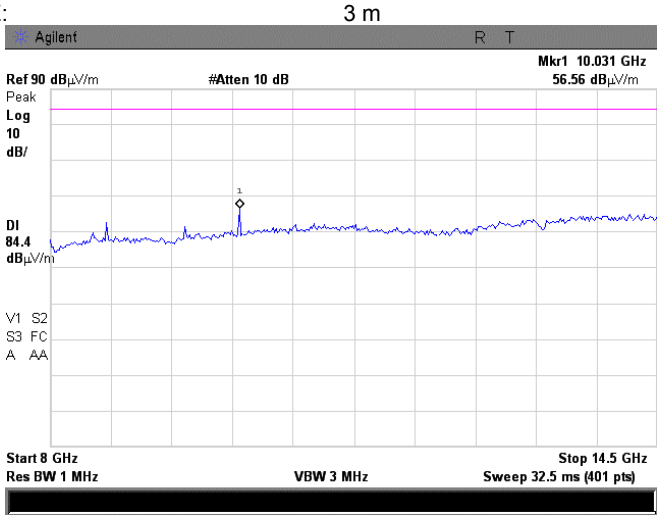
Plot 7.3.29 Radiated emission measurements in 2900 – 8000 MHz range

TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: High 1433.5 MHz
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Plot 7.3.30 Radiated emission measurements in 8000 – 14500 MHz range

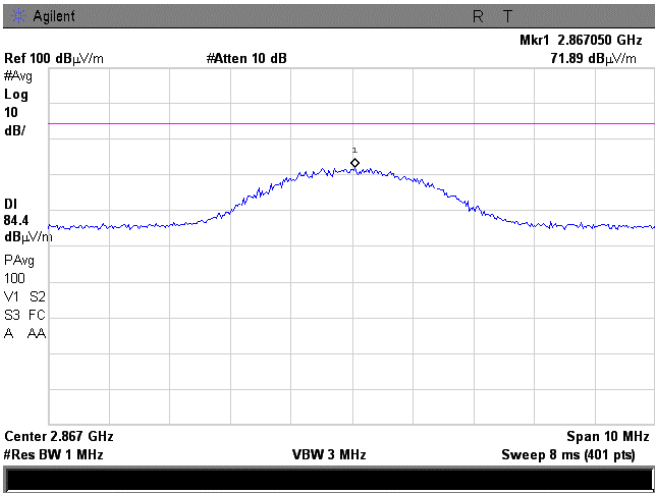
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: High 1433.5 MHz
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

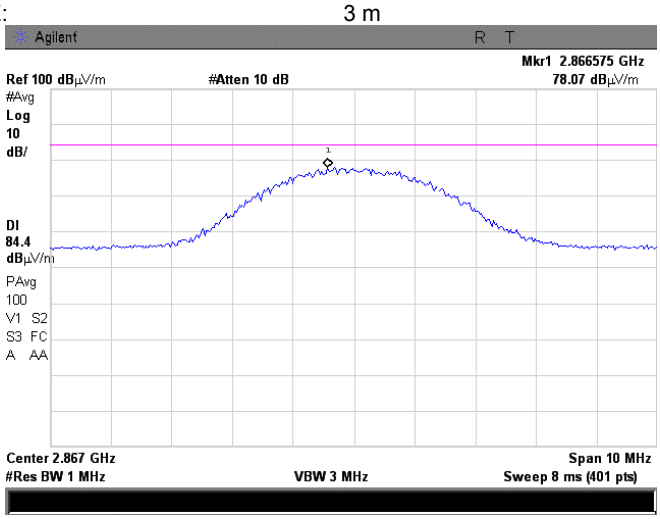
Plot 7.3.31 Radiated emission measurements at the 2nd harmonic

TEST SITE:	OATS
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.32 Radiated emission measurements at the 2nd harmonic

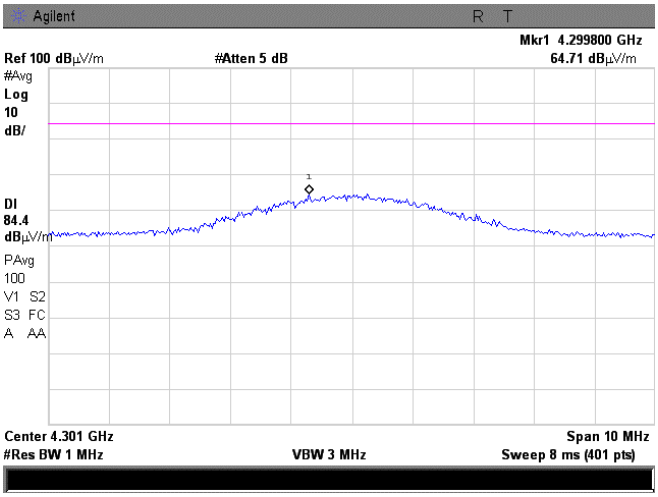
TEST SITE:	OATS
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

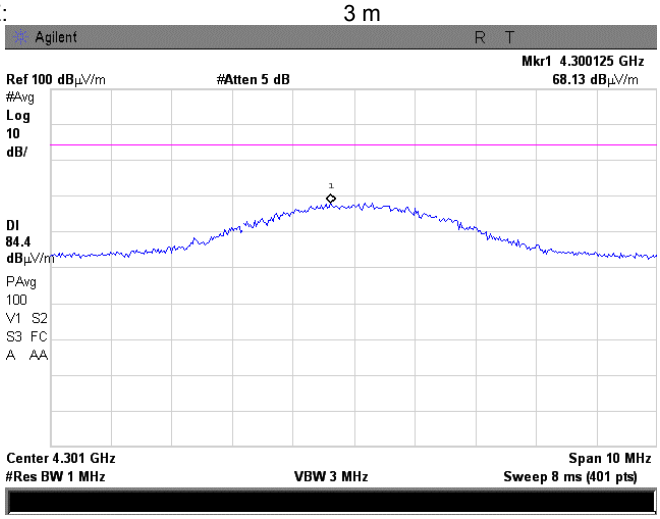
Plot 7.3.33 Radiated emission measurements at the 3rd harmonic

TEST SITE: OATS
CARRIER FREQUENCY: High 1433.5 MHz
ANTENNA POLARIZATION: Vertical
TEST DISTANCE: 3 m



Plot 7.3.34 Radiated emission measurements at the 3rd harmonic

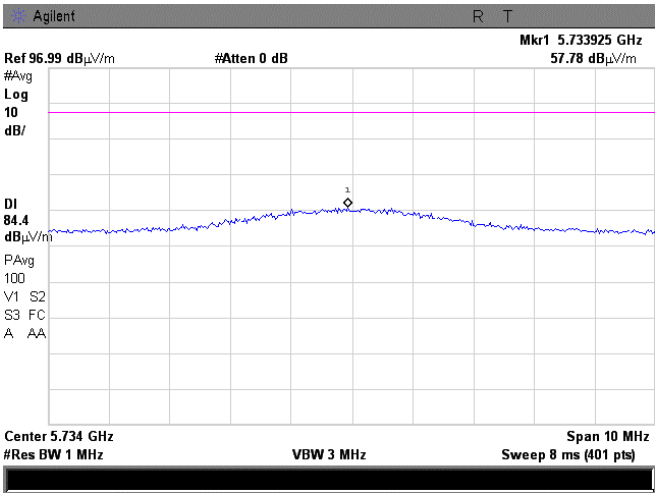
TEST SITE: OATS
CARRIER FREQUENCY: High 1433.5 MHz
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

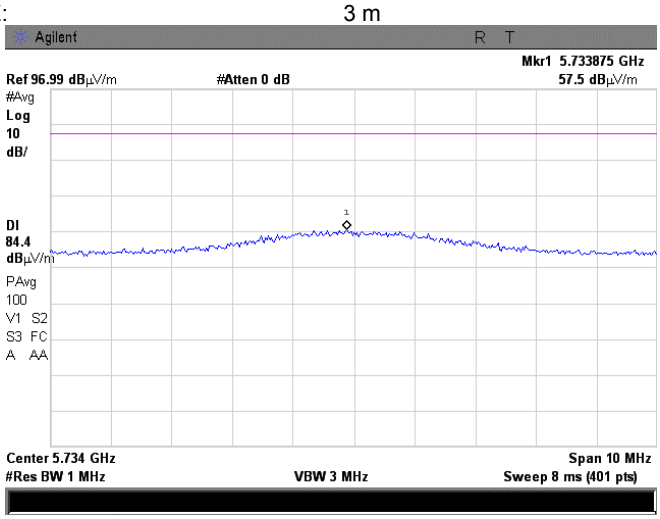
Plot 7.3.35 Radiated emission measurements at the 4th harmonic

TEST SITE: OATS
CARRIER FREQUENCY: High 1433.5 MHz
ANTENNA POLARIZATION: Vertical
TEST DISTANCE: 3 m



Plot 7.3.36 Radiated emission measurements at the 4th harmonic

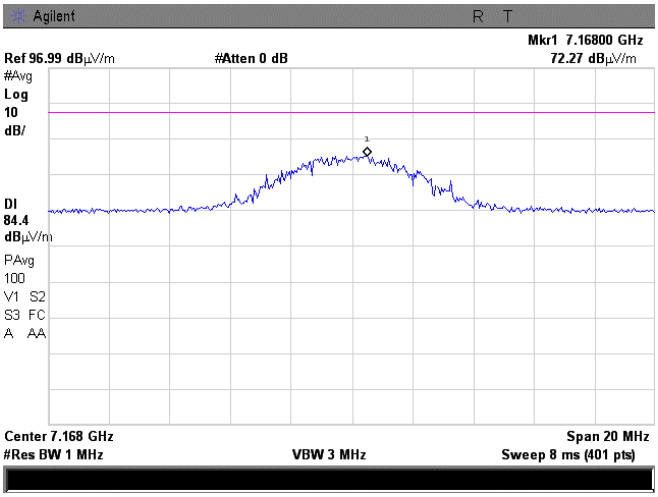
TEST SITE: OATS
CARRIER FREQUENCY: High 1433.5 MHz
ANTENNA POLARIZATION: Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53(j), Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-C, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/20/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

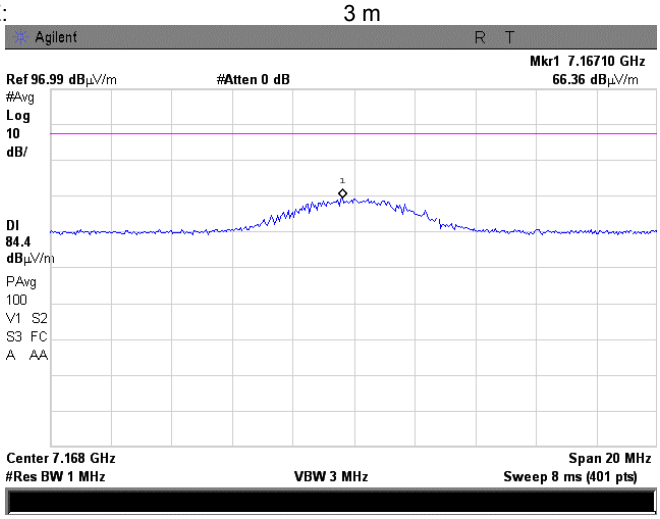
Plot 7.3.37 Radiated emission measurements at the 5th harmonic

TEST SITE:	OATS
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Vertical
TEST DISTANCE:	3 m



Plot 7.3.38 Radiated emission measurements at the 5th harmonic

TEST SITE:	OATS
CARRIER FREQUENCY:	High 1433.5 MHz
ANTENNA POLARIZATION:	Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

7.4 Spurious emissions at RF antenna connector test

7.4.1 General

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

Table 7.4.1 Spurious emission limits

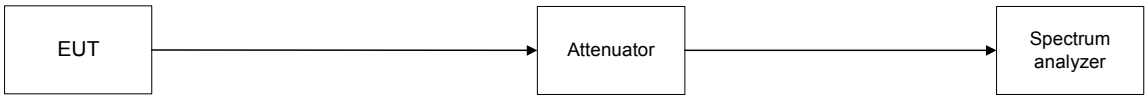
Frequency, MHz	Attenuation below carrier, dBc	ERP of spurious, dBm
0.009 – 10th harmonic*	43+10logP**	-13.0

* - 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

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.
7.4.2.2 The EUT was adjusted to produce maximum available for end user RF output power.
7.4.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.4.2, Table 7.4.3, Table 7.4.4, Table 7.4.5 and the associated plots.

Figure 7.4.1 Spurious emission test setup



Test specification:	**Section 27.53(j), Conducted spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	**Air Pressure:** 1019 hPa	**Relative Humidity:** 43%	**Power Supply:** 120 V AC
Remarks:			

Table 7.4.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 1390.0 – 1392.0 MHz
1392.0 – 1395.0 MHz
1432.0 – 1435.0 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 14500 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission*, dBm	Limit, dBm	Margin, dB**	Verdict
Low carrier frequency 1.5 MHz EBW BPSK								
1387.620	-31.42	Included	Included	300	-26.19	-13.0	-13.19	Pass
1394.000	-31.76	Included	Included	300	-26.53	-13.0	-13.53	Pass
Low carrier frequency 1.5 MHz EBW 64QAM								
1387.700	-35.12	Included	Included	300	-29.89	-13.0	-16.89	Pass
1394.000	-31.15	Included	Included	300	-25.92	-13.0	-12.92	Pass
Mid carrier frequency 1.5 MHz EBW BPSK								
1389.700	-33.40	Included	Included	300	-28.17	-13.0	-15.17	Pass
1397.425	-32.67	Included	Included	300	-27.44	-13.0	-14.44	Pass
Mid carrier frequency 1.5 MHz EBW 64QAM								
1389.600	-33.22	Included	Included	300	-27.99	-13.0	-14.99	Pass
1397.350	-29.95	Included	Included	300	-24.72	-13.0	-11.72	Pass
Mid carrier frequency 1.75 MHz EBW BPSK								
1389.925	-33.35	Included	Included	300	-28.12	-13.0	-15.12	Pass
1397.125	-31.95	Included	Included	300	-26.72	-13.0	-13.72	Pass
Mid carrier frequency 1.75 MHz EBW 64QAM								
1389.925	-32.13	Included	Included	300	-26.90	-13.0	-13.90	Pass
1397.175	-31.79	Included	Included	300	-26.56	-13.0	-13.56	Pass
Mid carrier frequency 2.5 MHz EBW BPSK								
1389.550	-30.14	Included	Included	300	-24.91	-13.0	-11.91	Pass
1397.025	-32.03	Included	Included	300	-26.80	-13.0	-13.80	Pass
Mid carrier frequency 2.5 MHz EBW 64QAM								
1389.925	-30.64	Included	Included	300	-25.41	-13.0	-12.41	Pass
1397.300	-32.03	Included	Included	300	-26.80	-13.0	-13.80	Pass
High carrier frequency 1.5 MHz EBW BPSK								
1429.875	-33.10	Included	Included	300	-27.87	-13.0	-14.87	Pass
1437.325	-32.87	Included	Included	300	-27.64	-13.0	-14.64	Pass
High carrier frequency 1.5 MHz EBW 64QAM								
1429.500	-32.59	Included	Included	300	-27.36	-13.0	-14.36	Pass
1437.350	-32.17	Included	Included	300	-26.94	-13.0	-13.94	Pass

* - Spurious emission, dBm = SA reading, dBm + Integration factor, dB***
**- Margin = Spurious emission – specification limit.
*** - Integration factor, dB = 10*log(1000 /300) = 5.23 dB

Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.4.3 Spurious emission test results at 1390.0 – 1397.0 and 1430.0 – 1437.0 MHz range

ASSIGNED FREQUENCY RANGE: 1390.0 – 1392.0 MHz
1392.0 – 1395.0 MHz
1432.0 – 1435.0 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 14500 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBc	Attenuator, dB	Cable loss, dB	RBW, kHz	Attenuation below carrier, dBc	Limit, dBc**	Margin, dB***	Verdict
Low frequency 1391.0 MHz								
BPSK 1.5 MHz EBW 28.55 dBm total power*								
1388-1389	53.26	Included	Included	30	53.26	41.55	11.71	Pass
1389-1390	43.78	Included	Included	30	43.78	41.55	2.23	Pass
1392-1393	45.17	Included	Included	30	45.17	41.55	3.62	Pass
1393-1394	53.96	Included	Included	30	53.96	41.55	12.41	Pass
64QAM 1.5 MHz EBW 27.67 dBm total power*								
1388-1389	52.54	Included	Included	30	52.54	40.67	11.87	Pass
1389-1390	42.22	Included	Included	30	42.22	40.67	1.55	Pass
1392-1393	44.71	Included	Included	30	44.71	40.67	4.04	Pass
1393-1394	53.98	Included	Included	30	53.98	40.67	13.31	Pass
Mid frequency 1393.5 MHz								
BPSK 1.5 MHz EBW 27.28 dBm total power*								
1390-1391	53.25	Included	Included	30	53.25	40.28	12.97	Pass
1391-1392	47.93	Included	Included	30	47.93	40.28	7.65	Pass
1395-1396	49.50	Included	Included	30	49.50	40.28	9.22	Pass
1396-1397	54.70	Included	Included	30	54.70	40.28	14.42	Pass
64QAM 1.5 MHz EBW 26.93 dBm total power*								
1390-1391	52.99	Included	Included	30	52.99	39.93	13.06	Pass
1391-1392	45.87	Included	Included	30	45.87	39.93	5.94	Pass
1395-1396	48.57	Included	Included	30	48.57	39.93	8.64	Pass
1396-1397	54.30	Included	Included	30	54.30	39.93	14.37	Pass
Mid frequency 1393.5 MHz								
BPSK 1.75 MHz EBW 27.48 dBm total power*								
1390-1391	51.85	Included	Included	30	51.85	40.48	11.37	Pass
1391-1392	46.25	Included	Included	30	46.25	40.48	5.77	Pass
1395-1396	46.84	Included	Included	30	46.84	40.48	6.36	Pass
1396-1397	53.43	Included	Included	30	53.43	40.48	12.95	Pass
64QAM 1.75 MHz EBW 27.61 dBm total power*								
1390-1391	51.79	Included	Included	30	51.79	40.61	11.18	Pass
1391-1392	45.36	Included	Included	30	45.36	40.61	4.75	Pass
1395-1396	47.42	Included	Included	30	47.42	40.61	6.81	Pass
1396-1397	52.91	Included	Included	30	52.91	40.61	12.3	Pass
Mid frequency 1393.5 MHz								
BPSK 2.5 MHz EBW 25.45 dBm total power*								
1390-1391	49.20	Included	Included	30	49.20	38.45	10.75	Pass
1391-1392	42.33	Included	Included	30	42.33	38.45	3.88	Pass
1395-1396	43.94	Included	Included	30	43.94	38.45	5.49	Pass
1396-1397	50.44	Included	Included	30	50.44	38.45	11.99	Pass
64QAM 2.5 MHz EBW 25.41 dBm total power*								
1390-1391	49.13	Included	Included	30	49.13	38.41	10.72	Pass
1391-1392	42.49	Included	Included	30	42.49	38.41	4.08	Pass
1395-1396	44.39	Included	Included	30	44.39	38.41	5.98	Pass
1396-1397	51.27	Included	Included	30	51.27	38.41	12.86	Pass

Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.4.3 Spurious emission test results at 1390.0 – 1397.0 and 1430.0 – 1437.0 MHz range (continued)

Frequency, MHz	SA reading, dBc	Attenuator, dB	Cable loss, dB	RBW, kHz	Attenuation below carrier, dBc	Limit, dBc**	Margin, dB***	Verdict
High frequency 1433.5 MHz								
BPSK 1.5 MHz EBW 27.62 dBm total power*								
1430-1431	54.00	Included	Included	30	54.00	40.62	13.38	Pass
1431-1432	47.95	Included	Included	30	47.95	40.62	7.33	Pass
1435-1436	47.82	Included	Included	30	47.82	40.62	7.20	Pass
1436-1437	55.64	Included	Included	30	55.64	40.62	15.02	Pass
64QAM 1.5 MHz EBW 27.73 dBm total power*								
1430-1431	54.42	Included	Included	30	54.42	40.73	13.69	Pass
1431-1432	49.52	Included	Included	30	49.52	40.73	8.79	Pass
1435-1436	49.50	Included	Included	30	49.50	40.73	8.77	Pass
1436-1437	54.72	Included	Included	30	54.72	40.73	13.99	Pass

* - Total power – measured with the same settings as spurious emissions
** -The limit was calculated as 43 dB+10 log(total power*)
***- Margin = Spurious emission – specification limit.

NOTE: Conducted spurious emissions were tested with EUT configured to transmit at 1.5 MHz EBW and 64QAM modulation assuming that this configuration produces maximum RF power density. However at the low and high frequencies in the range 1380.0 – 1407.0 MHz and 1420 – 1445 MHz, the 1.5 MHz EBW configuration under maximum and minimum bit rates was tested, and at the mid frequency in the range 1380.0 – 1407.0MHz and 1420 – 1445 MHz, the 1.5 MHz, 1.75 MHz and 2.5 MHz EBW configuration under maximum and minimum bit rates were tested.

Test specification:	**Section 27.53(j), Conducted spurious emissions**		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	**Air Pressure:** 1019 hPa	**Relative Humidity:** 43%	**Power Supply:** 120 V AC
Remarks:			

Table 7.4.4 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 1432.0 – 1435.0 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 14500 MHz
DETECTOR USED: Power Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
DUTY CYCLE: 100%
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission**, dBm	Limit, dBm	Margin, dB*	Verdict
BPSK 1.75 MHz EBW								
1430.000	-35.76	Included	Included	300	-30.53	-13.0	-17.53	Pass
1437.000	-36.82	Included	Included	300	-31.59	-13.0	-18.59	Pass
BPSK 2.5 MHz EBW								
1429.875	-32.27	Included	Included	300	-32.27	-13.0	-14.04	Pass
1437.080	-34.13	Included	Included	300	-34.13	-13.0	-15.90	Pass
64QAM 1.75 MHz EBW								
1429.950	-35.54	Included	Included	300	-30.31	-13.0	-17.31	Pass
1437.040	-37.22	Included	Included	300	-31.99	-13.0	-18.99	Pass
64QAM 2.5 MHz EBW								
1429.975	-32.27	Included	Included	300	-27.04	-13.0	-14.04	Pass
1437.000	-34.03	Included	Included	300	-28.80	-13.0	-15.80	Pass

*- Margin = Spurious emission – specification limit.
** - Spurious emission, dBm = SA reading, dBm + Integration factor, dB***
*** - Integration factor, dB = 10* Log (1000 kHz/300 kHz) = 5.23 dB

Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.4.5 Spurious emission test results in 1430.0 – 1437.0 MHz range

ASSIGNED FREQUENCY RANGE: 1432.0 – 1435.0 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 14500 MHz
RBW: 1% of the EBW
DETECTOR USED: Power Average
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATING SIGNAL: PRBS
DUTY CYCLE: 100%
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBc	Attenuator, dB	Cable loss, dB	RBW, kHz	Attenuation below carrier, dBc	Limit, dBc**	Margin, dB***	Verdict
BPSK 1.75 MHz EBW 25.16 dBm total power*								
1430-1431	51.66	Included	Included	30	51.66	38.16	13.50	Pass
1431-1432	43.60	Included	Included	30	43.60	38.16	5.44	Pass
1435-1436	43.99	Included	Included	30	43.99	38.16	5.83	Pass
1436-1437	53.42	Included	Included	30	53.42	38.16	15.26	Pass
BPSK 2.5 MHz EBW 25.00 dBm total power*								
1430-1431	46.78	Included	Included	30	46.78	38.0	8.78	Pass
1431-1432	39.44	Included	Included	30	39.44	38.0	1.44	Pass
1435-1436	39.72	Included	Included	30	39.72	38.0	1.72	Pass
1436-1437	47.80	Included	Included	30	47.80	38.0	9.80	Pass
64QAM 1.75 MHz EBW 25.27 dBm total power*								
1430-1431	51.90	Included	Included	30	51.90	38.27	13.63	Pass
1431-1432	44.10	Included	Included	30	44.10	38.27	5.83	Pass
1435-1436	43.79	Included	Included	30	43.79	38.27	5.52	Pass
1436-1437	52.73	Included	Included	30	52.73	38.27	14.46	Pass
64QAM 2.5 MHz EBW 24.92 dBm total power*								
1430-1431	46.78	Included	Included	30	46.78	37.92	8.86	Pass
1431-1432	39.14	Included	Included	30	39.14	37.92	1.22	Pass
1435-1436	39.76	Included	Included	30	39.76	37.92	1.84	Pass
1436-1437	47.11	Included	Included	30	47.11	37.92	9.19	Pass

* - Total power – measured with the same settings as spurious emissions
** -The limit was calculated as 43 dB+10 log(total power*)
***- Margin = Spurious emission – specification limit.

NOTE: Conducted spurious emissions were tested with EUT configured to transmit at 1.75 MHz EBW and 64QAM modulation assuming that this configuration produces the maximum RF power density. However in the 1420 – 1445 MHz range both 1.75 MHz and 2.5 MHz EBW configurations under maximum and minimum bit rates were tested.

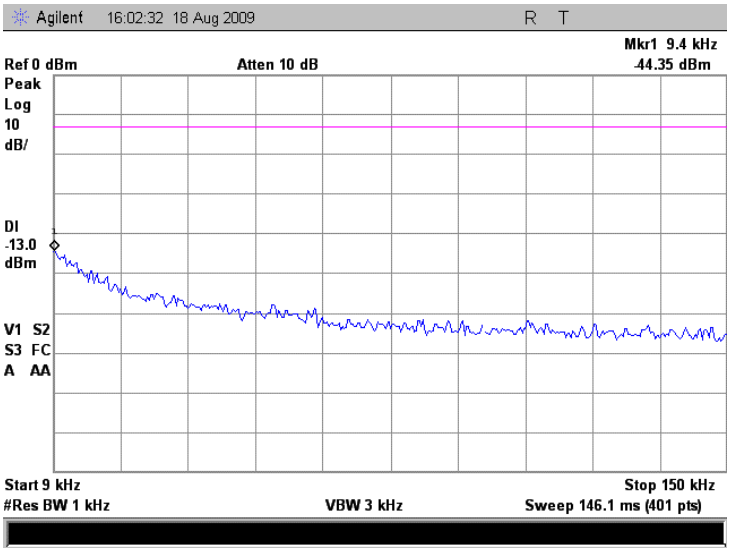
Reference numbers of test equipment used

HL 2867	HL 2909	HL 3439	HL 3442				

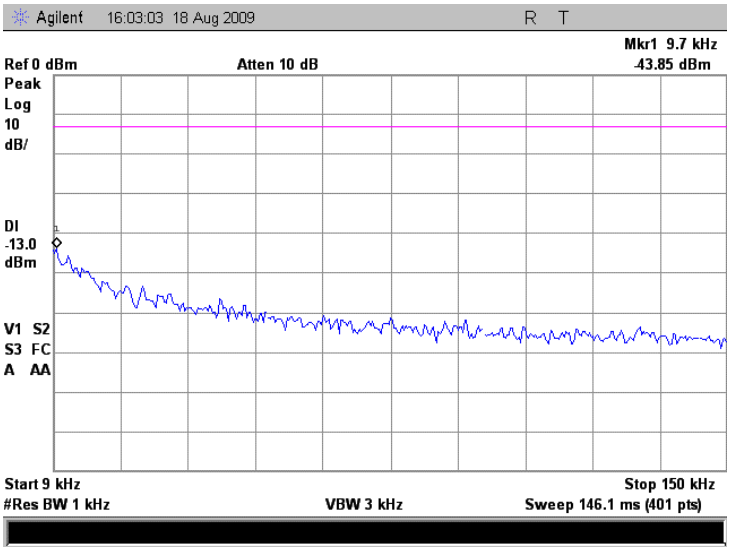
Full description is given in Appendix A.

Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

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

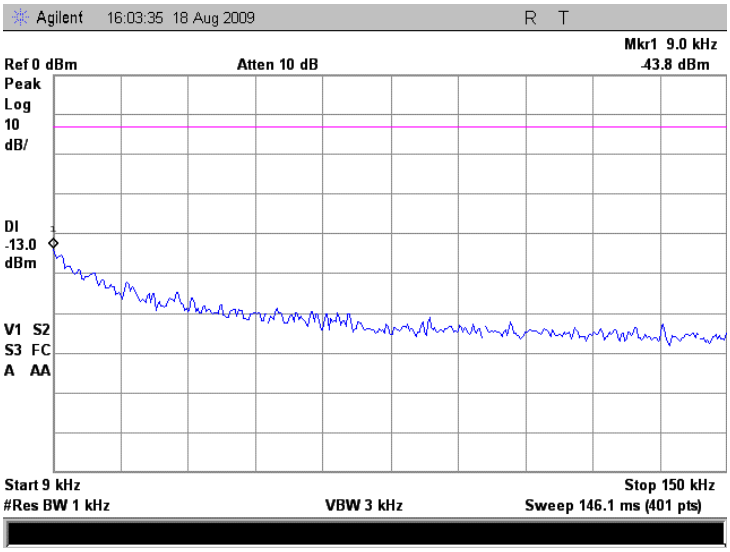


Plot 7.4.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

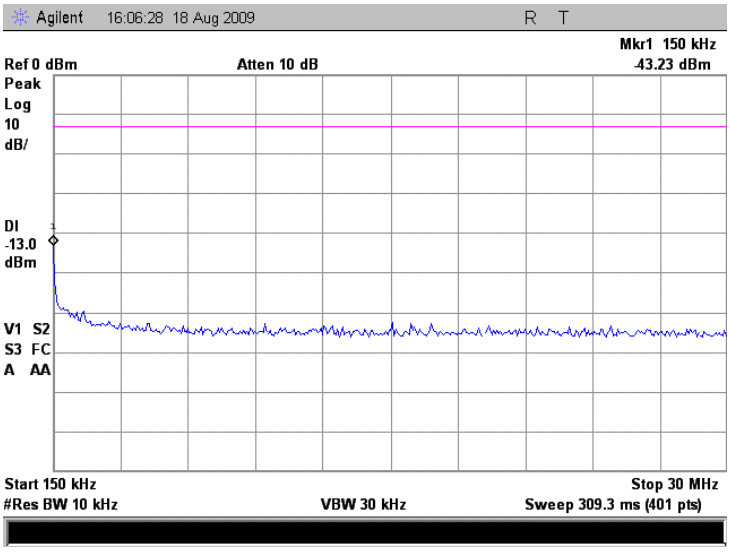


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency,1.5 MHz EBW

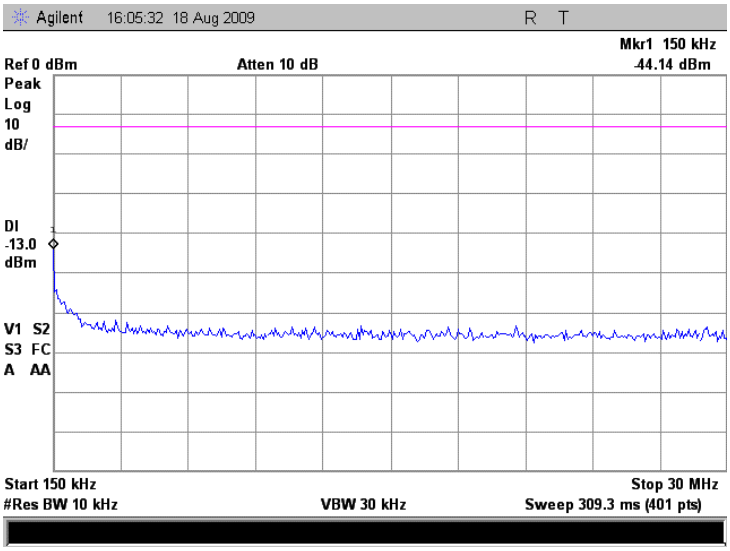


Plot 7.4.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency

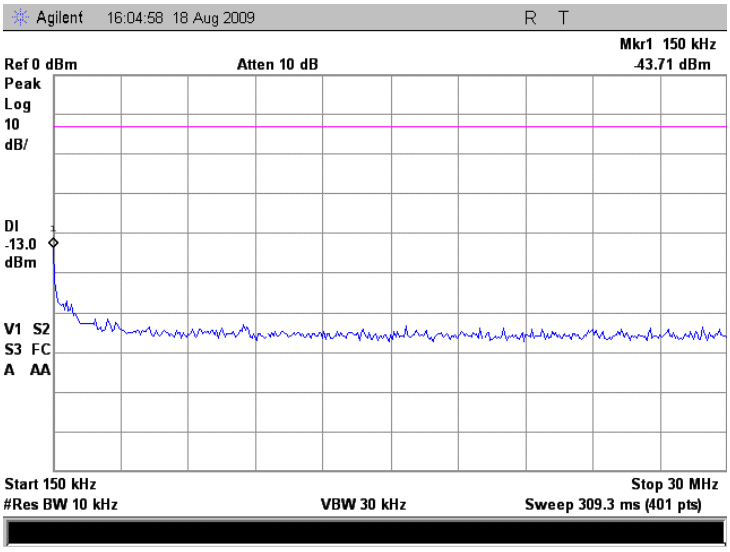


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

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

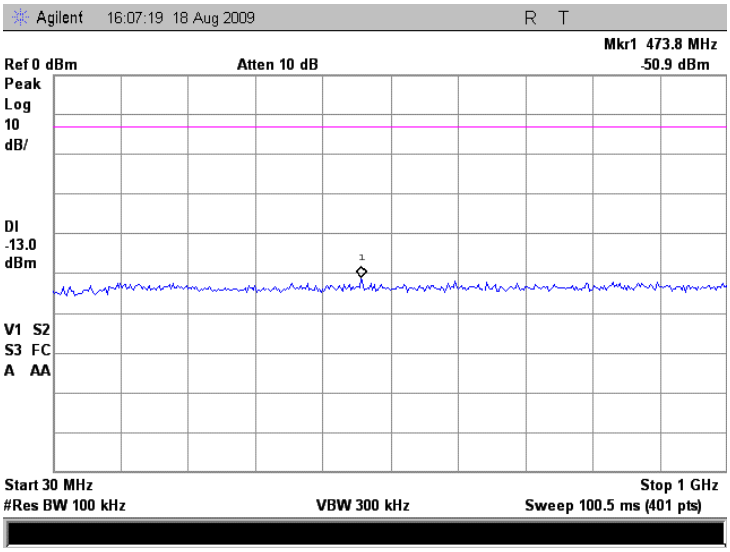


Plot 7.4.6 Spurious emission measurements in 0.15 – 30.0 MHz range at high carrier frequency,1.5 MHz EBW

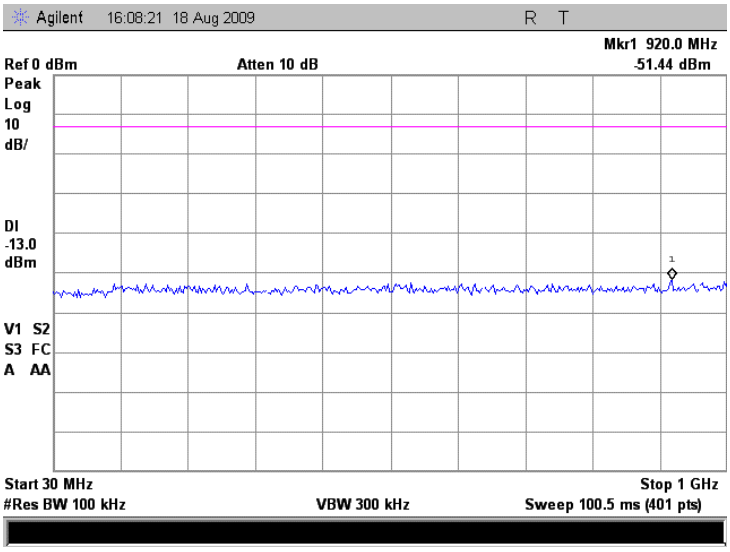


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

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

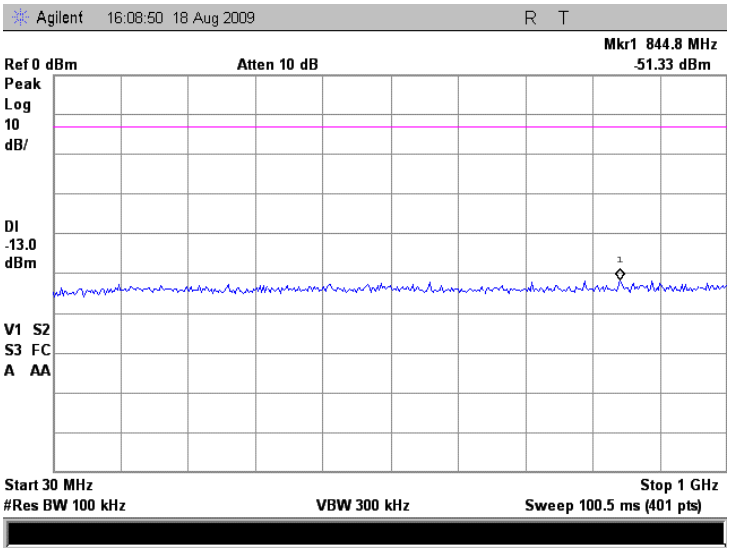


Plot 7.4.8 Spurious emission measurements in 30.0 - 1000 MHz range at mid carrier frequency



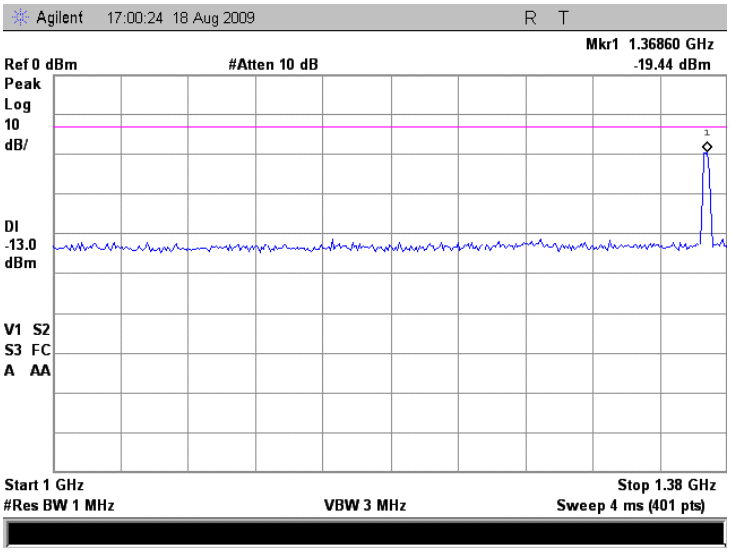
Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.9 Spurious emission measurements in 30.0 - 1000 MHz range at high carrier frequency,1.5 MHz EBW

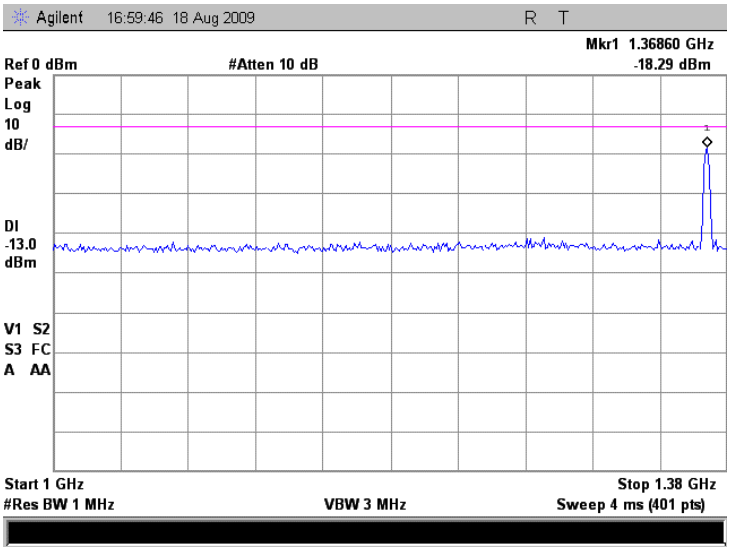


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.10 Spurious emission measurements in 1000 - 1380 MHz range at low carrier frequency

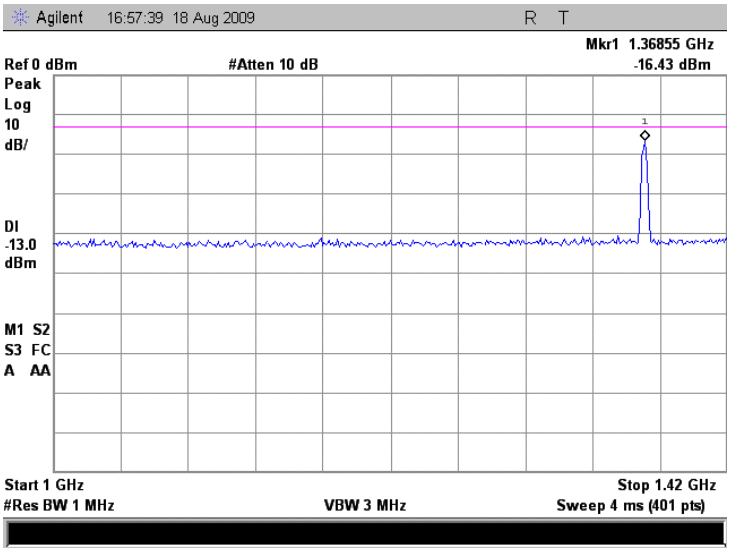


Plot 7.4.11 Spurious emission measurements in 1000 - 1380 MHz range at mid carrier frequency



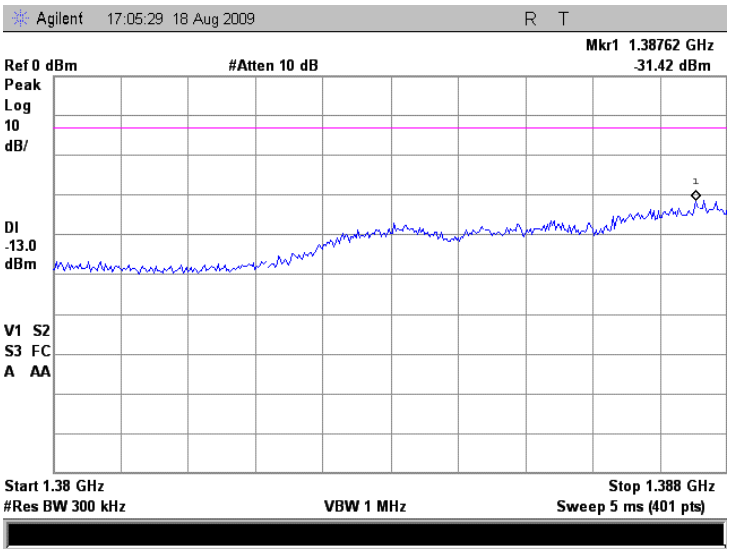
Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.12 Spurious emission measurements in 1000 - 1420 MHz at high carrier frequency,1.5 MHz EBW

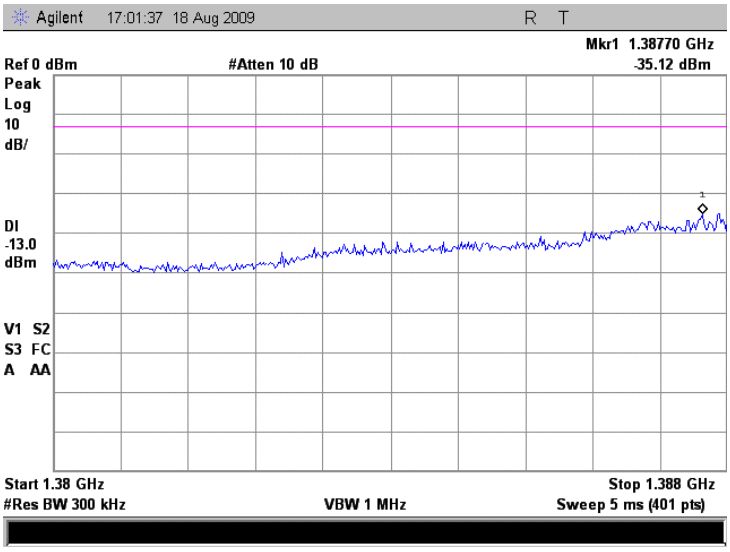


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.13 Spurious emission measurements in 1380 - 1388 MHz range at low carrier frequency, 1.5 MHz EBW, BPSK

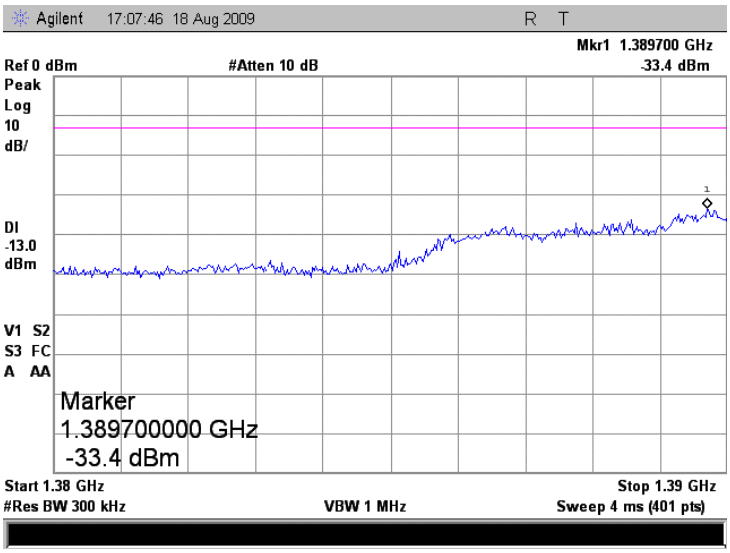


Plot 7.4.14 Spurious emission measurements in 1380 - 1388 MHz range at low carrier frequency, 1.5 MHz EBW, 64QAM

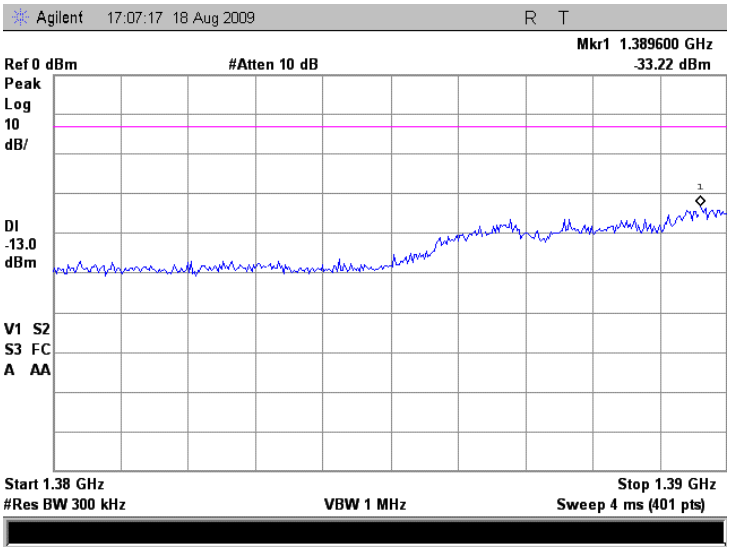


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.15 Spurious emission measurements in 1380 - 1390 MHz range at mid carrier frequency, 1.5 MHz EBW, BPSK

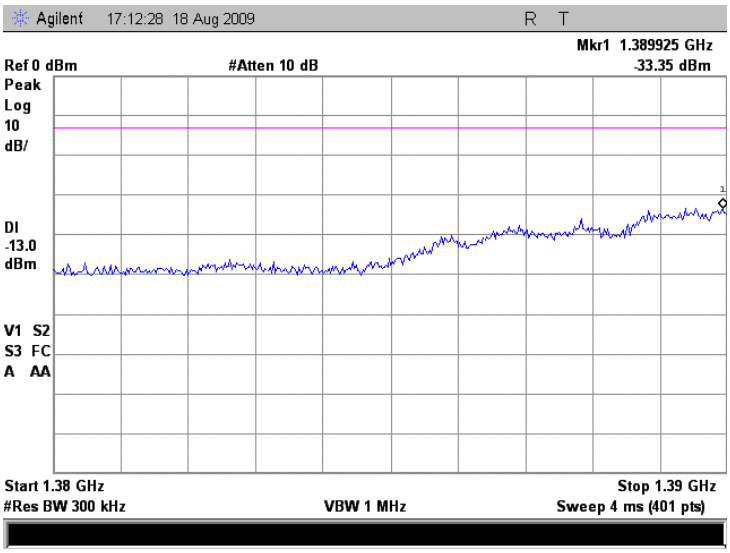


Plot 7.4.16 Spurious emission measurements in 1380 - 1390 MHz range at mid carrier frequency, 1.5 MHz EBW, 64QAM

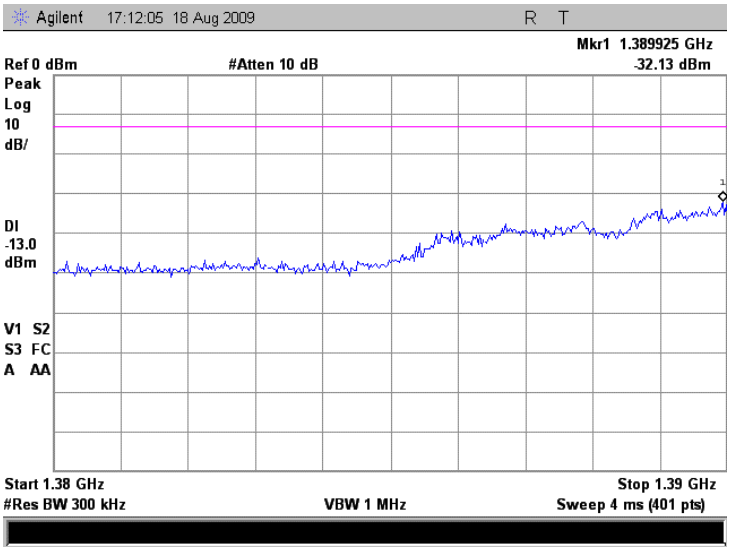


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.17 Spurious emission measurements in 1380 - 1390 MHz range at mid carrier frequency, 1.75 MHz EBW, BPSK

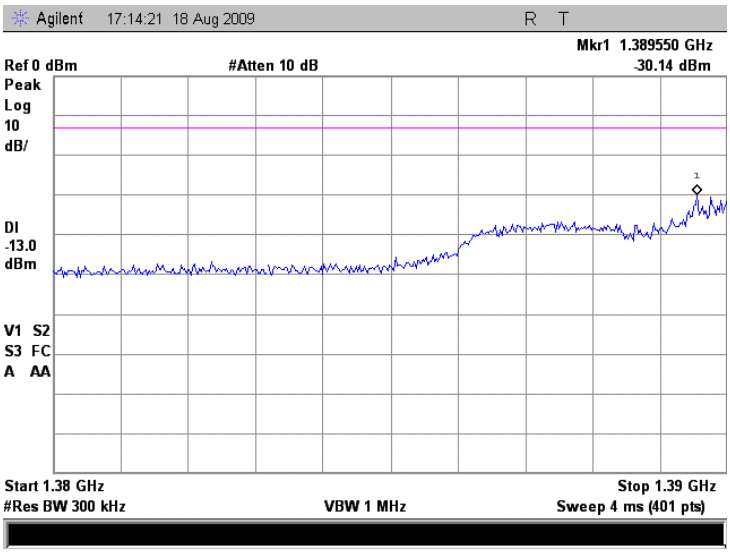


Plot 7.4.18 Spurious emission measurements in 1380 - 1390 MHz range at mid carrier frequency, 1.75 MHz EBW, 64QAM

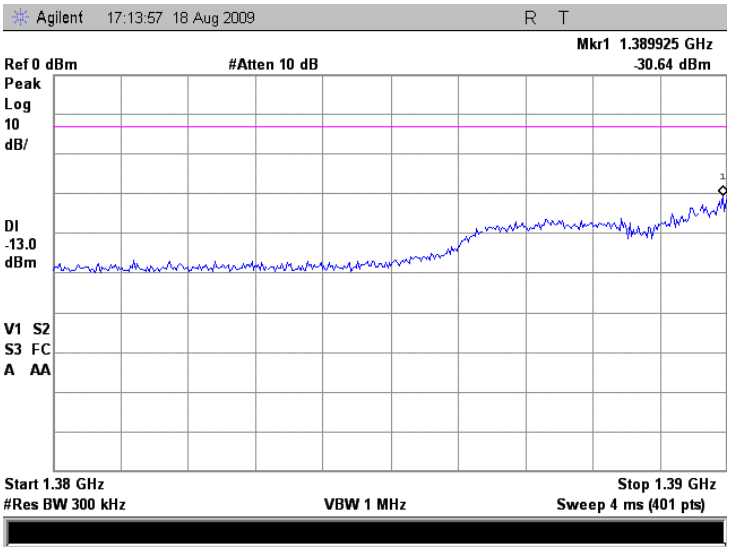


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.19 Spurious emission measurements in 1380 - 1390 MHz range at mid carrier frequency, 2.5 MHz EBW, BPSK

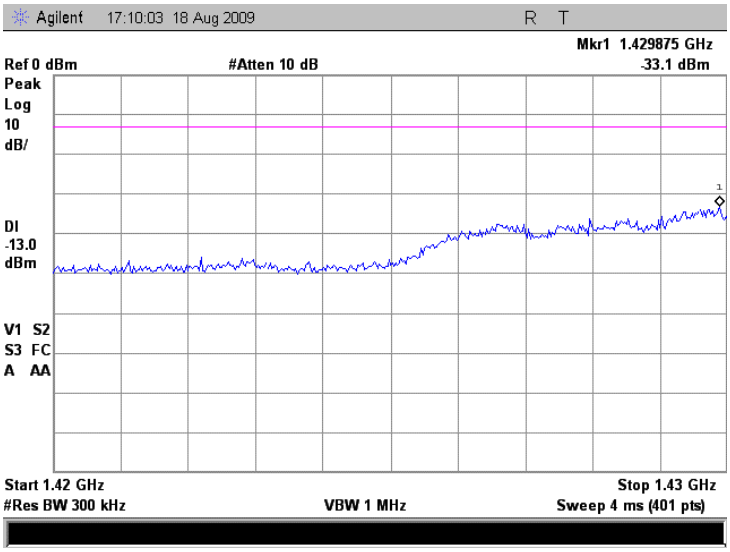


Plot 7.4.20 Spurious emission measurements in 1380 - 1390 MHz range at mid carrier frequency, 2.5 MHz EBW, 64QAM

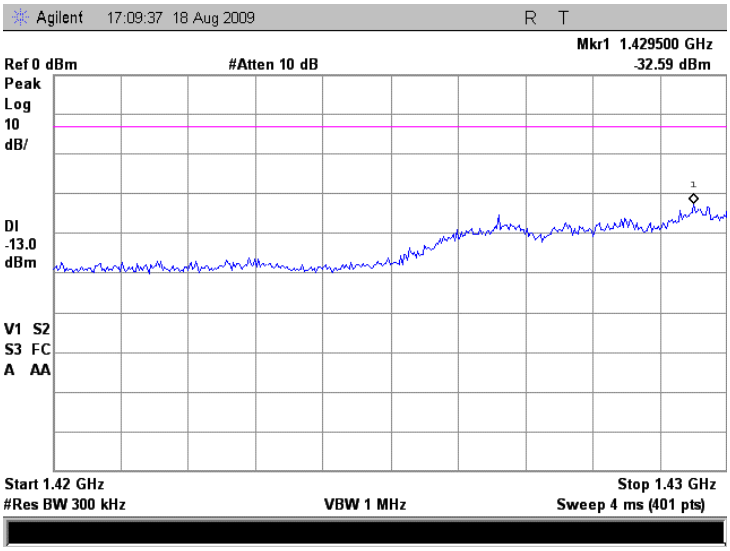


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.21 Spurious emission measurements in 1420 - 1430 MHz at high carrier frequency, 1.5 MHz EBW, BPSK

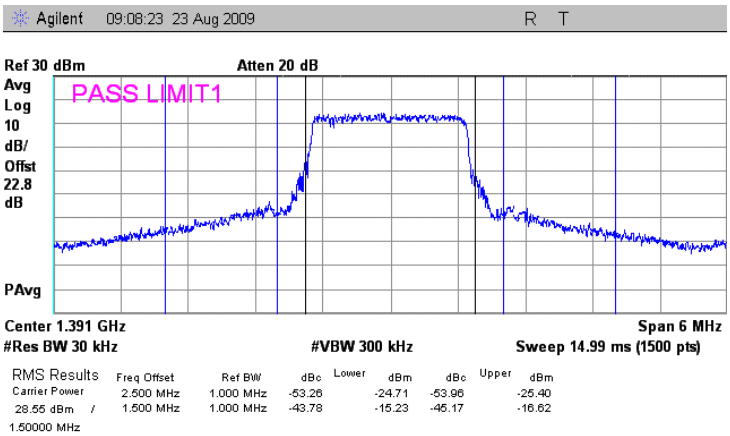


Plot 7.4.22 Spurious emission measurements in 1420 – 1430 MHz at high carrier frequency, 1.5 MHz EBW, 64QAM

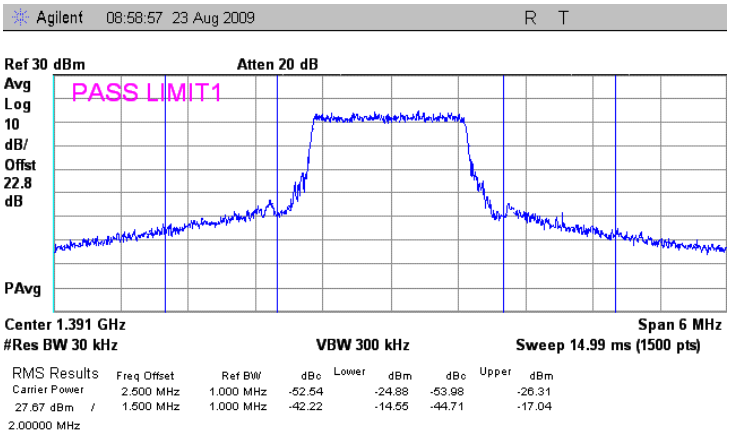


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.23 Spurious emission measurements in 1388 – 1389, 1389 – 1390, 1392 – 1393, 1393 - 1394 MHz at low carrier frequency, 1.5 MHz EBW, BPSK

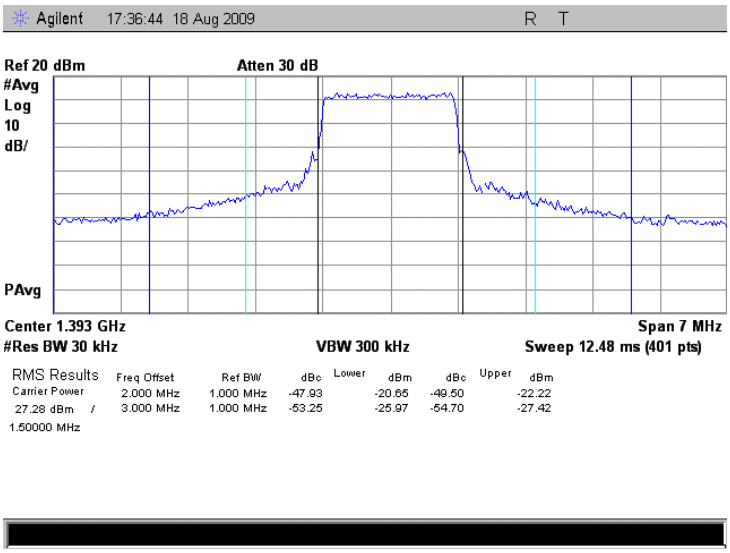


Plot 7.4.24 Spurious emission measurements in 1388 – 1389, 1389 – 1390, 1392 – 1393, 1393 - 1394 MHz at low carrier frequency, 1.5 MHz EBW, 64QAM

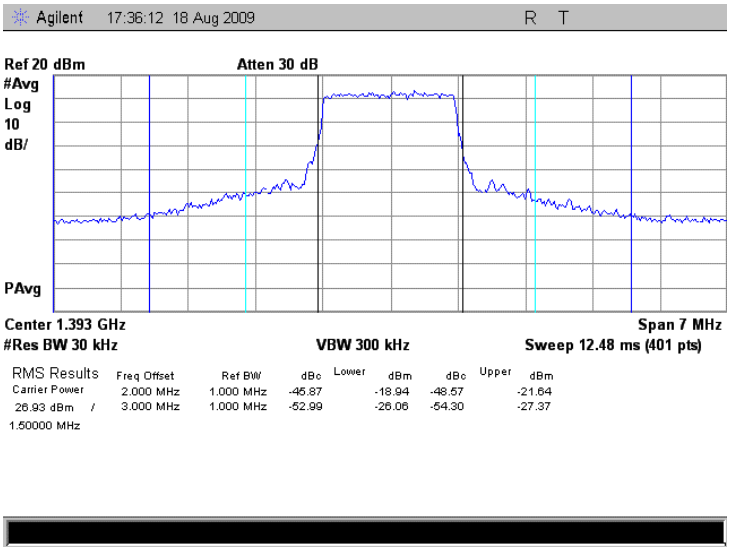


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.25 Spurious emission measurements in 1390 – 1391, 1391 – 1392, 1395 – 1396, 1396 – 1397 MHz at mid carrier frequency, 1.5 MHz EBW, BPSK

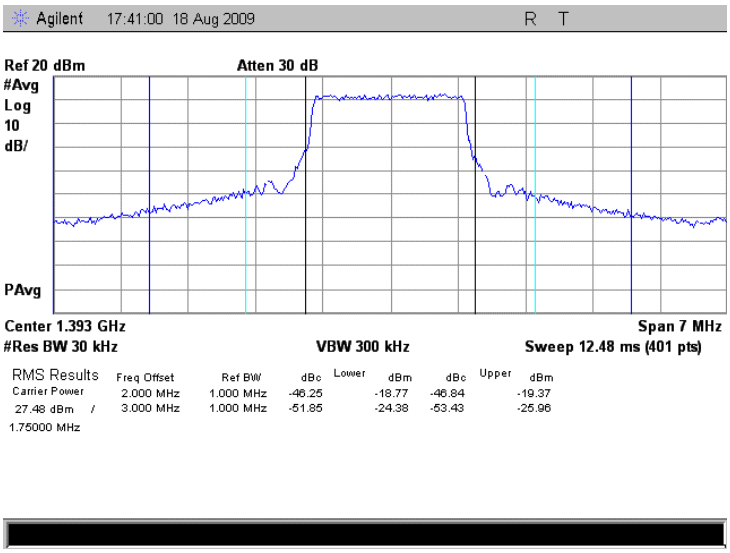


Plot 7.4.26 Spurious emission measurements in 1390 – 1391, 1391 – 1392, 1395 – 1396, 1396 – 1397 MHz at mid carrier frequency, 1.5 MHz EBW, 64QAM

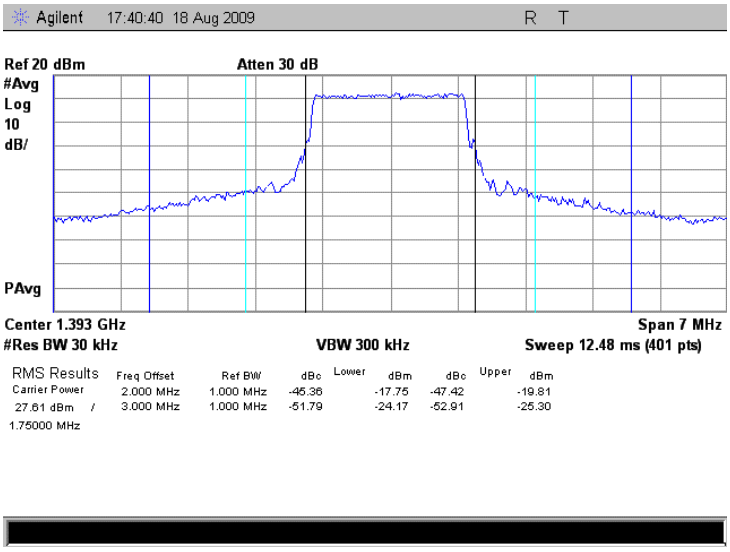


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.27 Spurious emission measurements in 1390 – 1391, 1391 – 1392, 1395 – 1396, 1396 – 1397 MHz at mid carrier frequency, 1.75 MHz EBW, BPSK

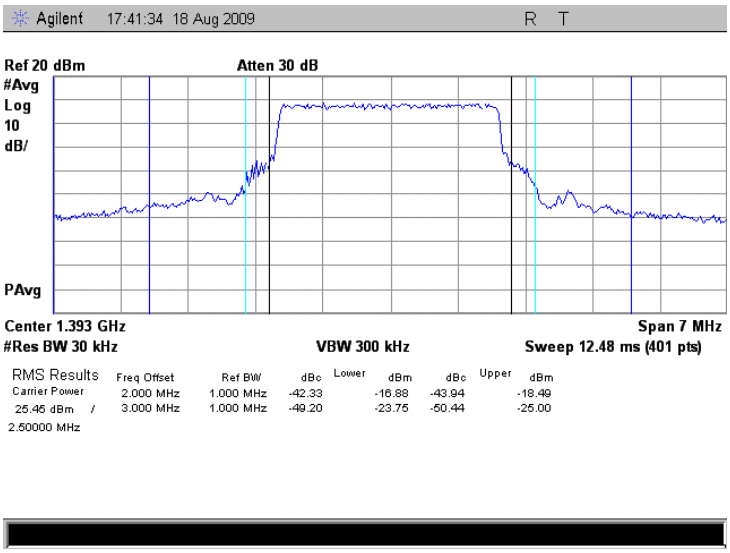


Plot 7.4.28 Spurious emission measurements in 1390 – 1391, 1391 – 1392, 1395 – 1396, 1396 – 1397 MHz at mid carrier frequency, 1.75 MHz EBW, 64QAM

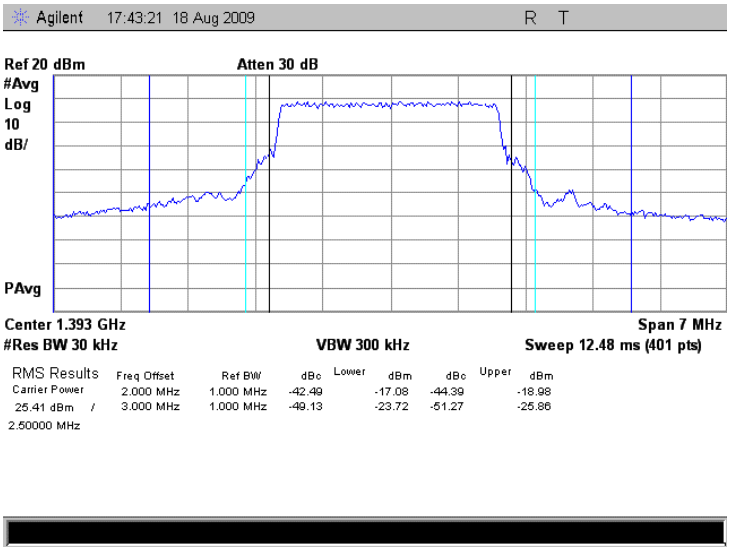


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.29 Spurious emission measurements in 1390 – 1391, 1391 – 1392, 1395 – 1396, 1396 – 1397 MHz at mid carrier frequency, 2.5 MHz EBW, BPSK

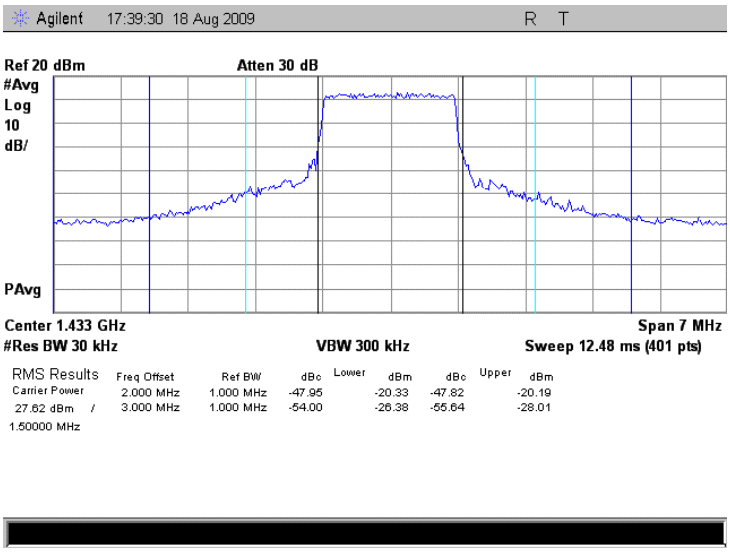


Plot 7.4.30 Spurious emission measurements in 1390 – 1391, 1391 – 1392, 1395 – 1396, 1396 – 1397 MHz at mid carrier frequency, 2.5 MHz EBW, 64QAM

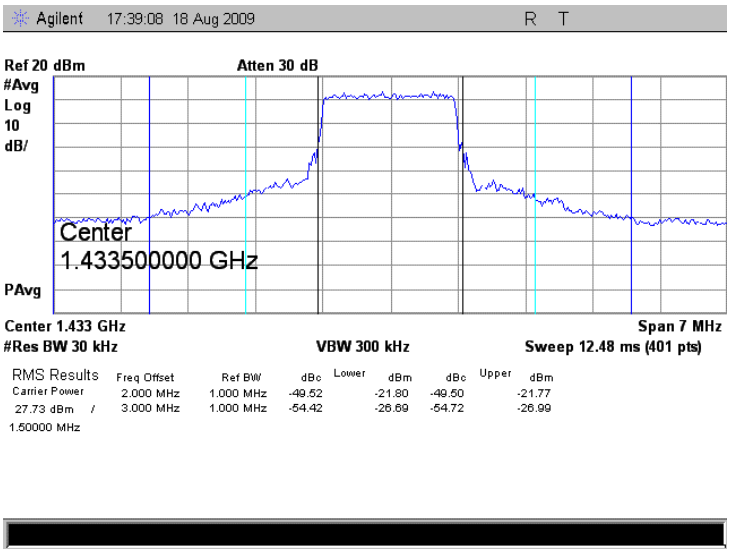


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.31 Spurious emission measurements in 1430 – 1431, 1431 – 1432, 1435 – 1436, 1436 - 1437 MHz at high carrier frequency, 1.5 MHz EBW, BPSK

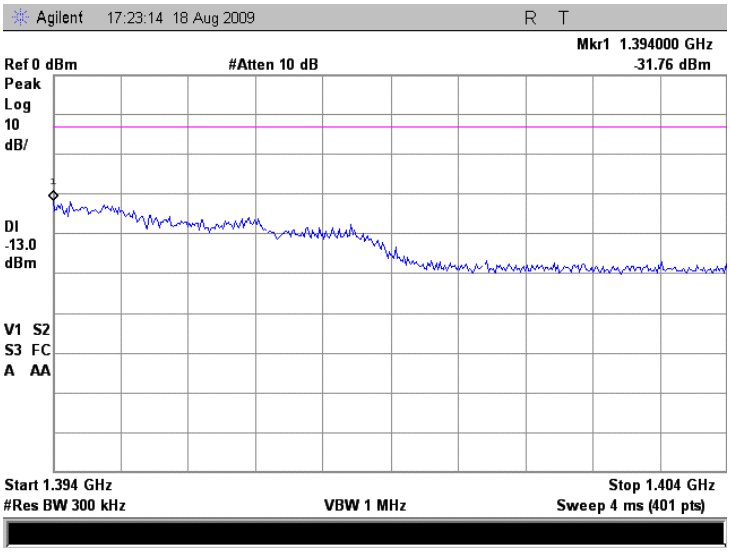


Plot 7.4.32 Spurious emission measurements in 1430 – 1431, 1431 – 1432, 1435 – 1436, 1436 - 1437 MHz at high carrier frequency, 1.5 MHz EBW, 64QAM

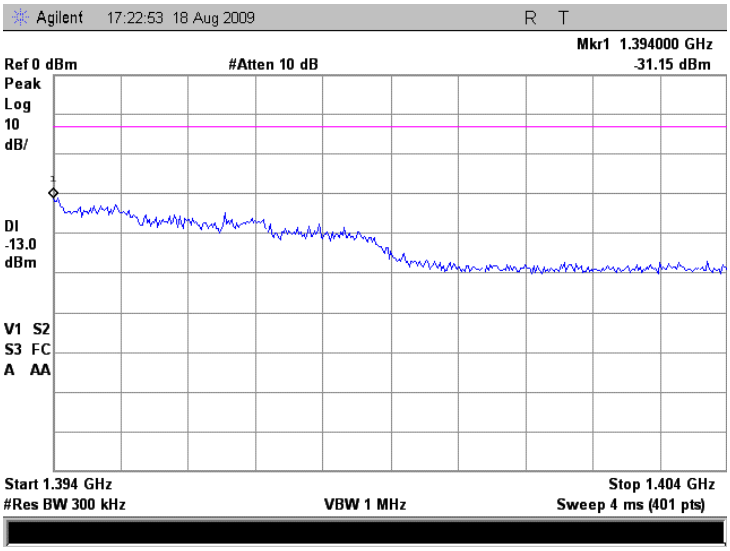


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.33 Spurious emission measurements in 1394 - 1404 MHz at low carrier frequency, 1.5 MHz EBW, BPSK

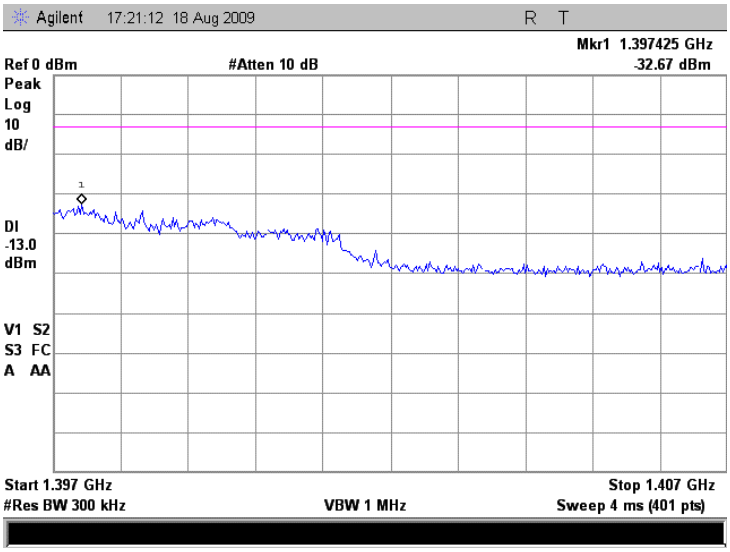


Plot 7.4.34 Spurious emission measurements in 1394 - 1404 MHz at low carrier frequency, 1.5 MHz EBW, 64QAM

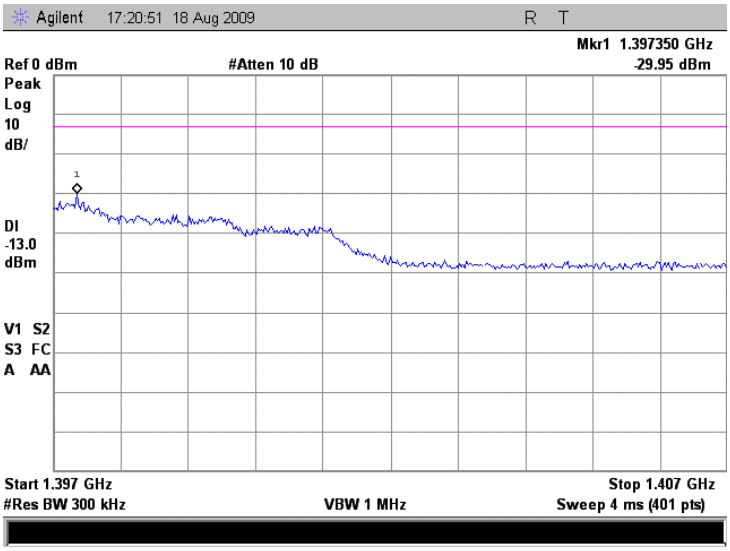


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.35 Spurious emission measurements in 1397 - 1407 MHz at mid carrier frequency, 1.5 MHz EBW, BPSK

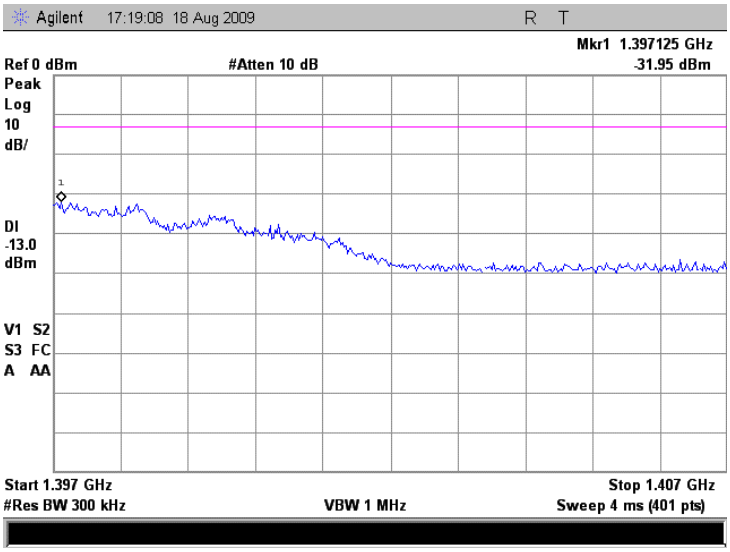


Plot 7.4.36 Spurious emission measurements in 1397 - 1407 MHz at mid carrier frequency, 1.5 MHz EBW, 64QAM

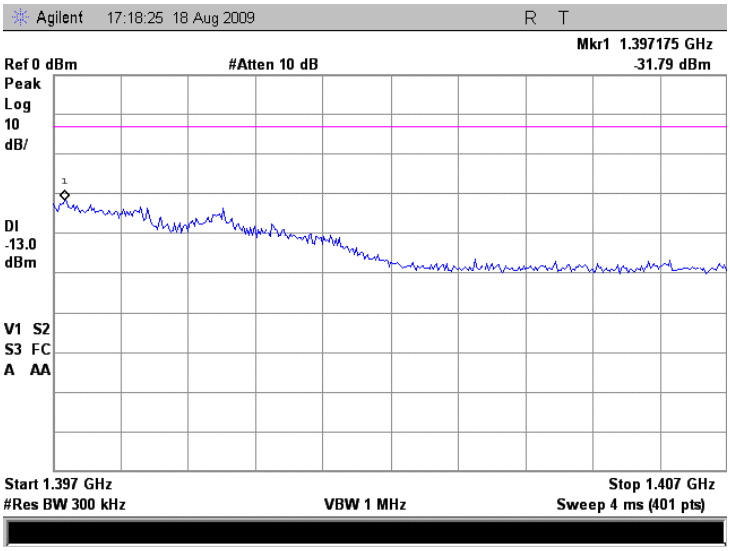


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.37 Spurious emission measurements in 1397 - 1407 MHz at mid carrier frequency, 1.75 MHz EBW, BPSK

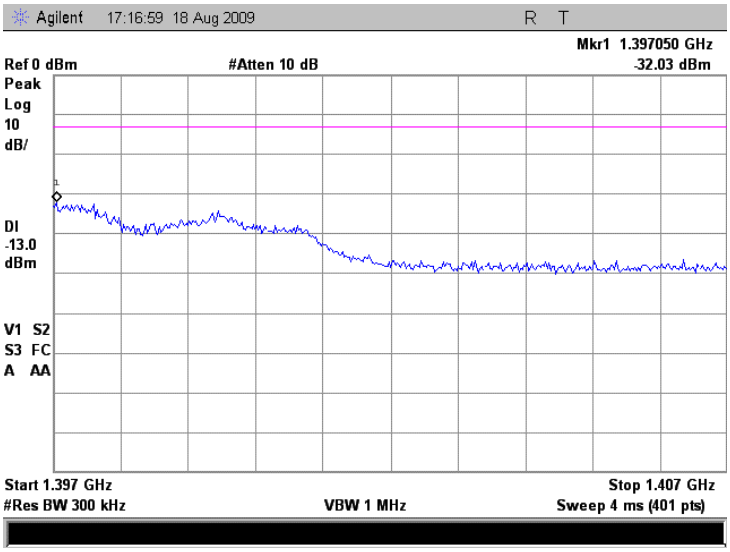


Plot 7.4.38 Spurious emission measurements in 1397 - 1407 MHz at mid carrier frequency, 1.75 MHz EBW, 64QAM

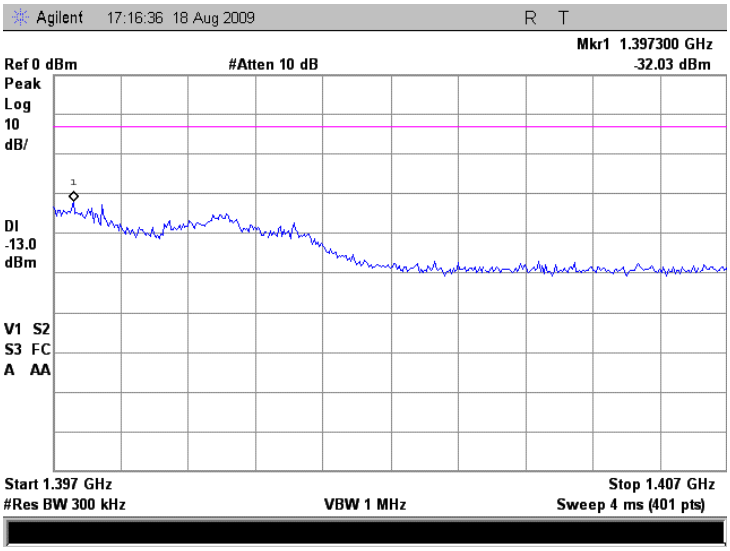


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.39 Spurious emission measurements in 1397 - 1407 MHz at mid carrier frequency, 2.5 MHz EBW, BPSK

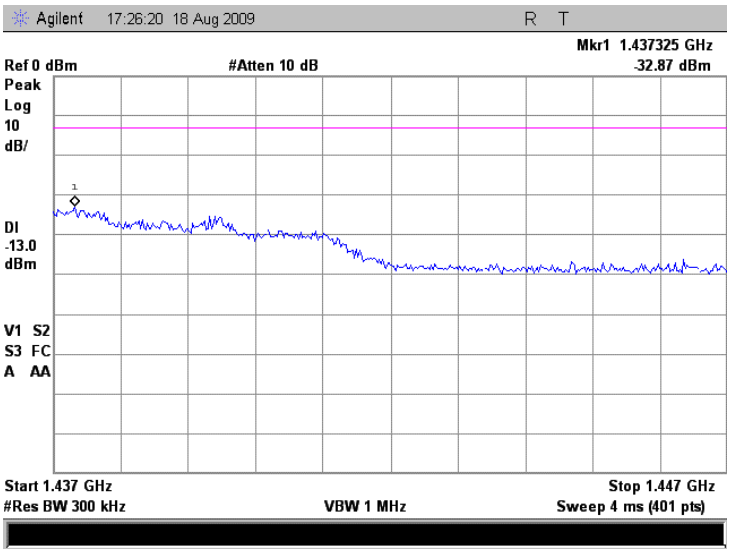


Plot 7.4.40 Spurious emission measurements in 1397 - 1407 MHz at mid carrier frequency, 2.5 MHz EBW, 64QAM

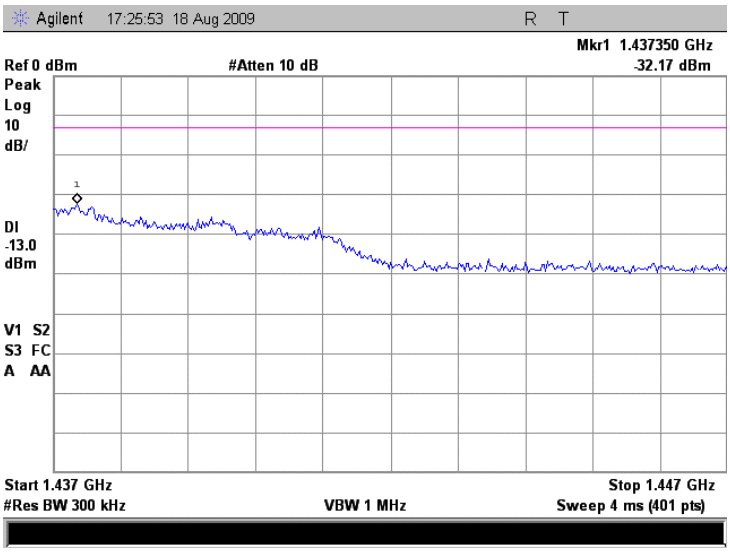


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.41 Spurious emission measurements in 1437 - 1447 MHz at high carrier frequency, 1.5 MHz EBW, BPSK

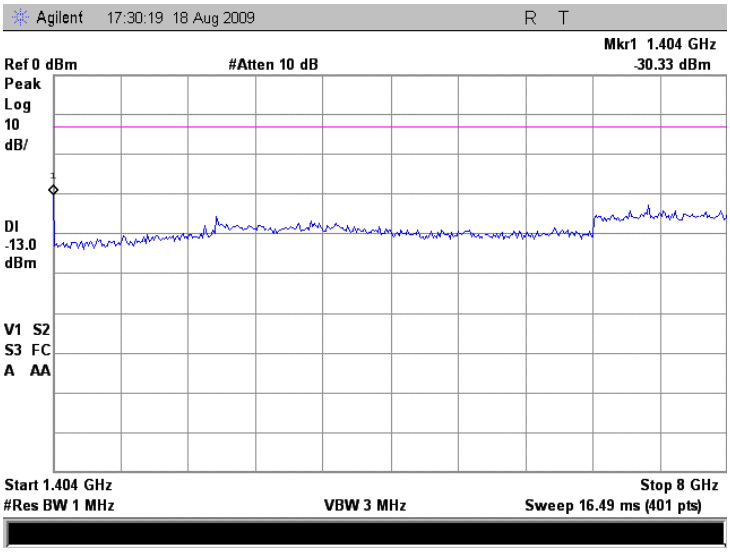


Plot 7.4.42 Spurious emission measurements in 1437 - 1447 MHz at high carrier frequency, 1.5 MHz EBW, 64QAM

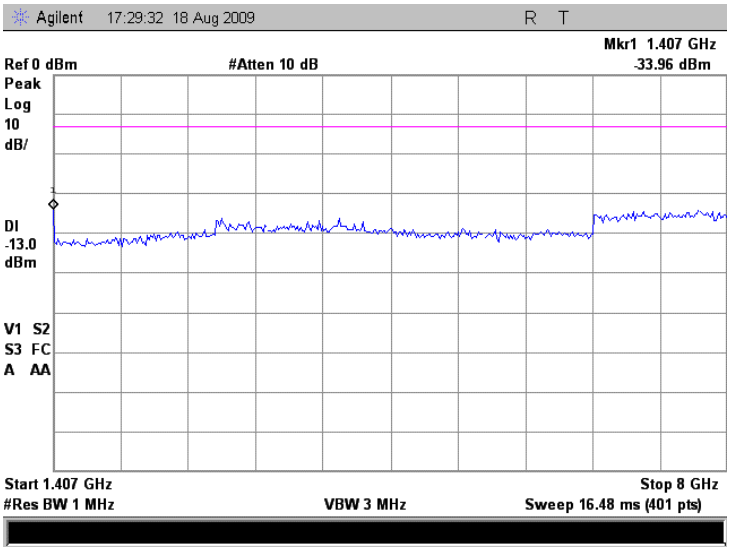


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.43 Spurious emission measurements in 1404 - 8000 MHz range at low carrier frequency

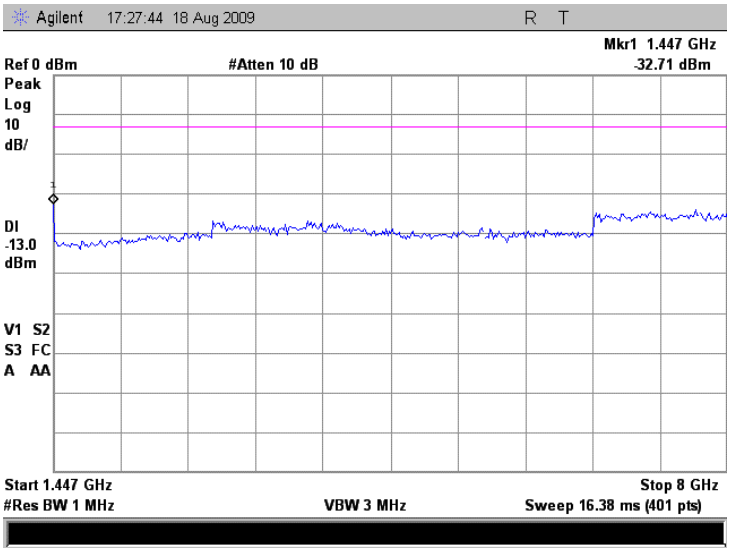


Plot 7.4.44 Spurious emission measurements in 1407 - 8000 MHz range at mid carrier frequency



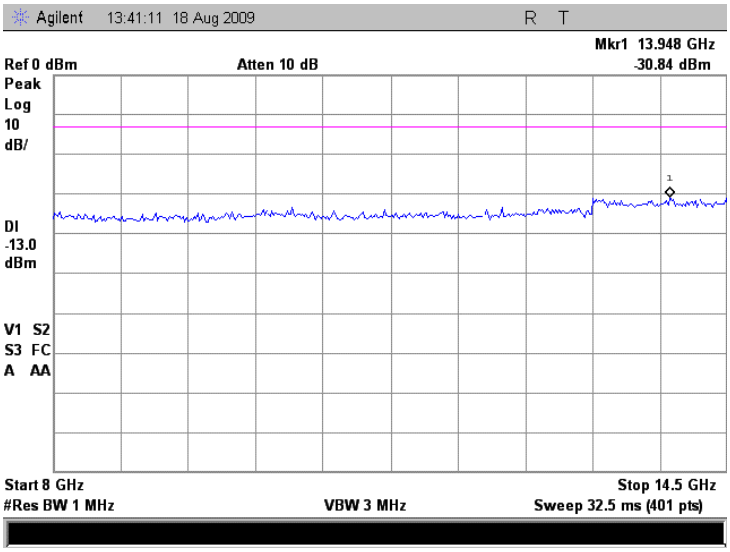
Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.45 Spurious emission measurements in 1447 - 8000 MHz at high carrier frequency, 1.5 MHz EBW

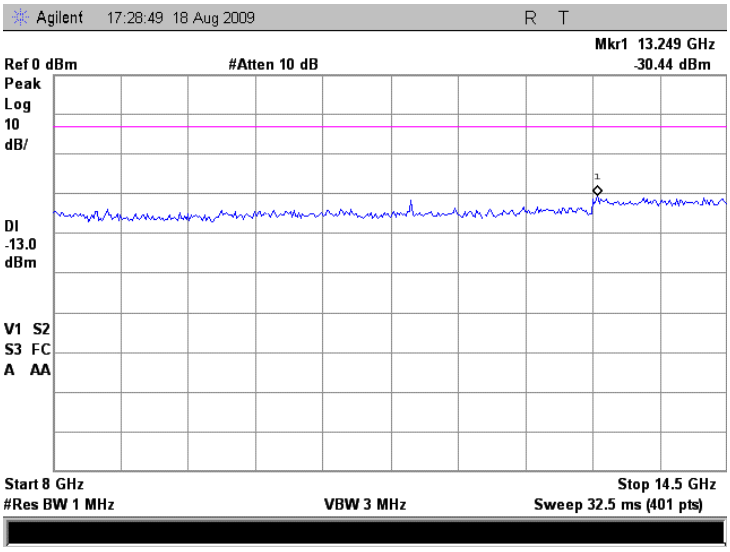


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.46 Spurious emission measurements in 8000 - 14500 MHz at low carrier frequency

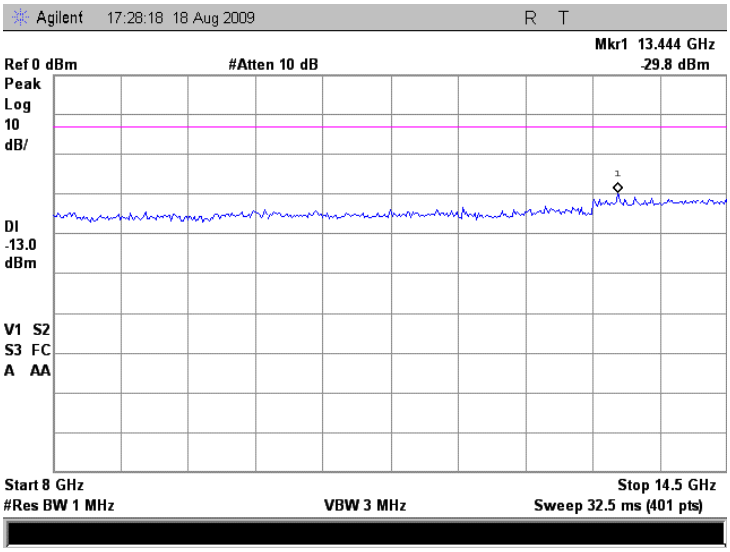


Plot 7.4.47 Spurious emission measurements in 8000 - 14500 MHz at mid carrier frequency



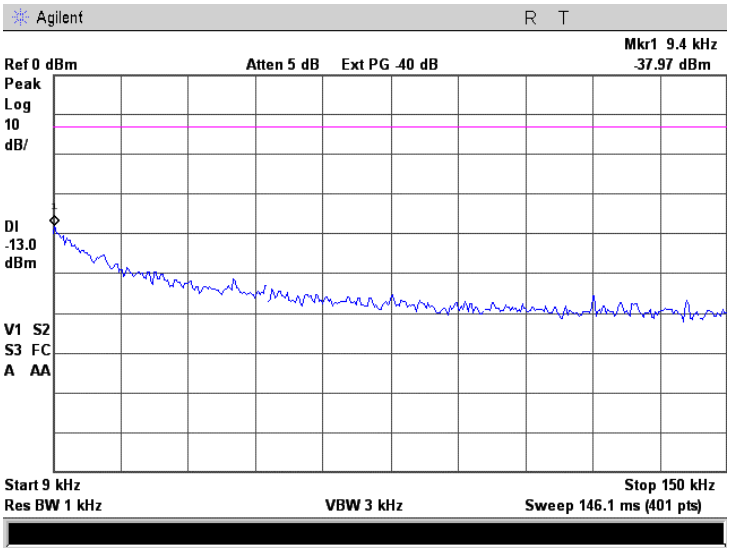
Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.48 Spurious emission measurements in 8000 - 14500 MHz at high carrier frequency, 1.5 MHz EBW

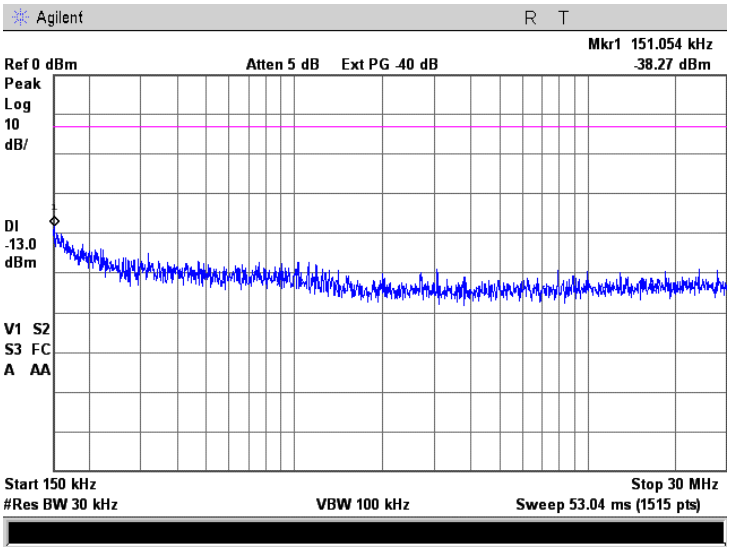


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.49 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency, 1.75 MHz EBW

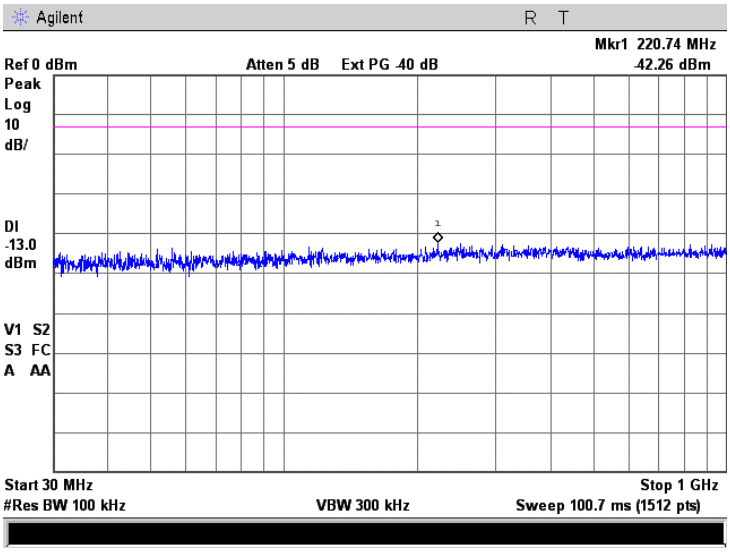


Plot 7.4.50 Spurious emission measurements in 0.15 - 30.0 MHz range at high carrier frequency, 1.75 MHz EBW

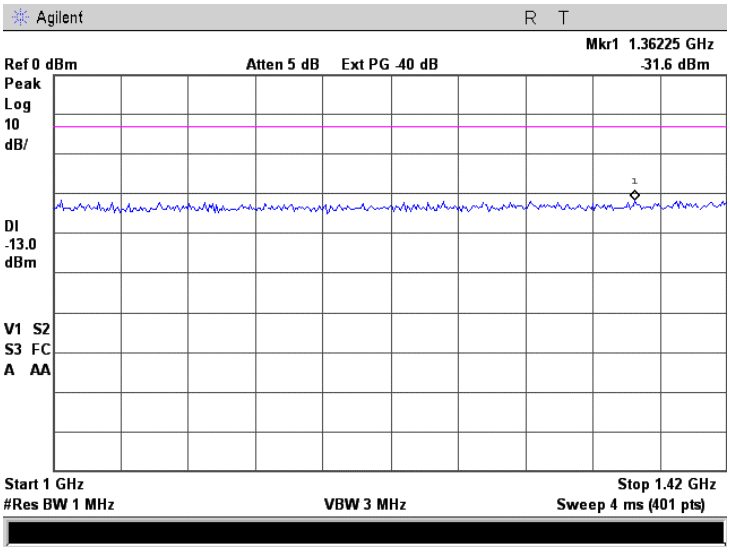


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.51 Spurious emission measurements in 30.0 - 1000 MHz range at high carrier frequency, 1.75 MHz EBW

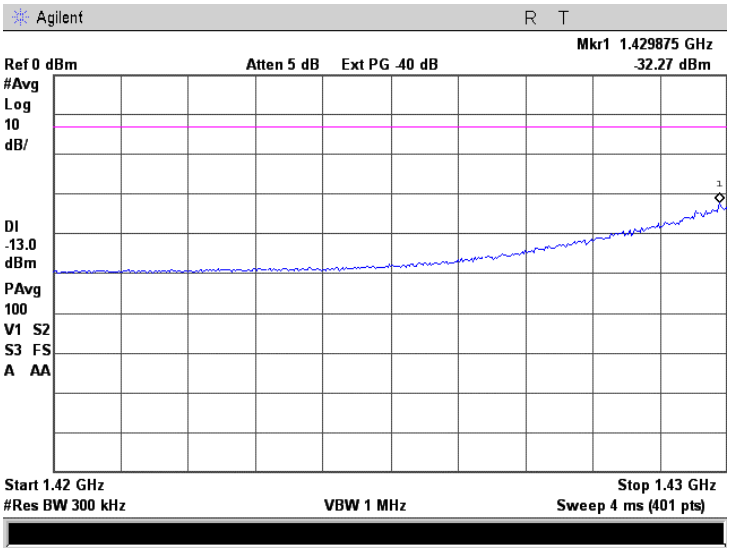


Plot 7.4.52 Spurious emission measurements in 1000 – 1420.0 MHz range at high carrier frequency, 1.75 MHz EBW

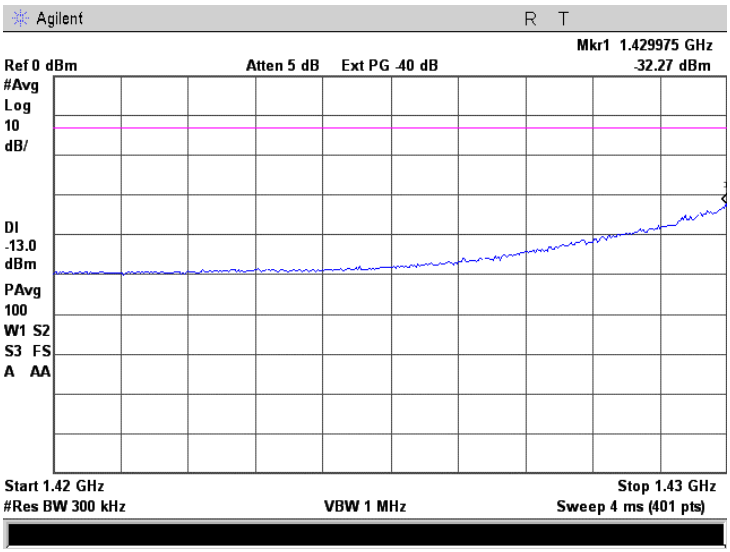


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.53 Spurious emission measurements in 1420 - 1430 MHz range, 2.5 MHz EBW, BPSK

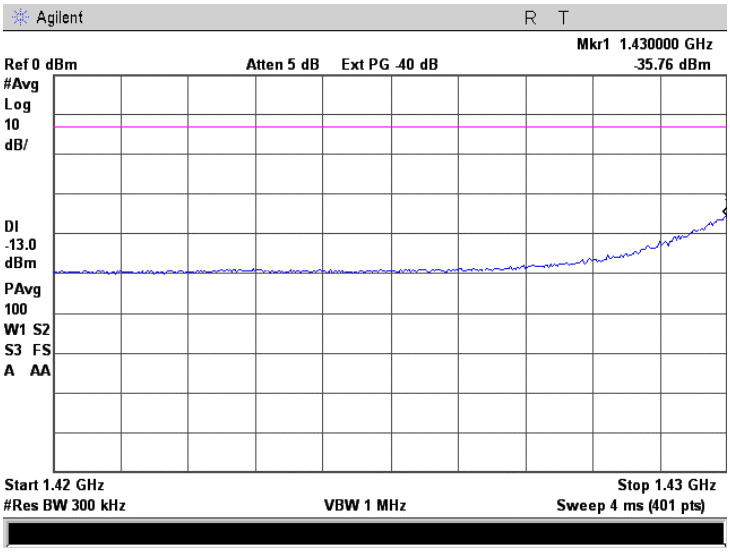


Plot 7.4.54 Spurious emission measurements in 1420 - 1430 MHz range, 2.5 MHz EBW, 64QAM



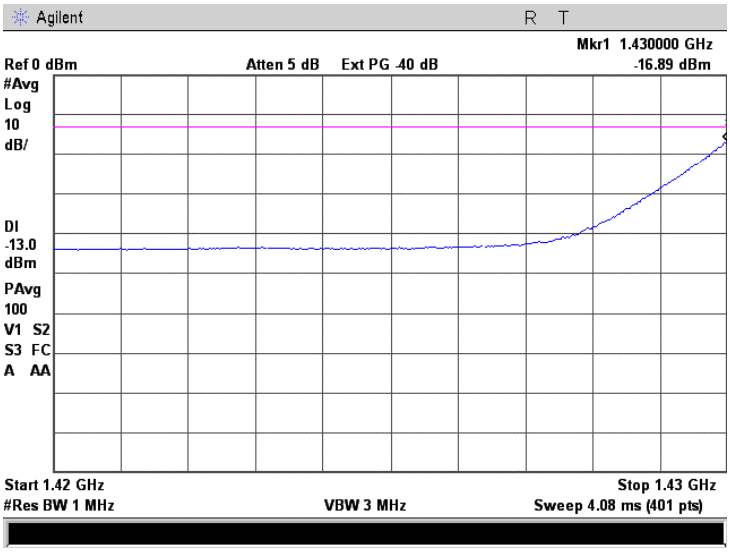
Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.55 Spurious emission measurements in 1420 - 1430 MHz range, 1.75 MHz EBW, BPSK

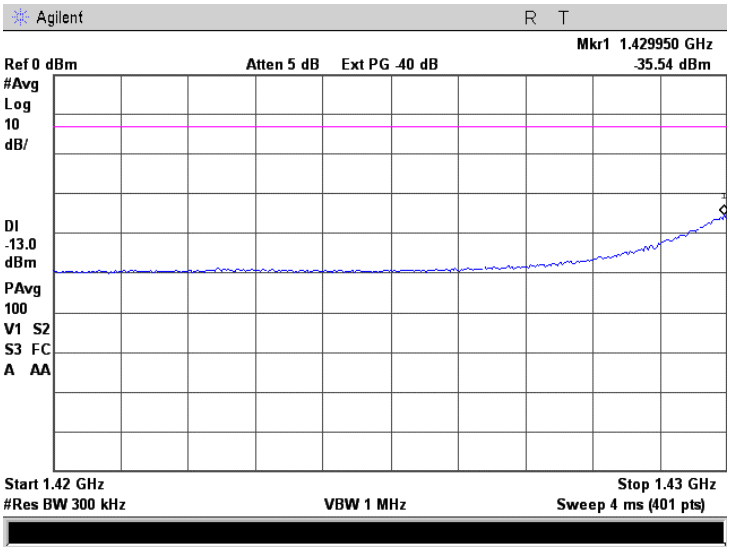


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.56 Spurious emission measurements in 1420 - 1430 MHz range, 1.75 MHz EBW, 64QAM, RBW=1000 kHz

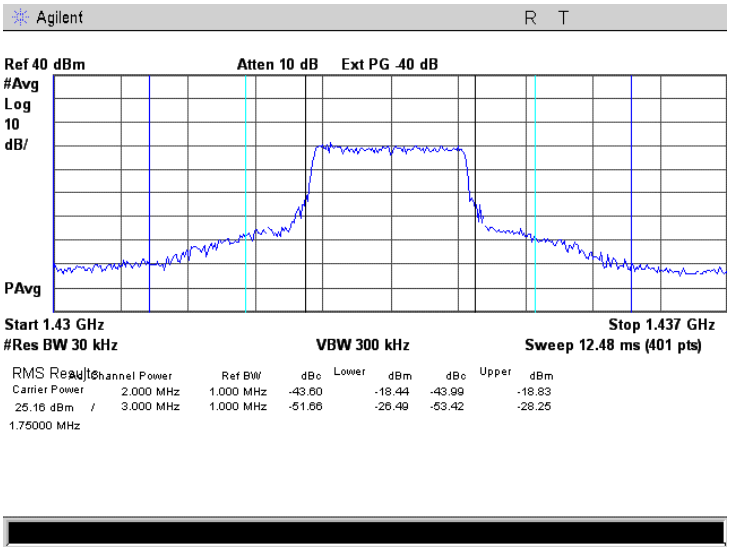


Plot 7.4.57 Spurious emission measurements in 1420 - 1430 MHz range, 1.75 MHz EBW, 64QAM, RBW=300 kHz

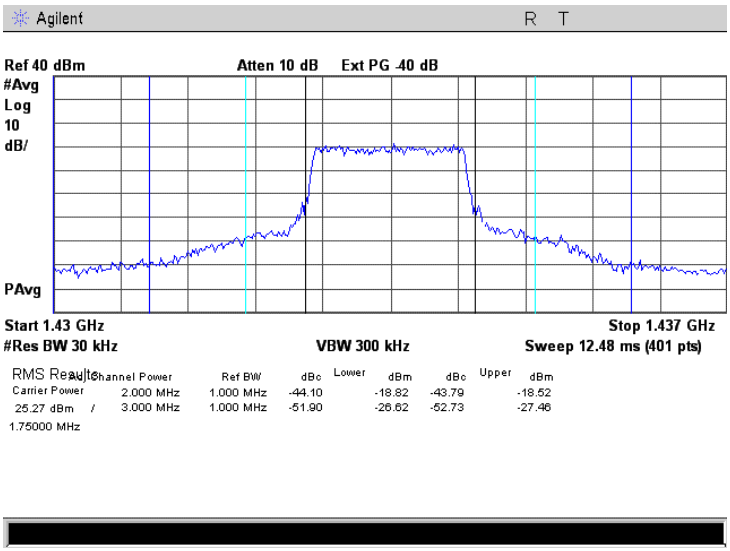


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.58 Band Edge Spurious emission measurements in 1430 – 1431, 1431 – 1432, 1435 – 1436, 1436 – 1437 MHz range, 1.75 MHz EBW, BPSK

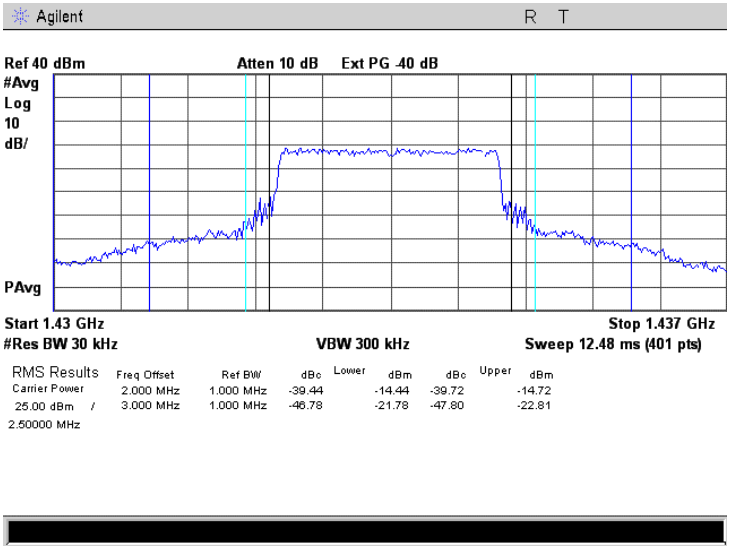


Plot 7.4.59 Band edge spurious emission measurements in 1430 – 1431, 1431 – 1432, 1435 – 1436, 1436 – 1437 MHz range, 1.75 MHz EBW, 64QAM

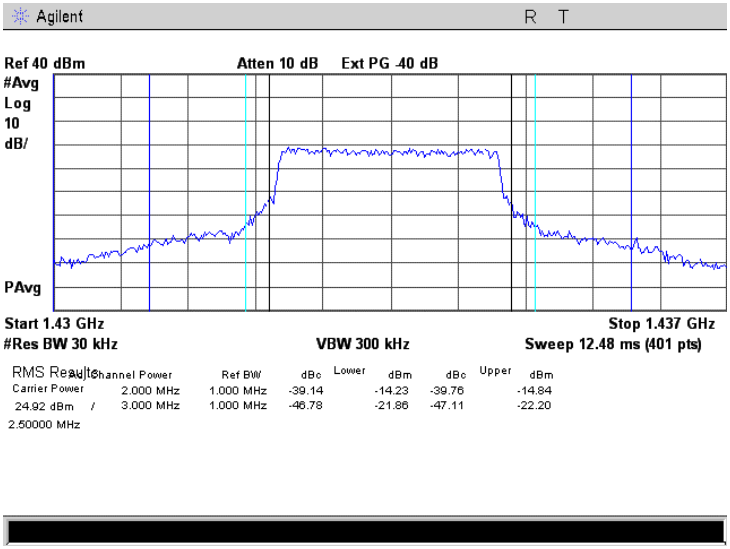


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.60 Band Edge Spurious emission measurements in 1430 – 1431, 1431 – 1432, 1435 – 1436, 1436 – 1437 MHz range, 2.5 MHz EBW, BPSK

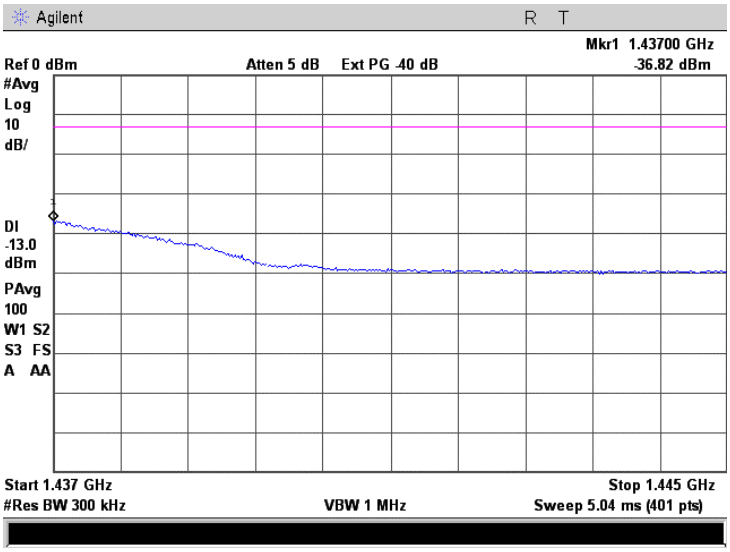


Plot 7.4.61 Band Edge Spurious emission measurements in 1430 – 1431, 1431 – 1432, 1435 – 1436, 1436 – 1437 MHz range, 2.5 MHz EBW, 64QAM



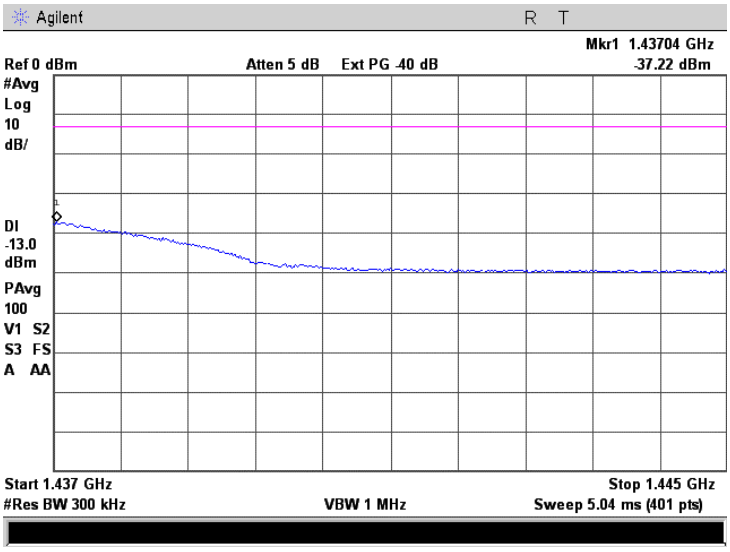
Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.62 Spurious emission measurements in 1437 - 1445 MHz range, 1.75 MHz EBW, BPSK, RBW=300 kHz

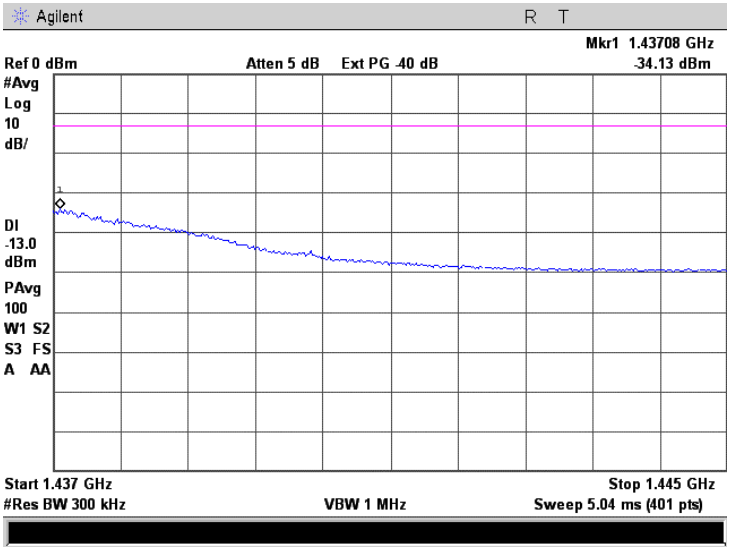


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.63 Spurious emission measurements in 1437 - 1445 MHz range, 1.75 MHz EBW, 64QAM

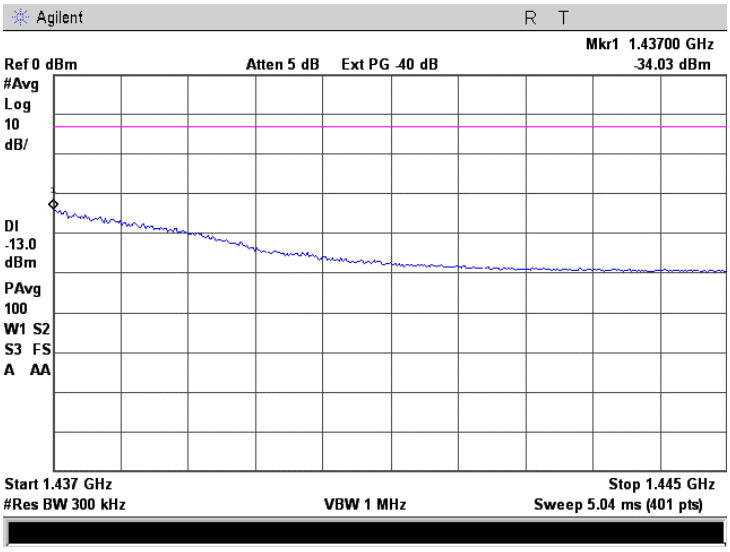


Plot 7.4.64 Spurious emission measurements in 1437 - 1445 MHz range, 2.5 MHz EBW, BPSK

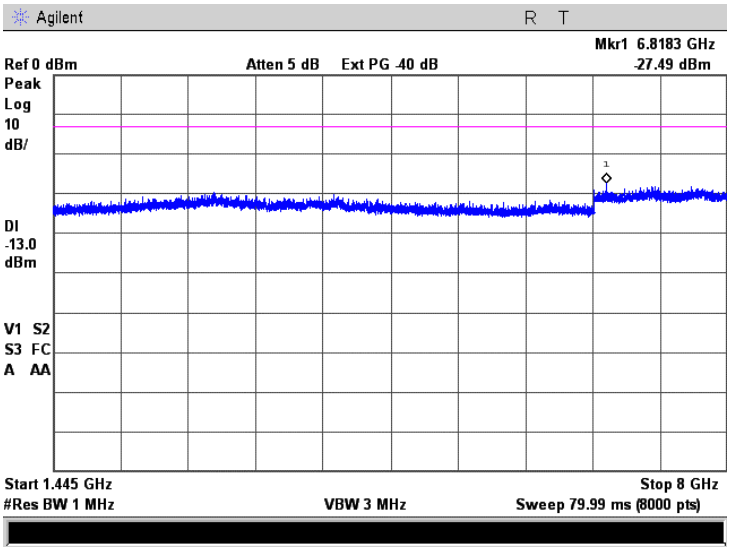


Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.65 Spurious emission measurements in 1437 - 1445 MHz range, 2.5 MHz EBW, 64QAM

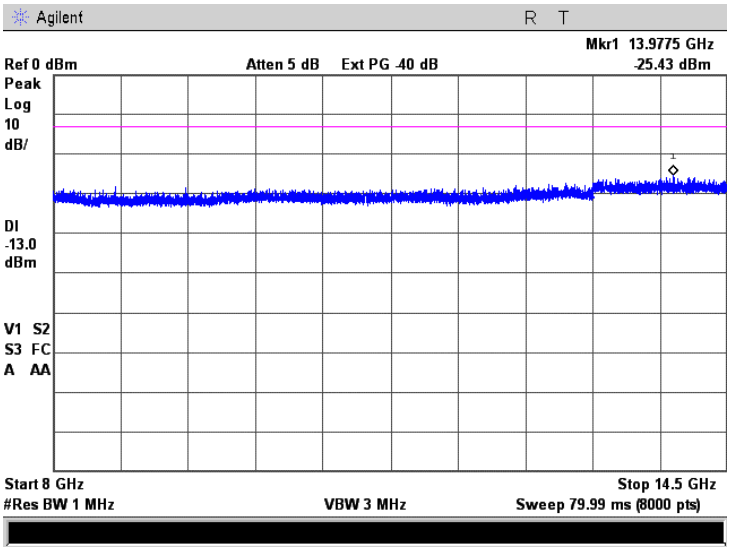


Plot 7.4.66 Spurious emission measurements in 1445 - 8000 MHz range at high carrier frequency, 1.75 MHz EBW



Test specification:	Section 27.53(j), Conducted spurious emissions		
Test procedure:	47 CFR, Sections 2.1051; TIA/EIA-603-C, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/31/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Plot 7.4.67 Spurious emission measurements in 8000 - 14500 MHz range at high carrier frequency, 1.75 MHz EBW



Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

7.5 Frequency stability test

7.5.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement Hz
1390.0 – 1392.0 1392.0 – 1395.0 1432.0 – 1435.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation

7.5.2 Test procedure

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

7.5.2.2 The EUT 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.

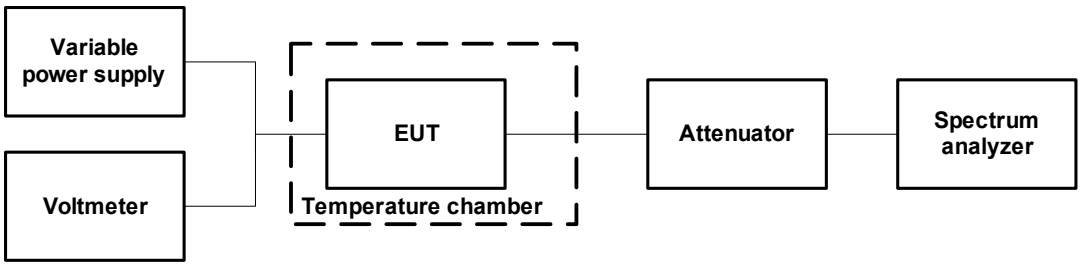
7.5.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

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

7.5.2.5 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.

7.5.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.5.2, Table 7.5.3, Table 7.5.4 and Table 7.5.5.

Figure 7.5.1 Frequency stability test setup



Test specification:	**Section 27.54, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	**Air Pressure:** 1019 hPa	**Relative Humidity:** 43%	**Power Supply:** 120 V AC
Remarks:			

Table 7.5.2 Frequency stability test results

OPERATING FREQUENCY:	1390.0 – 1392.0 MHz
	1392.0 – 1395.0 MHz
NOMINAL POWER VOLTAGE:	120 V
TEMPERATURE STABILIZATION PERIOD:	20 min
POWER DURING TEMPERATURE TRANSITION:	Off
SPECTRUM ANALYZER MODE:	Peak Hold
RESOLUTION BANDWIDTH:	100 Hz
VIDEO BANDWIDTH:	100 Hz
MODULATION:	Unmodulated

·, 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
Carrier frequency 1391.0 MHz										
-30	nominal	1390.995848	1390.995924	1390.995980	1390.996020	1390.996044	1390.996064	1390.996116	36	-232
-20	nominal	1390.996240	NA	NA	NA	NA	NA	1390.996128	160	0
-10	nominal	1390.996320	NA	NA	NA	NA	NA	1390.996304	240	0
0	nominal	1390.996304	1390.996260	1390.996232	1390.996200	1390.996184	1390.996160	1390.996092	224	0
10	nominal	1390.996108	NA	NA	NA	NA	NA	1390.995992	28	-88
20	+15%	1390.996083	NA	NA	NA	NA	NA	1390.996044	3	-36
20	nominal	1390.996242	NA	NA	NA	NA	NA	1390.996080*	162	0
20	-15%	1390.996044	NA	NA	NA	NA	NA	1390.995996	0	-84
30	nominal	1390.995752	1390.995740	1390.995724	1390.995716	1390.995708	1390.995704	1390.995676	0	-404
40	nominal	1390.995464	NA	NA	NA	NA	NA	1390.995428	0	-652
50	nominal	1390.994900	NA	NA	NA	NA	NA	1390.994896	0	-1184
Carrier frequency 1393.5 MHz										
-30	nominal	1393.496128	1393.496128	1393.496132	1393.496136	1393.496140	1393.496140	1393.496140	299	0
-20	nominal	1393.496120	NA	NA	NA	NA	NA	1393.496116	279	0
-10	nominal	1393.496324	NA	NA	NA	NA	NA	1393.496316	483	0
0	nominal	1393.496072	1393.496060	1393.496056	1393.496052	1393.496040	1393.496036	1393.496012	231	0
10	nominal	1393.495972	NA	NA	NA	NA	NA	1393.495920	131	0
20	+15%	1393.495841	NA	NA	NA	NA	NA	1393.495804	0	-37
20	nominal	1393.495960	NA	NA	NA	NA	NA	1393.495841*	119	0
20	-15%	1393.495804	NA	NA	NA	NA	NA	1393.495762	0	-79
30	nominal	1393.495664	1393.495660	1393.495660	1393.495660	1393.495652	1393.495652	1393.495644	0	-197
40	nominal	1393.495580	NA	NA	NA	NA	NA	1393.495456	0	-385
50	nominal	1393.494892	NA	NA	NA	NA	NA	1393.494928	0	-949

* - Reference frequency

Test specification:	**Section 27.54, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	**Air Pressure:** 1019 hPa	**Relative Humidity:** 43%	**Power Supply:** 120 V AC
Remarks:			

Table 7.5.3 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
Carrier frequency 1391.0 MHz 1.5 MHz EBW								
BPSK								
1390.225	1391.735	1390.223816	1391.735240	1390.0	1392.0	0.223816	-0.264760	Pass
64QAM								
1390.245	1391.735	1390.243816	1391.735240	1392.0	1395.0	0.223816	-0.264760	Pass
Carrier frequency 1393.5 MHz 1.5 MHz EBW								
BPSK								
1392.760	1394.210	1392.759051	1394.210483	1390.0	1392.0	0.759051	-0.789517	Pass
64QAM								
1392.770	1394.225	1392.769051	1394.225483	1392.0	1395.0	0.769051	-0.774517	Pass
Carrier frequency 1393.5 MHz 1.75 MHz EBW								
BPSK								
1392.685	1394.325	1392.684051	1394.325483	1390.0	1392.0	0.684051	-0.674517	Pass
64QAM								
1392.675	1394.325	1392.674051	1394.325483	1392.0	1395.0	0.674051	-0.674517	Pass
Carrier frequency 1393.5 MHz 2.5 MHz EBW								
BPSK								
1392.315	1394.670	1392.314051	1394.670483	1390.0	1392.0	0.314051	-0.329517	Pass
64QAM								
1392.315	1394.670	1392.314051	1394.670483	1392.0	1395.0	0.314051	-0.329517	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 1459	HL 3004	HL 3179	HL				

Full description is given in Appendix A.

Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-C Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date:	2/16/2009, 8/24/2009		
Temperature: 23ºC	Air Pressure: 1019 hPa	Relative Humidity: 43%	Power Supply: 120 V AC
Remarks:			

Table 7.5.4 Frequency stability test results

OPERATING FREQUENCY: 1432.0 – 1435.0 MHz
NOMINAL POWER VOLTAGE: 120 VAC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Peak Hold
RESOLUTION BANDWIDTH: 10 Hz
VIDEO BANDWIDTH: 30 Hz

T, ºC	Voltage, V	Frequency, MHz							lax frequency drift, H	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	›ositiv‹	Negative
Carrier frequency 1433.50 MHz										
-30	nominal	1433.499171	1433.499126	1433.499098	1433.499004	1433.498987	1433.498972	1433.498963	**1114.00**	0.00
-20	nominal	1433.499030	NA	NA	NA	NA	NA	1433.499012	973.00	0.00
-10	nominal	1433.499155	NA	NA	NA	NA	NA	1433.498905	1098.00	0.00
0	nominal	1433.498087	1433.498062	1433.498052	1433.498043	1433.498051	1433.498052	1433.498063	30.00	-14.00
10	nominal	1433.498025	NA	NA	NA	NA	NA	1433.497915	0.00	**-142.00**
20	15%	1433.498053	NA	NA	NA	NA	NA	1433.498069	12.00	-4.00
20	nominal	1433.498000	NA	NA	NA	NA	NA	1433.498057*	0.00	-57.00
20	-15%	1433.498066	NA	NA	NA	NA	NA	1433.498062	9.00	0.00
30	nominal	1433.498600	1433.498067	1433.498071	1433.498070	1433.498066	1433.498063	1433.498063	543.00	0.00
40	nominal	1433.498000	NA	NA	NA	NA	NA	1433.498133	76.00	-57.00
50	nominal	1433.498012	1433.498027	1433.498058	1433.498112	1433.498127	1433.498131	1433.498215	158.00	-45.00

* - Reference frequency

Table 7.5.5 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
Carrier frequency 1433.50 MHz, 2.5 MHz EBW								
BPSK								
1432.31	1434.71	1432.31	1434.711	1432	1435	-0.309858	-0.288886	Pass
64QAM								
1432.26	1434.73	1432.26	1434.731	1432	1435	-0.259858	-0.268886	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 1194	HL 2867	HL 2909	HL 3210				

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-09	29-Jun-10
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	27-Aug-09	27-Aug-10
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-09	11-Jan-10
0661	Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm	HP	83640B	3614A002 66	17-Sep-08	17-Sep-09
1194	Variac, 220 V/ 2.5 A	Matsunaga	NA	2962	01-Jan-09	01-Jan-10
1459	Cable, 1 m, N/N-type	Harbour Industries	MIL 17/60-RG142	1459	01-Sep-09	01-Sep-10
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	23-Jan-09	23-Jan-10
2387	Filter Bandpass, 8-14 GHz	Hermon Laboratories	FBP8-14	2387	05-Jun-07	05-Oct-09
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	23-Jan-09	23-Jan-10
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY451024 6	05-Jul-09	05-Jul-10
2785	Signal generator, 50 MHz to 26 GHz, pulse modulation	Giga-tronics	1026-01	284007	23-Feb-09	23-Feb-10
2867	Cable, 18 GHz, 0.9 m, SMA - SMA, Right Angle	Gore	NA	91P72076	04-Feb-09	04-Feb-10
2883	Cable, 18 GHz N-type, M-F, 3 m	Bird	TC-MNFN-3.0	211539 003	07-Dec-08	07-Dec-09
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	07-May-09	07-May-10
3004	Analyzer, Spectrum, 9.0 kHz - 2.2 GHz	Anritsu	MS2601A	MT09861	27-Mar-09	27-Mar-10
3121	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3121	07-Dec-08	07-Dec-09
3122	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3122	01-Jan-09	01-Jan-10
3123	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3123	01-Jan-09	01-Jan-10
3179	Attenuator, N-type, 20 dB, DC to 18 GHz, 5 W	Mini-Circuits	BW-N20W5+	NA	07-May-09	07-May-10
3207	Cable 40 GHz, 1.2 m	Gore	GOR245	05118337	11-Jun-09	11-Jun-10
3210	Temperature Chamber, (-50…+100) °C	Associated	NA	NA	11-Sep-08	11-Sep-09
3234	Signal generator, 9 kHz - 3.3 GHz	Rohde & Schwarz	SML03	103387	19-Jul-09	19-Jul-10
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY451010 57	03-Dec-08	03-Dec-09
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY452405 86	05-Dec-08	05-Dec-09
3342	High Pass Filter, 50 Ohm, 2000 to 5200 MHz	Mini-Circuits	VHF-1910+	NA	29-Oct-08	29-Oct-09
3344	High Pass Filter, 50 Ohm, 3400 to 9900 MHz	Mini-Circuits	VHF-3100+	NA	29-Oct-08	29-Oct-09
3435	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	08-Mar-09	08-Mar-10
3437	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	08-Mar-09	08-Mar-10

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
3439	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	08-Mar-09	08-Mar-10
3442	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	08-Mar-09	08-Mar-10
3531	Amplifier, low noise, 2 to 8 GHz	Quinstar Technology	QLJ-02084040-J0	11159002002	07-Dec-08	07-Dec-09
3532	Amplifier, low noise, 2 to 8 GHz	Quinstar Technology	QLJ-02084040-J0	11159002001	23-Nov-08	23-Nov-09
3533	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040-J0	11159001001	07-Dec-08	07-Dec-09
3534	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040-J0	11159001002	07-Dec-08	07-Dec-09
3616	Cable RF, 6.5 m, N type-N type, DC-6.5 GHz	Suhner Switzerland	Rg 214/U	NA	07-Dec-08	07-Dec-09
3632	Cable RF, 5.4 m, N type-N type, DC-6.5 GHz	Alpha Wire	RG 214/U	NA	17-Dec-08	17-Dec-09

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 and IC 2186A-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01).

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11 APPENDIX D Specification references

FCC 47CFR part 27: 2008	Miscellaneous wireless communications services
FCC 47CFR part 1: 2008	Practice and procedure
FCC 47CFR part 2: 2008	Frequency allocations and radio treaty matters; general rules and regulations
FCC 47CFR part 15: 2008	Radio Frequency Devices
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2005	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
ANSI/TIA/EIA-603-C:2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

12 APPENDIX E Test equipment correction factors

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

Frequency, MHz	Magnetic Antenna Factor, dB(S/m)	Electric Antenna Factor, dB(1/m)
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.7
0.750	-41.9	9.6
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.1
4.000	-41.4	10.1
5.000	-41.5	10.0
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

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

Antenna factor

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

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

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

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

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

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

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

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

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

Cable loss
Cable coaxial, Gore, 18 GHz, 0.9 m, SMA - SMA, model Right Angle, S/N 91P72076
HL 2867

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	5750	0.68	12000	1.06
30	0.04	6000	0.69	12250	1.07
100	0.07	6250	0.70	12500	1.09
250	0.14	6500	0.73	12750	1.09
500	0.19	6750	0.74	13000	1.15
750	0.22	7000	0.78	13250	1.17
1000	0.26	7250	0.77	13500	1.16
1250	0.27	7500	0.79	13750	1.17
1500	0.31	7750	0.81	14000	1.14
1750	0.35	8000	0.86	14250	1.13
2000	0.38	8250	0.86	14500	1.06
2250	0.41	8500	0.87	14750	1.12
2500	0.43	8750	0.87	15000	1.16
2750	0.46	9000	0.88	15250	1.11
3000	0.48	9250	0.89	15500	1.06
3250	0.51	9500	0.90	15750	1.12
3500	0.53	9750	0.94	16000	1.20
3750	0.55	10000	1.00	16250	1.25
4000	0.56	10250	1.01	16500	1.24
4250	0.58	10500	1.02	16750	1.34
4500	0.60	10750	1.01	17000	1.35
4750	0.62	11000	1.01	17250	1.35
5000	0.64	11250	1.01	17500	1.36
5250	0.67	11500	1.01	17750	1.40
5500	0.68	11750	1.05	18000	1.51

Cable loss
Cable coaxial, Bird, 18 GHz, N-type, M-F, model TC-MNFN-3.0, S/N 211539 003
HL 2883

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.06	5750	1.70	12000	2.46
30	0.12	6000	1.75	12250	2.48
100	0.21	6250	1.80	12500	2.52
250	0.34	6500	1.81	12750	2.50
500	0.47	6750	1.86	13000	2.54
750	0.59	7000	1.86	13250	2.48
1000	0.67	7250	1.92	13500	2.63
1250	0.76	7500	1.96	13750	2.65
1500	0.84	7750	1.98	14000	2.72
1750	0.92	8000	2.02	14250	2.67
2000	0.98	8250	2.03	14500	2.70
2250	1.05	8500	2.05	14750	2.72
2500	1.12	8750	2.11	15000	2.79
2750	1.17	9000	2.17	15250	2.80
3000	1.22	9250	2.17	15500	2.83
3250	1.27	9500	2.20	15750	2.75
3500	1.33	9750	2.19	16000	2.82
3750	1.38	10000	2.22	16250	2.85
4000	1.42	10250	2.25	16500	2.90
4250	1.46	10500	2.30	16750	2.89
4500	1.51	10750	2.28	17000	2.88
4750	1.54	11000	2.32	17250	2.85
5000	1.59	11250	2.34	17500	2.96
5250	1.62	11500	2.39	17750	3.04
5500	1.65	11750	2.42	18000	3.04

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3121

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	0.08	3600	2.10	7400	3.08	11200	3.85	15100	4.58
30	0.18	3700	2.14	7500	3.11	11300	3.85	15200	4.60
50	0.26	3800	2.18	7600	3.14	11400	3.86	15300	4.63
100	0.34	3900	2.19	7700	3.16	11500	3.86	15400	4.65
200	0.47	4000	2.25	7800	3.18	11600	3.87	15500	4.71
300	0.59	4100	2.25	7900	3.20	11700	3.85	15600	4.70
400	0.66	4200	2.28	8000	3.22	11800	3.96	15700	4.69
500	0.75	4300	2.35	8100	3.26	11900	3.92	15800	4.71
600	0.83	4400	2.35	8200	3.27	12000	3.92	15900	4.74
700	0.90	4500	2.38	8300	3.29	12100	3.94	16000	4.69
800	0.96	4600	2.43	8400	3.30	12200	3.94	16100	4.72
900	1.02	4700	2.43	8500	3.31	12300	3.99	16200	4.71
1000	1.07	4800	2.45	8600	3.33	12400	4.02	16300	4.74
1100	1.12	4900	2.48	8700	3.35	12500	4.10	16400	4.74
1200	1.15	5000	2.55	8800	3.36	12600	4.09	16500	4.75
1300	1.22	5100	2.54	8900	3.38	12700	4.15	16600	4.78
1400	1.28	5200	2.56	9000	3.40	12800	4.15	16700	4.86
1500	1.29	5300	2.58	9100	3.41	12900	4.08	16800	4.84
1600	1.36	5400	2.61	9200	3.45	13000	4.21	16900	4.83
1700	1.40	5500	2.64	9300	3.48	13100	4.19	17000	4.86
1800	1.45	5600	2.69	9400	3.52	13200	4.29	17100	4.83
1900	1.51	5700	2.67	9500	3.54	13300	4.24	17200	4.90
2000	1.50	5800	2.71	9600	3.59	13400	4.26	17300	4.91
2100	1.56	5900	2.73	9700	3.59	13500	4.26	17400	4.94
2200	1.59	6000	2.75	9800	3.62	13600	4.29	17500	4.93
2300	1.63	6100	2.81	9900	3.70	13700	4.35	17600	4.93
2400	1.73	6200	2.80	10000	3.70	13800	4.31	17700	5.00
2500	1.73	6300	2.82	10100	3.72	13900	4.29	17800	5.01
2600	1.78	6400	2.85	10200	3.73	14000	4.32	17900	5.00
2700	1.84	6500	2.87	10300	3.75	14100	4.33	18000	5.00
2800	1.84	6600	2.90	10400	3.76	14200	4.34		
2900	1.91	6700	2.91	10500	3.77	14300	4.36		
3000	1.91	6800	2.94	10600	3.79	14400	4.38		
3100	1.97	6900	2.96	10700	3.80	14600	4.42		
3200	1.98	7000	2.98	10800	3.81	14700	4.42		
3300	2.04	7100	3.01	10900	3.81	14800	4.55		
3400	2.04	7200	3.02	11000	3.83	14900	4.55		
3500	2.10	7300	3.04	11100	3.84	15000	4.55		

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3122

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	0.11	3600	2.08	7400	3.07	11200	3.92	15100	4.61
30	0.17	3700	2.12	7500	3.09	11300	3.95	15200	4.58
50	0.23	3800	2.15	7600	3.14	11400	3.93	15300	4.62
100	0.32	3900	2.18	7700	3.15	11500	3.93	15400	4.62
200	0.47	4000	2.21	7800	3.19	11600	3.94	15500	4.65
300	0.58	4100	2.24	7900	3.22	11700	3.97	15600	4.66
400	0.66	4200	2.27	8000	3.20	11800	3.98	15700	4.66
500	0.74	4300	2.31	8100	3.21	11900	4.08	15800	4.72
600	0.81	4400	2.31	8200	3.24	12000	4.03	15900	4.78
700	0.88	4500	2.36	8300	3.27	12100	4.06	16000	4.89
800	0.95	4600	2.37	8400	3.32	12200	4.05	16100	4.95
900	1.00	4700	2.40	8500	3.35	12300	4.16	16200	4.92
1000	1.06	4800	2.43	8600	3.35	12400	4.18	16300	4.95
1100	1.11	4900	2.45	8700	3.33	12500	4.20	16400	5.02
1200	1.16	5000	2.50	8800	3.37	12600	4.22	16500	5.04
1300	1.21	5100	2.51	8900	3.39	12700	4.23	16600	5.06
1400	1.26	5200	2.55	9000	3.45	12800	4.28	16700	5.17
1500	1.31	5300	2.56	9100	3.46	12900	4.26	16800	5.16
1600	1.35	5400	2.59	9200	3.47	13000	4.28	16900	5.19
1700	1.39	5500	2.62	9300	3.46	13100	4.28	17000	5.23
1800	1.44	5600	2.65	9400	3.50	13200	4.28	17100	5.30
1900	1.47	5700	2.67	9500	3.50	13300	4.29	17200	5.26
2000	1.52	5800	2.71	9600	3.53	13400	4.34	17300	5.30
2100	1.55	5900	2.72	9700	3.52	13500	4.31	17400	5.30
2200	1.60	6000	2.73	9800	3.54	13600	4.35	17500	5.36
2300	1.63	6100	2.76	9900	3.56	13700	4.36	17600	5.40
2400	1.67	6200	2.78	10000	3.57	13800	4.37	17700	5.47
2500	1.70	6300	2.81	10100	3.60	13900	4.41	17800	5.56
2600	1.74	6400	2.85	10200	3.69	14000	4.42	17900	5.45
2700	1.78	6500	2.87	10300	3.69	14100	4.45	18000	5.47
2800	1.83	6600	2.87	10400	3.67	14200	4.49		
2900	1.85	6700	2.90	10500	3.70	14300	4.55		
3000	1.89	6800	2.91	10600	3.70	14400	4.62		
3100	1.92	6900	2.96	10700	3.76	14600	4.54		
3200	1.96	7000	2.99	10800	3.88	14700	4.58		
3300	1.99	7100	3.01	10900	3.88	14800	4.57		
3400	2.03	7200	3.04	11000	3.85	14900	4.65		
3500	2.06	7300	3.08	11100	3.85	15000	4.64		

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3123

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	0.11	3600	1.97	7400	3.12	11200	3.90	15100	4.74
30	0.17	3700	1.97	7500	3.13	11300	3.93	15200	4.70
50	0.25	3800	2.03	7600	3.16	11400	3.88	15300	4.73
100	0.32	3900	2.04	7700	3.18	11500	3.87	15400	4.78
200	0.46	4000	2.10	7800	3.20	11600	3.90	15500	4.75
300	0.58	4100	1.97	7900	3.23	11700	3.86	15600	4.76
400	0.65	4200	1.97	8000	3.25	11800	3.88	15700	4.75
500	0.74	4300	2.03	8100	3.26	11900	3.86	15800	4.78
600	0.82	4400	2.04	8200	3.28	12000	3.89	15900	4.79
700	0.89	4500	2.10	8300	3.31	12100	3.94	16000	4.73
800	0.95	4600	1.97	8400	3.31	12200	3.92	16100	4.78
900	1.01	4700	1.97	8500	3.32	12300	3.96	16200	4.84
1000	1.07	4800	2.03	8600	3.34	12400	4.01	16300	4.90
1100	1.11	4900	2.04	8700	3.35	12500	4.07	16400	4.87
1200	1.17	5000	2.10	8800	3.37	12600	4.08	16500	4.90
1300	1.22	5100	2.53	8900	3.39	12700	4.17	16600	4.98
1400	1.27	5200	2.55	9000	3.42	12800	4.26	16700	5.05
1500	1.29	5300	2.60	9100	3.43	12900	4.16	16800	5.04
1600	1.35	5400	2.61	9200	3.51	13000	4.21	16900	5.02
1700	1.40	5500	2.64	9300	3.52	13100	4.24	17000	5.09
1800	1.44	5600	2.70	9400	3.54	13200	4.27	17100	5.07
1900	1.51	5700	2.67	9500	3.63	13300	4.31	17200	5.10
2000	1.49	5800	2.71	9600	3.61	13400	4.33	17300	5.13
2100	1.55	5900	2.74	9700	3.71	13500	4.25	17400	5.23
2200	1.58	6000	2.80	9800	3.66	13600	4.27	17500	5.21
2300	1.62	6100	2.79	9900	3.77	13700	4.33	17600	5.22
2400	1.72	6200	2.81	10000	3.75	13800	4.33	17700	5.36
2500	1.76	6300	2.83	10100	3.77	13900	4.31	17800	5.35
2600	1.78	6400	2.86	10200	3.80	14000	4.30	17900	5.45
2700	1.80	6500	2.88	10300	3.79	14100	4.30	18000	5.43
2800	1.86	6600	2.90	10400	3.87	14200	4.31		
2900	1.90	6700	2.92	10500	3.83	14300	4.37		
3000	1.90	6800	2.98	10600	3.88	14400	4.35		
3100	1.97	6900	2.98	10700	3.86	14600	4.53		
3200	1.97	7000	3.00	10800	3.87	14700	4.50		
3300	2.03	7100	3.02	10900	3.90	14800	4.62		
3400	2.04	7200	3.04	11000	3.84	14900	4.65		
3500	2.10	7300	3.06	11100	3.88	15000	4.79		

Cable loss
Cable coaxial, GORE-TEX, GOR245, 40 GHz, 1.2 m, SMA-SMA, S/N 05118337
HL 3207

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	0.17	5000	1.54	10200	2.26	15500	2.77	31500	4.07
30	0.14	5100	1.54	10300	2.26	15600	2.78	32000	4.03
50	0.16	5200	1.56	10400	2.24	15700	2.81	32500	3.93
100	0.22	5300	1.59	10500	2.23	15800	2.81	33000	4.00
200	0.30	5400	1.60	10600	2.25	15900	2.84	33500	4.09
300	0.38	5500	1.61	10700	2.31	16000	2.91	34000	4.08
400	0.44	5600	1.63	10800	2.34	16100	2.92	34500	4.13
500	0.48	5700	1.66	10900	2.38	16200	2.88	35000	4.15
600	0.54	5800	1.68	11000	2.38	16300	2.90	35500	4.18
700	0.58	5900	1.68	11100	2.38	16400	2.93	36000	4.22
800	0.62	6000	1.71	11200	2.37	16500	2.92	36500	4.25
900	0.65	6100	1.71	11300	2.38	16600	2.97	37000	4.26
1000	0.69	6200	1.73	11400	2.40	16700	3.02	37500	4.40
1100	0.73	6300	1.75	11500	2.41	16800	3.02	38000	4.40
1200	0.76	6400	1.76	11600	2.44	16900	3.01	38500	4.52
1300	0.78	6500	1.78	11700	2.44	17000	3.04	39000	4.54
1400	0.81	6600	1.77	11800	2.44	17100	3.08	39500	4.36
1500	0.85	6700	1.79	11900	2.45	17200	3.05	40000	4.48
1600	0.87	6800	1.80	12000	2.46	17300	3.06		
1700	0.90	6900	1.83	12100	2.45	17400	3.06		
1800	0.93	7000	1.84	12200	2.45	17500	3.07		
1900	0.96	7100	1.86	12300	2.48	17600	3.08		
2000	0.95	7200	1.88	12400	2.49	17700	3.09		
2100	0.98	7300	1.86	12500	2.51	17800	3.12		
2200	1.00	7400	1.87	12600	2.53	17900	3.09		
2300	1.02	7500	1.90	12700	2.51	18000	3.08		
2400	1.04	7600	1.91	12800	2.52	18500	3.11		
2500	1.06	7700	1.95	12900	2.54	19000	3.14		
2600	1.08	7800	1.98	13000	2.56	19500	3.20		
2700	1.11	7900	1.99	13100	2.56	20000	3.24		
2800	1.14	8000	1.98	13200	2.59	20500	3.31		
2900	1.15	8100	1.98	13300	2.59	21000	3.38		
3000	1.17	8200	2.00	13400	2.60	21500	3.44		
3100	1.19	8300	2.01	13500	2.65	22000	3.45		
3200	1.20	8400	2.05	13600	2.71	22500	3.45		
3300	1.24	8500	2.07	13700	2.71	23000	3.47		
3400	1.26	8600	2.08	13800	2.69	23500	3.47		
3500	1.27	8700	2.09	13900	2.67	24000	3.54		
3600	1.28	8800	2.09	14000	2.68	24500	3.62		
3700	1.32	8900	2.10	14100	2.68	25000	3.73		
3800	1.32	9000	2.12	14200	2.74	25500	3.77		
3900	1.35	9100	2.12	14300	2.77	26000	3.71		
4000	1.36	9200	2.15	14400	2.80	26500	3.73		
4100	1.39	9300	2.13	14600	2.74	27000	3.73		
4200	1.40	9400	2.16	14700	2.73	27500	3.78		
4300	1.41	9500	2.17	14800	2.75	28000	3.81		
4400	1.43	9600	2.17	14900	2.75	28500	3.81		
4500	1.47	9700	2.18	15000	2.77	29000	3.80		
4600	1.46	9800	2.16	15100	2.76	29500	3.81		
4700	1.49	9900	2.17	15200	2.76	30000	3.89		
4800	1.50	10000	2.20	15300	2.77	30500	4.03		
4900	1.52	10100	2.22	15400	2.79	31000	4.01		

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

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

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
CBW	channel bandwidth
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
dBΩ	decibel referred to one Ohm
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
NT	not tested
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

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