HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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TEST REPORT

ACCORDING TO: FCC CFR 47 PART 90 subpart Z and RSS-197 Issue 1:2010

FOR:

Telrad Networks Ltd.
BreezeCOMPACT base station
Model: CMP.XT-BS-3.X
FCC ID:ARA-COMPACT3X
IC:899A-COMPACT3X

Table of contents

1 Applicant information

Client name:	Telrad Networks Ltd.
Address:	1 Bat Sheva street, P.O.B. 6118, Lod 711600, Israel
Telephone:	972 732 467 651
Fax:	972 8913 3164
E-mail:	Klara.Milman@telrad.com
Contact name:	Ms. Klara Milman

2 Equipment under test attributes

Product name:	BreezeCOMPACT base station
Product type:	Transceiver
Brand:	BreezeCOMPACT
Model(s):	CMP.XT-BS-3.X
Serial number:	95006908
Hardware version:	1
Software release:	06.00.00626
Receipt date	26-Jan-15

3 Manufacturer information

Manufacturer name:	Telrad Networks Ltd.
Address:	1 Bat Sheva street, P.O.B. 6118, Lod 711600, Israel
Telephone:	972 732 467 651
Fax:	972 8913 3164
E-Mail:	Klara.Milman@telrad.com
Contact name:	Ms. Klara Milman

4 Test details

Project ID:	26610
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	26-Jan-15
Test completed:	27-Jan-15
Test specification(s):	47CFR part 90 subpart Z; RSS-197 issue 1:2010

5 Tests summary

Test	Status
Transmitter characteristics	
FCC Section 90.1321 / RSS-197, Section 5.6, Maximum conducted output power	Pass
FCC Section 90.1321 / RSS-197, Section 5.6, Peak EIRP power density	Pass
FCC Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth	Pass
FCC Section 90.210(b), Emission mask	Pass
FCC Section 90.1323 / RSS-197, Section 5.7, Spurious emissions at RF antenna connector	Not required
FCC Section 90.1323 / RSS-197, Section 5.7, Radiated spurious emissions	Not required
FCC Section 90.213 / RSS-197, Section 5.7, Frequency stability	Pass
FCC Section 90.1335 / RSS-Gen, Section 5.5, RF exposure	Pass, Exhibit attached to Application for certification
Receiver characteristics	
RSS-197, Section 5.8, Receiver spurious emissions	Not required

The product was approved by FCC under FCC ID:ARA-COMPACT3X and by Industry Canada under IC:899A-COMPACT3X for operation in 3652.5 – 3697.5 MHz band with 5 MHz, 7 MHz and 10 MHz channel bandwidth. The relevant tests to support 20 MHz channel bandwidth in 3660 – 3690 MHz band were performed to support Application for Class II permissive changes certification.
The bandwidth change is software controlled, no hardware change has been made.

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

	Name and Title	Date	Signature
Tested by:	Mrs. E. Pitt, test engineer	March 12, 2015	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	March 16, 2015	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	March 16, 2015	

6 EUT description

6.1 General information

The EUT, base station, is a part of BreezeCOMPACT Broadband Wireless Access system. The product is based on WiMAX technology TDD system covering 3400 MHz up to 3700 MHz range. The system contains an all outdor base station unit. The ODU consists of four identical RF radio paths based on two identical RF IC chipsets, all paths terminated with antenna ports. The detailed EUT description provided in the exhibit “Operational description” attached to application for certification, the calculation for maximum power limit provided in Table 6.6.2.

6.2 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length, m
Power	DC power	EUT	DC power supply	1	Unshielded	3
Signal	Ethernet	EUT	Cisco AUX	1	Shielded	1.5
Signal	Ethernet	EUT	PCB AUX	1	Shielded	1.5
Signal	GPS OUT	EUT	GPS	1	Shielded	3
RF	Antenna	EUT	Splitter	4	Coax	1.5
GND	GND	EUT	GND	1	Unshielded	1.5

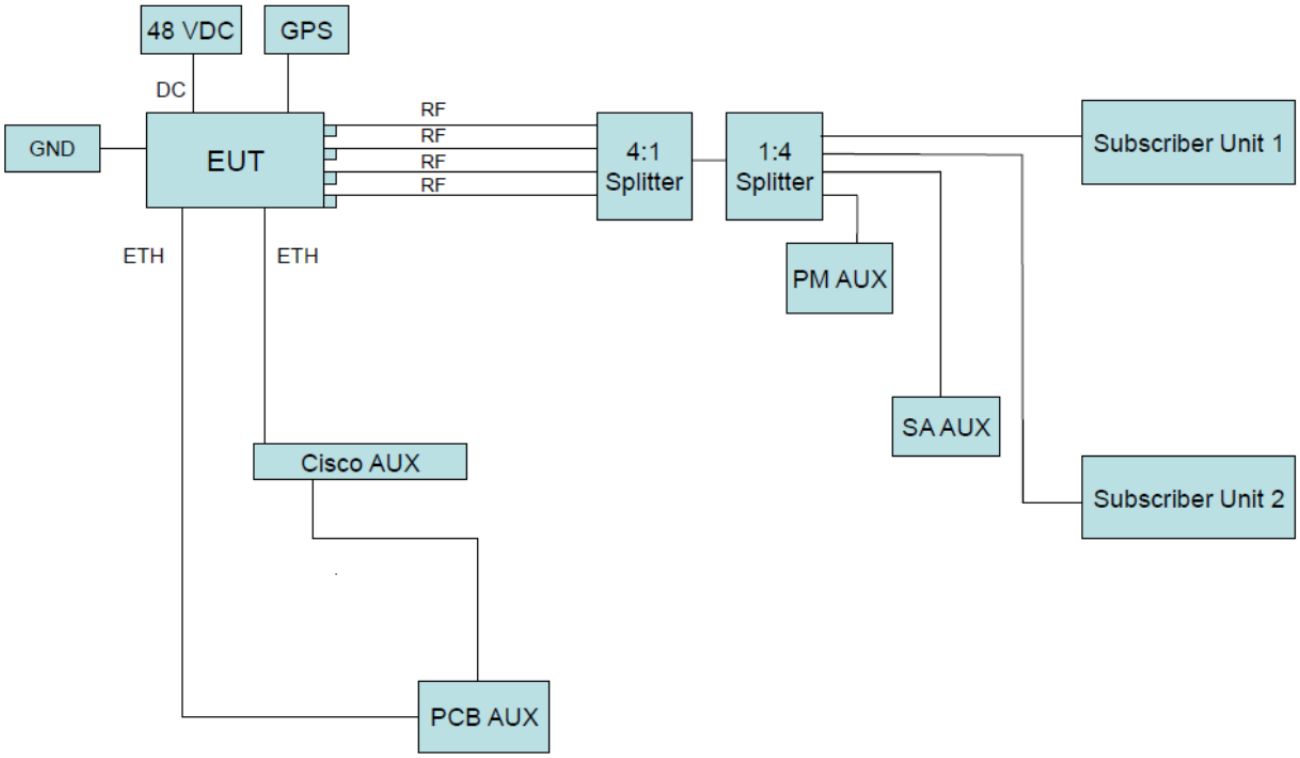
6.3 Auxiliary equipment

Description	Manufacturer	Model number	Serial number
Subscriber unit x 2	Telrad	4M-CPE6000-PRO-1D-1V-3.X	NA
DC power suply	Horizon	DHR3655D-10	773352
GPS	Alvarion	TA1556	NA
Splitter	Mini Circuits	ZN4PD1-50-S+	400914
Splitter	Mini Circuits	ZN4PD1-50-S+	800841
Cisco Hub (AUX)	Cisco	CNMZ210ARB	NA
PCB AUX (simulator)	Telrad	NA	NA
Power meter	Rohde&Schwarz	NRP-Z11	104297
Spectrum analyzer	Spirent communication	Smart Bits 2000	683831

6.4 Changes made in EUT

No changes were implemented in the EUT during testing.

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		3650 – 3700 MHz						
Operating frequency range		3660 – 3690 MHz						
RF channel spacing		20 MHz						
Maximum rated output power		EIRP, total:					39.1 dBm	
Is transmitter output power variable?			No					
		V	Yes		continuous variable			
				V	stepped variable with stepsize		1 dB	
				minimum RF power			17 dBm	
				maximum RF power, total			21.6 dBm	
Antenna connection								
unique coupling	**V**	standard connector	**V**	Integral	**V**	with temporary RF connector		
						without temporary RF connector		
Antenna/s technical characteristics								
Type		Manufacturer		Model number		Gain	Feeder loss	Assembly gain
External sector antenna		Alpha Wireless		AW3023-PT		18 dBi	0.5 dB	17.5 dBi
Transmitter 99% power bandwidth, MHz		20 MHz						
Type of modulation		QPSK1/2, QPSK3/4, 16QAM1/2,16QAM3/4, 64QAM5/6						
Modulating test signal (baseband)		PRBS						
Maximum transmitter duty cycle in normal use		60%						
Transmitter power source								
		Nominal rated voltage			Battery type			
V	DC	**Nominal rated voltage**	48 V					
	AC mains	**Nominal rated voltage**			Frequency			
Common power source for transmitter and receiver				**V**	yes		no	

Table 6.6.1 Type of modulation and bit rate

Modulation type	Bit rate, Mbps
	EBW=20 MHz
QPSK 1/2	7.3296
QPSK 3/4	9.504
QAM16 1/2	15.2736
QAM16 3/4	18.3456
QAM64 1/2	23.5392
QAM64 2/3	34.4016
QAM64 3/4	38.2656
QAM64 5/6	45.2256

Table 6.6.2 Table of calculations for the MAX power limits

Frequency channel, MHz			Type of modulation	CBW, MHz	Number of antennas	RF output power per antenna, dBm	Aggregate output power all antennas, dBm	Single antenna gain, dBi	Beam forming gain, dBi	Total* antenna gain, dBi	Total** EIRP, dBm
Low	Mid	High									
1 carrier 1 sector (4 ports: 2 dual slant antennas- no power aggregation, 2 antenna gains aggregation)											
3650	3675	3700	OFDMA	20	4	19.5	19.5	17.5	0	20.5	40
2 carrier 1sector- different frequencies (4 ports: 2 dual slant antennas- no power aggregation as 2 carriers occupy twice the BW, no antenna gains aggregation)											
3650	3675	3700	OFDMA	20	4	22.5	22.5	17.5	0	17.5	40 dBm per channel (43 dBm over the band)
2 carrier 2 sector – isolated sectors, therefore the carriers may use similar or different frequencies (4 ports: 2 sectors x 2 dual slant antenna, no carrier aggregation and no antenna gain aggregation)											
3650	3675	3700	OFDMA	20	2+2	22.5	22.5	17.5	0	17.5	40

* - Total antenna gain, dBi = Single antenna gain, dBi + 10 log (Number of antennas) + Beam forming gain, dBi

** - Total EIRP, dBm = RF output power per antenna, dBm + Single antenna gain, dBi + 10 log (Number of antennas) + Beam forming gain, dBi

Test specification:	Section 90.1321 / RSS-197, Section 5.6, Maximum conducted output power		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 90 and RSS-197 requirements

7.1 Maximum output power

7.1.1 General

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

Table 7.1.1 Maximum output power limits

Assigned frequency range, MHz	Occupied bandwidth, MHz	Maximum peak output power, EIRP	
		W	dBm
3650.0 – 3700.0	20	20	43

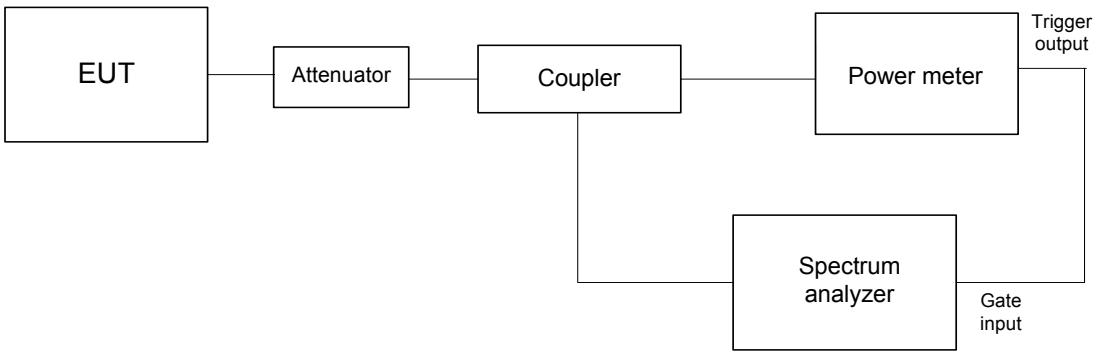
7.1.2 Test procedure

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 for 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 Transmitter output power test setup



Test specification:	**Section 90.1321 / RSS-197, Section 5.6, Maximum conducted output power**		
Test procedure:	47 CFR, Section 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	**Air Pressure:** 1020 hPa	**Relative Humidity:** 54 %	**Power Supply:** 48 VDC
Remarks:			

Table 7.1.2 Peak EIRP output power test results

ASSIGNED FREQUENCY RANGE: 3650.0 – 3700.0 MHz
DETECTOR USED: Average (Power Meter)
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
EBW: 20 MHz

Channel, MHz	Modulation	Pmeas, dBm	Loss,* dB	RF output power@con1**, dBm	Antenna assembly gain, dBi	EIRP***, dBm	Limit, dBm	Margin, dB	Verdict
3660	QPSK	-3.4	25	21.6	17.5	39.1	43	-3.9	Pass
3675	QPSK	-3.7	25	21.3	17.5	38.8	43	-4.2	
3690	QPSK	-3.6	25	21.4	17.5	38.9	43	-4.1	
3660	64QAM	-3.4	25	21.6	17.5	39.1	43	-3.9	Pass
3675	64QAM	-3.7	25	21.3	17.5	38.8	43	-4.2	
3690	64QAM	-3.6	25	21.4	17.5	38.9	43	-4.1	

Note 1: There are 4 completely independent RF chains, no aggregation of cross polarized antenna gains and no aggregation of sector antenna gains applies.
Note 2: In MIMO mode the maximum output power is reduced by 3 dB.
* - Loss, dB = loss from EUT antenna connector to power meter
** - RF output power@con1, dBm = Pmeas, dBm + Loss, dB
*** - EIRP, dBm = RF output power@con1, dBm + Antenna assembly gain, dBi

Reference numbers of test equipment used

HL 2013	HL 3301	HL 3302	HL 3764	HL 3818	HL 3903	HL 4274	HL 4366

Full description is given in Appendix A.

Test specification:	Section 90.1321 / RSS-197, Section 5.6, Peak EIRP power density		
Test procedure:	47 CFR, Sections 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

7.2 Peak EIRP power density

7.2.1 General

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

Table 7.2.1 Peak power density limits

Assigned frequency range, MHz	Occupied bandwidth, MHz	Maximum peak power spectral density, EIRP	
		W/MHz	dBm/MHz
3650.0 – 3700.0	20	1	30

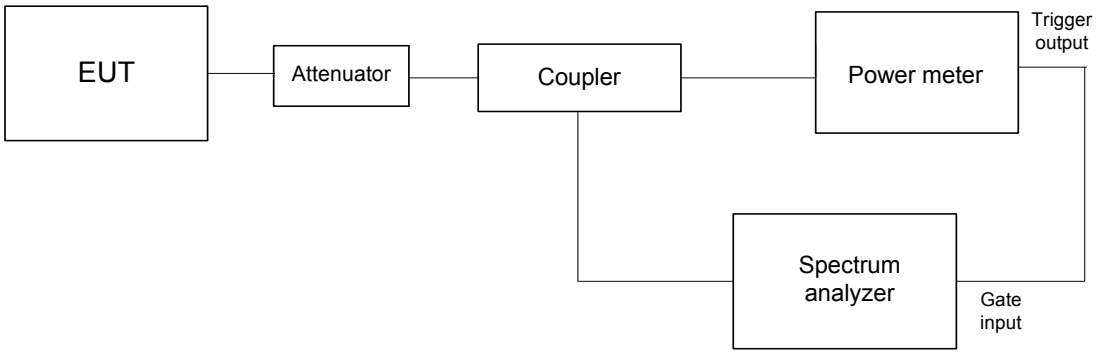
7.2.2 Test procedure

7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

7.2.2.2 The EUT was adjusted to produce maximum available for end user RF output power.

7.2.2.3 The peak output power density was measured with spectrum analyzer as provided in Table 7.2.2 and the associated plots.

Figure 7.2.1 Peak power density test setup



Test specification:	**Section 90.1321 / RSS-197, Section 5.6, Peak EIRP power density**		
Test procedure:	47 CFR, Sections 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	**Air Pressure:** 1020 hPa	**Relative Humidity:** 54 %	**Power Supply:** 48 VDC
Remarks:			

Table 7.2.2 Peak EIRP power density test results

OPERATING FREQUENCY RANGE: 3650.0 – 3700 MHz
DETECTOR USED: Average (RMS)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
EBW: **20 MHz**

Channel, MHz	Modulation	Power density, dBm/MHz	Antenna assembly gain, dBi	EIRP power density*, dBm/MHz	Limit, dBm/MHz	Margin, dB	Verdict
3660	QPSK	8.70	17.5	26.20	30	-3.80	Pass
3675	QPSK	8.39	17.5	25.89	30	-4.11	Pass
3690	QPSK	8.72	17.5	26.22	30	-3.78	Pass
3660	64QAM	8.70	17.5	26.20	30	-3.80	Pass
3675	64QAM	8.65	17.5	26.15	30	-3.85	Pass
3690	64QAM	8.70	17.5	26.20	30	-3.80	Pass

* - EIRP power density, dBm/MHz = Power density, dBm/MHz + Antenna assembly gain, dBi

Reference numbers of test equipment used

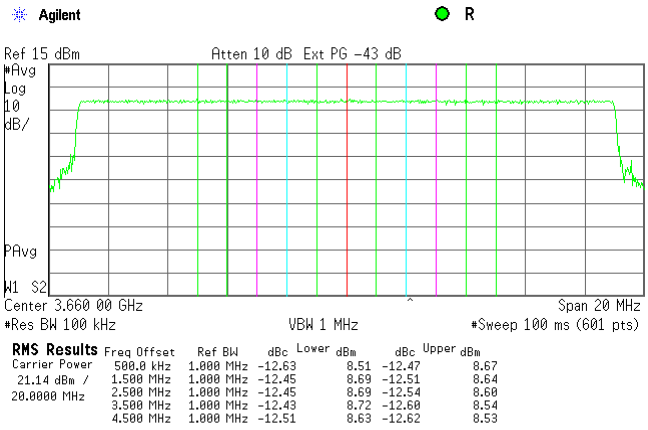
HL 1906	HL 3301	HL 3302	HL 3818	HL 3901	HL 4068	HL 4274	HL 4366

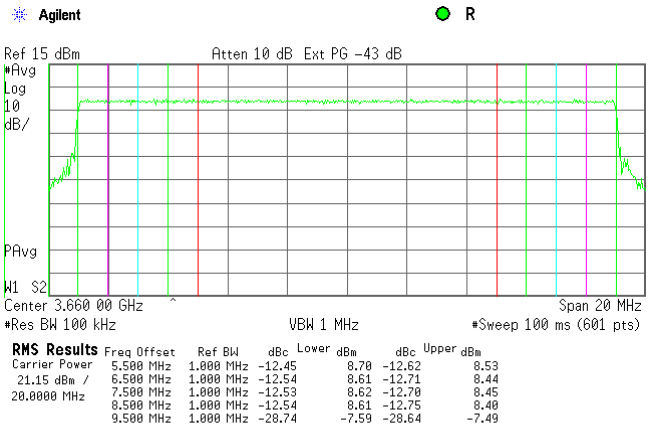
Full description is given in Appendix A.

Test specification:	Section 90.1321 / RSS-197, Section 5.6, Peak EIRP power density		
Test procedure:	47 CFR, Sections 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.2.1 Peak output power density test results at low frequency

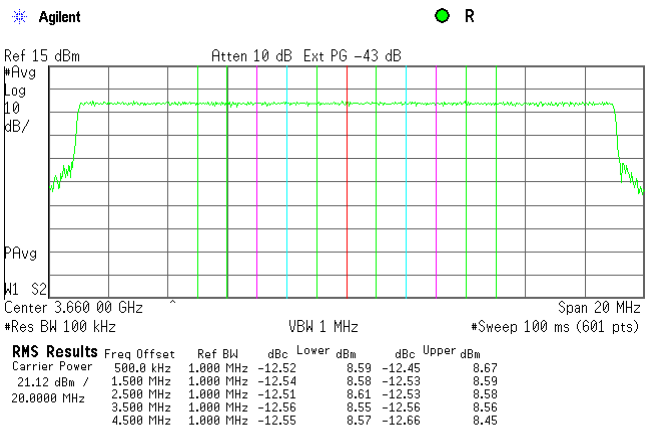
CARRIER FREQUENCY:	3660 MHz
EMISSION BANDWIDTH:	20 MHz
MODULATION	QPSK

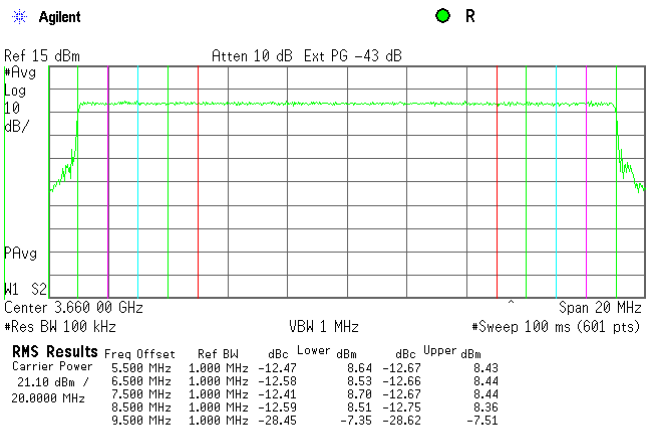




Plot 7.2.2 Peak output power density test results at low frequency

CARRIER FREQUENCY:	3660 MHz
EMISSION BANDWIDTH:	20 MHz
MODULATION	64QAM

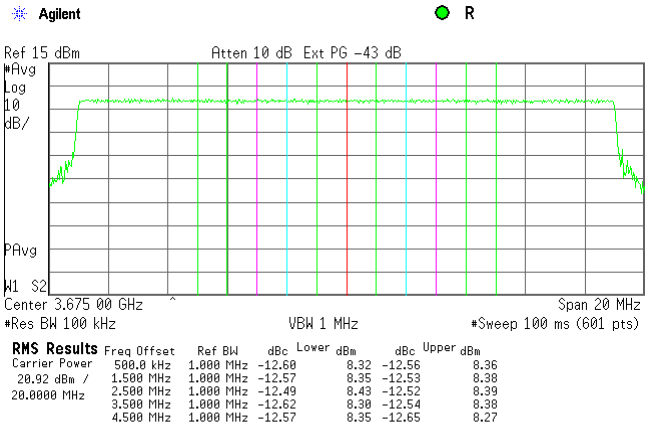


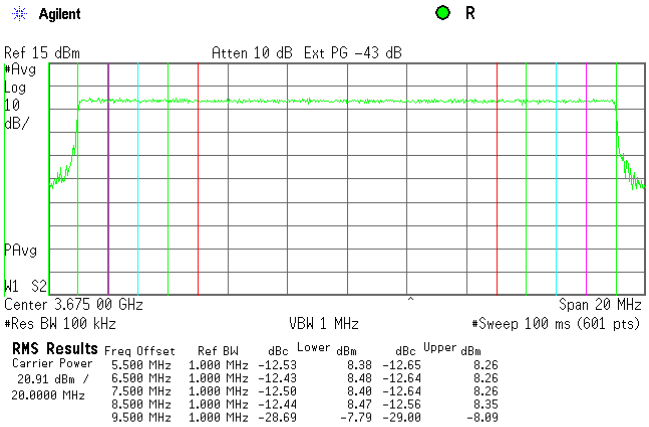


Test specification:	Section 90.1321 / RSS-197, Section 5.6, Peak EIRP power density		
Test procedure:	47 CFR, Sections 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.2.3 Peak output power density test results at mid frequency

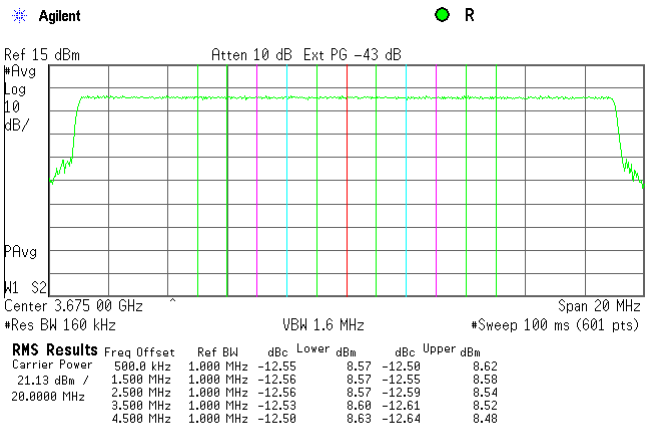
CARRIER FREQUENCY:	3675 MHz
EMISSION BANDWIDTH:	20 MHz
MODULATION	QPSK

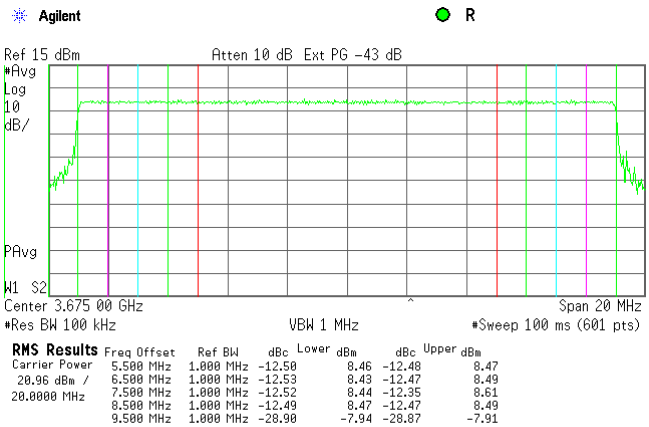




Plot 7.2.4 Peak output power density test results at mid frequency

CARRIER FREQUENCY:	3675 MHz
EMISSION BANDWIDTH:	20 MHz
MODULATION	64QAM

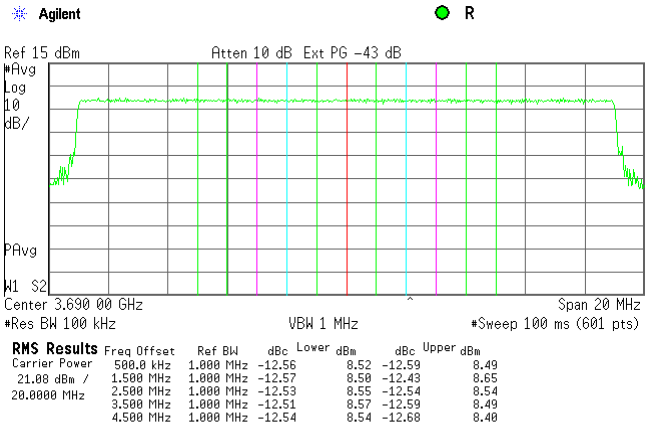


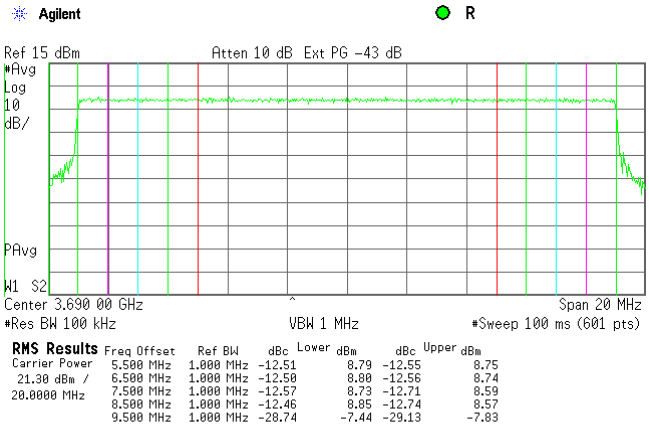


Test specification:	Section 90.1321 / RSS-197, Section 5.6, Peak EIRP power density		
Test procedure:	47 CFR, Sections 2.1046; TIA/EIA-603-D, Section 2.2.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.2.5 Peak output power density test results at high frequency

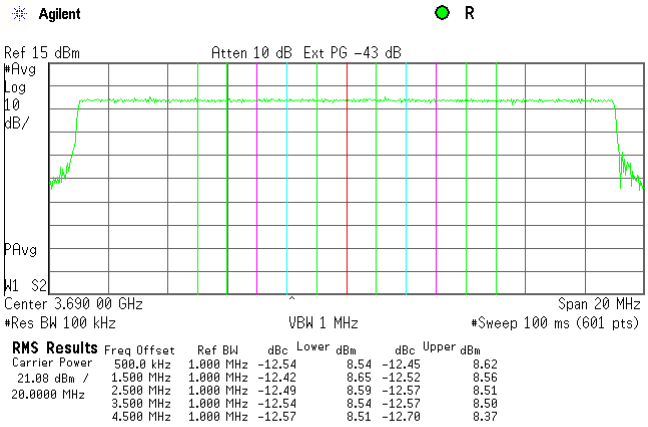
CARRIER FREQUENCY:	3690 MHz
EMISSION BANDWIDTH:	20 MHz
MODULATION:	QPSK

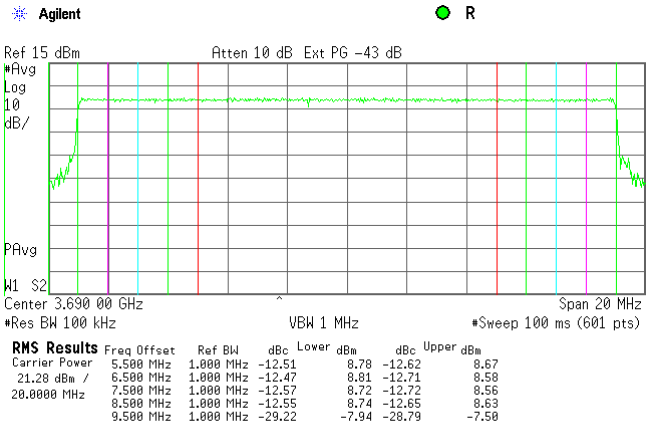




Plot 7.2.6 Peak output power density test results at high frequency

CARRIER FREQUENCY:	3690 MHz
EMISSION BANDWIDTH:	20 MHz
MODULATION:	64QAM





Test specification:	Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

7.3 Occupied bandwidth test

7.3.1 General

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

Table 7.3.1 Occupied bandwidth limits

FCC part 90

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Maximum allowed bandwidth, MHz
3650.0 – 3700.0	26	NA

* - Modulation envelope reference points are provided in terms of attenuation below the total average power.

RSS-197

Assigned frequency, MHz	Modulation envelope reference points	Maximum allowed bandwidth, MHz
3650.0 – 3700.0	99% EBW	NA

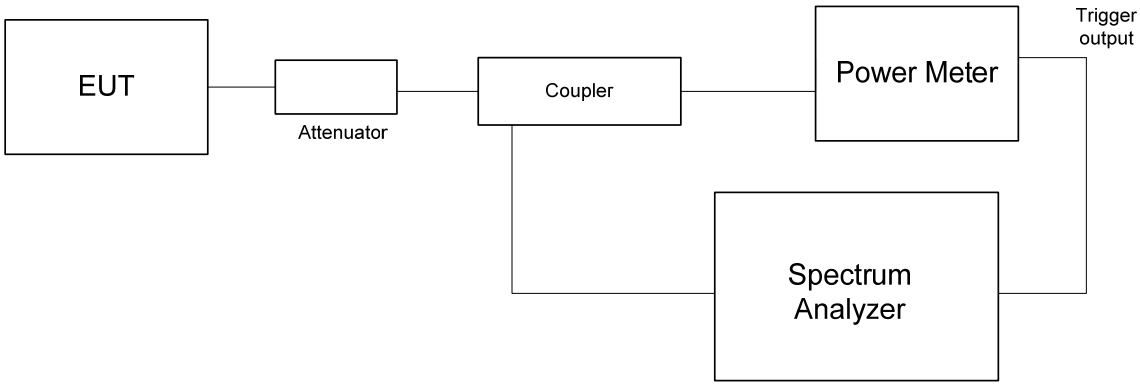
7.3.2 Test procedure

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.

7.3.2.2 The EUT was set to transmit the normally modulated carrier.

7.3.2.3 The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup



Test specification:	**Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth**		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	**Air Pressure:** 1020 hPa	**Relative Humidity:** 54 %	**Power Supply:** 48 VDC
Remarks:			

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Average
RESOLUTION BANDWIDTH: 1% of the Emission bandwidth
VIDEO BANDWIDTH: 3 times RBW
MODULATION ENVELOPE REFERENCE POINTS: 26 dB below total average power
MODULATING SIGNAL: PRBS
20 MHz

Carrier frequency, MHz	Modulation	99% Occupied bandwidth, MHz	Occupied bandwidth 26 dBc, MHz	Verdict
3660	QPSK	17.8566	18.748	Pass
3675	QPSK	17.8627	18.861	Pass
3690	QPSK	17.8568	18.820	Pass
3660	64QAM	17.8570	18.766	Pass
3675	64QAM	17.8619	18.807	Pass
3690	64QAM	17.8683	18.761	Pass

Reference numbers of test equipment used

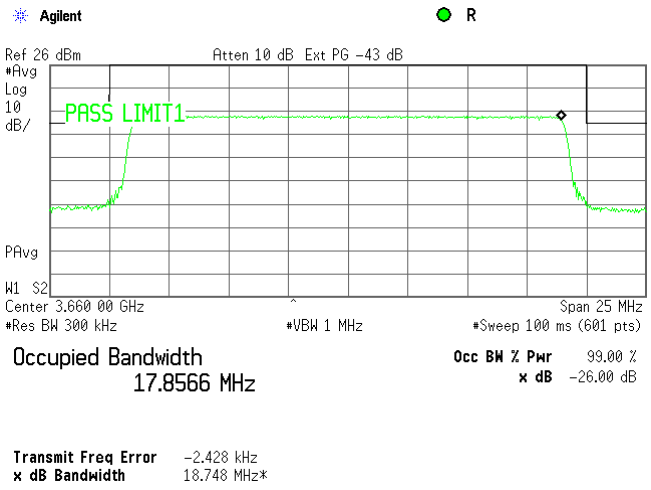
HL 1906	HL 3301	HL 3302	HL 3818	HL 3901	HL 4068	HL 4274	HL 4366

Full description is given in Appendix A.

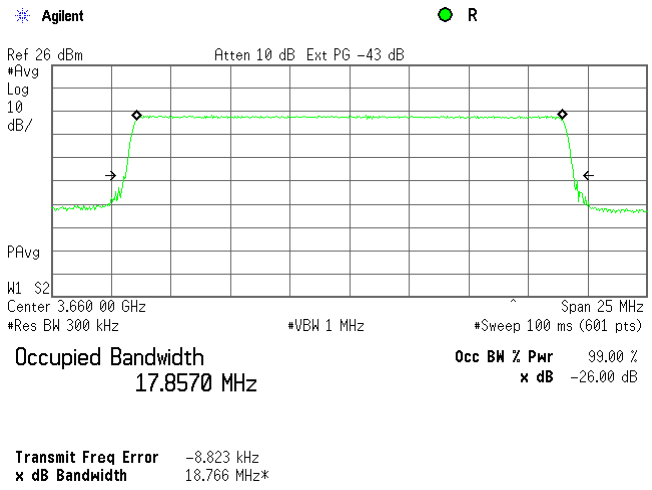
Test specification:	Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.3.1 Occupied bandwidth test result at low frequency

Modulation QPSK

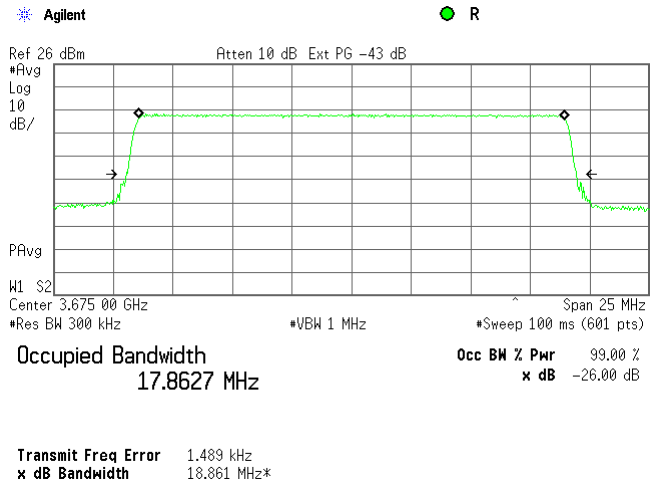


Modulation 64 QAM

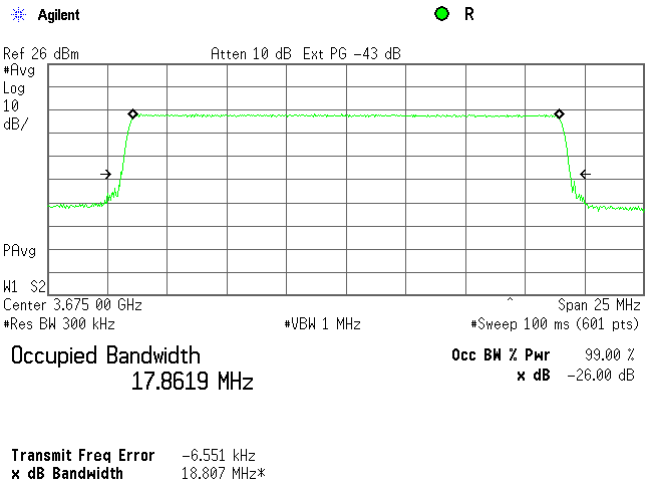


Plot 7.3.2 Occupied bandwidth test result at mid frequency

Modulation QPSK



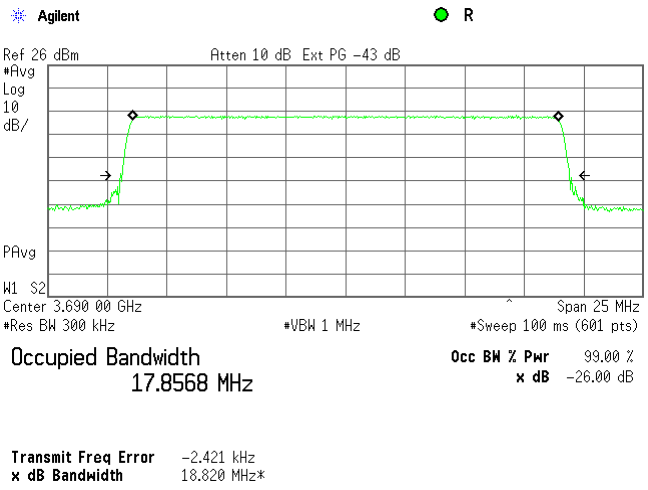
Modulation 64 QAM



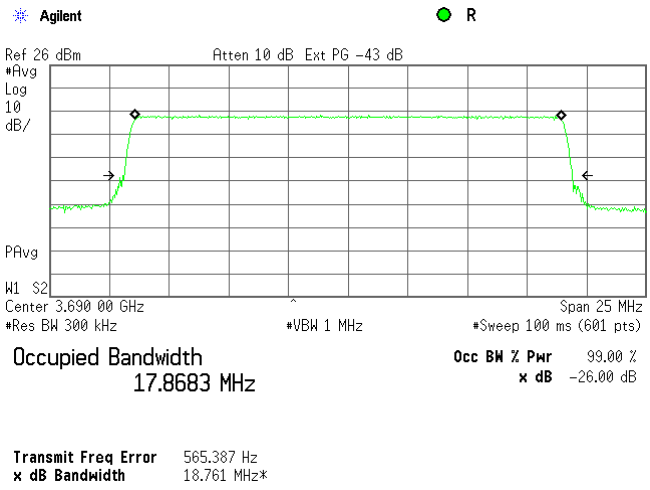
Test specification:	Section 90.209 / RSS-197, Section 5.2, Occupied bandwidth		
Test procedure:	47 CFR, Section 2.1049		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.3.3 Occupied bandwidth test result at high frequency

Modulation QPSK



Modulation 64 QAM



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-D, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

7.4 Emission mask test

7.4.1 General

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

Table 7.4.1 Emission mask limits

Frequency displacement from carrier	Attenuation below carrier, dBc
Emission mask B (Emission bandwidth 20 MHz)	
0 – 10 MHz	0
10 – 20.0 MHz	25
20.0 – 50.0 MHz	35
More than* 25.0 MHz	43 + 10 log(P)

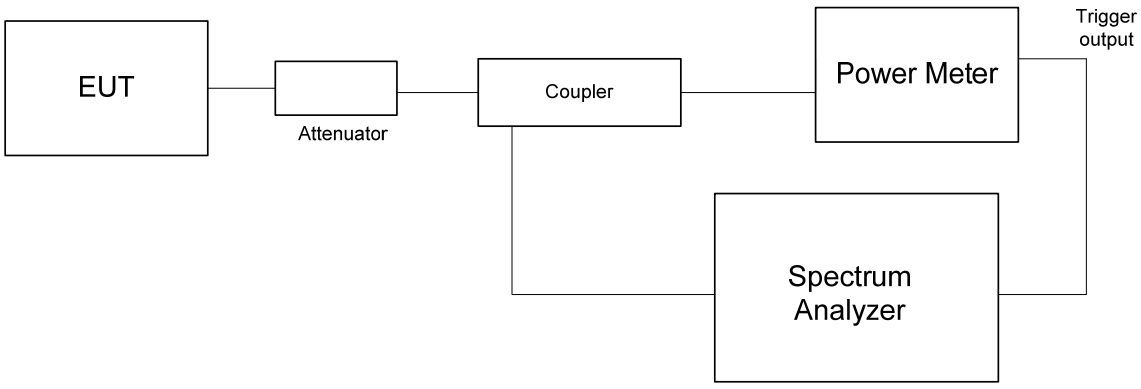
* - emission mask includes carrier modulation envelope within ± 250 % of the authorized bandwidth; the frequency range removed beyond ± 250 % of the authorized bandwidth from carrier was investigated as spurious emission

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 emission mask was measured with spectrum analyzer as provided in the associated plots. The test results recorded in Table 7.4.2.

Figure 7.4.1 Emission mask test setup



Test specification:	**Section 90.210(b), Emission mask**		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-D, Section 2.2.13		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	**Air Pressure:** 1020 hPa	**Relative Humidity:** 54 %	**Power Supply:** 48 VDC
Remarks:			

Table 7.4.2 Emission mask test results

Carrier frequency, MHz	Modulation	Limit	Reference to Plot	Verdict
3660	QPSK	Emission mask B	Plot 7.4.1	Pass
3675	QPSK		Plot 7.4.3	
3690	QPSK		Plot 7.4.5	
3660	64QAM		Plot 7.4.2	
3675	64QAM		Plot 7.4.4	
3690	64QAM		Plot 7.4.6	

Reference numbers of test equipment used

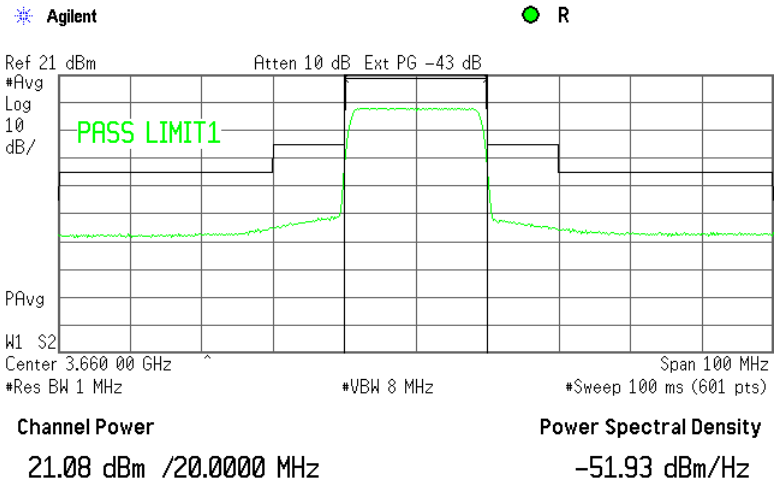
HL 1906	HL 3301	HL 3302	HL 3818	HL 3901	HL 4068	HL 4274	HL 4366

Full description is given in Appendix A.

Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-D, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

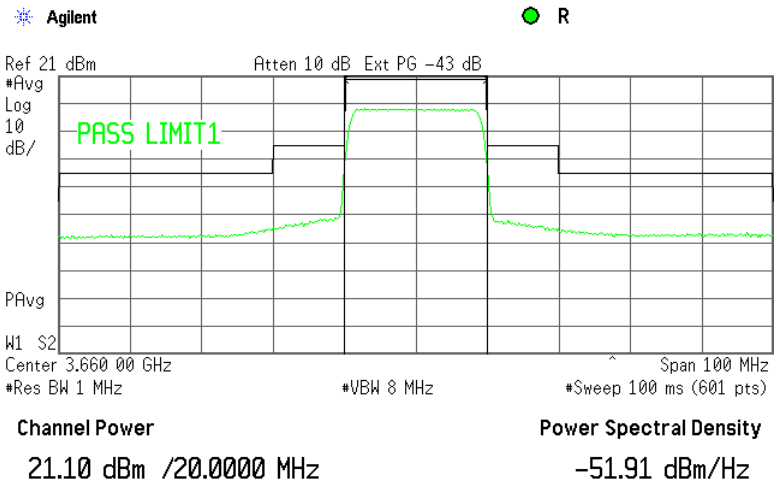
Plot 7.4.1 Emission mask test results at low carrier frequency

MODULATION: QPSK



Plot 7.4.2 Emission mask test results at low carrier frequency

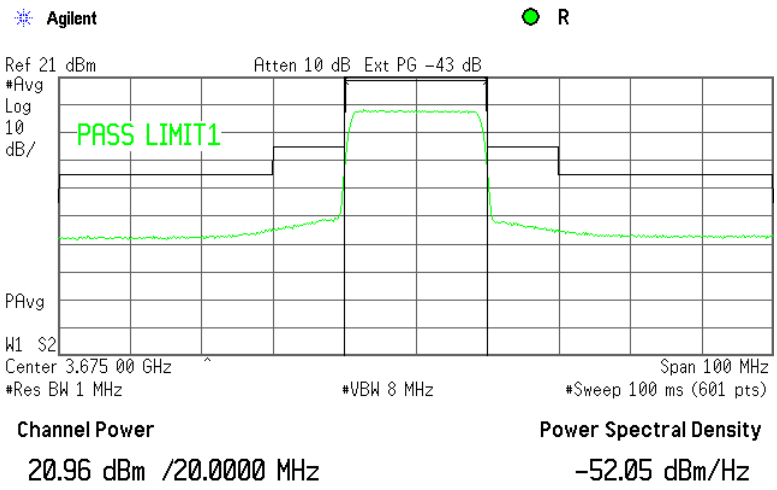
MODULATION: 64 QAM



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-D, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

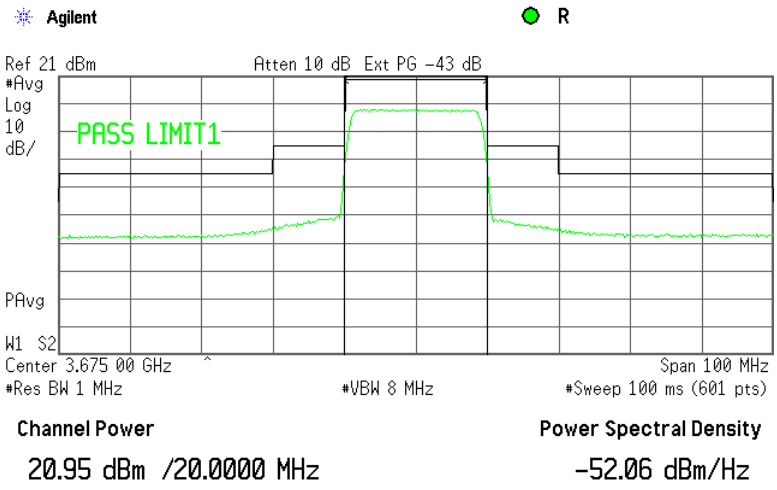
Plot 7.4.3 Emission mask test results at mid carrier frequency

MODULATION: QPSK



Plot 7.4.4 Emission mask test results at mid carrier frequency

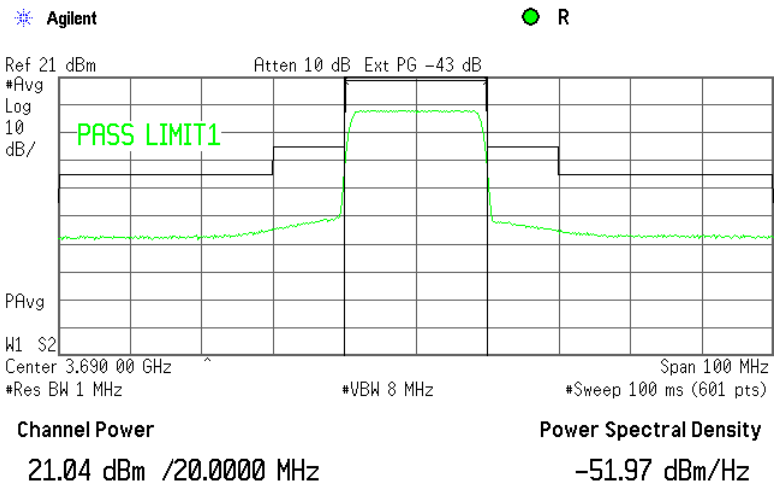
MODULATION: 64 QAM



Test specification:	Section 90.210(b), Emission mask		
Test procedure:	47 CFR, Sections 2.1051, 2.1047, 90.210; TIA/EIA-603-D, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

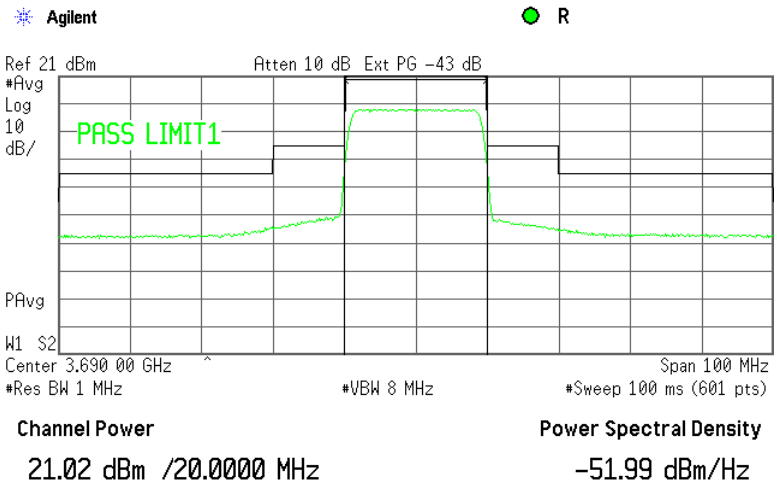
Plot 7.4.5 Emission mask test results at high carrier frequency

MODULATION: QPSK



Plot 7.4.6 Emission mask test results at high carrier frequency

MODULATION: 64 QAM



Test specification:	Section 90.213 / RSS-197, Section 5.7, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-D Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
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 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement	
	ppm	Hz
3650.0 – 3700.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation	

Table 7.5.2.

Table 7.5.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement	
	ppm	Hz
3650.0 – 3700.0	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation	

Table 7.5.2 Frequency stability limitsaccording to RSS-197

Assigned frequency, MHz	Maximum allowed frequency displacement
3650.0 – 3700.0	The frequency stability shall be sufficient to ensure that f_L minus the frequency offset and f_H plus the frequency offset shall be within the authorized band 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.

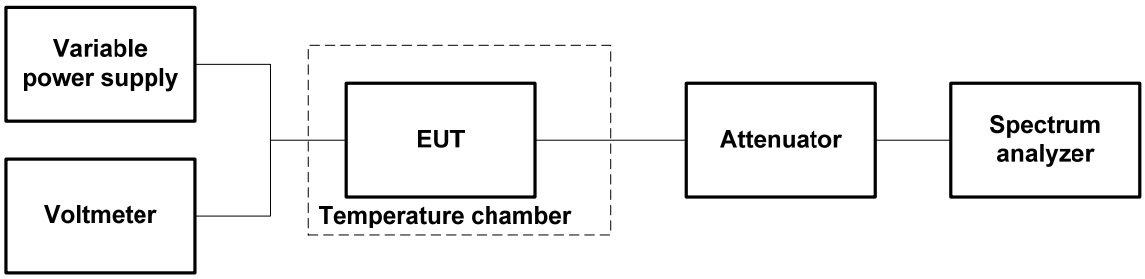
7.5.2.4 The above procedure was repeated at 0˚C and at the lowest test temperature.

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 inTable 7.5.3.

Test specification:	Section 90.213 / RSS-197, Section 5.7, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-D Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Figure 7.5.1 Frequency stability test setup



Test specification:	**Section 90.213 / RSS-197, Section 5.7, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-D Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	**Air Pressure:** 1020 hPa	**Relative Humidity:** 54 %	**Power Supply:** 48 VDC
Remarks:			

Table 7.5.3 Frequency stability test results according to RSS-197

ASSIGNED FREQUENCY RANGE:	3650.0 – 3700.0 MHz
NOMINAL POWER VOLTAGE:	48 VDC
TEMPERATURE STABILIZATION PERIOD:	20 min
SPECTRUM ANALYZER MODE:	Peak
RESOLUTION BANDWIDTH:	300 kHz
VIDEO BANDWIDTH:	1 MHz
MODULATION:	Modulated

Modulation	**Band edge frequency at normal condition, MHz**		**Frequency drift, Hz***		**Band edge frequency at extreme condition, MHz**	**Limit, MHz**	**Verdict**
			Positive	**Negative**			
QPSK	Low	3650.71	86	NA	3650.709914	3650	Pass
	High	3699.29	NA	250	3699.290250	3700	Pass
64QAM	Low	3650.71	86	NA	3650.709914	3650	Pass
	High	3699.29	NA	250	3699.290250	3700	Pass

* -used from the test report TLDRAD_FCC_IC_24990_RSS197 provided for certification under FCC ID:ARA-COMPACT3X and IC:899A-COMPACT3X.

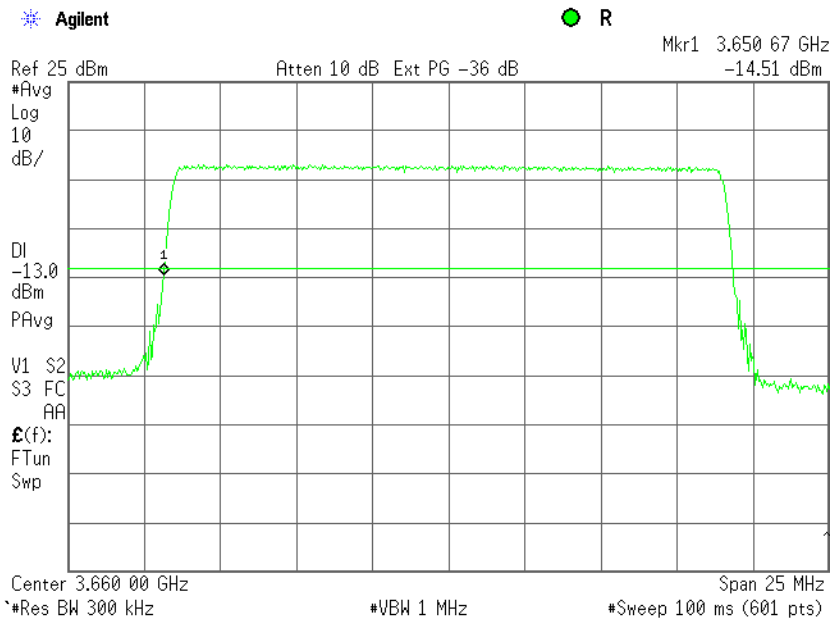
Reference numbers of test equipment used

HL 1424	HL 1906	HL 3286	HL 3301	HL 3310	HL 3474	HL 3818	HL 3903
HL 4068	HL 4164	HL 4273	HL 4274	HL 4366			

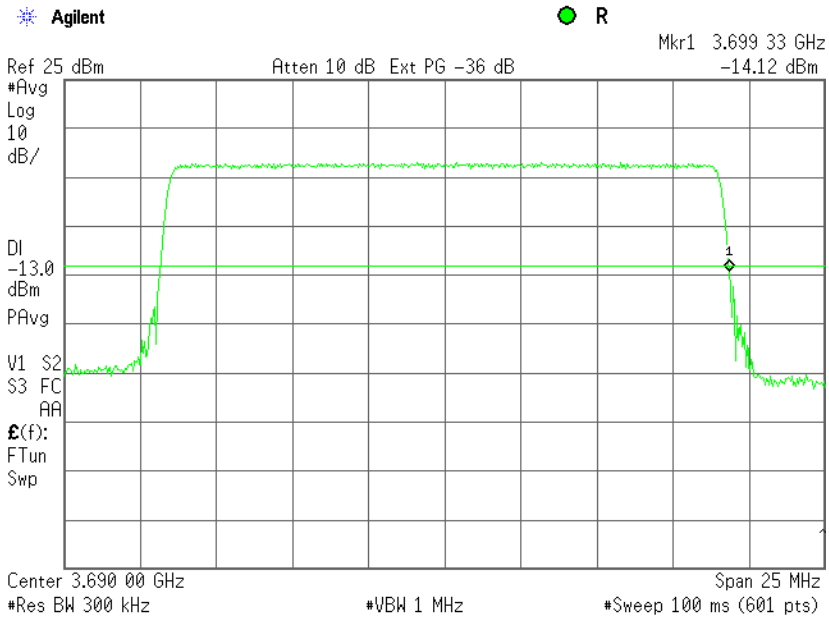
Full description is given in Appendix A.

Test specification:	Section 90.213 / RSS-197, Section 5.7, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-D Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.5.1 Band edge test result at low frequency, QPSK, EBW 20 MHz

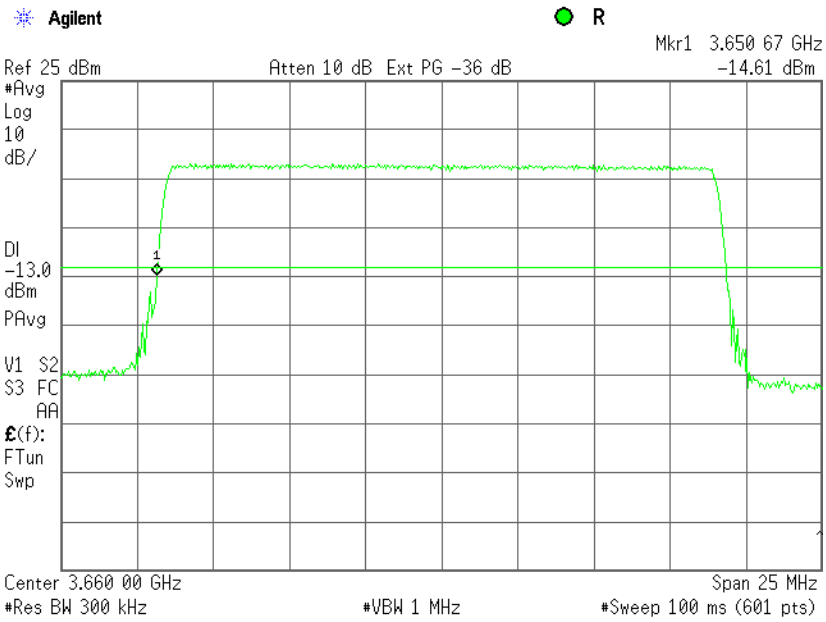


Plot 7.5.2 Band edge test result at high frequency, QPSK, EBW 20 MHz

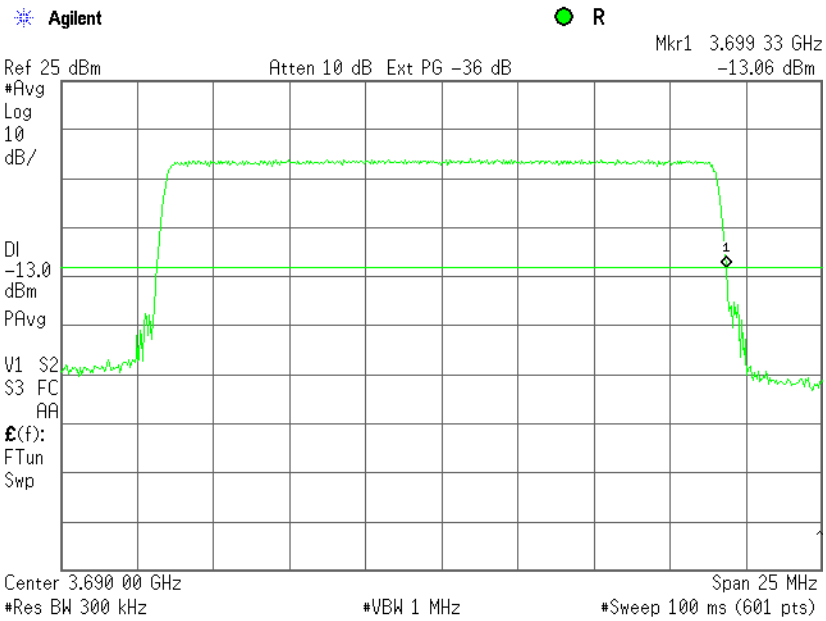


Test specification:	Section 90.213 / RSS-197, Section 5.7, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-D Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	12-Mar-15		
Temperature: 23 ºC	Air Pressure: 1020 hPa	Relative Humidity: 54 %	Power Supply: 48 VDC
Remarks:			

Plot 7.5.3 Band edge test result at low frequency, 64QAM, EBW 20 MHz



Plot 7.5.4 Band edge test result at high frequency, 64QAM, EBW 20 MHz



8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies	8564EC	3946A00219	23-Oct-14	23-Oct-15
1906	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	NA	01-Dec-14	01-Dec-16
2013	Power Divider, 0.5-18.0 GHz, 80 W	Omni Spectra	2090-6204-00	NA	01-Dec-14	01-Dec-16
3286	Temperature Chamber, (-50 to +170) °C	Thermotron	EL-8-CH-1-1-CO2	21-9048	23-Sep-14	23-Sep-15
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	30-Jan-15	30-Jan-16
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	30-Jan-15	30-Jan-16
3310	Multimeter	Fluke	115C	94321810	14-Jul-14	14-Jul-15
3474	Cable, Coax, Microwave, DC-18 GHz, SMA-SMA, 0.6 m	Gore	GORE 65475	1640102	11-May-14	11-May-15
3764	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	09-Mar-15	09-Mar-16
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	20-May-14	20-May-15
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1225/2A	06-Feb-15	06-Feb-16
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1226/2A	06-Feb-15	06-Feb-16
4068	Attenuator, SMA, 30 dB, DC to 12.4 GHz	Midwest Microwave	ATT-0527-30-SMA-07	NA	27-Nov-14	27-Nov-15
4164	DC Power Supply, 60V, 5A	Standig	605D	NA	11-Jan-15	11-Jan-16
4273	Test Cable , DC-18 GHz, 1.8 m, SMA/M - N/M	Mini-Circuits	CBL-6FT-SMNM+	70045	27-Nov-14	27-Nov-15
4274	Test Cable , DC-18 GHz, 1.8 m, SMA/M - N/M	Mini-Circuits	CBL-6FT-SMNM+	70047	27-Nov-14	27-Nov-15
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	18-May-14	18-May-16

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%
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
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 number IC 2186A-1 for OATS), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-27 for full-anechoic chamber for RE measurements above 1 GHz, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01). The FCC Designation Number is US1003.

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Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

FCC 47CFR part 90: 2013	Private land mobile radio services
ANSI/TIA/EIA-603-D:2010	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
RSS-197 Issue 1:2010	Wireless Broadband Access Equipment Operating in the Band 3650-3700 MHz
SRSP-303.65 Issue 1:2010	Technical Requirements for Wireless Broadband Services (WBS) in the Band 3650-3700 MHz
RSS-Gen Issue 4: 2014	General Requirements and Information for the certification of Radiocommunication Equipment

12 APPENDIX E Test equipment correction factors

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 3.5 m, SMA-SMA, S/N 1225/2A
HL 3901

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	9500	4.29	21000	6.67
100	0.41	10000	4.40	22000	6.92
500	0.93	10500	4.52	23000	7.00
1000	1.33	11000	4.64	24000	7.18
1500	1.63	11500	4.76	25000	7.29
2000	1.90	12000	4.87	26000	7.55
2500	2.12	12500	4.99	27000	7.70
3000	2.33	13000	5.11	28000	7.88
3500	2.50	13500	5.20	29000	8.02
4000	2.67	14000	5.31	30000	8.15
4500	2.82	14500	5.42	31000	8.35
5000	2.99	15000	5.51	32000	8.40
5500	3.16	15500	5.58	33000	8.62
6000	3.32	16000	5.68	34000	8.73
6500	3.51	16500	5.78	35000	8.78
7000	3.65	17000	5.91	36000	8.94
7500	3.79	17500	5.99	37000	9.21
8000	3.92	18000	6.07	38000	9.37
8500	4.04	19000	6.36	39000	9.45
9000	4.18	20000	6.49	40000	9.52

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

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

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1226/2A
HL 3903

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	-0.02	9500	1.84	21000	2.98
100	0.15	10000	1.86	22000	3.07
500	0.38	10500	1.93	23000	3.13
1000	0.56	11000	1.99	24000	3.21
1500	0.69	11500	2.04	25000	3.26
2000	0.82	12000	2.10	26000	3.48
2500	0.90	12500	2.15	27000	3.44
3000	0.98	13000	2.21	28000	3.53
3500	1.06	13500	2.25	29000	3.59
4000	1.11	14000	2.29	30000	3.66
4500	1.17	14500	2.34	31000	3.70
5000	1.24	15000	2.36	32000	3.79
5500	1.32	15500	2.40	33000	3.88
6000	1.40	16000	2.45	34000	3.94
6500	1.50	16500	2.48	35000	3.91
7000	1.56	17000	2.56	36000	4.05
7500	1.62	17500	2.58	37000	4.22
8000	1.68	18000	2.60	38000	4.25
8500	1.74	19000	2.84	39000	4.27
9000	1.78	20000	2.88	40000	4.33

Cable loss
Test cable, Mini-Circuits, S/N 70045, 18 GHz, 1.8 m, SMA/M - N/M
CBL-6FT-SMNM+, HL 4273

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	4800	1.76	9800	2.70	14800	3.59
30	0.11	4900	1.78	9900	2.71	14900	3.59
50	0.14	5000	1.81	10000	2.73	15000	3.60
100	0.20	5100	1.82	10100	2.75	15100	3.63
200	0.30	5200	1.86	10200	2.76	15200	3.67
300	0.38	5300	1.89	10300	2.79	15300	3.70
400	0.45	5400	1.92	10400	2.81	15400	3.68
500	0.50	5500	1.96	10500	2.82	15500	3.70
600	0.55	5600	2.00	10600	2.83	15600	3.71
700	0.60	5700	2.03	10700	2.87	15700	3.77
800	0.65	5800	2.04	10800	2.87	15800	3.75
900	0.69	5900	2.07	10900	2.88	15900	3.77
1000	0.73	6000	2.10	11000	2.89	16000	3.79
1100	0.77	6100	2.10	11100	2.91	16100	3.85
1200	0.80	6200	2.11	11200	2.92	16200	3.82
1300	0.84	6300	2.11	11300	2.94	16300	3.83
1400	0.88	6400	2.14	11400	2.95	16400	3.88
1500	0.92	6500	2.15	11500	2.98	16500	3.89
1600	0.95	6600	2.15	11600	3.00	16600	3.92
1700	0.98	6700	2.16	11700	3.02	16700	3.88
1800	1.01	6800	2.19	11800	3.04	16800	3.95
1900	1.04	6900	2.22	11900	3.08	16900	3.91
2000	1.07	7000	2.24	12000	3.09	17000	3.97
2100	1.09	7100	2.26	12100	3.12	17100	3.92
2200	1.13	7200	2.29	12200	3.13	17200	3.94
2300	1.15	7300	2.32	12300	3.16	17300	3.94
2400	1.18	7400	2.36	12400	3.17	17400	3.98
2500	1.21	7500	2.39	12500	3.19	17500	3.93
2600	1.24	7600	2.41	12600	3.20	17600	3.95
2700	1.27	7700	2.43	12700	3.21	17700	3.96
2800	1.30	7800	2.46	12800	3.21	17800	3.97
2900	1.34	7900	2.49	12900	3.22	17900	3.96
3000	1.36	8000	2.52	13000	3.22	18000	3.97
3100	1.38	8100	2.52	13100	3.24		
3200	1.41	8200	2.54	13200	3.24		
3300	1.45	8300	2.59	13300	3.27		
3400	1.46	8400	2.61	13400	3.28		
3500	1.49	8500	2.60	13500	3.31		
3600	1.51	8600	2.63	13600	3.31		
3700	1.55	8700	2.65	13700	3.35		
3800	1.34	8800	2.65	13800	3.37		
3900	1.36	8900	2.65	13900	3.40		
4000	1.38	9000	2.66	14000	3.43		
4100	1.41	9100	2.66	14100	3.45		
4200	1.45	9200	2.67	14200	3.46		
4300	1.46	9300	2.67	14300	3.46		
4400	1.49	9400	2.67	14400	3.49		
4500	1.51	9500	2.68	14500	3.50		
4600	1.55	9600	2.69	14600	3.50		
4700	1.34	9700	2.69	14700	3.52		

Cable loss
Test cable, Mini-Circuits, S/N 70047, 18 GHz, 1.8 m, SMA/M - N/M
CBL-6FT-SMNM+, HL 4274

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.07	4800	1.69	9800	2.62	14800	3.42
30	0.11	4900	1.70	9900	2.63	14900	3.39
50	0.14	5000	1.72	10000	2.64	15000	3.38
100	0.21	5100	1.75	10100	2.64	15100	3.40
200	0.26	5200	1.76	10200	2.66	15200	3.41
300	0.30	5300	1.77	10300	2.67	15300	3.40
400	0.37	5400	1.79	10400	2.68	15400	3.39
500	0.44	5500	1.82	10500	2.68	15500	3.41
600	0.49	5600	1.85	10600	2.70	15600	3.44
700	0.54	5700	1.86	10700	2.71	15700	3.46
800	0.58	5800	1.87	10800	2.73	15800	3.45
900	0.63	5900	1.91	10900	2.74	15900	3.47
1000	0.67	6000	1.94	11000	2.76	16000	3.51
1100	0.71	6100	1.97	11100	2.77	16100	3.56
1200	0.75	6200	1.98	11200	2.78	16200	3.55
1300	0.78	6300	1.99	11300	2.79	16300	3.54
1400	0.81	6400	2.02	11400	2.80	16400	3.57
1500	0.85	6500	2.05	11500	2.82	16500	3.62
1600	0.88	6600	2.06	11600	2.83	16600	3.61
1700	0.91	6700	2.06	11700	2.84	16700	3.60
1800	0.94	6800	2.08	11800	2.85	16800	3.62
1900	0.97	6900	2.10	11900	2.87	16900	3.68
2000	1.00	7000	2.12	12000	2.88	17000	3.70
2100	1.03	7100	2.12	12100	2.89	17100	3.68
2200	1.06	7200	2.13	12200	2.90	17200	3.70
2300	1.08	7300	2.16	12300	2.92	17300	3.80
2400	1.11	7400	2.19	12400	2.94	17400	3.84
2500	1.14	7500	2.22	12500	2.95	17500	3.83
2600	1.16	7600	2.23	12600	2.96	17600	3.83
2700	1.19	7700	2.26	12700	2.98	17700	3.86
2800	1.21	7800	2.30	12800	3.00	17800	3.86
2900	1.27	7900	2.33	12900	3.02	17900	3.80
3000	1.29	8000	2.35	13000	3.03	18000	3.79
3100	1.32	8100	2.37	13100	3.06		
3200	1.35	8200	2.41	13200	3.08		
3300	1.37	8300	2.44	13300	3.09		
3400	1.38	8400	2.47	13400	3.10		
3500	1.41	8500	2.48	13500	3.13		
3600	1.43	8600	2.51	13600	3.17		
3700	1.46	8700	2.53	13700	3.17		
3800	1.47	8800	2.55	13800	3.18		
3900	1.49	8900	2.56	13900	3.22		
4000	1.52	9000	2.57	14000	3.26		
4100	1.55	9100	2.58	14100	3.28		
4200	1.56	9200	2.59	14200	3.30		
4300	1.58	9300	2.59	14300	3.35		
4400	1.60	9400	2.60	14400	3.39		
4500	1.63	9500	2.60	14500	3.39		
4600	1.65	9600	2.61	14600	3.39		
4700	1.67	9700	2.61	14700	3.41		

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
BB	broad band
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(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
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
ITE	information technology equipment
k	kilo
kHz	kilohertz
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
PCB	printed circuit board
PM	pulse modulation
PS	power supply
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
VA	volt-ampere

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