HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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TEST REPORT

ACCORDING TO:

FCC 47CFR part 15 2018 subpart E §15.407,
RSS-247 Issue 2:2017, RSS-Gen Issue 5:2018

FOR:

Telrad Networks LTD.

LTE Outdoor Base Station

Model:BreezeU100e-5.X

FCC ID:ARA-BU1005X

IC:899A-BU1005X

Table of contents

1 Applicant information

Client name:	Telrad Networks
Address:	P.O. Box 6118, 1 Bat Sheva Str., Lod 7116002, Israel
Telephone:	+972 73-2467651
Fax:	+972 73-2467504
E-mail:	Klara.Milman@telrad.com
Contact name:	Mr. Klara Milman

2 Equipment under test attributes

Product name:	LTE Outdoor Base Station
Product type:	Transceiver
Model(s):	BreezeU100e-5X
Serial number:	95029961
Hardware version:	004-002-00
Software release:	0702.09329
Receipt date	03-Mar-19

3 Manufacturer information

Manufacturer name:	Telrad Networks Ltd.
Address:	P.O. Box 6118, 1 Bat Sheva Str., Lod 7116002, Israel
Telephone:	+972 73-2467651
Fax:	+972 73-2467504
E-Mail:	Klara.Milman@telrad.com
Contact name:	Mrs. Klara Milman

4 Test details

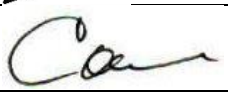
Project ID:	31832
Location:	Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel
Test started:	05-Mar-19
Test completed:	15-Apr-19
Test specification(s):	FCC 47CFR part 15 2018 subpart E §15.407 and RSS-247 issue 2 2017 and RSS-Gen Issue 5:2018

5 Tests summary

Test	Status
Transmitter characteristics	
FCC section 15.407(a)(5)/(e), RSS-Gen section 6.7,RSS-247 section 6.2.1.2 26 dB, 6 dB, 99%,occupied bandwidth	Pass
FCC section 15.407(a)(1,3), RSS-247 section 6.2.1.1, 6.2.4.1, Peak output power	Pass
FCC section 15.407(a)(1,3), RSS-247 section 6.2.1.1, Peak spectral power density	Pass
FCC section 15.407(b), RSS-247 sections 6.2.1.2, 6.2.4.2, Conducted out of band emissions	Pass
FCC section 15.407(b), RSS-247 sections 6.2.1.2, 6.2.4.2, Field strength of unwanted emissions	Pass
FCC section 15.407(b)(6), 15.207(a), RSS-Gen section 8.8, Conducted emissions	Pass
FCC section 15.203, RSS-Gen section 6.8, Antenna requirement	Pass
FCC section 15.407(f), RSS-102 section 2.5.2, RF exposure	Pass, the exhibit to the application of certification is provided
FCC section 15.407(c), RSS-247 section 6.4 Continuity of transmission	Comply*
FCC section 15.407(g) Frequency stability	Comply*

* Operation of description.
** Declared by the manufacturer.

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. A. Morozov, test engineer	05-Mar-19 – 15-Apr-19	
Reviewed by:	Mrs. S.Peysahov Sheynin test engineer	25-Apr-19	
Approved by:	Mr. S. Samokha, technical manager, EMC and Radio	23-May-19	

6 EUT description

6.1 General information

BreezeU100 5GHz Base Station is a high capacity, IP services oriented Broadband Wireless Access system. The system contains an all outdoor base station unit. The basic base station system configuration is contains power supply, MODEM and based on RF IC radio.
BreezeU100 5 GHz Base station implements a single LTE BS entity that transmits and receives to/from the registered MSs Over a 10/15/20 MHz (selectable by the operator) frequency channel (Band Width), through one or more ODUs.
Telrad Breeze Compact solution support LTE R9/10 and works with UE up to category 12.

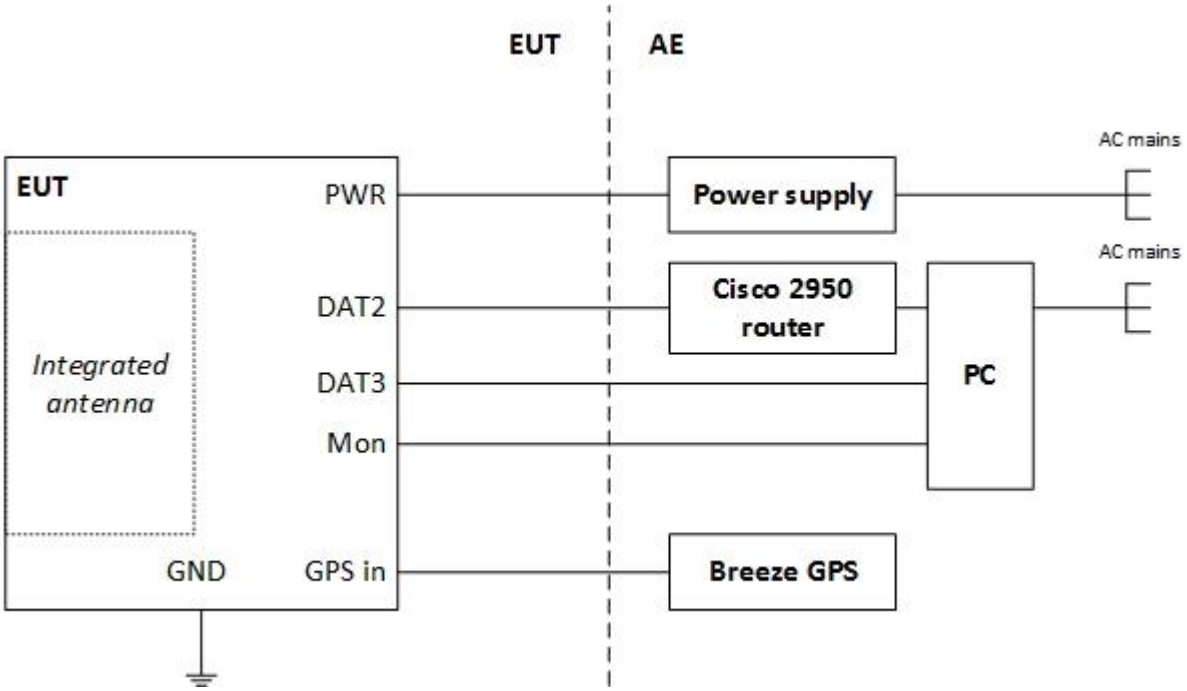
6.2 Ports and lines

Port type	Port description	Conn. from	Conn. to	Qty.	Cable type	Cable length, m	Indoor / outdoor
Telecom	Ethernet	NA	backhaul	3	FTP	100	NA
Telecom	Ethernet	NA	backhaul	1	Fiber optic	100	NA
Power	DC	NA	PS	1	Shielded	100	NA

6.3 Auxiliary equipment

Description	Manufacturer	Model number	Serial number
Smart bits	Spirent communication	SMB200	1563-B
Subscriber unit	NA	CPE4300	NA
DC power supply	NA	Horizon DHR3655D or from Hermon LAB	NA
Router	Cisco	Catalyst 2950	FOC08127T0WP
BreezeGPS	Telrad	TA1556	NA
PC	Lenovo	PC	NA
Splitter	Mini circuit	ZN2PD-9G-S+	F244200801_F689300614

6.4 Test configuration



6.5 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	5150.0 – 5250.0 MHz, 5725.0 – 5850.0 MHz
Operating frequency range	5160.0 – 5245.0 MHz 5730.0 – 5845.0 MHz
RF channel spacing	10 MHz, 15 MHz, 20 MHz

Maximum rated output power	At transmitter 50 Ω RF output connector (per port) in 5730.0 – 5845.0 MHz	19 dBm for 10 MHz 19 dBm for 15 MHz 18.93 dBm for 20 MHz
Maximum rated output power	At transmitter 50 Ω RF output connector (per port) in 5160.0 – 5245.0 MHz	Refer to Table 6.7
Maximum EIRP	Per port in 5730.0 – 5845.0 MHz	36 dBm for 10 MHz 36 dBm for 15 MHz 35.93 dBm for 20 MHz

Is transmitter output power variable?				continuous variable	
	V	Yes	V	stepped variable with step size	0.25dB
			minimum RF power		0dBm
			maximum RF power at antenna connector		19 dBm for 10 MHz 19 dBm for 15 MHz 18.93 dBm for 20 MHz

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

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Integral 2 x Dual Slant	Mars	MA-WC54-DS17TR	17dBi

Transmitter aggregate data rate/s, Mbps

Transmitter 26dBc power bandwidth	Type of modulation		
	QPSK	16QAM	64QAM
10 MHz	12	22	55
15 MHz	18	34	82
20 MHz	24	46	109

Type of modulation	QPSK, 16QAM, 64QAM
Modulating test signal (baseband)	PRBS
Maximum transmitter duty cycle in normal use	74%

Transmitter power source					
		Nominal rated voltage		Battery type	
	DC	**Nominal rated voltage**			
V	AC mains	**Nominal rated voltage**	via 48 VDC	Frequency	

Common power source for transmitter and receiver	**V**	yes		no

6.6 Table of calculations for the MAX EIRP at frequency range 5725 – 5850 MHz

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) coherent signal											
5730.0	5788.0	5845.0	OFDMA	10	4	13.0	15.99	17.0	3	20.0	35.99
5733.0	5788.0	5843.0	OFDMA	15	4	13.0	15.96	17.0	3	20.0	35.96
5735.0	5788.0	5840.0	OFDMA	20	4	12.93	15.90	17.0	3	20.0	35.90
1 carrier 1 sector (4 ports: 2 dual slant antennas) non-coherent signal or 2 carriers from the same band 1 sectors (2 ports: 1 dual slant antenna for 1-st carrier and 2 ports: 1 dual slant antenna for 2-nd carrier)											
5730.0	5788.0	5845.0	OFDMA	10	4	15.88	18.87	17.0	0	17.0	35.87
5733.0	5788.0	5843.0	OFDMA	15	4	15.98	18.92	17.0	0	17.0	35.92
5735.0	5788.0	5840.0	OFDMA	20	4	15.95	18.94	17.0	0	17.0	35.94
2 carrier 1 sector (4 ports: 2 dual slant antennas)											
5730.0	5788.0	5845.0	OFDMA	10	4	19.0	19.0	17.0	0	17.0	36.0
5733.0	5788.0	5843.0	OFDMA	15	4	19.0	19.0	17.0	0	17.0	36.0
5735.0	5788.0	5840.0	OFDMA	20	4	18.92	18.92	17.0	0	17.0	35.92

6.7 Table of calculations for the MAX EIRP at frequency range 5150 – 5250 MHz

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) coherent signal											
5160.0			OFDMA	10	4	3.70	6.63	17.0	3	20.0	26.63
	5200.0	5245.0	OFDMA	10	4	8.91	11.91	17.0	3	20.0	31.91
5165.0			OFDMA	15	4	3.66	6.61	17.0	3	20.0	26.61
	5200.0	5240.0	OFDMA	15	4	10.82	13.82	17.0	3	20.0	33.82
5165.0			OFDMA	20	4	2.25	5.20	17.0	3	20.0	25.20
	5200.0	5240.0	OFDMA	20	4	11.83	14.83	17.0	3	20.0	34.83
1 carrier 1 sector (4 ports: 2 dual slant antennas) non-coherent signal or 2 carriers from the same band 1 sectors (2 ports: 1 dual slant antenna for 1-st carrier and 2 ports: 1 dual slant antenna for 2-nd carrier)											
5160.0			OFDMA	10	4	5.33	8.32	17.0	0	17.0	25.32
	5200.0	5245.0	OFDMA	10	4	12.05	15.02	17.0	0	17.0	32.02
5165.0			OFDMA	15	4	6.39	9.36	17.0	0	17.0	26.36
	5200.0	5240.0	OFDMA	15	4	13.99	16.97	17.0	0	17.0	33.97
5165.0			OFDMA	20	4	5.25	8.20	17.0	0	17.0	25.20
	5200.0	5240.0	OFDMA	20	4	14.82	17.82	17.0	0	17.0	34.82
2 carrier 1 sector (4 ports: 2 dual slant antennas)											
5160.0			OFDMA	10	4	5.33	5.33	17.0	0	17.0	22.33
	5200.0	5245.0	OFDMA	10	4	15.02	15.02	17.0	0	17.0	32.02
5165.0			OFDMA	15	4	6.39	6.39	17.0	0	17.0	23.39
	5200.0	5240.0	OFDMA	15	4	16.82	16.82	17.0	0	17.0	33.82
5165.0			OFDMA	20	4	5.25	5.25	17.0	0	17.0	22.25
	5200.0	5240.0	OFDMA	20	4	15.86	15.86	17.0	0	17.0	32.86

* - 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:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart E and RSS-247.

7.1 Occupied 6 dB bandwidth at 5725 – 5850 MHz range

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1The 6 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, kHz
5150.0 – 5250.0	6.0	500.0
5725.0 – 5850.0	6.0	500.0

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

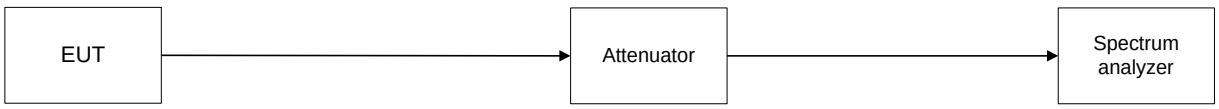
7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer RBW=1% of EBW as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and the associated plots.

Figure 7.1.1 The 6 dB bandwidth test setup



Test specification:	**FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth**		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1018 hPa	**Power:** 48 VDC
Remarks:			

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 5.725 – 5.850 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: ≥RBW
EBW: 10 MHz

Carrier frequency, GHz	Modulation	6 dB bandwidth, MHz	Limit, MHz	Margin*, MHz	Verdict
Low frequency					
5.730	QPSK	9.031	0.5	9.017	Pass
	16QAM	9.031	0.5	9.031	Pass
	64QAM	9.031	0.5	9.035	Pass
Mid frequency					
5.788	QPSK	9.011	0.5	9.004	Pass
	16QAM	9.011	0.5	9.029	Pass
	64QAM	8.951	0.5	9.039	Pass
High frequency					
5.845	QPSK	9.051	0.5	9.001	Pass
	16QAM	8.991	0.5	8.986	Pass
	64QAM	9.071	0.5	9.007	Pass

EBW: 15 MHz

Carrier frequency, GHz	Modulation	6 dB bandwidth, MHz	Limit, MHz	Margin*, MHz	Verdict
Low frequency					
5.7325	QPSK	13.527	0.5	-13.027	Pass
	16QAM	13.497	0.5	-12.997	Pass
	64QAM	13.528	0.5	-13.028	Pass
Mid frequency					
5.7880	QPSK	13.504	0.5	-13.004	Pass
	16QAM	13.549	0.5	-13.049	Pass
	64QAM	13.497	0.5	-12.997	Pass
High frequency					
5.8425	QPSK	13.492	0.5	-12.992	Pass
	16QAM	13.525	0.5	-13.025	Pass
	64QAM	13.516	0.5	-13.016	Pass

Test specification:	**FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth**		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1018 hPa	**Power:** 48 VDC
Remarks:			

Table 7.1.2 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 5.725 – 5.850 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: ≥RBW
EBW: 20 MHz

Carrier frequency, GHz	Modulation	6 dB bandwidth, MHz	Limit, MHz	Margin*, MHz	Verdict
Low frequency					
5.7350	QPSK	18.040	0.5	-17.540	Pass
	16QAM	18.024	0.5	-17.524	Pass
	64QAM	18.024	0.5	-17.524	Pass
Mid frequency					
5.7880	QPSK	18.026	0.5	-17.526	Pass
	16QAM	18.027	0.5	-17.527	Pass
	64QAM	18.014	0.5	-17.514	Pass
High frequency					
5.8400	QPSK	18.032	0.5	-17.532	Pass
	16QAM	18.030	0.5	-17.530	Pass
	64QAM	18.045	0.5	-17.545	Pass

* Margin = 6 dB bandwidth – specification limit

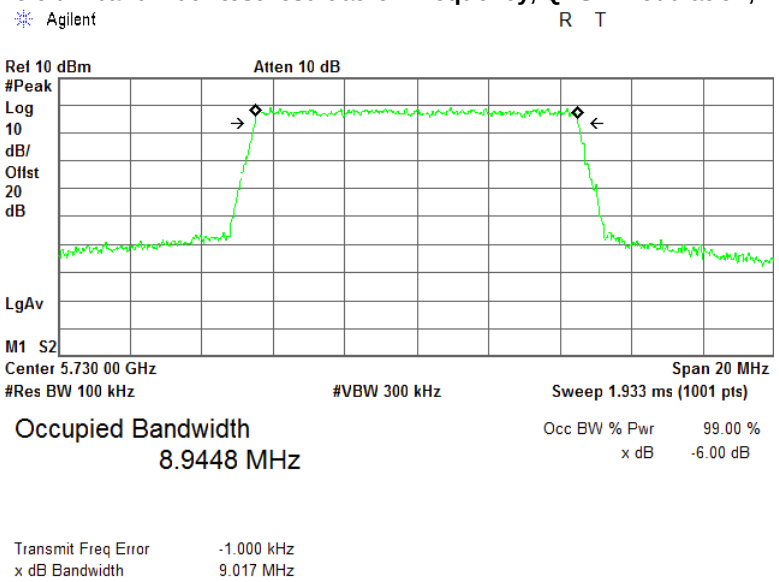
Reference numbers of test equipment used

HL 2909	HL 3655	HL 3901						

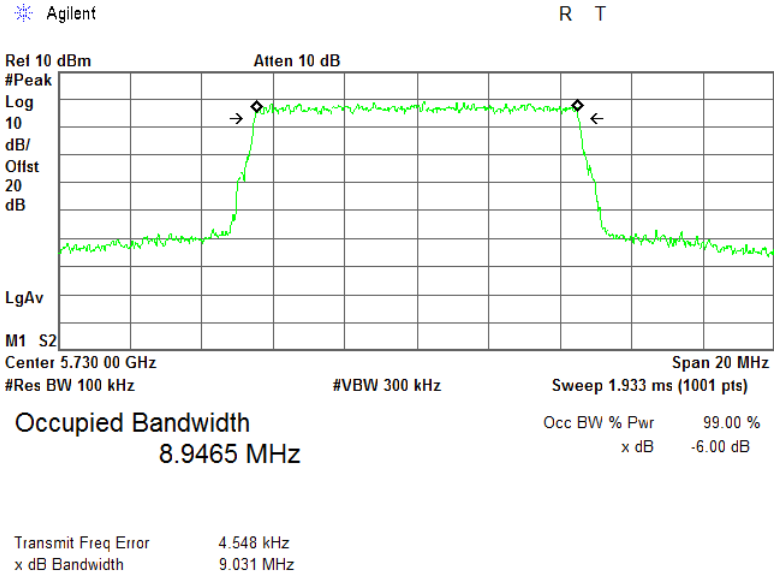
Full description is given in Appendix A.

Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.1 The 6 dB bandwidth test result at low frequency, QPSK modulation, 10 MHz EBW

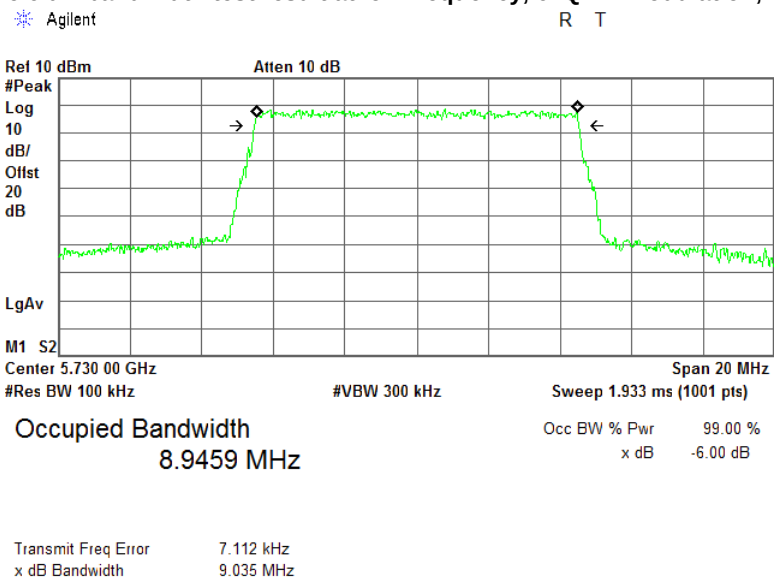


Plot 7.1.2 The 6 dB bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



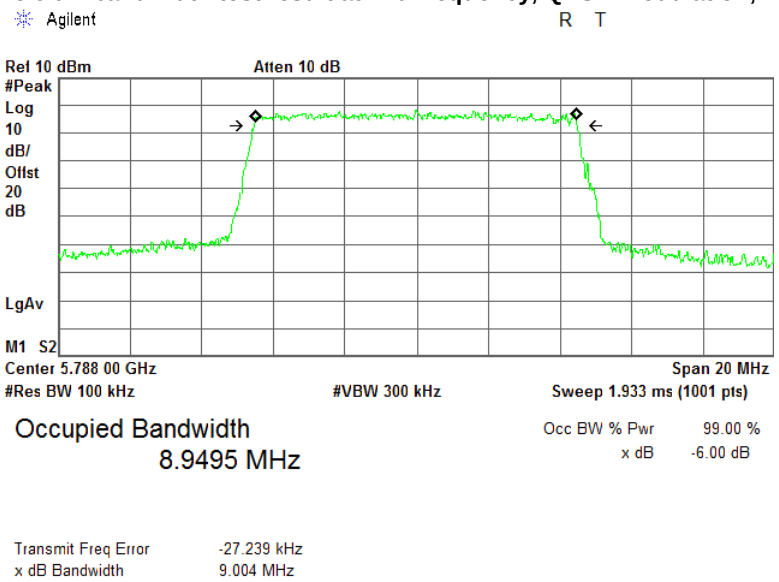
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.3 The 6 dB bandwidth test result at low frequency, 64QAM modulation, 10 MHz EBW

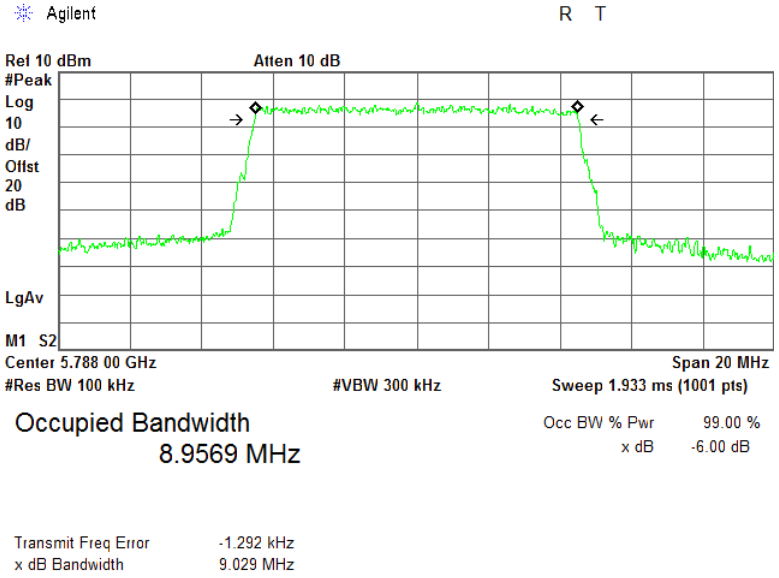


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.4 The 6 dB bandwidth test result at mid frequency, QPSK modulation, 10 MHz EBW

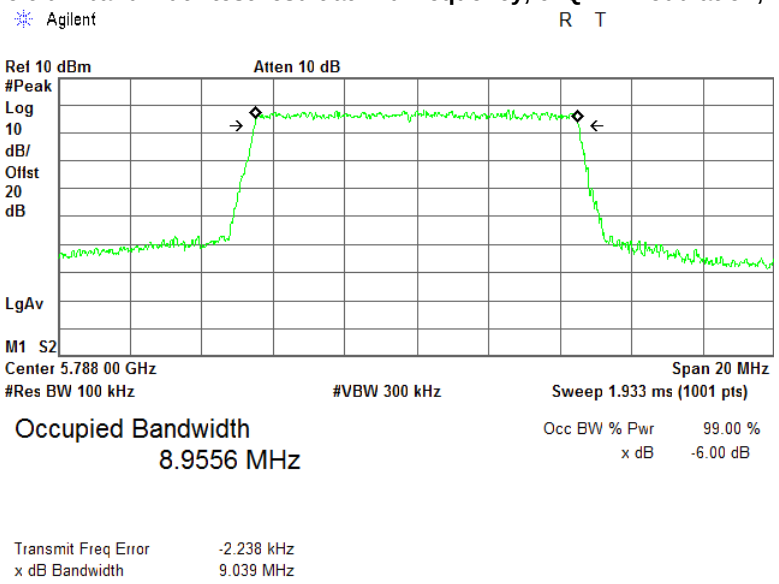


Plot 7.1.5 The 6 dB bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



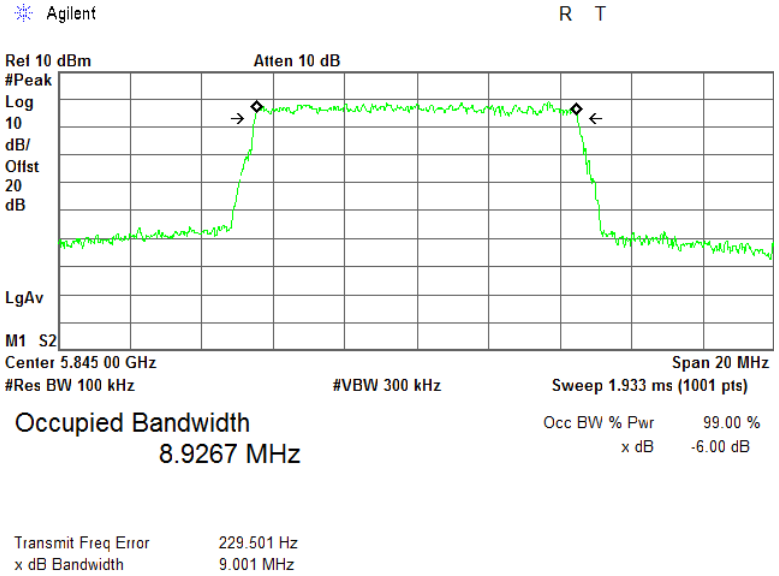
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.6 The 6 dB bandwidth test result at mid frequency, 64QAM modulation, 10 MHz EBW

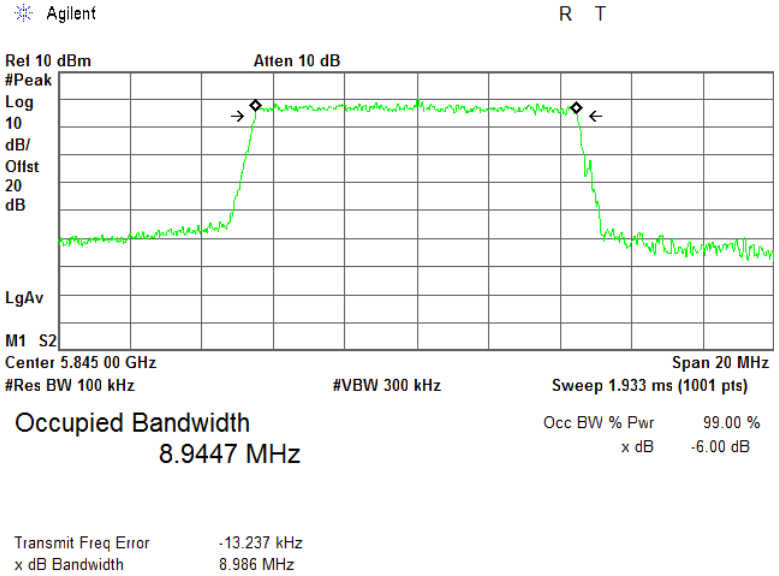


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.7 The 6 dB bandwidth test result at high frequency, QPSK modulation, 10 MHz EBW

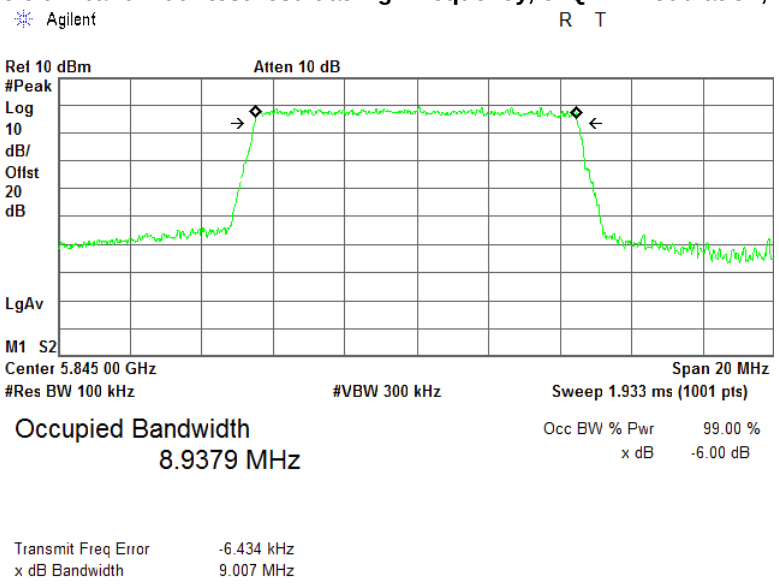


Plot 7.1.8 The 6 dB bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



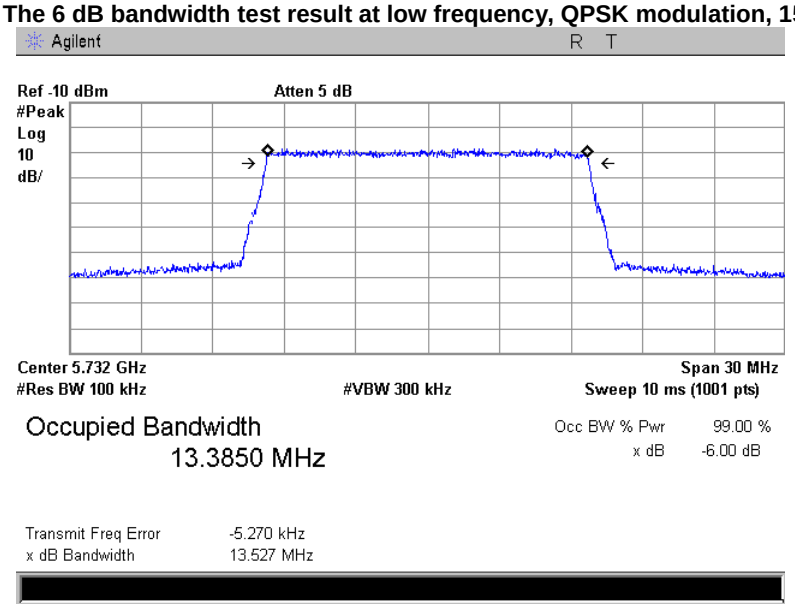
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.9 The 6 dB bandwidth test result at high frequency, 64QAM modulation, 10 MHz EBW

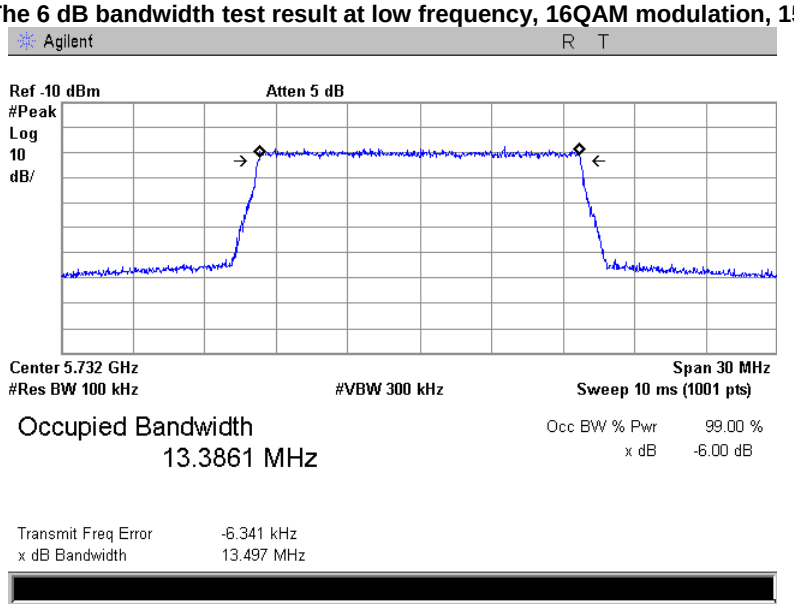


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.10 The 6 dB bandwidth test result at low frequency, QPSK modulation, 15 MHz EBW

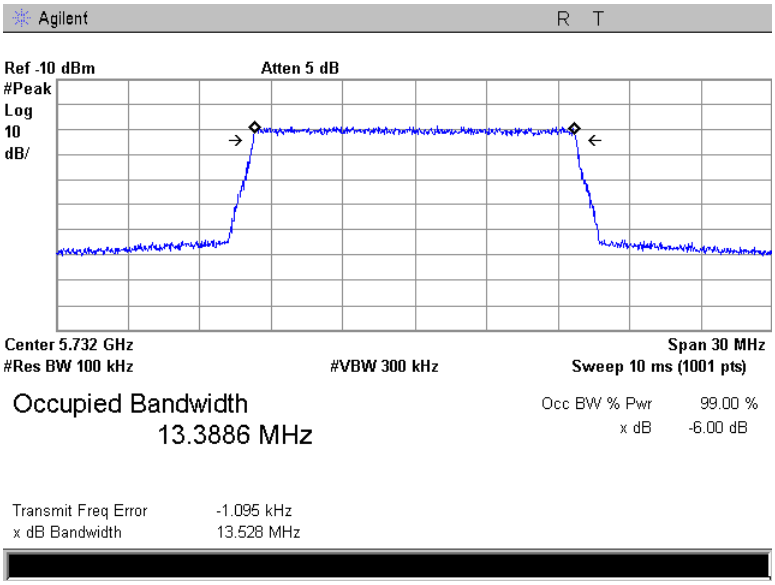


Plot 7.1.11 The 6 dB bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



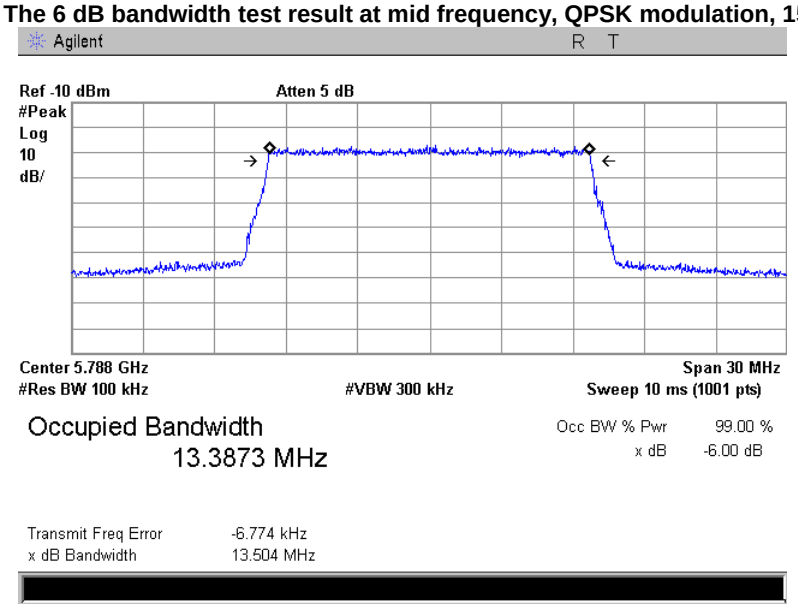
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.12 The 6 dB bandwidth test result at low frequency, 64QAM modulation, 15 MHz EBW

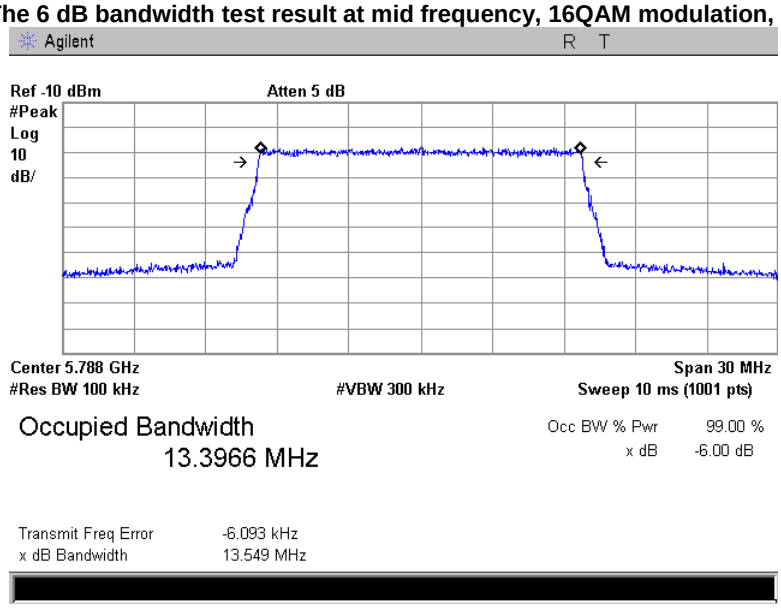


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.13 The 6 dB bandwidth test result at mid frequency, QPSK modulation, 15 MHz EBW

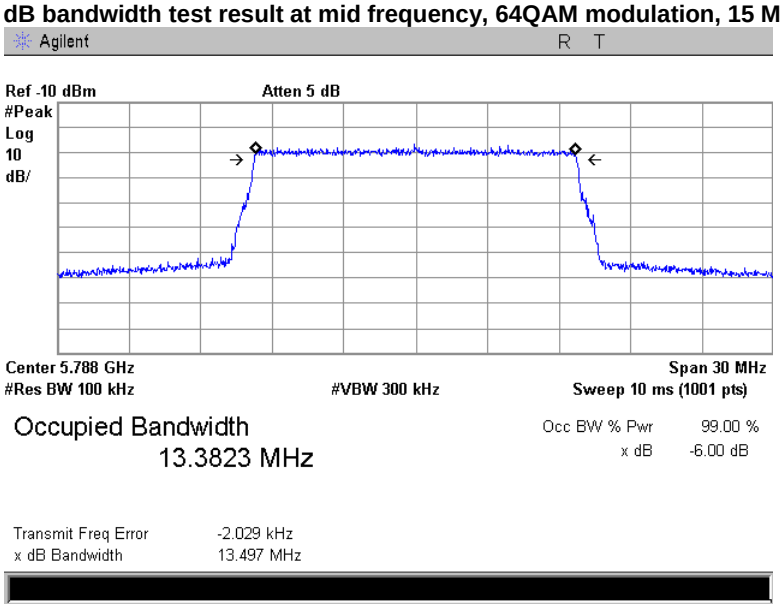


Plot 7.1.14 The 6 dB bandwidth test result at mid frequency, 16QAM modulation, 15 MHz EBW



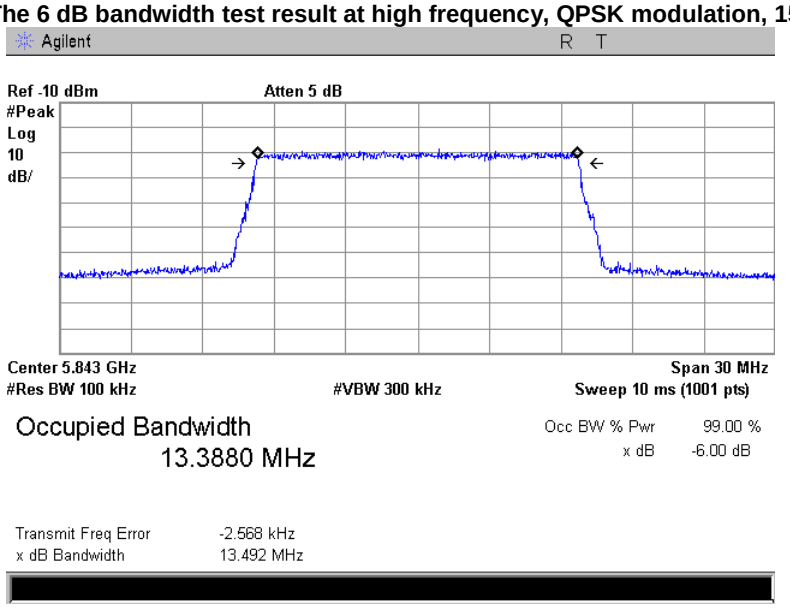
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.15 The 6 dB bandwidth test result at mid frequency, 64QAM modulation, 15 MHz EBW

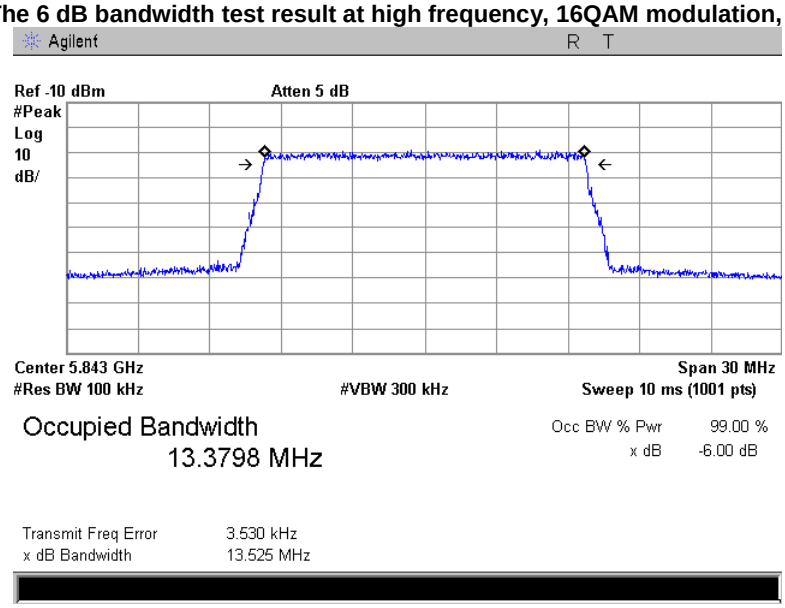


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.16 The 6 dB bandwidth test result at high frequency, QPSK modulation, 15 MHz EBW

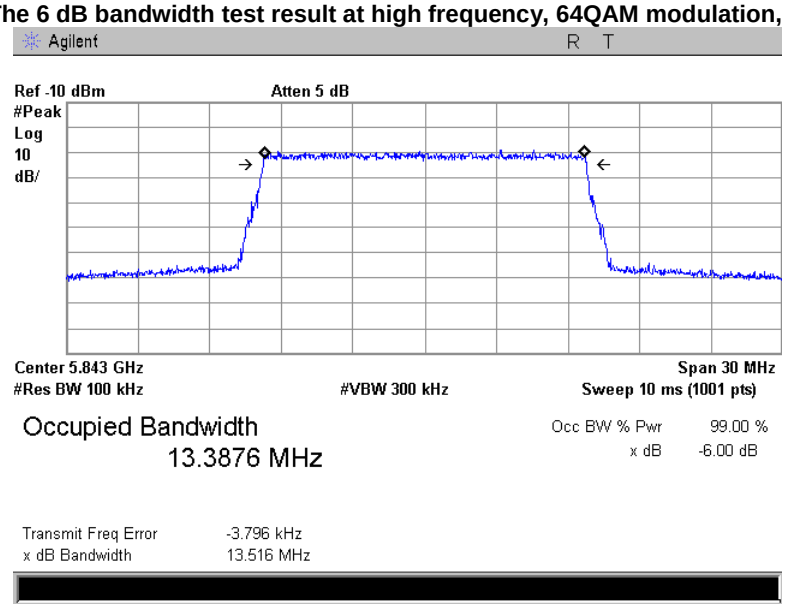


Plot 7.1.17 The 6 dB bandwidth test result at high frequency, 16QAM modulation, 15 MHz EBW



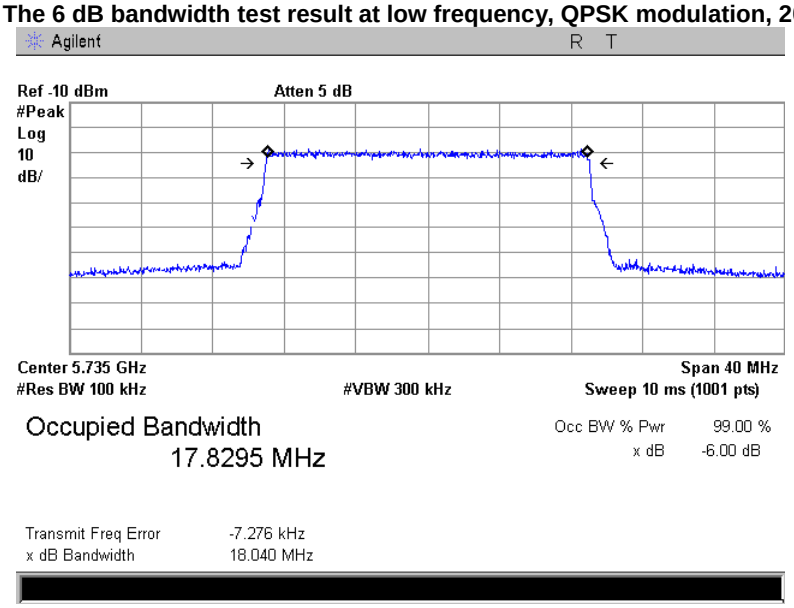
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.18 The 6 dB bandwidth test result at high frequency, 64QAM modulation, 15 MHz EBW

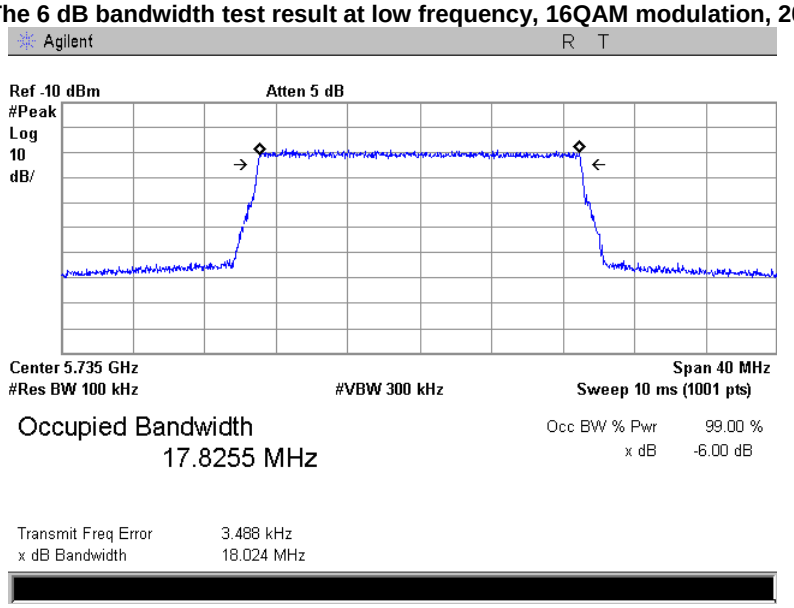


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.19 The 6 dB bandwidth test result at low frequency, QPSK modulation, 20 MHz EBW

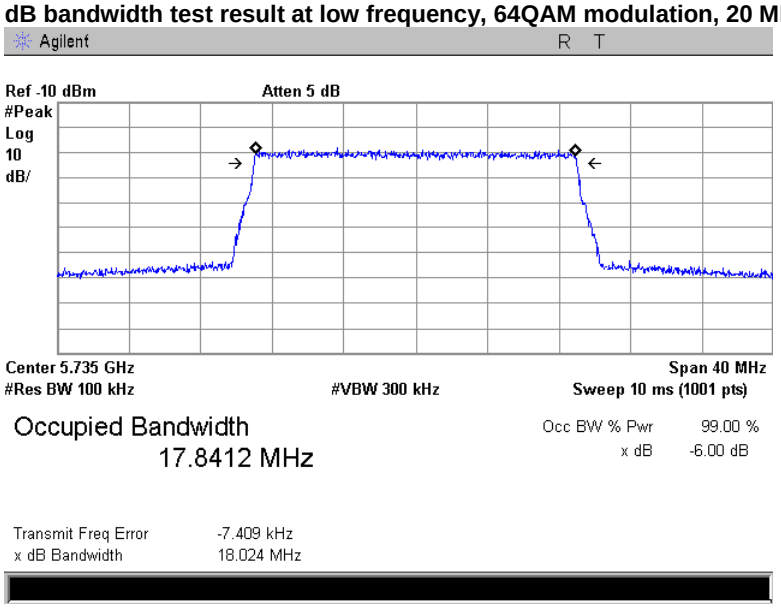


Plot 7.1.20 The 6 dB bandwidth test result at low frequency, 16QAM modulation, 20 MHz EBW



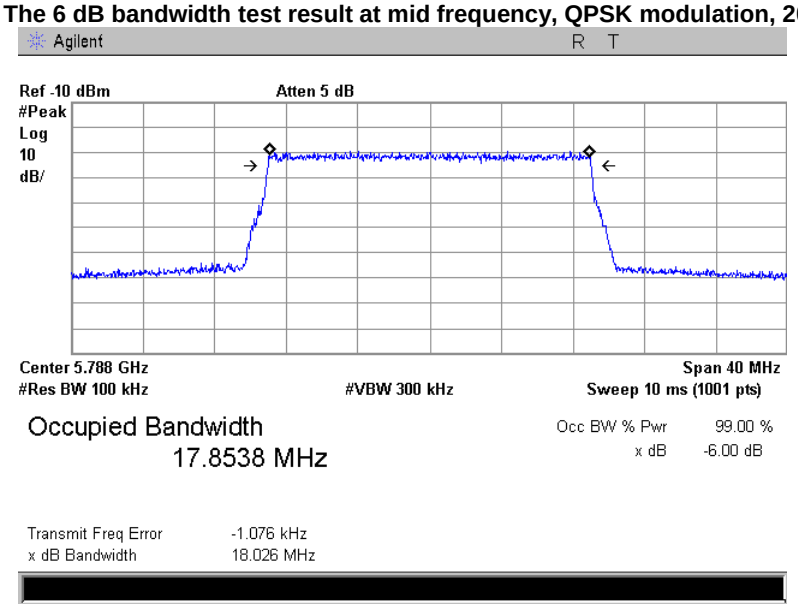
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.21 The 6 dB bandwidth test result at low frequency, 64QAM modulation, 20 MHz EBW

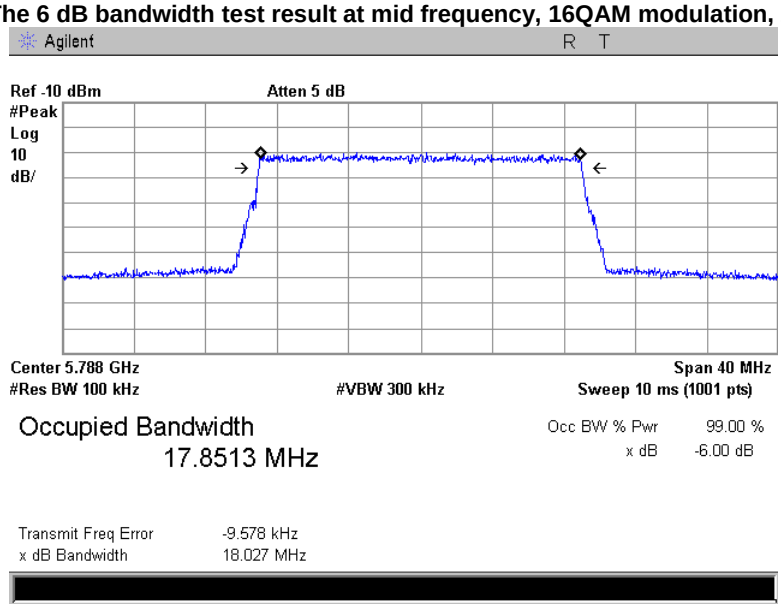


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.22 The 6 dB bandwidth test result at mid frequency, QPSK modulation, 20 MHz EBW

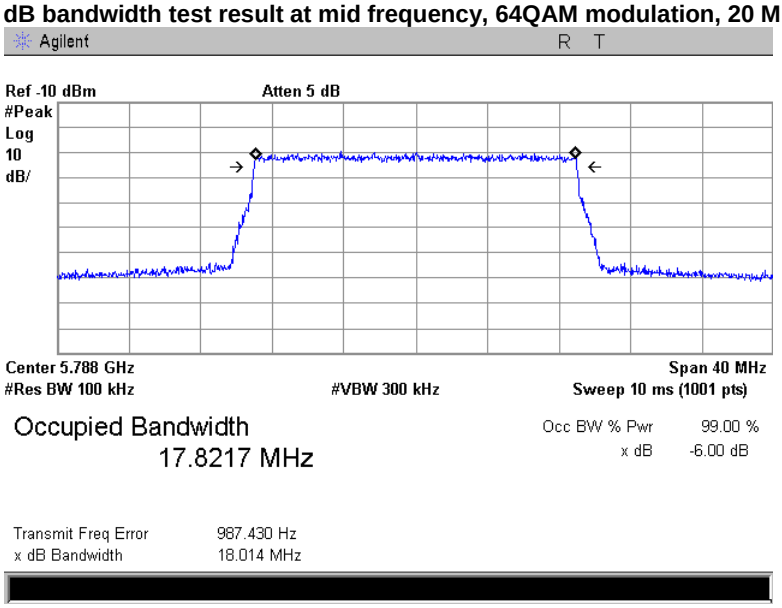


Plot 7.1.23 The 6 dB bandwidth test result at mid frequency, 16QAM modulation, 20 MHz EBW



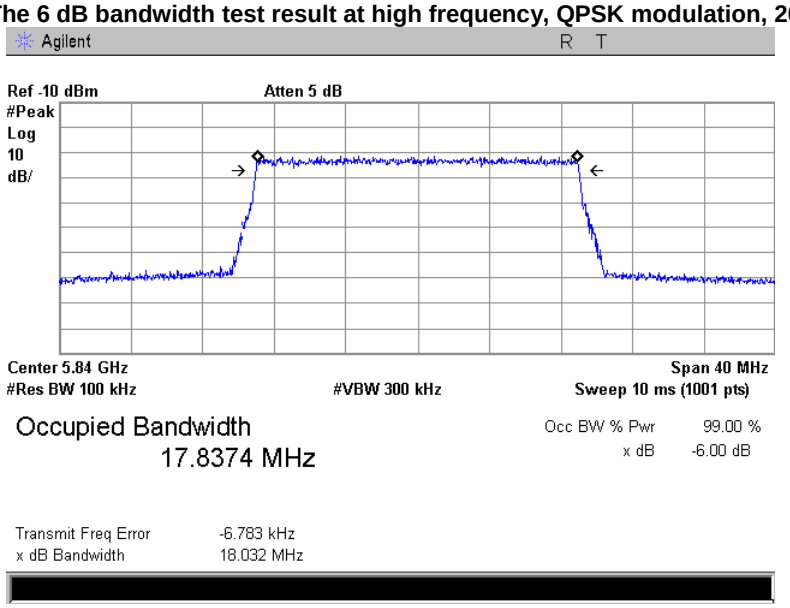
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.24 The 6 dB bandwidth test result at mid frequency, 64QAM modulation, 20 MHz EBW

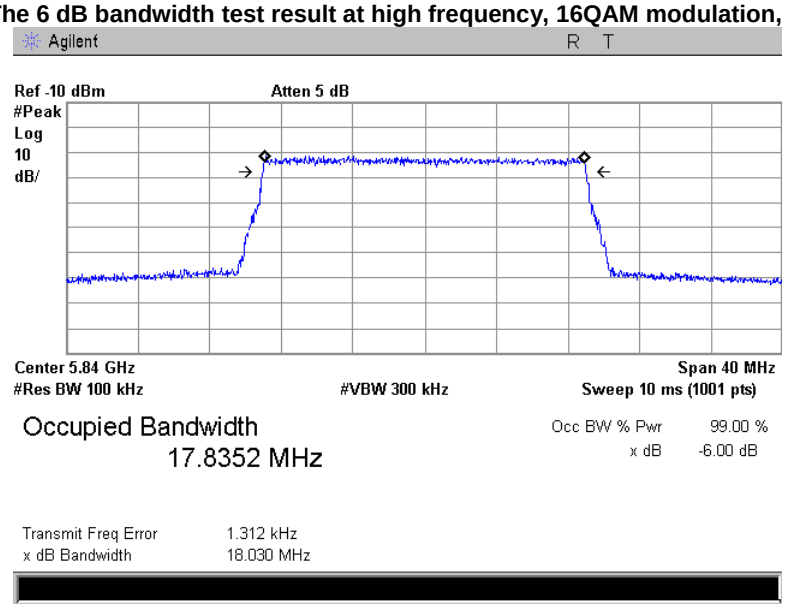


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.25 The 6 dB bandwidth test result at high frequency, QPSK modulation, 20 MHz EBW

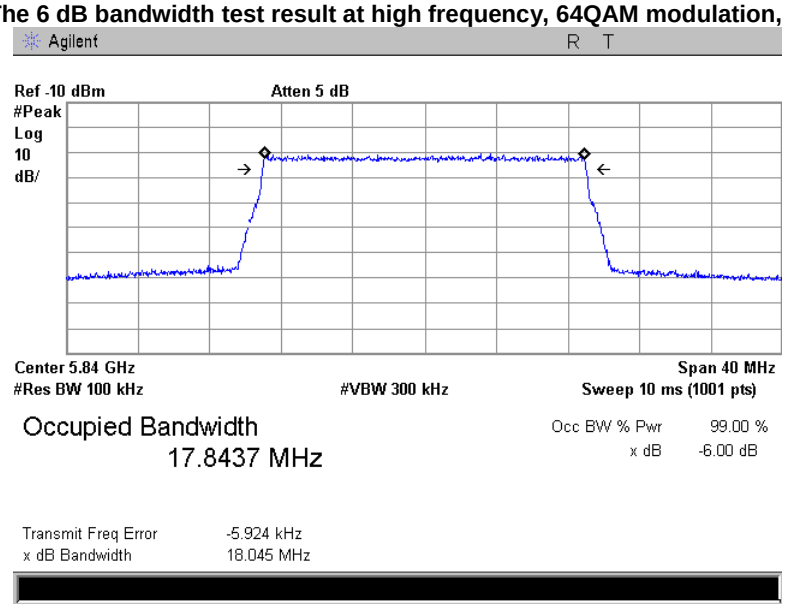


Plot 7.1.26 The 6 dB bandwidth test result at high frequency, 16QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.1.27 The 6 dB bandwidth test result at high frequency, 64QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

7.2 Occupied 99% bandwidth at 5725 – 5850 MHz range

7.2.1 General

This test was performed to measure 99% bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.2.1.

Table 7.2.1 The 99% bandwidth limits

Assigned frequency, MHz	Modulation envelope, %	Minimum bandwidth, kHz
5150.0 – 5250.0	99	NA
5725.0 – 5850.0	99	NA

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

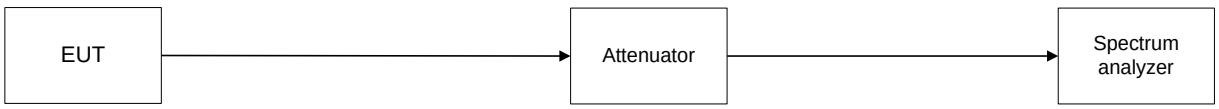
7.2.2 Test procedure

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 modulated carrier.

7.2.2.3 The transmitter minimum 99% bandwidth was measured with spectrum analyzer RBW=1% of EBW as frequency delta between reference points on modulation envelope and provided in Table 7.2.2 and the associated plots.

Figure 7.2.1 The 99% bandwidth test setup



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Table 7.2.2 The 99% bandwidth test results

ASSIGNED FREQUENCY BAND: 5.725 – 5.850 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 1% of the EBW
VIDEO BANDWIDTH: ≥RBW
EBW: 10 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.7300	QPSK	8.9392
	16QAM	8.9257
	64QAM	8.9616
Mid frequency		
5.7880	QPSK	8.9612
	16QAM	8.9389
	64QAM	8.9621
High frequency		
5.8450	QPSK	8.9568
	16QAM	8.9419
	64QAM	8.9477

EBW: 15 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.7325	QPSK	13.4025
	16QAM	13.3981
	64QAM	13.4224
Mid frequency		
5.7880	QPSK	13.4524
	16QAM	13.4483
	64QAM	13.3967
High frequency		
5.8425	QPSK	13.4703
	16QAM	13.4356
	64QAM	13.3886

Test specification:	**FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth**		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1018 hPa	**Power:** 48 VDC
Remarks:			

Table 7.2.2 The 99% bandwidth test results

ASSIGNED FREQUENCY BAND: 5.725 – 5.850 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 1% of the EBW
VIDEO BANDWIDTH: ≥RBW
EBW: 20 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.7350	QPSK	17.8621
	16QAM	17.8908
	64QAM	17.8575
Mid frequency		
5.7880	QPSK	17.8735
	16QAM	17.8928
	64QAM	17.8827
High frequency		
5.8400	QPSK	17.8967
	16QAM	17.8481
	64QAM	17.8505

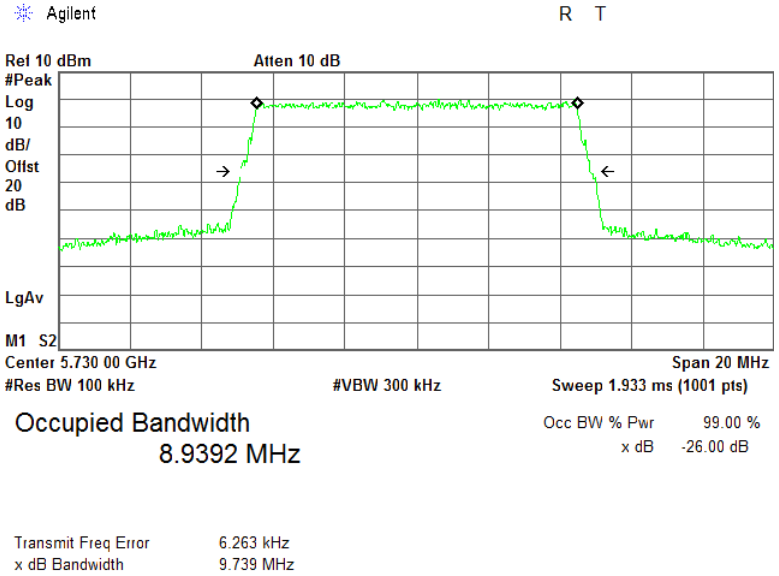
Reference numbers of test equipment used

HL 3901	HL 4355							

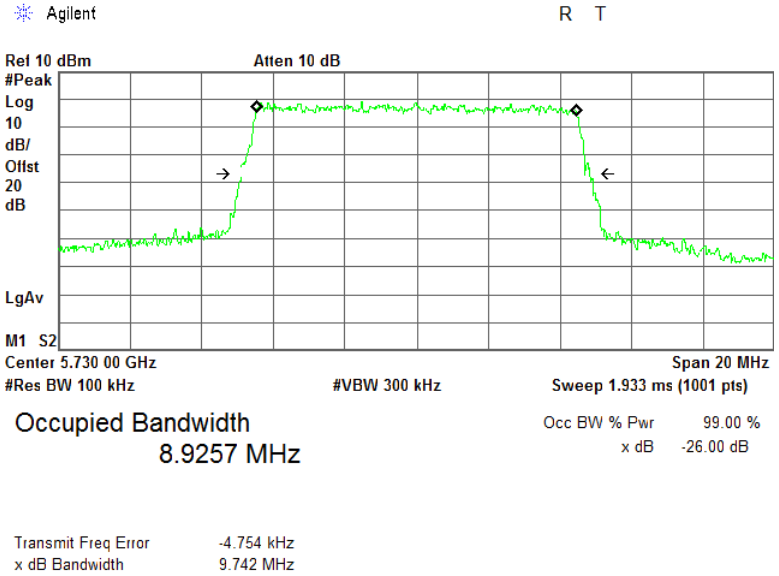
Full description is given in Appendix A.

Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.1 The 99% bandwidth test result at low frequency, QPSK modulation, 10 MHz EBW

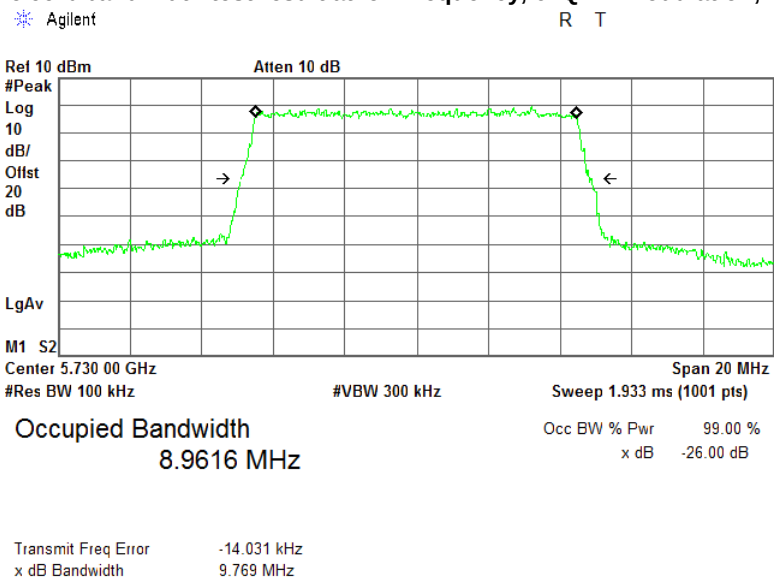


Plot 7.2.2 The 99% bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



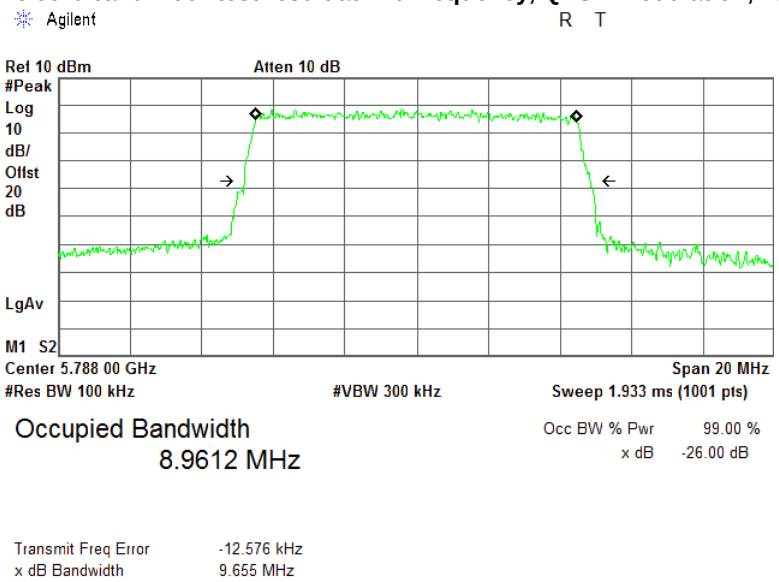
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.3 The 99% bandwidth test result at low frequency, 64QAM modulation, 10 MHz EBW

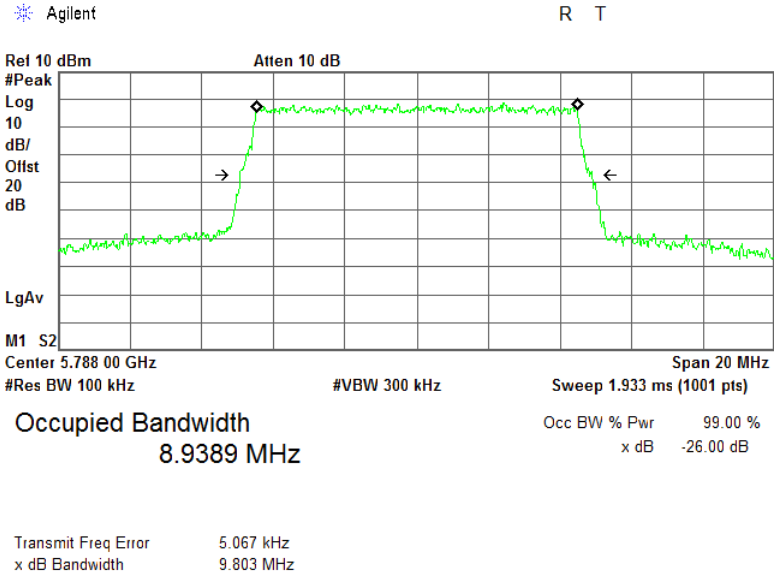


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.4 The 99% bandwidth test result at mid frequency, QPSK modulation, 10 MHz EBW

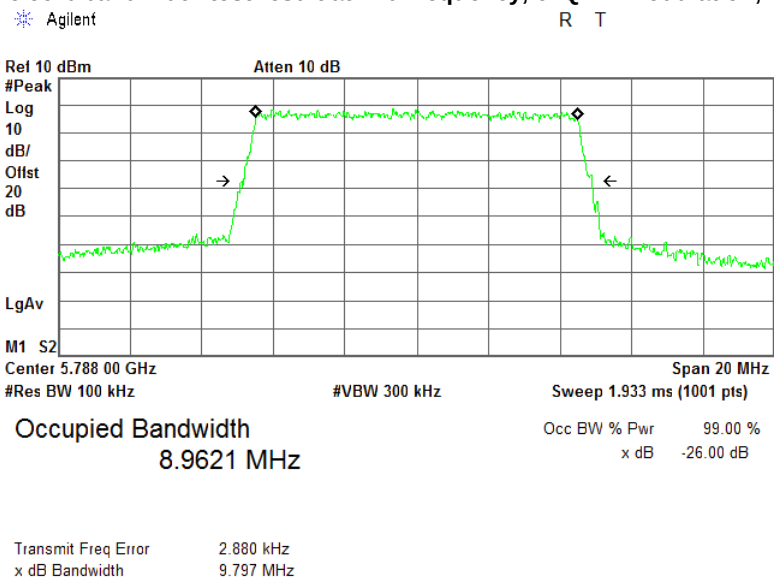


Plot 7.2.5 The 99% bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



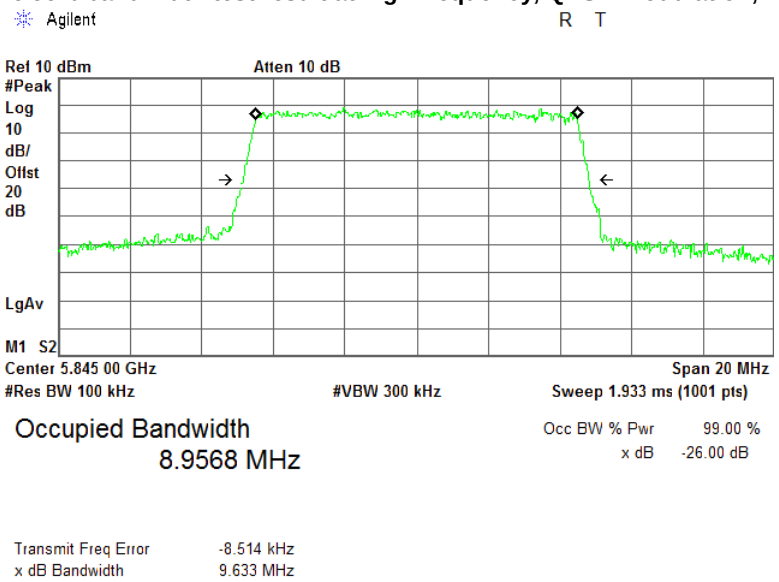
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.6 The 99% bandwidth test result at mid frequency, 64QAM modulation, 10 MHz EBW

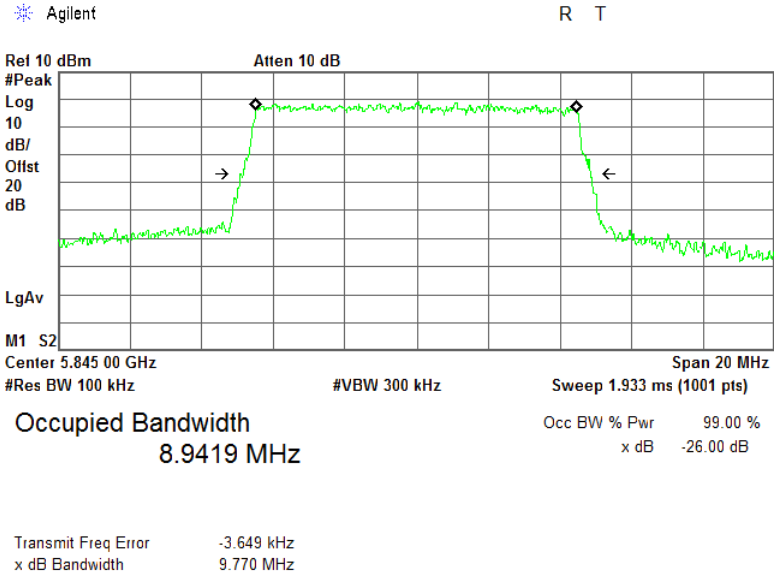


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.7 The 99% bandwidth test result at high frequency, QPSK modulation, 10 MHz EBW

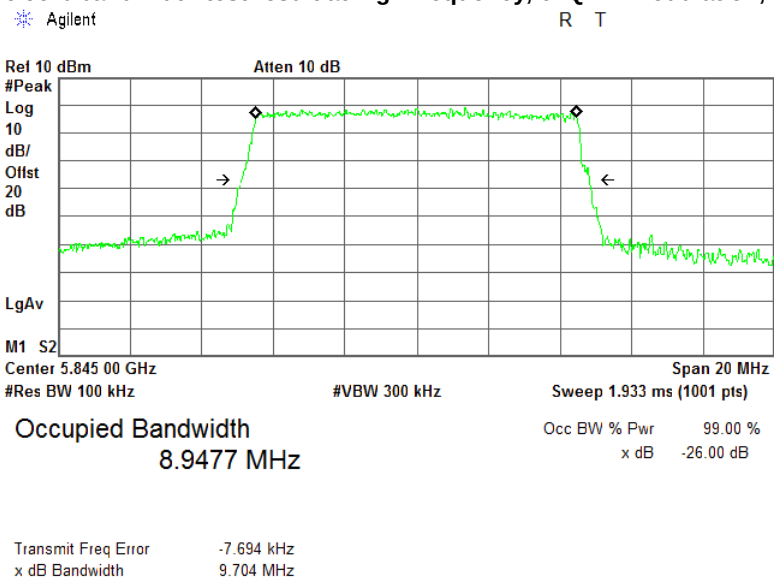


Plot 7.2.8 The 99% bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



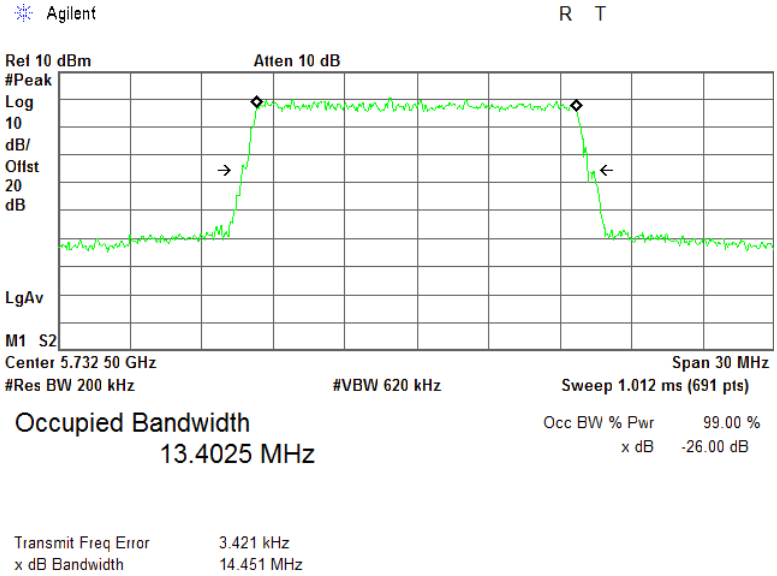
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.9 The 99% bandwidth test result at high frequency, 64QAM modulation, 10 MHz EBW

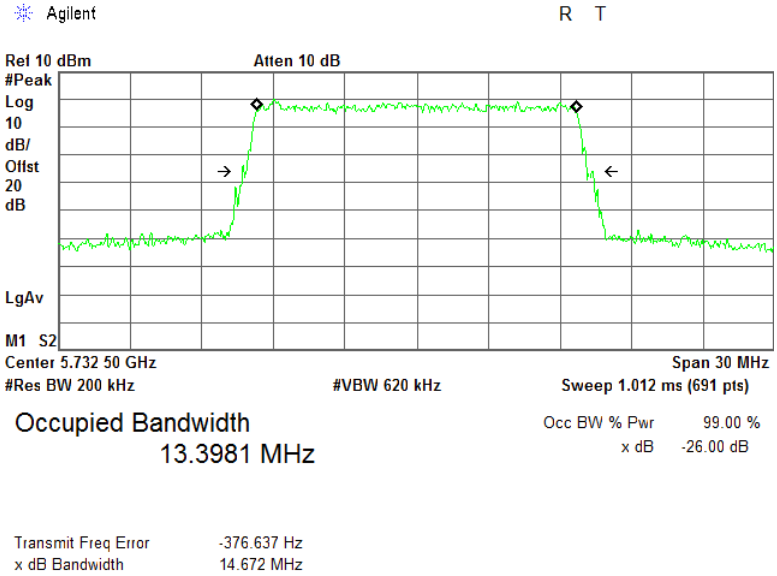


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.10 The 99% bandwidth test result at low frequency, QPSK modulation, 15 MHz EBW

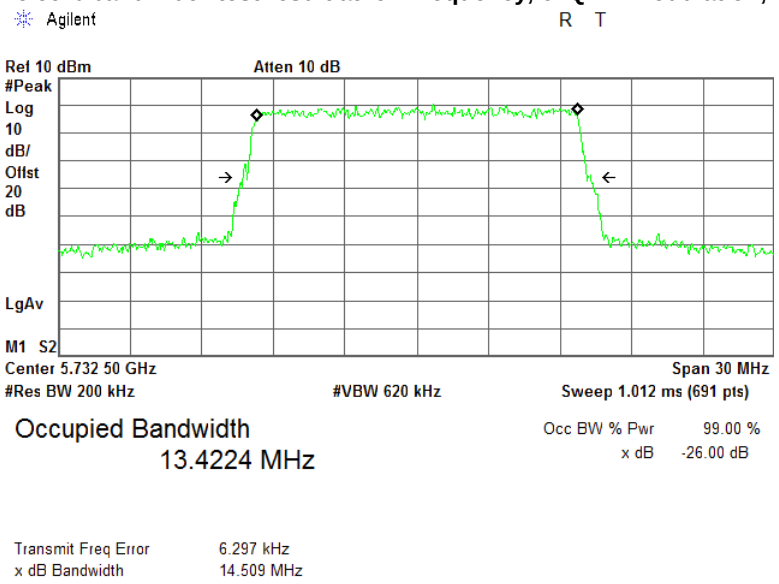


Plot 7.2.11 The 99% bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



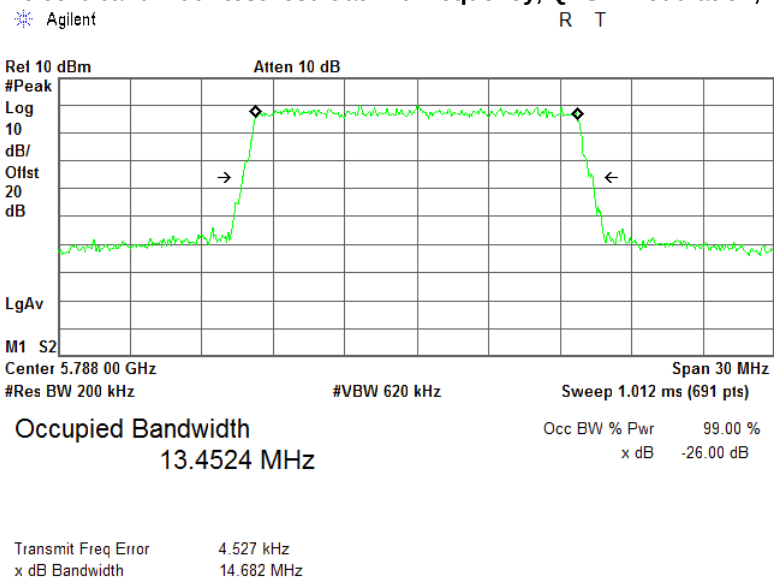
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.12 The 99% bandwidth test result at low frequency, 64QAM modulation, 15 MHz EBW

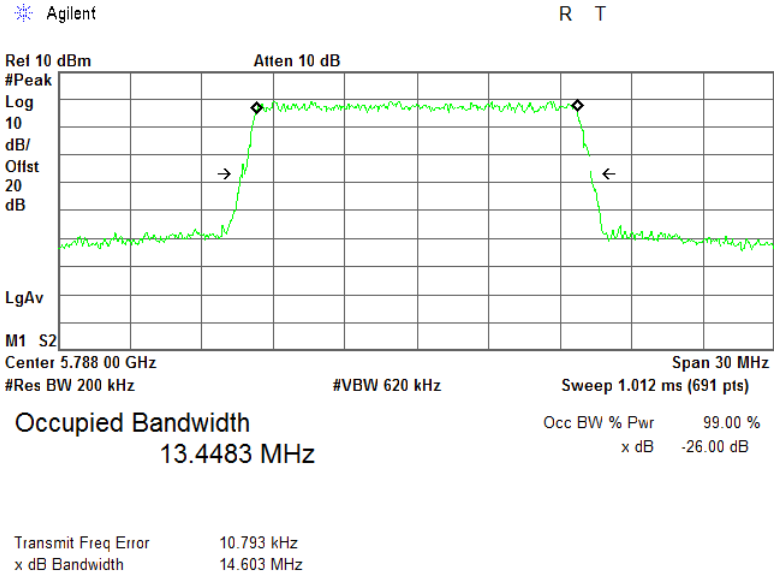


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.13 The 99% bandwidth test result at mid frequency, QPSK modulation, 15 MHz EBW

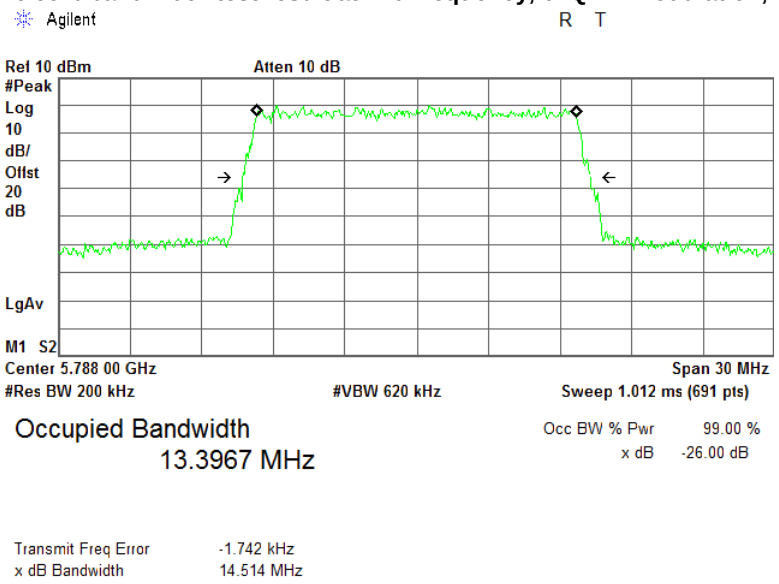


Plot 7.2.14 The 99% bandwidth test result at mid frequency, 16QAM modulation, 15 MHz EBW



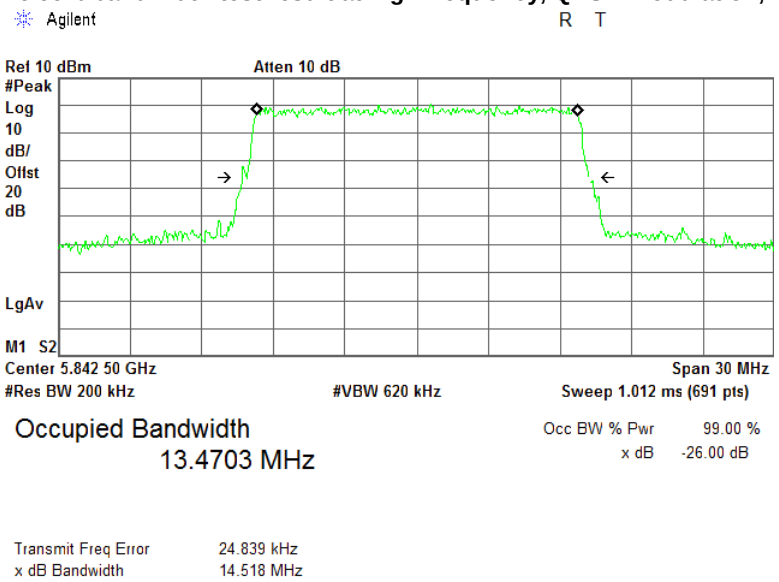
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.15 The 99% bandwidth test result at mid frequency, 64QAM modulation, 15 MHz EBW

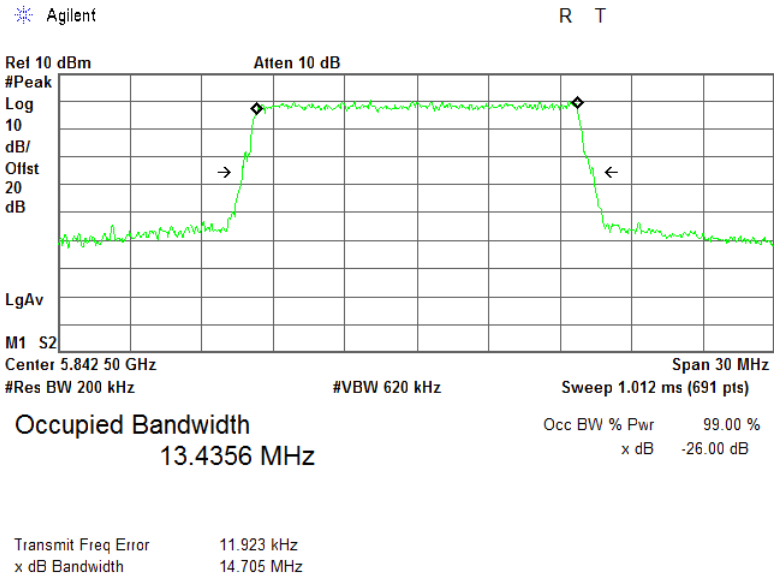


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.16 The 99% bandwidth test result at high frequency, QPSK modulation, 15 MHz EBW

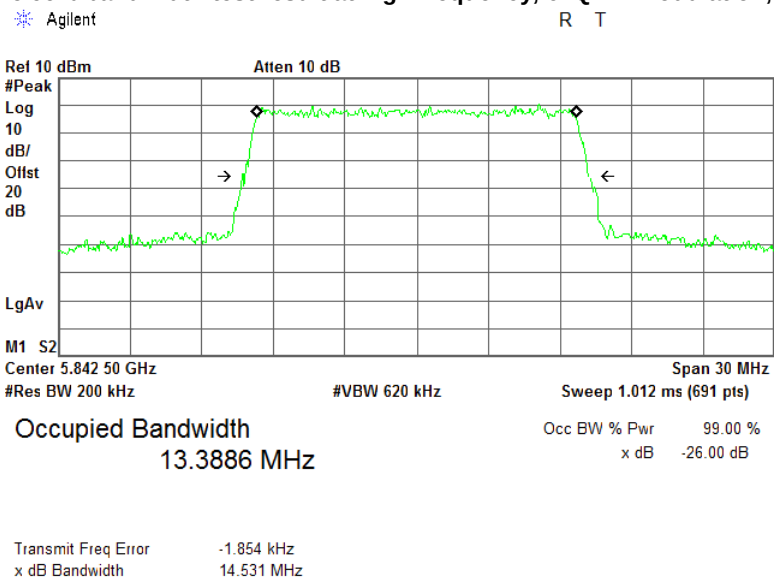


Plot 7.2.17 The 99% bandwidth test result at high frequency, 16QAM modulation, 15 MHz EBW



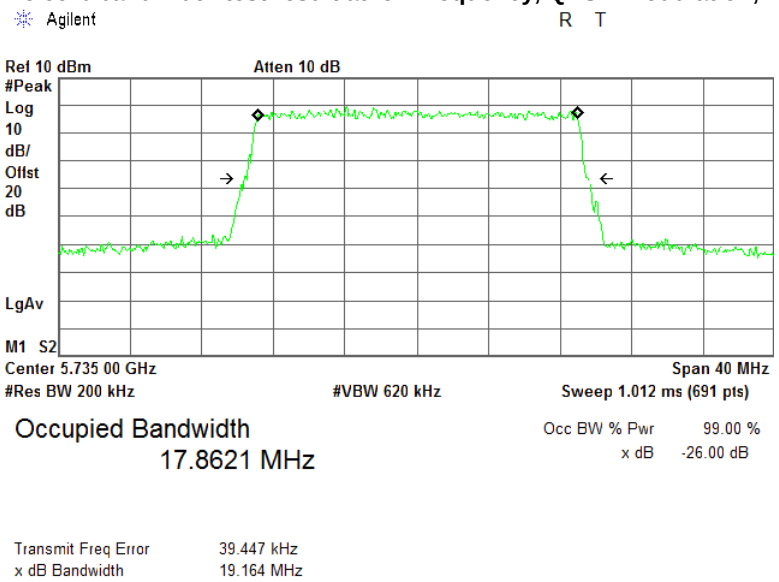
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.18 The 99% bandwidth test result at high frequency, 64QAM modulation, 15 MHz EBW

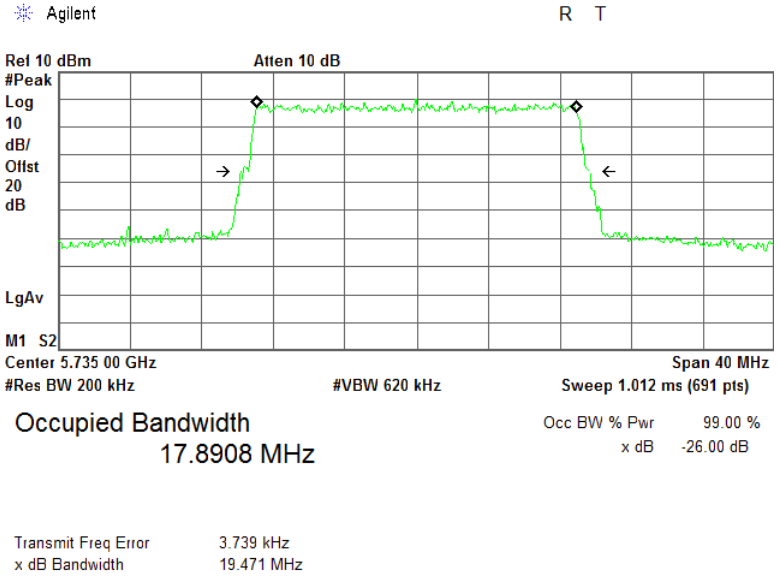


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.19 The 99% bandwidth test result at low frequency, QPSK modulation, 20 MHz EBW

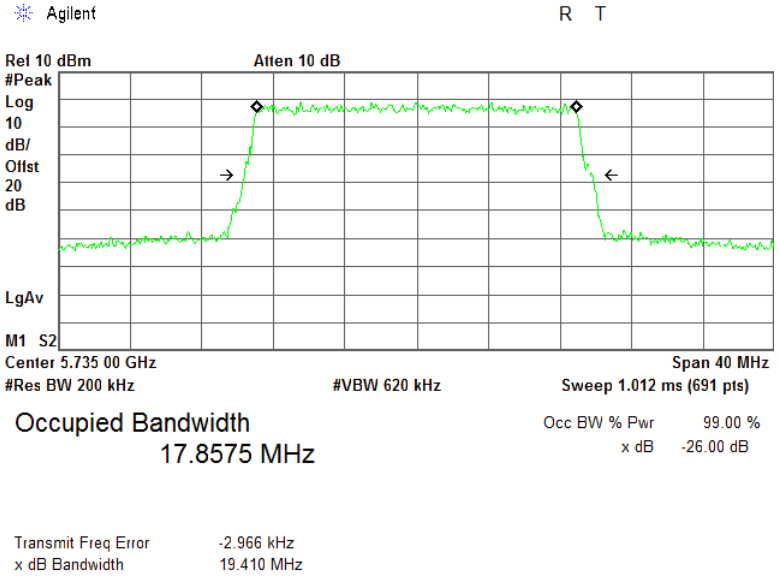


Plot 7.2.20 The 99% bandwidth test result at low frequency, 16QAM modulation, 20 MHz EBW



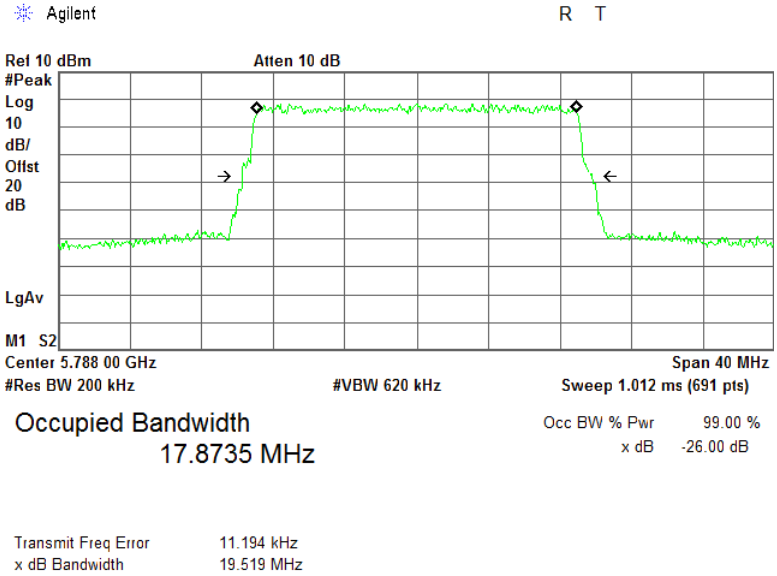
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.21 The 99% bandwidth test result at low frequency, 64QAM modulation, 20 MHz EBW

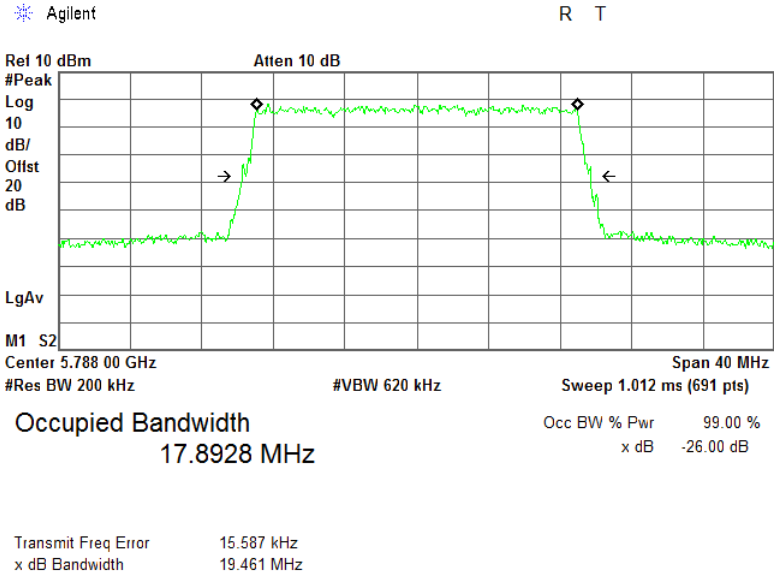


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.22 The 99% bandwidth test result at mid frequency, QPSK modulation, 20 MHz EBW

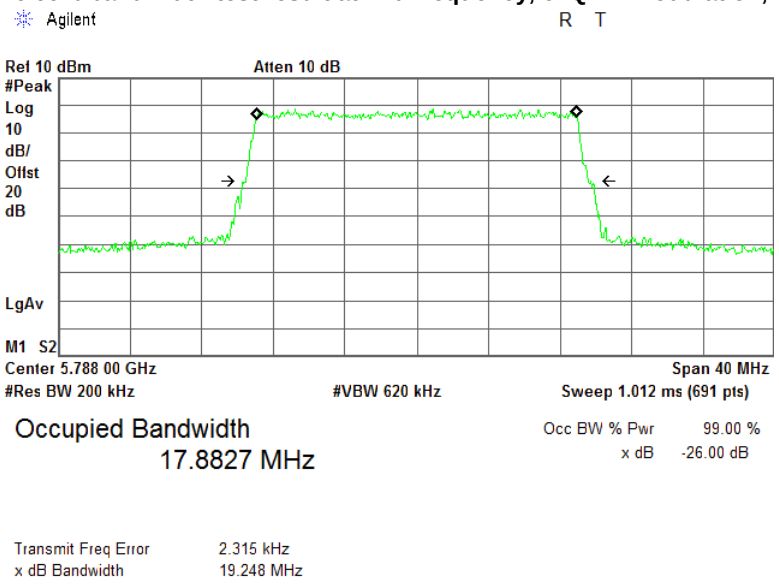


Plot 7.2.23 The 99% bandwidth test result at mid frequency, 16QAM modulation, 20 MHz EBW



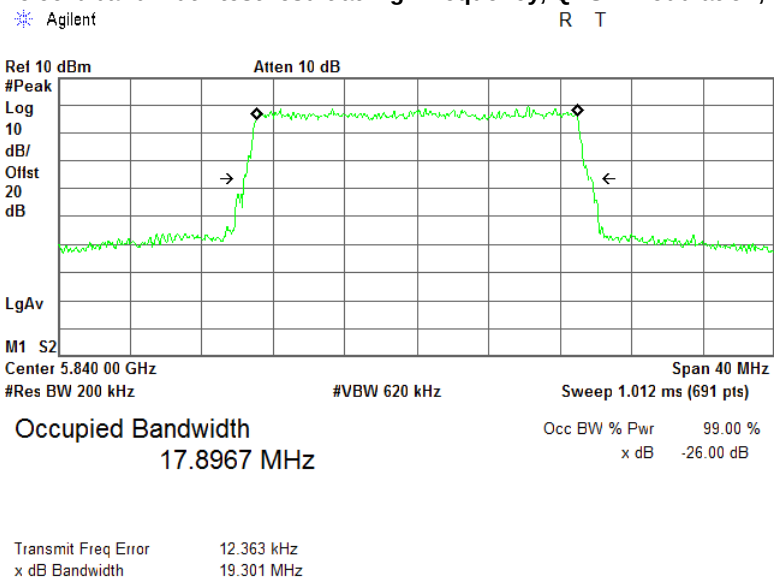
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.24 The 99% bandwidth test result at mid frequency, 64QAM modulation, 20 MHz EBW

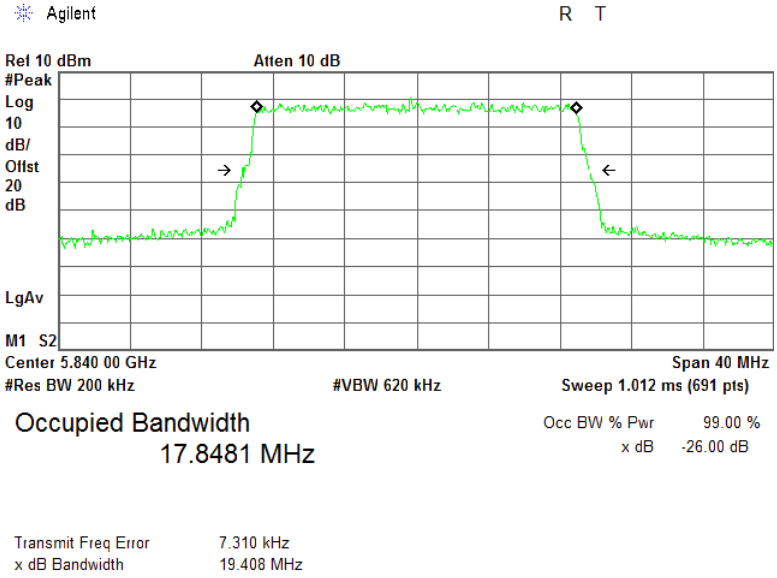


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.25 The 99% bandwidth test result at high frequency, QPSK modulation, 20 MHz EBW

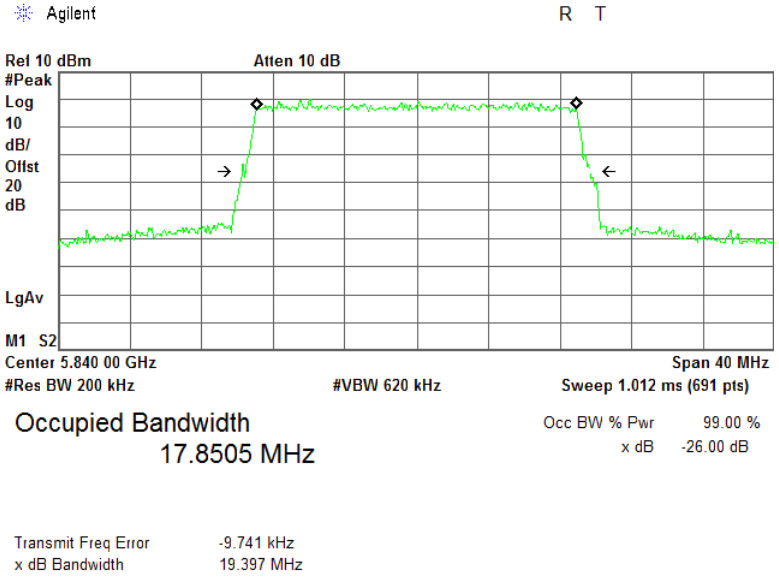


Plot 7.2.26 The 99% bandwidth test result at high frequency, 16QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.27 The 99% bandwidth test result at high frequency, 64QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

7.3 Occupied 26 dB bandwidth at 5150 – 5250 MHz range

7.3.1 General

This test was performed to measure 26 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.3.1.

Table 7.3.1 The 26 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, kHz
5150.0 – 5250.0	26.0	NA
5725.0 – 5850.0	26.0	NA

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

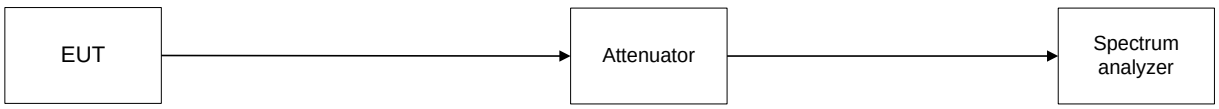
7.3.2 Test procedure

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

7.3.2.2 The EUT was set to transmit modulated carrier.

7.3.2.3 The transmitter minimum 26 dB bandwidth was measured with spectrum analyzer RBW=1% of EBW as frequency delta between reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 The 26 dB bandwidth test setup



Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Table 7.3.2 The 26 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 5.15 – 5.25 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 1% of the EBW
VIDEO BANDWIDTH: ≥RBW
EBW: 10 MHz

Carrier frequency, GHz	Modulation	26 dB bandwidth, MHz
Low frequency		
5.160	QPSK	9.808
	16QAM	9.820
	64QAM	9.692
Mid frequency		
5.200	QPSK	9.832
	16QAM	9.772
	64QAM	9.785
High frequency		
5.245	QPSK	9.814
	16QAM	9.799
	64QAM	9.739

EBW: 15 MHz

Carrier frequency, GHz	Modulation	26 dB bandwidth, MHz
Low frequency		
5.165	QPSK	14.707
	16QAM	14.627
	64QAM	14.564
Mid frequency		
5.200	QPSK	14.652
	16QAM	14.635
	64QAM	14.541
High frequency		
5.240	QPSK	14.806
	16QAM	14.503
	64QAM	14.597

Test specification:	**FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth**		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1018 hPa	**Power:** 48 VDC
Remarks:			

Table 7.3.3 The 26 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 5.15 – 5.25 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 1% of the EBW
VIDEO BANDWIDTH: ≥RBW
EBW: 20 MHz

Carrier frequency, GHz	Modulation	26 dB bandwidth, MHz
Low frequency		
5.165	QPSK	19.349
	16QAM	19.259
	64QAM	19.384
Mid frequency		
5.200	QPSK	19.369
	16QAM	19.446
	64QAM	19.312
High frequency		
5.240	QPSK	19.403
	16QAM	19.180
	64QAM	19.380

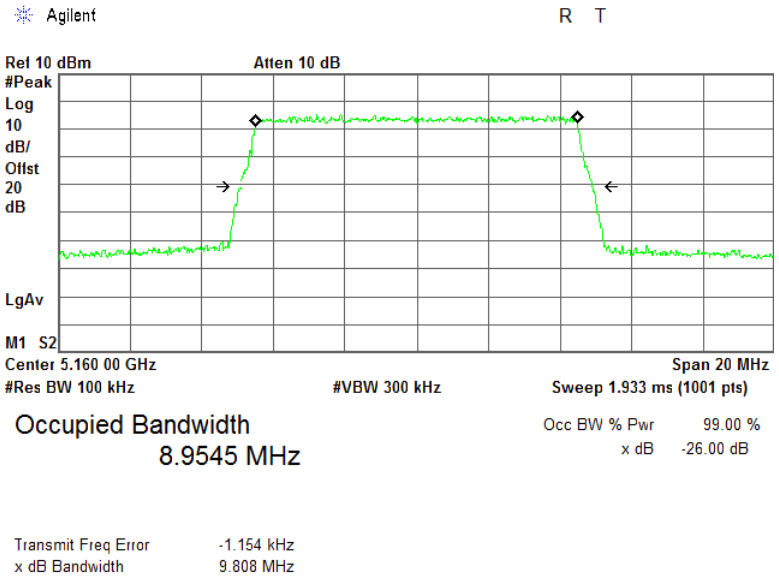
Reference numbers of test equipment used

HL 3901	HL 4068							

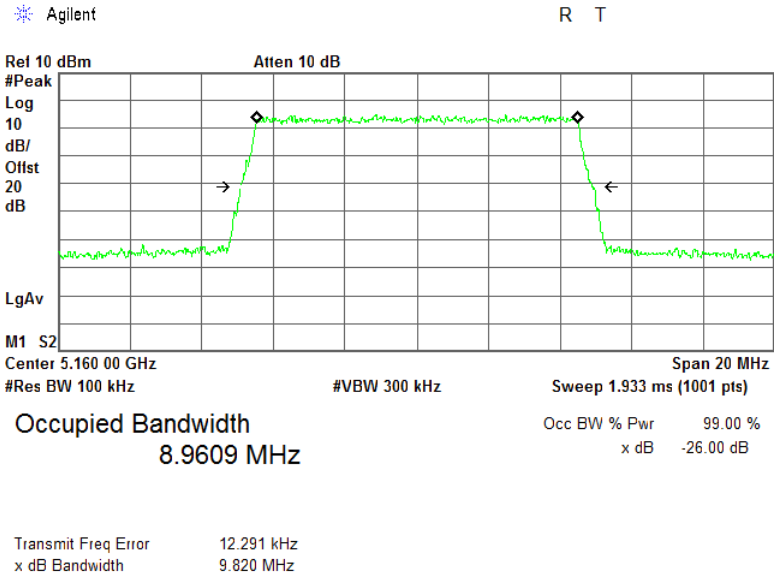
Full description is given in Appendix A.

Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.1 The 26 dB bandwidth test result at low frequency, QPSK modulation, 10 MHz EBW

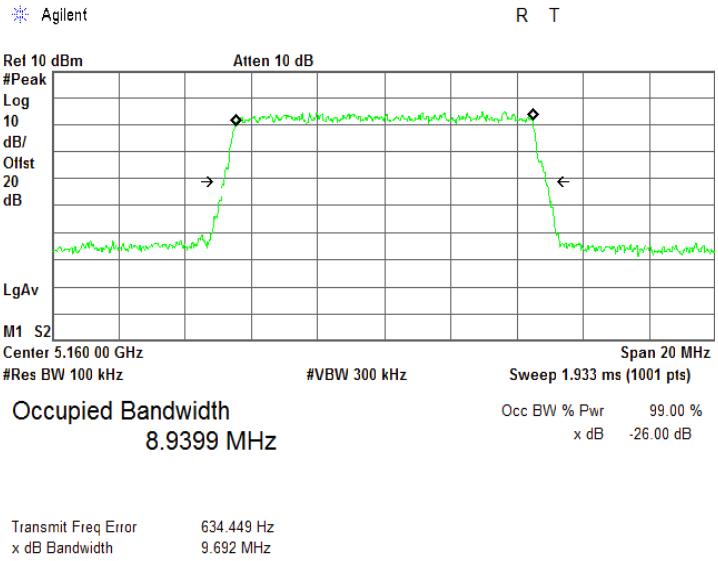


Plot 7.3.2 The 26 dB bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



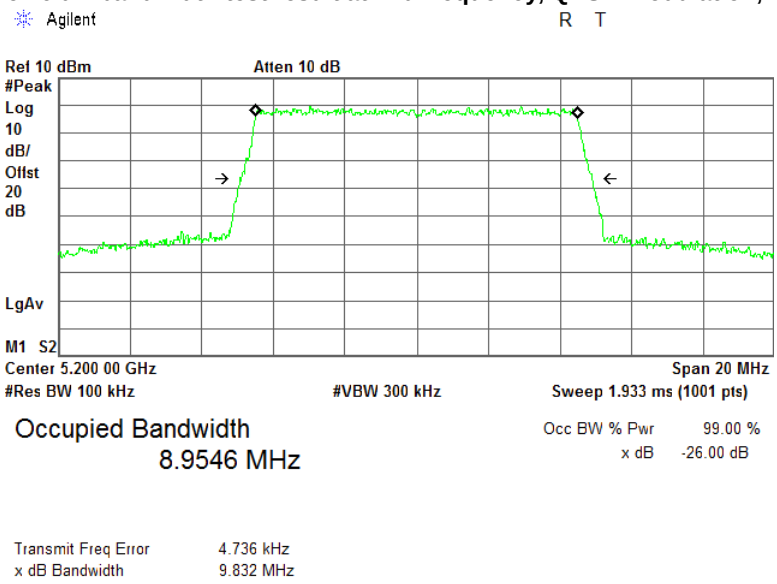
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.3 The 26 dB bandwidth test result at low frequency, 64QAM modulation, 10 MHz EBW

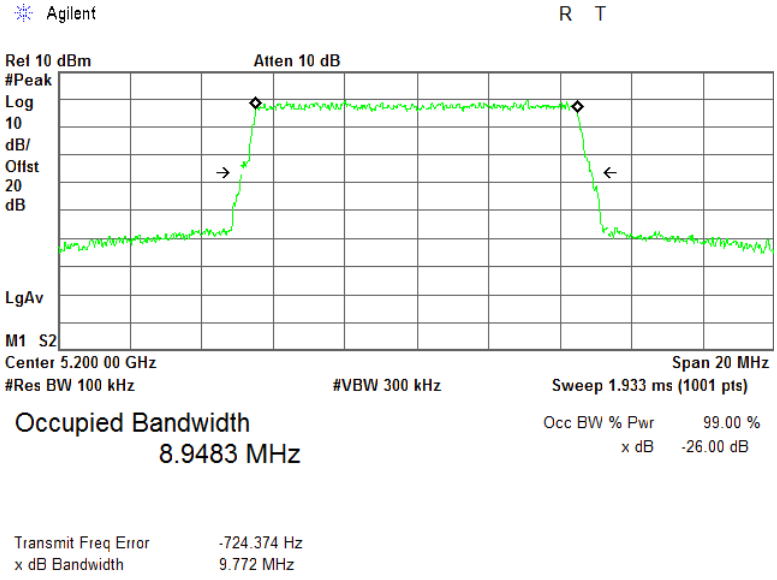


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.4 The 26 dB bandwidth test result at mid frequency, QPSK modulation, 10 MHz EBW

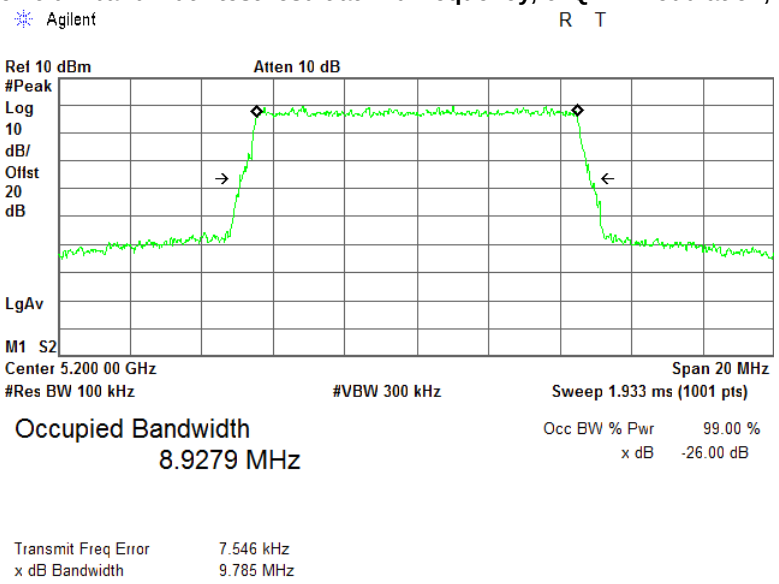


Plot 7.3.5 The 26 dB bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



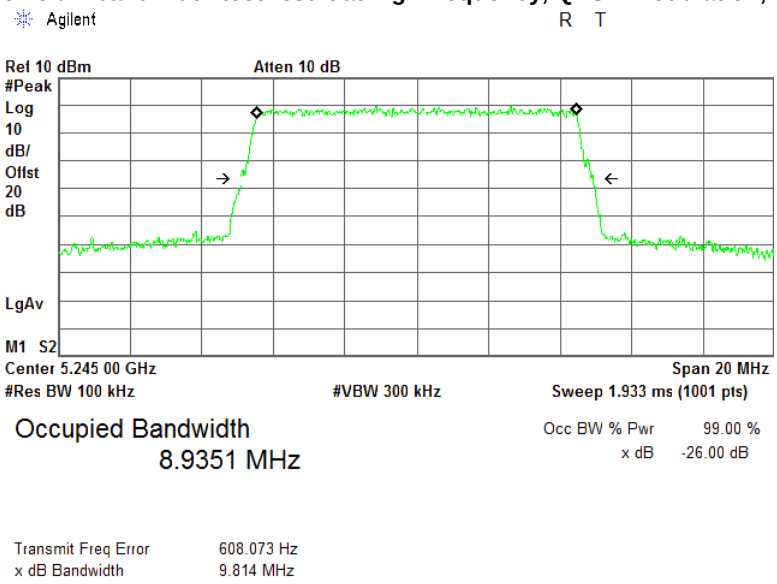
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.6 The 26 dB bandwidth test result at mid frequency, 64QAM modulation, 10 MHz EBW

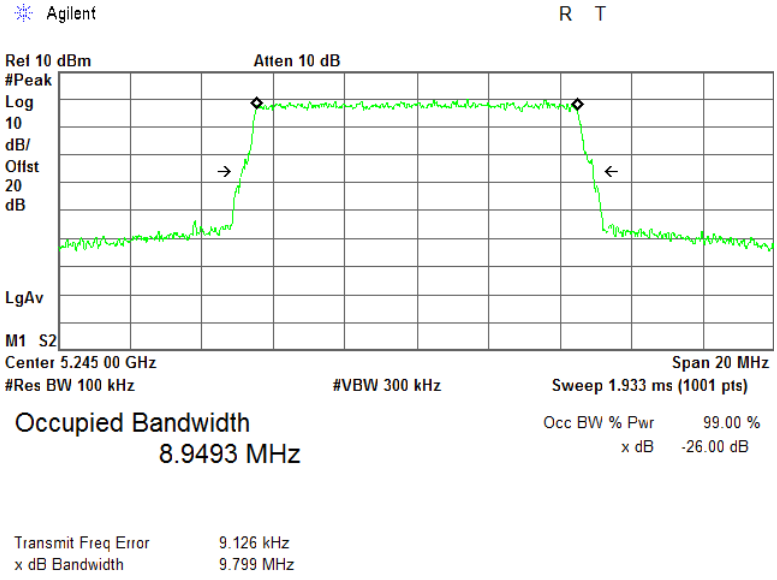


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.7 The 26 dB bandwidth test result at high frequency, QPSK modulation, 10 MHz EBW

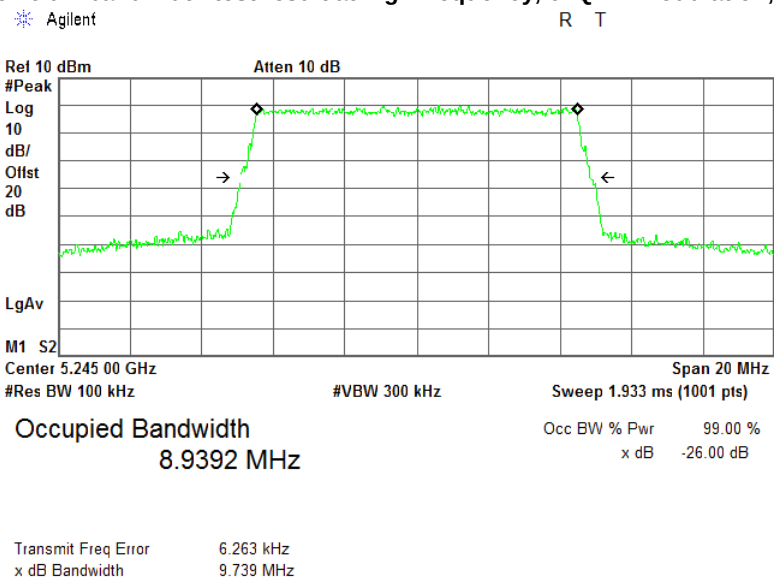


Plot 7.3.8 The 26 dB bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



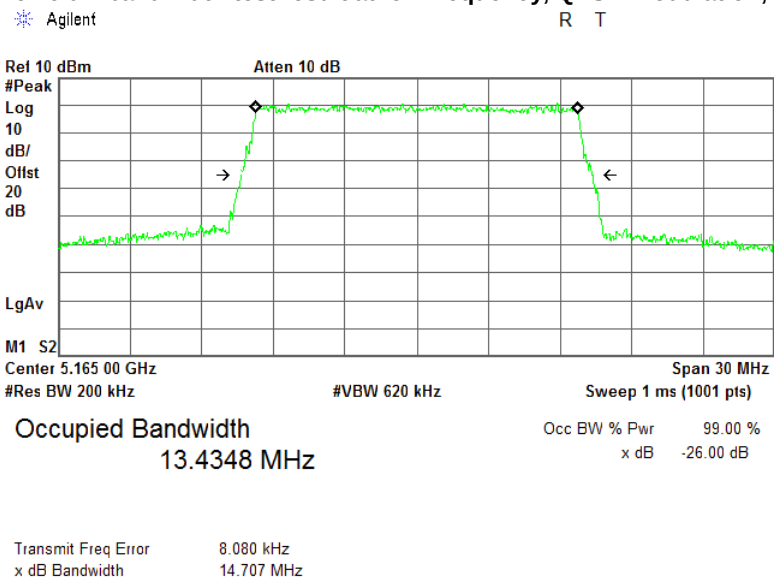
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.9 The 26 dB bandwidth test result at high frequency, 64QAM modulation, 10 MHz EBW

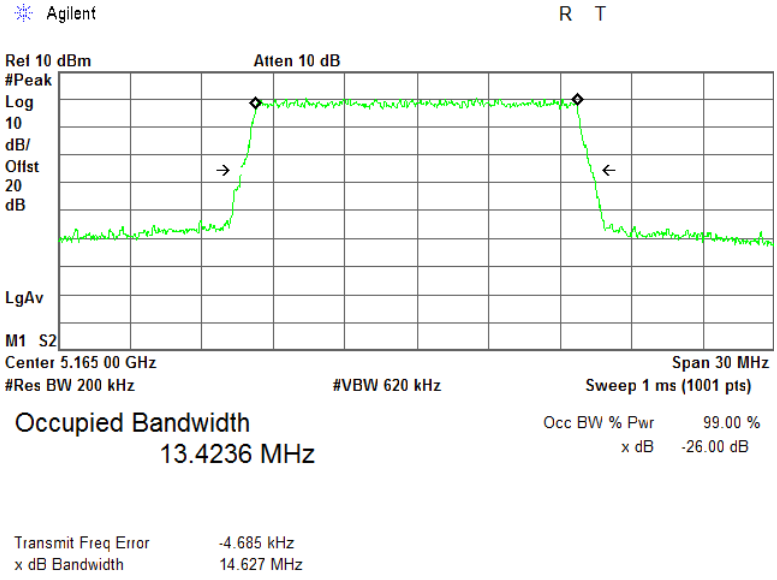


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.10 The 26 dB bandwidth test result at low frequency, QPSK modulation, 15 MHz EBW

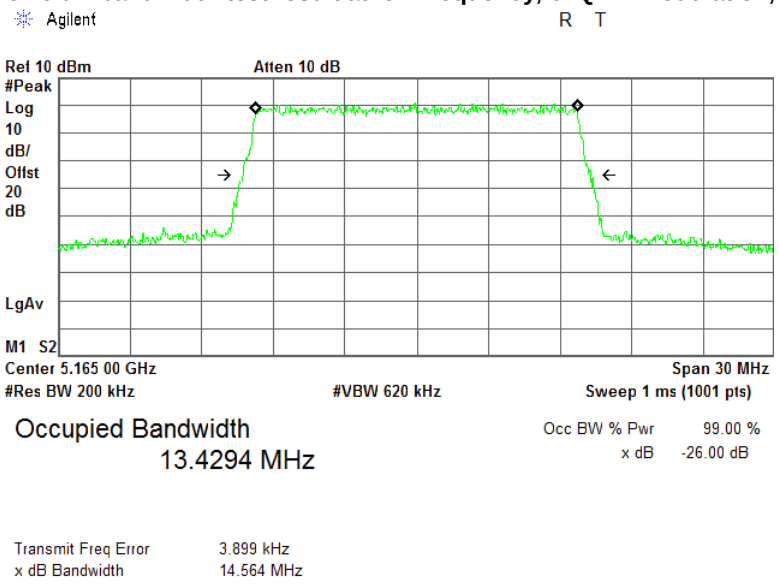


Plot 7.3.11 The 26 dB bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



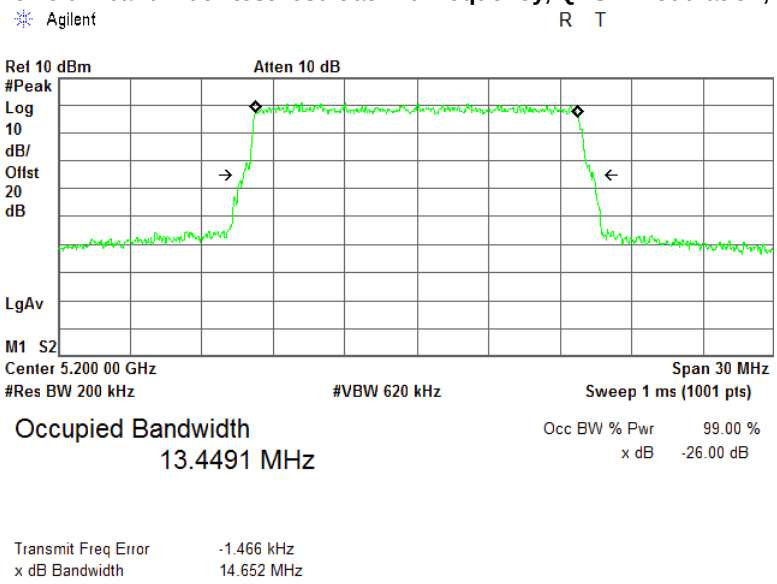
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.12 The 26 dB bandwidth test result at low frequency, 64QAM modulation, 15 MHz EBW

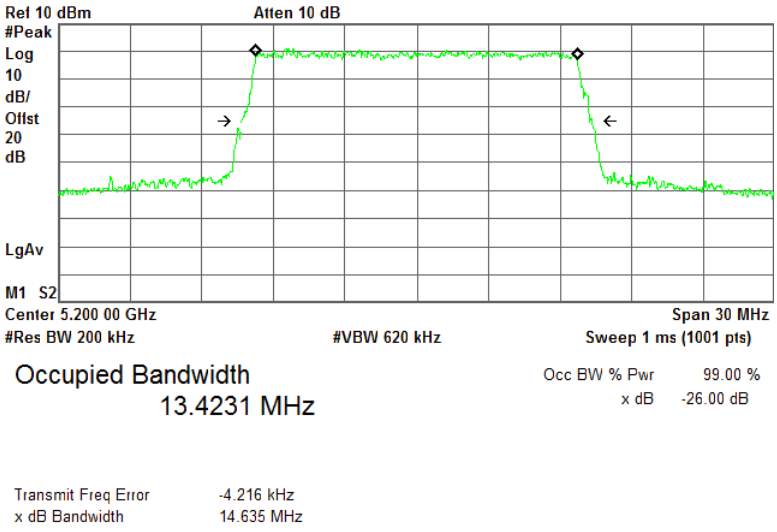


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.13 The 26 dB bandwidth test result at mid frequency, QPSK modulation, 15 MHz EBW

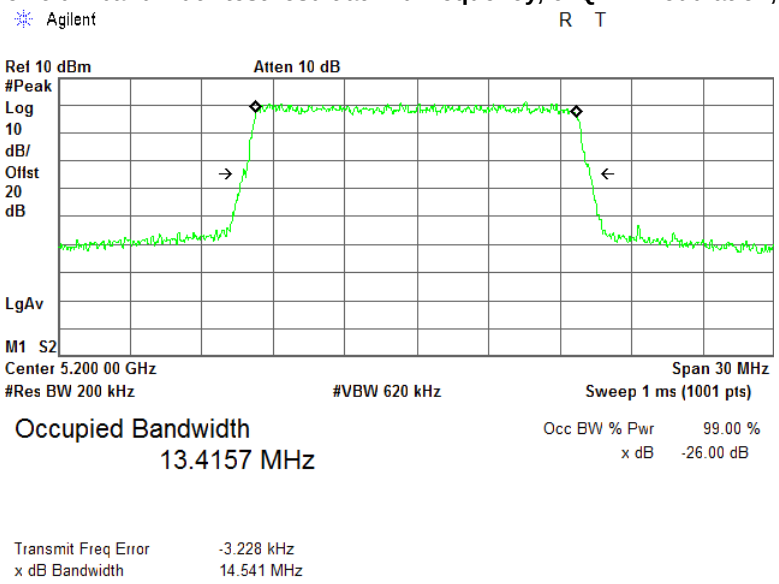


Plot 7.3.14 The 26 dB bandwidth test result at mid frequency, 16QAM modulation, 15 MHz EBW



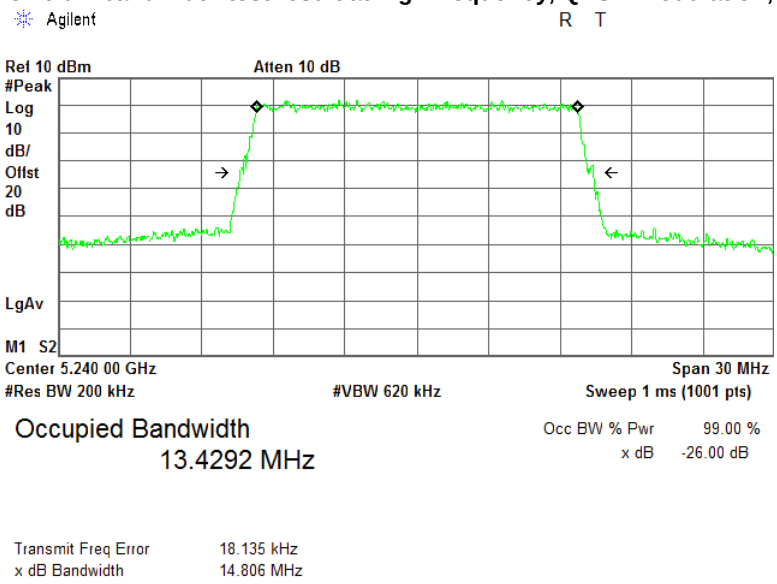
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.15 The 26 dB bandwidth test result at mid frequency, 64QAM modulation, 15 MHz EBW

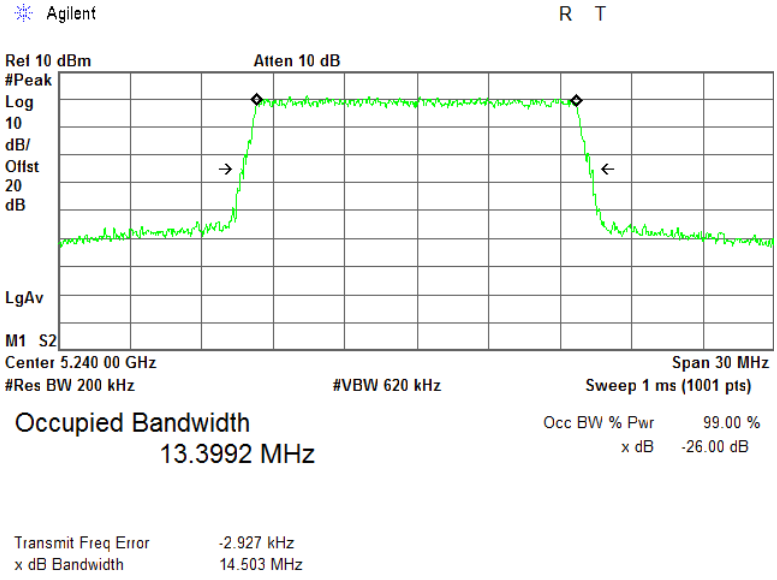


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.16 The 26 dB bandwidth test result at high frequency, QPSK modulation, 15 MHz EBW

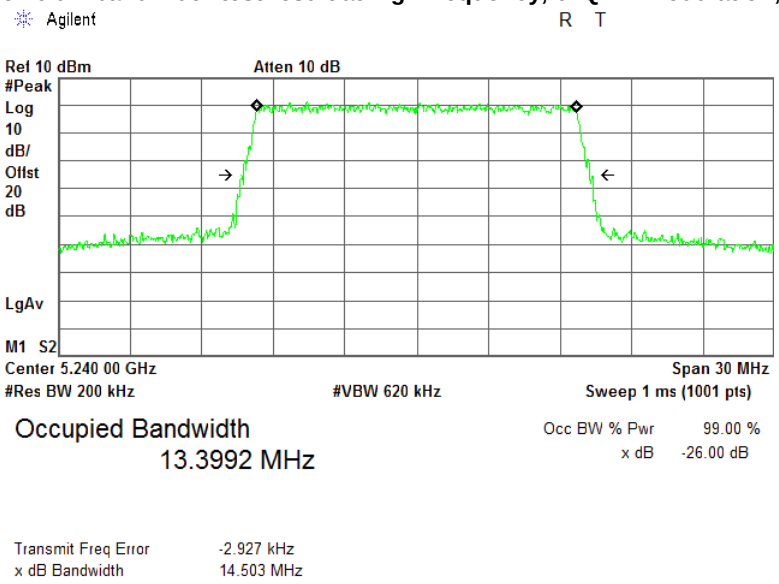


Plot 7.3.17 The 26 dB bandwidth test result at high frequency, 16QAM modulation, 15 MHz EBW



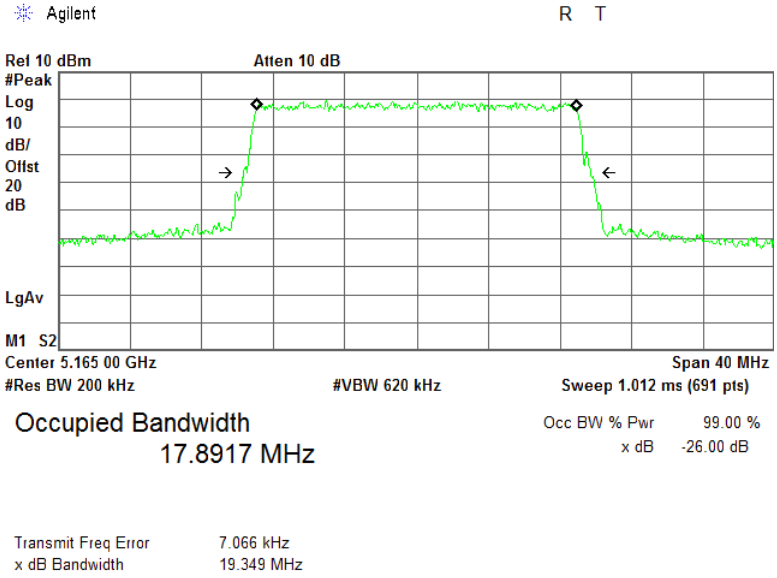
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.18 The 26 dB bandwidth test result at high frequency, 64QAM modulation, 15 MHz EBW

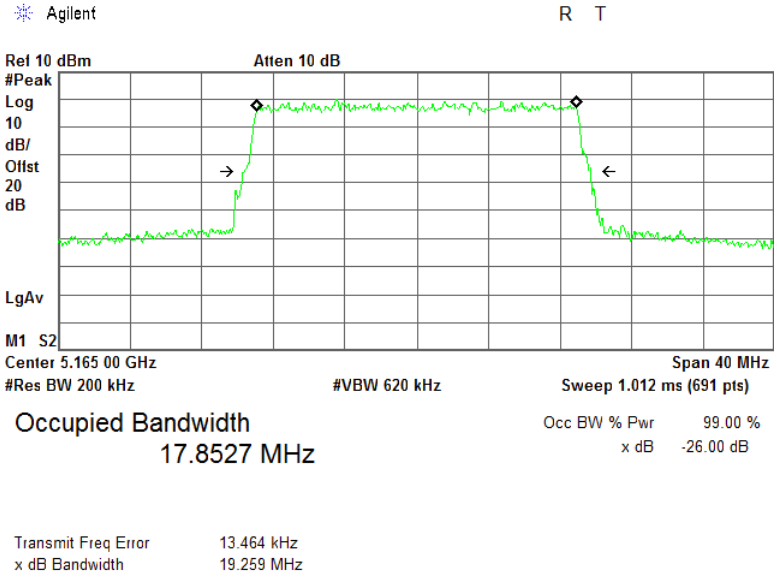


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.19 The 26 dB bandwidth test result at low frequency, QPSK modulation, 20 MHz EBW

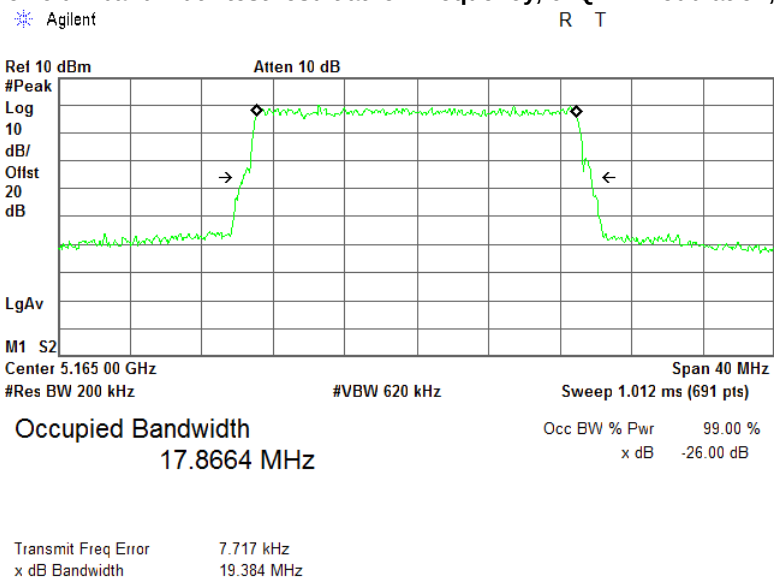


Plot 7.3.20 The 26 dB bandwidth test result at low frequency, 16QAM modulation, 20 MHz EBW



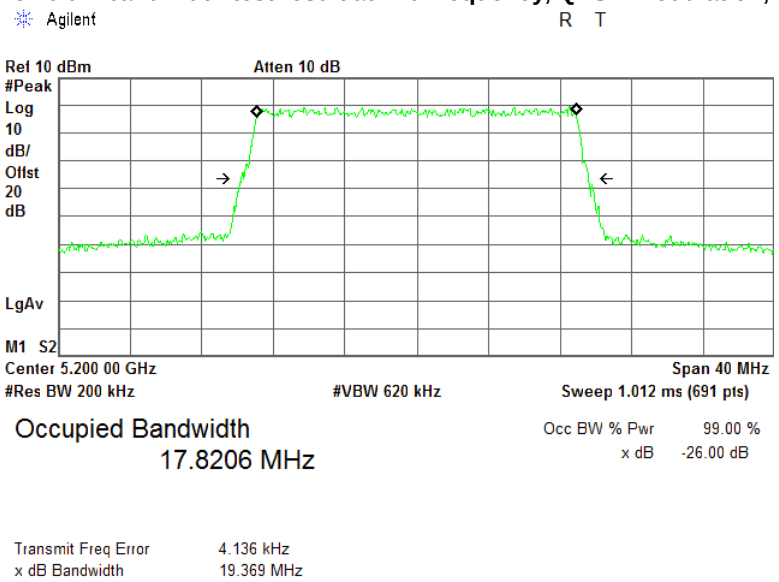
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.21 The 26 dB bandwidth test result at low frequency, 64QAM modulation, 20 MHz EBW

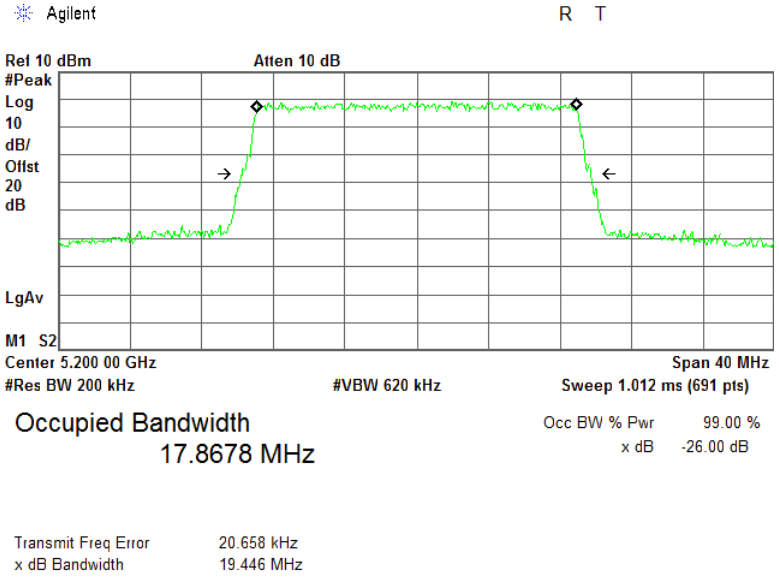


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.22 The 26 dB bandwidth test result at mid frequency, QPSK modulation, 20 MHz EBW

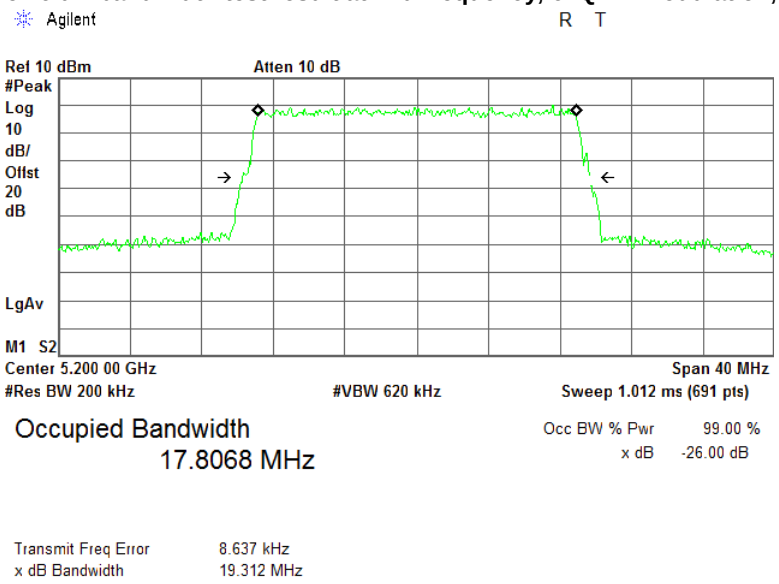


Plot 7.3.23 The 26 dB bandwidth test result at mid frequency, 16QAM modulation, 20 MHz EBW



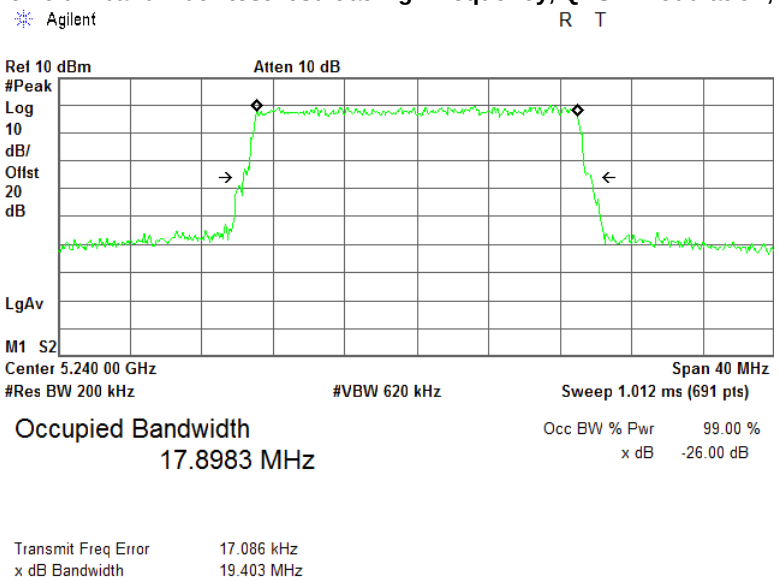
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.24 The 26 dB bandwidth test result at mid frequency, 64QAM modulation, 20 MHz EBW

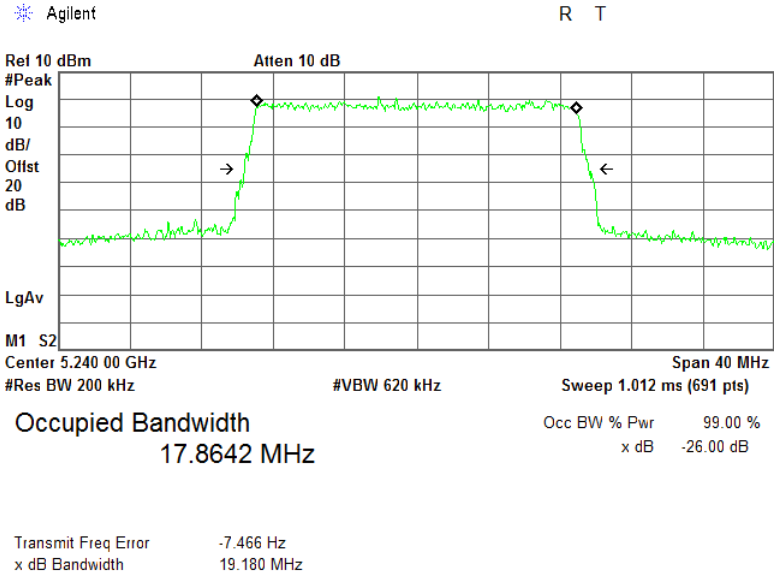


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.25 The 26 dB bandwidth test result at high frequency, QPSK modulation, 20 MHz EBW

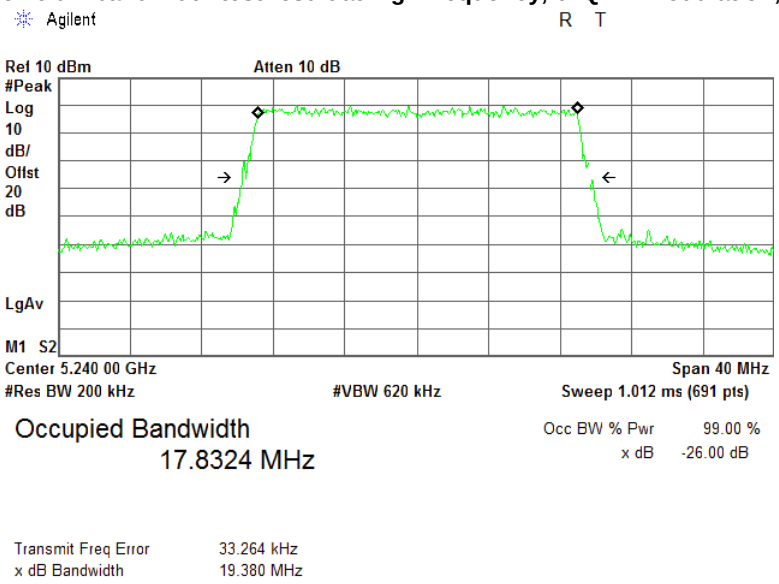


Plot 7.3.26 The 26 dB bandwidth test result at high frequency, 16QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.27 The 26 dB bandwidth test result at high frequency, 64QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

7.4 Occupied 99% bandwidth at 5150 – 5250 MHz range

7.4.1 General

This test was performed to measure 99% bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.4.1.

Table 7.4.1 The 99% bandwidth limits

Assigned frequency, MHz	Modulation envelope, 99%	Minimum bandwidth, kHz
5150.0 – 5250.0	99	NA
5725.0 – 5850.0	99	NA

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

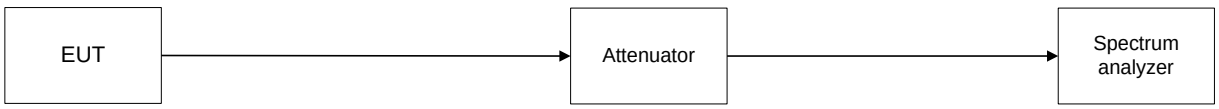
7.4.2 Test procedure

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 set to transmit modulated carrier.

7.4.2.3 The transmitter minimum 99% bandwidth was measured with spectrum analyzer RBW=1% of EBW as frequency delta between reference points on modulation envelope and provided in Table 7.4.2 and the associated plots.

Figure 7.4.1 The 99% bandwidth test setup



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Table 7.4.2 The 99% bandwidth test results

ASSIGNED FREQUENCY BAND: 5.15 – 5.25 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 1% of the EBW
VIDEO BANDWIDTH: ≥RBW
EBW: 10 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.160	QPSK	8.9545
	16QAM	8.9609
	64QAM	8.9399
Mid frequency		
5.200	QPSK	8.9546
	16QAM	8.9483
	64QAM	8.9279
High frequency		
5.245	QPSK	8.9351
	16QAM	8.9493
	64QAM	8.9392

EBW: 15 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.165	QPSK	13.4348
	16QAM	13.4236
	64QAM	13.4294
Mid frequency		
5.200	QPSK	13.4491
	16QAM	13.4231
	64QAM	13.4157
High frequency		
5.240	QPSK	13.4292
	16QAM	13.3992
	64QAM	13.3898

Test specification:	**FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth**		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1018 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.3 The 99% bandwidth test results

ASSIGNED FREQUENCY BAND: 5.15 – 5.25 GHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 1% of the EBW
VIDEO BANDWIDTH: ≥RBW
EBW: 20 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.165	QPSK	17.8917
	16QAM	17.8527
	64QAM	17.8664
Mid frequency		
5.200	QPSK	17.8206
	16QAM	17.8678
	64QAM	17.8068
High frequency		
5.240	QPSK	17.8983
	16QAM	17.8642
	64QAM	17.8324

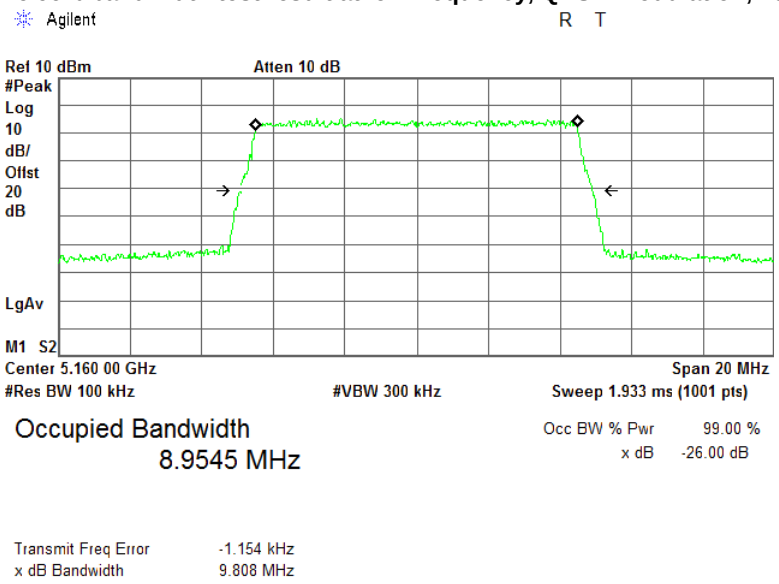
Reference numbers of test equipment used

HL 3901	HL 4068							

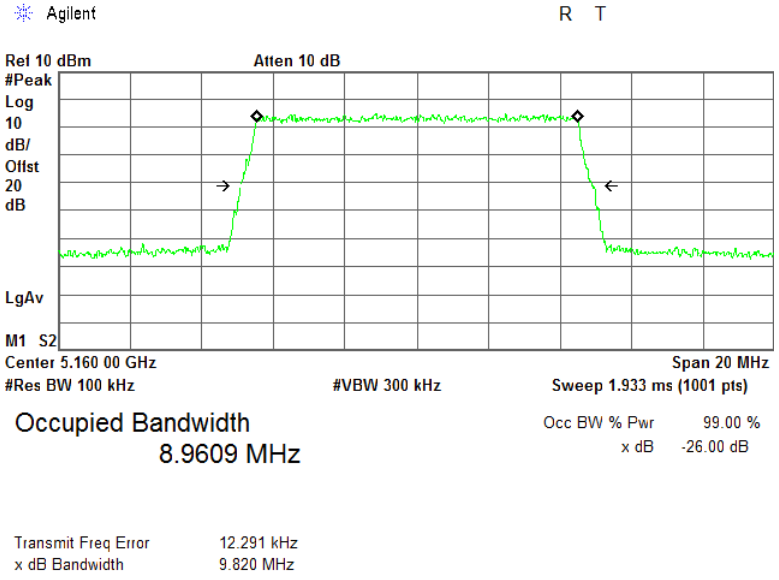
Full description is given in Appendix A.

Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.1 The 99% bandwidth test result at low frequency, QPSK modulation, 10 MHz EBW

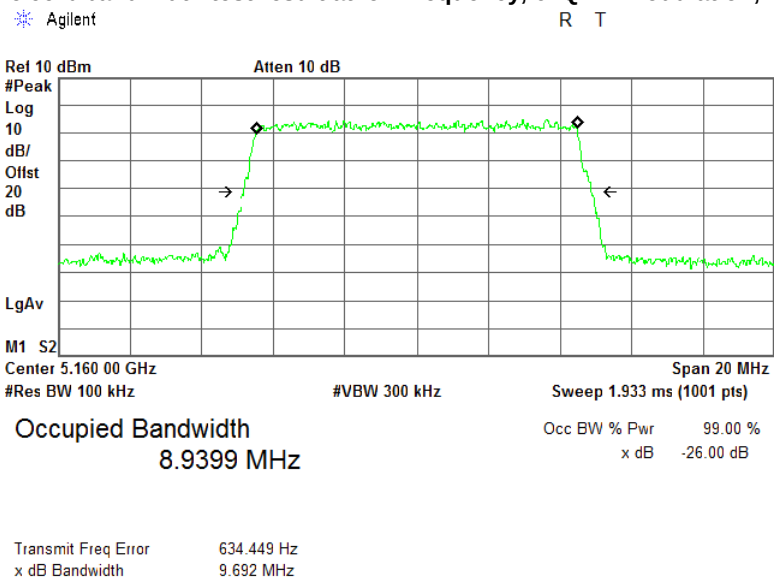


Plot 7.4.2 The 99% bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



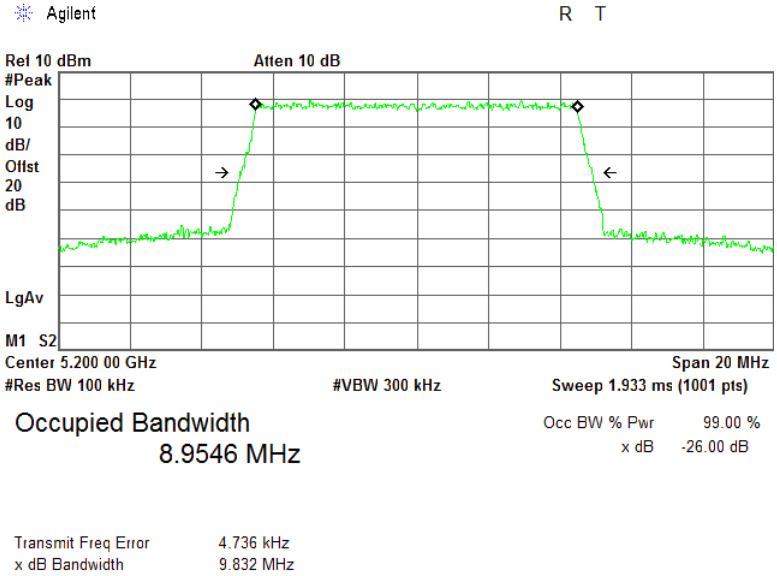
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.3 The 99% bandwidth test result at low frequency, 64QAM modulation, 10 MHz EBW

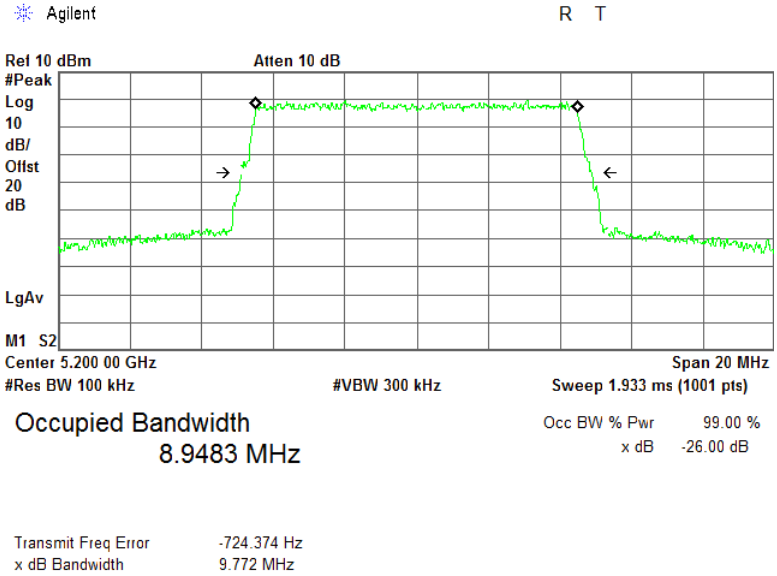


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.4 The 99% bandwidth test result at mid frequency, QPSK modulation, 10 MHz EBW

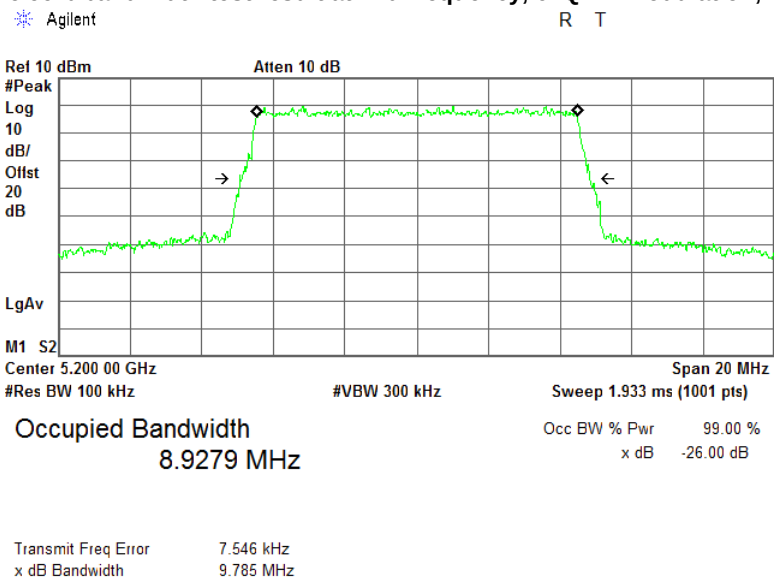


Plot 7.4.5 The 99% bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



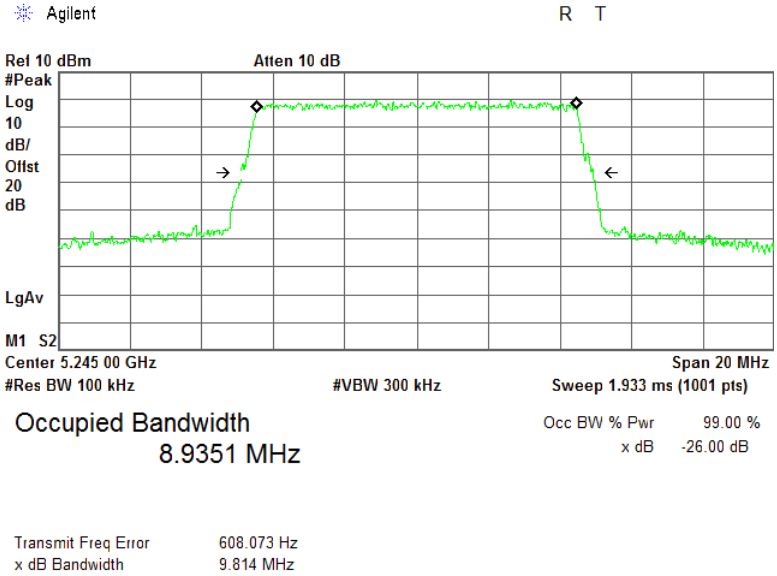
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.6 The 99% bandwidth test result at mid frequency, 64QAM modulation, 10 MHz EBW

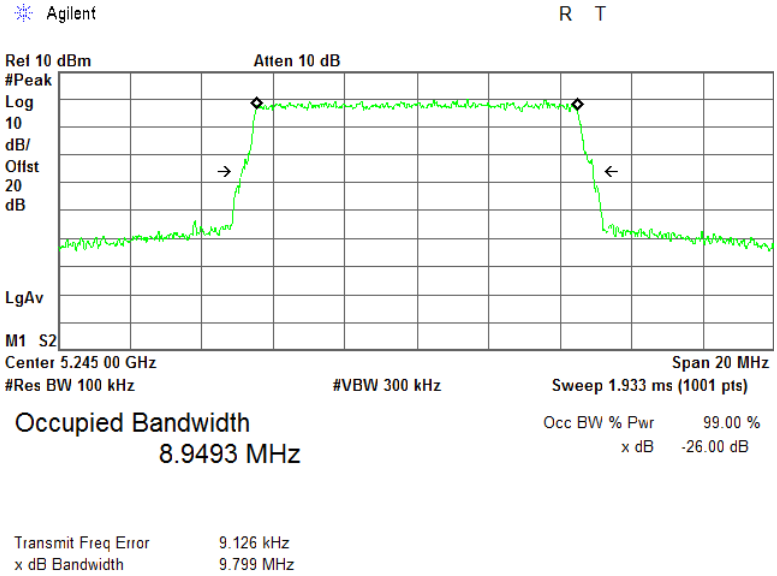


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.7 The 99% bandwidth test result at high frequency, QPSK modulation, 10 MHz EBW

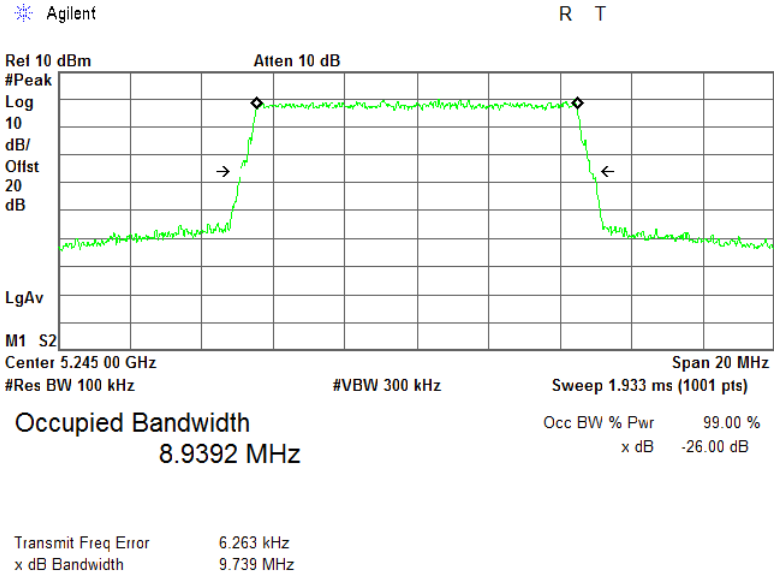


Plot 7.4.8 The 99% bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



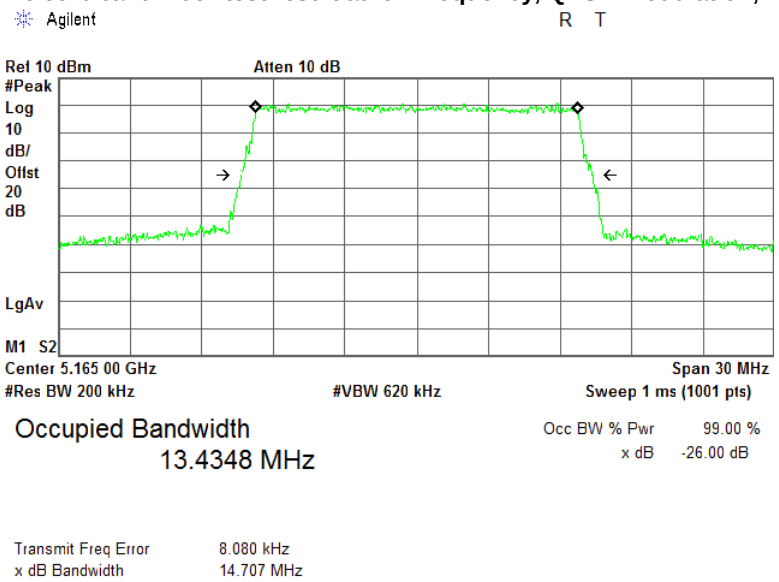
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.9 The 99% bandwidth test result at high frequency, 64QAM modulation, 10 MHz EBW

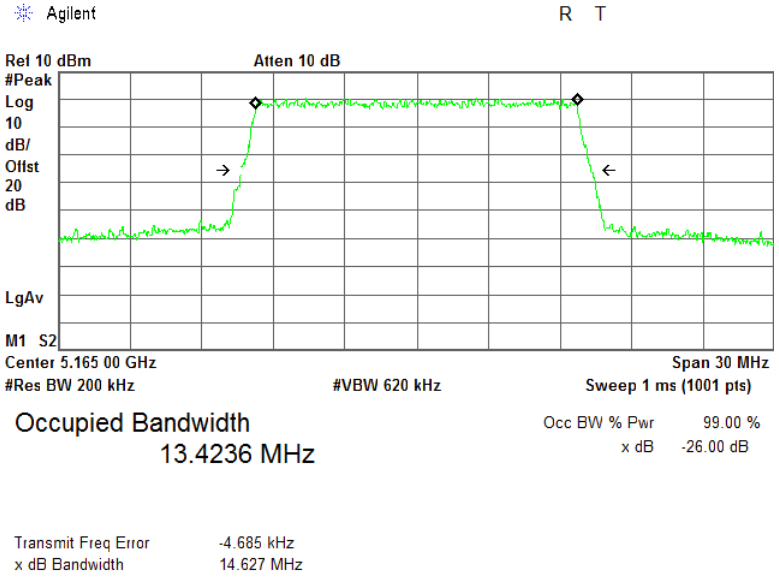


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.10 The 99% bandwidth test result at low frequency, QPSK modulation, 15 MHz EBW

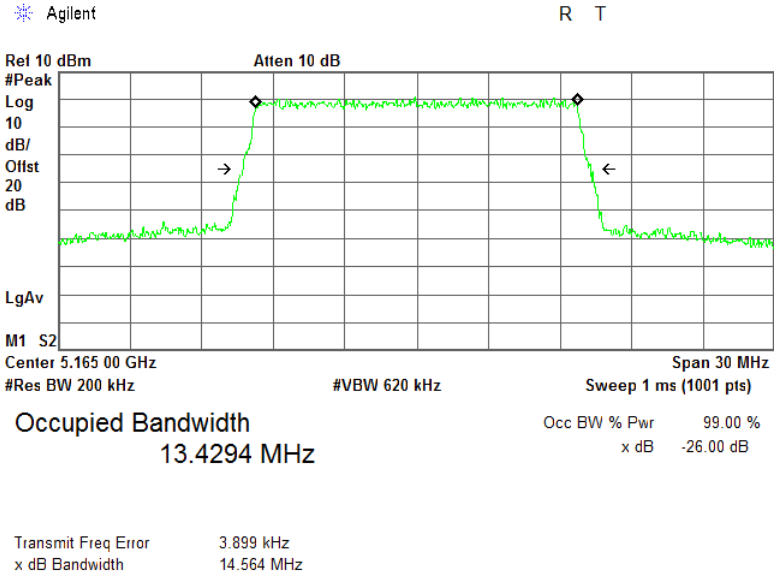


Plot 7.4.11 The 99% bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



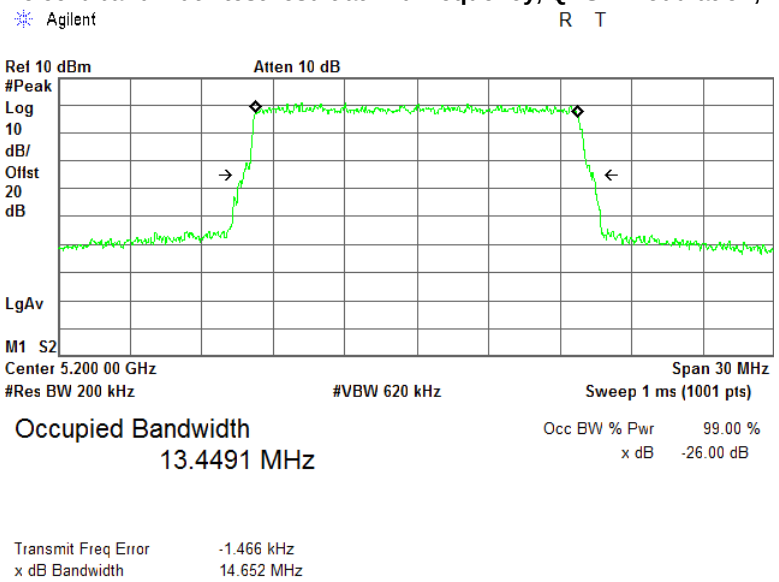
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.12 The 99% bandwidth test result at low frequency, 64QAM modulation, 15 MHz EBW

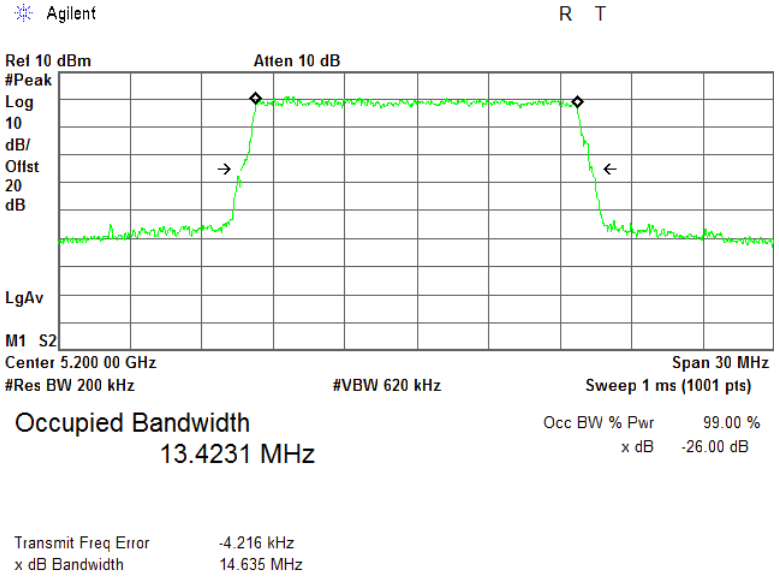


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.13 The 99% bandwidth test result at mid frequency, QPSK modulation, 15 MHz EBW

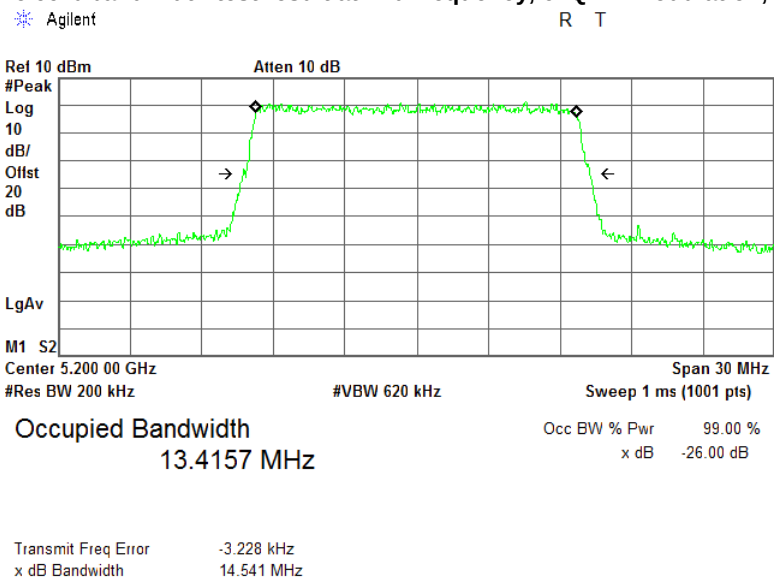


Plot 7.4.14 The 99% bandwidth test result at mid frequency, 16QAM modulation, 15 MHz EBW



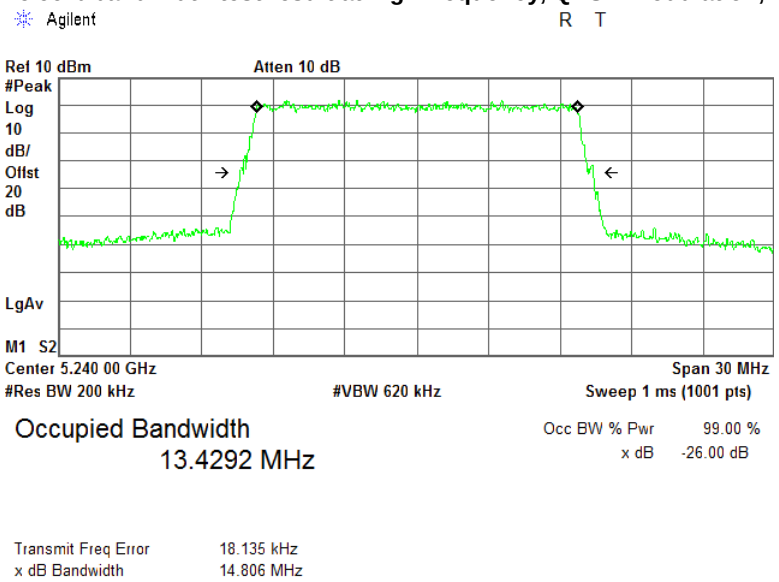
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.15 The 99% bandwidth test result at mid frequency, 64QAM modulation, 15 MHz EBW

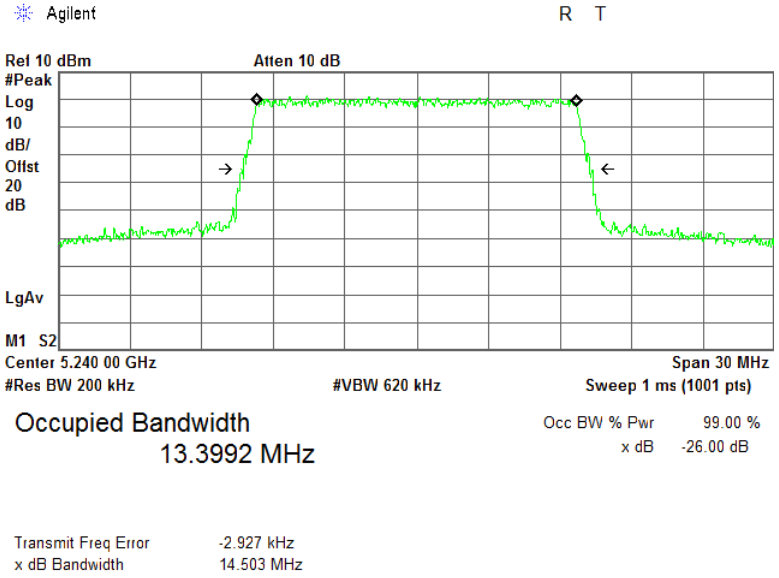


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.16 The 99% bandwidth test result at high frequency, QPSK modulation, 15 MHz EBW

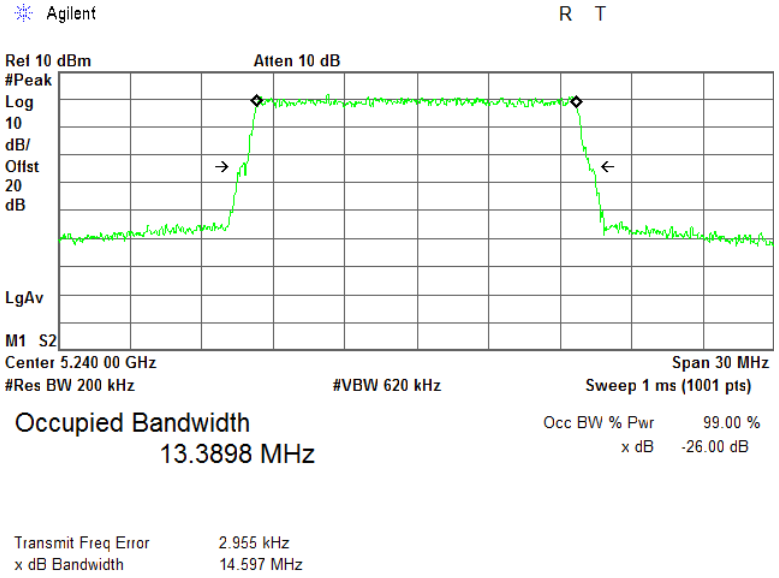


Plot 7.4.17 The 99% bandwidth test result at high frequency, 16QAM modulation, 15 MHz EBW



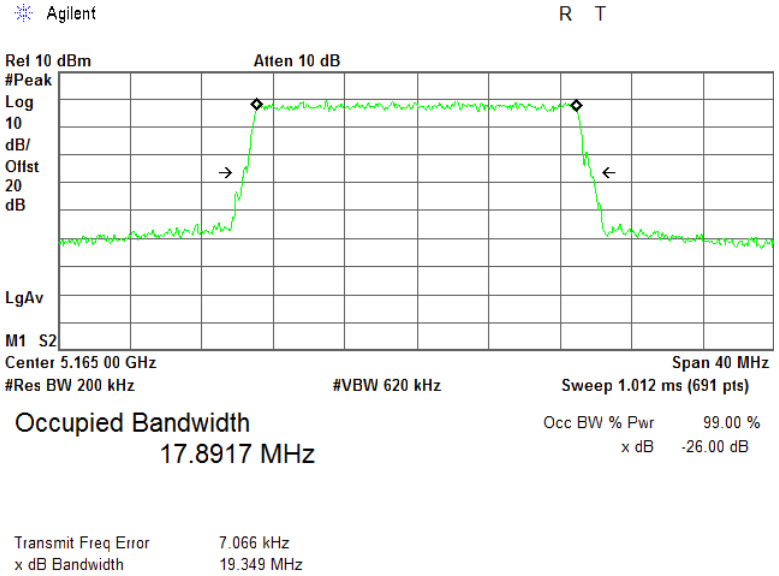
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.18 The 99% bandwidth test result at high frequency, 64QAM modulation, 15 MHz EBW

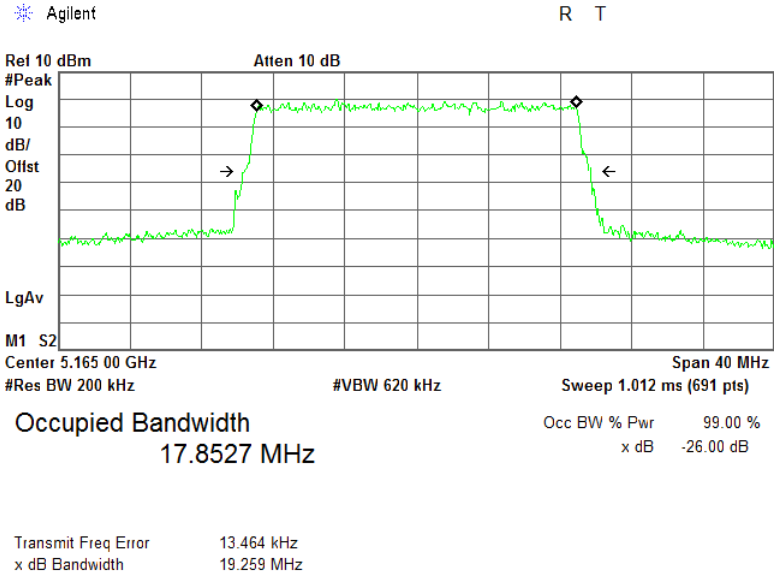


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.19 The 99% bandwidth test result at low frequency, QPSK modulation, 20 MHz EBW

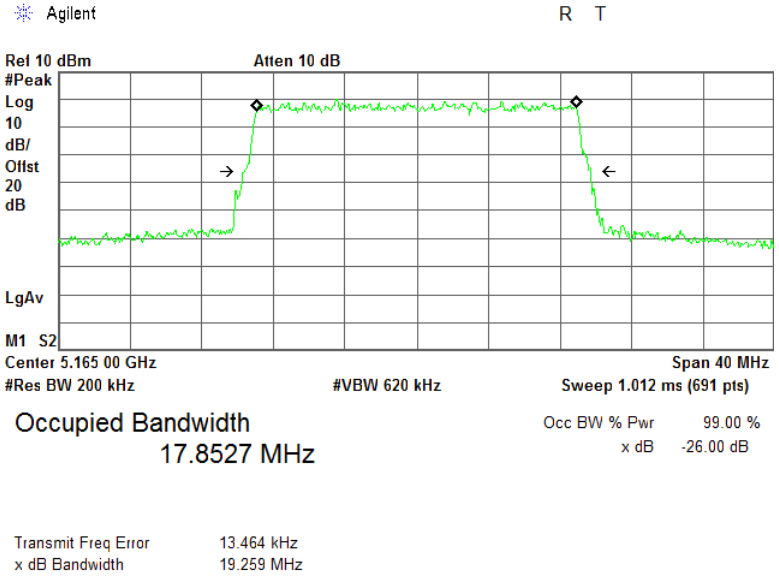


Plot 7.4.20 The 99% bandwidth test result at low frequency, 16QAM modulation, 20 MHz EBW



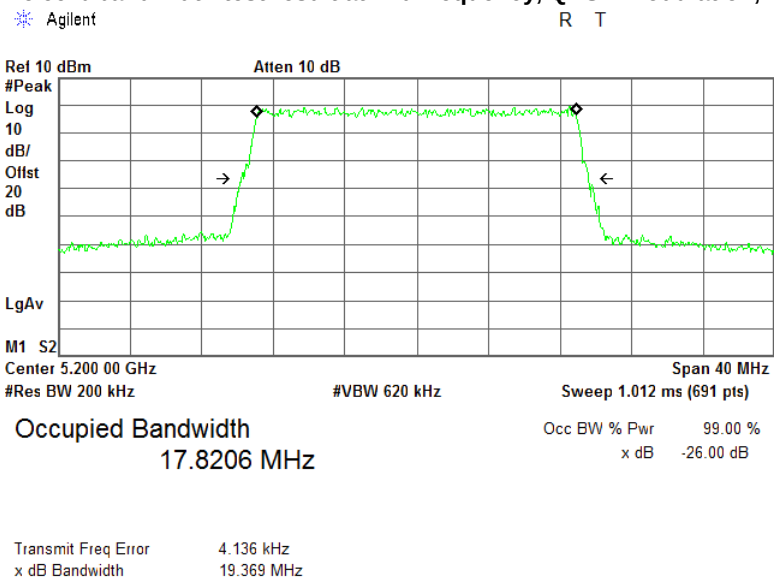
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.21 The 99% bandwidth test result at low frequency, 64QAM modulation, 20 MHz EBW

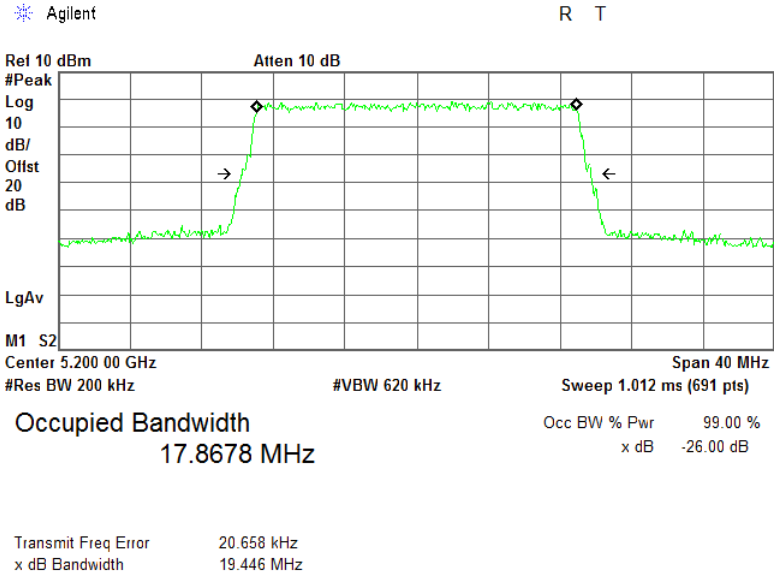


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.22 The 99% bandwidth test result at mid frequency, QPSK modulation, 20 MHz EBW

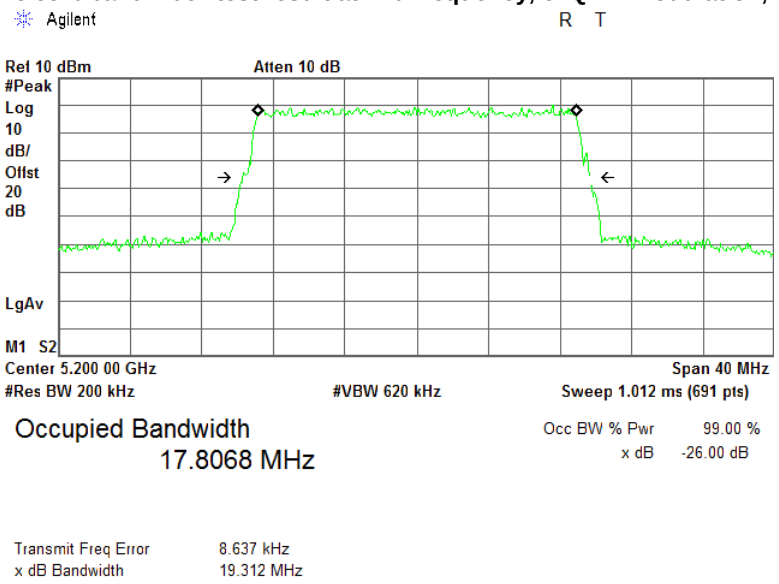


Plot 7.4.23 The 99% bandwidth test result at mid frequency, 16QAM modulation, 20 MHz EBW



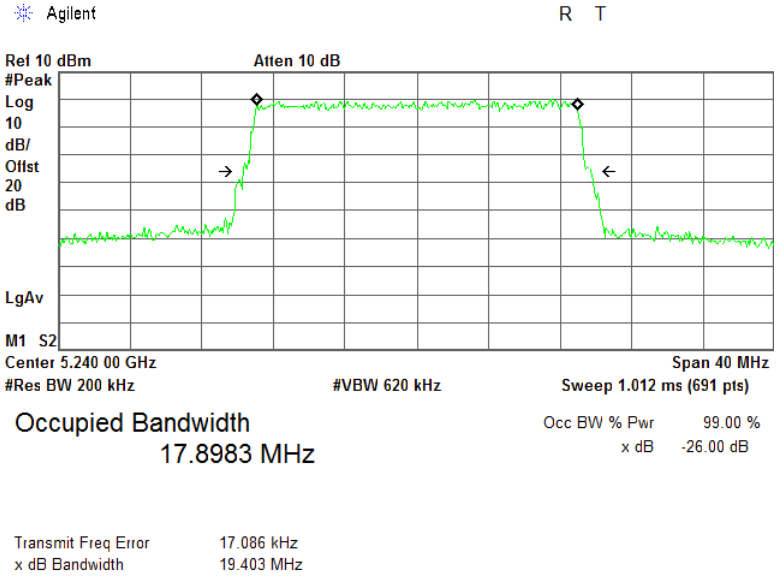
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.24 The 99% bandwidth test result at mid frequency, 64QAM modulation, 20 MHz EBW

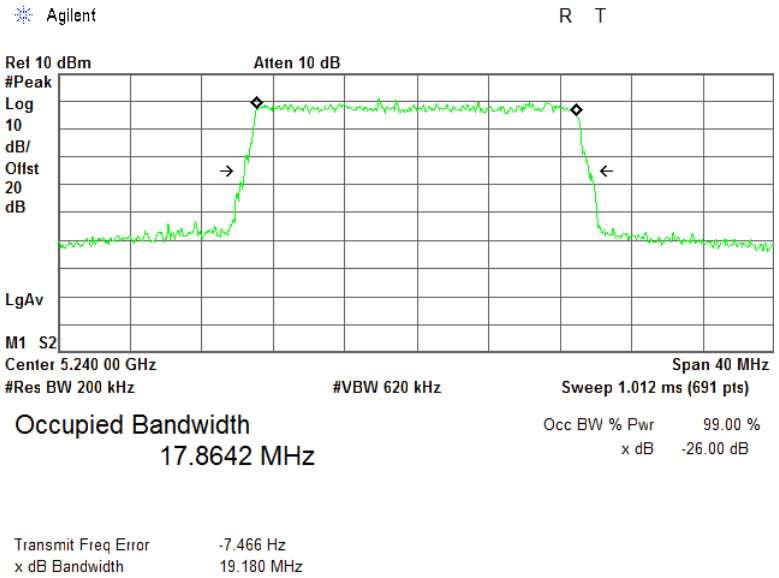


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.25 The 99% bandwidth test result at high frequency, QPSK modulation, 20 MHz EBW

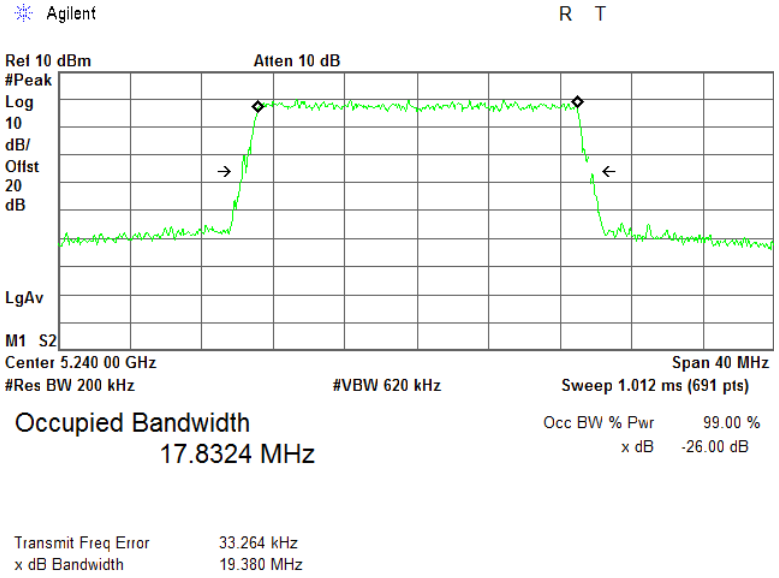


Plot 7.4.26 The 99% bandwidth test result at high frequency, 16QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.27 The 99% bandwidth test result at high frequency, 64QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	Relative Humidity: 46 %	Air Pressure: 1009 hPa	Power: 48 VDC
Remarks:			

7.5 Peak output power at 5725 – 5850 MHz range

7.5.1 General

This test was performed to measure the maximum peak output power at the transmitter RF antenna connector. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Peak output power limits

Assigned frequency range, MHz	Conducted output power limit	EIRP limit
5725 - 5850	1 W (30 dBm)	36 dBm

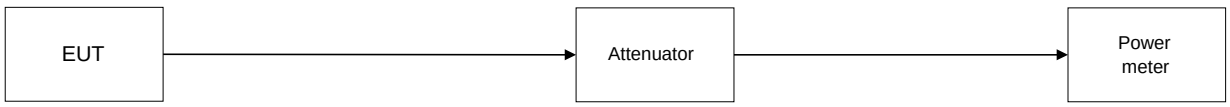
7.5.2 Test procedure

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

7.5.2.3 The measurements were performed in continuous transmission mode of operation for carrier (channel) frequency at low, mid and high edges with a peak detector. The power was computed by integrating the spectrum across the 26 dB bandwidth of the signal as provided in the associated tables and plots.

Figure 7.5.1 Peak output power test setup



Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.2 Peak output power test results

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), coherent signal

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm				Total output power*, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT1	ANT2	ANT3	ANT4				
10	QPSK	5730	13.00	12.97	12.86	12.79	18.91	30.00	-11.09	Pass
		5788	12.91	12.85	12.79	12.78	18.83	30.00	-11.17	Pass
		5845	12.98	12.90	12.93	12.81	18.91	30.00	-11.09	Pass
	16QAM	5730	12.98	12.98	12.86	12.78	18.90	30.00	-11.10	Pass
		5788	12.91	12.85	12.79	12.78	18.83	30.00	-11.17	Pass
		5845	13.00	12.90	12.95	12.82	18.92	30.00	-11.08	Pass
	64QAM	5730	12.99	12.99	12.87	12.78	18.91	30.00	-11.09	Pass
		5788	12.92	12.86	12.76	12.79	18.83	30.00	-11.17	Pass
		5845	13.00	12.89	12.95	12.81	18.91	30.00	-11.09	Pass
15	QPSK	5733	12.90	12.93	12.78	12.86	18.87	30.00	-11.13	Pass
		5788	13.00	12.91	12.87	12.73	18.88	30.00	-11.12	Pass
		5843	12.85	12.85	12.99	12.71	18.85	30.00	-11.15	Pass
	16QAM	5733	12.90	12.93	12.78	12.85	18.87	30.00	-11.13	Pass
		5788	13.00	12.90	12.87	12.72	18.87	30.00	-11.13	Pass
		5843	13.00	12.84	13.00	12.71	18.89	30.00	-11.11	Pass
	64QAM	5733	12.89	12.93	12.77	12.87	18.87	30.00	-11.13	Pass
		5788	12.99	12.89	12.86	12.72	18.87	30.00	-11.13	Pass
		5843	12.83	12.85	12.99	12.71	18.85	30.00	-11.15	Pass
20	QPSK	5735	12.88	12.92	12.77	12.81	18.85	30.00	-11.15	Pass
		5788	12.93	12.76	12.82	12.69	18.80	30.00	-11.20	Pass
		5840	12.86	12.88	12.91	12.75	18.85	30.00	-11.15	Pass
	16QAM	5735	12.80	12.92	12.78	12.87	18.84	30.00	-11.16	Pass
		5788	12.92	12.76	12.84	12.70	18.81	30.00	-11.19	Pass
		5840	12.85	12.88	12.92	12.74	18.85	30.00	-11.15	Pass
	64QAM	5735	12.80	12.93	12.79	12.88	18.85	30.00	-11.15	Pass
		5788	12.93	12.77	12.82	12.71	18.81	30.00	-11.19	Pass
		5840	12.86	12.88	12.93	12.72	18.85	30.00	-11.15	Pass

* Total output power = (10*LOG (10^(Output power ANT1/10) + 10^(Output power ANT2/10) + 10^(Output power ANT3/10) +10^(Output power ANT4/10)))
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.3 Peak output power test results

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), non-coherent signal

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm				Total output power*, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT1	ANT2	ANT3	ANT4				
10	QPSK	5730	15.83	15.84	15.76	15.87	21.83	30.00	-8.17	Pass
		5788	15.88	15.78	15.74	15.75	21.79	30.00	-8.21	Pass
		5845	15.86	15.85	15.78	15.81	21.83	30.00	-8.17	Pass
	16QAM	5730	15.82	15.85	15.77	15.85	21.82	30.00	-8.18	Pass
		5788	15.88	15.78	15.74	15.75	21.79	30.00	-8.21	Pass
		5845	15.87	15.85	15.78	15.82	21.83	30.00	-8.17	Pass
	64QAM	5730	15.83	15.86	15.78	15.85	21.83	30.00	-8.17	Pass
		5788	15.88	15.76	15.76	15.74	21.79	30.00	-8.21	Pass
		5845	15.88	15.86	15.80	15.81	21.84	30.00	-8.16	Pass
15	QPSK	5733	15.98	15.82	15.93	15.81	21.89	30.00	-8.11	Pass
		5788	15.93	15.91	15.78	15.70	21.83	30.00	-8.17	Pass
		5843	15.93	15.81	15.83	15.95	21.88	30.00	-8.12	Pass
	16QAM	5733	15.97	15.82	15.93	15.81	21.88	30.00	-8.12	Pass
		5788	15.93	15.91	15.78	15.70	21.83	30.00	-8.17	Pass
		5843	15.95	15.81	15.84	15.94	21.89	30.00	-8.11	Pass
	64QAM	5733	15.96	15.81	15.92	15.82	21.88	30.00	-8.12	Pass
		5788	15.93	15.91	15.79	15.70	21.83	30.00	-8.17	Pass
		5843	15.94	15.79	15.82	15.94	21.87	30.00	-8.13	Pass
20	QPSK	5735	15.81	15.88	15.65	15.87	21.80	30.00	-8.20	Pass
		5788	15.67	15.76	15.90	15.77	21.78	30.00	-8.22	Pass
		5840	15.95	15.93	15.78	15.83	21.87	30.00	-8.13	Pass
	16QAM	5735	15.81	15.87	15.64	15.87	21.80	30.00	-8.20	Pass
		5788	15.66	15.77	15.90	15.78	21.78	30.00	-8.22	Pass
		5840	15.95	15.93	15.78	15.83	21.87	30.00	-8.13	Pass
	64QAM	5735	15.82	15.87	15.64	15.88	21.80	30.00	-8.20	Pass
		5788	15.64	15.77	15.88	15.77	21.77	30.00	-8.23	Pass
		5840	15.95	15.93	15.81	15.82	21.88	30.00	-8.12	Pass

* Total output power = (10*LOG (10^(Output power ANT1/10) + 10^(Output power ANT2/10) + 10^(Output power ANT3/10) +10^(Output power ANT4/10)))
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.4 Peak output power test results (continued)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 2 carrier, 1 sectors (4 ports to 2 dual slant antennas)

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm		Total output power*, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT1	ANT3				
10	QPSK	5730	19.00	19.00	22.00	30.00	-8.00	Pass
		5788	19.00	18.95	21.98	30.00	-8.02	Pass
		5845	19.00	19.00	22.00	30.00	-8.00	Pass
	16QAM	5730	19.00	18.98	21.99	30.00	-8.01	Pass
		5788	19.00	18.96	21.98	30.00	-8.02	Pass
		5845	19.00	19.00	22.00	30.00	-8.00	Pass
	64QAM	5730	18.99	18.97	21.98	30.00	-8.02	Pass
		5788	19.00	18.94	21.97	30.00	-8.03	Pass
		5845	19.00	19.00	22.00	30.00	-8.00	Pass
15	QPSK	5733	18.88	19.00	21.94	30.00	-8.06	Pass
		5788	18.99	18.97	21.98	30.00	-8.02	Pass
		5843	18.91	18.94	21.93	30.00	-8.07	Pass
	16QAM	5733	18.88	19.00	21.94	30.00	-8.06	Pass
		5788	19.00	18.96	21.98	30.00	-8.02	Pass
		5843	18.90	18.94	21.92	30.00	-8.08	Pass
	64QAM	5733	18.88	19.00	21.94	30.00	-8.06	Pass
		5788	18.98	18.96	21.97	30.00	-8.03	Pass
		5843	18.91	18.95	21.93	30.00	-8.07	Pass
20	QPSK	5735	18.81	18.92	21.87	30.00	-8.13	Pass
		5788	18.79	18.82	21.81	30.00	-8.19	Pass
		5840	18.90	18.83	21.87	30.00	-8.13	Pass
	16QAM	5735	18.82	18.92	21.87	30.00	-8.13	Pass
		5788	18.82	18.82	21.82	30.00	-8.18	Pass
		5840	18.90	18.84	21.87	30.00	-8.13	Pass
	64QAM	5735	18.81	18.91	21.86	30.00	-8.14	Pass
		5788	18.81	18.81	21.81	30.00	-8.19	Pass
		5840	18.91	18.85	21.88	30.00	-8.12	Pass

* Total output power = (10*LOG (10^(Output power ANT1/10) + 10^(Output power ANT3/10))
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.5 Peak output power test results (continue)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 2 carrier, 1 sectors (4 ports to 2 dual slant antennas)

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm		Total output power*, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT2	ANT4				
10	QPSK	5730	18.99	18.96	21.98	30.00	-8.02	Pass
		5788	18.87	19.00	21.94	30.00	-8.06	Pass
		5845	19.00	18.92	21.96	30.00	-8.04	Pass
	16QAM	5730	18.99	18.93	21.96	30.00	-8.04	Pass
		5788	18.87	19.00	21.94	30.00	-8.06	Pass
		5845	19.00	18.93	21.97	30.00	-8.03	Pass
	64QAM	5730	18.99	18.94	21.97	30.00	-8.03	Pass
		5788	18.87	19.00	21.94	30.00	-8.06	Pass
		5845	19.00	18.94	21.97	30.00	-8.03	Pass
15	QPSK	5733	18.95	18.76	21.86	30.00	-8.14	Pass
		5788	19.00	19.00	22.00	30.00	-8.00	Pass
		5843	18.95	18.79	21.87	30.00	-8.13	Pass
	16QAM	5733	18.95	18.77	21.86	30.00	-8.14	Pass
		5788	19.00	19.00	22.00	30.00	-8.00	Pass
		5843	18.96	18.79	21.88	30.00	-8.12	Pass
	64QAM	5733	18.94	18.76	21.85	30.00	-8.15	Pass
		5788	19.00	18.99	22.00	30.00	-8.00	Pass
		5843	18.95	18.78	21.87	30.00	-8.13	Pass
20	QPSK	5735	18.93	18.76	21.85	30.00	-8.15	Pass
		5788	18.70	18.84	21.77	30.00	-8.23	Pass
		5840	18.87	18.90	21.89	30.00	-8.11	Pass
	16QAM	5735	18.91	18.68	21.80	30.00	-8.20	Pass
		5788	18.72	18.78	21.75	30.00	-8.25	Pass
		5840	18.88	18.89	21.89	30.00	-8.11	Pass
	64QAM	5735	18.93	18.68	21.81	30.00	-8.19	Pass
		5788	18.71	18.78	21.75	30.00	-8.25	Pass
		5840	18.86	18.88	21.87	30.00	-8.13	Pass

* Total output power = (10*LOG (10^(Output power ANT2/10) + 10^(Output power ANT4/10))
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.6 EIRP test results (continued)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), coherent signal

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm		Total output power*, dBm	Antenna gain array, dB	Single antenna gain, dBi	Total EIRP**, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT1	ANT2							
10	QPSK	5730	13.00	12.97	15.99	3.00	17.00	35.99	36.00	-0.01	Pass
		5788	12.91	12.85	15.88	3.00	17.00	35.88	36.00	-0.12	Pass
		5845	12.98	12.90	15.94	3.00	17.00	35.94	36.00	-0.06	Pass
	16QAM	5730	12.98	12.98	15.98	3.00	17.00	35.98	36.00	-0.02	Pass
		5788	12.91	12.85	15.88	3.00	17.00	35.88	36.00	-0.12	Pass
		5845	13.00	12.90	15.95	3.00	17.00	35.95	36.00	-0.05	Pass
	64QAM	5730	12.99	12.99	15.99	3.00	17.00	35.99	36.00	-0.01	Pass
		5788	12.92	12.86	15.89	3.00	17.00	35.89	36.00	-0.11	Pass
		5845	13.00	12.89	15.95	3.00	17.00	35.95	36.00	-0.05	Pass
15	QPSK	5732.5	12.90	12.93	15.92	3.00	17.00	35.92	36.00	-0.08	Pass
		5788	13.00	12.91	15.96	3.00	17.00	35.96	36.00	-0.04	Pass
		5842.5	12.85	12.85	15.85	3.00	17.00	35.85	36.00	-0.15	Pass
	16QAM	5732.5	12.90	12.93	15.92	3.00	17.00	35.92	36.00	-0.08	Pass
		5788	13.00	12.90	15.95	3.00	17.00	35.95	36.00	-0.05	Pass
		5842.5	13.00	12.84	15.92	3.00	17.00	35.92	36.00	-0.08	Pass
	64QAM	5732.5	12.89	12.93	15.91	3.00	17.00	35.91	36.00	-0.09	Pass
		5788	12.99	12.89	15.94	3.00	17.00	35.94	36.00	-0.06	Pass
		5842.5	12.83	12.85	15.84	3.00	17.00	35.84	36.00	-0.16	Pass
20	QPSK	5735	12.88	12.92	15.90	3.00	17.00	35.90	36.00	-0.10	Pass
		5788	12.93	12.76	15.85	3.00	17.00	35.85	36.00	-0.15	Pass
		5840	12.86	12.88	15.87	3.00	17.00	35.87	36.00	-0.13	Pass
	16QAM	5735	12.80	12.92	15.86	3.00	17.00	35.86	36.00	-0.14	Pass
		5788	12.92	12.76	15.84	3.00	17.00	35.84	36.00	-0.16	Pass
		5840	12.85	12.88	15.87	3.00	17.00	35.87	36.00	-0.13	Pass
	64QAM	5735	12.80	12.93	15.87	3.00	17.00	35.87	36.00	-0.13	Pass
		5788	12.93	12.77	15.85	3.00	17.00	35.85	36.00	-0.15	Pass
		5840	12.86	12.88	15.87	3.00	17.00	35.87	36.00	-0.13	Pass

* Total output power = (10*LOG (10^(Output power ANT1/10) + 10^(Output power ANT2/10)))
** Total EIRP = Total output power + Antenna gain array + Single antenna gain
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.7 EIRP test results (continue)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), coherent signal

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm		Total output power*, dBm	Antenna gain array, dB	Single antenna gain, dBi	Total EIRP**, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT3	ANT4							
10	QPSK	5730	12.86	12.79	15.83	3.00	17.00	35.83	36.00	-0.17	Pass
		5788	12.79	12.78	15.79	3.00	17.00	35.79	36.00	-0.21	Pass
		5845	12.93	12.81	15.87	3.00	17.00	35.87	36.00	-0.13	Pass
	16QAM	5730	12.86	12.78	15.82	3.00	17.00	35.82	36.00	-0.18	Pass
		5788	12.79	12.78	15.79	3.00	17.00	35.79	36.00	-0.21	Pass
		5845	12.95	12.82	15.89	3.00	17.00	35.89	36.00	-0.11	Pass
	64QAM	5730	12.87	12.78	15.83	3.00	17.00	35.83	36.00	-0.17	Pass
		5788	12.76	12.79	15.78	3.00	17.00	35.78	36.00	-0.22	Pass
		5845	12.95	12.81	15.88	3.00	17.00	35.88	36.00	-0.12	Pass
15	QPSK	5732.5	12.78	12.86	15.82	3.00	17.00	35.82	36.00	-0.18	Pass
		5788	12.87	12.73	15.80	3.00	17.00	35.80	36.00	-0.20	Pass
		5842.5	12.99	12.71	15.85	3.00	17.00	35.85	36.00	-0.15	Pass
	16QAM	5732.5	12.78	12.85	15.82	3.00	17.00	35.82	36.00	-0.18	Pass
		5788	12.87	12.72	15.80	3.00	17.00	35.80	36.00	-0.20	Pass
		5842.5	13.00	12.71	15.86	3.00	17.00	35.86	36.00	-0.14	Pass
	64QAM	5732.5	12.77	12.87	15.82	3.00	17.00	35.82	36.00	-0.18	Pass
		5788	12.86	12.72	15.79	3.00	17.00	35.79	36.00	-0.21	Pass
		5842.5	12.99	12.71	15.85	3.00	17.00	35.85	36.00	-0.15	Pass
20	QPSK	5735	12.77	12.81	15.79	3.00	17.00	35.79	36.00	-0.21	Pass
		5788	12.82	12.69	15.76	3.00	17.00	35.76	36.00	-0.24	Pass
		5840	12.91	12.75	15.83	3.00	17.00	35.83	36.00	-0.17	Pass
	16QAM	5735	12.78	12.87	15.83	3.00	17.00	35.83	36.00	-0.17	Pass
		5788	12.84	12.70	15.77	3.00	17.00	35.77	36.00	-0.23	Pass
		5840	12.92	12.74	15.83	3.00	17.00	35.83	36.00	-0.17	Pass
	64QAM	5735	12.79	12.88	15.84	3.00	17.00	35.84	36.00	-0.16	Pass
		5788	12.82	12.71	15.77	3.00	17.00	35.77	36.00	-0.23	Pass
		5840	12.93	12.72	15.83	3.00	17.00	35.83	36.00	-0.17	Pass

* Total output power = (10*LOG (10^(Output power ANT3/10) + 10^(Output power ANT4/10)))
** Total EIRP = Total output power + Antenna gain array + Single antenna gain
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.8 EIRP test results (continued)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), non-coherent signal

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm		Total output power*, dBm	Antenna gain array, dB	Single antenna gain, dBi	Total EIRP**, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT1	ANT2							
10	QPSK	5730	15.83	15.84	18.84	0	17.00	35.84	36.00	-0.16	Pass
		5788	15.88	15.78	18.83	0	17.00	35.83	36.00	-0.17	Pass
		5845	15.86	15.85	18.86	0	17.00	35.86	36.00	-0.14	Pass
	16QAM	5730	15.82	15.85	18.84	0	17.00	35.84	36.00	-0.16	Pass
		5788	15.88	15.78	18.83	0	17.00	35.83	36.00	-0.17	Pass
		5845	15.87	15.85	18.86	0	17.00	35.86	36.00	-0.14	Pass
	64QAM	5730	15.83	15.86	18.85	0	17.00	35.85	36.00	-0.15	Pass
		5788	15.88	15.76	18.82	0	17.00	35.82	36.00	-0.18	Pass
		5845	15.88	15.86	18.87	0	17.00	35.87	36.00	-0.13	Pass
15	QPSK	5732.5	15.98	15.82	18.90	0	17.00	35.90	36.00	-0.10	Pass
		5788	15.93	15.91	18.92	0	17.00	35.92	36.00	-0.08	Pass
		5842.5	15.93	15.81	18.87	0	17.00	35.87	36.00	-0.13	Pass
	16QAM	5732.5	15.97	15.82	18.90	0	17.00	35.90	36.00	-0.10	Pass
		5788	15.93	15.91	18.92	0	17.00	35.92	36.00	-0.08	Pass
		5842.5	15.95	15.81	18.88	0	17.00	35.88	36.00	-0.12	Pass
	64QAM	5732.5	15.96	15.81	18.89	0	17.00	35.89	36.00	-0.11	Pass
		5788	15.93	15.91	18.92	0	17.00	35.92	36.00	-0.08	Pass
		5842.5	15.94	15.79	18.87	0	17.00	35.87	36.00	-0.13	Pass
20	QPSK	5735	15.81	15.88	18.85	0	17.00	35.85	36.00	-0.15	Pass
		5788	15.67	15.76	18.72	0	17.00	35.72	36.00	-0.28	Pass
		5840	15.95	15.93	18.94	0	17.00	35.94	36.00	-0.06	Pass
	16QAM	5735	15.81	15.87	18.84	0	17.00	35.84	36.00	-0.16	Pass
		5788	15.66	15.77	18.72	0	17.00	35.72	36.00	-0.28	Pass
		5840	15.95	15.93	18.94	0	17.00	35.94	36.00	-0.06	Pass
	64QAM	5735	15.82	15.87	18.85	0	17.00	35.85	36.00	-0.15	Pass
		5788	15.64	15.77	18.71	0	17.00	35.71	36.00	-0.29	Pass
		5840	15.95	15.93	18.94	0	17.00	35.94	36.00	-0.06	Pass

* Total output power = (10*LOG (10^(Output power ANT1/10) + 10^(Output power ANT2/10)))
** Total EIRP = Total output power + Antenna gain array + Single antenna gain
** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.9 EIRP test results (continue)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 1 carrier, 1 sector (4 ports to 2 dual slant antennas), non-coherent signal

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power per port, dBm		Total output power*, dBm	Antenna gain array, dB	Single antenna gain, dBi	Total EIRP**, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT3	ANT4							
10	QPSK	5730	15.76	15.87	18.82	0	17.00	35.82	36.00	-0.18	Pass
		5788	15.74	15.75	18.75	0	17.00	35.75	36.00	-0.25	Pass
		5845	15.78	15.81	18.80	0	17.00	35.80	36.00	-0.20	Pass
	16QAM	5730	15.77	15.85	18.81	0	17.00	35.81	36.00	-0.19	Pass
		5788	15.74	15.75	18.75	0	17.00	35.75	36.00	-0.25	Pass
		5845	15.78	15.82	18.80	0	17.00	35.80	36.00	-0.20	Pass
	64QAM	5730	15.78	15.85	18.82	0	17.00	35.82	36.00	-0.18	Pass
		5788	15.76	15.74	18.75	0	17.00	35.75	36.00	-0.25	Pass
		5845	15.80	15.81	18.81	0	17.00	35.81	36.00	-0.19	Pass
15	QPSK	5732.5	15.93	15.81	18.87	0	17.00	35.87	36.00	-0.13	Pass
		5788	15.78	15.70	18.74	0	17.00	35.74	36.00	-0.26	Pass
		5842.5	15.83	15.95	18.89	0	17.00	35.89	36.00	-0.11	Pass
	16QAM	5732.5	15.93	15.81	18.87	0	17.00	35.87	36.00	-0.13	Pass
		5788	15.78	15.70	18.74	0	17.00	35.74	36.00	-0.26	Pass
		5842.5	15.84	15.94	18.89	0	17.00	35.89	36.00	-0.11	Pass
	64QAM	5732.5	15.92	15.82	18.87	0	17.00	35.87	36.00	-0.13	Pass
		5788	15.79	15.70	18.75	0	17.00	35.75	36.00	-0.25	Pass
		5842.5	15.82	15.94	18.88	0	17.00	35.88	36.00	-0.12	Pass
20	QPSK	5735	15.65	15.87	18.76	0	17.00	35.76	36.00	-0.24	Pass
		5788	15.90	15.77	18.84	0	17.00	35.84	36.00	-0.16	Pass
		5840	15.78	15.83	18.81	0	17.00	35.81	36.00	-0.19	Pass
	16QAM	5735	15.64	15.87	18.76	0	17.00	35.76	36.00	-0.24	Pass
		5788	15.90	15.78	18.84	0	17.00	35.84	36.00	-0.16	Pass
		5840	15.78	15.83	18.81	0	17.00	35.81	36.00	-0.19	Pass
	64QAM	5735	15.64	15.88	18.76	0	17.00	35.76	36.00	-0.24	Pass
		5788	15.88	15.77	18.83	0	17.00	35.83	36.00	-0.17	Pass
		5840	15.81	15.82	18.82	0	17.00	35.82	36.00	-0.18	Pass

* Total output power = (10*LOG (10^(Output power ANT3/10) + 10^(Output power ANT4/10)))
** Total EIRP = Total output power + Antenna gain array + Single antenna gain
*** Margin = Total output power – specification limit

Test specification:	**FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power**		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.10 EIRP test results (continued)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 2 carrier, 1 sectors (4 ports to 2 dual slant antennas)

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power, dBm	Antenna gain array, dB	Single antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT1						
10	QPSK	5730	19.00	0	17.00	36.00	36.00	0.00	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5845	19.00	0	17.00	36.00	36.00	0.00	Pass
	16QAM	5730	19.00	0	17.00	36.00	36.00	0.00	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5845	19.00	0	17.00	36.00	36.00	0.00	Pass
	64QAM	5730	18.99	0	17.00	35.99	36.00	-0.01	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5845	19.00	0	17.00	36.00	36.00	0.00	Pass
15	QPSK	5732.5	18.88	0	17.00	35.88	36.00	-0.12	Pass
		5788	18.99	0	17.00	35.99	36.00	-0.01	Pass
		5842.5	18.91	0	17.00	35.91	36.00	-0.09	Pass
	16QAM	5732.5	18.88	0	17.00	35.88	36.00	-0.12	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5842.5	18.90	0	17.00	35.90	36.00	-0.10	Pass
	64QAM	5732.5	18.88	0	17.00	35.88	36.00	-0.12	Pass
		5788	18.98	0	17.00	35.98	36.00	-0.02	Pass
		5842.5	18.91	0	17.00	35.91	36.00	-0.09	Pass
20	QPSK	5735	18.81	0	17.00	35.81	36.00	-0.19	Pass
		5788	18.79	0	17.00	35.79	36.00	-0.21	Pass
		5840	18.90	0	17.00	35.90	36.00	-0.10	Pass
	16QAM	5735	18.82	0	17.00	35.82	36.00	-0.18	Pass
		5788	18.82	0	17.00	35.82	36.00	-0.18	Pass
		5840	18.90	0	17.00	35.90	36.00	-0.10	Pass
	64QAM	5735	18.81	0	17.00	35.81	36.00	-0.19	Pass
		5788	18.81	0	17.00	35.81	36.00	-0.19	Pass
		5840	18.91	0	17.00	35.91	36.00	-0.09	Pass

* Total EIRP = Output power + Antenna gain array + Single antenna gain
** Margin = Total output power – specification limit

Test specification:	FCC section 15.407(a)(1-3), RSS-247 section 6.2.4.1, Peak output power		
Test procedure:	FCC section 15.407(a)(4); KDB 662911, KDB 789033, ANSI C63.10, section 12.3.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	16-Jan-19		
Temperature: 25 ºC	Relative Humidity: 46 %	Air Pressure: 1009 hPa	Power: 48 VDC
Remarks:			

Table 7.5.11 EIRP test results (continue)

ASSIGNED FREQUENCY RANGE: 5.725 - 5.850 GHz
DETECTOR USED: Average
METHOD OF POWER MEASUREMENTS: PM-G (789033 D02)
MIMO CONFIGURATION: 2 carrier, 1 sectors (4 ports to 2 dual slant antennas)

Channel bandwidth, MHz	Modulation	Frequency, MHz	Output power, dBm	Antenna gain array, dB	Single antenna gain, dBi	Total EIRP*, dBm	Limit, dBm	Margin**, dB	Verdict
			ANT2						
10	QPSK	5730	18.99	0	17.00	35.99	36.00	-0.01	Pass
		5788	18.87	0	17.00	35.87	36.00	-0.13	Pass
		5845	19.00	0	17.00	36.00	36.00	0.00	Pass
	16QAM	5730	18.99	0	17.00	35.99	36.00	-0.01	Pass
		5788	18.87	0	17.00	35.87	36.00	-0.13	Pass
		5845	19.00	0	17.00	36.00	36.00	0.00	Pass
	64QAM	5730	18.99	0	17.00	35.99	36.00	-0.01	Pass
		5788	18.87	0	17.00	35.87	36.00	-0.13	Pass
		5845	19.00	0	17.00	36.00	36.00	0.00	Pass
15	QPSK	5732.5	18.95	0	17.00	35.95	36.00	-0.05	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5842.5	18.95	0	17.00	35.95	36.00	-0.05	Pass
	16QAM	5732.5	18.95	0	17.00	35.95	36.00	-0.05	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5842.5	18.96	0	17.00	35.96	36.00	-0.04	Pass
	64QAM	5732.5	18.94	0	17.00	35.94	36.00	-0.06	Pass
		5788	19.00	0	17.00	36.00	36.00	0.00	Pass
		5842.5	18.95	0	17.00	35.95	36.00	-0.05	Pass
20	QPSK	5735	18.93	0	17.00	35.93	36.00	-0.07	Pass
		5788	18.70	0	17.00	35.70	36.00	-0.30	Pass
		5840	18.87	0	17.00	35.87	36.00	-0.13	Pass
	16QAM	5735	18.91	0	17.00	35.91	36.00	-0.09	Pass
		5788	18.72	0	17.00	35.72	36.00	-0.28	Pass
		5840	18.88	0	17.00	35.88	36.00	-0.12	Pass
	64QAM	5735	18.93	0	17.00	35.93	36.00	-0.07	Pass
		5788	18.71	0	17.00	35.71	36.00	-0.29	Pass
		5840	18.86	0	17.00	35.86	36.00	-0.14	Pass

* Total EIRP = Output power + Antenna gain array + Single antenna gain
** Margin = Total output power – specification limit