HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

Hermon Laboratories Ltd.
P.O. Box 23, Binyamina 3055001, Israel
Tel. +972 4628 8001
Fax. +972 4628 8277
E-mail: mail@hermonlabs.com

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.

BreezeCompact Base Station

Model:CMP.TX-BS-5.X

FCC ID:ARA-COMPACT5X

IC:899A-COMPACT5X

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:	BreezeCompact Base Station
Product type:	Transceiver
Model(s):	CMP.TX-BS-5.X
Serial number:	95041791
Hardware version:	004-A02-00
Software release:	0702.09358
Receipt date	20-Jan-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:	21-Jan-19
Test completed:	19-Mar-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, 15.407, RSS-Gen section 7.1.4, The maximum EIRP at any elevation angle above 30 degrees	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.

This test report supersedes the previously issued test report identified by Doc ID: TelRad_FCC_31832_rev1

	Name and Title	Date	Signature
Tested by:	Mr. A. Morozov, test engineer	21-Jan-19 – 19-Mar-19	
Reviewed by:	Mrs. S.Peysahov Sheynin test engineer	25-Apr-19	
Approved by:	Mr. S. Samokha, technical manager, EMC and Radio	25-Jun-19	

6 EUT description

6.1 General information

Breeze Compact 1000 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.
Breeze Compact 1000 5GHz 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.

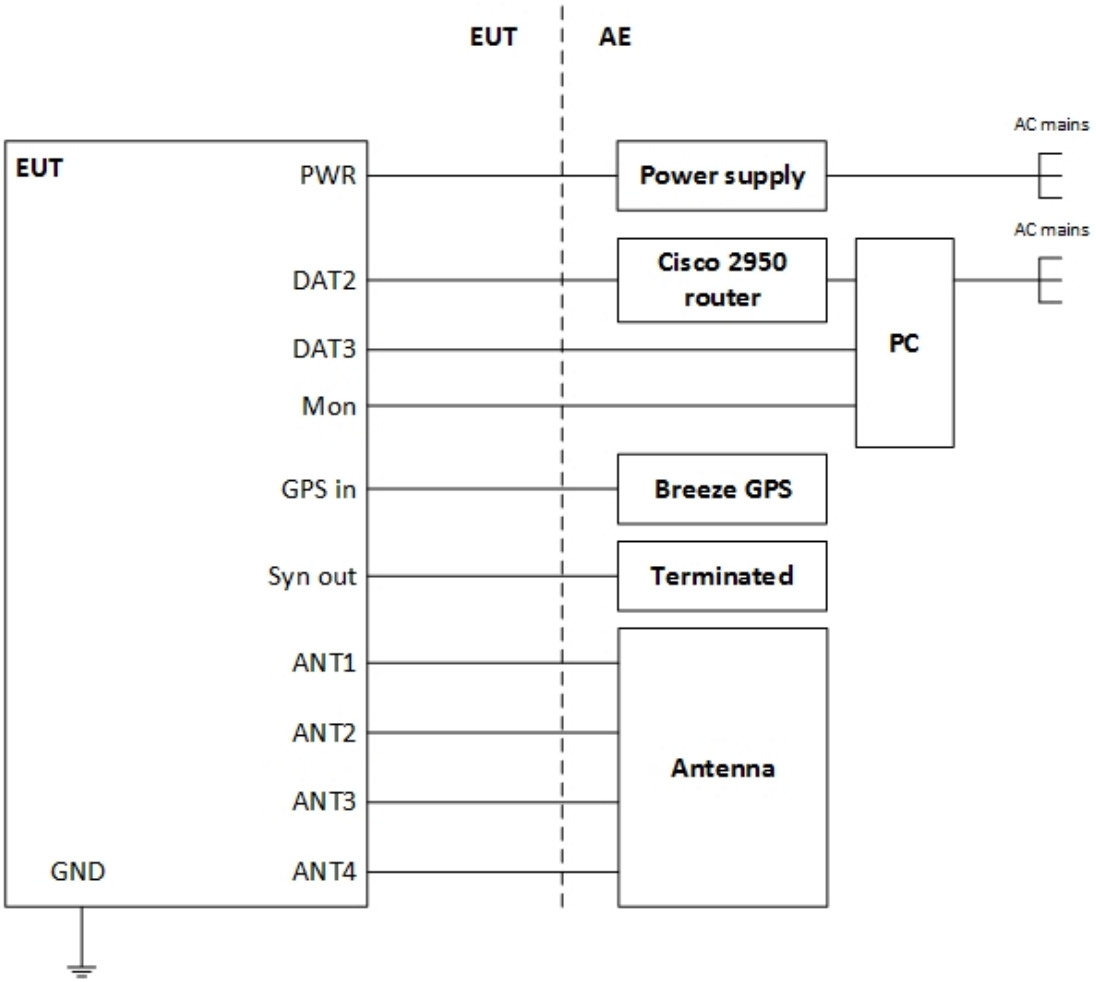
6.2 Ports and lines

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 test 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 (full bands)	5160.0 – 5245.0 MHz 5730.0 – 5845.0 MHz
RF channel spacing	10 MHz, 15 MHz, 20 MHz

Maximum EIRP	At transmitter 50 Ω RF output connector (per port)	36.00 dBm for 10MHz 35.96 dBm for 15MHz 35.92 dBm for 20MHz
Maximum rated output power	At transmitter 50 Ω RF output connector (per port) in 5730.0 – 5845.0 MHz	16.39 dBm for 10MHz 16.49 dBm for 15MHz 16.46 dBm for 20MHz

Is transmitter output power variable?	**V**	Yes		continuous variable	
			V	stepped variable with step size	0.25dB
			minimum RF power		0dBm
			maximum RF power at antenna connector (per port) in 5160.0 – 5245.0 MHz		15.51 dBm for 10MHz 14.48 dBm for 15MHz 16.37 dBm for 20MHz

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

Antenna/s technical characteristics				
Type	Manufacturer	Model number		Gain
External	MTI WIRELESS EDGE LTD.	MT-464042/ND		16.5dBi

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	
V	DC	**Nominal rated voltage**	DC 48V		
	AC mains	**Nominal rated voltage**		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	Antenna array gain, dBi	Total antenna gain, dBi	Total EIRP, dBm
Low	Mid	High									
1 carrier 1 sector (4 ports: 2 dual slant antennas) non-coherent signal or 2carriers 1sector- different frequencies (4 ports: 2 dual slant antennas- power aggregation, no antenna gains aggregation)											
5730.0	5788.0	5845.0	OFDMA	10	4	13.50	19.42	16.5	3	19.5	36.00
5733.0	5788.0	5843.0	OFDMA	15	4	13.51	19.39	16.5	3	19.5	35.96
5735.0	5788.0	5840.0	OFDMA	20	4	13.44	19.36	16.5	3	19.5	35.92
(2carriers 2sectors) – isolated sectors, therefore the carriers may use similar or different frequencies (4 ports: 2 sectors x 2 dual slant antenna, no carrier aggregation and no antenna gain aggregation)											
5730.0	5788.0	5845.0	OFDMA	10	4	13.50	19.42	16.5	0	16.5	33.00
5733.0	5788.0	5843.0	OFDMA	15	4	13.51	19.39	16.5	0	16.5	32.96
5735.0	5788.0	5840.0	OFDMA	20	4	13.44	19.36	16.5	0	16.5	32.92
2 Bands 2carriers 1sector- different frequencies and different Bands(4 ports: 2 dual slant antennas- no power aggregation as 2 carriers are in different bands and 2 Bands, no antenna gains aggregation)											
5730.0	5788.0	5845.0	OFDMA	10	4	16.39	19.36	16.5	0	16.5	32.89
5733.0	5788.0	5843.0	OFDMA	15	4	16.49	19.47	16.5	0	16.5	32.99
5735.0	5788.0	5840.0	OFDMA	20	4	16.46	19.39	16.5	0	16.5	32.96

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	Antenna array gain, dBi	Total antenna gain, dBi	Total EIRP, dBm
Low	Mid	High									
1 carrier 1 sector (4 ports: 2 dual slant antennas) non-coherent signal or 2carriers 1sector- different frequencies (4 ports: 2 dual slant antennas- power aggregation, no antenna gains aggregation)											
5160.0			OFDMA	10	4	4.31	10.29	16.5	3	19.5	26.80
	5200.0		OFDMA	10	4	9.30	15.29	16.5	3	19.5	31.80
		5245.0	OFDMA	10	4	8.01	13.99	16.5	3	19.5	30.50
5165.0			OFDMA	15	4	4.20	10.19	16.5	3	19.5	26.78
	5200.0		OFDMA	15	4	11.26	17.24	16.5	3	19.5	33.75
		5240.0	OFDMA	15	4	11.32	17.31	16.5	3	19.5	33.82
5165.0			OFDMA	20	4	3.20	9.18	16.5	3	19.5	25.69
	5200.0		OFDMA	20	4	10.70	16.68	16.5	3	19.5	33.19
		5240.0	OFDMA	20	4	10.43	16.41	16.5	3	19.5	32.92
(2carriers 2sectors) – isolated sectors, therefore the carriers may use similar or different frequencies (4 ports: 2 sectors x 2 dual slant antenna, no carrier aggregation and no antenna gain aggregation)											
5160.0			OFDMA	10	4	4.31	10.29	16.5	0	16.5	23.80
	5200.0		OFDMA	10	4	9.30	15.29	16.5	0	16.5	28.80
		5245.0	OFDMA	10	4	8.01	13.99	16.5	0	16.5	27.50
5165.0			OFDMA	15	4	4.20	10.19	16.5	0	16.5	23.48
	5200.0		OFDMA	15	4	11.26	17.24	16.5	0	16.5	30.75
		5240.0	OFDMA	15	4	11.32	17.31	16.5	0	16.5	30.82
5165.0			OFDMA	20	4	3.20	9.18	16.5	0	16.5	22.69
	5200.0		OFDMA	20	4	10.70	16.68	16.5	0	16.5	30.19
		5240.0	OFDMA	20	4	10.43	16.41	16.5	0	16.5	29.92
2 Bands 2carriers 1sector- different frequencies and different Bands(4 ports: 2 dual slant antennas- no power aggregation as 2 carriers are in different bands and 2 Bands, no antenna gains aggregation)											
5160.0			OFDMA	10	4	6.20	9.19	16.5	0	16.5	22.70
	5200.0		OFDMA	10	4	15.51	18.49	16.5	0	16.5	32.01
		5245.0	OFDMA	10	4	15.36	18.34	16.5	0	16.5	31.86
5165.0			OFDMA	15	4	7.60	10.59	16.5	0	16.5	24.10
	5200.0		OFDMA	15	4	14.46	17.47	16.5	0	16.5	30.96
		5240.0	OFDMA	15	4	14.48	17.47	16.5	0	16.5	30.98
5165.0			OFDMA	20	4	5.60	8.59	16.5	0	16.5	22.10
	5200.0		OFDMA	20	4	15.33	18.32	16.5	0	16.5	31.83
		5240.0	OFDMA	20	4	16.37	19.36	16.5	0	16.5	32.87

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.

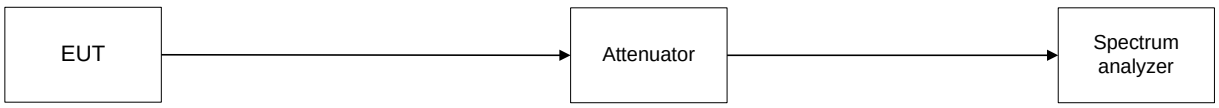
7.1.2 Test procedure

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	8.531	Pass
	16QAM	9.031	0.5	8.531	Pass
	64QAM	9.031	0.5	8.531	Pass
Mid frequency					
5.788	QPSK	9.011	0.5	8.511	Pass
	16QAM	9.011	0.5	8.511	Pass
	64QAM	9.011	0.5	8.451	Pass
High frequency					
5.845	QPSK	9.051	0.5	8.551	Pass
	16QAM	8.991	0.5	8.491	Pass
	64QAM	9.071	0.5	8.571	Pass

EBW: 15 MHz

Carrier frequency, GHz	Modulation	6 dB bandwidth, MHz	Limit, MHz	Margin*, MHz	Verdict
Low frequency					
5.7325	QPSK	13.539	0.5	-13.039	Pass
	16QAM	13.548	0.5	-13.048	Pass
	64QAM	13.532	0.5	-13.032	Pass
Mid frequency					
5.7880	QPSK	13.519	0.5	-13.019	Pass
	16QAM	13.517	0.5	-13.017	Pass
	64QAM	13.524	0.5	-13.024	Pass
High frequency					
5.8425	QPSK	13.541	0.5	-13.041	Pass
	16QAM	13.547	0.5	-13.047	Pass
	64QAM	13.519	0.5	-13.019	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	18.052	0.5	-17.552	Pass
	16QAM	18.050	0.5	-17.550	Pass
	64QAM	18.010	0.5	-17.510	Pass
Mid frequency					
5.7880	QPSK	18.037	0.5	-17.537	Pass
	16QAM	18.020	0.5	-17.520	Pass
	64QAM	18.035	0.5	-17.535	Pass
High frequency					
5.8400	QPSK	18.027	0.5	-17.527	Pass
	16QAM	18.032	0.5	-17.532	Pass
	64QAM	18.012	0.5	-17.512	Pass

* Margin = 6 dB bandwidth – specification limit

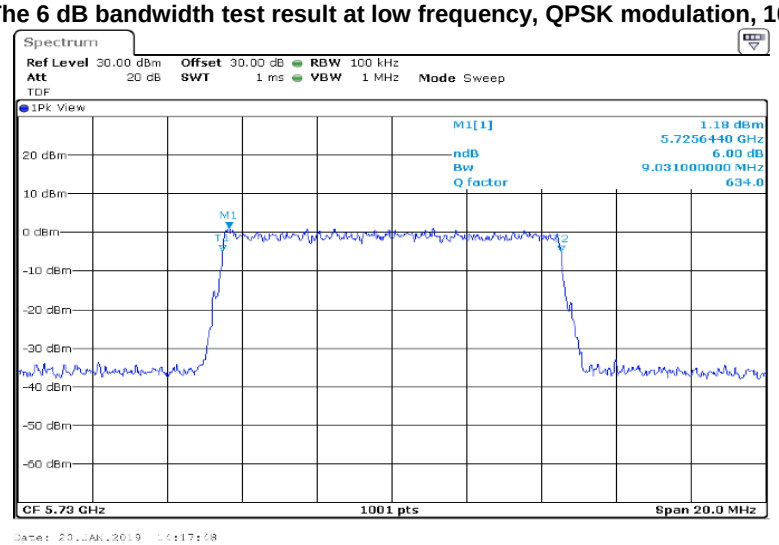
Reference numbers of test equipment used

HL 2909	HL 3655	HL 3901						

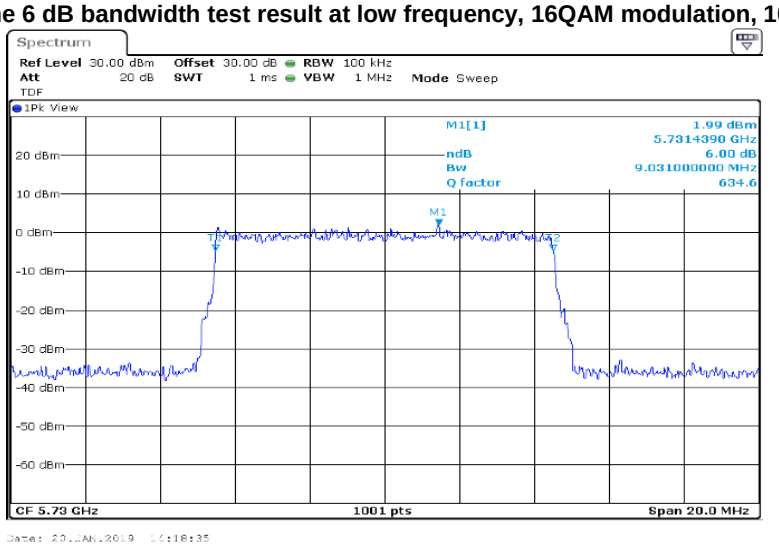
Full description is given in Appendix A.

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

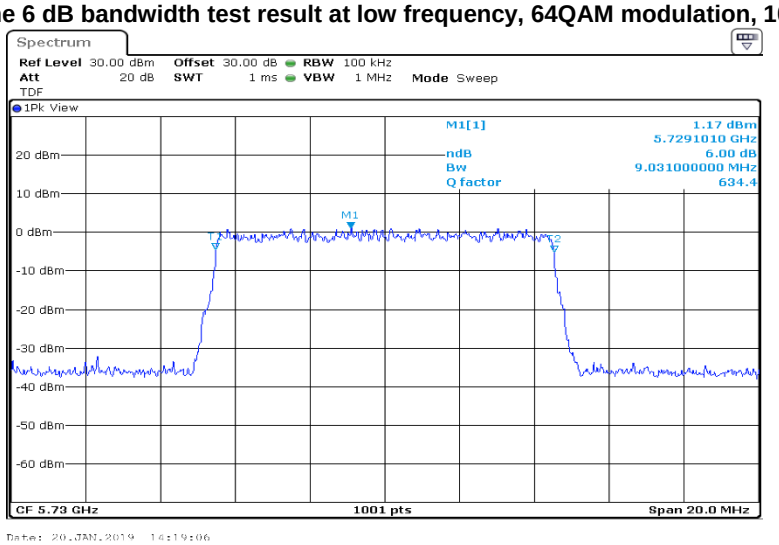


Plot 7.1.2 The 6 dB bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



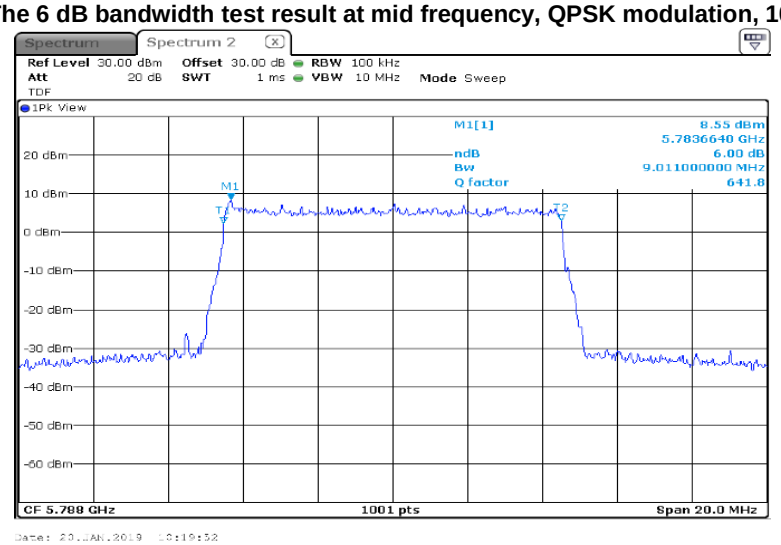
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

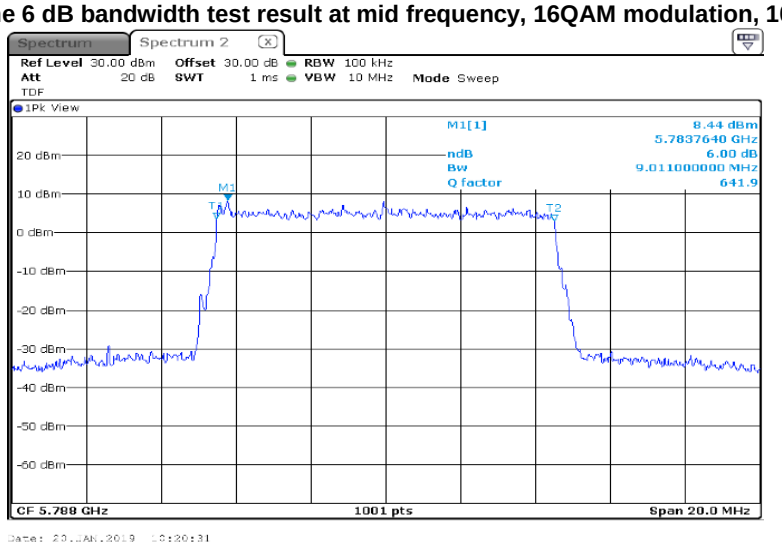


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

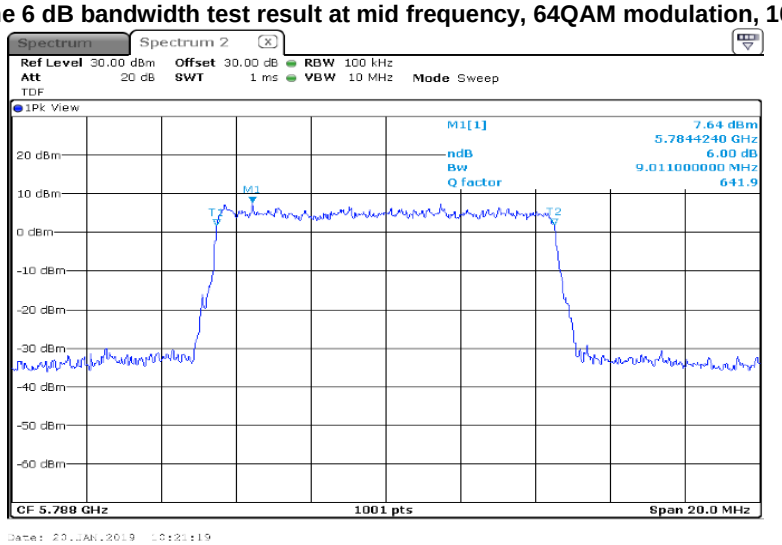


Plot 7.1.5 The 6 dB bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



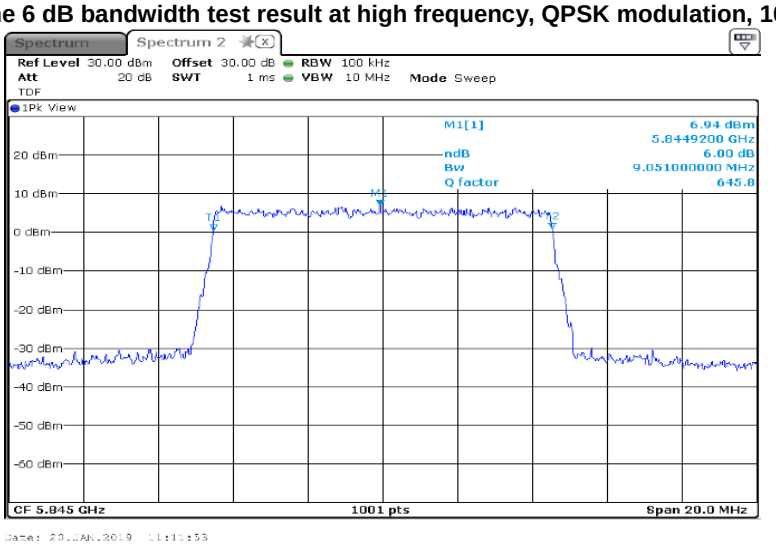
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

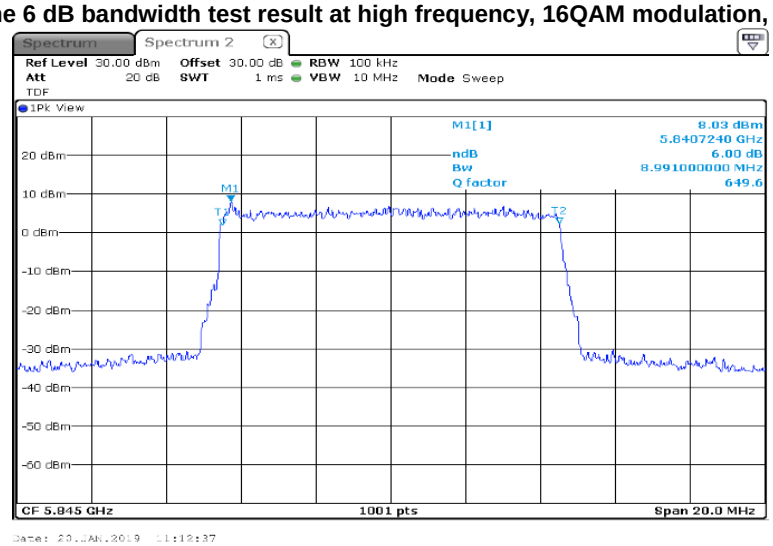


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

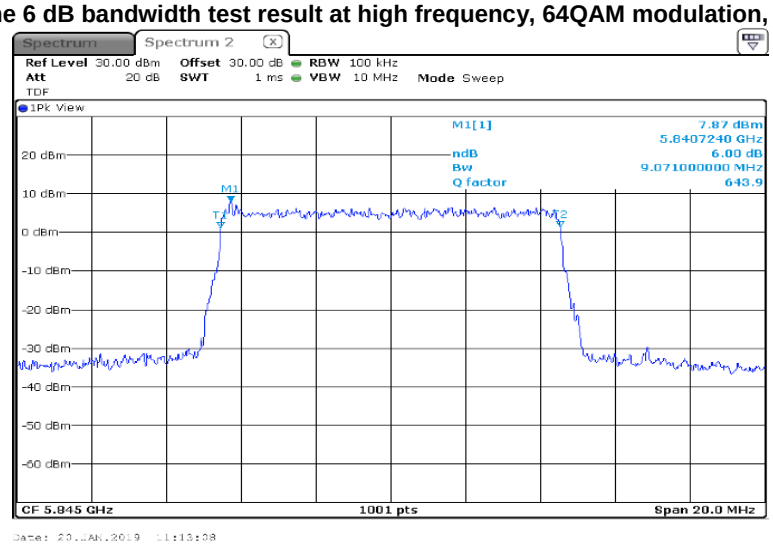


Plot 7.1.8 The 6 dB bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



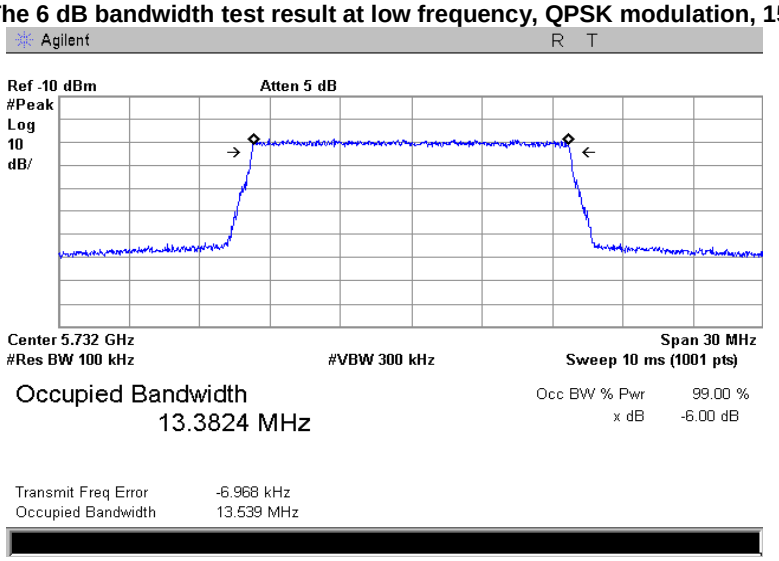
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

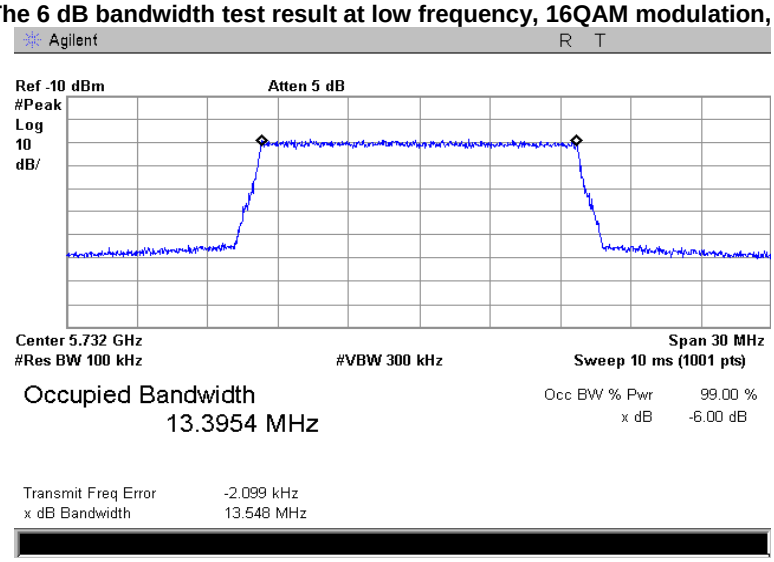


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

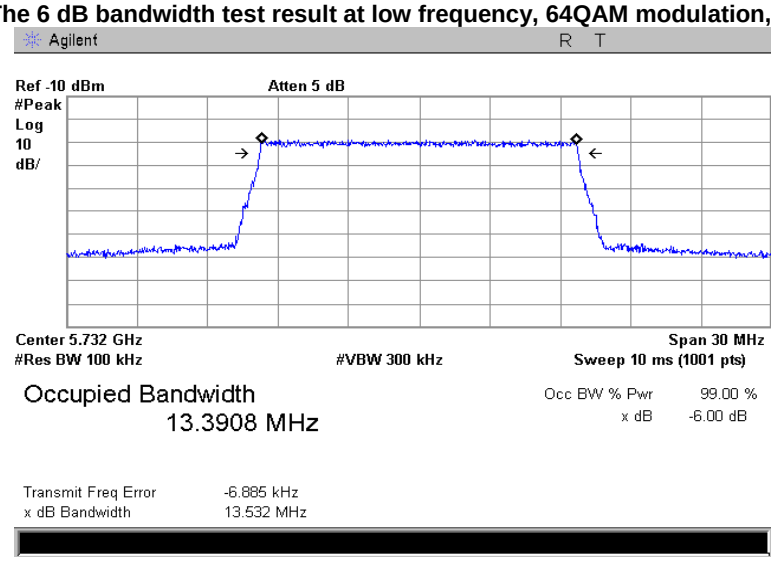


Plot 7.1.11 The 6 dB bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



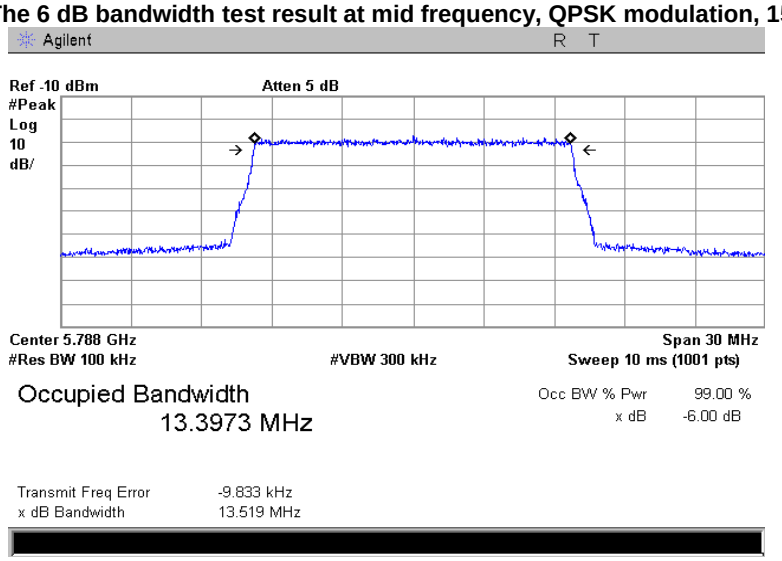
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

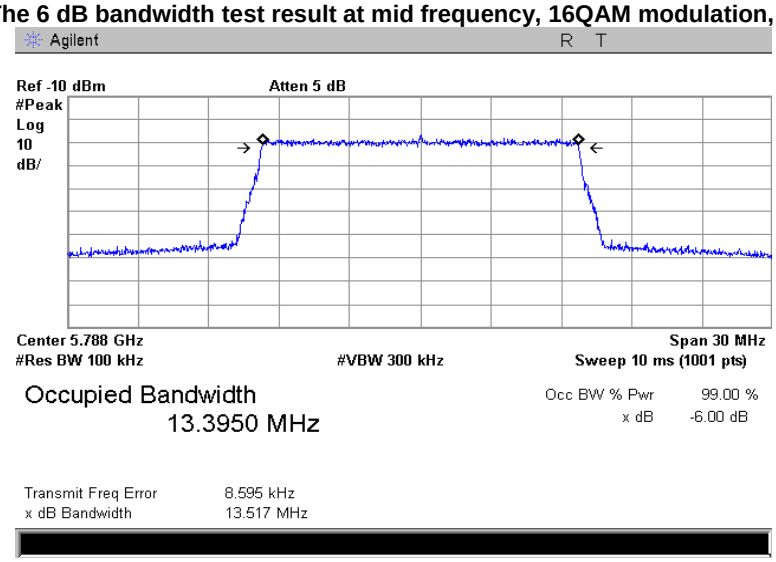


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

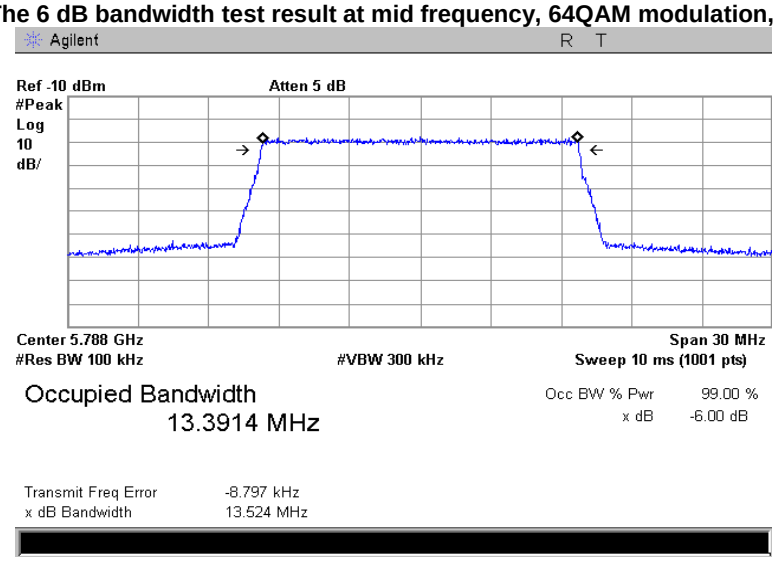


Plot 7.1.14 The 6 dB bandwidth test result at mid frequency, 16QAM modulation, 15 MHz EBW



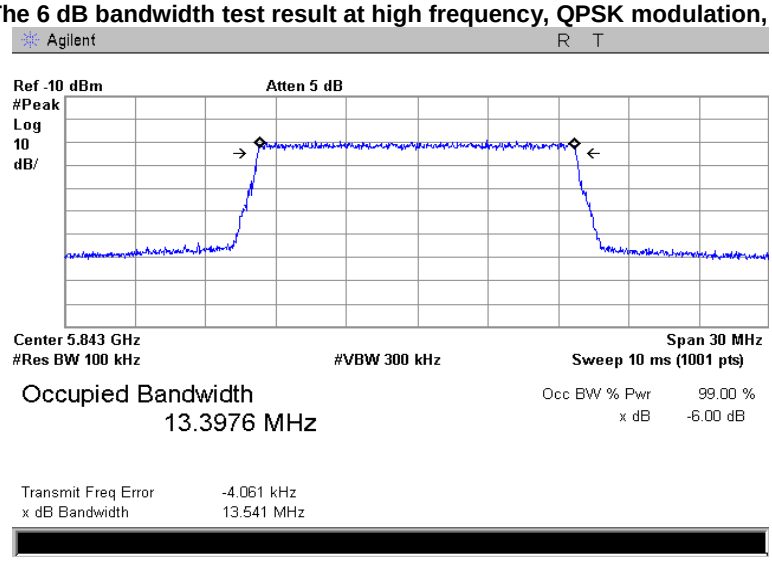
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

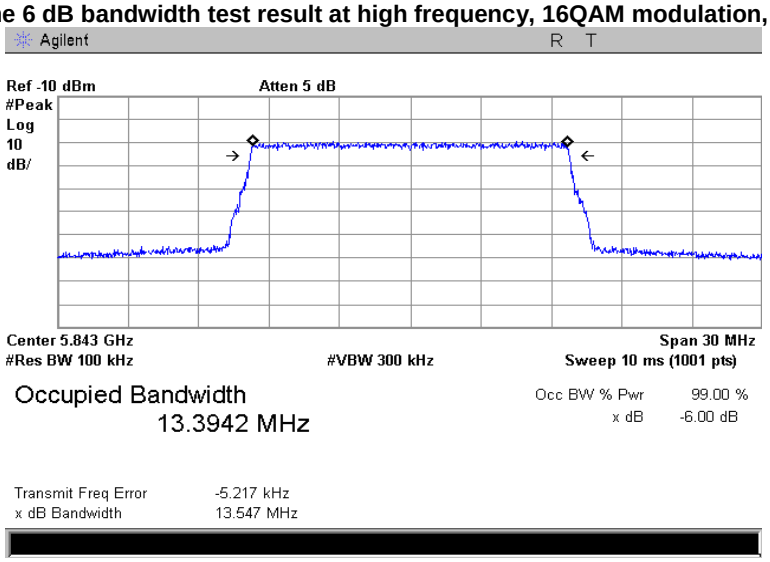


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

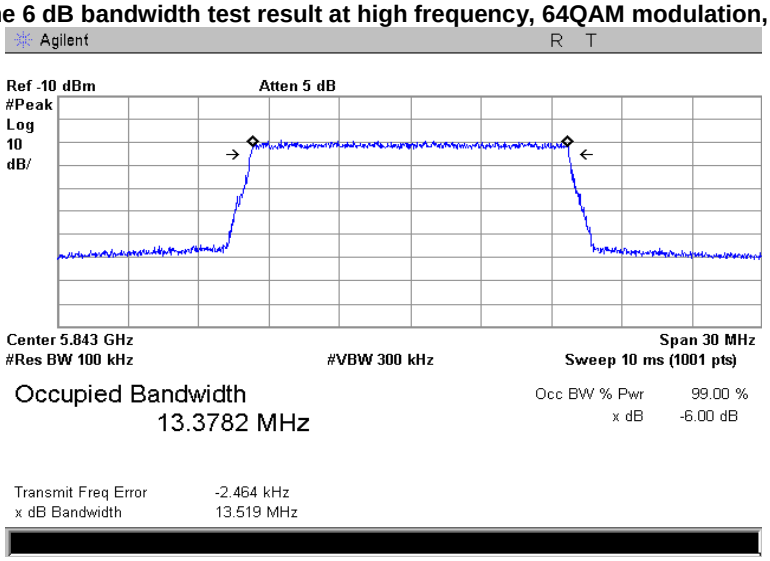


Plot 7.1.17 The 6 dB bandwidth test result at high frequency, 16QAM modulation, 15 MHz EBW



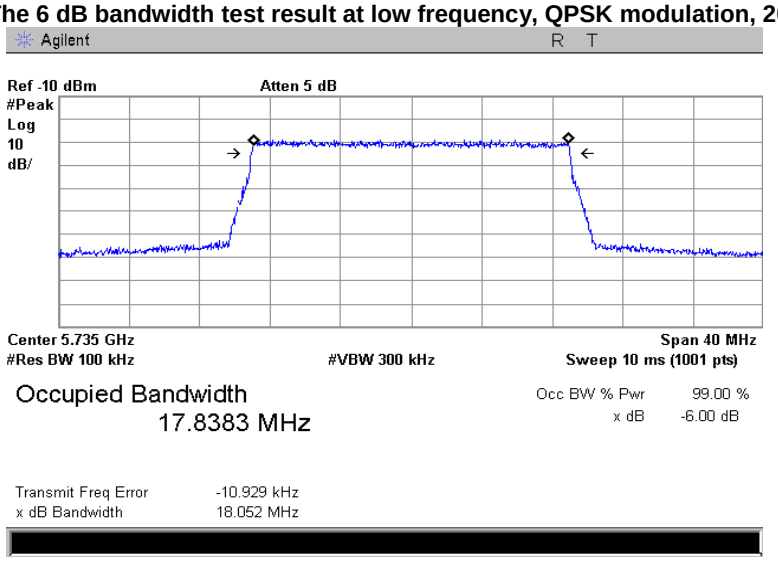
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

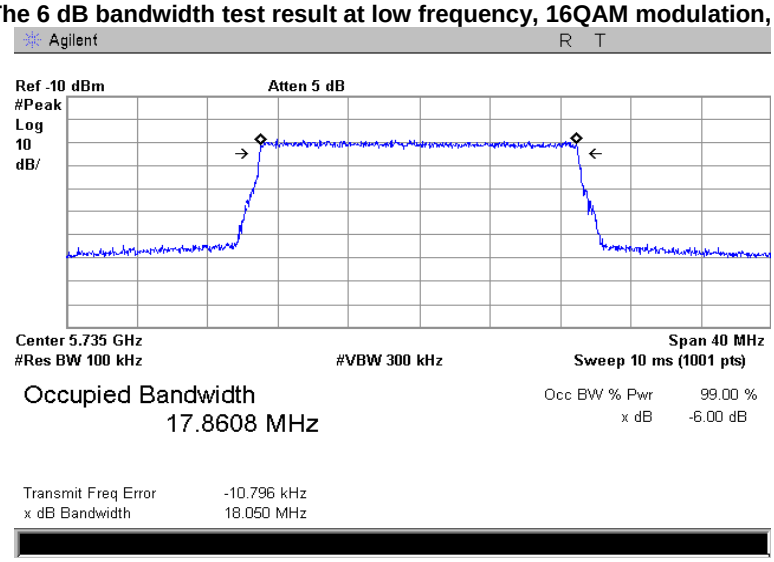


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

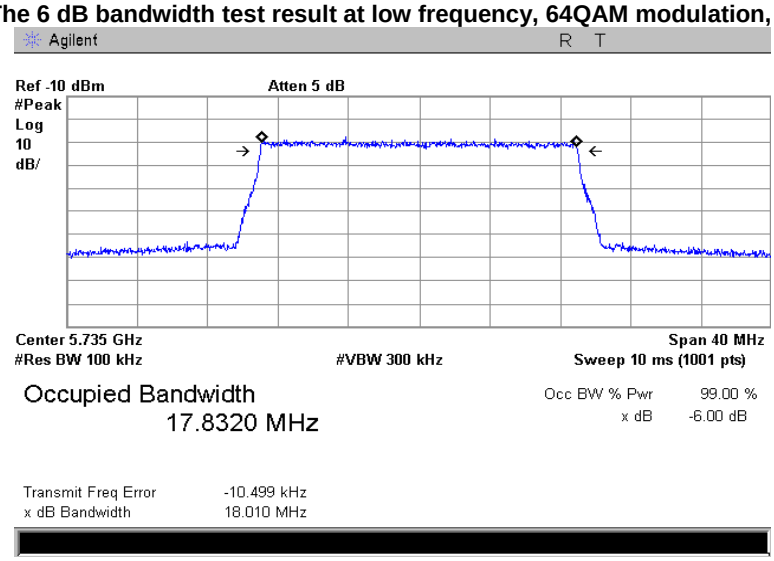


Plot 7.1.20 The 6 dB bandwidth test result at low frequency, 16QAM modulation, 20 MHz EBW



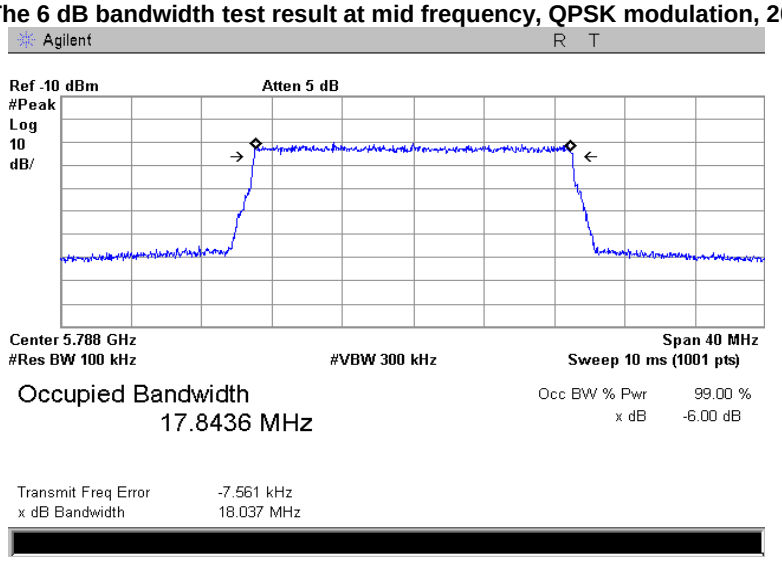
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

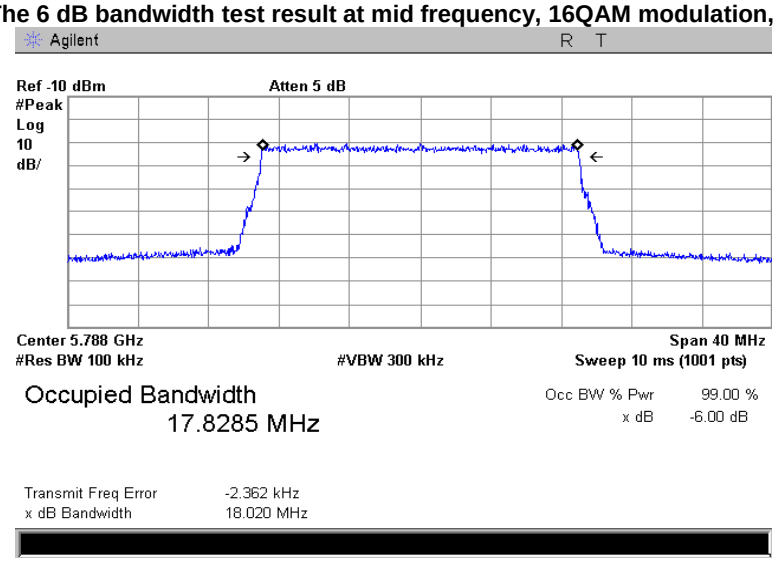


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

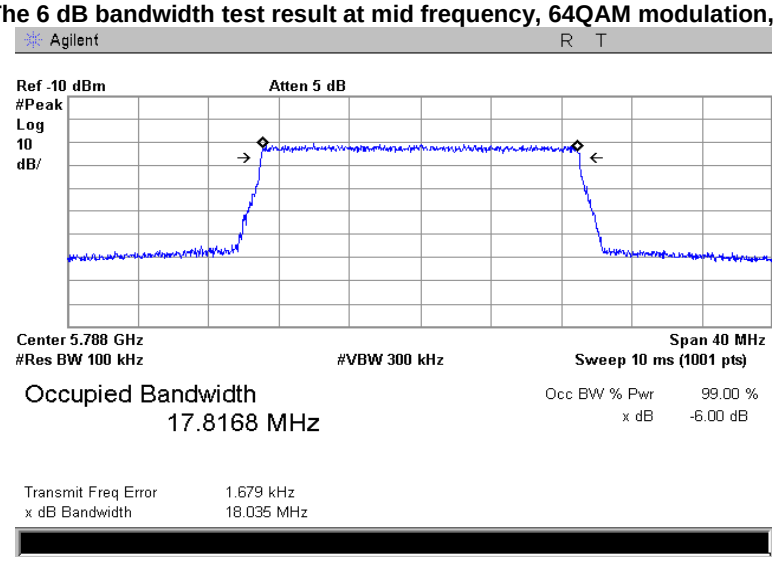


Plot 7.1.23 The 6 dB bandwidth test result at mid frequency, 16QAM modulation, 20 MHz EBW



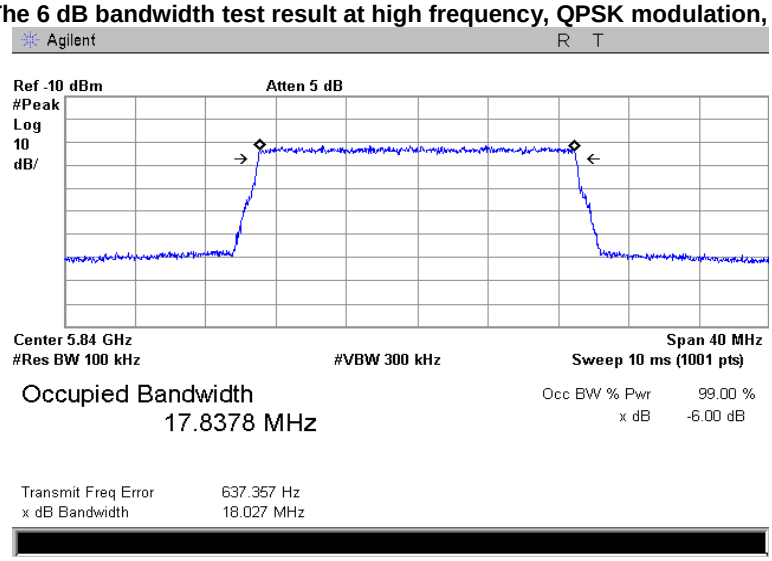
Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

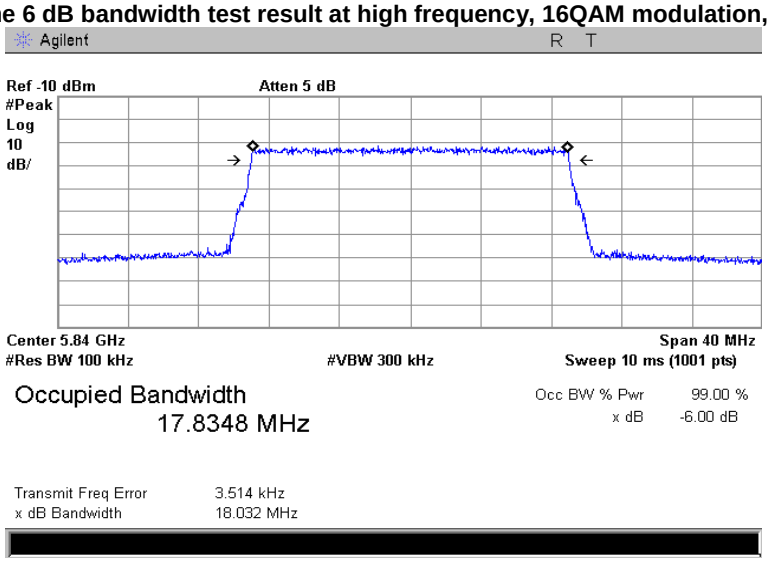


Test specification:	FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

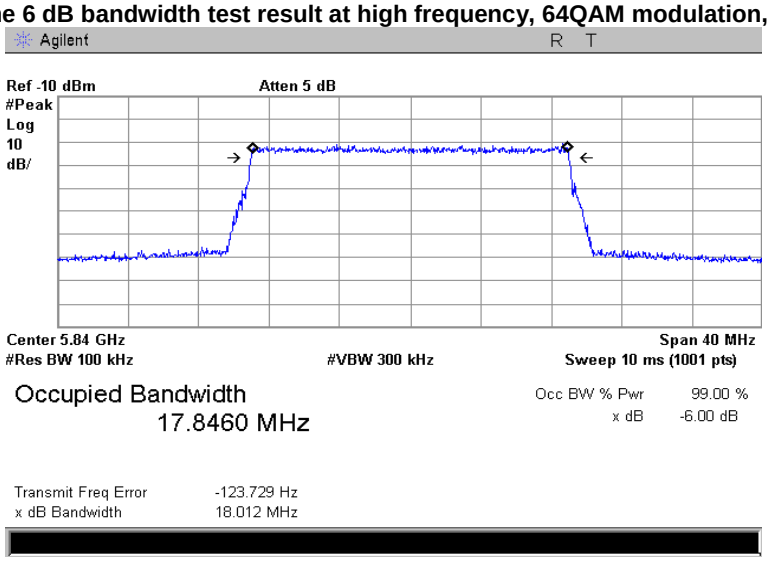


Plot 7.1.26 The 6 dB bandwidth test result at high frequency, 16QAM modulation, 20 MHz EBW



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 6.9.3; 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:			

7.2 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.

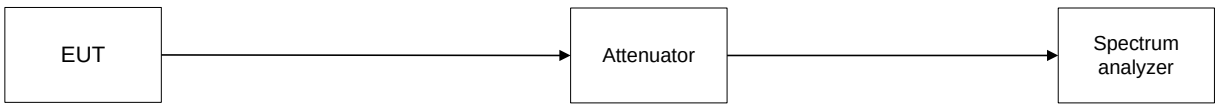
7.2.2 Test procedure

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 6.9.3; 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 7.2.2 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	8.951
	16QAM	8.951
	64QAM	8.971
Mid frequency		
5.7880	QPSK	8.951
	16QAM	8.951
	64QAM	9.011
High frequency		
5.8450	QPSK	8.971
	16QAM	8.991
	64QAM	8.971

EBW: 15 MHz

Carrier frequency, GHz	Modulation	99% bandwidth, MHz
Low frequency		
5.7325	QPSK	13.457
	16QAM	13.457
	64QAM	13.487
Mid frequency		
5.7880	QPSK	13.427
	16QAM	13.457
	64QAM	13.457
High frequency		
5.8425	QPSK	13.457
	16QAM	13.457
	64QAM	13.457

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 7.2.2 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	17.862
	16QAM	17.902
	64QAM	17.902
Mid frequency		
5.7880	QPSK	17.902
	16QAM	17.902
	64QAM	17.902
High frequency		
5.8400	QPSK	17.862
	16QAM	17.902
	64QAM	17.942

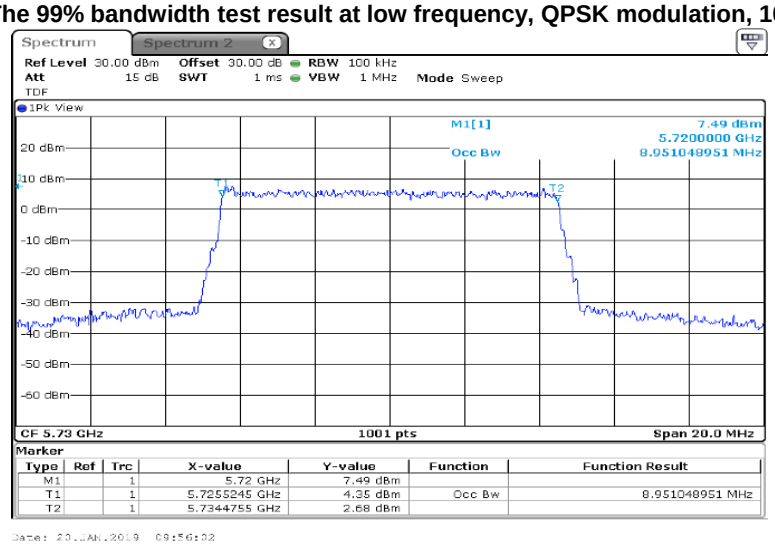
Reference numbers of test equipment used

HL 3901	HL 4355							

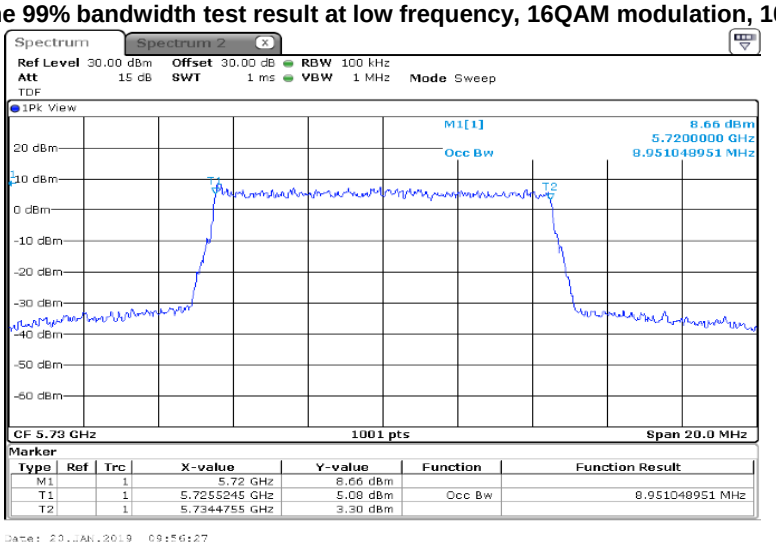
Full description is given in Appendix A.

Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; 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 7.2.1 The 99% bandwidth test result at low frequency, QPSK modulation, 10 MHz EBW

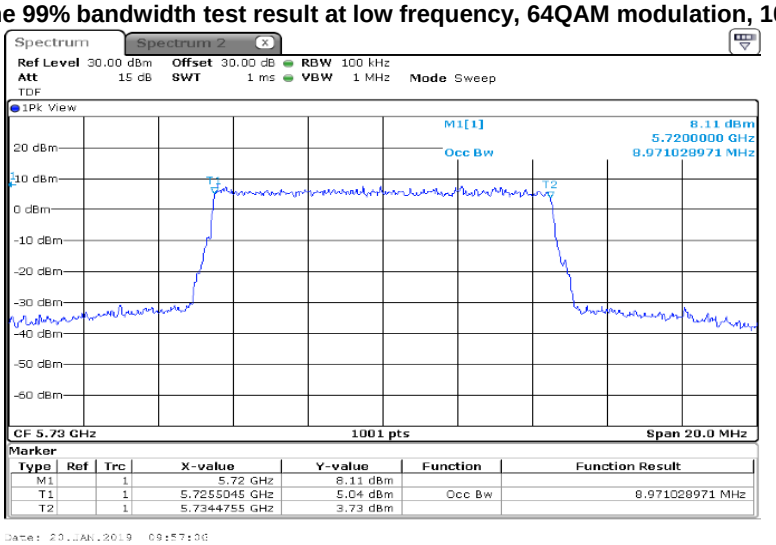


Plot 7.2.2 The 99% bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



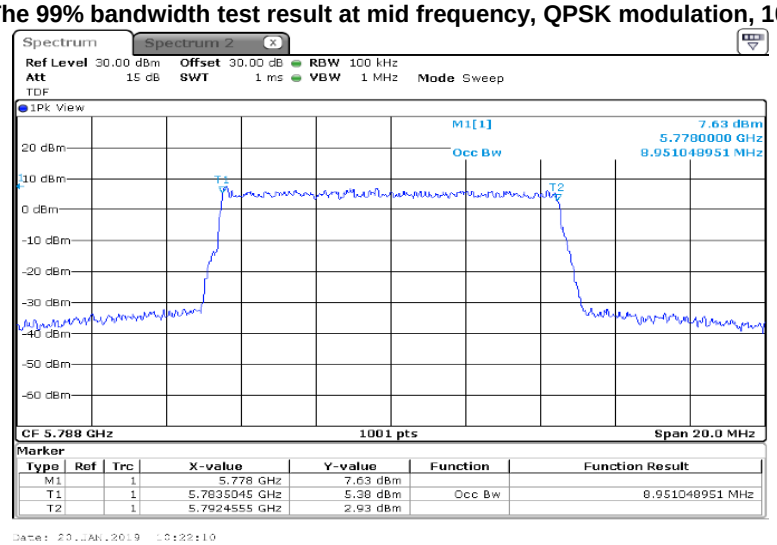
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

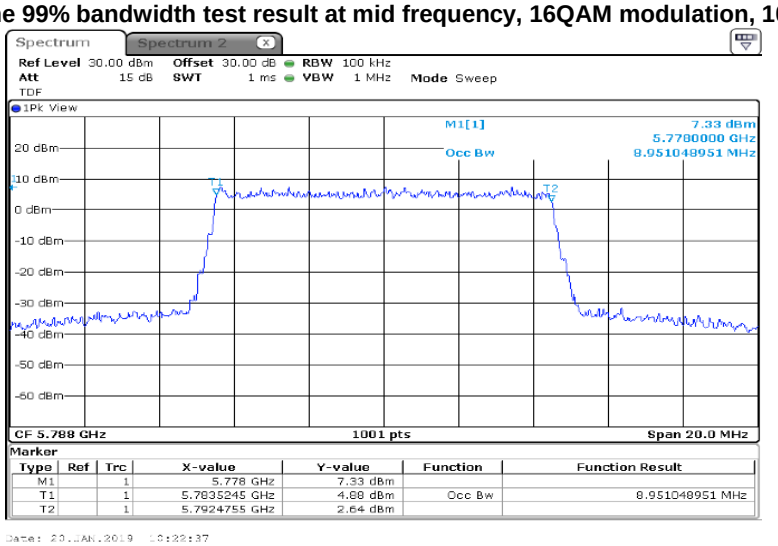


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

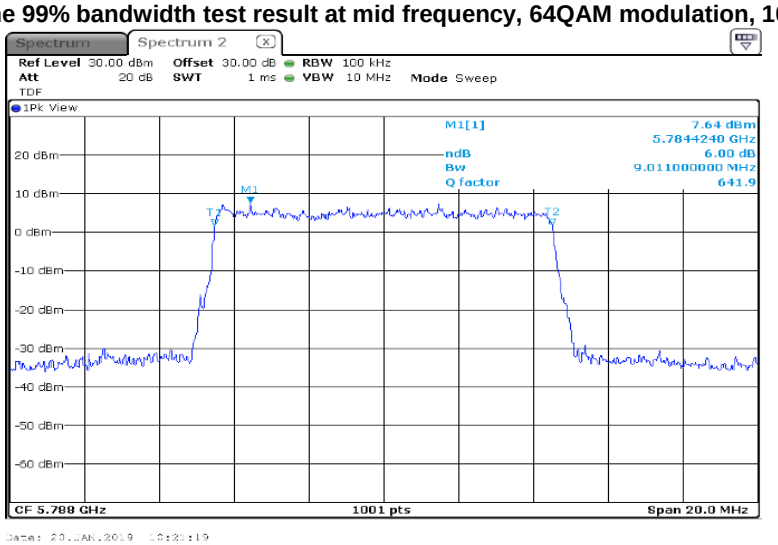


Plot 7.2.5 The 99% bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



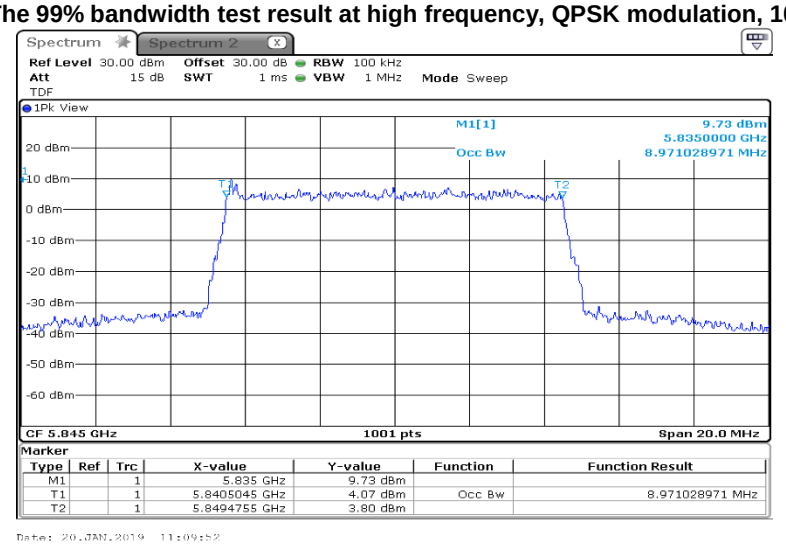
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

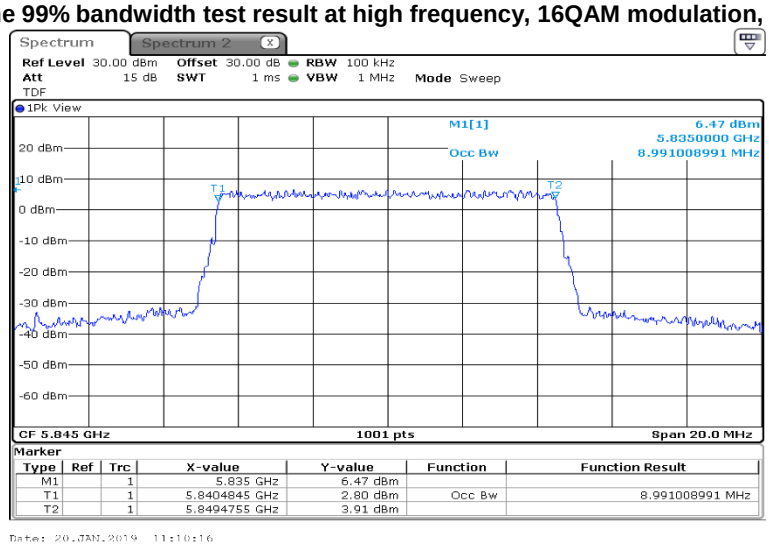


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

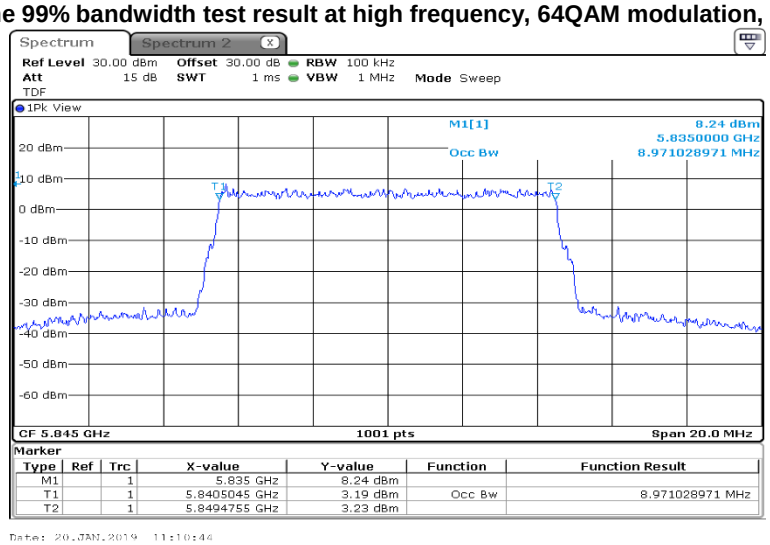


Plot 7.2.8 The 99% bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



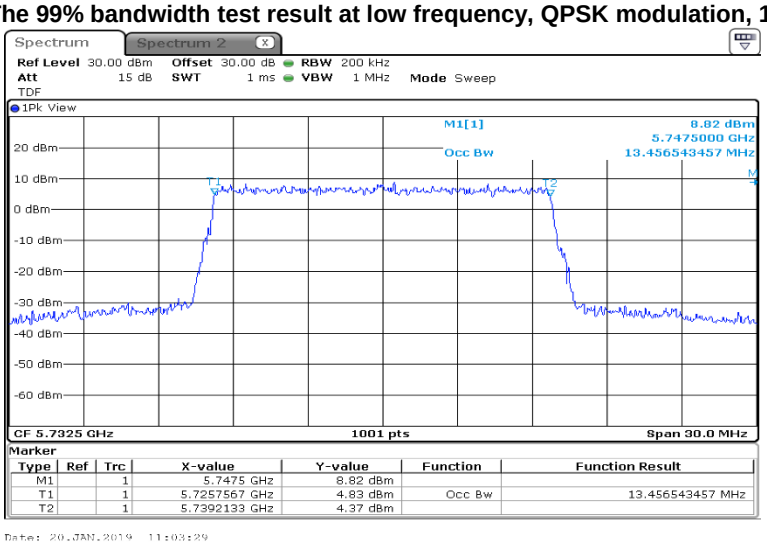
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

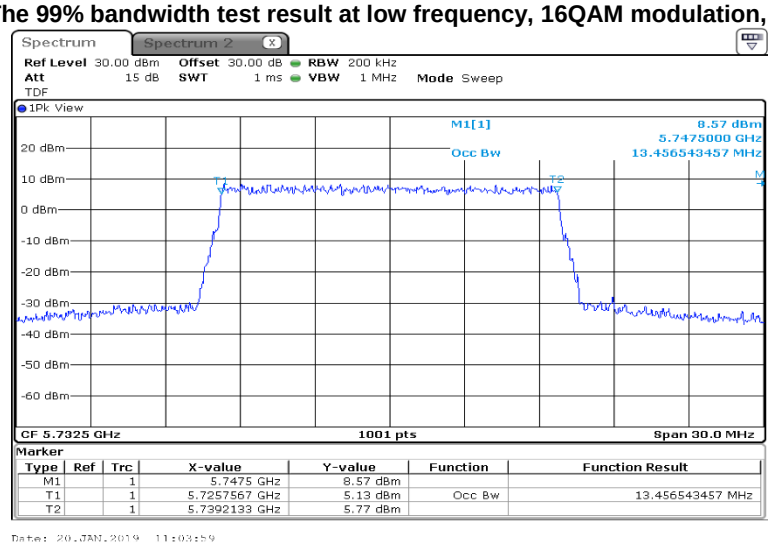


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

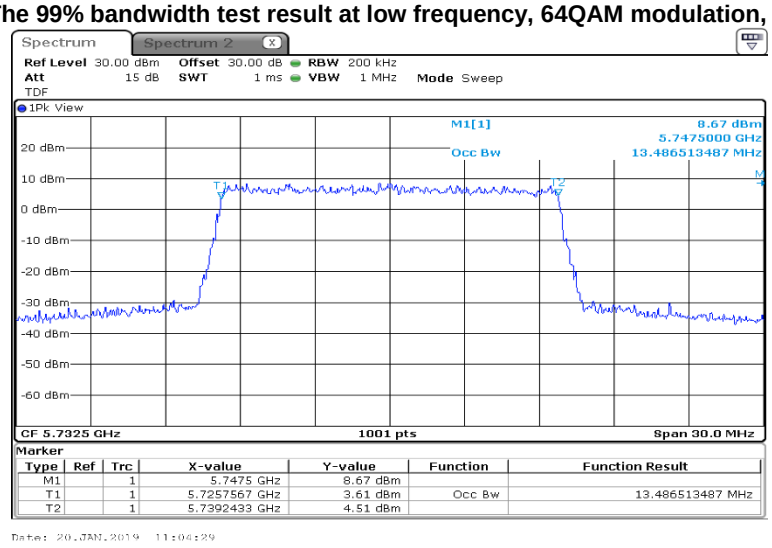


Plot 7.2.11 The 99% bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



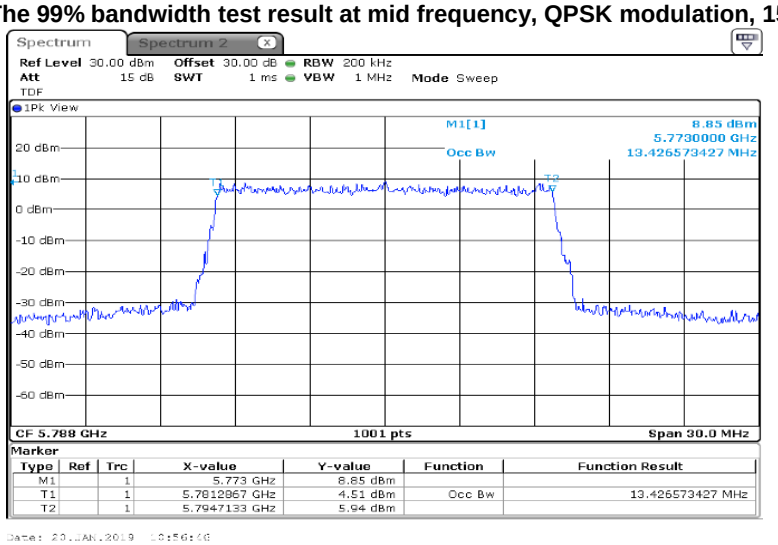
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

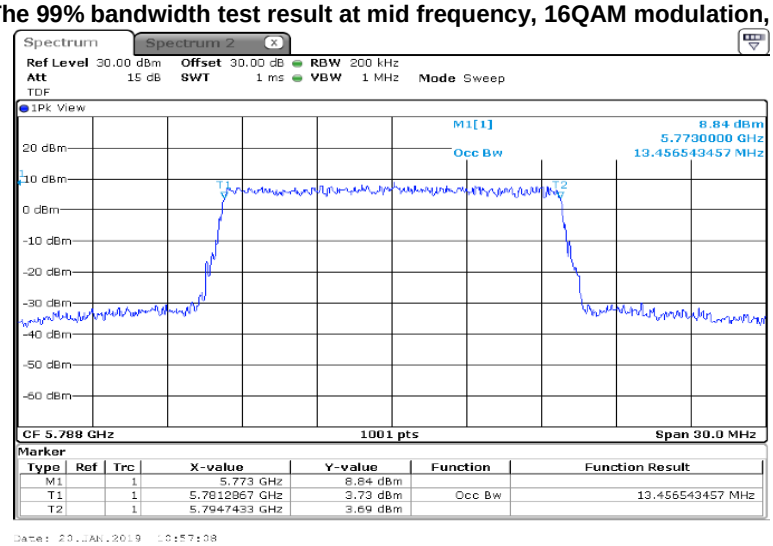


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

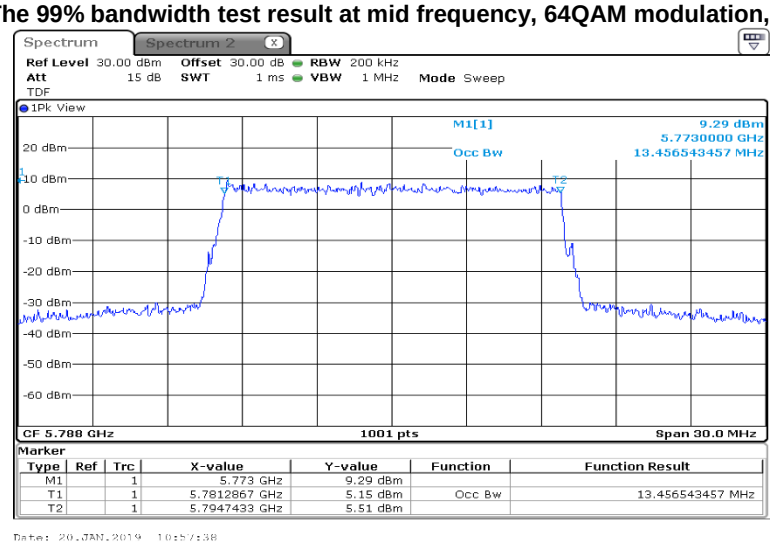


Plot 7.2.14 The 99% bandwidth test result at mid frequency, 16QAM modulation, 15 MHz EBW



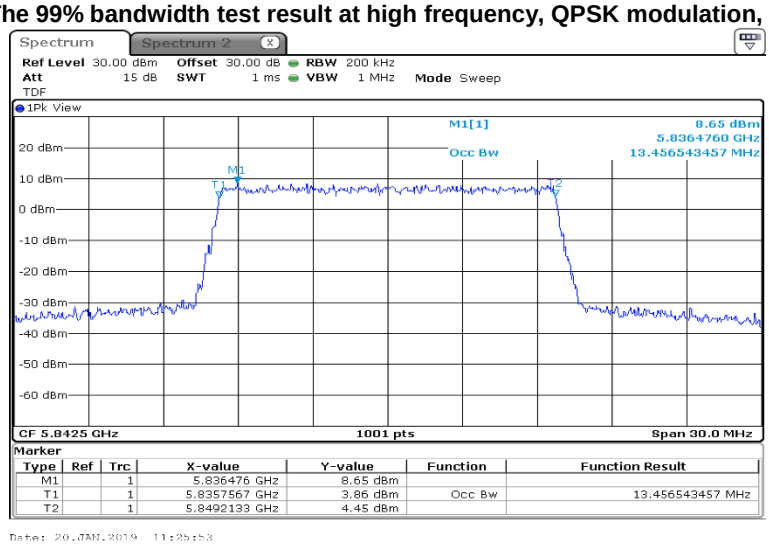
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

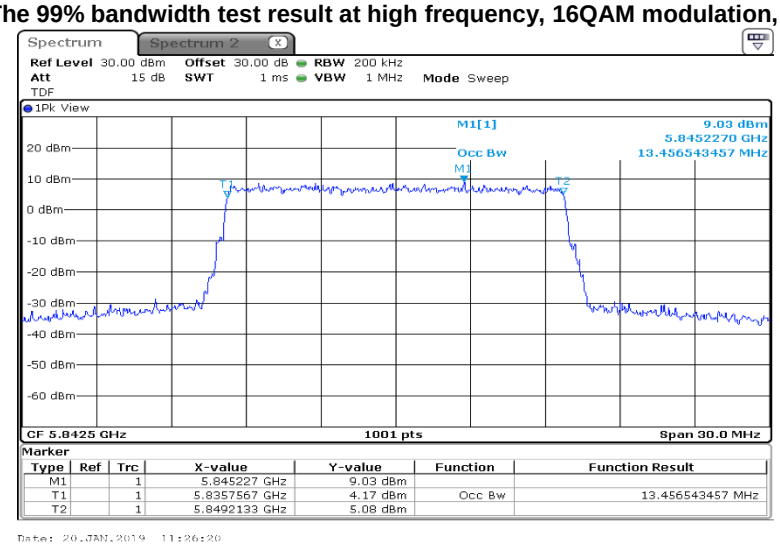


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

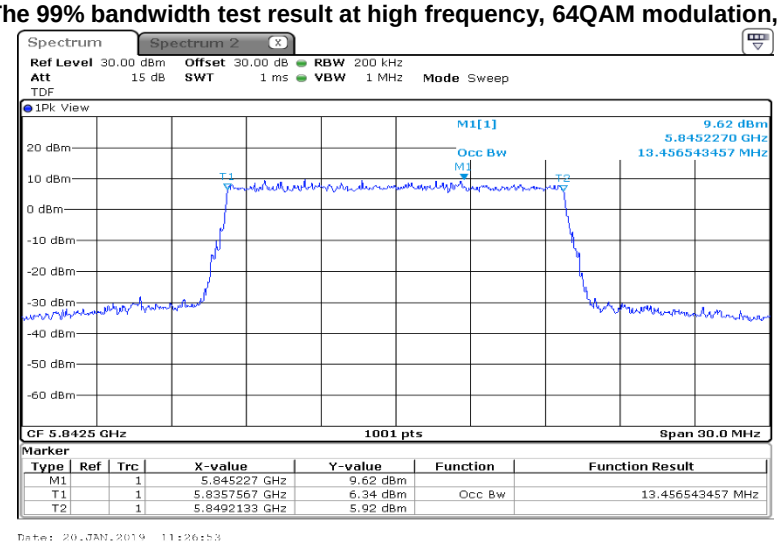


Plot 7.2.17 The 99% bandwidth test result at high frequency, 16QAM modulation, 15 MHz EBW



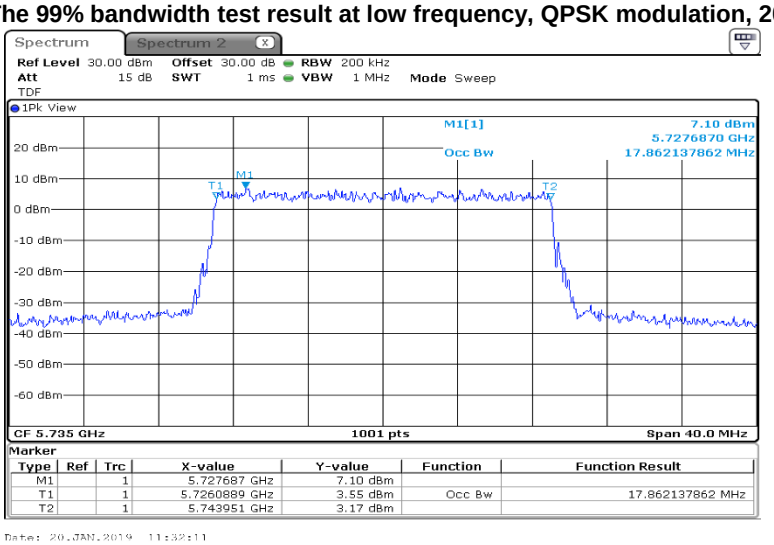
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

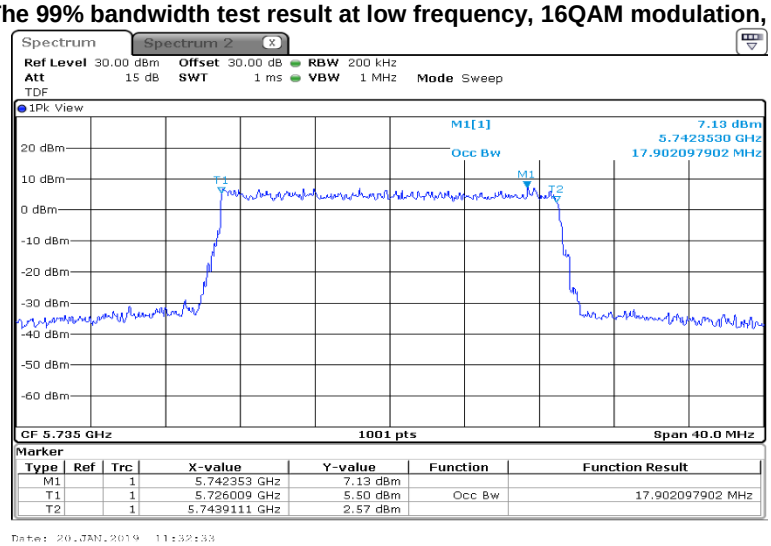


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

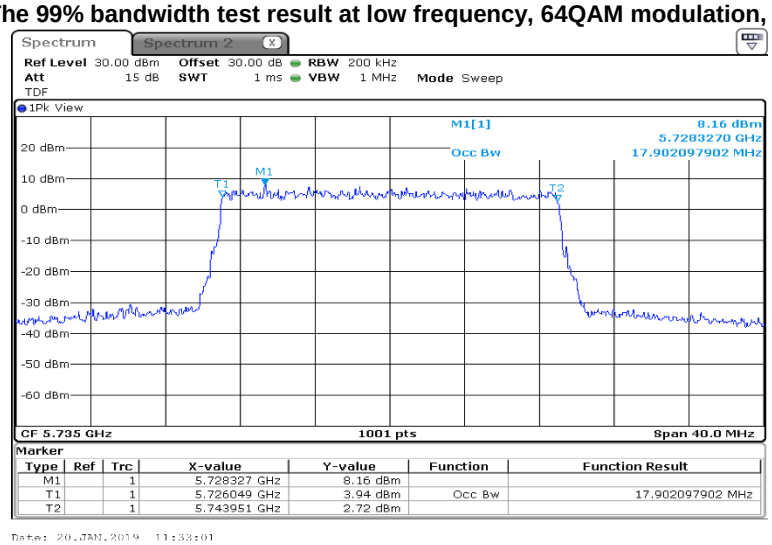


Plot 7.2.20 The 99% bandwidth test result at low frequency, 16QAM modulation, 20 MHz EBW



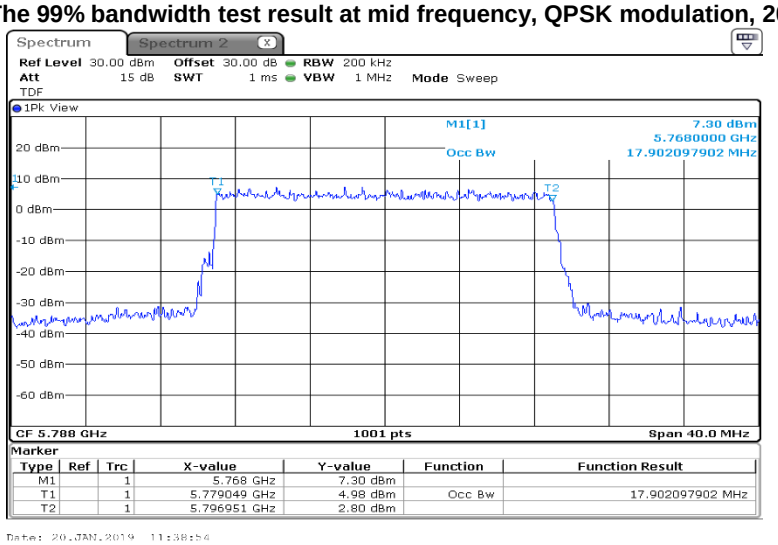
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

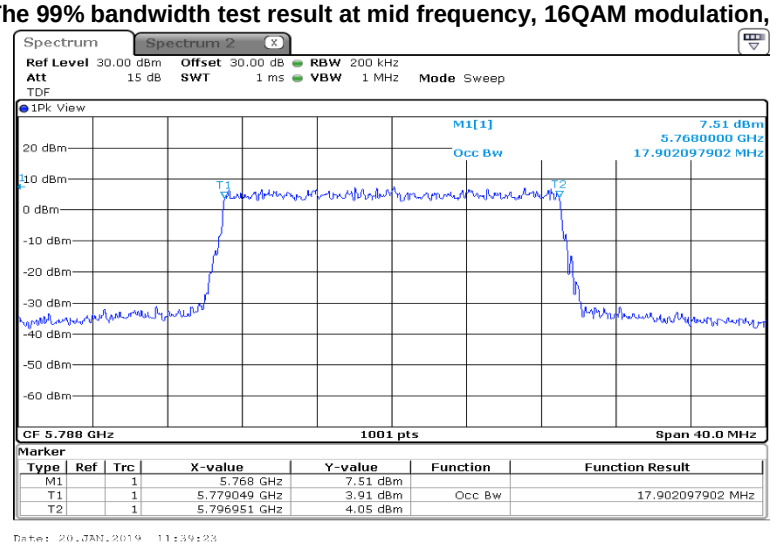


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

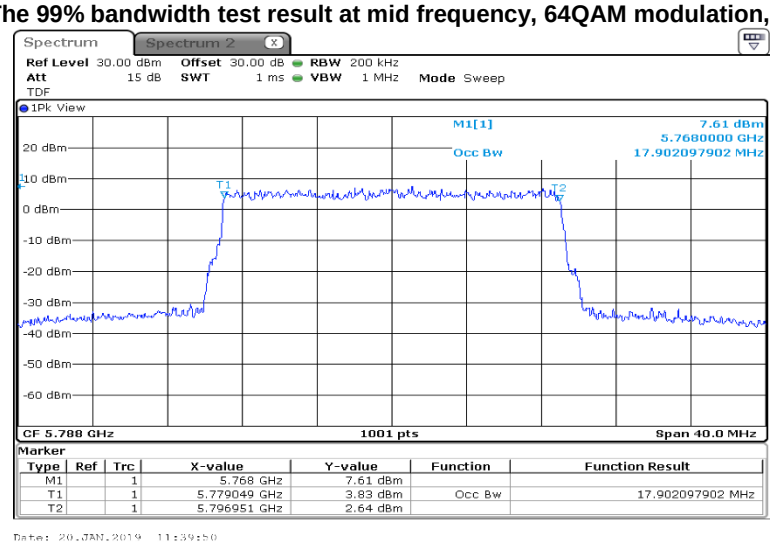


Plot 7.2.23 The 99% bandwidth test result at mid frequency, 16QAM modulation, 20 MHz EBW



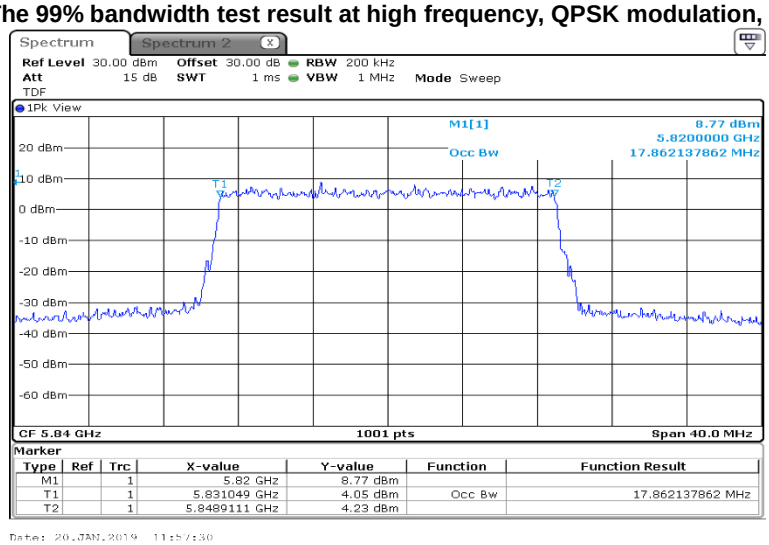
Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

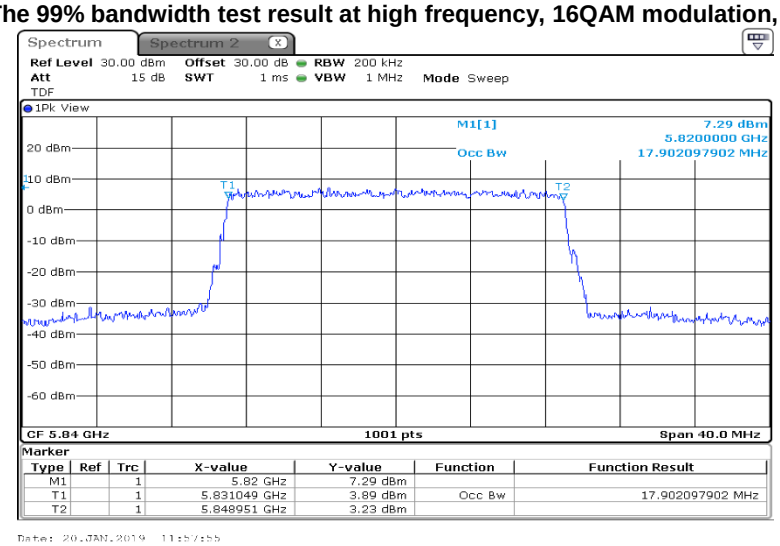


Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

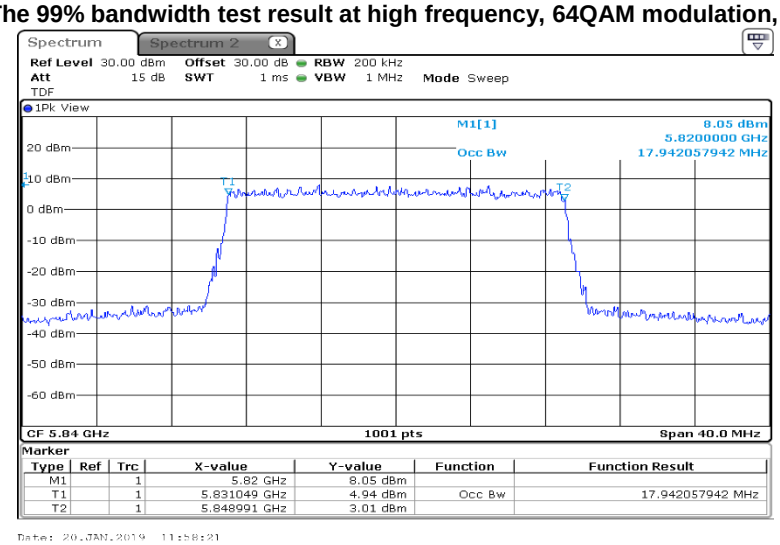


Plot 7.2.26 The 99% bandwidth test result at high frequency, 16QAM modulation, 20 MHz EBW



Test specification:	FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth		
Test procedure:	ANSI C63.10, section 6.9.3; 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 7.2.27 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.

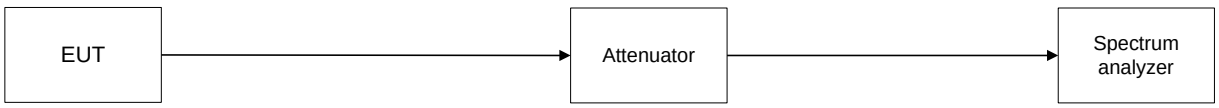
7.3.2 Test procedure

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	9.920
	16QAM	9.812
	64QAM	9.812
Mid frequency		
5.200	QPSK	9.770
	16QAM	9.830
	64QAM	9.800
High frequency		
5.245	QPSK	9.800
	16QAM	9.800
	64QAM	9.830

EBW: 15 MHz

Carrier frequency, GHz	Modulation	26 dB bandwidth, MHz
Low frequency		
5.165	QPSK	14.505
	16QAM	14.685
	64QAM	14.416
Mid frequency		
5.200	QPSK	14.595
	16QAM	14.715
	64QAM	14.715
High frequency		
5.240	QPSK	14.625
	16QAM	14.505
	64QAM	14.476

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	19.221
	16QAM	19.181
	64QAM	19.221
Mid frequency		
5.200	QPSK	19.181
	16QAM	19.101
	64QAM	19.301
High frequency		
5.240	QPSK	19.341
	16QAM	19.461
	64QAM	19.141

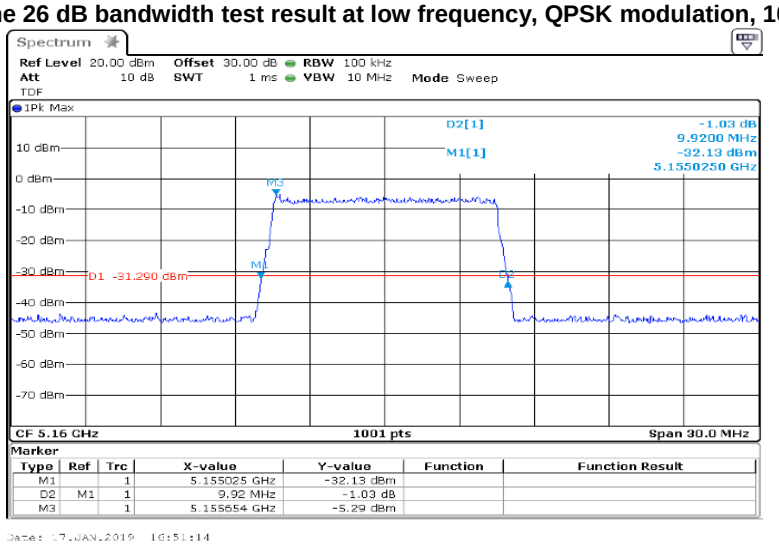
Reference numbers of test equipment used

HL 3901	HL 4068							

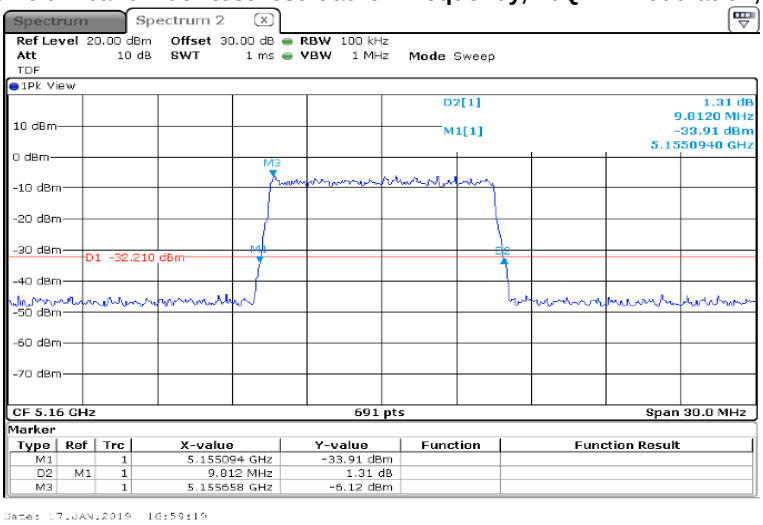
Full description is given in Appendix A.

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

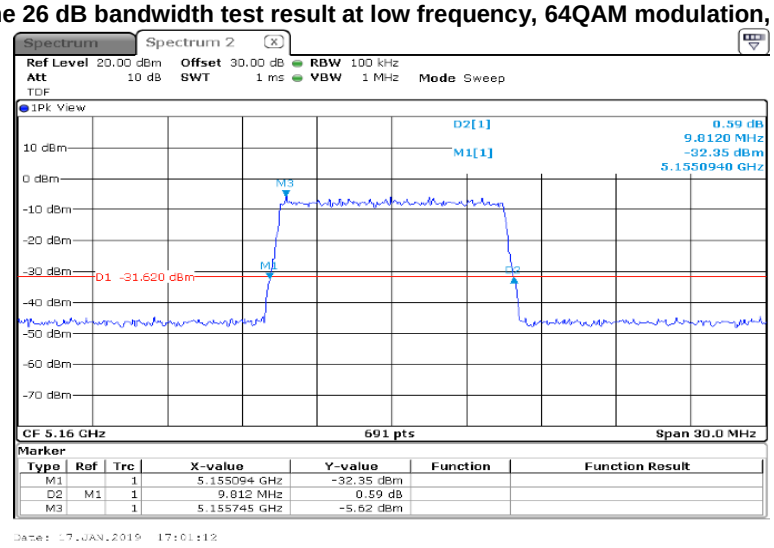


Plot 7.3.2 The 26 dB bandwidth test result at low frequency, 16QAM modulation, 10 MHz EBW



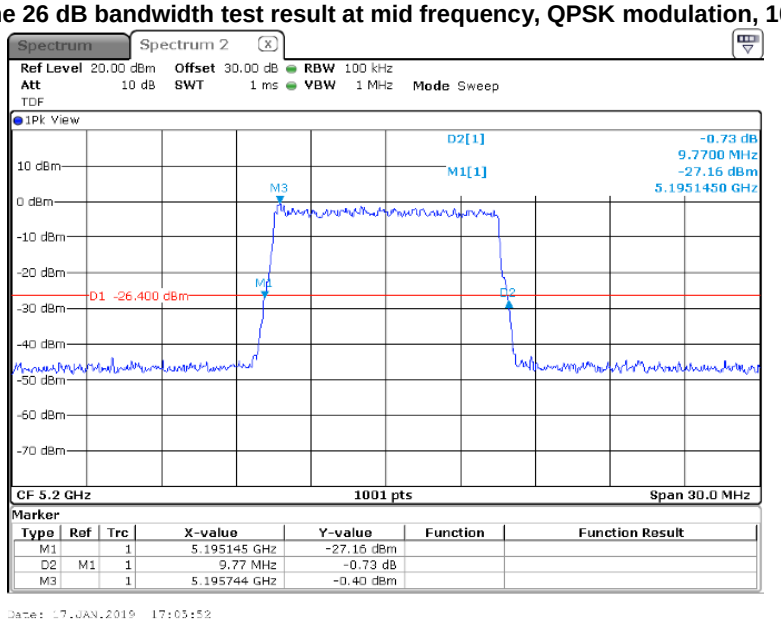
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

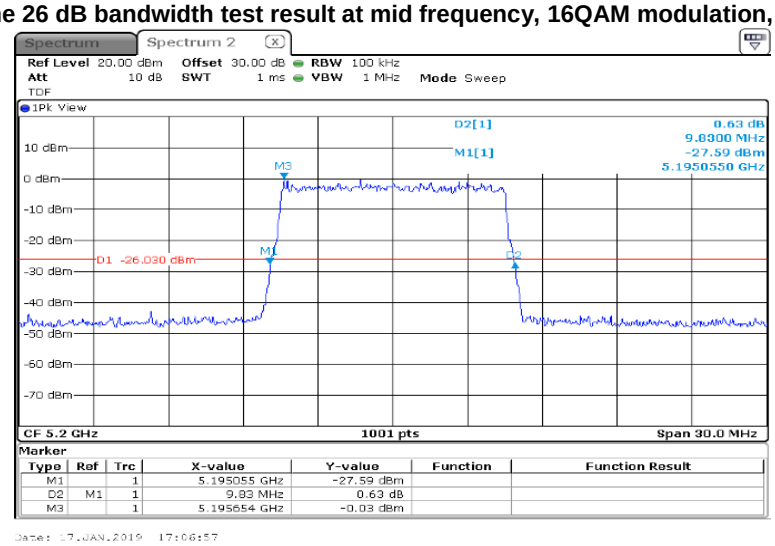


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

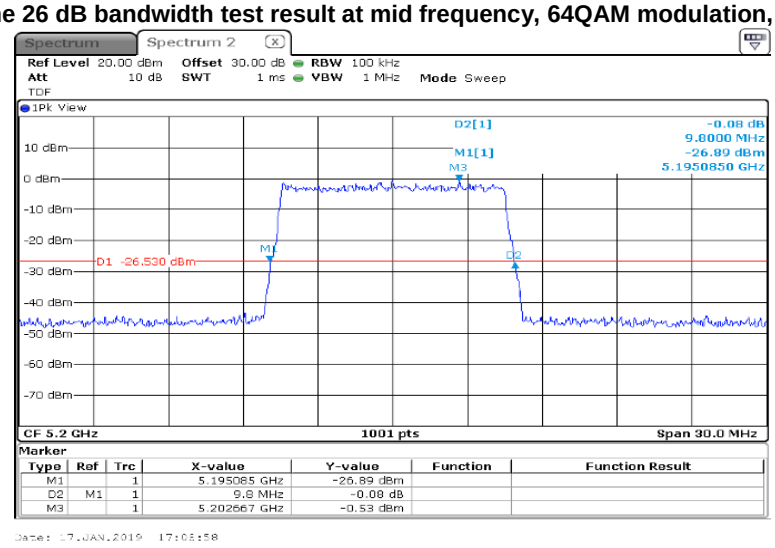


Plot 7.3.5 The 26 dB bandwidth test result at mid frequency, 16QAM modulation, 10 MHz EBW



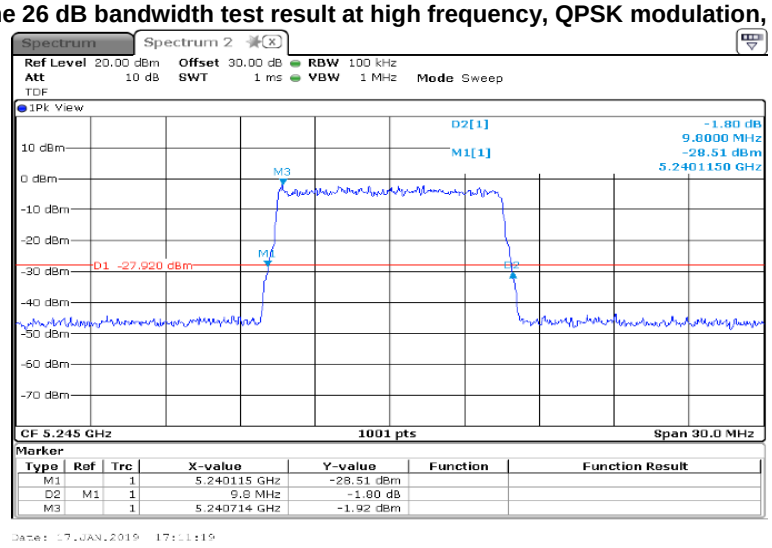
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

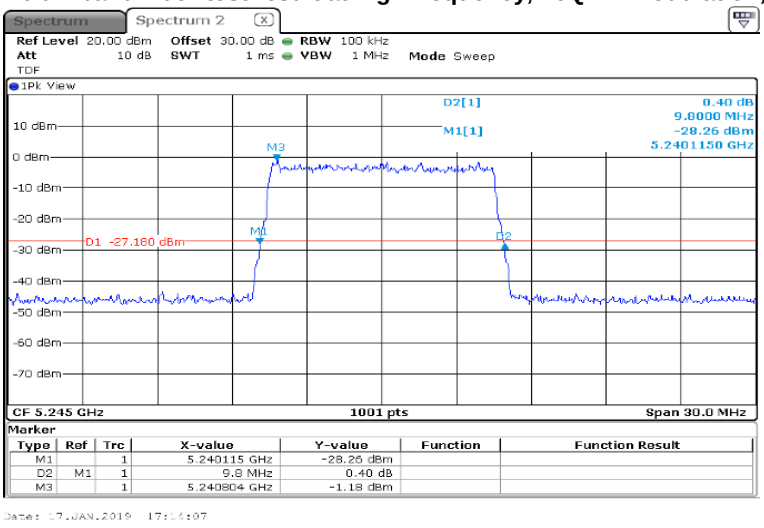


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

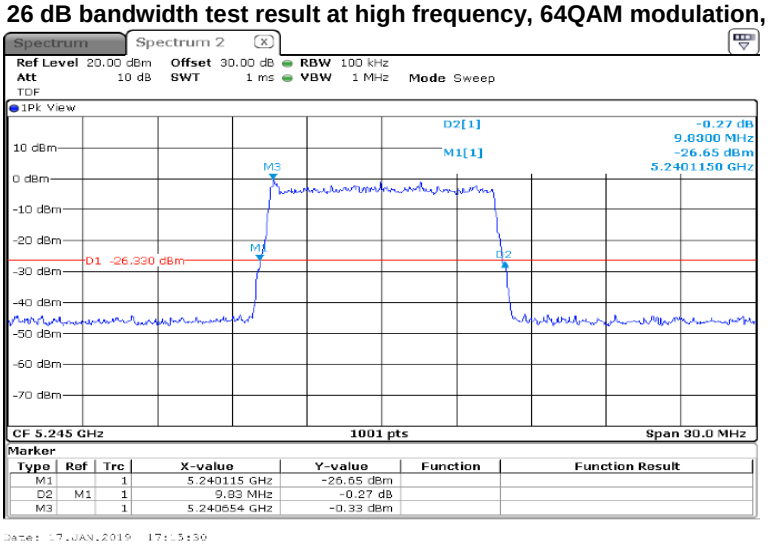


Plot 7.3.8 The 26 dB bandwidth test result at high frequency, 16QAM modulation, 10 MHz EBW



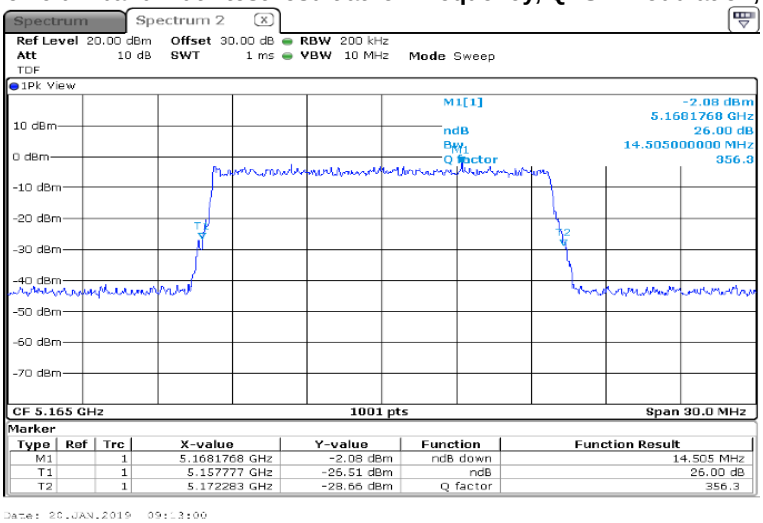
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

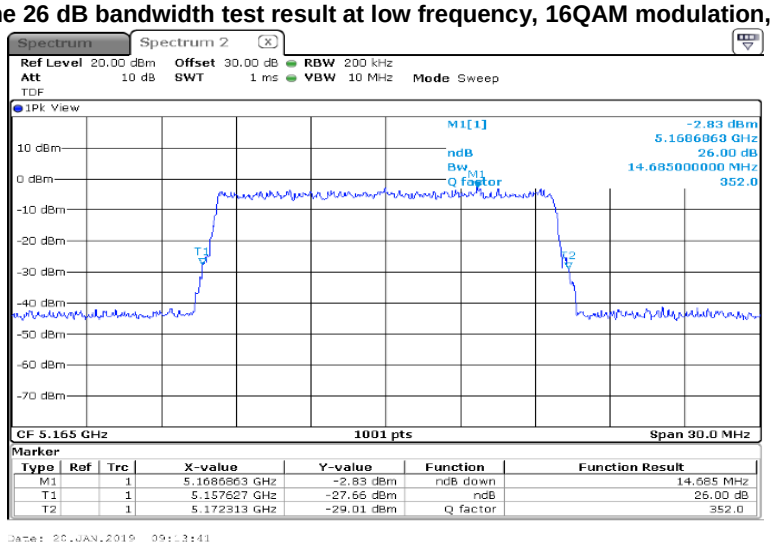


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

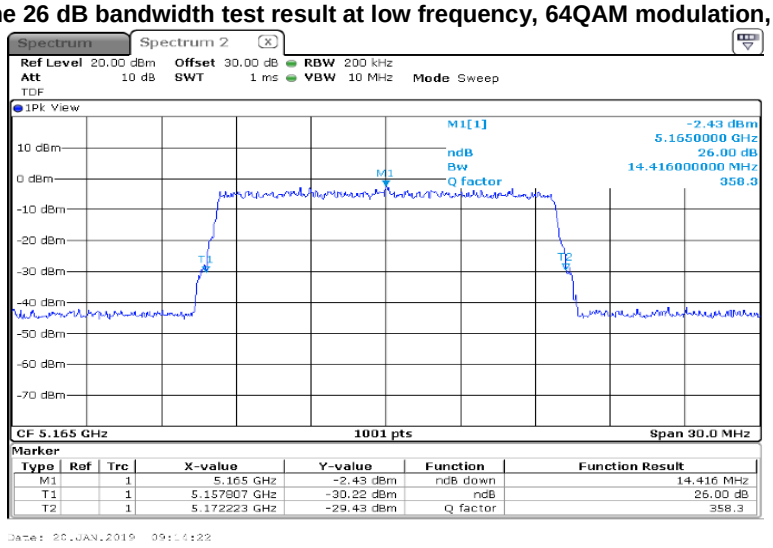


Plot 7.3.11 The 26 dB bandwidth test result at low frequency, 16QAM modulation, 15 MHz EBW



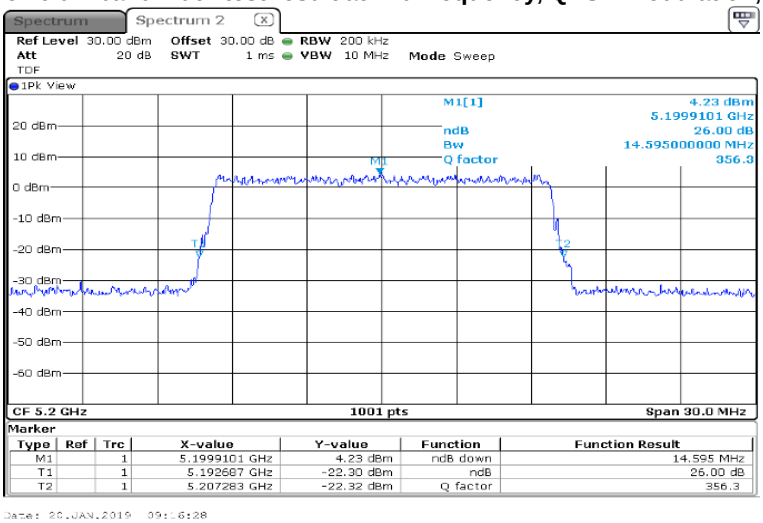
Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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

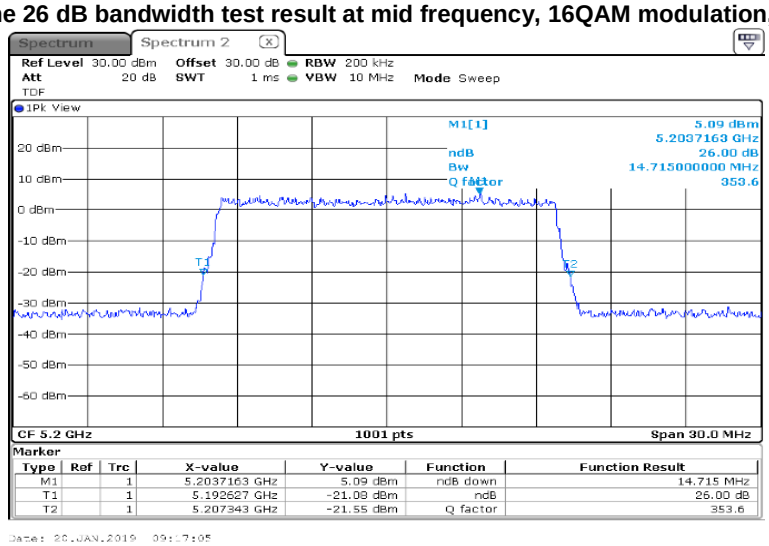


Test specification:	FCC section 15.407(a)(5), RSS-247 section 6.2.1.2, 26 dB Occupied bandwidth		
Test procedure:	ANSI C63.10, section 6.9.2; KDB 789033		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-19		
Temperature: 26 ºC	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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