

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

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1 Applicant information

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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.

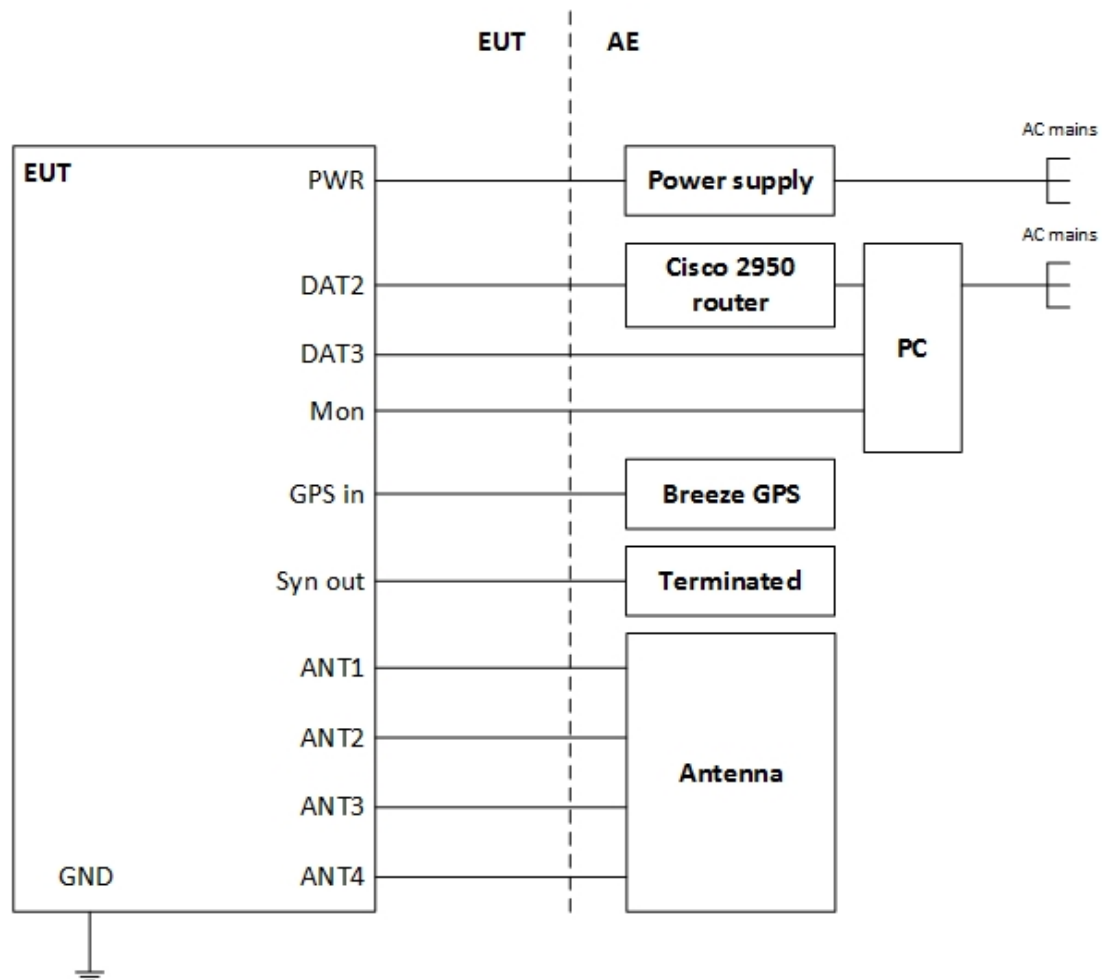
6.2 Ports and lines

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	FOC08127TOWP
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	V	with temporary RF connector 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 °C	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 7.1.1 The 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.

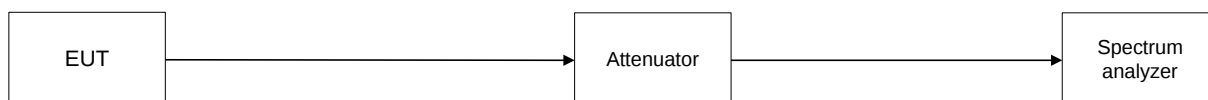
7.1.2 Test procedure

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 °C	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 °C	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						
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Full description is given in Appendix A.



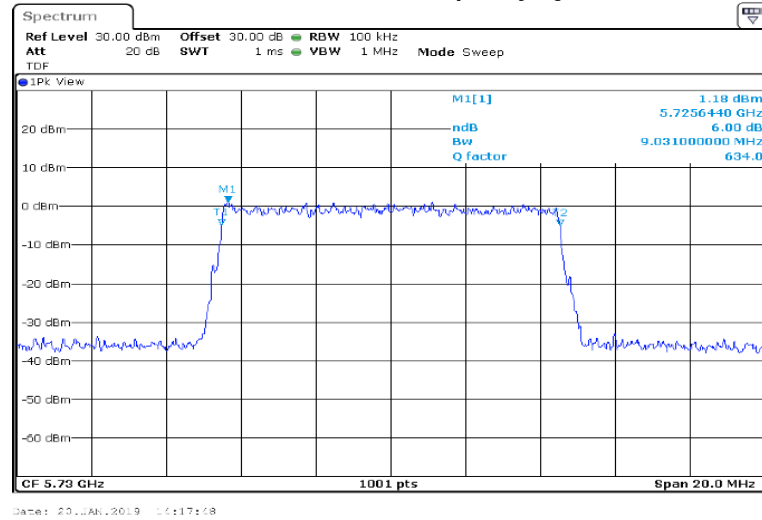
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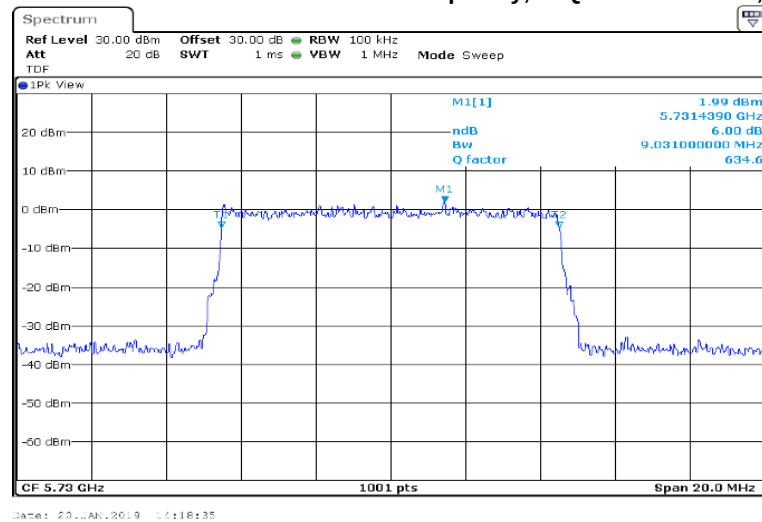
Date of Issue: 25-Jun-19

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 °C	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





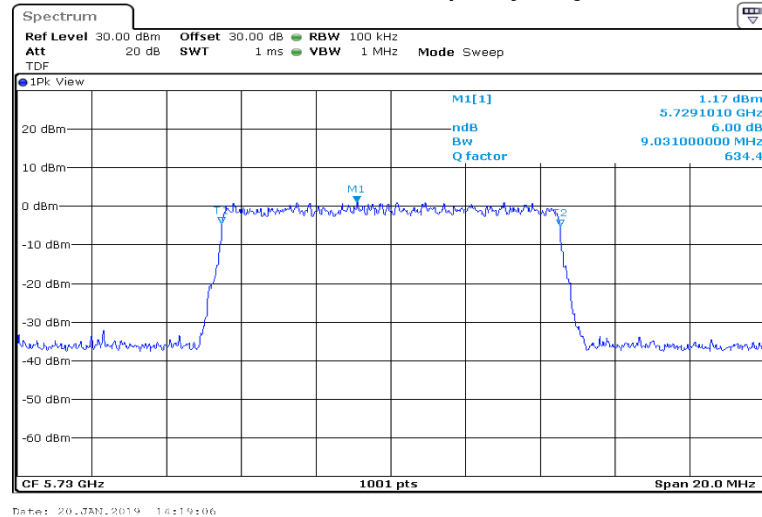
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Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





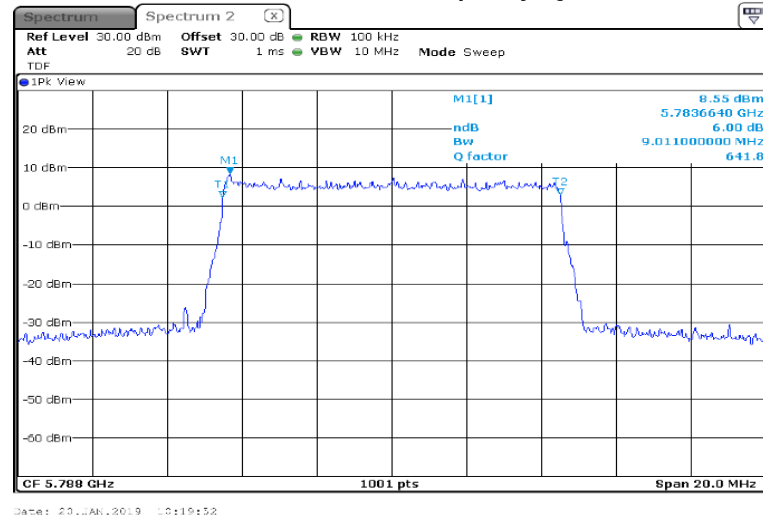
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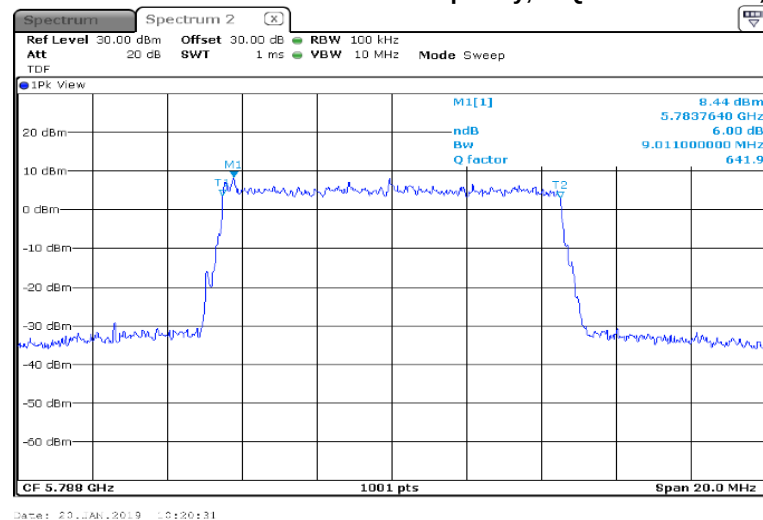
Date of Issue: 25-Jun-19

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 °C	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





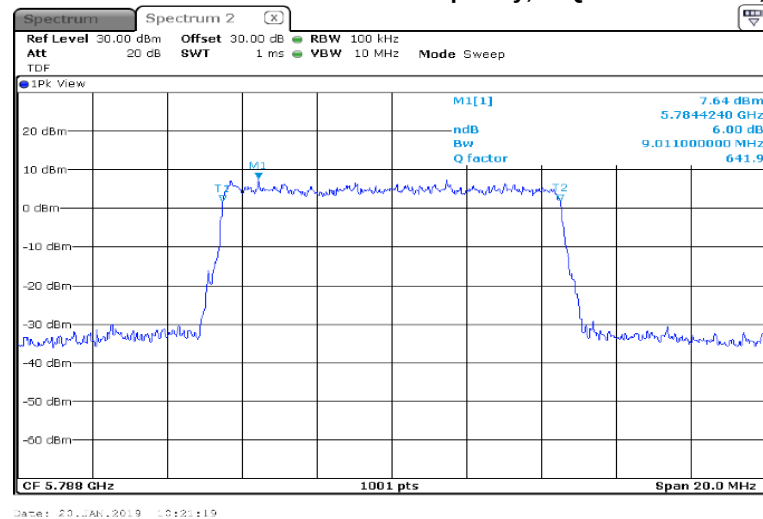
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Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





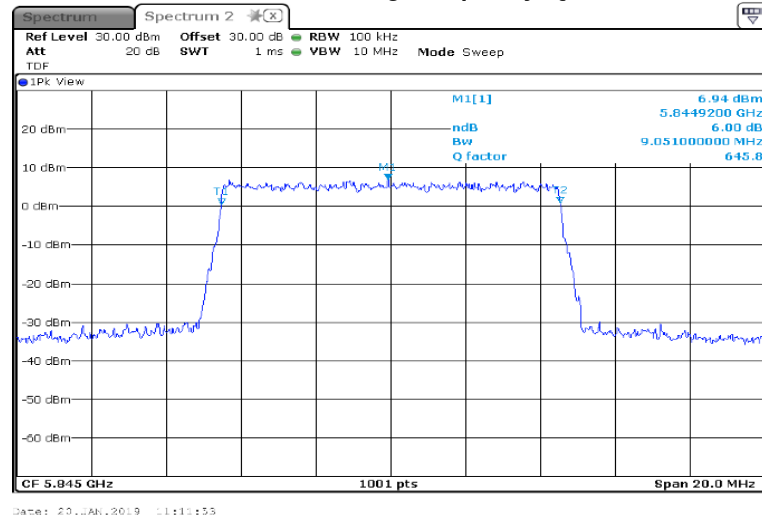
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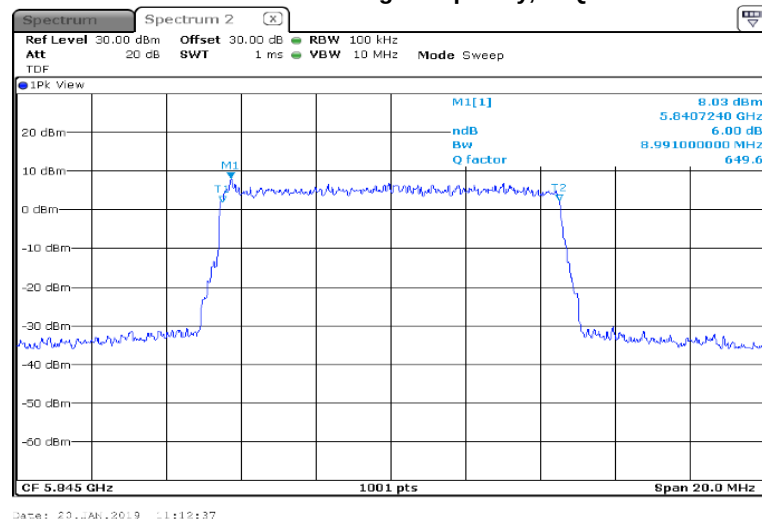
Date of Issue: 25-Jun-19

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 °C	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





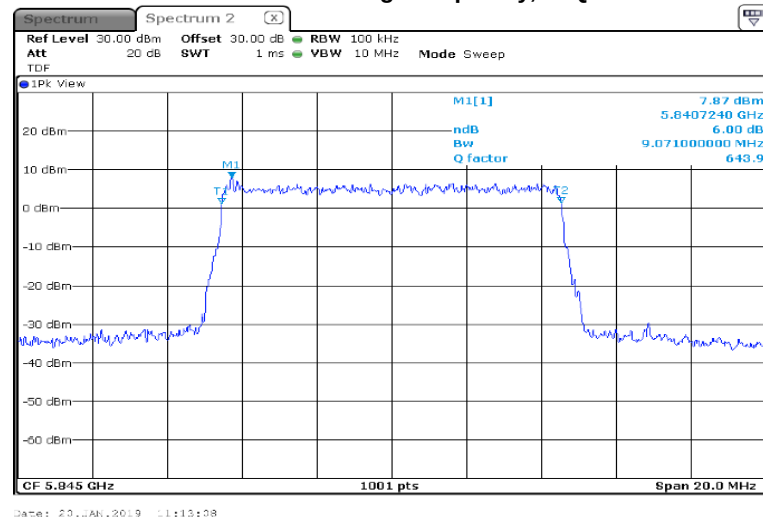
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



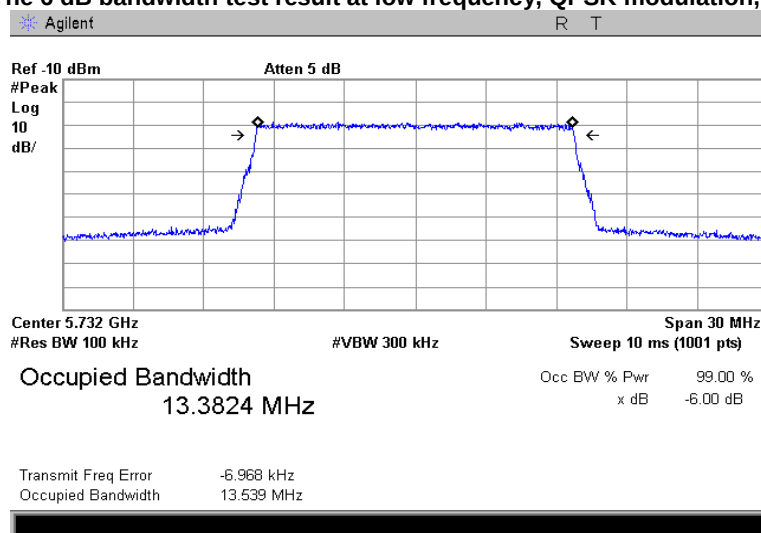


HERMON LABORATORIES

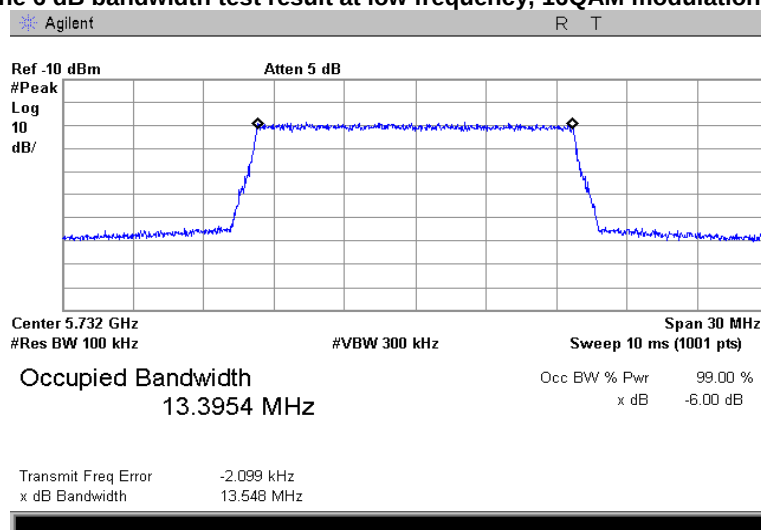
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Date of Issue: 25-Jun-19

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 °C	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



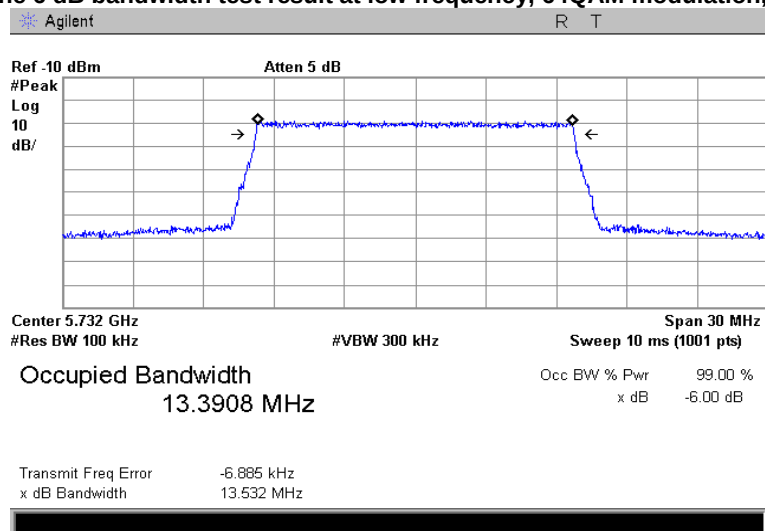


HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2
Date of Issue: 25-Jun-19

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 °C	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





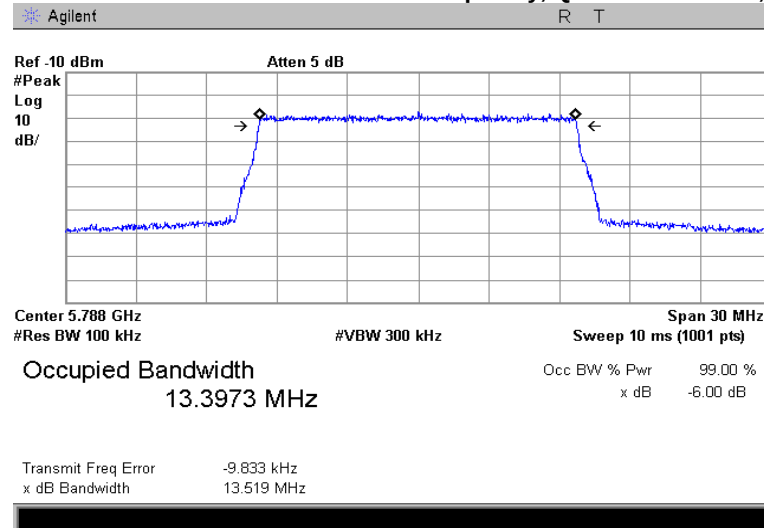
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Report ID: TelRad_FCC_31832_rev2

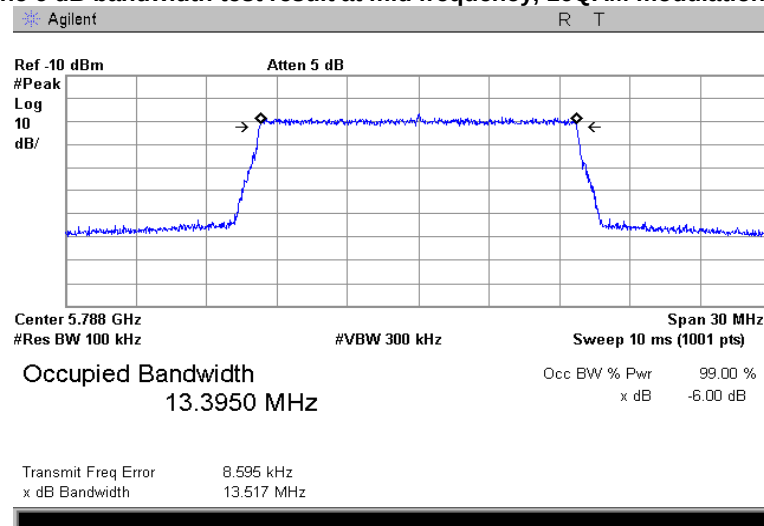
Date of Issue: 25-Jun-19

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 °C	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





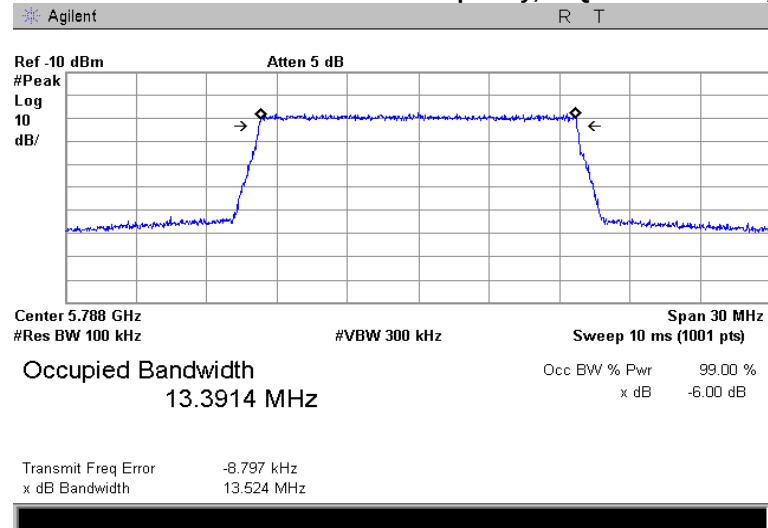
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





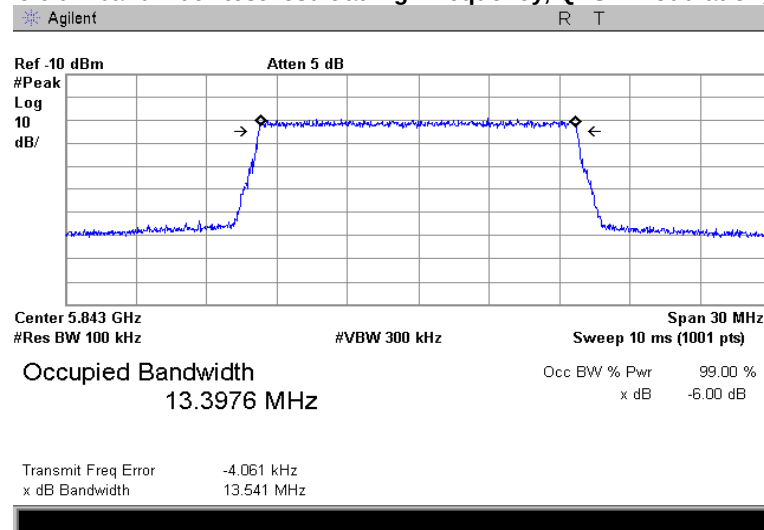
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

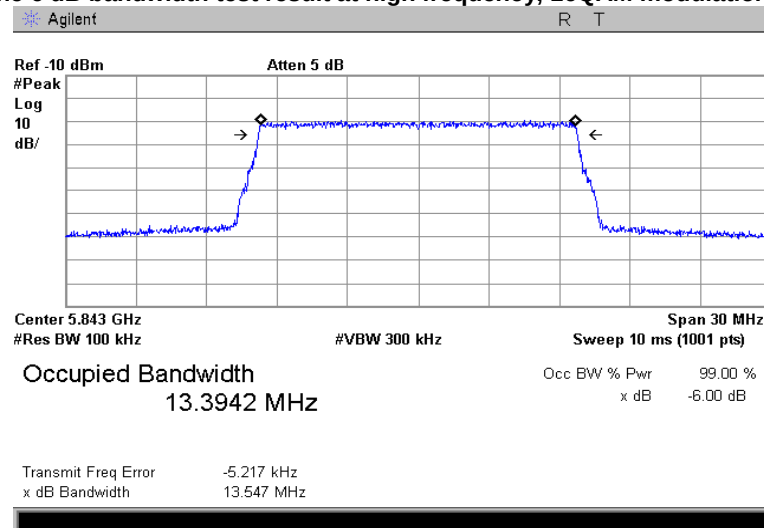
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Test specification: FCC section 15.407(e), RSS-247 section 6.2.4.1, 6 dB Occupied bandwidth			
Test procedure: ANSI C63.10, section 6.9.2; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 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





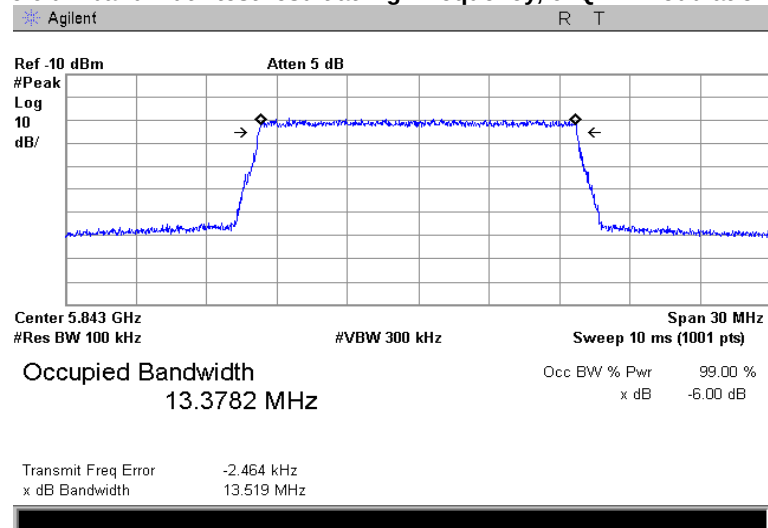
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





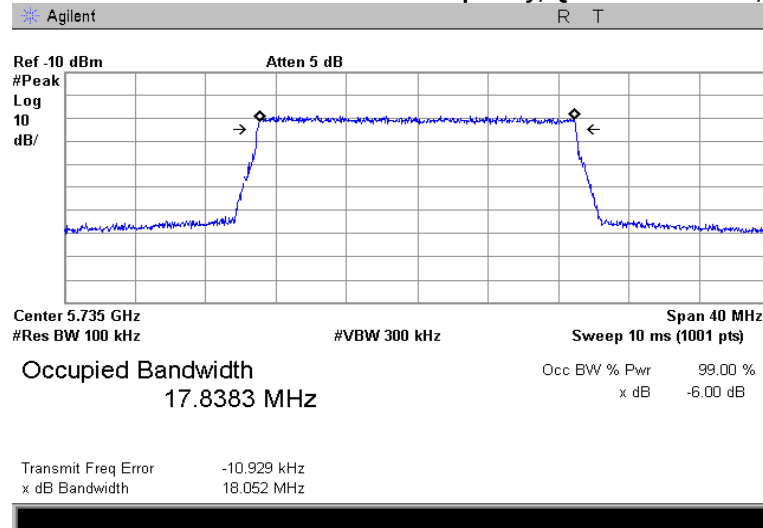
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

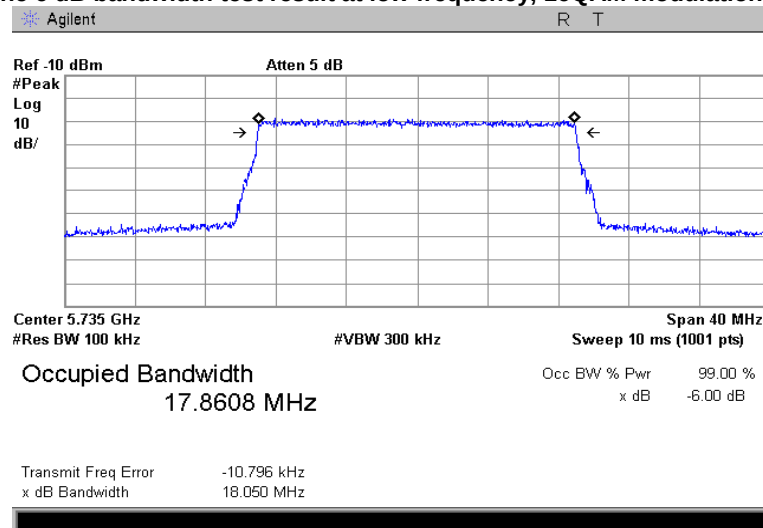
Date of Issue: 25-Jun-19

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Test procedure: ANSI C63.10, section 6.9.2; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	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





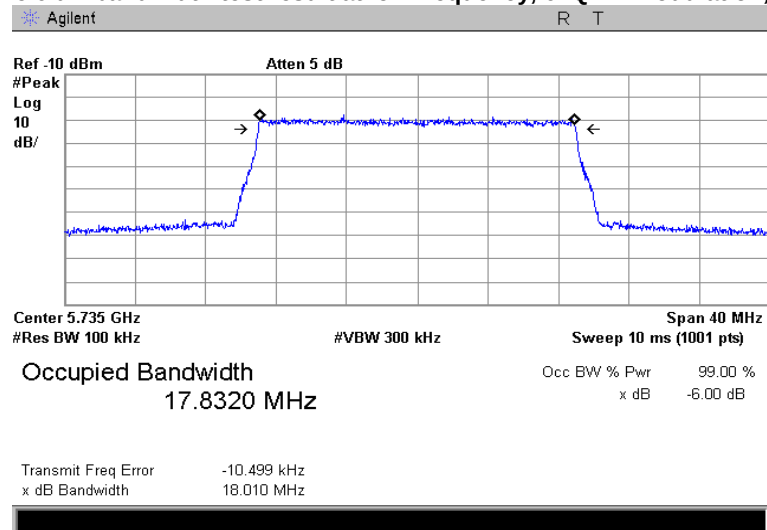
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





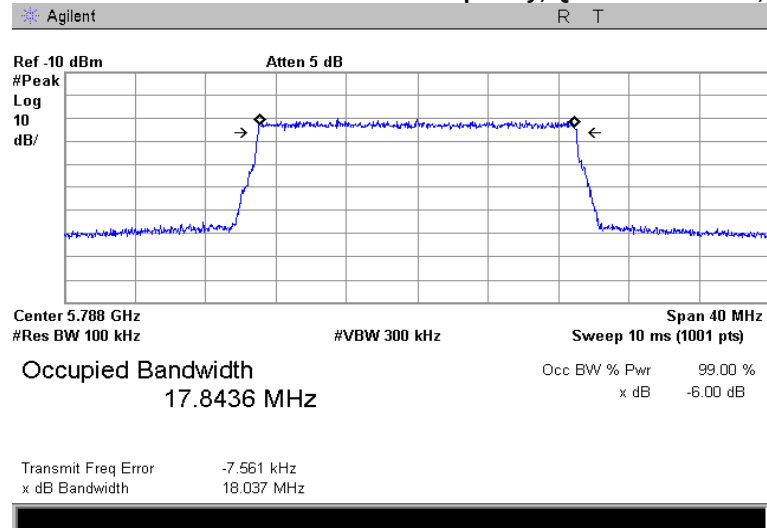
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Report ID: TelRad_FCC_31832_rev2

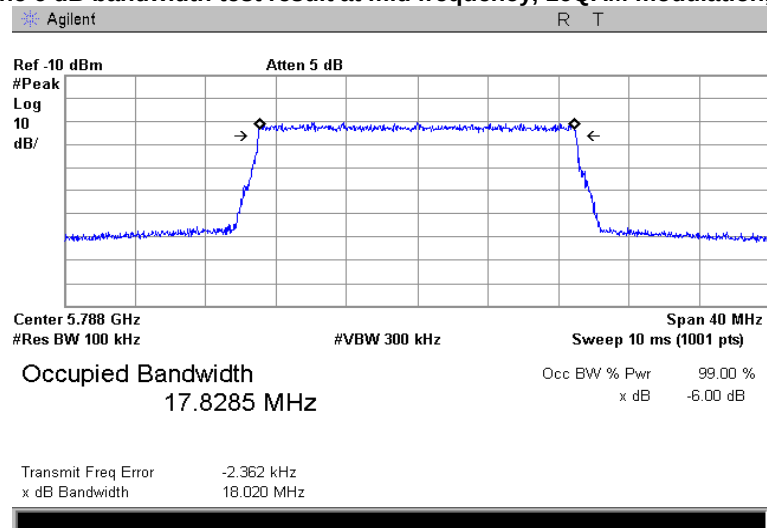
Date of Issue: 25-Jun-19

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 °C	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





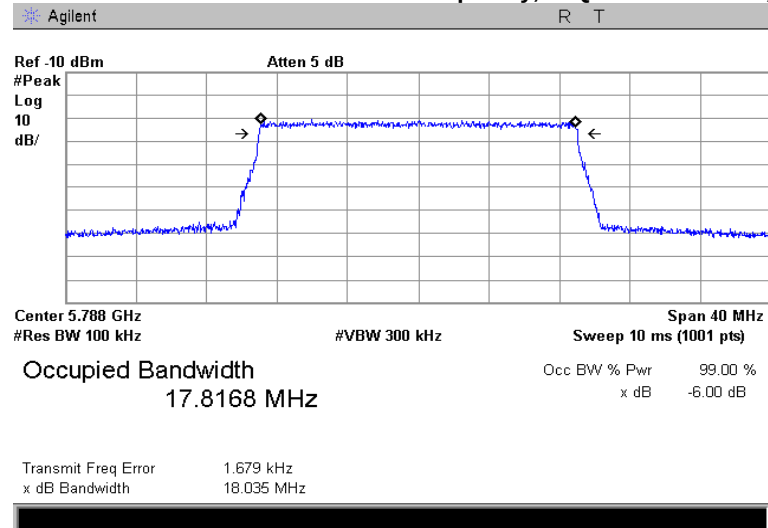
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





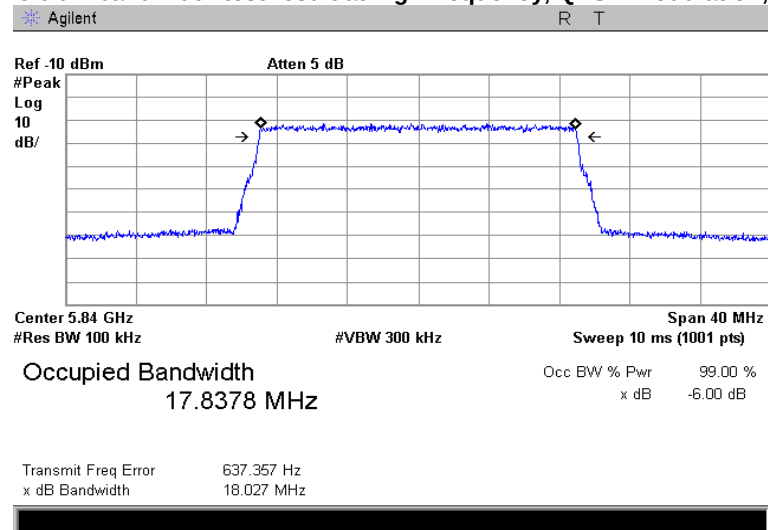
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Report ID: TelRad_FCC_31832_rev2

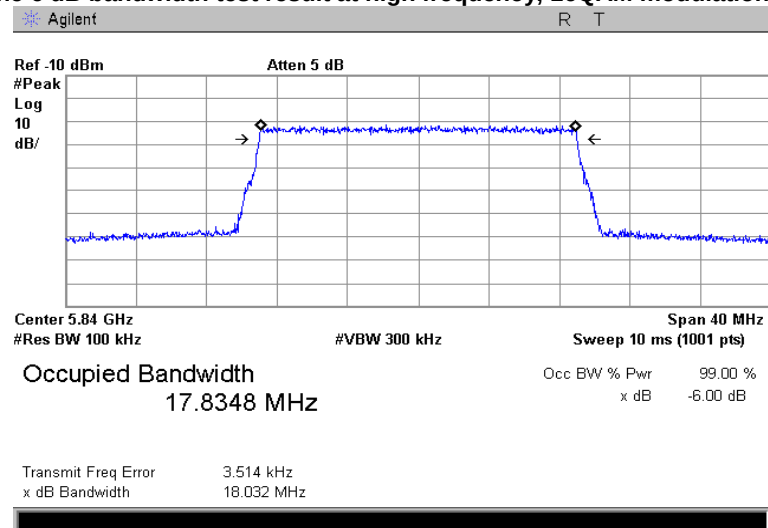
Date of Issue: 25-Jun-19

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 °C	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





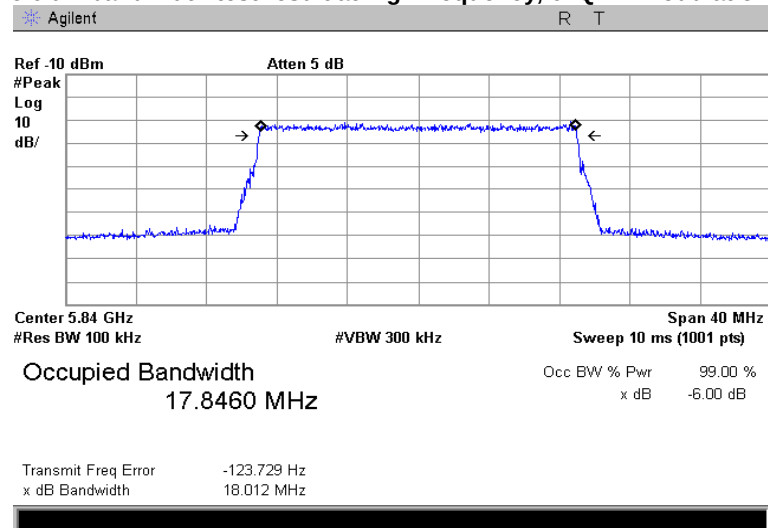
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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 °C	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.

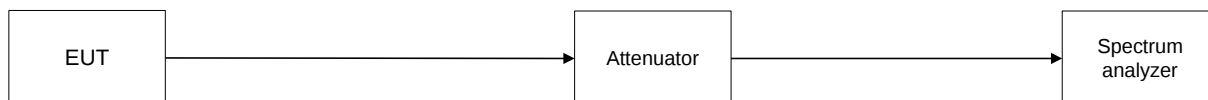
7.2.2 Test procedure

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 °C	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 °C	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							
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Full description is given in Appendix A.



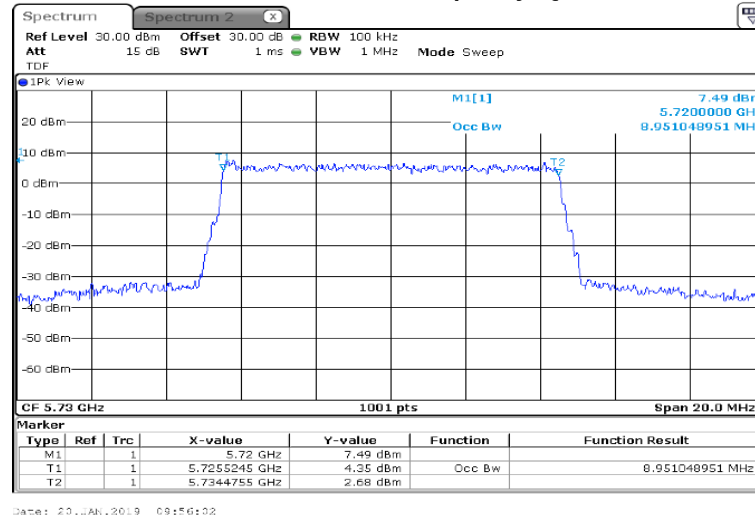
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

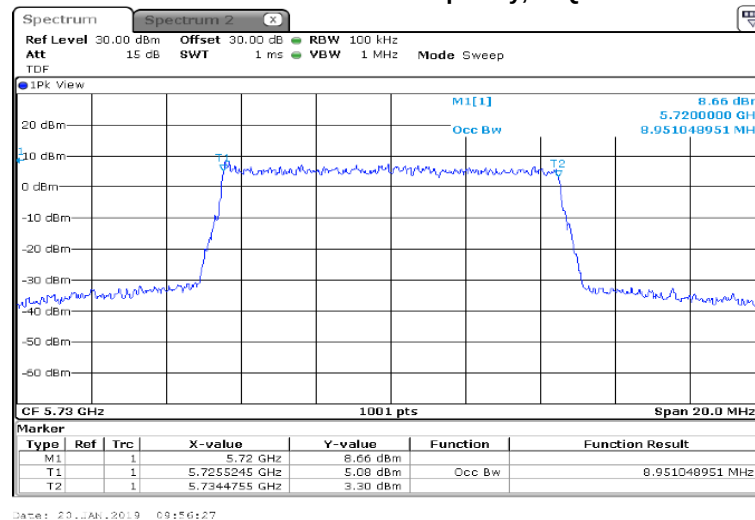
Date of Issue: 25-Jun-19

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 °C	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





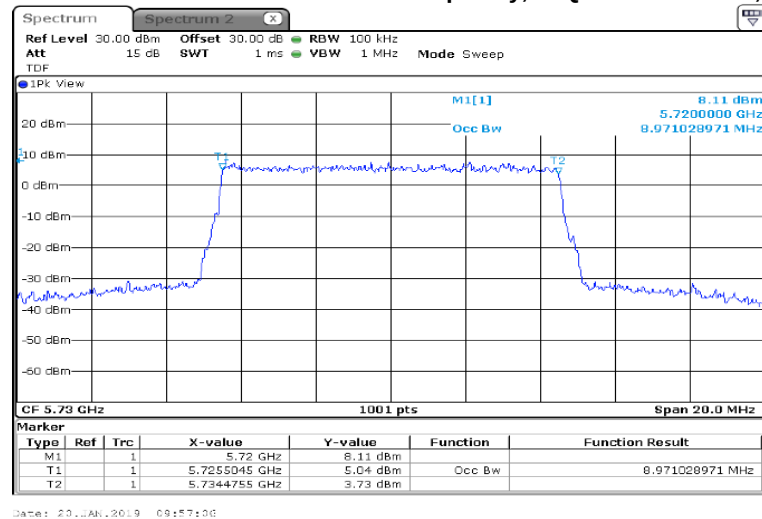
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





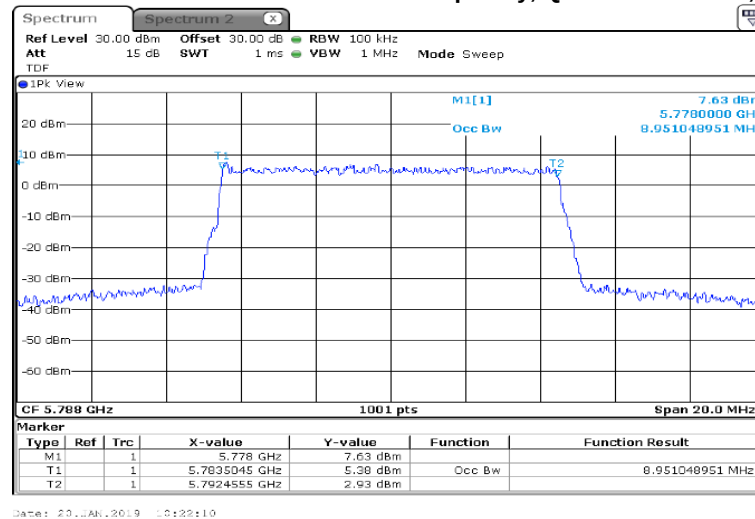
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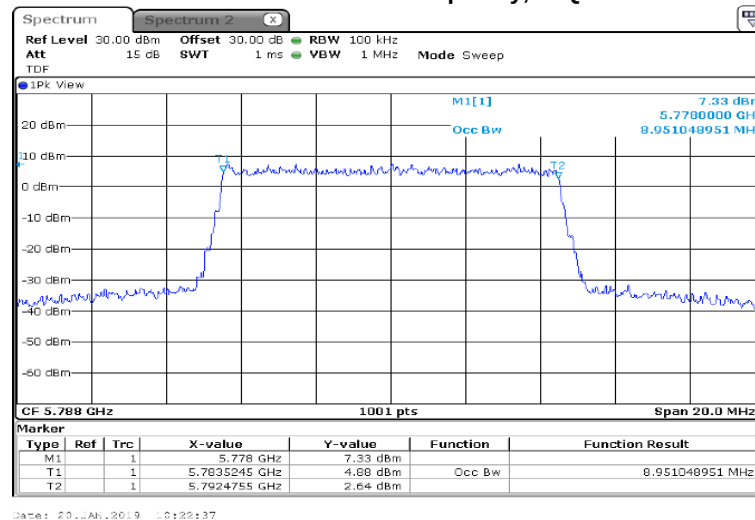
Date of Issue: 25-Jun-19

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 °C	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



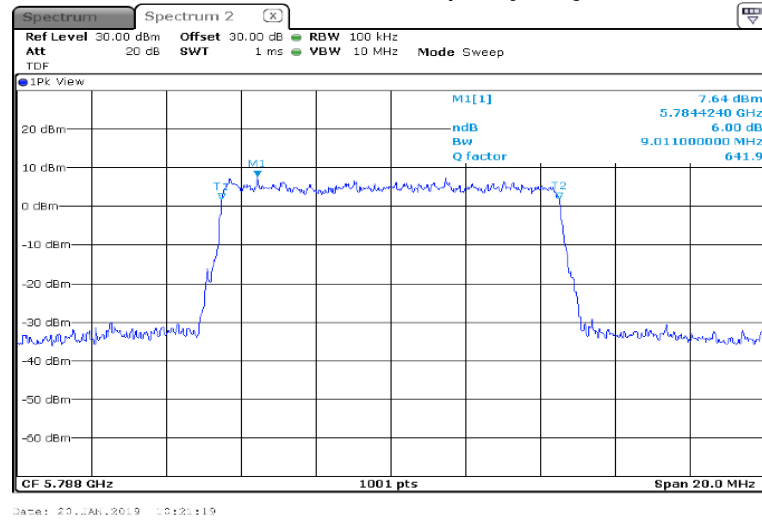


HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2
Date of Issue: 25-Jun-19

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 °C	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





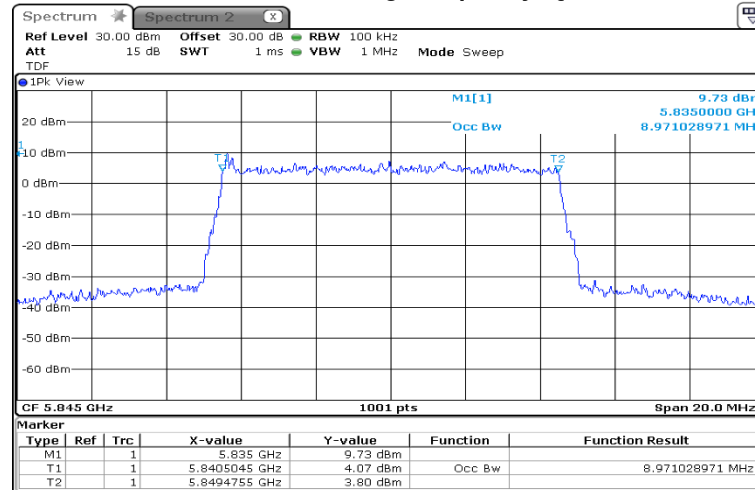
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

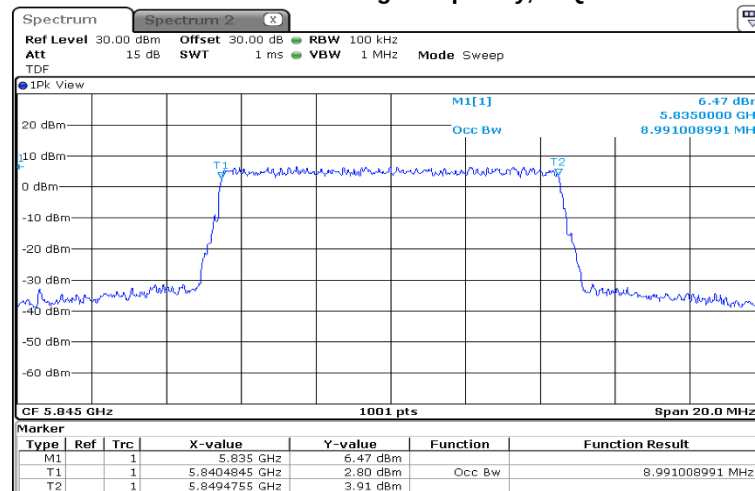
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Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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



Date: 20-JAN-2019 11:09:52

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



Date: 20-JAN-2019 11:10:16



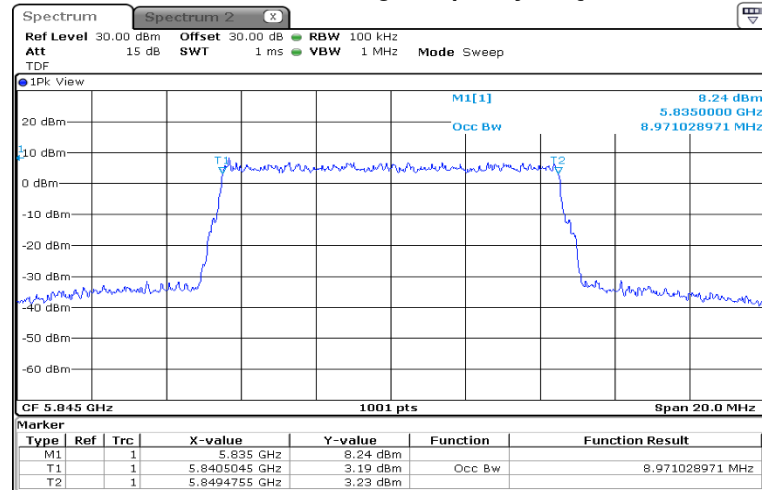
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 20-JAN-2019 11:10:46



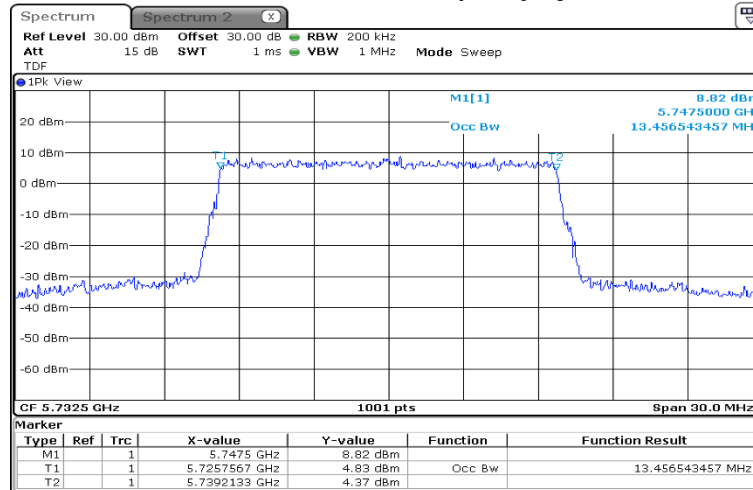
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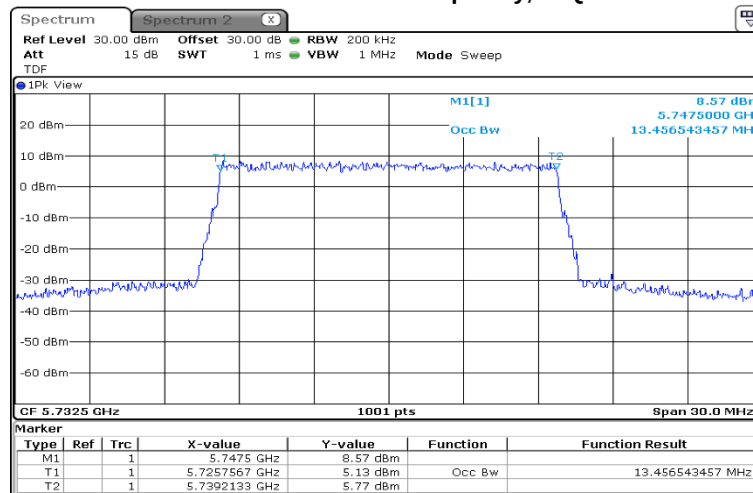
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Test specification: FCC section 15.407, RSS-Gen section 6.7, Occupied 99% bandwidth			
Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	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





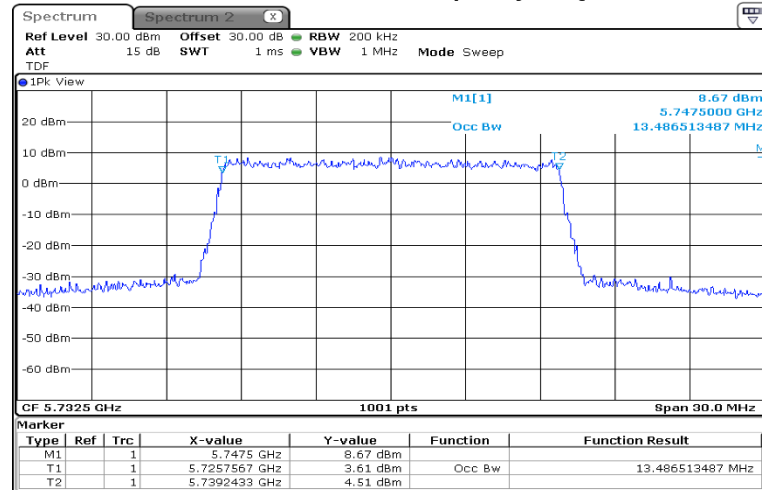
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 20-JAN-2019 11:06:29



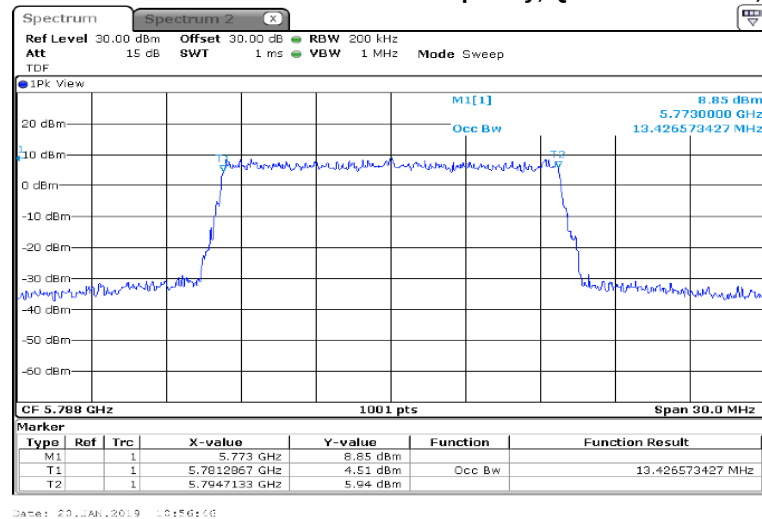
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Report ID: TelRad_FCC_31832_rev2

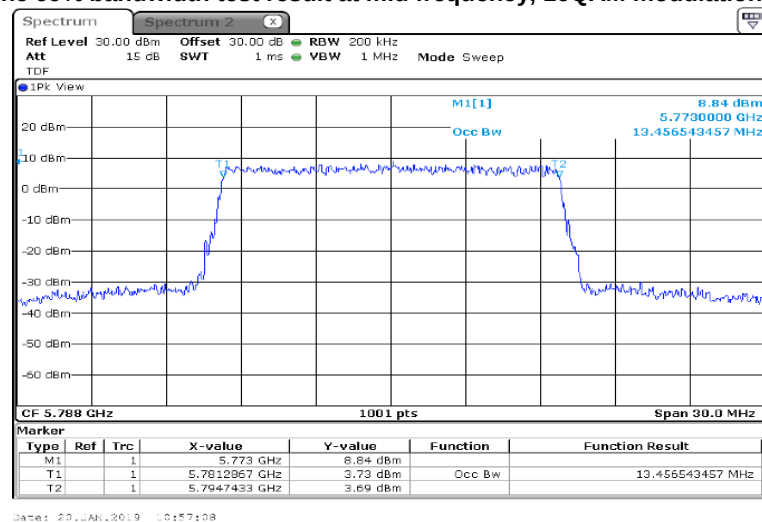
Date of Issue: 25-Jun-19

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 °C	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





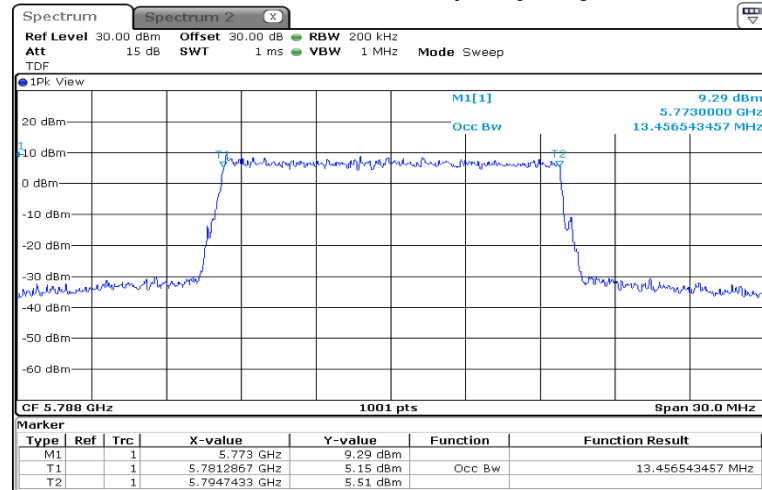
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 20-JAN-2019 10:57:38



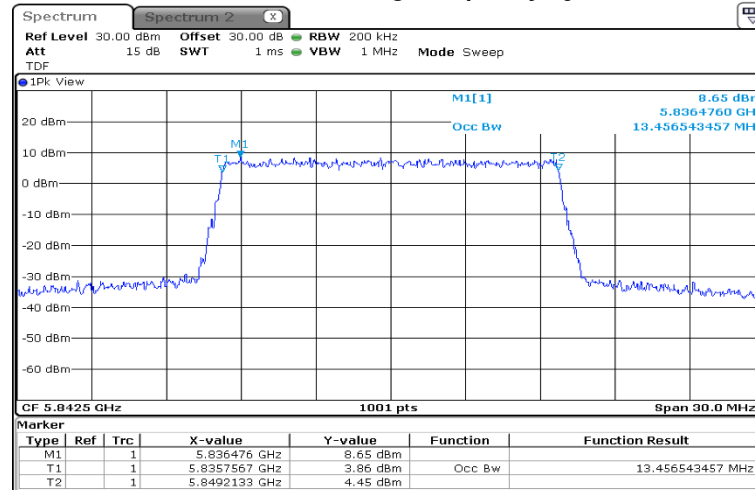
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

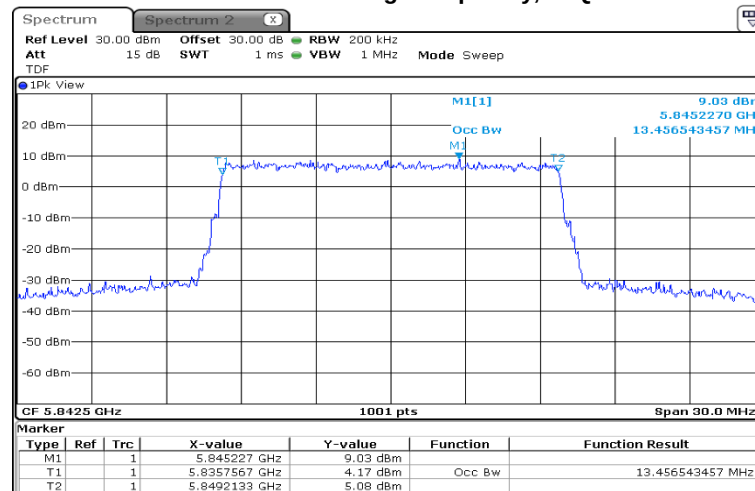
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Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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



Date: 20-JAN-2019 11:25:53

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



Date: 20-JAN-2019 11:26:20



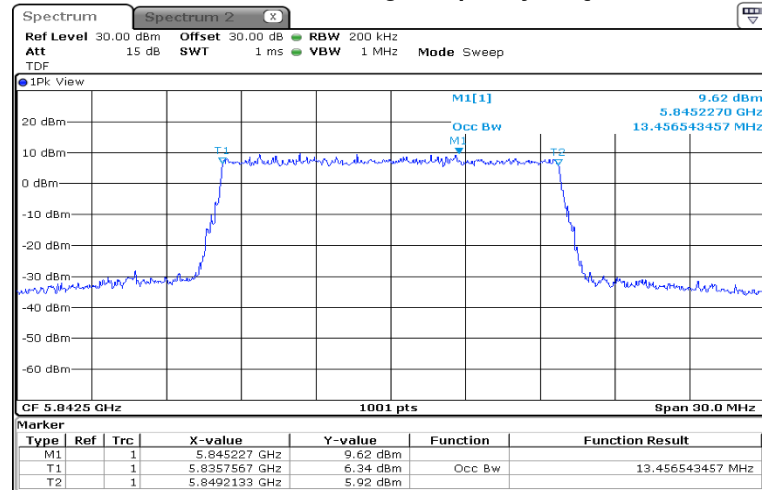
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





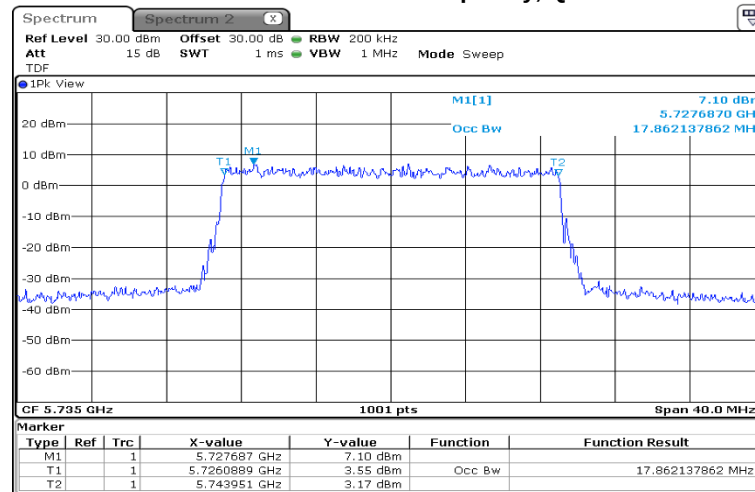
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Date of Issue: 25-Jun-19

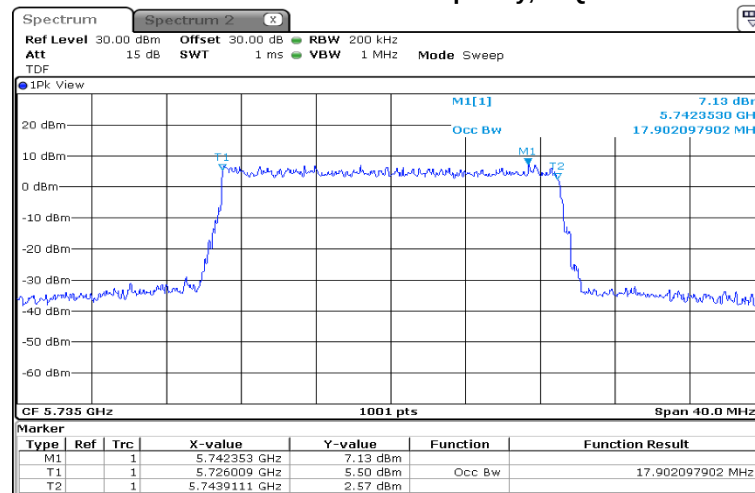
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Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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



Date: 20-JAN-2019 11:32:11

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



Date: 20-JAN-2019 11:32:33



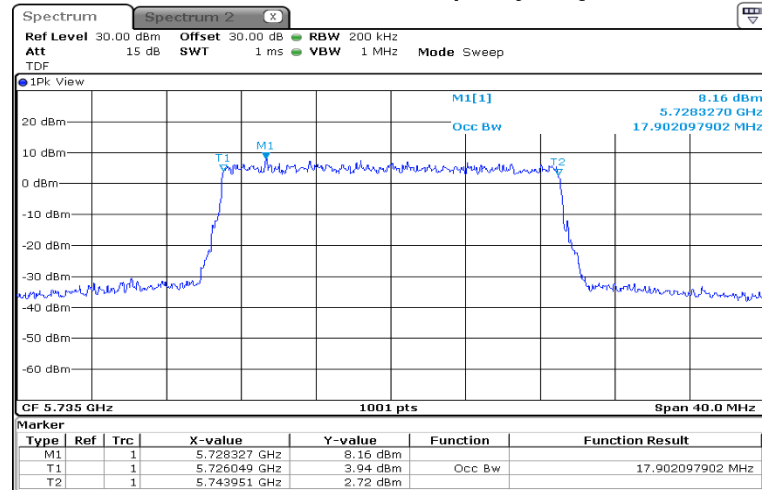
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Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 20-JAN-2019 11:33:01



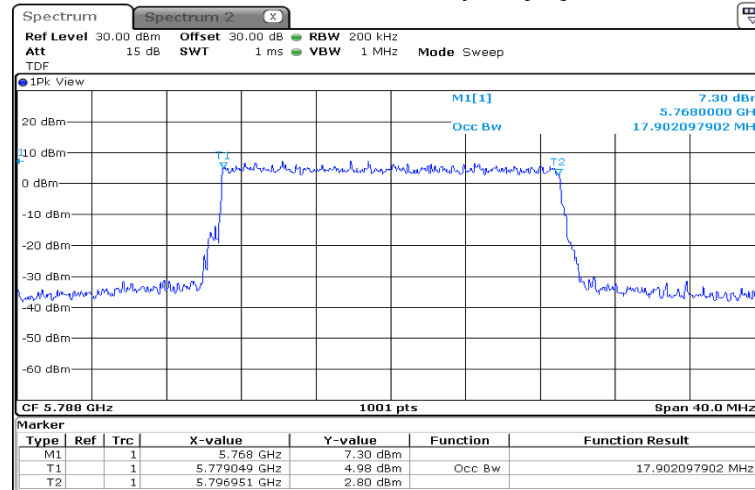
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Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

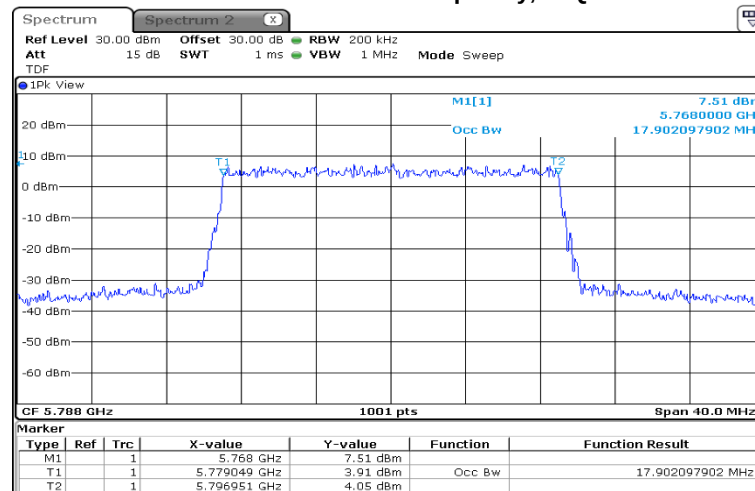
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Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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



Date: 20-JAN-2019 11:38:54

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



Date: 20-JAN-2019 11:39:23



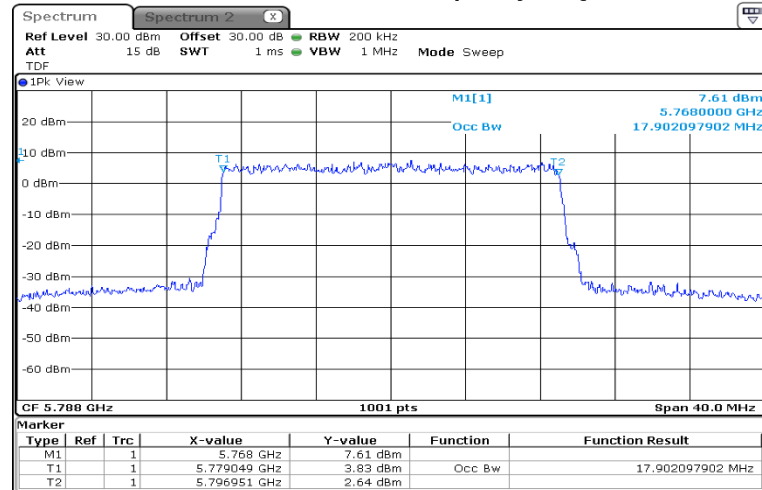
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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





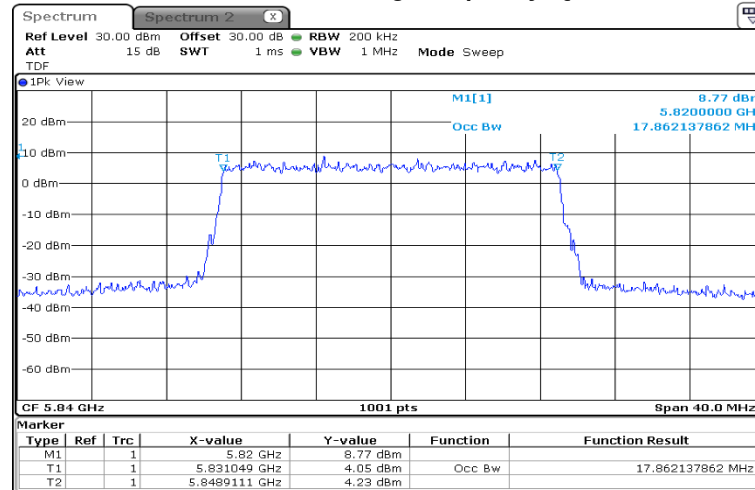
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Date of Issue: 25-Jun-19

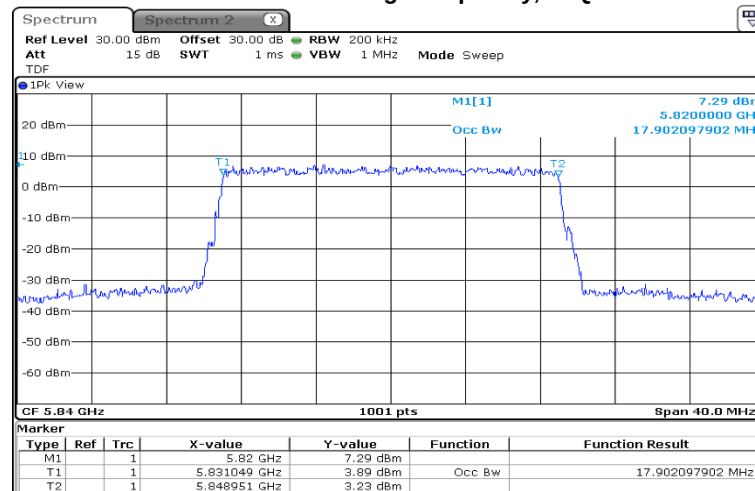
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Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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



Date: 20-JAN-2019 11:57:30

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



Date: 20-JAN-2019 11:57:55



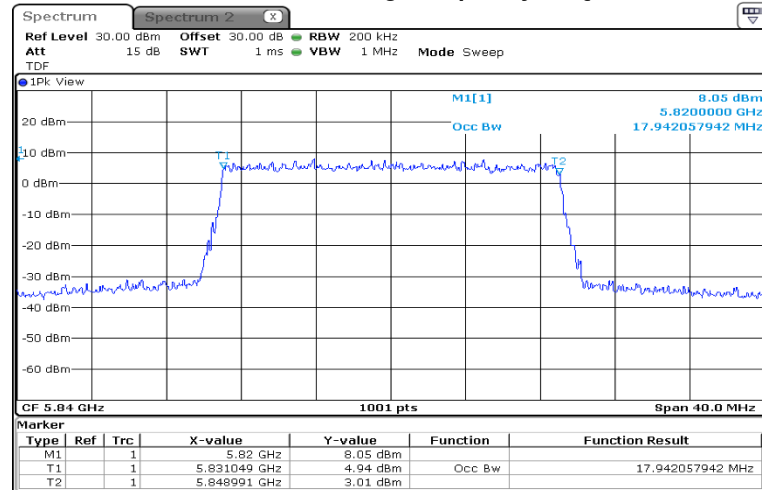
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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Test procedure: ANSI C63.10, section 6.9.3; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	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



Date: 20-JAN-2019 11:58:21



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 °C	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.

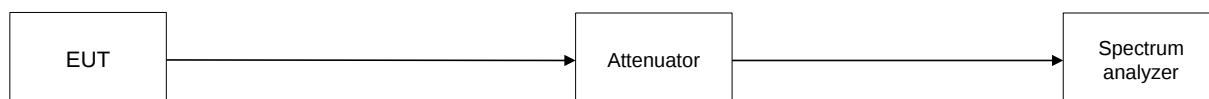
7.3.2 Test procedure

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 °C	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 °C	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							
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Full description is given in Appendix A.



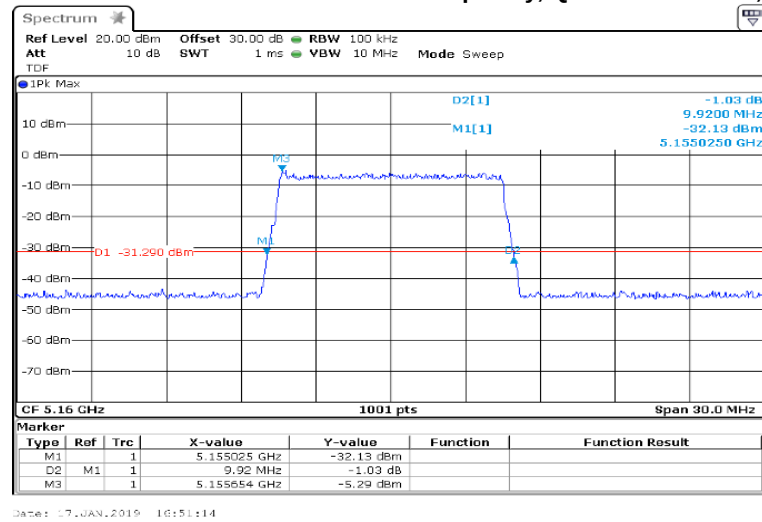
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

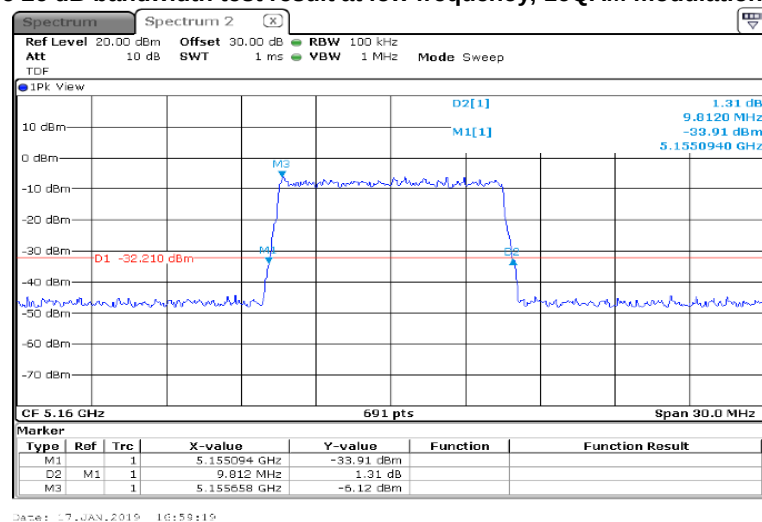
Date of Issue: 25-Jun-19

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 °C	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





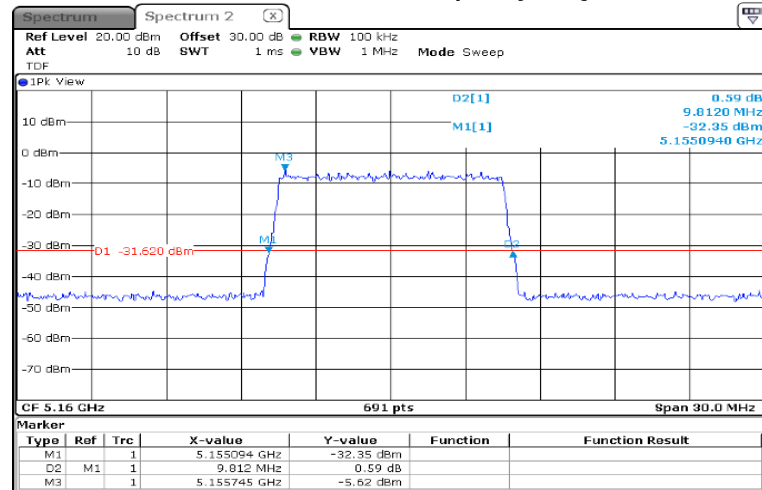
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Date of Issue: 25-Jun-19

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Test procedure: ANSI C63.10, section 6.9.2; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	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



Date: 17-JAN-2019 17:01:12



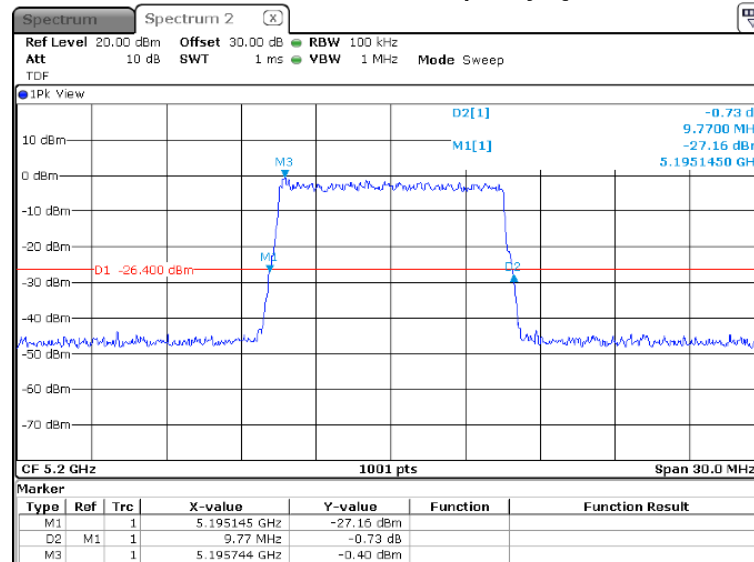
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Date of Issue: 25-Jun-19

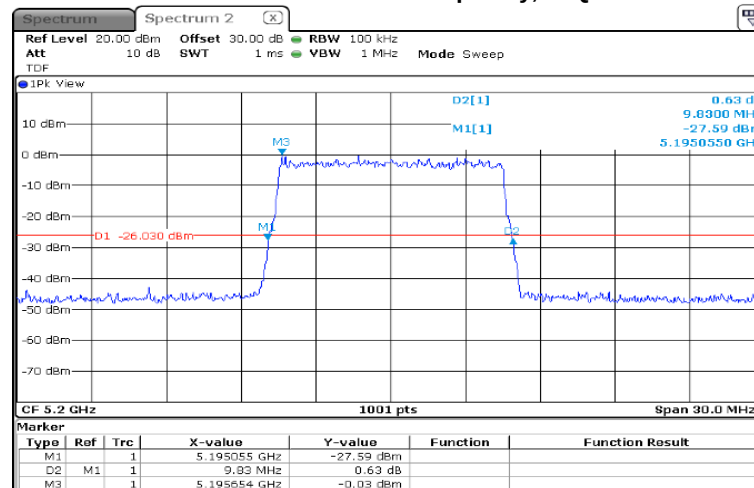
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Test procedure: ANSI C63.10, section 6.9.2; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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



Date: 17.JAN.2019 17:03:52

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



Date: 17.JAN.2019 17:06:57



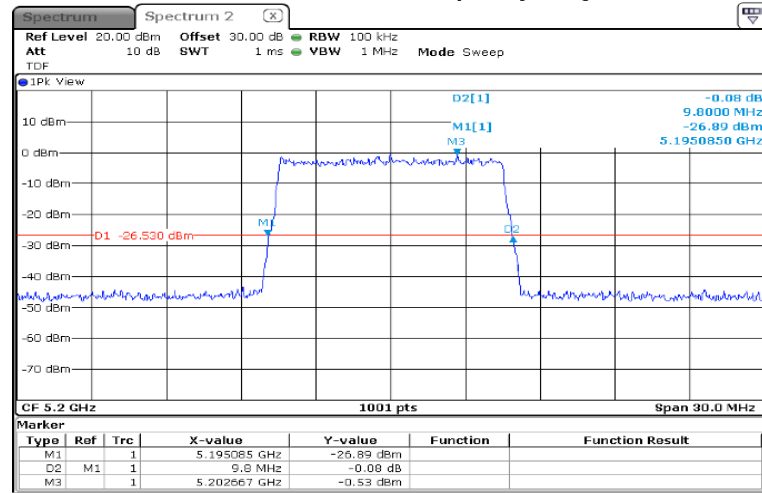
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 17-JAN-2019 17:02:58



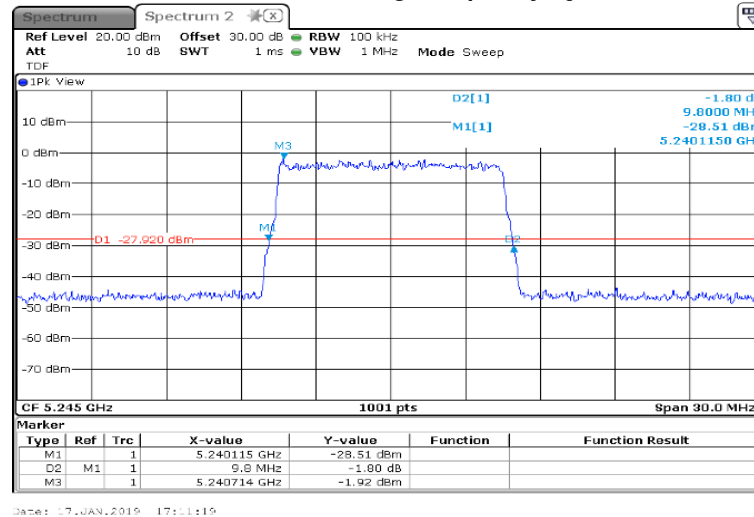
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Report ID: TelRad_FCC_31832_rev2

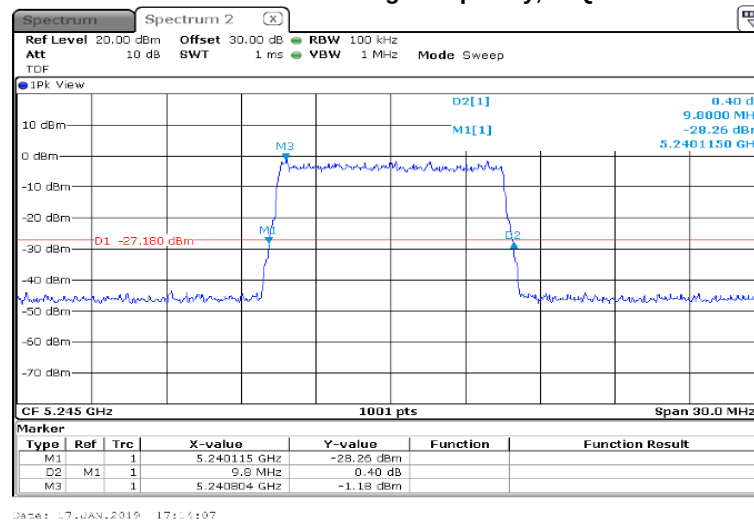
Date of Issue: 25-Jun-19

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 °C	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





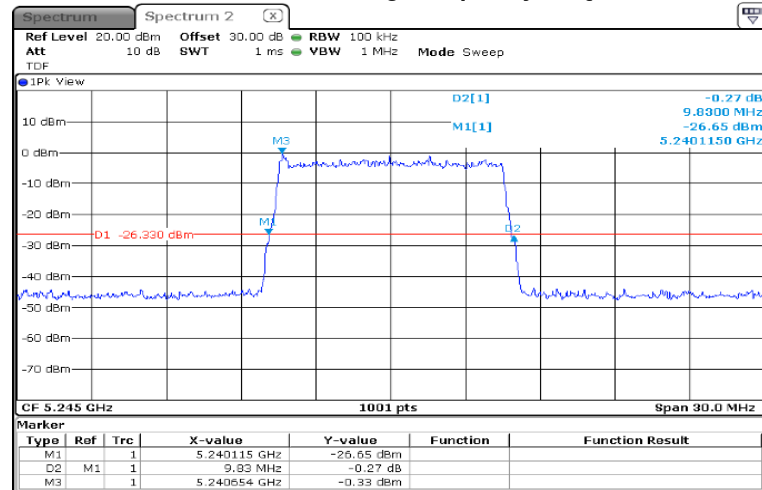
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 17-JAN-2019 17:13:50



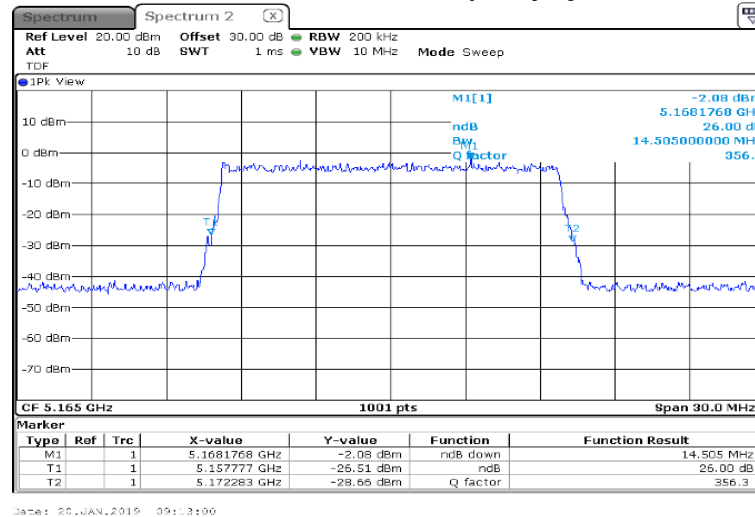
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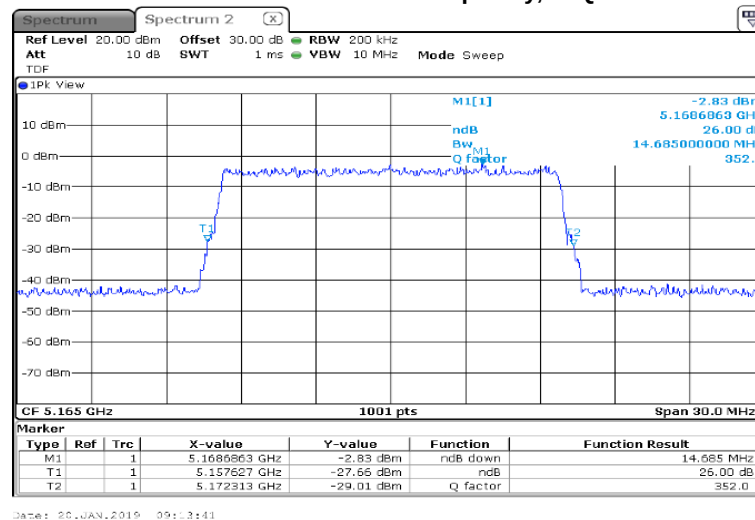
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Test procedure: ANSI C63.10, section 6.9.2; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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





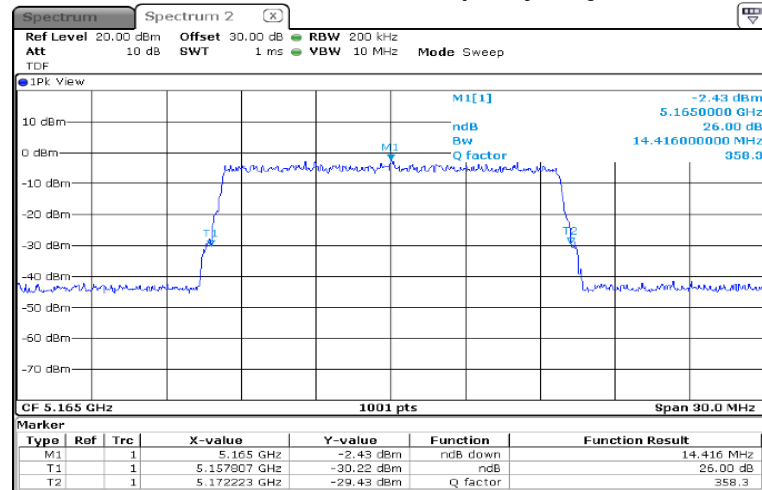
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Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 20-JAN-2019 09:14:22



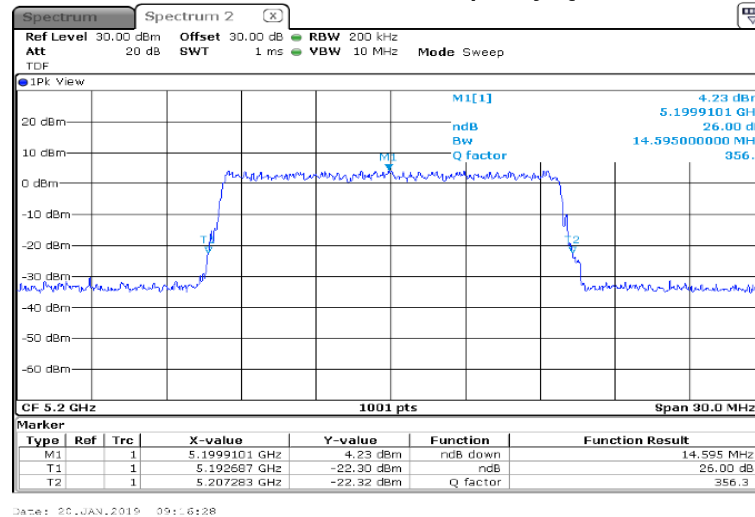
HERMON LABORATORIES

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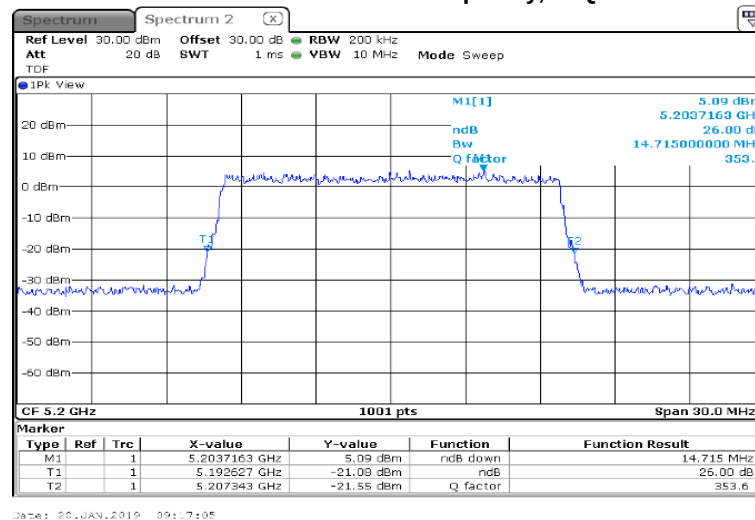
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Test procedure: ANSI C63.10, section 6.9.2; KDB 789033			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Jan-19			
Temperature: 26 °C	Relative Humidity: 49 %	Air Pressure: 1018 hPa	Power: 48 VDC
Remarks:			

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





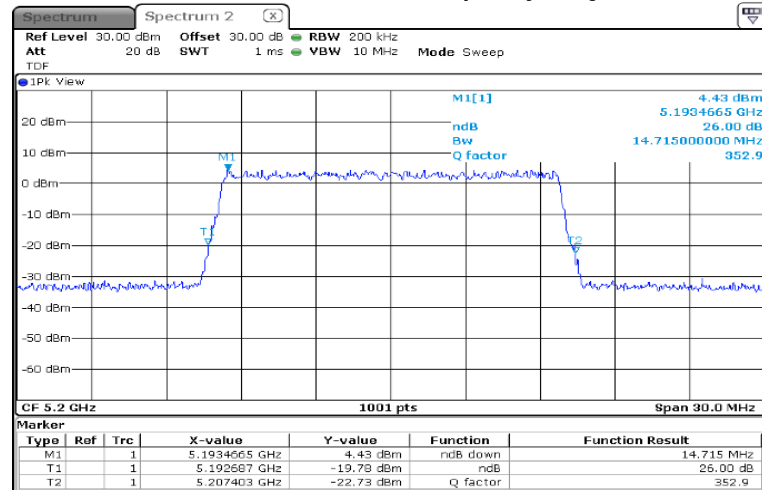
HERMON LABORATORIES

Report ID: TelRad_FCC_31832_rev2

Date of Issue: 25-Jun-19

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 °C	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



Date: 20-JAN-2019 09:17:49