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Acronyms

Acronym ID	Acronym Description
	E.I.R.P.
Ebw	Emission Bandwidth
Equipment	Equipment Type
EUT	Equipment Under Test
Freq	Frequency
Inband Peak Lvl	Inband Peak Level
Lvl	Level
MP	Measurement Point
Mod	Modulation
Occ Ch BW	Occupied Channel Bandwidth
Operation Band	Operation Band
PSD	Power Spectral Density
Peak Power	Maximum Peak Conducted Output Power
Port	Active Port
RU	Resource Unit

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification S.A.U. is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the radiated emissions of EUT from 30 MHz to 1 GHz is:
Measurement uncertainty $\leq \pm 5,35$ dB with factor ($k = 2$).

The total uncertainty of the measurement system for the radiated emissions of EUT from 1 GHz to 17 GHz is:
Measurement uncertainty $\leq \pm 4,32$ dB with factor ($k = 2$).

The total uncertainty of the measurement system for the radiated emissions of EUT from 17 GHz to 26 GHz is:
Measurement uncertainty $\leq \pm 5,51$ dB with factor ($k = 2$).

The total uncertainty of the measurement system for the conducted testing of EUT is:

RF Peak Output Power: Measurement uncertainty $\leq \pm 0,80$ dB

RF Average Output Power: Measurement uncertainty $\leq \pm 0,99$ dB

Power Spectral Density: Measurement uncertainty $\leq \pm 0,99$ dB

6dB Bandwidth: Measurement uncertainty $\leq \pm 2,84$ %

Occupied Channel Bandwidth: Measurement uncertainty $\leq \pm 1,17$ %

Conducted Band-edge spurious emissions: Measurement uncertainty $\leq \pm 1,76$ dB

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample consists of two SW architectures (Star3.0 now and Star 3.5 about half a year later).

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results. The laboratory is not responsible for such information and it is not covered by accreditation.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/01	81218C_3.1	Multimedia Device With Bluetooth and WLAN	RSUI31	0007756	2025-04-15	Element Under Test
S/01	81218C_14.1	Harness			2025-04-15	Auxiliary Element
S/01	81218C_15.1	Fakra to USB Cable			2025-04-15	Auxiliary Element
S/01	81218C_54.1	Fakra to 4 Fakra Cable			2025-04-15	Auxiliary Element
S/01	81218C_83.1	Module Antenna		012168	2025-06-02	Auxiliary Element
S/01	81218C_84.1	Module Antenna		013508	2025-06-02	Auxiliary Element
S/01	81218C_85.1	Module Antenna		013489	2025-06-02	Auxiliary Element
S/01	81218C_86.1	Module Antenna		019682	2025-06-02	Auxiliary Element
S/02	81218C_1.1	Multimedia Device With Bluetooth and WLAN	RSUI31	0007764	2025-04-15	Element Under Test
S/02	76719D_56.1	Fakra 1x4 cable			2024-04-17	Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for Radiated test
S/02	Sample used for Conducted test

Test sample description

Ports..... :	Port name and description	Cable											
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾								
	Main connector	3	[X]	[]	[]								
	HD-BaseT	3	[X]	[]	[]								
	BT/WLAN antenna	3	[X]	[]	[]								
	Video	3	[X]	[]	[]								
	USB3.0	3	[]	[]	[]								
	USB2.0	3	[]	[]	[]								
Supplementary information to the ports..... :	USB 3.0 and USB2.0: Only used in BOSCH production, not used by customer or end user												
Rated power supply	Voltage and Frequency		Reference poles										
			L1	L2	L3	N	PE						
	[]	AC:	[]	[]	[]	[]	[]						
	[]	AC:	[]	[]	[]	[]	[]						
	[X]	DC: Nominal supply voltage: 9.0 - 16.0 VDC											
	[]	DC:											
Rated Power	Max. Current consumption: < 8A												
Clock frequencies.....													
Other parameters													
Software version	E219.0												
Hardware version	D3.2												
Dimensions in cm (W x H x D)	Length: 224,57mm (+/- 0,6), width: 139,45mm (+/-1,5), height: 51,9mm (+/-1,2)												
Mounting position	[]	Table top equipment											
	[]	Wall/Ceiling mounted equipment											
	[]	Floor standing equipment											
	[]	Hand-held equipment											

	☒ [X]	Other: in vehicle	
Modules/parts.....:	Module/parts of test item	Type	Manufacturer
			
Accessories (not part of the test item)	Description	Type	Manufacturer
	Laptop	Latitude 5500	Dell
	Display		
	USB-Ethernet Adapter		
	Harness and Cable		
	Infotainment systems and extension of USB	VA6000	Valens
	other necessary equipment and cables		
Documents as provided by the applicant	Description	File name	Issue date
			
			
			
			

⁽³⁾ Only for Medical Equipment

Identification of the client

Robert Bosch GmbH
Robert-Bosch-Strasse 200, 31139 Hildesheim Germany

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U. Severo Ochoa, 6 29590, Málaga SPAIN
Date (start)	2025-06-03
Date (finish)	2025-08-11

Document history

Report number	Date	Description
81218RRF.001	2025-08-29	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Álvaro Gutiérrez Naranjo, Pablo Redondo Reyes and Valentín Andarias.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
06791	SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	N/A
06792	SHIELDED ROOM	S101	ETS LINDGREN	N/A
06609	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-21
06615	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-24
06143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2027-01-22
06142	PRE-AMPLIFIER G>38dB 30MHz-6GHz	BLNA 0360-01N	BONN ELEKTRONIK	2025-07-25
06496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2026-12-01
03783	PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2026-03-17
04657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2026-06-12
10537	PRE-AMPLIFIER G>46dB 18-40 GHz	BLMA 1840-5G	BONN ELEKTRONIK	2026-03-07
07817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-07-01
07445	DC POWER SUPPLY 30V/5A	U8002A	KEYSIGHT TECHNOLOGIES	N/A
07760	DIGITAL MULTIMETER	175	FLUKE	2025-11-07
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A
06793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
06611	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04-21
06668	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2027-04-01
07796	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	ROHDE AND SCHWARZ	2027-01-09
08848	OPEN SWITCH UNIT UP TO 7.5 GHz	OSP-B157W8 PLUS	ROHDE AND SCHWARZ	2027-01-02
00922	POWER SUPPLY DC 40 V / 40 A	NGPE 40/40	ROHDE AND SCHWARZ	N/A
05850	DIGITAL MULTIMETER	179	FLUKE	2025-11-04

Control No.	Equipment	Model	Manufacturer	Next Calibration
07798	SOFTWARE FOR EMC/RF TESTING	WMS32	ROHDE AND SCHWARZ	N/A

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P

Summary

Bluetooth Low Energy (2M, 1M)

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	P	
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	P	
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	P	
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	P	
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	
<u>Supplementary information and remarks:</u>			
None			

Bluetooth EDR

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	20 dB Bandwidth and Carrier frequency separation	P	
FCC 15.247 (b) / RSS-247 5.4. (d)	Time of Occupancy (Dwell Time)	P	
FCC 15.247 (d) / RSS-247 5.5.	Number of hopping channels	P	
FCC 15.247 (e) / RSS-247 5.2. (b)	Maximum peak output power and antenna gain	P	
FCC 15.247 (d) / RSS-247 5.5	Band-edge emissions compliance	P	
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	
<u>Supplementary information and remarks:</u>			
None			

WLAN 2.4 GHz (B/G/N/AX MIMO 2x2)

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	P	
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	P	
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	P	
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	P	
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	
<u>Supplementary information and remarks:</u>			
None			

Appendix A: Test results. CHIPSET 002 Bluetooth Low Energy (2M, 1M)

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FCC 47 CFR PART 15.247 / RSS-247	17
<i>Occupied Channel Bandwidth 99%</i>	17
<i>RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth</i>	25
<i>RSS-247 5.2 (b) / FCC 15.247 (e) Power Spectral Density</i>	33
<i>RSS-247 5.4 / FCC 15.247 (b) Maximum Peak Conducted Output Power</i>	41
<i>RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter)</i>	49
<i>RSS-247 5.5 / FCC 15.247 (d) Emission limitations radiated (Transmitter)</i>	59

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 12 Vdc
Type of Power Supply: Battery

ANTENNA (*):

Technology	Antenna Gain	Type
BTLE	+0.1 dBi	External

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel	Middle Channel	High Channel
BTLE GFSK	1M 1 Mbit/s	2402 MHz	2440 MHz	2480 MHz
BTLE GFSK	2M 2 Mbit/s	2402 MHz	2440 MHz	2480 MHz

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required.

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.



RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

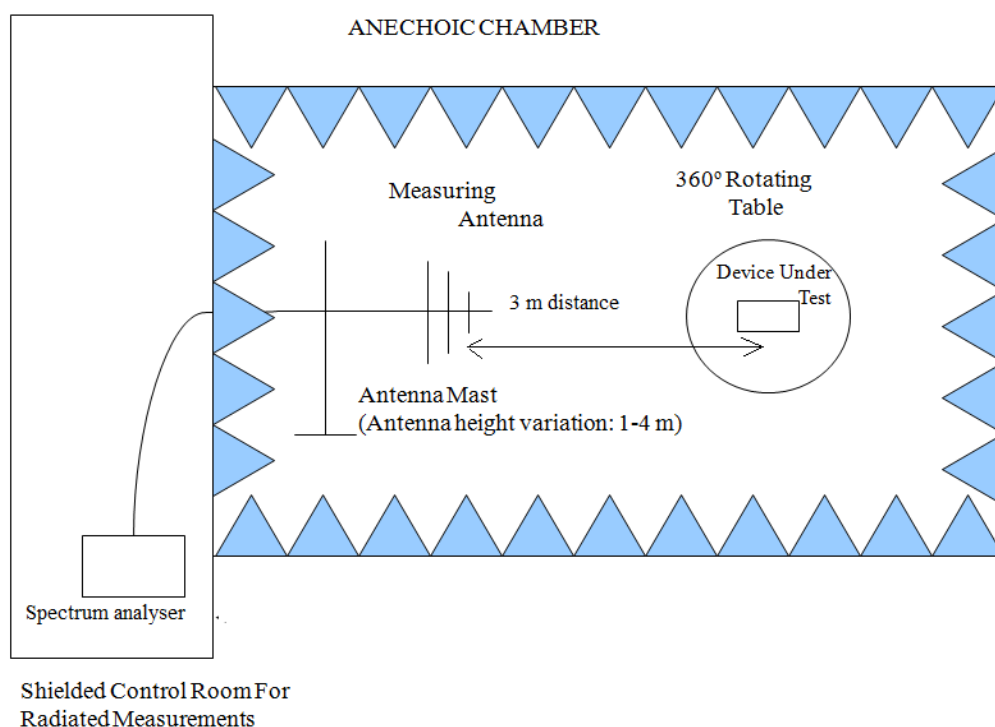
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

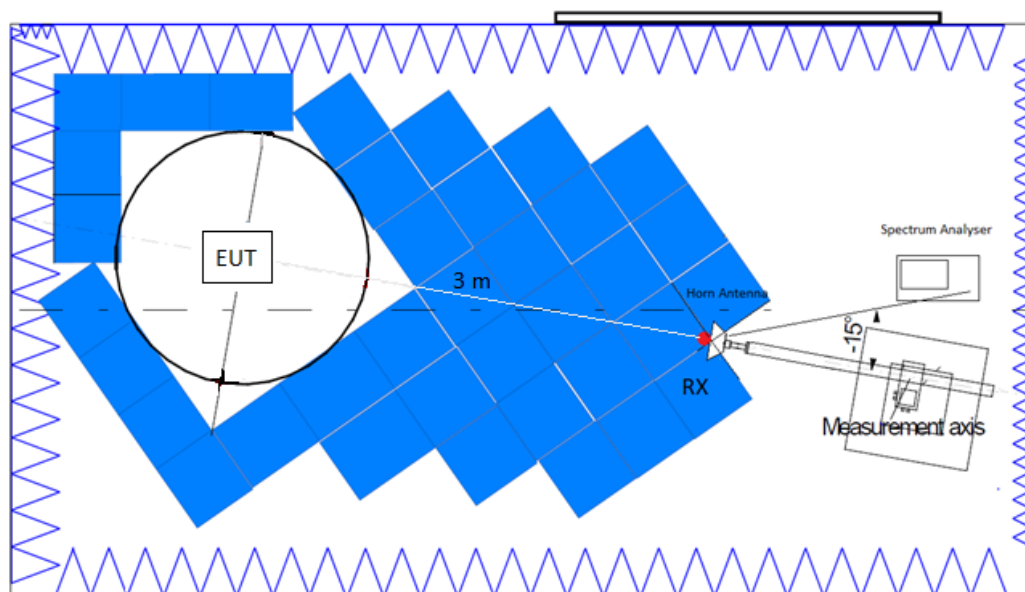
Measurements were made in both horizontal and vertical planes of polarization.

A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

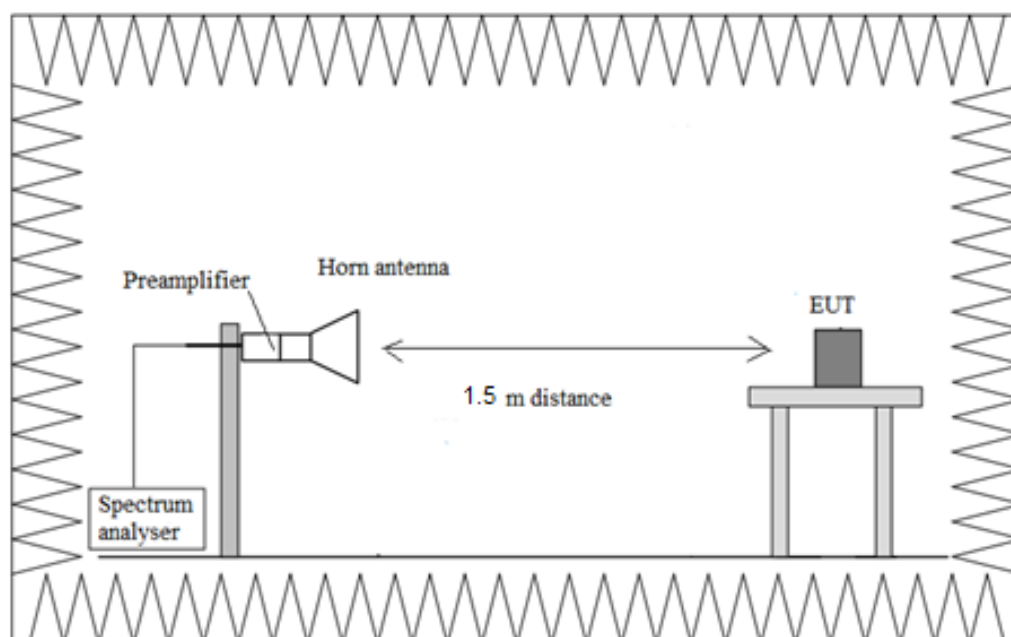
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup $f > 17$ GHz:



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247 Occupied Channel Bandwidth 99%

Limits

RSS-Gen 6.7 / FCC 2.1049 - Occupied Channel Bandwidth 99%

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

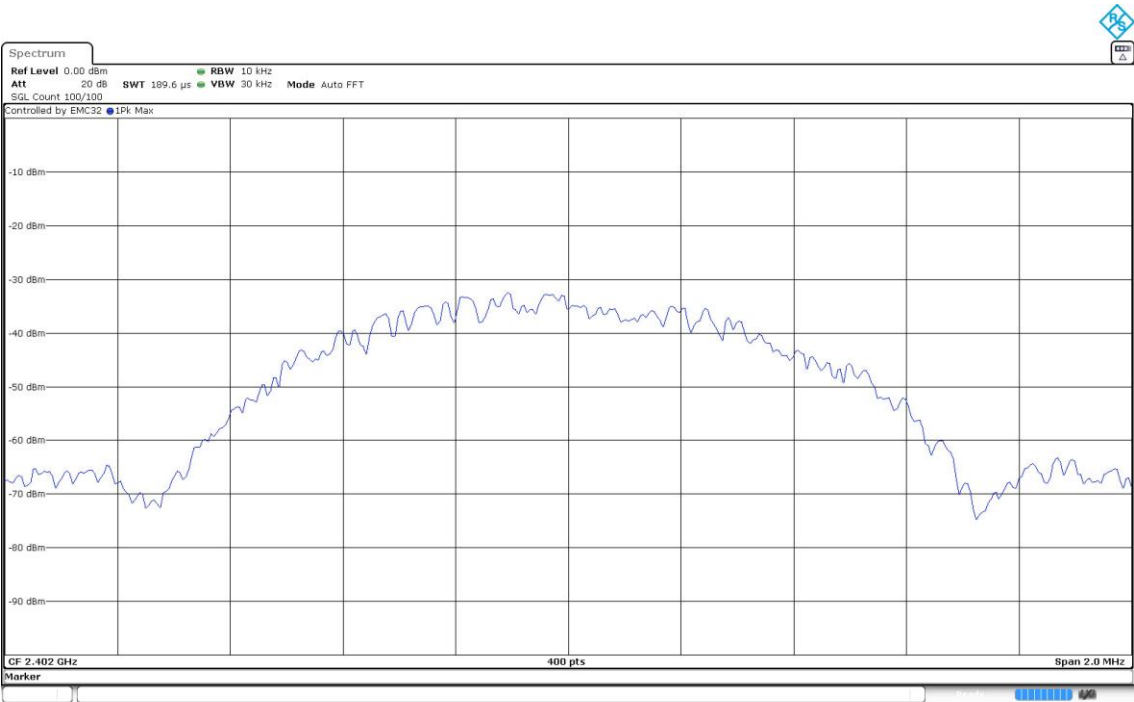
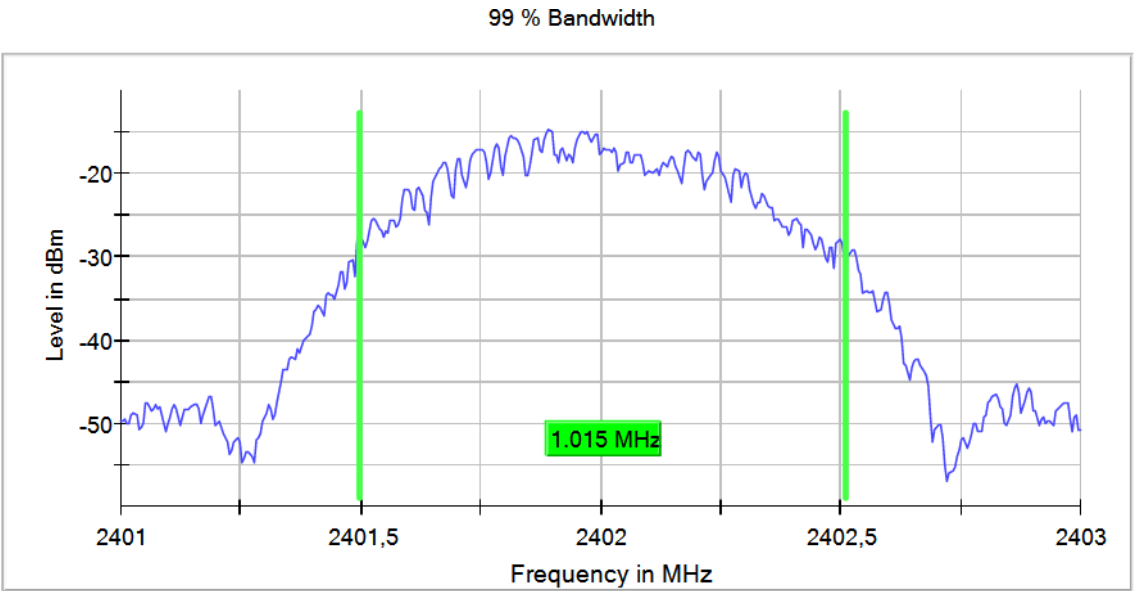
Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Occ Ch BW (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	1.015
		2440.00000		1.020
		2480.00000		1.025

Attachments

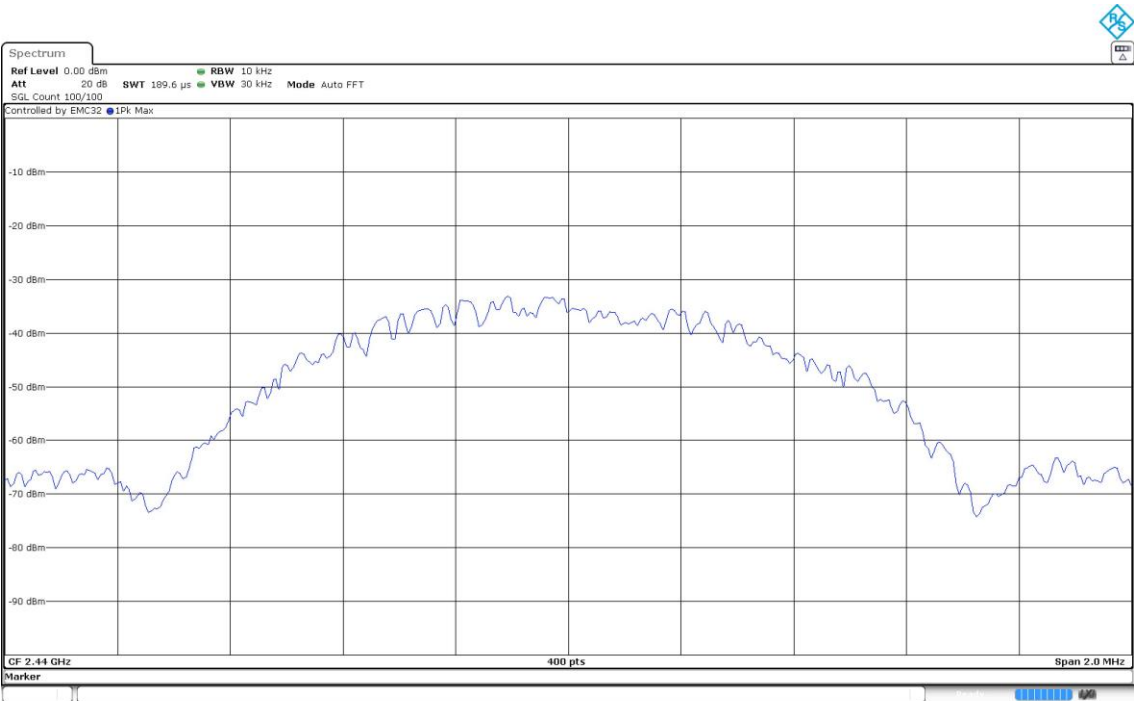
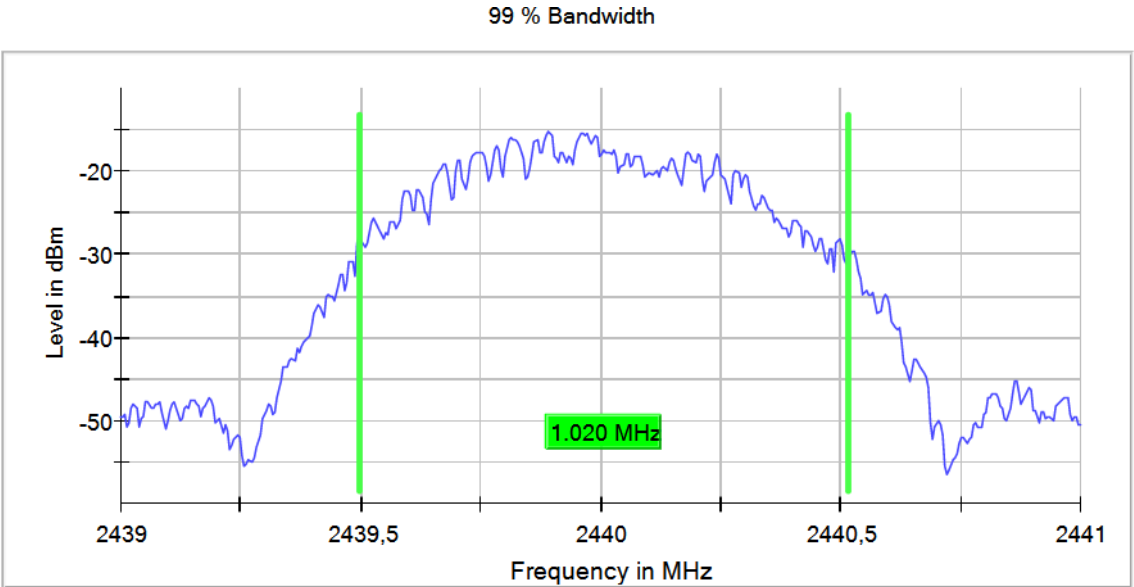
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



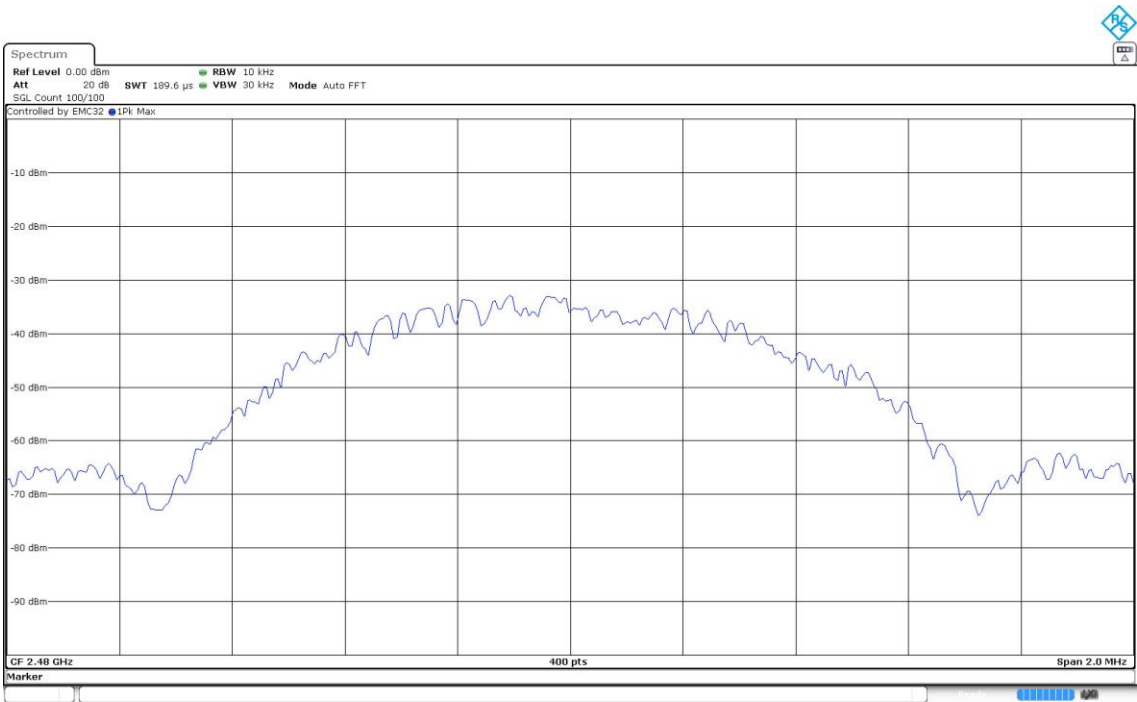
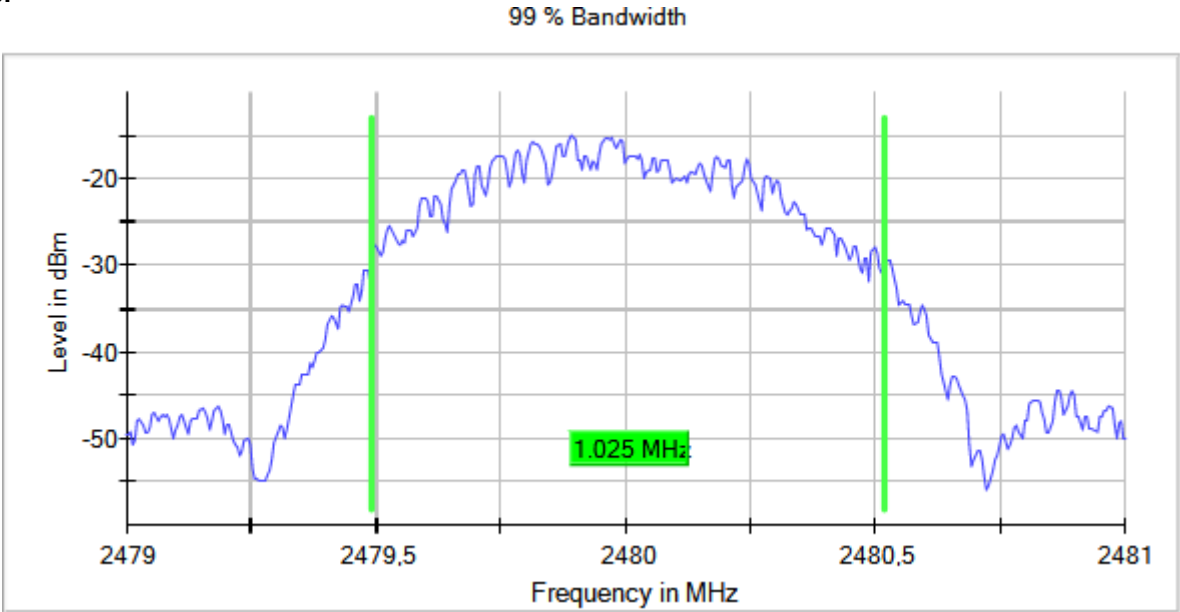
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

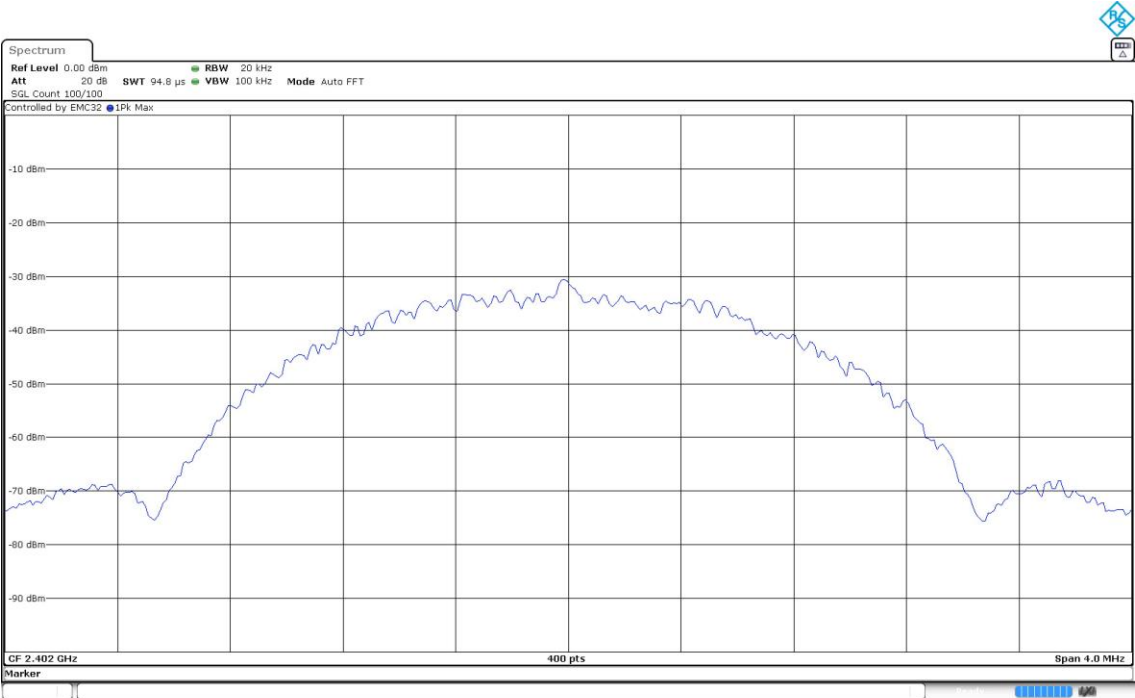
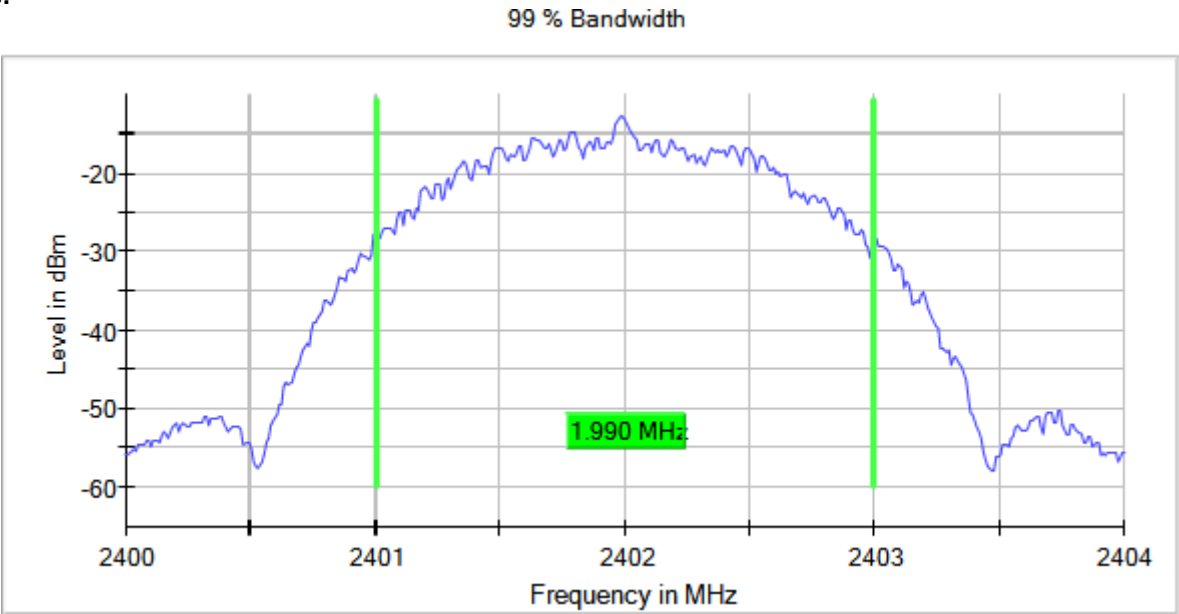
Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Occ Ch BW (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	1.990
		2440.00000		1.970
		2480.00000		1.970

Attachments

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5]

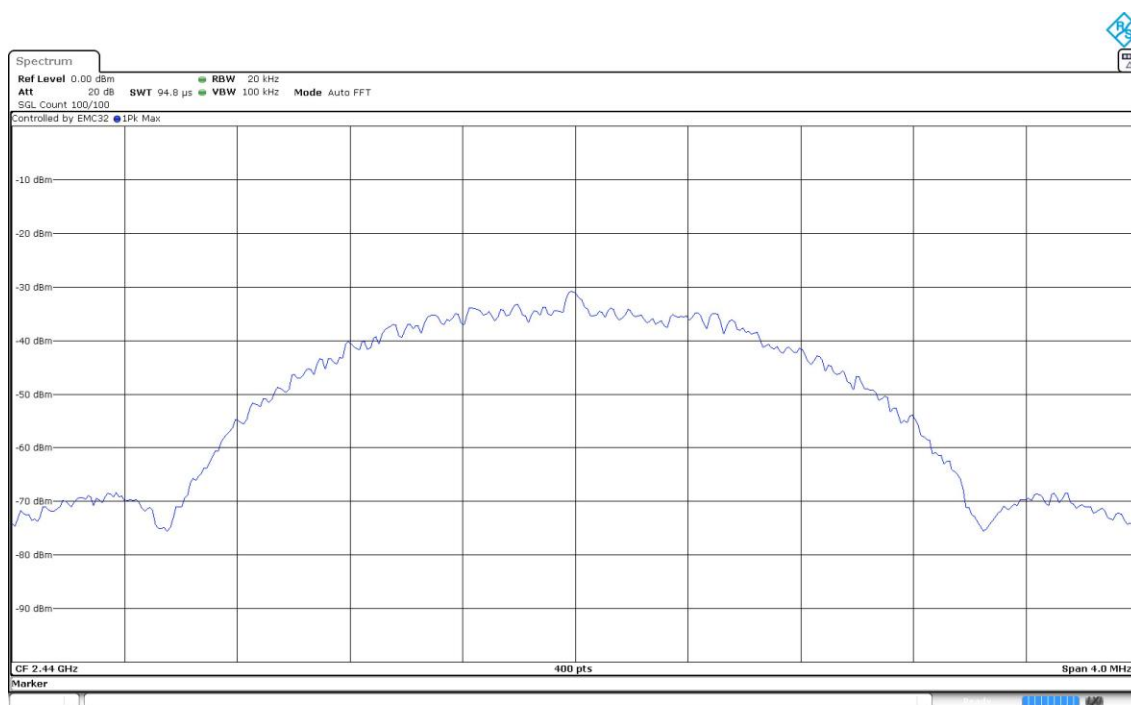
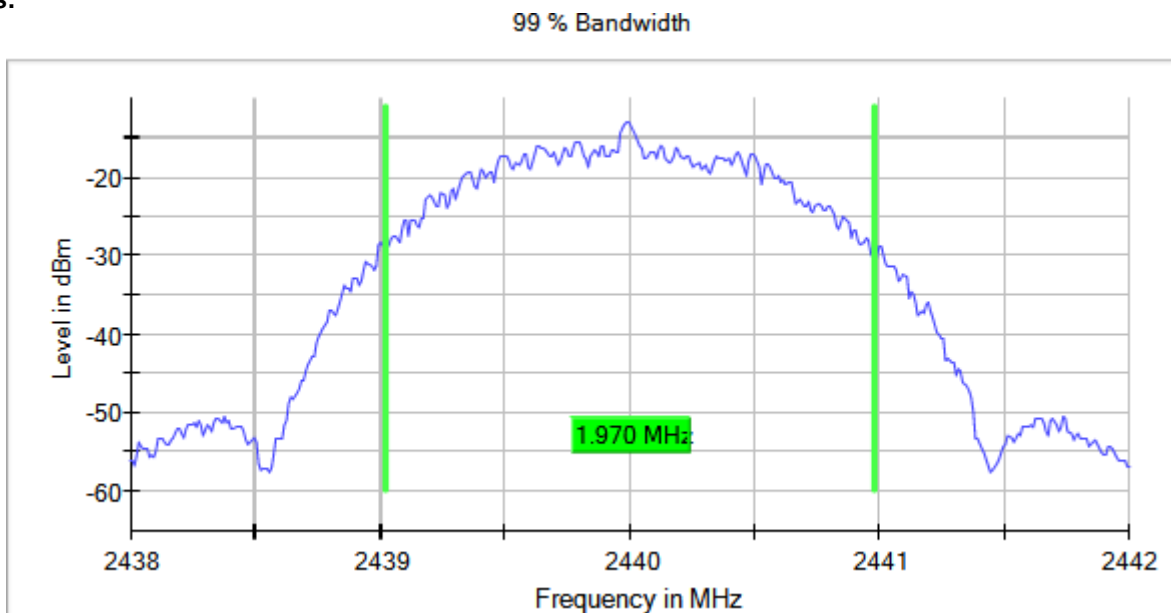
Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2440.00000

Active Port = 1

Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5]

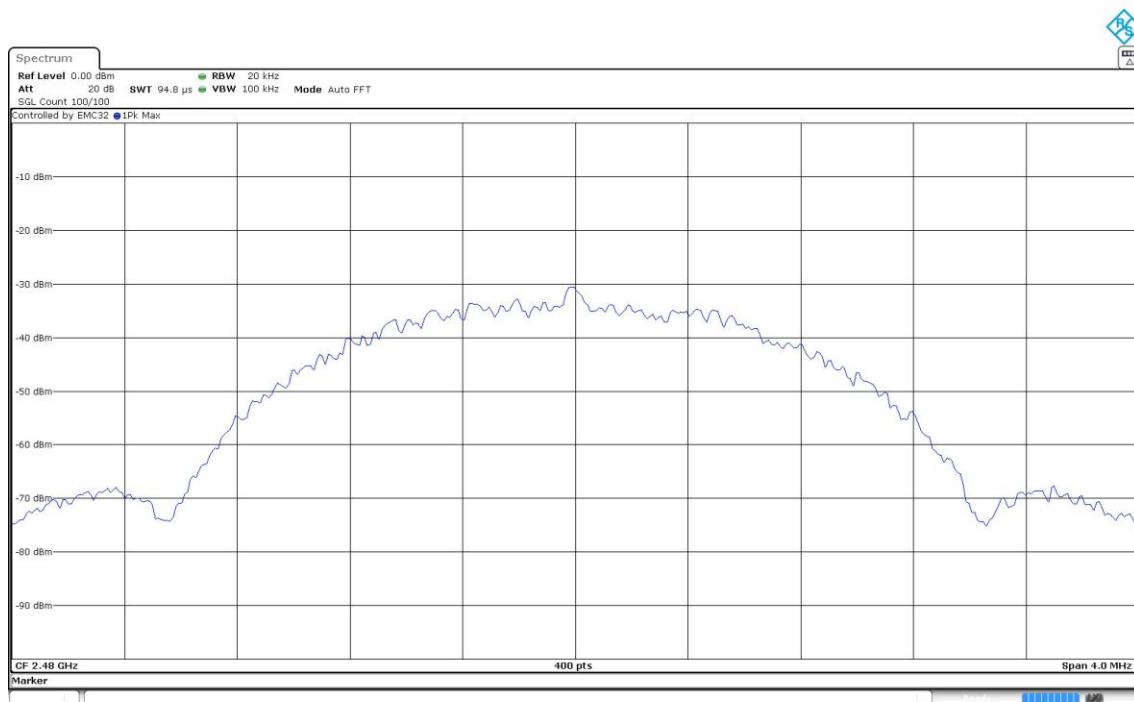
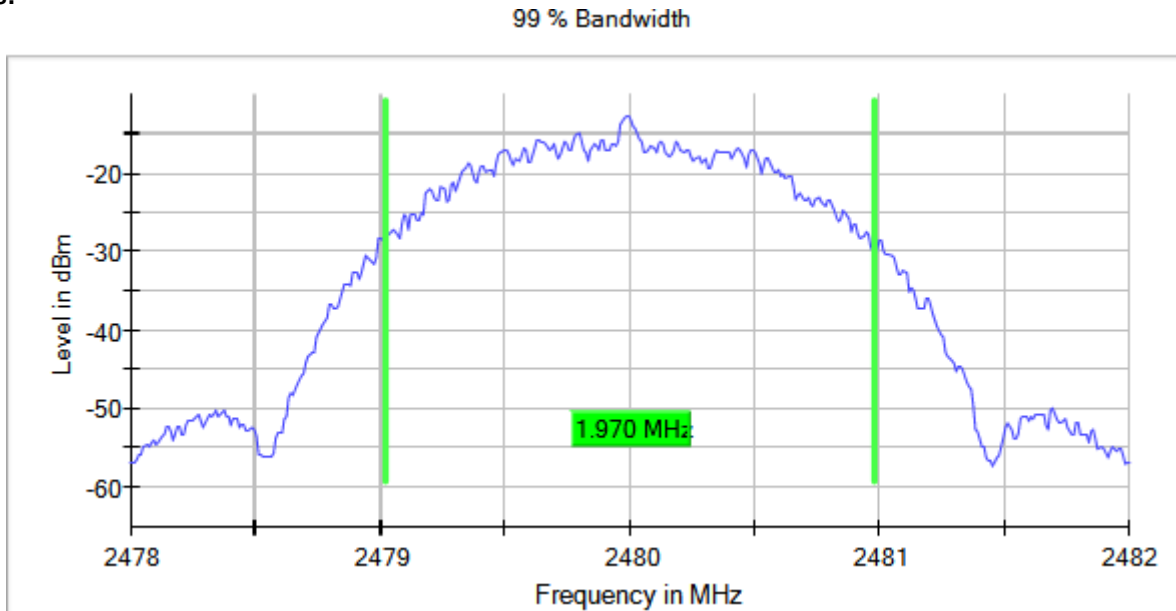
Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2480.00000

Active Port = 1

Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth

Limits

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Ebw (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	0.693
		2440.00000		0.693
		2480.00000		0.693

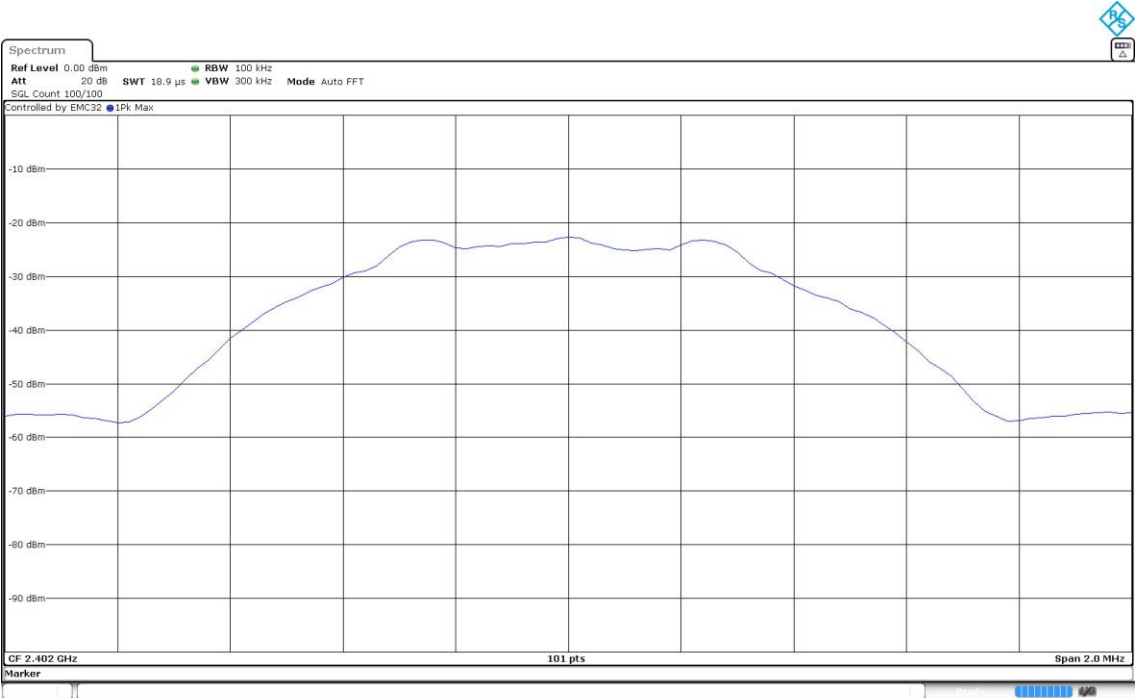
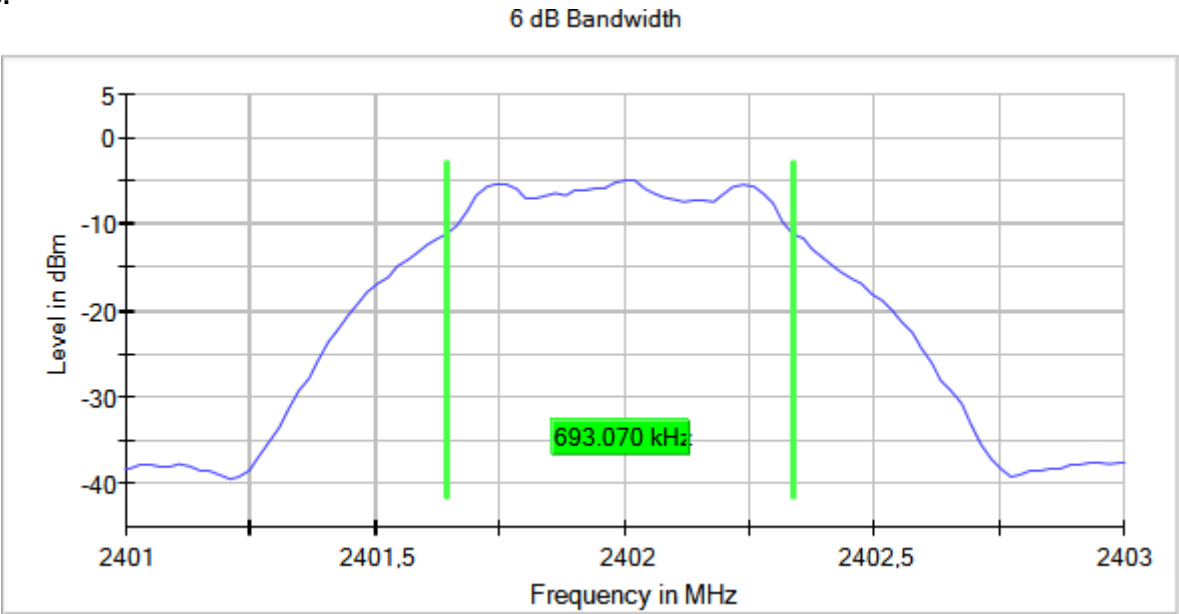
Verdict

Pass

Attachments

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

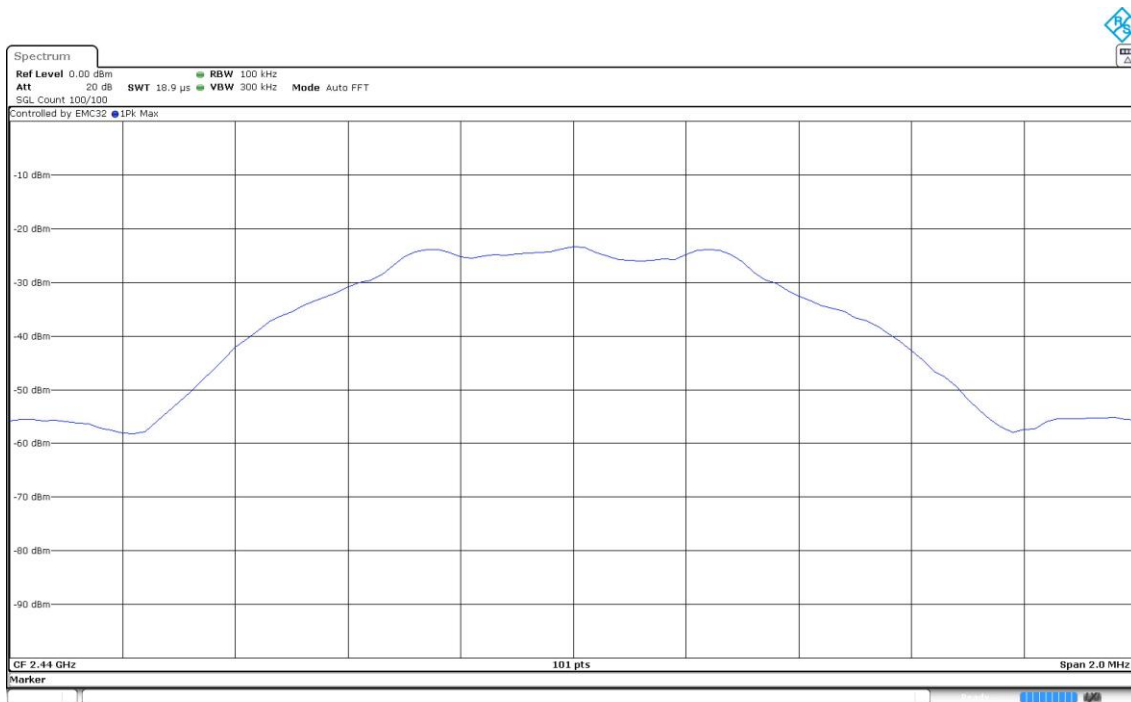
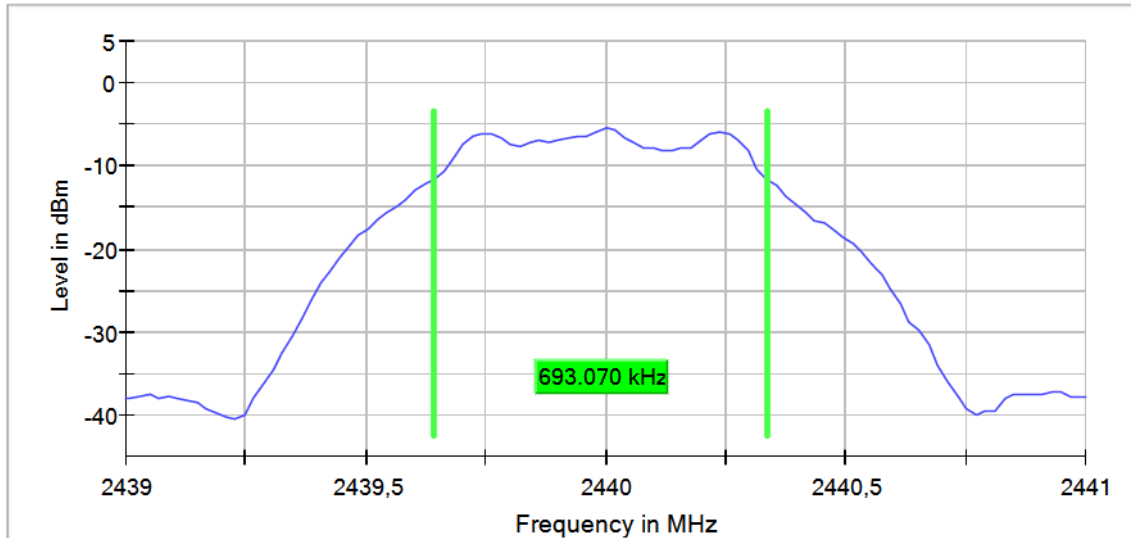
Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

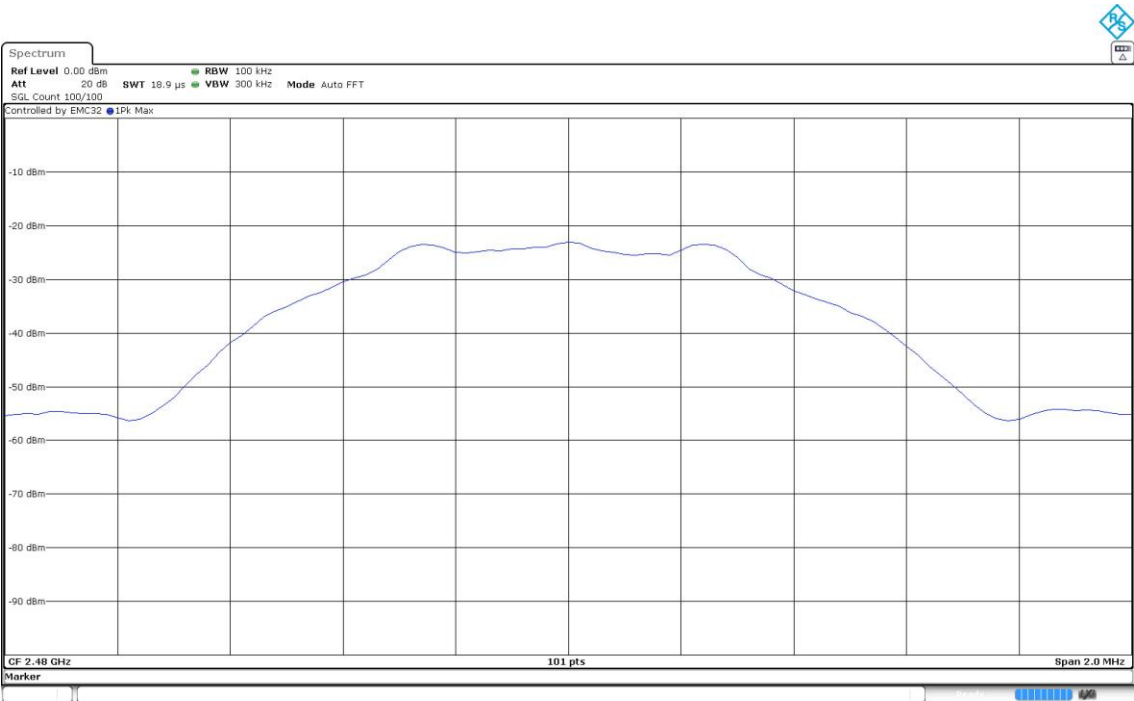
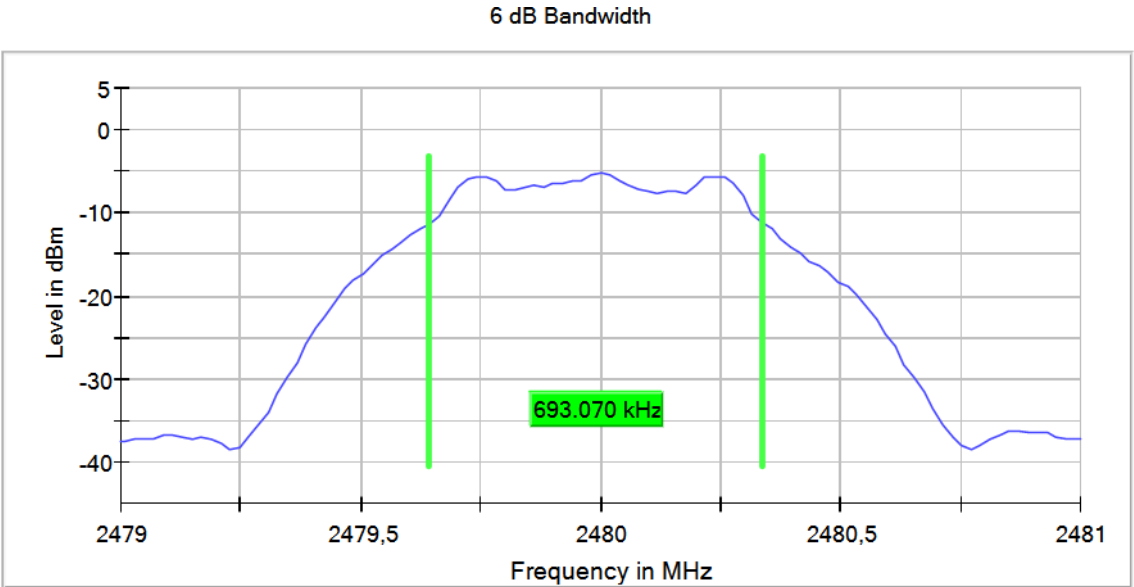
Images:

6 dB Bandwidth



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Ebw (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	1.188
		2440.00000		1.228
		2480.00000		1.188

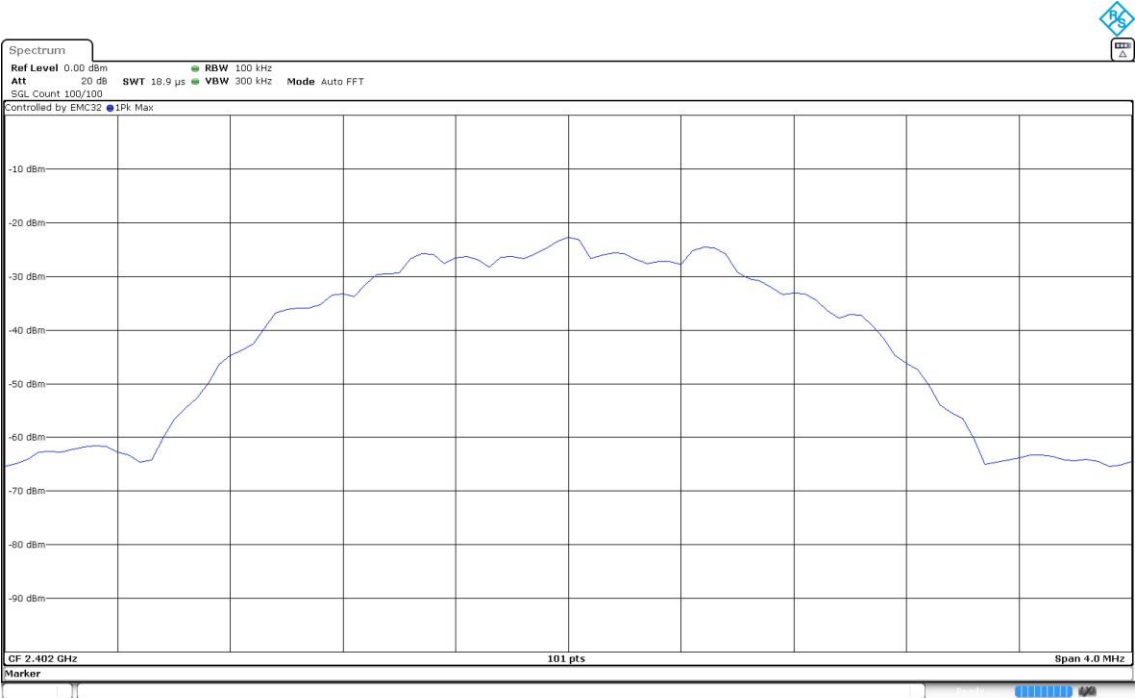
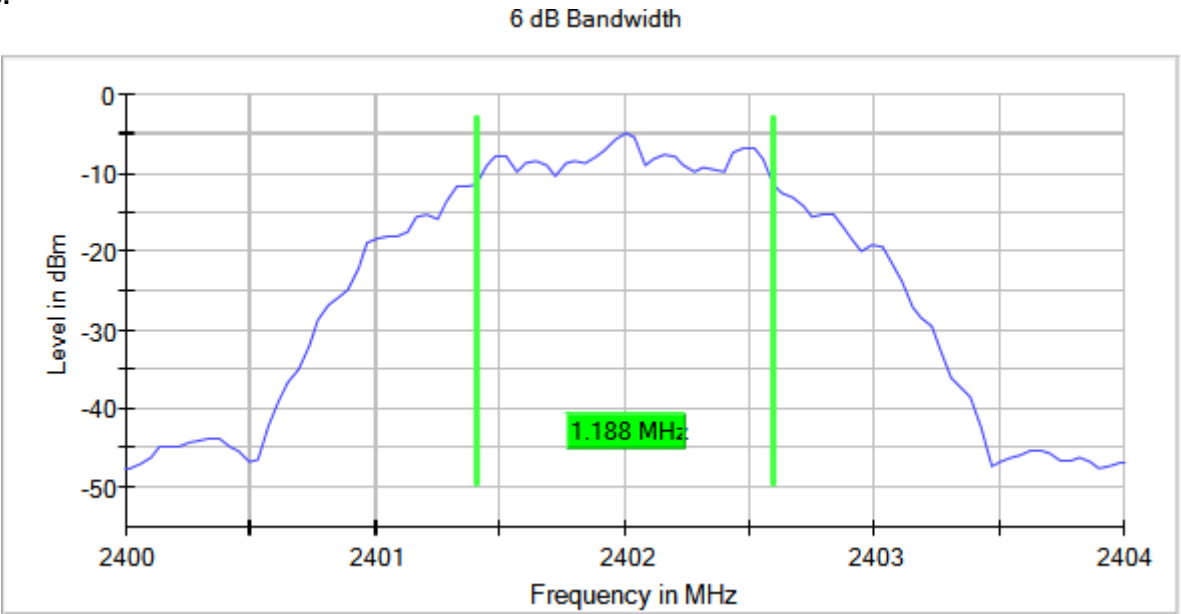
Verdict

Pass

Attachments

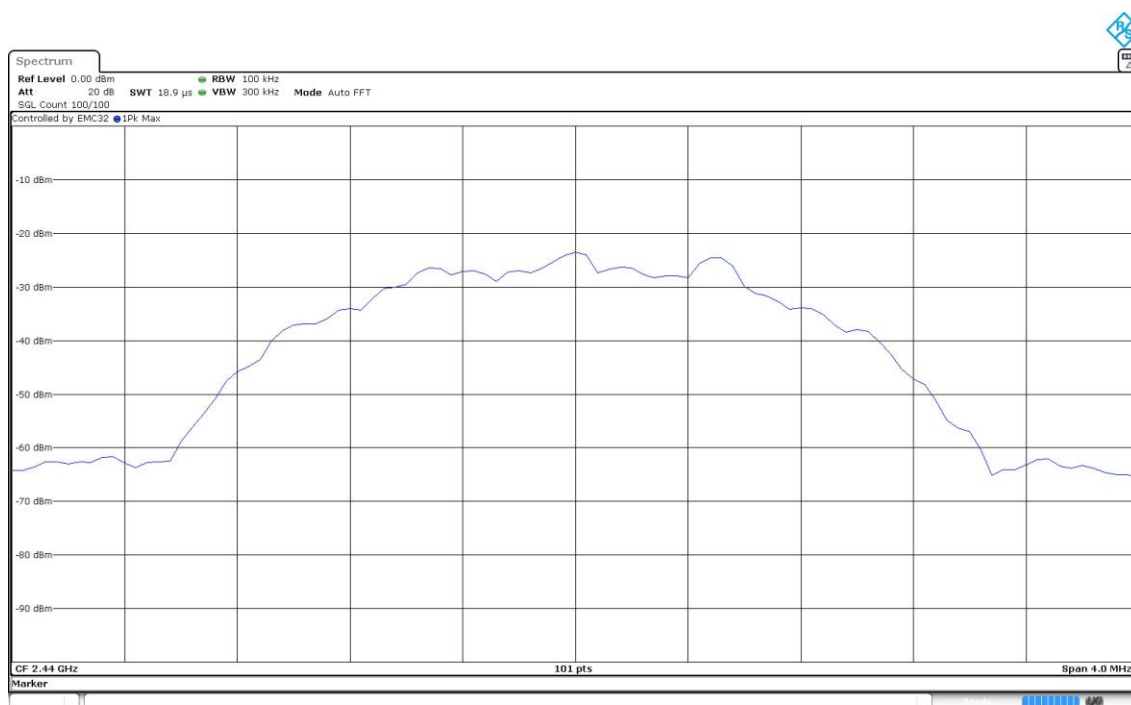
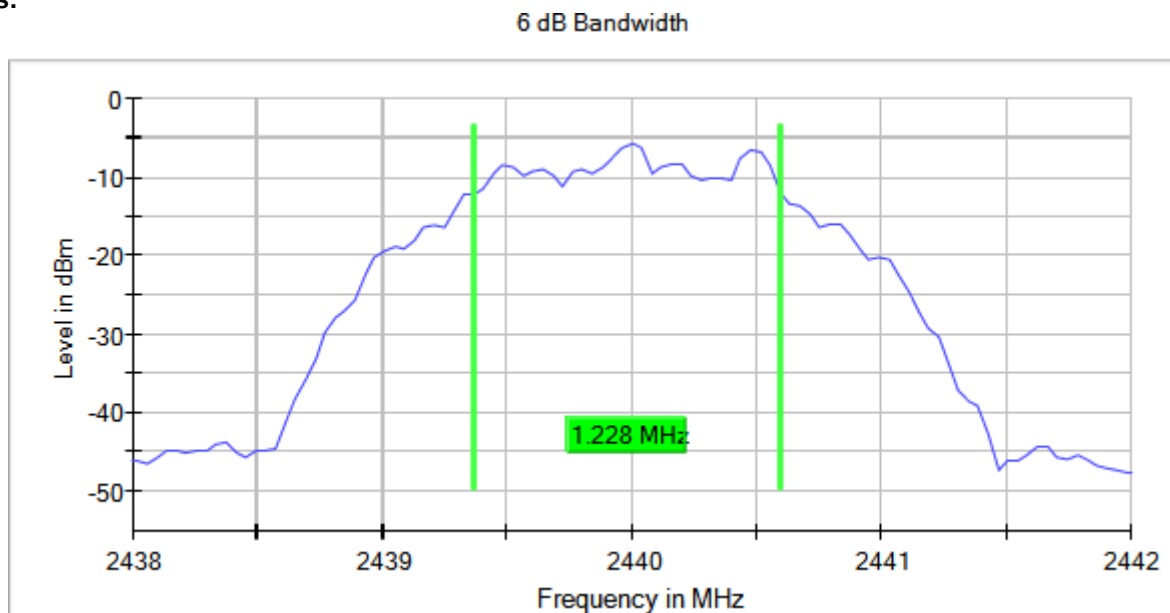
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



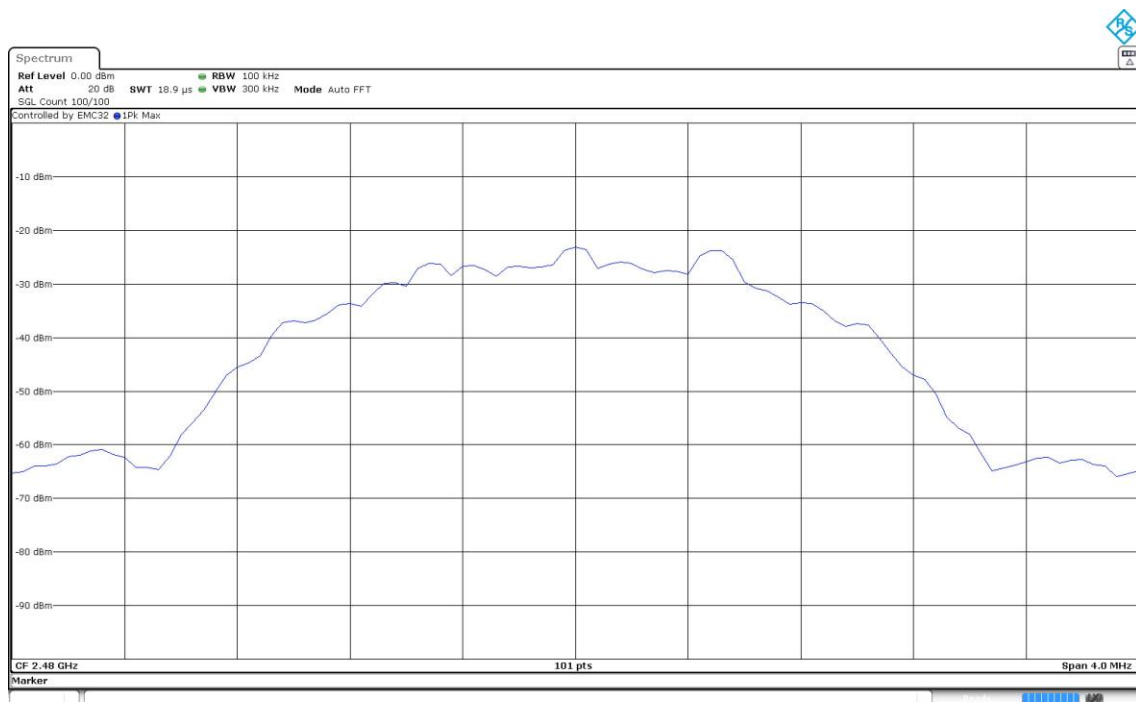
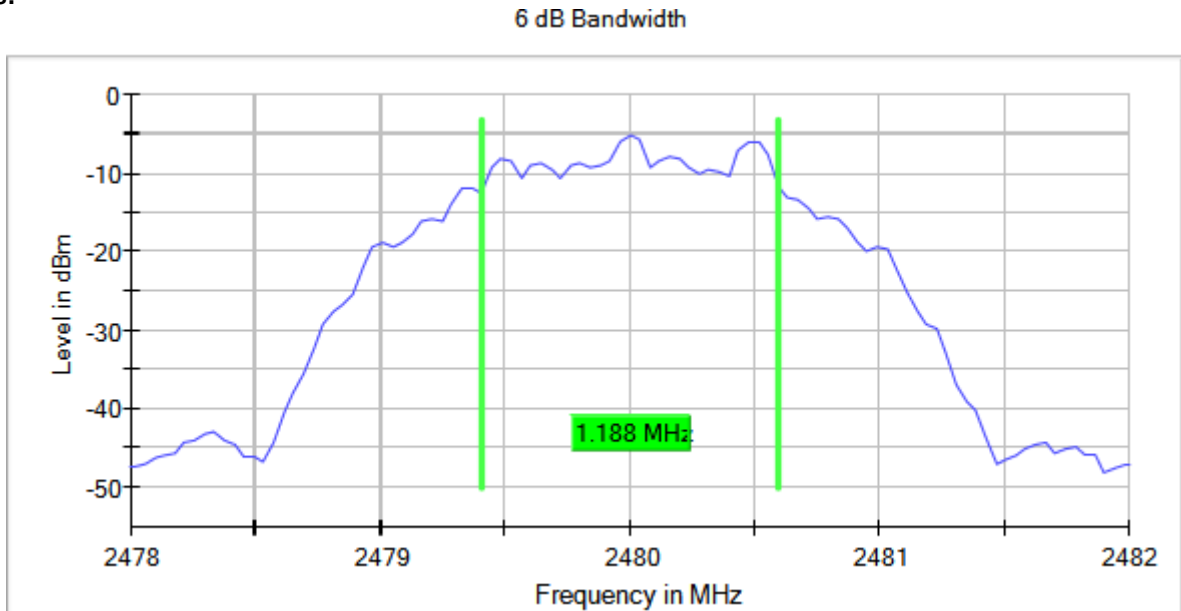
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
 Frequency MHz = 2440.00000 Active Port = 1
 Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
 Frequency MHz = 2480.00000 Active Port = 1
 Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.2 (b) / FCC 15.247 (e) Power Spectral Density

Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	PSD (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	-14.64
		2440.00000		-15.15
		2480.00000		-14.88

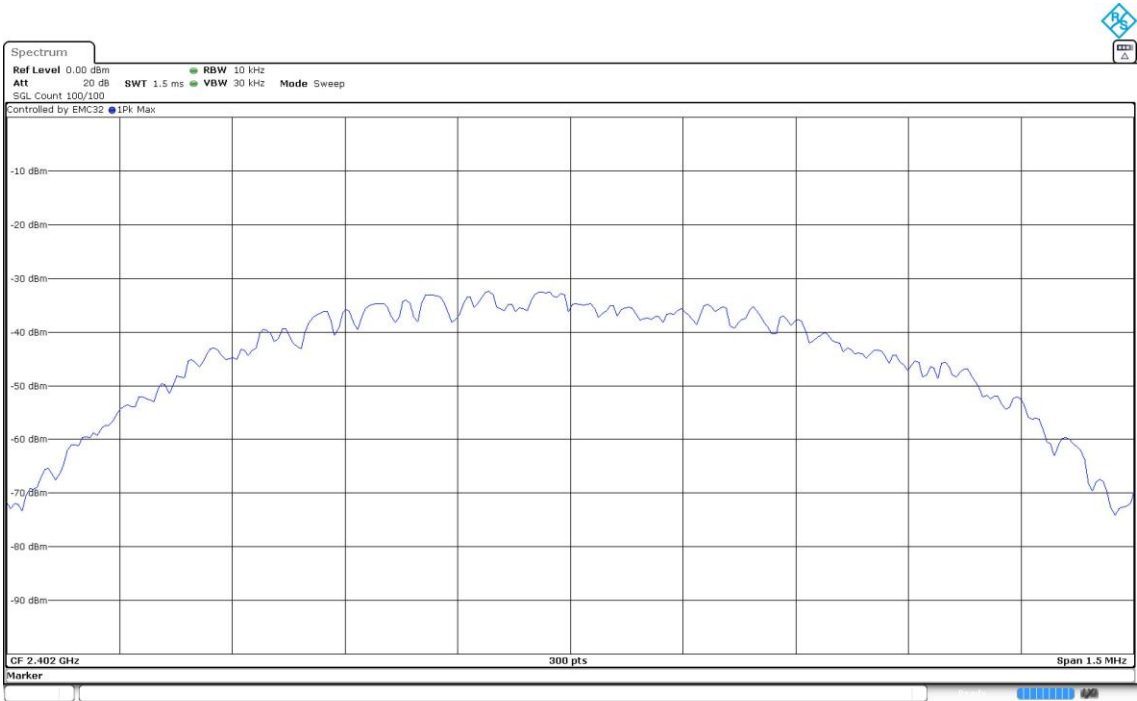
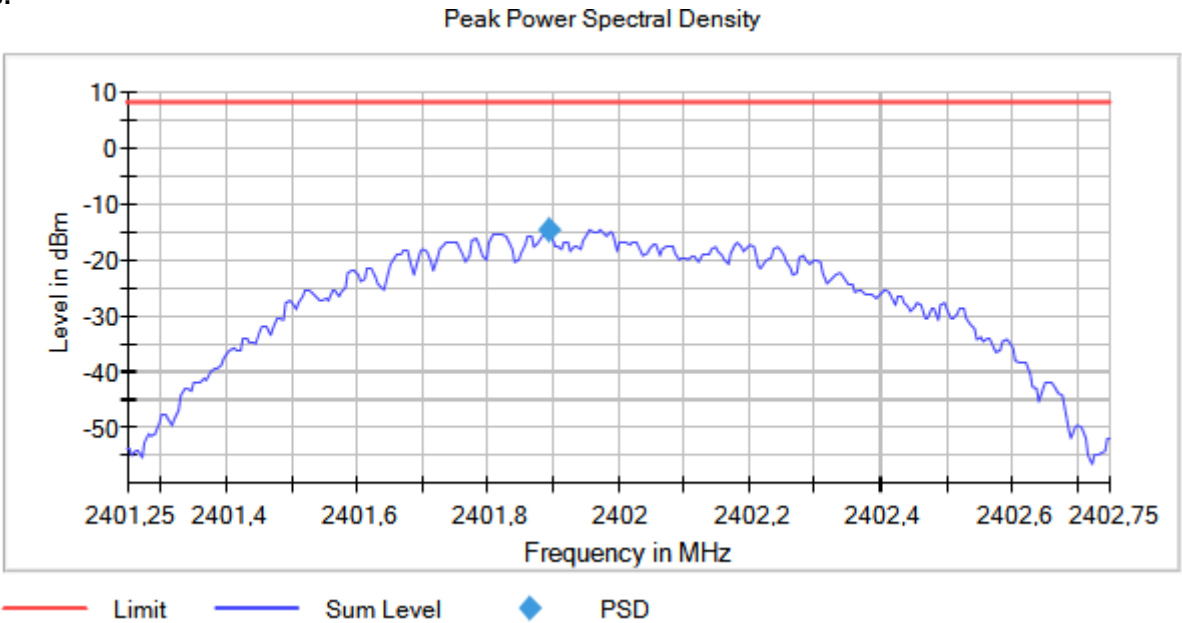
Verdict

Pass

Attachments

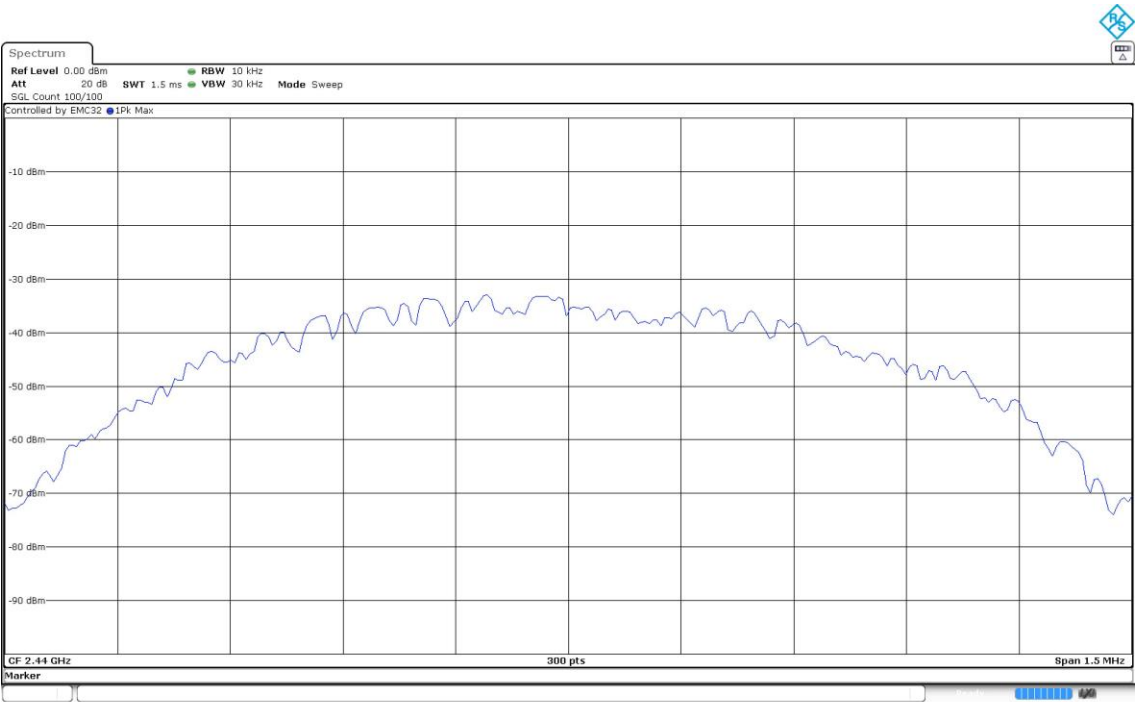
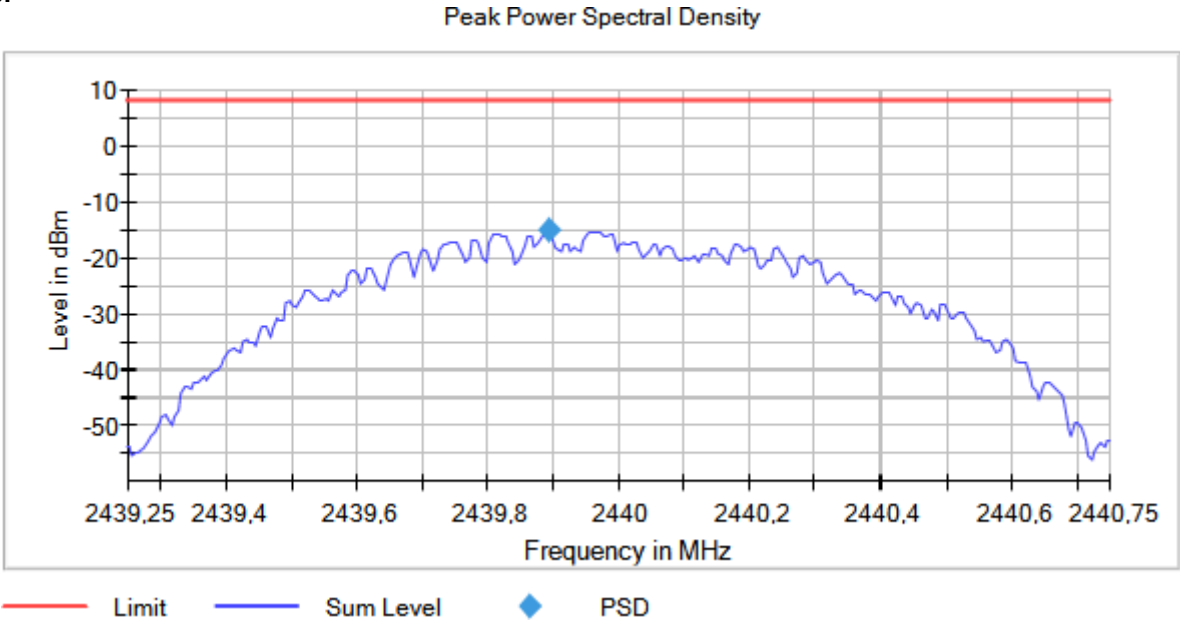
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



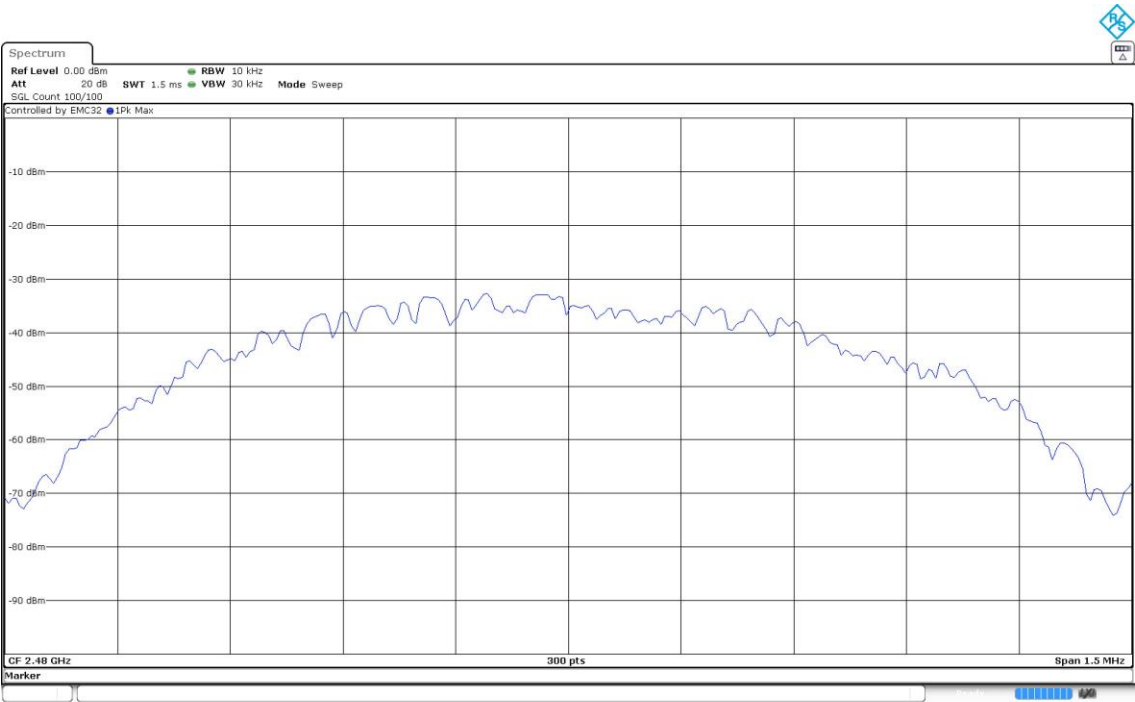
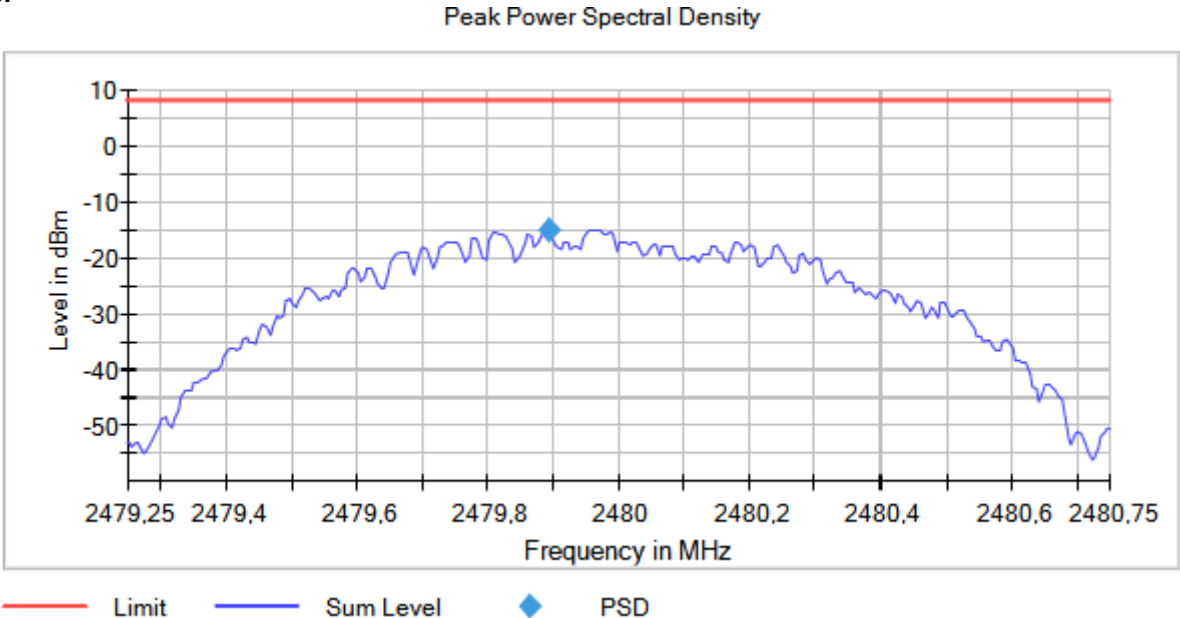
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	PSD (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	-17.20
		2440.00000		-17.70
		2480.00000		-17.50

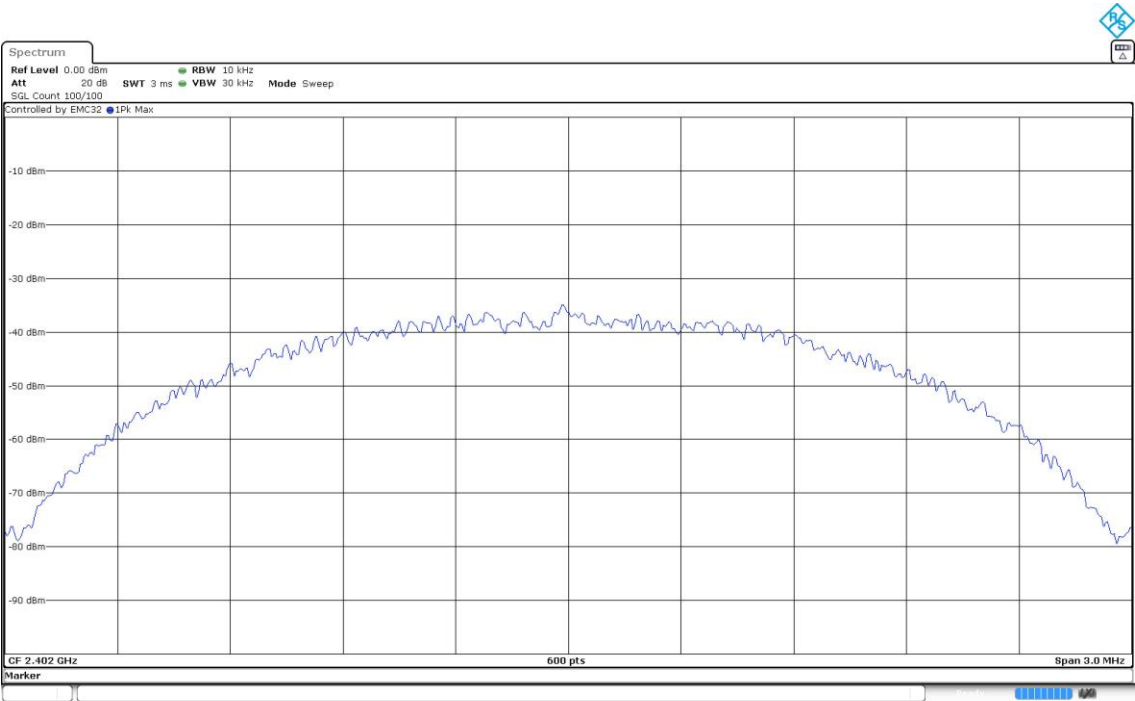
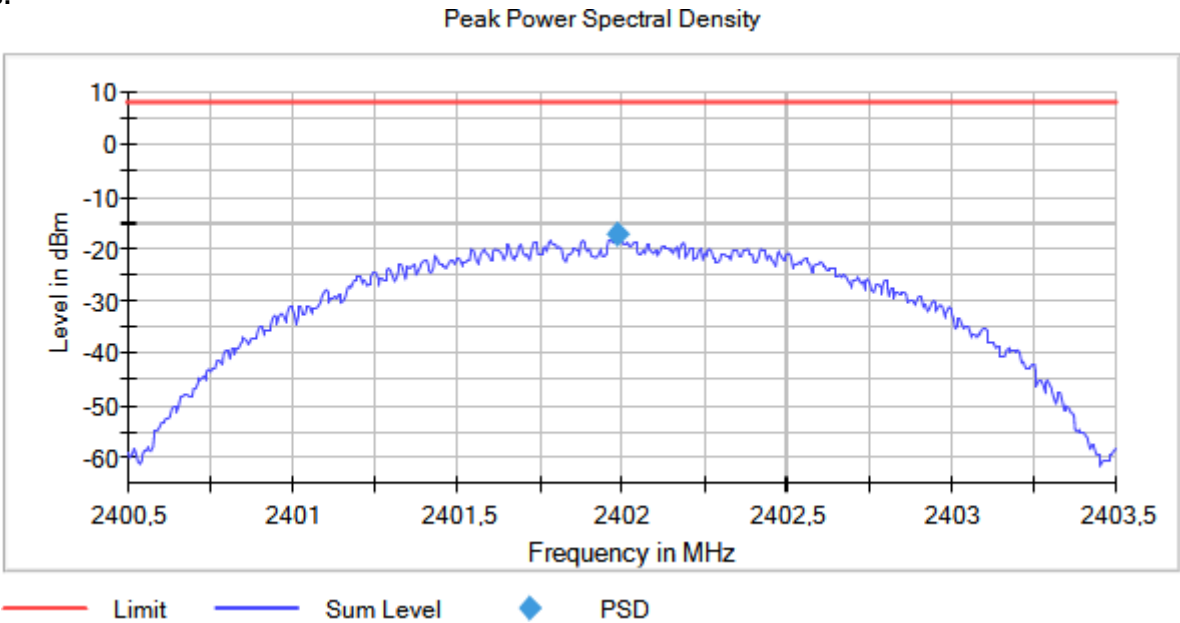
Verdict

Pass

Attachments

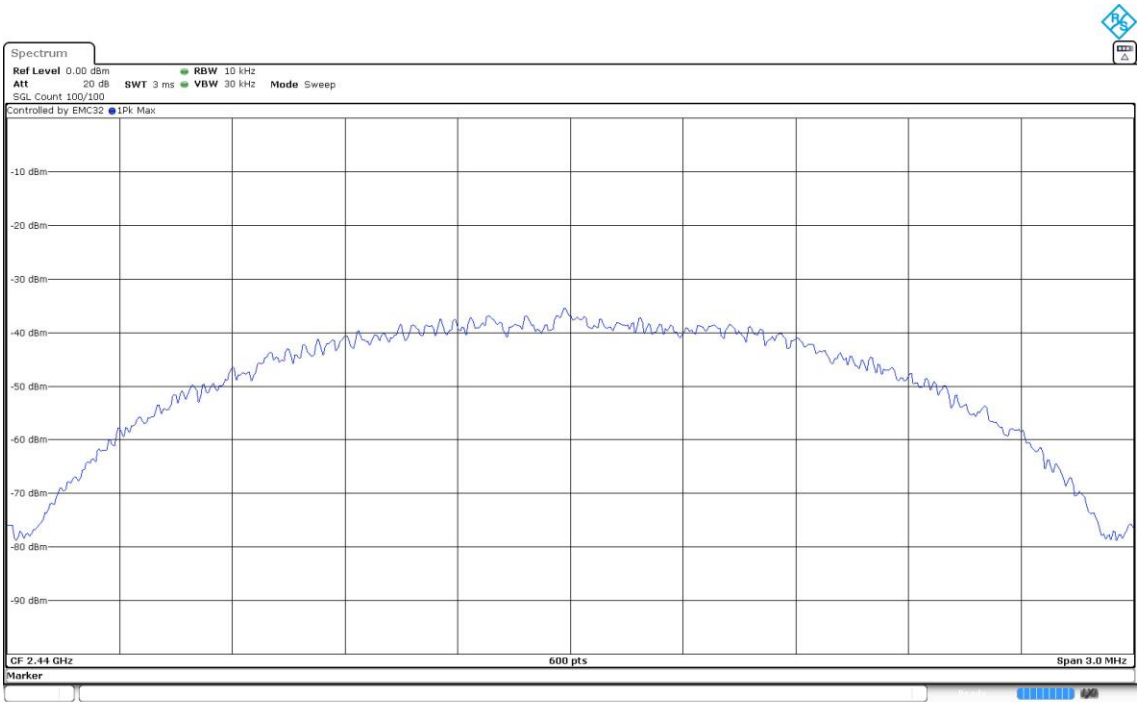
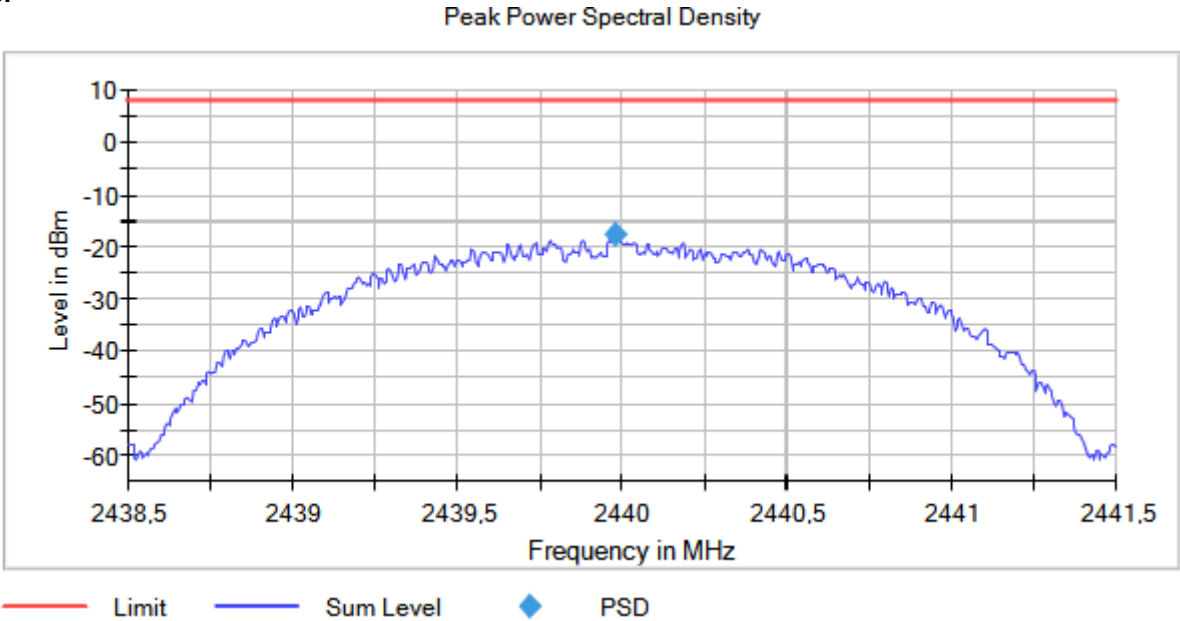
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



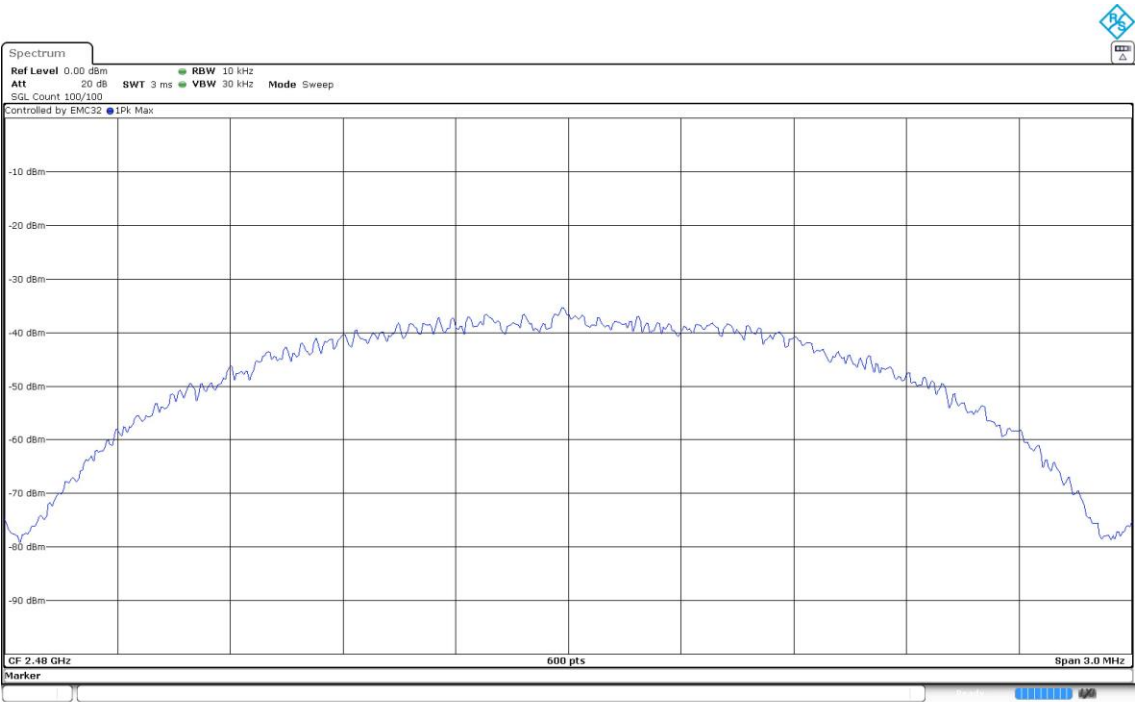
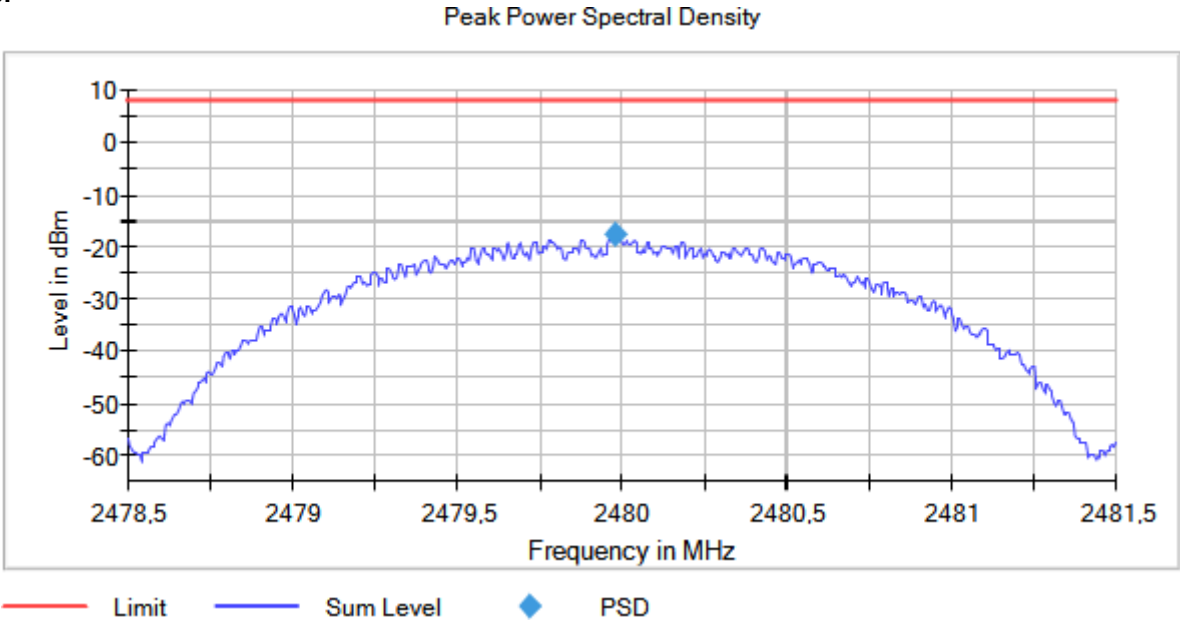
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.4 / FCC 15.247 (b) Maximum Peak Conducted Output Power

Limits

FCC 15.247 (b) (3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

RSS 5.4 (d)

For DTSSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Peak Power (dBm)	E.I.R.P. (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	-4.3880	-4.2880
		2440.00000		-4.9200	-4.8200
		2480.00000		-4.5780	-4.4780

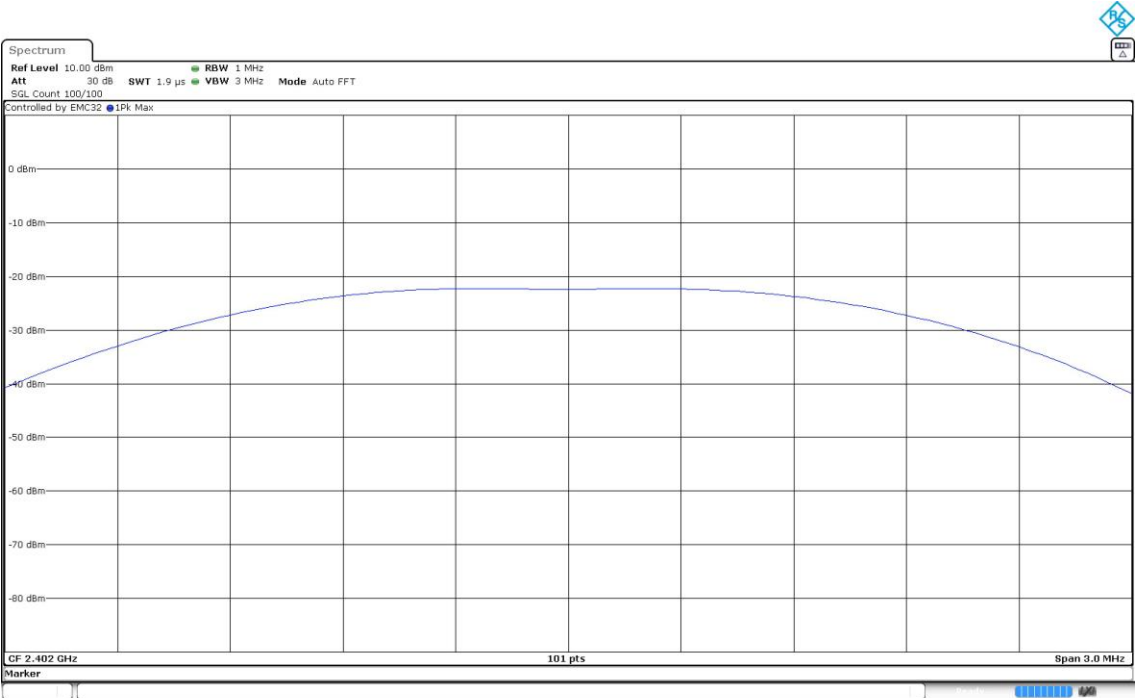
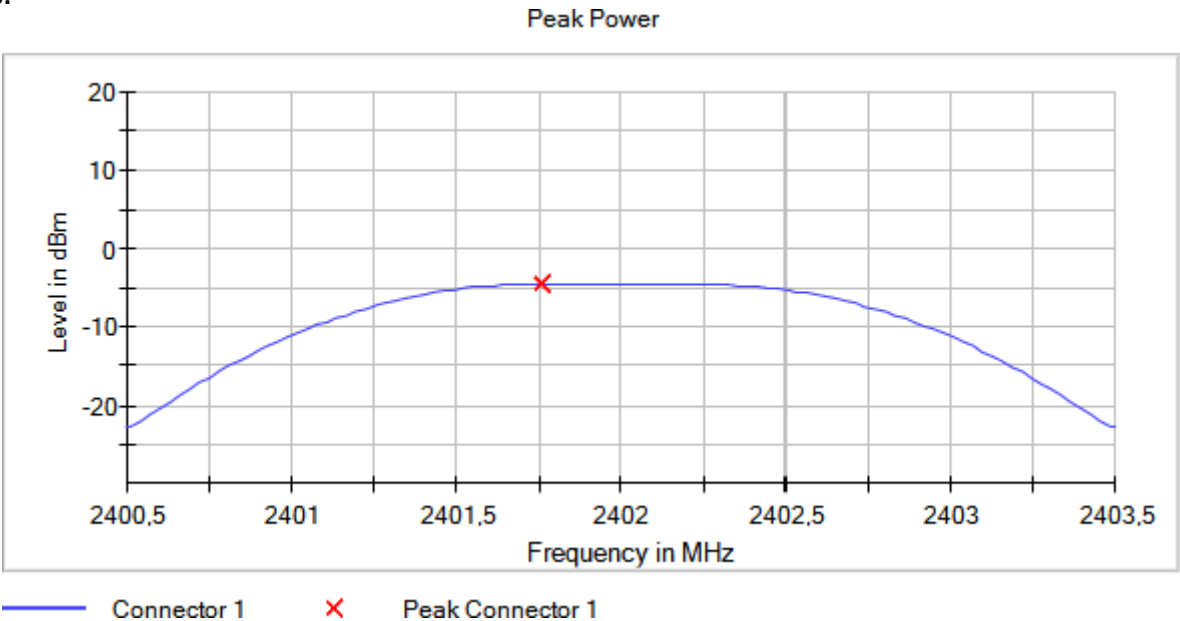
Verdict

Pass

Attachments

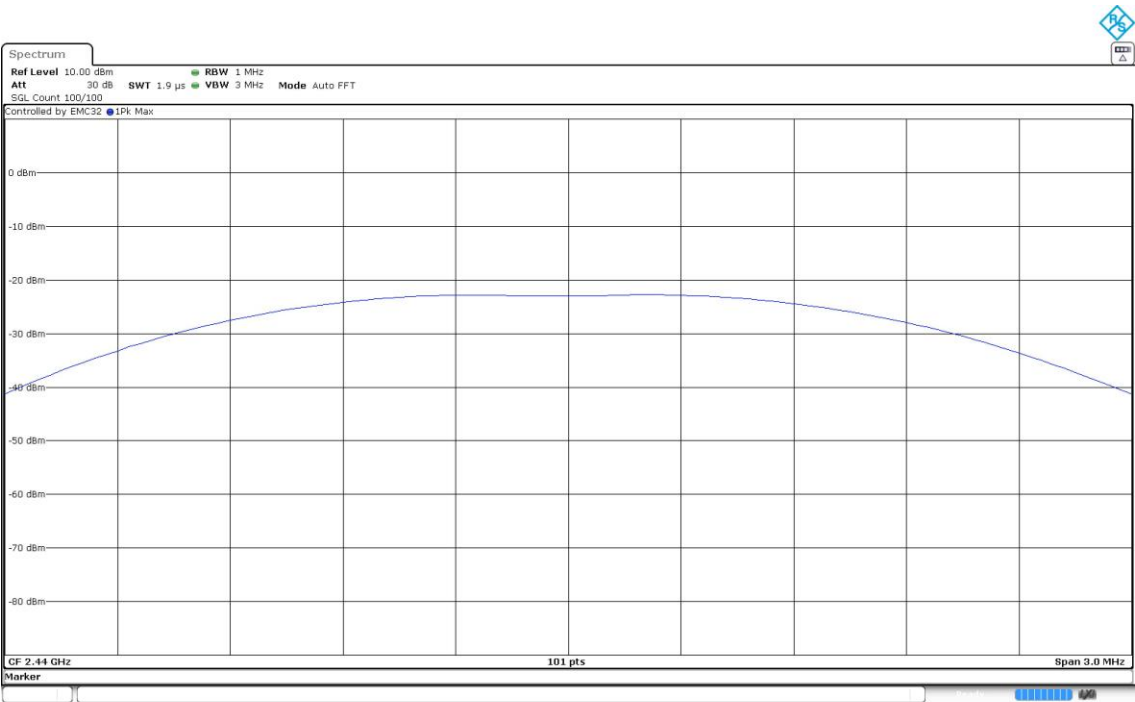
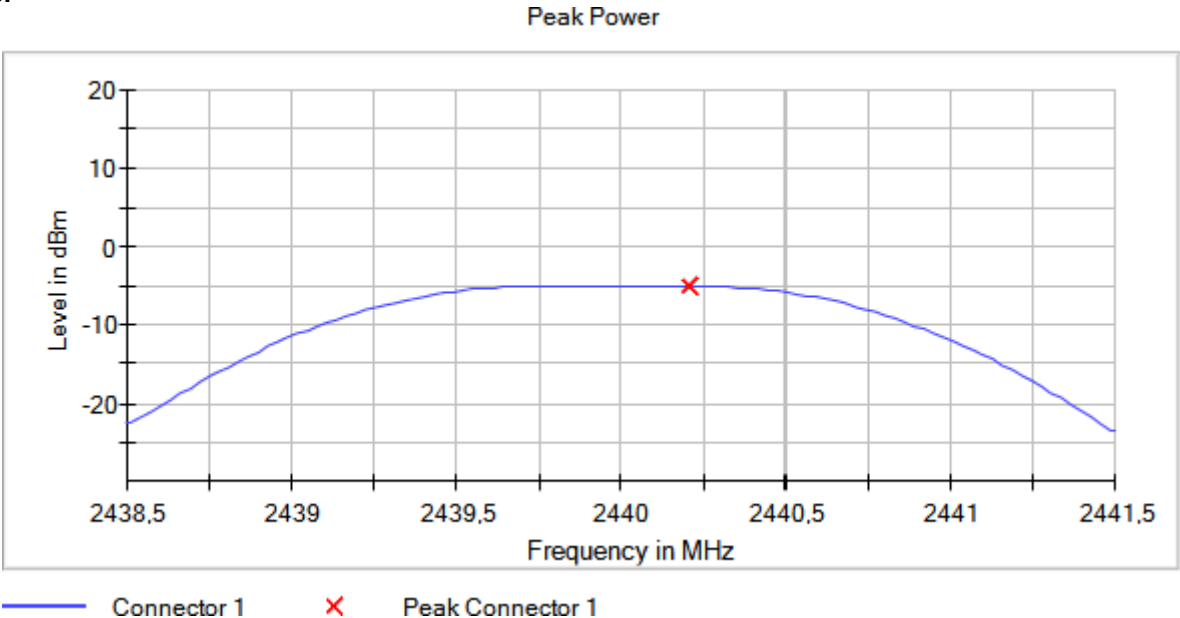
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



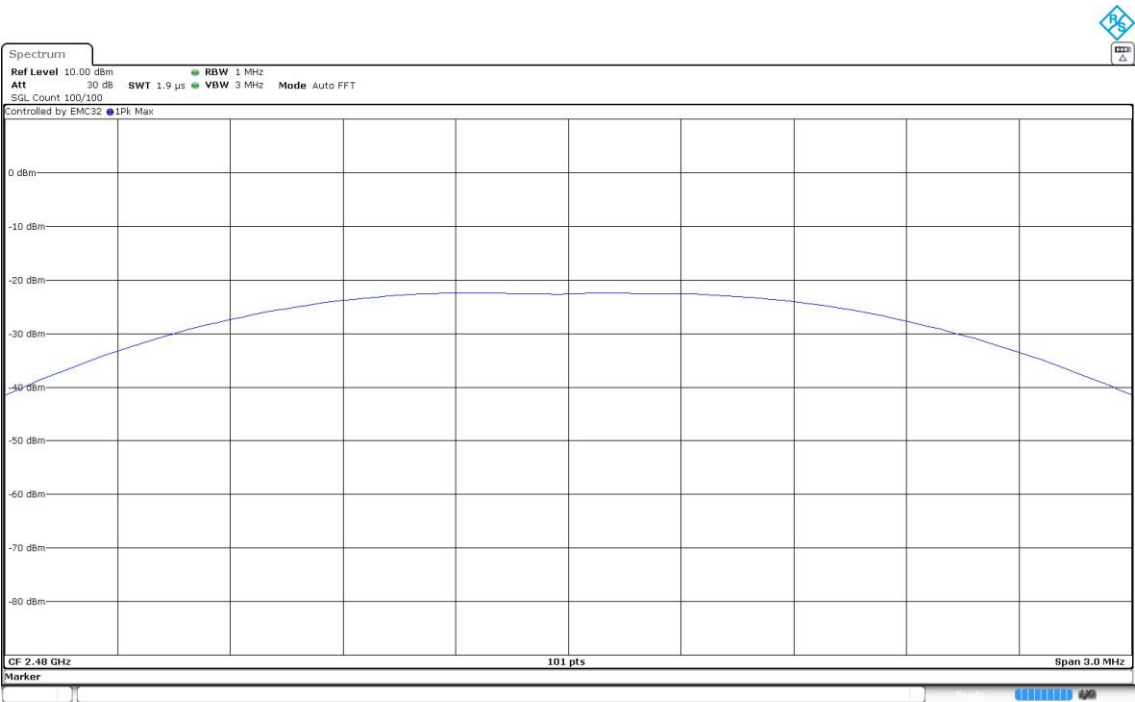
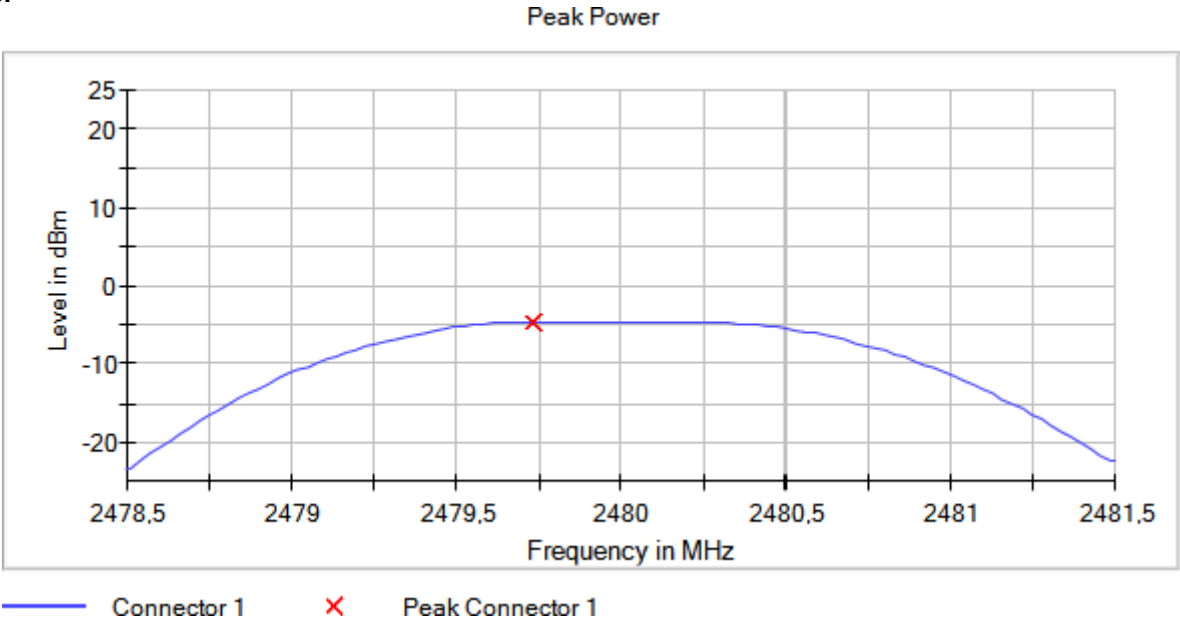
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Peak Power (dBm)	E.I.R.P. (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	-4.2840	-4.1840
		2440.00000		-4.9020	-4.8020
		2480.00000		-4.4140	-4.3140

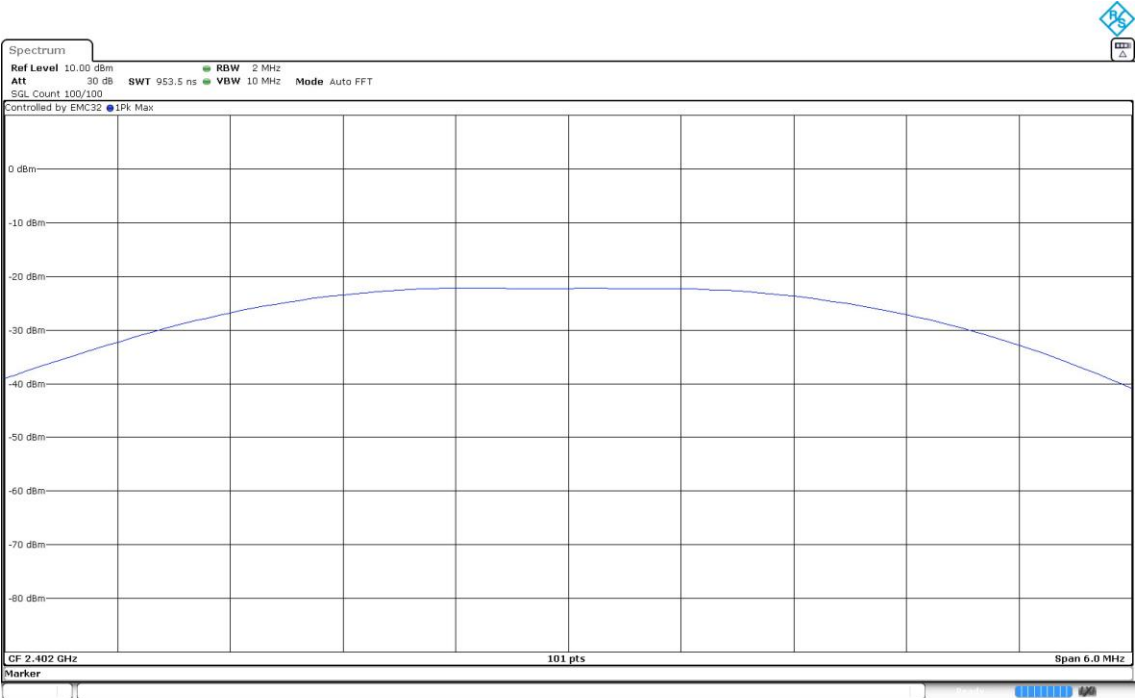
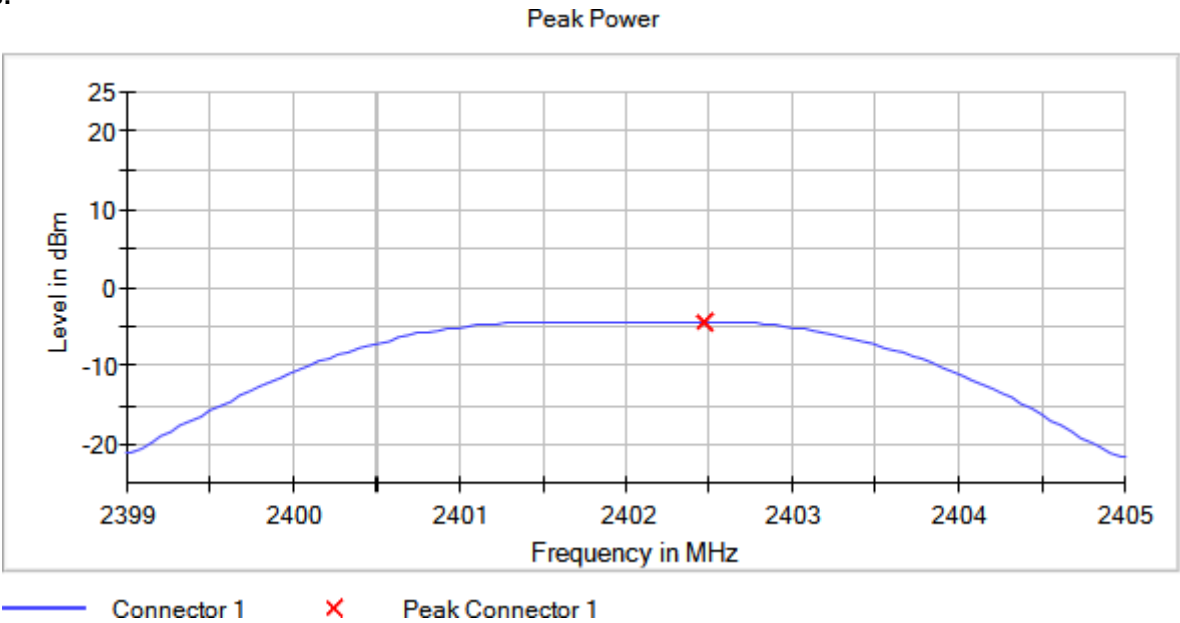
Verdict

Pass

Attachments

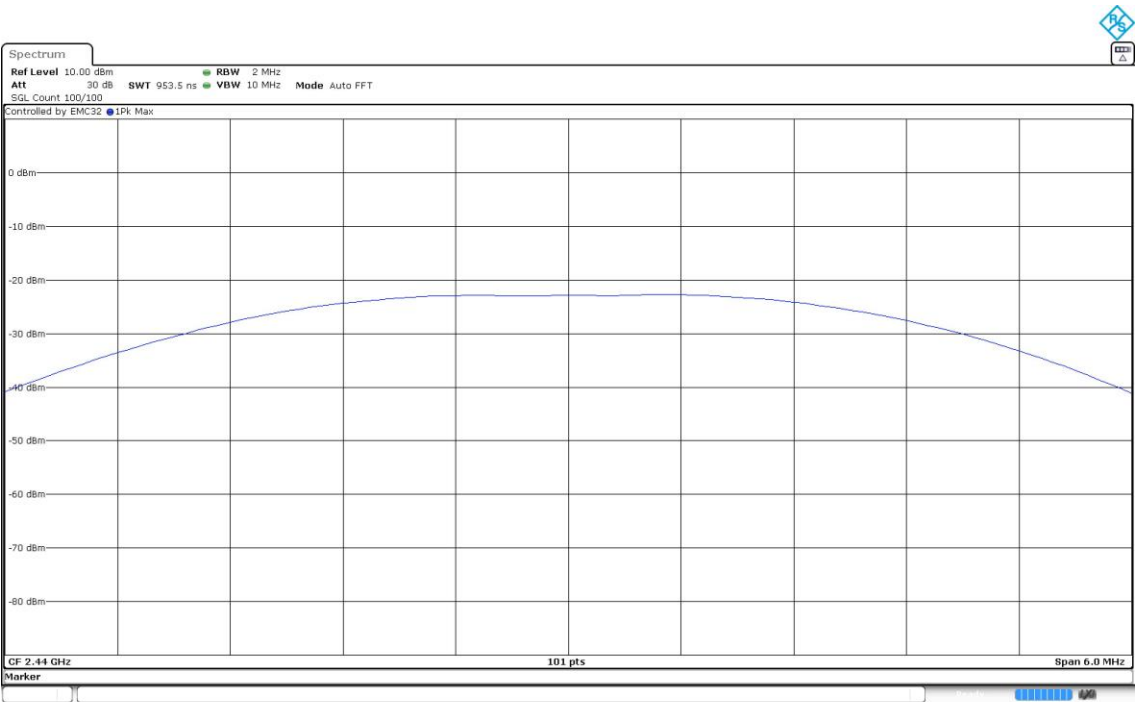
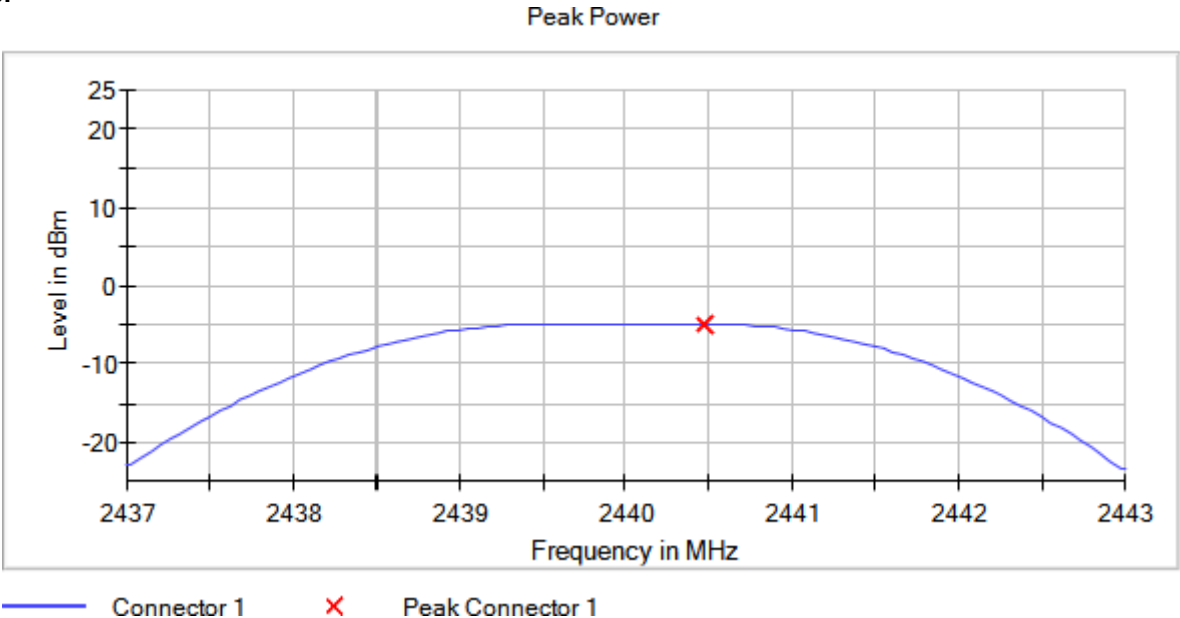
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



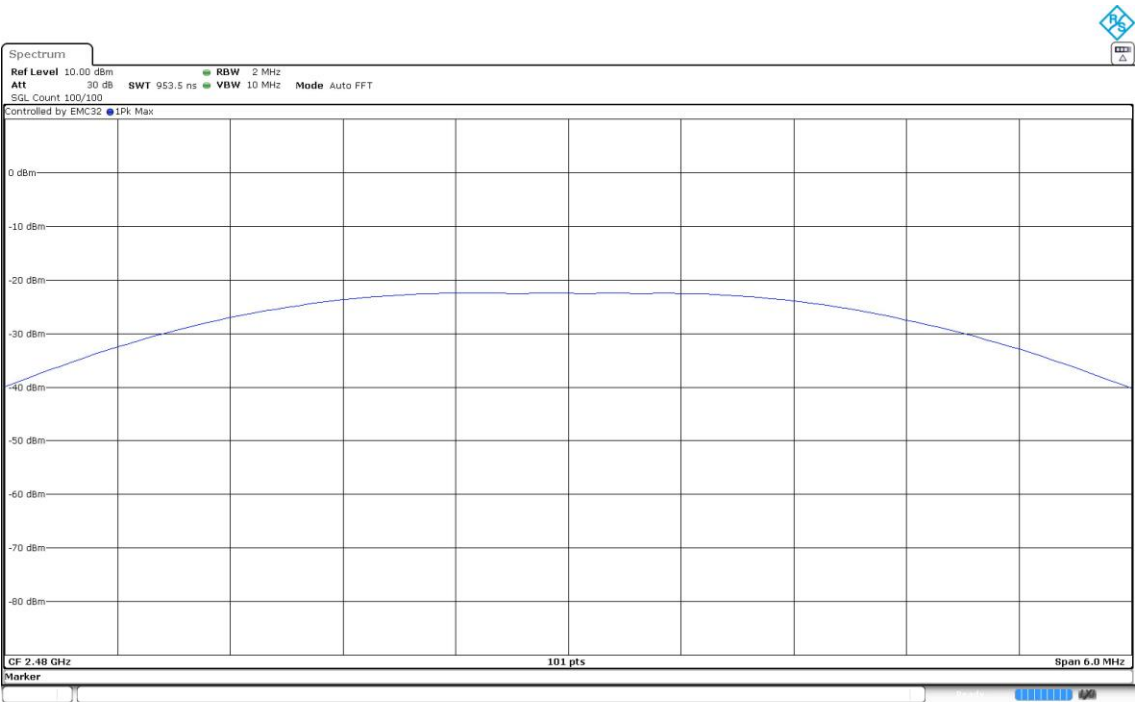
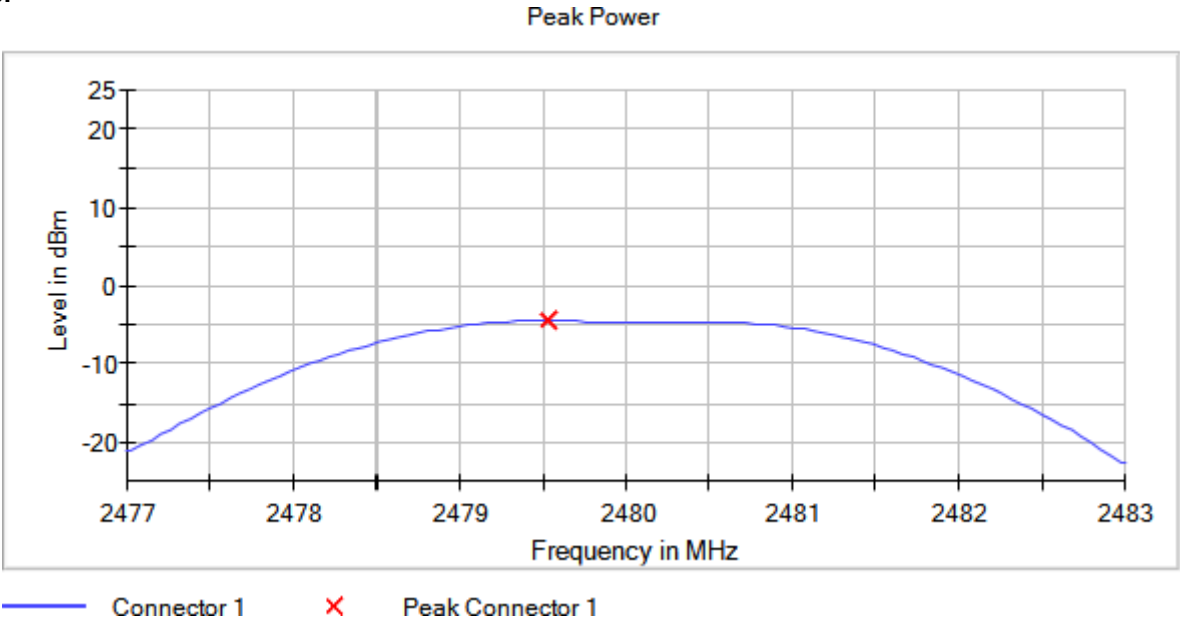
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter)

Limits

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

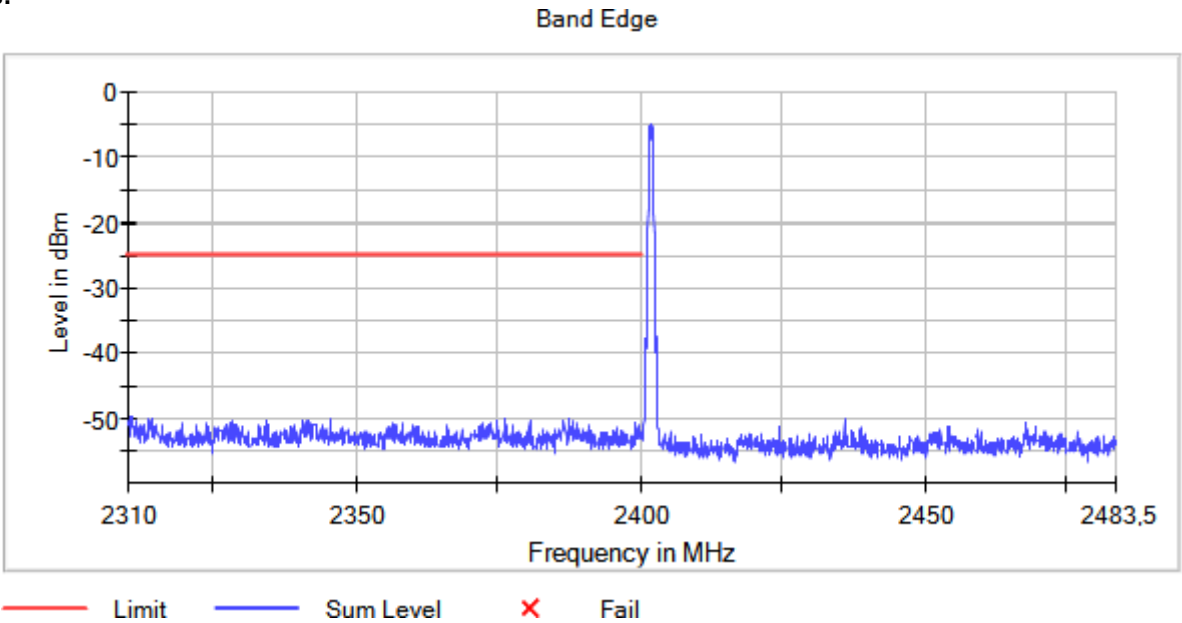
Verdict

Pass

Attachments

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Tables:

Spectrum Analyzer Parameters 1

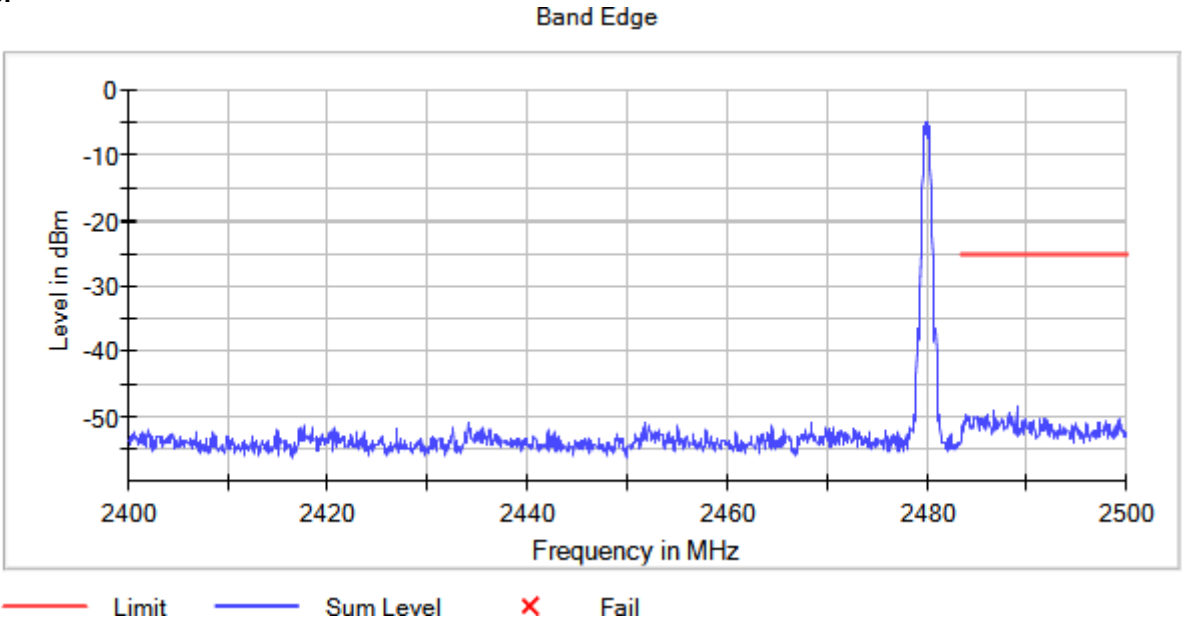
Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.15 dB	0.50 dB

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
SweepTime	113.672 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.15 dB	0.50 dB

Results

Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

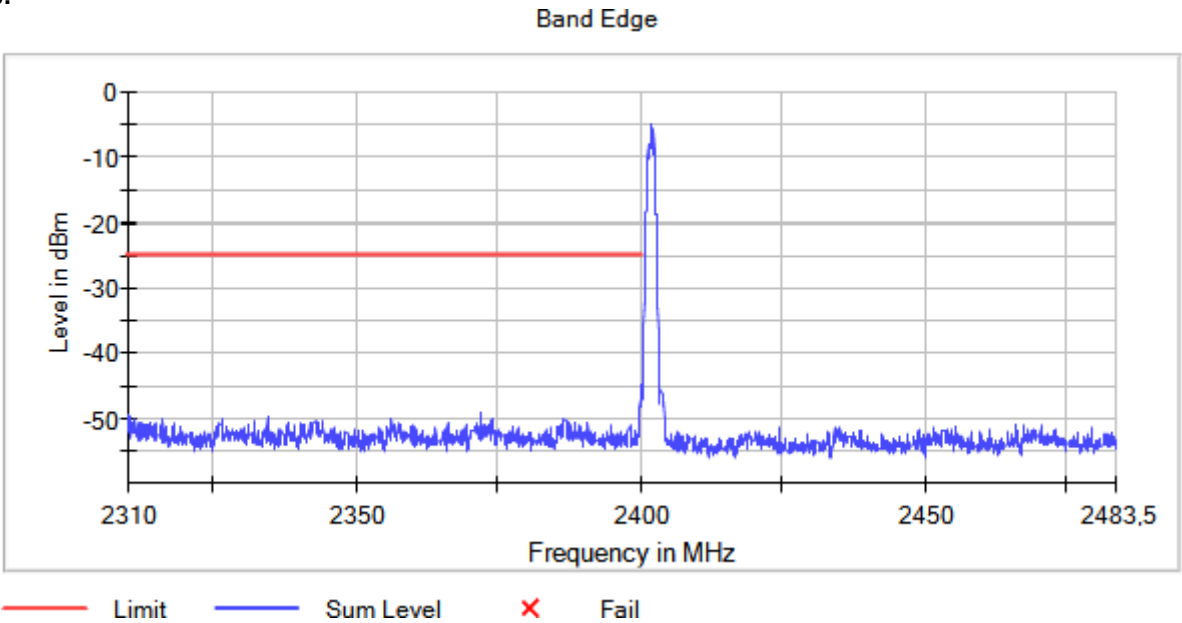
Verdict

Pass

Attachments

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Tables:

Spectrum Analyzer Parameters 1

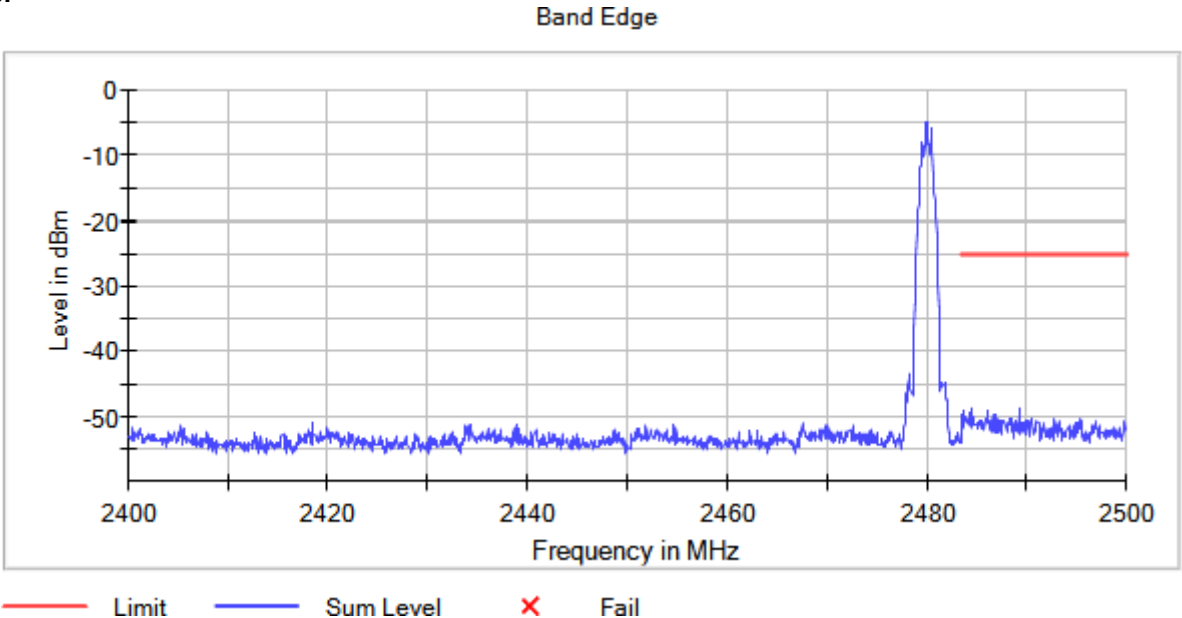
Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.14 dB	0.50 dB

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 1
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
SweepTime	113.672 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.14 dB	0.50 dB

RSS-247 5.5 / FCC 15.247 (d) Emission limitations radiated (Transmitter)

Limits

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)/RSS-Gen):

Frequency Range (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247: Attenuation below the general field strength limits specified in RSS-Gen is not required.

Frequency range tested for Radiated emissions:

Start frequency: no radiofrequency signal generated in the device found below 10th sub-harmonic, no further investigation required.

Stop frequency: it has been performed the radiated spurious emissions until 10th harmonic.

Modulation: BTLE (GFSK 1 Mbit/s)

Results

Freq Rng (GHz)	Operation Band (MHz)	Equipment	Freq (MHz)	Port	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	1	30.291	29.68	V	PK
					30.291	24.27	V	QP
					79.858	21.81	V	QP
					79.858	25.05	V	PK
					875.015	35.62	H	PK
					875.015	32.71	H	QP

Modulation: BTLE (GFSK 2 Mbit/s)

Results

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

Attachments

Frequency Range GHz = [0.03, 1]

Equipment Type = Digital Transmission System (DTS)

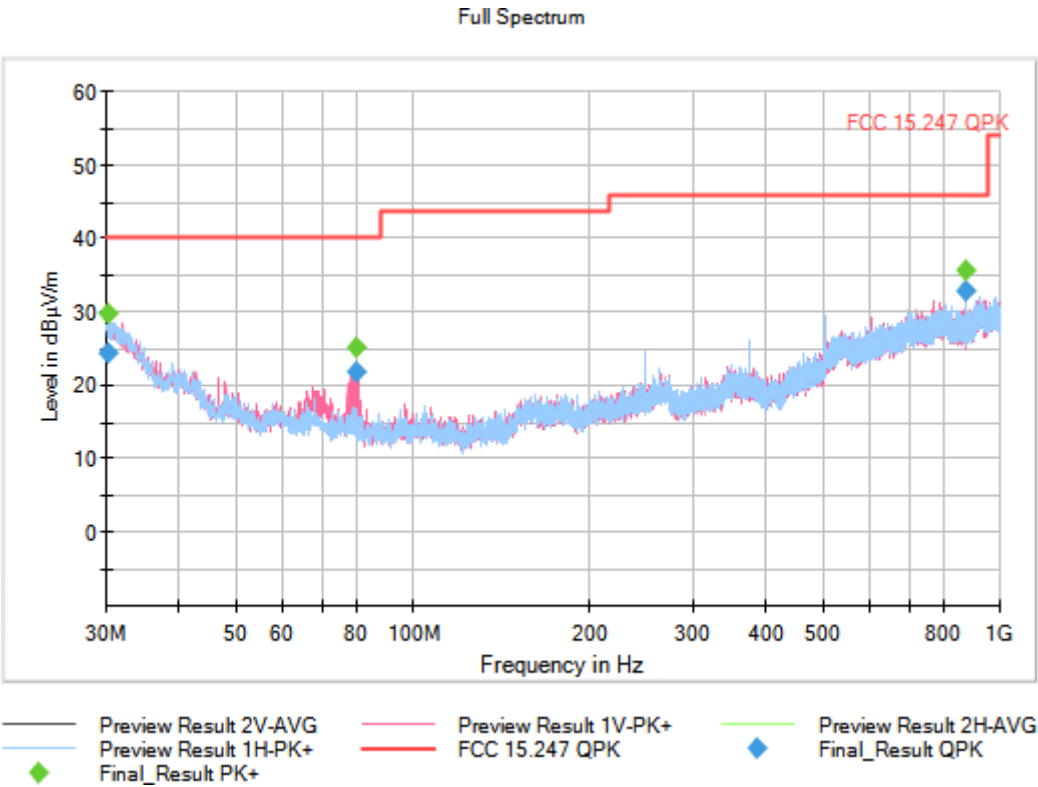
Active Port = 1

Operation Band MHz = [2400, 2483.5]

Frequency MHz = The spurious frequencies detected do not depend on the operating channel.

Modulation = The spurious frequencies detected do not depend on the modulation.

Images:



Tables:

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48,5 kHz	PK+	100 kHz	1 s	0 dB

Frequency Range GHz = [1, 17]

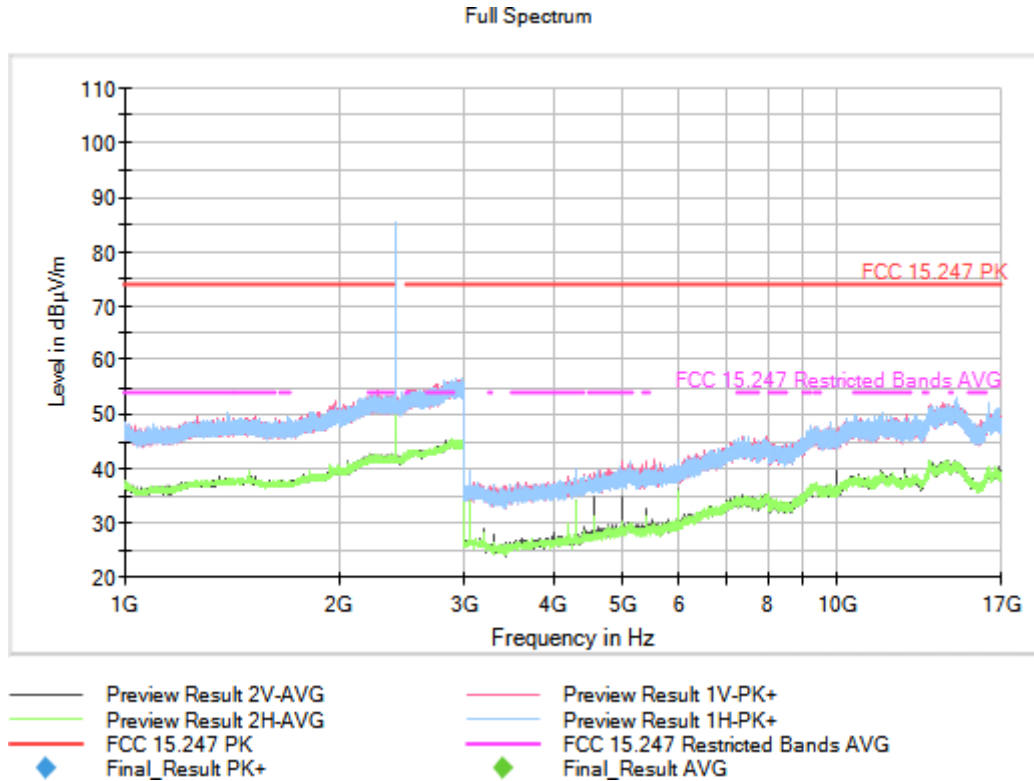
Operation Band MHz = [2400, 2483.5]

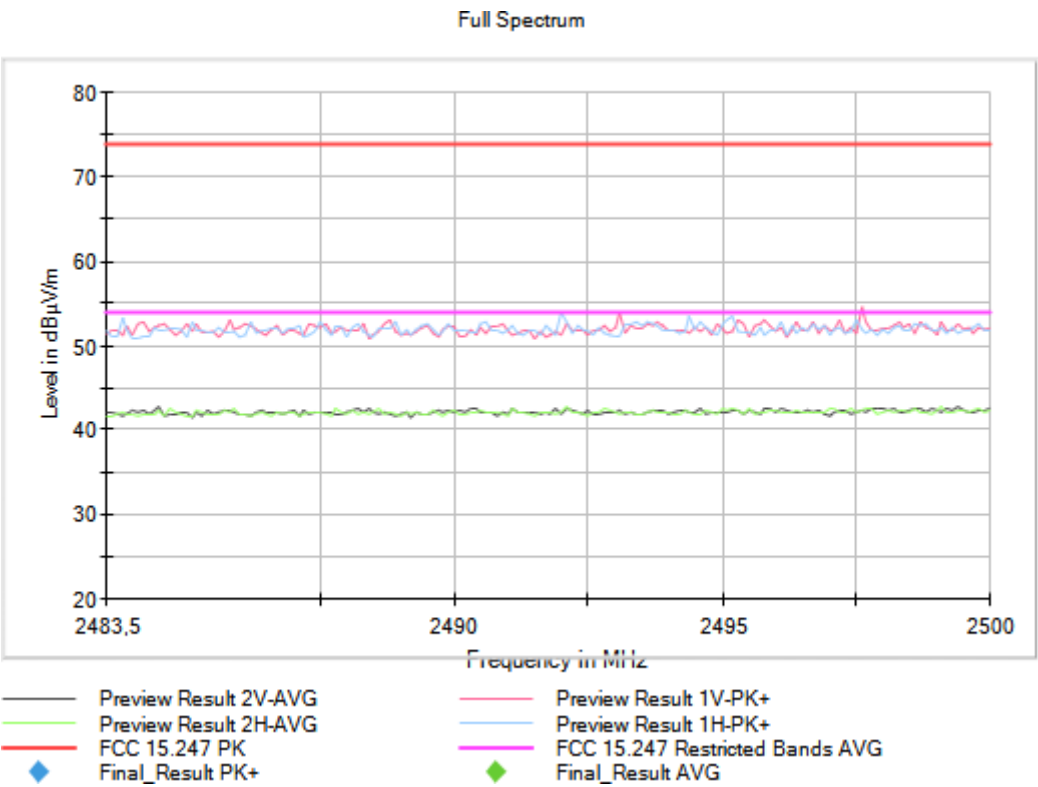
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 2402.00000

Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

Images:





Frequency Range GHz = [1, 17]

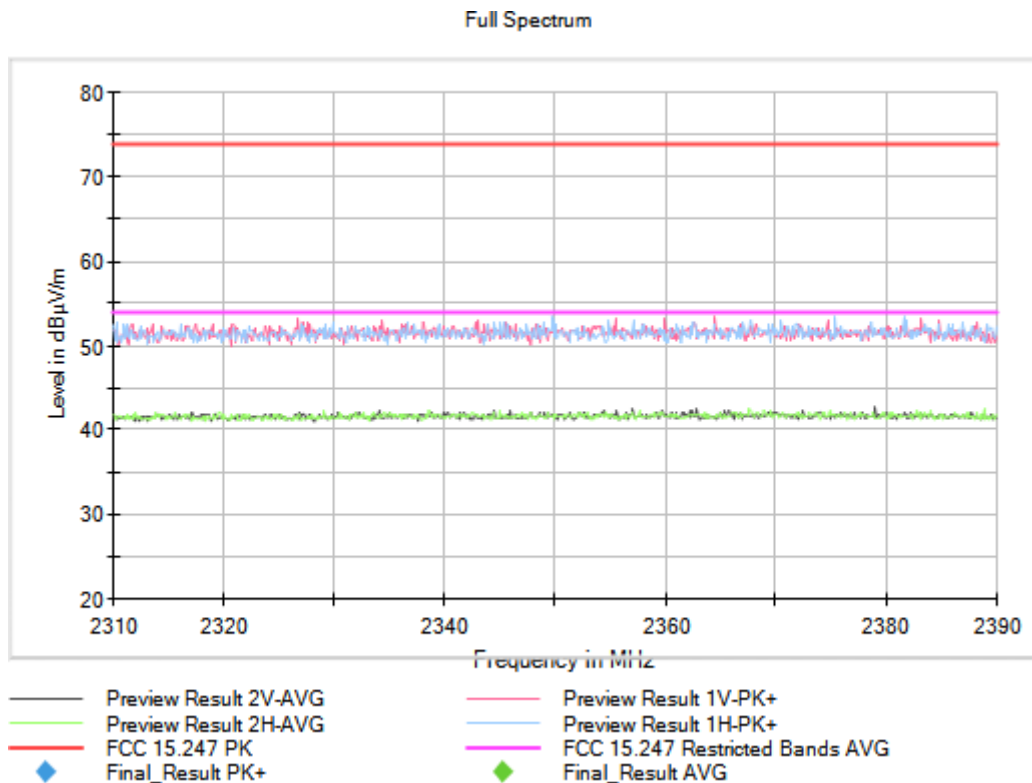
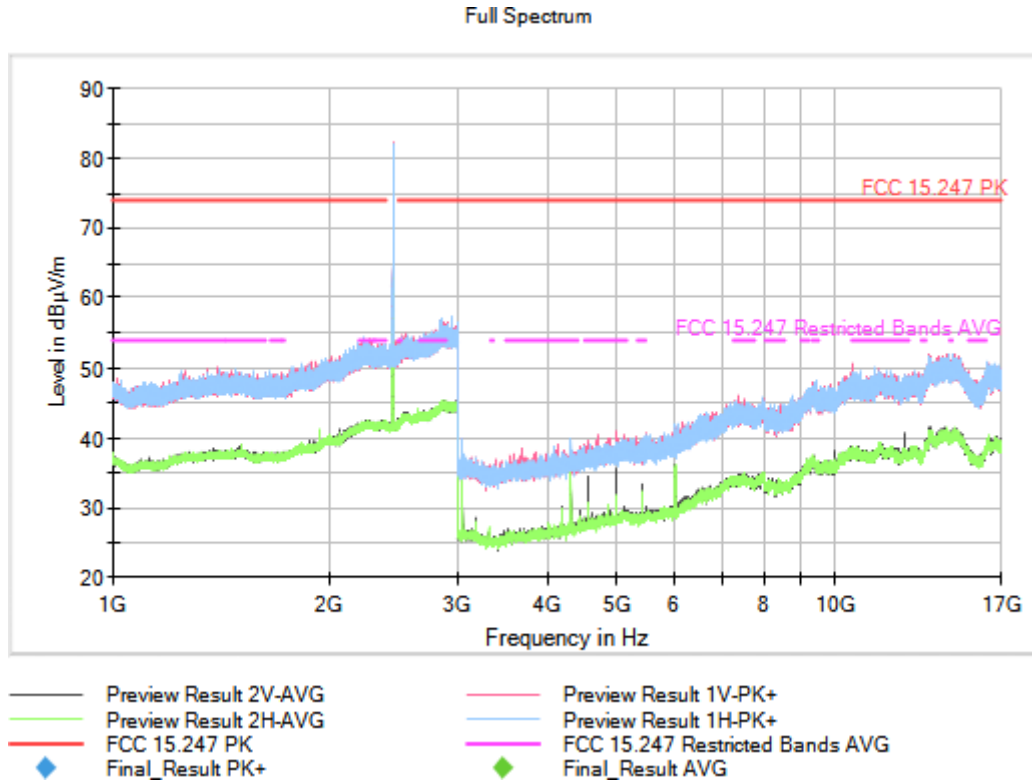
Operation Band MHz = [2400, 2483.5]

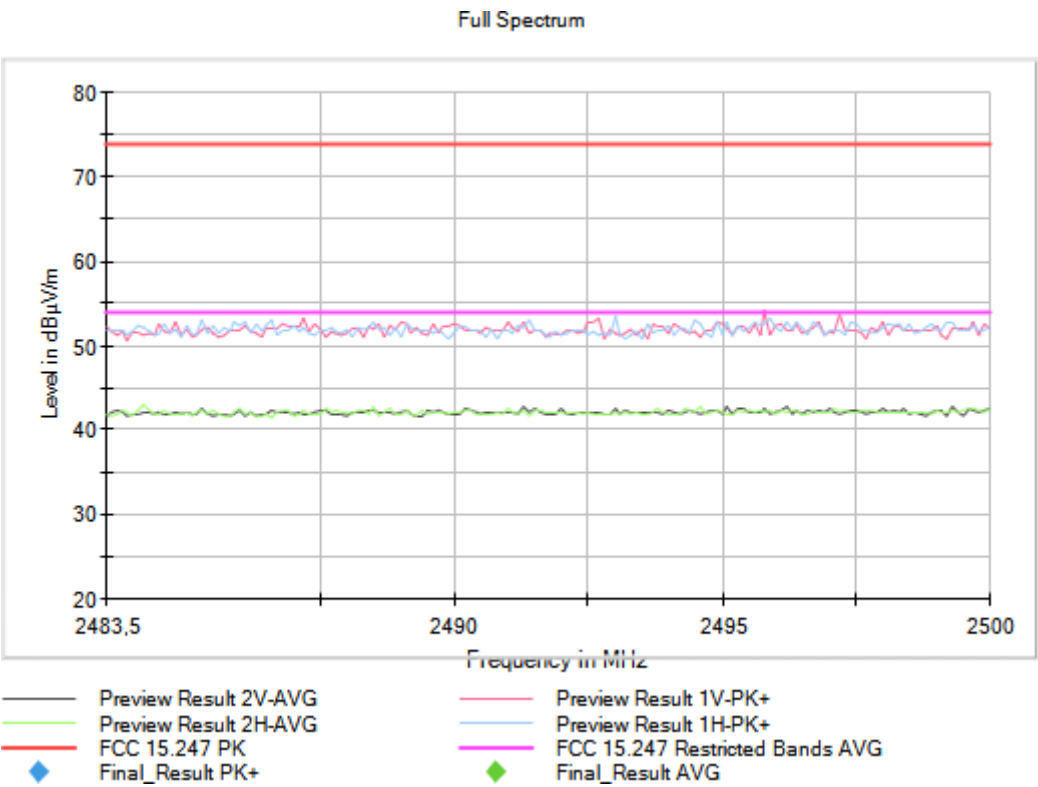
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 2440.00000

Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

Images:





Frequency Range GHz = [1, 17]

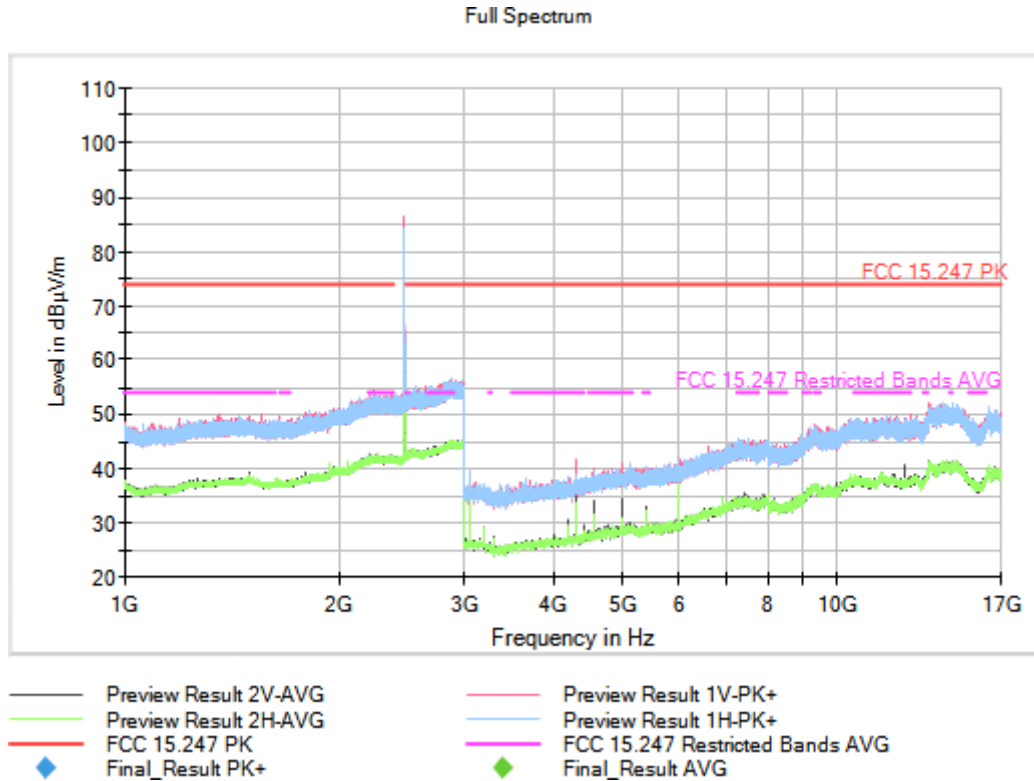
Operation Band MHz = [2400, 2483.5]

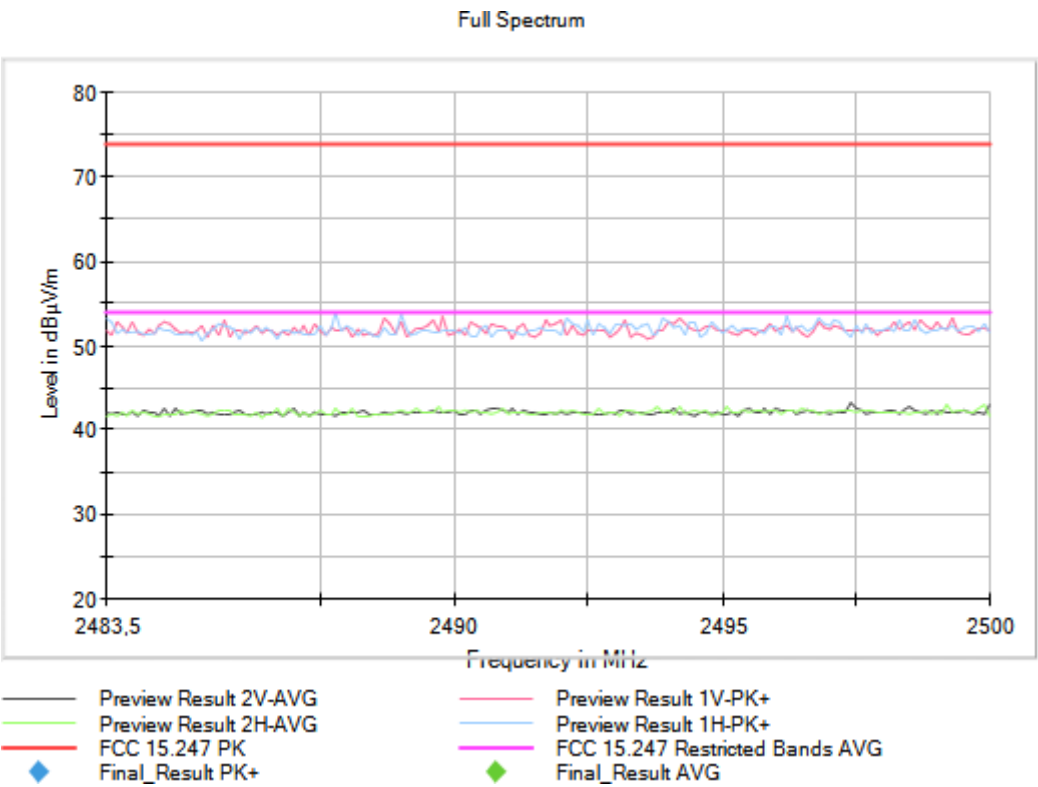
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 2480.00000

Active Port = 1

Modulation = BTLE (GFSK 1 Mbit/s)

Images:





Frequency Range GHz = [1, 17]

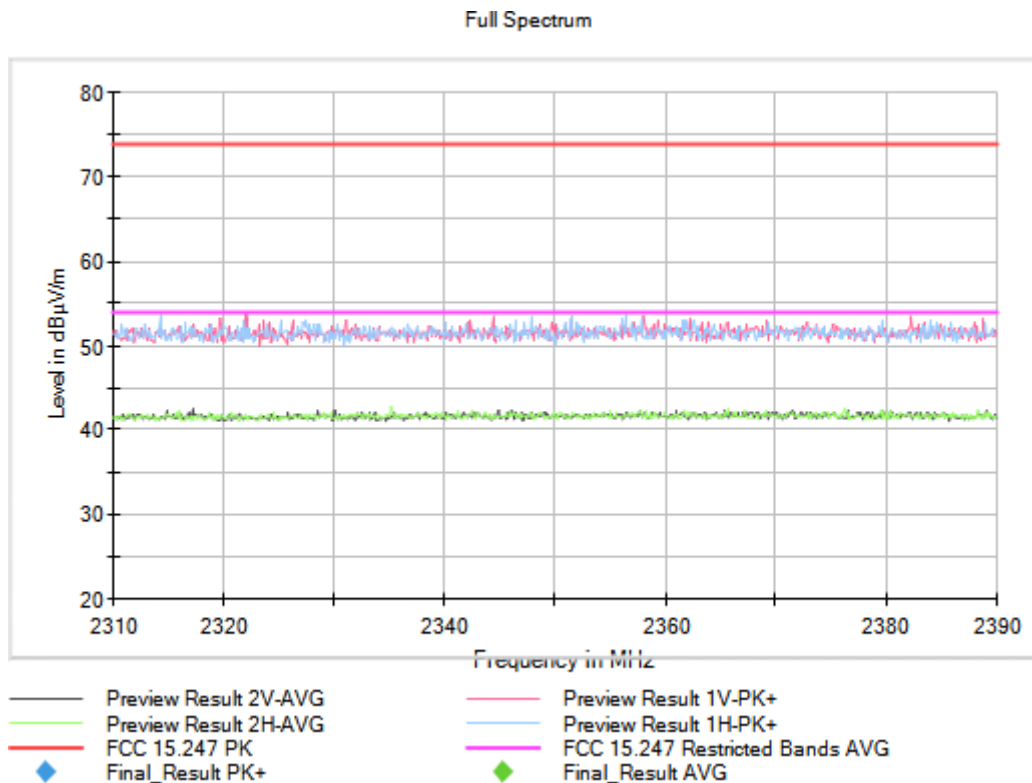
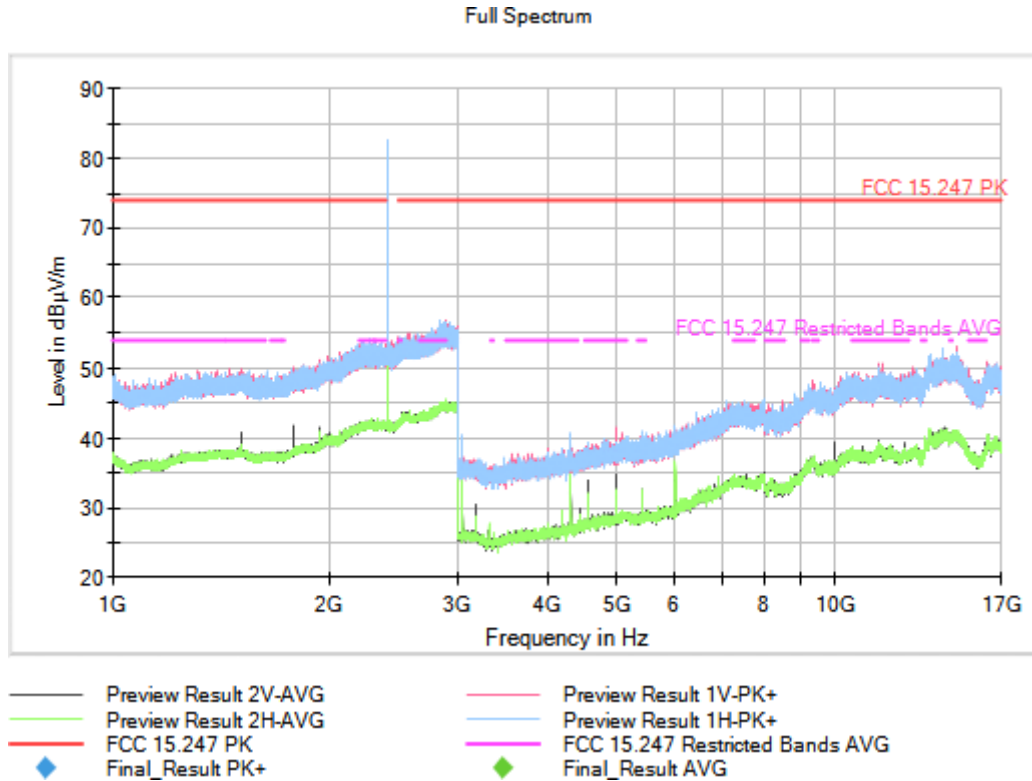
Operation Band MHz = [2400, 2483.5]

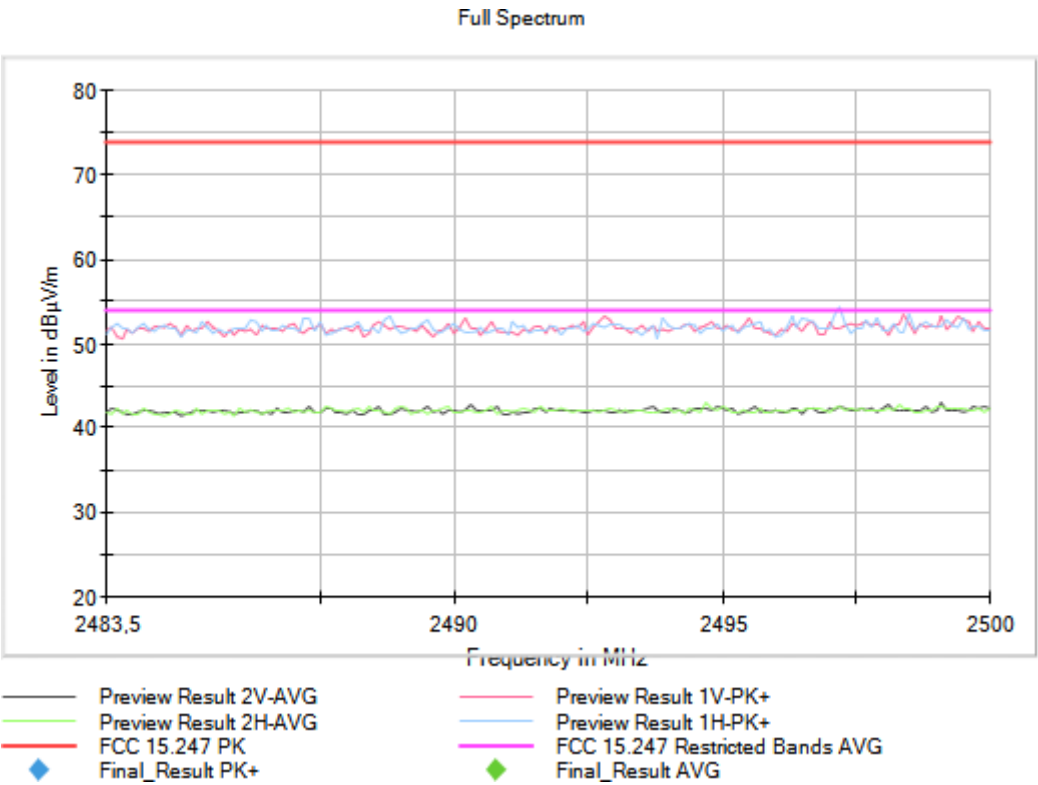
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 2402.00000

Active Port = 1

Modulation = BTLE (GFSK 2 Mbit/s)

Images:





Frequency Range GHz = [1, 17]

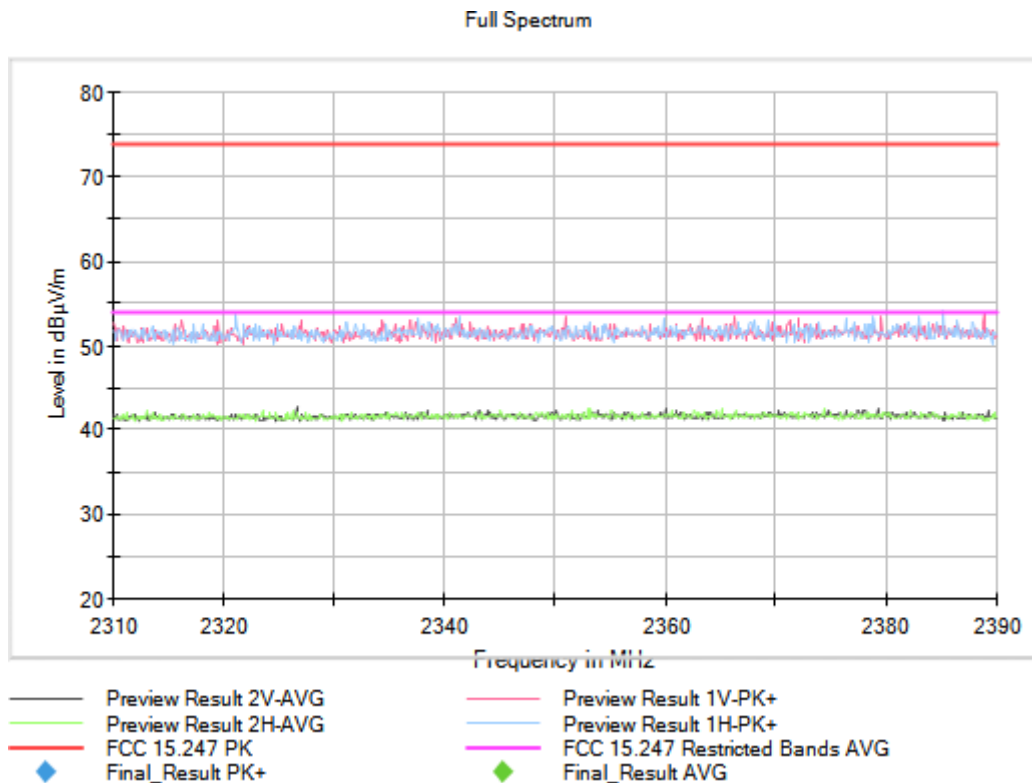
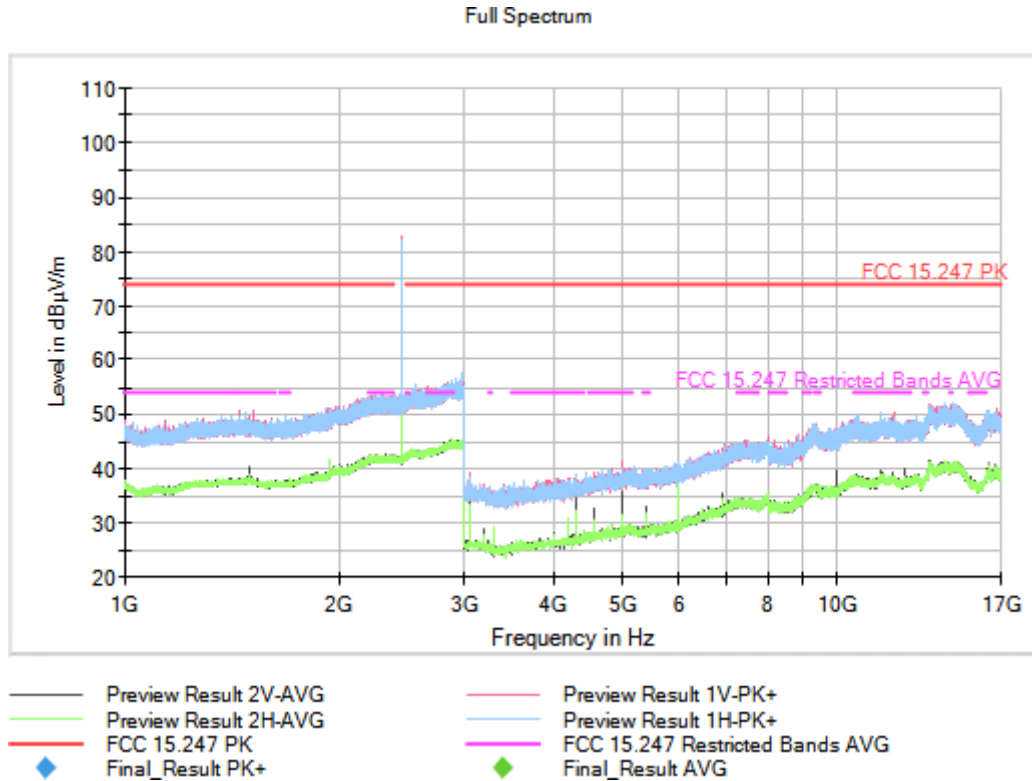
Operation Band MHz = [2400, 2483.5]

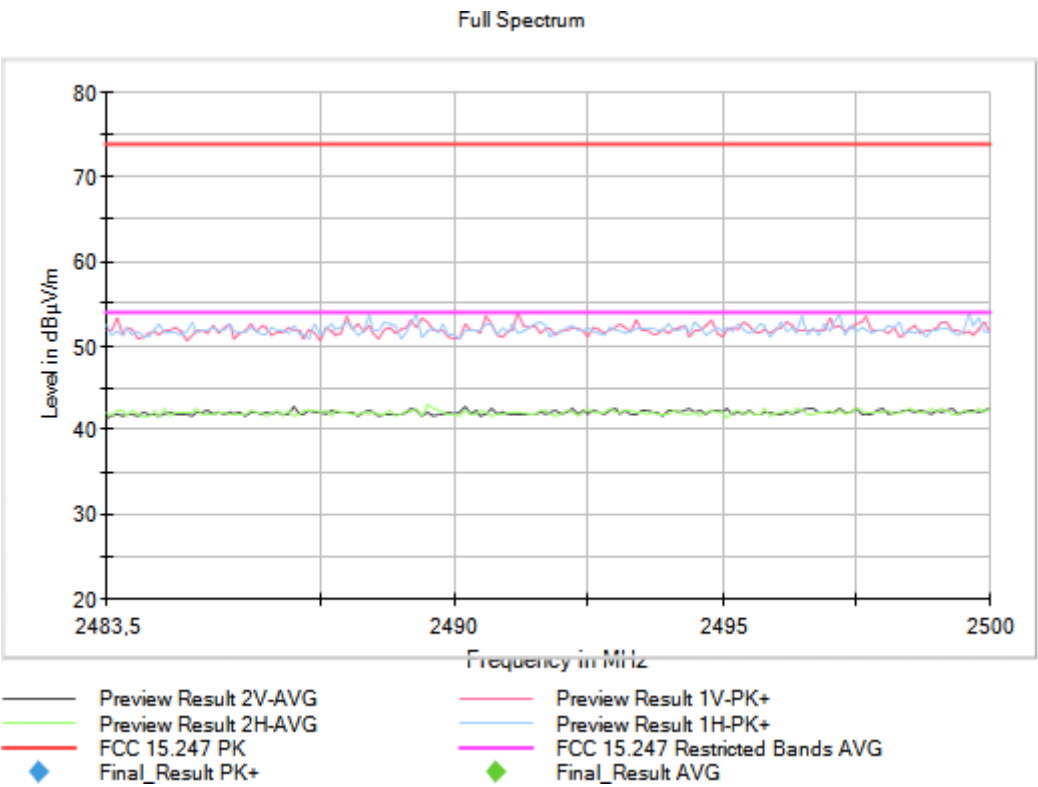
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 2440.00000

Active Port = 1

Modulation = BTLE (GFSK 2 Mbit/s)

Images:





Frequency Range GHz = [1, 17]

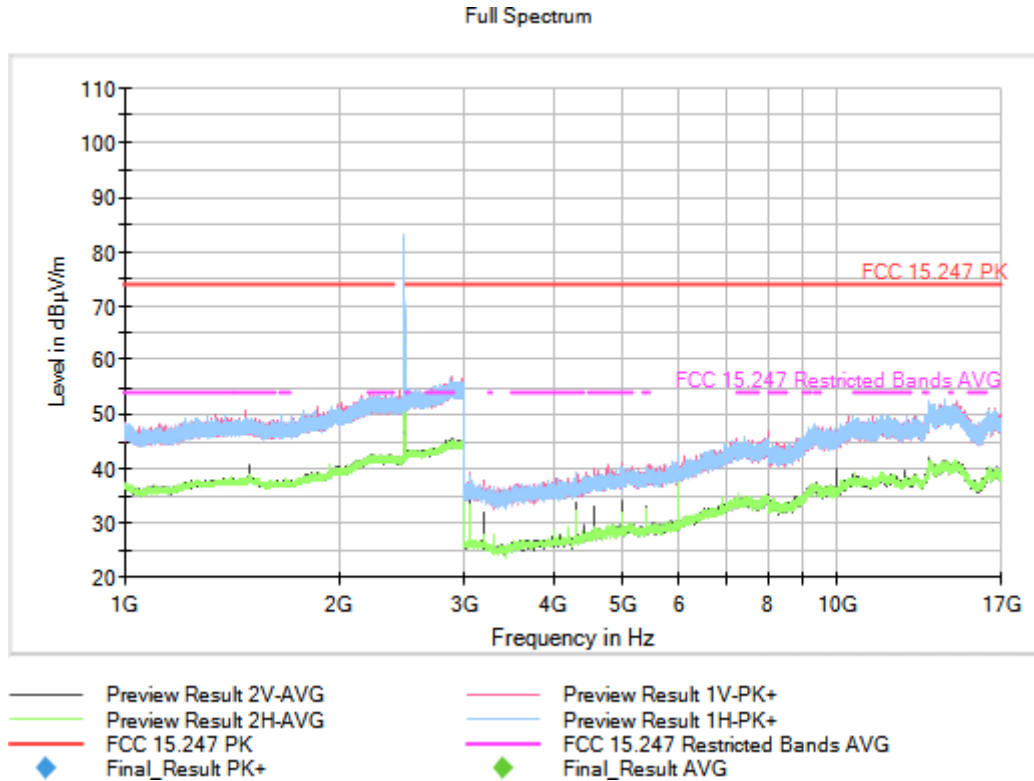
Operation Band MHz = [2400, 2483.5]

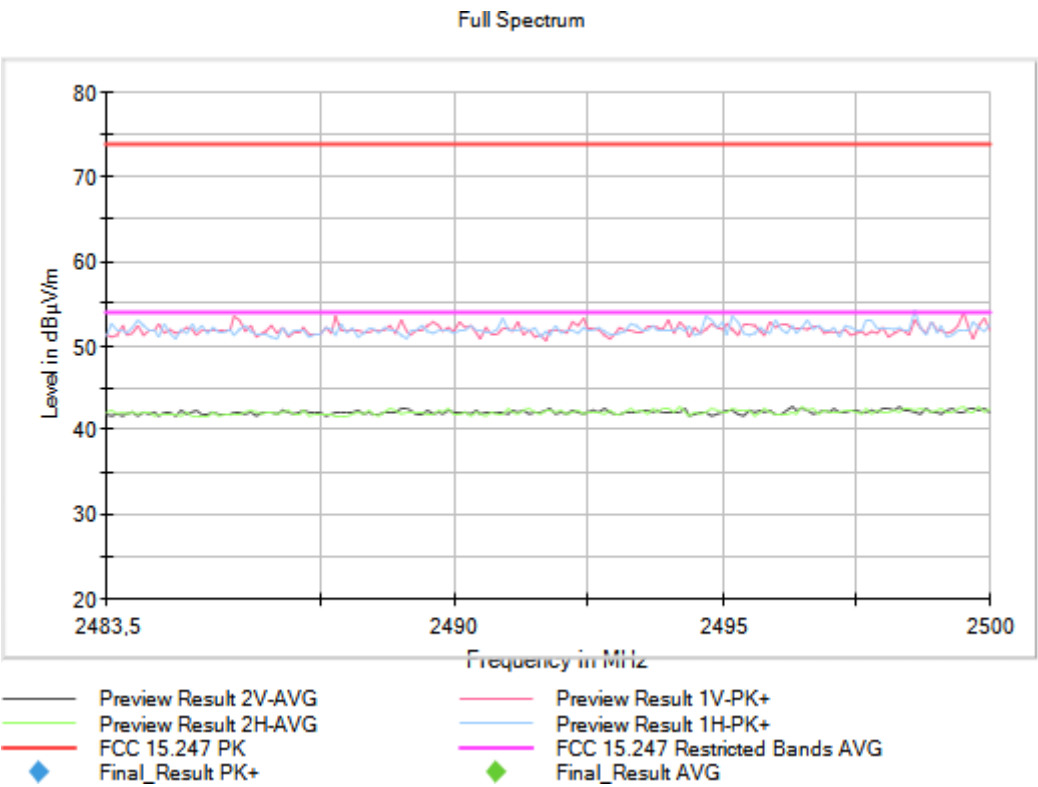
Equipment Type = Digital Transmission System (DTS) Frequency MHz = 2480.00000

Active Port = 1

Modulation = BTLE (GFSK 2 Mbit/s)

Images:





Tables:
Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
1 GHz - 2,39 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB
2,39 GHz - 2,484 GHz	40 kHz	PK+	100 kHz	0,01 s	0 dB
2,484 GHz - 3 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB
3 GHz - 17 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB

Frequency Range GHz = [17, 26]

Equipment Type = Digital Transmission
System (DTS)

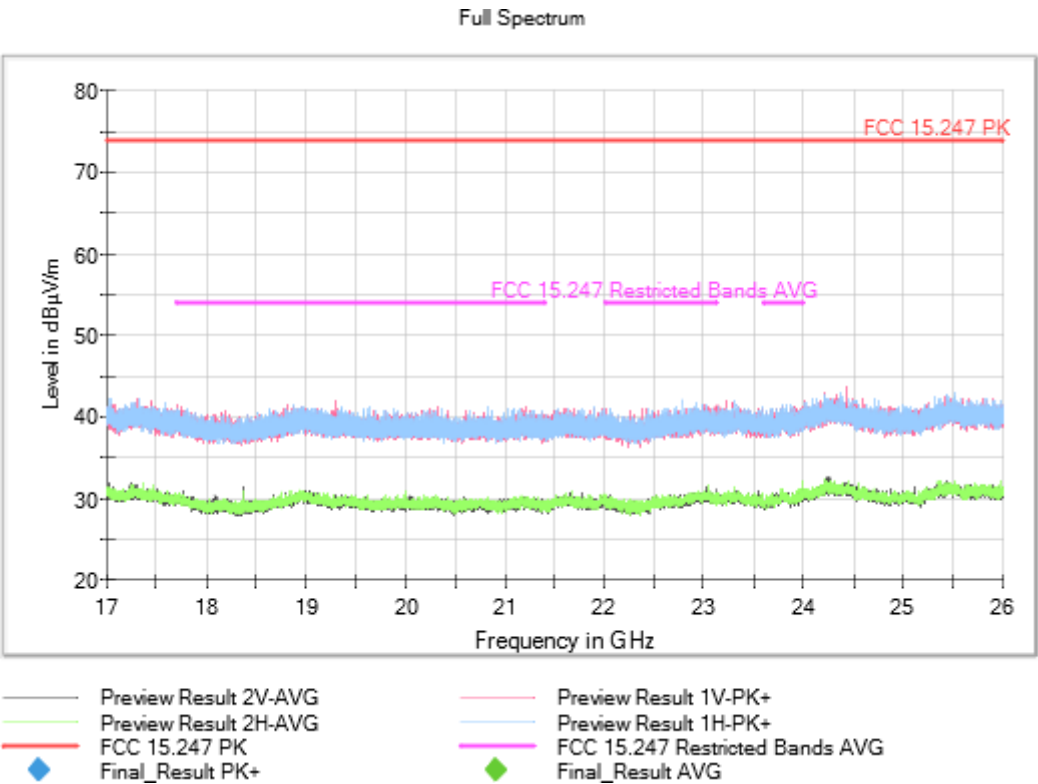
Active Port = 1

Operation Band MHz = [2400, 2483.5]

Frequency MHz = The spurious frequencies detected do not depend on the operating channel.

Modulation = The spurious frequencies detected do not depend on the modulation.

Images:



Tables:

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
17 GHz - 26 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB

Appendix B: Test results. CHIPSET 004 Bluetooth Low Energy (2M, 1M)

TEST CONDITIONS	77
TEST CASES DETAILS	80
FCC 47 CFR PART 15.247 / RSS-247	80
<i>Occupied Channel Bandwidth 99%</i>	80
<i>RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth</i>	88
<i>RSS-247 5.2 (b) / FCC 15.247 (e) Power Spectral Density</i>	96
<i>RSS-247 5.4 / FCC 15.247 (b) Maximum Peak Conducted Output Power</i>	104
<i>RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter)</i>	112
<i>RSS-247 5.5 / FCC 15.247 (d) Emission limitations radiated (Transmitter)</i>	122

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 12 Vdc
Type of Power Supply: Battery

ANTENNA (*):

Technology	Antenna Gain	Type
BTLE	+0.1 dBi	External

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel	Middle Channel	High Channel
BTLE GFSK	1M 1 Mbit/s	2402 MHz	2440 MHz	2480 MHz
BTLE GFSK	2M 2 Mbit/s	2402 MHz	2440 MHz	2480 MHz

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required.

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.



RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

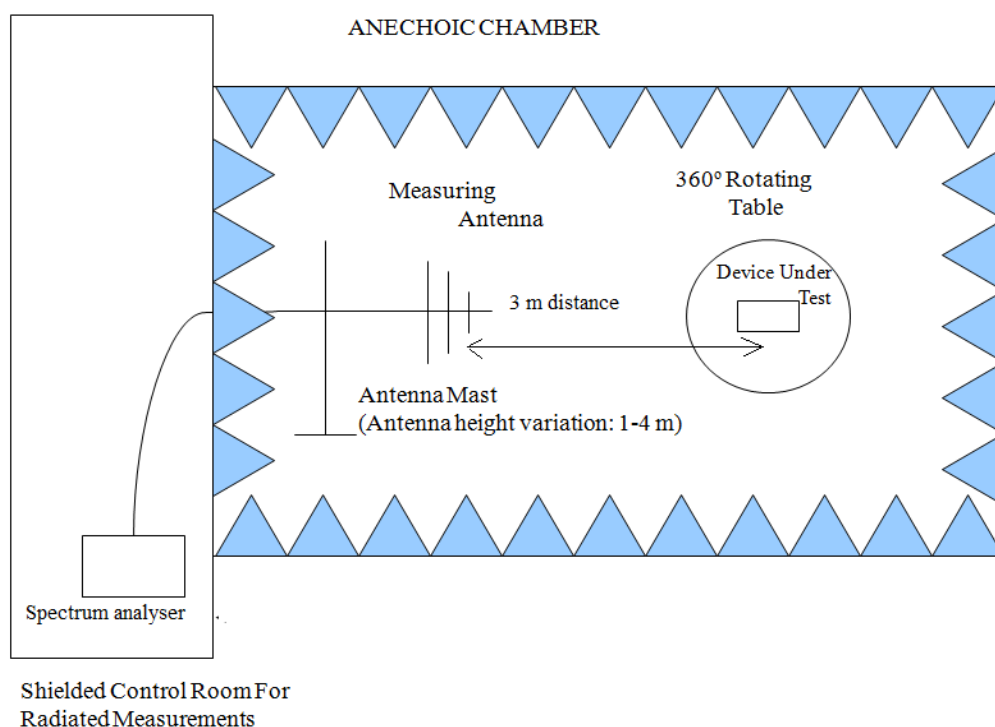
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

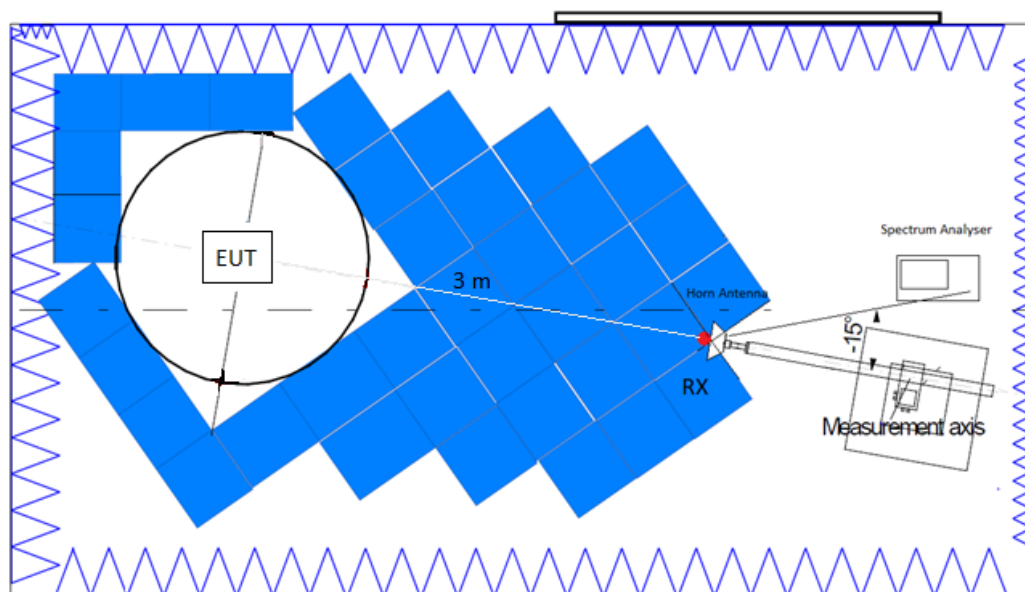
Measurements were made in both horizontal and vertical planes of polarization.

A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

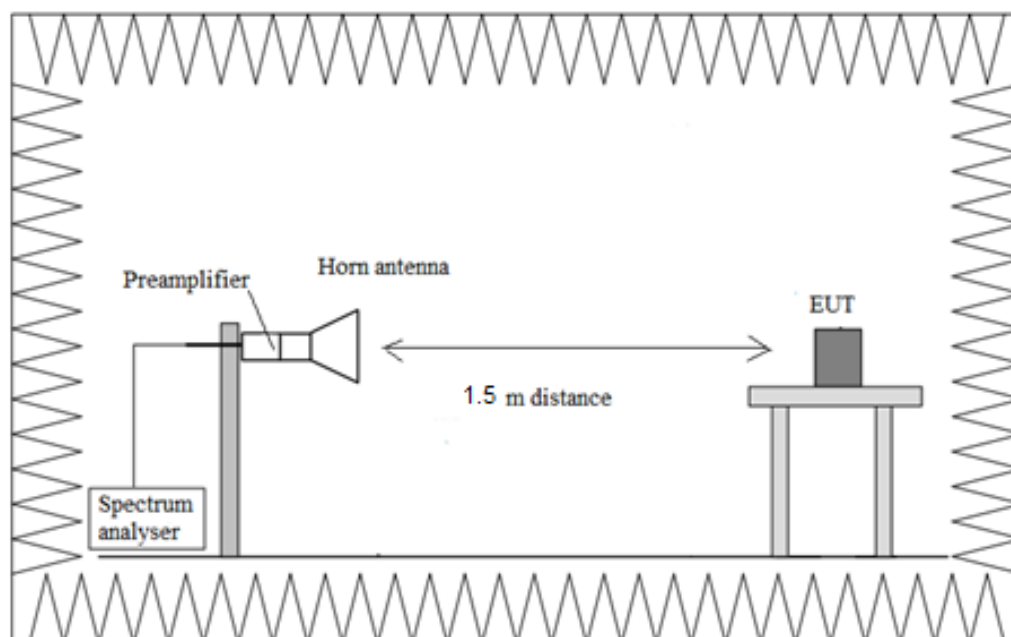
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup $f > 17$ GHz:



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247
Occupied Channel Bandwidth 99%

Limits

RSS-Gen 6.7 / FCC 2.1049 - Occupied Channel Bandwidth 99%

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

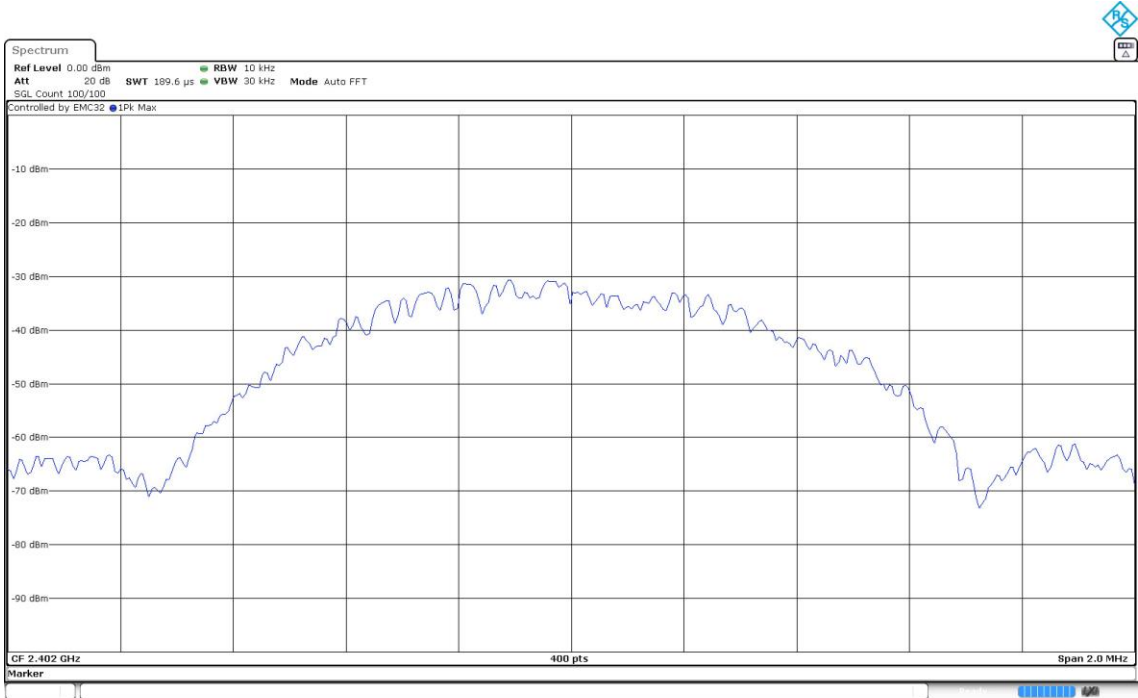
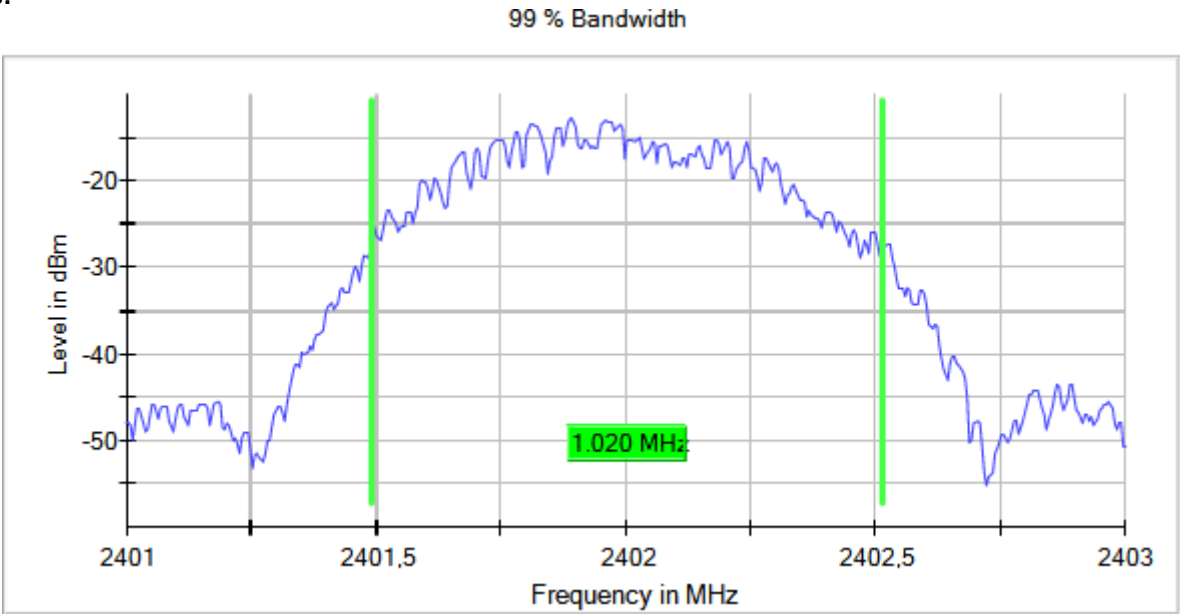
Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Occ Ch BW (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	1.020
		2440.00000		1.020
		2480.00000		1.020

Attachments

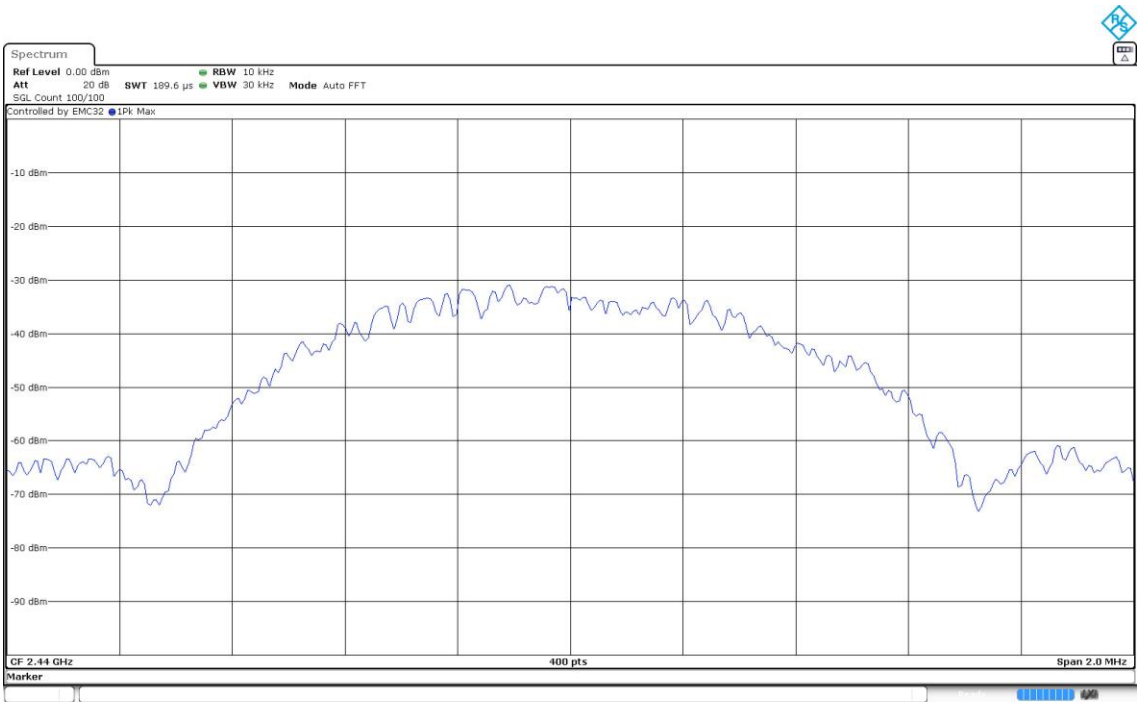
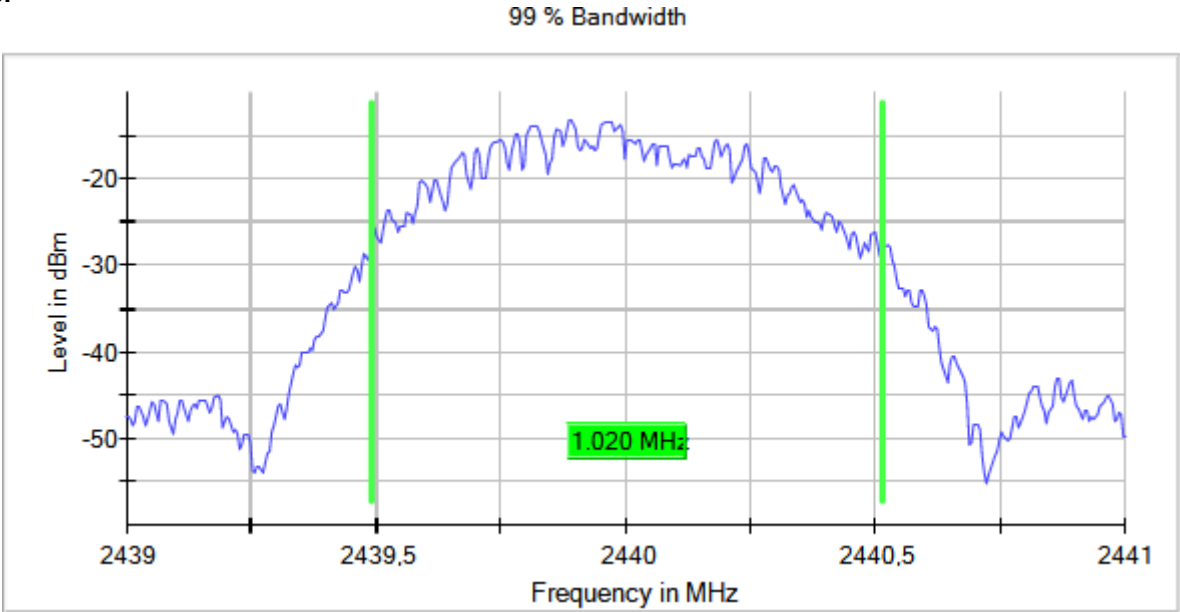
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



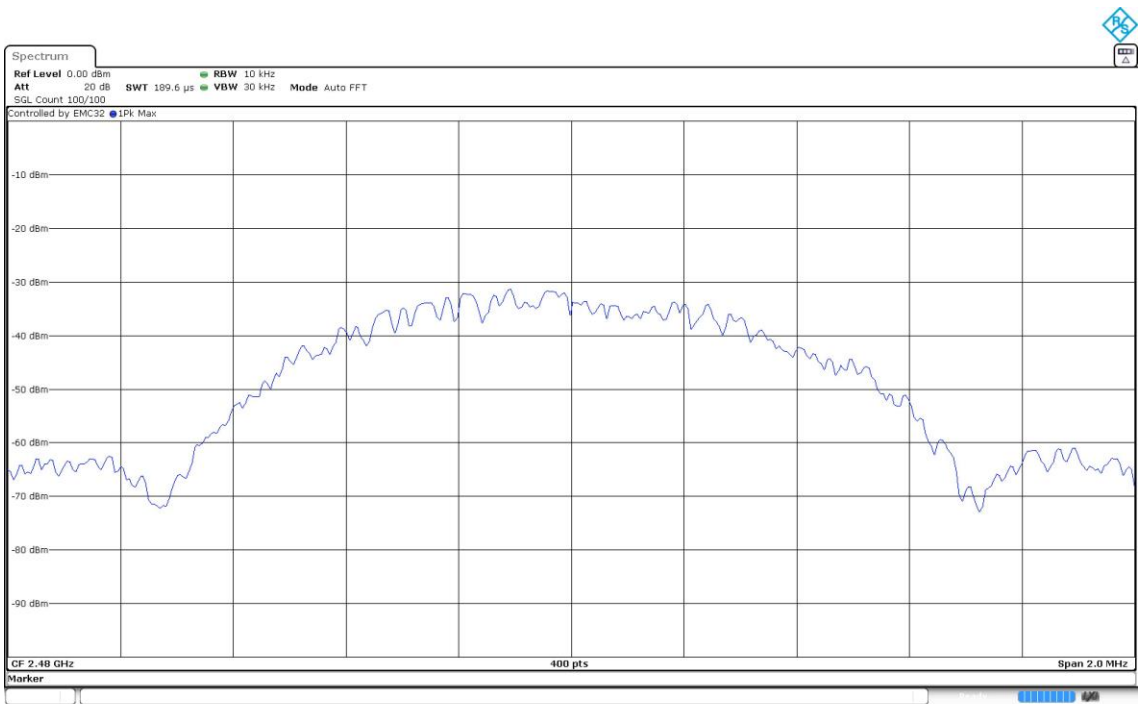
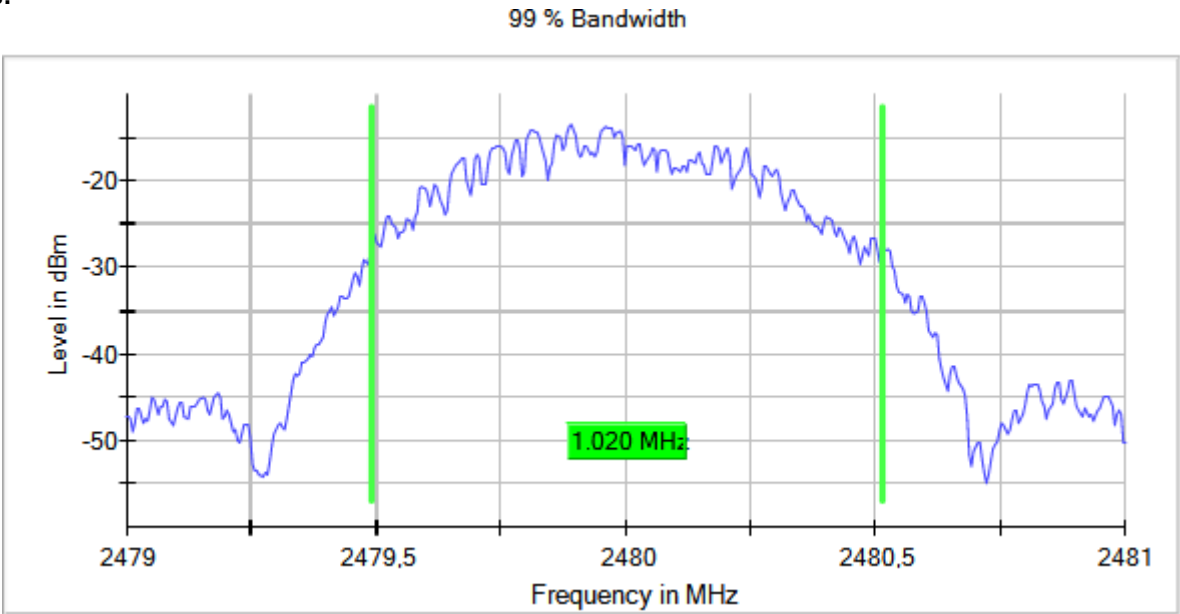
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

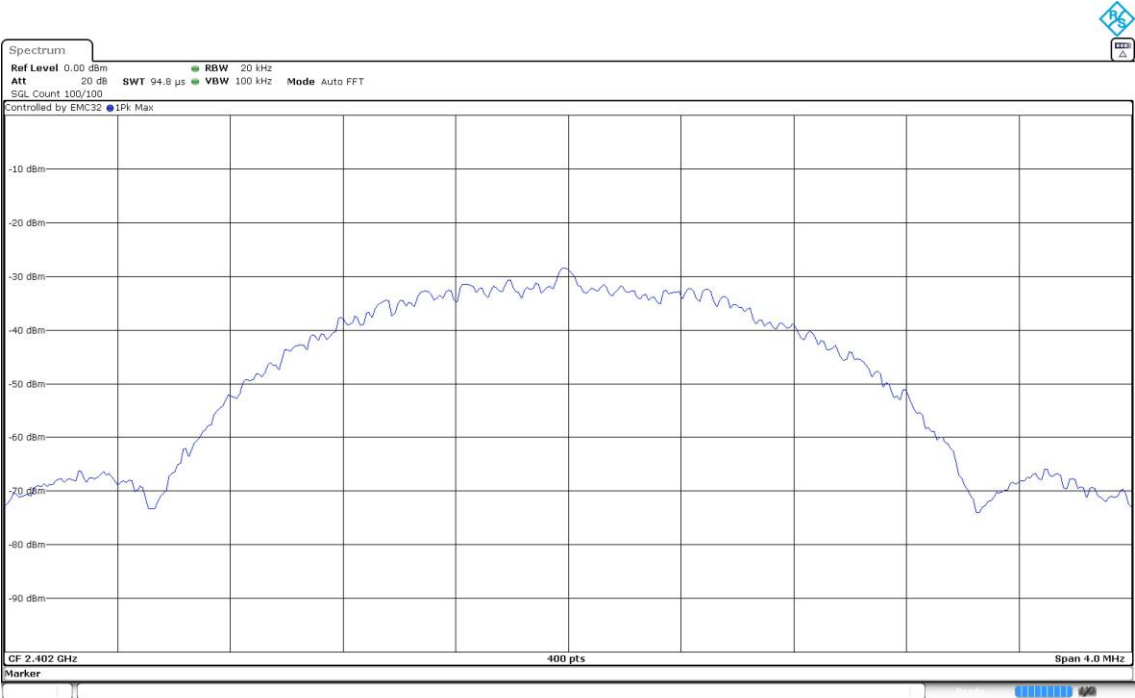
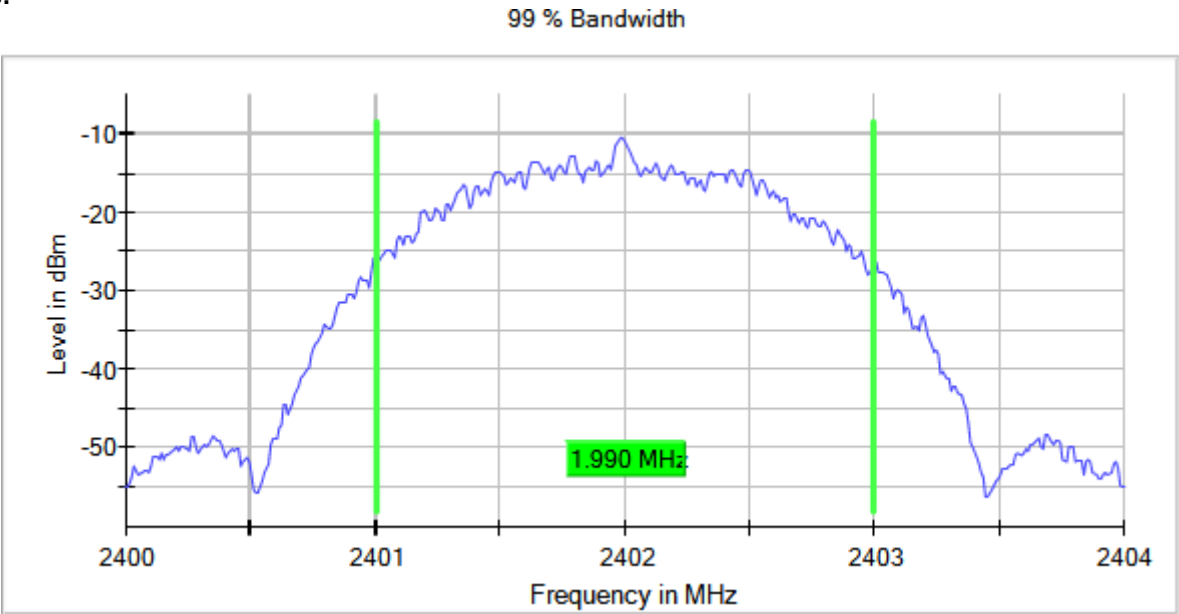
Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Occ Ch BW (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	1.990
		2440.00000		1.980
		2480.00000		1.970

Attachments

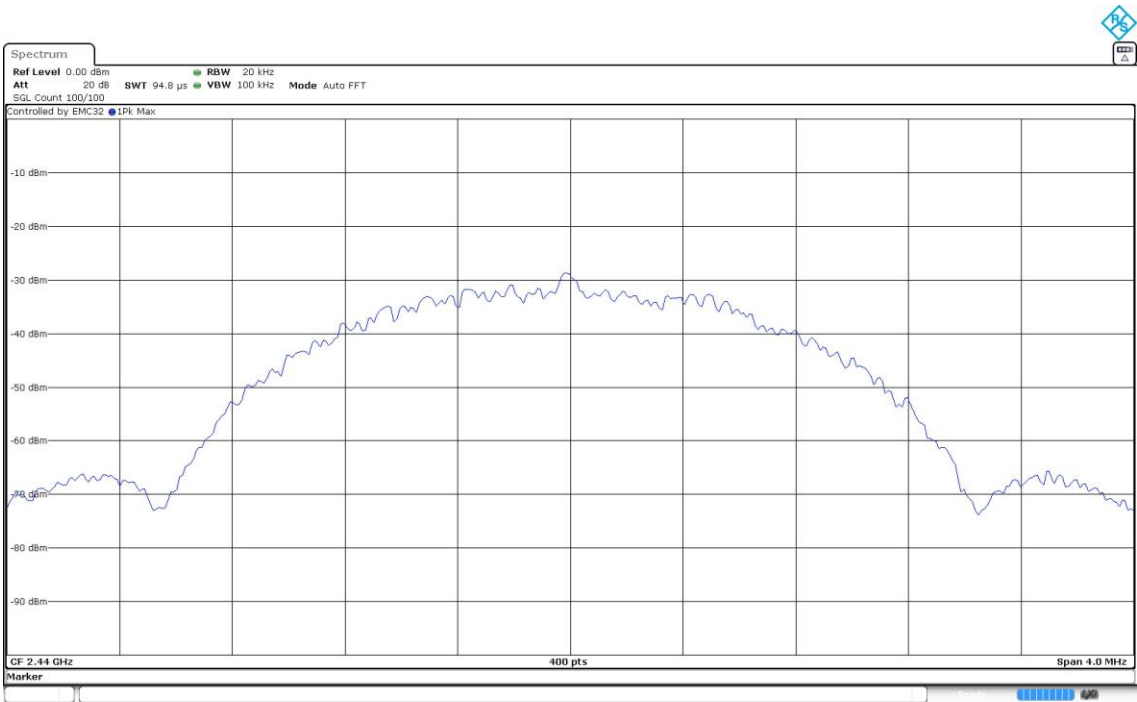
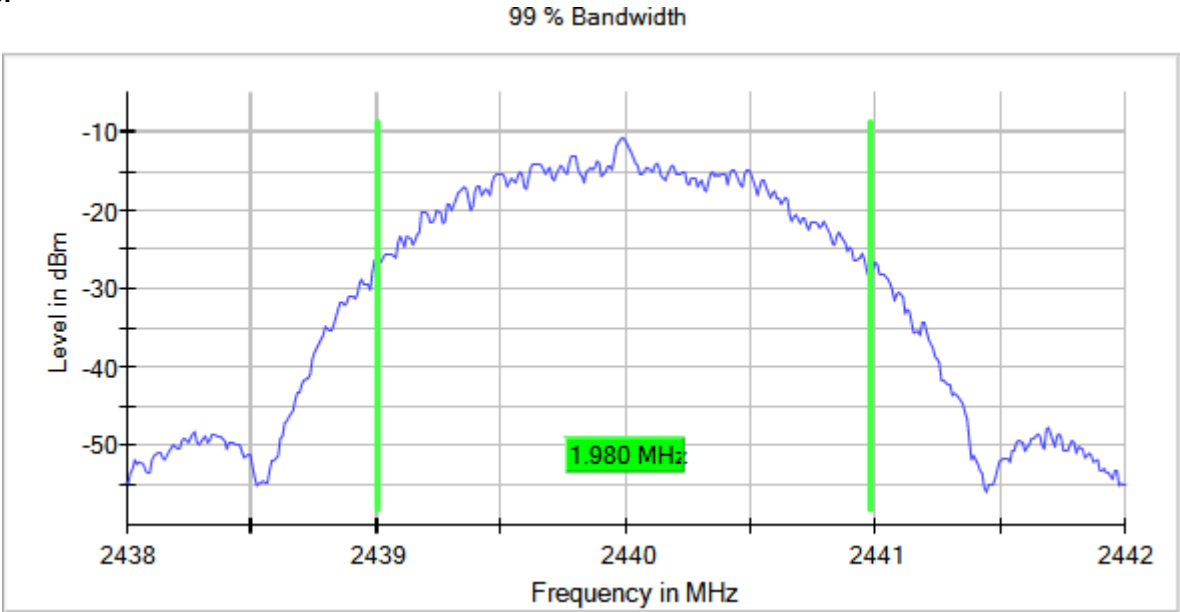
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



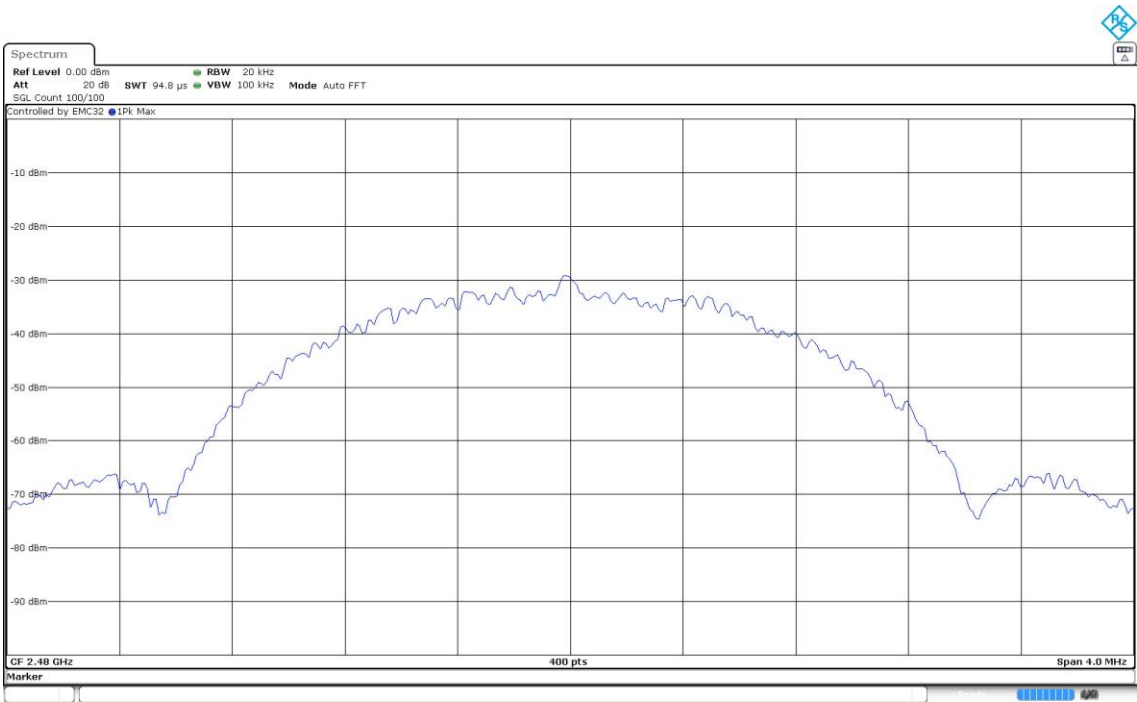
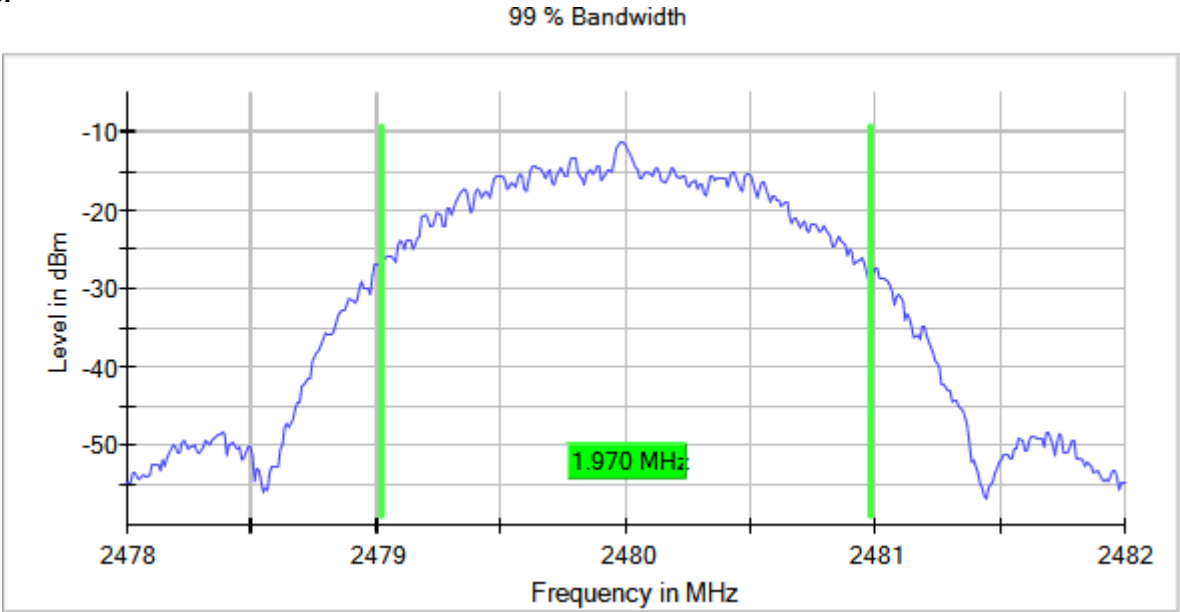
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth

Limits

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Ebw (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	0.693
		2440.00000		0.693
		2480.00000		0.693

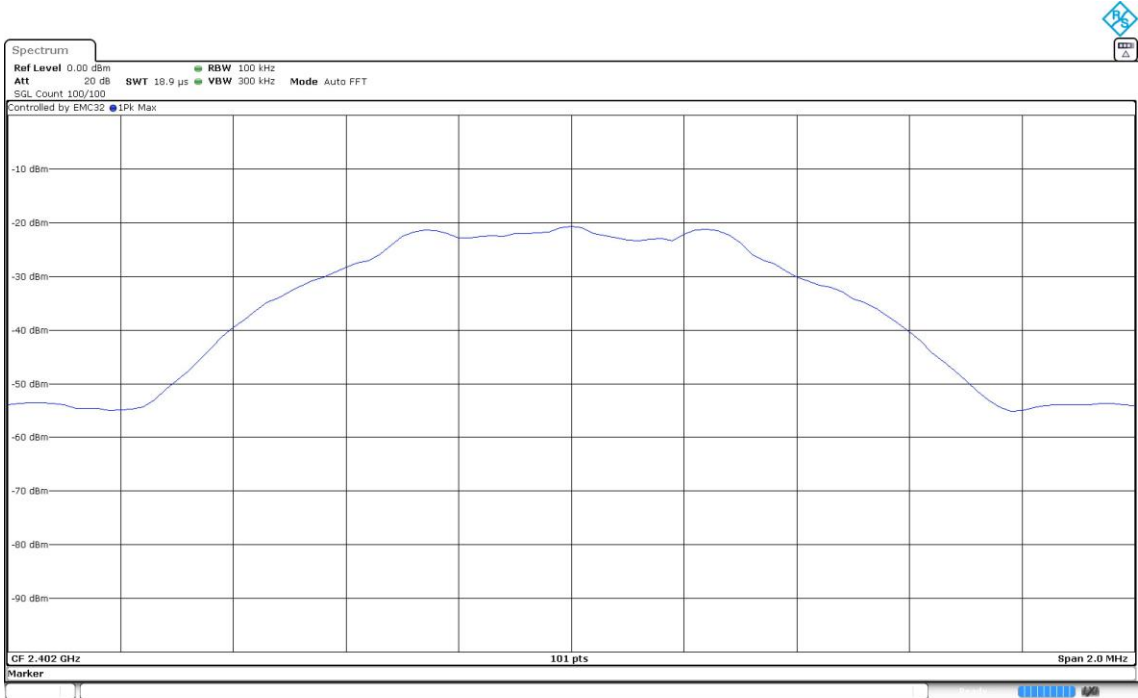
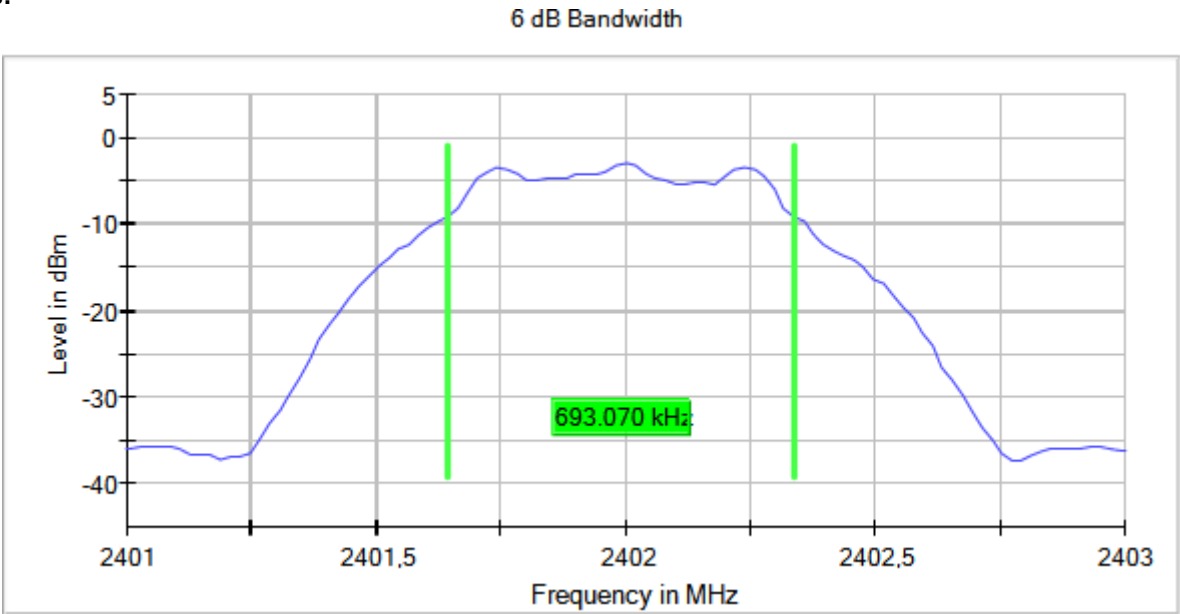
Verdict

Pass

Attachments

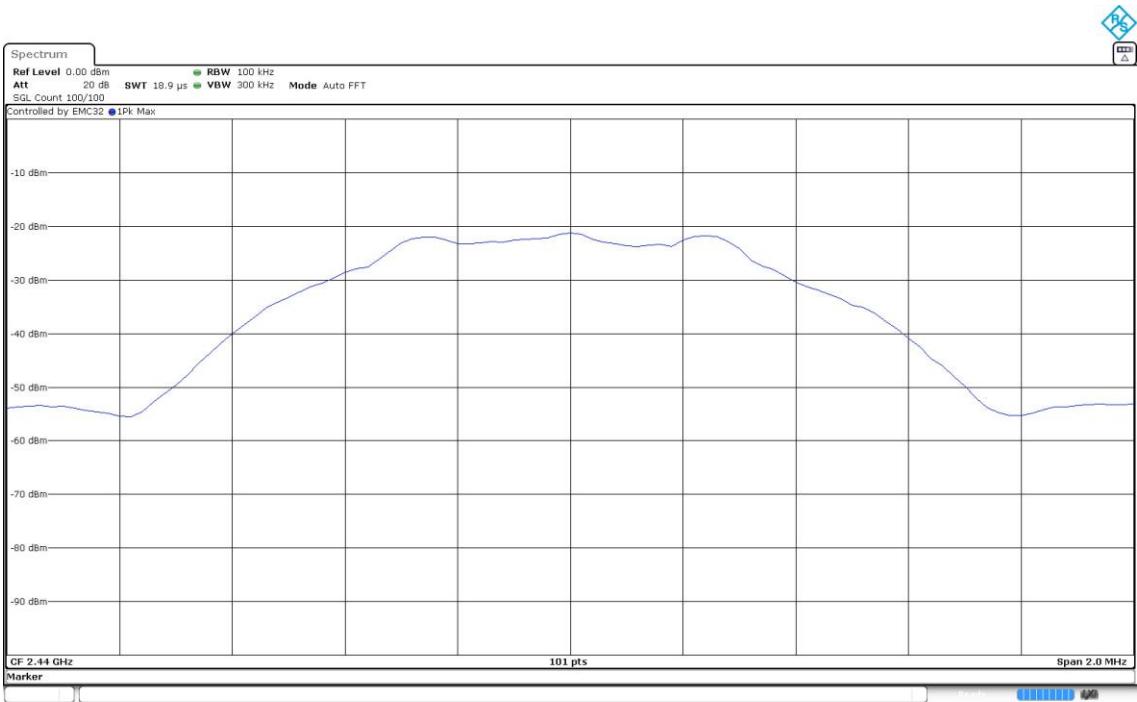
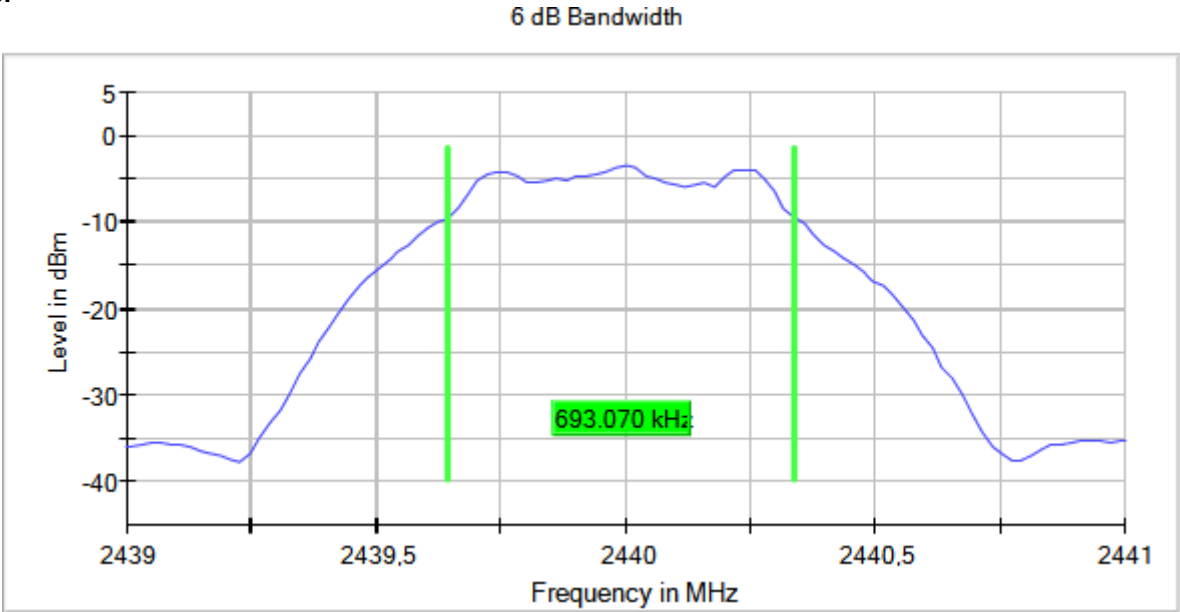
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



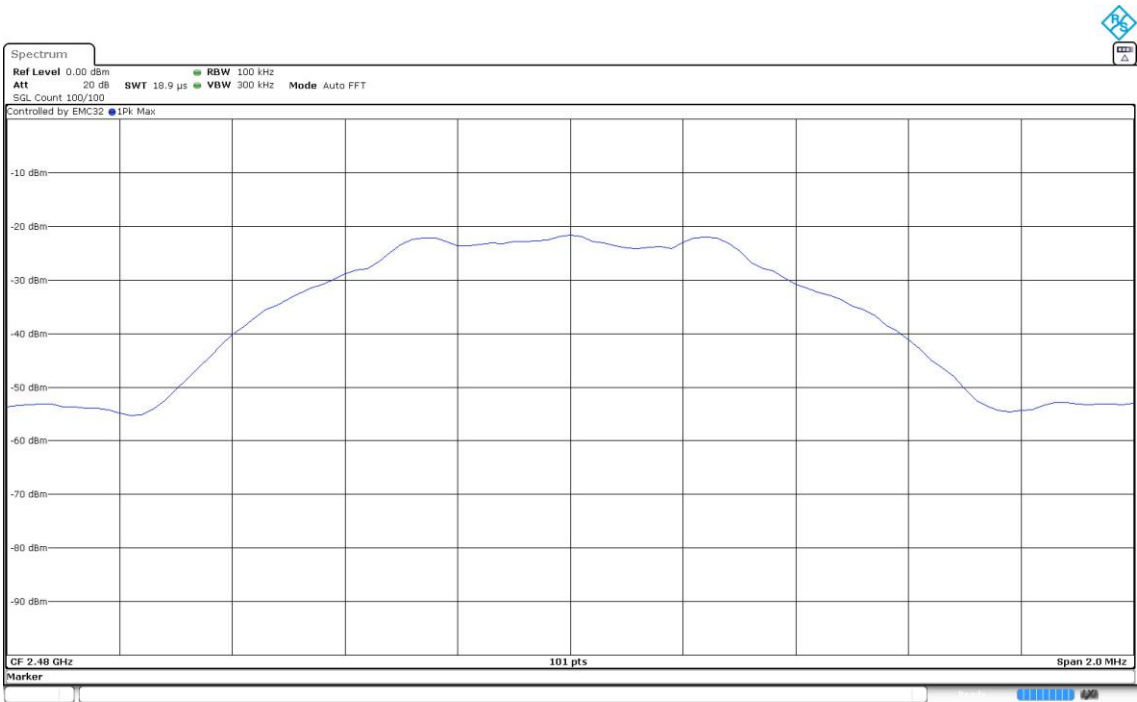
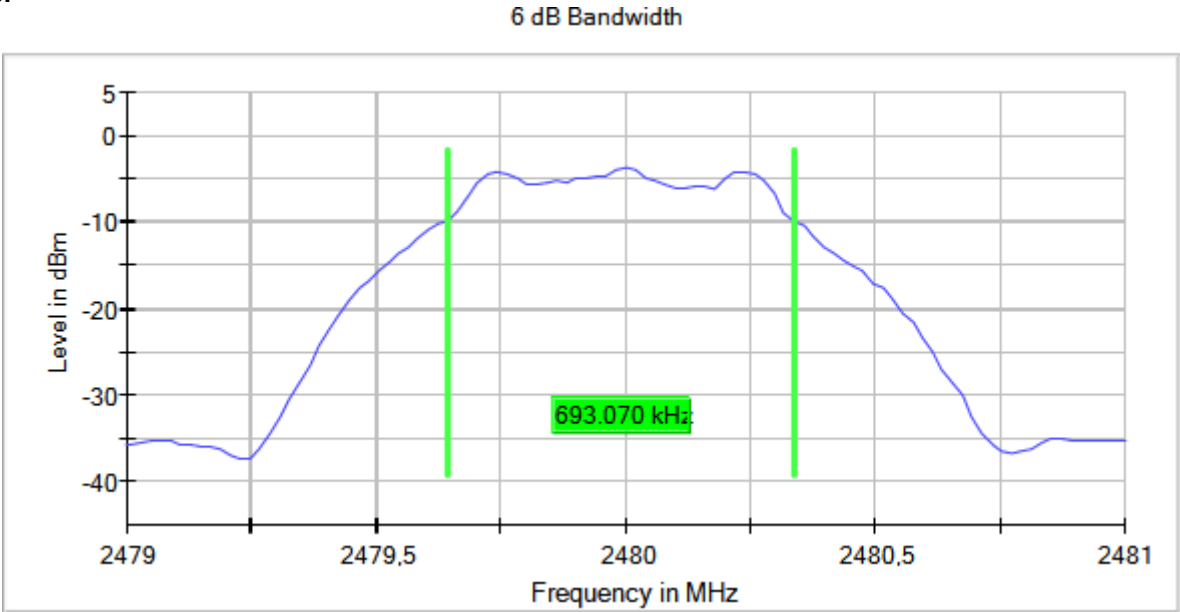
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Ebw (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	1.188
		2440.00000		1.188
		2480.00000		1.228

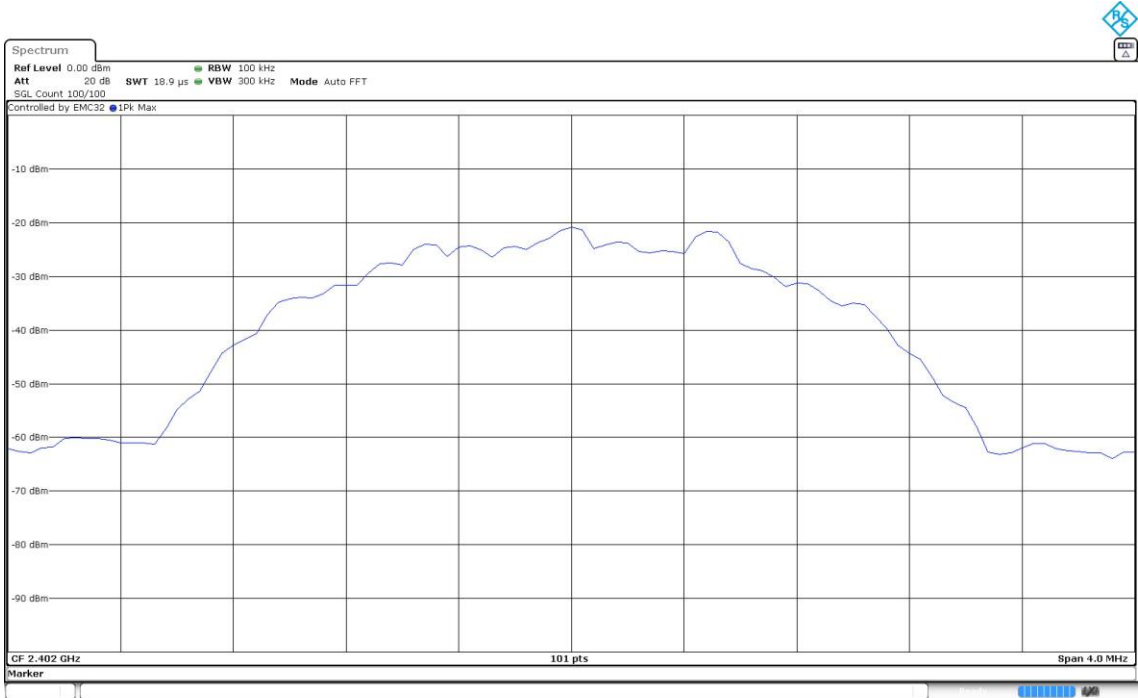
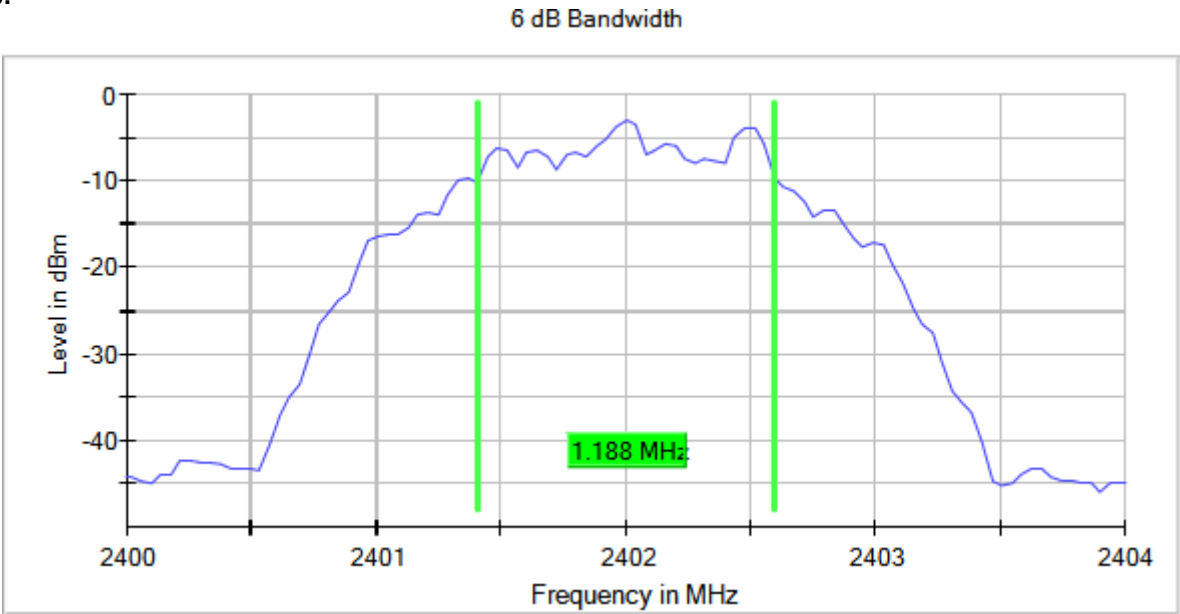
Verdict

Pass

Attachments

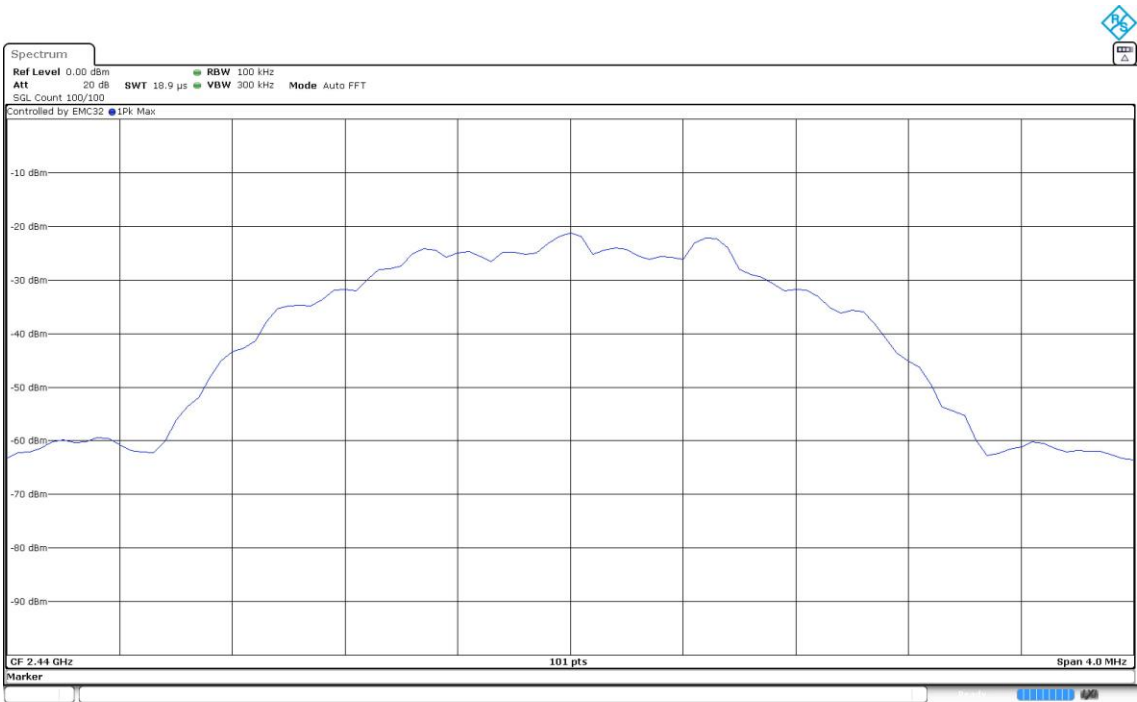
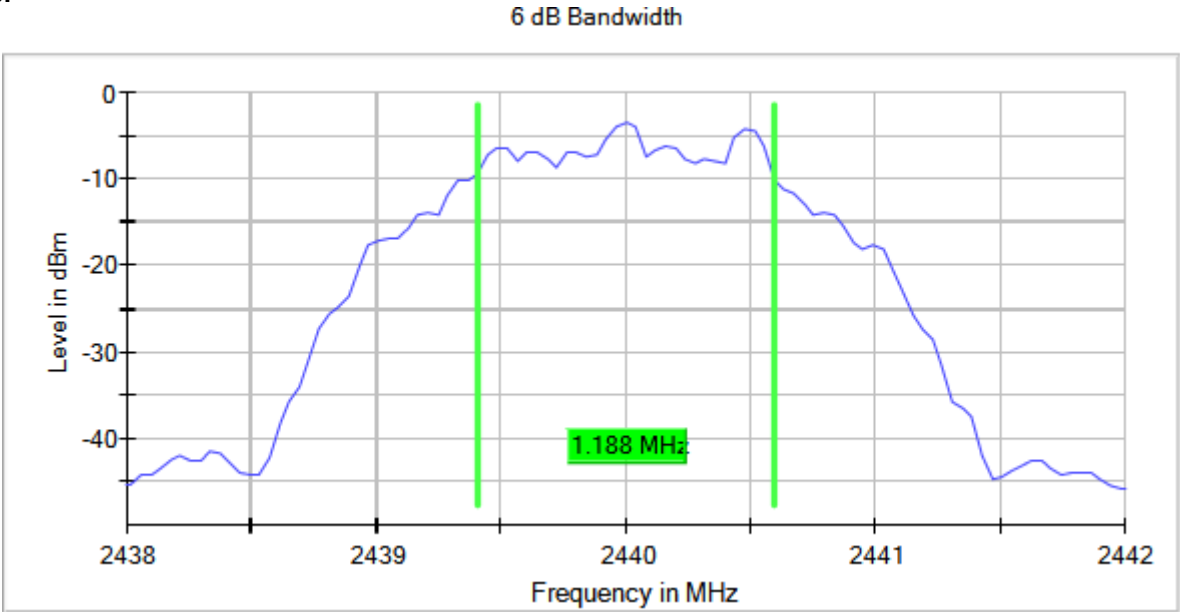
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



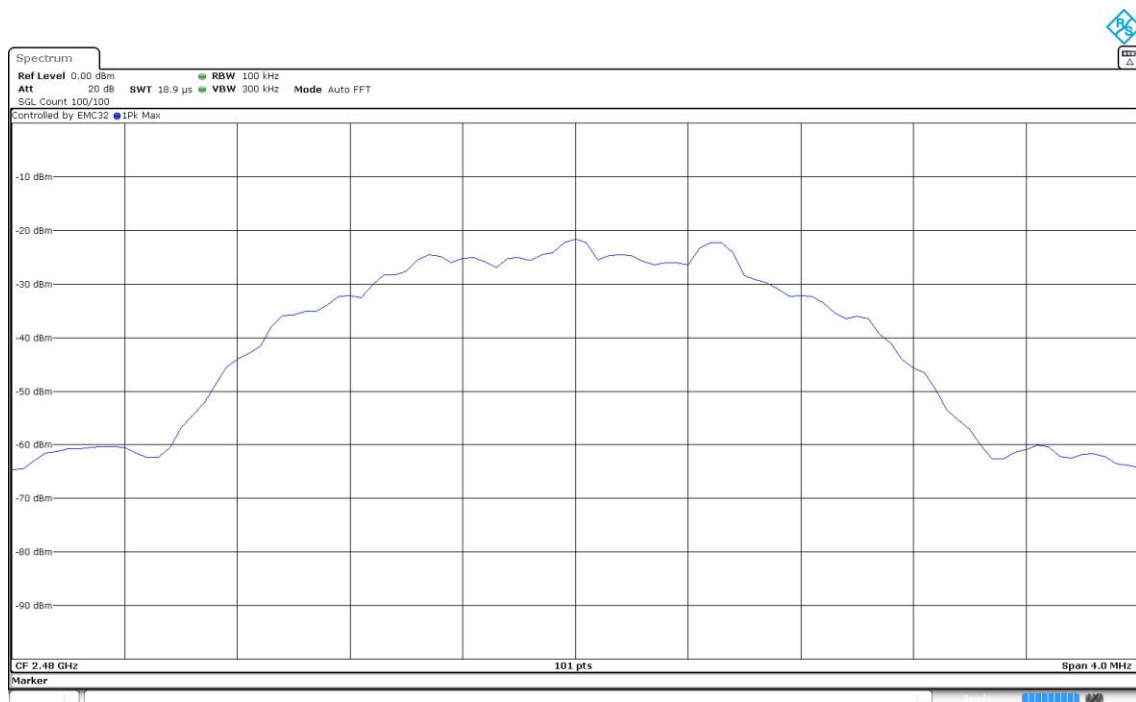
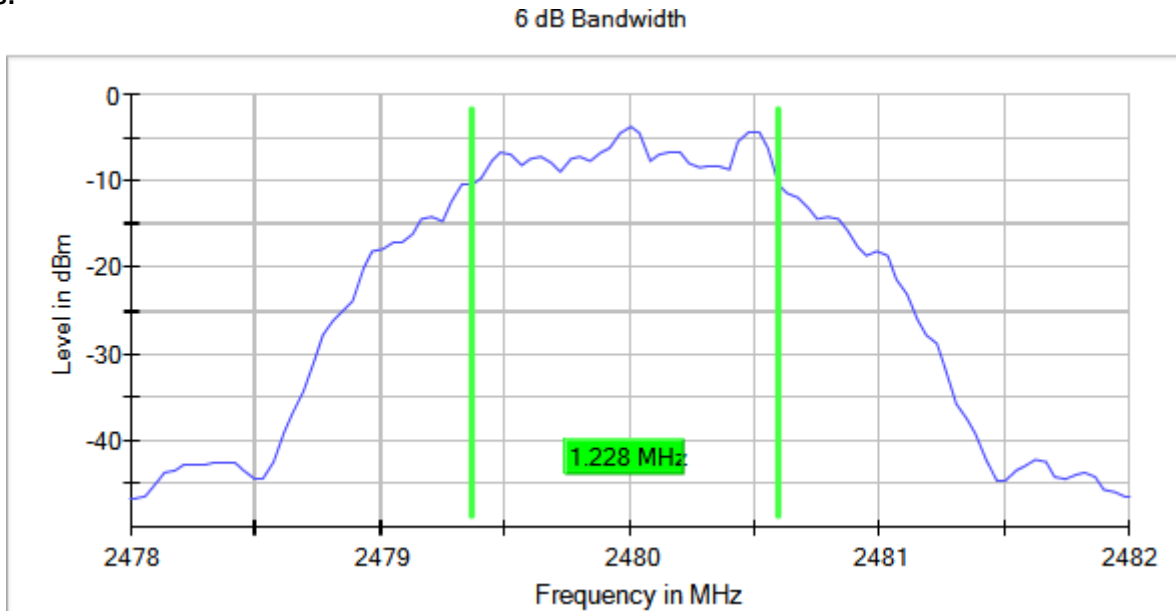
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
 Frequency MHz = 2480.00000 Active Port = 3
 Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.2 (b) / FCC 15.247 (e) Power Spectral Density

Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	PSD (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	-12.72
		2440.00000		-13.05
		2480.00000		-13.49

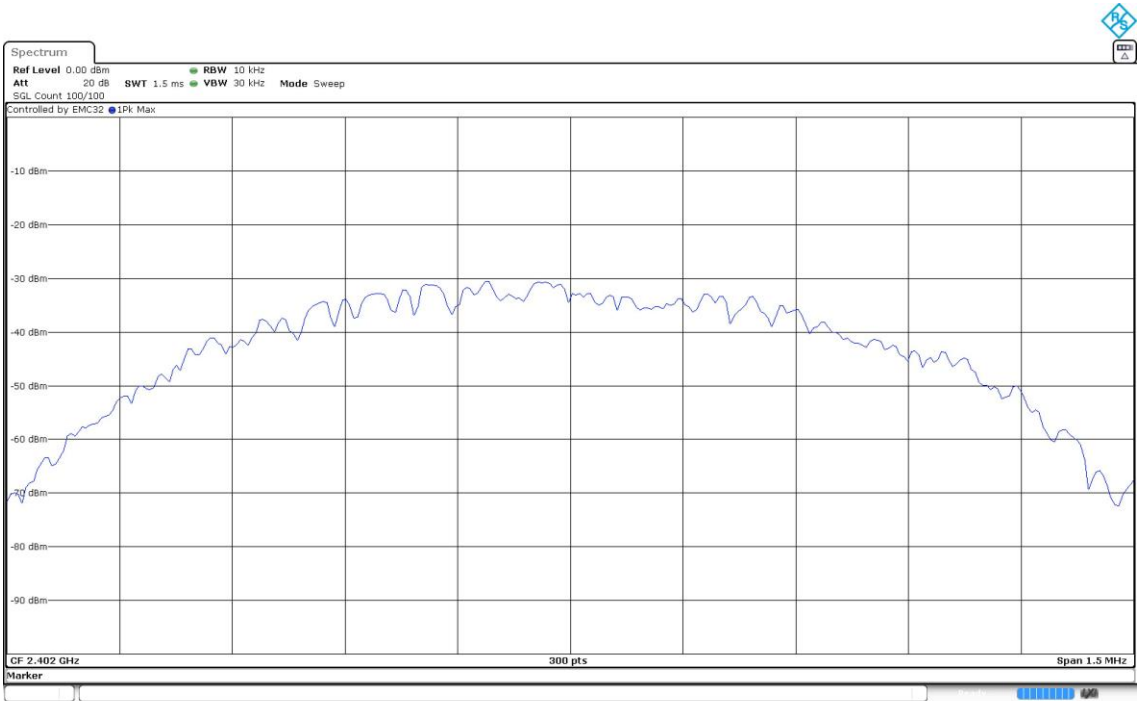
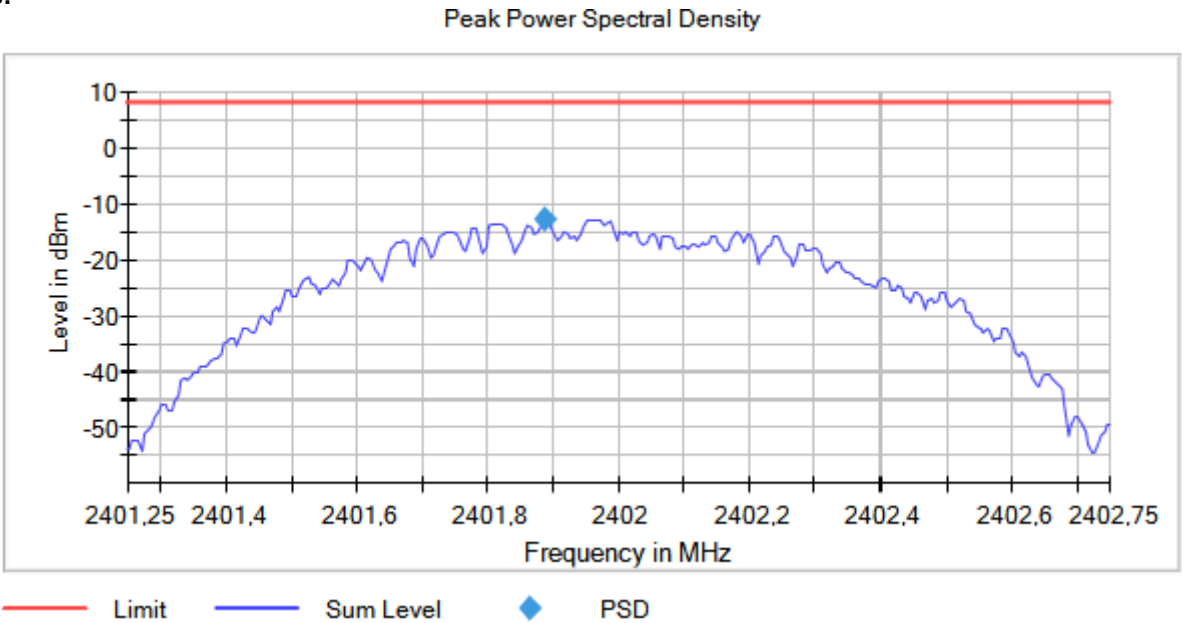
Verdict

Pass

Attachments

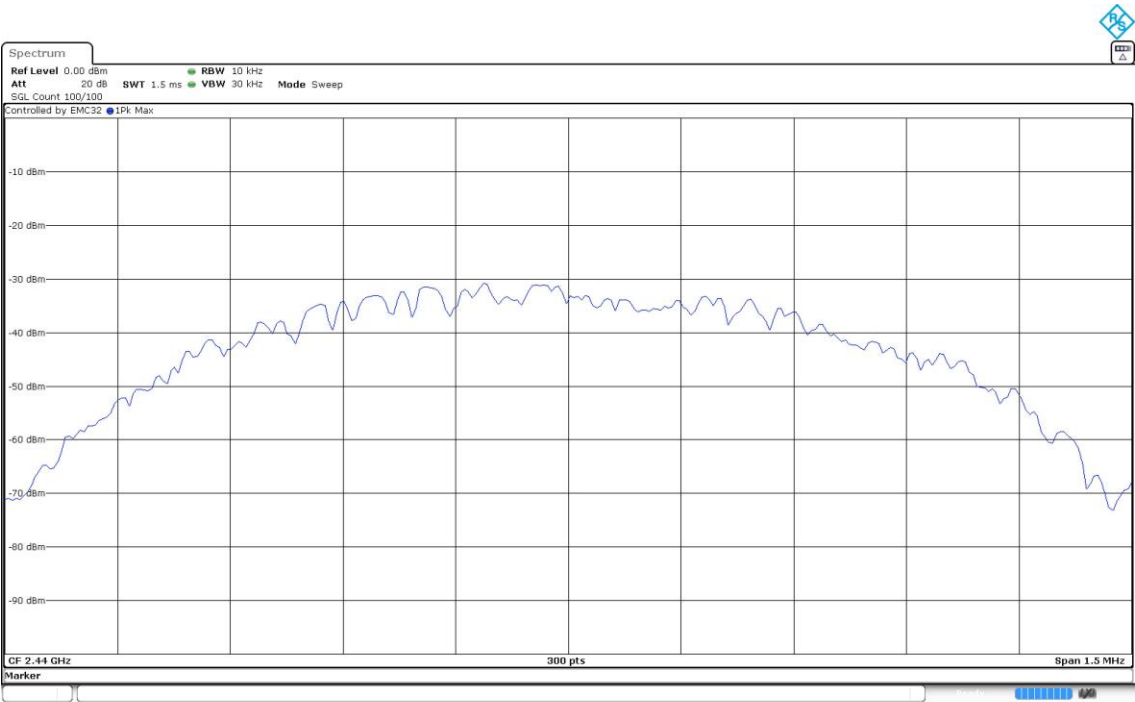
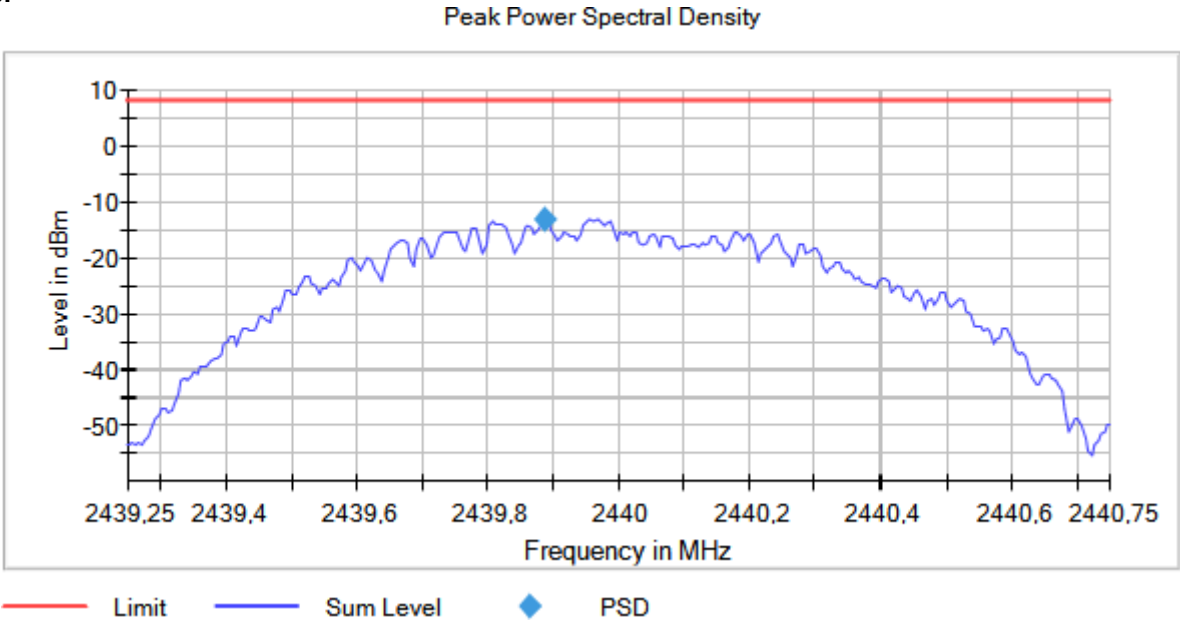
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



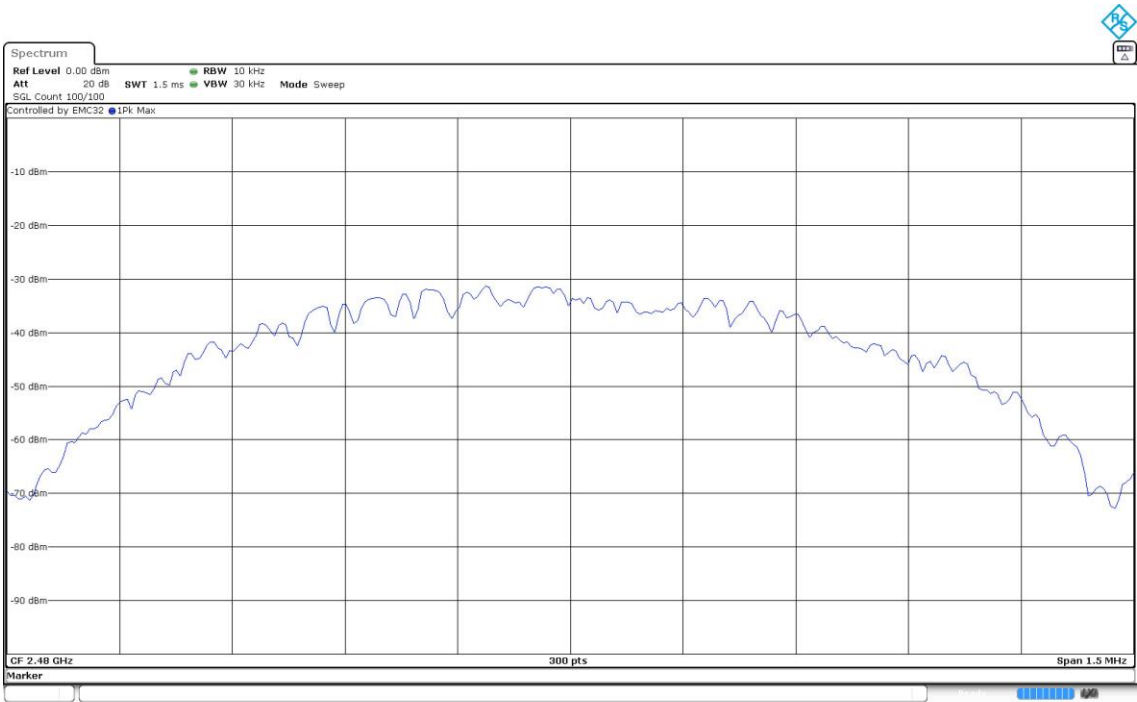
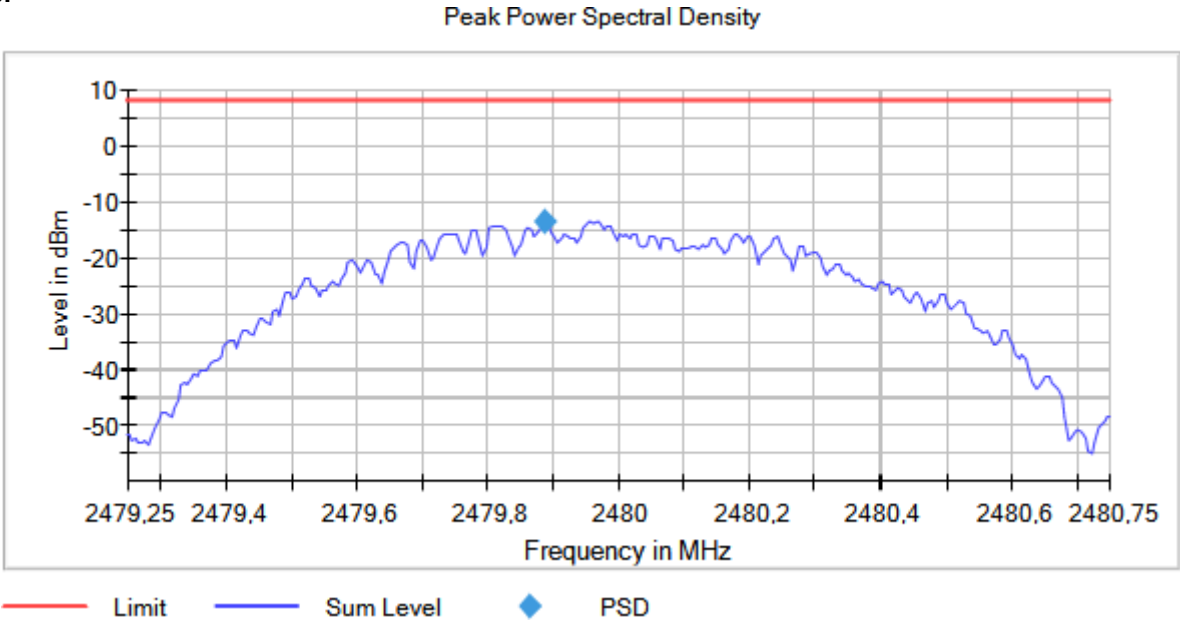
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	PSD (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	-15.41
		2440.00000		-15.74
		2480.00000		-16.14

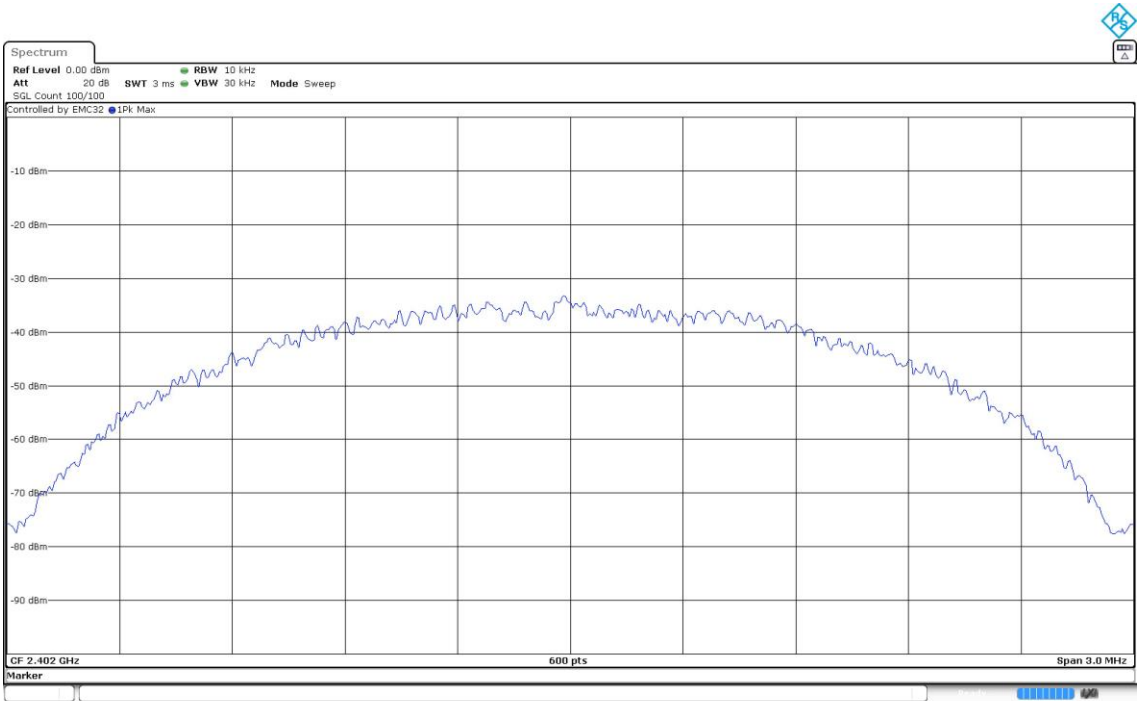
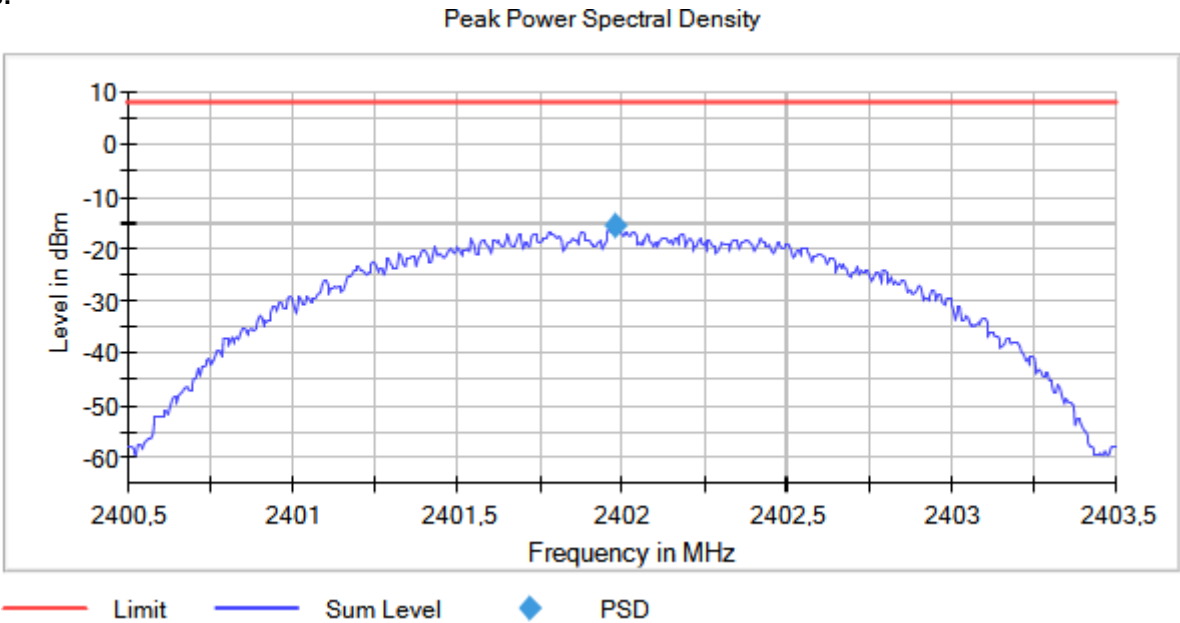
Verdict

Pass

Attachments

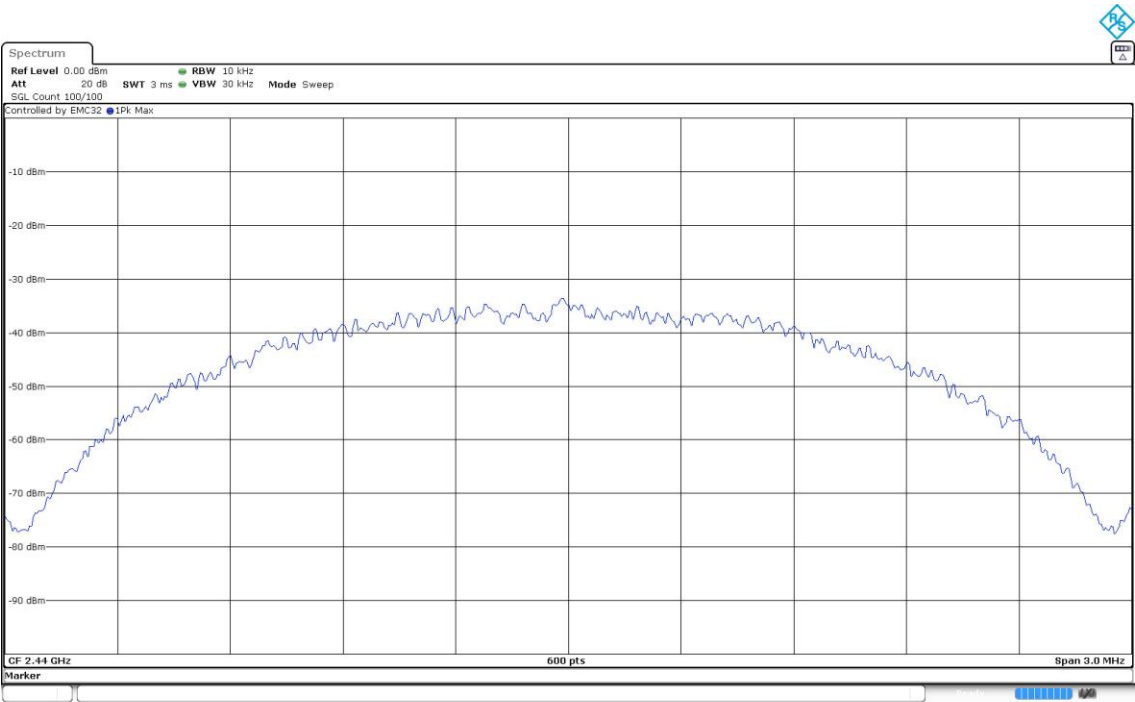
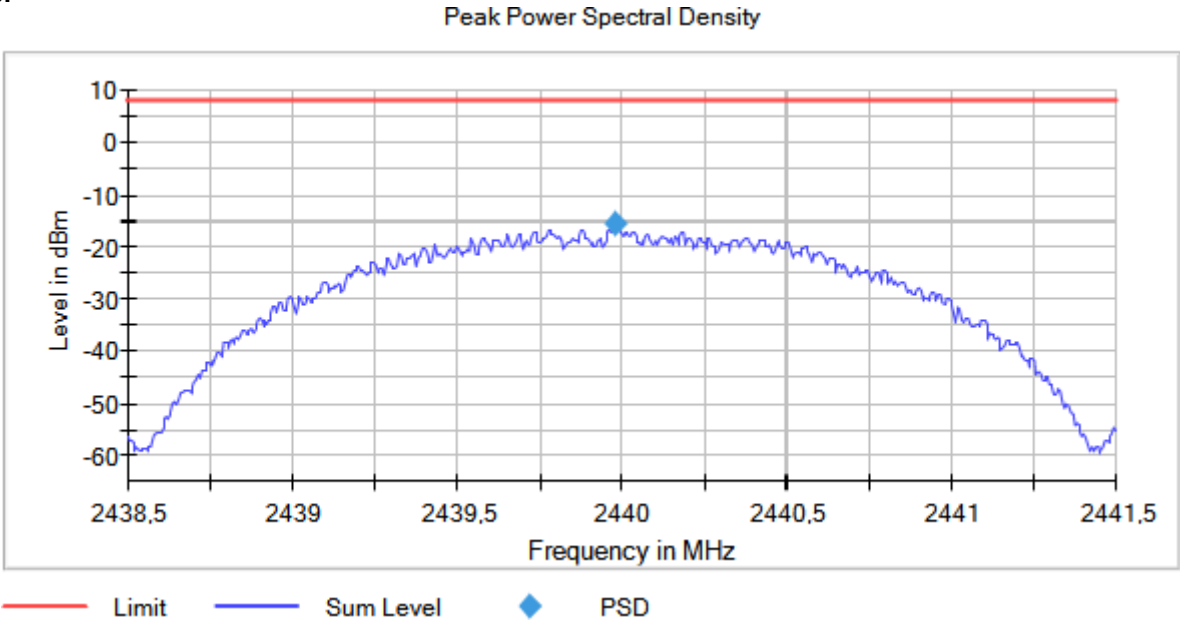
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



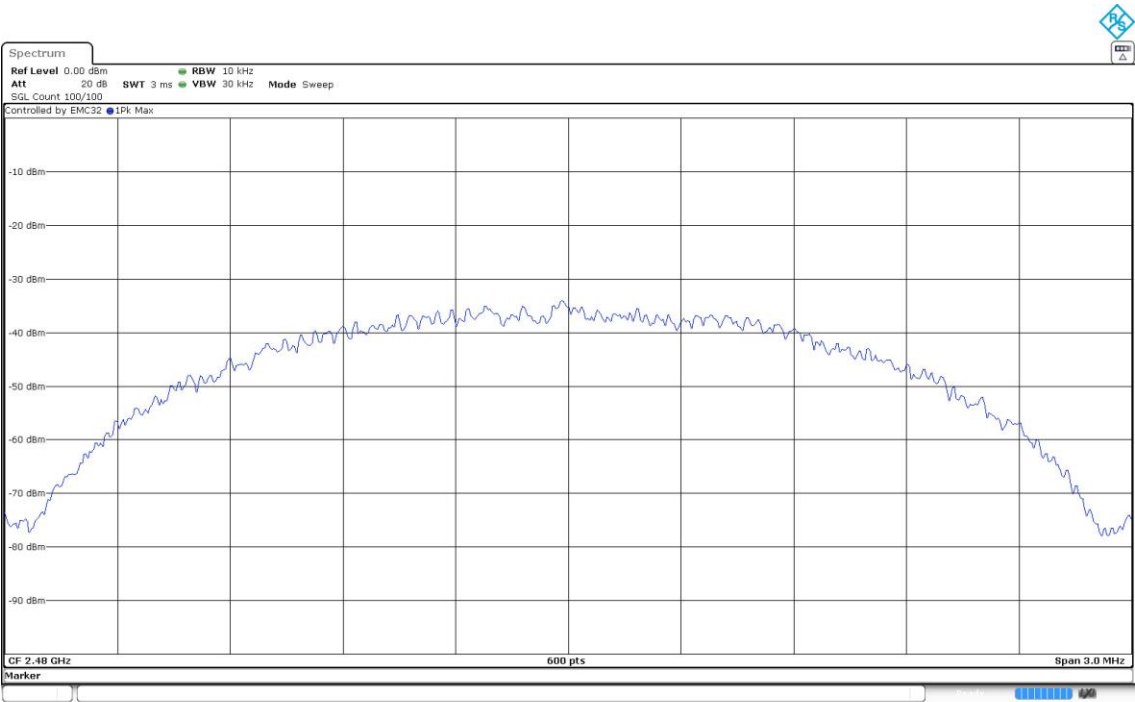
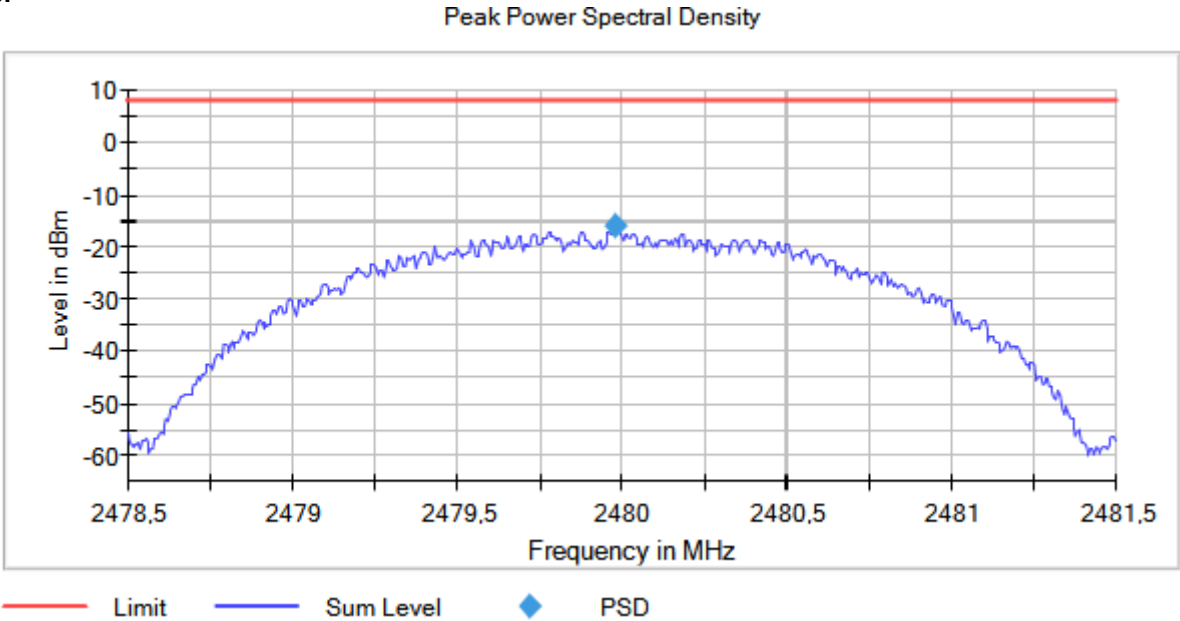
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:



RSS-247 5.4 / FCC 15.247 (b) Maximum Peak Conducted Output Power

Limits

FCC 15.247 (b) (3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

RSS 5.4 (d)

For DTSS employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Peak Power (dBm)	E.I.R.P. (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	-2.3730	-2.2730
		2440.00000		-2.8010	-2.7010
		2480.00000		-3.1490	-3.0490

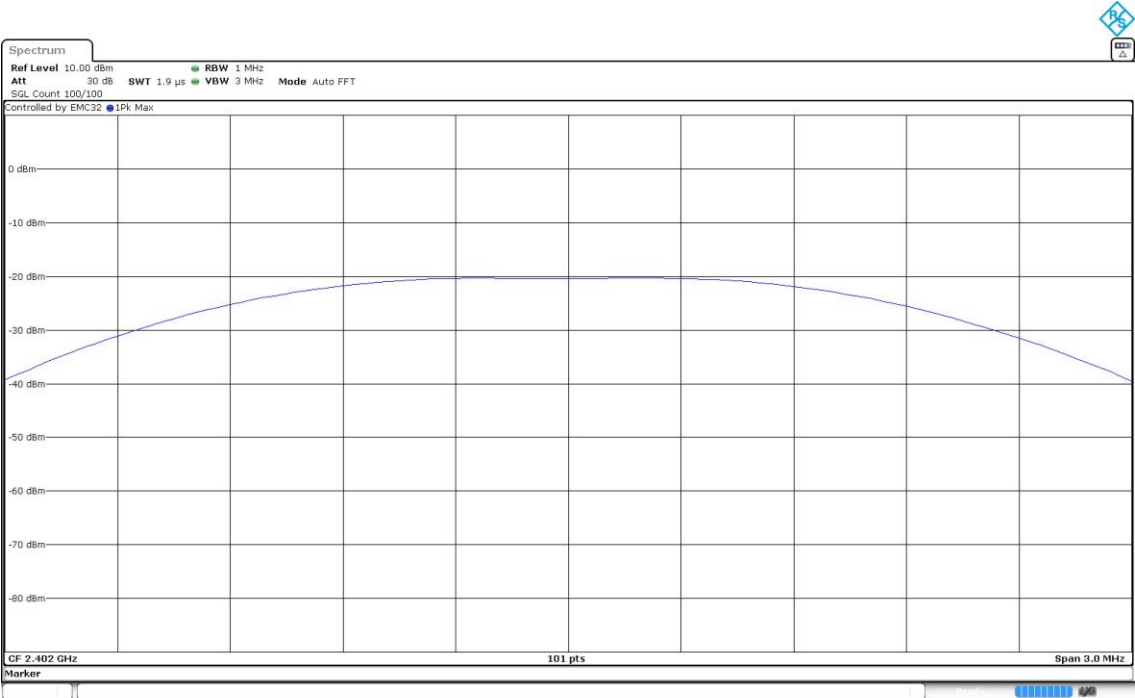
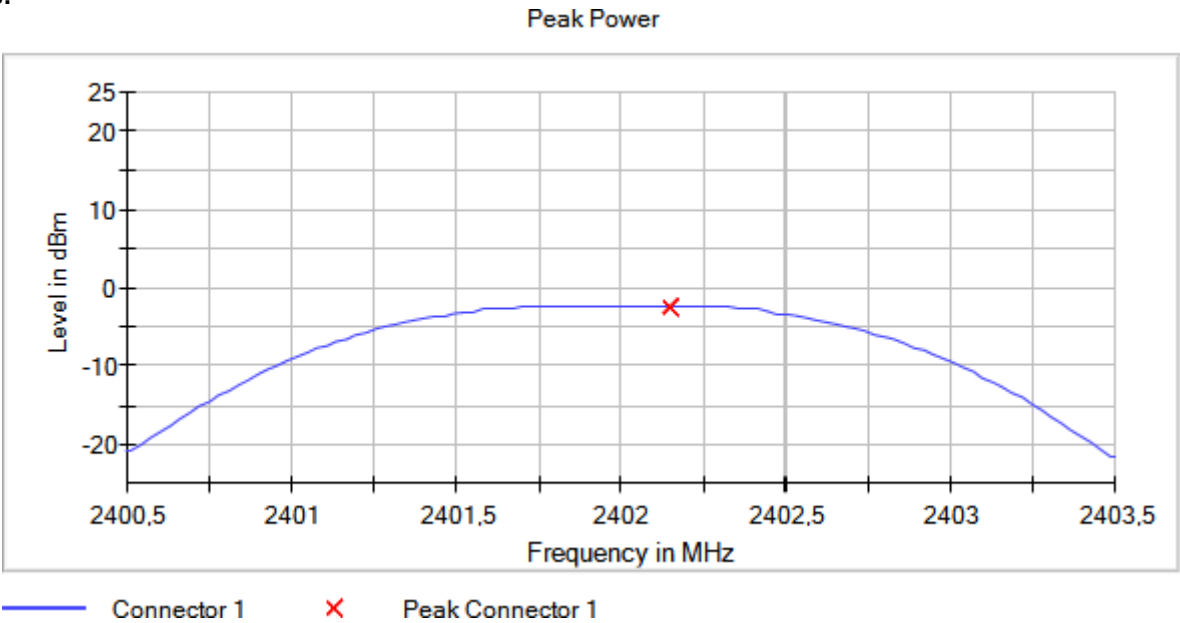
Verdict

Pass

Attachments

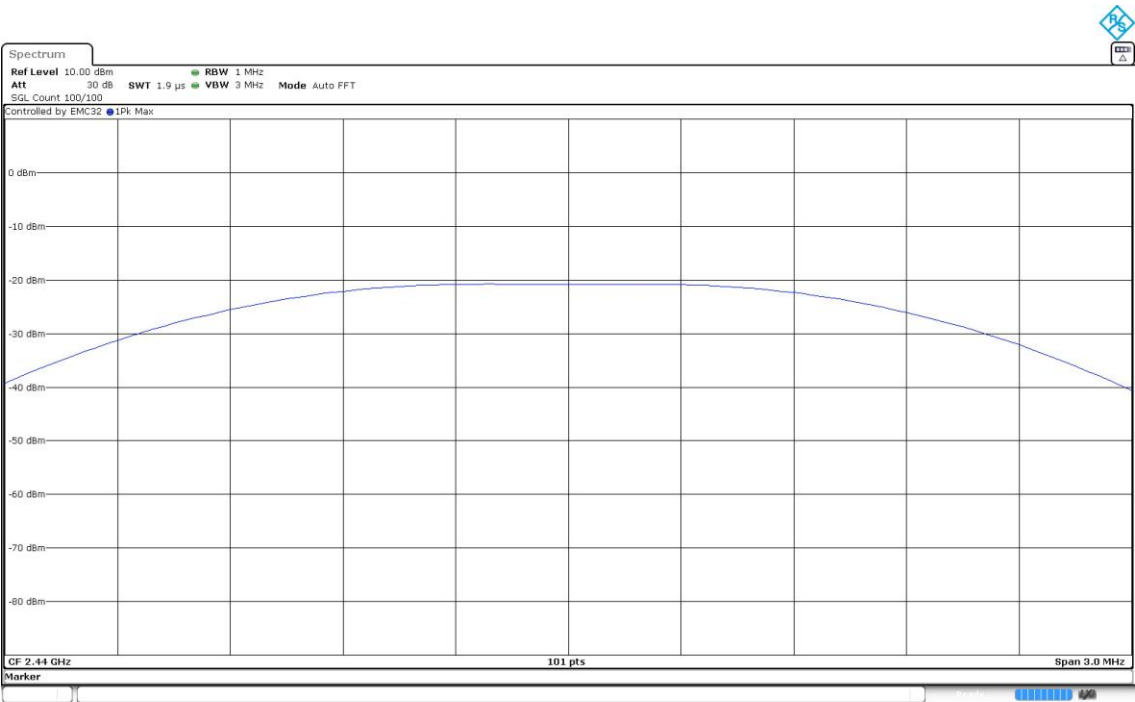
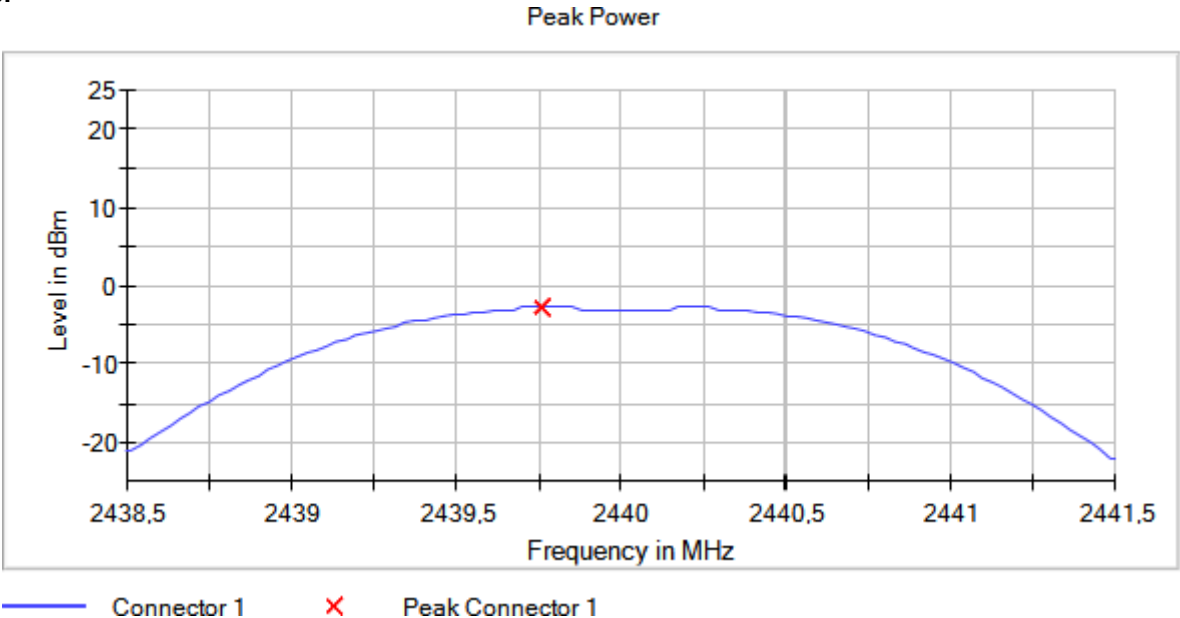
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



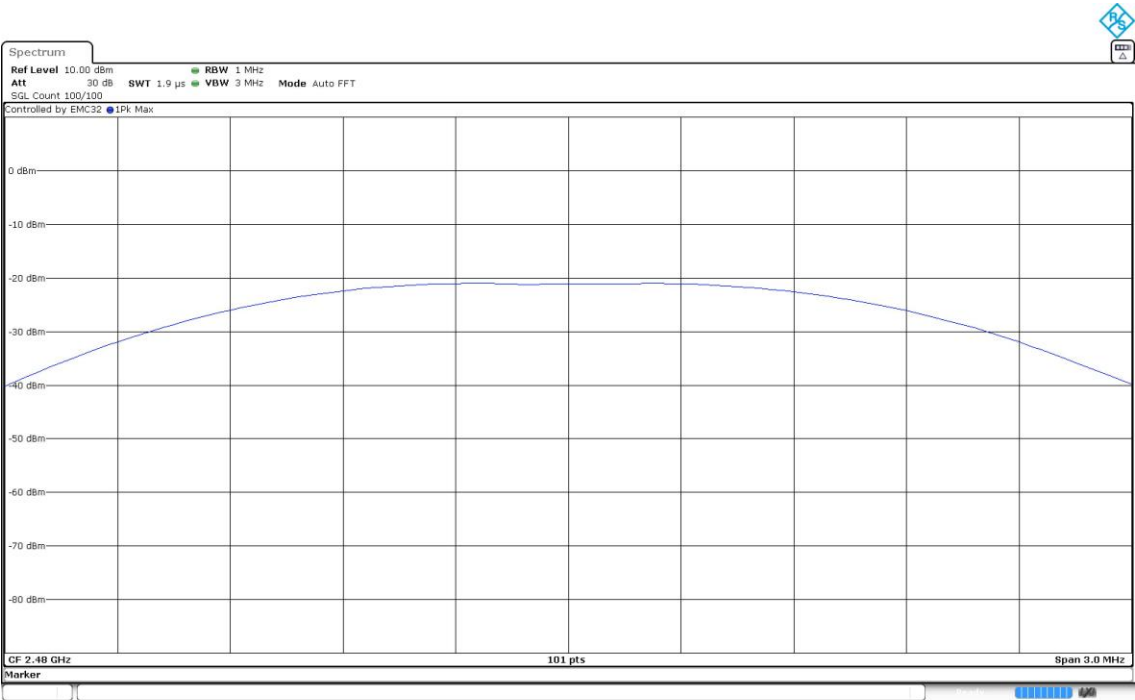
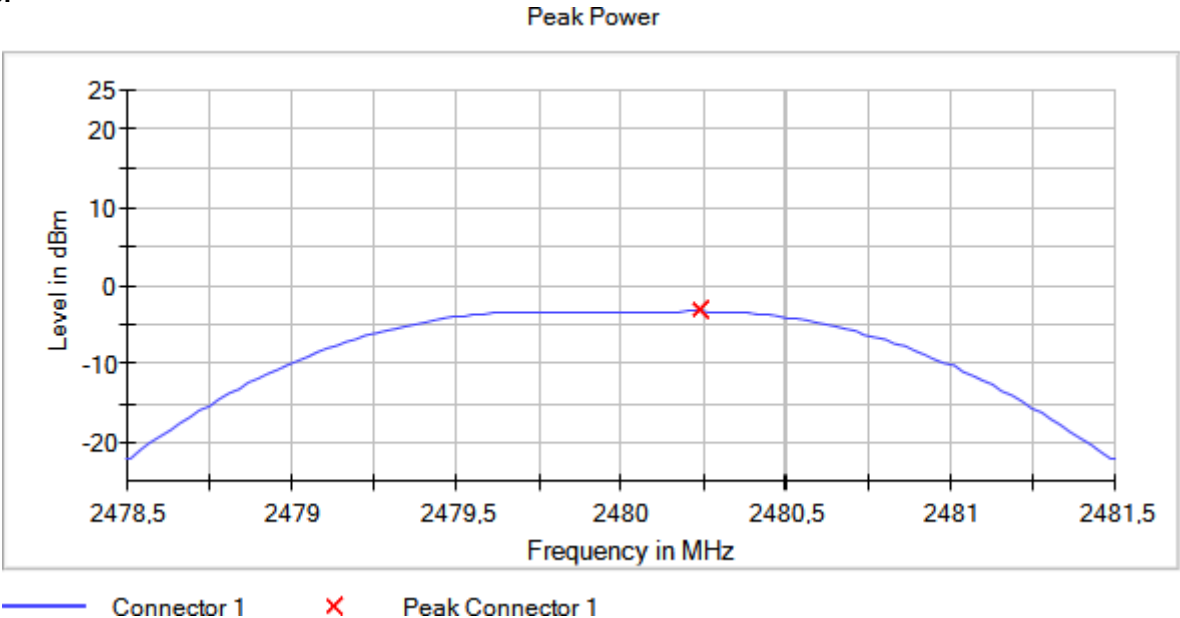
Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2440.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2480.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Images:



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Results

Operation Band (MHz)	Equipment	Freq (MHz)	Port	Peak Power (dBm)	E.I.R.P. (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2402.00000	3	-2.4440	-2.3440
		2440.00000		-2.6420	-2.5420
		2480.00000		-3.0170	-2.9170

Verdict

Pass

Attachments

Operation Band MHz = [2400, 2483.5] Equipment Type = Digital Transmission System (DTS)
Frequency MHz = 2402.00000 Active Port = 3
Modulation = BTLE 5.2 (GFSK 2 Mbit/s)

Images:

