

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:

73206RRF.001A1

Partial Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	OCS Lock
(*) Trademark	Ojmar
(*) Model and /or type reference	OCS SMART
Other identification of the product	HW version: 5.3 SW version: 3.0.0 FCC ID: 2ANY7OJM005
(*) Features	Bluetooth low energy
Manufacturer	OJMAR S.A. Pol. Indus. de Lerun s/n 20870 Elgoibar (Gipuzkoa)
Test method requested, standard	USA FCC Part 15.247 (10-1-21 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-21 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 amendment 1 (March 2019). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager  Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2023-05-19
Report template No	FDT08_24 (*) "Data provided by the client"

Index

INDEX	2
ACRONYMS	3
COMPETENCES AND GUARANTEES	3
GENERAL CONDITIONS	3
UNCERTAINTY	4
DATA PROVIDED BY THE CLIENT	4
USAGE OF SAMPLES	4
TEST SAMPLE DESCRIPTION	5
IDENTIFICATION OF THE CLIENT	7
TESTING PERIOD AND PLACE	7
DOCUMENT HISTORY	7
ENVIRONMENTAL CONDITIONS	7
REMARKS AND COMMENTS	8
TESTING VERDICTS	8
SUMMARY	9
APPENDIX A: TEST RESULTS. BLUETOOTH LOW ENERGY 5.0 (2M).....	10

Acronyms

Acronym ID	Acronym Description
	Emission Bandwidth
# of Tx Chains	Number of Transmission Chains
BW	Bandwidth
Equipment	Equipment Type
Freq	Frequency
Inband Peak Lvl	Inband Peak Level
Lvl	Level
MP	Measurement Point
Mod	Modulation
Occ Ch BW	Occupied Channel Bandwidth
PSD	Power Spectrum Density
Peak Power	Maximum Peak Conducted Output Power
Port	Active Port

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 is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification 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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification S.A.U.

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 a OCS Lock. Electronic lock powered by battery which is used to close lockers..

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.

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	70982B_13	Sample Holder	--	--	2022-03-28	Auxiliary Element
S/01	70982B_14	Keyboard (conducted)	--	14	2022-04-04	Element Under Test
S/01	70982B_9	Intelligent locking systems	OCS	--	2022-03-28	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for Conducted testing

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
	Supplementary information to the ports..... :						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
	[]	AC:	[]	[]	[]	[]	[]
	[]	DC:					
	[]	DC:					
Rated Power	Battery						
Clock frequencies.....	32 MHz						
Other parameters							
Software version							
Hardware version							
Dimensions in cm (W x H x D)							
Mounting position	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[]	Other:					
Modules/parts.....	Module/parts of test item		Type	Manufacturer			

			
			
			
			
Accessories (not part of the test item)	Description	Type	Manufacturer
			
			
			
			
			
			
Documents as provided by the applicant	Description	File name	Issue date
			
			
			
			

(3) Only for Medical Equipment

Identification of the client

OJMAR S.A.
Pol. Indus. de Lerun s/n 20870 Elgoibar (Gipuzkoa)

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-08-17
Date (finish)	2023-04-19

Document history

Report number	Date	Description
73206RRF.001	2022-08-22	First release.
73206RRF.001A1	2023-05-19	Second release. This report is modified due to changes in the power setting. This modification test report cancels and replaces the test report 73206RRF.001

Environmental conditions

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: Rafael Fernandez Martin.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
7796	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	ROHDE AND SCHWARZ	2024-03-16
6668	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2024-12-14
6793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
7798	WMS32	WMS32	ROHDE AND SCHWARZ	N/A

Testing verdicts

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

Summary

Bluetooth Low Energy 5.0 (2M)

Requirement – Test case	FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth		Pass	
RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] Power spectral density		Pass	
RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power		Pass	
RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter)		Pass	
RSS-247 5.5 / FCC 15.247 (d). Emission limitations radiated (Transmitter)		N/A	(1)
<u>Supplementary information and remarks:</u> 1. Only conducted testing has been requested.			

Appendix A: Test results. Bluetooth Low Energy 5.0 (2M)

TEST CONDITIONS	12
TEST CASES DETAILS	13
FCC 47 CFR PART 15.247 / RSS-247	13
RSS-247 5.2 (a) / FCC 15.247 (a) (2) [6dBw] 6 dB Bandwidth	13
RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] Power spectral density	17
RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power	21
RSS-247 5.5 / FCC 15.247 (d) [Bndedge] Band-edge emissions compliance (Transmitter)	25
99dBw Occupied Channel Bandwidth 99%	30

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	6 V DC
Type of Power Supply:	Battery

ANTENNA (*):

Type of Antenna:	Internal
Maximum Declared Antenna Gain:	1.95 dBi

TEST FREQUENCIES (*):

Low Channel:	2402 MHz
Middle Channel:	2440 MHz
High Channel:	2480 MHz

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

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.

POWER VALUES USED FOR TESTING (*):

Modulation	Frequency (MHz)	Power setting
BTLE 5.0 (GFSK 2 Mbit/s)	2402	-7.8
	2440	-7.8
	2480	-7.8

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.



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247

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

Limits

The minimum 6 dB bandwidth shall be at least 500 kHz.

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Freq (MHz)	Emission Bandwidth (MHz)
2402.00000	1.188
2440.00000	1.188
2480.00000	1.188

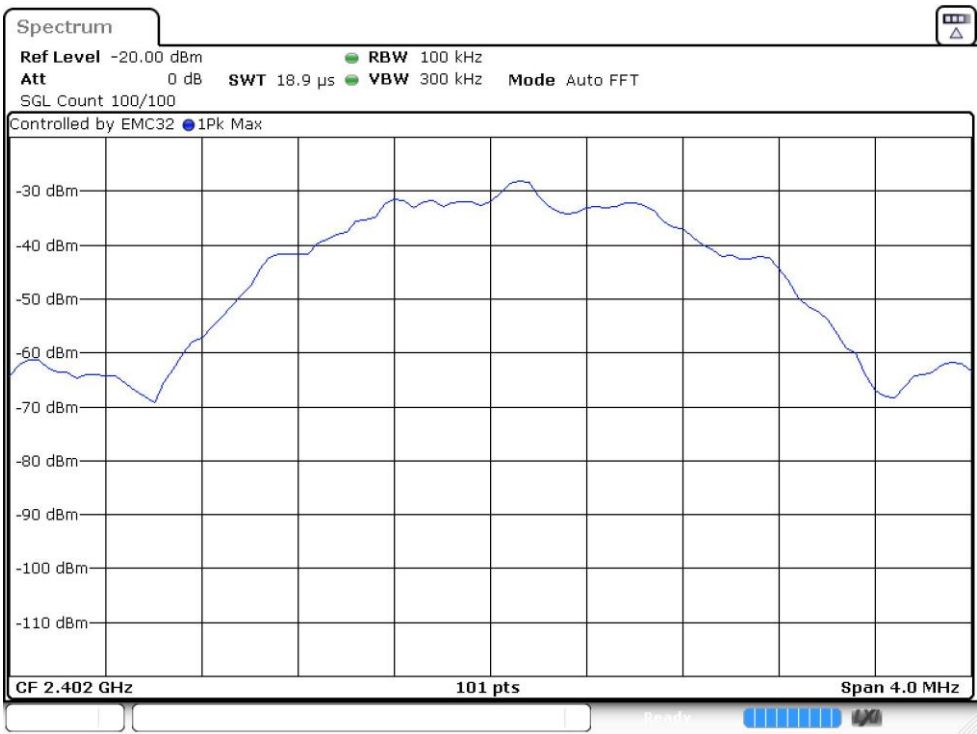
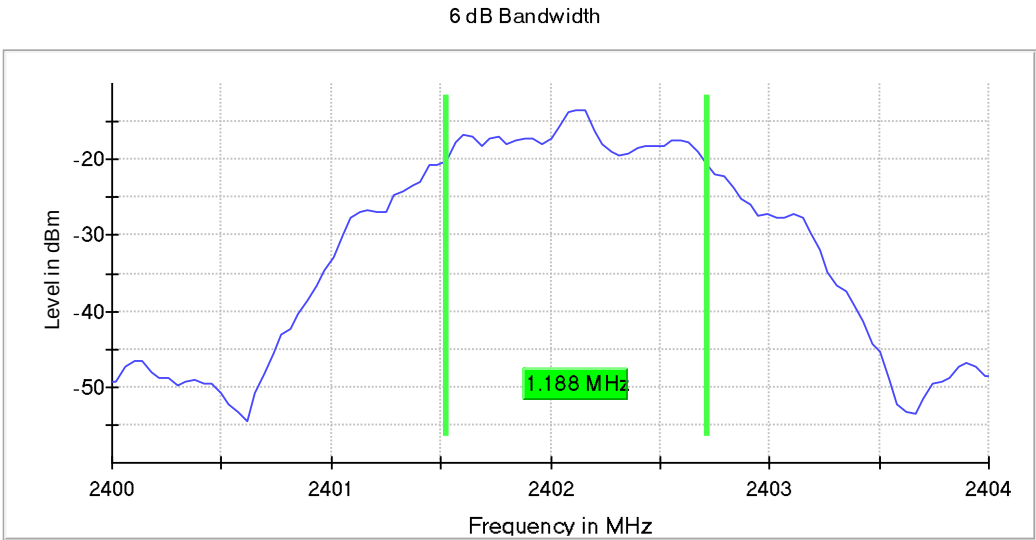
Verdict

Pass

Attachments

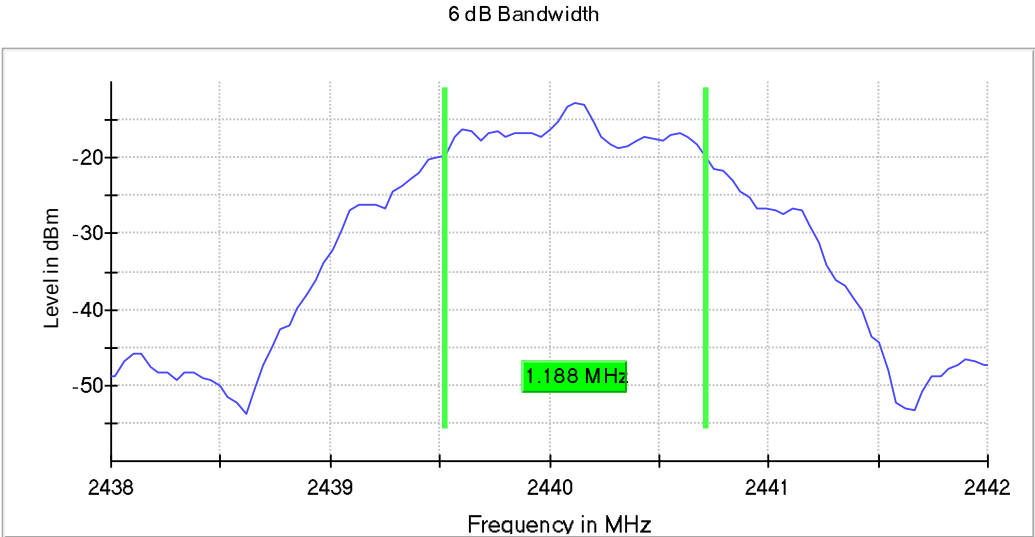
Frequency MHz = 2402.00000, Bandwidth MHz = 2, Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



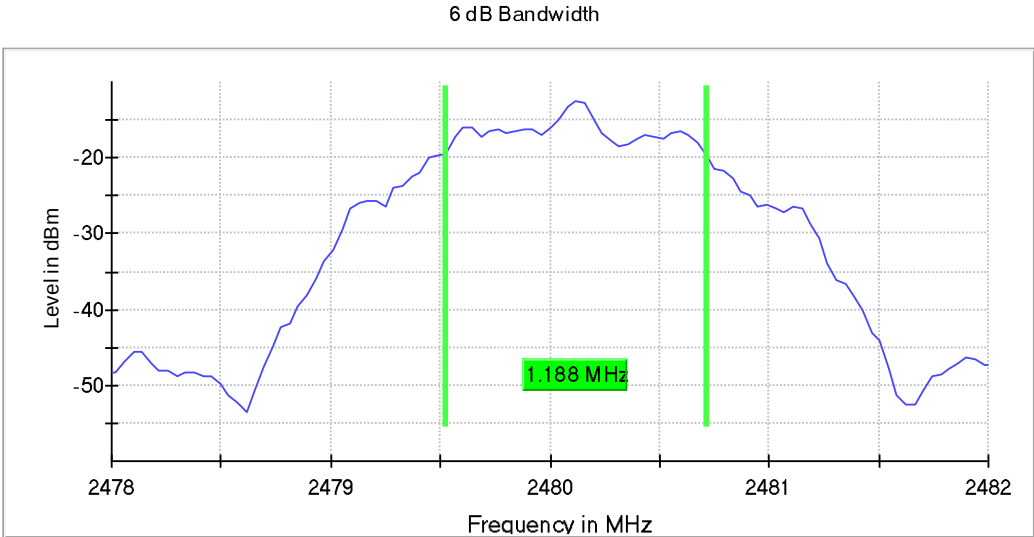
Frequency MHz = 2440.00000, Bandwidth MHz = 2, Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



Frequency MHz = 2480.00000, Bandwidth MHz = 2, Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] 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 5.0 (GFSK 2 Mbit/s)

Results

Freq (MHz)	PSD (dBm)
2402.00000	-18.88
2440.00000	-18.05
2480.00000	-18.15

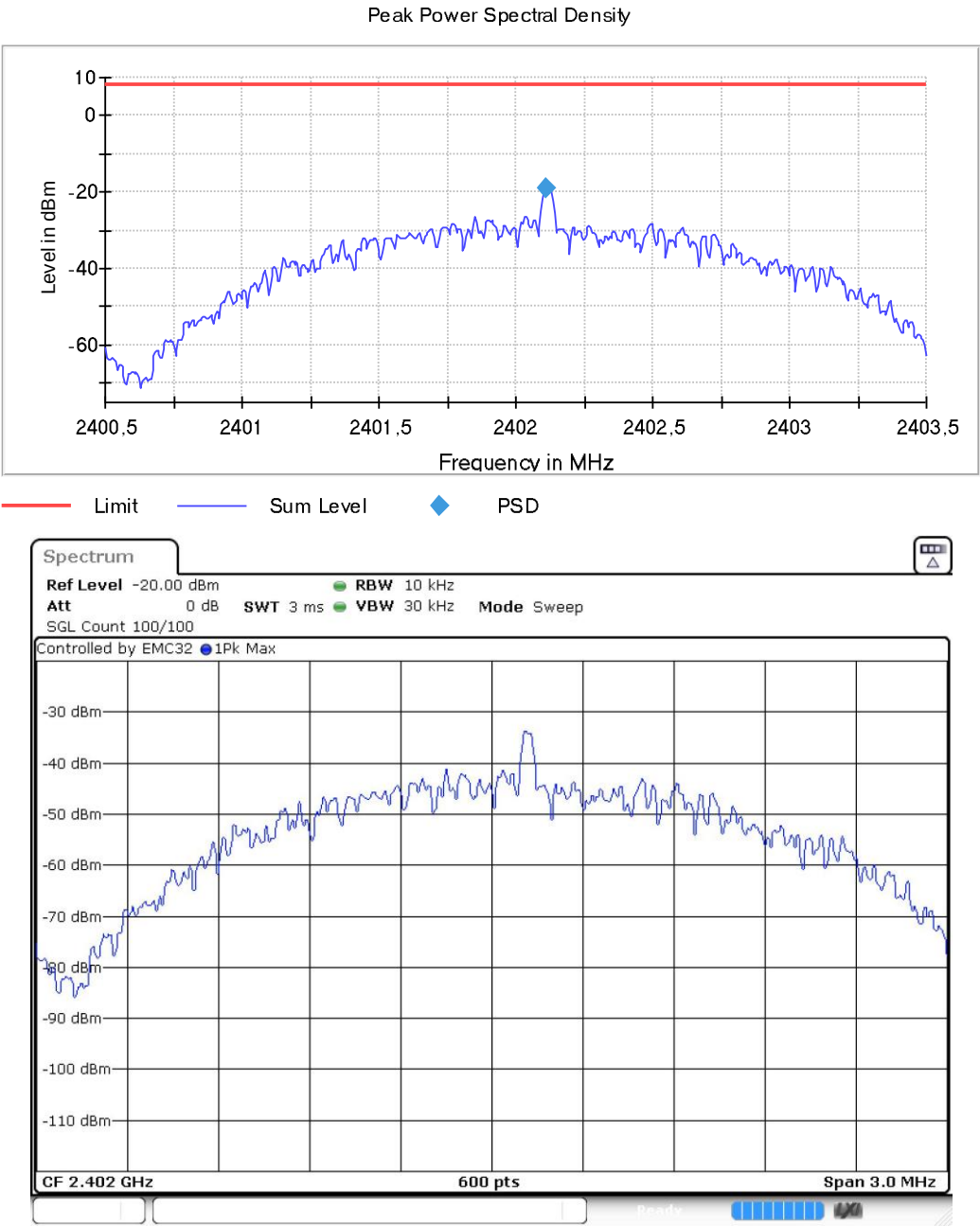
Verdict

Pass

Attachments

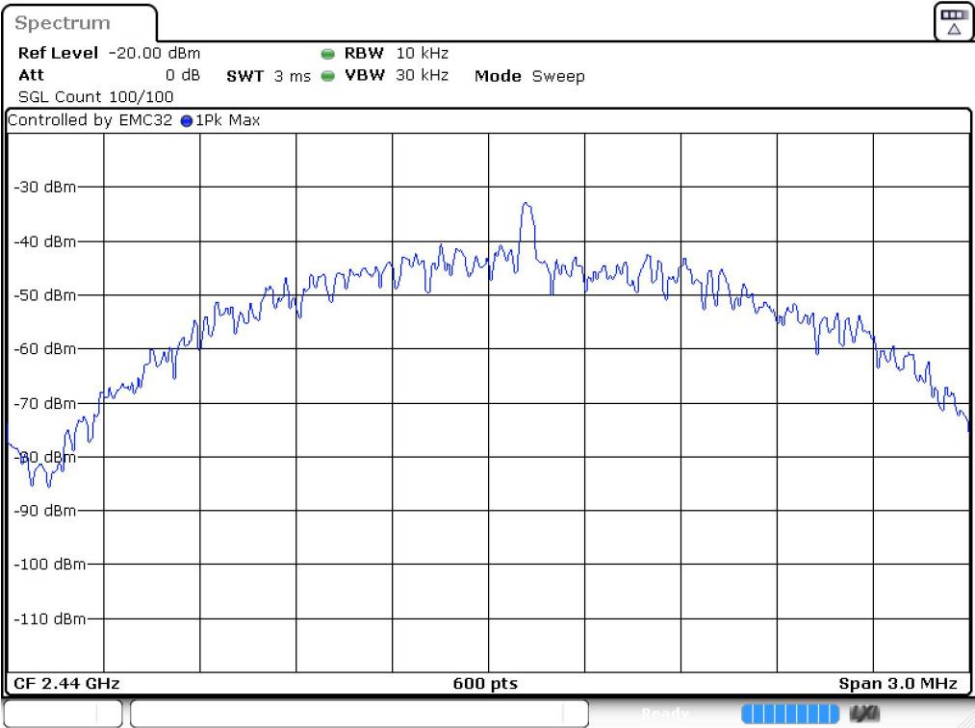
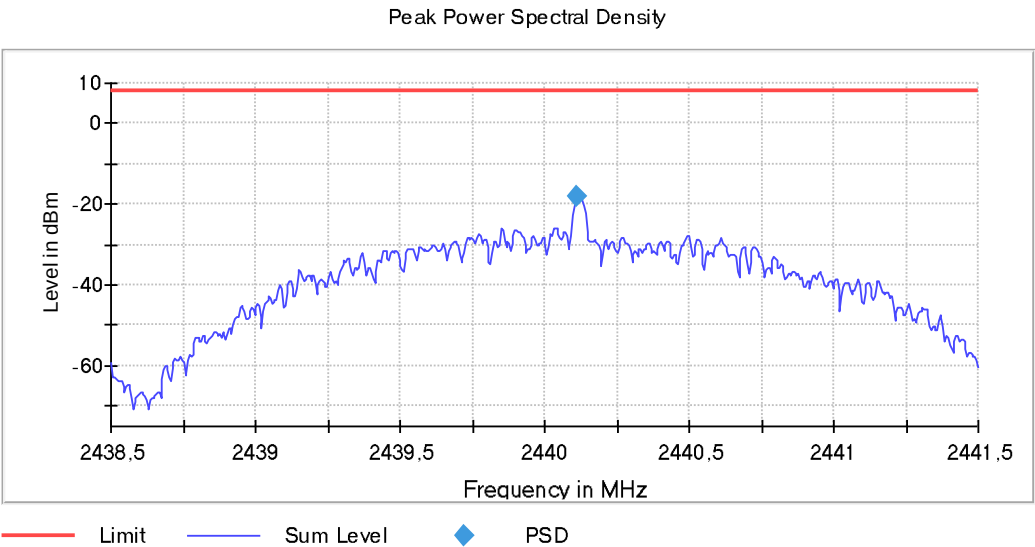
Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



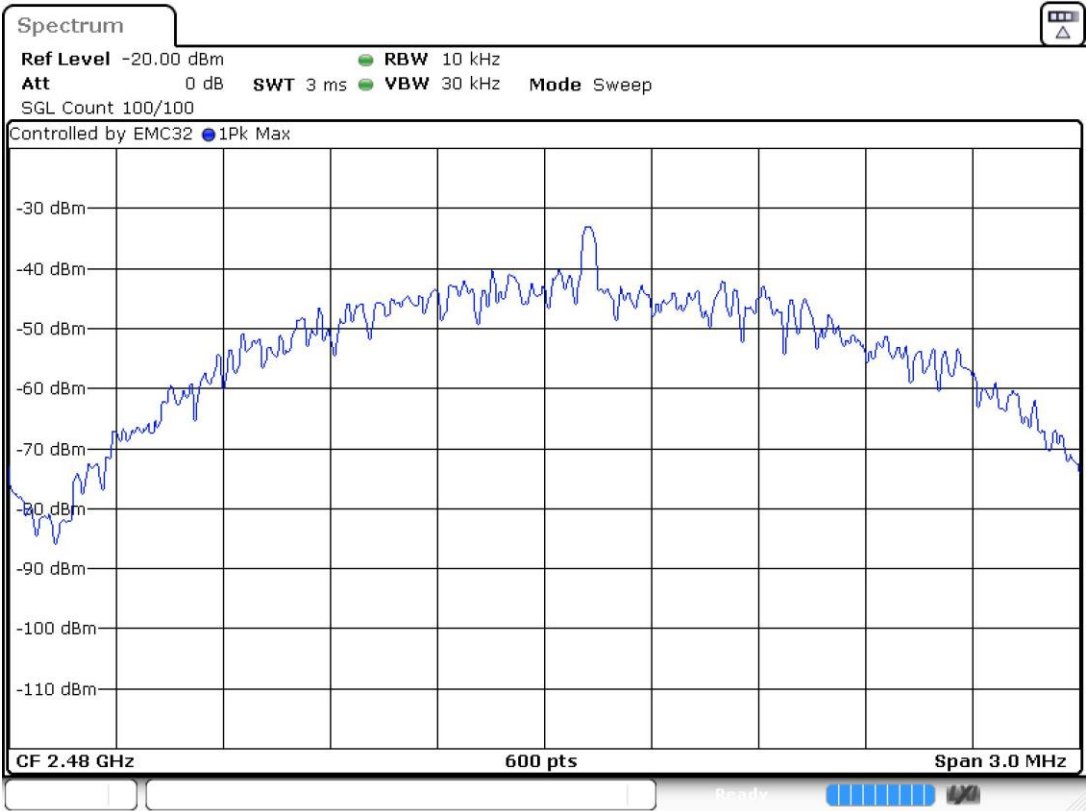
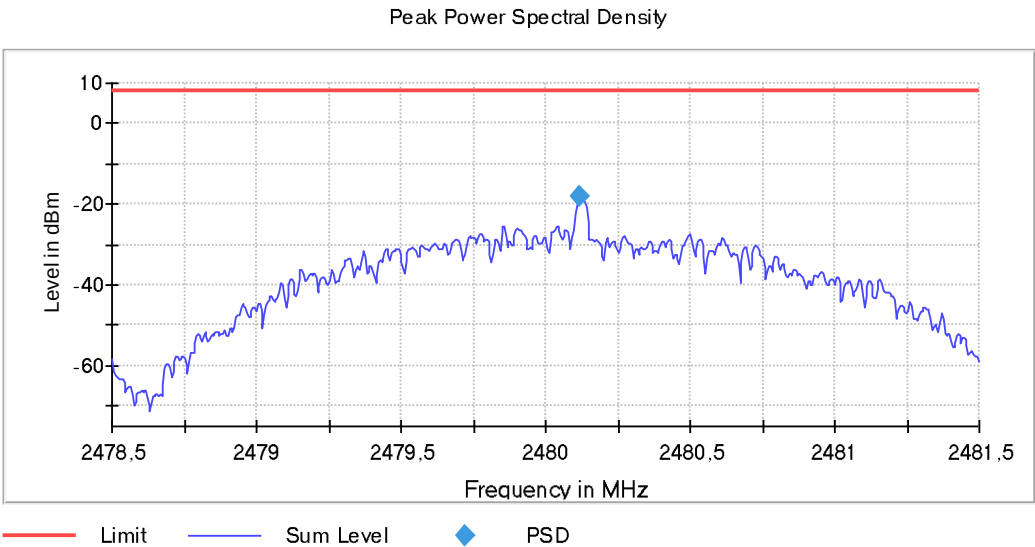
Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power

Limits

For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).
The e.i.r.p. shall not exceed 4 W (36 dBm) (Canada).
The maximum peak conducted output power level in the fundamental emission was measured using the method according to point 11.9.1.1 "RBW ≥ DTS bandwidth" of ANSI C.63.10-2013.

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Freq (MHz)	Peak Power (dBm)	EIRP (dBm)
2402.00000	-13.248	-11.298
2440.00000	-12.512	-10.562
2480.00000	-12.663	-10.713

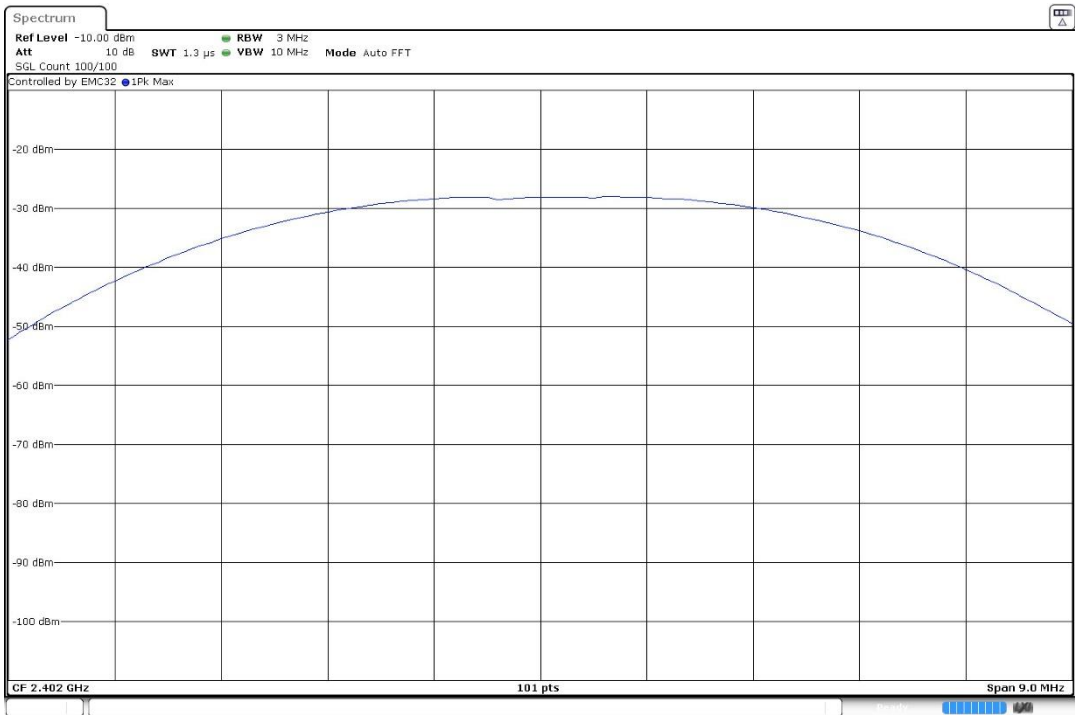
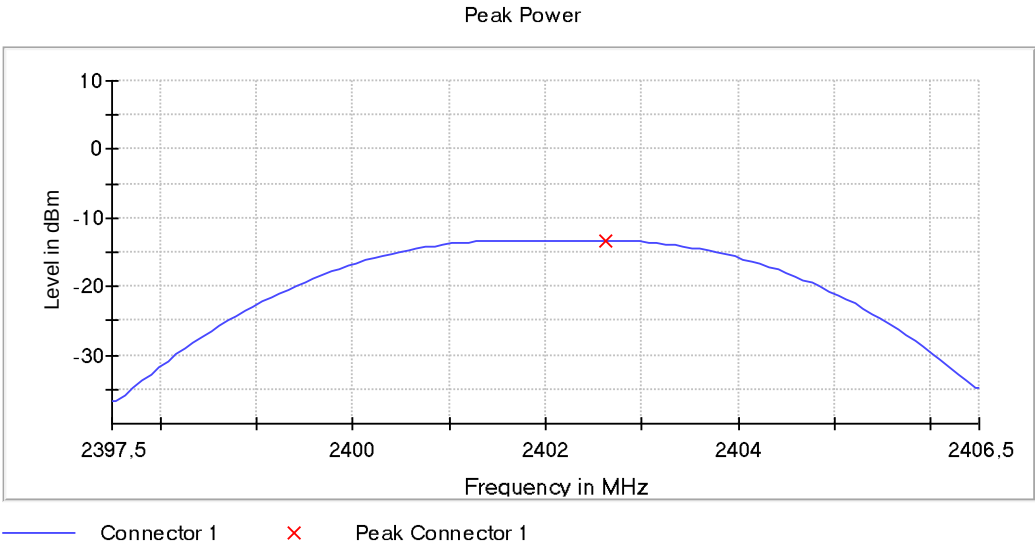
Verdict

Pass

Attachments

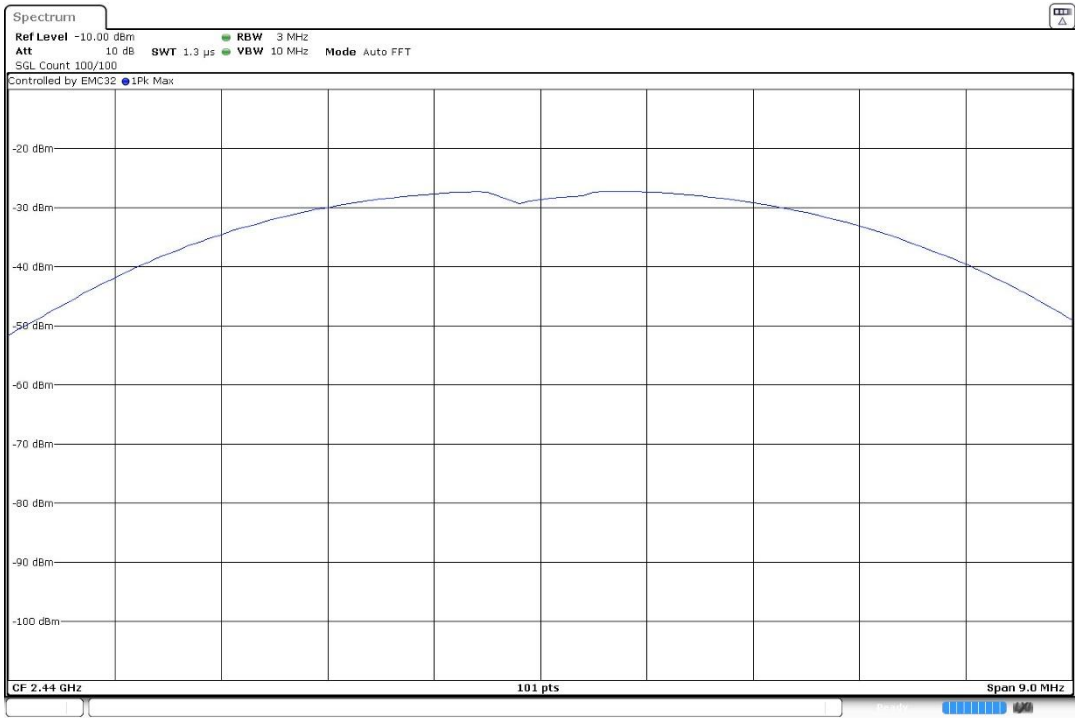
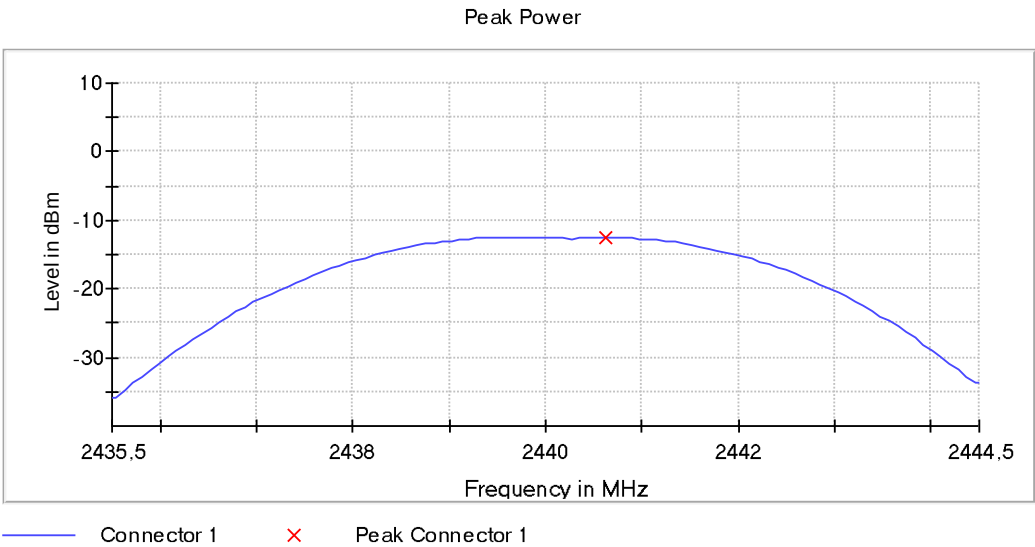
Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



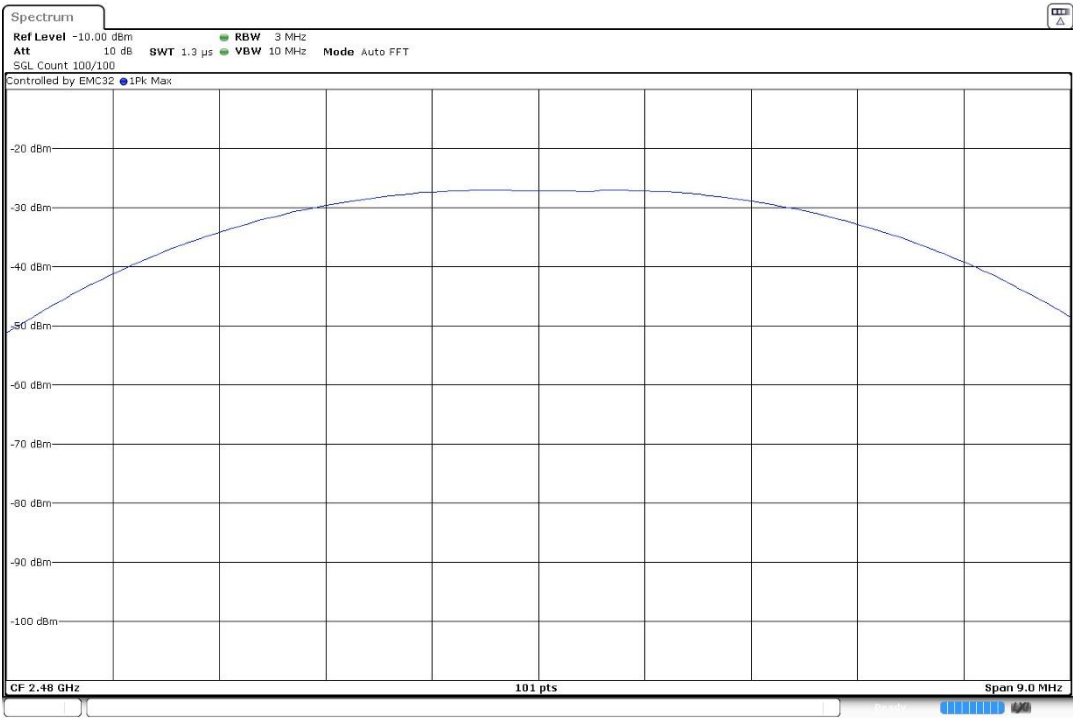
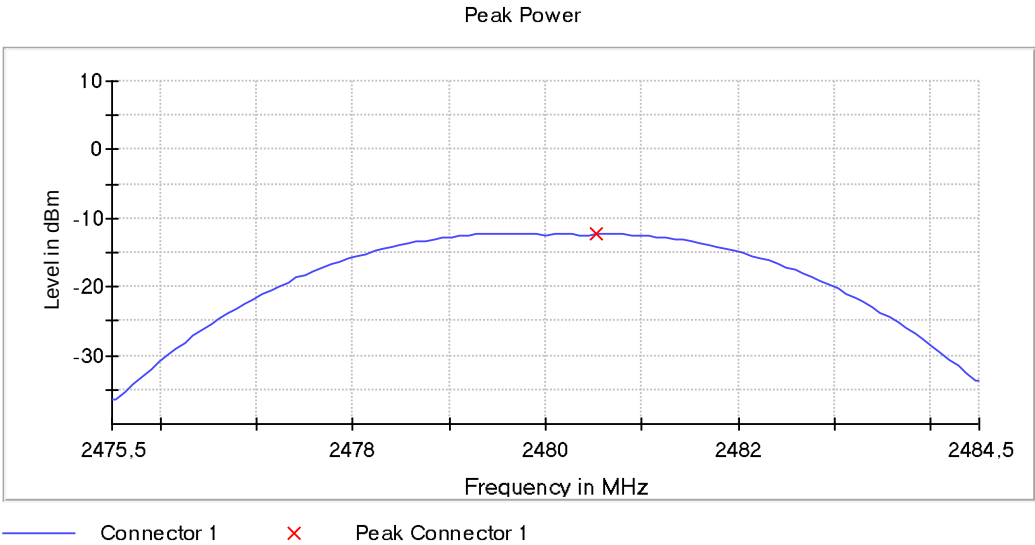
Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2, Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



RSS-247 5.5 / FCC 15.247 (d) [Bndedge] 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.

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Freq (MHz)	Inband Peak Lvl (dBm)	Freq (MHz)	Lvl (dBm)
2402.00000	-2.7	2399.975000	-39.5
	-2.7	2399.925000	-42.0
	-2.7	2399.875000	-42.3
	-2.7	2399.825000	-45.3
	-2.7	2399.775000	-47.9
	-2.7	2399.725000	-49.8
	-2.7	2399.675000	-52.2
	-2.7	2399.625000	-53.0
2480.00000	-2.7	2399.575000	-54.9
	-3.3	2483.525000	-63.3
	-3.3	2483.725000	-63.4
	-3.3	2483.675000	-63.5
	-3.3	2483.575000	-63.5
	-3.3	2483.625000	-64.3
	-3.3	2483.775000	-65.1
	-3.3	2483.825000	-65.6
2402.00000	-3.3	2483.875000	-65.9
	-3.3	2483.975000	-65.9
	-2.7	2399.525000	-57.9
	-2.7	2399.475000	-58.9
	-2.7	2399.425000	-59.2
	-2.7	2399.175000	-59.4
2480.00000	-2.7	2399.125000	-59.6
	-2.7	2399.325000	-59.8
	-3.3	2484.325000	-66.1
	-3.3	2484.375000	-66.1
2402.00000	-3.3	2484.025000	-66.2
	-3.3	2484.225000	-66.6

Freq (MHz)	Inband Peak Lvl (dBm)	Freq (MHz)	Lvl (dBm)
	-3.3	2484.175000	-66.6
	-3.3	2484.275000	-66.8

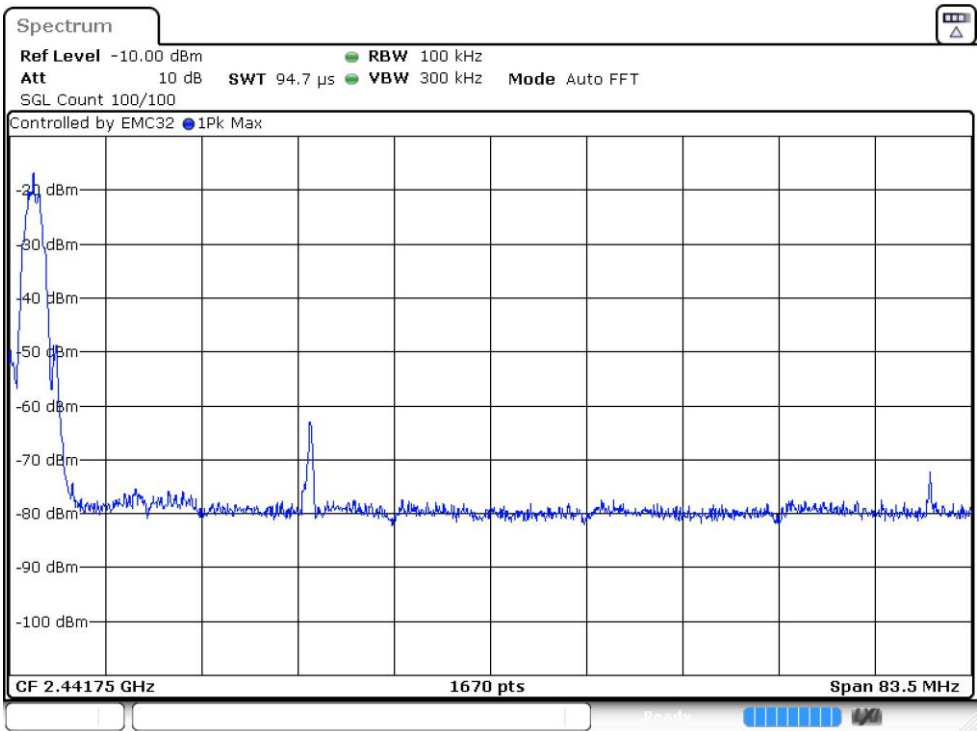
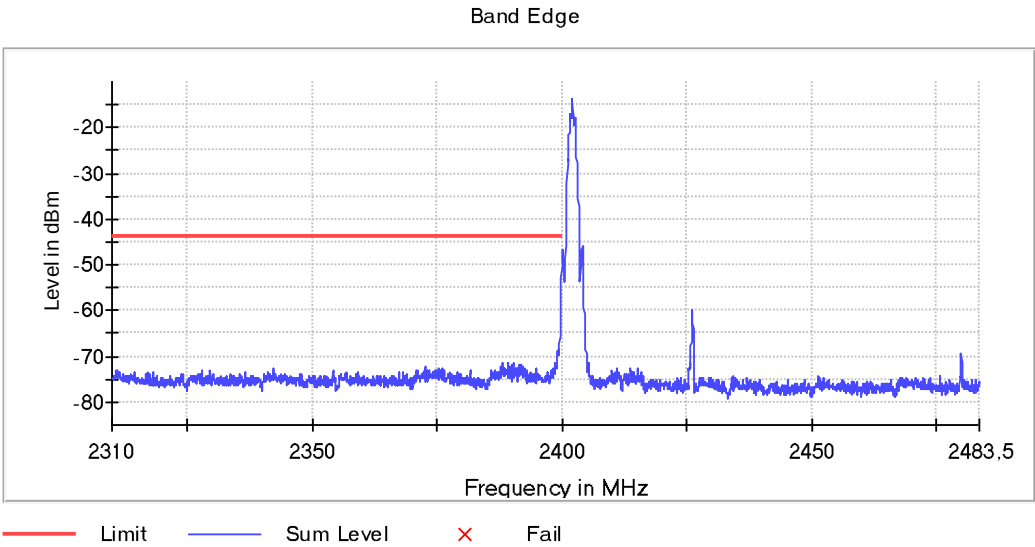
Verdict

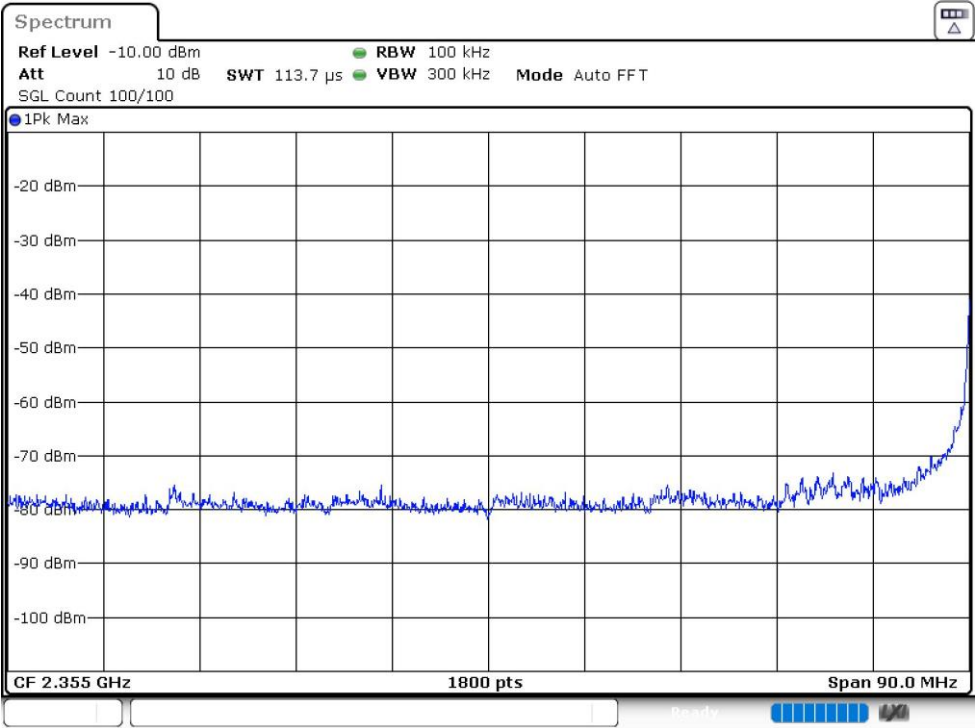
Pass

Attachments

Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2, Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Measurement Point = 1, Active Port = 1

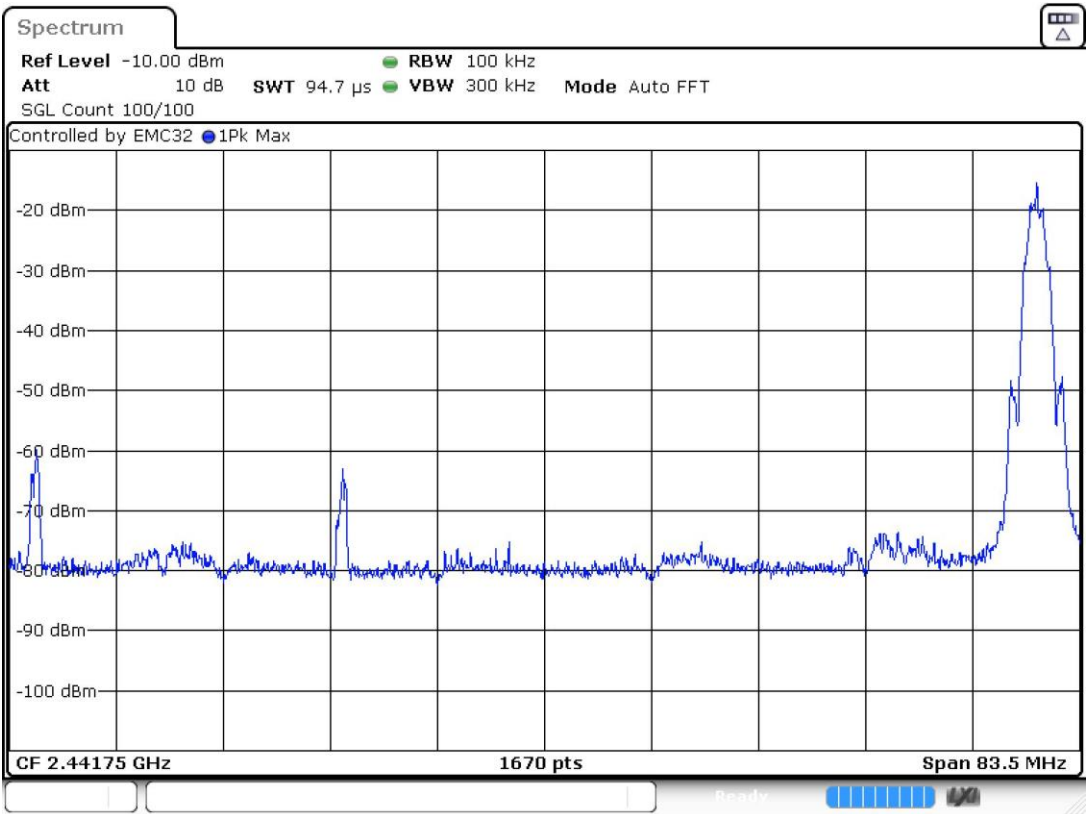
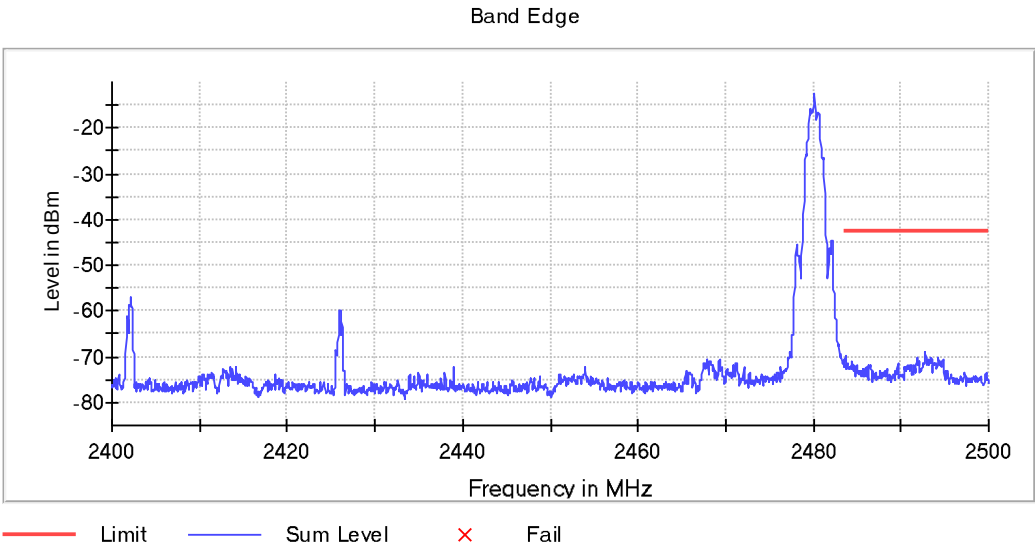
Images:

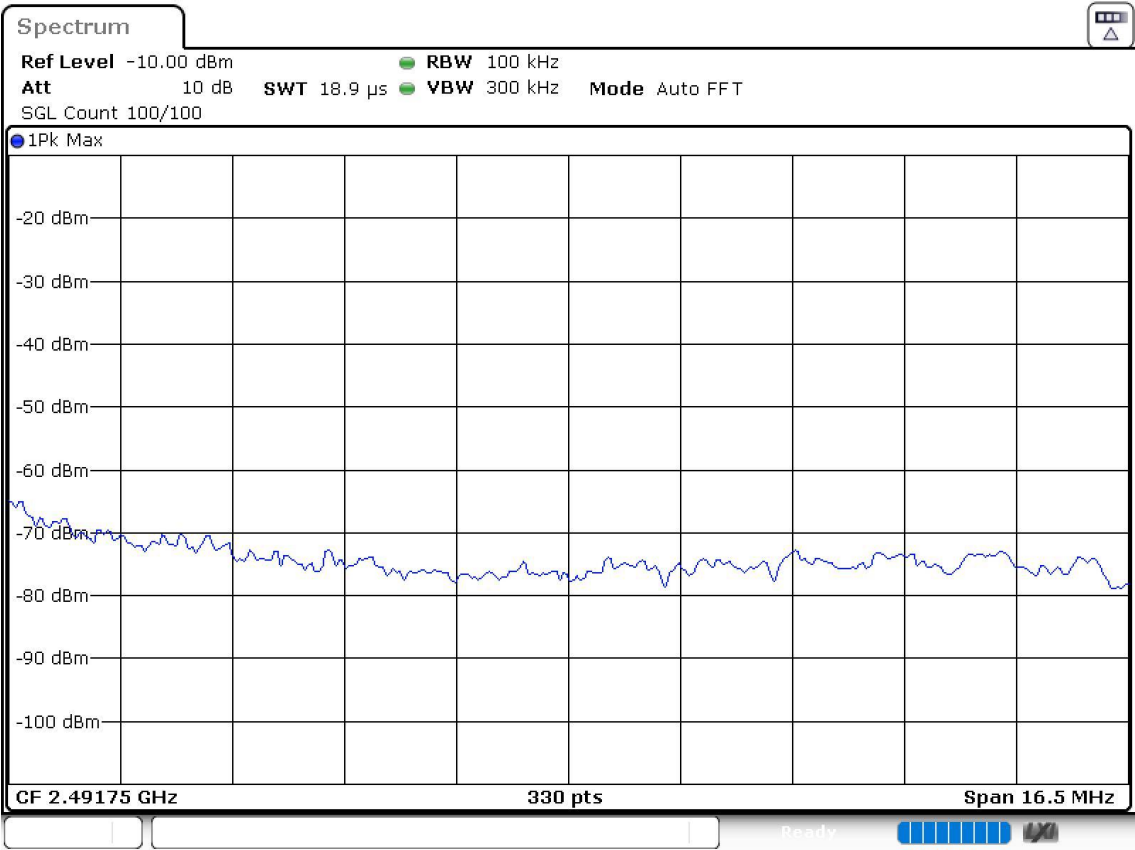




Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Measurement Point = 1,
Active Port = 1

Images:





99dBw Occupied Channel Bandwidth 99%

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

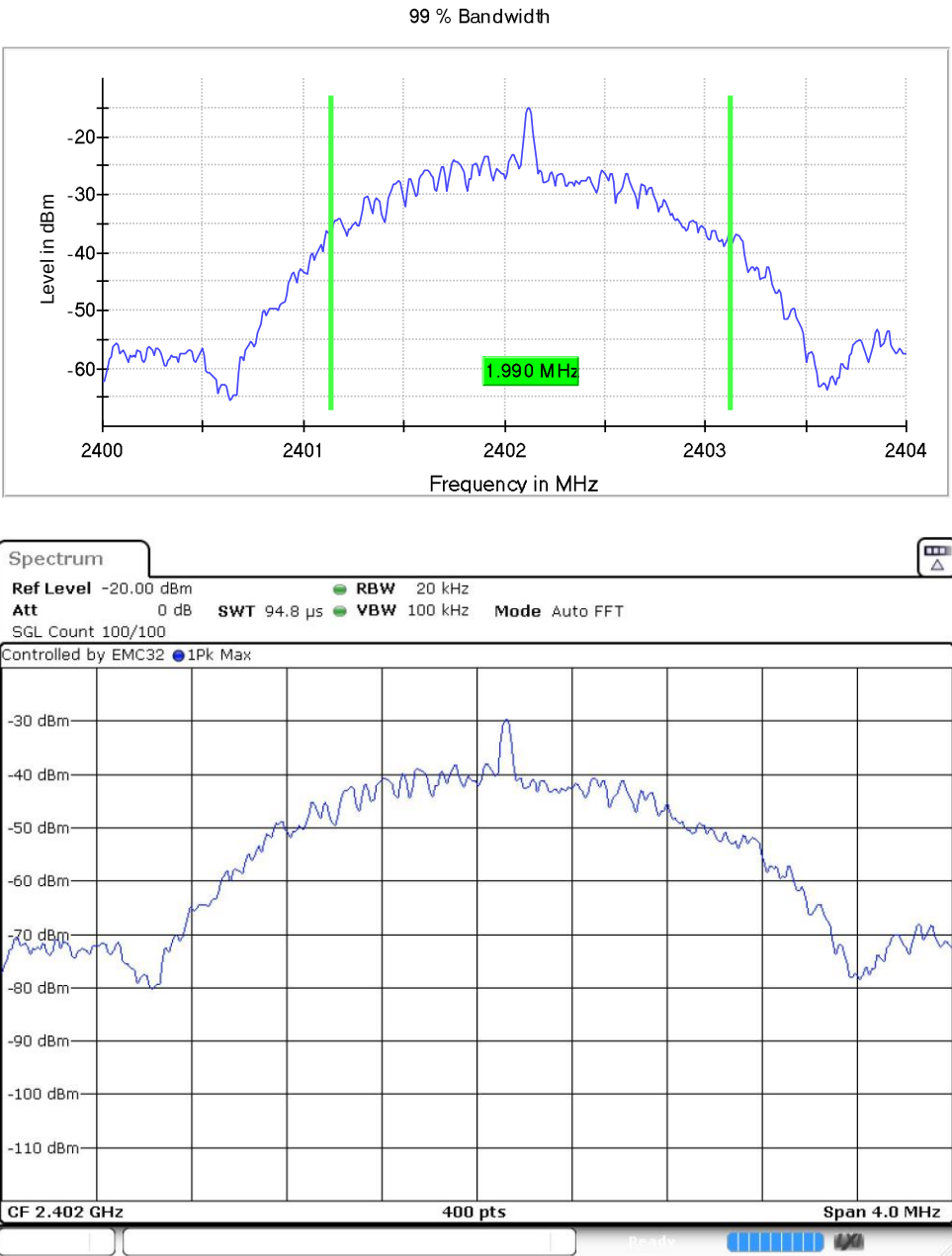
Results

Freq (MHz)	Occ Ch BW (MHz)
2402.00000	1.990
2440.00000	1,990
2480.00000	1,990

Attachments

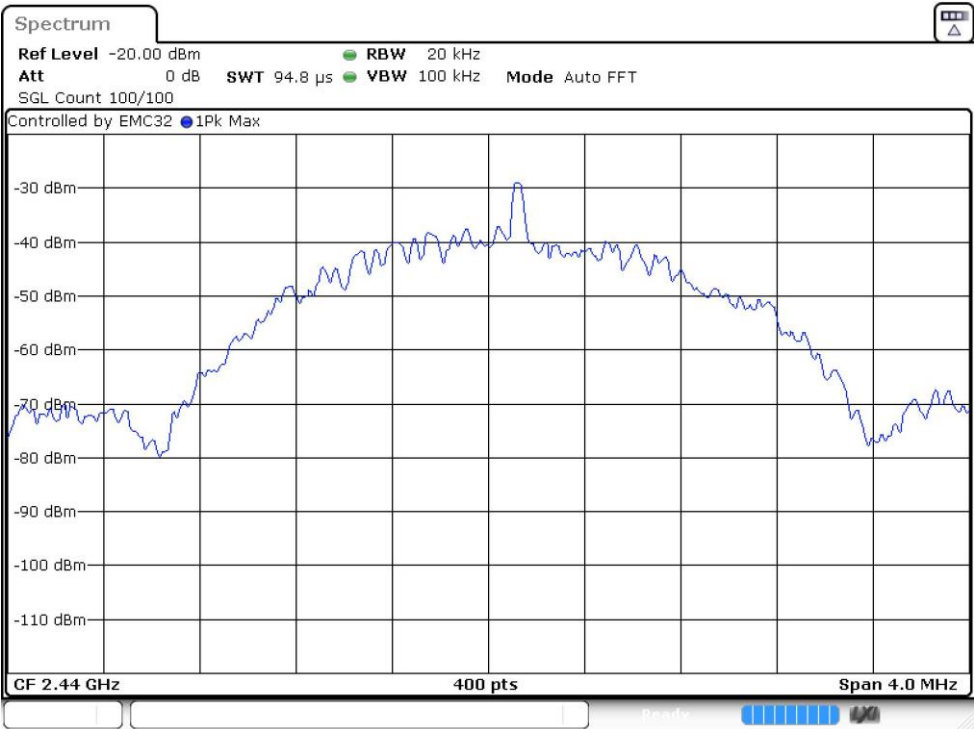
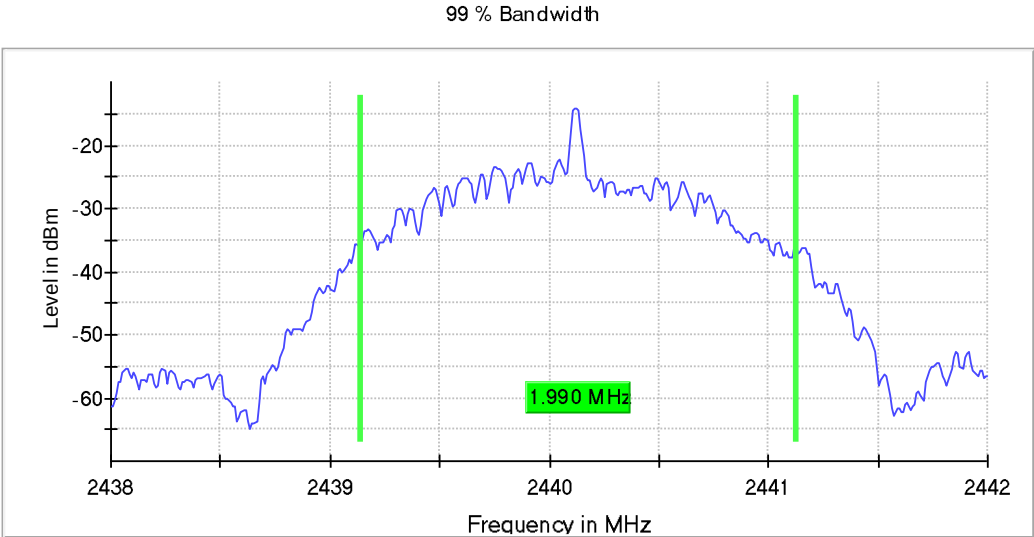
Frequency MHz = 2402.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2, Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



Frequency MHz = 2440.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:



Frequency MHz = 2480.00000, Equipment Type = Digital Transmission System (DTS), Bandwidth MHz = 2,
Modulation = BTLE 5.0 (GFSK 2 Mbit/s), Number of Transmission Chains = 1, Active Port = 1

Images:

