DEKRA Certification, Inc.
405 Glenn Dr. Suite 12,
Sterling, VA 20164
United States of America

FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test Report No:
3735ERM.005A2

Test Report

USA FCC Part 15.247, 15.209, 15.207; & CANADA RSS-247, RSS-Gen

Radio Frequency Devices. Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices.

(*) Identification of item tested	Automotive Rear Seat Entertainment LCD Display mounted on the ceiling
(*) Trademark	Innolux
(*) Model and /or type reference	Padi 31.3 CN
Other identification of the product	FCC ID: 2AQPW-DD313IA-01A IC: 27960-DD313IA01A
(*) Features	Bluetooth Classic
Manufacturer	CARUX TECHNOLOGY INC. No. 12, Building B, Nanke 8th Road, Shanhua District, Tainan City, 74144
Test method requested, standard	USA FCC Part 15.247 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-20 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.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager Digitally signed by Domingo Galvez DN: cn=Domingo Galvez, o=DEKRA Certification Inc., ou=Regulatory Lab, email=dgalvez@dekra.com, c=US
Date of issue	12-07-2022
Report template No	FDT08_24 (*) "Data provided by the client"

Index

Acronyms

Acronym ID	Acronym Description
# of Tx Chains	Number of Transmission Chains
26Ebw	Emission Bandwidth
Avg COT	Average Channel Occupancy Time
BW	Bandwidth
Detector	Detector used
Equipment	Equipment Type
Freq	Frequency
Freq Rng	Frequency Range
Freq Sep	Frequency Separation
Inband Peak Lvl	Inband Peak Level
Lvl	Level
MP	Measurement Point
Mod	Modulation
NHC	Number of Hopping Channels
NHp	Number of hops over the period
Occ Ch BW	Occupied Channel Bandwidth
Peak Power	Maximum Peak Conducted Output Power
Pol	Polarization
Port	Active Port
Unwanted Freq	Unwanted Emissions Frequency
Unwanted Lvl	Unwanted Emissions Level

Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

DEKRA Certification Inc. 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 Certification at the time of performance of the test.

DEKRA Certification Inc. 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.

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 Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Certification internal document PODT000.

Test case	Frequency (MHz)	U (k=2)	Units
RF Power and PSD	5150-5850	0.88	dB
Occupied Bandwidth		1.87	%
Dwell Time		0.01	%
Band Edge		0.64	dB
Radiated Spurious Emission	30-180	4.27	dB
	180-1000	3.14	dB
	1000-18000	3.30	dB
	18000-40000	3.49	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 an Automotive Rear Seat Entertainment LCD Display mounted on the ceiling

DEKRA 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.

Sample S/01 is composed of the following elements, accessories and auxiliary equipment:

Id	Control Number	Description	Manufacturer/Model	Serial Nº	Date of Reception	Application
S/01	3735/01	Automotive Rear Seat Entertainment LCD Display	Innolux / Padi 31.3	0611211109	2022-08-15	Element Under Test
S/01	3735/10	Padi Power DC Cable	-	-	2022-08-15	Accessory
S/01	3735/16	AC/DC Adapter	TT Electronics / SW3477D	-	2022-08-15	Accessory
S/01	3735/26	USB 3.0A female to USB-C 3.1 male - Adapter	ALLTEQ	-	2022-08-15	Accessory
S/01	3735/30	Pen drive	Scandisk / SDCZ48-016G	-	2022-08-15	Accessory
S/01	3735/32	Gigabit Ethernet Adapter	StarTech / USB31000S	211001000649	2022-08-15	Accessory
S/01	3735/34	UTP RJ45 to RJ45 Ethernet cable - 2m	Cat5e	-	2022-08-15	Accessory
S/01	1302	Automotive Ethernet Adapter	Rad Moon	12813	-	Auxiliary
S/01	DEKRA 46	Broad-Reach (100Base-T1) to OABR cable	-	-	-	Auxiliary
S/01	DEKRA 02	Laptop	DELL / Latitude 5470	9T12LT2	-	Auxiliary

Sample S/01 was used for the following test(s): All Radiated test indicated in appendix A.

Sample S/02 is composed of the following elements, accessories and auxiliary equipment:

Id	Control Number	Description	Manufacturer/Model	Serial Nº	Date of Reception	Application
S/02	3735/06	Automotive Rear Seat Entertainment LCD Display	Innolux / Padi 31.3	2311211114	2022-08-15	Element Under Test
S/02	3735/09	Padi Power DC Cable	-	-	2022-08-15	Accessory
S/02	3735/15	AC/DC Adapter	TT Electronics / SW3477D	-	2022-08-15	Accessory
S/02	3735/24	USB 3.0A female to USB-C 3.1 male - Adapter	ALLTEQ	-	2022-08-15	Accessory
S/02	3735/30	Pen drive	Scandisk / SDCZ48-016G	-	2022-08-15	Accessory
S/02	3735/31	Gigabit Ethernet Adapter	StarTech / USB31000S	211001000649	2022-08-15	Accessory
S/02	3735/34	UTP RJ45 to RJ45 Ethernet cable - 2m	Cat5e	-	2022-08-15	Accessory
S/02	DEKRA 40	Automotive Ethernet Adapter	BR-Adapter	-	-	Auxiliary
S/02	DEKRA 42	HSD (male) to OABR cable	-	-	-	Auxiliary
S/02	DEKRA 05	Laptop	DELL / Latitude 7240	16NWL32	-	Auxiliary

Sample S/02, was used for the following test(s): All Conducted test indicated in appendix A.

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Test sample description

Test Sample description (compulsory information for EMC and RF testing services

Ports…… :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded	Coupled to patient	
	USB-C		2	☒	☒	☐	
	HDMI		2	☒	☒	☐	
	Headphone jacks		2	☒	☒	☐	
	OABR		2	☒	☒	☐	
	Power Supply		2	☒	☐	☐	
Supplementary information to the ports…… :	No Data Provided						
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 13 Vdc					
	☐	DC:					
Rated Power .....:	110 Watts						
Clock frequencies.....:	No Data Provided						
Other parameters.....:	No Data Provided						
Software version .....:	12						
Hardware version.....:	12						
Dimensions in cm (W x H x D) ....:	82.5 X 26 X 4.6						
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		
	Padi 31.3, GDD313IA0010S		China		CarUX		

Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	No Data Provided		
Documents as provided by the applicant.....:	Description	File name	Issue date
	Declaration Equipment Data	FDT30_18 Declaration Equipment Data Signed	09/13/2022

Copy of marking plate:

Identification of the client

Innolux Europe BV
Stationsstraat 39G, 6411NK, Heerlen
Netherlands

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	2022-08-19
Date (finish)	2022-09-06

Document history

Report number	Date	Description
3735ERM.005	09-16-2022	First release.
3735ERM.005A1	10-27-2022	Second release.
3735ERM.005A2	12-07-2022	Third release. Modification of the model name of sample tested in the cover page. This modification of test report cancels and replaces the test report 3735ERM.005A1.

Environmental conditions

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

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

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

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

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

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

Remarks and comments

The tests have been performed by the technical personnel: Lakshmi Gollamudi, Juliana Cherry, Yuri Barone, Nasir Khan and Koji Nishimoto.

List of equipment used during the test

FCC 47 CFR Part 15.247 / RSS-247

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	Serial No	LAST CALIBRATION	NEXT CALIBRATION
1039	FSV40 SIGNAL ANALYSER 40GHZ	101627	2020-09-24	2022-09-24
1042	SMBV 100A VECTOR SIGNAL GENERATOR	262575	2022-03-16	2024-03-16

1107	ETHERNET SNMP THERMOMETER	60038026952	2020-09-16	2022-09-16
1313	WIRELESS MEASUREMENT SOFTWARE R&S WMS32	-	N/A	N/A

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	Serial No	LAST CALIBRATION	NEXT CALIBRATION
981	LOW NOISE PREAMPLIFIER	1711156B	2020-11-10	2022-11-10
1012	ESR26 EMI TEST RECEIVER	101478	2022-04-12	2024-04-12
1014	FSV40 SIGNAL ANALYZER 40GHZ	101626	2021-05-19	2023-05-19
1056	3116C DOUBLE-RIDGED WAVEGUIDE HORN ANTENNAS	213179	2020-01-10	2023-01-10
1057	3115 DOUBLE-RIDGED WAVEGUIDE HORN ANTENNAS	211373	2020-06-03	2023-06-03
1065	3142E BICONILOG ANTENNA	208587	2020-08-13	2023-08-13
1108	ETHERNET SNMP THERMOMETER	60038026954	2020-09-16	2022-09-16
1111	ETHERNET SNMP THERMOMETER	60038026577	2020-09-16	2022-09-16
1179	SEMI-ANECHOIC CHAMBER	F169021	N/A	N/A
1314	WIRELESS MEASUREMENT SOFTWARE R&S EMC32	1040-OT102236	N/A	N/A

Testing verdicts

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

Summary

Bluetooth EDR

Requirement – Test case	FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
RSS-247 5.1 (b) / FCC 15.247 (a) (1) 20 dB Bandwidth		Pass	N/A
FCC 2.1049 / 99dBw Occupied Channel Bandwidth 99%		Pass	N/A
RSS-247 5.1 (b) / FCC 15.247 (a) (1) Carrier Frequency Separation		Pass	N/A
RSS-247 5.1 (d) / FCC 15.247 (a) (1) (iii) Time of Occupancy (Dwell Time)		Pass	N/A
RSS-247 5.1 (d) / FCC 15.247 (a) (1) (iii) Number of hopping channels		Pass	N/A
RSS-247 5.4 (b) / FCC 15.247 (b) (1) Maximum Peak Conducted output power & Antenna gain		Pass	N/A
RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter) - Conducted		Pass	N/A
RSS-247 5.5 / FCC 15.247 (d) Emissions compliance (Transmitter) - Conducted		N/A	Refer 1
RSS-247 5.5 / FCC 15.247 (d) Emissions compliance (Transmitter) - Radiated		Pass	N/A

Supplementary information and remarks:

1. DUT has an integral antenna, and no conducted testing is required

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Appendix A: Test results. Bluetooth EDR

PRODUCT INFORMATION

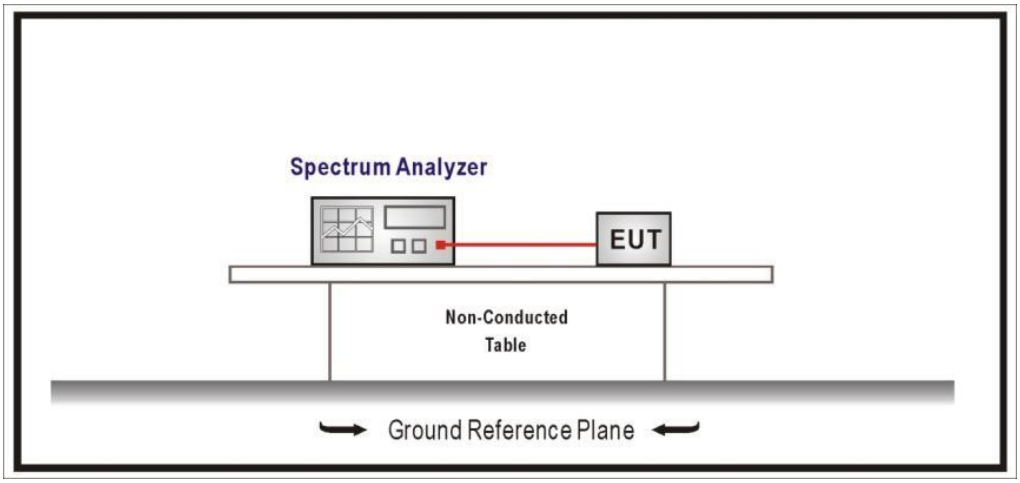
Information	Description
Modulation	BR/EDR: GFSK, π/4-DQPSK, 8-DPSK
Operation mode 1: Single Antenna Equipment	
- Operating Frequency Band	BR/EDR: 2400 - 2483.5 MHz
- Nominal Channel Bandwidth	BR/EDR: 1 MHz
- RF Output Power	BR/EDR: 4 dBm
Antenna type	Whip
Antenna gain	-3.2 dBi
Nominal Voltage	
- Supply Voltage	13 Vdc
- Type of power source	DC voltage
Equipment type	Bluetooth Classic (BR & EDR)
Geo-location capability	No

TEST CONDITIONS

(*): Data provided by the client.

TEST CONDITIONS	DESCRIPTION
TC#01	Power supply (V): $V_{nominal}$ = 13 Vdc Modulation: GFSK Test Frequencies for conducted/Radiated tests: Lowest range: 2402 MHz Middle channel: 2441 MHz Highest range: 2480 MHz
TC#02	Power supply (V): $V_{nominal}$ = 13 Vdc Modulation: π/4-DQPSK Test Frequencies for Conducted/Radiated tests: Lowest range: 2402 MHz Middle channel: 2441 MHz Highest range: 2480 MHz
TC#03	Power supply (V): PI $V_{nominal}$ = 13 Vdc Modulation: 8DPSK Test Frequencies for Conducted/Radiated tests: Lowest range: 2402 MHz Middle channel: 2441 MHz Highest range: 2480 MHz

CONDUCTED MEASUREMENTS:



RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at 3 m for the frequency range 30-1000 MHz (Bilog antenna) and 1-18 GHz Double ridge horn antennas, and 1m for the frequency range 18 GHz- 26 GHz Double ridge horn antenna.

For radiated emissions in the range 18 - 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 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

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

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

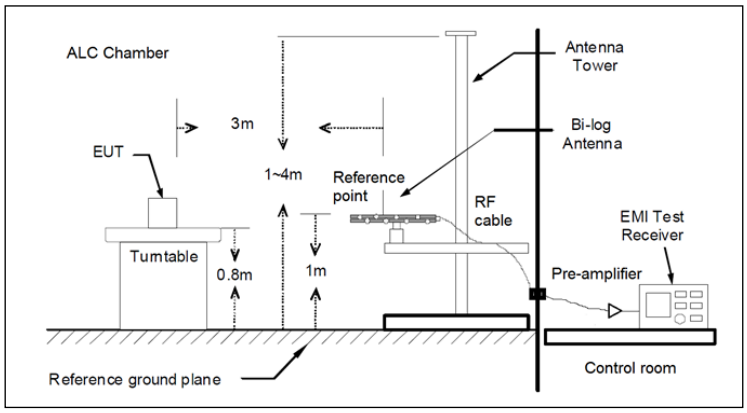


Fig A1: Radiated measurements Setup f < 1 GHz

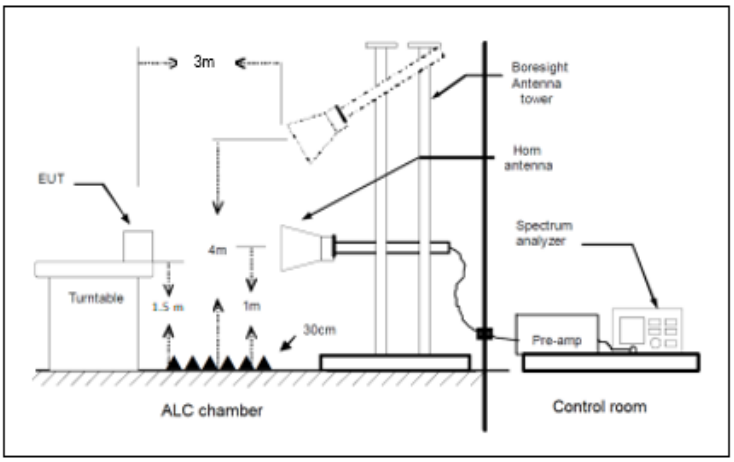


Fig A2: Radiated measurements setup f > 1-18 GHz

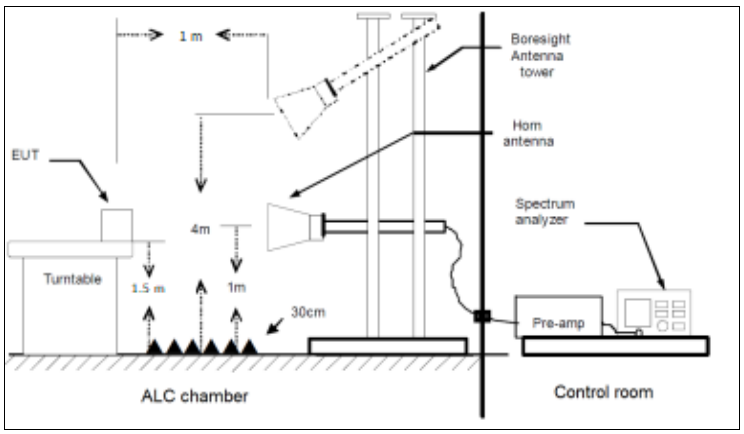


Fig A3: Radiated measurements setup f > 18 GHz

TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247

RSS-247 5.1 (b) / FCC 15.247 (a) (1) 20 dB Bandwidth

Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Modulation: BT (GFSK 1-DH5)
Results

Freq (MHz)	Equipment	BW (MHz)	20 dB Emission Bandwidth (MHz)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	1	0.930
2441.00000			0.930
2480.00000			0.930

Modulation: BT (π/4 DQPSK 2-DH5)
Results

Freq (MHz)	Equipment	BW (MHz)	20 dB Emission Bandwidth (MHz)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	1	1.315
2441.00000			1.315
2480.00000			1.315

Modulation: BT (8DPSK 3-DH5)
Results

Freq (MHz)	Equipment	BW (MHz)	20 dB Emission Bandwidth (MHz)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	**1**	1.270
2441.00000			1.270
2480.00000			1.270

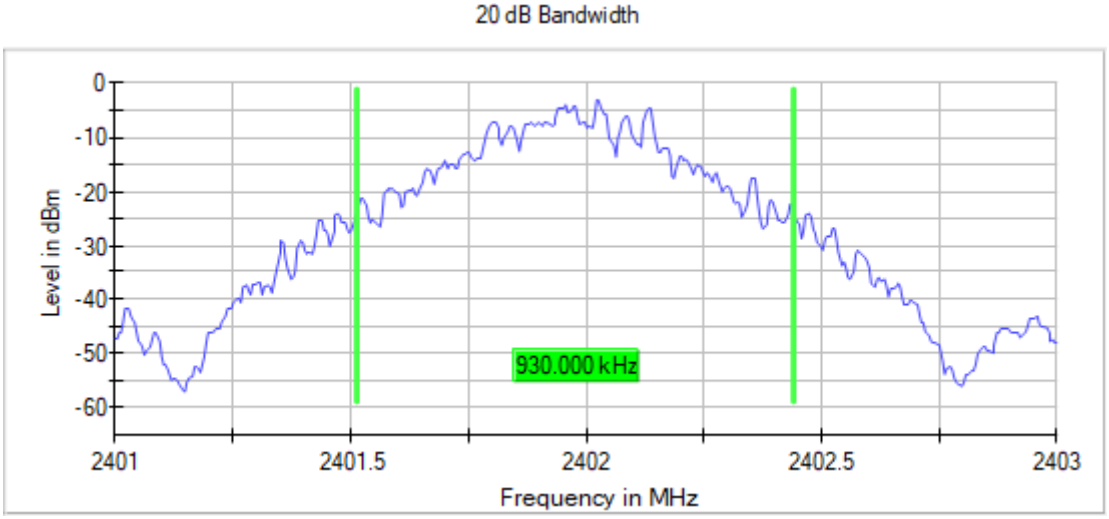
Verdict

Pass

Attachments

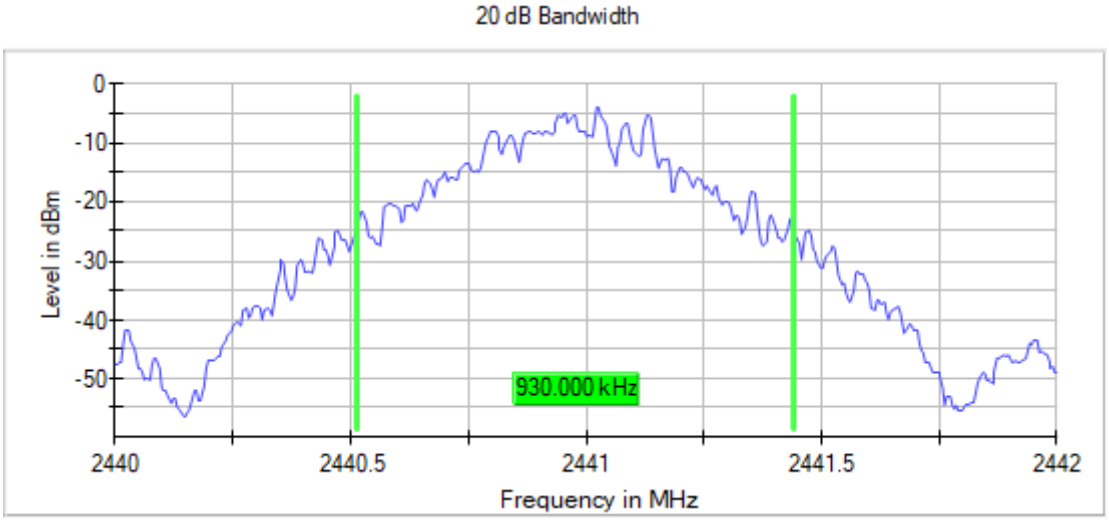
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



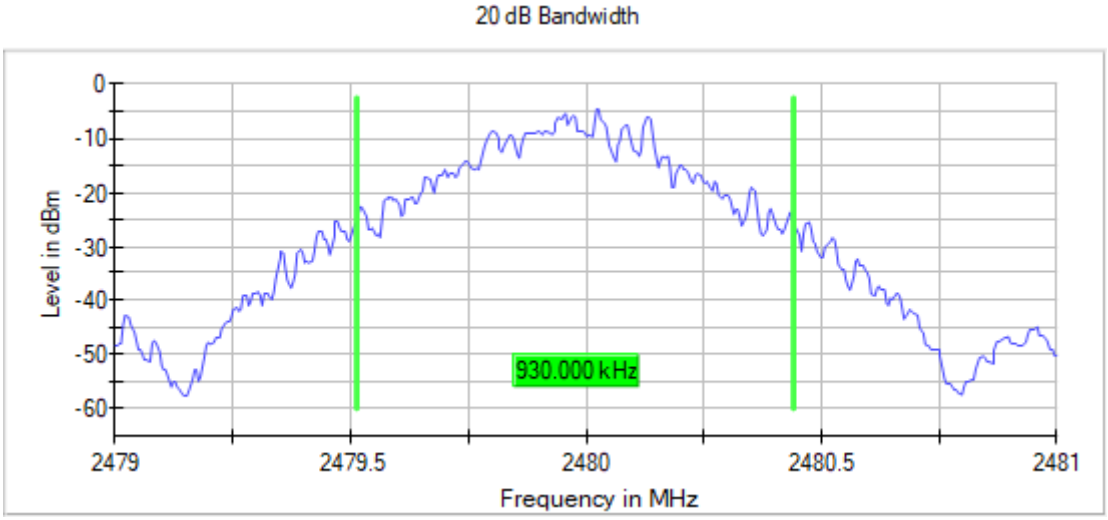
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



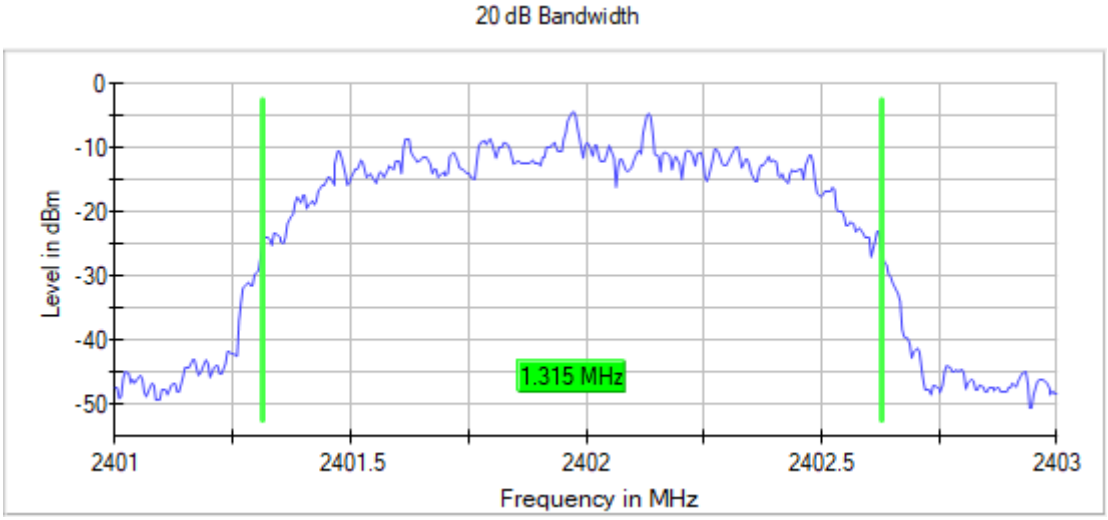
Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



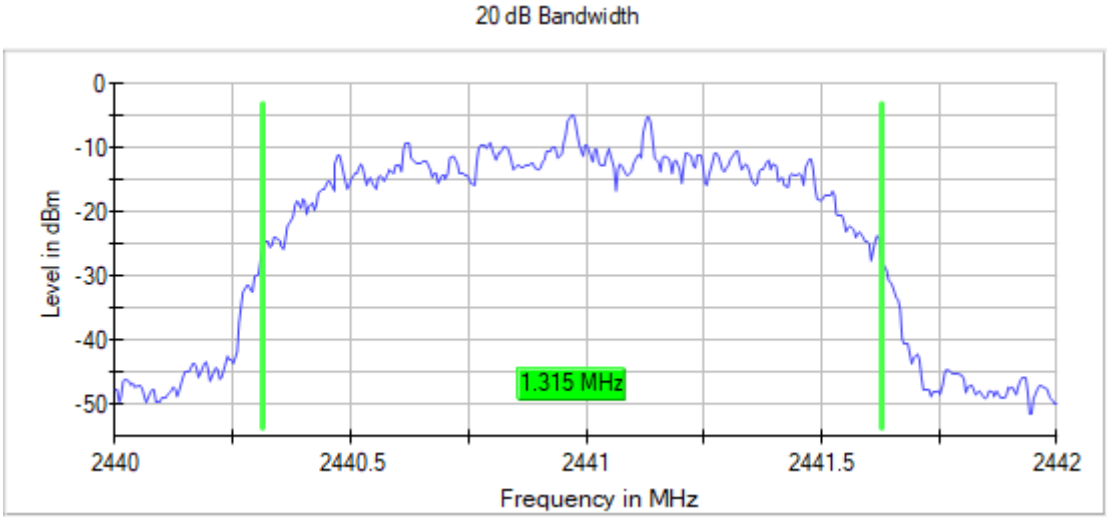
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

Images:



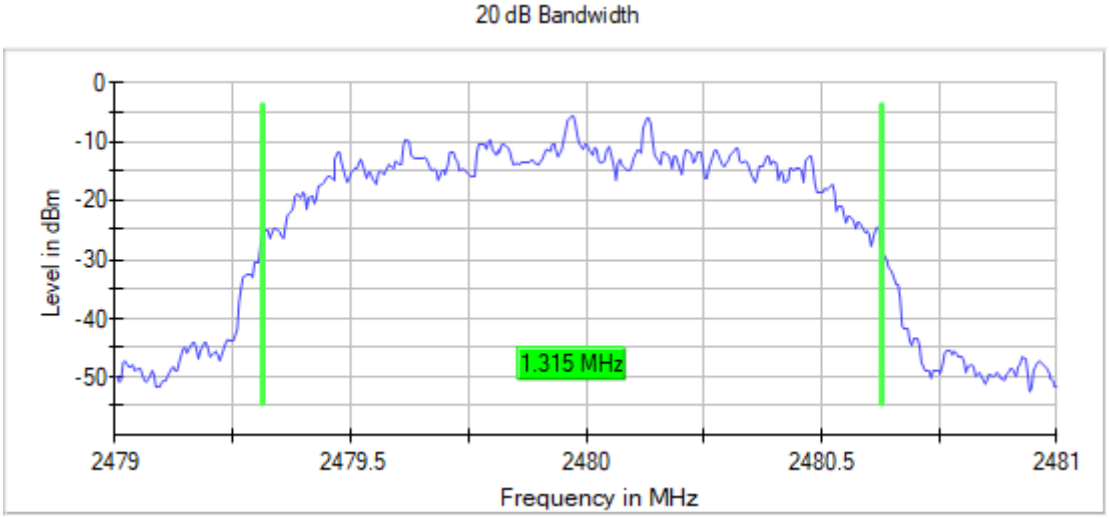
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

Images:



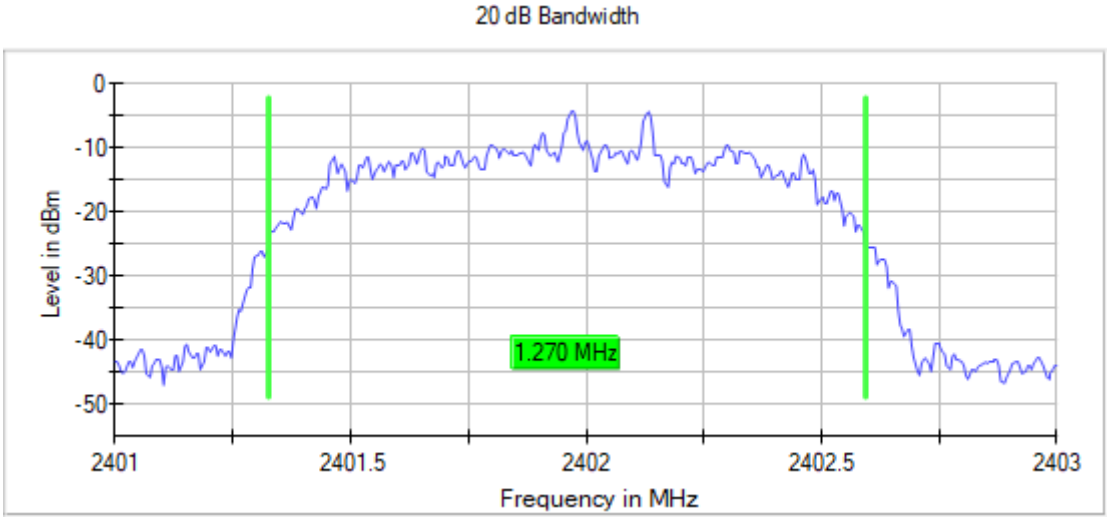
Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

Images:



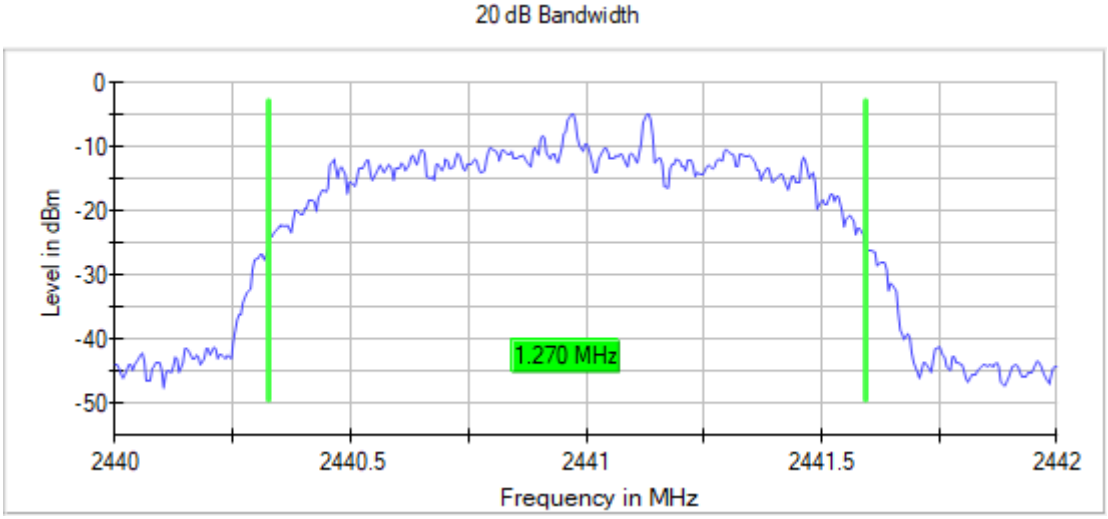
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



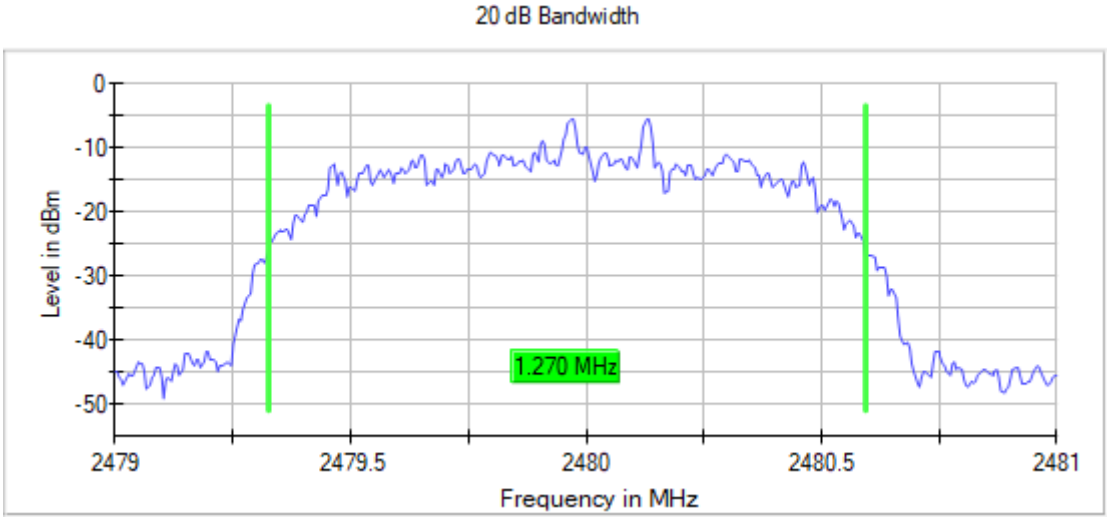
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



Measurement Set up

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40100 GHz	2.44000 GHz	2.47900 GHz
Stop Frequency	2.40300 GHz	2.44200 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz	2.000 MHz
RBW	10.000 kHz	10.000 kHz	10.000 kHz
VBW	30.000 kHz	30.000 kHz	30.000 kHz
Sweep Points	400	400	400
Sweep time	189.648 µs	189.648 µs	189.648 µs
Reference Level	10.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	8 / max. 150	7 / max.	7 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.03 dB	0.04 dB	0.04 dB

RSS-247 5.2 (a) / FCC 15.247 (a) (2) 99dBw Occupied Channel Bandwidth 99%

Limits

No Limit has been set to this test case

Modulation: BT (GFSK 1-DH5)
Results

Freq (MHz)	Equipment	BW (MHz)	Occ Ch BW (MHz)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	1	0.865
2441.00000		1	0.865
2480.00000		1	0.865

Modulation: BT (Pi/4 DQPSK 2-DH5)
Results

Freq (MHz)	Equipment	BW (MHz)	Occ Ch BW (MHz)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	1	1.170
2441.00000		1	1.165
2480.00000		1	1.165

Modulation: BT (8DPSK 3-DH5)
Results

Freq (MHz)	Equipment	BW (MHz)	Occ Ch BW (MHz)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	1	1.175
2441.00000		1	1.175
2480.00000		1	1.170

Verdict

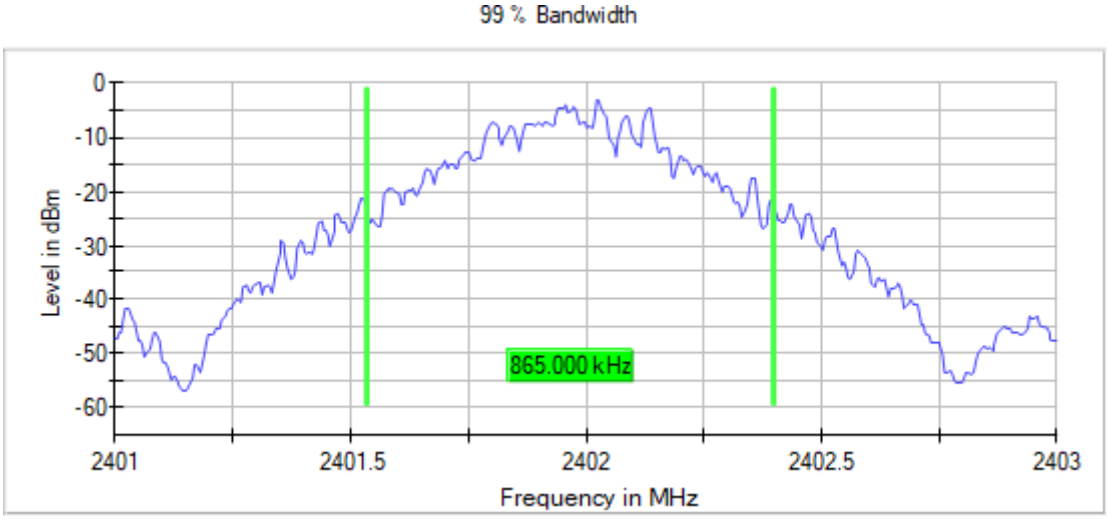
Pass

Modulation: BT (8DPSK 3-DH5)
Results

Attachments

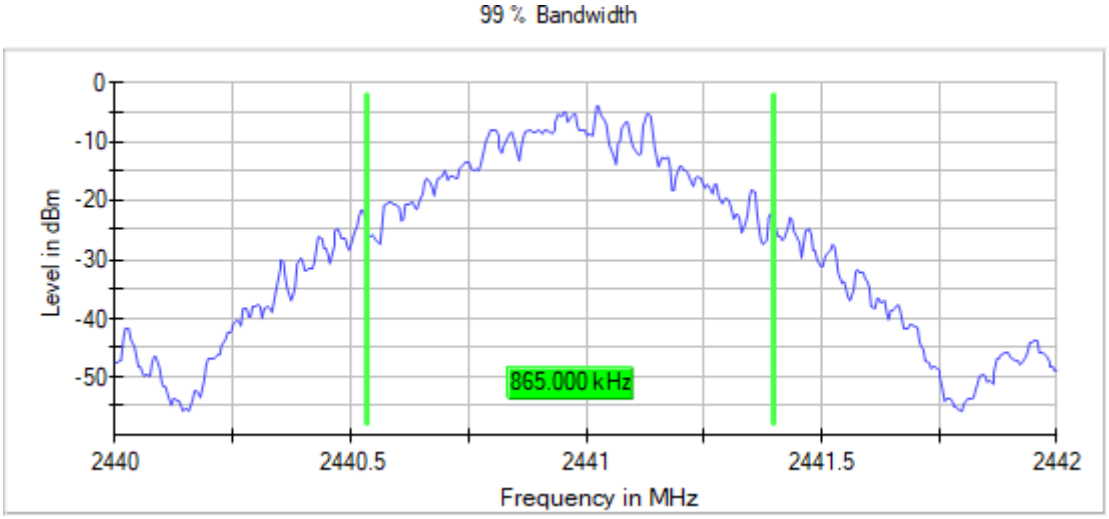
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



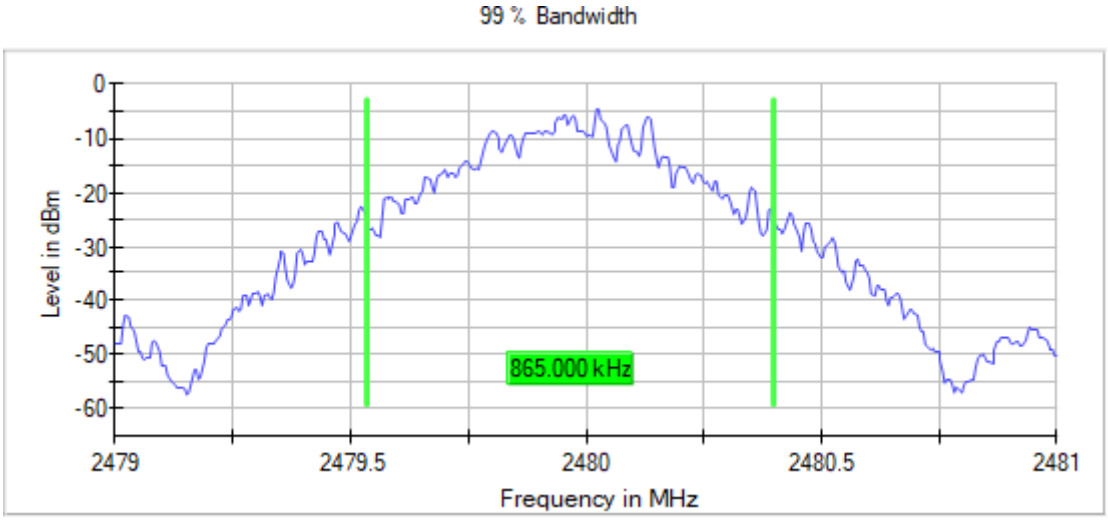
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

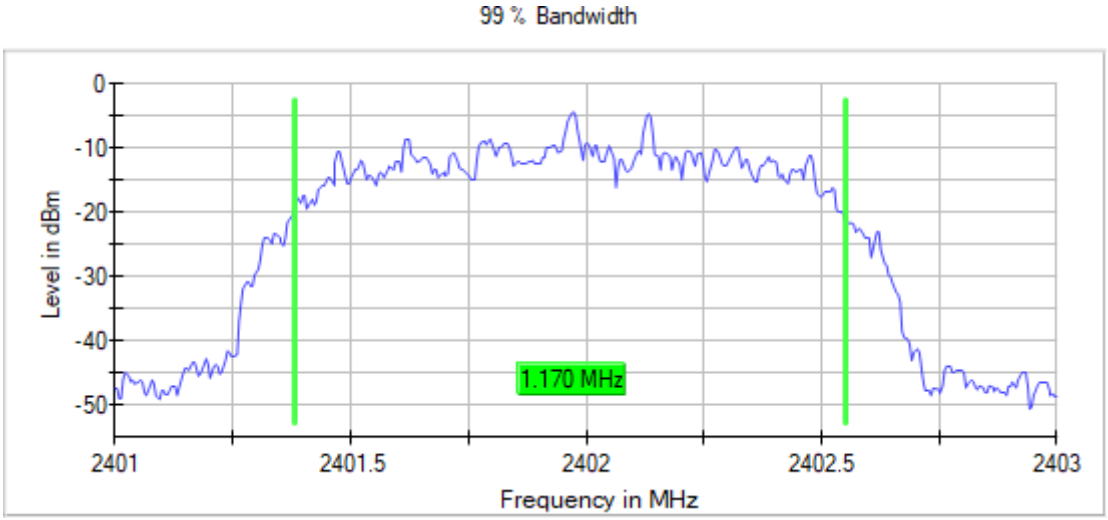
Images:



Attachments

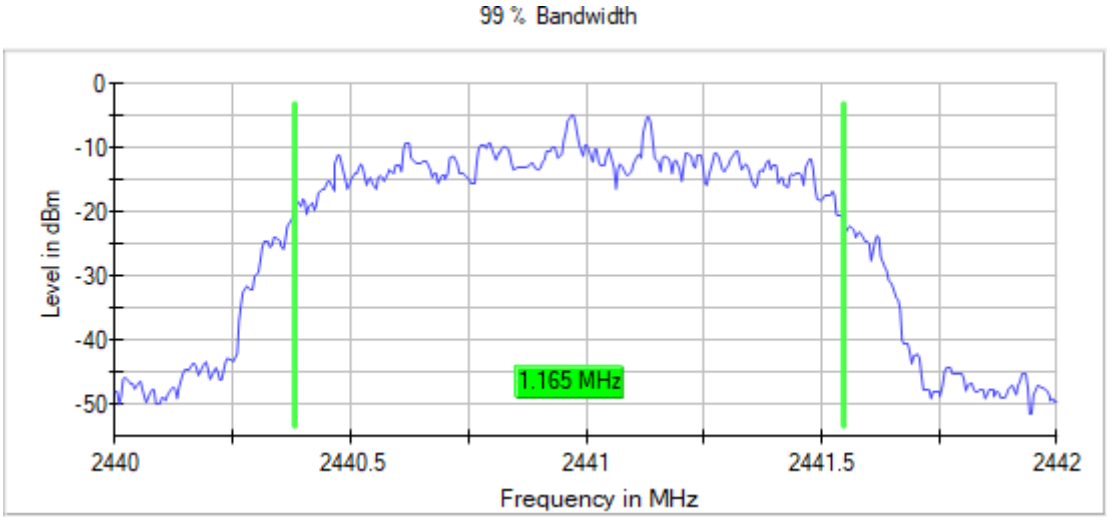
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

Images:



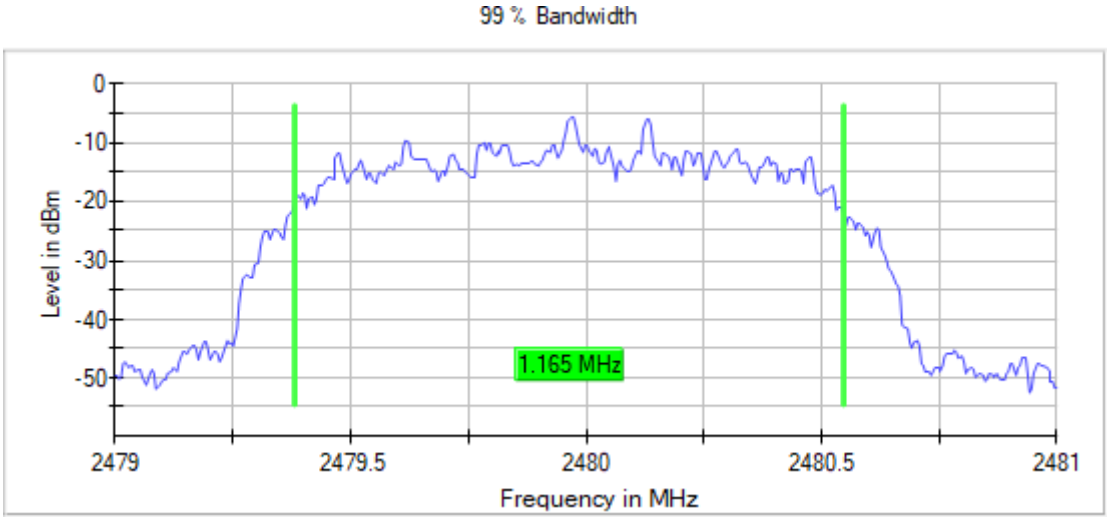
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

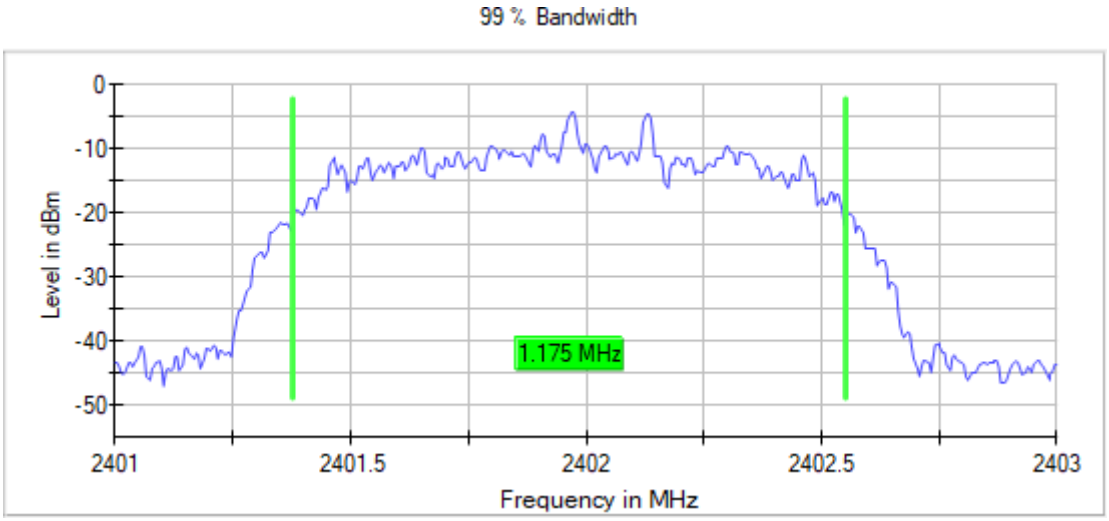
Images:



Attachments

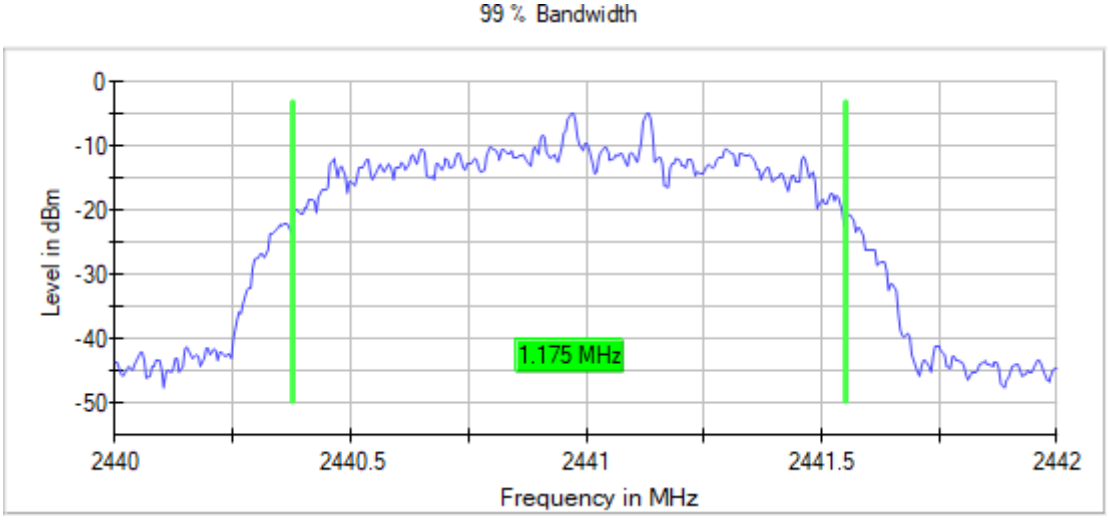
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



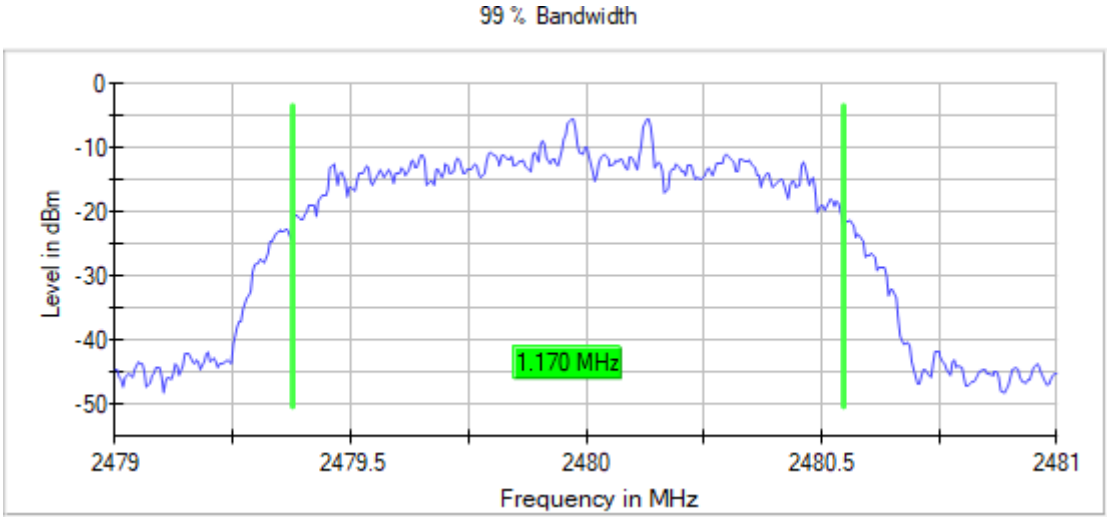
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



Measurement Set- up

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40100 GHz	2.44000 GHz	2.47900 GHz
Stop Frequency	2.40300 GHz	2.44200 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz	2.000 MHz
RBW	10.000 kHz	10.000 kHz	10.000 kHz
VBW	30.000 kHz	30.000 kHz	30.000 kHz
Sweep Points	400	400	400
Sweep time	189.648 us	189.648 us	189.648 us
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	500	500	500
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	off	off
Stable mode	Trace	Trace	Trace
Stable value	0.30 dB	0.30 dB	0.30 dB
Run	4 / max.150	5 / max.150	4 / max.150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.11 dB	0.06 dB	0.10 dB

RSS-247 5.1 (b) / FCC 15.247 (a) (1) Carrier Frequency Separation

Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Modulation: BT (GFSK 1-DH5)
Results

Equipment	BW (MHz)	Freq Sep (MHz)
Frequency Hopping Spread Spectrum systems (DSS)	1	0.98

Modulation: BT (π/4 DQPSK 2-DH5)
Results

Equipment	BW (MHz)	Freq Sep (MHz)
Frequency Hopping Spread Spectrum systems (DSS)	1	1.01

Modulation: BT (8DPSK 3-DH5)
Results

Equipment	BW (MHz)	Freq Sep (MHz)
Frequency Hopping Spread Spectrum systems (DSS)	1	1.01

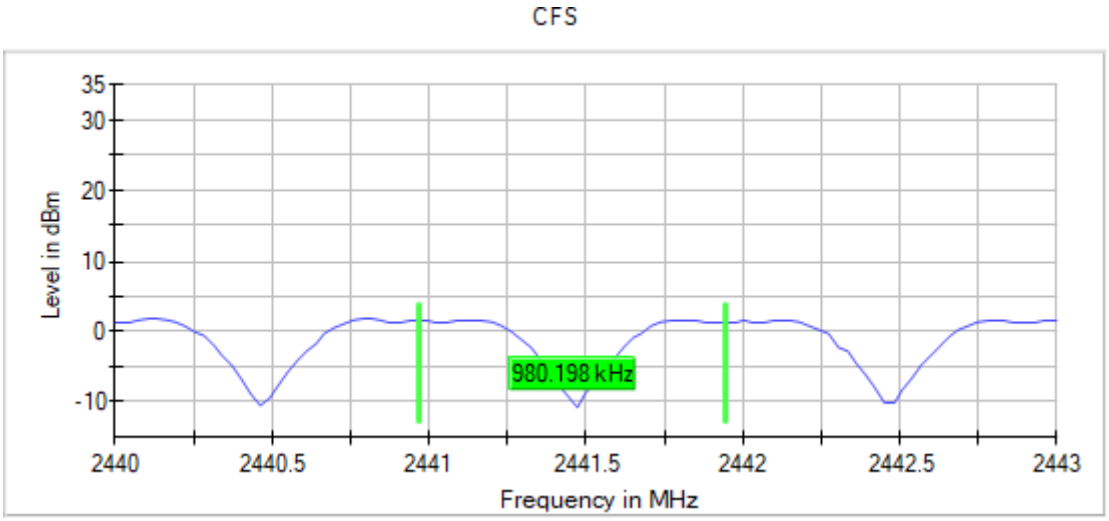
Verdict

Pass

Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

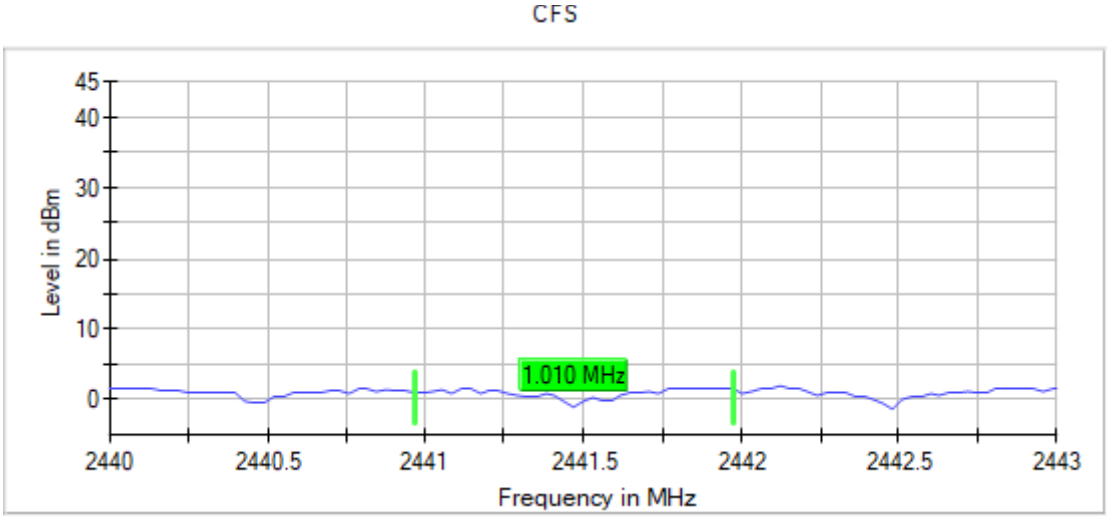
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

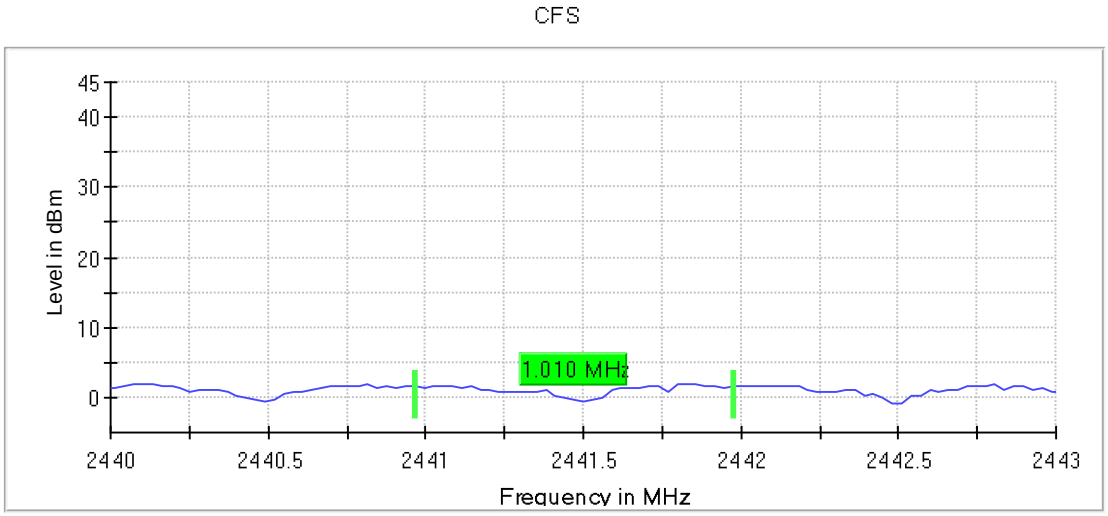
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



RSS-247 5.1 (d) / FCC 15.247 (a) (1) (iii) Time of Occupancy (Dwell Time)

Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds (400 ms) within a period of 0.4 seconds multiplied by the number of hopping channels employed = 0.4 x 79= 31.6 seconds.

Modulation: BT (GFSK 1-DH1)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	11	4.64

Modulation: BT (GFSK 1-DH3)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	4	8.21

Modulation: BT (GFSK 1-DH5)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	6	20.24

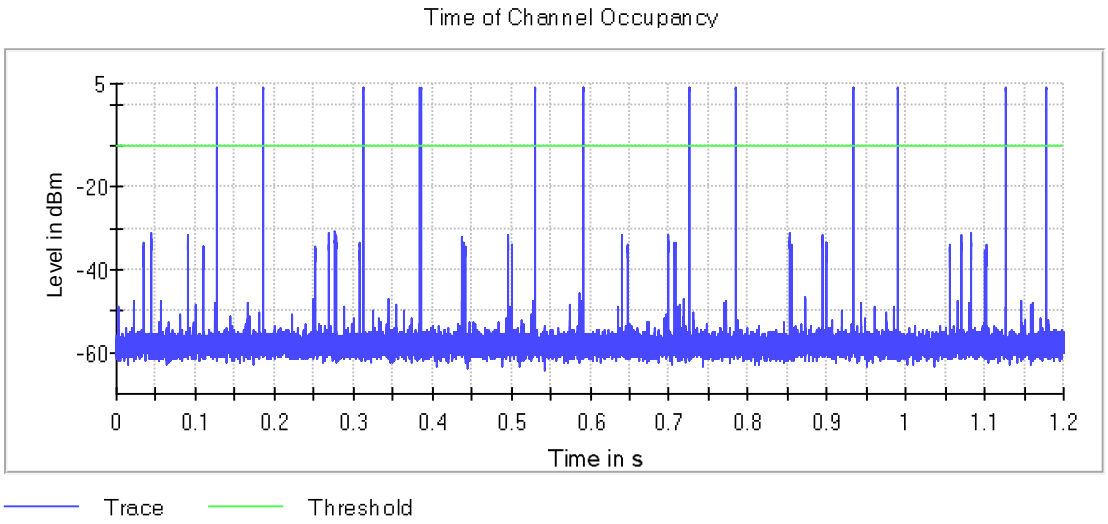
Verdict

Pass

Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH1)

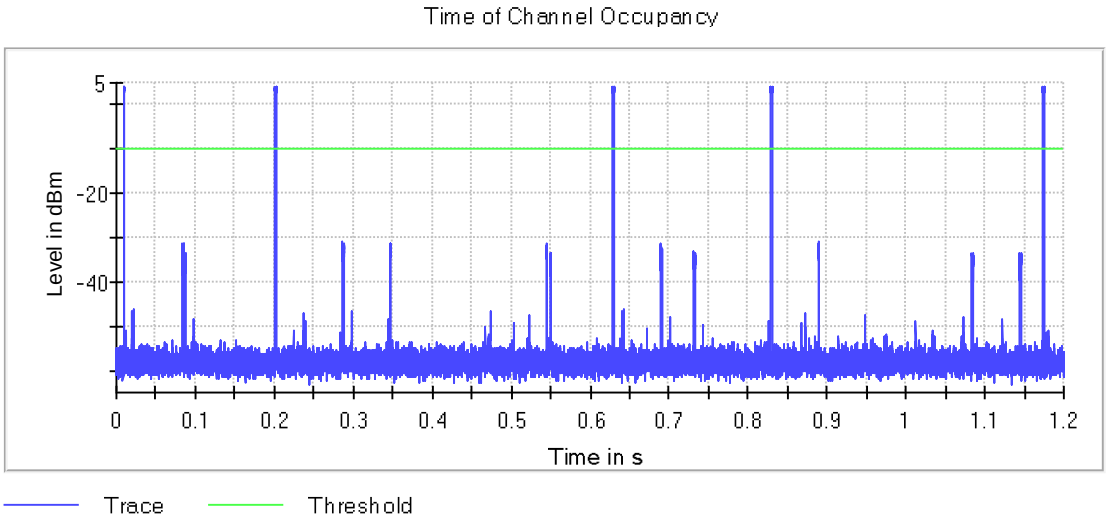
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH3)

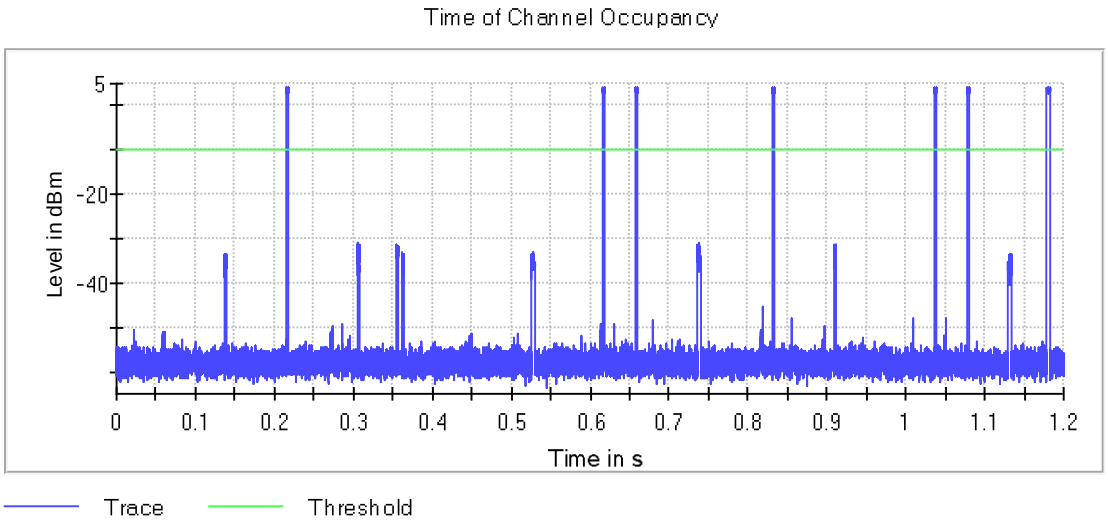
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



Modulation: BT (π/4 DQPSK 2-DH1)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	11	4.58

Modulation: BT (π/4 DQPSK 2-DH3)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	3	6.40

Modulation: BT (π/4 DQPSK 2-DH5)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	6	19.75

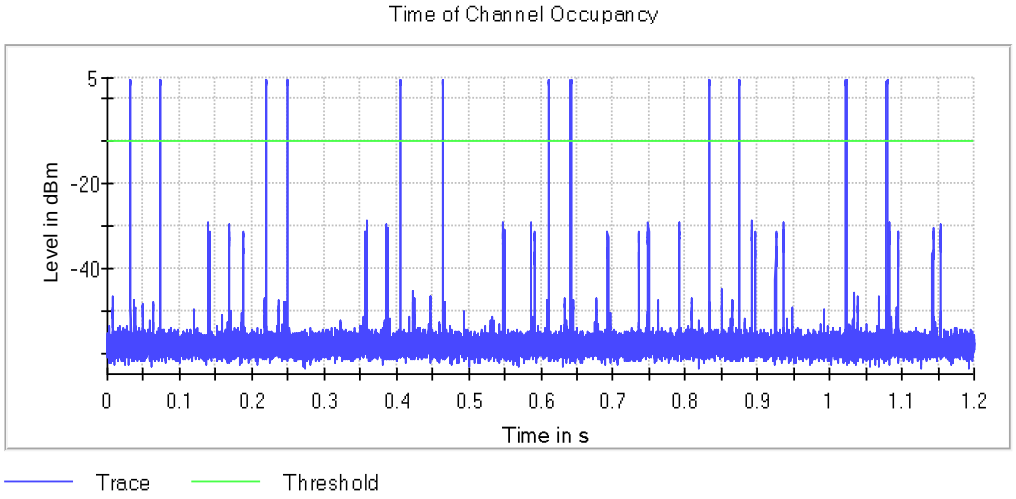
Verdict

Pass

Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH1)

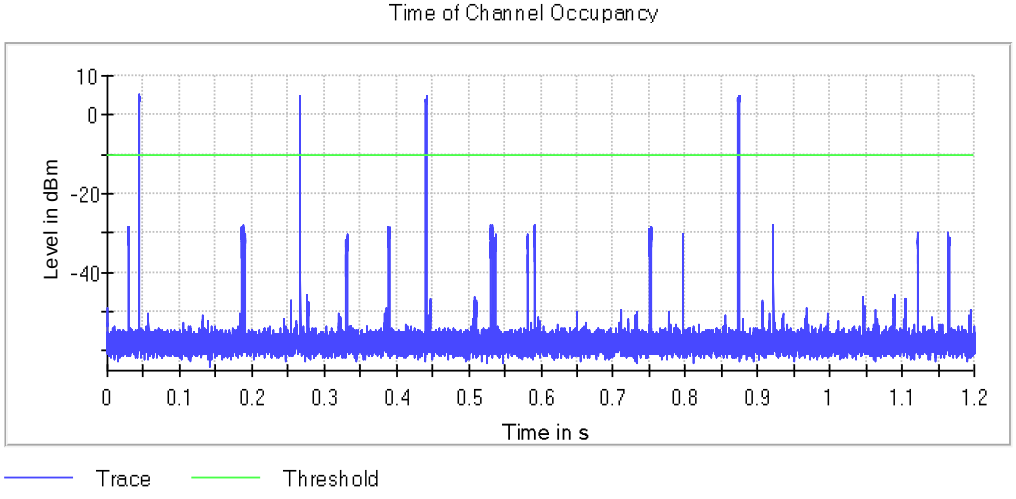
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH3)

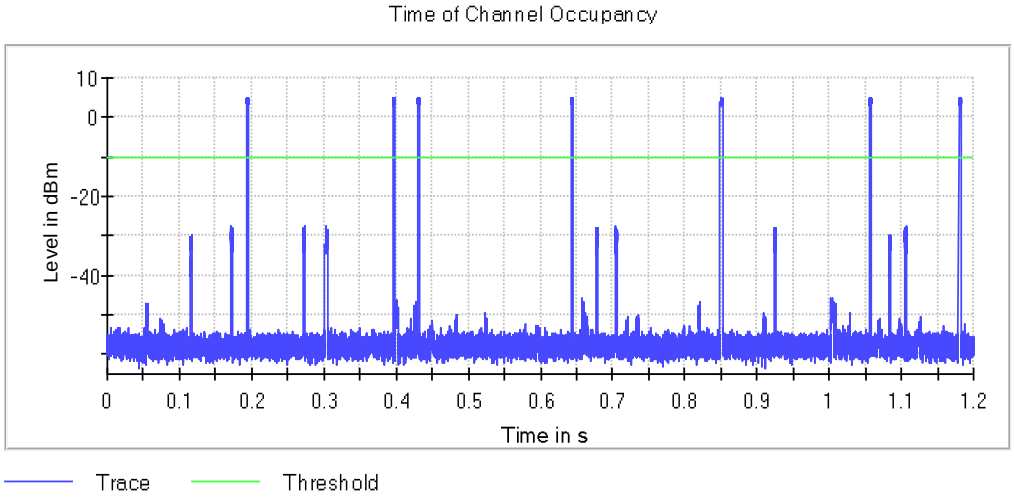
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5)

Images:



Modulation: BT (8DPSK 3-DH1)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	11	4.61

Modulation: BT (8DPSK 3-DH3)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	5	9.70

Modulation: BT (8DPSK 3-DH5)
Results

Equipment	BW (MHz)	NHp	Avg COT (ms)
Frequency Hopping Spread Spectrum systems (DSS)	1	5	17.10

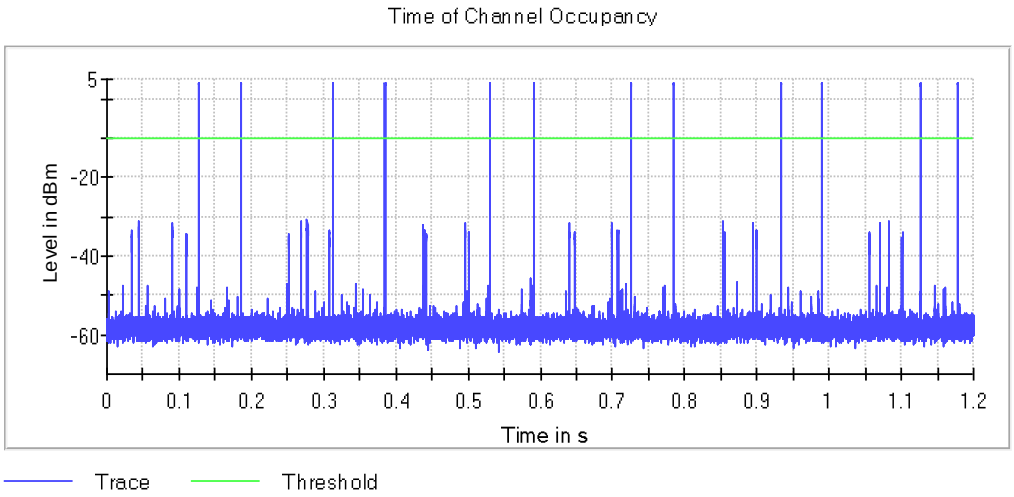
Verdict

Pass

Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH1)

Images:

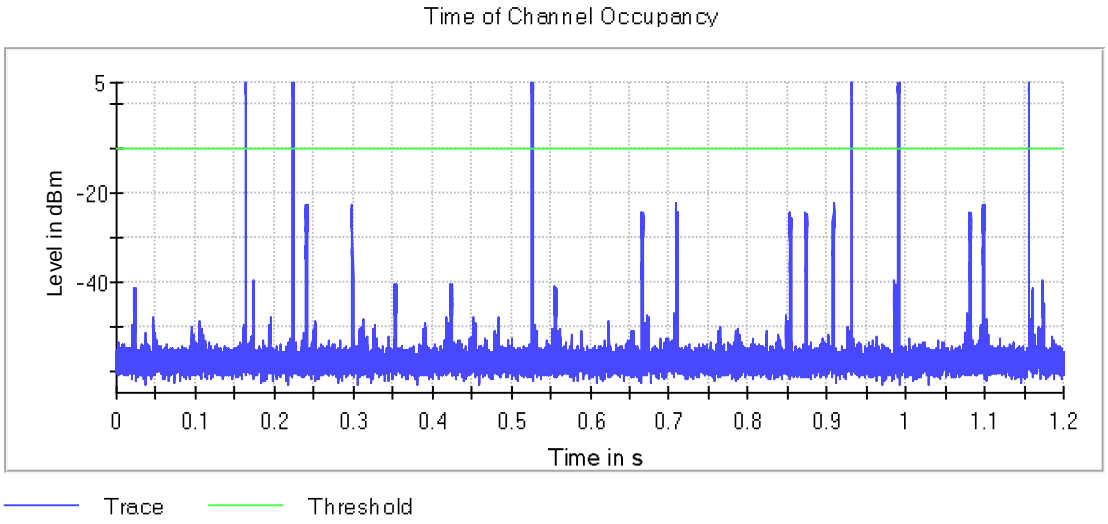


75

Attachments

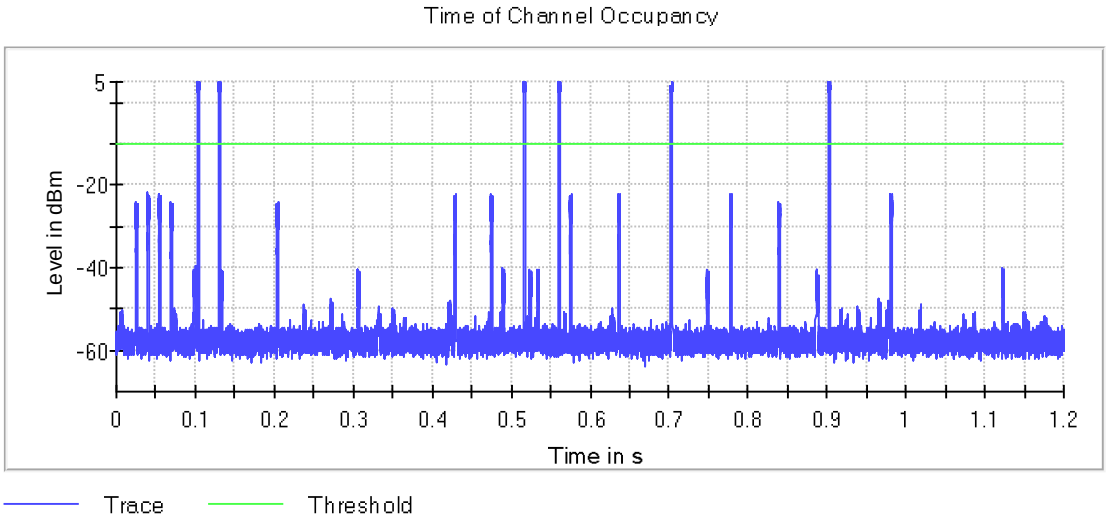
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH3)

Images:



Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5**)**

Images:



Measurement Set- up

Setting	Instrument Value	Instrument Value	Instrument Value
Center	2.44100	2.44100	2.44100
Span	Zero Span	Zero Span	Zero Span
RBW	500.000	500.000 kHz	500.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
Sweep Points	30001	30001	30001
Sweep time	1.200 s	1.200 s	1.200 s
Reference Level	-10.000	-10.000 dBm	-10.000 dBm
Attenuation	0.000 dB	0.000 dB	0.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	1	1	1
Filter	Channel	Channel	Channel
Trace Mode	Clear Write	Clear Write	Clear Write
Sweep type	Sweep	Sweep	Sweep
Preamp	off	off	off
Trigger	External	External	External
Trigger Offset	0.000 s	0.000 s	0.000 s

RSS-247 5.1 (d) / FCC 15.247 (a) (1) (iii) Number of hopping channels

Limits

Frequency hopping system in the 2400-2483.5 MHz band shall use at least 15 channels.

Modulation: BT (GFSK 1-DH5)
Results

Equipment	BW (MHz)	NHC
Frequency Hopping Spread Spectrum systems (DSS)	1	79

Modulation: BT (π/4 DQPSK 2-DH5)
Results

Equipment	BW (MHz)	NHC
Frequency Hopping Spread Spectrum systems (DSS)	1	79

Modulation: BT (8DPSK 3-DH5)
Results

Equipment	BW (MHz)	NHC
Frequency Hopping Spread Spectrum systems (DSS)	1	79

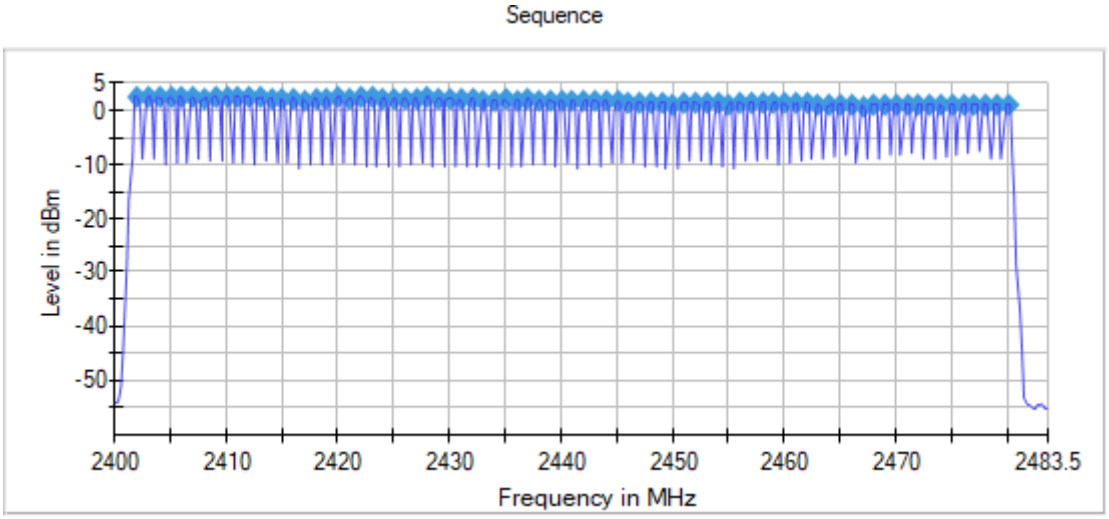
Verdict

Pass

Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

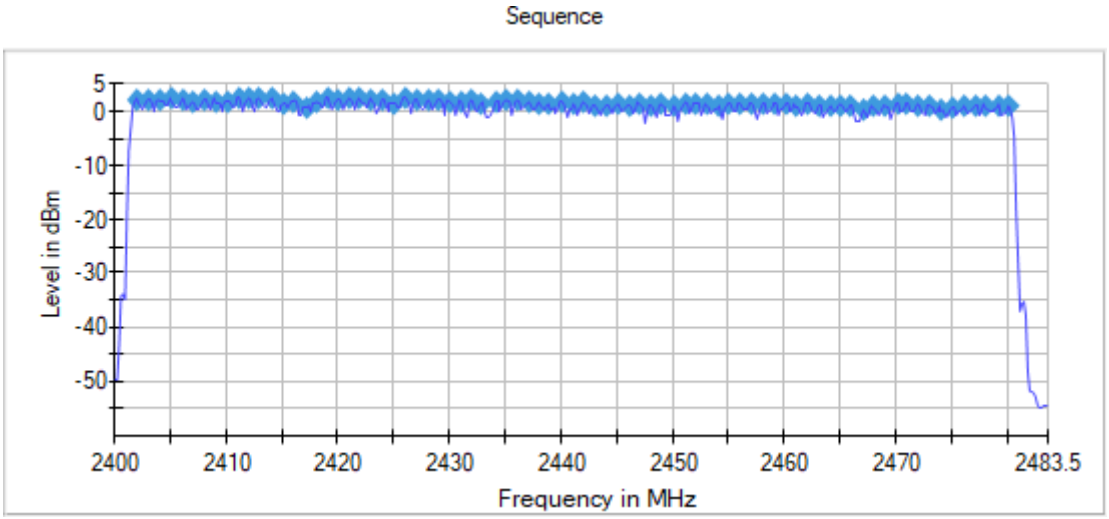
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (Pi/4 DQPSK 2-DH5)

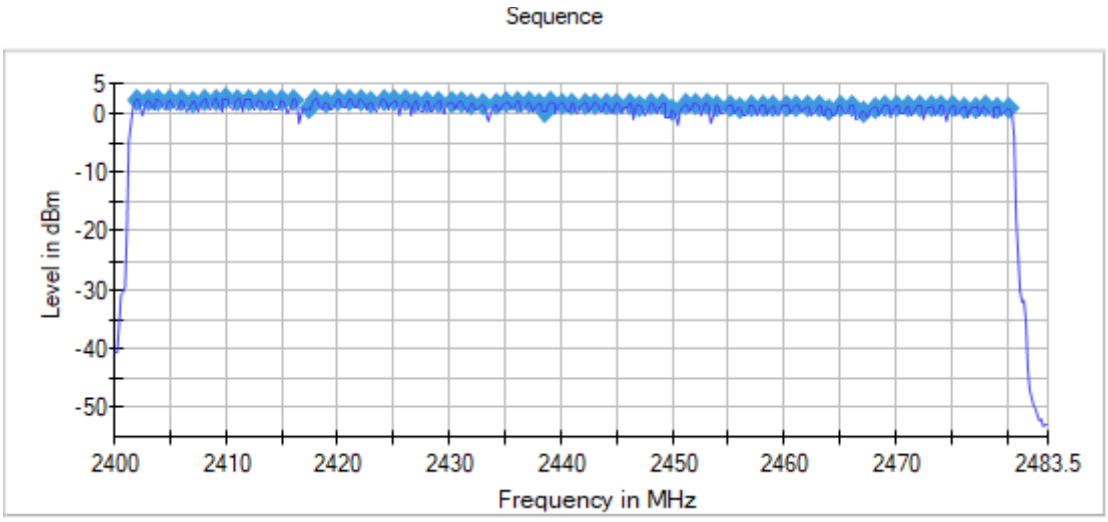
Images:



Attachments

Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



Measurement Set- up

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40000	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz	83.500 MHz
RBW	200.000	200.000 kHz	200.000 kHz
VBW	200.000	200.000 kHz	200.000 kHz
Sweep Points	418	418	418
Sweep time	47.405 µs	47.405 µs	47.405 µs
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	45 / max.	71 / max. 150	133 / max.
Stable	3 / 3	3 / 3	3 / 3
Max Stable	0.12 dB	0.07 dB	0.00 dB

RSS-247 5.4 (b) / FCC 15.247 (b) (1) Maximum Peak Conducted output power & Antenna gain

Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 1 watt (30 dBm). The e.i.r.p. shall not exceed 4 W (RSS-247).

Maximum declared antenna gain: -3.2 dBi

Modulation: BT (GFSK 1-DH5)
Results

Freq (MHz)	Equipment	Peak Power (dBm)	Maximum EIRP power (dBm)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	2.5	-0.7
2441.00000	Frequency Hopping Spread Spectrum systems (DSS)	1.8	-1.4
2480.00000	Frequency Hopping Spread Spectrum systems (DSS)	1.1	-2.1

Modulation: BT (π/4 DQPSK 2-DH5)
Results

Freq (MHz)	Equipment	Peak Power (dBm)	Maximum EIRP power (dBm)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	4.6	1.4
2441.00000	Frequency Hopping Spread Spectrum systems (DSS)	4.0	0.8
2480.00000	Frequency Hopping Spread Spectrum systems (DSS)	3.5	0.3

Modulation: BT (8DPSK 3-DH5)
Results

Freq (MHz)	Equipment	Peak Power (dBm)	Maximum EIRP power (dBm)
2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	4.8	1.6
2441.00000	Frequency Hopping Spread Spectrum systems (DSS)	4.4	1.2
2480.00000	Frequency Hopping Spread Spectrum systems (DSS)	3.8	0.6

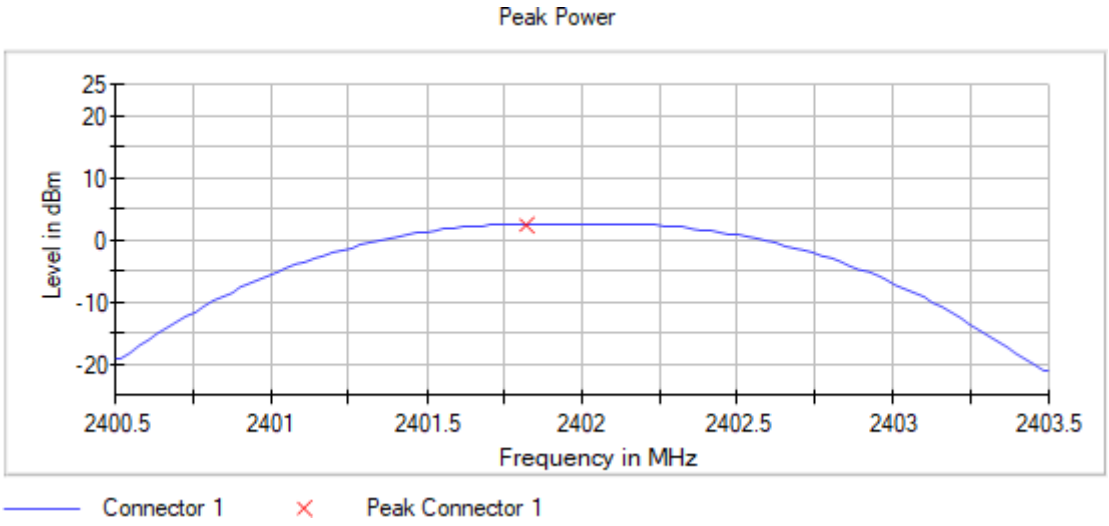
Verdict

Pass

Attachments

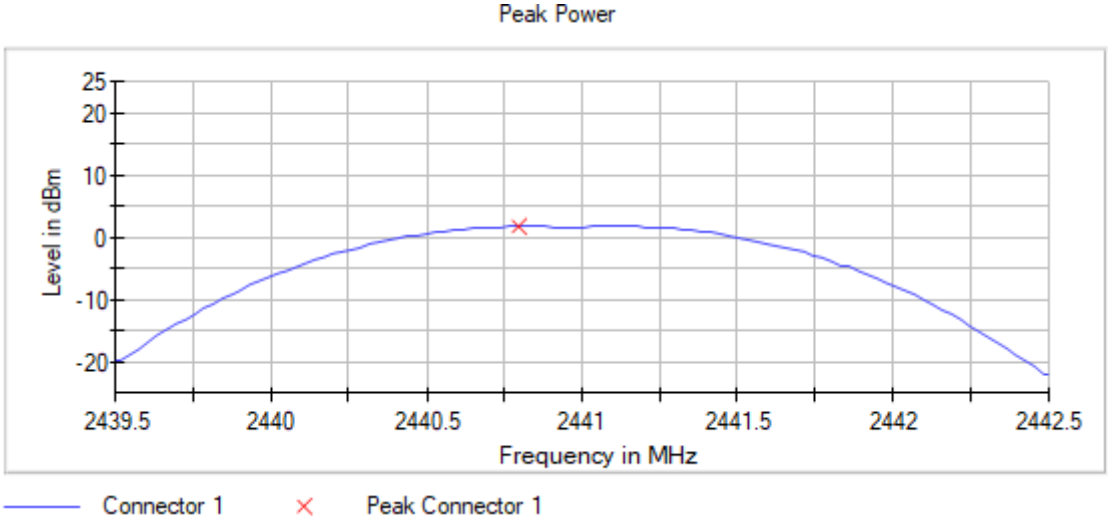
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



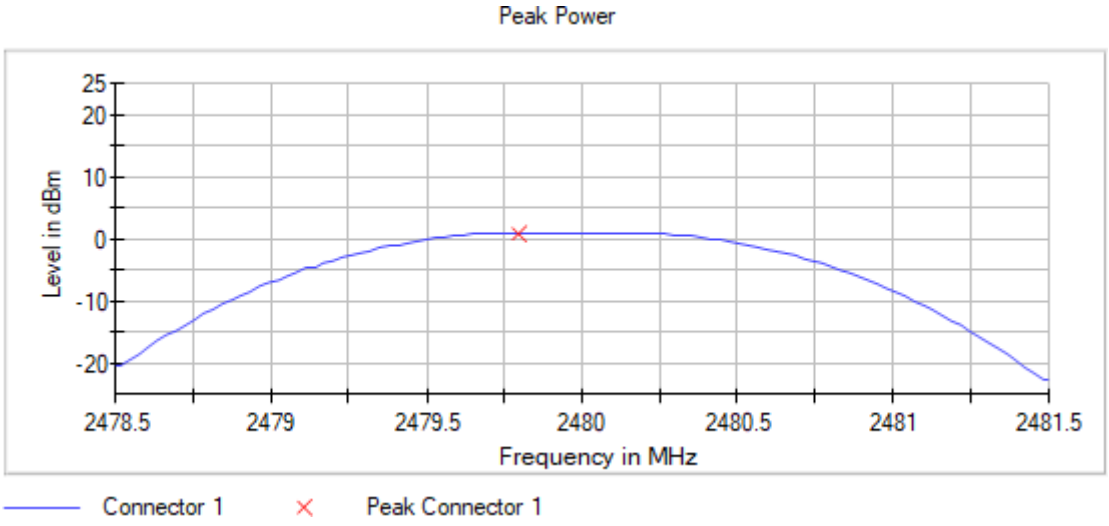
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (GFSK 1-DH5)

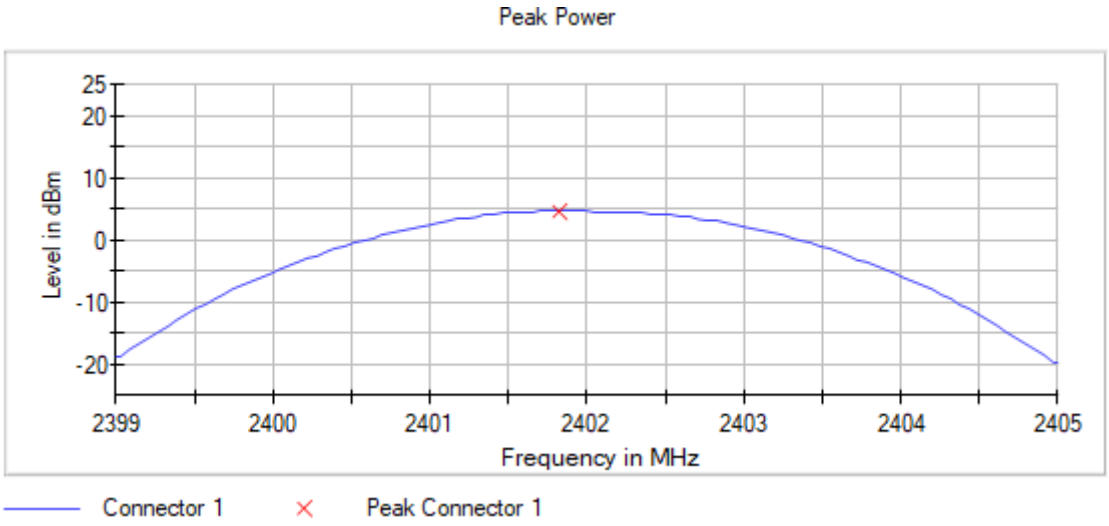
Images:



Attachments

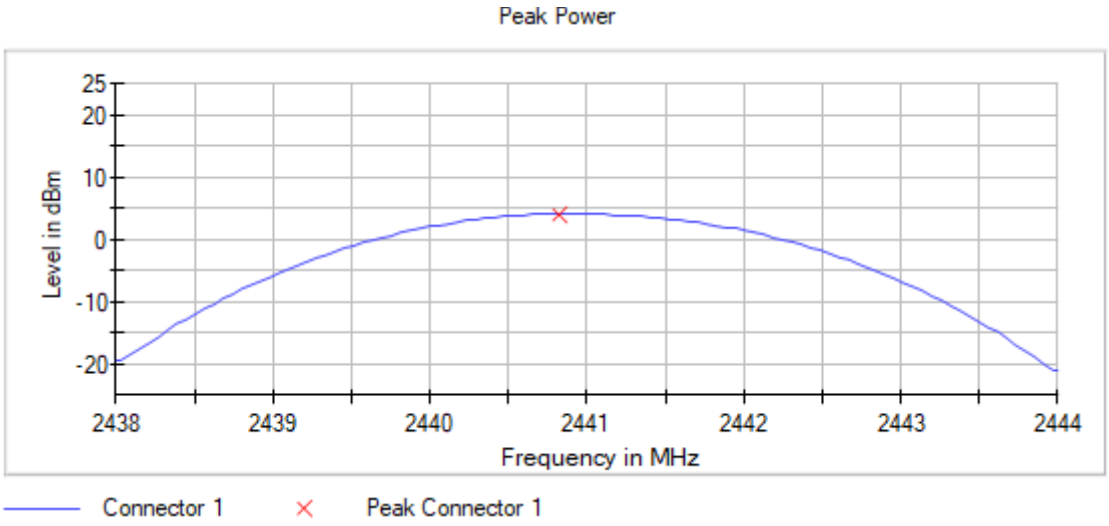
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5), Number of Transmission Chains = 1, Active Port = 1

Images:



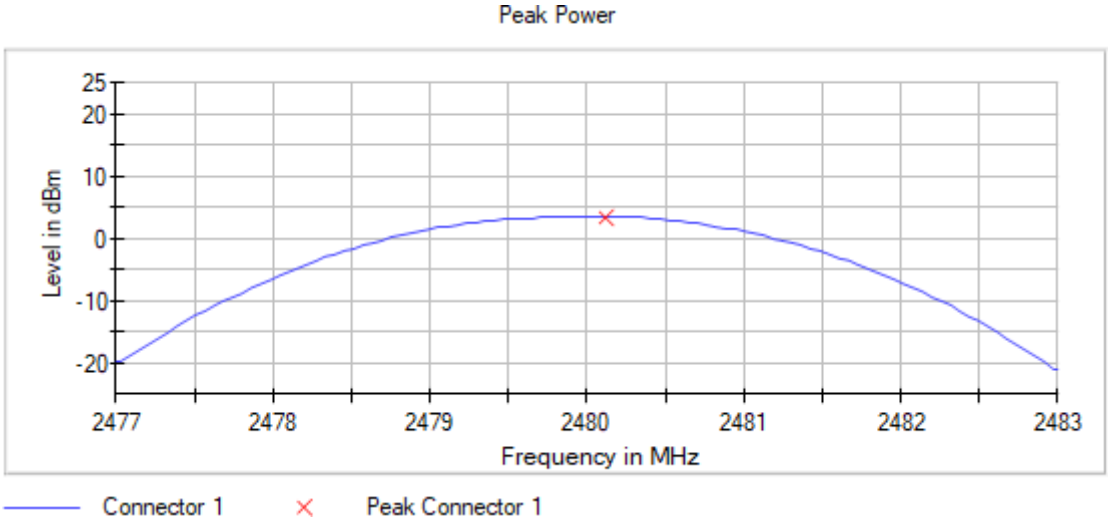
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5), Number of Transmission Chains = 1, Active Port = 1

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (π/4 DQPSK 2-DH5), Number of Transmission Chains = 1, Active Port = 1

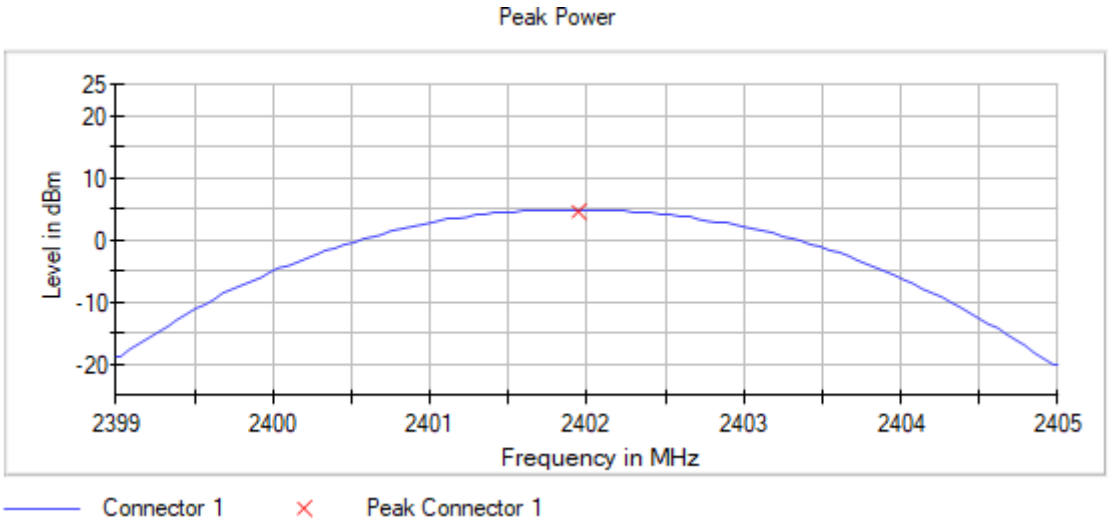
Images:



Attachments

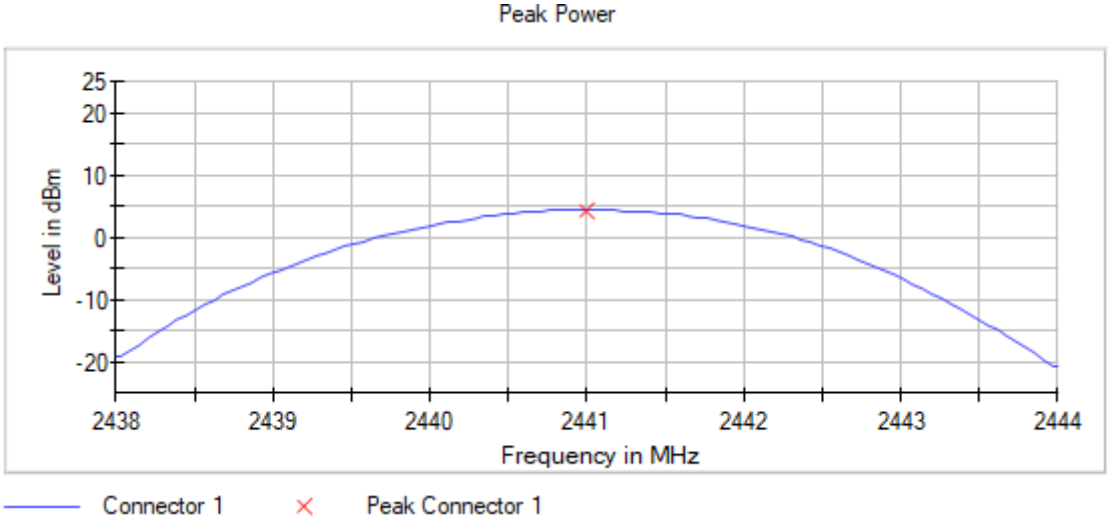
Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



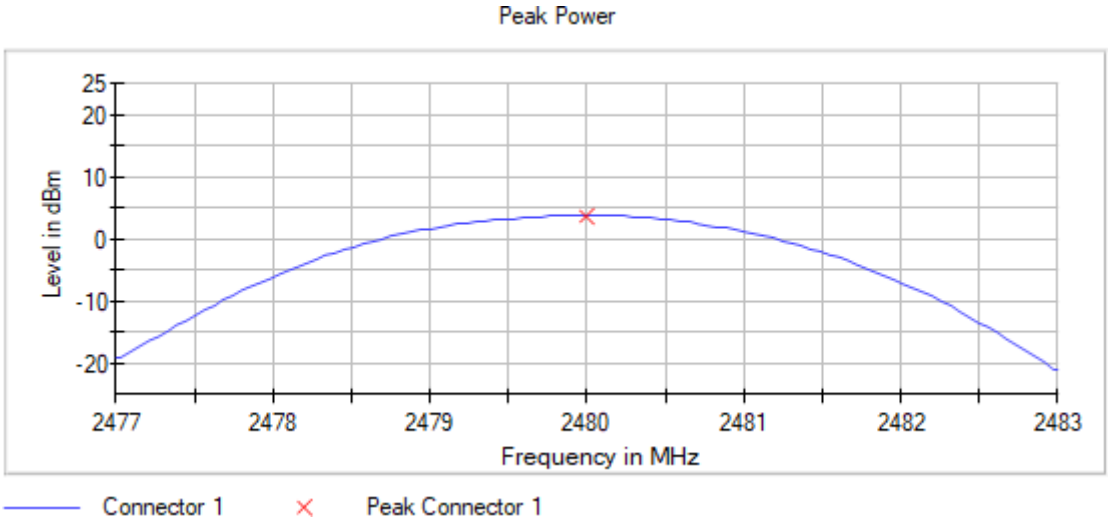
Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5)

Images:



Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Bandwidth MHz = 1, Modulation = BT (8DPSK 3-DH5), Number of Transmission Chains = 1, Active Port = 1

Images:



Measurement Set- up

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40050	2.43950 GHz	2.47850 GHz
Stop Frequency	2.40350	2.44250 GHz	2.48150 GHz
Span	3.000 MHz	3.000 MHz	3.000 MHz
RBW	1.000 MHz	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz	3.000 MHz
Sweep Points	101	101	101
Sweep time	1.907 us	1.907 us	1.907 us
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	4 / max. 150	4 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable	0.02 dB	0.05 dB	0.02 dB

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

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: BT (GFSK 1-DH5) - HOPPING OFF
Lowest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2359.225000	-54.7	37.1	-17.6
	2353.125000	-54.7	37.1	-17.6
	2359.175000	-54.8	37.2	-17.6
	2353.075000	-54.9	37.3	-17.6
	2394.625000	-55.2	37.6	-17.6
	2358.475000	-55.3	37.7	-17.6
	2399.425000	-55.3	37.7	-17.6
	2368.425000	-55.3	37.7	-17.6
	2399.625000	-55.4	37.8	-17.6
	2399.125000	-55.4	37.8	-17.6
	2399.175000	-55.4	37.8	-17.6
	2397.825000	-55.5	37.9	-17.6
	2394.575000	-55.5	37.9	-17.6
	2397.875000	-55.5	37.9	-17.6
	2394.675000	-55.5	37.9	-17.6

Highest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2483.975000	-54.2	35.2	-19.0
	2492.725000	-54.5	35.5	-19.0
	2491.775000	-54.6	35.6	-19.0
	2484.025000	-54.7	35.7	-19.0
	2487.525000	-54.7	35.7	-19.0
	2491.825000	-54.8	35.7	-19.0
	2487.475000	-54.8	35.8	-19.0
	2486.425000	-54.8	35.8	-19.0
	2486.375000	-54.9	35.8	-19.0
	2498.925000	-55.0	36.0	-19.0
	2492.675000	-55.1	36.1	-19.0
	2483.925000	-55.1	36.1	-19.0
	2485.825000	-55.1	36.1	-19.0
	2483.775000	-55.2	36.1	-19.0
	2486.475000	-55.2	36.2	-19.0

Verdict

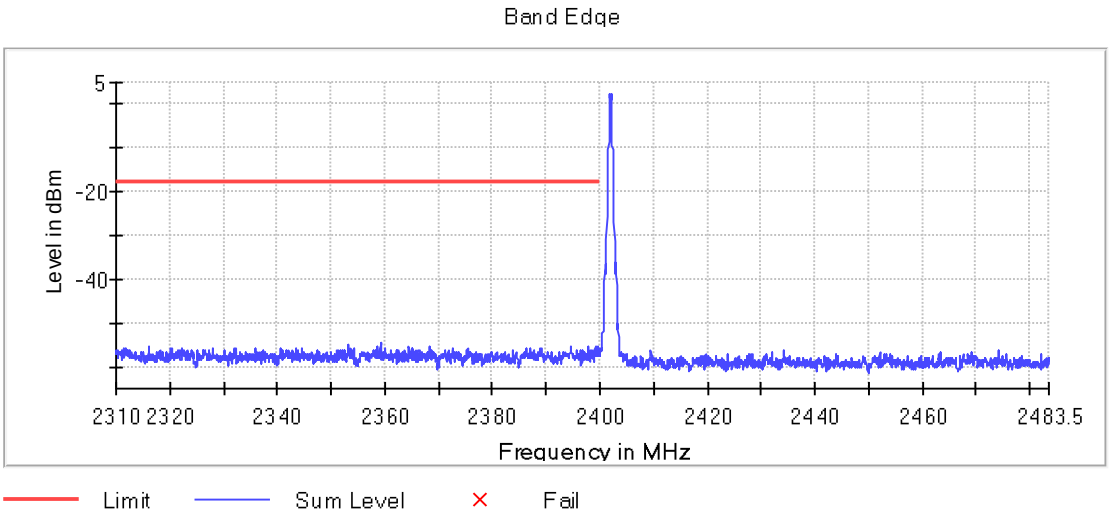
Pass

Attachments

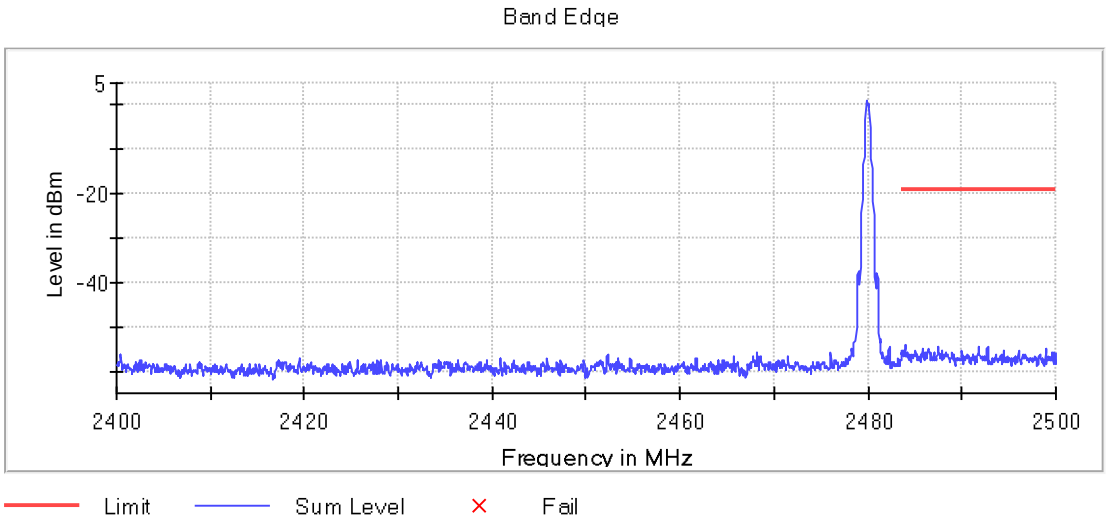
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5)

Images:

Lowest Channel



Highest Channel



Modulation: BT (GFSK 1-DH5) - HOPPING ON
Lowest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2341.825000	-48.1	30.6	-17.5
	2341.775000	-48.2	30.7	-17.5
	2365.625000	-48.8	31.3	-17.5
	2365.675000	-49.2	31.7	-17.5
	2375.575000	-49.3	31.8	-17.5
	2341.875000	-49.4	31.9	-17.5
	2366.625000	-49.6	32.1	-17.5
	2375.625000	-49.7	32.1	-17.5
	2365.575000	-49.9	32.4	-17.5
	2350.475000	-50.0	32.5	-17.5
	2350.525000	-50.1	32.5	-17.5
	2366.675000	-50.1	32.6	-17.5
	2375.525000	-50.3	32.8	-17.5
	2366.575000	-50.5	33.0	-17.5
	2316.325000	-50.9	33.4	-17.5

Highest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2496.425000	-52.6	35.1	-17.5
	2496.375000	-52.7	35.2	-17.5
	2496.475000	-52.9	35.4	-17.5
	2496.525000	-53.6	36.1	-17.5
	2487.525000	-54.6	37.0	-17.5
	2483.525000	-54.9	37.3	-17.5
	2496.325000	-54.9	37.4	-17.5
	2487.475000	-55.0	37.4	-17.5
	2487.575000	-55.1	37.6	-17.5
	2492.925000	-55.3	37.8	-17.5
	2499.575000	-55.4	37.9	-17.5
	2499.525000	-55.4	37.9	-17.5
	2492.875000	-55.5	37.9	-17.5
	2486.925000	-55.5	38.0	-17.5
	2486.975000	-55.6	38.1	-17.5

Verdict

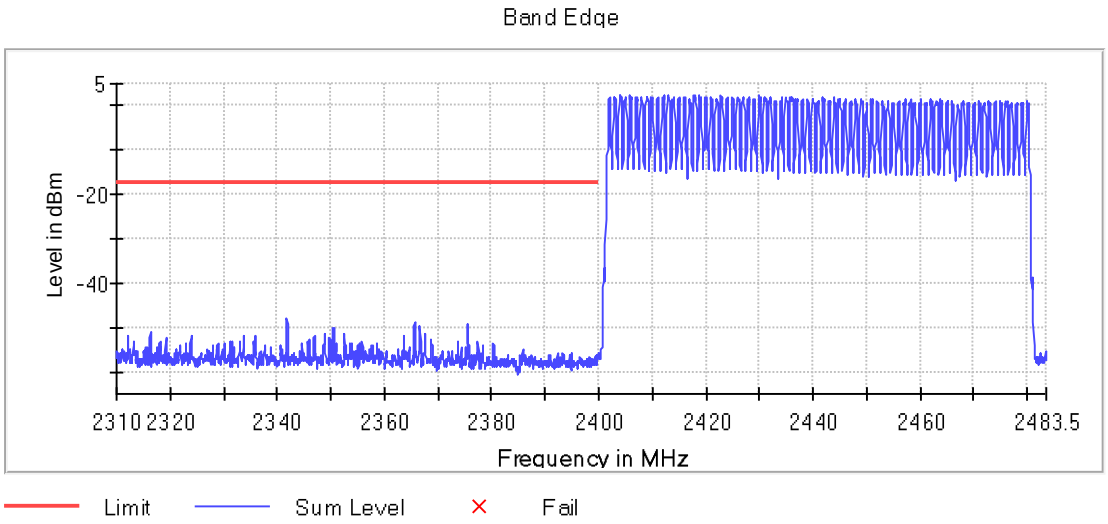
Pass

Attachments

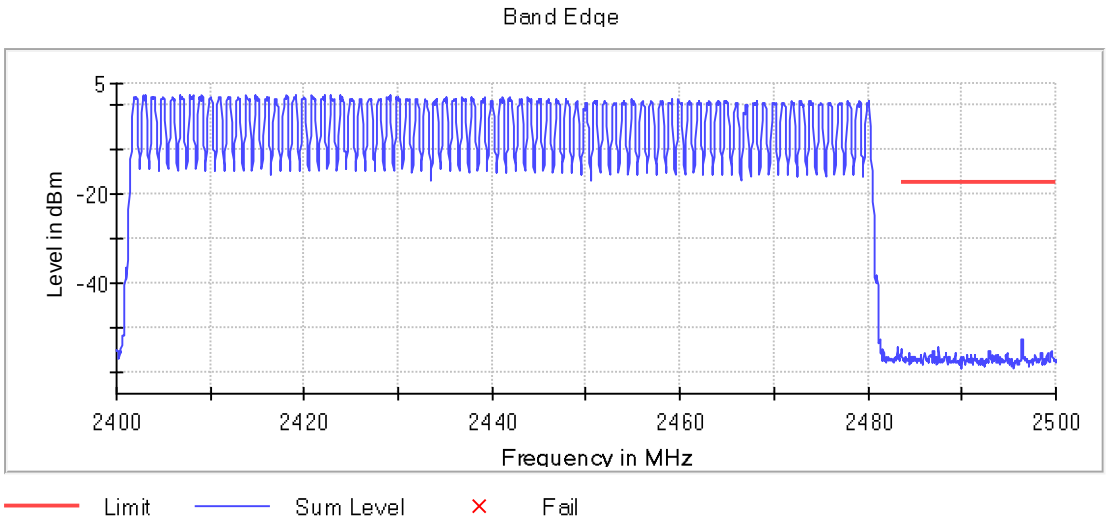
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5)

Images:

Lowest Channel



Highest Channel



Modulation: BT (π/4 DQPSK 2-DH5) - HOPPING OFF
Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2399.975000	-52.9	35.2	-17.7
	2399.825000	-53.2	35.6	-17.7
	2399.875000	-53.4	35.7	-17.7
	2399.925000	-53.4	35.7	-17.7
	2399.625000	-54.3	36.7	-17.7
	2399.725000	-54.4	36.7	-17.7
	2399.575000	-54.4	36.7	-17.7
	2399.425000	-54.5	36.8	-17.7
	2399.475000	-54.5	36.9	-17.7
	2399.775000	-54.5	36.9	-17.7
	2351.525000	-54.6	36.9	-17.7
	2399.675000	-54.6	37.0	-17.7
	2351.575000	-54.7	37.0	-17.7
	2398.375000	-54.8	37.2	-17.7
	2312.475000	-54.9	37.2	-17.7

Highest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2484.775000	-54.5	35.5	-19.0
	2484.825000	-54.7	35.7	-19.0
	2483.575000	-54.7	35.7	-19.0
	2484.525000	-54.8	35.8	-19.0
	2485.025000	-55.0	36.0	-19.0
	2483.525000	-55.2	36.2	-19.0
	2484.475000	-55.2	36.2	-19.0
	2491.475000	-55.4	36.4	-19.0
	2491.525000	-55.5	36.5	-19.0
	2499.525000	-55.5	36.5	-19.0
	2495.675000	-55.5	36.5	-19.0
	2485.075000	-55.6	36.6	-19.0
	2489.025000	-55.6	36.6	-19.0
	2495.725000	-55.6	36.6	-19.0
	2499.575000	-55.6	36.6	-19.0

Verdict

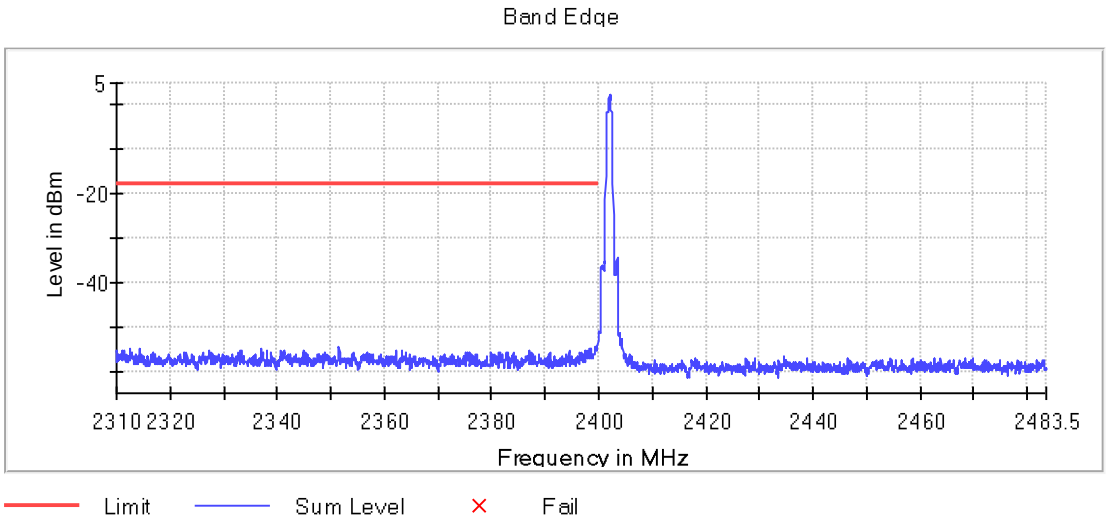
Pass

Attachments

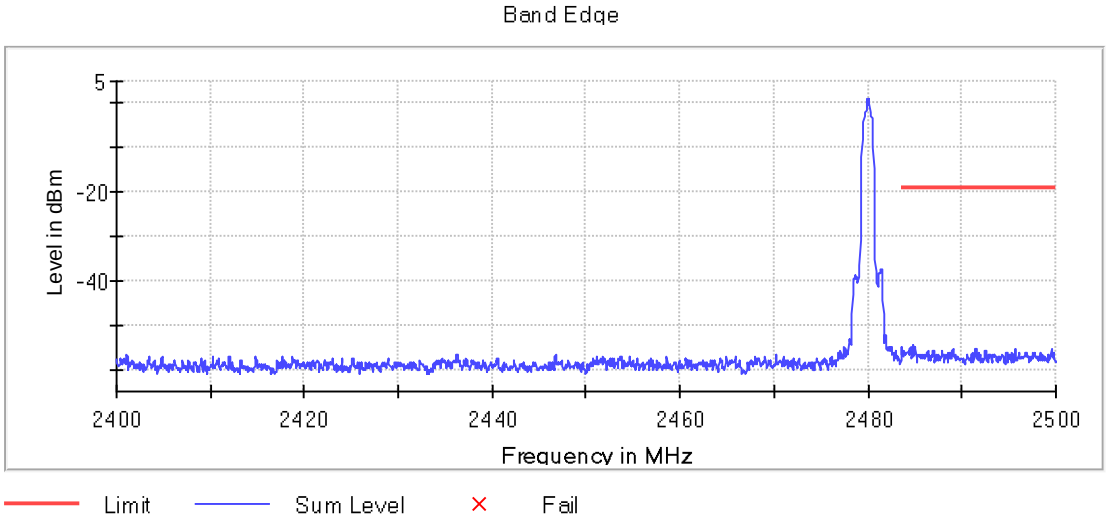
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5)

Images:

Lowest Channel



Highest Channel



Modulation: BT (π/4 DQPSK 2-DH5) - HOPPING ON
Lowest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2318.225000	-52.4	34.7	-17.7
	2377.875000	-52.5	34.8	-17.7
	2318.275000	-52.5	34.8	-17.7
	2377.825000	-52.6	34.8	-17.7
	2322.575000	-52.6	34.8	-17.7
	2322.625000	-52.6	34.9	-17.7
	2377.925000	-53.2	35.5	-17.7
	2318.325000	-53.3	35.6	-17.7
	2318.175000	-53.8	36.0	-17.7
	2368.675000	-53.8	36.1	-17.7
	2377.775000	-54.1	36.4	-17.7
	2322.525000	-54.2	36.5	-17.7
	2322.675000	-54.3	36.5	-17.7
	2368.725000	-54.3	36.5	-17.7
	2341.125000	-54.6	36.9	-17.7

Highest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2496.175000	-54.8	37.0	-17.8
	2496.225000	-54.8	37.0	-17.8
	2483.675000	-55.0	37.2	-17.8
	2483.725000	-55.0	37.3	-17.8
	2484.725000	-55.0	37.3	-17.8
	2484.675000	-55.1	37.3	-17.8
	2487.475000	-55.2	37.5	-17.8
	2487.425000	-55.4	37.6	-17.8
	2487.325000	-55.5	37.8	-17.8
	2495.225000	-55.6	37.8	-17.8
	2484.175000	-55.6	37.8	-17.8
	2489.725000	-55.7	37.9	-17.8
	2496.275000	-55.7	37.9	-17.8
	2488.525000	-55.7	37.9	-17.8
	2484.125000	-55.7	37.9	-17.8

Verdict

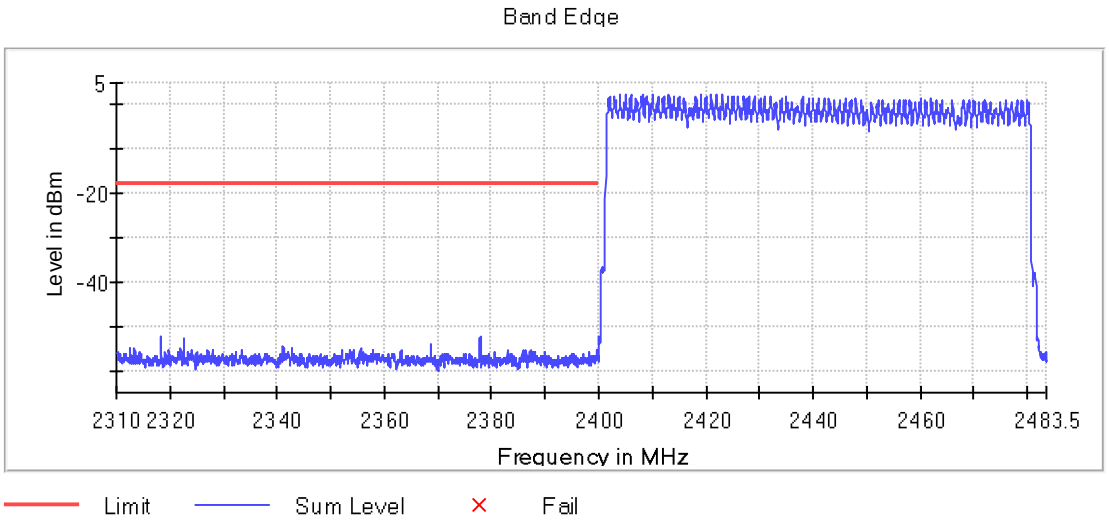
Pass

Attachments

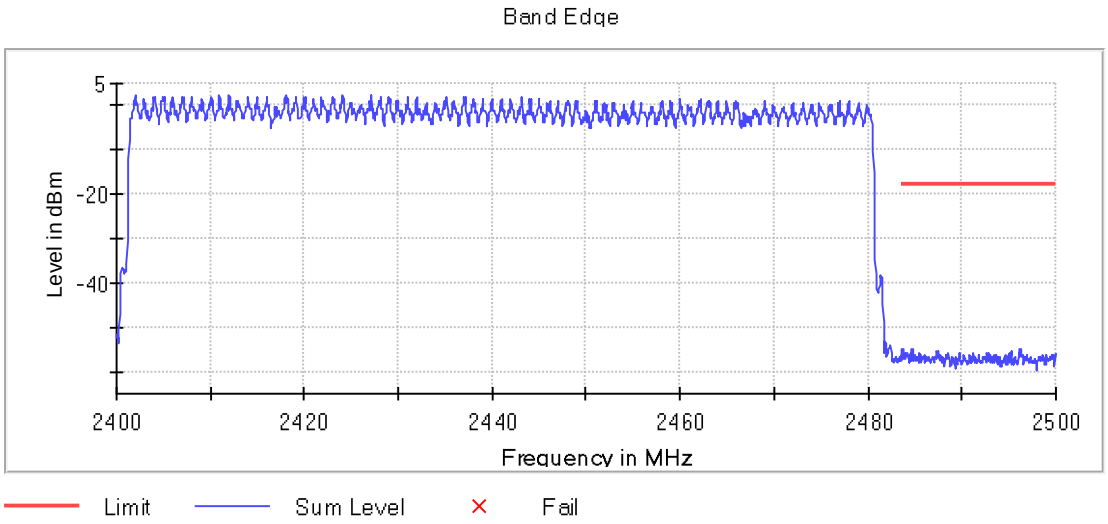
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5)

Images:

Lowest Channel



Highest Channel



Modulation: BT (8DPSK 3-DH5) - HOPPING OFF
Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2399.975000	-46.1	28.3	-17.8
	2399.575000	-48.3	30.5	-17.8
	2399.525000	-48.4	30.6	-17.8
	2399.775000	-48.4	30.7	-17.8
	2399.625000	-48.4	30.7	-17.8
	2399.725000	-48.5	30.7	-17.8
	2399.825000	-48.7	30.9	-17.8
	2399.675000	-49.1	31.3	-17.8
	2399.875000	-49.2	31.4	-17.8
	2399.925000	-49.3	31.6	-17.8
	2399.475000	-49.3	31.6	-17.8
	2397.925000	-50.0	32.2	-17.8
	2397.875000	-50.1	32.3	-17.8
	2399.425000	-51.1	33.3	-17.8
	2399.375000	-51.2	33.4	-17.8

Highest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2484.275000	-53.0	34.2	-18.7
	2484.325000	-53.1	34.4	-18.7
	2483.775000	-53.8	35.1	-18.7
	2484.825000	-53.8	35.1	-18.7
	2483.825000	-53.9	35.1	-18.7
	2484.475000	-53.9	35.2	-18.7
	2484.225000	-54.0	35.2	-18.7
	2484.525000	-54.0	35.3	-18.7
	2483.525000	-54.1	35.4	-18.7
	2483.575000	-54.1	35.4	-18.7
	2484.775000	-54.2	35.5	-18.7
	2484.175000	-54.3	35.5	-18.7
	2483.625000	-54.3	35.5	-18.7
	2484.025000	-54.4	35.7	-18.7
	2483.975000	-54.5	35.7	-18.7

Verdict

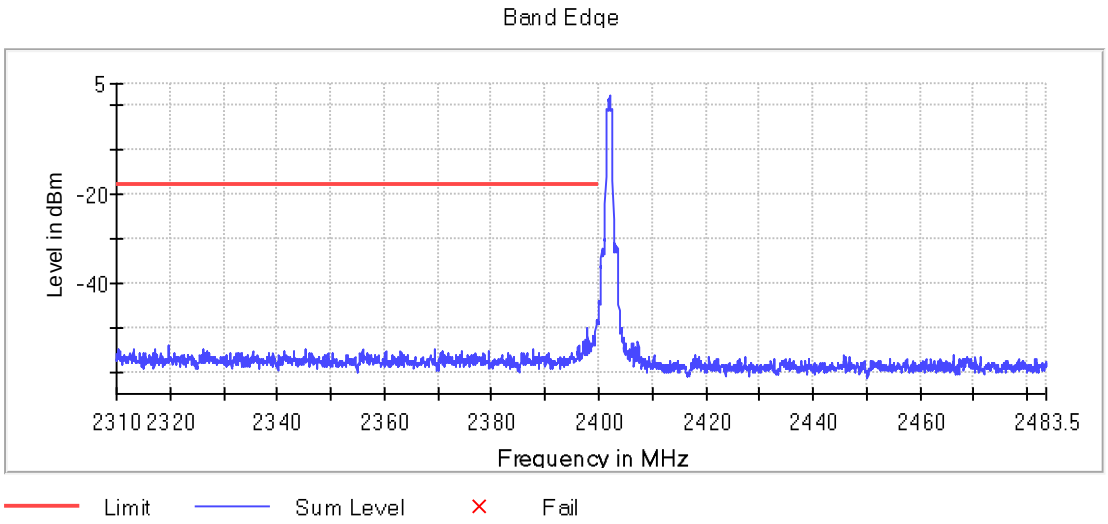
Pass

Attachments

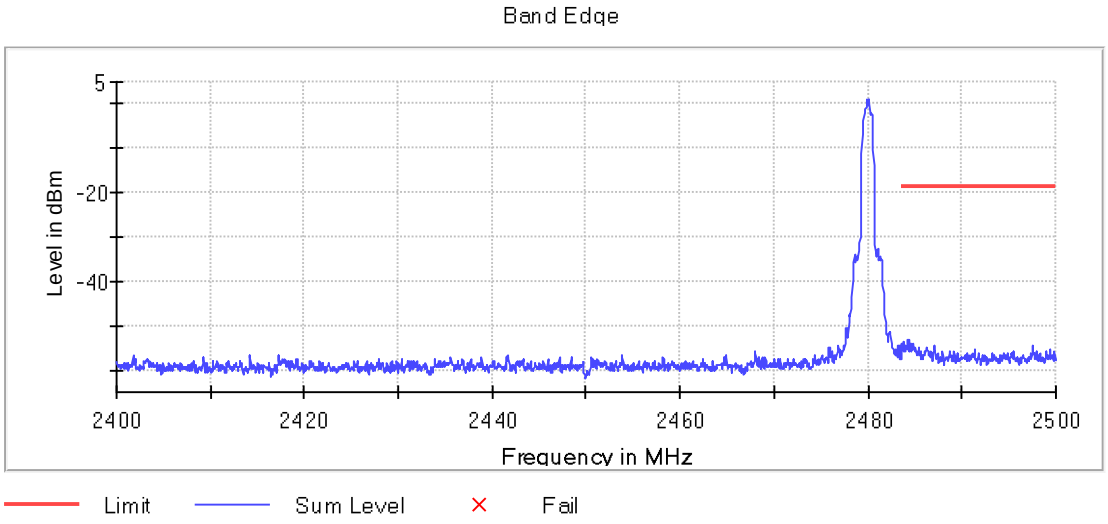
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5)

Images:

Lowest Channel



Highest Channel



Modulation: BT (8DPSK 3-DH5) - HOPPING ON
Lowest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2399.825000	-49.7	32.1	-17.7
	2399.775000	-50.1	32.4	-17.7
	2399.975000	-50.2	32.5	-17.7
	2399.875000	-50.7	33.0	-17.7
	2360.575000	-51.1	33.4	-17.7
	2335.075000	-51.3	33.6	-17.7
	2360.525000	-51.7	34.1	-17.7
	2360.625000	-51.8	34.1	-17.7
	2335.025000	-51.8	34.1	-17.7
	2335.125000	-51.9	34.2	-17.7
	2399.725000	-52.9	35.2	-17.7
	2399.425000	-52.9	35.2	-17.7
	2399.475000	-53.1	35.5	-17.7
	2399.925000	-53.5	35.8	-17.7
	2399.375000	-53.7	36.1	-17.7

Highest Channel

Results

Equipment	Freq (MHz)	Lvl (dBm)	Margin (dB)	Limit (dBm)
Frequency Hopping Spread Spectrum systems (DSS)	2499.975000	-54.9	37.5	-17.5
	2500.000000	-54.9	37.5	-17.5
	2498.625000	-55.5	38.0	-17.5
	2498.675000	-55.5	38.0	-17.5
	2499.925000	-55.5	38.1	-17.5
	2483.525000	-55.6	38.1	-17.5
	2483.825000	-55.6	38.2	-17.5
	2483.875000	-55.7	38.2	-17.5
	2483.675000	-55.7	38.3	-17.5
	2497.025000	-55.8	38.4	-17.5
	2483.575000	-55.9	38.4	-17.5
	2499.725000	-55.9	38.4	-17.5
	2483.625000	-55.9	38.4	-17.5
	2484.125000	-55.9	38.5	-17.5
	2493.975000	-55.9	38.5	-17.5

Verdict

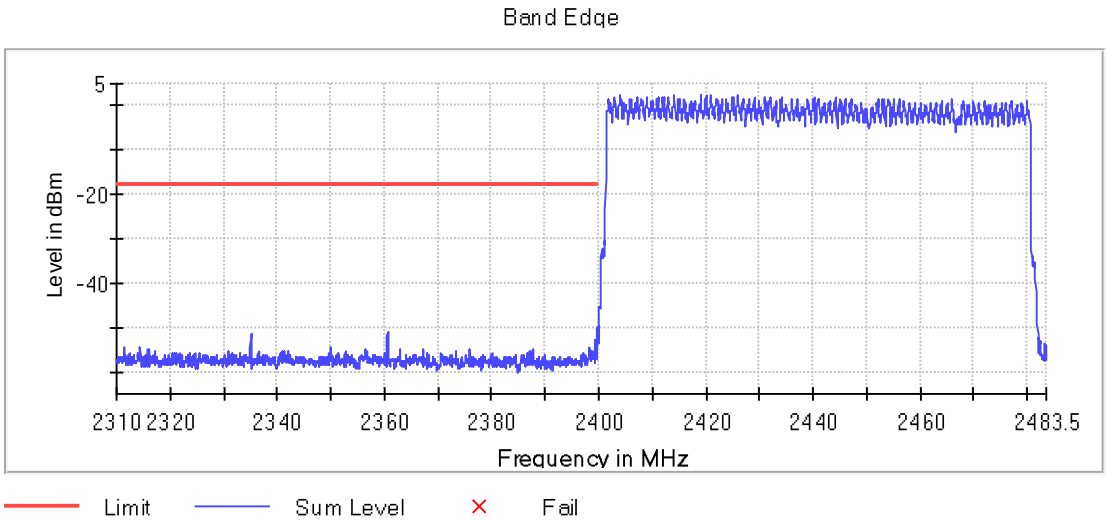
Pass

Attachments

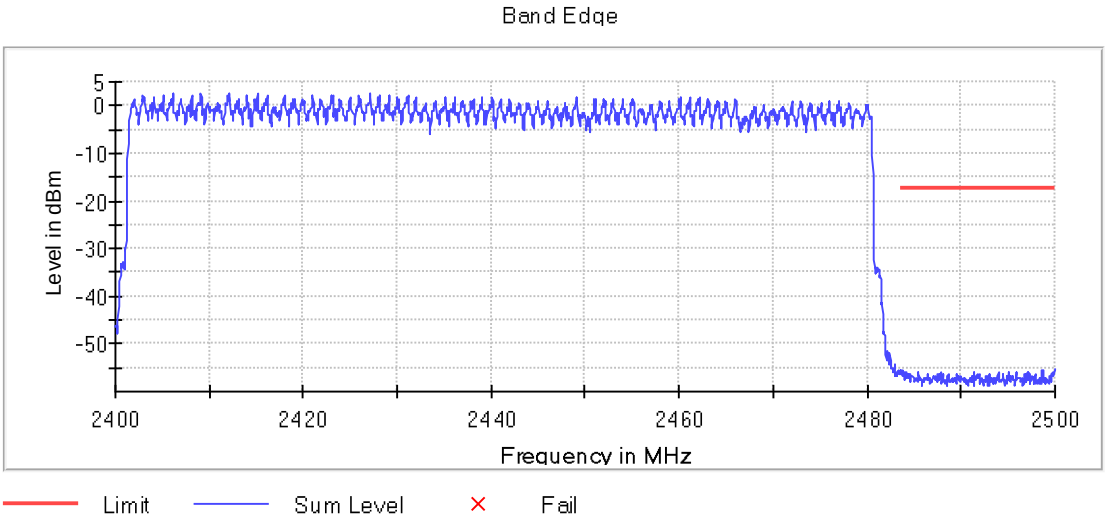
Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5)

Images:

Lowest Channel



Highest Channel



Measurement Set- up - Band Edge

Band Edge				
Setting	HOPPING OFF		HOPPING ON	
	Instrument Value - low	Instrument Value- high	Instrument Value- low	Instrument Value- high
Start Frequency	2.31000	2.40000 GHz	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000	2.48350 GHz	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz	90.000 MHz	83.500 MHz
RBW	100.000	100.000 kHz	100.000 kHz	100.000 kHz
VBW	300.000	300.000 kHz	300.000 kHz	300.000 kHz
Sweep Points	1800	1670	1800	1670
Sweep time	113.672 us	94.727 us	113.672 us	94.727 us
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100	100
Filter	3 dB	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT	FFT
Preamp	off	off	off	off
Stable mode	Trace	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB	0.50 dB
Run	4 / max. 150	5 / max. 150	4 / max. 150	139 / max.
Stable	3 / 3	3 / 3	3 / 3	3 / 3
Max Stable	0.00 dB	0.12 dB	0.00 dB	0.00 dB

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

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 (µV/m)	Field strength (dBµV/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.

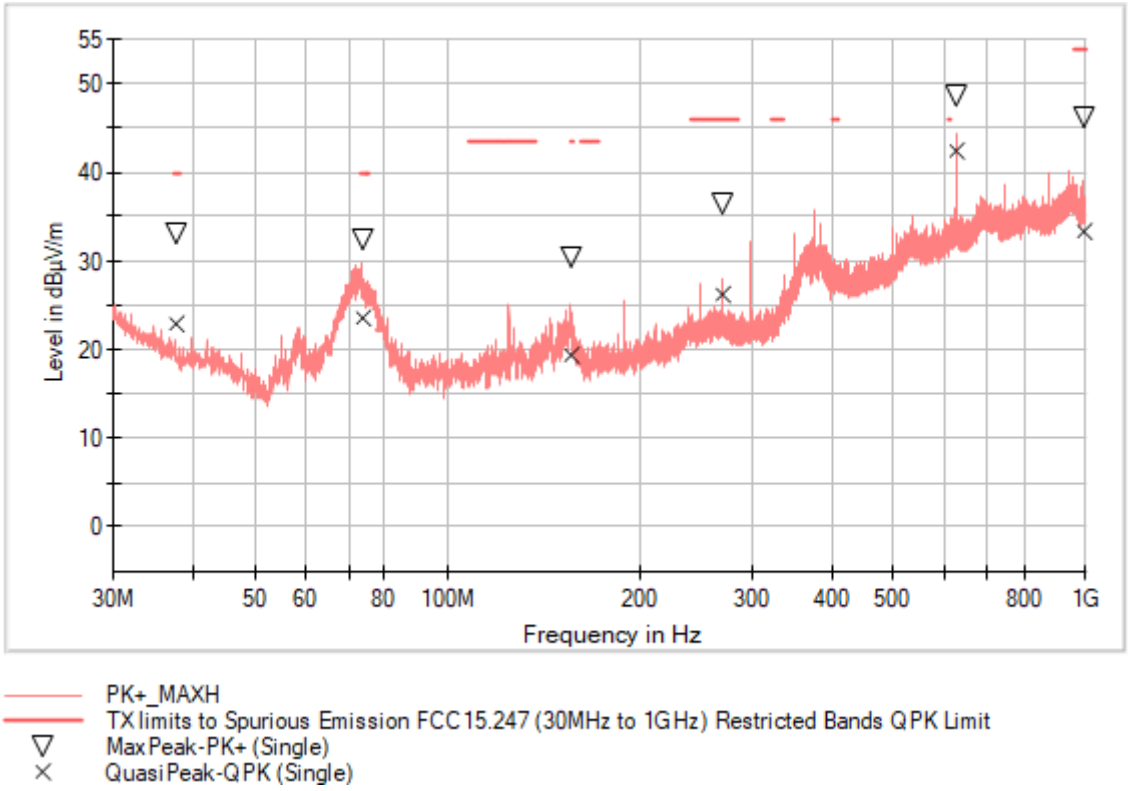
Modulation: BT (GFSK 1-DH5)
Results: Frequency range 0.03 - 1 GHz
The spurious emissions below 1 GHz do not depend on the operating channel selected in the EUT.

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [0.03, 1]

Images:



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
37.663000	33.1	23.0	V	17.0	40.0
73.844000	32.4	23.5	V	16.5	40.0
156.827500	30.4	19.3	V	24.3	43.5
269.978000	36.4	26.2	H	19.8	46.0
624.998000	48.7	42.5	V	---	---
990.591000	46.1	33.4	V	20.6	54.0

Verdict

Pass

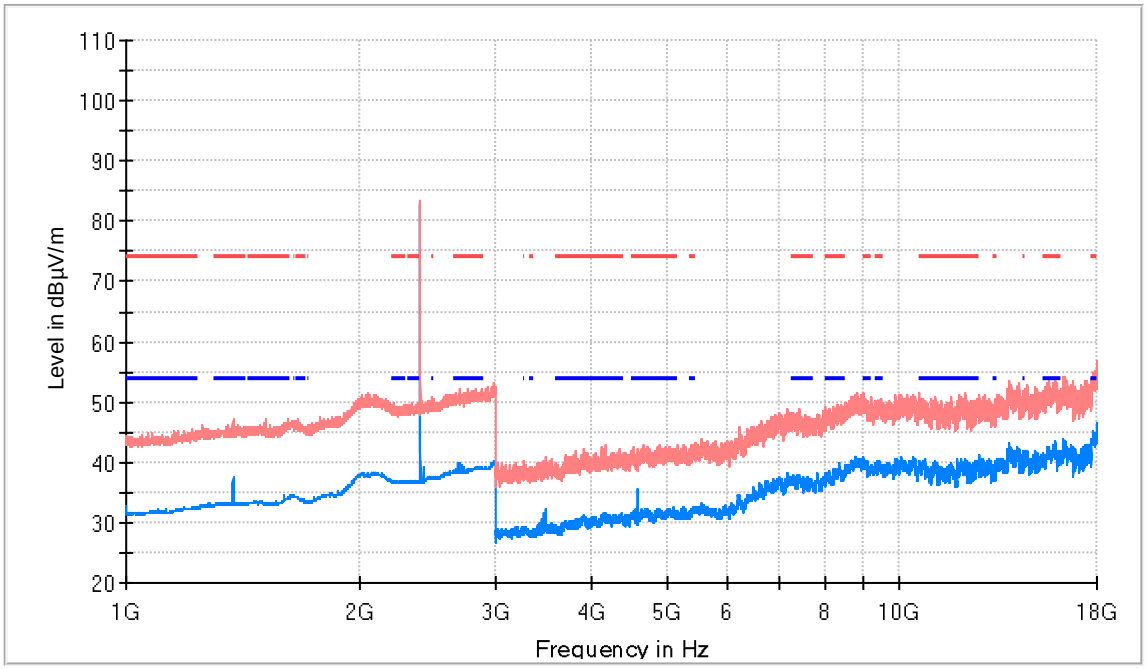
Modulation: BT (GFSK 1-DH5)
Results: Frequency range 1 - 18 GHz

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	83.3	82.7	V	---	---	Fundamental
4590.000000	41.4	35.7	V	18.3	54.0	
17992.000000	55.3	46.4	V	7.6	54.0	

Verdict

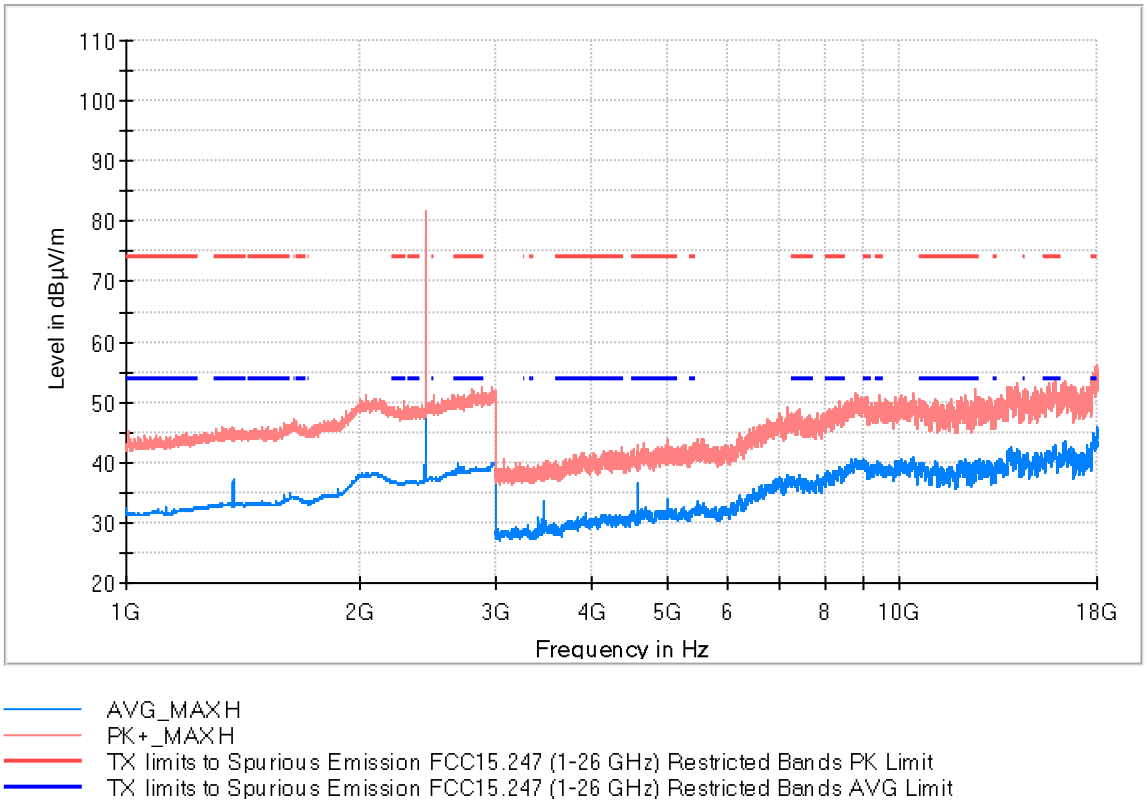
Pass

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2441.000000	81.8	76.9	V	---	---	Fundamental
4590.000000	42.8	36.6	V	17.4	54.0	
17993.500000	54.4	45.7	V	8.3	54.0	

Verdict

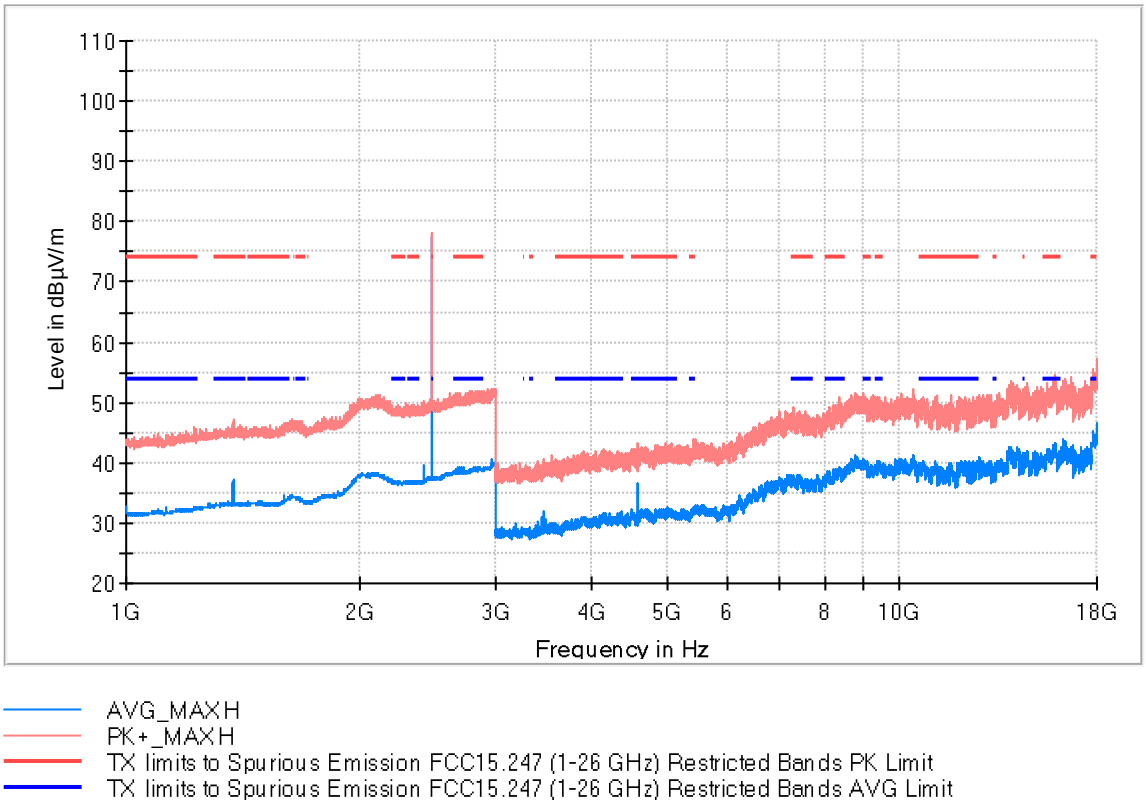
Pass

Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2480.000000	78.2	77.5	V	---	---	Fundamental
4590.000000	42.8	36.5	V	17.5	54.0	
17986.500000	55.5	46.4	H	7.6	54.0	

Verdict

Pass

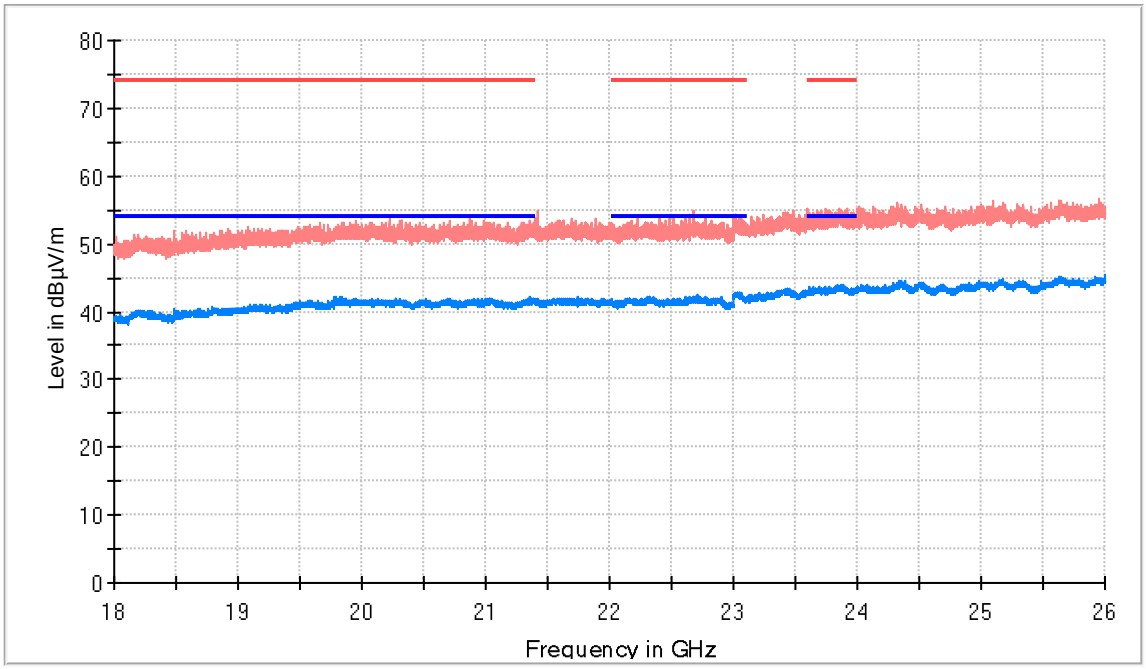
Modulation: BT (GFSK 1-DH5)
Results: Frequency range 18 - 26 GHz

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23889.000000	53.9	44.1	V	9.9	54.0

Verdict

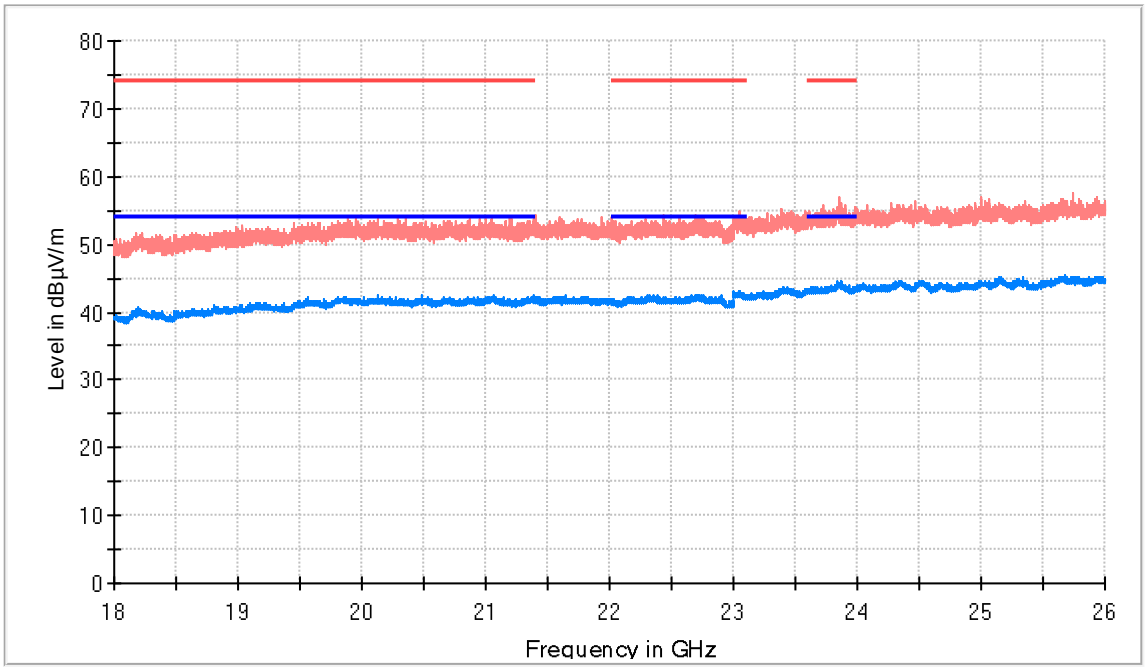
Pass

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23864.500000	54.2	44.5	V	9.5	54.0

Verdict

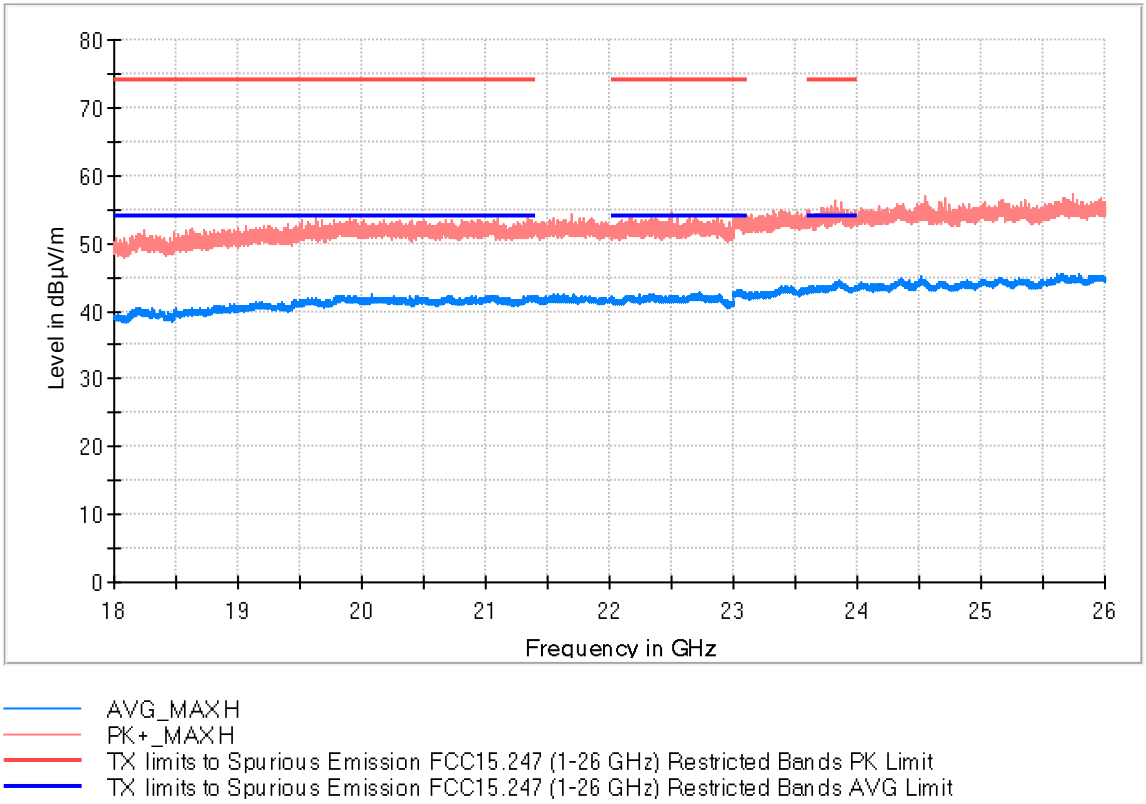
Pass

Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23860.500000	54.3	44.5	H	9.5	54.0

Verdict

Pass

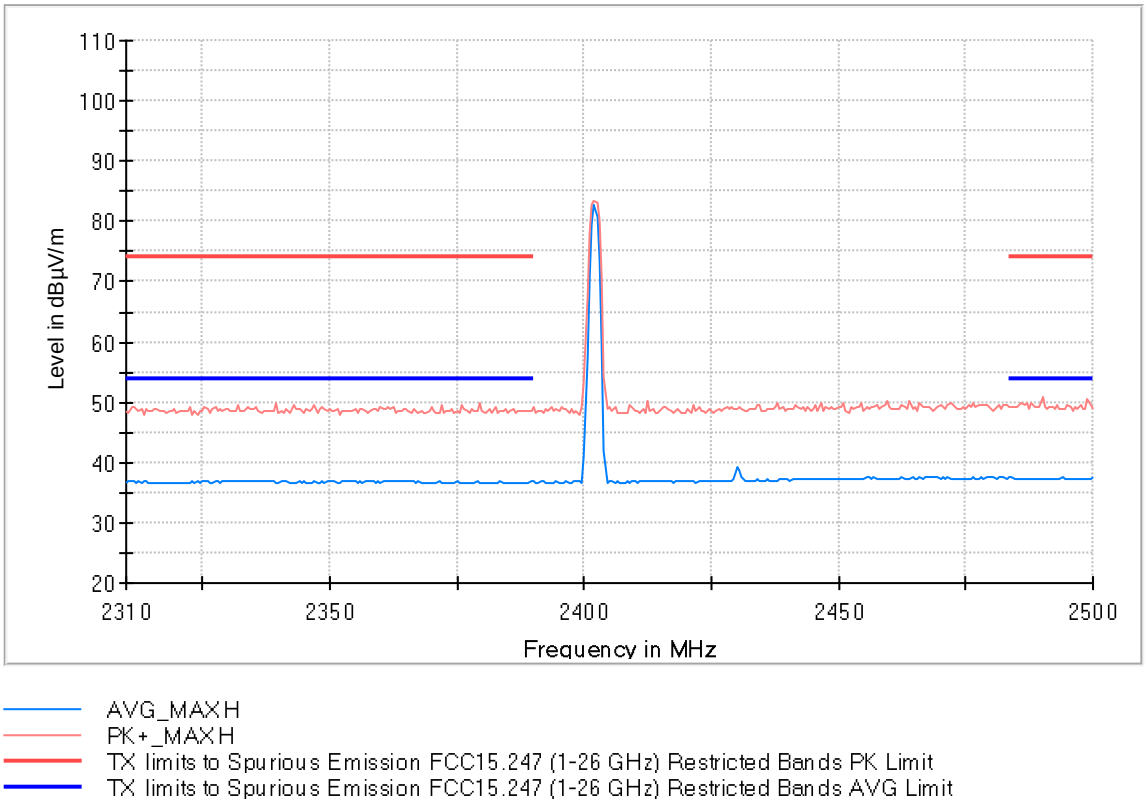
Restricted Bands (2.31 GHz - 2.5 GHz)

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [1, 18]

Images:

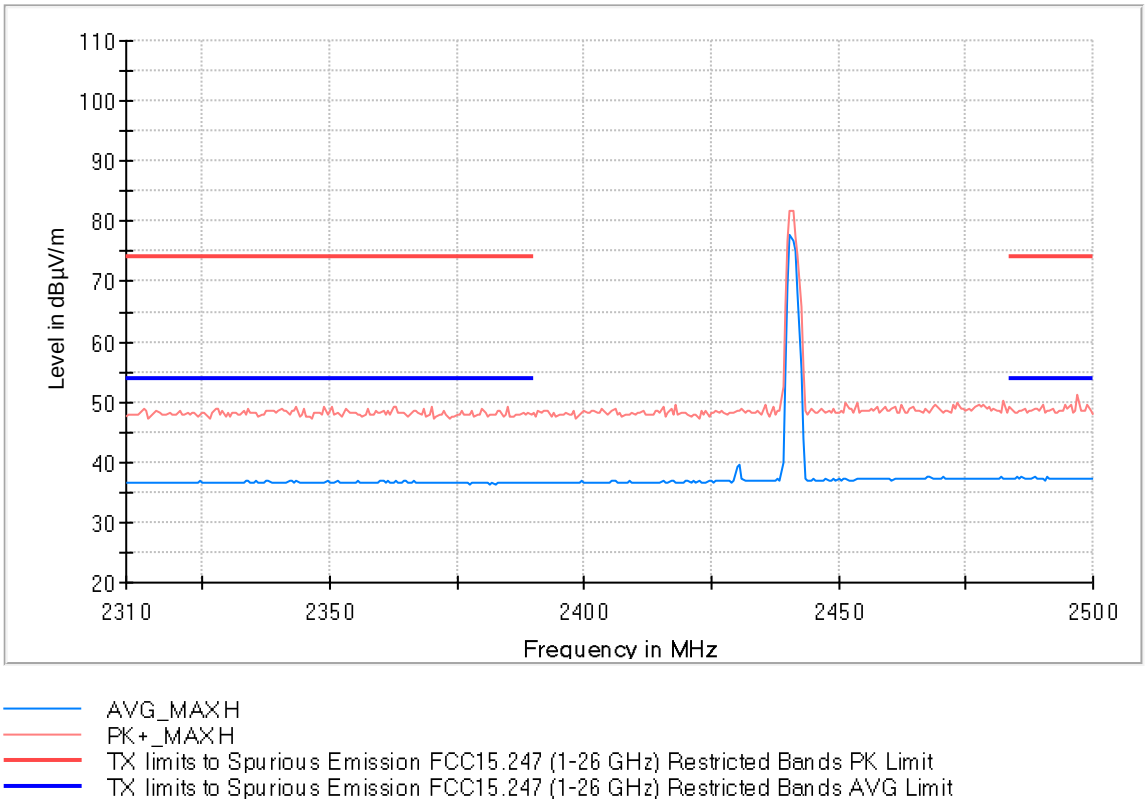


Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [1, 18]

Images:

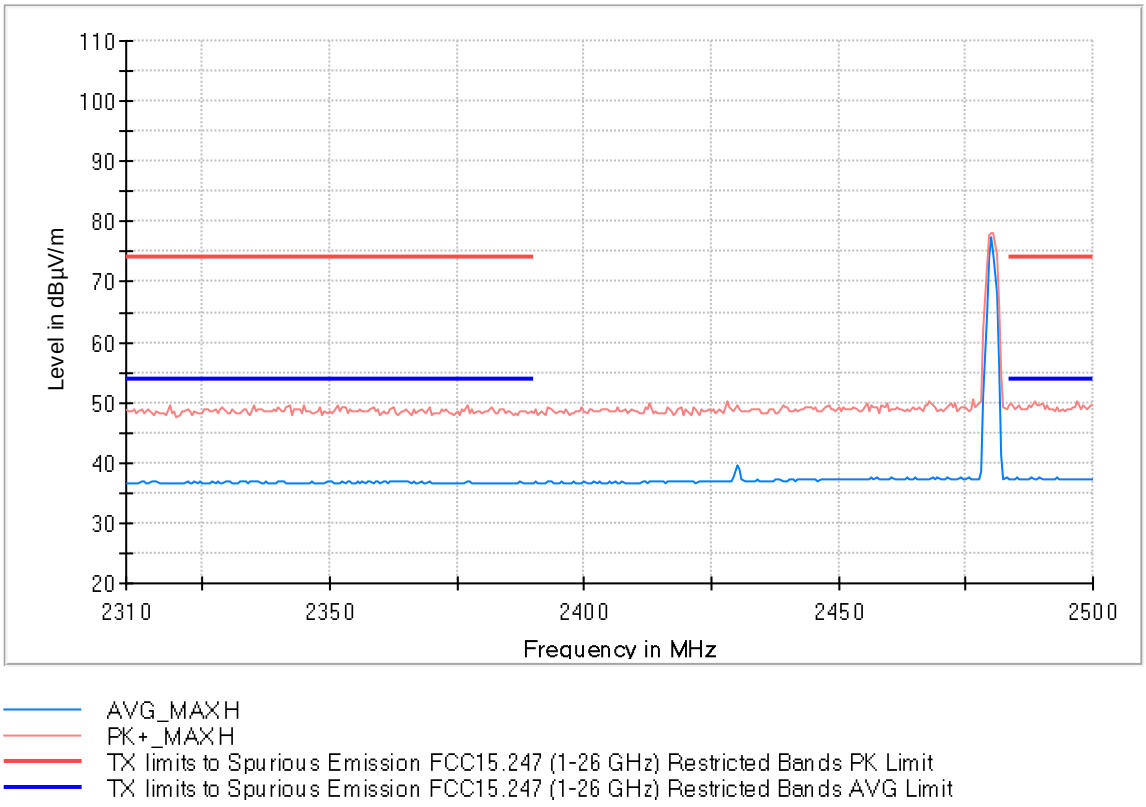


Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (GFSK 1-DH5), Frequency Range GHz = [1, 18]

Images:



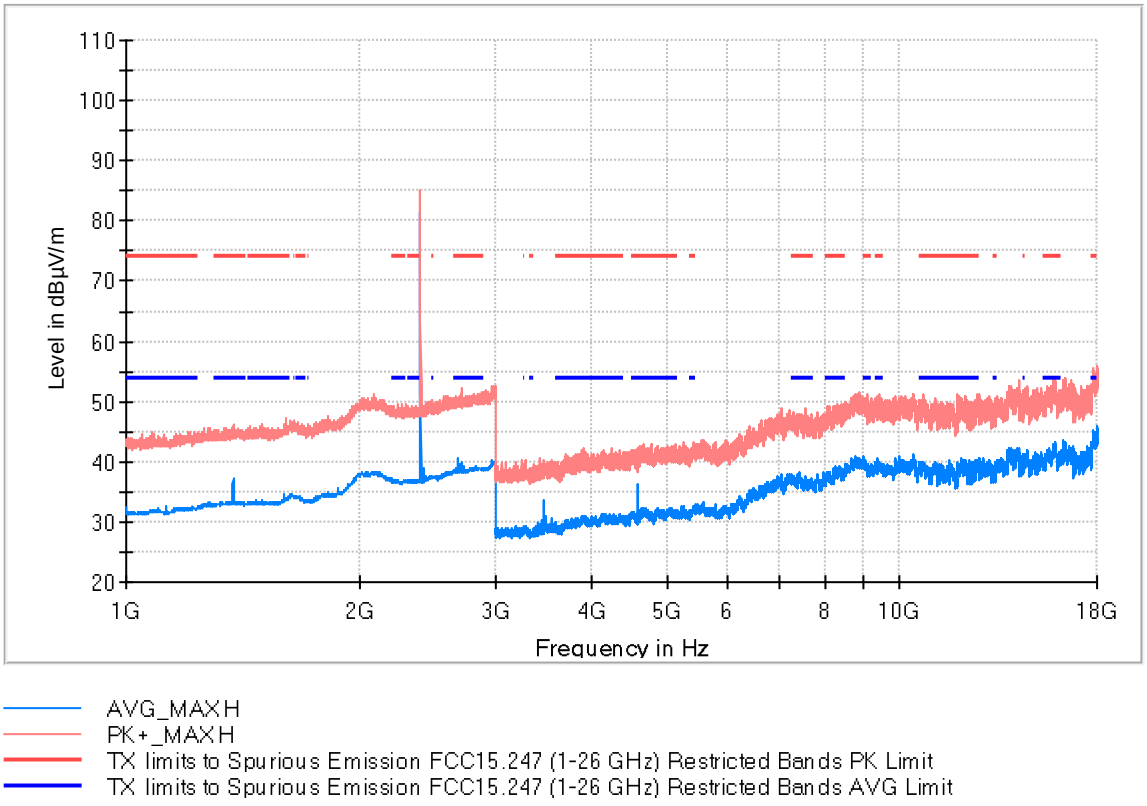
Modulation: BT (π/4 DQPSK 2-DH5)
Results: Frequency range 1 - 18 GHz

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	85.1	81.5	V	---	---	Fundamental
4590.000000	42.0	36.3	V	17.7	54.0	
17984.500000	54.9	45.8	V	8.2	54.0	

Verdict

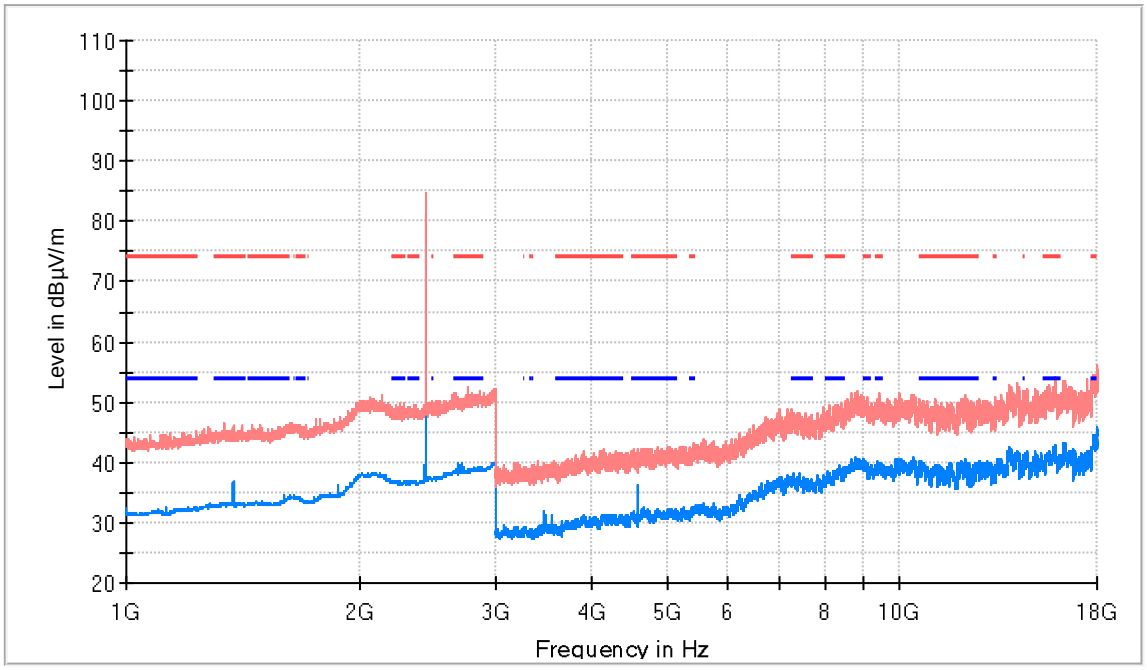
Pass

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	85.1	81.5	V	---	---	Fundamental
4590.000000	42.0	36.3	V	17.7	54.0	
17984.500000	54.9	45.8	V	8.2	54.0	

Verdict

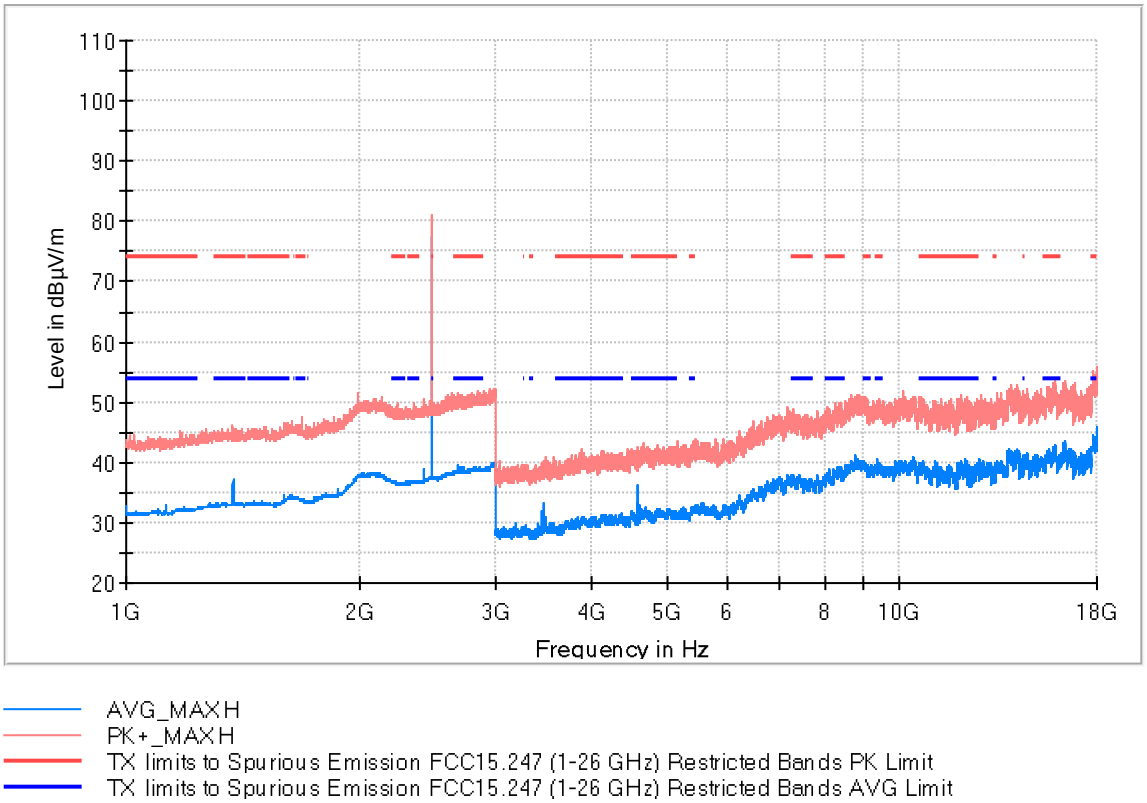
Pass

Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	85.1	81.5	V	---	---	Fundamental
4590.000000	42.0	36.3	V	17.7	54.0	
17984.500000	54.9	45.8	V	8.2	54.0	

Verdict

Pass

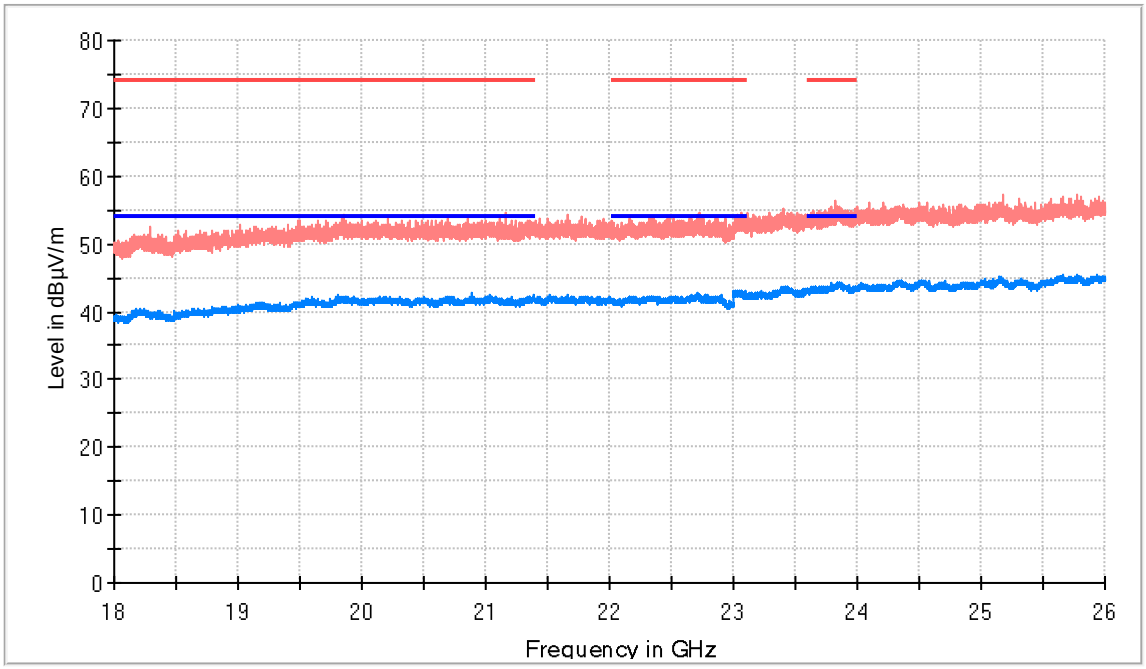
Modulation: BT (π/4 DQPSK 2-DH5)
Results: Frequency range 18 - 26 GHz

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23857.500000	54.1	44.4	H	9.6	54.0

Verdict

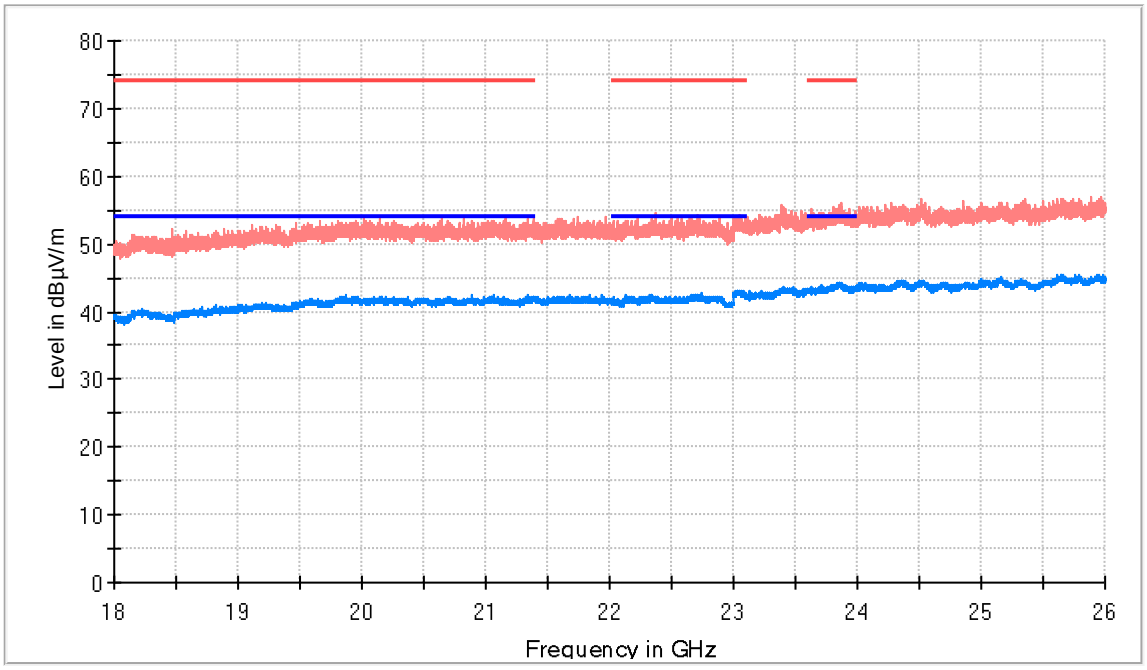
Pass

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23857.500000	54.1	44.4	H	9.6	54.0

Verdict

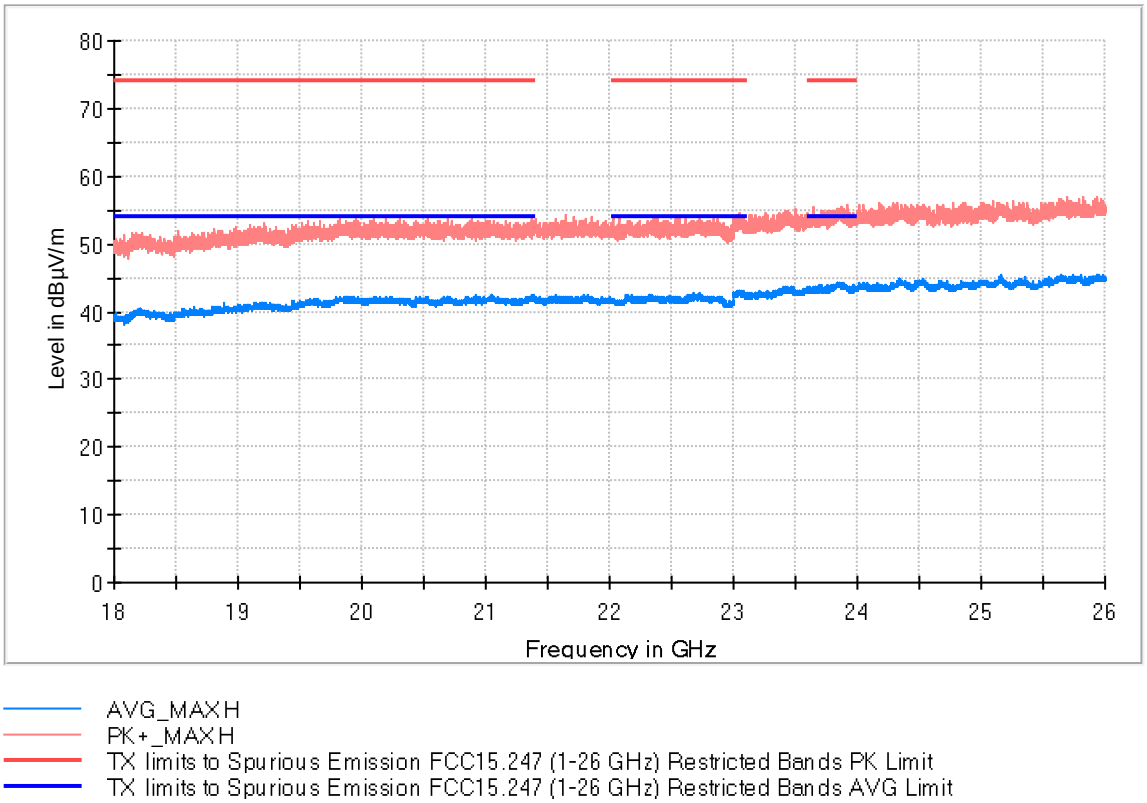
Pass

Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23855.500000	55.0	44.4	H	9.6	54.0

Verdict

Pass

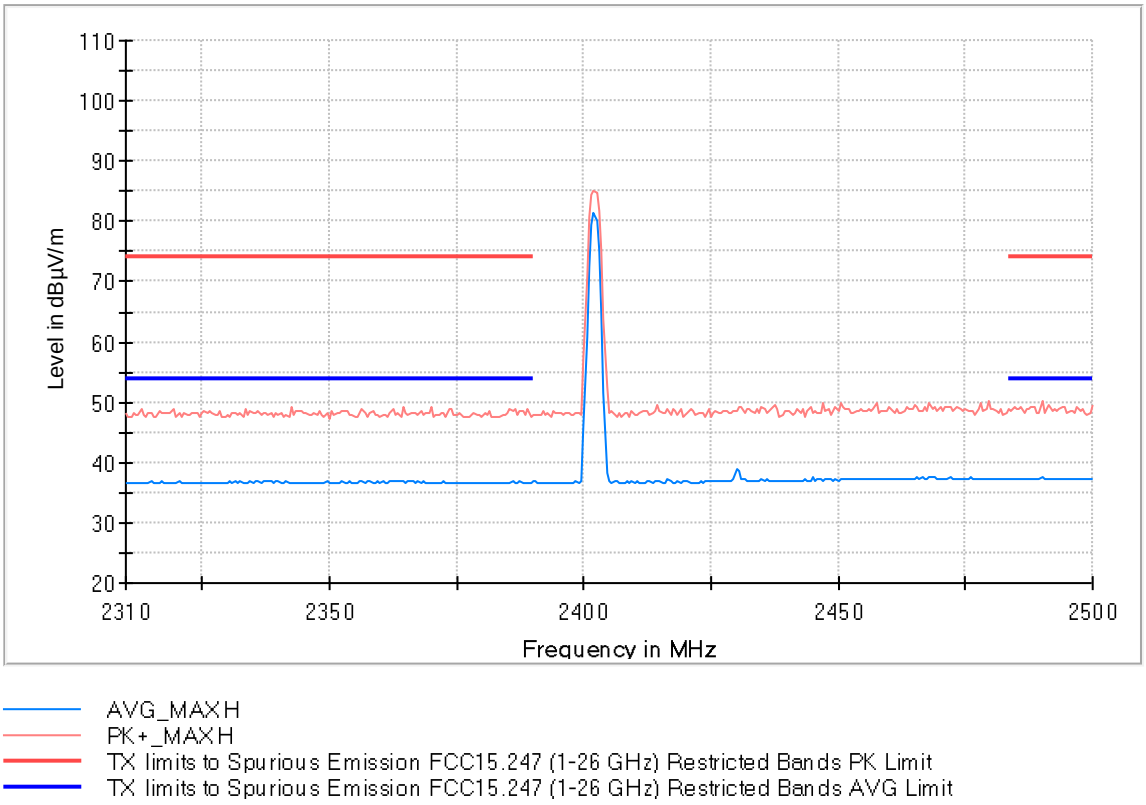
Restricted Bands (2.31 GHz - 2.5 GHz)

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [1, 18]

Images:

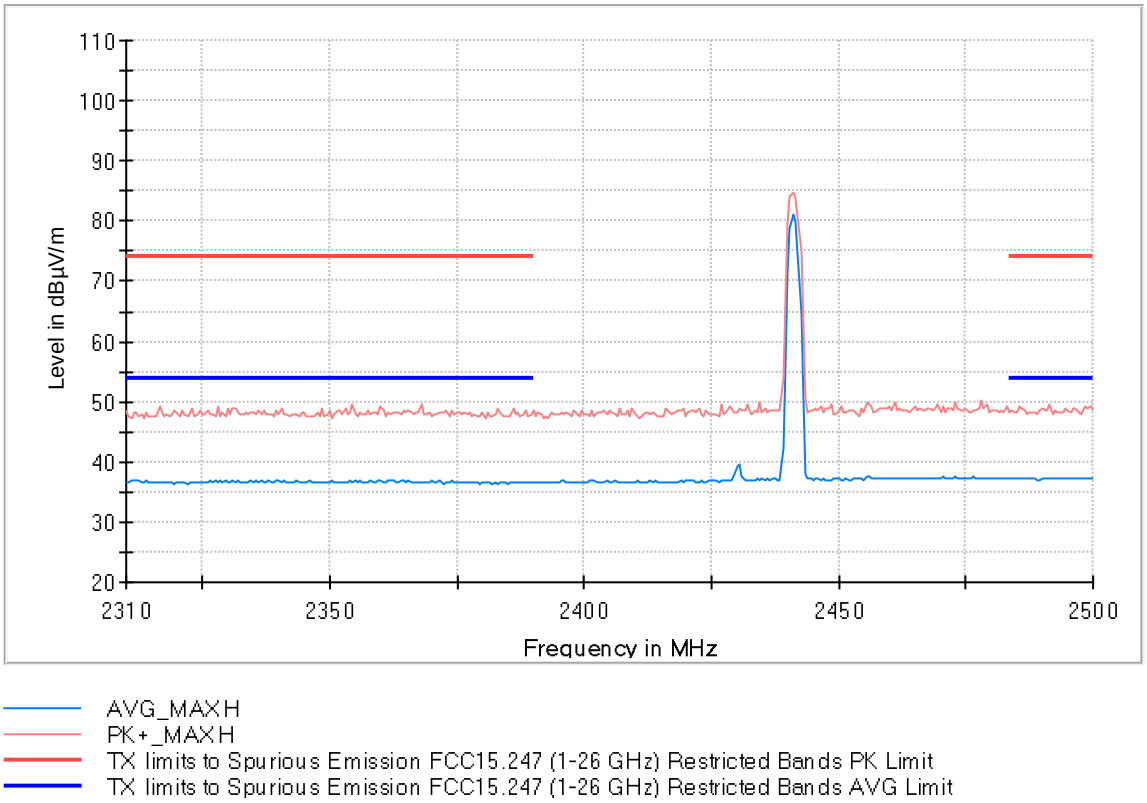


Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [1, 18]

Images:

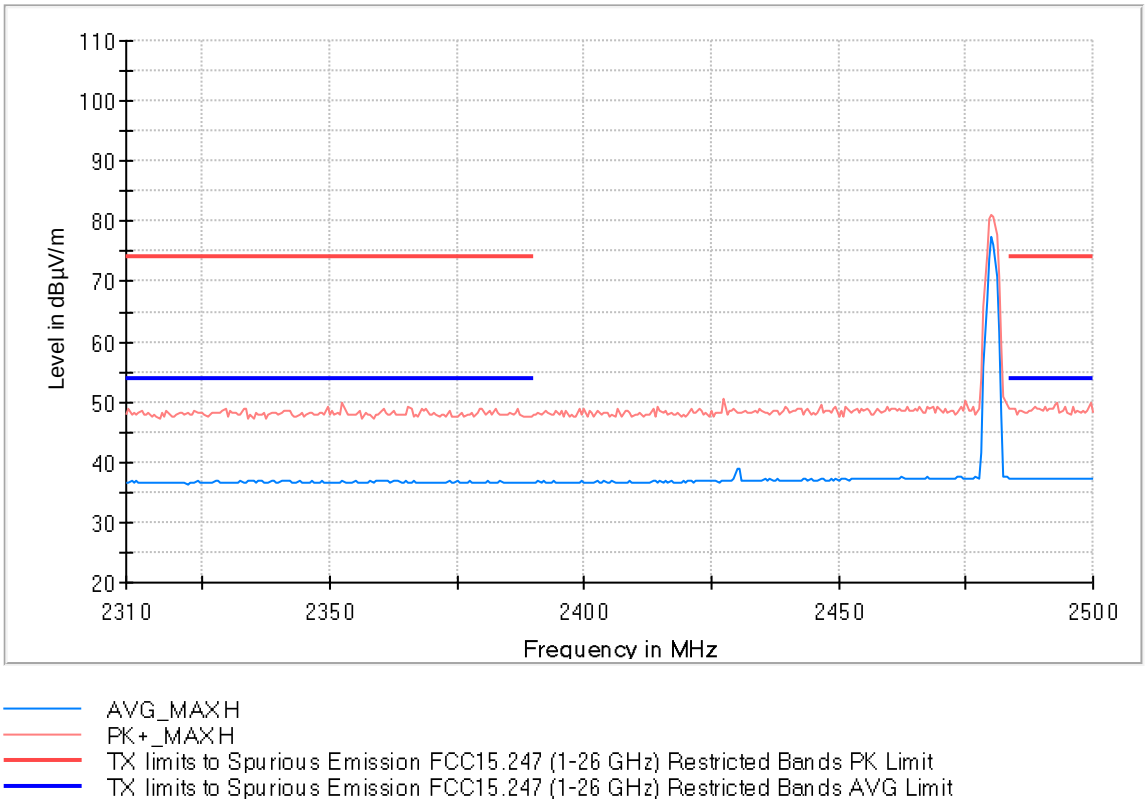


Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (π/4 DQPSK 2-DH5), Frequency Range GHz = [1, 18]

Images:



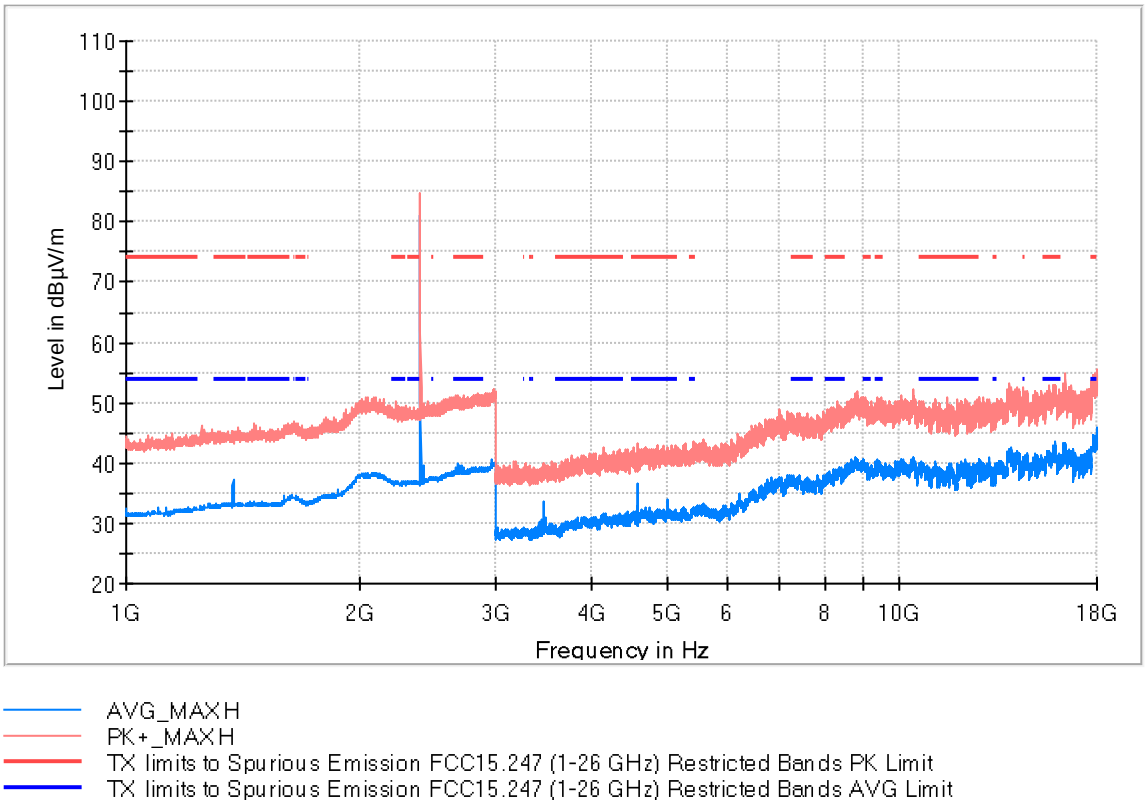
Modulation: BT (8DPSK 3-DH5)
Results: Frequency range 1 - 18 GHz

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	85.1	81.5	V	---	---	Fundamental
4590.000000	42.0	36.3	V	17.7	54.0	
17984.500000	54.9	45.8	V	8.2	54.0	

Verdict

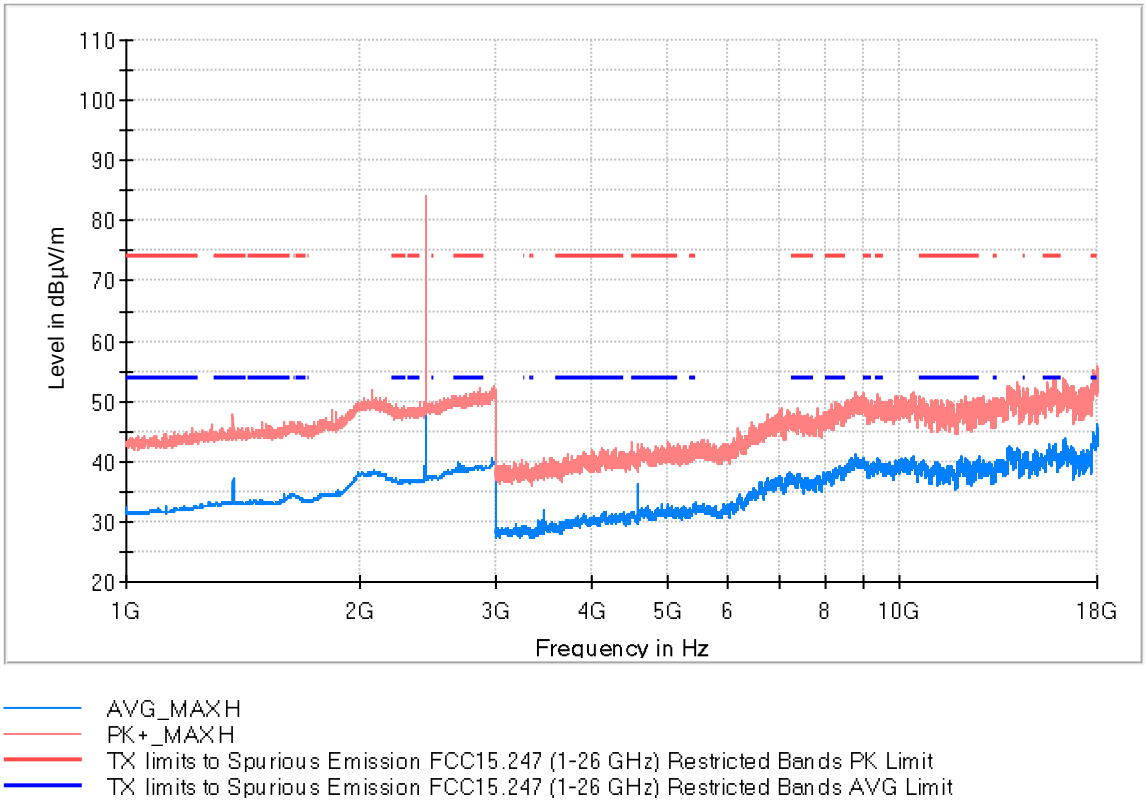
Pass

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2441.000000	84.1	80.3	V	---	---	Fundamental
4590.000000	42.0	36.3	V	17.7	54.0	
17990.000000	53.3	45.7	V	8.3	54.0	

Verdict

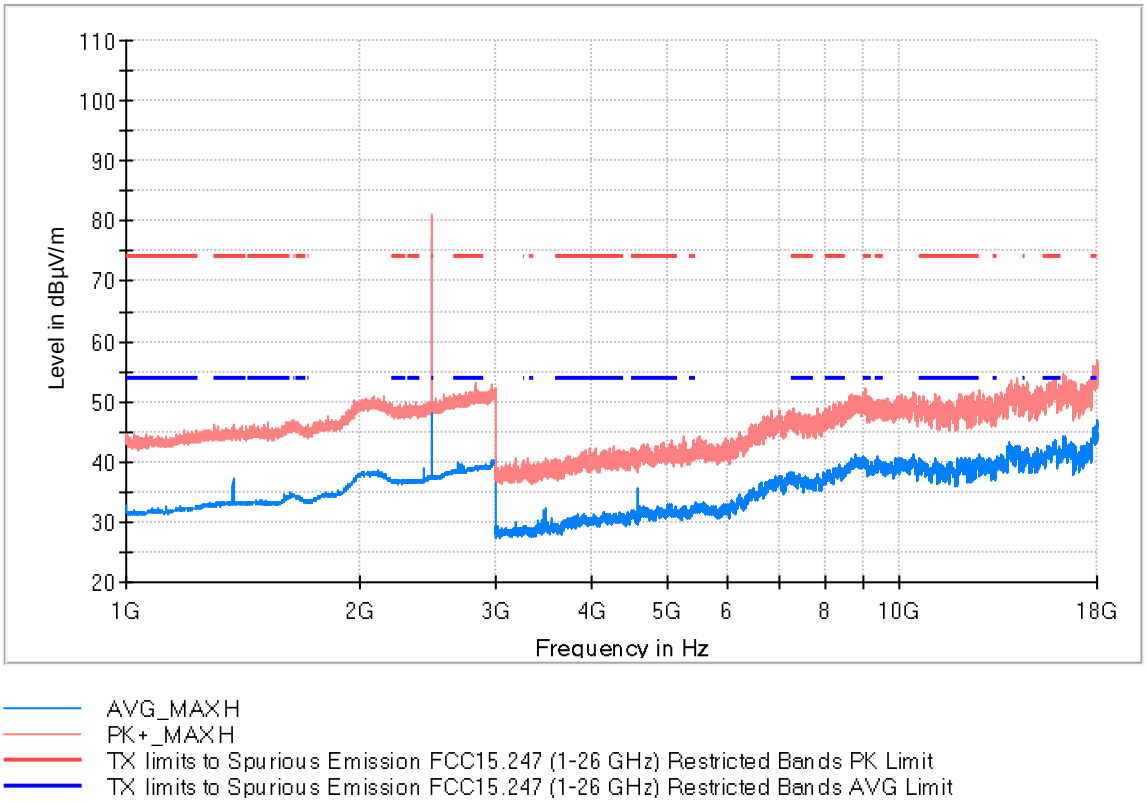
Pass

Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2480.000000	85.1	81.5	V	---	---	Fundamental
4590.000000	42.0	36.3	V	17.7	54.0	
17984.500000	54.9	45.8	V	8.2	54.0	

Verdict

Pass

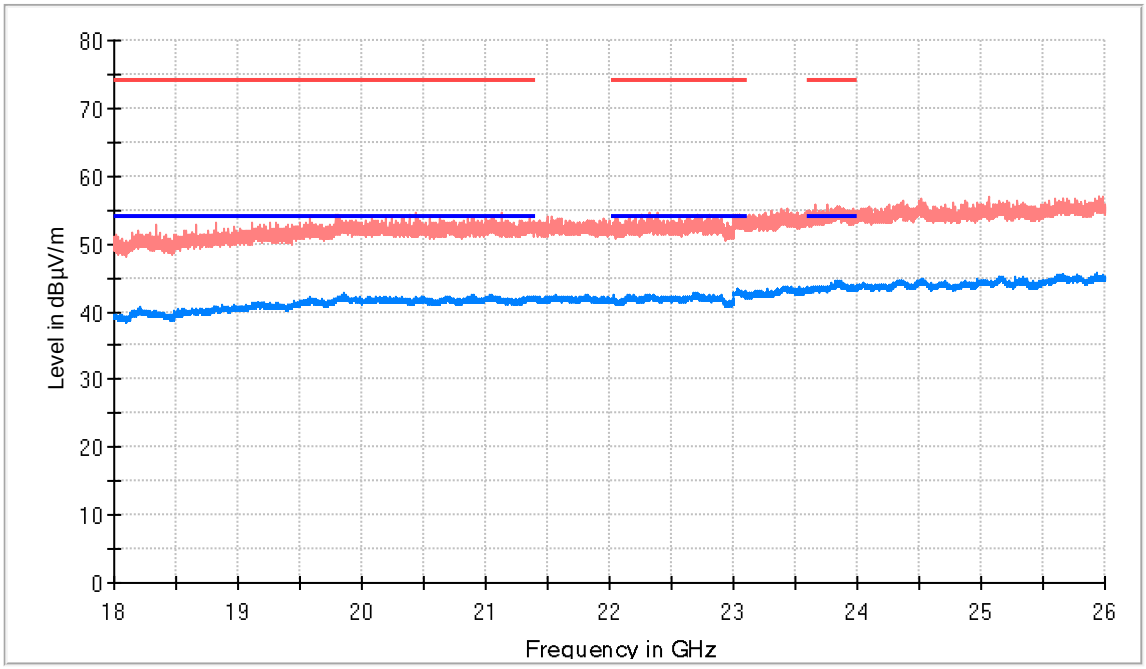
Modulation: BT (8DPSK 3-DH5)
Results: Frequency range 18 - 26 GHz

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23842.500000	54.6	44.6	H	9.4	54.0

Verdict

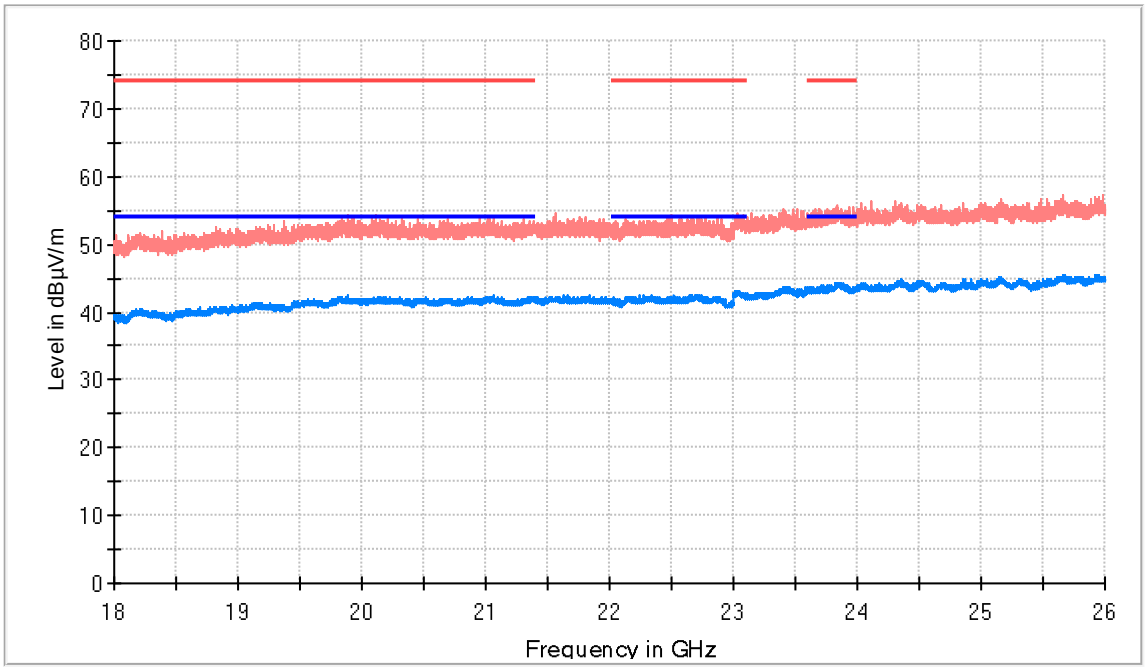
Pass

Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23872.500000	54.5	44.3	V	9.7	54.0

Verdict

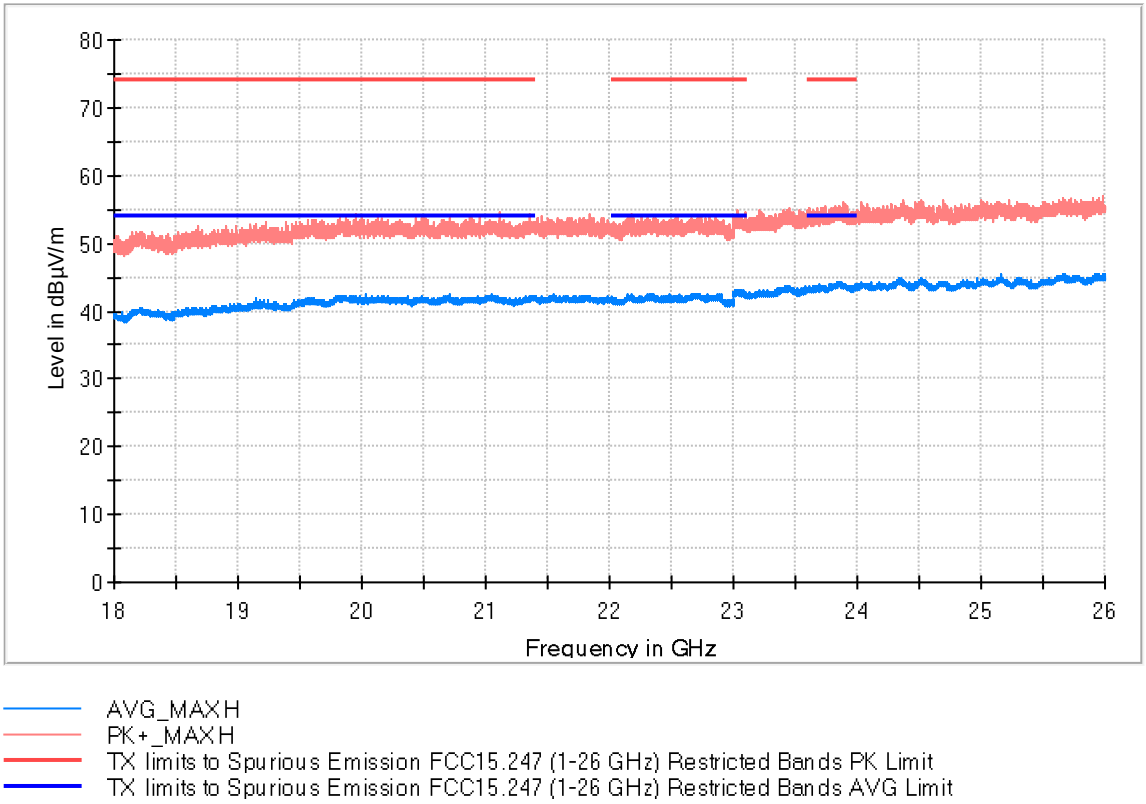
Pass

Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [18, 26]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23873.000000	54.7	44.4	V	9.6	54.0

Verdict

Pass

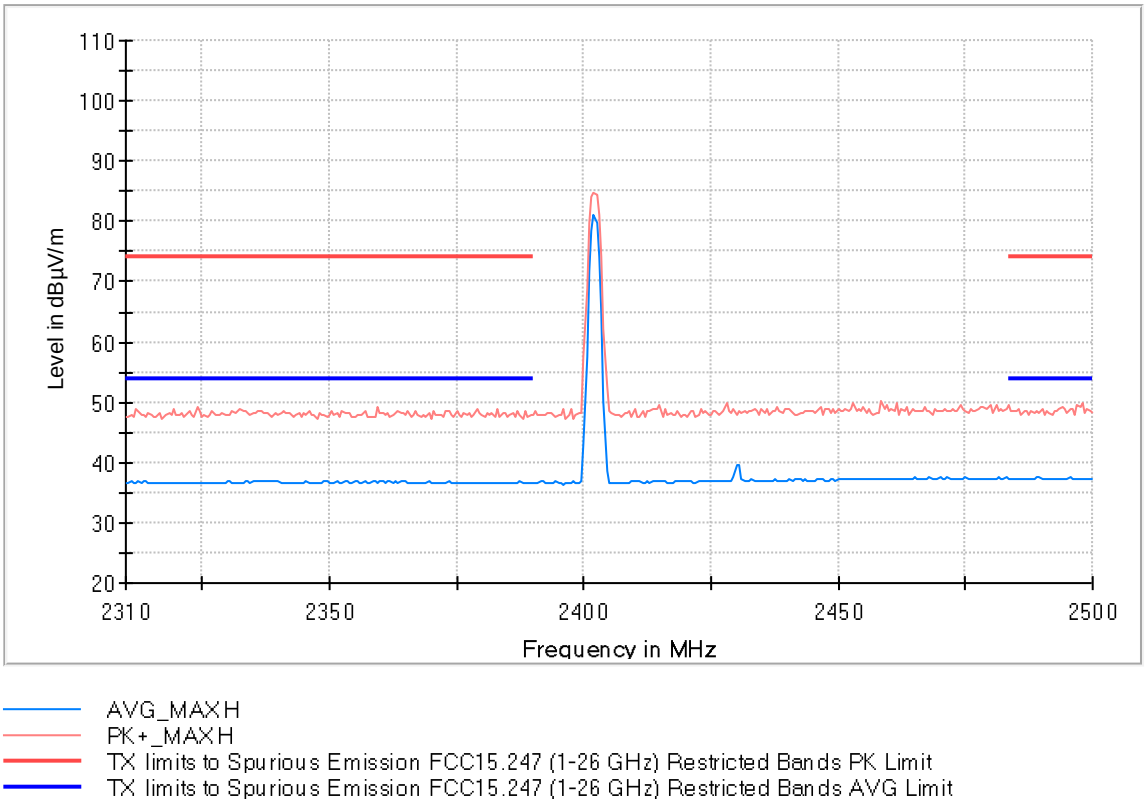
Restricted Bands (2.31 GHz - 2.5 GHz)

Lowest Channel

Attachments

Frequency MHz = 2402.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [1, 18]

Images:

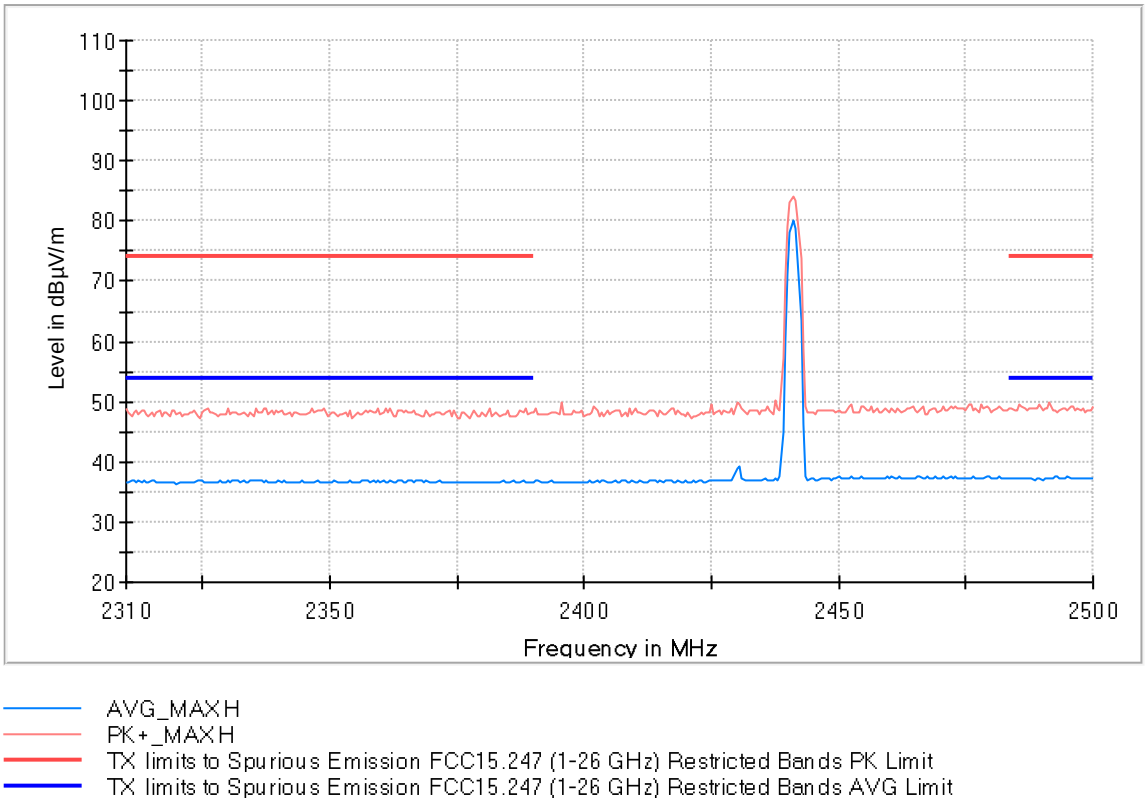


Middle Channel

Attachments

Frequency MHz = 2441.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [1, 18]

Images:



Highest Channel

Attachments

Frequency MHz = 2480.00000, Equipment Type = Frequency Hopping Spread Spectrum systems (DSS), Modulation = BT (8DPSK 3-DH5), Frequency Range GHz = [1, 18]

Images: