

Produkte
 Products

Prüfbericht - Nr.: 19660188 001		Seite 1 von 50	
<i>Test Report No.:</i>		<i>Page 1 of 50</i>	
Auftraggeber: <i>Client:</i>		American Megatrends India Private Limited Kumaran Nagar, Off Old Mahabalipuram Road Semmanchery, Chennai-600119, India	
Gegenstand der Prüfung: <i>Test item:</i>		Wireless Vitals Monitor	
Bezeichnung: <i>Identification:</i>	VA06	Serien-Nr.: Engineering Sample <i>Serial No.</i>	
Wareneingangs-Nr.: <i>Receipt No.:</i>	1803095548	Eingangsdatum: 26.08.2015 <i>Date of receipt:</i>	
Prüfart: <i>Testing location:</i>		Refer Page 4 of 50 for test facilities	
Prüfgrundlage: <i>Test specification:</i>		FCC Part 15: Subpart C Section 15.247 ANSI C63.10-2013	
Prüfergebnis: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test items passed the test specification(s).</i>	
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland (India) Pvt. Ltd. 82/A, 3rd Main, West Wing, Electronic City Phase 1 Hosur Road, Bangalore – 560 100, India FCC Registration No.: 176555	
geprüft / tested by:		kontrolliert / reviewed by:	
21.09.2015 Girish Kumar.G  Test Engineer		26.09.2015 Raghavendra Kulkarni  Sr. Manager	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	
Sonstiges / Other Aspects: FCC ID : 2AFV6-AMI-BU-01			
Abkürzungen:		Abbreviations:	
P(ass) = entspricht Prüfgrundlage		P(ass) = passed	
F(ail) = entspricht nicht Prüfgrundlage		F(ail) = failed	
N/A = nicht anwendbar		N/A = not applicable	
N/T = nicht getestet		N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			

 TÜV Rheinland India Pvt. Ltd. 82/A, 3rd Main, West Wing Electronic City Phase 1, Hosur Road, Bangalore-560100, India
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Test Result Summary

Clause	Test Item	Result
Section 15.203 and 15.204	Antenna Requirement	Pass
Section 15.247 (a)	Pseudorandom Frequency Hopping Sequence	Pass
Section 15.247 (a)	Equal Hopping Frequency Use	Pass
Section 15.247 (a)	Receiver Input Bandwidth	Pass
Section 15.247 (a)	Receiver Hopping Capability	Pass
Section 15.247 (b) (1)	Peak Output Power	Pass
Section 15.247 (a)(1)	20dB Bandwidth	Pass
Section 15.247 (a)(1)(ii)	Number of Hopping Channels	Pass
Section 15.247 (a)(1)	Carrier Frequency Separation	Pass
Section 15.247 (a)(1)(iii)	Time of Occupancy	Pass
Section 15.247 (d)	Band-edge compliance of RF Conducted Emissions	Pass
Section 15.209 & 15.205	Spurious Radiated Emissions and Restricted bands of operation	Pass
Section 15.207	Conducted emission test on a.c Power line	Pass

Note: Conducted measurements are done according to the procedure given in KDB No. **DA 00-705**
March 2000

Content

List of Test and Measurement Instruments.....	4
General Product Information	5
Product Function and Intended Use	5
Ratings and System Details.....	5
Test Set-up and Operation Mode.....	6
Principle of Configuration Selection	6
Test Operation and Test Software	6
Test Modes – Data Rates and Modulations	6
Test Methodology	7
Radiated Emission Test	7
Conducted Emission Test on A.C. mains line	7
Test Results	8
Antenna Requirement	Section 15.203 and 15.2048
Pseudorandom Frequency Hopping Sequence	Section 15.247 (a).....8
Equal Hopping Frequency Use	Section 15.247 (a).....10
Receiver Input Bandwidth	Section 15.247 (a).....10
Receiver Hopping Capability	Section 15.247 (a).....10
Peak Output Power	Section 15.247 (b) (1).....11
20dB Bandwidth	Section 15.247 (a) (1).....18
Number of Hopping Channels	Section (a) (1) (iii).....29
Carrier Frequency Separation	Section 15.247 (a) (1)31
Time of Occupancy (Dwell Time)	Section 15.247 (a)(1)(III)32
Band-edge Compliance of RF Conducted Emissions	Section 15.257 (d).....33
Spurious Radiated Emissions & Restricted Bands of Operation	Section 15.209 & 15.20543
Conducted Emission Test on A.C. Power Line	Section 15.207.....48
Appendix 1: Test Setup Photo	
Appendix 2: EUT External Photo	
Appendix 3: EUT Internal Photo	
Appendix 4: FCC Label and Label Location	
Appendix 5: Block Diagram	
Appendix 6: Specification of EUT	
Appendix 7: Schematic Diagrams	
Appendix 8: Bill of Material	
Appendix 9: User Manual	
Appendix 10: SAR Exclusion Calculation	

List of Test and Measurement Instruments

Testing Facilities

- 1) TÜV Rheinland (India) Pvt. Ltd.
82/A, 3rd Main, West Wing, Electronic City,
West Phase, Hosur Road
Bangalore - 560 100.

Equipment	Manufacturer	Model Name	Serial Number	Calibration Due Date	Periodicity	Used for Test Items
Spectrum Analyser	Agilent Technologies	E4407B	US41192772	15.04.2016	Yearly	Antenna - Port Conducted Tests

- 2) TUV Rheinland (India) Private Limited
108 , Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100.

Equipment	Manufacturer	Model Name	Serial Number	Calibration Due Date	Periodicity	Used for Test Items
EMI Test Receiver	Rohde & Schwarz	ESU 40	100288	20.06.2016	Yearly	Spurious Radiated Emissions
Broadband Antenna	Frankonia	ALX-4000	ALX-4000-806	22.06.2016	Yearly	
Active Loop Antenna	Frankonia	LAX-10	LAX-10-800	22.06.2016	Yearly	
Broadband Horn Antenna	Frankonia	HAX-18	HAX18-802	22.06.2016	Yearly	
Emission Horn Antenna	ETS Lindgren	116706	00107323	22.06.2016	Yearly	
Anechoic Chamber	Frankonia	-	-	-	-	Conducted Emission on AC power lines
EMI Test Receiver	Rohde & Schwarz	ESR7	101133	19.11.2015	Yearly	
Two Line V-Network (LISN)	Rohde & Schwarz	ENV216	100022	04.09.2016	Yearly	

General Product Information

Product Function and Intended Use

Wireless Vitals Monitor is a Non Invasive medical gadget that combines multiple vital physiological parameters into a small form factor device which gets controlled from a mobile device. Wireless Vitals Monitor is a cloud enabled solution. With Wireless Vitals Monitor your health vitals can be stored in your personal health cloud. For Wireless Vitals Monitor to be in your hands, all you need is any leading mobile device that operates with the compatible Operating System. It is used to measure the vital signs like Blood Pressure, Body temperature, Blood oxygen saturation level & Blood glucose, hemoglobin, cholesterol levels etc.

Ratings and System Details

Operating Frequency Range	2400MHz – 2483.50MHz	
No. of channel	79	
Channel Spacing	1MHz	
Modulation	1Mbps	GFSK
	2Mbps	$\pi/4$ -DQPSK
	3Mbps	8DPSK
Transmitted Power	-13.93dBm	
Number of antenna	One	
Antenna Gain and Antenna type	0.5dBi and Trace Antenna	
Supply Voltage to Product	5V DC from Power Charger	
Environmental	Operational Temperature: 16°C to 35° C	

Test Conditions:

Supply Voltage: 5V DC from Power Charger

Environmental conditions:

Temperature: +24.6 ° C RH: 55%

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Test Set-up and Operation Mode

Principle of Configuration Selection

Transmission was enabled with 100% duty cycle duty on low, mid and high channel.

Test Operation and Test Software

Test software was used to enable the transmission with 100% duty cycle, changing channels (low/mid/high) and data rates on the EUT for the tests in this report.

Special Accessories and Auxiliary Equipment

- None

Countermeasures to achieve EMC Compliance

- Testing was conducted with the Power adaptor cable connected to the AC mains (5v supply for charging EUT).

Test Modes – Data Rates and Modulations

For Radiated spurious emissions, the tests were performed for all data rates and only worst case results are reported in this report.

For Conducted emission, the tests was performed, both in normal operating mode and channel selection mode in charging condition, power adaptor cable connected to AC mains. And only worst case results are reported in this report.

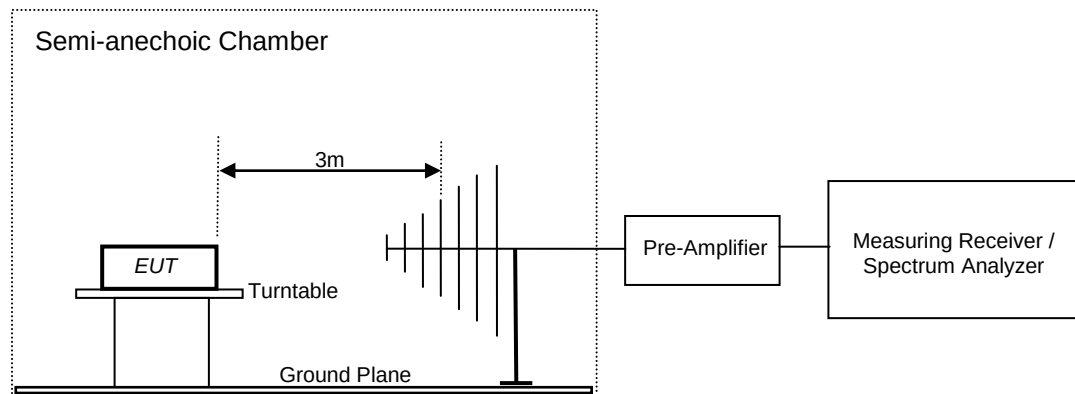
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Test Methodology

Radiated Emission Test

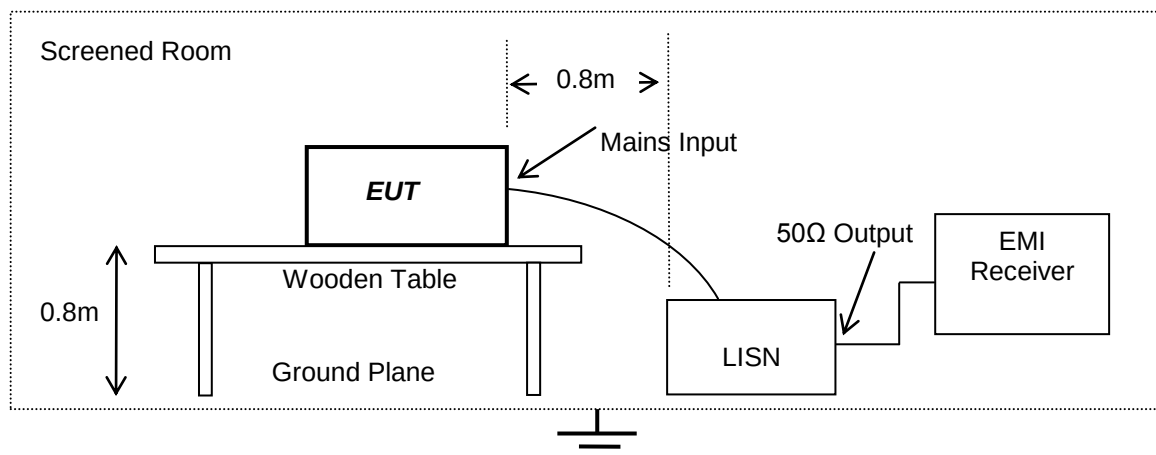
The radiated emission measurement was performed according to the procedures in ANSI C63.10 - 2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1GHz and 150 cm high turntable for above 1GHz, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000MHz was performed by horn antenna. The measurement below 30MHz was performed by loop antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded.



Conducted Emission Test on A.C. mains line

The equipment under test (EUT) was placed on a wooden table 80cm above the ground plane, the LISN was placed 80cm away from the EUT. The test was performed in accordance with ANSI C63.10 - 2013, with the following: an initial measurement was performed in peak and average detection mode on the live and neutral lines. The pre-scan was performed by peak detection on both live and neutral conductors. Any emissions recorded within 20dB of the relevant limit line were re-measured using quasi-peak and average detections, the 6 worst cases were recorded in the table of results.



Test Results

Antenna Requirement

Section 15.203 and 15.204

Result

Pass

FCC Requirement: No antenna other than that furnished by the responsible party shall be used with the device. Permanently attached antenna is used in the device.

Antenna details:

1. Antenna Type: Trace Antenna
2. Peak Gain: 0.5dBi

Pseudorandom Frequency Hopping Sequence

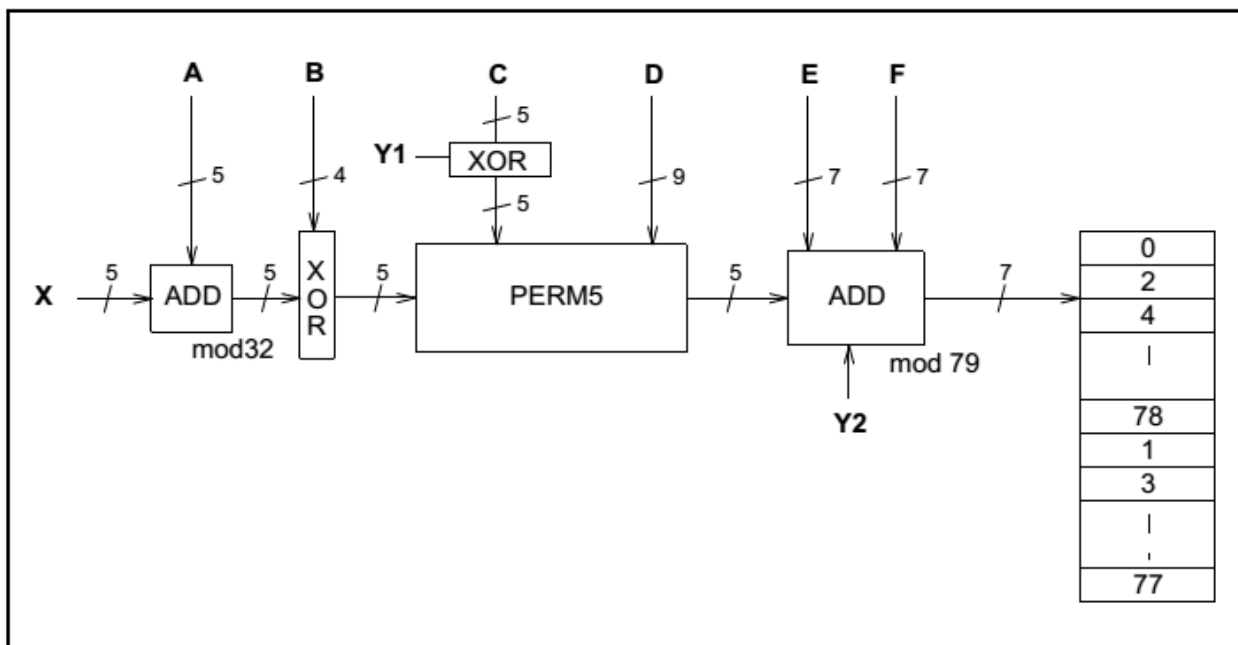
Section 15.247 (a)

Result

Pass

FCC Requirement: The Hopping Sequence is generated and provided with an example

The adapted channel hopping selection kernel is described in The X input determines the phase in the 32-hop segment, whereas Y1 and Y2 selects between master-to-slave and slave-to-master. The inputs A to D determine the ordering within the segment, the inputs E and F determine the mapping onto the hop frequencies. The kernel addresses a register containing the RF channel indices. This list is ordered so that first all even RF channel indices are listed and then all odd hop frequencies. In this way, a 32-hop segment spans about 64 MHz.



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Example data:

Hop Sequence {k} for CONNECTION STATE (Adapted channel hopping sequence with all channel used; ie, AFH(79)):

CLK start: 0x0000010

ULAP: 0x00000000

Used Channels:0x7fffffffffffffff

#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |

```
-----
0x0000010 08 08 | 10 10 | 12 12 | 14 14 | 16 16 | 18 18 | 20 20 | 22 22 |
0x0000030 24 24 | 26 26 | 28 28 | 30 30 | 32 32 | 34 34 | 36 36 | 38 38 |
0x0000050 40 40 | 42 42 | 44 44 | 46 46 | 48 48 | 50 50 | 52 52 | 54 54 |
0x0000070 56 56 | 58 58 | 60 60 | 62 62 | 32 32 | 36 36 | 34 34 | 38 38 |
0x0000090 40 40 | 44 44 | 42 42 | 46 46 | 48 48 | 52 52 | 50 50 | 54 54 |
0x00000b0 56 56 | 60 60 | 58 58 | 62 62 | 64 64 | 68 68 | 66 66 | 70 70 |
0x00000d0 72 72 | 76 76 | 74 74 | 78 78 | 01 01 | 05 05 | 03 03 | 07 07 |
0x00000f0 09 09 | 13 13 | 11 11 | 15 15 | 64 64 | 66 66 | 68 68 | 70 70 |
0x0000110 01 01 | 03 03 | 05 05 | 07 07 | 72 72 | 74 74 | 76 76 | 78 78 |
0x0000130 09 09 | 11 11 | 13 13 | 15 15 | 17 17 | 19 19 | 21 21 | 23 23 |
0x0000150 33 33 | 35 35 | 37 37 | 39 39 | 25 25 | 27 27 | 29 29 | 31 31 |
0x0000170 41 41 | 43 43 | 45 45 | 47 47 | 17 17 | 21 21 | 19 19 | 23 23 |
0x0000190 33 33 | 37 37 | 35 35 | 39 39 | 25 25 | 29 29 | 27 27 | 31 31 |
0x00001b0 41 41 | 45 45 | 43 43 | 47 47 | 49 49 | 53 53 | 51 51 | 55 55 |
0x00001d0 65 65 | 69 69 | 67 67 | 71 71 | 57 57 | 61 61 | 59 59 | 63 63 |
0x00001f0 73 73 | 77 77 | 75 75 | 00 00 | 49 49 | 51 51 | 57 57 | 59 59 |
0x0000210 53 53 | 55 55 | 61 61 | 63 63 | 65 65 | 67 67 | 73 73 | 75 75 |
0x0000230 69 69 | 71 71 | 77 77 | 00 00 | 02 02 | 04 04 | 10 10 | 12 12 |
0x0000250 06 06 | 08 08 | 14 14 | 16 16 | 18 18 | 20 20 | 26 26 | 28 28 |
0x0000270 22 22 | 24 24 | 30 30 | 32 32 | 02 02 | 06 06 | 10 10 | 14 14 |
0x0000290 04 04 | 08 08 | 12 12 | 16 16 | 18 18 | 22 22 | 26 26 | 30 30 |
0x00002b0 20 20 | 24 24 | 28 28 | 32 32 | 34 34 | 38 38 | 42 42 | 46 46 |
0x00002d0 36 36 | 40 40 | 44 44 | 48 48 | 50 50 | 54 54 | 58 58 | 62 62 |
0x00002f0 52 52 | 56 56 | 60 60 | 64 64 | 34 34 | 36 36 | 50 50 | 52 52 |
0x0000310 38 38 | 40 40 | 54 54 | 56 56 | 42 42 | 44 44 | 58 58 | 60 60 |
0x0000330 46 46 | 48 48 | 62 62 | 64 64 | 66 66 | 68 68 | 03 03 | 05 05 |
0x0000350 70 70 | 72 72 | 07 07 | 09 09 | 74 74 | 76 76 | 11 11 | 13 13 |
0x0000370 78 78 | 01 01 | 15 15 | 17 17 | 66 66 | 70 70 | 03 03 | 07 07 |
0x0000390 68 68 | 72 72 | 05 05 | 09 09 | 74 74 | 78 78 | 11 11 | 15 15 |
0x00003b0 76 76 | 01 01 | 13 13 | 17 17 | 19 19 | 23 23 | 35 35 | 39 39 |
0x00003d0 21 21 | 25 25 | 37 37 | 41 41 | 27 27 | 31 31 | 43 43 | 47 47 |
0x00003f0 29 29 | 33 33 | 45 45 | 49 49 | 19 19 | 21 21 | 23 23 | 25 25 |
```

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Equal Hopping Frequency Use

Section 15.247 (a)

Result

Pass

FCC Requirement: Each of the Transmitter's hopping channels is used equally on average.

The EUT Complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.

Receiver Input Bandwidth

Section 15.247 (a)

Result

Pass

FCC Requirement: The associated receiver(s) complies with the requirement that its bandwidth matches the bandwidth of the transmitted signal.

The receiver bandwidth is equal to the receiver bandwidth in the 79 hopping channel mode, which is 1MHz. The receiver bandwidth was verified during Bluetooth RF conformance testing.

Receiver Hopping Capability

Section 15.247 (a)

Result

Pass

FCC Requirement: The associated receiver has the ability to shift frequencies in synchronization with the transmitted signals.

The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.

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Peak Output Power

Section 15.247 (b) (1)

Result

Pass

Test Specification	FCC Part 15C
Measurement Bandwidth (RBW)	3MHz
Detector	Peak
Requirement	<125 mW

Test Method:

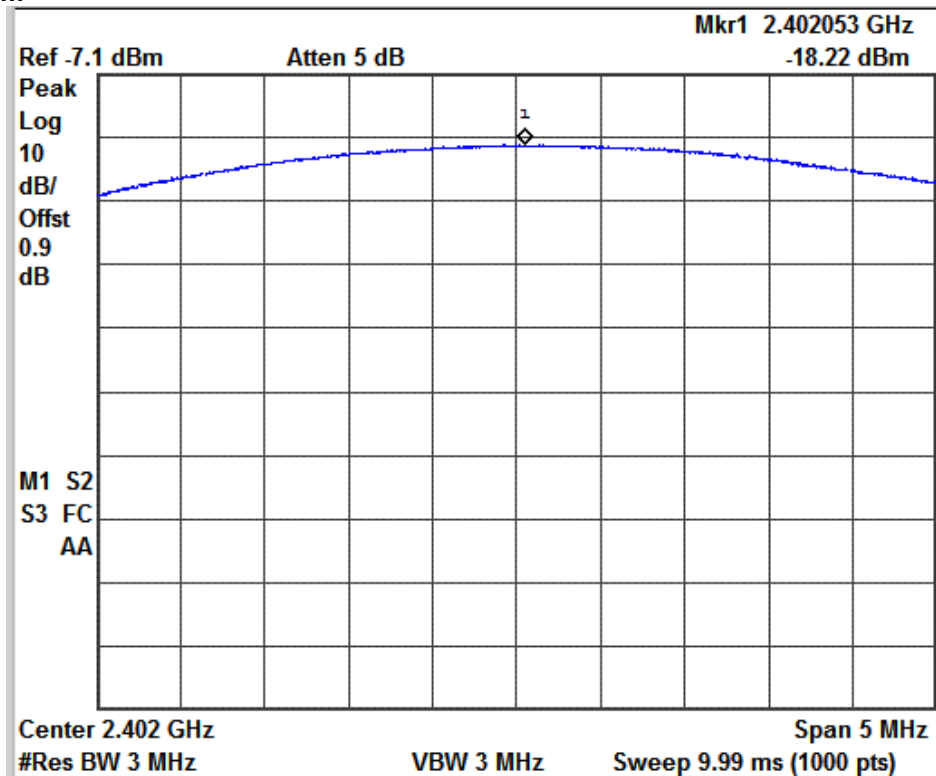


Test Result:

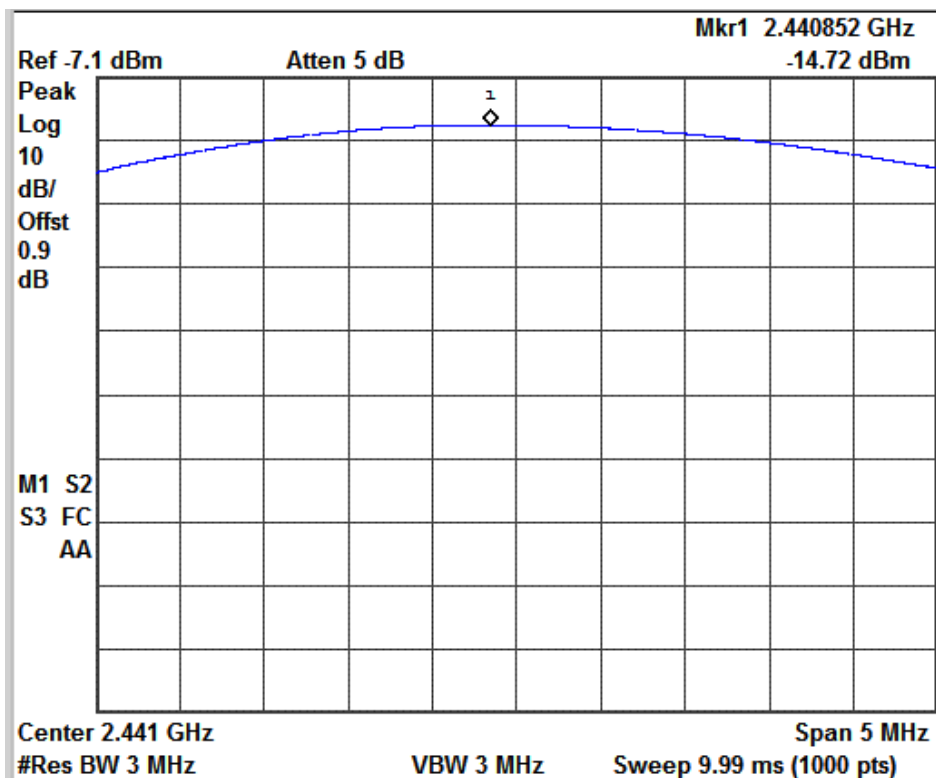
Modulation Type: GFSK

Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
Low	2402	-18.22	30
Mid	2441	-14.72	30
High	2480	-13.93	30

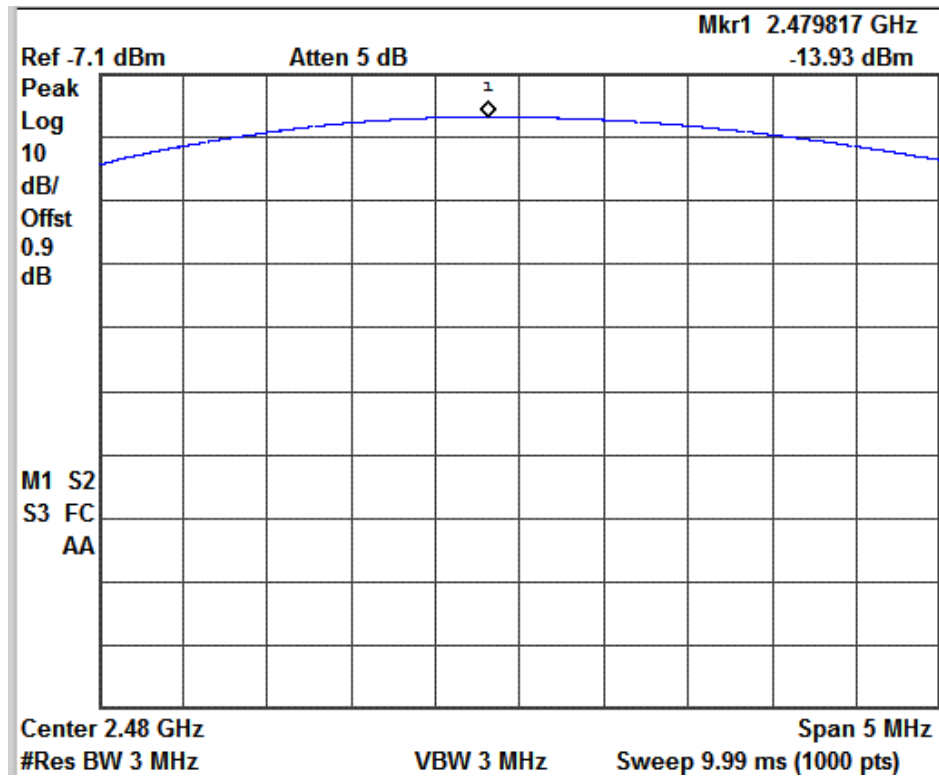
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Channel Frequency: 2402 MHz



Channel Frequency: 2441 MHz



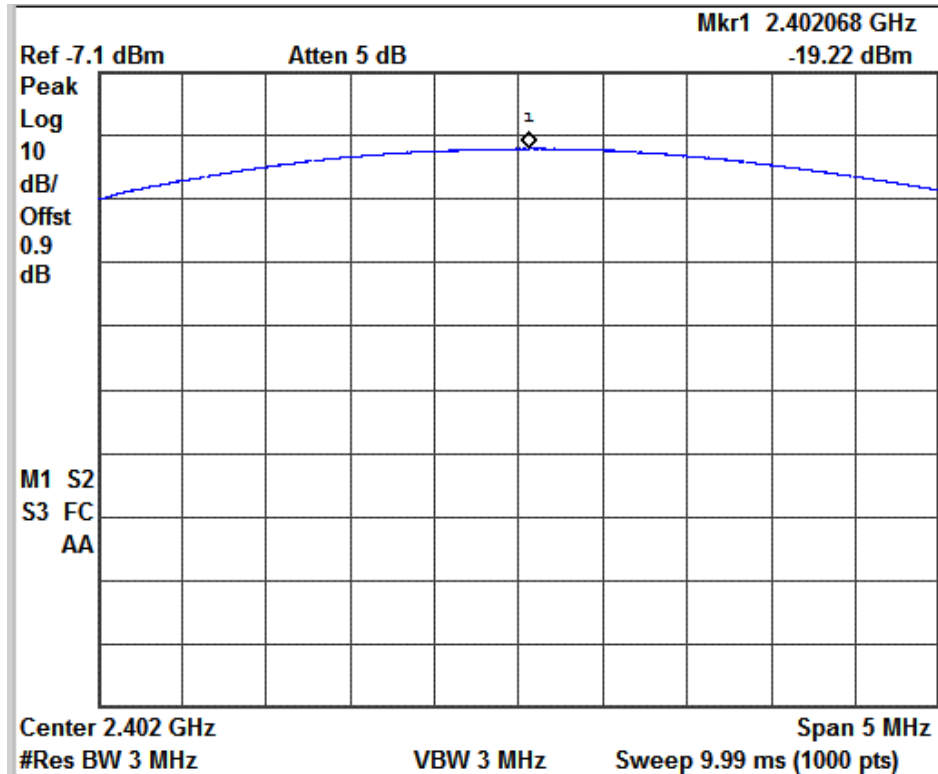
Channel Frequency: 2480 MHz

Modulation Type: Pi/4 DQPSK

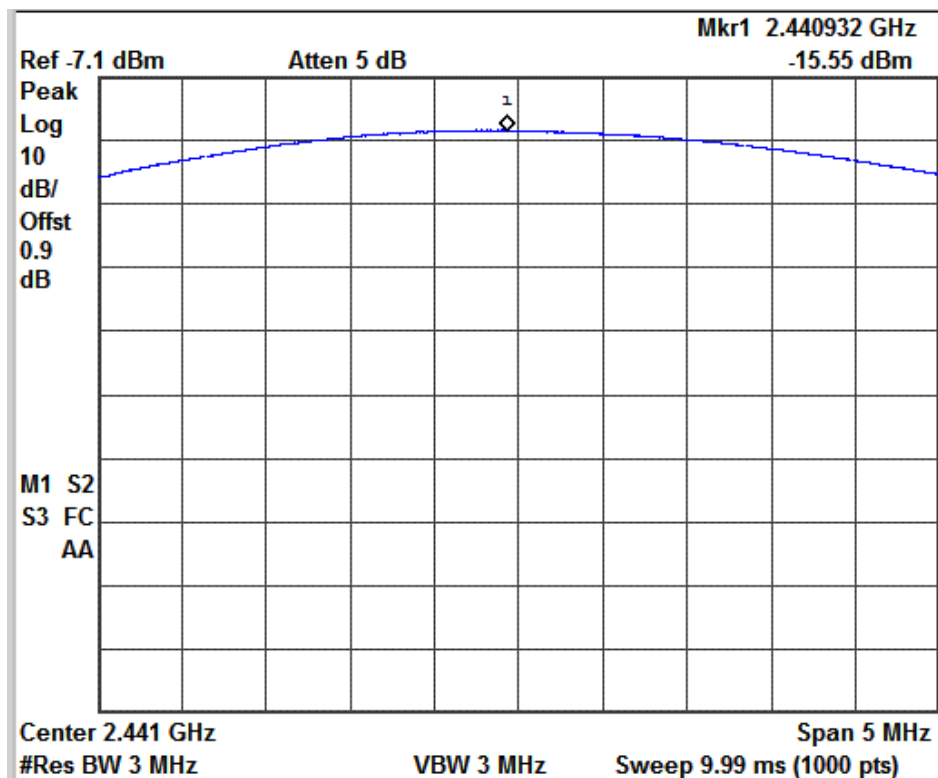
Test Results:

Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
Low	2402	-19.22	20.96
Mid	2441	-15.55	20.96
High	2480	-14.83	20.96

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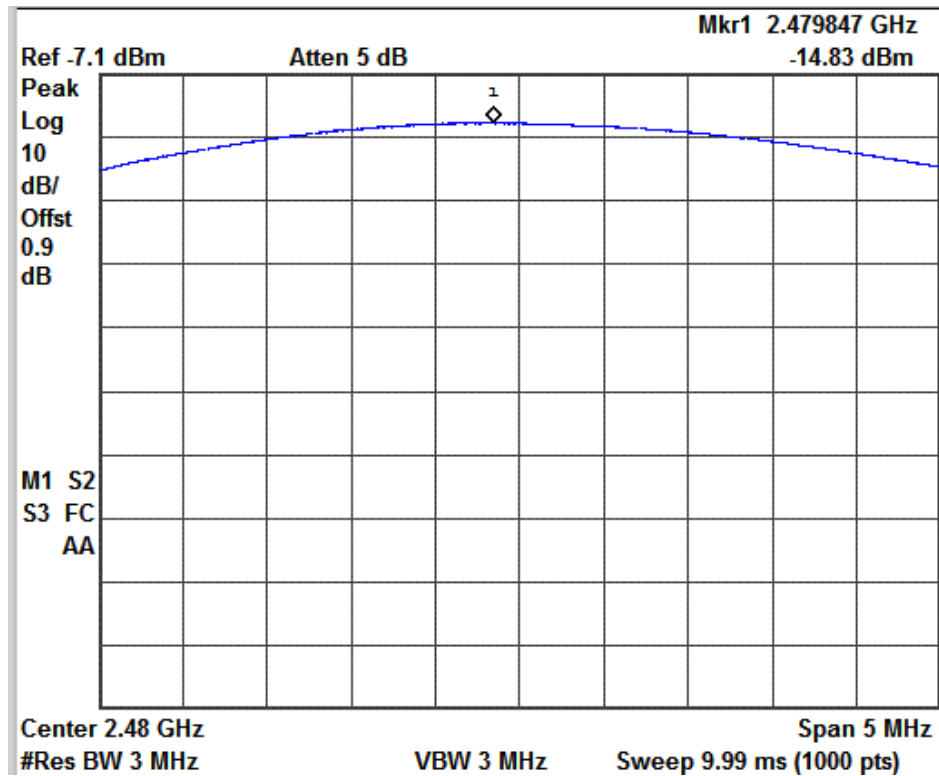


Channel Frequency: 2402 MHz



Channel Frequency: 2441 MHz

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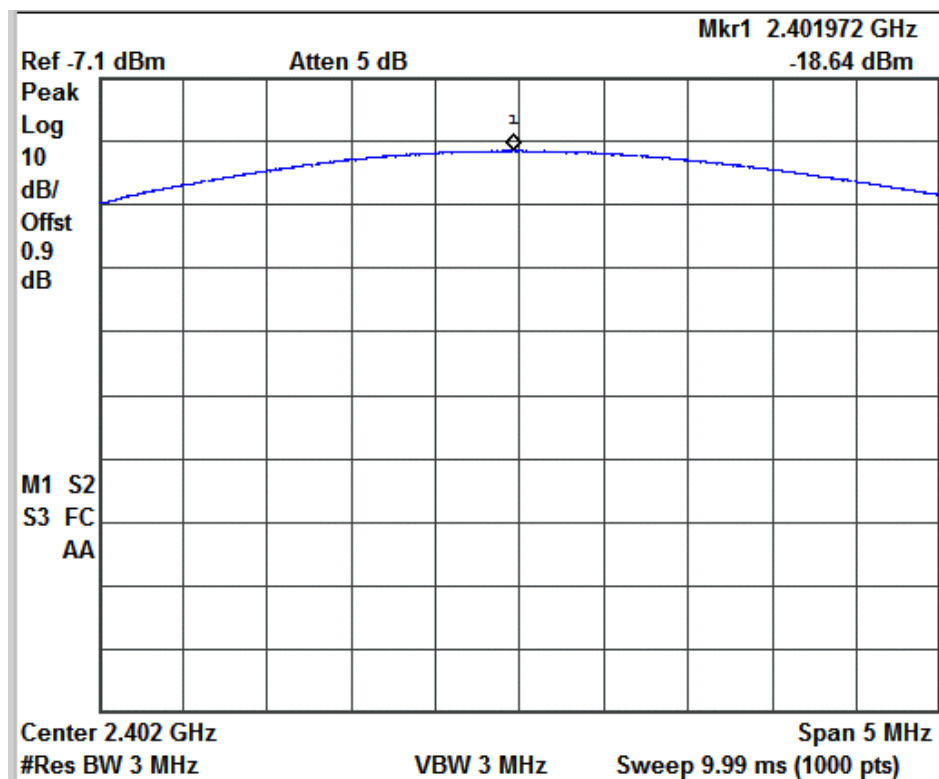
Channel Frequency: 2480 MHz

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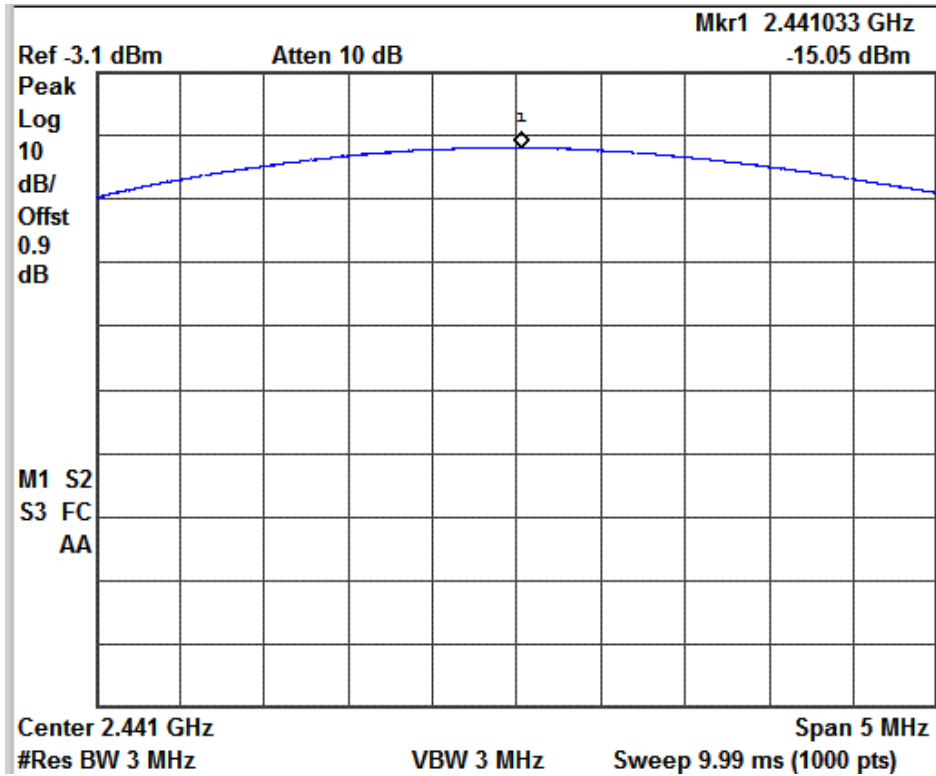
Modulation Type: 8 DPSK

Test Results:

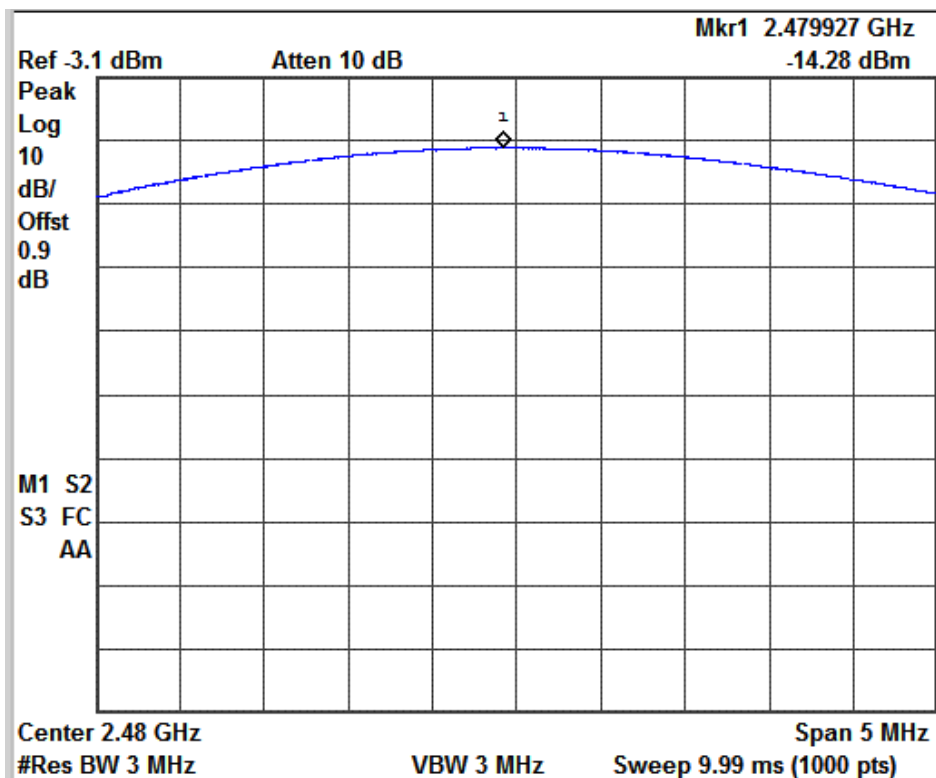
Channel	Frequency (MHz)	Output power (dBm)	Limit (dBm)
Low	2402	-18.64	20.96
Mid	2441	-15.05	20.96
High	2480	-14.28	20.96



Channel Frequency: 2402 MHz



Channel Frequency: 2441 MHz



Channel Frequency: 2480 MHz

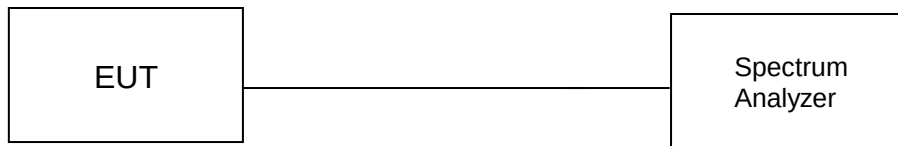
Result

Pass

Test Specification
Detector Function
Port of testing
RequirementFCC Part 15C
Peak
Antenna port

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

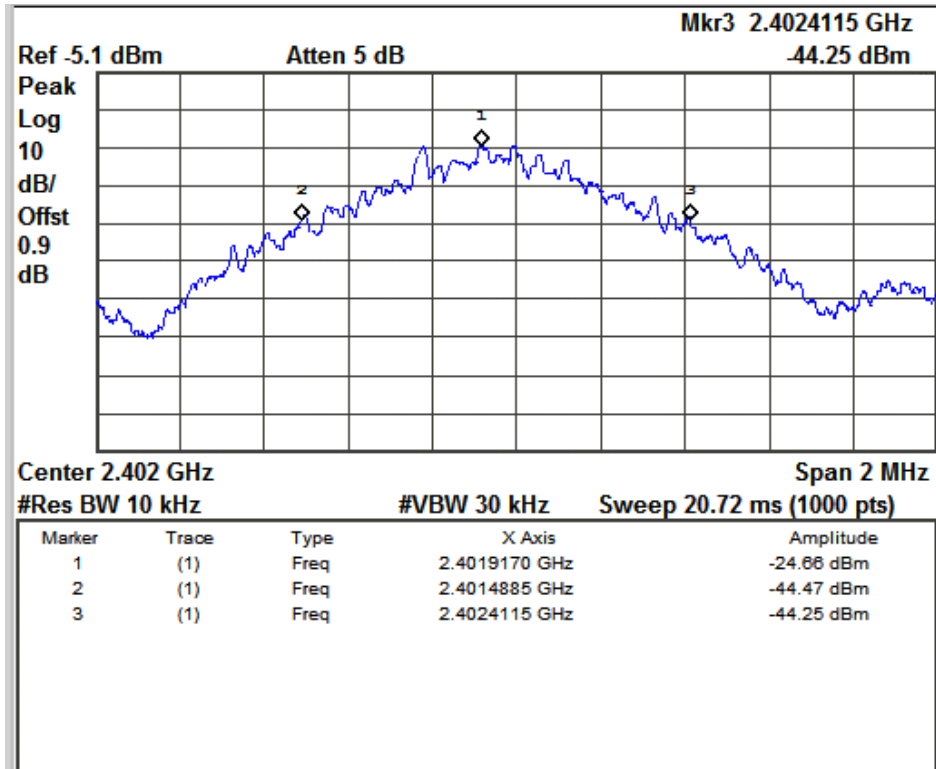
Test Method:



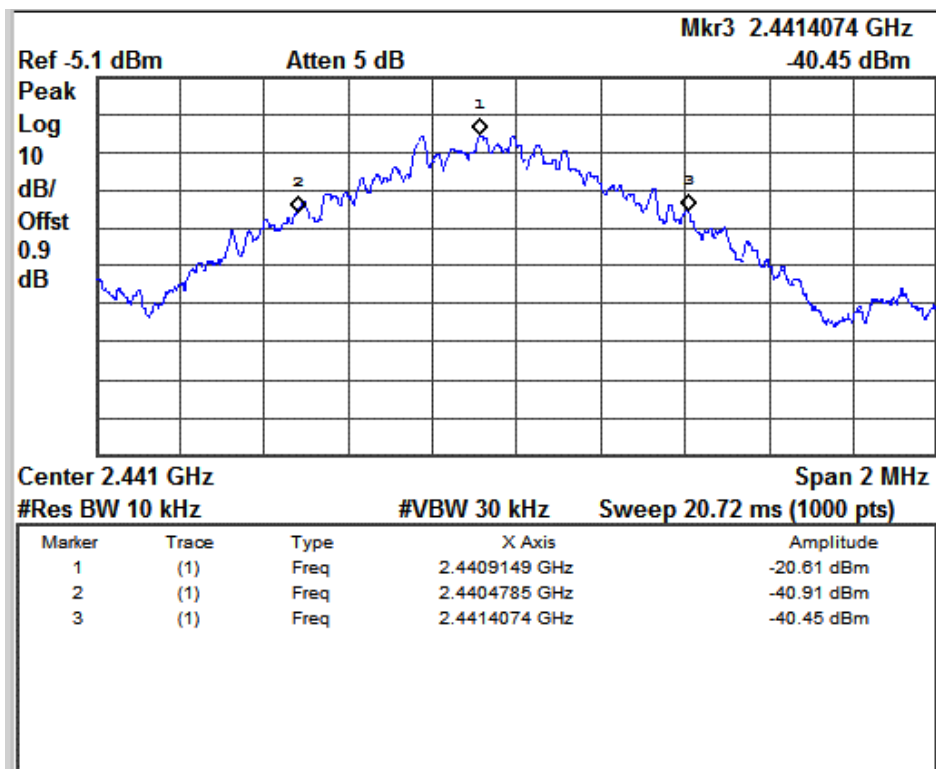
Test Result:

Modulation Type: GFSK

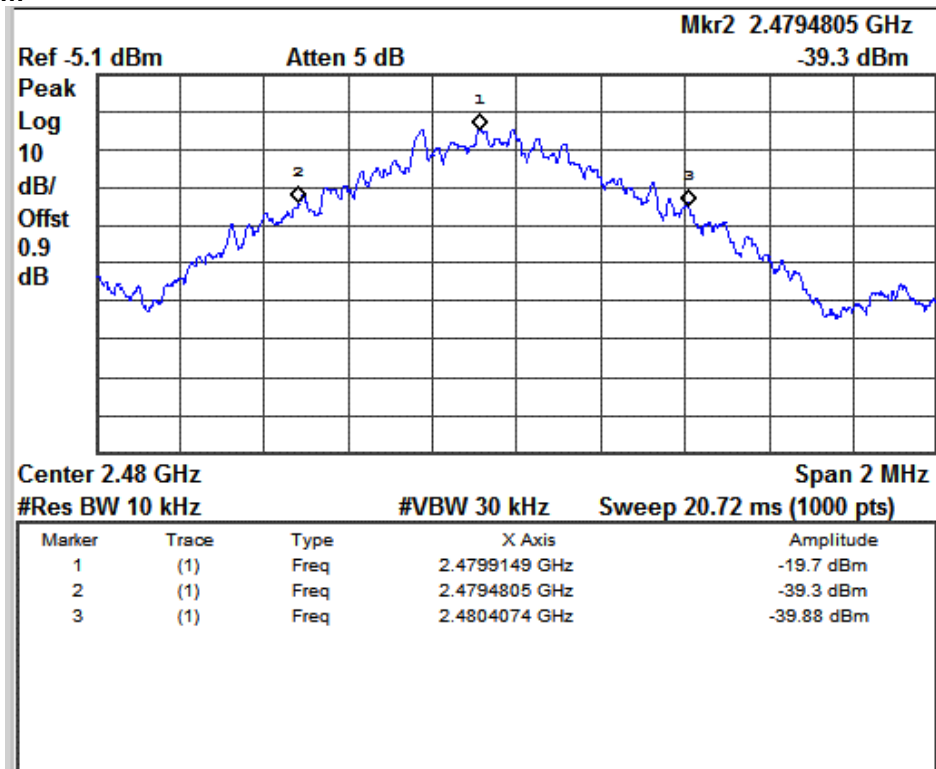
Channel	Channel Frequency (MHz)	Lower 20dB Frequency (MHz)	Higher 20dB Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	2402	2401.4885	2402.4115	0.92	0.97
Mid	2441	2440.4785	2441.4074	0.93	0.96
High	2480	2479.4805	2480.4074	0.93	0.96



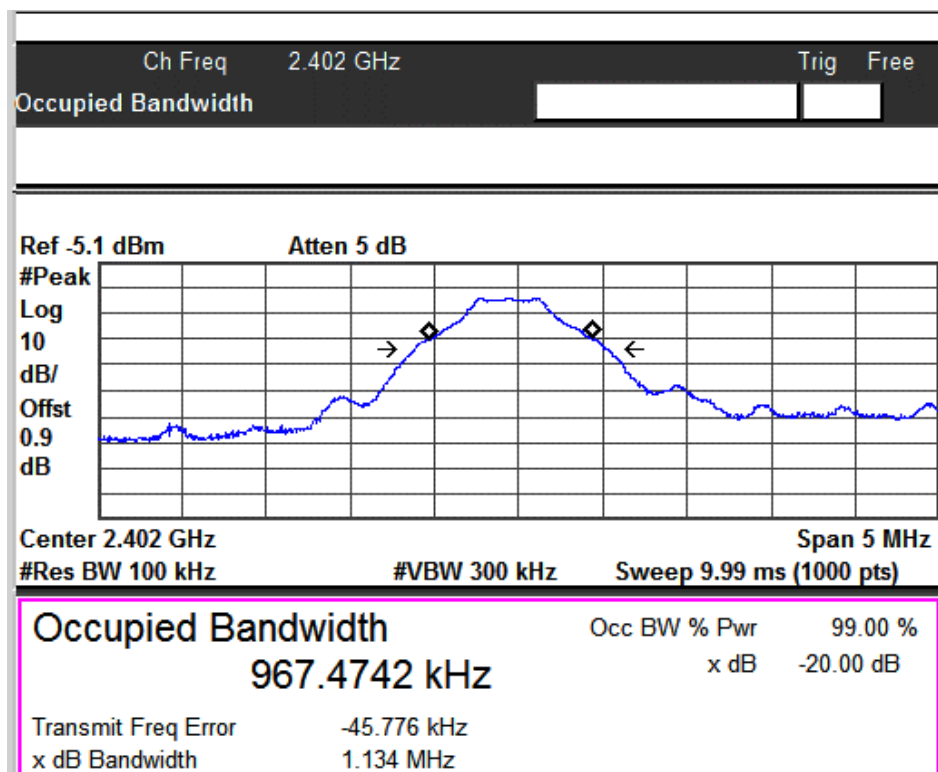
Channel Low: 20dB Bandwidth Measurement



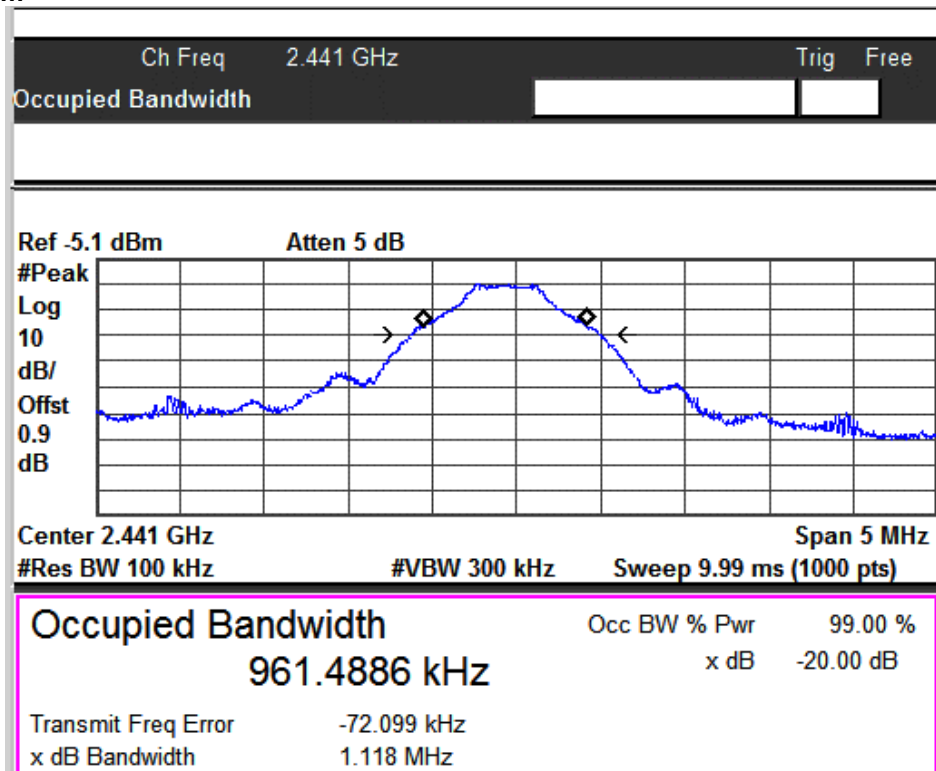
Channel Mid: 20dB Bandwidth Measurement



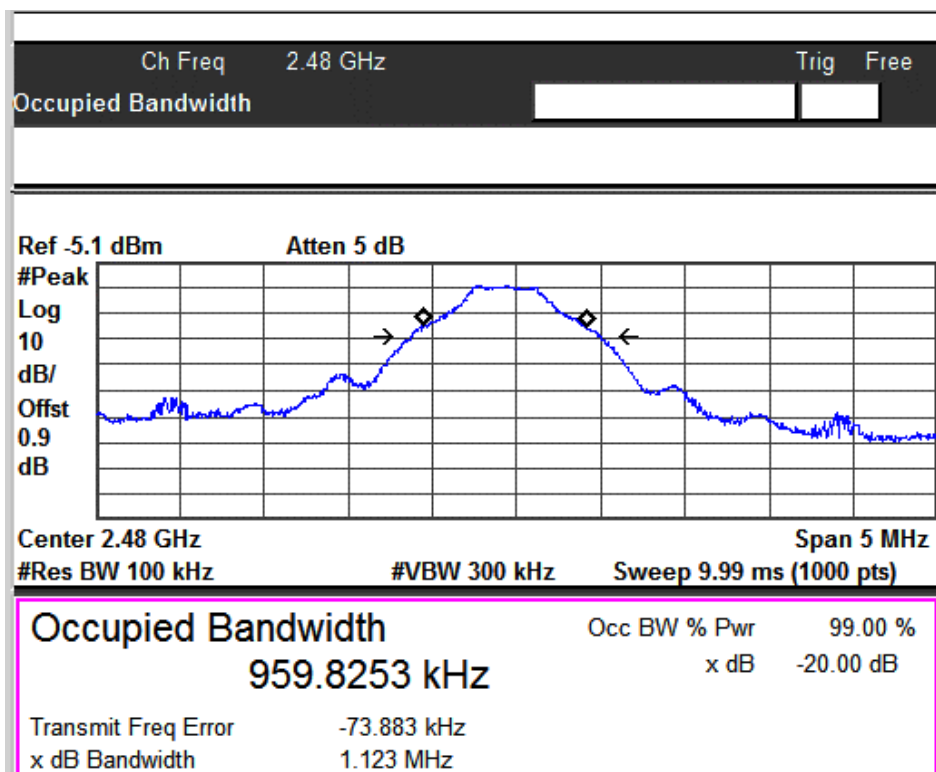
Channel High: 20dB Bandwidth Measurement



99% Occupied Bandwidth: Channel Low



99% Occupied Bandwidth: Channel Mid



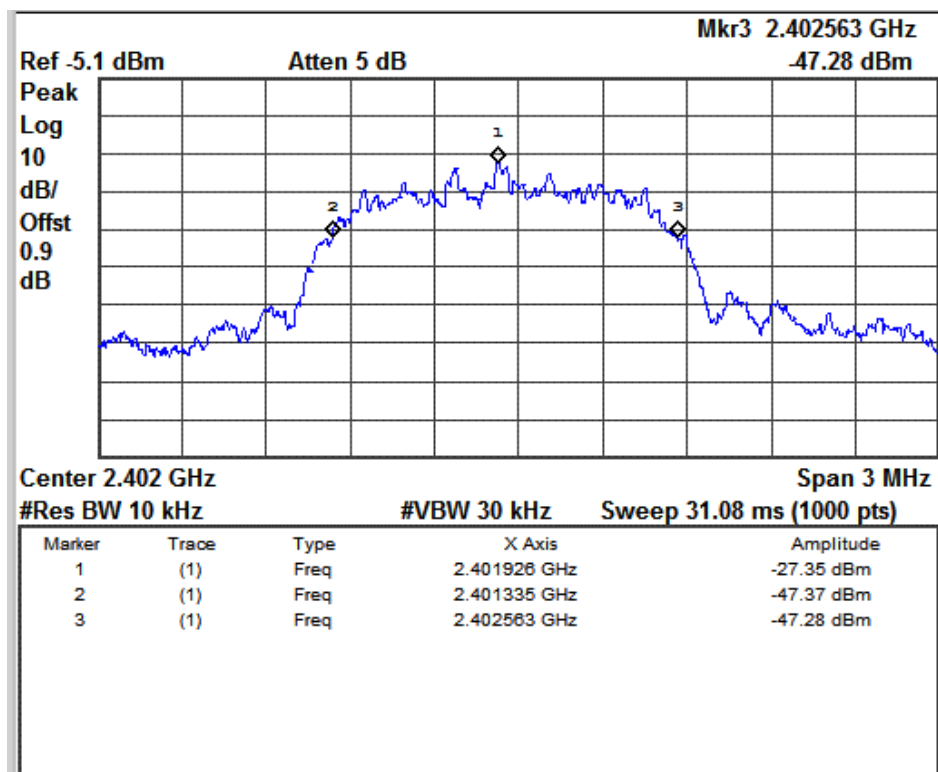
99% Occupied Bandwidth: Channel High

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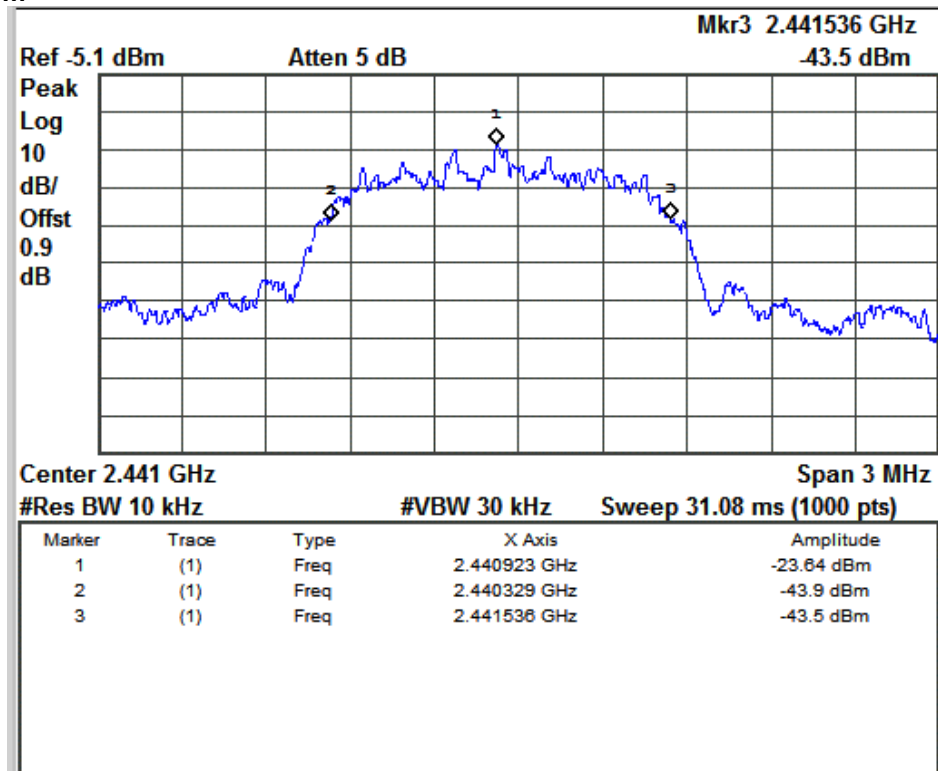
Modulation Type: Pi/4 DQPSK

Test Results:

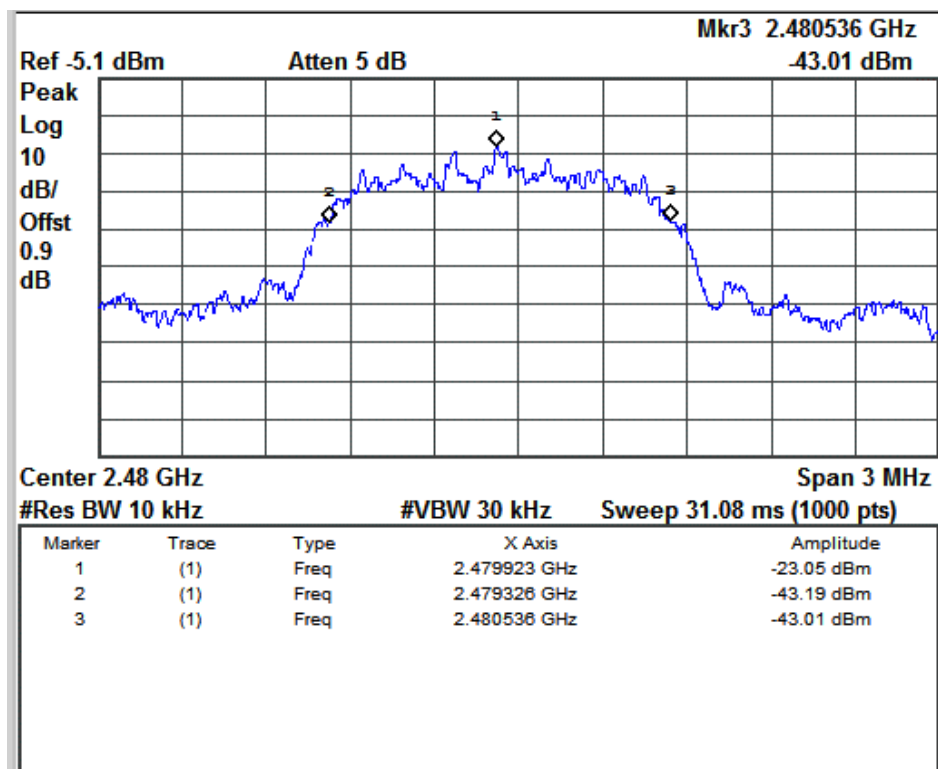
Channel	Channel Frequency (MHz)	Lower 20dB Frequency (MHz)	Higher 20dB Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	2402	2401.3350	2402.5630	1.23	1.21
Mid	2441	2440.3290	2441.5360	1.21	1.22
High	2480	2479.3260	2480.5360	1.21	1.21



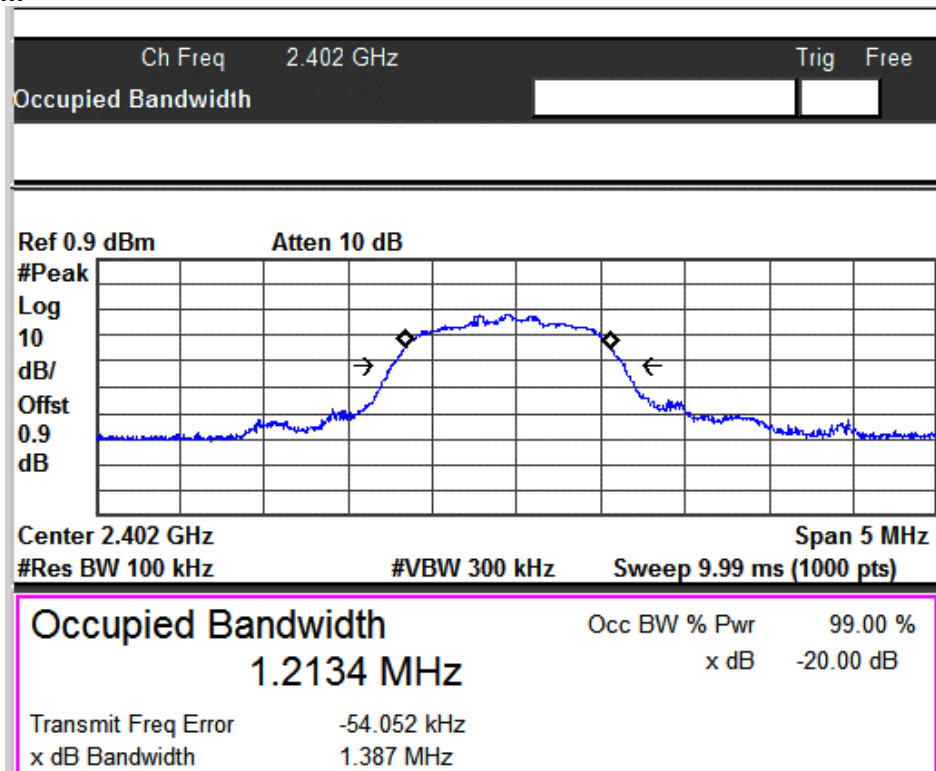
Channel Low: 20dB Bandwidth Measurement



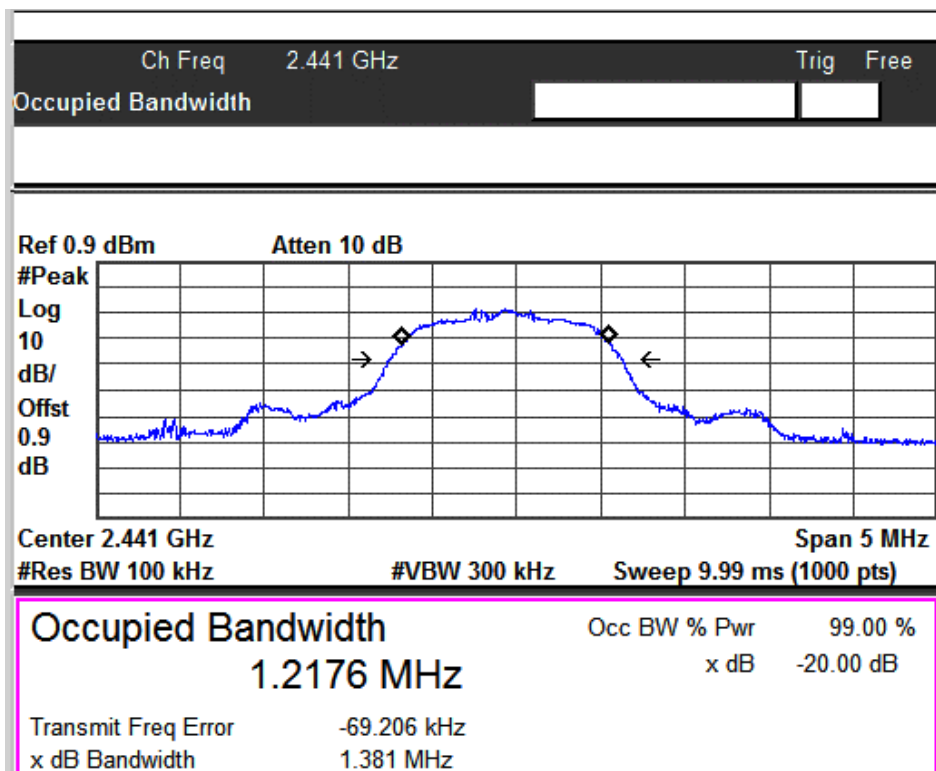
Channel Mid: 20dB Bandwidth Measurement



Channel High: 20dB Bandwidth Measurement

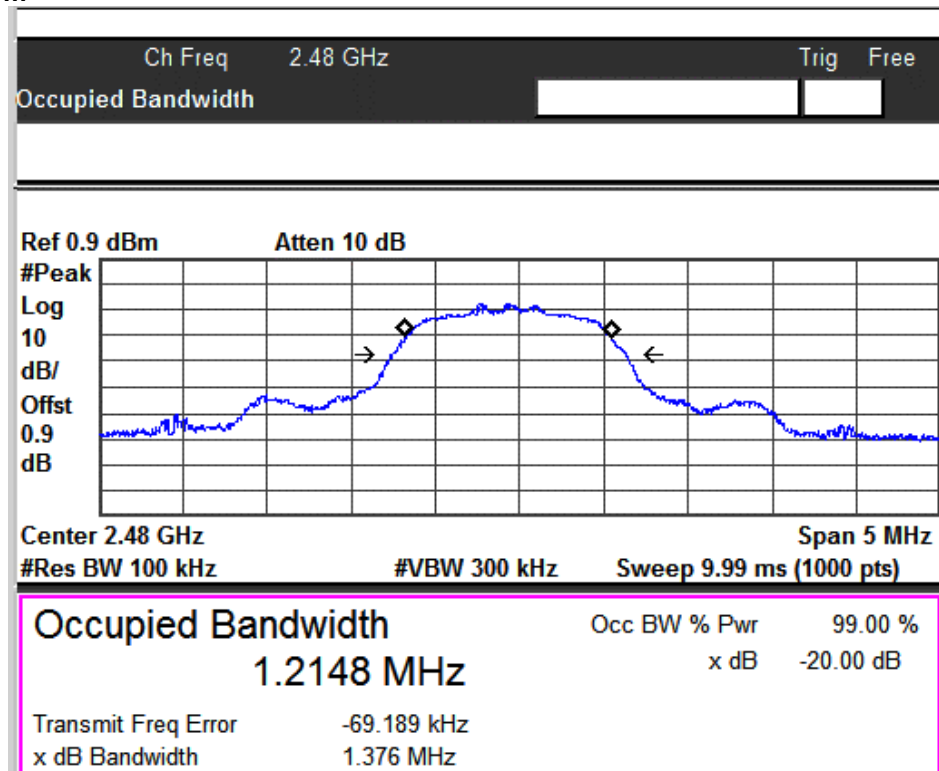


99% Occupied Bandwidth: Channel Low



99% Occupied Bandwidth: Channel Mid

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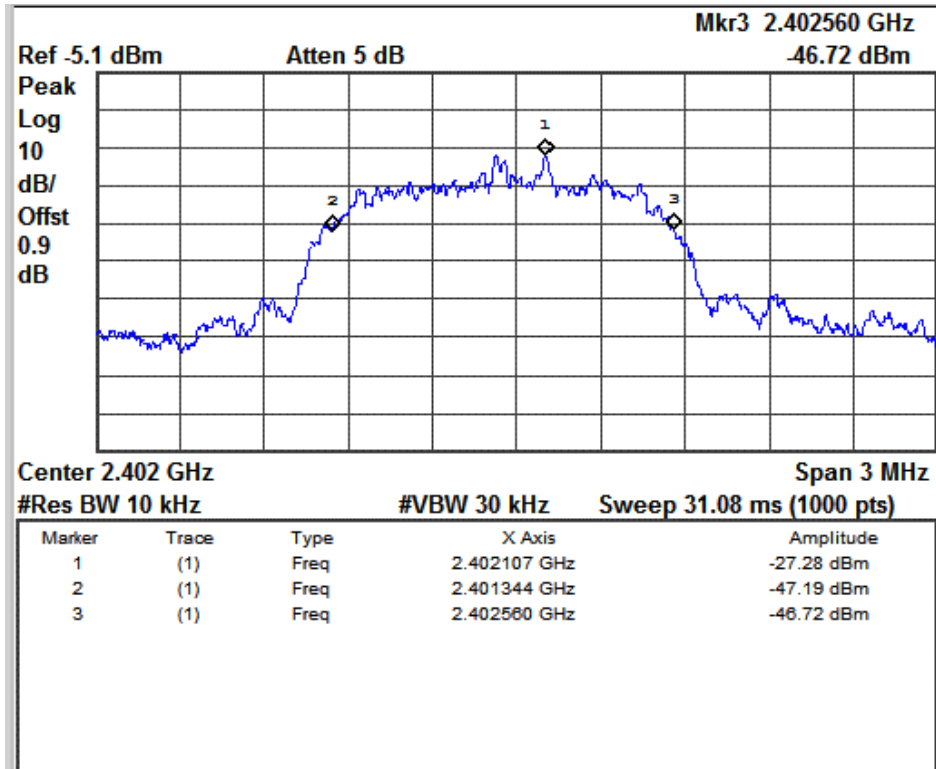


99% Occupied Bandwidth: Channel High

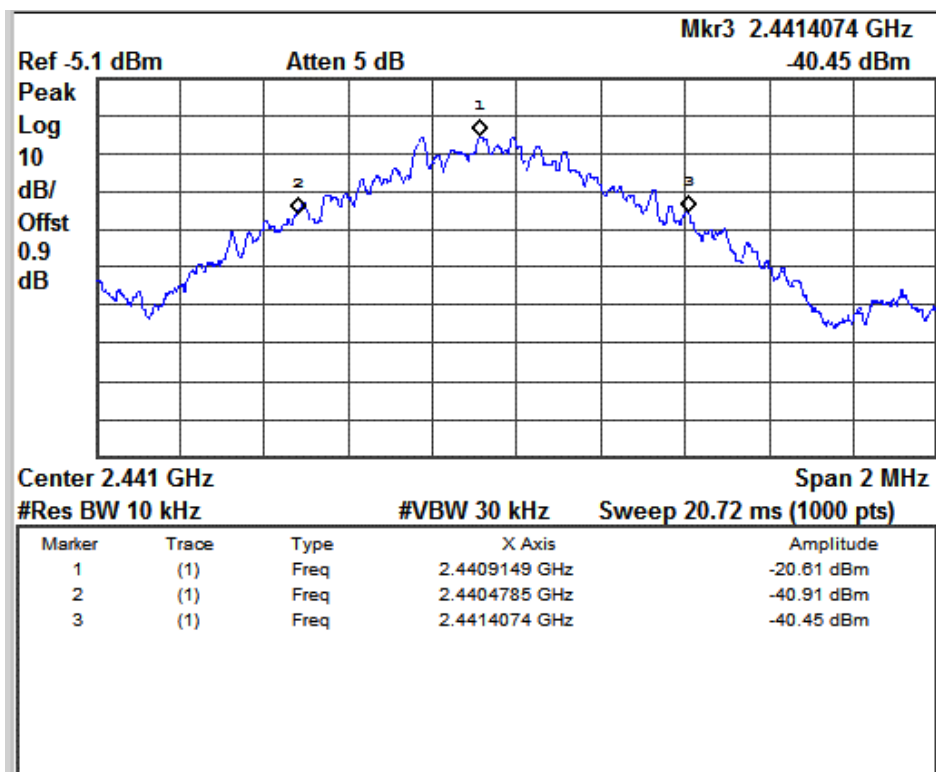
Modulation Type: 8 DPSK

Test Results:

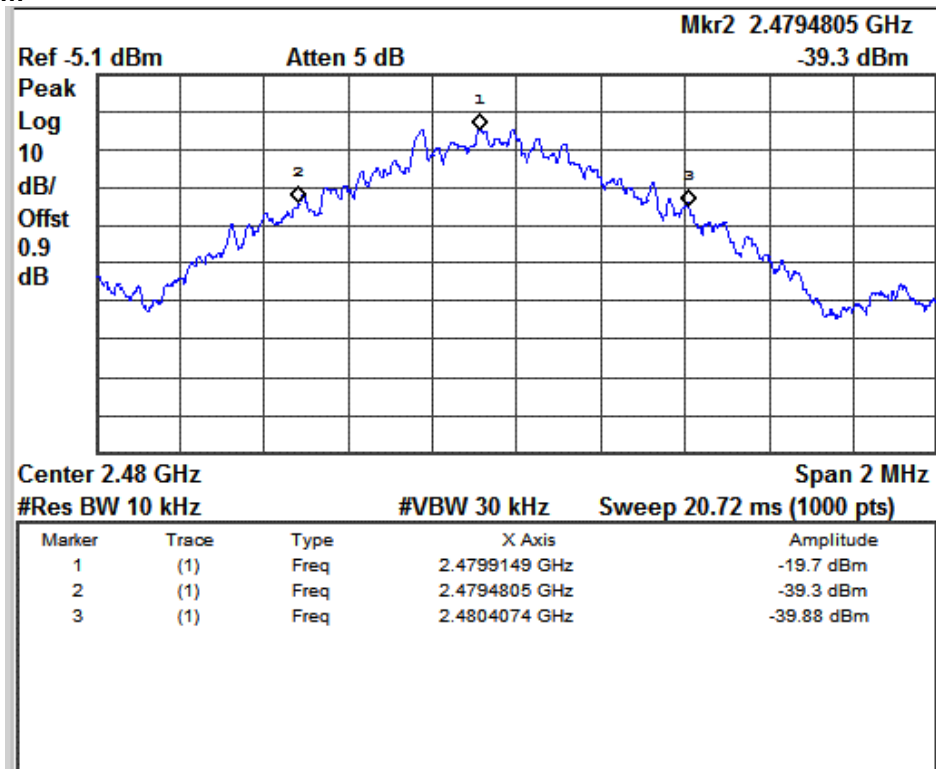
Channel	Channel Frequency (MHz)	Lower 20dB Frequency (MHz)	Higher 20dB Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	2402	2401.3440	2402.5600	1.22	1.22
Mid	2441	2440.4785	2441.4074	0.93	1.22
High	2480	2479.4805	2480.4074	0.93	1.22



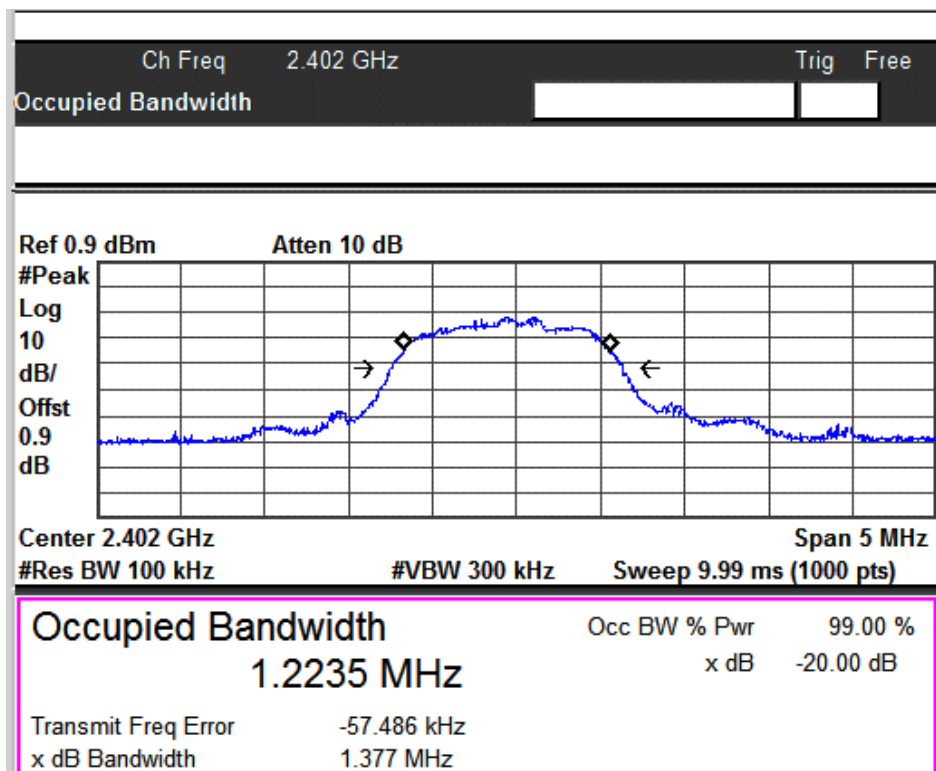
Channel Low: 20dB Bandwidth Measurement



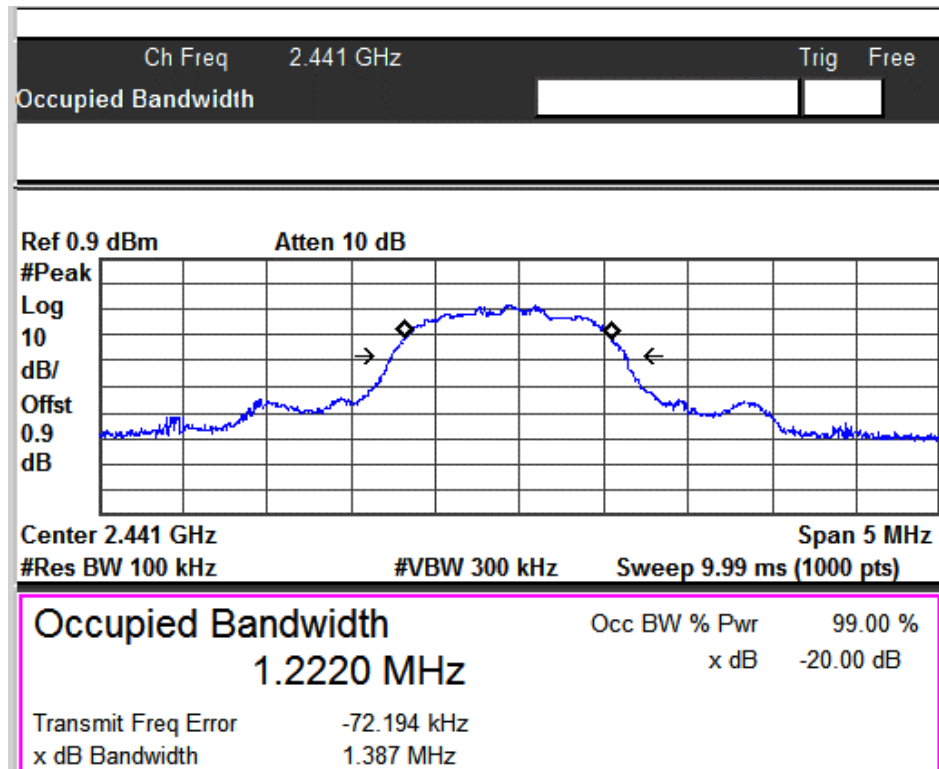
Channel Mid: 20dB Bandwidth Measurement



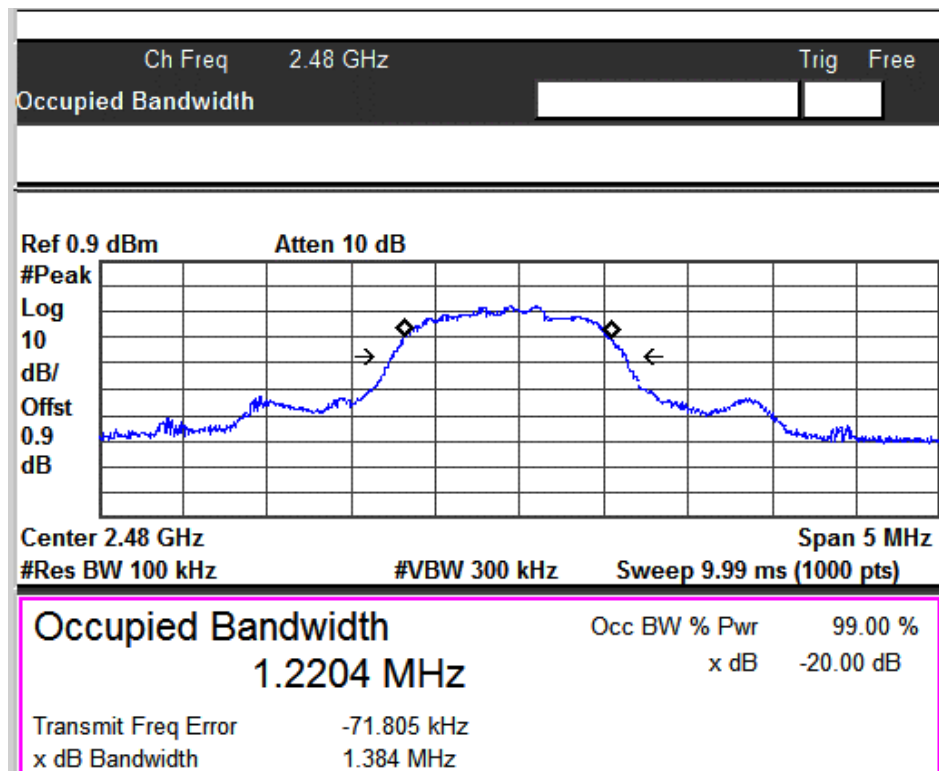
Channel High: 20dB Bandwidth Measurement



99% Occupied Bandwidth: Channel Low



99% Occupied Bandwidth: Channel Mid



99% Occupied Bandwidth: Channel High

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Number of Hopping Channels

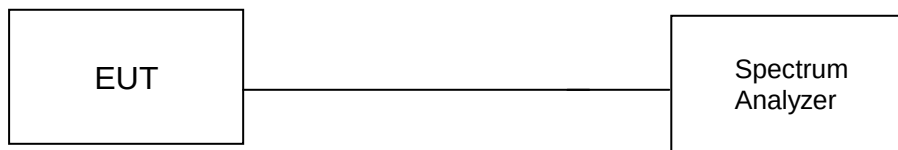
Section (a) (1) (iii)

Result

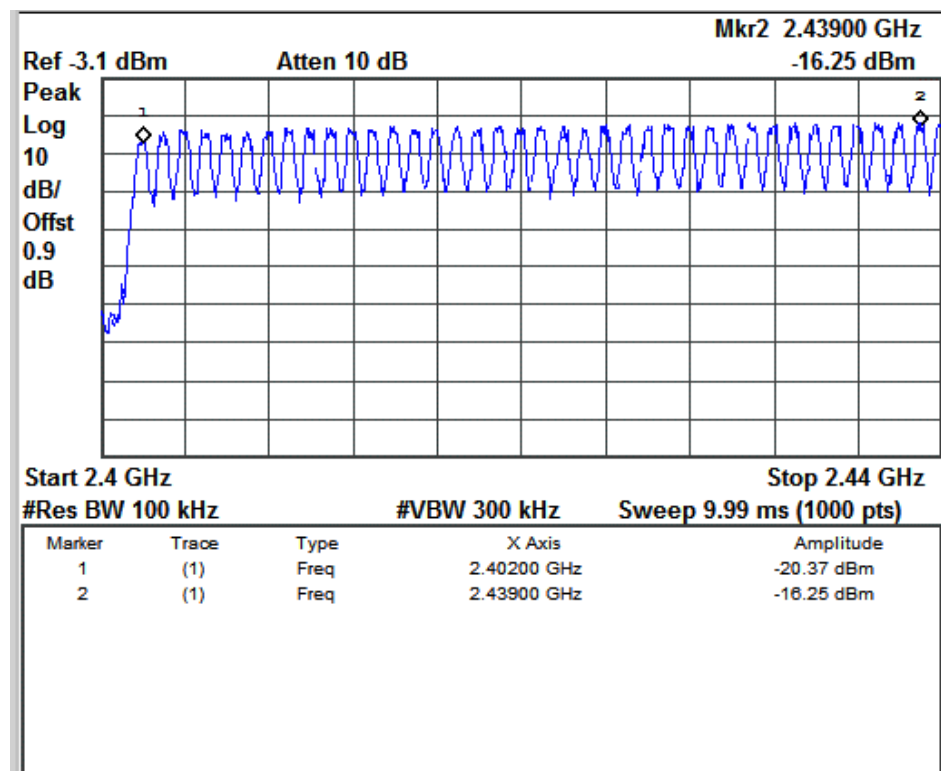
Pass

Test Specification	FCC part 15C
Detector Function	Peak
Port of testing	Antenna port
Requirement	Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels

Test Method:

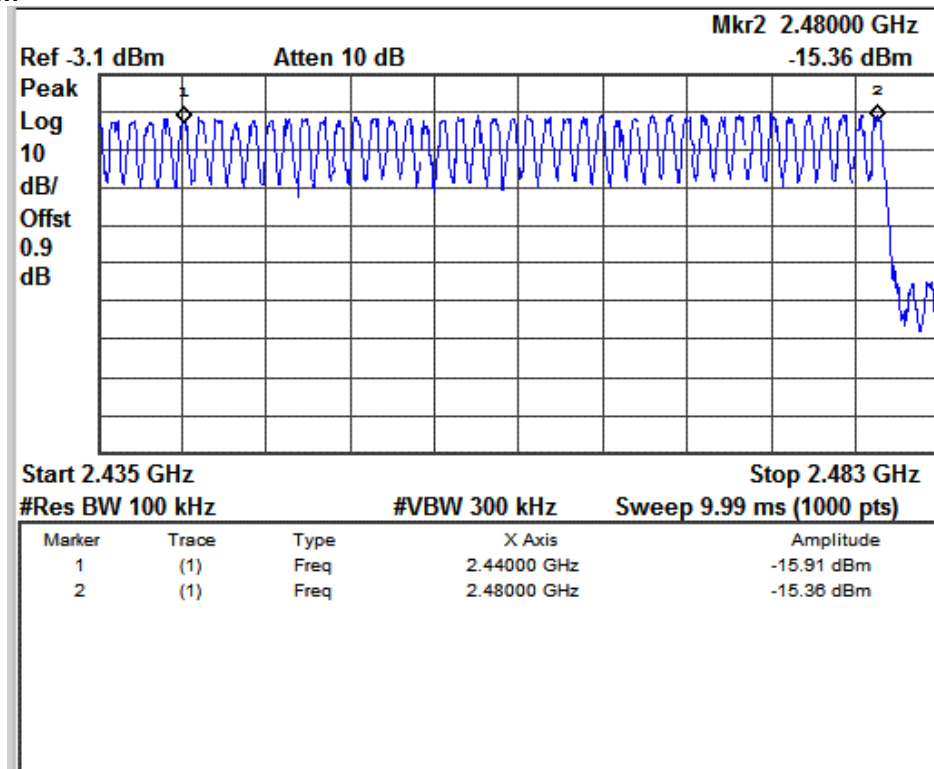


Test Result:



Number of Hopping Channels: 38

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Number of Hopping Channels: 41

Total Number of hopping channels = 79 (38+41)

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Carrier Frequency Separation

Section 15.247 (a) (1)

Result

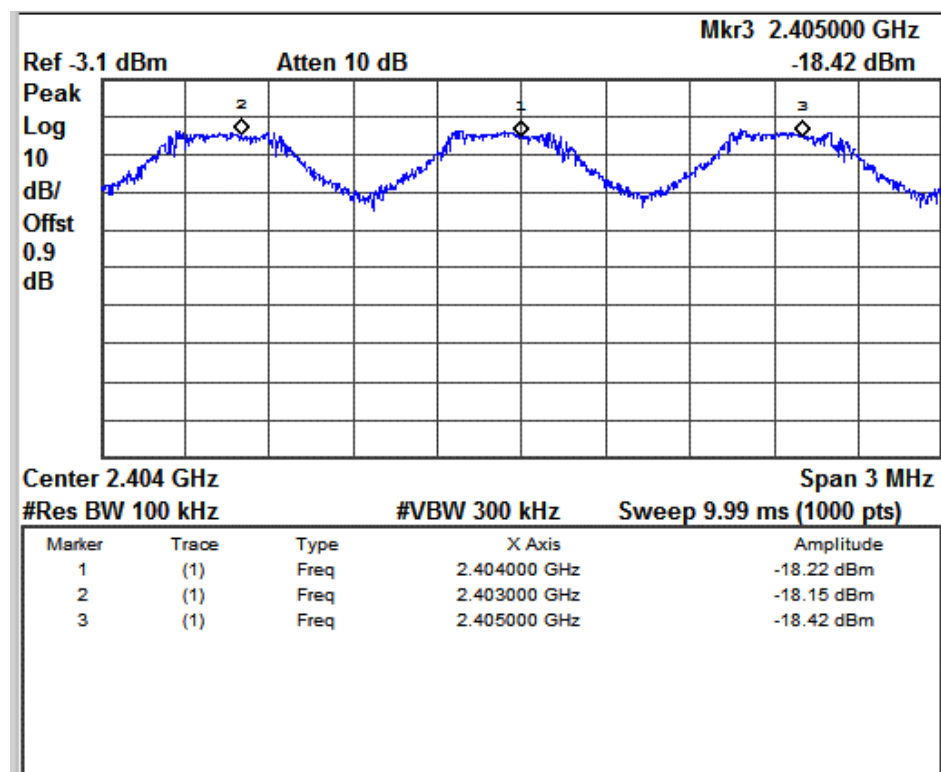
Pass

Test Specification	FCC Part 15C
Detector Function	Peak
Port of testing	Antenna port
Requirement	Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater

Test Method:



Test Result:



Channel Separation

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Time of Occupancy (Dwell Time)

Section 15.247 (a)(1)(III)

Result

Pass

Test Specification RSS-210 Issue 7, A8.1 (c)
Detector Function Peak
Port of testing Antenna port
Requirement The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that a minimum of 15 hopping channels are used.

Test Method:



Test Result:

Time slot		Time Slot (s)
DH	Measurement Value (sec)	
DH5	0.00236	0.2517
2DH5	0.00164	0.1749
3DH5	0.00275	0.2933

Measurement Method

Period Time = 0.4(sec)*79 (hopping channel) = 31.6 s

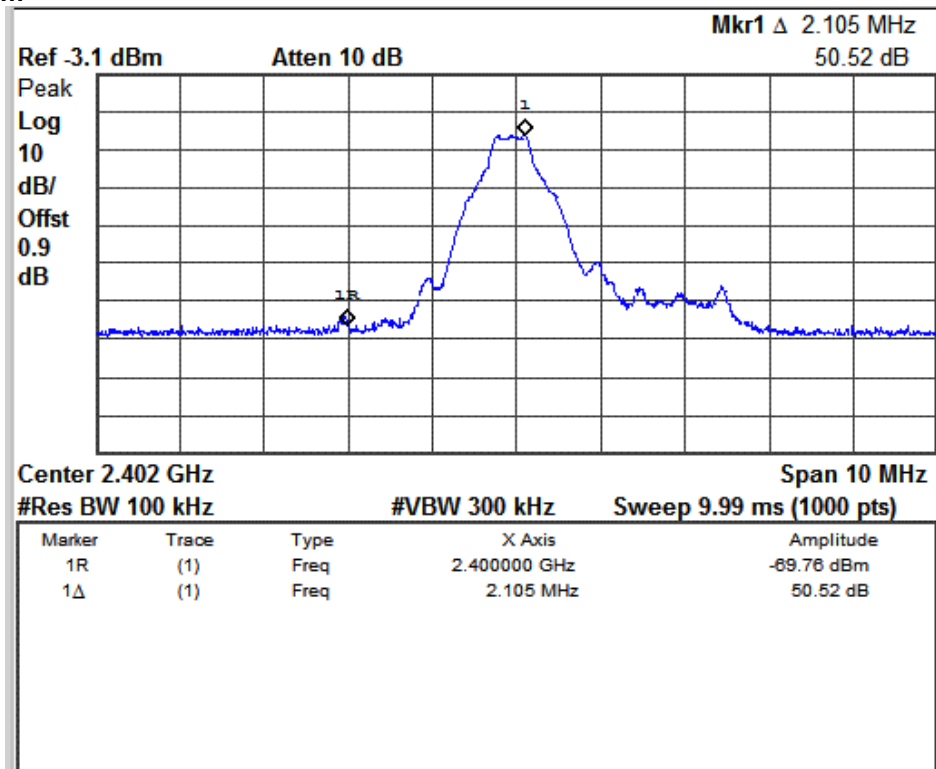
DH Time slot = Measurement value (Sec)*(1600/ (6*79))*Period time

Band-edge Compliance of RF Conducted Emissions**Section 15.257 (d)****Result****Pass**

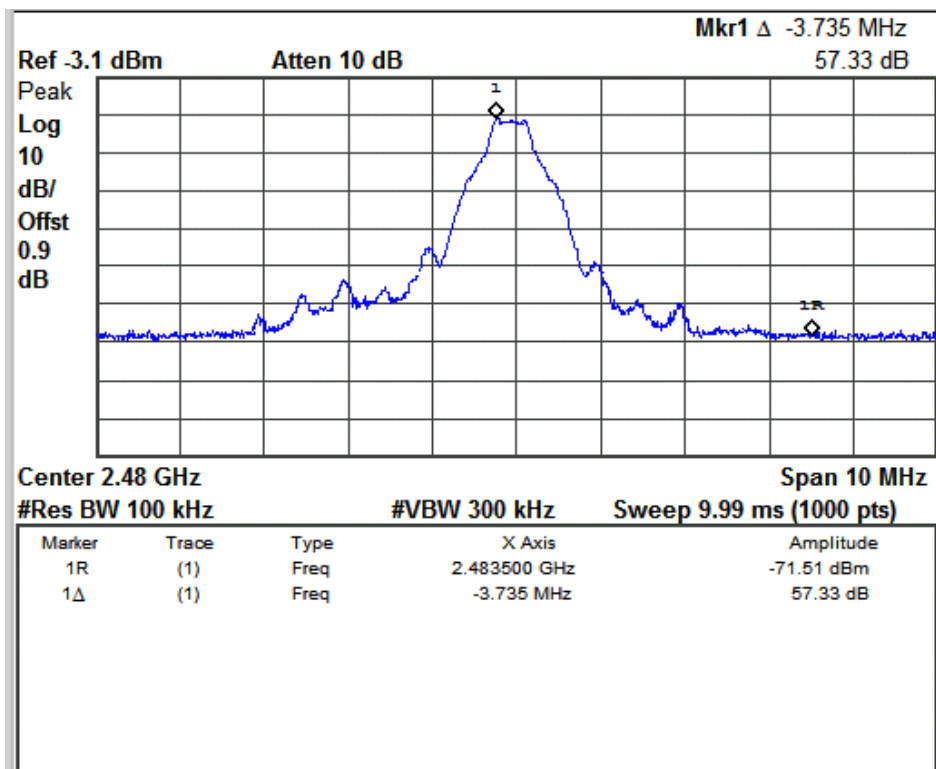
Test Specification	FCC Part 15C
Detector Function	Peak
Port of testing	Antenna port
Requirement	In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz 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.

Test Method:**Modulation Type: GFSK****Test Result:**

Channel	Fundamental Frequency (MHz)	Value at Band Edge		Limit (dBc)
		Frequency (MHz)	Value (dBc)	
Low	2402.00	2400.0	-50.52	-20
High	2480.00	2483.5	-57.33	-20



Channel Low



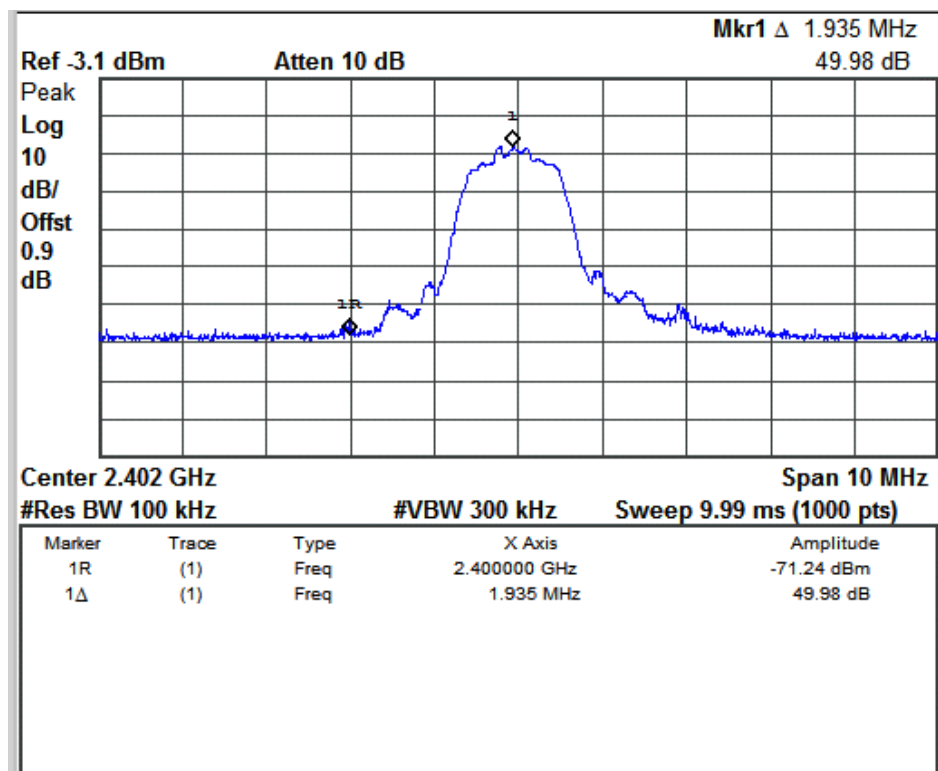
Channel High

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Modulation Type: Pi/4 DQPSK

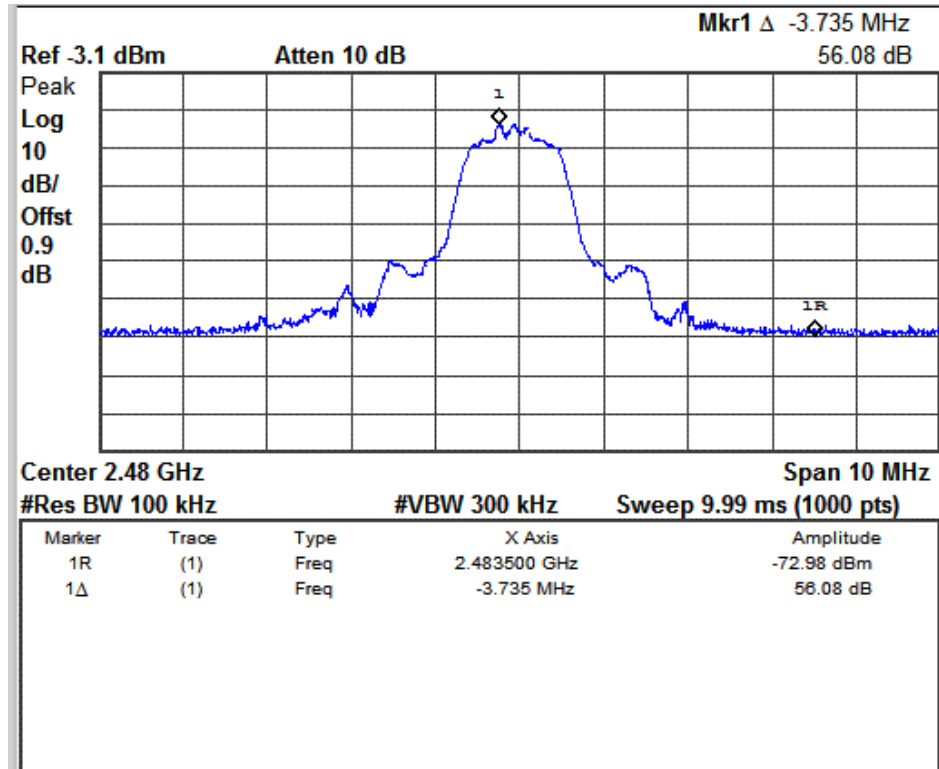
Test Results:

Channel	Fundamental Frequency (MHz)	Value at Band Edge		Limit (dBc)
		Frequency (MHz)	Value (dBc)	
Low	2402.00	2400.0	-49.98	-20
High	2480.00	2483.5	-56.08	-20



Channel Low

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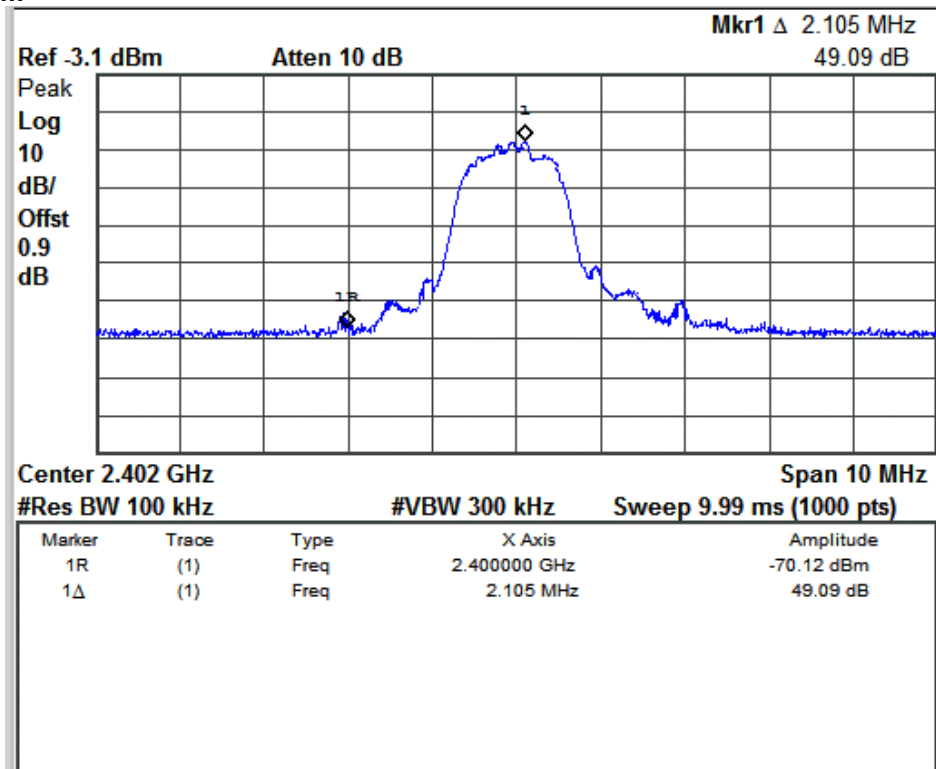


Channel High

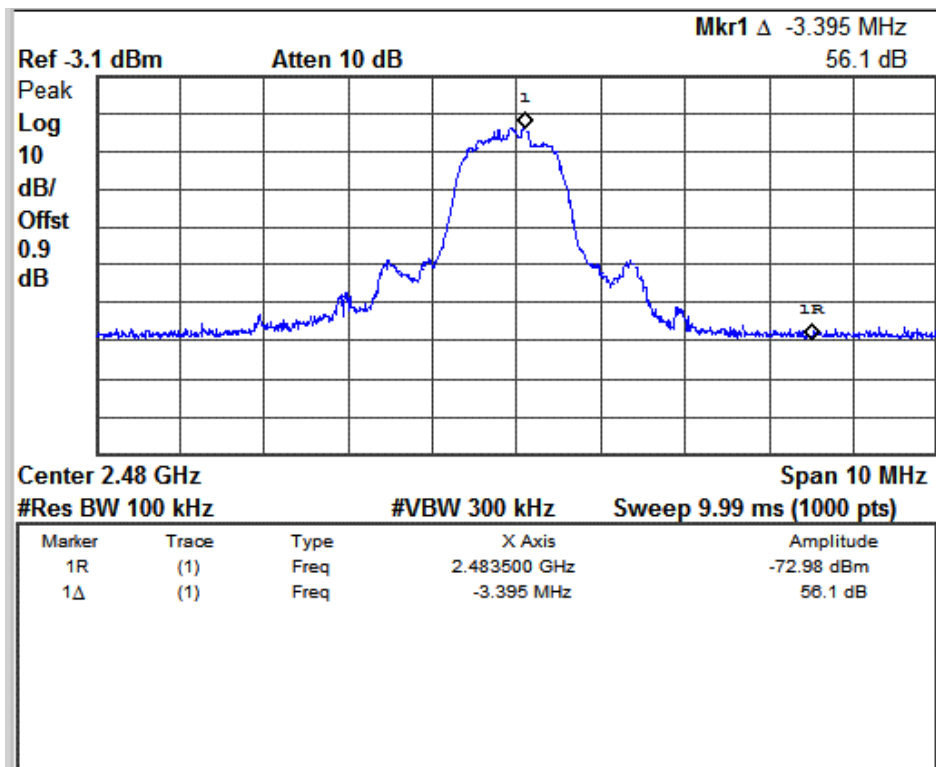
Modulation Type: 8 DPSK

Test Results:

Channel	Fundamental Frequency (MHz)	Value at Band Edge		Limit (dBc)
		Frequency (MHz)	Value (dBc)	
Low	2402.00	2400.0	-49.09	-20
High	2480.00	2483.5	-56.10	-20

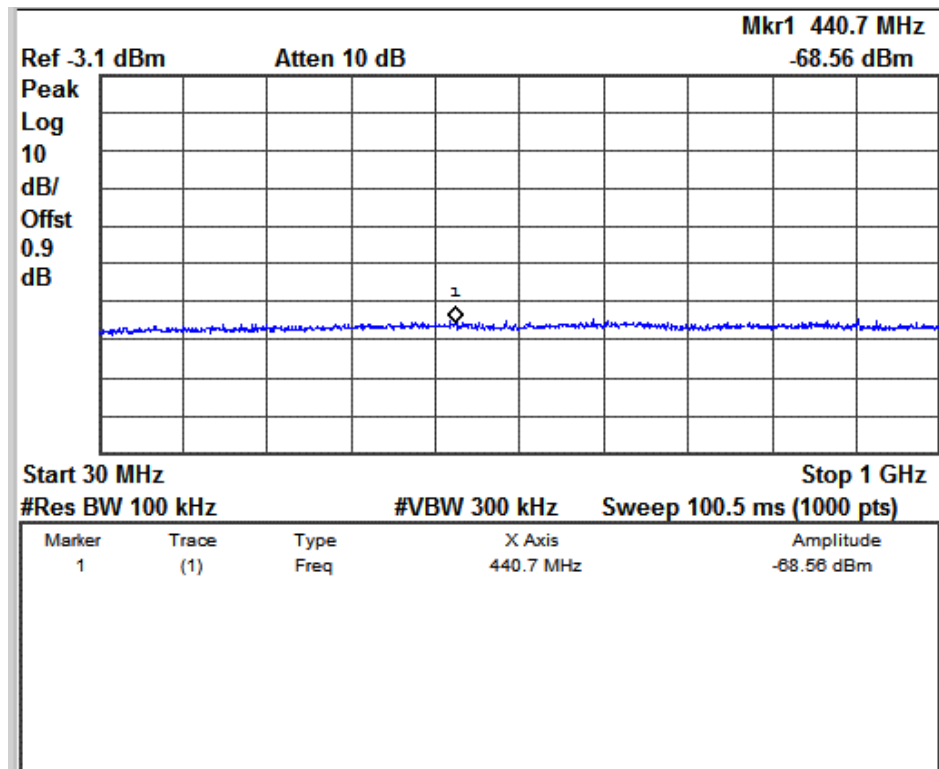


Channel Low

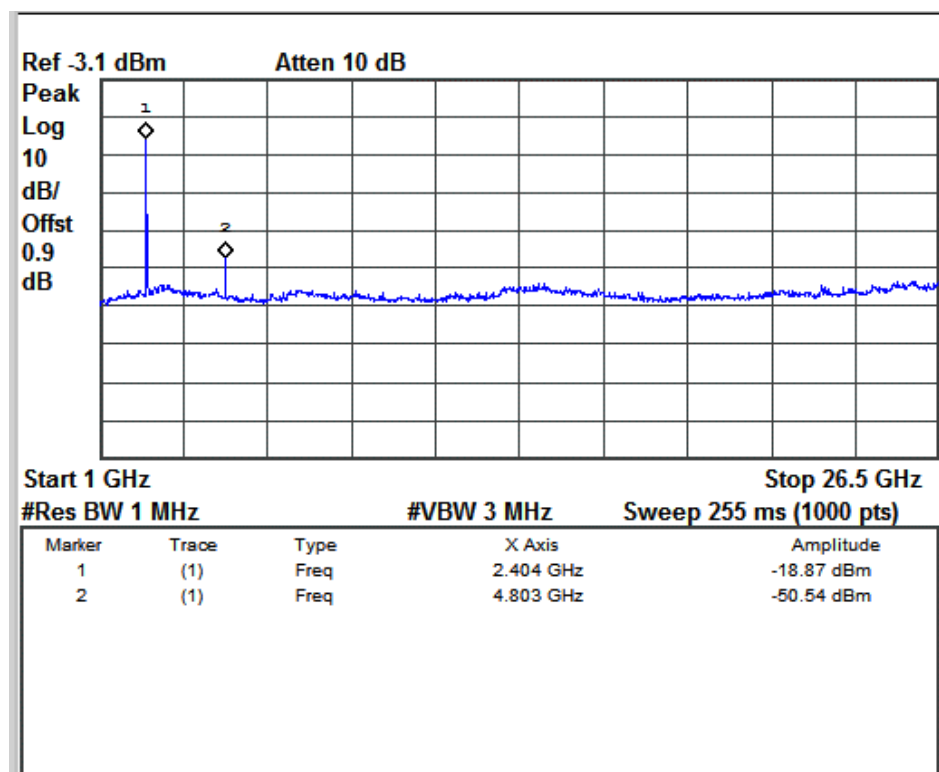


Channel High

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Conducted Spurious Emissions

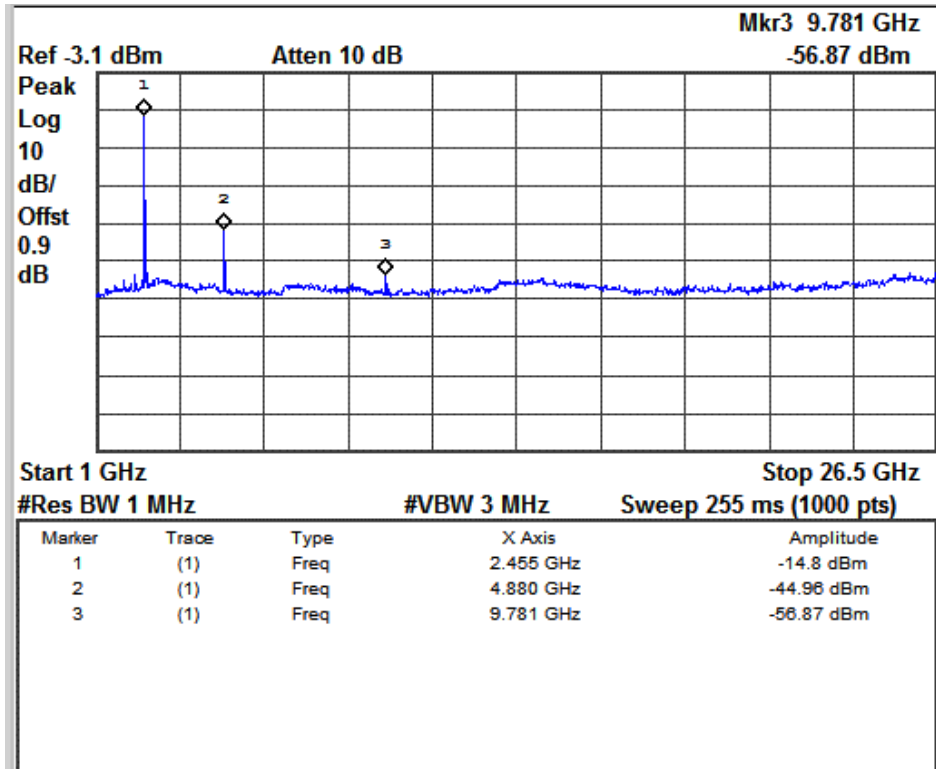


30MHz to 1GHz Spurious Emissions



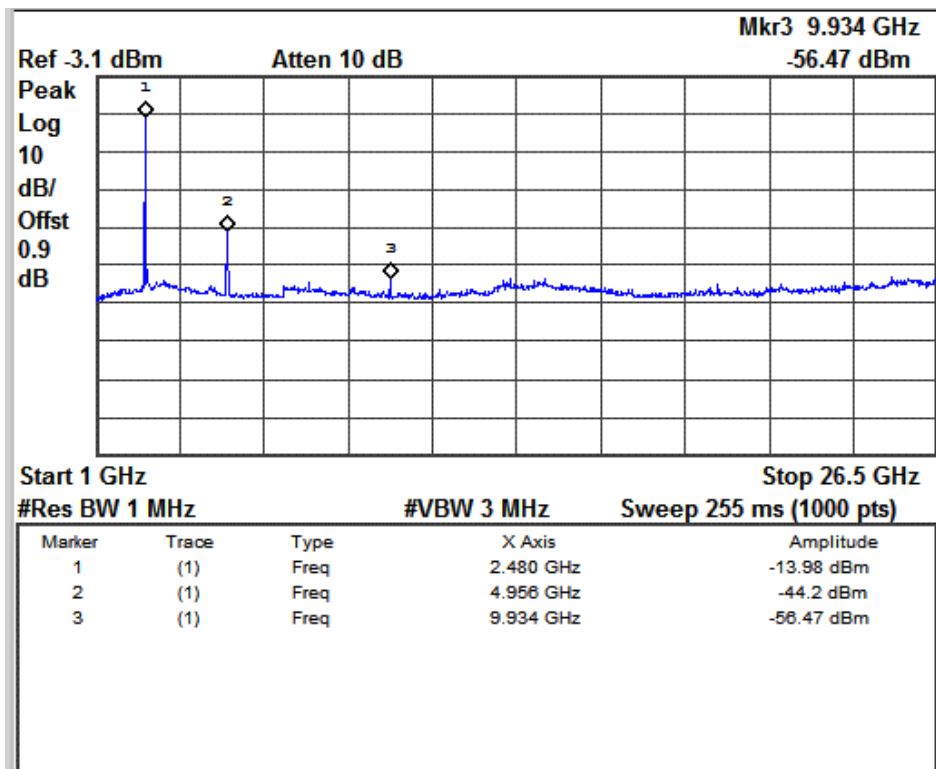
Channel: Low

Modulation: GFSK



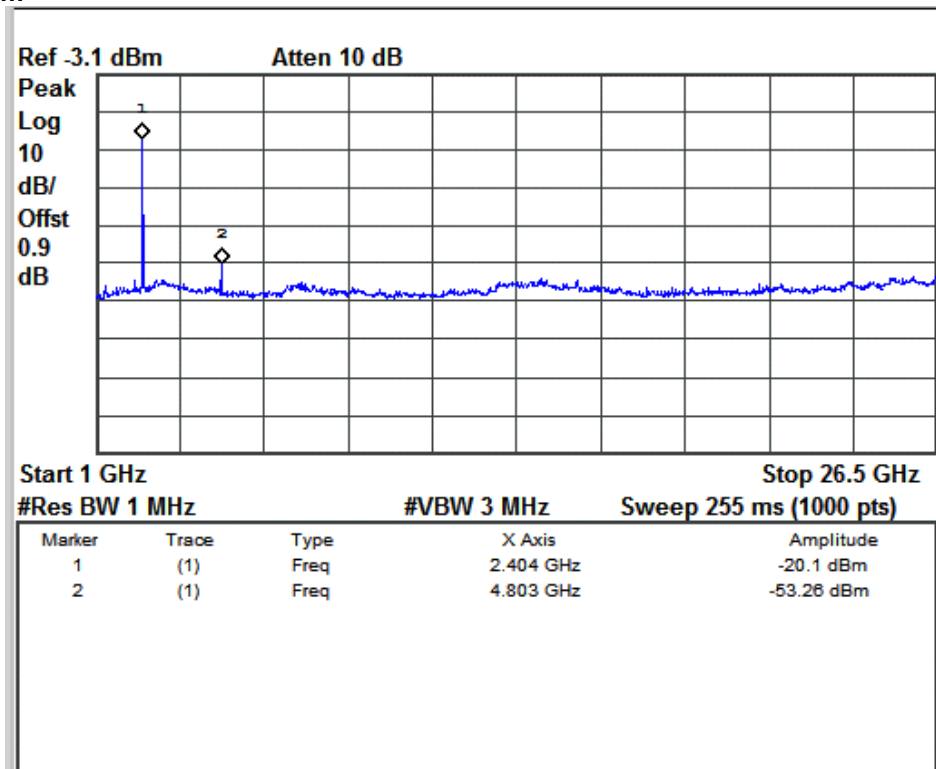
Channel: Mid

Modulation: GFSK



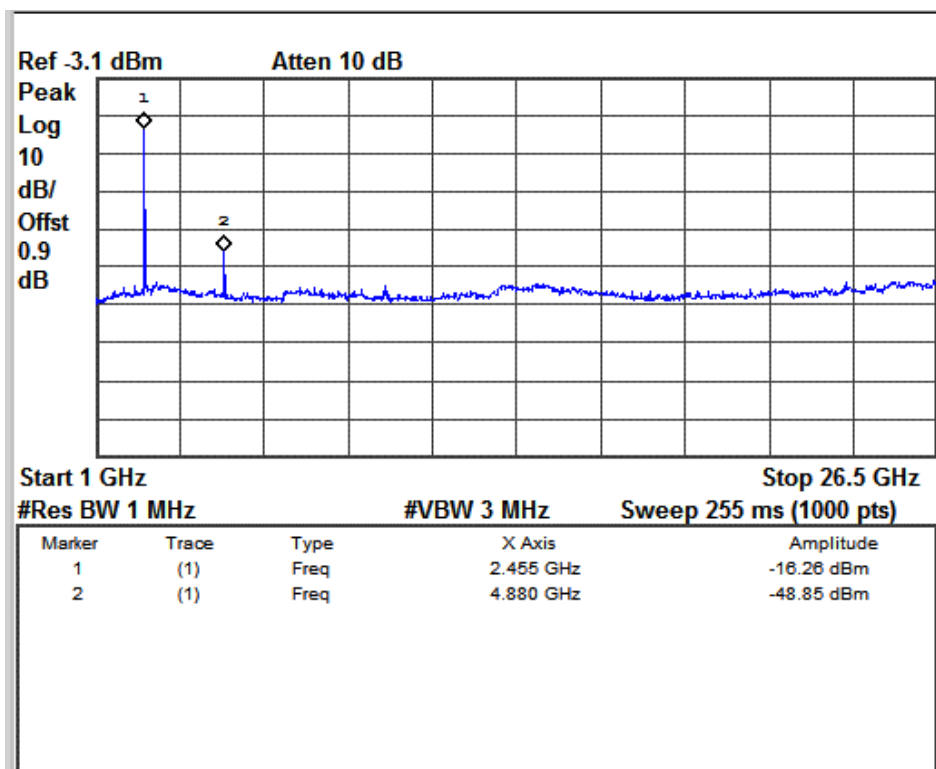
Channel: High

Modulation: GFSK



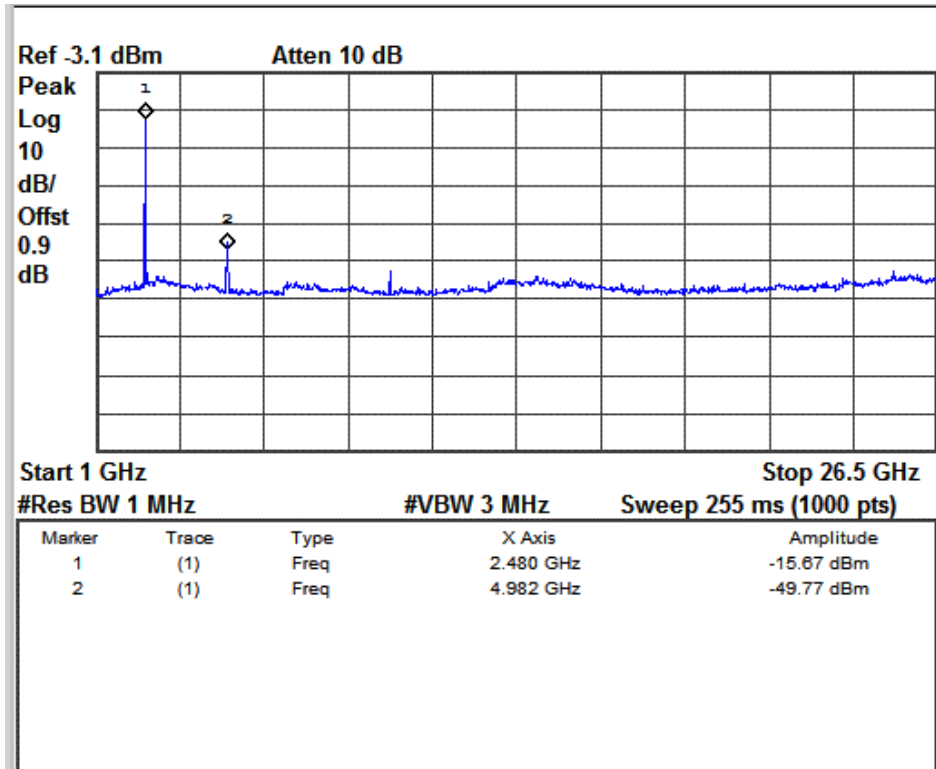
Channel: Low

Modulation: Pi/4 DQPSK



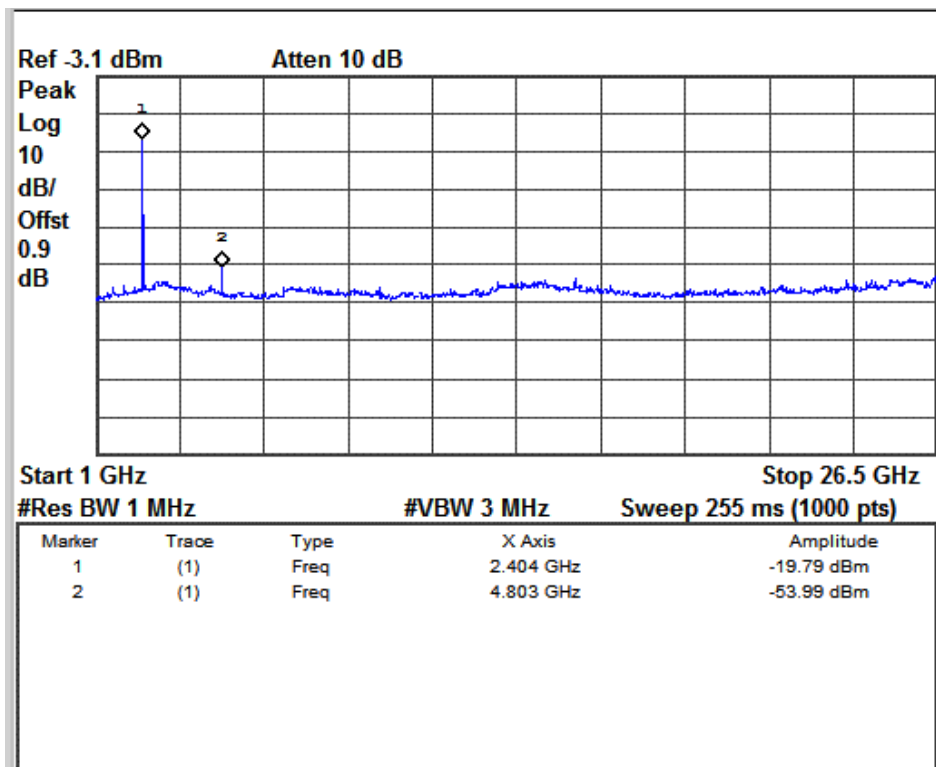
Channel: Mid

Modulation: Pi/4 DQPSK



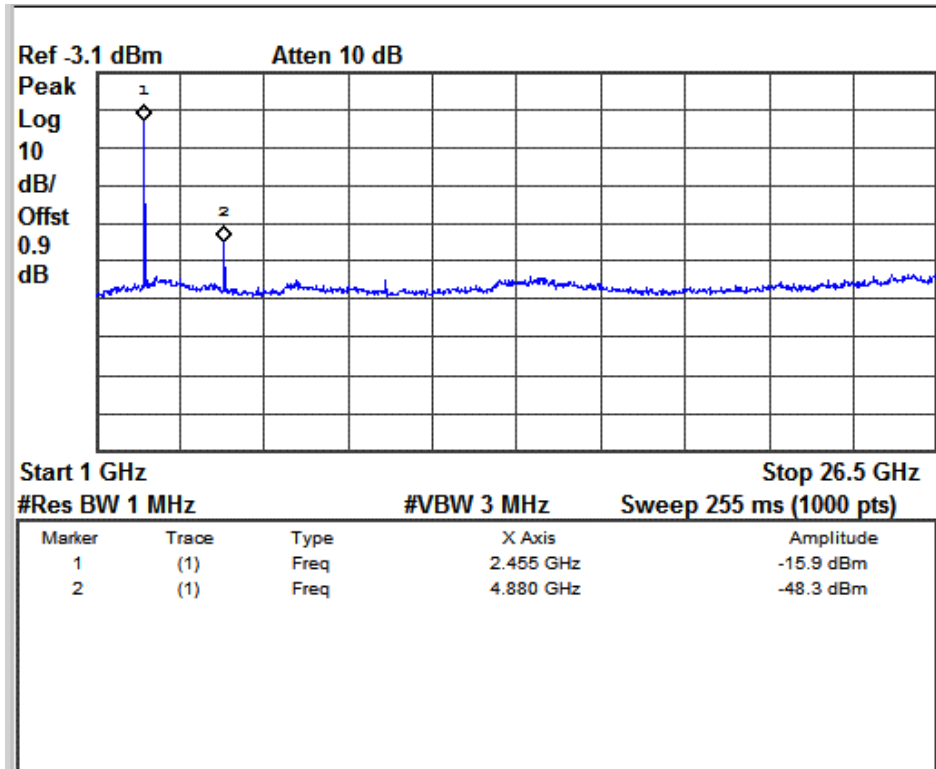
Channel: High

Modulation: Pi/4 DQPSK



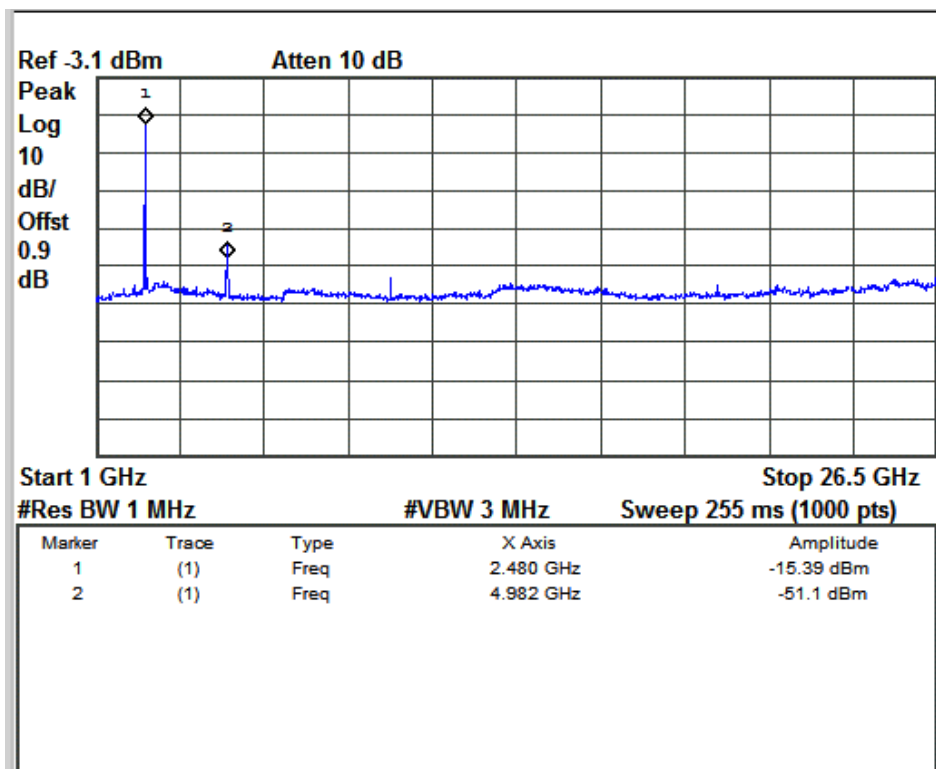
Channel: Low

Modulation: 8 DPSK



Channel: Mid

Modulation: 8 DPSK



Channel: High

Modulation: 8 DPSK

Spurious Radiated Emissions & Restricted Bands of Operation
Section 15.209 & 15.205
Result
Pass

Test Specification	FCC Part 15C
Test Method	ANSI C63.10-2013
Measurement Location	Semi Anechoic Chamber
Measuring Frequency Range	9kHz to 40GHz (Up to 10 th harmonic of the highest fundamental frequency)
Measuring Distance	3m
Detection	QP for frequency below 1GHz, Peak, Average for frequency above 1GHz
Requirement	As per the limits mentioned in the bellow table

Limit for Radiated Emission of Section 15.209:

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * the limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 88, 50 – 53.80, 53.80 – 43.00 and 49.5dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a 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.

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Test results:

No emissions were found in the range 9 kHz to 1GHz.

Test results for frequencies in the range 1 GHz 26.5 GHz

Modulation type: GFSK

Channel	Polarization	Frequency (MHz)	Measured Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
LOW	V	2390(Pk)	38.97	74	-35.03
		2390(Av)	27.09	54	-26.91
		2402(Pk)	68.85	*	*
		2402(Av)	68.22	*	*
		4804(Pk)	51.48	74	-22.52
		4804(Av)	40.73	54	-13.27
		7206(Pk)	56.14	74	-17.86
		7206(Av)	44.24	54	-09.76
	H	2390(Pk)	40.51	74	-33.49
		2390(Av)	27.11	54	-26.89
		2402(Pk)	65.90	*	*
		2402(Av)	65.21	*	*
		4804(Pk)	52.17	74	-21.83
		4804(Av)	42.53	54	-11.47
		7206(Pk)	56.41	74	-17.59
		7206(Av)	44.21	54	-09.79
MID	V	2441(Pk)	73.78	*	*
		2441(Av)	70.48	*	*
		4882(Pk)	52.75	74	-21.25
		4882(Av)	42.88	54	-11.12
		7323(Pk)	57.46	74	-16.54
		7323(Av)	44.89	54	-09.11
	H	2441(Pk)	70.14	*	*
		2441(Av)	68.99	*	*
		4882(Pk)	56.04	74	-17.96
		4882(Av)	47.77	54	-06.23
		7323(Pk)	56.78	74	-17.22
		7323(Av)	44.85	54	-09.15
HIGH	V	2483.5(Pk)	39.04	74	-34.96
		2483.5(Av)	27.25	54	-26.75

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		2480(Pk)	70.45	*	*
		2480(Av)	68.22	*	*
		4960(Pk)	52.86	74	-21.14
		4960(Av)	43.67	54	-10.33
		7440(Pk)	57.90	74	-16.10
		7440(Av)	45.60	54	-08.40
	H	2483.5(Pk)	38.91	74	-35.09
		2483.5(Av)	27.16	54	-26.84
		2480(Pk)	67.09	*	*
		2480(Av)	66.16	*	*
		4960(Pk)	57.38	74	-16.62
		4960(Av)	49.40	54	-04.60
		7440(Pk)	57.82	74	-16.18
		7440(Av)	45.60	54	-08.40

** -> Fundamental Frequency

Pk - > Peak Detector

Av->Average Detector

Modulation type: Pi/4 DQPSK

Channel	Polarization	Frequency (MHz)	Measured Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
LOW	V	2390(Pk)	38.73	74	-35.27
		2390(Av)	26.99	54	-27.01
		2402(Pk)	67.67	*	*
		2402(Av)	62.53	*	*
		4804(Pk)	49.75	74	-24.25
		4804(Av)	37.47	54	-16.53
		7206(Pk)	57.85	74	-16.15
		7206(Av)	44.25	54	-09.75
	H	2390(Pk)	38.41	74	-35.59
		2390(Av)	27.16	54	-26.84
		2402(Pk)	63.25	*	*
		2402(Av)	59.31	*	*
		4804(Pk)	50.00	74	-24.00
		4804(Av)	38.32	54	-15.68
		7206(Pk)	56.50	74	-17.50
		7206(Av)	44.23	54	-09.77
MID	V	2441(Pk)	72.39	*	*
		2441(Av)	68.47	*	*
		4882(Pk)	52.50	74	-21.50
		4882(Av)	40.44	54	-13.56

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HIGH		7323(Pk)	57.63	74	-16.37
		7323(Av)	44.87	54	-09.13
	H	2441(Pk)	68.40	*	*
		2441(Av)	64.24	*	*
		4882(Pk)	53.18	74	-20.82
		4882(Av)	42.77	54	-11.23
		7323(Pk)	58.13	74	-15.87
		7323(Av)	44.83	54	-09.17
	V	2483.5(Pk)	38.94	74	-35.06
		2483.5(Av)	27.22	54	-26.78
		2480(Pk)	67.94	*	*
		2480(Av)	64.30	*	*
		4960(Pk)	51.58	74	-22.42
		4960(Av)	40.32	54	-13.68
		7440(Pk)	57.65	74	-16.35
		7440(Av)	45.62	54	-08.38
	H	2483.5(Pk)	39.07	74	-34.93
		2483.5(Av)	27.17	54	-26.83
		2480(Pk)	65.73	*	*
		2480(Av)	60.65	*	*
		4960(Pk)	53.99	74	-20.01
		4960(Av)	43.30	54	-10.70
		7440(Pk)	58.31	74	-15.69
		7440(Av)	45.56	54	-08.44

** -> Fundamental Frequency

Pk - > Peak Detector

Av->Average Detector

Modulation Type: 8 DPSK

Channel	Polarization	Frequency (MHz)	Measured Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
LOW	V	2390(Pk)	39.35	74	-34.65
		2390(Av)	27.17	54	-26.83
		2402(Pk)	67.42	*	*
		2402(Av)	62.28	*	*
		4804(Pk)	49.23	74	-24.77
		4804(Av)	37.38	54	-16.62
		7206(Pk)	56.70	74	-17.30
		7206(Av)	44.21	54	-09.79
	H	2390(Pk)	39.36	74	-34.64
		2390(Av)	27.15	54	-26.85

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		2402(Pk)	64.41	*	*
		2402(Av)	60.58	*	*
		4804(Pk)	49.50	74	-24.50
		4804(Av)	38.42	54	-15.58
		7206(Pk)	56.63	74	-17.37
		7206(Av)	44.26	54	-09.74
MID	V	2441(Pk)	72.45	*	*
		2441(Av)	66.44	*	*
		4882(Pk)	51.20	74	-22.80
		4882(Av)	40.25	54	-13.75
		7323(Pk)	57.26	74	-16.74
		7323(Av)	44.86	54	-09.14
	H	2441(Pk)	68.44	*	*
		2441(Av)	64.81	*	*
		4882(Pk)	54.66	74	-19.34
		4882(Av)	43.43	54	-10.57
		7323(Pk)	56.34	74	-17.66
		7323(Av)	44.12	54	-09.88
HIGH	V	2483.5(Pk)	39.17	74	-34.83
		2483.5(Av)	27.11	54	-26.89
		2480(Pk)	68.76	*	*
		2480(Av)	63.29	*	*
		4960(Pk)	51.69	74	-22.31
		4960(Av)	40.34	54	-13.66
		7440(Pk)	57.64	74	-16.36
		7440(Av)	45.59	54	-08.41
	H	2483.5(Pk)	38.86	74	-35.14
		2483.5(Av)	27.18	54	-26.82
		2480(Pk)	64.76	*	*
		2480(Av)	60.11	*	*
		4960(Pk)	53.99	74	-20.01
		4960(Av)	43.52	54	-10.48
		7440(Pk)	57.79	74	-16.21
		7440(Av)	45.69	54	-08.31

** -> Fundamental Frequency

Pk - > Peak Detector

Av->Average Detector

Result**Pass**

Test Specification : FCC Part 15 Section 15.207
Test Method : ANSI C63.10-2013
Testing Location : Screened room
Measurement Bandwidth : 9kHz
Frequency Range : 150kHz – 30MHz
Supply Voltage : 120VAC,60Hz

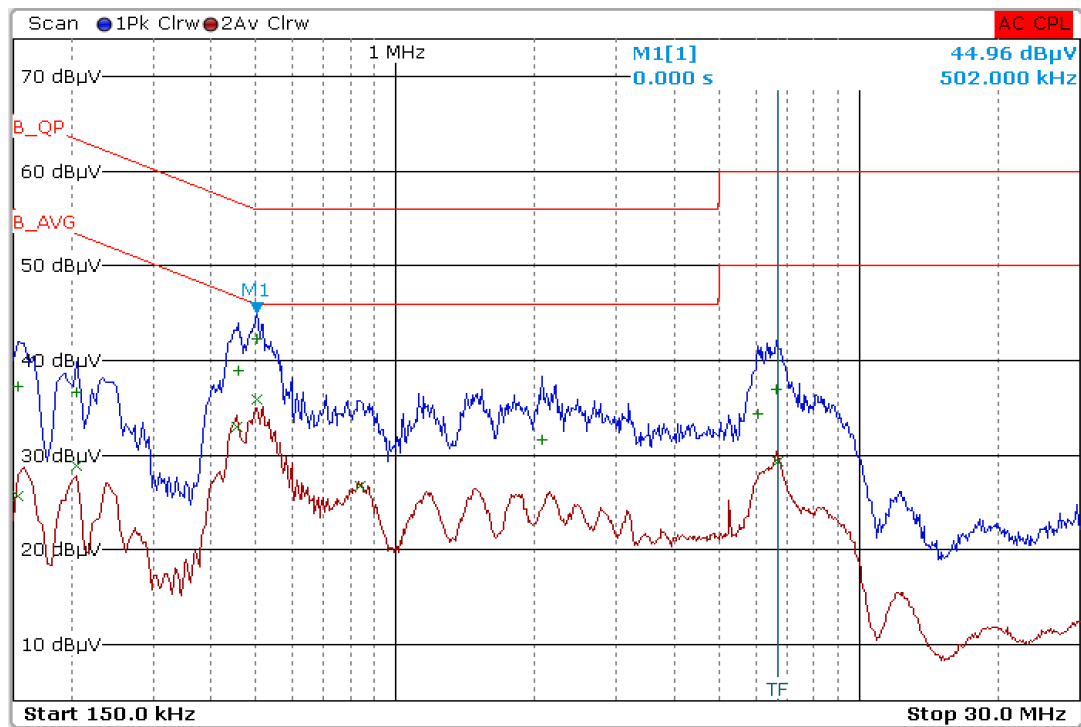
Limit of section 15.207

Frequency of emission (MHz)	QP Limit (dBμV)	AV Limit (dBμV/m)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

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Test Result:

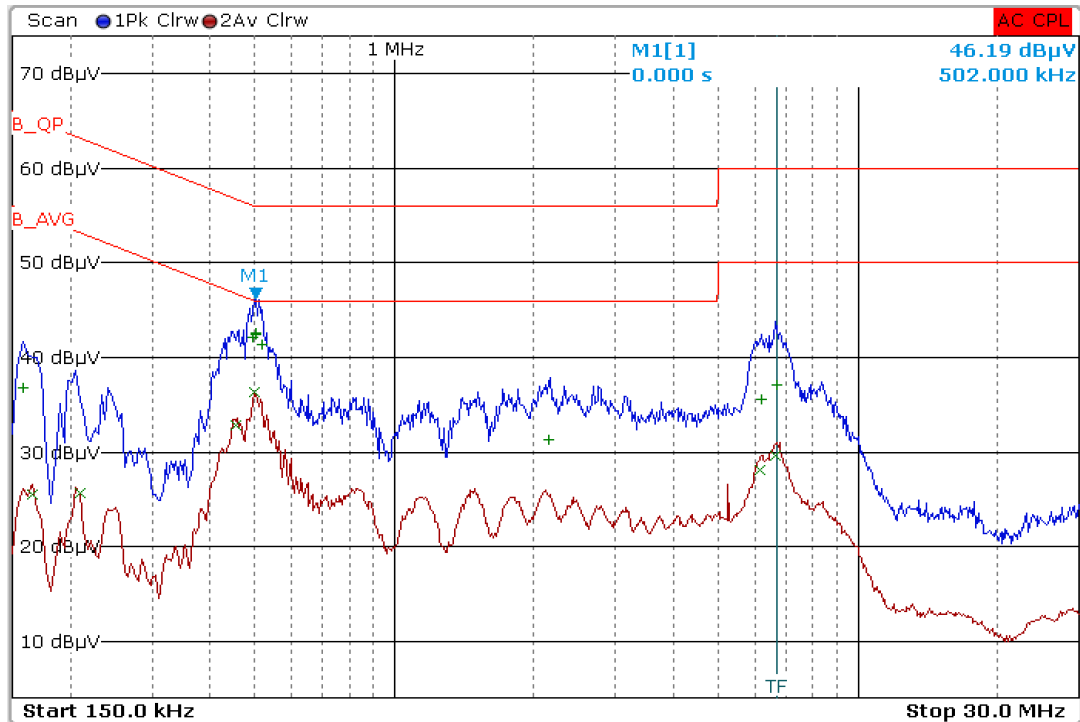


Line Graph

Frequency [MHz]	Emission Level [dBµV]	Limit [dBµV]	Detector
0.502	42.30	56.0	Quasi Peak
0.458	38.93	56.7	Quasi Peak
6.634	36.93	60.0	Quasi Peak
2.074	31.64	56.0	Quasi Peak
6.058	34.35	60.0	Quasi Peak
0.206	36.64	63.4	Quasi Peak
0.502	35.84	46.0	Average
0.454	33.02	46.8	Average
0.838	26.71	46.0	Average
6.678	29.34	50.0	Average
0.206	28.90	53.4	Average
0.154	25.73	55.8	Average

Line: Table

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Neutral: Graph

Frequency [MHz]	Emission Level [dBµV]	Limit [dBµV]	Detector
0.502	42.55	56.0	Quasi Peak
0.494	42.17	56.1	Quasi Peak
0.518	41.32	56.0	Quasi Peak
6.714	37.13	60.0	Quasi Peak
6.198	35.53	60.0	Quasi Peak
2.150	31.24	56.0	Quasi Peak
0.498	36.28	46.0	Average
0.454	32.88	46.8	Average
6.622	29.66	50.0	Average
6.146	28.03	50.0	Average
0.210	25.73	53.2	Average
0.166	25.57	55.2	Average

Neutral: Table