FCC TEST REPORT

No. 170800863SHA-001

Applicant	:	WANG XING DA (FENGSHUN) ELECRTRONICS CO., LTD. Wang Xing Da Technology Park, Tongpan Village, Tangkeng town, Fengshun County ,Meizhou City, Guangdong Province, China
Manufacturer	:	Same as applicant
Product Name	:	TROLLY SPEAKER
Type/Model	:	K18
TEST RESULT	:	**PASS**

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2016): Radio Frequency Devices

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Date of issue: December 18, 2017

Prepared by:

Eric Li (*Project Engineer*)

Reviewed by:

Daniel Zhao (*Reviewer*)

Description of Test Facility

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IC Assigned Code: 2402B-1

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Content

1 GENERAL INFORMATION

1.1 Description of Client

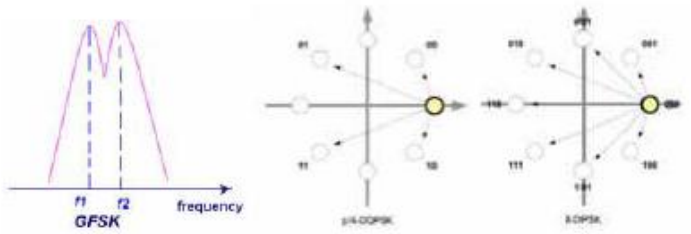
Applicant	:	WANG XING DA (FENGSHUN) ELECRTRONICS CO., LTD. Wang Xing Da Technology Park, Tongpan Village, Tangkeng town, Fengshun County ,Meizhou City, Guangdong Province, China
Name of contact	:	Sun Zezhi
Tel	:	+86-18682096568
Fax	:	/
Email	:	Sales21@larkcn.com
Manufacturer	:	Same as applicant

1.2 Identification of the EUT

Product Name	:	TROLLY SPEAKER
Type/model	:	K18
FCC ID	:	2AMLC-K18

1.3 Technical Specification

Operation Frequency Band	:	2402 - 2480 MHz
Type of Modulation	:	BT 2.1 (BR+EDR)
EUT Modes of Modulation	:	GFSK, π/4 DQPSK, 8DPSK



GFSK is different from π/4DQPSK and 8DPSK. 8DPSK is similar with π/4DQPSK but more complex, and with a bigger data rate. So all the tests except output power, occupied bandwidth, dwell time and number of hopping frequencies were performed with GFSK modulation and 8DPSK modulation for representative.

Channel Number	:	79
Description of EUT	:	The EUT is a portable active speaker, which contains a Bluetooth function, and there have only one model, We tested it and listed the BT results in this report.
Port identification		DC Input *1;
Antenna		Internal PCB antenna 0.5dBi
Rating		DC IN 13.5V
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Sample received date	:	November 10,2017
Sample Identification No	:	/
Date of test	:	November 20,2017~ November 30,2017

1.4 Mode of operation during the test / Test peripherals used

While testing the transmitter mode of the EUT, the internal modulation is applied.
All the functions of the host device except the BT module were set on stand-by mode.

The test setting software is offered by the manufactory. The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases.

Radiated test mode:
Mode 1: EUT transmitted signal with BT antenna, FM is received;

Conducted test mode:
Mode 2: EUT transmitted signal from BT RF port connected to SPA directly;

The worst case modulation configuration:

Worst Modulation Used for Conformance Testing			
Bluetooth Mode	**Packet Type**	**Data Rate**	**Worst Mode**
GFSK	BR-1Mbps	DH1,DH3,DH5	**BR-1Mbps DH5**
π/4 DQPSK	EDR-2Mbps	2DH1,2DH3,2DH5	EDR-2Mbps 2DH5
8DPSK	EDR-3Mbps	3DH1,3DH3,3DH5	EDR-3Mbps 3DH5
Note: The BR-1Mbps DH5 mode was chosen for radiation emission bellow 1GHz and Conducted emission testing as representative in this report.			

The power setting parameter:

The worst case power setting parameter			
Test software Version	CSR Bluesuite 2.4.8		
Modulation Mode	2402MHz	2441MHz	2480MHz
BR-1Mbps	255,63	255,63	255,63
EDR-2Mbps	255,63	255,63	255,63
EDR-3Mbps	255,63	255,63	255,63

Test Peripherals:

Equipment	Brand Name	Model	Note
Notebook	HP	6470b	
Mobile Phone	Apple	IPhone 5	
Note: The accessories are used for configuration only and not used during test.			

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2014)
ANSI C63.10 (2013)

2.2 Instrument list

Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESIB 26	EC 3045	2018-10-18
☑	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2018-05-30
☑	Horn antenna	R&S	HF 906	EC 3049	2018-09-222
☐	Horn antenna	ETS	3117	EC 4792-1	2018-08-23
☑	Pre-amplifier	R&S	Pre-amp 18	EC5881	2018-06-19
☑	Semi-anechoic chamber	Albatross project	-	EC 3048	2018-09-08
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2018-09-10
☑	Power sensor	Agilent	U2021XA	EC 5338-1	2018-03-03
☑	Vector Signal Generator	Agilent	N5182B	EC 5175	2018-03-06
☑	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2018-03-03
☑	Mobile Test System	Litepoint	Iqxel	EC 5176	2018-01-11
☑	Test Receiver	R&S	ESCI 7	EC 4501	2018-02-23
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3323	2018-06-14
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3324	2018-04-09
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3325	2018-03-23
☑	Pressure meter	YM3	Shanghai Mengde	EC 3320	2018-06-28

2.3 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	RESULT
20 dB Bandwidth	15.247(a)(1)	Tested
Carrier Frequency Separation	15.247(a)(1)	Pass
Output power	15.247(b)(1)	Pass
Radiated Spurious Emissions	15.205 & 15.209	Pass
Conducted Spurious Emissions &Band Edge	15.247(d)	Pass
Power line conducted emission	15.207	Pass
Number of Hopping Frequencies	15.247(a)(1)(iii)	Pass
Dwell time	15.247(a)(1)(iii)	Pass
Occupied bandwidth	-	Tested
Spurious emission for receiver	15B	NA

Notes: 1: NA =Not Applicable

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2.4 Frequency Hopping System Requirement

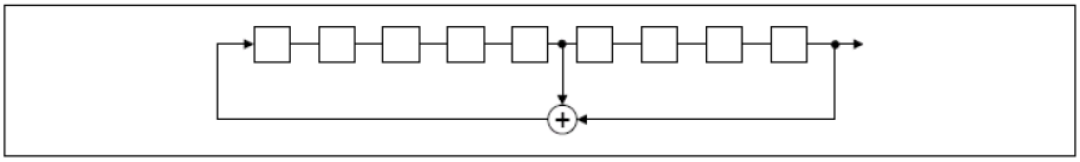
Test Requirement: Section 15.247 (a)(1), (g), (h) requirement:
The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

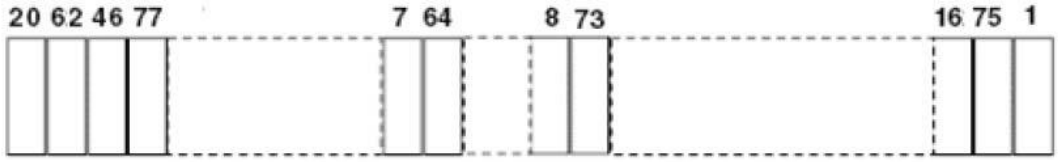
Compliance for section 15.247(a)(1)

According to Bluetooth Core Specification, the pseudorandom sequence may be generated in a nine stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs;
i.e. the shift register is initialized with nine ones.
• Number of shift register stages: 9
• Length of pseudo-random sequence: 2^9 -1 = 511 bits
• Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.
According to Bluetooth Core Specification, Bluetooth receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any Bluetooth transmitters and shift frequencies in synchronization with the transmitted signals.

Compliance for section 15.247(g)

According to Bluetooth Core Specification, the Bluetooth system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the Bluetooth system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.

Compliance for section 15.247(h)

According to Bluetooth Core specification, the Bluetooth system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels.
According to the Bluetooth Core specification, the Bluetooth system is designed not have the ability to coordinate with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.

2.5 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum peak output power	±0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	±4.90dB
Radiated Emissions in restricted frequency bands above 1GHz	±5.02dB
Emission outside the frequency band	±2.89dB
Power line conducted emission	±3.19dB

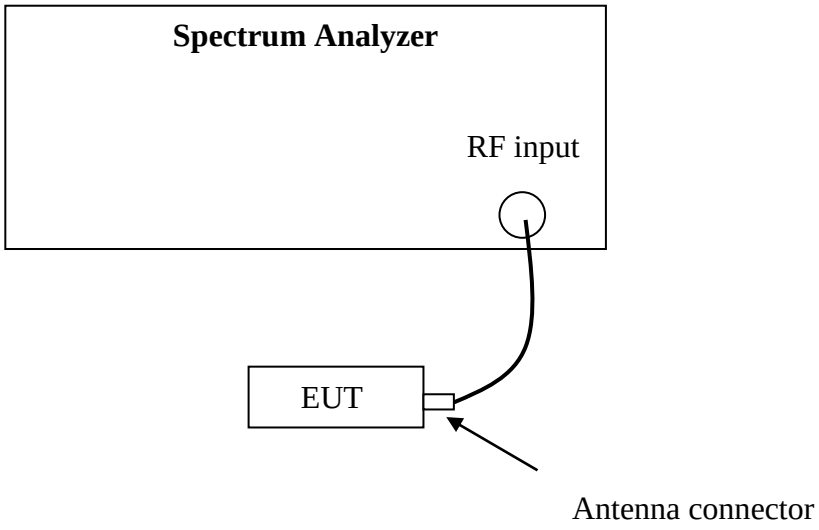
3 20 dB Bandwidth

Test result: Pass

3.1 Limit

☐ 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.
☒ 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 125mW.

3.2 Test Configuration



3.3 Test Procedure and test setup

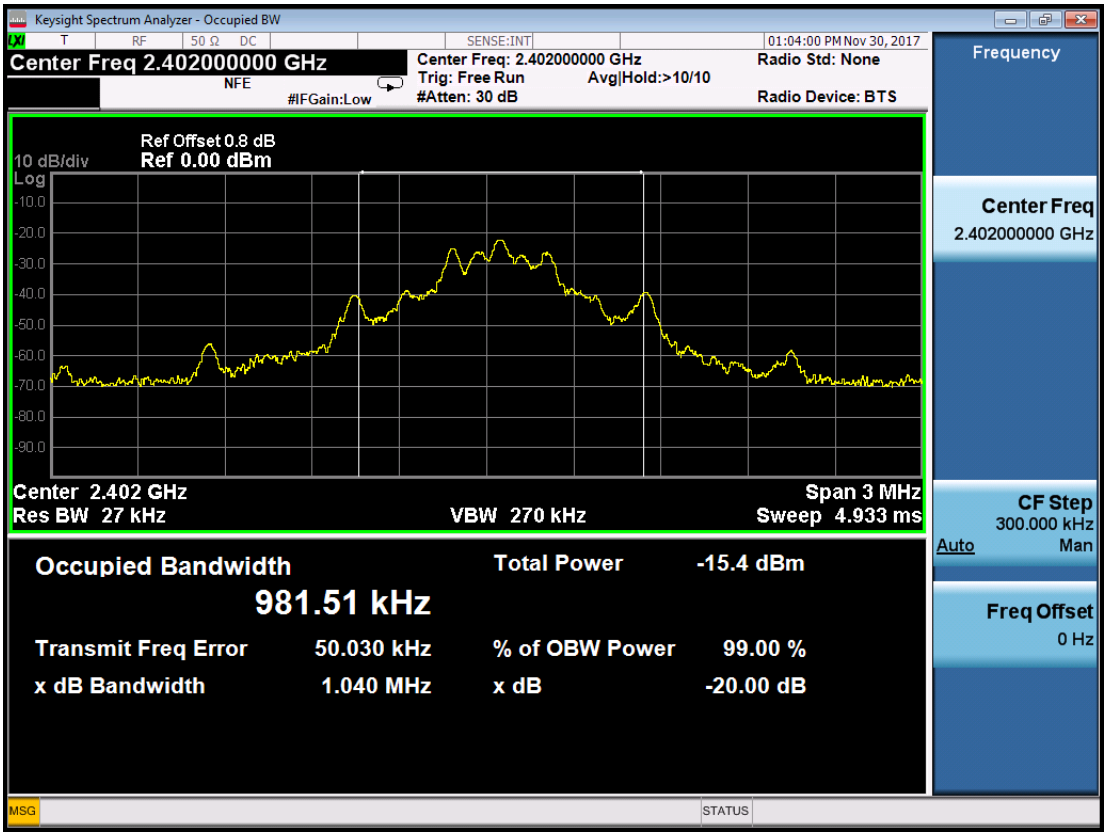
The 20 bandwidth per FCC §15.247(a)(1) is measured using the Spectrum Analyzer with Span =2 to 3 times the 20 dB bandwidth, RBW≥1% of the 20 dB bandwidth, VBW≥RBW, Sweep = auto,Detector = peak, Trace = max hold.
The test was performed at 3 channels (lowest, middle and highest channel).
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems)

3.4 Test Protocol

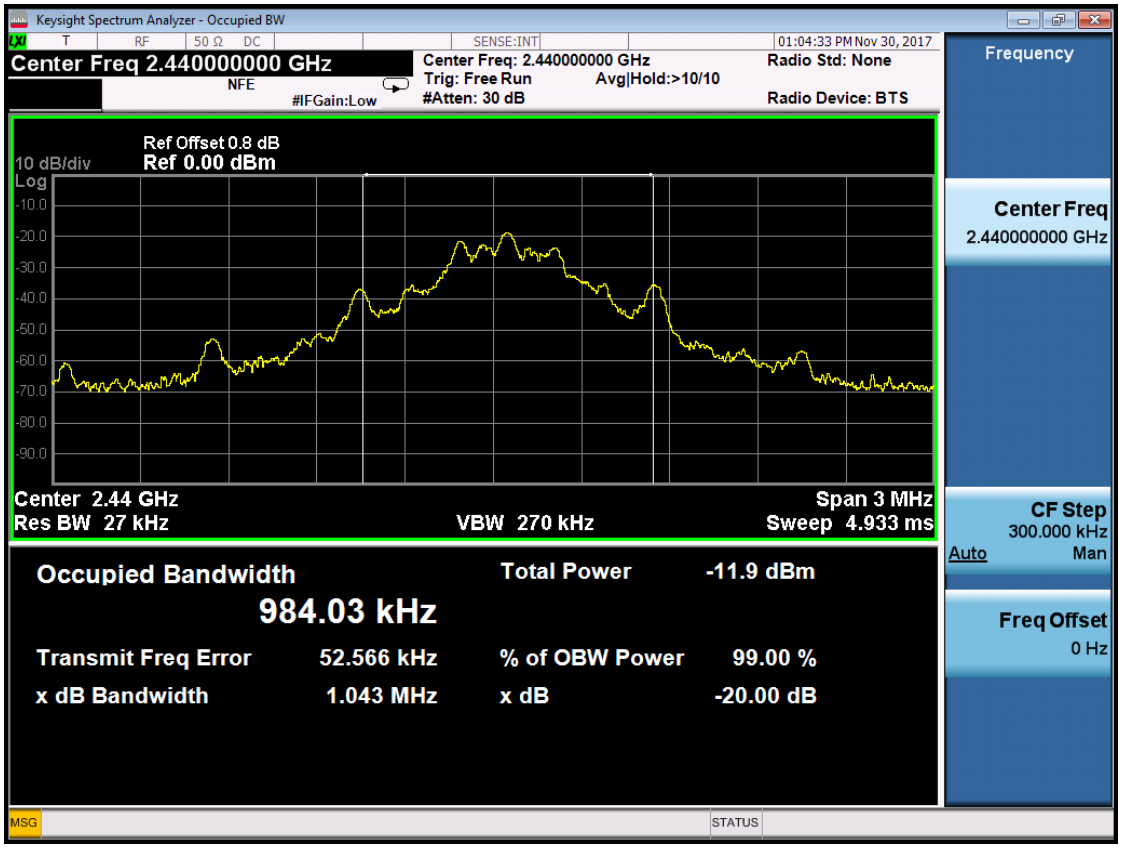
Temperature: 24°C
Relative Humidity: 52%

Modulation	CH	Bandwidth (kHz)	Two-thirds of Bandwidth (kHz)
GFSK	L	1040	693
	M	1043	695
	H	1050	700

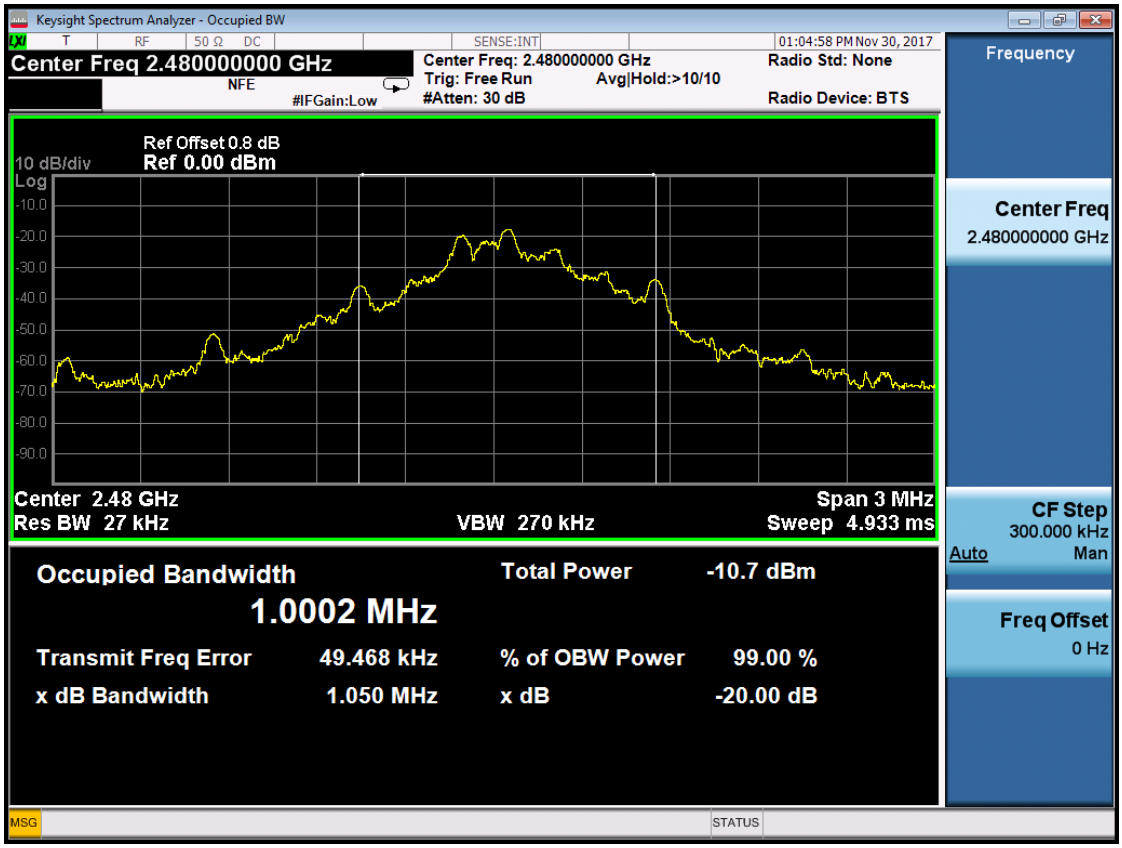
Channel L



Channel M

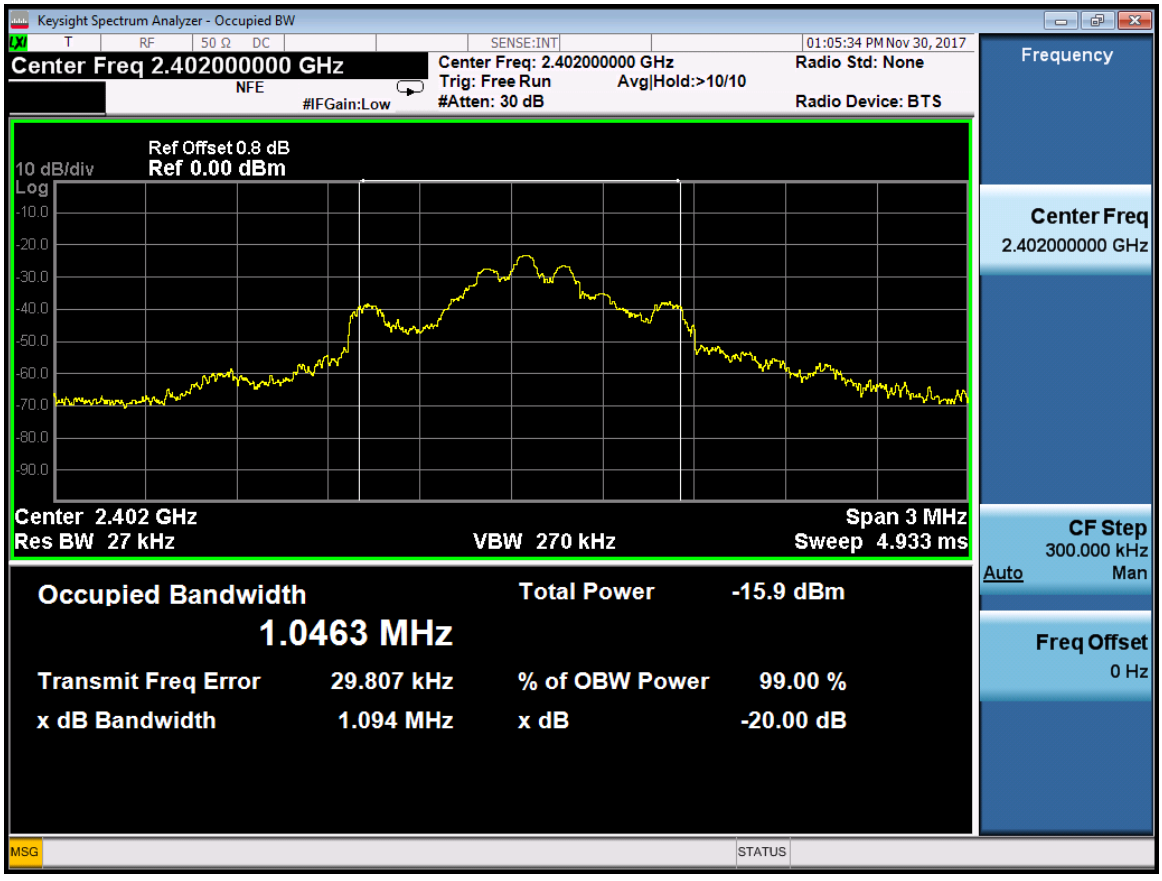


Channel H

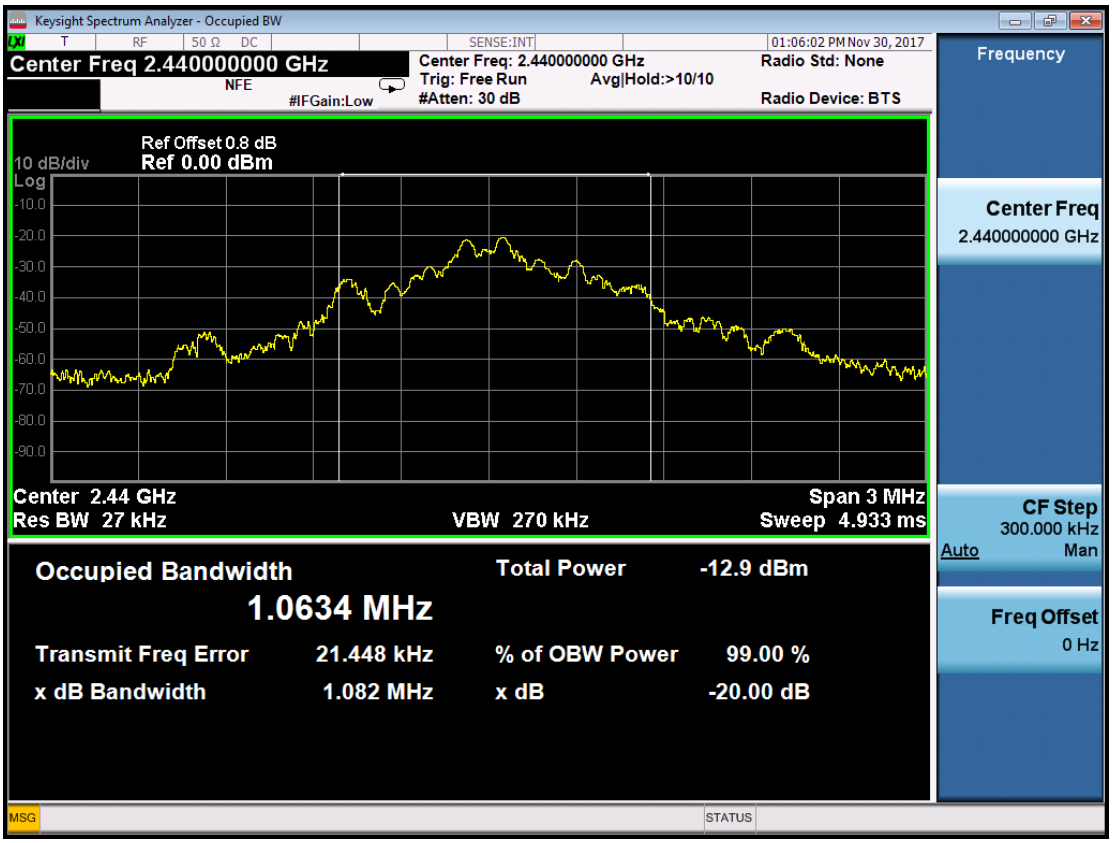


Modulation	CH	Bandwidth (kHz)	Two-thirds of Bandwidth (kHz)
π /4 DQPSK	L	1094	729
	M	1082	721
	H	1164	776

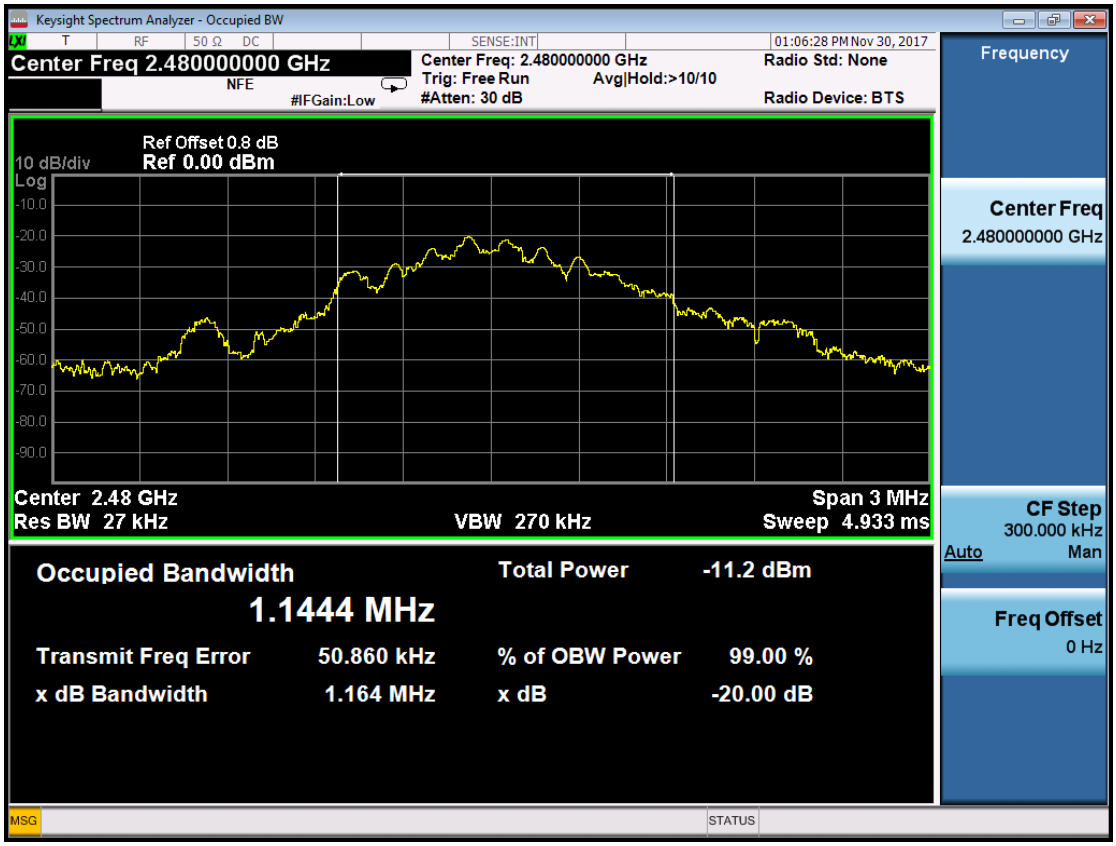
Channel L



Channel M

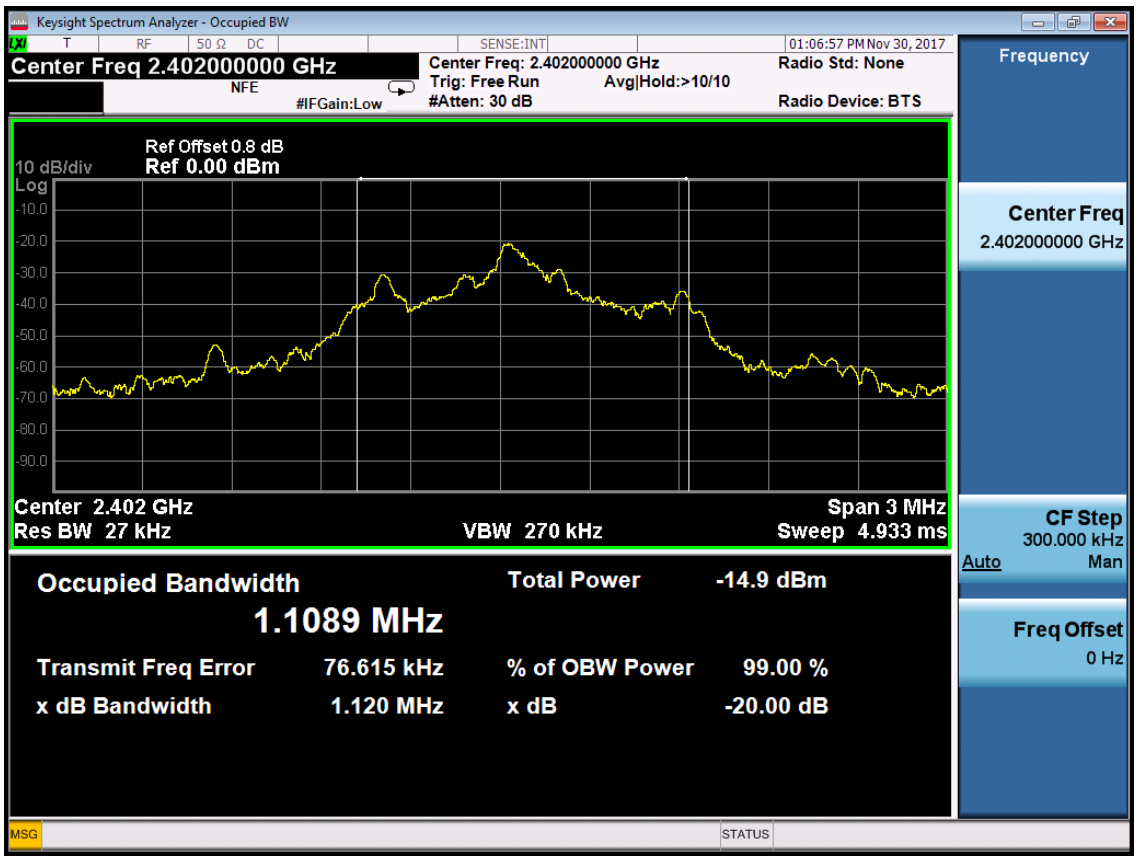


Channel H

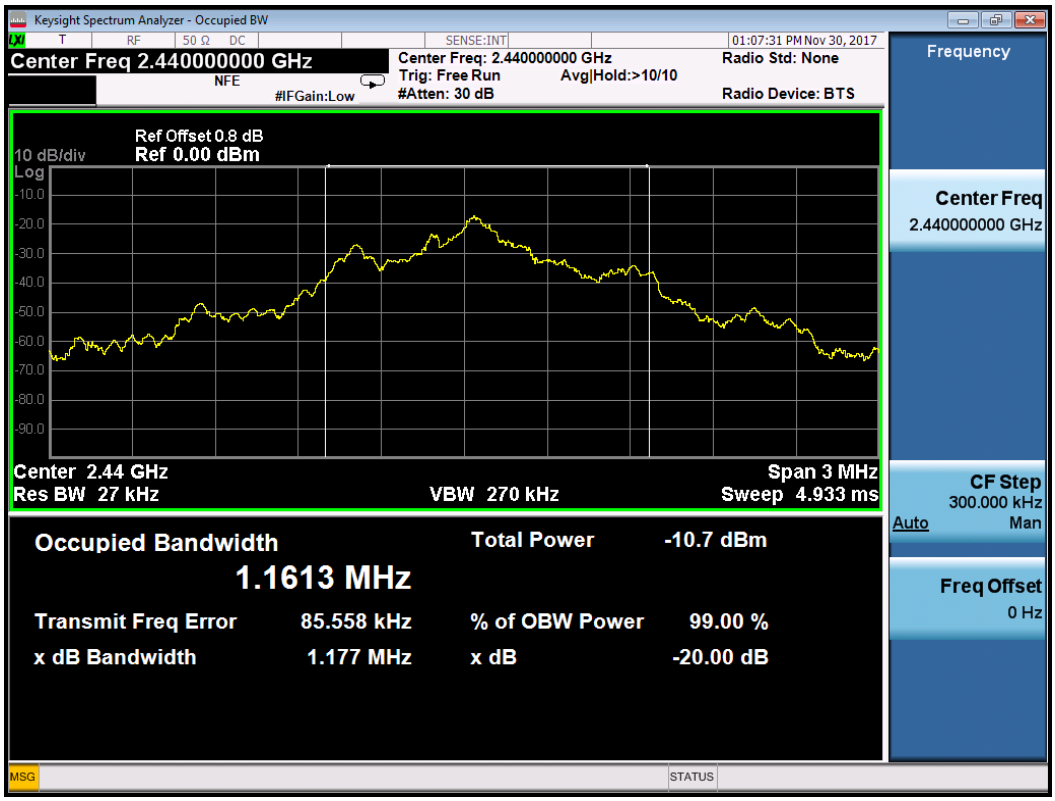


Modulation	CH	Bandwidth (kHz)	Two-thirds of Bandwidth (kHz)
8DPSK	L	1120	746
	M	1177	785
	H	1197	798

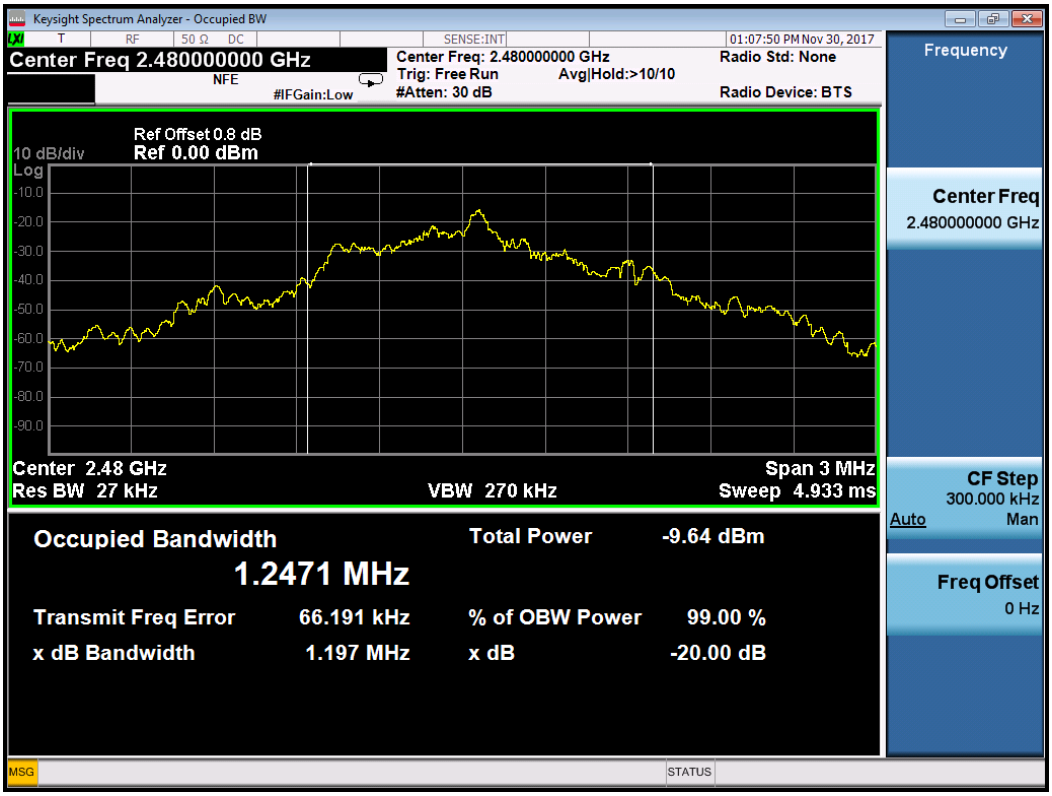
Channel L



Channel M



Channel H



4 Carrier Frequency Separation

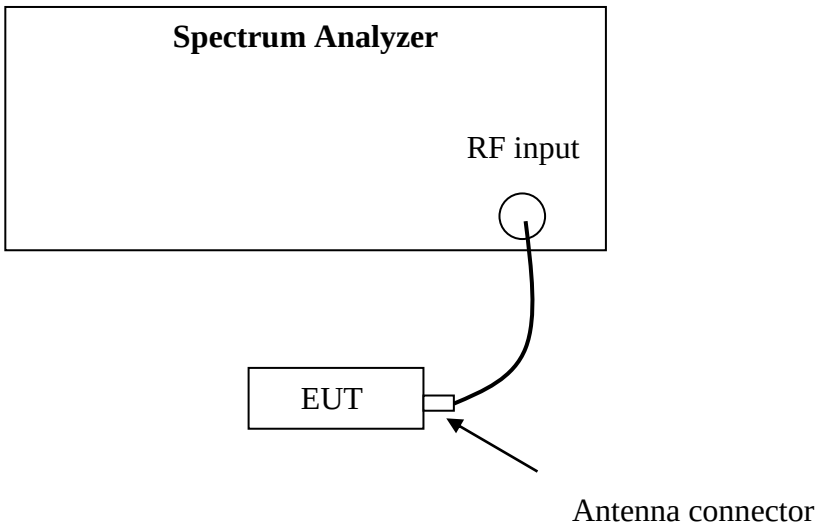
Test result: Pass

4.1 Limit

☐ Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

☒ 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 125mW.

4.2 Test Configuration



4.3 Test Procedure and test setup

The Carrier Frequency Separation per FCC § 15.247(a)(1) is measured using the Spectrum Analyzer with Span can capture two adjacent channels, RBW≥1% of the span, VBW≥RBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at 3 channels (lowest, middle and highest channel).
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems)

4.4 Test Protocol

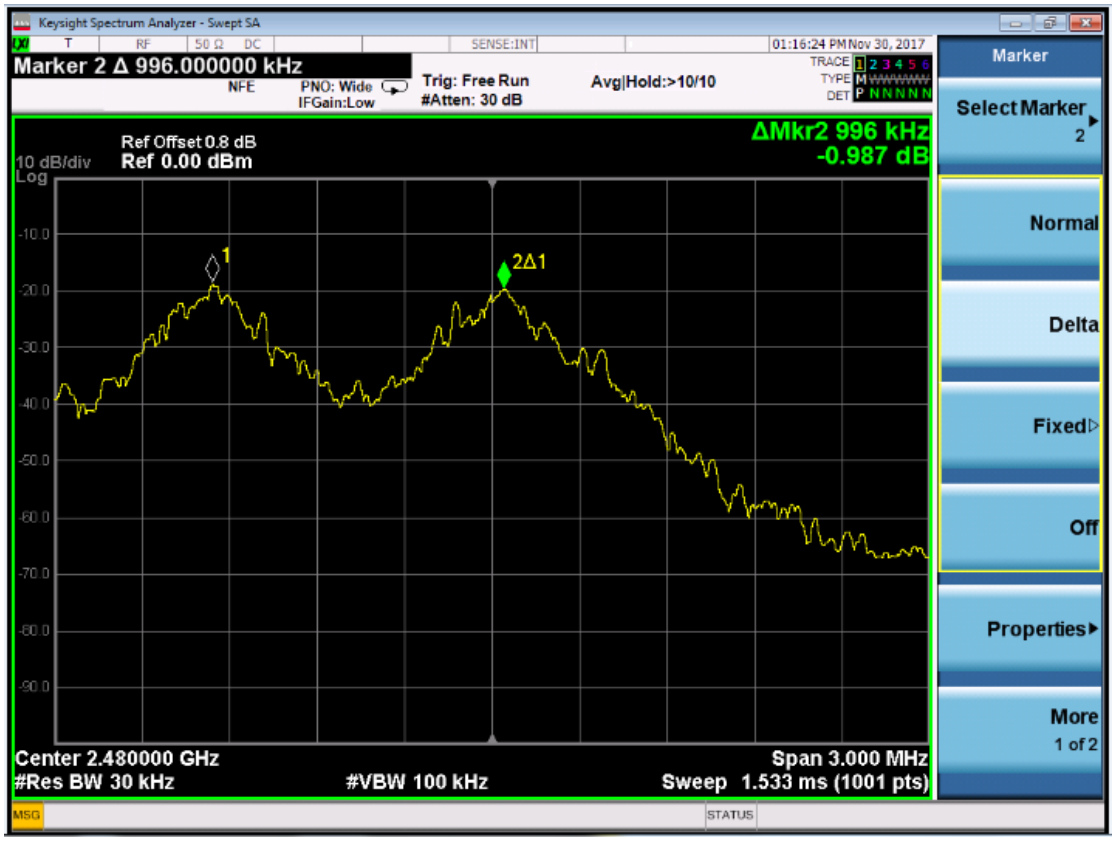
Temperature : 25°C
Relative Humidity : 55 %

Mode	CH	Frequency Separation (kHz)	Limit (kHz)
GFSK	L	993	≥693
	M	993	≥695
	H	996	≥700

Channel L

Channel M

Channel H



Mode	CH	Frequency Separation (kHz)	Limit (kHz)
π /4 DQPSK	L	1002	≥729
	M	999	≥721
	H	1002	≥776

Channel L

Channel M

Channel H

Mode	CH	Frequency Separation (kHz)	Limit (kHz)
8DPSK	L	999	≥746
	M	1029	≥785
	H	975	≥798

Channel L

Channel M

Channel H

5 Maximum peak output power

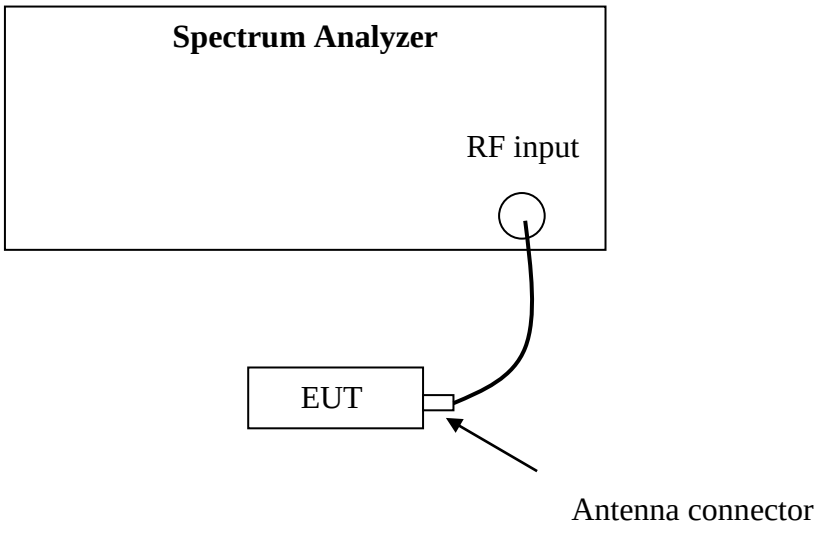
Test result: Pass

5.1 Test limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt

For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

5.2 Test Configuration



5.3 Test procedure and test setup

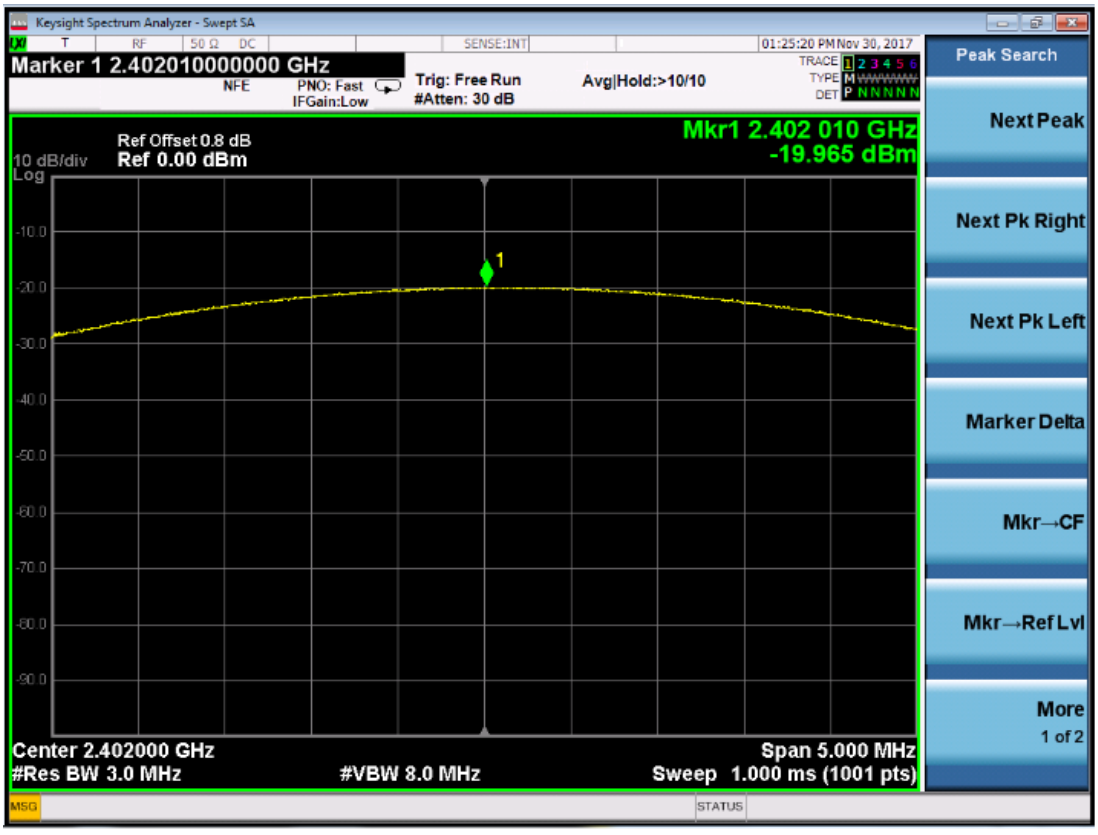
The power output per FCC § 15.247(b) is measured using the Spectrum Analyzer with Span = 5 times the 20 dB bandwidth, RBW≥ the 20 dB bandwidth, VBW≥RBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at 3 channels (lowest, middle and highest channel).
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems)

5.4 Test protocol

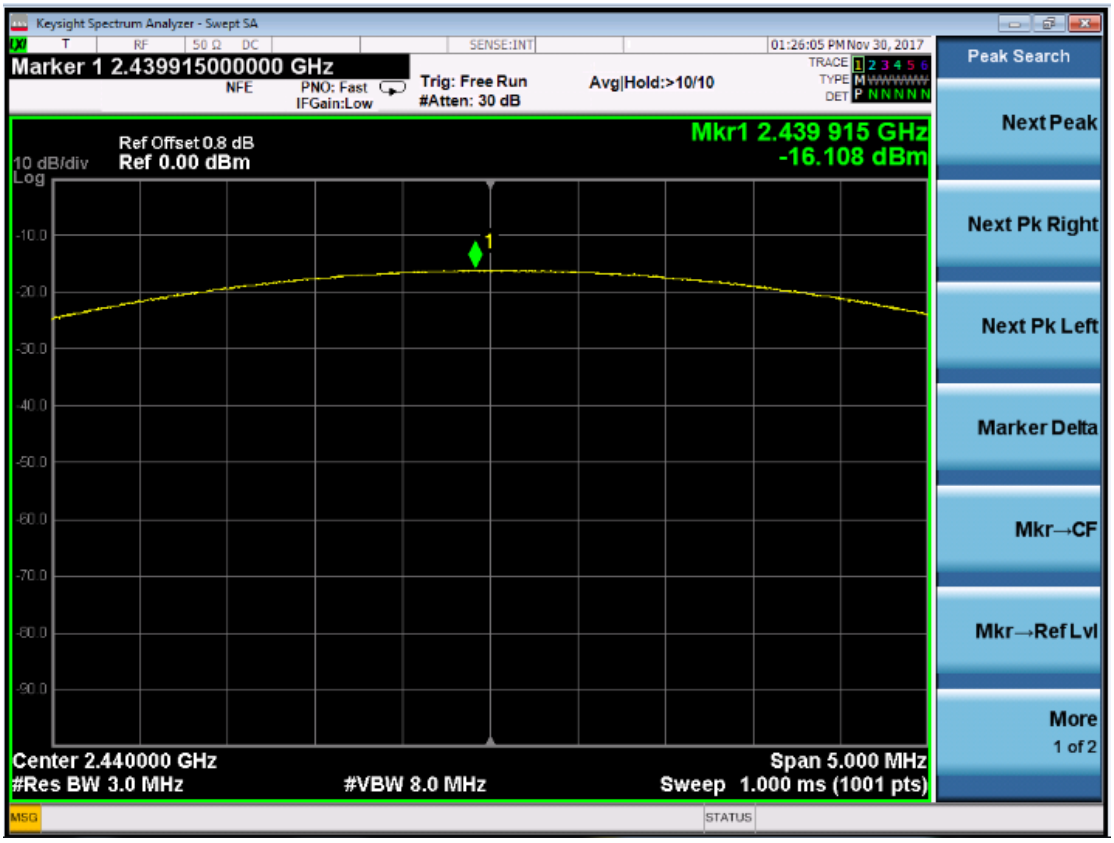
Temperature : 25 °C
Relative Humidity : 55 %

Mode	CH	Cable loss (dB)	Corrected reading (dBm)	Limit (dBm)
GFSK (DH5)	L	0.8	-19.965	≤21.00
	M	0.8	-16.108	
	H	0.8	-14.622	

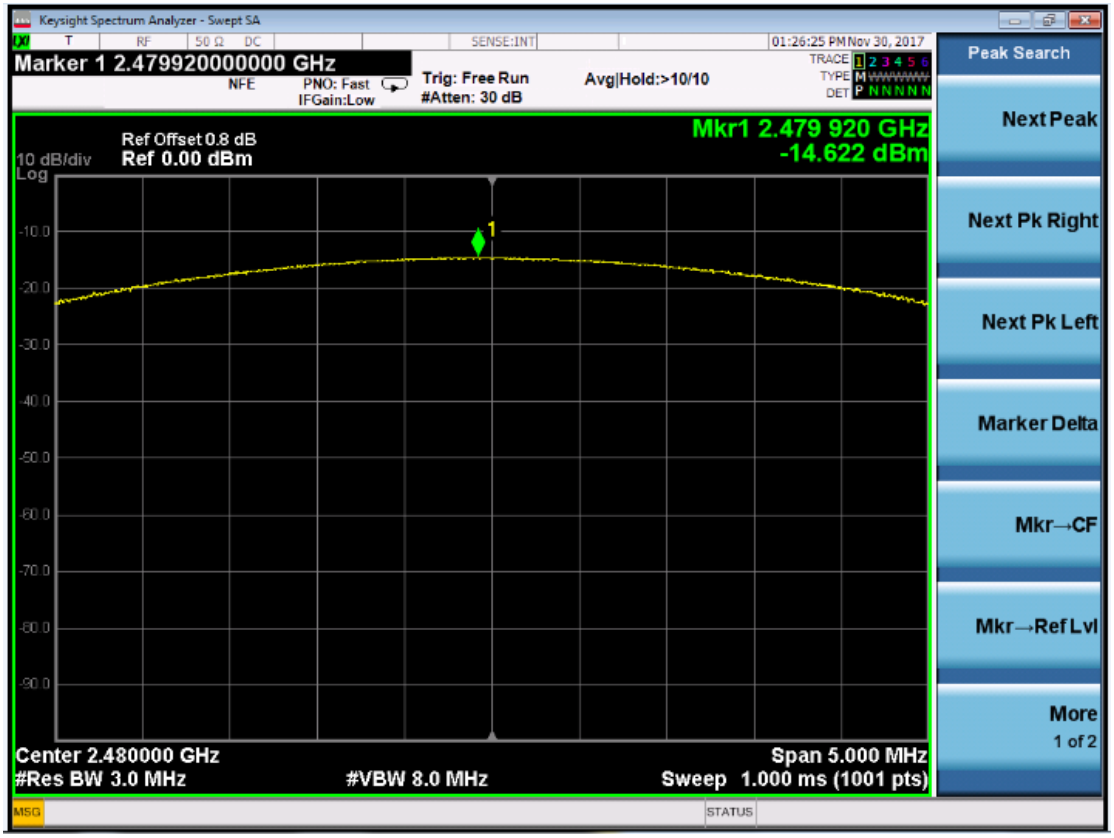
Channel L



Channel M

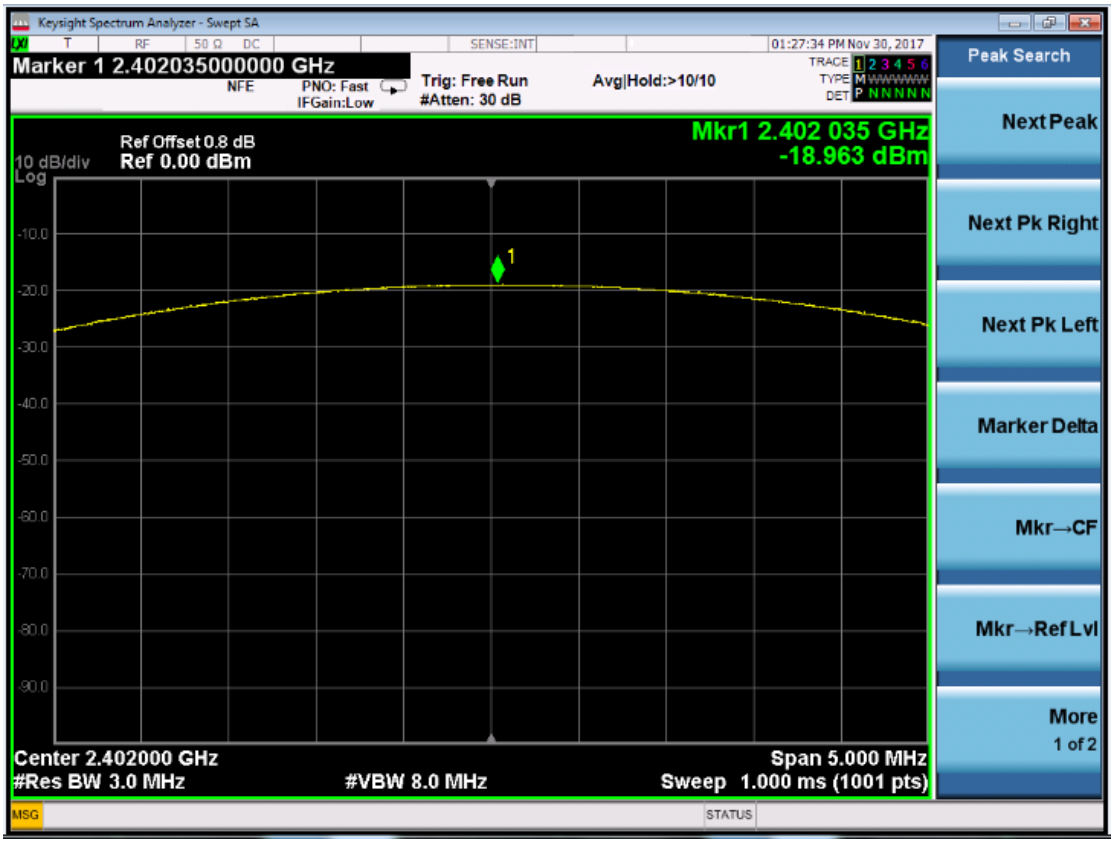


Channel H

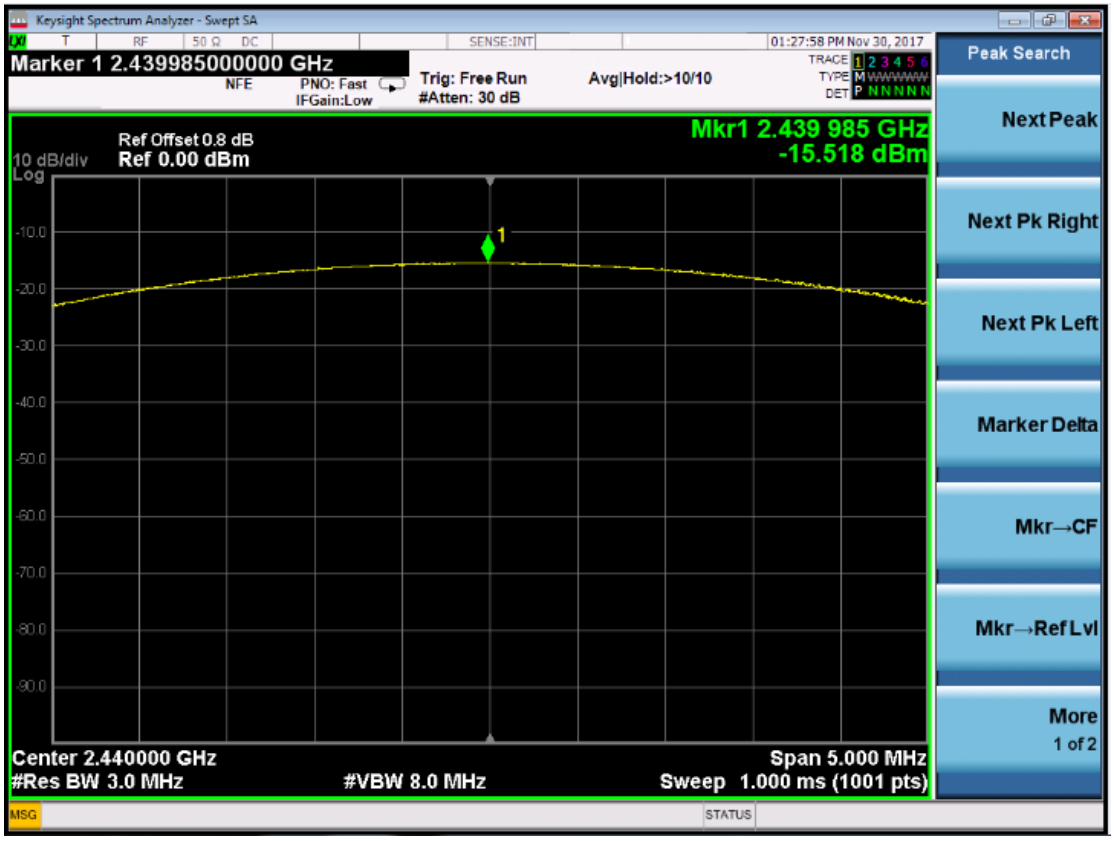


Mode	CH	Cable loss (dB)	Corrected reading (dBm)	Limit (dBm)
π /4 DQPSK (2DH5)	L	0.8	-18.963	≤21.00
	M	0.8	-15.518	
	H	0.8	-14.640	

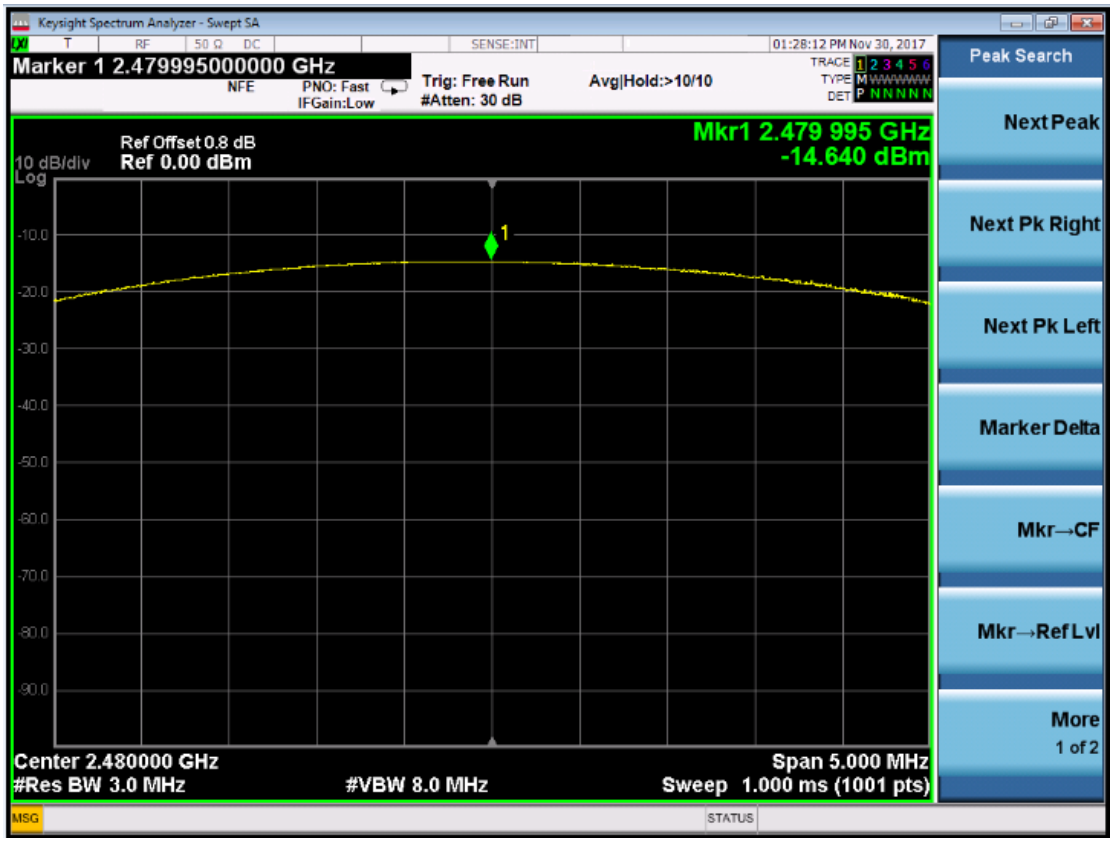
Channel L



Channel M

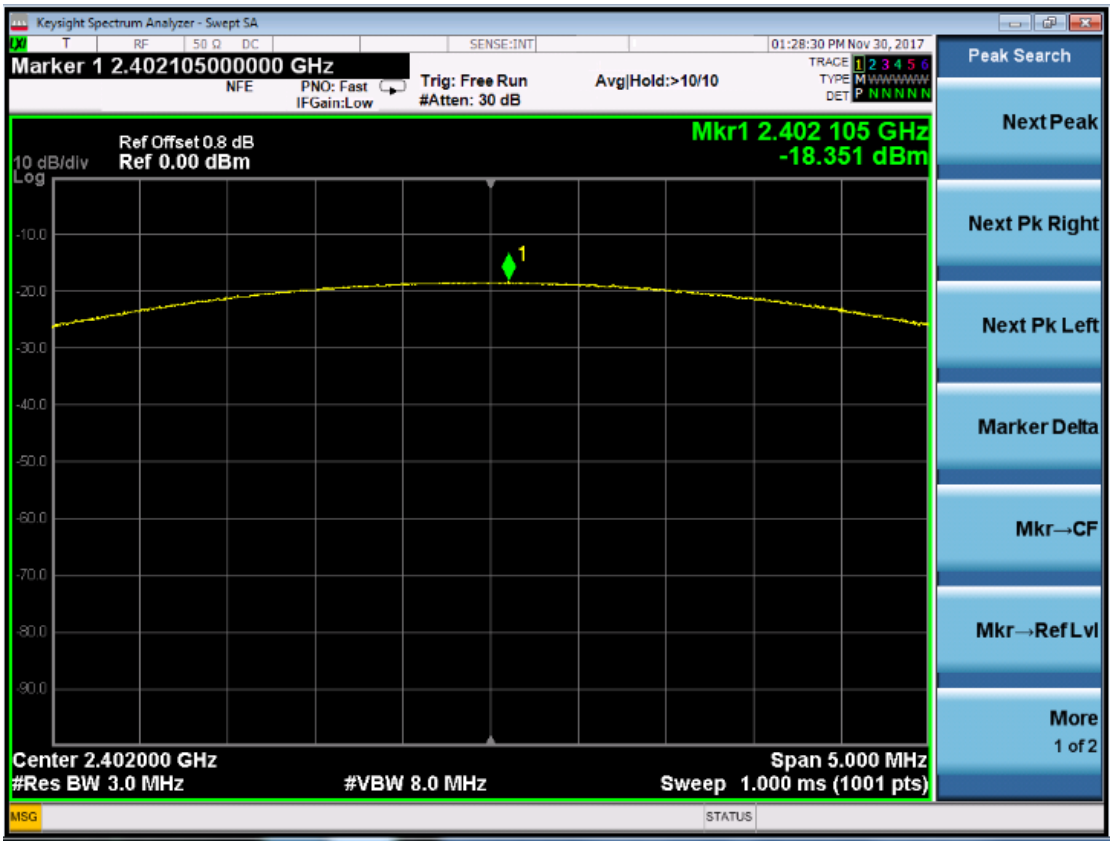


Channel H

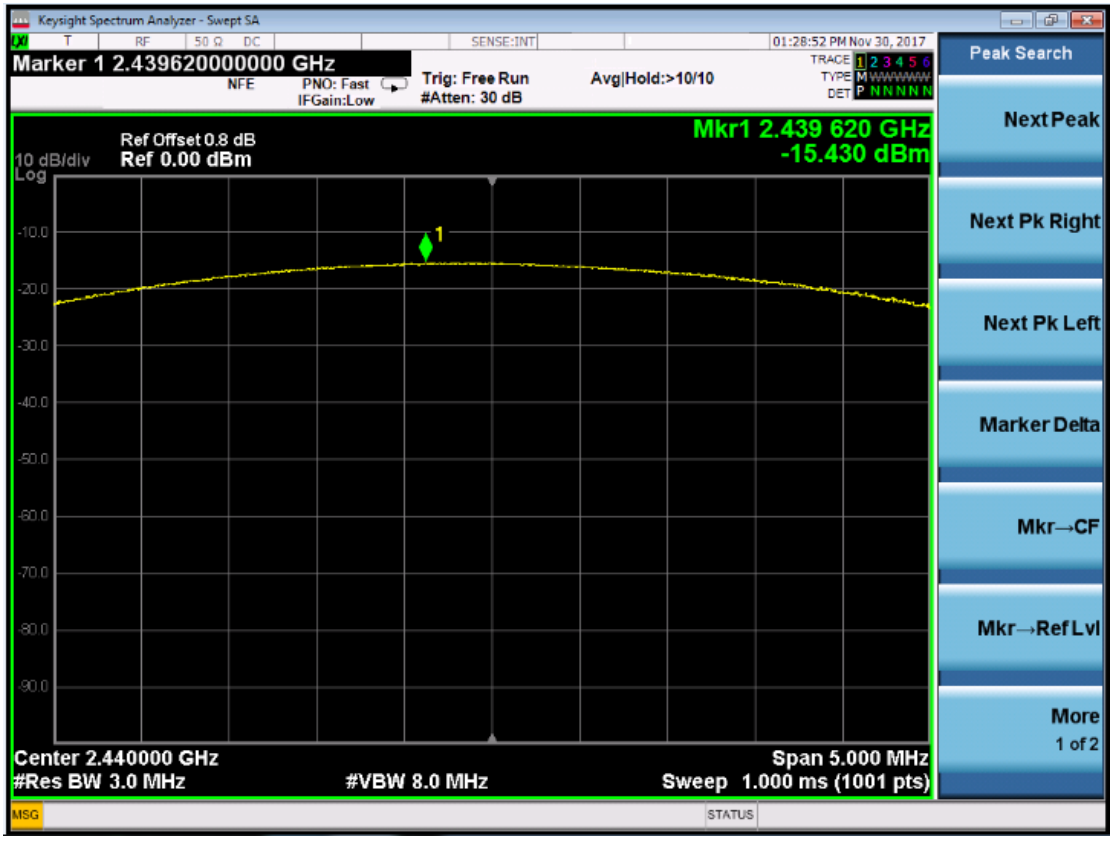


Mode	CH	Cable loss (dB)	Corrected reading (dBm)	Limit (dBm)
8DPSK (3DH5)	L	0.8	-18.351	≤21.00
	M	0.8	-15.430	
	H	0.8	-14.867	

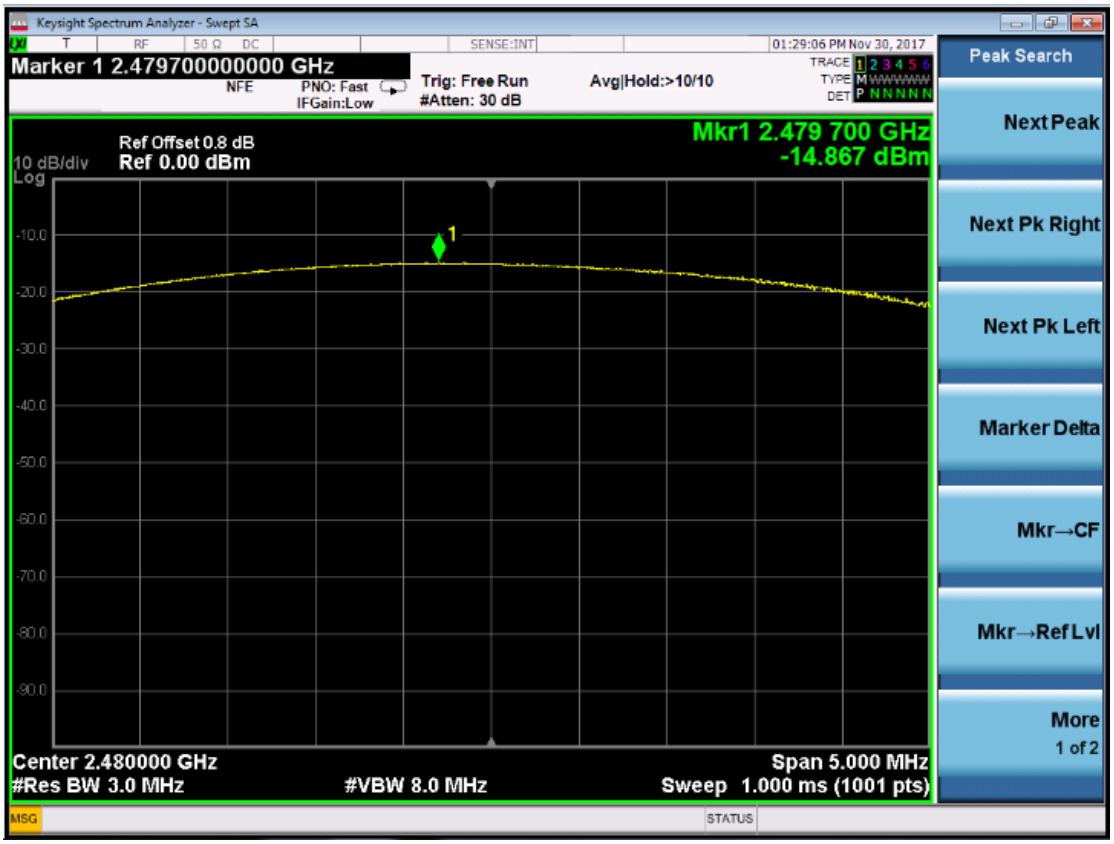
Channel L



Channel M



Channel H



6 Radiated Spurious Emissions

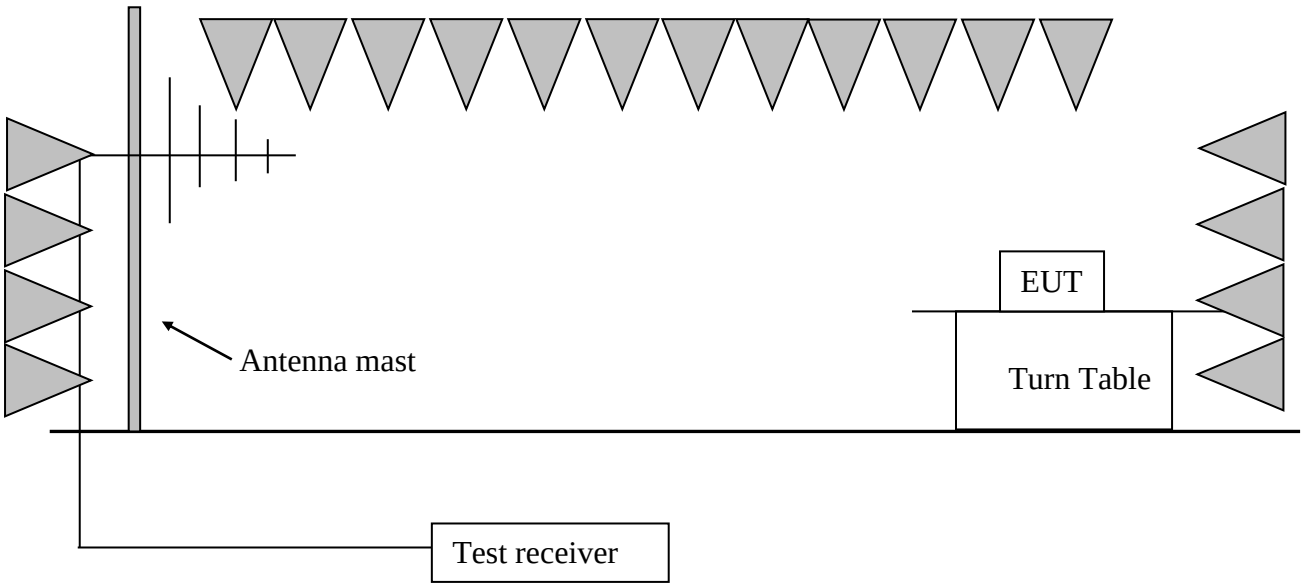
Test result: Pass

6.1 Test limit

The radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

6.2 Test Configuration



6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems)

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

Remark: 1. For fundamental emission, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The emission was conducted from 30MHz to 25GHz.

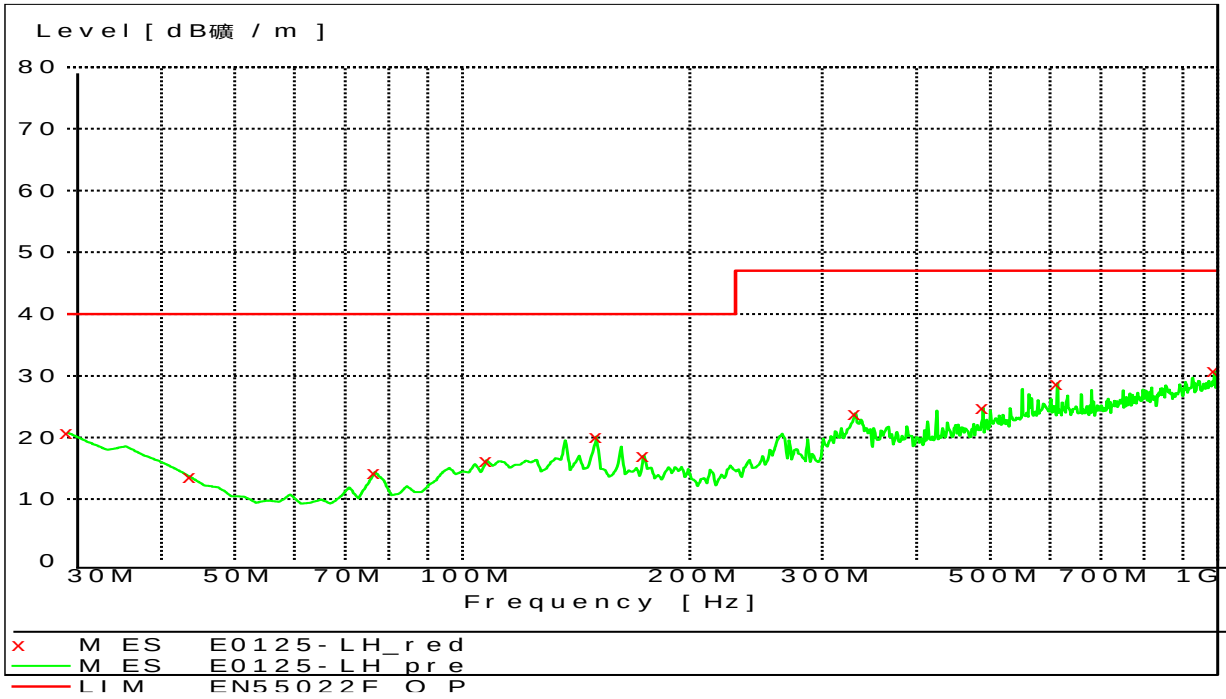
Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then
Margin = 54 -10.20 = 43.80dBuV/m

6.4 Test protocol

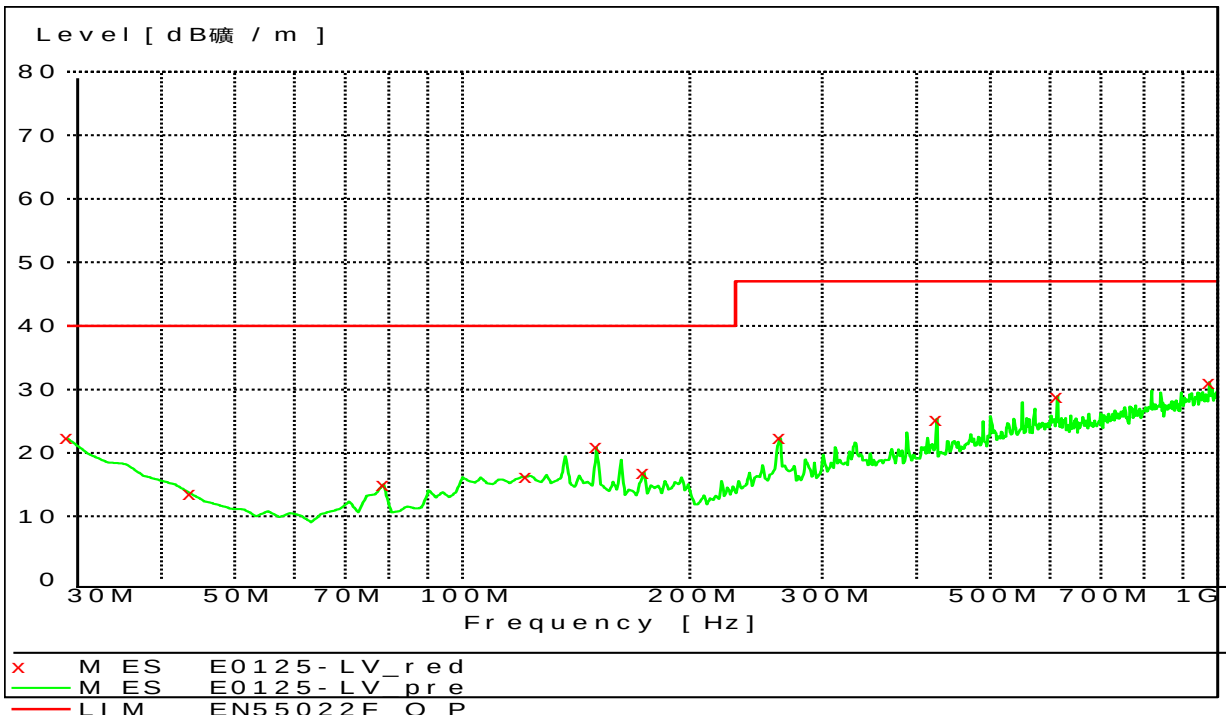
Temperature	:	25 °C
Relative Humidity	:	55 %

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Horizontal



Vertical



Test data (30MHz~1GHz, GFSK (DH5) Mode):

Horizontal

Frequency (MHz)	Measured level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
30.00	30.00	20.80	40.00	PK
150.52	150.52	20.10	40.00	PK
173.85	173.85	17.00	40.00	PK
424.61	488.76	24.80	47.00	PK
613.17	613.17	28.80	47.00	PK
Remark: If the margin higher than 10dB, it would be marked as *.				

Vertical

Frequency (MHz)	Measured level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
30.00	22.30	40.00	17.70	PK
150.52	20.90	40.00	19.10	PK
173.85	16.80	40.00	23.20	PK
424.61	25.30	47.00	21.70	PK
613.17	28.90	47.00	18.10	PK
30.00	22.30	40.00	17.70	PK
Remark: If the margin higher than 10dB, it would be marked as *.				

Test Data (>1GHz):

GFSK (DH5) Modulation:

H	**Antenna**	**Frequency (MHz)**	**Corrected Reading (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Detector**
L	H	2402.00	64.70	Fundamental	/	PK
	H	2399.98	35.10	74.00	38.90	PK
	H	7206.00	51.90	74.00	22.10	PK
	H	9608.00	41.80	74.00	40.60	PK
M	V	2442.00	62.30	Fundamental	/	PK
	V	4882.00	39.50	74.00	34.50	PK
H	H	2480.00	63.80	Fundamental	/	PK
	V	2483.50	38.20	74.00	35.80	PK
	V	4960.00	41.60	74.00	32.40	PK

π /4DQPSK (2DH5) Modulation:

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.00	63.30	Fundamental	/	PK
	H	2390.96	46.10	74.00	27.90	PK
	H	4804.00	36.50	74.00	37.50	PK
M	V	2442.00	61.30	Fundamental	/	PK
	V	4882.00	39.60	74.00	34.40	PK
H	H	2480.00	61.50	Fundamental	/	PK
	V	2483.50	39.10	74.00	34.90	PK
	V	4960.00	40.90	74.00	33.10	PK

8DPSK (3DH5) Modulation:

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2402.00	62.50	Fundamental	/	PK
	H	2391.90	47.10	74.00	26.90	PK
	H	4804.00	41.20	74.00	33.80	PK
M	V	2442.00	63.70	Fundamental	/	PK
	V	4882.00	41.30	74.00	32.70	PK
H	H	2480.00	62.70	Fundamental	/	PK
	V	2483.50	39.50	74.00	34.50	PK
	V	4960.00	41.80	74.00	32.20	PK

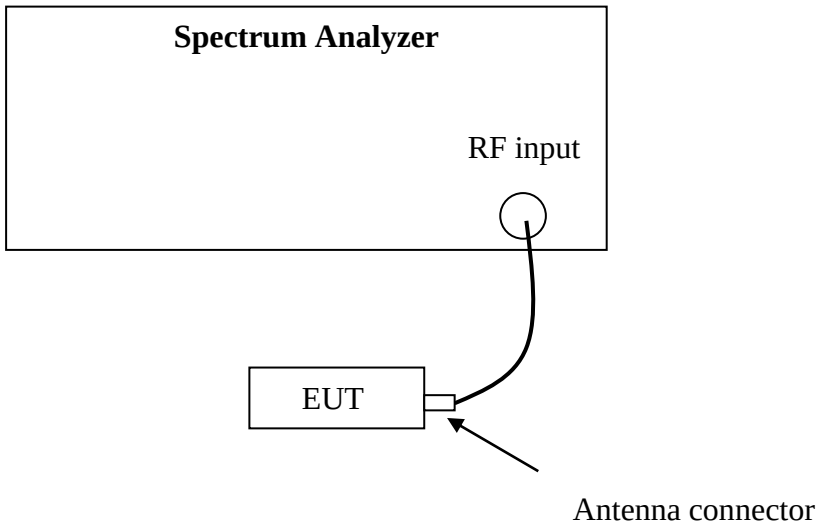
7 Conducted Spurious Emissions & Band Edge

Test result: Pass

7.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

7.2 Test Configuration



7.3 Test procedure and test setup

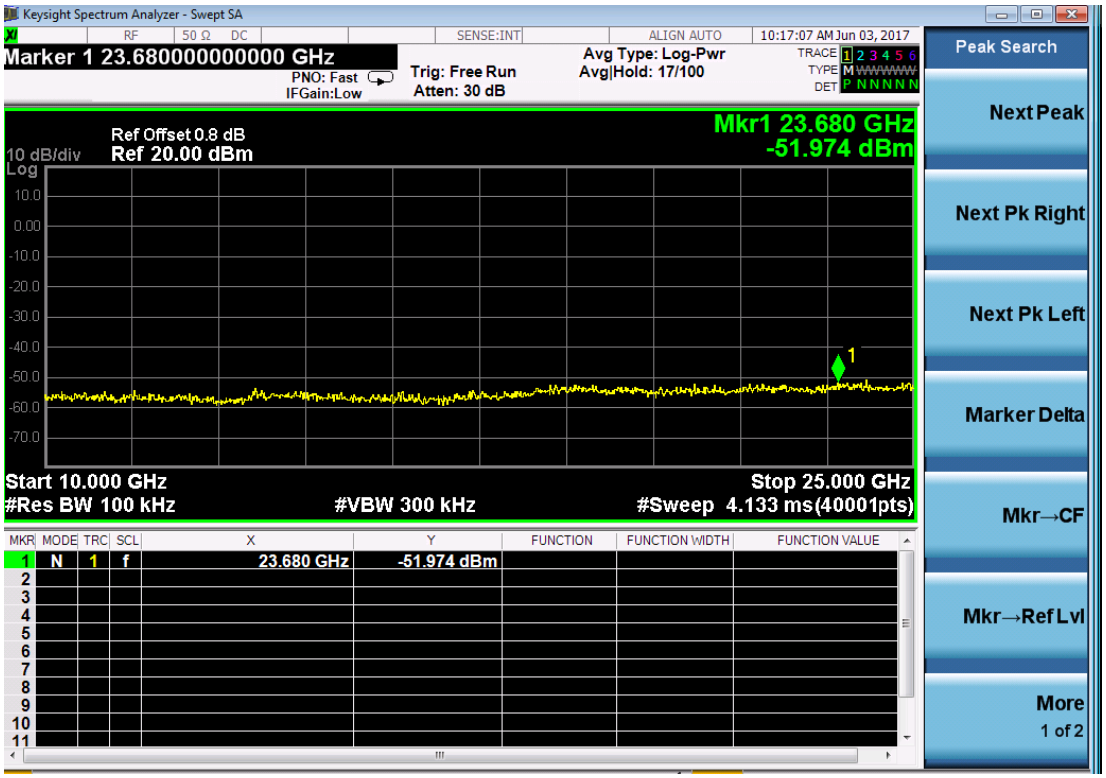
The Conducted Spurious Emissions per FCC § 15.247(d) is measured using the Spectrum Analyzer with Span wide enough capturing all spurious from the lowest emission frequency of the EUT up to 10th harmonics, RBW = 100kHz, VBW≥RBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at 2 channels (lowest and highest channel).
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems)

7.4 Test protocol

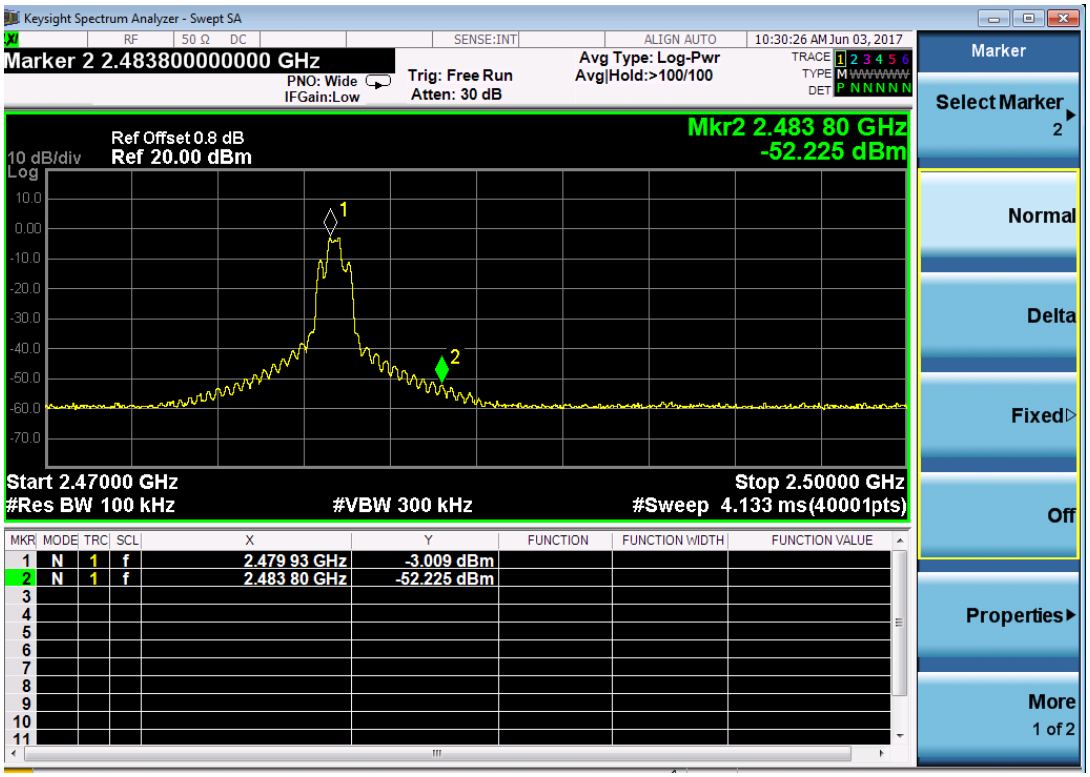
Temperature : 25 °C
Relative Humidity : 55 %

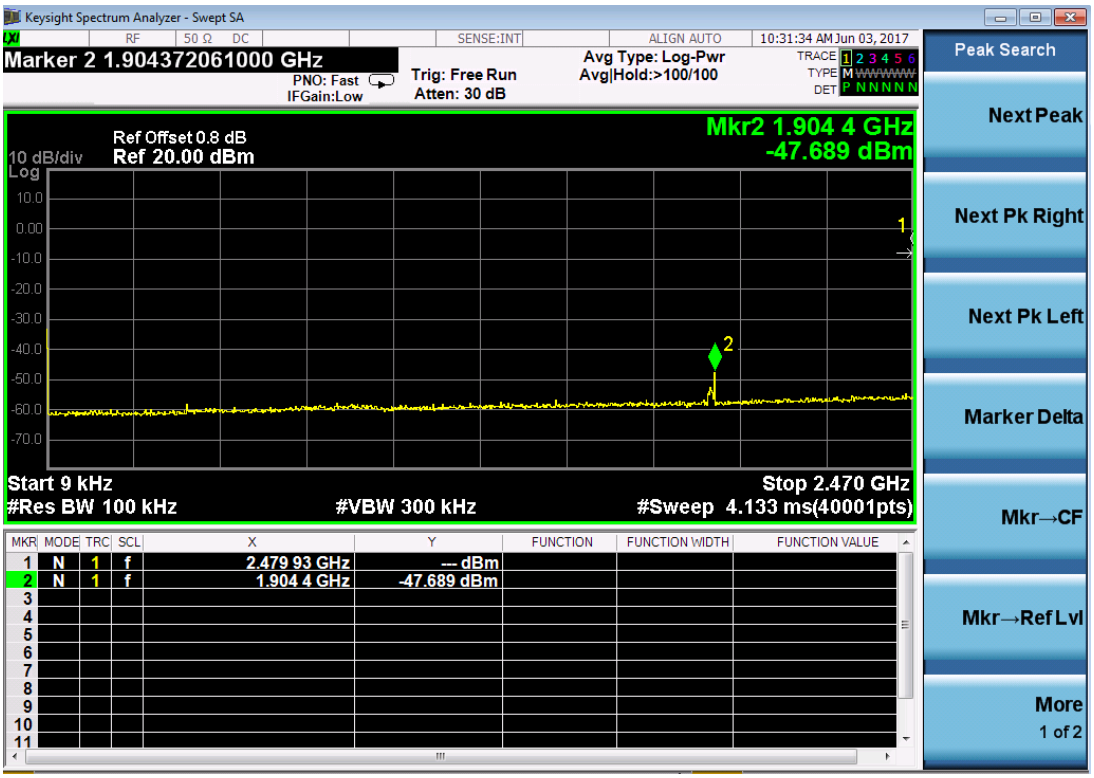
GFSK Channel- L


Keysight Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:INT
ALIGN AUTO
10:16:27 AM Jun 03, 2017
Marker 1 4.797425000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 4.797 GHz
-45.904 dBm
Start 2.405 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms(40001pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 4.797 GHz -45.904 dBm

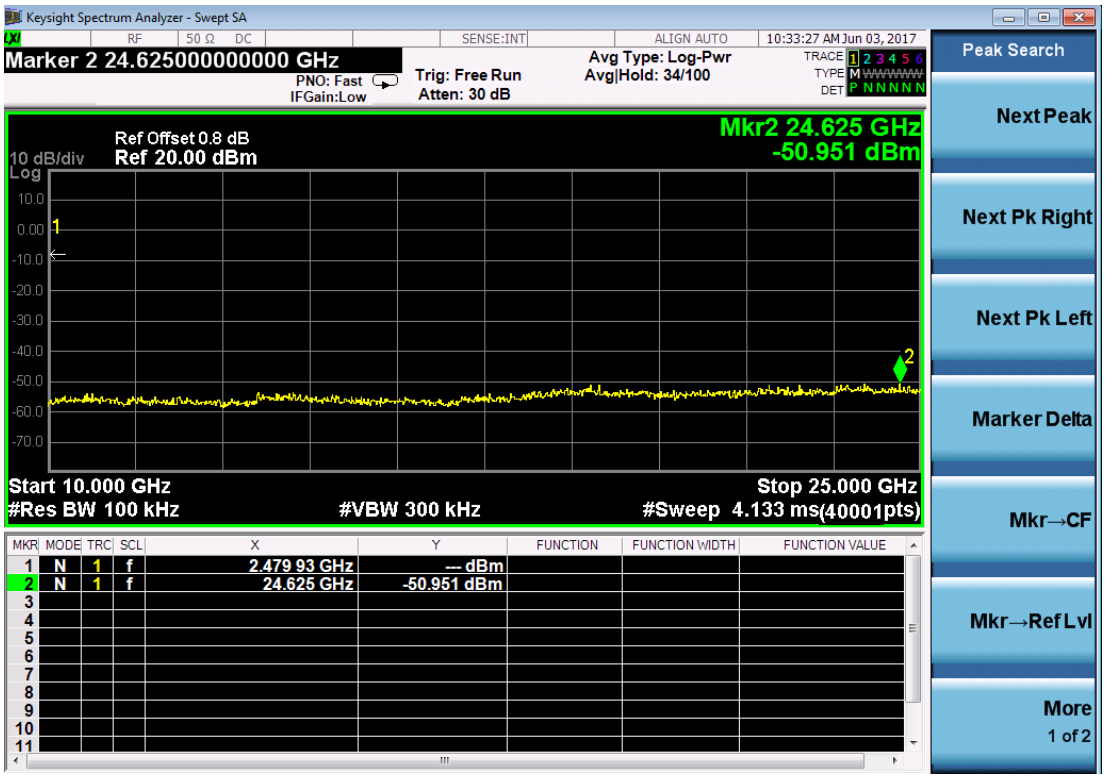

Keysight Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:INT
ALIGN AUTO
10:17:07 AM Jun 03, 2017
Marker 1 23.680000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 17/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 23.680 GHz
-51.974 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms(40001pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 23.680 GHz -51.974 dBm

GFSK Channel- H

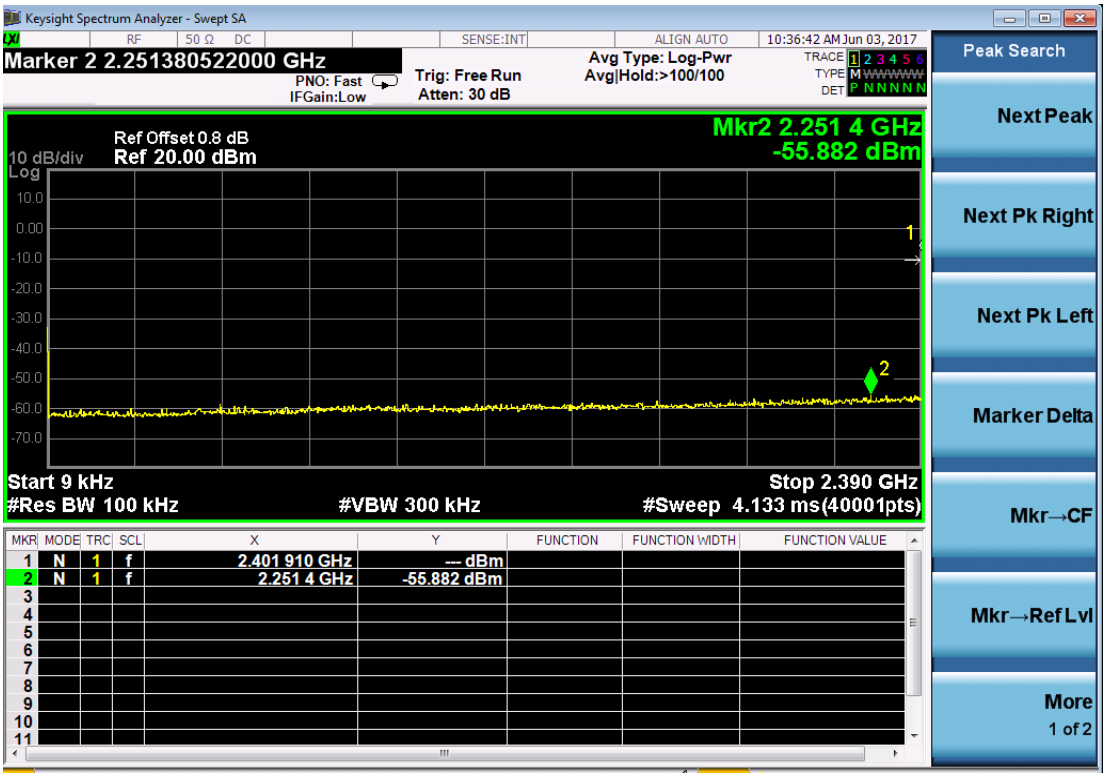


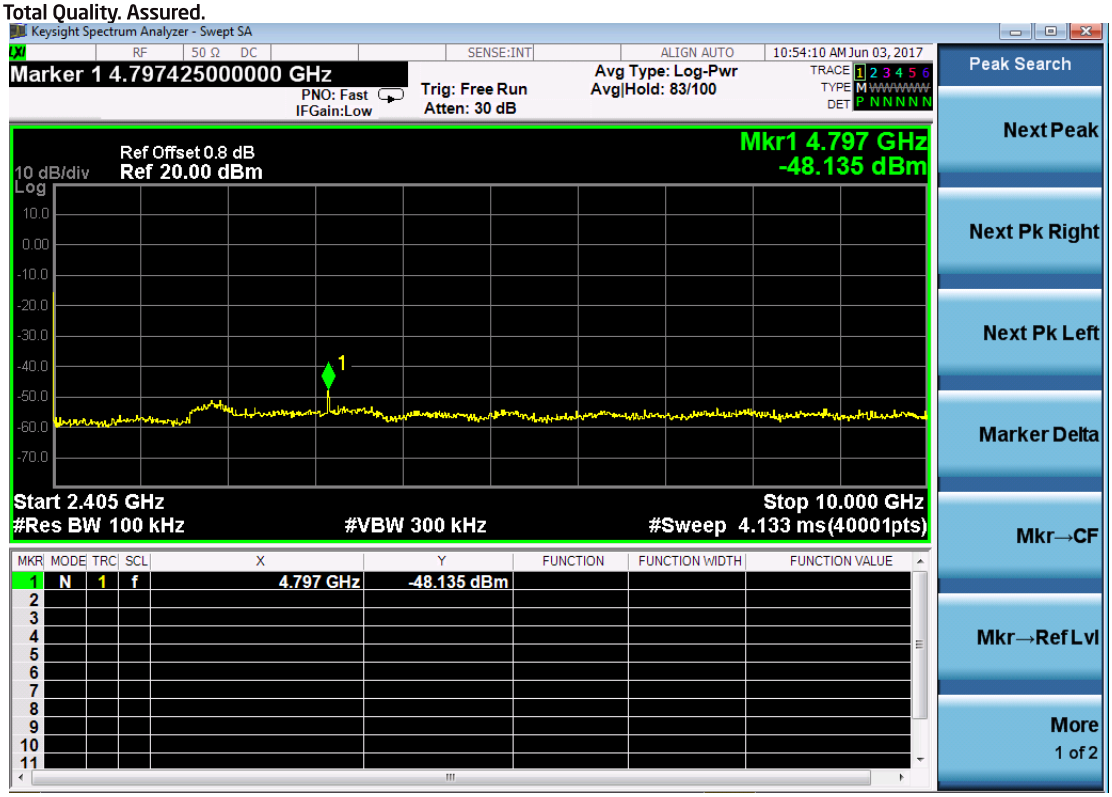


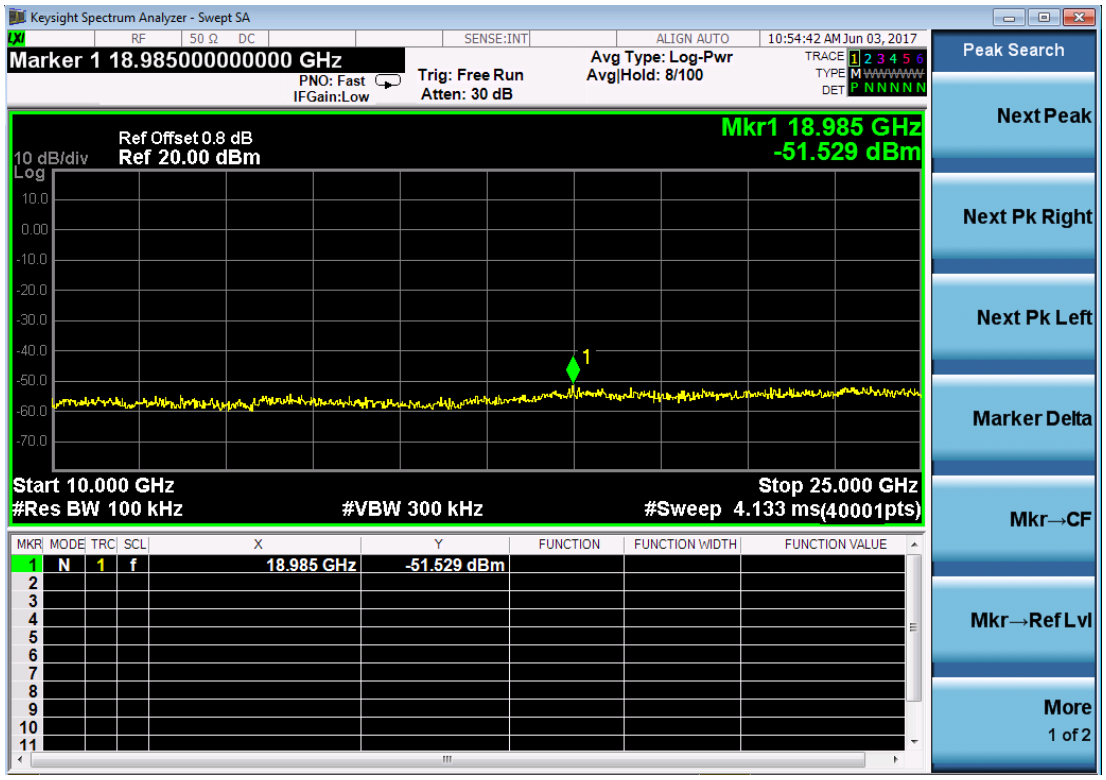

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
10:32:32 AM Jun 03, 2017
Marker 2 4.960000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 42/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 4.960 0 GHz
-47.424 dBm
Start 2.500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms(40001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.479 93 GHz --- dBm
2 N 1 f 4.960 0 GHz -47.424 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
10:33:27 AM Jun 03, 2017
Marker 2 24.625000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 34/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 24.625 GHz
-50.951 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms(40001pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.479 93 GHz --- dBm
2 N 1 f 24.625 GHz -50.951 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

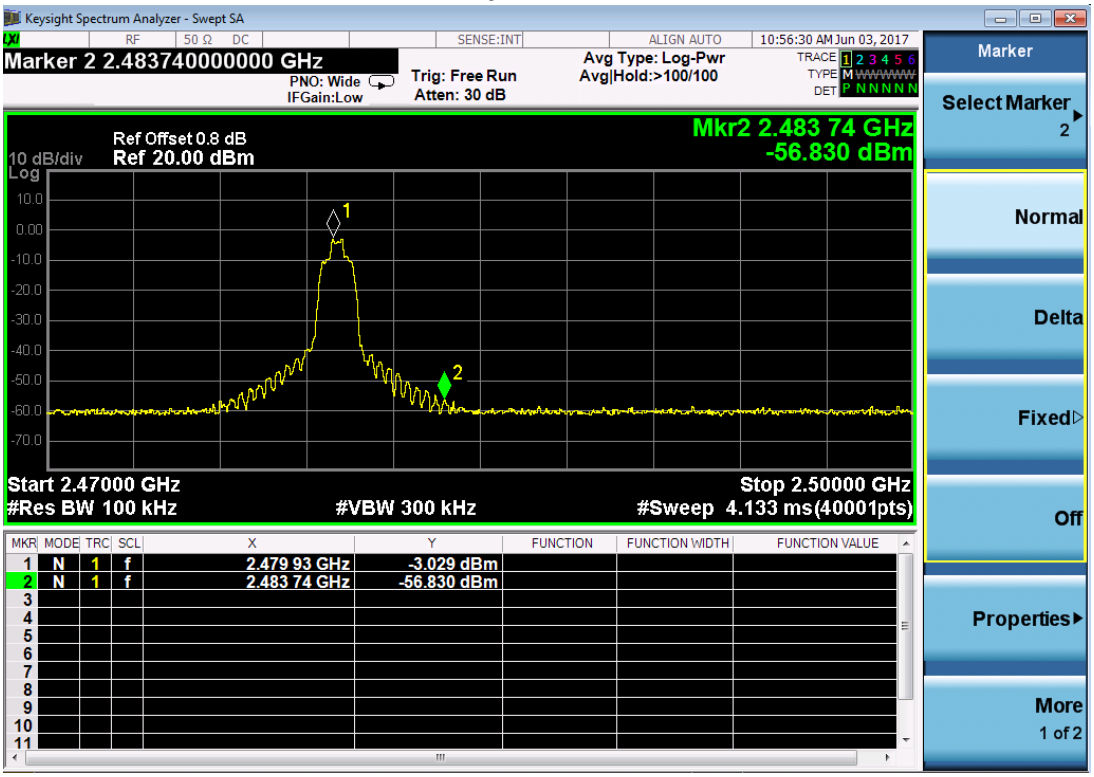
π /4 DQPSK Channel- L

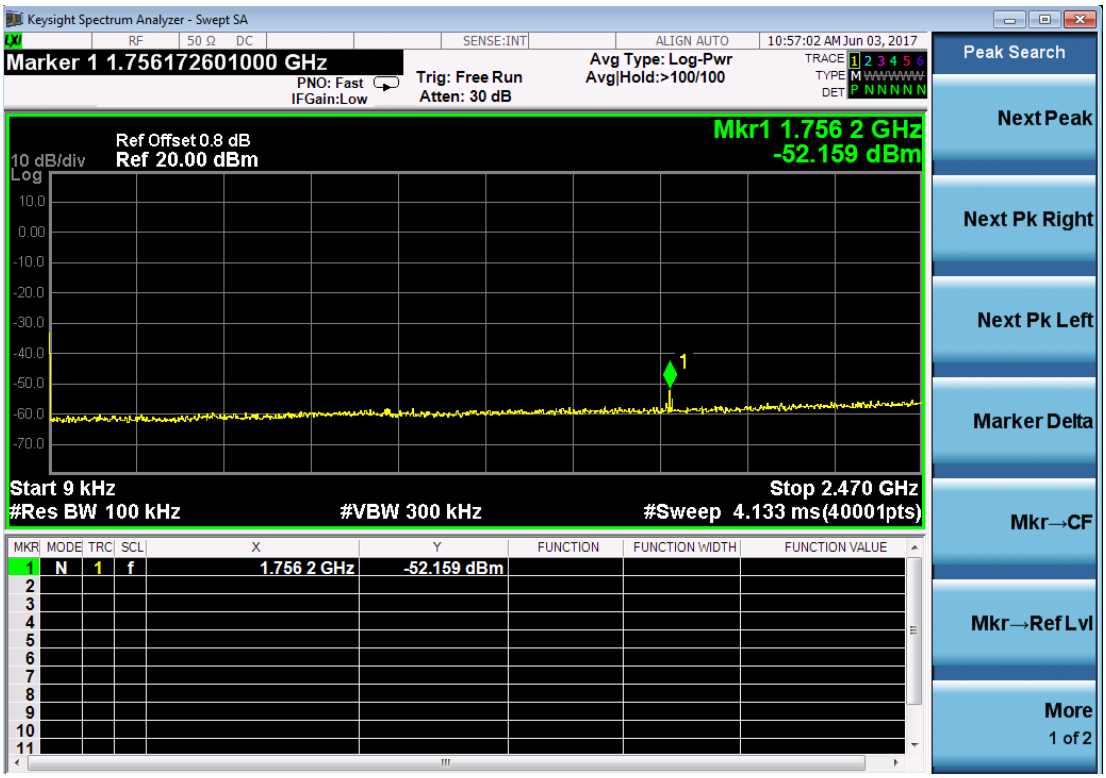


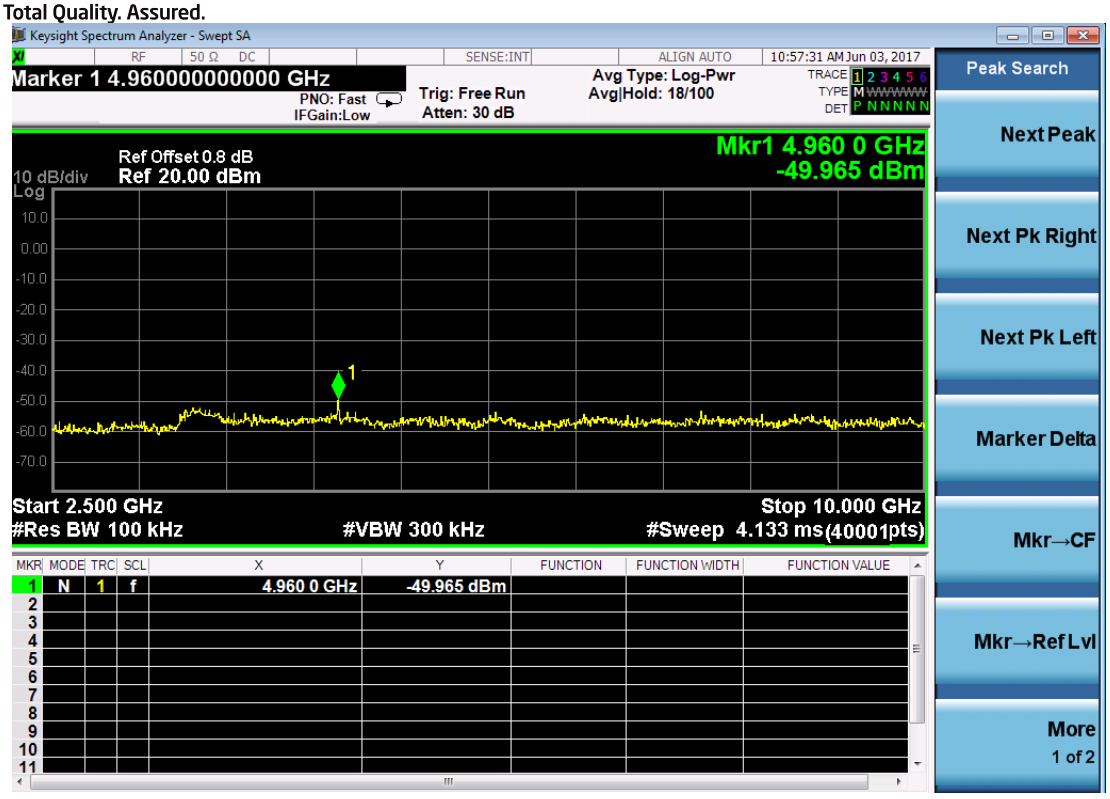

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
10:54:10 AM Jun 03, 2017
Marker 1 4.797425000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 83/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 4.797 GHz
-48.135 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.405 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms(40001pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 4.797 GHz -48.135 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

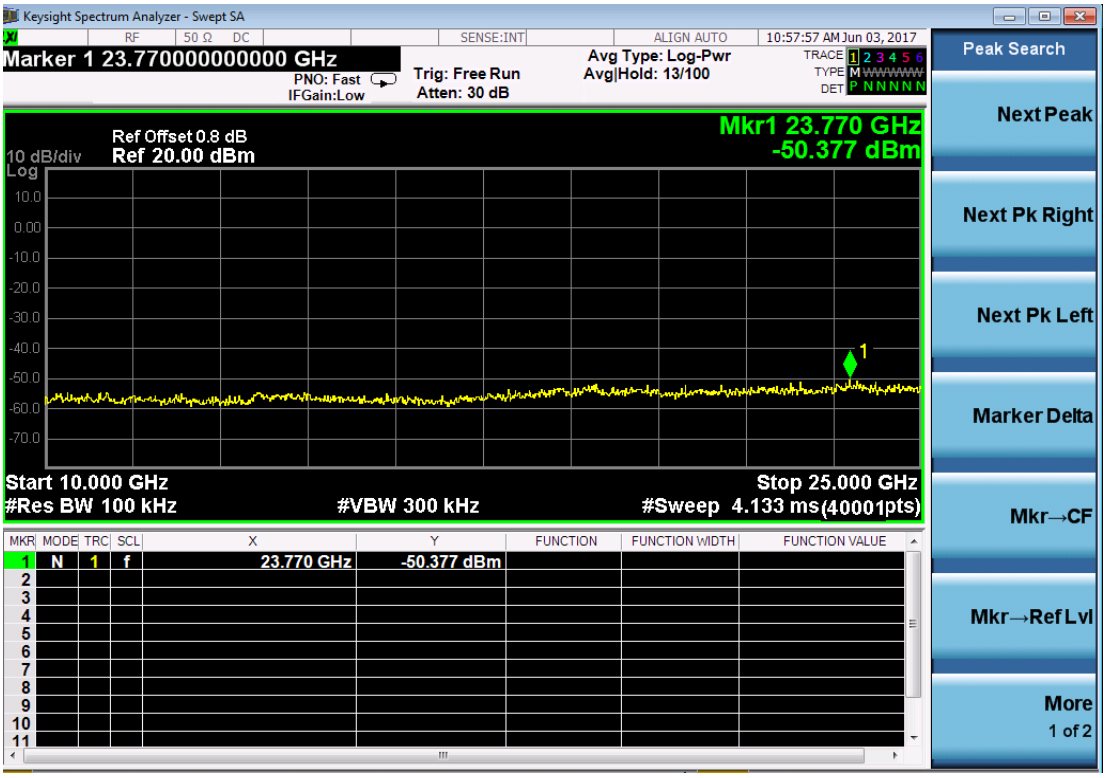

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
10:54:42 AM Jun 03, 2017
Marker 1 18.985000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 8/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 18.985 GHz
-51.529 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms(40001pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 18.985 GHz -51.529 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

π /4 DQPSK Channel- H

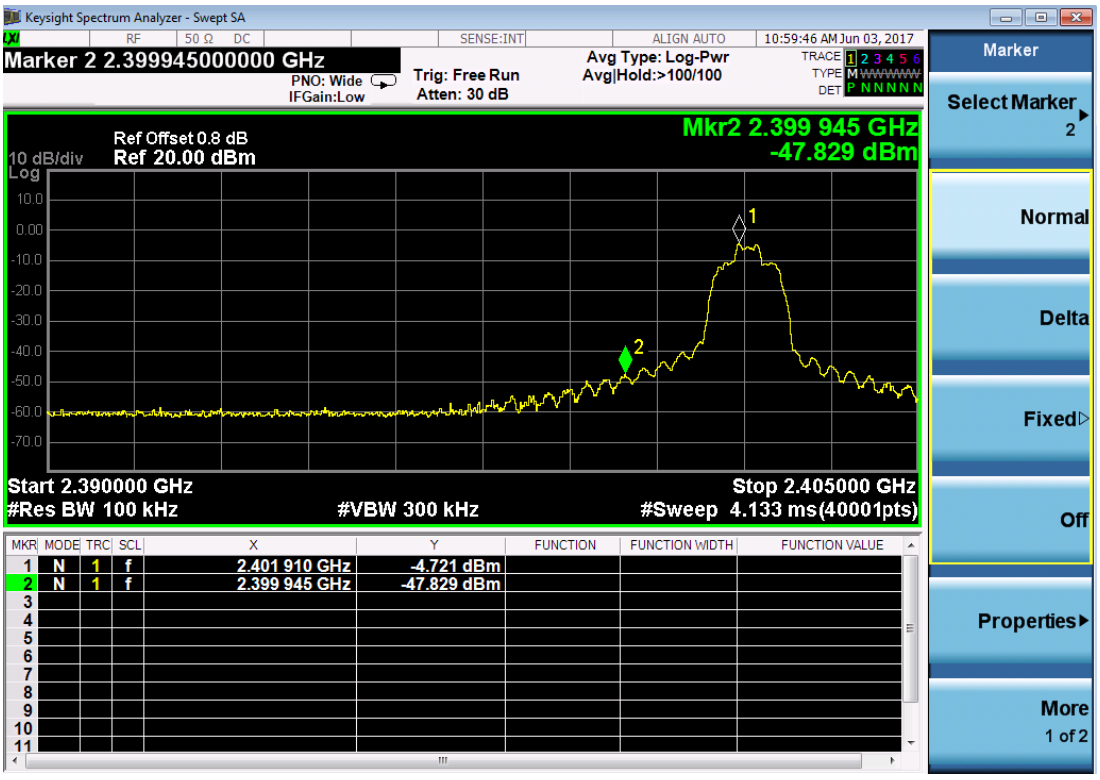


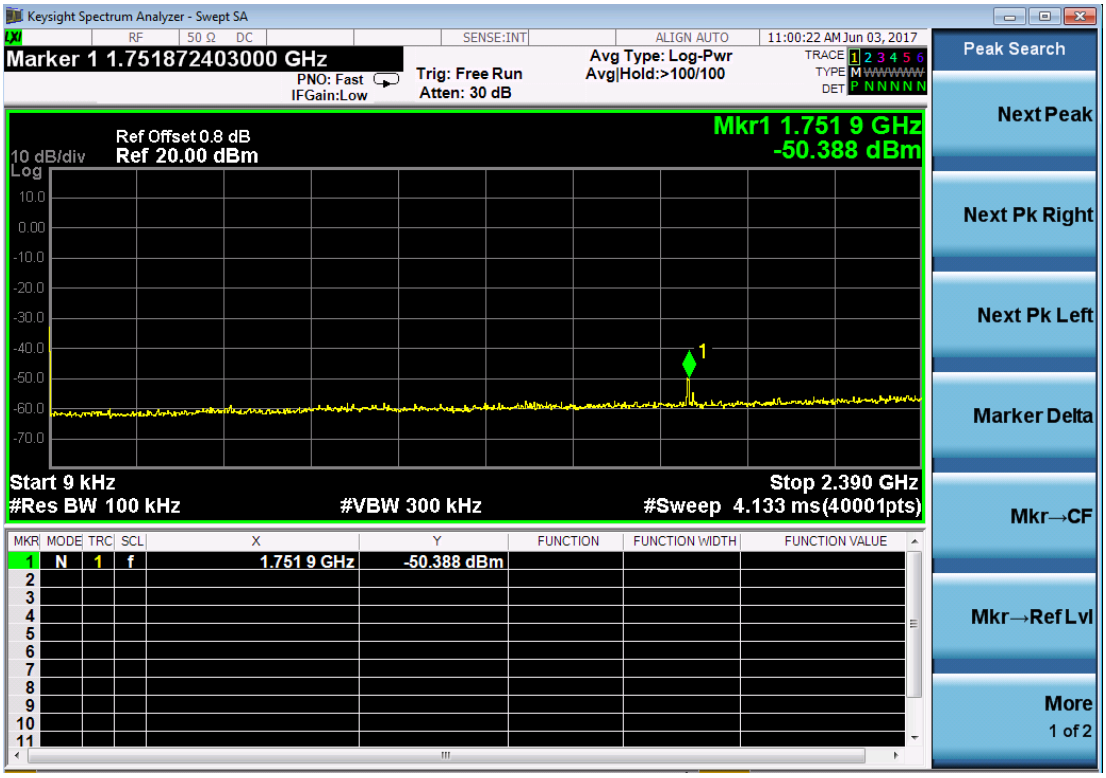


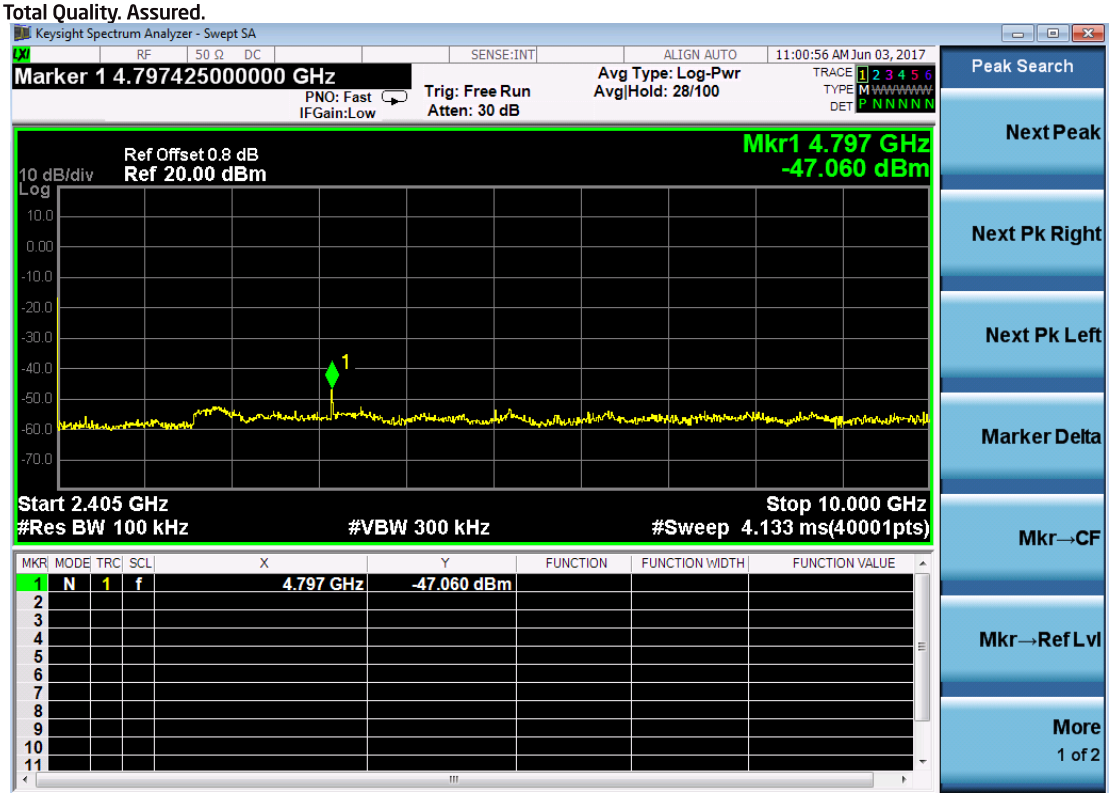

Keysight Spectrum Analyzer - Swept SA
Marker 1 4.960000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 18/100
10:57:31 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 4.960 0 GHz
-49.965 dBm
Start 2.500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms (40001 pts)
1 N 1 f 4.960 0 GHz -49.965 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

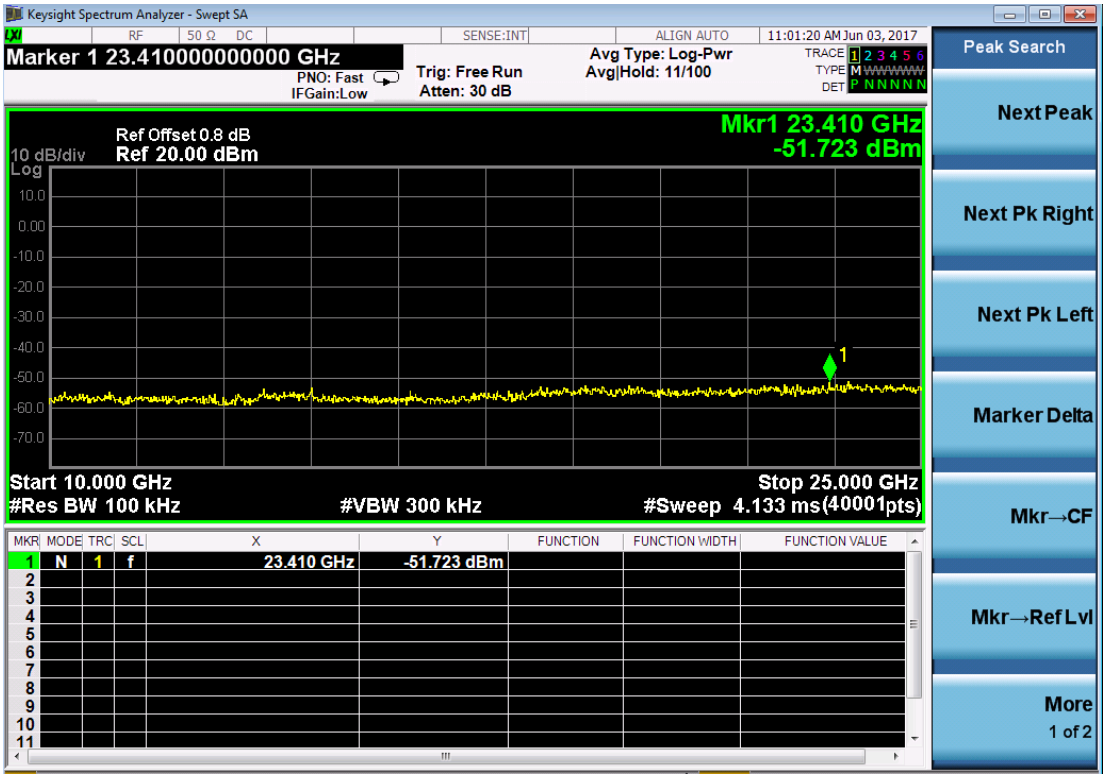

Keysight Spectrum Analyzer - Swept SA
Marker 1 23.770000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 13/100
10:57:57 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 23.770 GHz
-50.377 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms (40001 pts)
1 N 1 f 23.770 GHz -50.377 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

8DPSK Channel- L

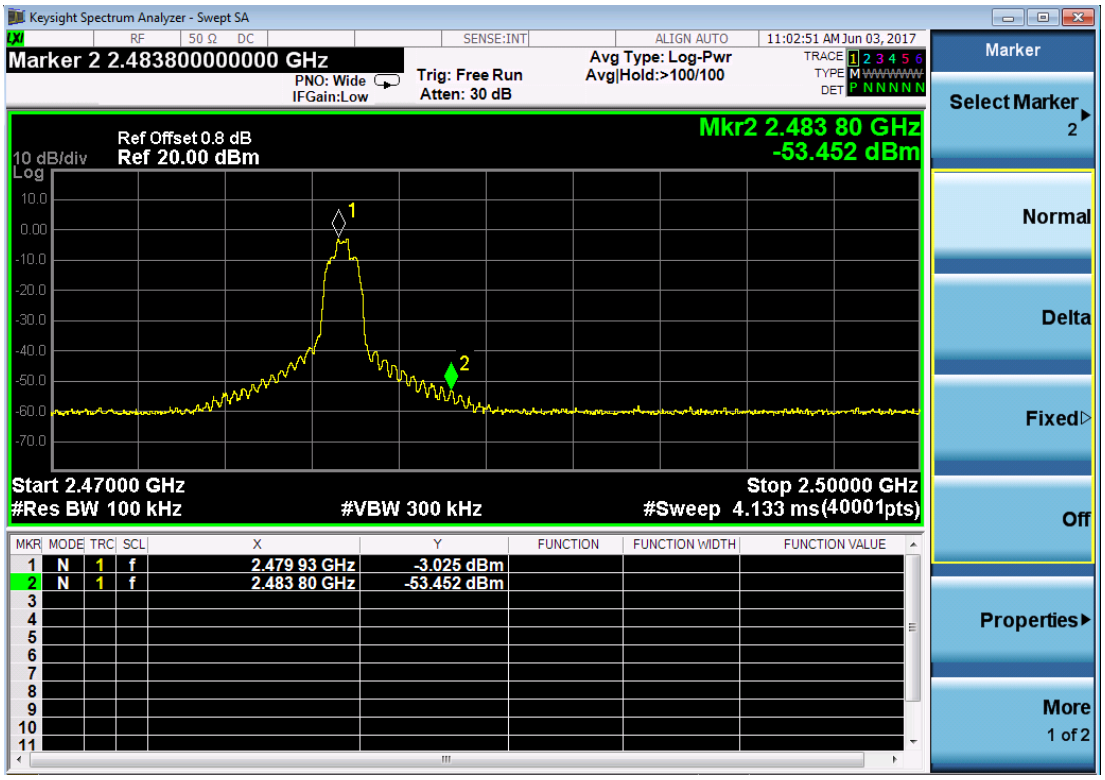


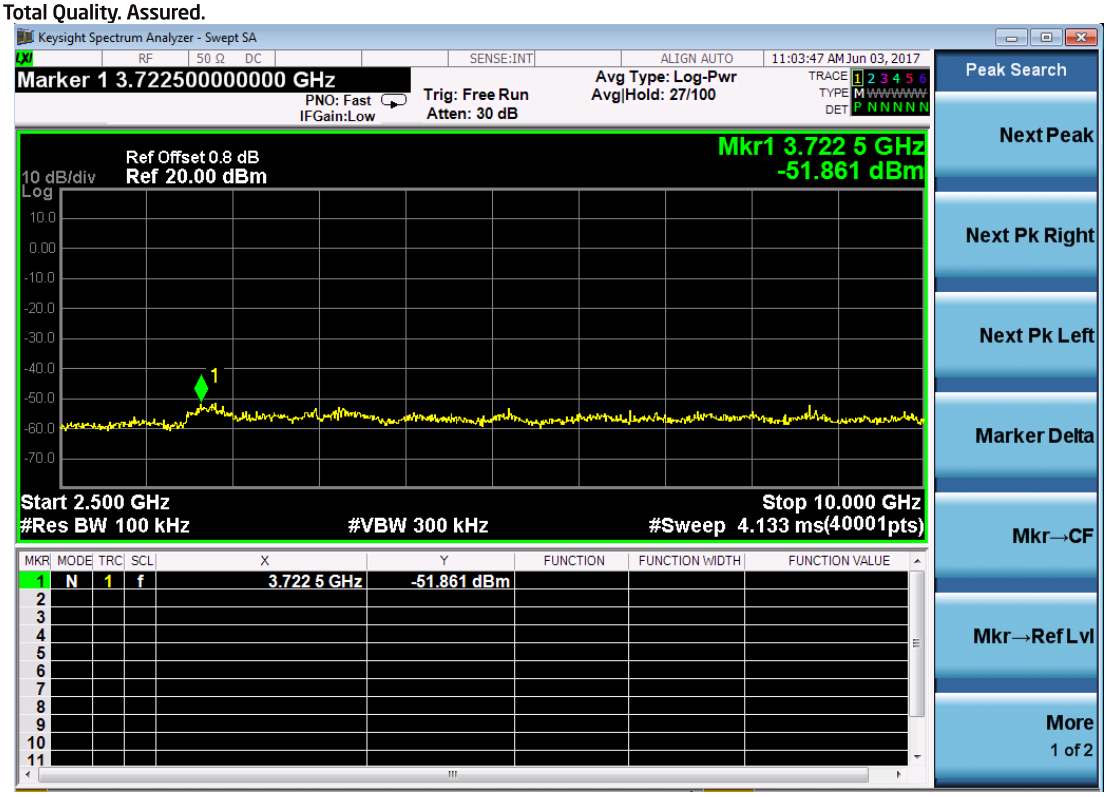


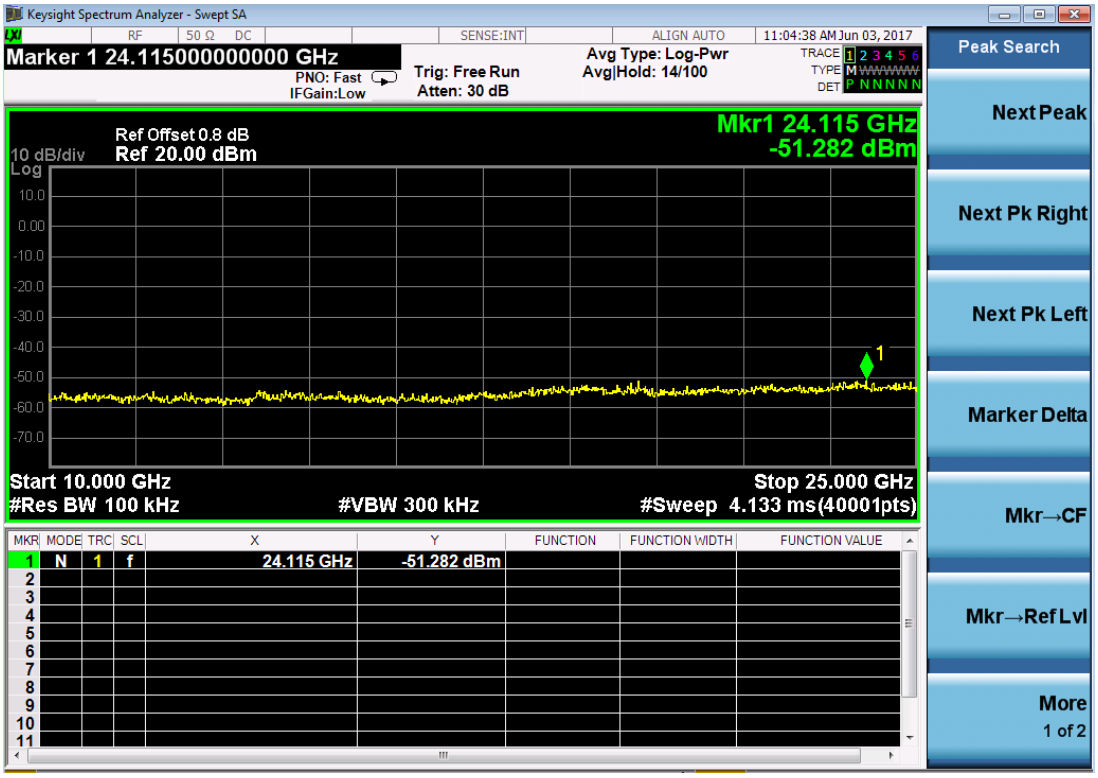

Keysight Spectrum Analyzer - Swept SA
Marker 1 4.797425000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 28/100
11:00:56 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Mkr1 4.797 GHz
-47.060 dBm
Start 2.405 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms(40001pts)
1 N 1 f 4.797 GHz -47.060 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Keysight Spectrum Analyzer - Swept SA
Marker 1 23.410000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 11/100
11:01:20 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Mkr1 23.410 GHz
-51.723 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms(40001pts)
1 N 1 f 23.410 GHz -51.723 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

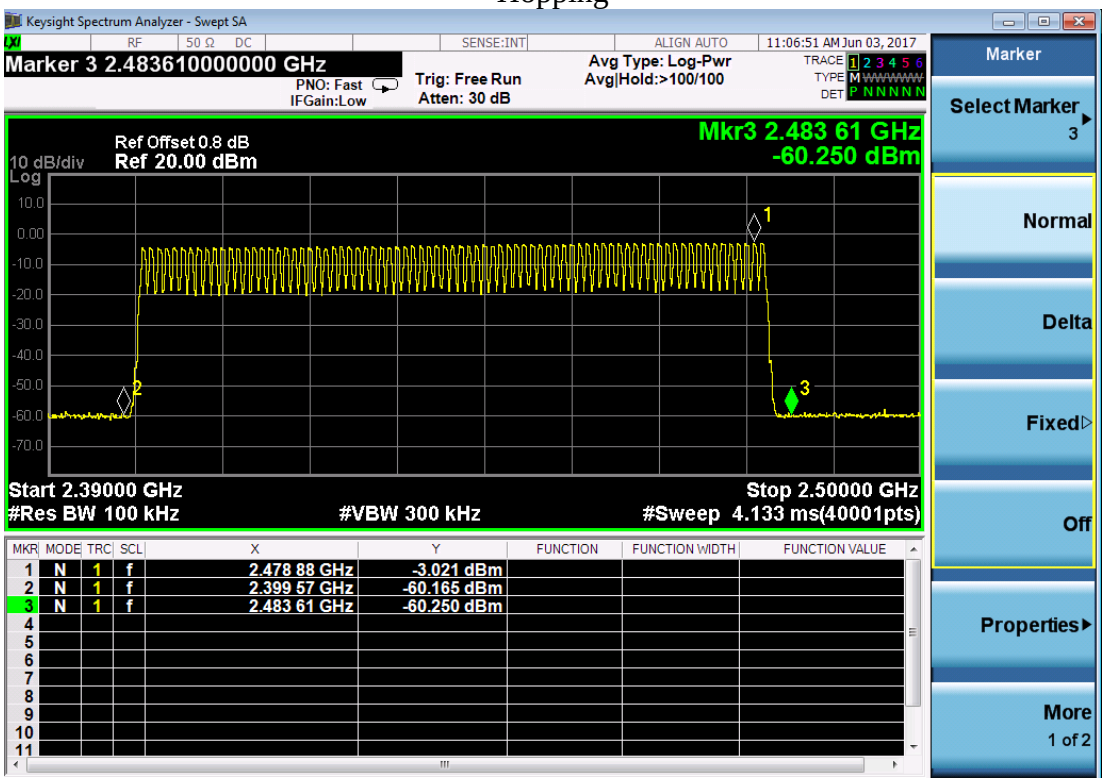
8DPSK Channel- H



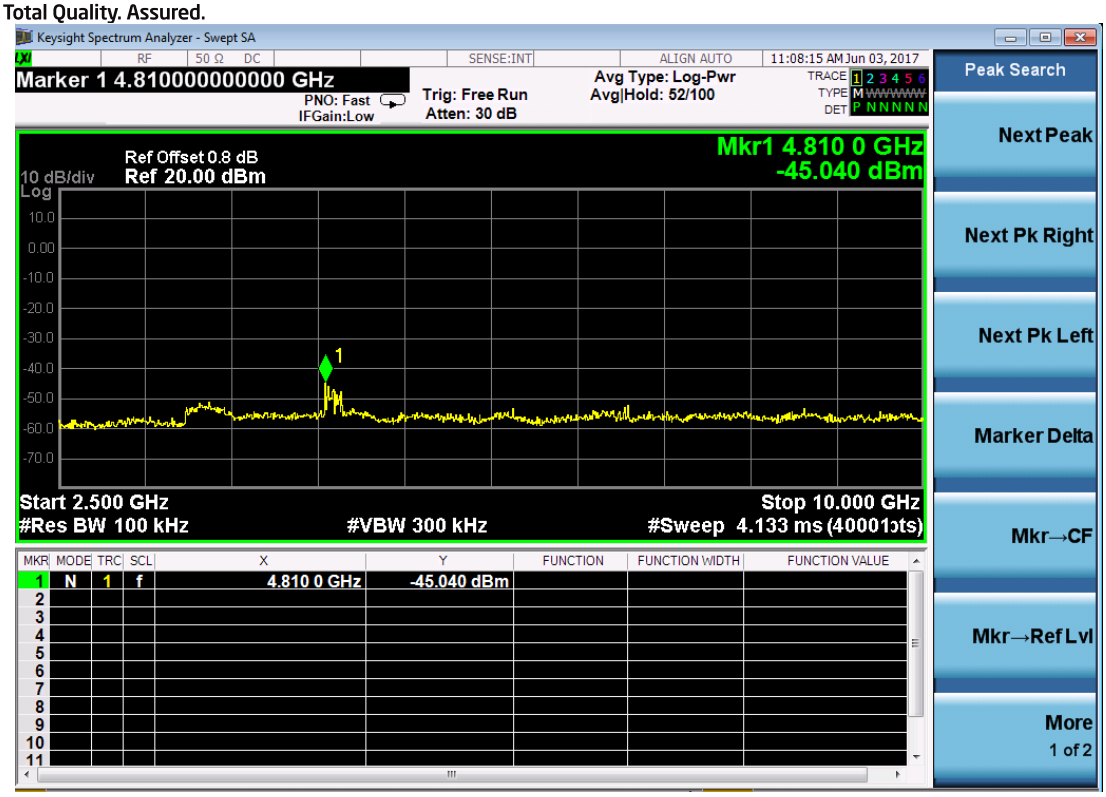

Keysight Spectrum Analyzer - Swept SA
Marker 1 3.722500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 27/100
11:03:47 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 3.722 5 GHz
-51.861 dBm
Start 2.500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms(40001pts)
1 N 1 f 3.722 5 GHz -51.861 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

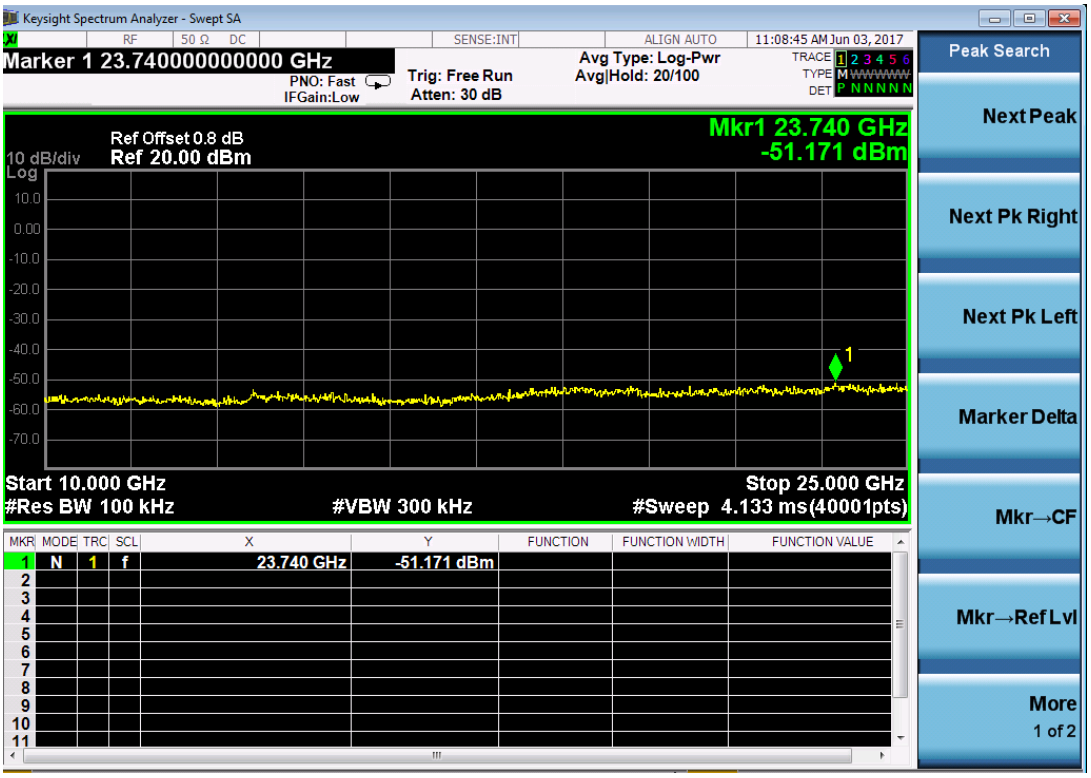

Keysight Spectrum Analyzer - Swept SA
Marker 1 24.115000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 14/100
11:04:38 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 24.115 GHz
-51.282 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms(40001pts)
1 N 1 f 24.115 GHz -51.282 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Hopping


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:06:51 AM Jun 03, 2017
Marker 3 2.483610000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr3 2.483 61 GHz
-60.250 dBm
Start 2.39000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
#Sweep 4.133 ms(40001pts)
1 N 1 f 2.478 88 GHz -3.021 dBm
2 N 1 f 2.399 57 GHz -60.165 dBm
3 N 1 f 2.483 61 GHz -60.250 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:07:41 AM Jun 03, 2017
Marker 1 2.339810189000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.339 8 GHz
-55.777 dBm
Start 9 kHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.390 GHz
#Sweep 4.133 ms(40001pts)
1 N 1 f 2.339 8 GHz -55.777 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More 1 of 2


Keysight Spectrum Analyzer - Swept SA
Marker 1 4.810000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 52/100
11:08:15 AM Jun 03, 2017
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 4.810 0 GHz
-45.040 dBm
Start 2.500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
#Sweep 4.133 ms (40001pts)
1 N 1 f 4.810 0 GHz -45.040 dBm


Keysight Spectrum Analyzer - Swept SA
Marker 1 23.740000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
11:08:45 AM Jun 03, 2017
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 23.740 GHz
-51.171 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
#Sweep 4.133 ms (40001pts)
1 N 1 f 23.740 GHz -51.171 dBm

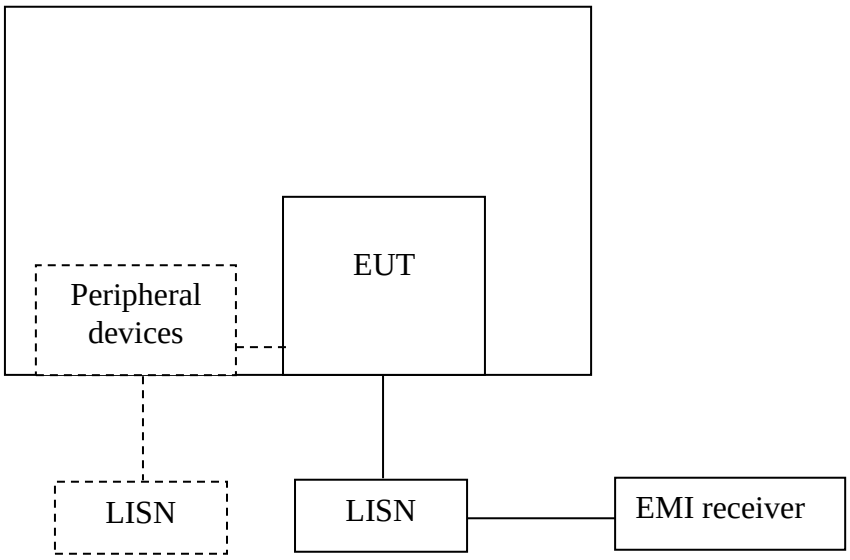
8 Power line conducted emission

Test result: **NA**

8.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

8.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.12m height rack.

8.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50Ω/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω/50uH coupling impedance with 50Ω termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.
The bandwidth of the test receiver is set at 9 kHz.
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems)

8.4 Test protocol

Temperature	:	°C
Relative Humidity	:	%

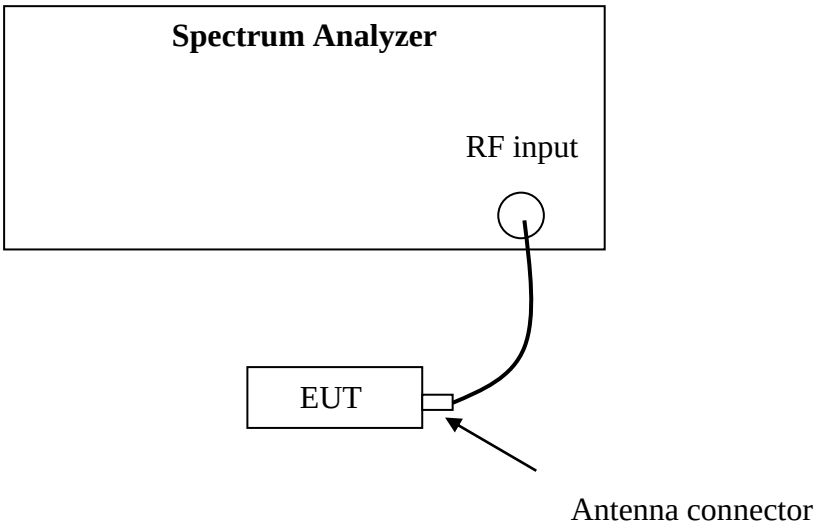
9 Number of Hopping Frequencies

Test result: **Pass**

9.1 Limit

Number of Hopping Frequencies in the 2400-2483.5 MHz band shall use at least 15 channels.

9.2 Test Configuration



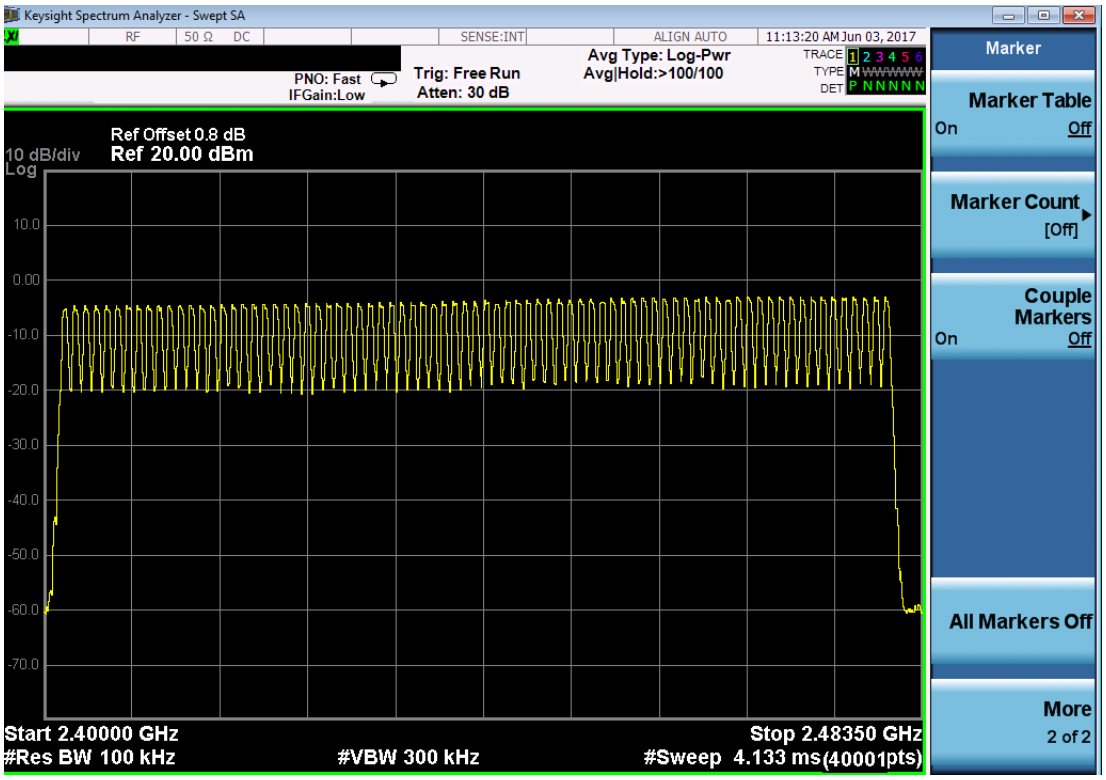
9.3 Test procedure and test setup

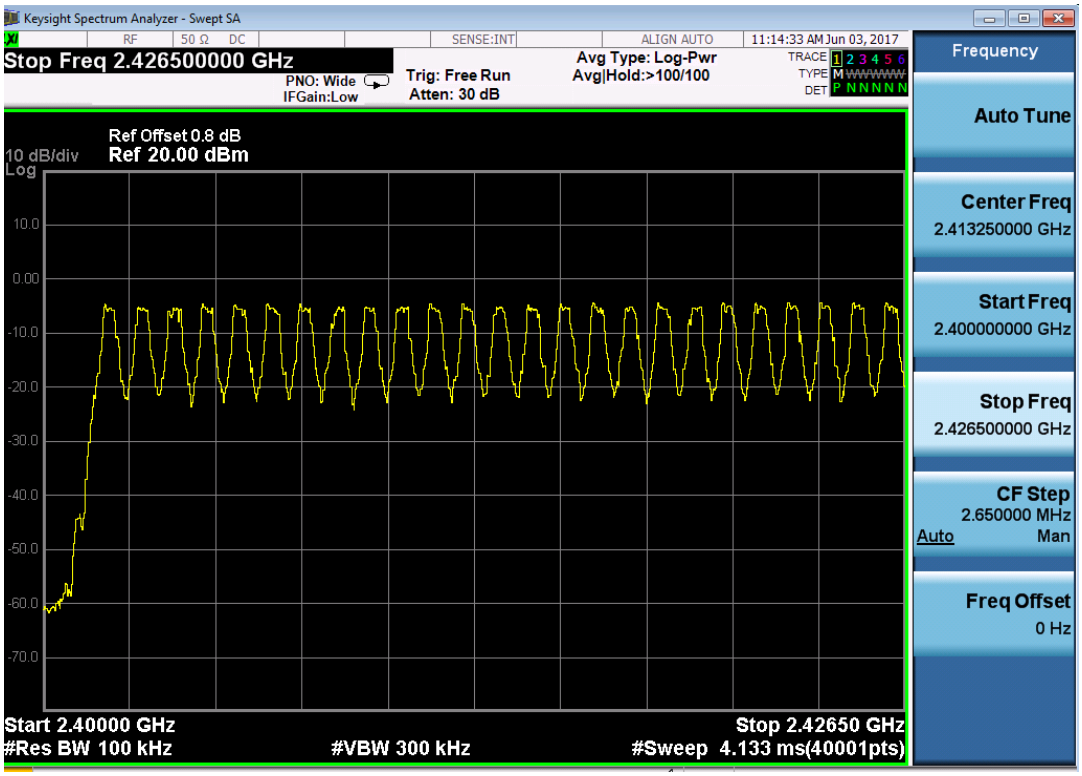
The channel number per FCC §15.247(a)(1)(iii) is measured using the Spectrum Analyzer with RBW=100kHz, VBW≥RBW, Sweep = auto, Detector = peak, Trace = max hold.
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems).

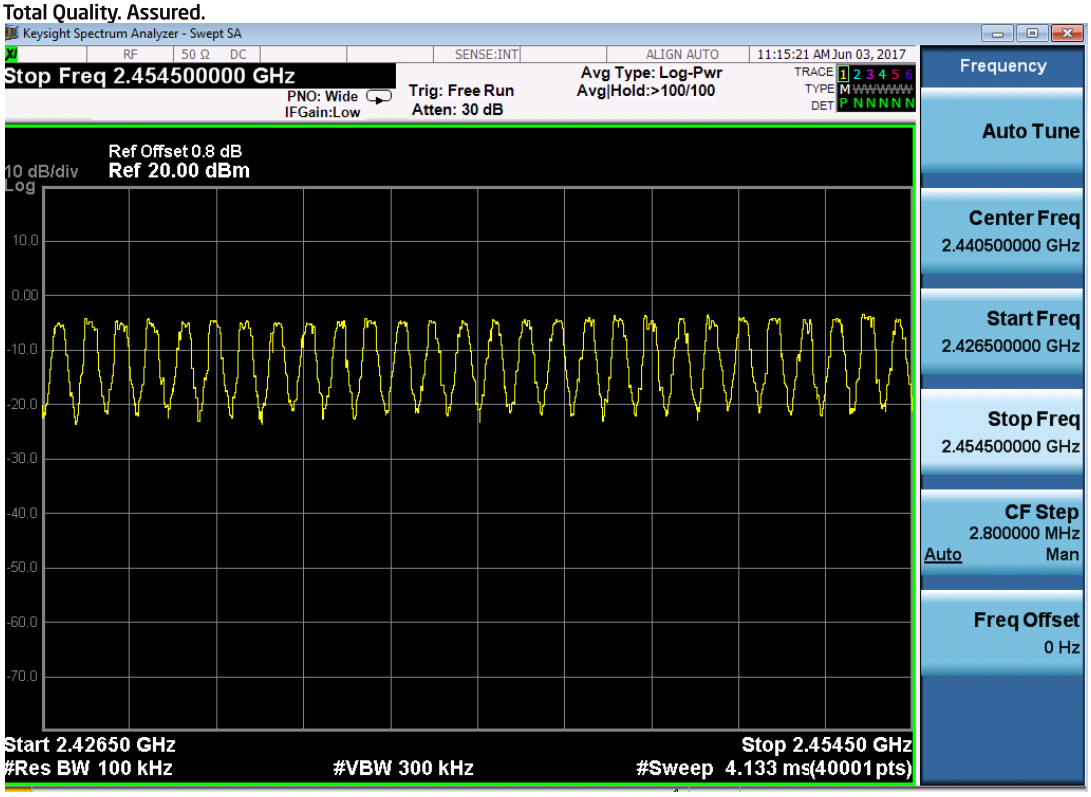
9.4 Test protocol

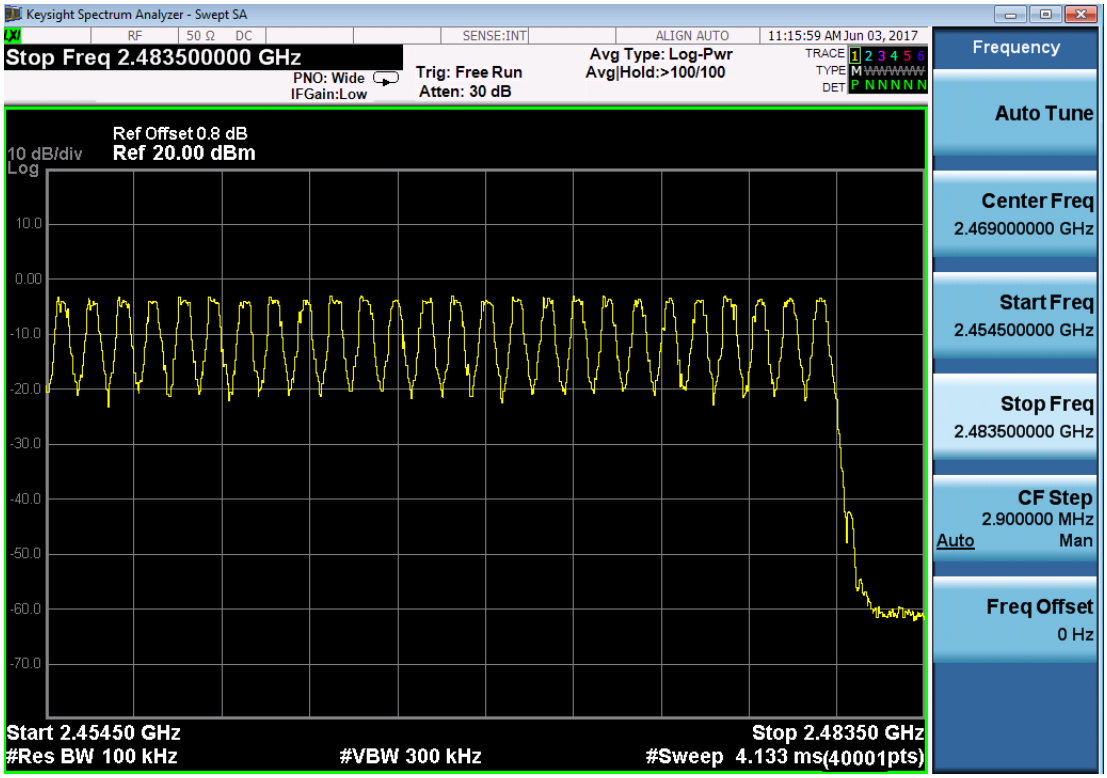
Temperature : 25 °C
Relative Humidity : 55 %

Channel Number	Limit
79	≥15


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:13:20 AM Jun 03, 2017
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
#Sweep 4.133 ms(40001pts)
Marker
Marker Table
On Off
Marker Count
[Off]
Couple Markers
On Off
All Markers Off
More
2 of 2


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:14:33 AM Jun 03, 2017
Stop Freq 2.426500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42650 GHz
#Sweep 4.133 ms(40001pts)
Frequency
Auto Tune
Center Freq
2.413250000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.426500000 GHz
CF Step
2.650000 MHz
Auto Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:15:21 AM Jun 03, 2017
Stop Freq 2.454500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.42650 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.45450 GHz
#Sweep 4.133 ms(40001 pts)
Frequency
Auto Tune
Center Freq
2.440500000 GHz
Start Freq
2.426500000 GHz
Stop Freq
2.454500000 GHz
CF Step
2.800000 MHz
Auto
Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:15:59 AM Jun 03, 2017
Stop Freq 2.483500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.45450 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
#Sweep 4.133 ms(40001pts)
Frequency
Auto Tune
Center Freq
2.469000000 GHz
Start Freq
2.454500000 GHz
Stop Freq
2.483500000 GHz
CF Step
2.900000 MHz
Auto
Man
Freq Offset
0 Hz

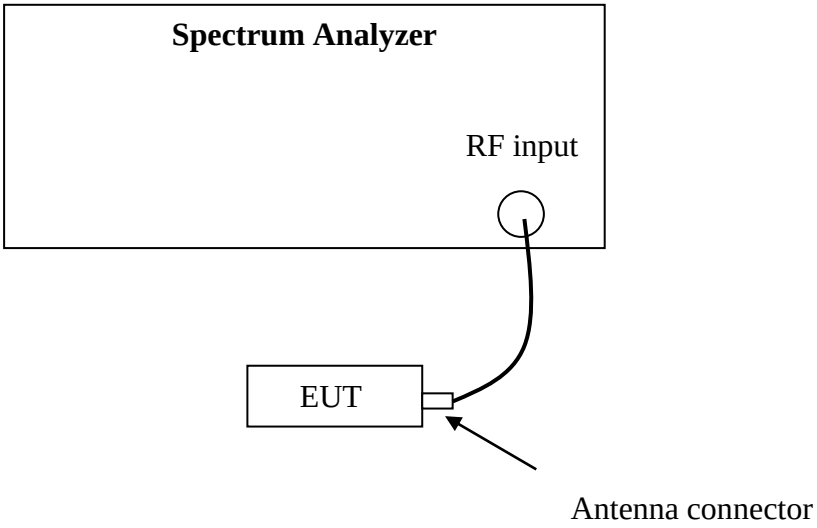
10 Dwell Time

Test result: **Pass**

10.1 Limit

The dwell time 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

10.2 Test Configuration



10.3 Test procedure and test setup

Dwell time per FCC § 15.247(a)(1)(iii) is measured using the Spectrum Analyzer with Span = 0, RBW=1MHz, VBW≥RBW, Sweep can capture the entire dwell time, Detector = peak, Trace = max hold.
The EUT was tested according to DA 00-705 (Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems).

10.4 Test protocol

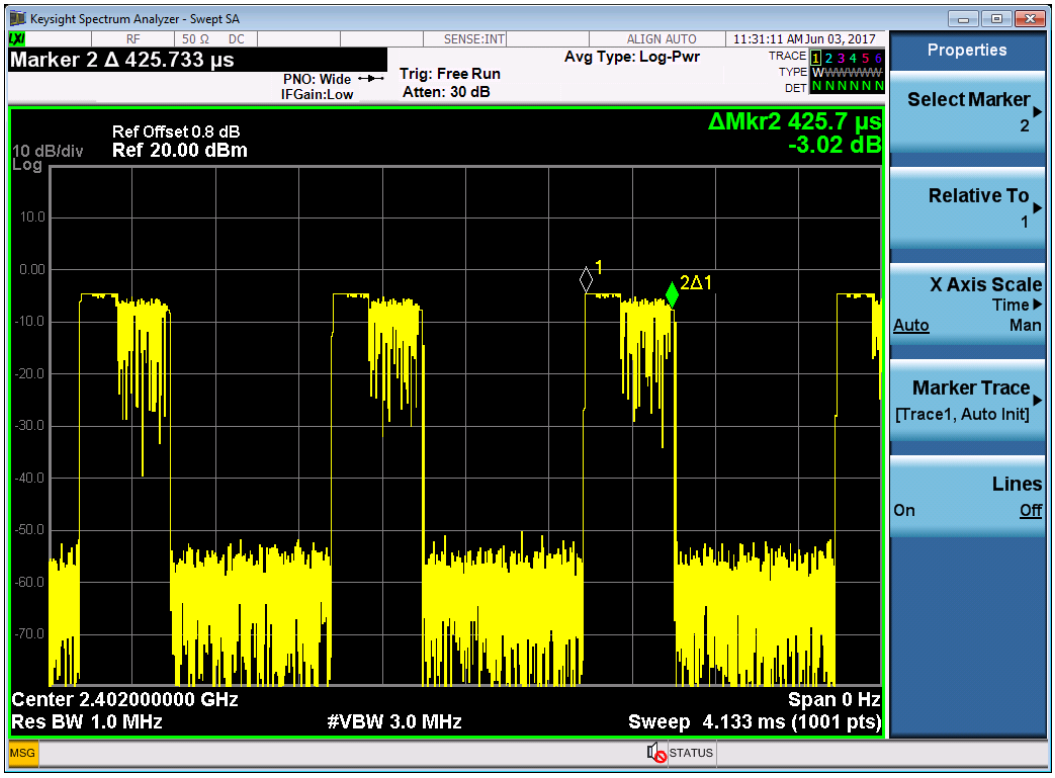
Temperature : 25 °C
Relative Humidity : 55 %

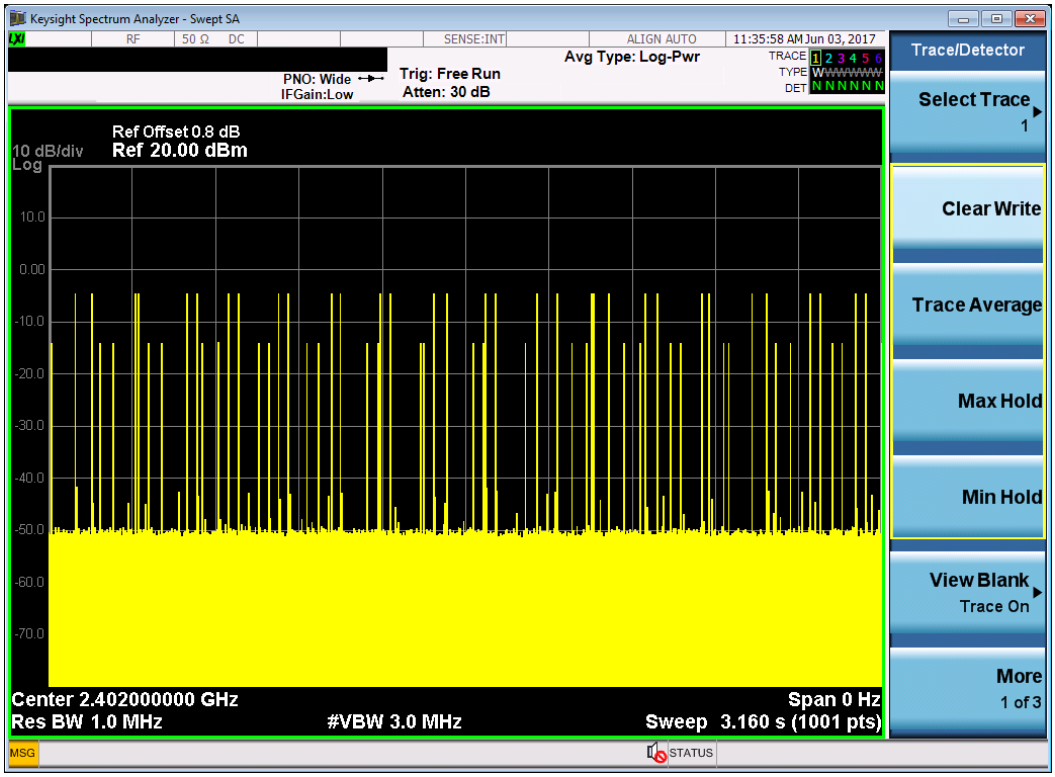
8DPSK Modulation:

Packet	Occupancy time for single hop (ms) **O**	CH	Real observed period (s) **P**	Hops among Observed period **I**	Dwell time (ms) **T**	Limit (s)
DH1	0.426	L	3.16	31	132.06	≤0.4
		M	3.16	31	132.06	
		H	3.16	31	132.06	
DH3	1.695	L	3.16	15	254.25	
		M	3.16	15	254.25	
		H	3.16	15	254.25	
DH5	2.948	L	3.16	11	324.48	
		M	3.16	11	324.48	
		H	3.16	11	324.48	

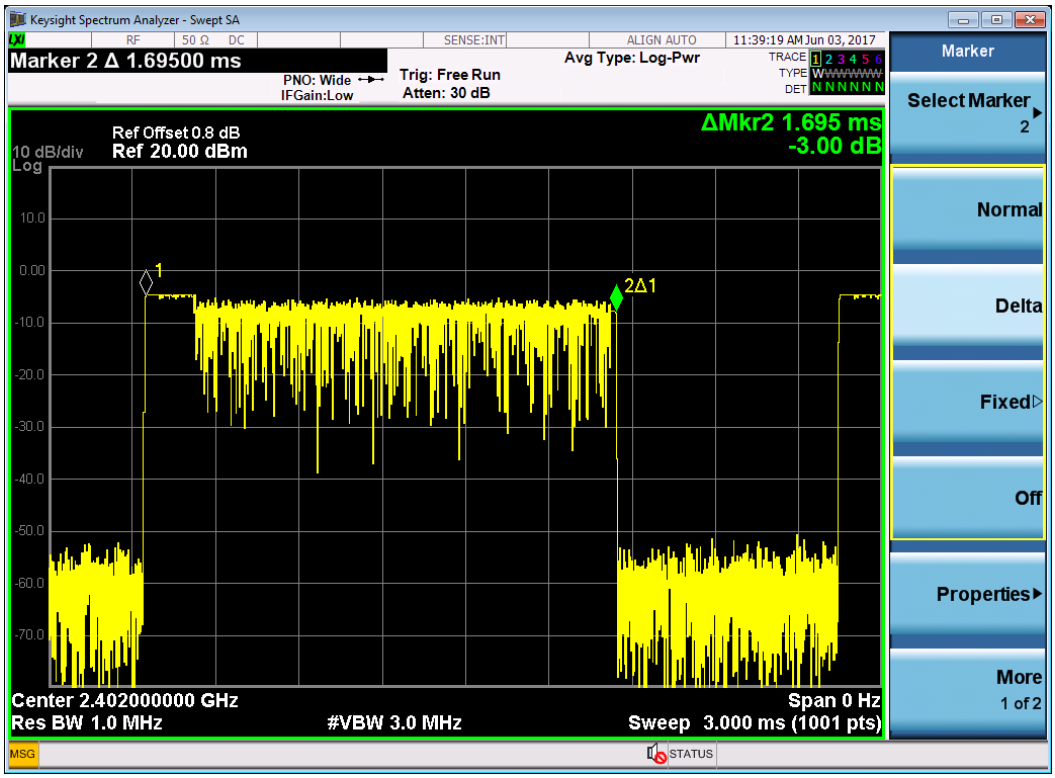
Remark: 1. There are 79 channels in all. So the complete observed period P = 0.4 * 79 = 31.6 s.
2. Average time of occupancy **T = O *I * 31.6 / P**

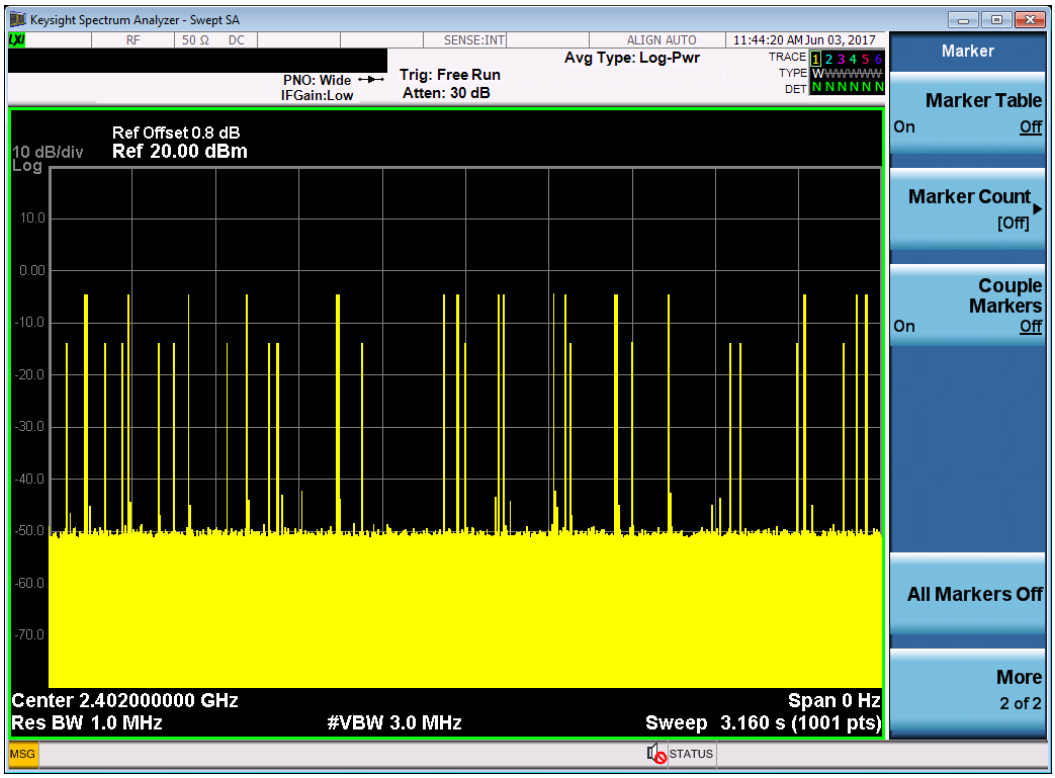
DH1


Keysight Spectrum Analyzer - Swept SA
Marker 2 Δ 425.733 µs
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
11:31:11 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr2 425.7 µs
-3.02 dB
Center 2.402000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 4.133 ms (1001 pts)
Properties
Select Marker
Relative To
X Axis Scale
Time
Auto
Man
Marker Trace
[Trace1, Auto Init]
Lines
On
Off


Keysight Spectrum Analyzer - Swept SA
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
11:35:58 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Center 2.402000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.160 s (1001 pts)
Trace/Detector
Select Trace
Clear Write
Trace Average
Max Hold
Min Hold
View Blank
Trace On
More
1 of 3

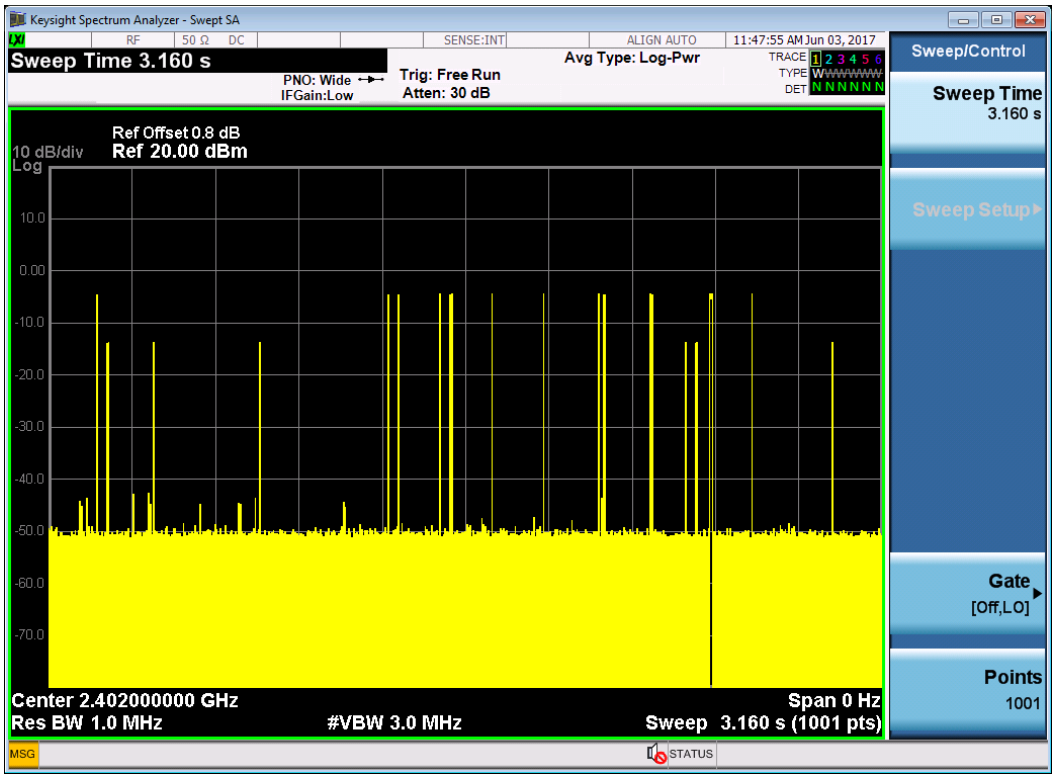
DH3


Keysight Spectrum Analyzer - Swept SA
Marker 2 Δ 1.69500 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
11:39:19 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr2 1.695 ms
-3.00 dB
Center 2.402000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.000 ms (1001 pts)
Marker
Select Marker
2
Normal
Delta
Fixed
Off
Properties
More
1 of 2


Keysight Spectrum Analyzer - Swept SA
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
11:44:20 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Center 2.402000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.160 s (1001 pts)
Marker
Marker Table
On Off
Marker Count
[Off]
Couple Markers
On Off
All Markers Off
More
2 of 2

DH5


Keysight Spectrum Analyzer - Swept SA
Marker 2 Δ 2.94800 ms
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
11:46:02 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr2 2.948 ms
-1.76 dB
Center 2.402000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 4.000 ms (1001 pts)
Marker
Select Marker 2
Normal
Delta
Fixed
Off
Properties
More 1 of 2
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Sweep Time 3.160 s
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
11:47:55 AM Jun 03, 2017
Ref Offset 0.8 dB
10 dB/div
Log
Ref 20.00 dBm
Center 2.402000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.160 s (1001 pts)
Sweep/Control
Sweep Time 3.160 s
Sweep Setup
Gate [Off,LO]
Points 1001
MSG
STATUS

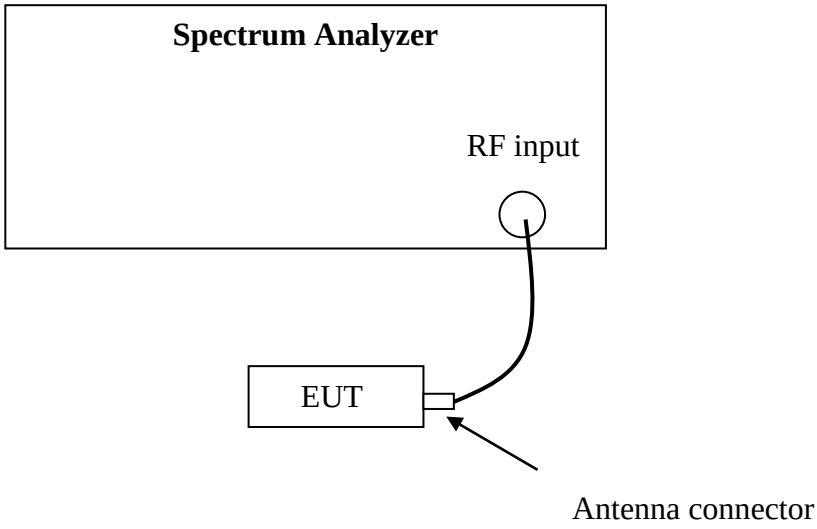
11 Occupied Bandwidth

Test result: Tested

11.1 Test limit

None

11.2 Test Configuration



11.3 Test procedure and test setup

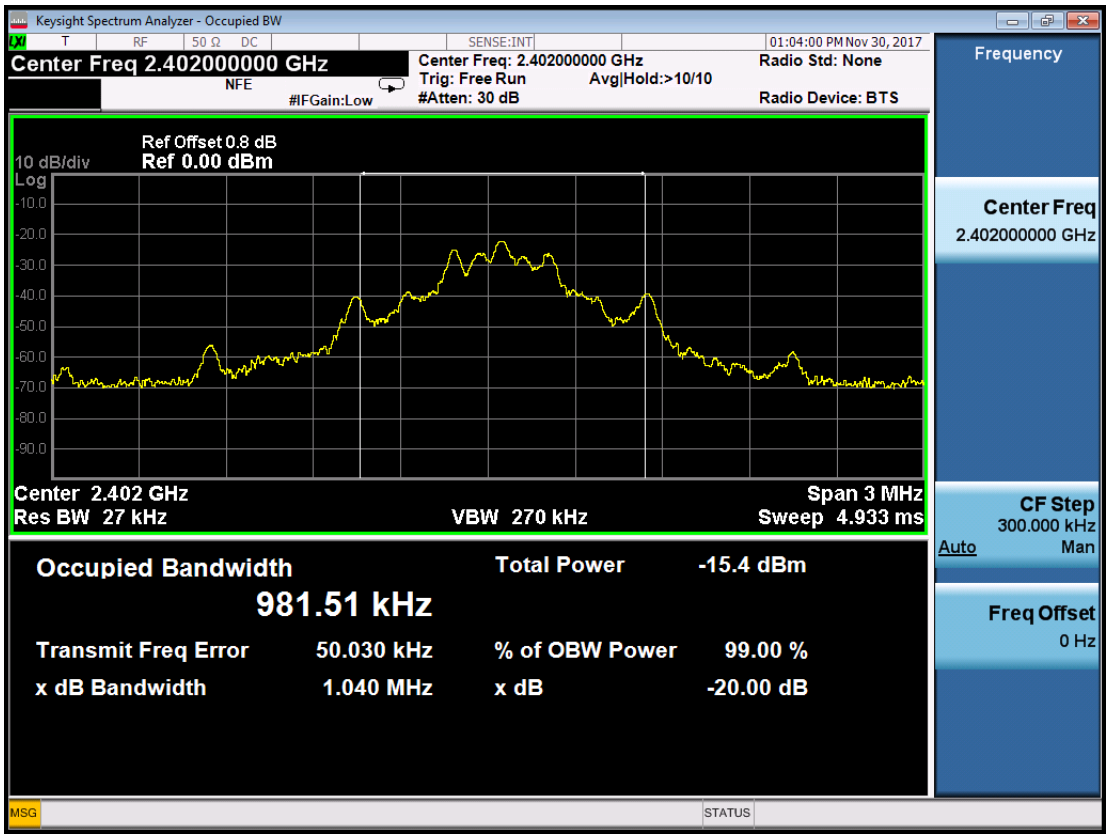
The occupied bandwidth per RSS-Gen Issue 4 Clause 6.6 was measured using the Spectrum Analyzer with the RBW in the range of 1% to 5% of the occupied bandwidth (OBW)
, VBW = 3 * RBW Detector = peak hold.

11.4 Test protocol

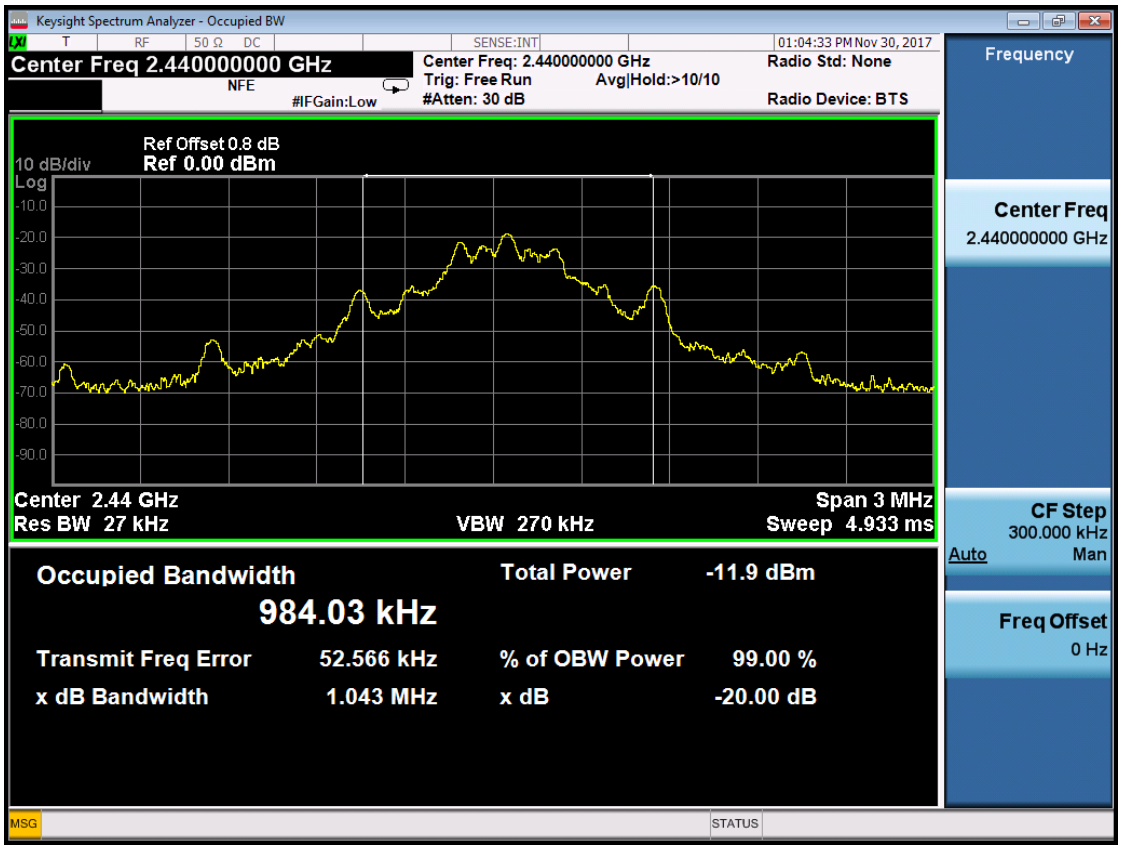
Temperature : 25 °C
Relative Humidity : 55 %

Modulation	Channel	99% Occupied Bandwidth (kHz)
GFSK	L	981.51
	M	984.03
	H	1000.2

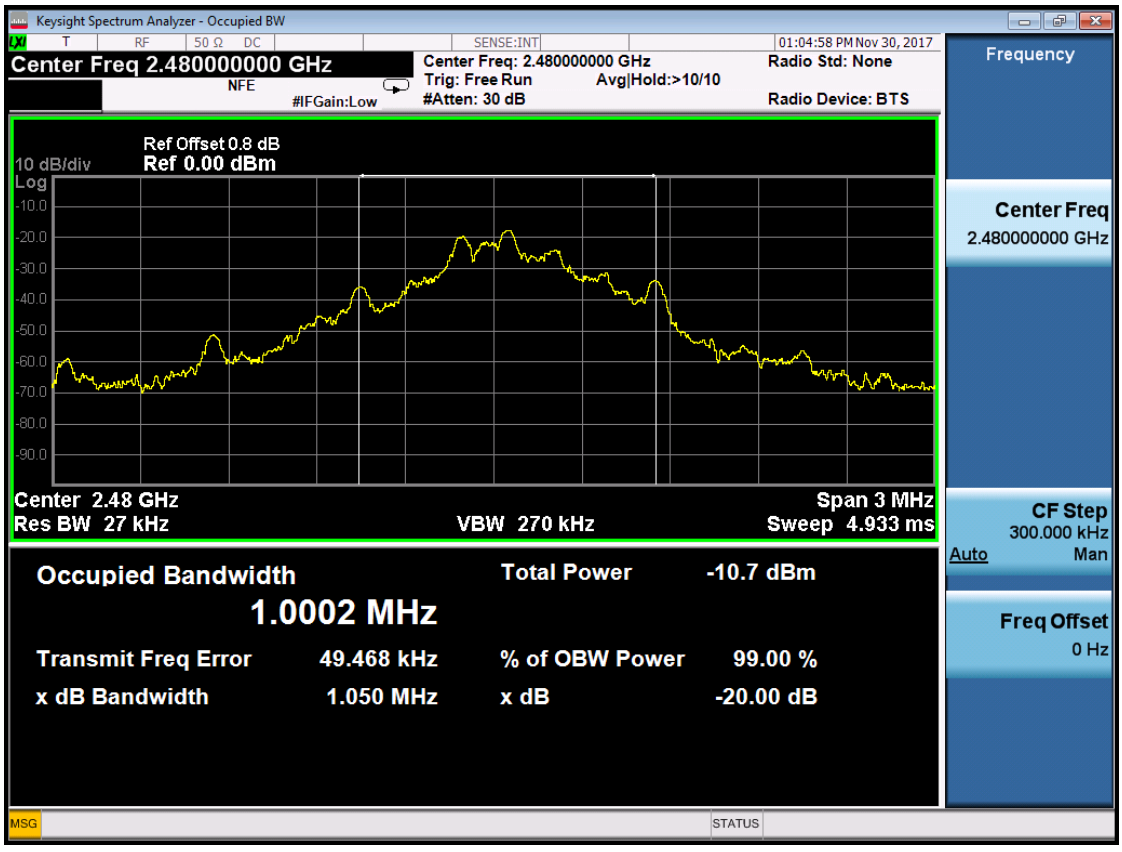
Channel L



Channel M

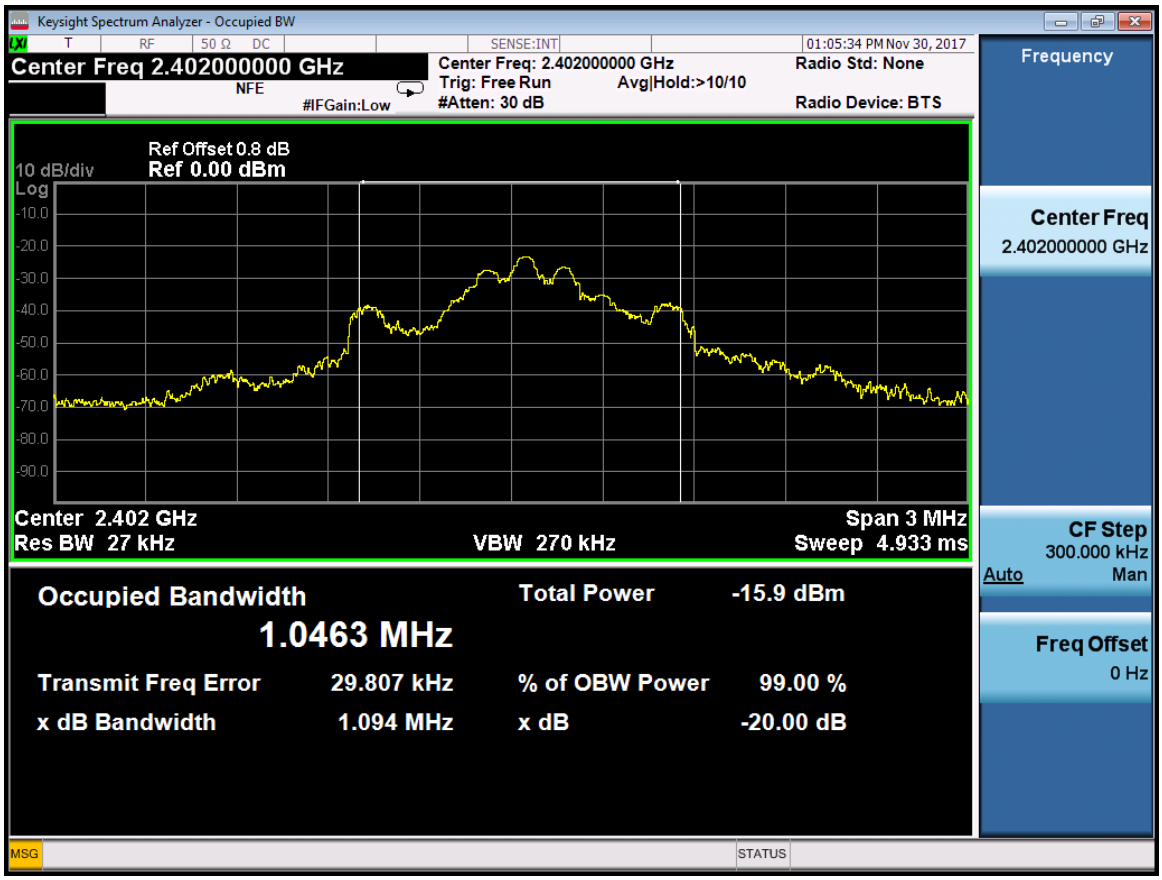


Channel H

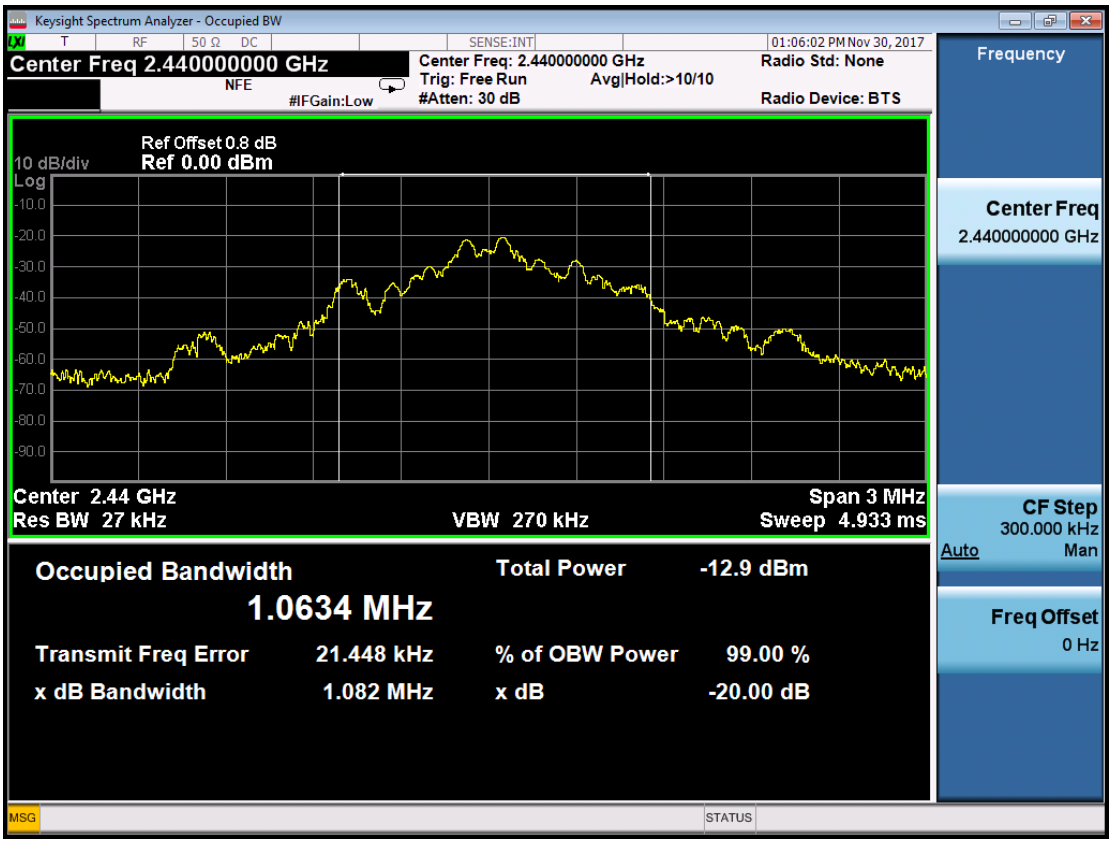


Modulation	Channel	99% Occupied Bandwidth (kHz)
π /4 DQPSK	L	1046.3
	M	1063.4
	H	1144.4

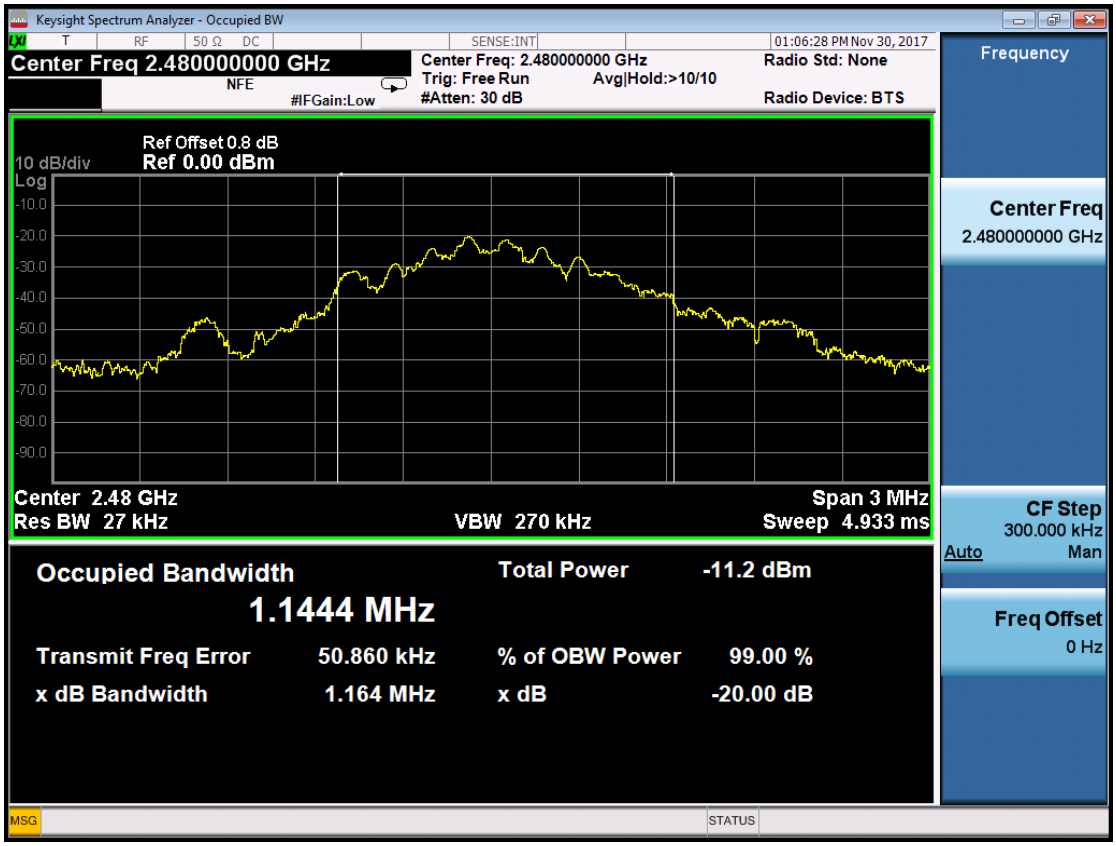
Channel L



Channel M

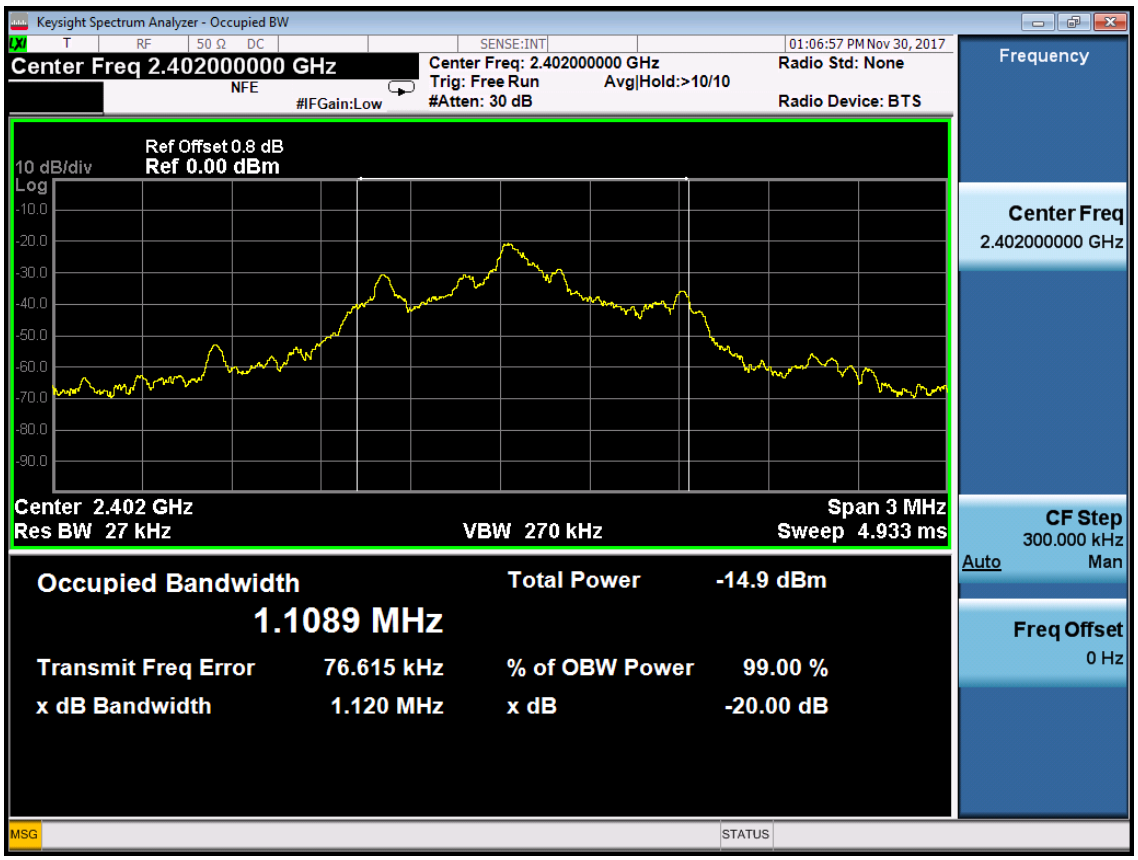


Channel H

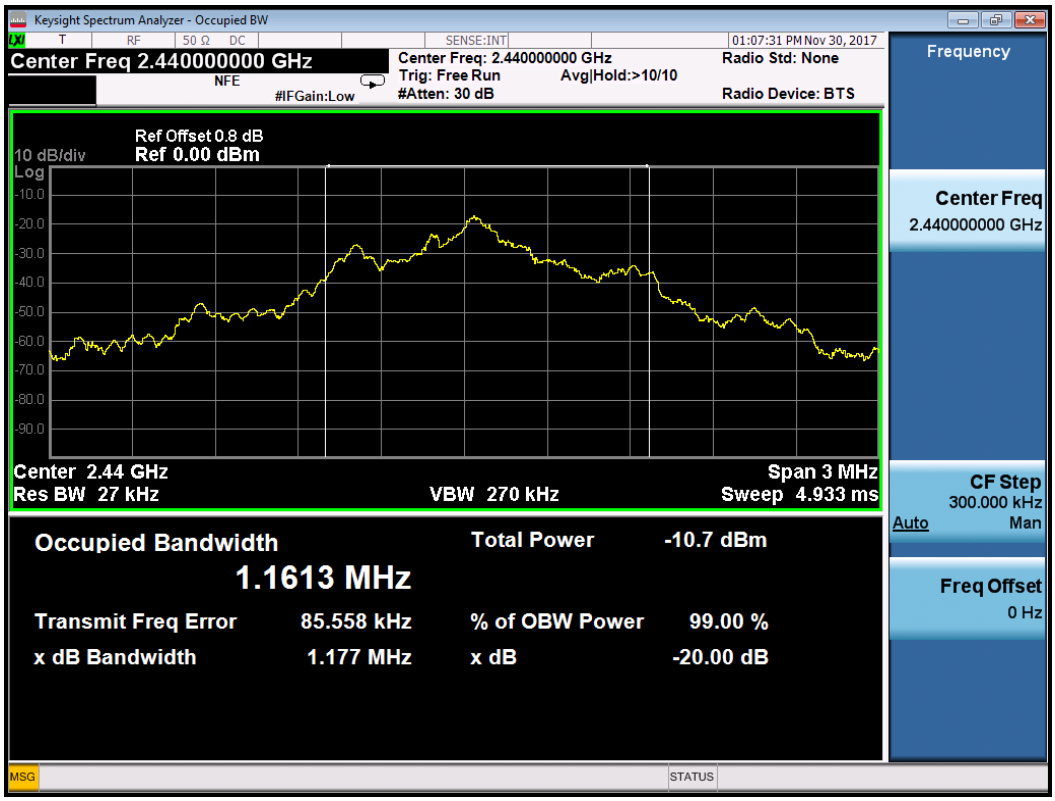


Modulation	Channel	99% Occupied Bandwidth (kHz)
8DPSK	L	1108.9
	M	1161.3
	H	1247.1

Channel L



Channel M



Channel H