RF TEST REPORT

Report No.: SET2018-08407

Product Name: “I’M CUBE” PORTABLE BLUETOOTH SPEAKER

FCC ID: 2AQIY-LB-BS-01

Model No. : LB-BS-01

Applicant: Meki Culture Development Co., Ltd.

Address: Room 101, Qiaocheng East Rd No.99, Nanshan, Shenzhen, China.

Dates of Testing: 07/01/2018 — 07/06/2018

Issued by: CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

Lab Location: Building 28/29, East of Shigu Xili Industrial Zone, Nanshan District Shenzhen, Guangdong 518055, China

Tel: 86 755 26627338 **Fax:** 86 755 26627238

This test report consists of **67** pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 20 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Test Report

Product Name.....:	"I'M CUBE" PORTABLE BLUETOOTH SPEAKER
Model No. .....:	LB-BS-01
Brand Name.....:	クレヨンしんちゃん
Trade Name.....:	MQ 萌奇
Applicant.....:	Meki Culture Development Co., Ltd.
Applicant Address.....:	Room 101, Qiaocheng East Rd No.99, Nanshan, Shenzhen, China.
Manufacturer .....:	Meki Culture Development Co., Ltd.
Manufacturer Address .....:	Room 101, Qiaocheng East Rd No.99, Nanshan, Shenzhen, China.
Test Standards.....:	47 CFR Part 15 Subpart C 2017：Radio Frequency Devices ANSI C63.10:2013：American National Standard for Testing Unlicensed Wireless Devices DA 00-705: Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
Test Result.....:	PASS
Tested by .....:	Shallwe Yang 2018.07.06 Shallwe Yang, Test Engineer
Reviewed by .....:	Zhu Qi 2018.07.06 Zhu Qi, Senior Engineer
Approved by .....:	Smartli 2018.07.06 Smart Li, Manager

Table of contents

RF TEST REPORT **1**

1. GENERAL INFORMATION **5**

1.1. EUT Description 5

1.2. Test Standards and Results 6

1.3. Frequency Hopping System Requirements 7

1.4. Facilities and Accreditations 9

2. 47 CFR PART 15C REQUIREMENTS **10**

2.1. Antenna requirement 10

2.2. Number of Hopping Frequency 11

2.3. Peak Output Power 13

2.4. 20dB Bandwidth 15

2.5. Carried Frequency Separation 17

2.6. Dwell time 19

2.7. Conducted Spurious Emissions 21

2.8. Conducted Band Edge 23

2.9. Conducted Emission 25

2.10. Radiated Band Edges and Spurious Emission 29

3. LIST OF MEASURING EQUIPMENT **43**

APPENDIX A **44**

Change History		
Issue	Date	Reason for change
1.0	2018.07.06	First edition

1. General Information

1.1. EUT Description

EUT Type	"I'M CUBE" PORTABLE BLUETOOTH SPEAKER	
EUT supports Radios application	Bluetooth V3.0+EDR	
Frequency Range	Bluetooth EDR	2402MHz~2480MHz
Channel Number	Bluetooth EDR	79
Bit Rate of Transmitter	Bluetooth EDR	1/2/3Mbps
Modulation Type	Bluetooth EDR	GFSK, pi/4DQPSK,8DPSK
Antenna Type	Internal	
Antenna Gain	0dBi	

Note 1: The EUT is a Bluetooth Speaker, it contains Bluetooth Module operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth Module is F(MHz)=2402+1*n (0<=n<=78). The lowest, middle, highest channel numbers of the Bluetooth Module used and tested in this report are separately 0 (2402MHz), 39 (2441MHz) and 78 (2480MHz).

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 3: a. When power on, the EUT will scan the whole frequency until a Connection command from the other BT devices.

b. When receiving the signal from the other BT devices, The EUT transmit are sponse signal.

c. The other devices receive the response signal and recognize it, then send a connection command to establish the connection.

d. After the connection establish successfully, the data transmission is beginning. At the same time, the both devices will shift frequencies in synchronization per a same pseudo randomly ordered list of hopping frequencies, the hopping rate is1600 times per second. This device conforms to the criteria in FCC Public Notice DA 00-705.

e. The bandwidth of the receiver, which is set to a fixed width by the software.

Note 4: Bluetooth signal has 9 packages 1DH1, 1DH3, 1DH5, 2DH1, 2DH3, 2DH5, 3DH1, 3DH3, 3DH5, DH5 package is largest, we are testing DH5 in the document.

1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (Bluetooth, 2.4GHz ISM band radiators) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2017	Radio Frequency Devices
2	ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section in CFR 47	Description	Result
1	15.203	Antenna Requirement	PASS
2	15.247(a)	Number of Hopping Frequency	PASS
3	15.247(b)	Peak Output Power	PASS
4	15.247(a)	20dB Bandwidth	PASS
5	15.247(a)	Carrier Frequency Separation	PASS
6	15.247(a)	Time of Occupancy (Dwell time)	PASS
7	15.247(d)	Conducted Spurious Emission	PASS
8	15.247(d)	Conducted Band Edge	PASS
9	15.207	Conducted Emission	PASS
10	15.209 15.247(c)	Radiated Band Edges and Spurious Emission	PASS

Note 1: The tests were performed according to the method of measurements prescribed in DA-00-705.

Note 2: The test of Radiated Emission was performed according to the method of measurements prescribed in ANSI C63.10 2013.

1.3. Frequency Hopping System Requirements

1.3.1. Standard Applicable

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly 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.

(g) 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.

(h) 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 hopsets 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.

1.3.2. Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no

impact on the bandwidth used.

This device was tested with a bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements for DA 00-705 and FCC Part 15.247 rule.

Carrier Frequency and channel List:

Channel	Frequency(MHz)
0	2402
1	2403
…	…
39	2441
40	2442
…	…
77	2479
78	2480

Note: F(MHz)=2402+1*n (0<=n<=78)

1.4. Facilities and Accreditations

1.4.1. Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: CN5031

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until December 31, 2018.

ISED Registration: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Aug. 03, 2019.

NVLAP Lab Code: 201008-0

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

1.4.2. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.1.2. Antenna Information

Antenna Category: Internal antenna

An Internal antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

Antenna General Information:

No.	EUT	Ant. Type	Gain(dBi)
1	"I'M CUBE" PORTABLE BLUETOOTH SPEAKER	Internal	0

2.1.3. Result: comply

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Number of Hopping Frequency

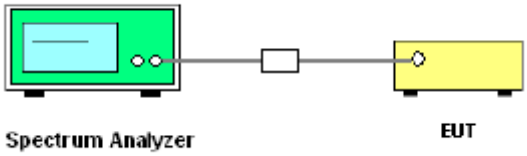
2.2.1. Limit of Number of Hopping Frequency

Frequency hopping systems operating in the 2400MHz to 2483.5MHz bands shall use at least 15 hopping frequencies.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation; RBW⩾100KHz; VBW⩾RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. The number of hopping frequency used is defined as the number of total channel.
7. Record the measurement data derived from spectrum analyzer.

2.2.5. Test Results of Number of Hopping Frequency

Please refer to Appendix A for detail

2.3. Peak Output Power

2.3.1. Limit of Peak Output Power

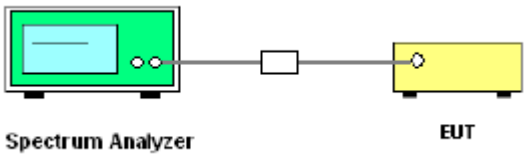
Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.

Requency 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

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to Spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power with cable loss and record the results in the test report.
5. Measure and record the results in the test report.

2.3.5. Test Result of Output Power

Please refer to Appendix A for detail

2.4. 20dB Bandwidth

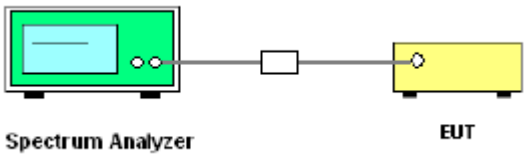
2.4.1. Definition

According to FCC §15.247(a)(1), the 20dB bandwidth is known as the 99% emission bandwidth, or 20dB bandwidth (10*log1% = 20dB) taking the total RF output power.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.

   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;

   RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak;

   Trace = max hold.
5. Measure and record the results in the test report.

2.4.5. Test Results of 20dB Bandwidth

Please refer to Appendix A for detail

2.5. Carried Frequency Separation

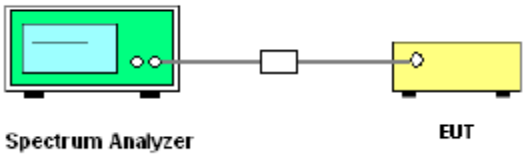
2.5.1. Limit of Carried Frequency Separation

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

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings:

   Span = wide enough to capture the peaks of two adjacent channels; RBW≥1% of the span;

   VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

2.5.5. Test Results of Carried Frequency Separation

Please refer to Appendix A for detail

2.6. Dwell time

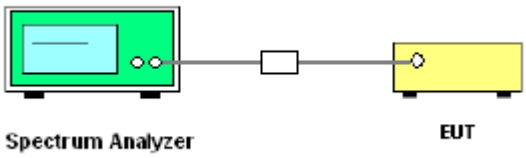
2.6.1. Limit of Dwell Time

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.

2.6.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup



2.6.4. Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW≥RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

2.6.5. Test Results of Dwell Time

Please refer to Appendix A for detail

2.7. Conducted Spurious Emissions

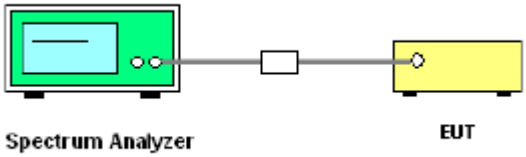
2.7.1. Limit of Spurious Emission

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3. Test Setup



2.7.4. Test Procedure

1. The testing follows the guidelines in Spurious RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2.7.5. Test Results of Conducted Spurious Emissions

Please refer to Appendix A for detail

2.8. Conducted Band Edge

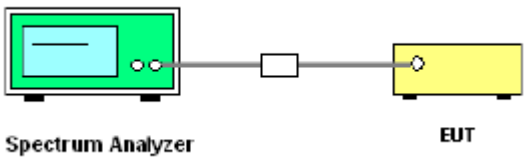
2.8.1. Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

2.8.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.8.3. Test Setup



2.8.1. Test Procedure

1. The testing follows the guidelines in Band-edge Compliance of RF Conducted Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100kHz (≥1% span=10MHz), VBW = 300kHz (≥RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW.
4. Enable hopping function of the EUT and then repeat step 2. and 3.
5. Measure and record the results in the test report.

2.8.2. Test Results of Conducted Band Edge

Please refer to Appendix A for detail

2.9. Conducted Emission

2.9.1. Limit of Conducted Emission

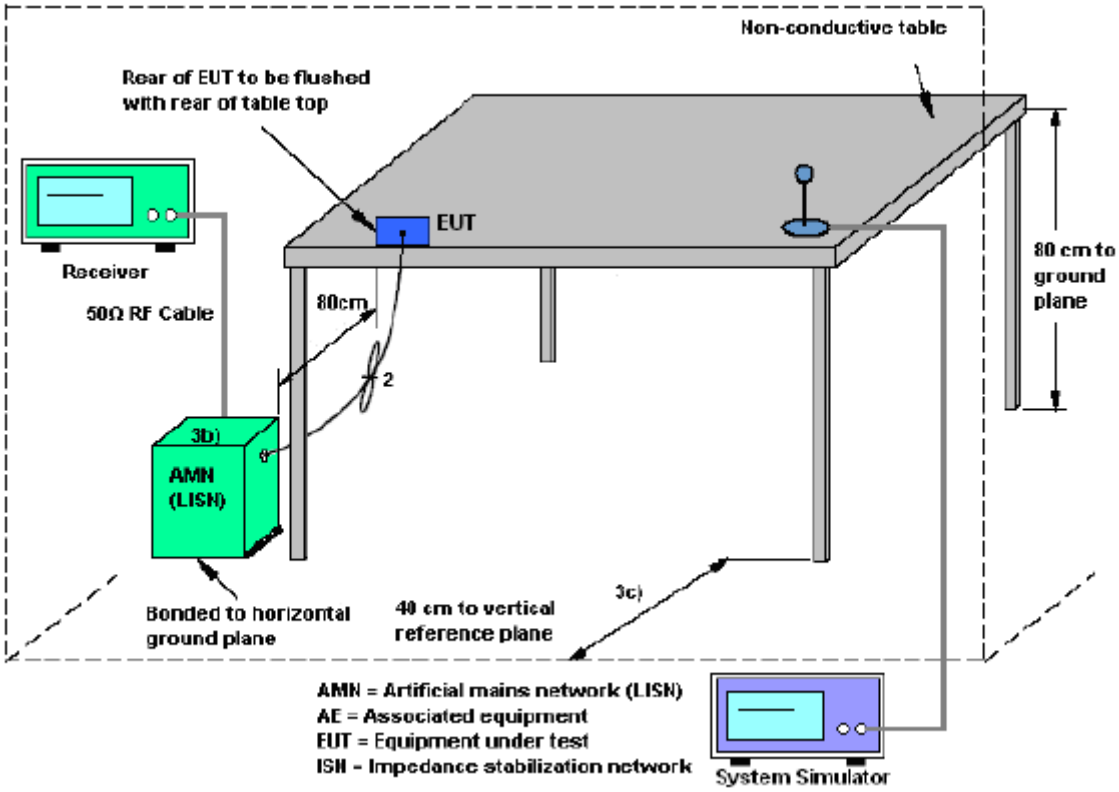
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

2.9.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.9.3. Test Setup

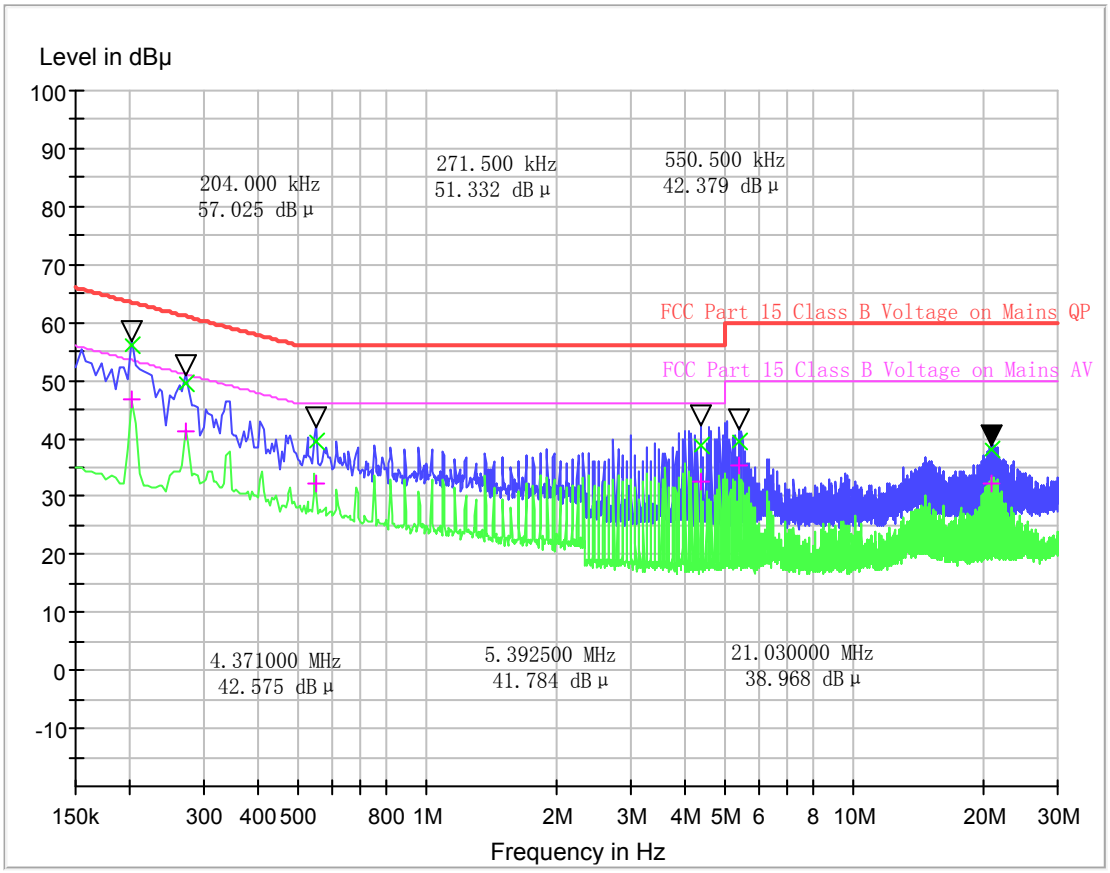


2.9.4. Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 micrometry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

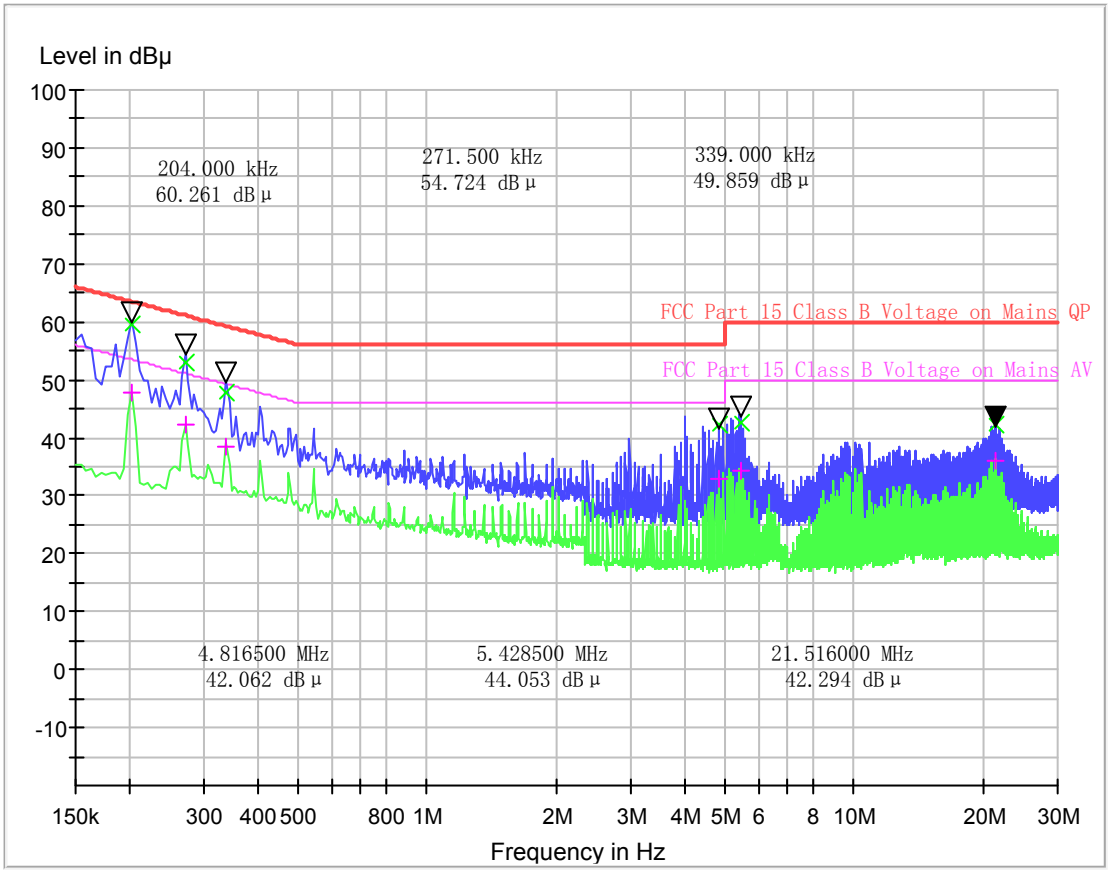
2.9.3. Test Results of Conducted Emission

The EUT configuration of the emission tests is Bluetooth Link + USB Cable (Charging from Adapter)



(Plot A: L Phase)

Conducted Disturbance at Mains Terminals					
L Test Data					
QP			**AV**		
Frequency (MHz)	**Limits (dBµV)**	**Measurement Value (dBµV)**	**Frequency (MHz)**	**Limits (dBµV)**	**Measurement Value (dBµV)**
0.204000	63.4	56.07	0.204000	53.4	46.89
0.271500	61.1	49.49	0.271500	51.1	41.11
0.550500	56.0	39.31	0.550500	46.0	32.30
4.371000	56.0	38.91	4.371000	46.0	32.57
5.392500	60.0	39.55	5.392500	50.0	35.30
21.030000	60.0	37.99	21.030000	50.0	32.07



(Plot B: N Phase)

Conducted Disturbance at Mains Terminals					
N Test Data					
QP			AV		
Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)
0.204000	63.4	59.60	0.204000	53.4	47.94
0.271500	61.1	53.02	0.271500	51.1	42.40
0.339000	59.2	47.94	0.339000	49.2	38.44
4.816500	56.0	42.33	4.816500	46.0	32.84
5.428500	60.0	42.73	5.428500	50.0	34.28
21.516000	60.0	42.12	21.516000	50.0	35.87

Test Result: PASS

2.10. Radiated Band Edges and Spurious Emission

2.10.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

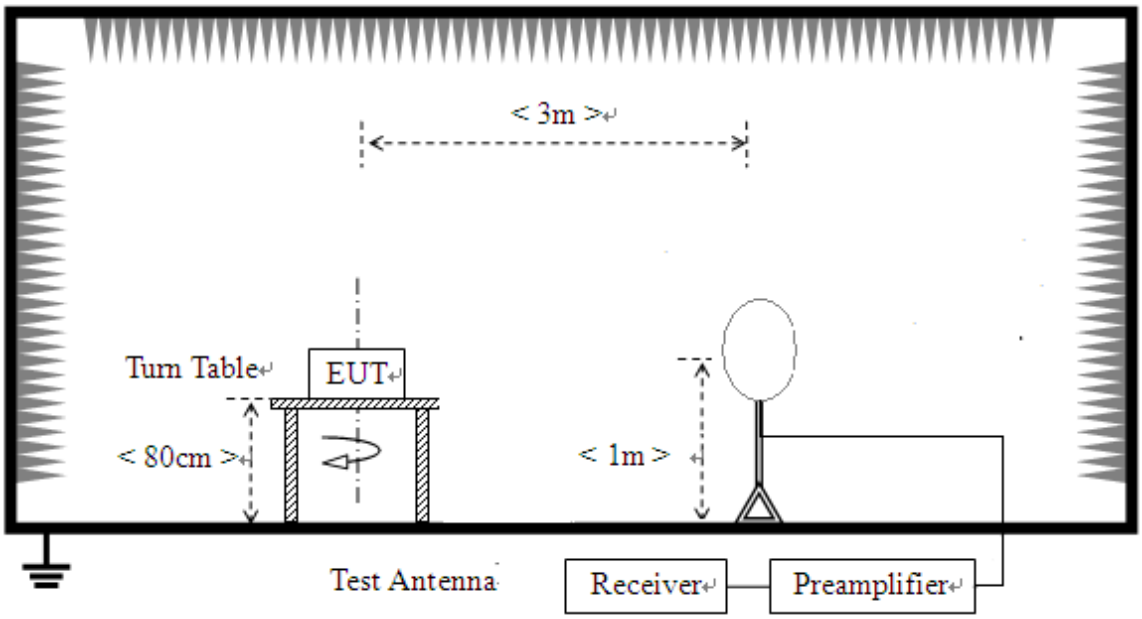
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.10.2. Measuring Instruments

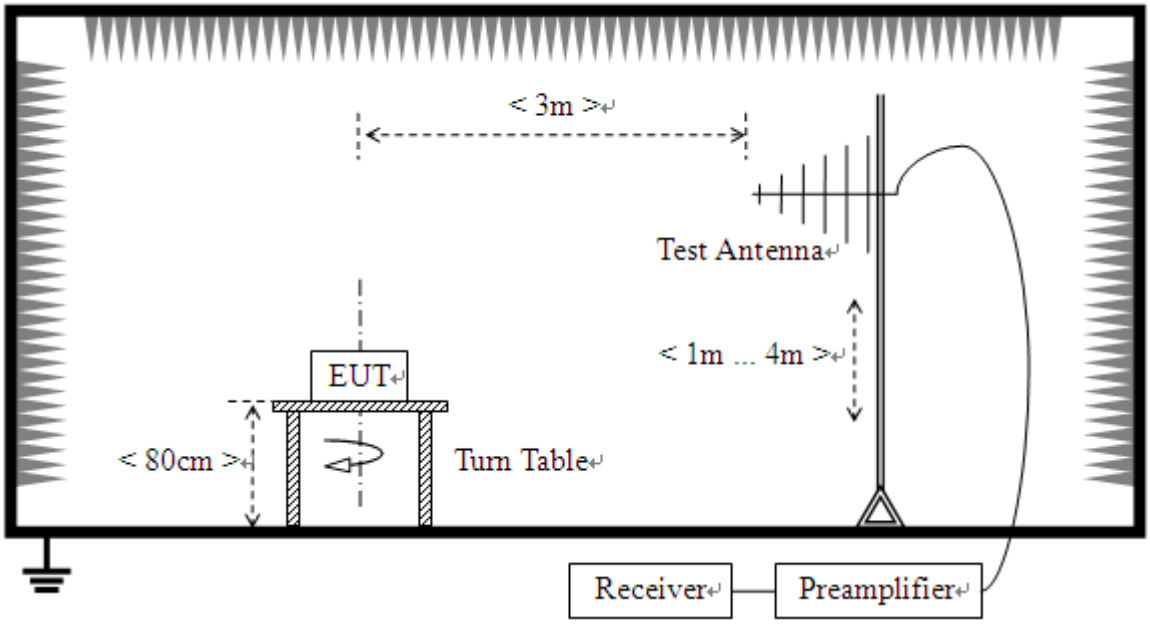
The measuring equipment is listed in the section 3 of this test report.

2.10.3. Test Setup

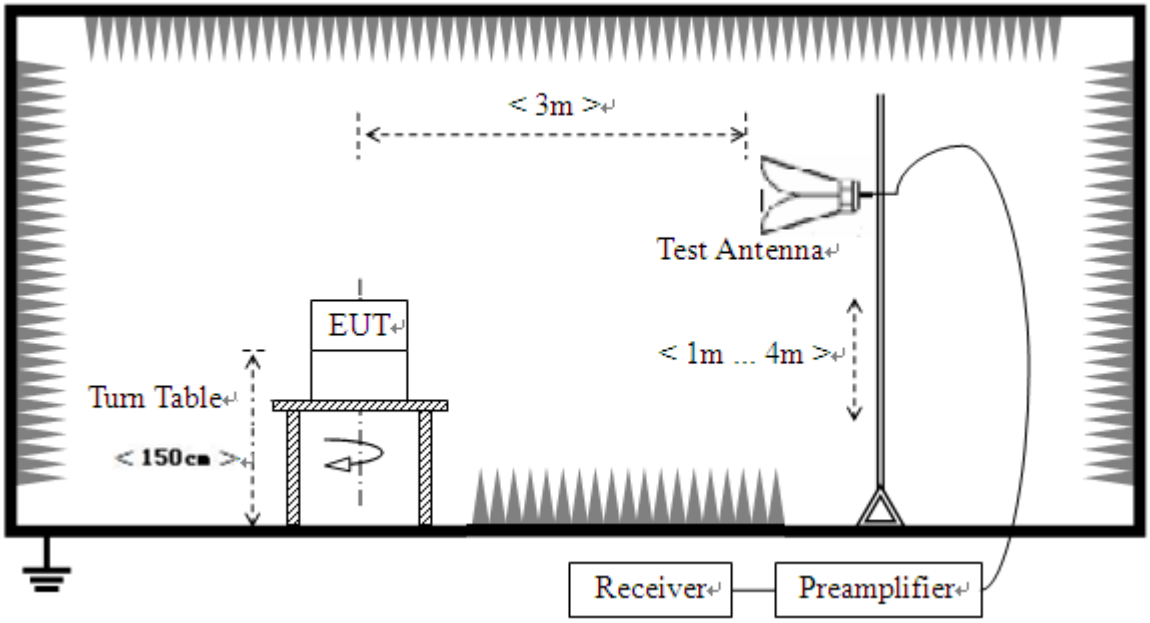
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



2.10.4. Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
2. The EUT was placed on a turntable 0.8m below 1GHz and 1.5m above 1GHz above ground.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings:

(1) Span shall wide enough to fully capture the emission being measured;

(2) Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW⩾RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak

(3) For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds

On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+Nn*Ln$

Where N_1 is number of type 1 pulses, L1 is length of type 1 pulses, etc.

Average Emission Level = Peak Emission Level + 20*log(Duty cycle)

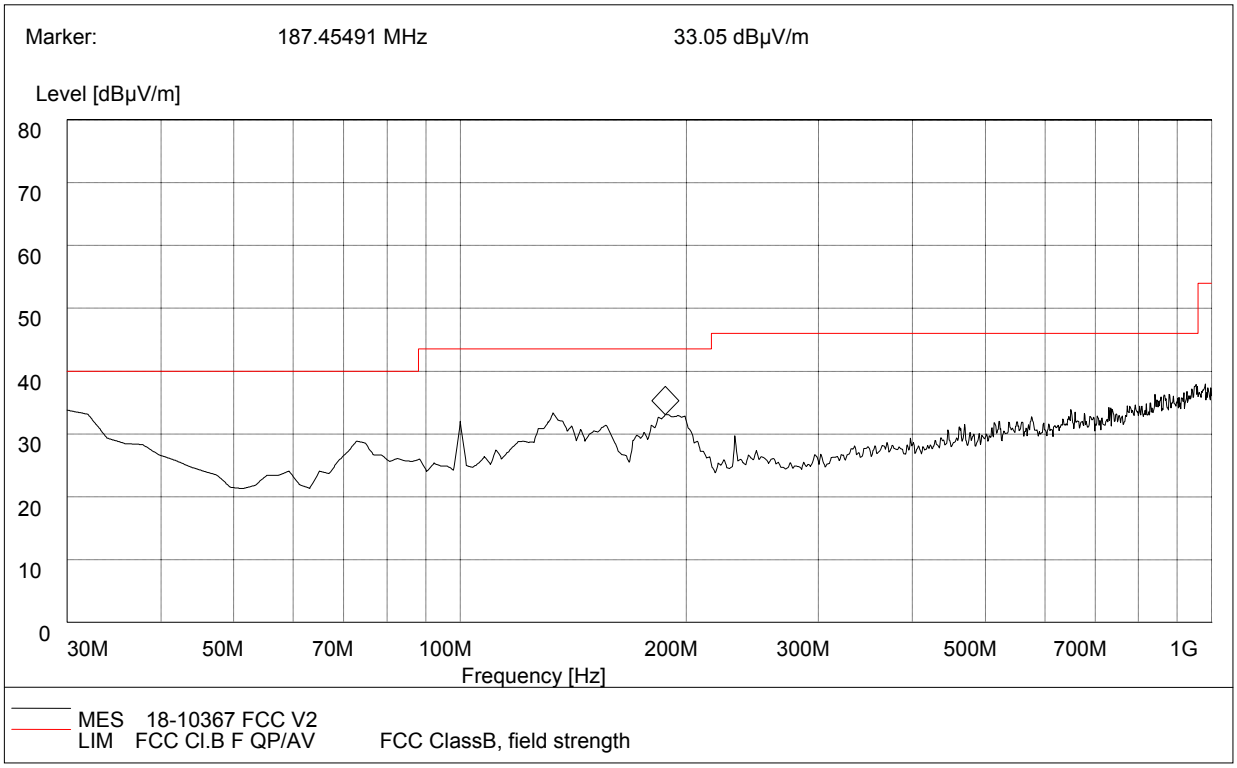
7. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

2.10.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 KHz to 30MHz

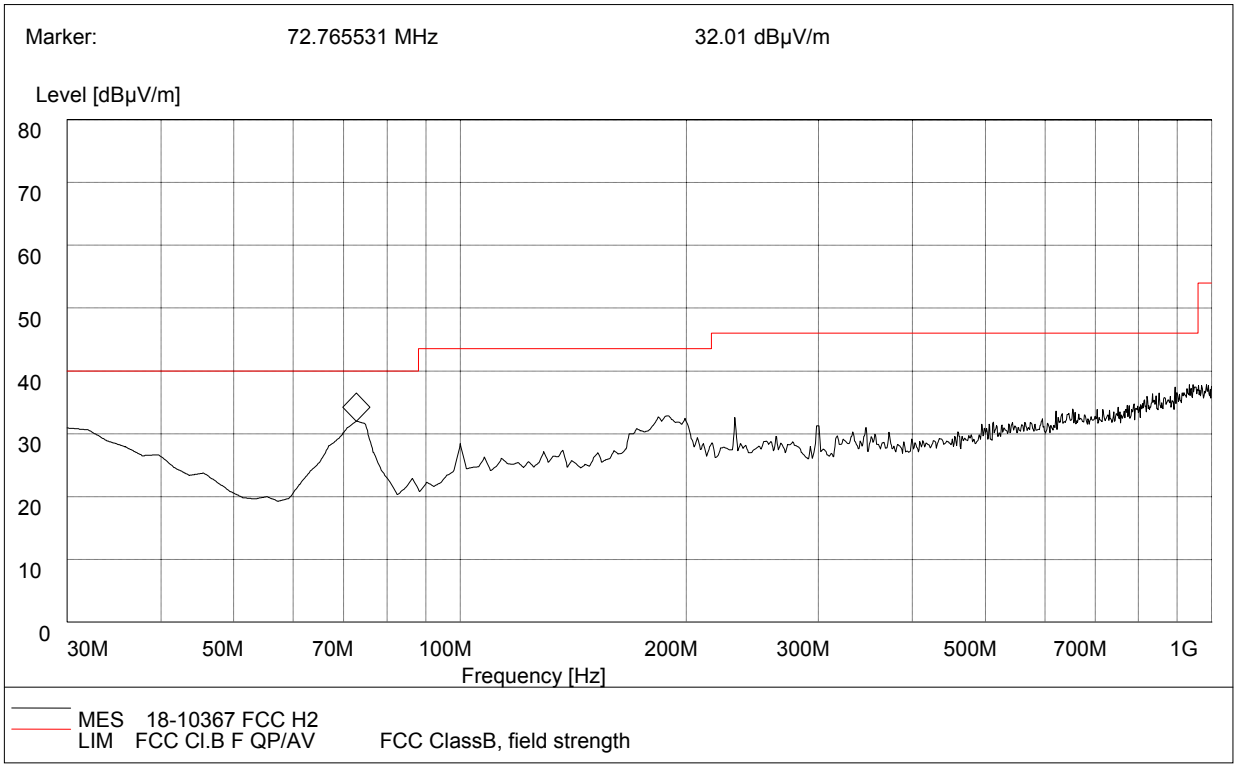
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000MHz



Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB µ V/m)	Antenna	Verdict
30.00	34.85	120.000	100.0	40.0	Vertical	Pass
100.00	32.65	120.000	100.0	43.5	Vertical	Pass
187.45	33.05	120.000	100.0	43.5	Vertical	Pass
356.42	25.91	120.000	100.0	46.0	Vertical	Pass
505.90	30.42	120.000	100.0	46.0	Vertical	Pass
880.25	33.43	120.000	100.0	46.0	Vertical	Pass

(Plot A: 30MHz to 1GHz, Antenna Vertical)



Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB µ V/m)	Antenna	Verdict
30.15	28.55	120.000	100.0	40.0	Horizontal	Pass
72.78	32.01	120.000	100.0	40.0	Horizontal	Pass
116.42	21.54	120.000	100.0	43.5	Horizontal	Pass
140.59	26.55	120.000	100.0	43.5	Horizontal	Pass
833.91	32.86	120.000	100.0	46.0	Horizontal	Pass
940.35	35.69	120.000	100.0	46.0	Horizontal	Pass

(Plot B: 30MHz to 1GHz, Antenna Horizontal)

For 1GHz to 25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（GFSK-2402MHz）												
No.	Fre. (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390	51.29	PK	74	-22.71	1.00 H	180	49.99	5.2	28.6	32.5	1.3
2	2390	42.94	AV	54	-11.06	1.00 H	180	41.64	5.2	28.6	32.5	1.3
3	4804	53.57	PK	74	-20.43	1.50 H	100	47.17	7.4	30.4	31.4	6.4
4	4804	44.51	AV	54	-9.49	1.50 H	100	38.11	7.4	30.4	31.4	6.4
5	7206	47.85	PK	74	-26.15	1.00 H	90	38.55	9.9	31.5	32.1	9.3
6	7206	38.96	AV	54	-15.04	1.00 H	90	29.66	9.9	31.5	32.1	9.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（GFSK-2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390	58.25	PK	74	-15.75	1.17V	200	56.95	5.2	28.6	32.5	1.3
2	2390	49.68	AV	54	-4.32	1.17V	200	48.38	5.2	28.6	32.5	1.3
3	4804	47.01	PK	74	-26.99	1.20 V	90	40.61	7.4	30.4	31.4	6.4
4	4804	38.06	AV	54	-15.94	1.20 V	90	31.66	7.4	30.4	31.4	6.4
5	7206	48.87	PK	74	-25.13	1.30 V	270	39.57	9.9	31.5	32.1	9.3
6	7206	39.83	AV	54	-14.17	1.30 V	270	30.53	9.9	31.5	32.1	9.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（GFSK-2441MHz）												
No.	Fre. (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1250.85	48.35	PK	74	-25.65	1.20 H	155	48.95	1.8	29.5	31.9	-0.6
2	1250.85	40.21	AV	54	-13.79	1.20 H	155	40.81	1.8	29.5	31.9	-0.6
3	2010	40.15	PK	74	-33.85	1.00 H	200	40.75	2.8	28.7	32.1	-0.6
4	2010	32.11	AV	54	-21.89	1.00 H	200	32.71	2.8	28.7	32.1	-0.6
5	4882	53.54	PK	74	-20.46	1.50 H	120	47.14	6.7	31.2	31.5	6.4
6	4882	45.8	AV	54	-8.20	1.50 H	120	39.4	6.7	31.2	31.5	6.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（GFSK-2441MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1250.85	49.39	PK	74	-24.61	1.20 V	46	49.99	1.8	29.5	31.9	-0.6
2	1250.85	40.65	AV	54	-13.35	1.20 V	46	41.25	1.8	29.5	31.9	-0.6
3	2010	41.68	PK	74	-32.32	1.50 V	50	42.28	2.8	28.7	32.1	-0.6
4	2010	33.92	AV	54	-20.08	1.50 V	50	34.52	2.8	28.7	32.1	-0.6
5	4882	45.74	PK	74	-28.26	2.50 V	56	39.34	6.7	31.2	31.5	6.4
6	4882	37.68	AV	54	-16.32	2.50 V	56	31.28	6.7	31.2	31.5	6.4

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（GFSK _2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1010.58	48.25	PK	74	-25.75	2.00 H	120	49.05	1.5	29.6	31.9	-0.8
2	1010.58	40.11	AV	54	-13.89	2.00 H	120	40.91	1.5	29.6	31.9	-0.8
3	2483.5	51.24	PK	74	-22.76	1.50 H	100	48.64	5.7	28.7	31.8	2.6
4	2483.5	42.4	AV	54	-11.6	1.50 H	100	39.8	5.7	28.7	31.8	2.6
5	4960	52.08	PK	74	-21.92	1.50 H	130	45.38	7	31.2	31.5	6.7
6	4960	43.95	AV	54	-10.05	1.50 H	130	37.25	7	31.2	31.5	6.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（GFSK _2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1010.58	46.35	PK	74	-27.65	1.50 V	130	47.15	1.5	29.6	31.9	-0.8
2	1010.58	38.21	AV	54	-15.79	1.50 V	230	39.01	1.5	29.6	31.9	-0.8
3	2483.5	48.98	PK	74	-25.02	1.00 V	130	46.38	5.7	28.7	31.8	2.6
4	2483.5	39.97	AV	54	-14.03	1.00 V	130	37.37	5.7	28.7	31.8	2.6
5	4960	52.94	PK	74	-21.06	1.00 V	180	46.24	7	31.2	31.5	6.7
6	4960	44.47	AV	54	-9.53	1.00 V	90	37.77	7	31.2	31.5	6.7

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（pi/4DQPSK -2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390	45.58	PK	74	-28.42	1.20 H	0	44.28	5.2	28.6	32.5	1.3
2	2390	37.52	AV	54	-16.48	1.20 H	0	36.22	5.2	28.6	32.5	1.3
3	4804	58.88	PK	74	-15.12	1.50 H	200	52.48	6.7	31.2	31.5	6.4
4	4804	49.78	AV	54	-4.22	1.50 H	200	43.38	6.7	31.2	31.5	6.4
5	7206	57.42	PK	74	-16.58	1.00 H	120	42.52	16	30.9	32	14.9
6	7206	40.09	AV	54	-13.91	1.00 H	180	25.19	16	30.9	32	14.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（pi/4DQPSK -2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390	46.95	PK	74	-27.05	1.50 V	120	45.65	5.2	28.6	32.5	1.3
2	2390	38.9	AV	54	-15.1	1.50 V	120	37.6	5.2	28.6	32.5	1.3
3	4804	50.34	PK	74	-23.66	1.20 V	180	43.94	6.7	31.2	31.5	6.4
4	4804	42.36	AV	54	-11.64	1.20 V	180	35.96	6.7	31.2	31.5	6.4
5	7206	47.94	PK	74	-26.06	1.00 V	100	33.04	16	30.9	32	14.9
6	7206	39.13	AV	54	-14.87	1.00 V	100	24.23	16	30.9	32	14.9

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（pi/4DQPSK _2441MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1600.18	46.65	PK	74	-27.35	1.20H	120	48.15	2	29	32.5	-1.5
2	1600.18	38.5	AV	54	-15.5	1.20H	120	40	2	29	32.5	-1.5
3	3100.25	48.17	PK	74	-25.83	1.20 H	210	43.42	6.2	30.05	31.5	4.75
4	3100.25	39.83	AV	54	-14.17	1.20 H	210	35.08	6.2	30.05	31.5	4.75
5	4882	58.64	PK	74	-15.36	1.50 H	150	51.94	7	31.2	31.5	6.7
6	4882	50.23	AV	54	-3.77	1.50 H	150	43.53	7	31.2	31.5	6.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（pi/4DQPSK _2441MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1600.18	45.18	PK	74	-28.82	1.50 V	130	46.68	2	29	32.5	-1.5
2	1600.18	37.13	AV	54	-16.87	1.50 V	130	38.63	2	29	32.5	-1.5
3	3100.25	48.71	PK	74	-25.29	1.50 V	120	43.96	6.2	30.05	31.5	4.75
4	3100.25	40.86	AV	54	-13.14	1.50 V	120	36.11	6.2	30.05	31.5	4.75
5	4882	49.65	PK	74	-24.35	1.50 V	115	42.95	7	31.2	31.5	6.7
6	4882	41.69	AV	54	-12.31	1.50 V	115	34.99	7	31.2	31.5	6.7

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（pi/4DQPSK _2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1510.58	47.15	PK	74	-26.85	1.00 H	100	48.65	2	29	32.5	-1.5
2	1510.58	39.4	AV	54	-14.6	1.00 H	100	40.90	2	29	32.5	-1.5
3	2483.5	50.14	PK	74	-23.86	2.00 H	180	47.54	5.7	28.7	31.8	2.6
4	2483.5	41.91	AV	54	-12.09	2.00 H	180	39.31	5.7	28.7	31.8	2.6
5	4960	57.07	PK	74	-16.93	1.50 H	120	50.37	7	31.2	31.5	6.7
6	4960	48.71	AV	54	-5.29	1.50 H	120	42.01	7	31.2	31.5	6.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（pi/4DQPSK _2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1600.58	46.62	PK	74	-27.38	1.00 V	120	48.12	2	29	32.5	-1.5
2	1600.58	38.88	AV	54	-15.12	1.00 V	120	40.38	2	29	32.5	-1.5
3	2483.5	48.25	PK	74	-25.75	1.40 V	160	45.65	5.7	28.7	31.8	2.6
4	2483.5	39.91	AV	54	-14.09	1.40 V	160	37.31	5.7	28.7	31.8	2.6
5	4960	46.18	PK	74	-27.82	1.50 V	0	39.48	7	31.2	31.5	6.7
6	4960	38.22	AV	54	-15.78	1.50 V	0	31.52	7	31.2	31.5	6.7

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（8DPSK _2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1400.85	45.36	PK	74	-28.64	1.00 H	180	45.96	1.8	29.5	31.9	-0.6
2	1400.85	36.01	AV	54	-17.99	1.00 H	180	36.61	1.8	29.5	31.9	-0.6
3	2390	47.08	PK	74	-26.92	1.50 H	130	45.78	5.2	28.6	32.5	1.3
4	2390	38.44	AV	54	-15.56	1.50 H	130	37.14	5.2	28.6	32.5	1.3
5	4804	51.06	PK	74	-22.94	2.00 H	120	44.66	7.4	30.4	31.4	6.4
6	4804	42.21	AV	54	-11.79	2.00 H	120	35.81	7.4	30.4	31.4	6.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（8DPSK_2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1400.75	44.35	PK	74	-29.65	2.10 V	120	44.95	1.8	29.5	31.9	-0.6
2	1400.75	36.26	AV	54	-17.74	2.10 V	120	36.86	1.8	29.5	31.9	-0.6
3	2390	47.68	PK	74	-26.32	1.80 V	150	46.38	5.2	28.6	32.5	1.3
4	2390	39.29	AV	54	-14.71	1.80 V	150	37.99	5.2	28.6	32.5	1.3
5	4804	51.1	PK	74	-22.9	2.00 V	200	44.7	7.4	30.4	31.4	6.4
6	4804	42.45	AV	54	-11.55	2.00 V	200	36.05	7.4	30.4	31.4	6.4

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（8DPSK_2441MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1800.56	46.57	PK	74	-27.43	2.50 H	120	47.07	2.5	29.4	32.4	-0.5
2	1800.56	38.43	AV	54	-15.57	2.50 H	120	38.93	2.5	29.4	32.4	-0.5
3	4882	51.24	PK	74	-22.76	1.00 H	110	44.84	6.7	31.2	31.5	6.4
4	4882	42.21	AV	54	-11.79	1.00 H	110	35.81	6.7	31.2	31.5	6.4
5	9764	46.58	PK	74	-27.42	1.00 H	200	37.78	9.9	31	32.1	8.8
6	9764	38.24	AV	54	-15.76	1.00 H	200	29.44	9.9	31	32.1	8.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（8DPSK_2441MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	1800.65	44.15	PK	74	-29.85	2.00 V	150	44.65	2.5	29.4	32.4	-0.5
2	1800.65	35.88	AV	54	-18.12	2.00 V	150	36.38	2.5	29.4	32.4	-0.5
3	4882	48.36	PK	74	-25.64	1.80 V	220	41.96	6.7	31.2	31.5	6.4
4	4882	40.09	AV	54	-13.91	1.80 V	220	33.69	6.7	31.2	31.5	6.4
5	9764	45.5	PK	74	-28.5	2.00 V	360	36.7	9.9	31	32.1	8.8
6	9764	37.34	AV	54	-16.66	2.00 V	360	28.54	9.9	31	32.1	8.8

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（8-DPSK _2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.5	46.25	PK	74	-27.75	2.00 H	200	43.65	5.7	28.7	31.8	2.6
2	2483.5	37.9	AV	54	-16.1	2.00 H	200	35.3	5.7	28.7	31.8	2.6
3	4960	51.19	PK	74	-22.81	2.20 H	150	44.79	6.7	31.2	31.5	6.4
4	4960	43.05	AV	54	-10.95	2.20 H	150	36.65	6.7	31.2	31.5	6.4
5	7440	48.98	PK	74	-25.02	1.50 H	100	34.08	16	30.9	32	14.9
6	7440	40.92	AV	54	-13.08	1.50 H	100	26.02	16	30.9	32	14.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（8-DPSK _2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.5	46.25	PK	74	-27.75	2.00 V	36	43.65	5.7	28.7	31.8	2.6
2	2483.5	37.92	AV	54	-16.08	2.00 V	36	35.32	5.7	28.7	31.8	2.6
3	4960	50.24	PK	74	-23.76	1.80V	150	43.84	6.7	31.2	31.5	6.4
4	4960	41.77	AV	54	-12.23	1.80V	150	35.37	6.7	31.2	31.5	6.4
5	7440	48.65	PK	74	-25.35	1.50 V	120	33.75	16	30.9	32	14.9
6	7440	40.58	AV	54	-13.42	1.50 V	120	25.68	16	30.9	32	14.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
   − Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level − Limit value
5. " * ": Fundamental frequency.

3. List of measuring equipment

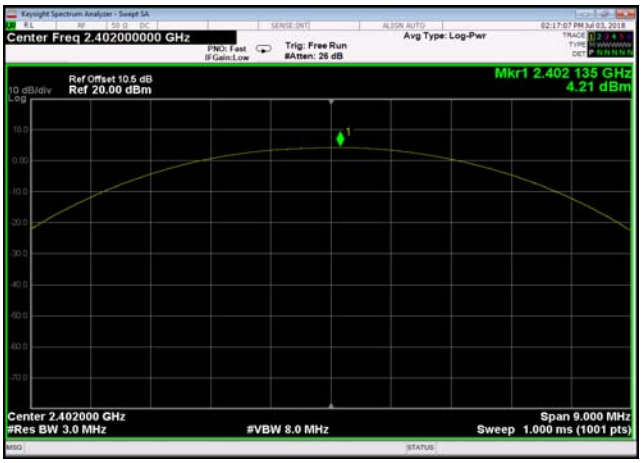
Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	11/12/2017
2	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	11/12/2017
3	EMI TEST Software	Audix	E3	N/A	N/A
4	TURNTABLE	ETS	2088	2149	N/A
5	ANTENNA MAST	ETS	2075	2346	N/A
6	EMI TEST Software	Rohde&Schwarz	ESK1	N/A	N/A
7	HORNANTENNA	ShwarzBeck	9120D	1011	11/12/2017
8	Amplifer	Sonoma	310N	E009-13	11/12/2017
9	JS amplifer	Rohde&Schwarz	JS4-00101800-28-5A	F201504	11/12/2017
10	High pass filter	Compliance Direction systems	BSU-6	34202	11/12/2017
11	HORNANTENNA	ShwarzBeck	9120D	1012	11/12/2017
12	Amplifer	Compliance Direction systems	PAP1-4060	120	11/12/2017
13	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	11/12/2017
14	TURNTABLE	MATURO	TT2.0	----	N/A
15	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
16	Horn Antenna	SCHWARZBECK	BBHA9170	25841	11/12/2017
17	ULTRA-BROADBAND ANTENNA	Rohde&Schwarz	HL562	100015	11/12/2017
18	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
19	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	11/12/2017
20	Spectrum Analyzer	Keysight	N9030A	ATO-67098	10/09/2017

Appendix A

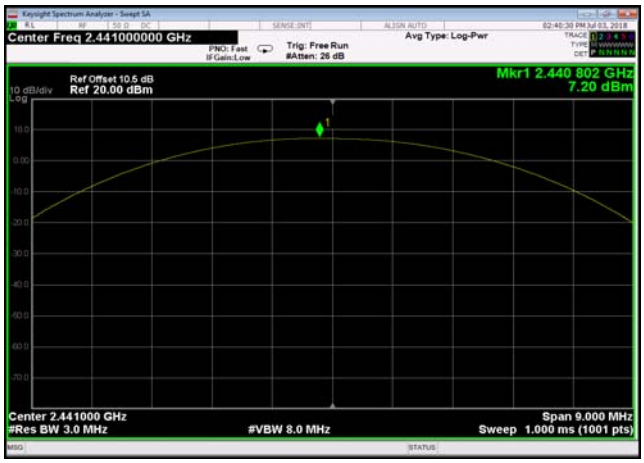
RF Output Power
Test Result and Data

BT Maximum Output Power					
Mode	Test Frequency	Packet Type	Power(dBm)	Limit(dBm)	Result
GFSK	2402	DH5	4.21	21	Pass
GFSK	2441	DH5	7.20	21	Pass
GFSK	2480	DH5	8.25	21	Pass
pi/4DQPSK	2402	2DH5	2.02	21	Pass
pi/4DQPSK	2441	2DH5	5.62	21	Pass
pi/4DQPSK	2480	2DH5	6.82	21	Pass
8DPSK	2402	3DH5	2.35	21	Pass
8DPSK	2441	3DH5	5.97	21	Pass
8DPSK	2480	3DH5	7.01	21	Pass

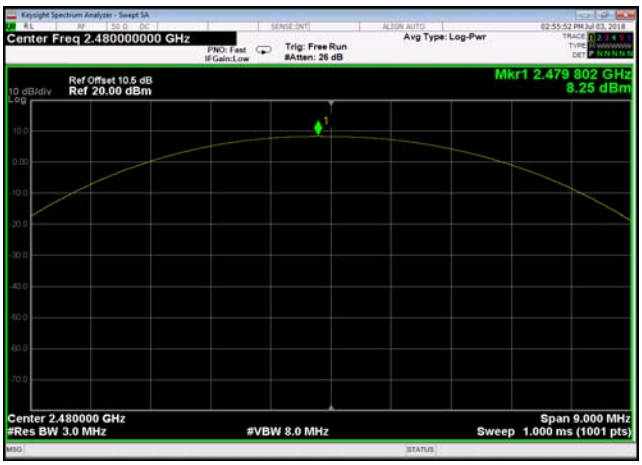
Output Power：GFSK,2402MHz,DH5



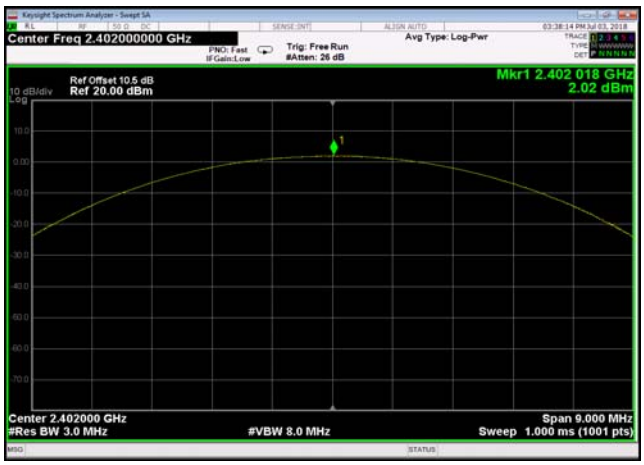
Output Power：GFSK,2441MHz,DH5



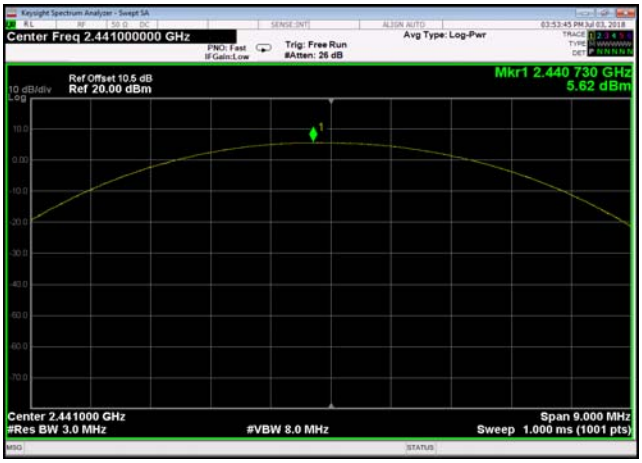
Output Power：GFSK,2480MHz,DH5



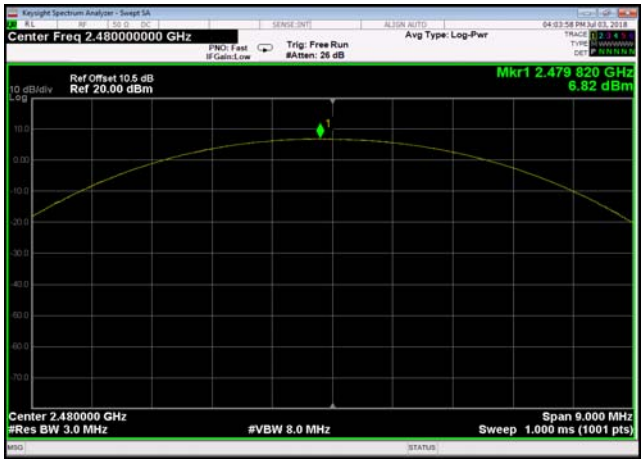
Output Power：pi/4DQPSK,2402MHz,2DH5



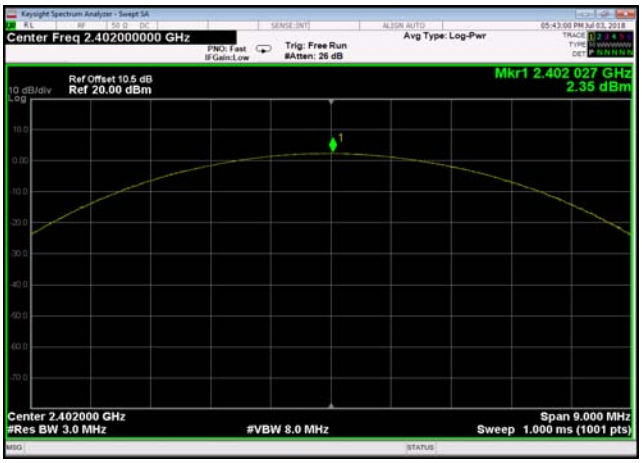
Output Power：pi/4DQPSK,2441MHz,2DH5



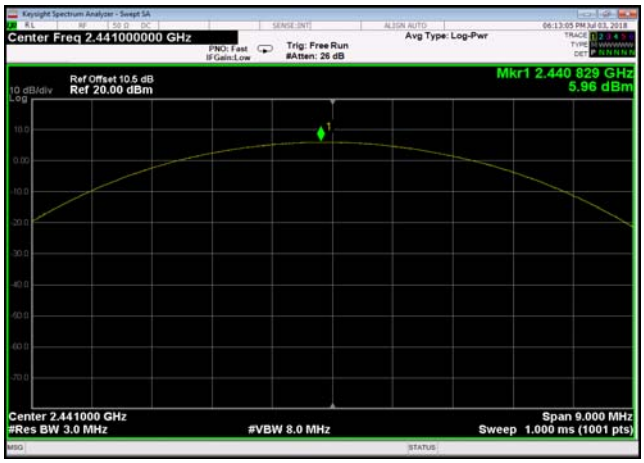
Output Power：pi/4DQPSK,2480MHz,2DH5



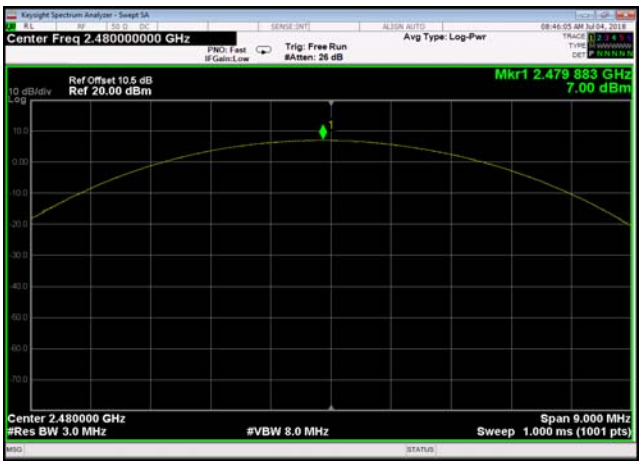
Output Power：8DPSK,2402MHz,3DH5



Output Power：8DPSK,2441MHz,3DH5



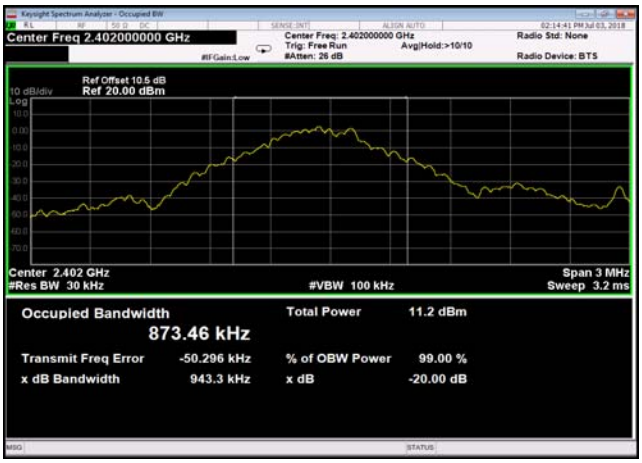
Output Power：8DPSK,2480MHz,3DH5



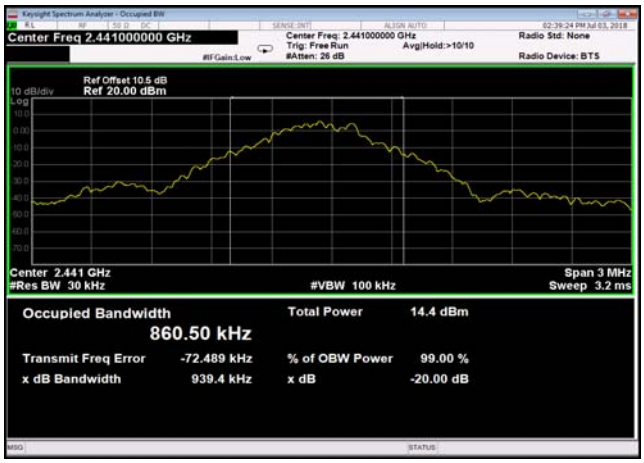
20dB Bandwidth
Test Result and Data

BT Occupied 20dB Bandwidth				
Mode	Test Frequency	Packet Type	-20db Occupy Bandwidth(KHz)	Result
GFSK	2402	DH5	943.256	Pass
GFSK	2441	DH5	939.429	Pass
GFSK	2480	DH5	941.06	Pass
pi/4DQPSK	2402	2DH5	1268.095	Pass
pi/4DQPSK	2441	2DH5	1239.214	Pass
pi/4DQPSK	2480	2DH5	1238.541	Pass
8DPSK	2402	3DH5	1267.819	Pass
8DPSK	2441	3DH5	1256.622	Pass
8DPSK	2480	3DH5	1256.927	Pass

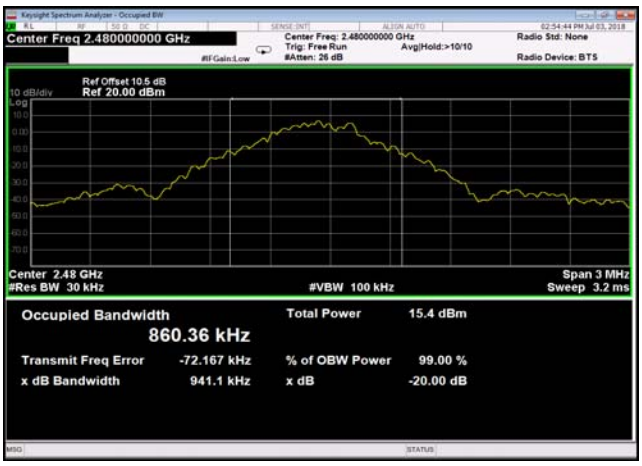
20dB Bandwidth：GFSK,2402MHz,DH5



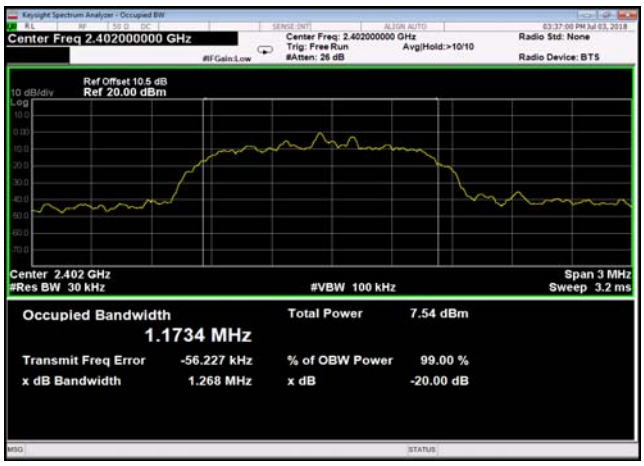
20dB Bandwidth：GFSK,2441MHz,DH5



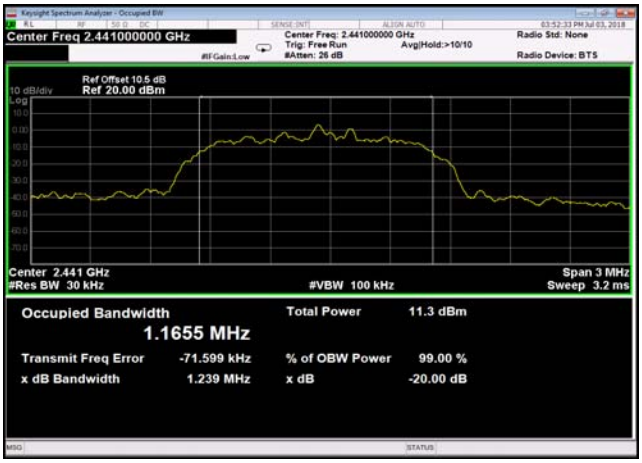
20dB Bandwidth：GFSK,2480MHz,DH5



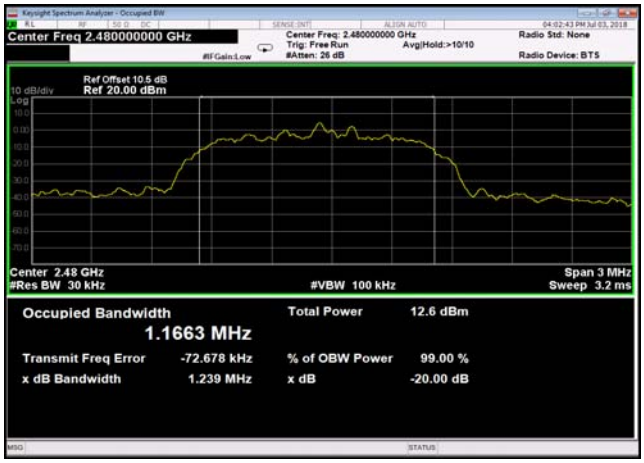
20dB Bandwidth：pi/4DQPSK,2402MHz,2DH5



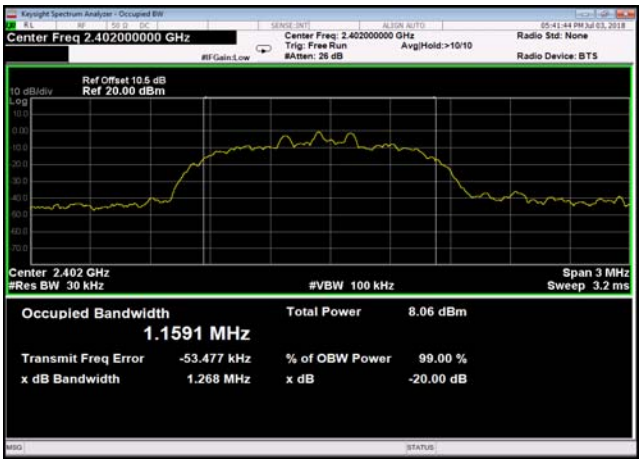
20dB Bandwidth：pi/4DQPSK,2441MHz,2DH5



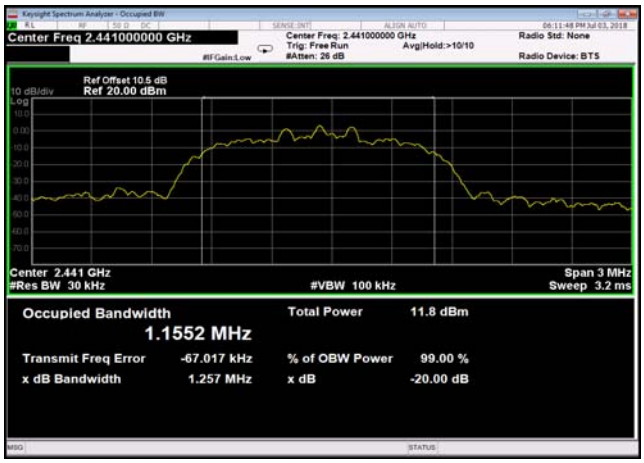
20dB Bandwidth：pi/4DQPSK,2480MHz,2DH5



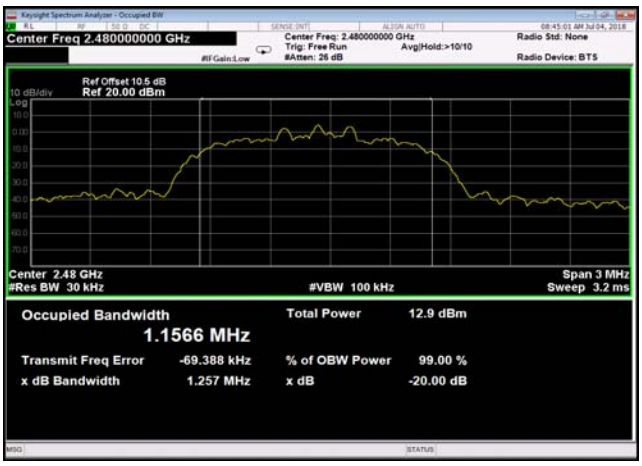
20dB Bandwidth：8DPSK,2402MHz,3DH5



20dB Bandwidth：8DPSK,2441MHz,3DH5

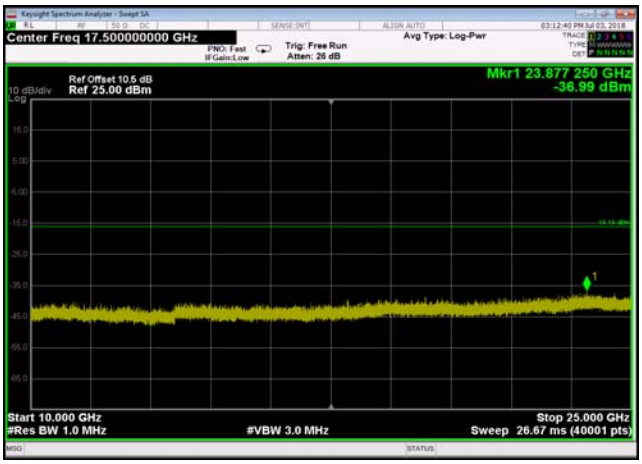


20dB Bandwidth：8DPSK,2480MHz,3DH5

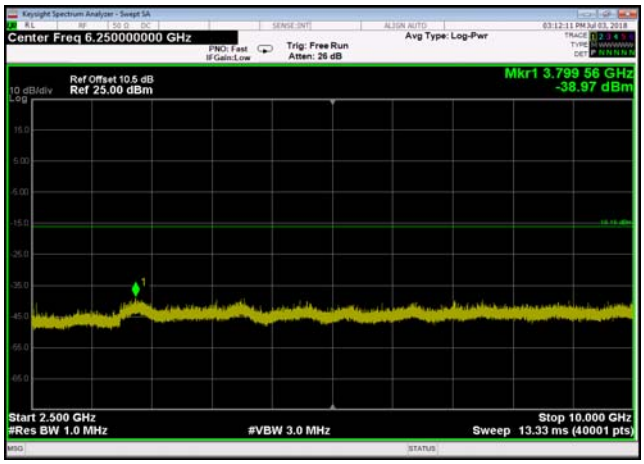


Transmitter Spurious Emission
Test Result and Data

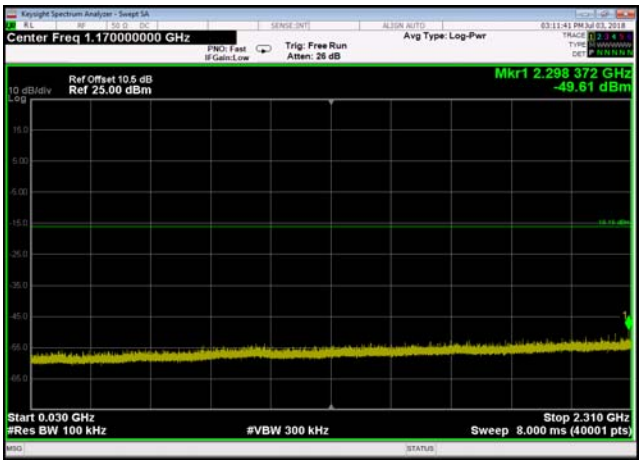
Conducted Emission：GFSK,2402,DH5 ,10000MHz~25000MHz



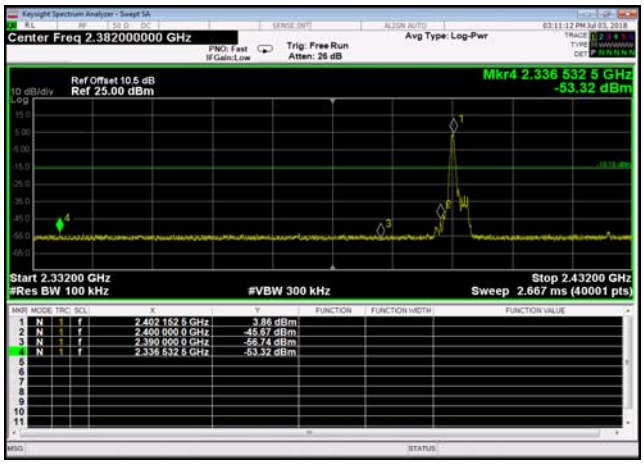
Conducted Emission：GFSK,2402,DH5 ,2500MHz~10000MHz



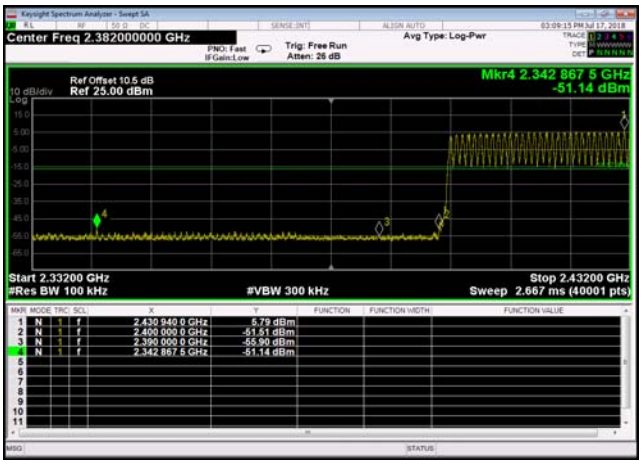
Conducted Emission：GFSK,2402,DH5 ,30MHz~2310MHz



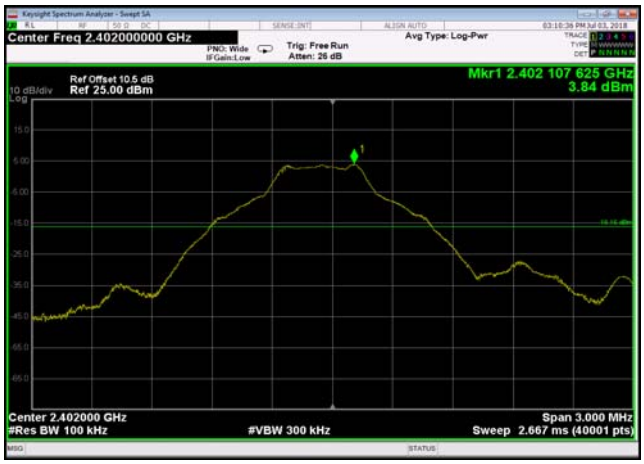
Conducted Emission：GFSK,2402,DH5 ,Band Edge HoppingOFF



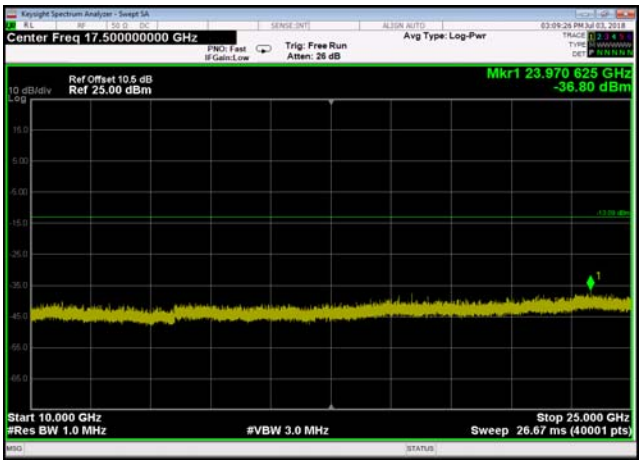
Conducted Emission：GFSK,2402,DH5 ,Band Edge HoppingON



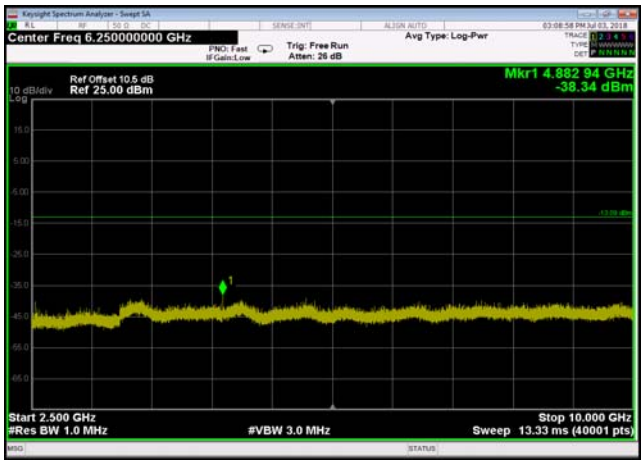
Conducted Emission：GFSK,2402,DH5 ,Reference Level



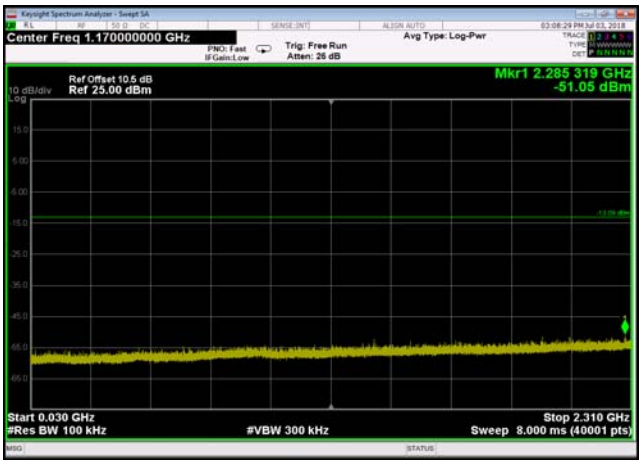
Conducted Emission：GFSK,2441,DH5 ,10000MHz~25000MHz



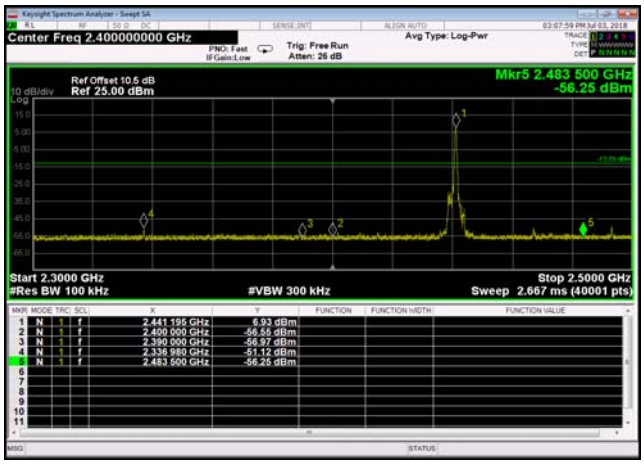
Conducted Emission：GFSK,2441,DH5 ,2500MHz~10000MHz



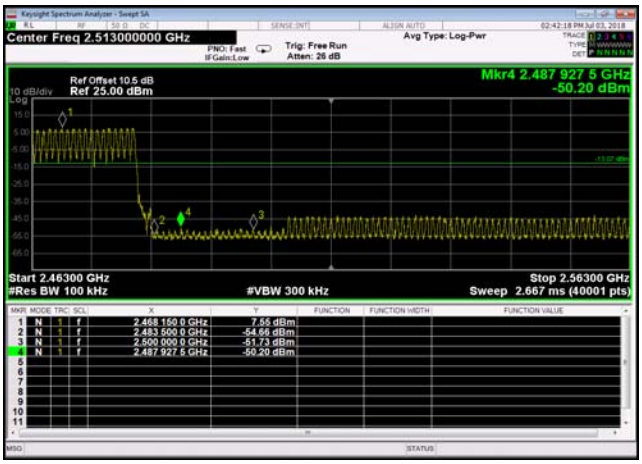
Conducted Emission：GFSK,2441,DH5 ,30MHz~2310MHz



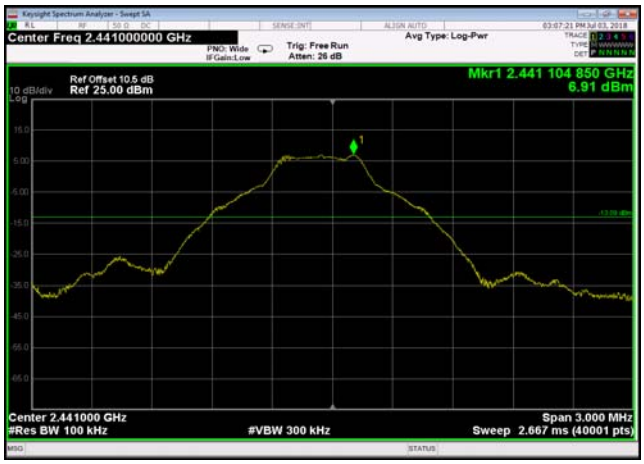
Conducted Emission：GFSK,2441,DH5 ,Band Edge HoppingOFF



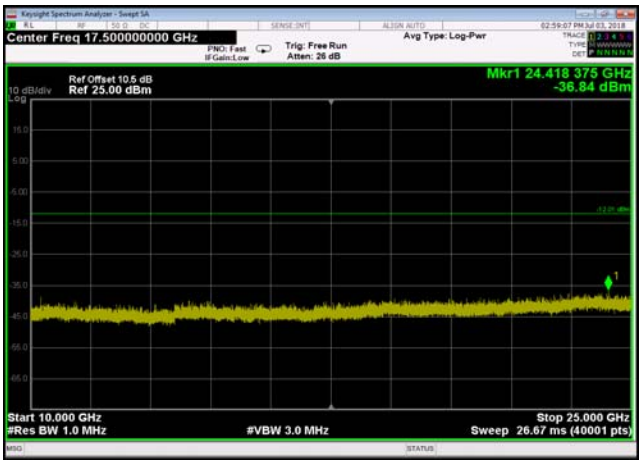
Conducted Emission：GFSK,2441,DH5 ,Band Edge HoppingON



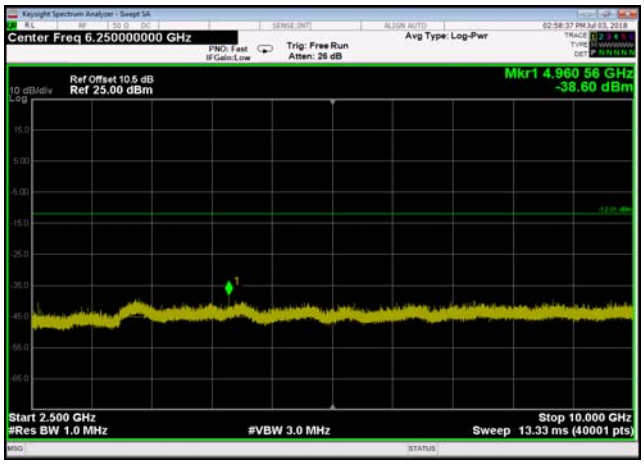
Conducted Emission：GFSK,2441,DH5 ,Reference Level



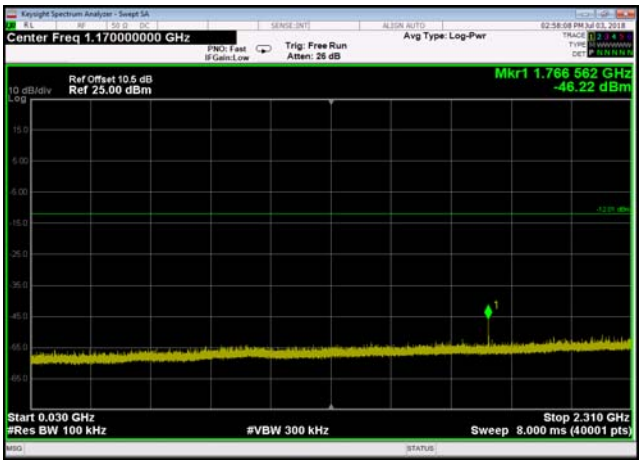
Conducted Emission：GFSK,2480,DH5 ,10000MHz~25000MHz



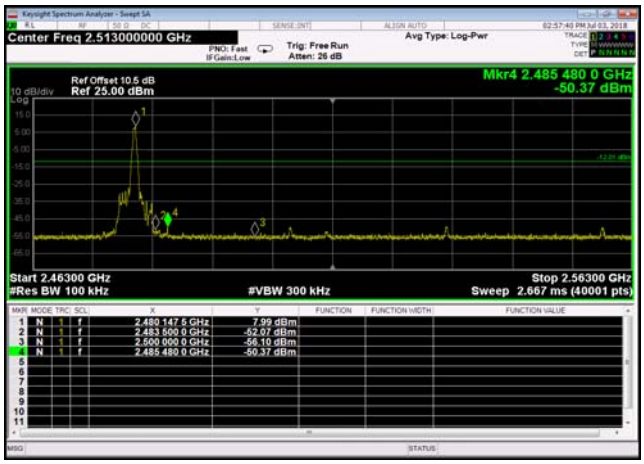
Conducted Emission：GFSK,2480,DH5 ,2500MHz~10000MHz



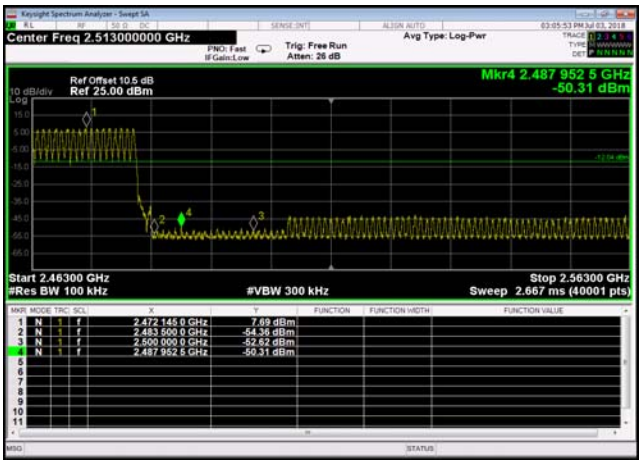
Conducted Emission：GFSK,2480,DH5 ,30MHz~2310MHz



Conducted Emission：GFSK,2480,DH5 ,Band Edge HoppingOFF

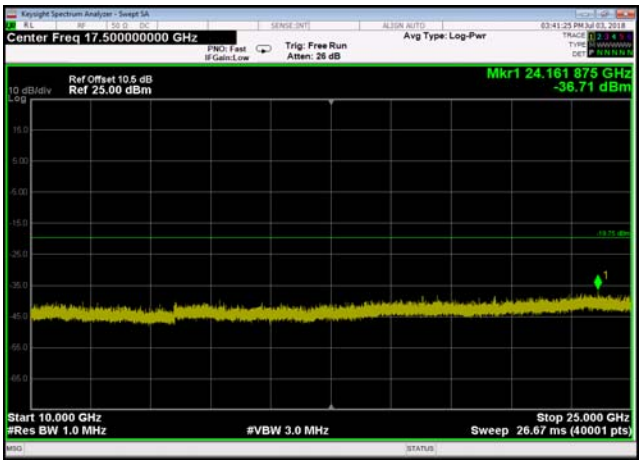


Conducted Emission：GFSK,2480,DH5 ,Band Edge HoppingON

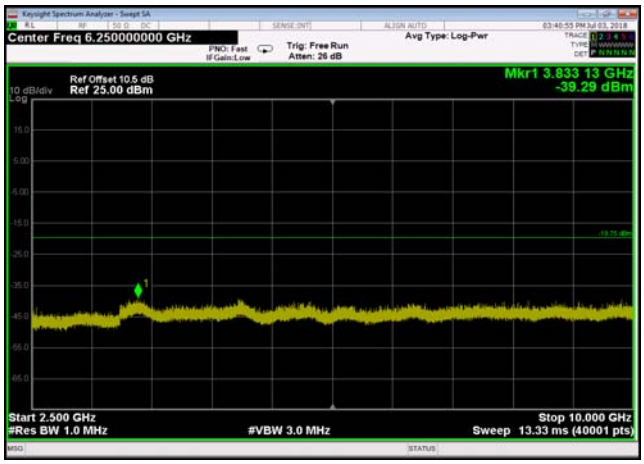


Conducted Emission：GFSK,2480,DH5 ,Reference Level

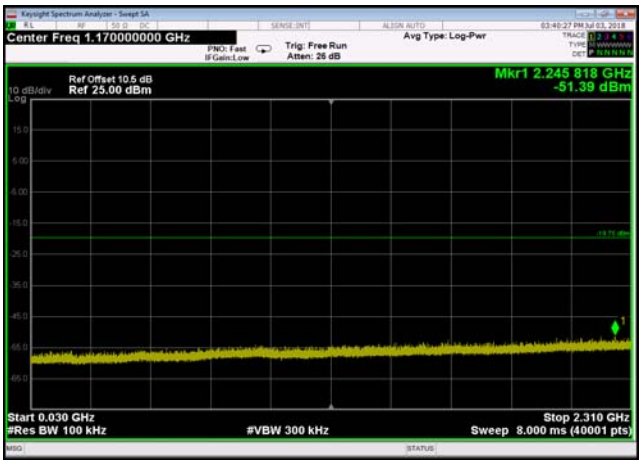
Conducted Emission：pi/4DQPSK,2402,2DH5 ,10000MHz~25000MHz



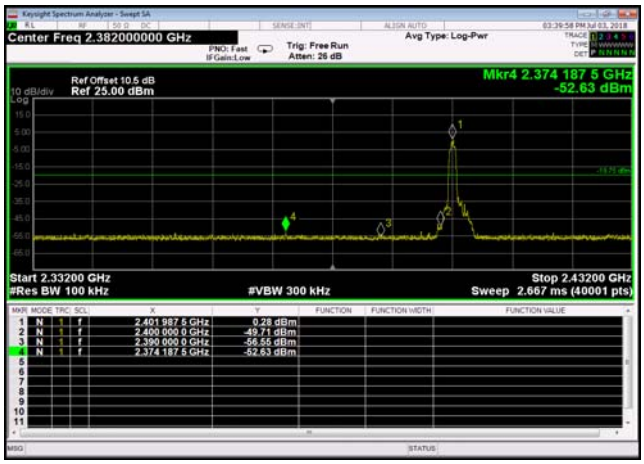
Conducted Emission：pi/4DQPSK,2402,2DH5 ,2500MHz~10000MHz



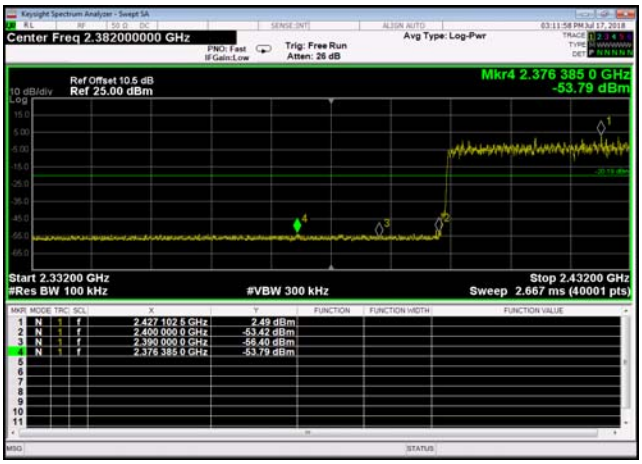
Conducted Emission：pi/4DQPSK,2402,2DH5 ,30MHz~2310MHz



Conducted Emission：pi/4DQPSK,2402,2DH5 ,Band Edge HoppingOFF

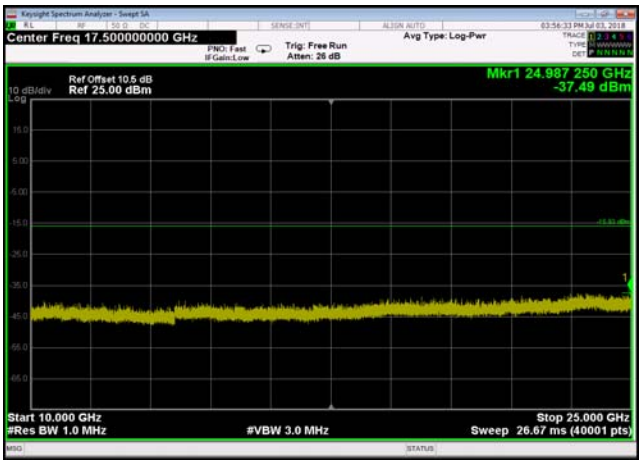


Conducted Emission：pi/4DQPSK,2402,2DH5 ,Band Edge HoppingON

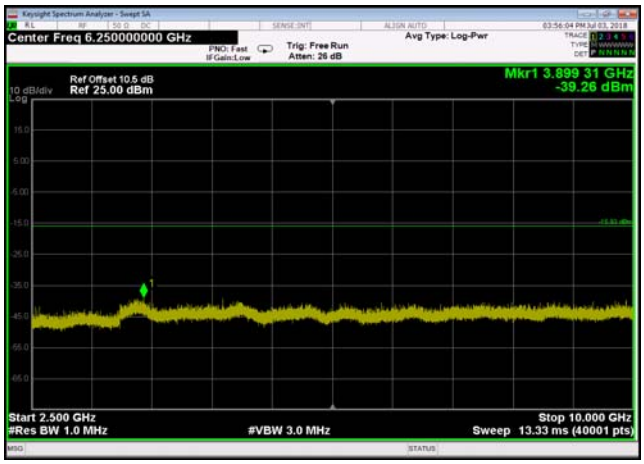


Conducted Emission：pi/4DQPSK,2402,2DH5 ,Reference Level

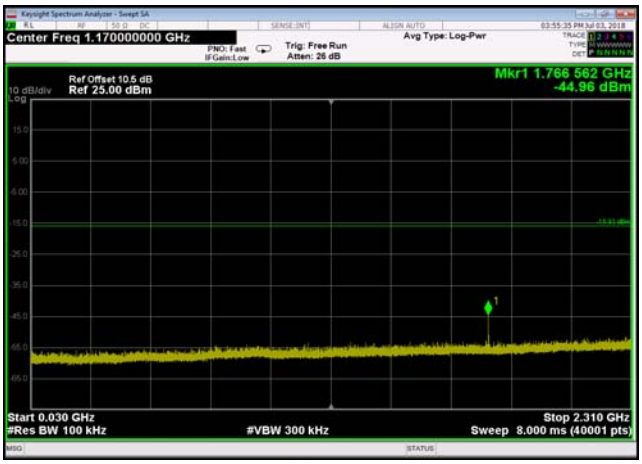
Conducted Emission：pi/4DQPSK,2441,2DH5 ,10000MHz~25000MHz



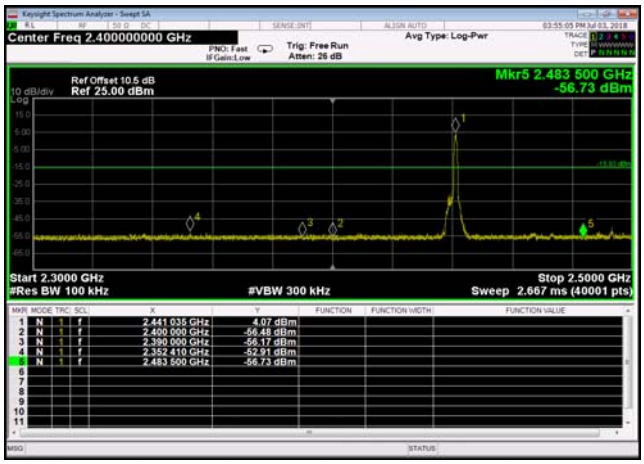
Conducted Emission：pi/4DQPSK,2441,2DH5 ,2500MHz~10000MHz



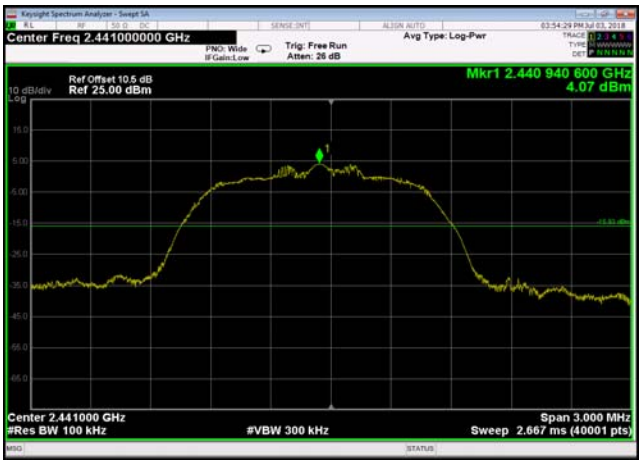
Conducted Emission：pi/4DQPSK,2441,2DH5 ,30MHz~2310MHz



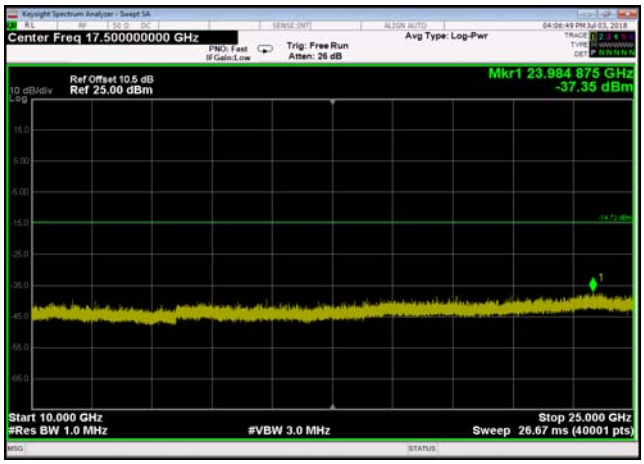
Conducted Emission：pi/4DQPSK,2441,2DH5 ,Band Edge HoppingOFF



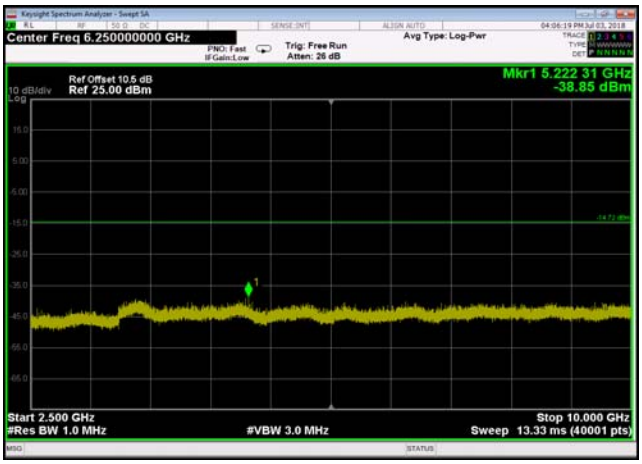
Conducted Emission：pi/4DQPSK,2441,2DH5 ,Reference Level



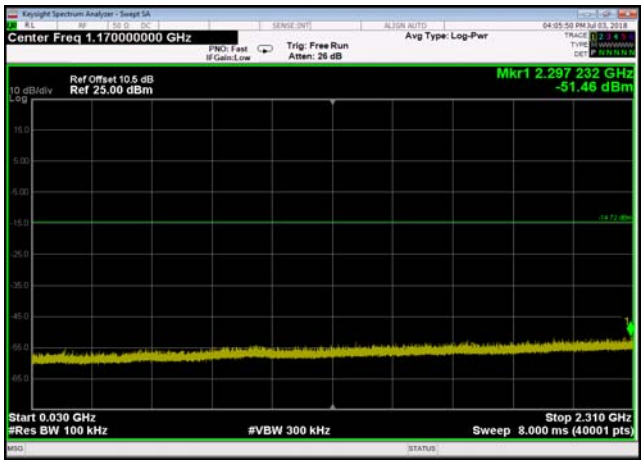
Conducted Emission：pi/4DQPSK,2480,2DH5 ,10000MHz~25000MHz



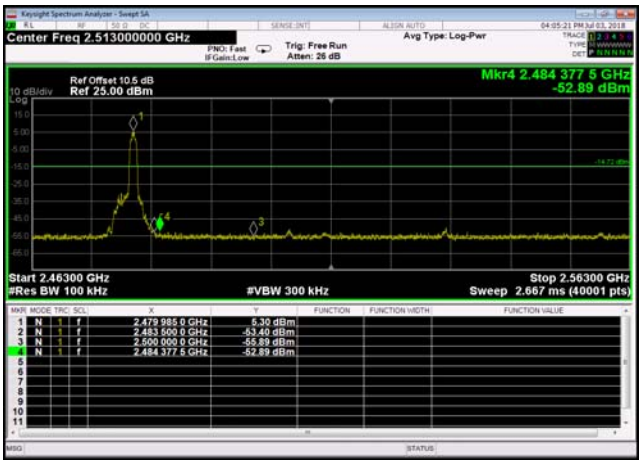
Conducted Emission：pi/4DQPSK,2480,2DH5 ,2500MHz~10000MHz



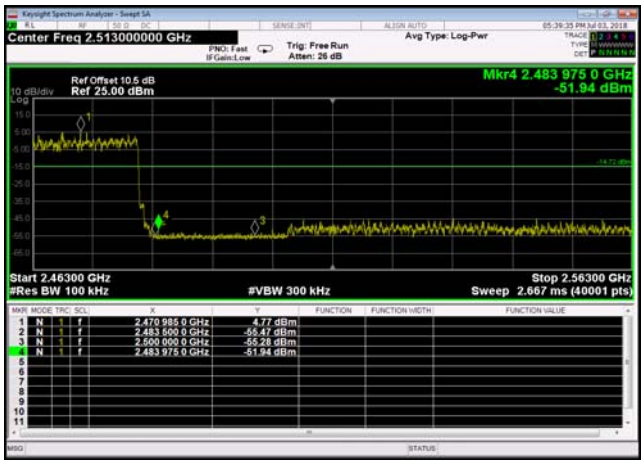
Conducted Emission：pi/4DQPSK,2480,2DH5 ,30MHz~2310MHz



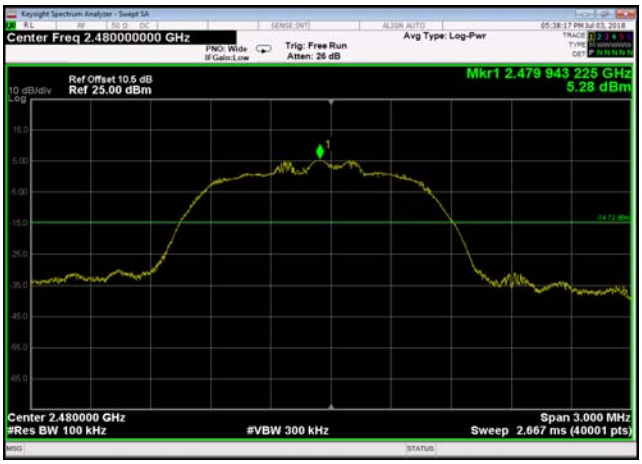
Conducted Emission：pi/4DQPSK,2480,2DH5 ,Band Edge HoppingOFF



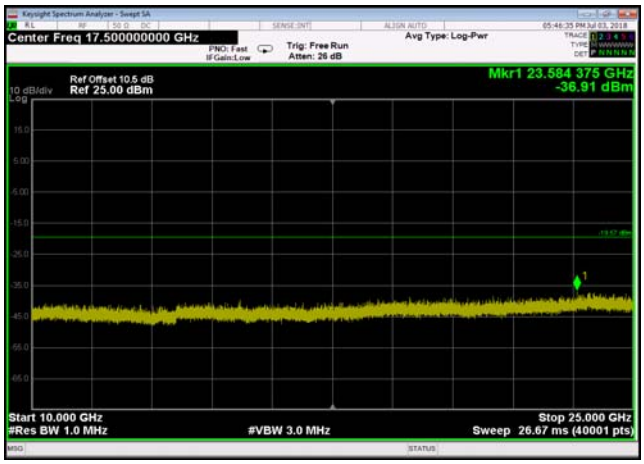
Conducted Emission：pi/4DQPSK,2480,2DH5 ,Band Edge HoppingON



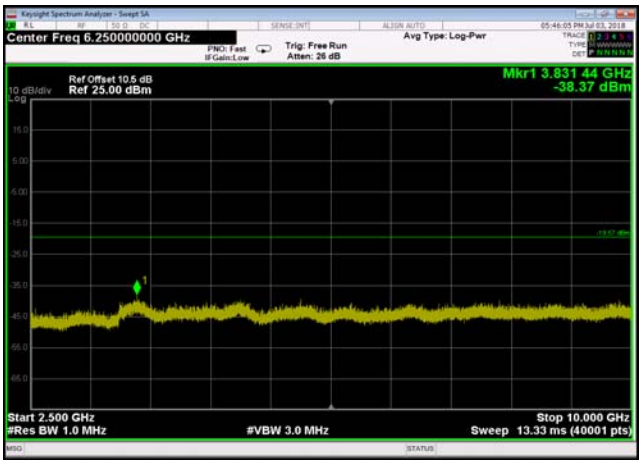
Conducted Emission：pi/4DQPSK,2480,2DH5 ,Reference Level



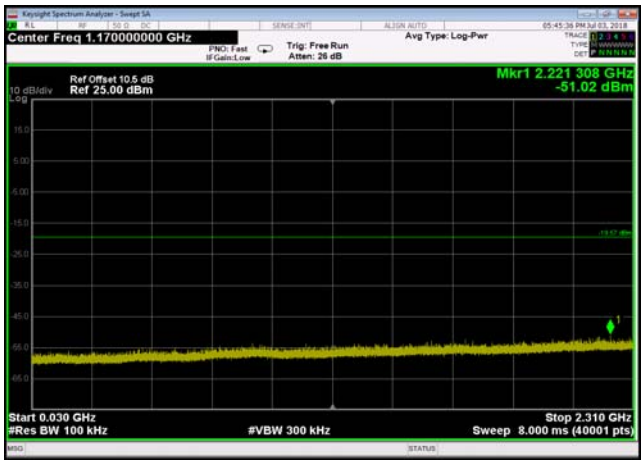
Conducted Emission：8DPSK,2402,3DH5 ,10000MHz~25000MHz



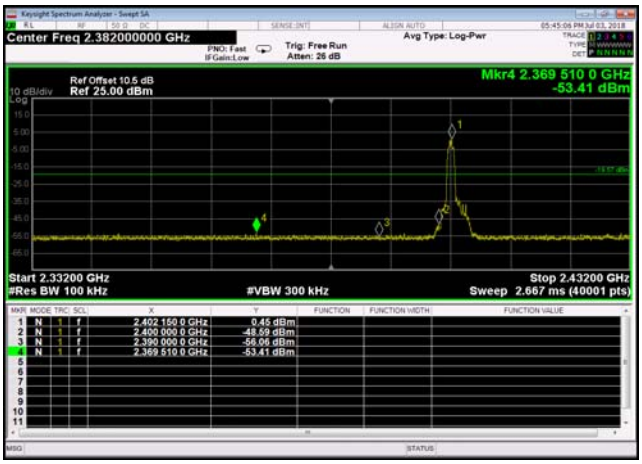
Conducted Emission：8DPSK,2402,3DH5 ,2500MHz~10000MHz



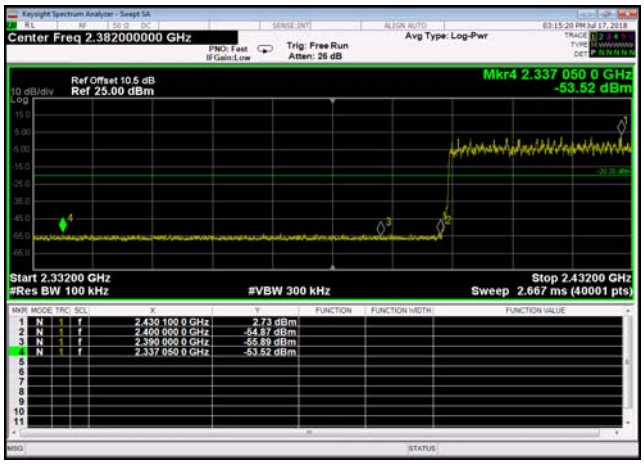
Conducted Emission：8DPSK,2402,3DH5 ,30MHz~2310MHz



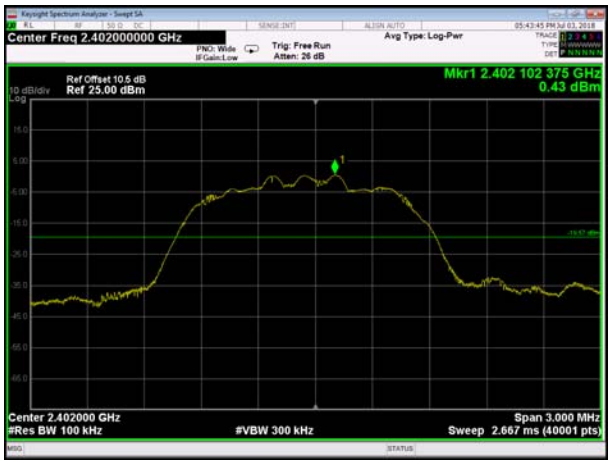
Conducted Emission：8DPSK,2402,3DH5 ,Band Edge HoppingOFF



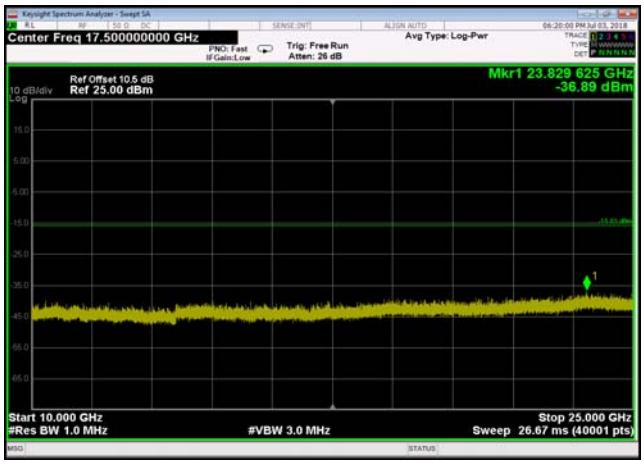
Conducted Emission：8DPSK,2402,3DH5 ,Band Edge HoppingON



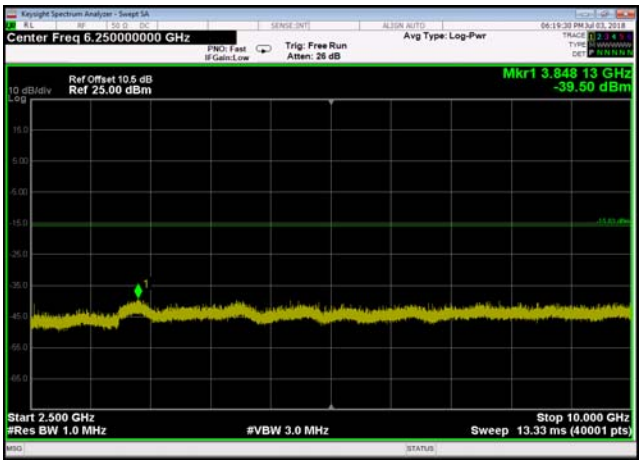
Conducted Emission：8DPSK,2402,3DH5 ,Reference Level



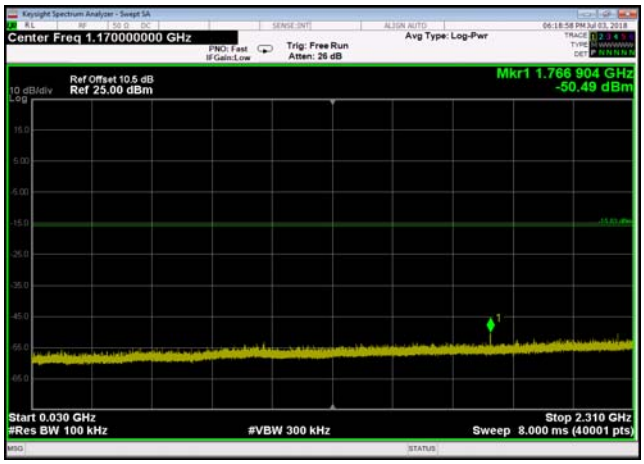
Conducted Emission：8DPSK,2441,3DH5 ,10000MHz~25000MHz



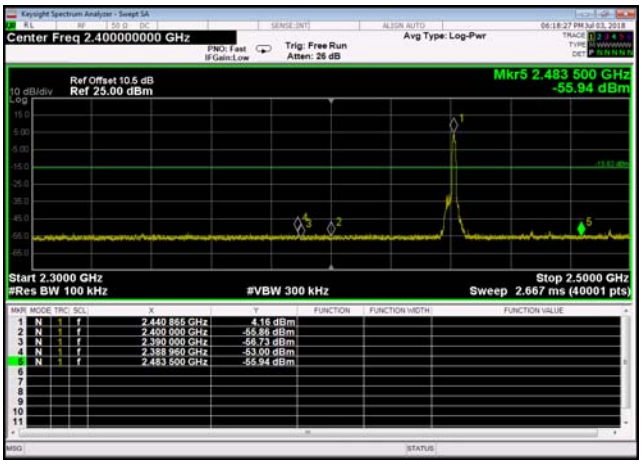
Conducted Emission：8DPSK,2441,3DH5 ,2500MHz~10000MHz



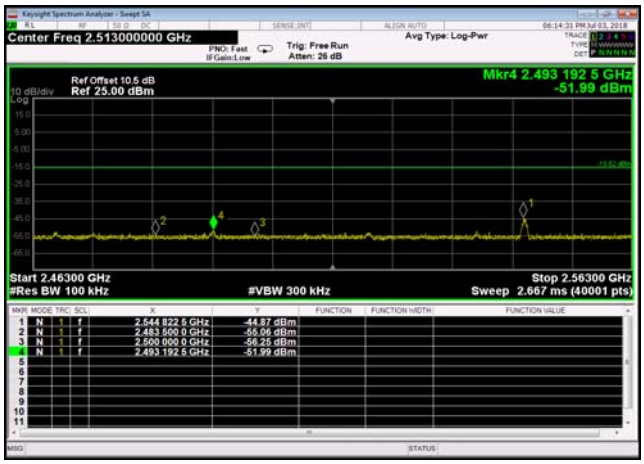
Conducted Emission：8DPSK,2441,3DH5 ,30MHz~2310MHz



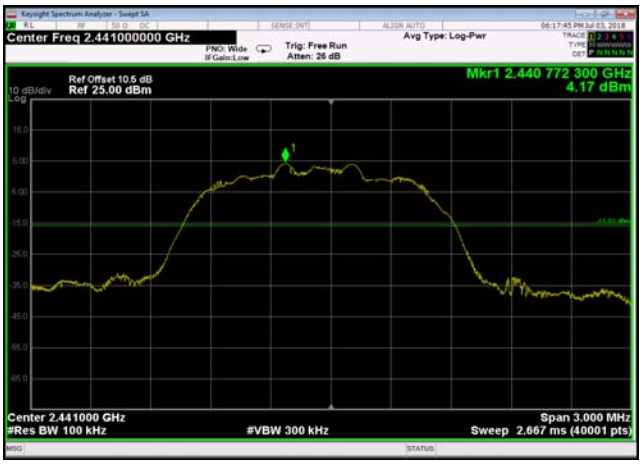
Conducted Emission：8DPSK,2441,3DH5 ,Band Edge HoppingOFF



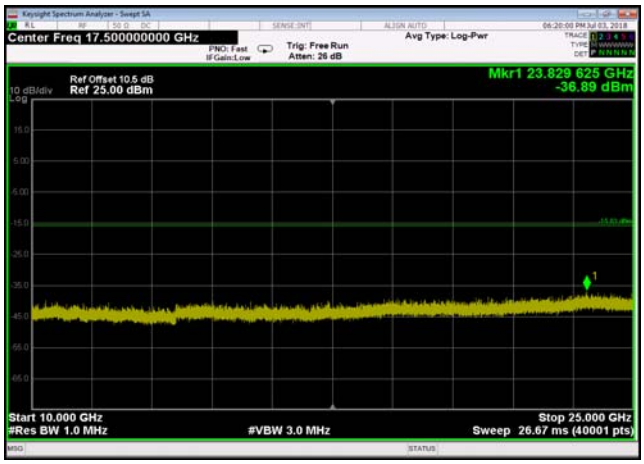
Conducted Emission：8DPSK,2441,3DH5 ,Band Edge HoppingON



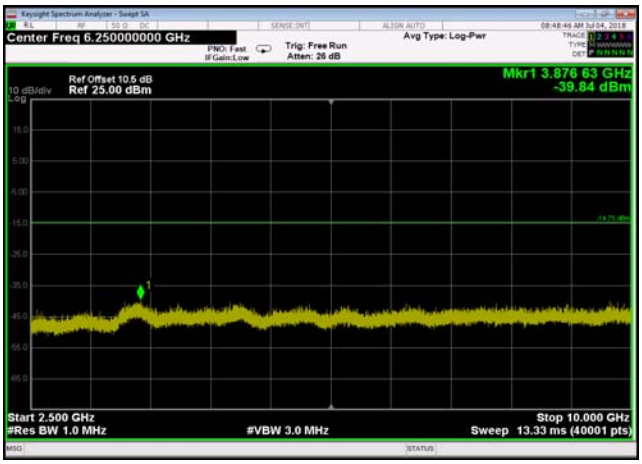
Conducted Emission：8DPSK,2441,3DH5 ,Reference Level



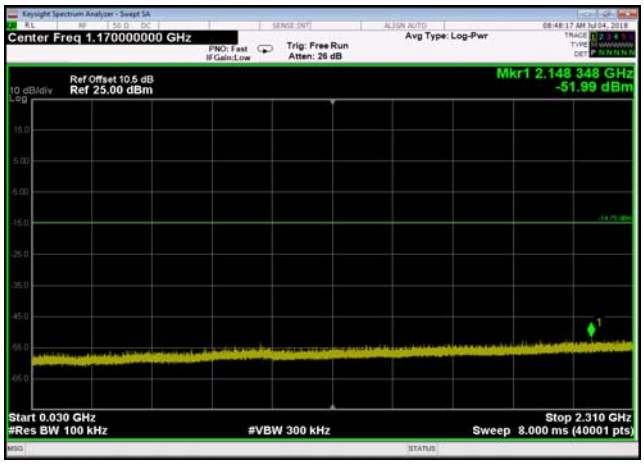
Conducted Emission：8DPSK,2480,3DH5 ,10000MHz~25000MHz



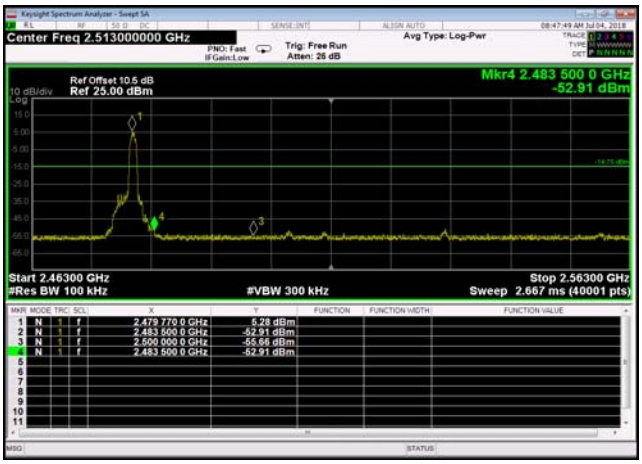
Conducted Emission：8DPSK,2480,3DH5 ,2500MHz~10000MHz



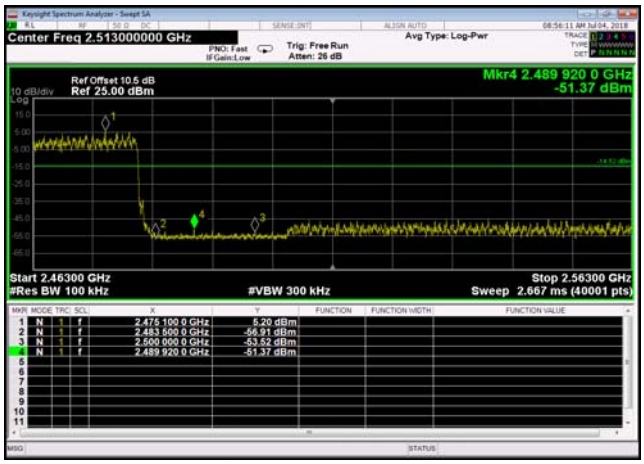
Conducted Emission：8DPSK,2480,3DH5 ,30MHz~2310MHz



Conducted Emission：8DPSK,2480,3DH5 ,Band Edge HoppingOFF



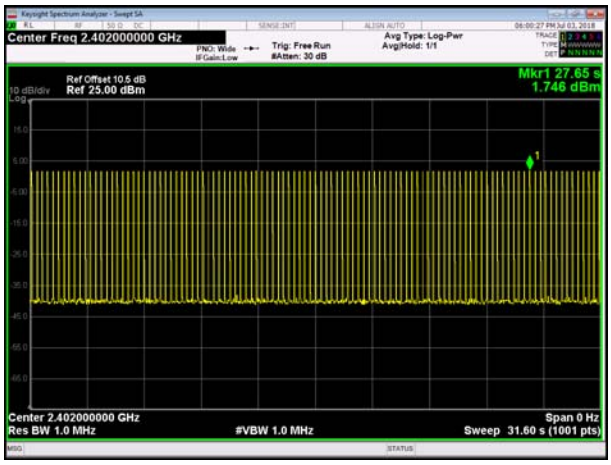
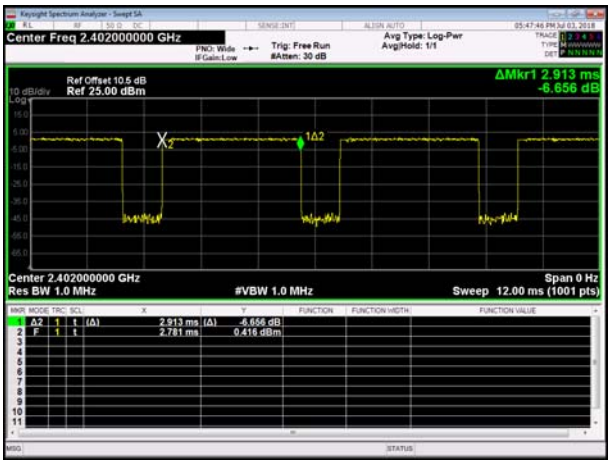
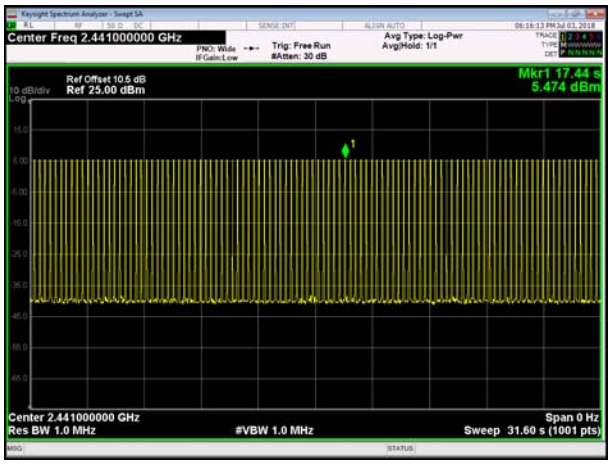
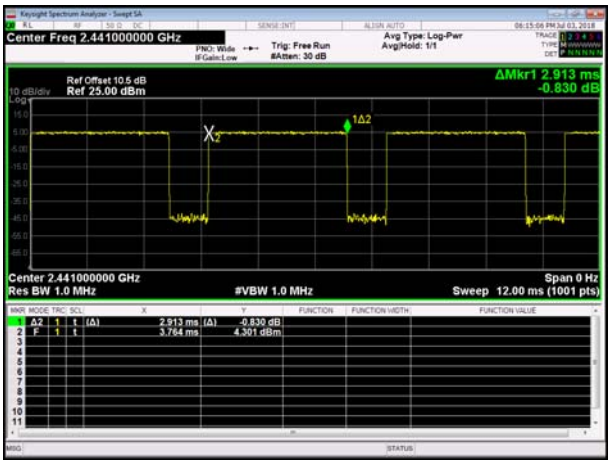
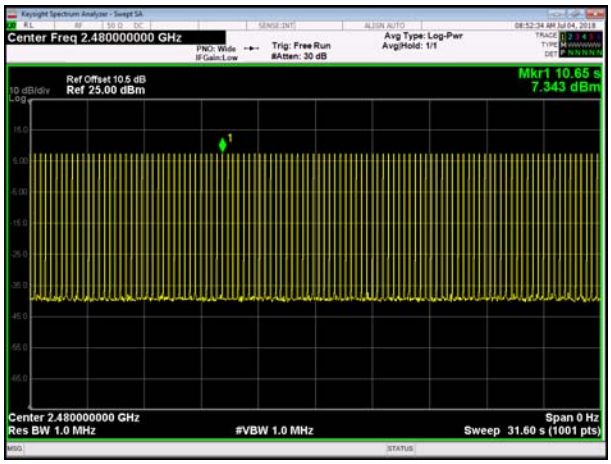
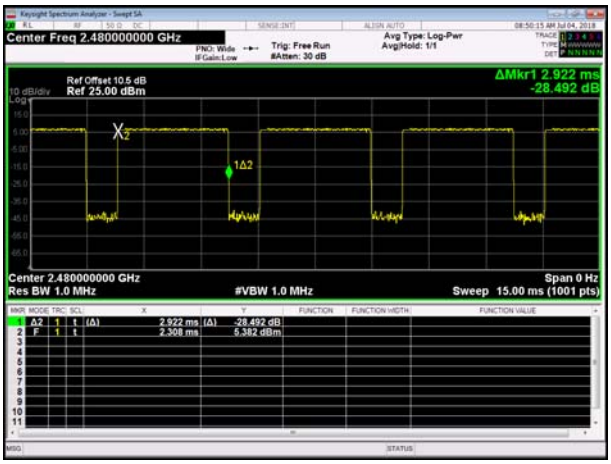
Conducted Emission：8DPSK,2480,3DH5 ,Band Edge HoppingON

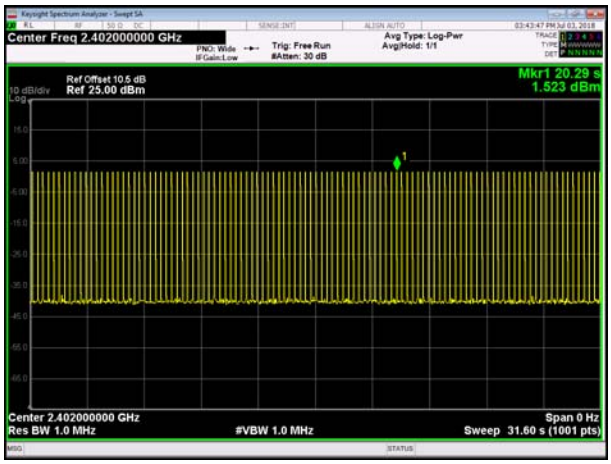
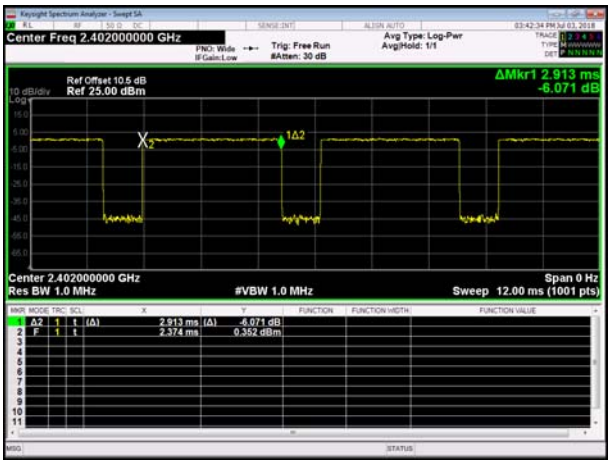
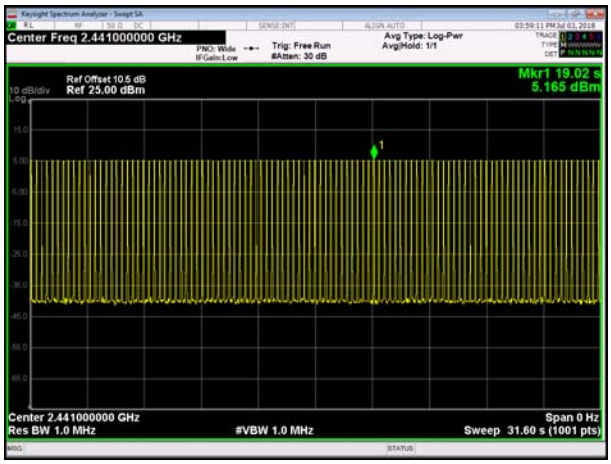
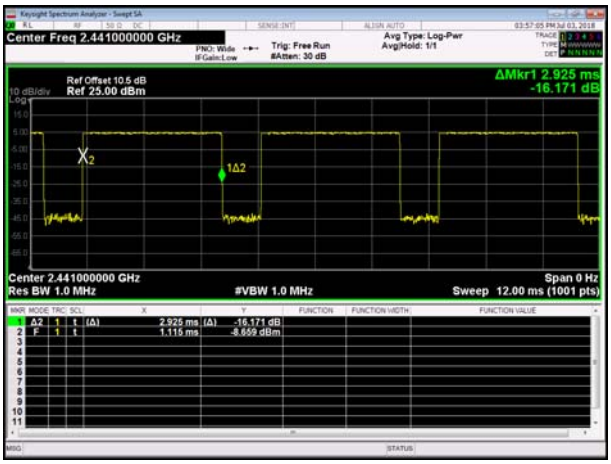
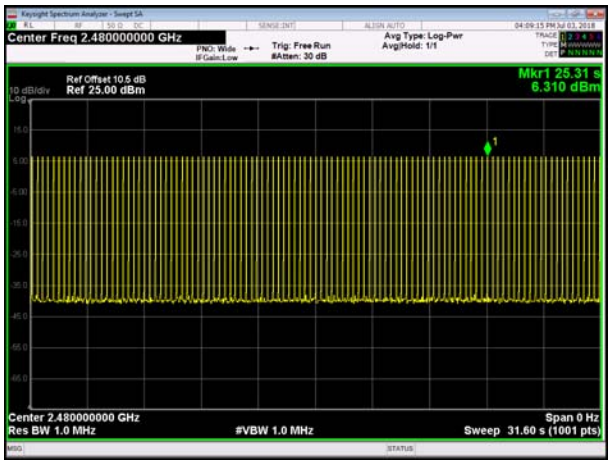
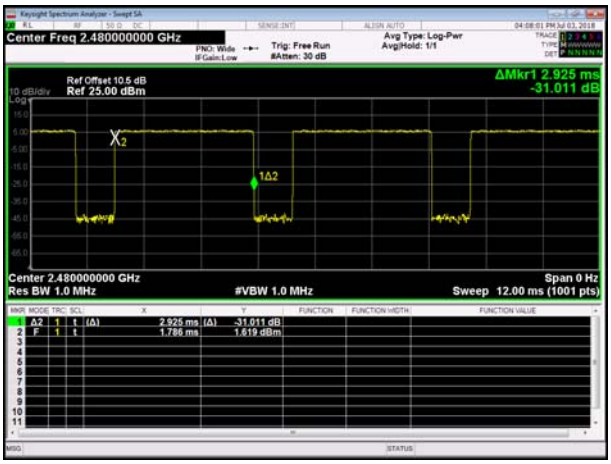


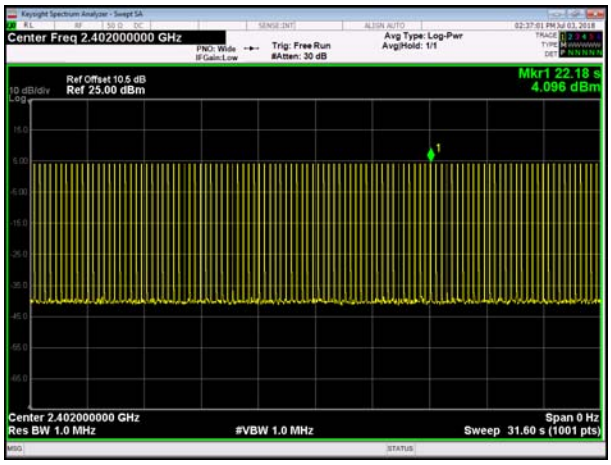
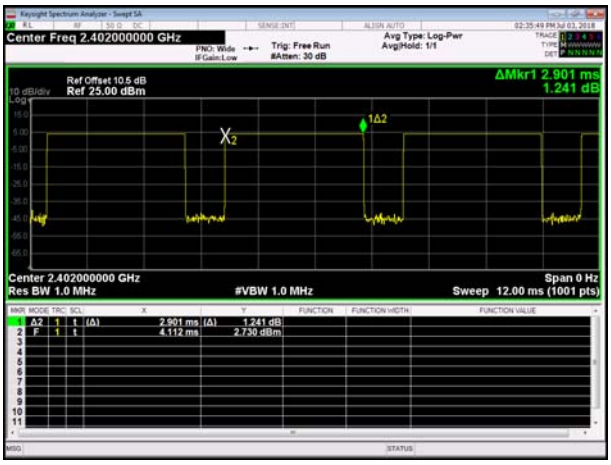
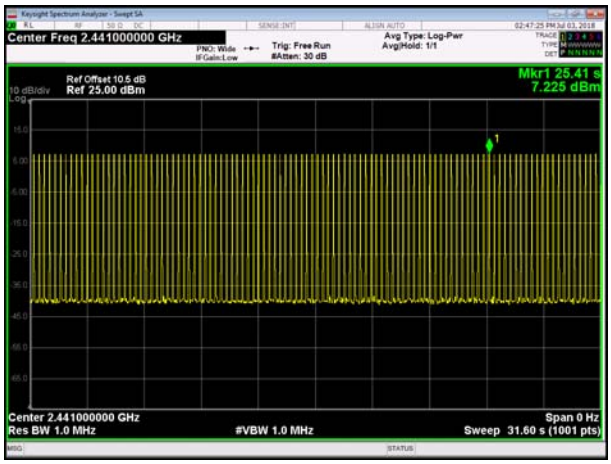
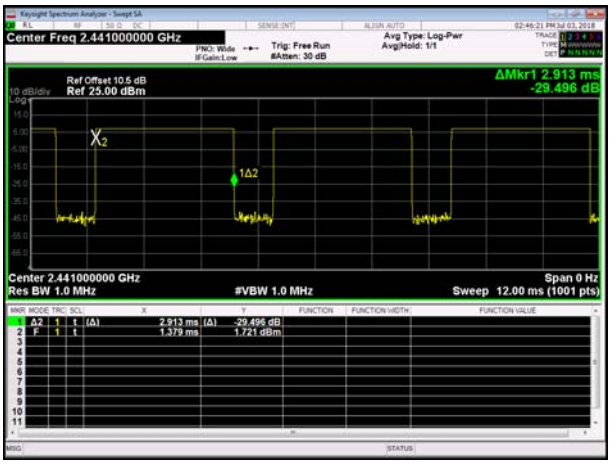
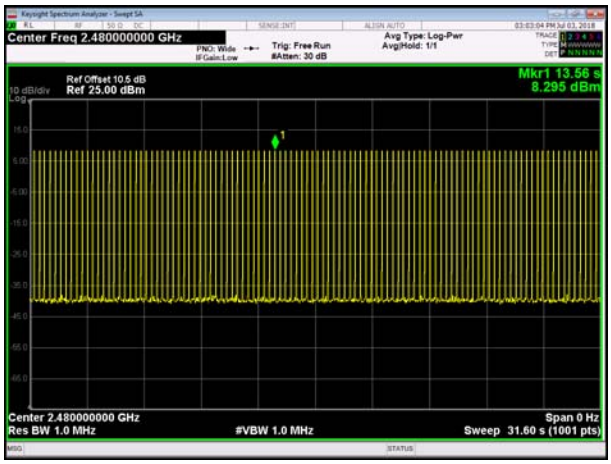
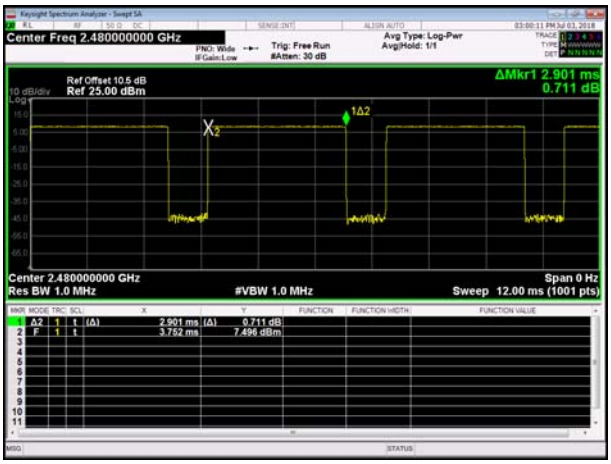
Conducted Emission：8DPSK,2480,3DH5 ,Reference Level

Dwell Time
Test Result and Data

BT Dwell Time						
Mode	Test Frequency	Packet Type	Transmission Time(ms)	Number	Dwell Time(ms)	Result
GFSK	2402	DH5	2.90	106	307.52	Pass
GFSK	2441	DH5	2.91	106	308.79	Pass
GFSK	2480	DH5	2.90	106	307.52	Pass
pi/4DQPSK	2402	2DH5	2.91	107	311.7	Pass
pi/4DQPSK	2441	2DH5	2.93	107	312.98	Pass
pi/4DQPSK	2480	2DH5	2.93	107	312.98	Pass
8DPSK	2402	3DH5	2.91	107	311.7	Pass
8DPSK	2441	3DH5	2.91	106	308.79	Pass
8DPSK	2480	3DH5	2.92	107	312.66	Pass

Dwell Time：8DPSK,2402,3DH5,Transmission Number	Dwell Time：8DPSK,2402,3DH5,Transmission Time
	
Dwell Time：8DPSK,2441,3DH5,Transmission Number	Dwell Time：8DPSK,2441,3DH5,Transmission Time
	
Dwell Time：8DPSK,2480,3DH5,Transmission Number	Dwell Time：8DPSK,2480,3DH5,Transmission Time
	

Dwell Time：pi/4DQPSK,2402,2DH5,Transmission Number	Dwell Time：pi/4DQPSK,2402,2DH5,Transmission Time
	
Dwell Time：pi/4DQPSK,2441,2DH5,Transmission Number	Dwell Time：pi/4DQPSK,2441,2DH5,Transmission Time
	
Dwell Time：pi/4DQPSK,2480,2DH5,Transmission Number	Dwell Time：pi/4DQPSK,2480,2DH5,Transmission Time
	

Dwell Time：GFSK,2402,DH5,Transmission Number	Dwell Time：GFSK,2402,DH5,Transmission Time
	
Dwell Time：GFSK,2441,DH5,Transmission Number	Dwell Time：GFSK,2441,DH5,Transmission Time
	
Dwell Time：GFSK,2480,DH5,Transmission Number	Dwell Time：GFSK,2480,DH5,Transmission Time
	

Carrier Frequency Separation

Test Result and Data

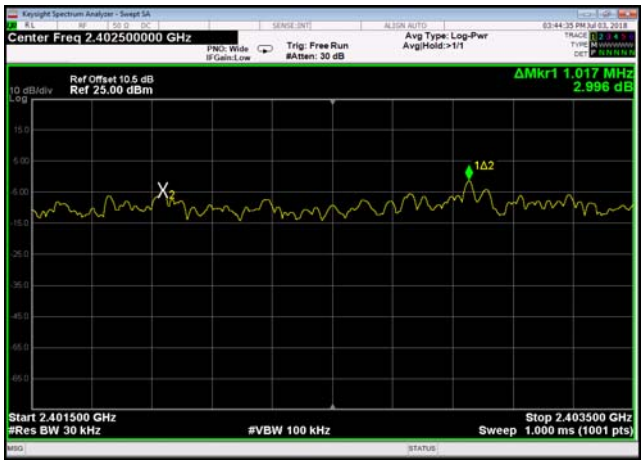
BT Carrier Frequency Separation						
Mode	Test Frequency	Packet Type	Range (MHz~MHz)	Separation (kHz)	Limit (KHz)	Result
GFSK	Hopping	DH5	2401.5MHz~2403.5MHz	997	500.00	Pass
GFSK	Hopping	DH5	2401.5MHz~2403.5MHz	977	500.00	Pass
GFSK	Hopping	DH5	2401.5MHz~2403.5MHz	1107	500.00	Pass
pi/4DQPSK	Hopping	2DH5	2401.5MHz~2403.5MHz	1017	500.00	Pass
pi/4DQPSK	Hopping	2DH5	2440.5MHz~2442.5MHz	997	500.00	Pass
pi/4DQPSK	Hopping	2DH5	2478.5MHz~2480.5MHz	1035	500.00	Pass
8DPSK	Hopping	3DH5	2401.5MHz~2403.5MHz	1001	500.00	Pass
8DPSK	Hopping	3DH5	2440.5MHz~2442.5MHz	1181	500.00	Pass
8DPSK	Hopping	3DH5	2478.5MHz~2480.5MHz	1157	500.00	Pass

Carrier Frequency Separation：GFSK ,HoppingDH5 2401.5~2403.5

Carrier Frequency Separation：GFSK ,HoppingDH5 2440.5~2442.5

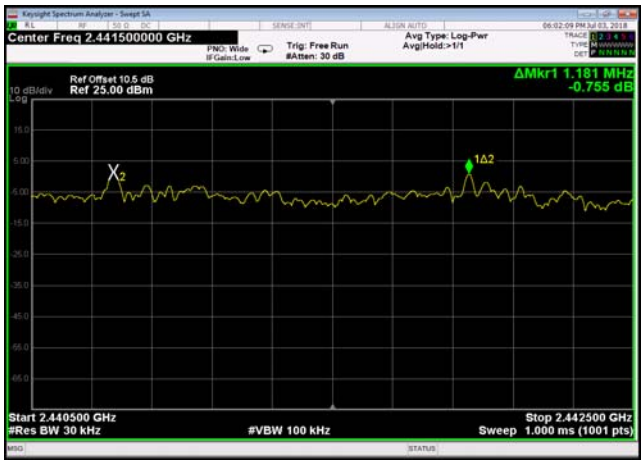
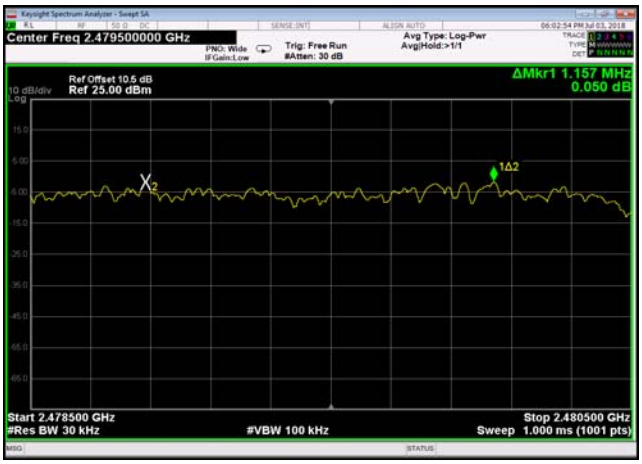
Carrier Frequency Separation：GFSK ,HoppingDH5 2478.5~2480.5

Carrier Frequency Separation：pi/4DQPSK ,Hopping2DH5 2401.5~2403.5



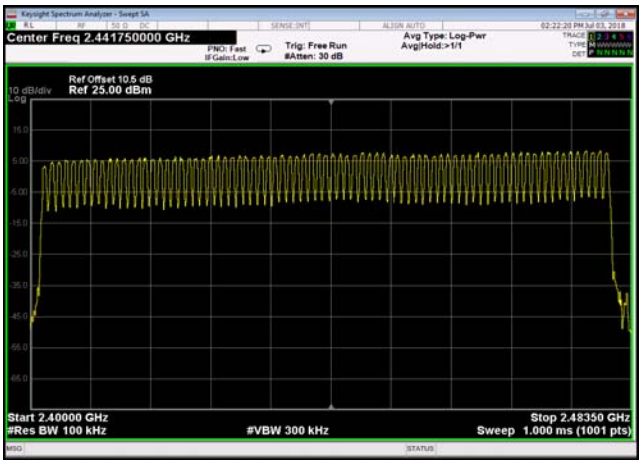
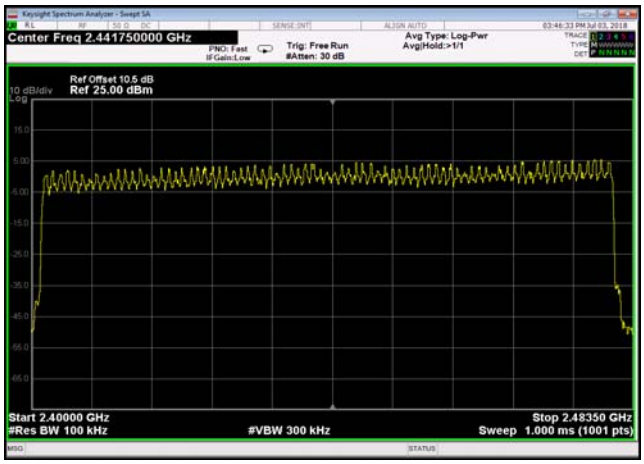
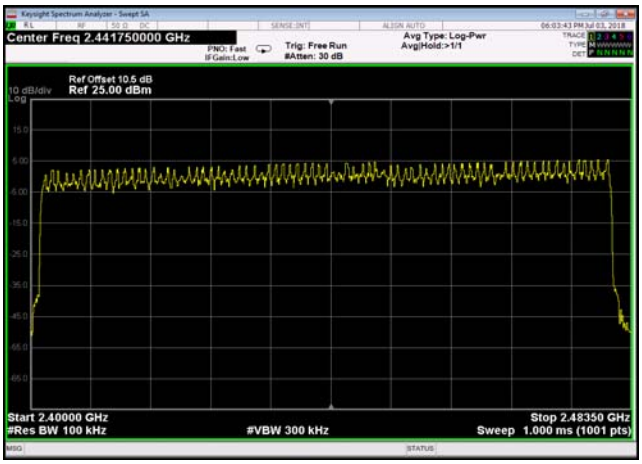
Carrier Frequency Separation：pi/4DQPSK ,Hopping2DH5 2440.5~2442.5

Carrier Frequency Separation：pi/4DQPSK ,Hopping2DH5 2478.5~2480.5

Carrier Frequency Separation：8DPSK ,Hopping3DH5 2401.5~2403.5	Carrier Frequency Separation：8DPSK ,Hopping3DH5 2440.5~2442.5
	
Carrier Frequency Separation：8DPSK ,Hopping3DH5 2478.5~2480.5	
	

Hopping Channel Numbers
Test Result and Data

BT Number Of Hopping Channels				
Mode	Test Frequency	Packet Type	Test Range(MHz~MHz)	Result
GFSK	Hopping	DH5	2400~2483.5	Pass
pi/4DQPSK	Hopping	2DH5	2400~2483.5	Pass
8DPSK	Hopping	3DH5	2400~2483.5	Pass

Number Of Hopping Channels：GFSK ,HoppingMhz,DH5__2400~2483.5	Number Of Hopping Channels：pi/4DQPSK ,HoppingMhz,2DH5__2400~2483.5
	
Number Of Hopping Channels：8DPSK ,HoppingMhz,3DH5__2400~2483.5	
	

** END OF REPORT **