RF TEST REPORT

Report No.: SET2019-13140

Product Name: 24VREDIO

FCC ID: 2AUSR-LT0326

Model No. : HS-LT0326

Applicant: Liuzhou hangsheng technology co. LTD.

Address: 1 machang road, liubei district, liuzhou city, guangxi province, China.

Dates of Testing: 9/20/2019 —10/11/2019

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.
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Test Report

Product Name.....: 24VREDIO

Brand Name.....: HSAE

Trade Name.....: HSAE

Applicant.....: Liuzhou hangsheng technology co. LTD.

Applicant Address.....: 1 machang road, liubei district, liuzhou city, guangxi province, China.

Manufacturer .....: Liuzhou hangsheng technology co. LTD.

Manufacturer Address .....: 1 machang road, liubei district, liuzhou city, guangxi province, China.

Test Standards.....: 47 CFR Part 15 Subpart C：Radio Frequency Devices
ANSI C63.10-2013：American National Standard for Testing Unlicensed Wireless Devices

Test Result.....: PASS

Tested by .....: Vincent 2019.10.11

Vincent, Test Engineer

Reviewed by .....: Chris You 2019.10.11

Chris You, Senior Engineer

Approved by .....: Shuangwen Zhang 2019.10.11

Shuangwen Zhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2019.10.11	First edition

1. General Information

1.1. EUT Description

EUT Type	24VREDIO	
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
Hardware Version	S00	
Software version	V008	
Antenna Type	PCB Antenna	
Antenna Gain	-2.6dBi	

Note 1: The EUT is a 24VREDIO, 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.

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 C63.102013	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) 15.205	Radiated Band Edges and Spurious Emission	PASS

Note: The tests were 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 systemhopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equallyon the average by each transmitter. The system receivers shall have input bandwidths that match the hoppingchannel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with thetransmitted signals.

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

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the systemto recognize other users within the spectrum band so that it individually andindependently chooses and adapts itshopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems inany other manner for the express purpose of avoiding the simultaneous occupancy of individual hoppingfrequencies 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 technologycalled frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitterswitches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devicesparticipating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequencyhopping sequence is determined by the master's device address and the phase of the hopping sequence (thefrequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconetmust 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 fora Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wirelessdevices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. TheAFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of anyidentified bad channels. The devices will then switch to alternative available "good" channels, away from theareas 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. DesignationNumber: CN5031, valid time is until December 31, 2019.

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 December 31, 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 antennawas 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	24VREDIO	PCB	-2.6

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

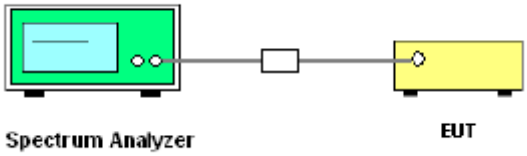
2.2.1. Limit of Number of Hopping Frequency

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 ANSI C63.10-2013 Clause 7.8.3

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;

   Set the RBW to less than 30% of the channelspacing or the 20 dB bandwidth,

   Whichever is smaller.VBW≥RBW, Trace = max hold, Sweep=auto, Detector function=peak.

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

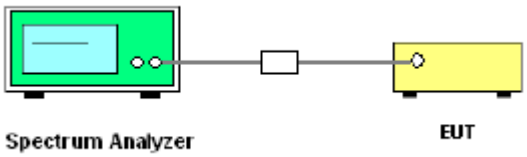
2.3.1. Limit of Peak Output Power

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 the5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band0.125 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 ANSI C63.10-2013 Clause 7.8.5
2. The RF output of EUT was connected to Spectrum analyzer by RF cable and attenuator. The pathloss 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

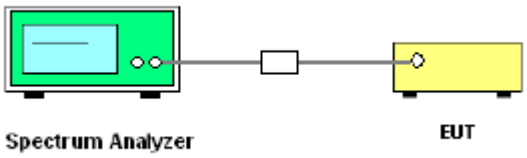
2.4.1. Definition

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 ANSI C63.10-2013 Clause 6.9.2
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. Thepath 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 5 times the OBW, centered on a hopping channel;

   RBW⩾1% to 5% of the OBW; VBWshall be approximately three times 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

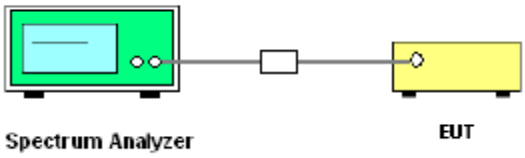
2.5.1. Limit of Carried Frequency Separation

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 ANSI C63.10-2013 Clause 7.8.2.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. Thepath 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: Start with the RBW set to approximately 30% of the channel spacing;

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

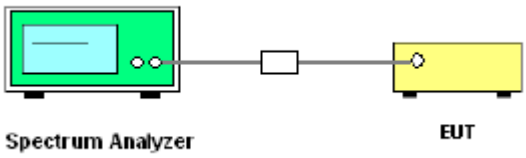
2.6.1. Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a periodof 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 ANSI C63.10-2013 Clause 7.8.4.
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 shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is theexpected dwell time per channel; VBW⩾RBW; Sweep = as necessary to capture the entire dwell timeper 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

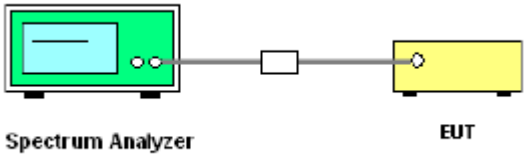
2.7.1. Limit of Spurious Emission

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency powershall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissionswhich 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 ANSI C63.10-2013 Clause 7.8.8.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. Thepath 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 = 300kHz, scan up through 10th harmonic. All harmonics / spurs mustbe at least 20 dB down from the highest emission level within the authorized band as measuredwith 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 operatingfrequency band.

2.7.5. Test Results of Conducted Spurious Emissions

Please refer to Appendix A for detail

2.8. Conducted Band Edge

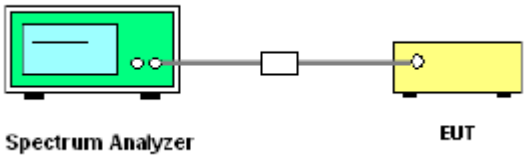
2.8.1. Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency powershall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissionswhich 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 ANSI C63.10-2013 Clause 7.8.6.
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 emissionsmust be at least 20 dB down from the highest emission level within the authorized band asmeasured 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

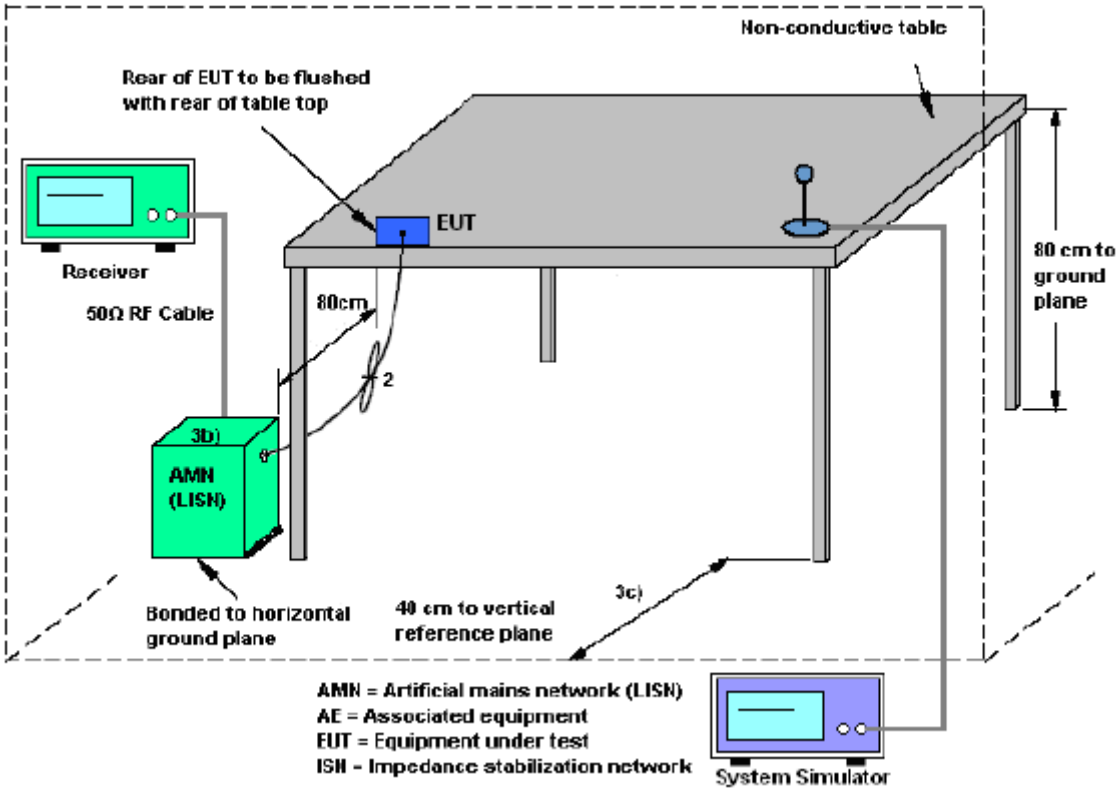
For equipment that is designed to be connected to the public utility (DC) power line, the radio frequency voltage that is conducted back onto the DC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

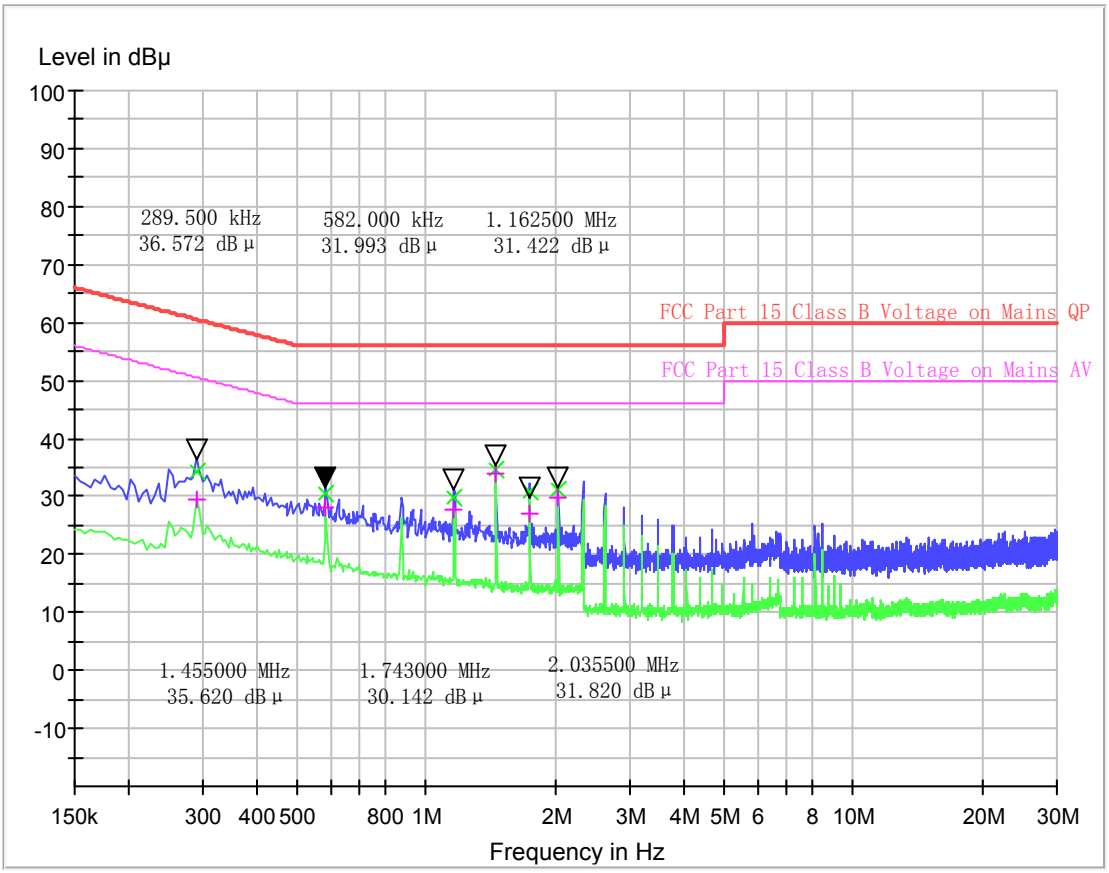
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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 + 12VDC

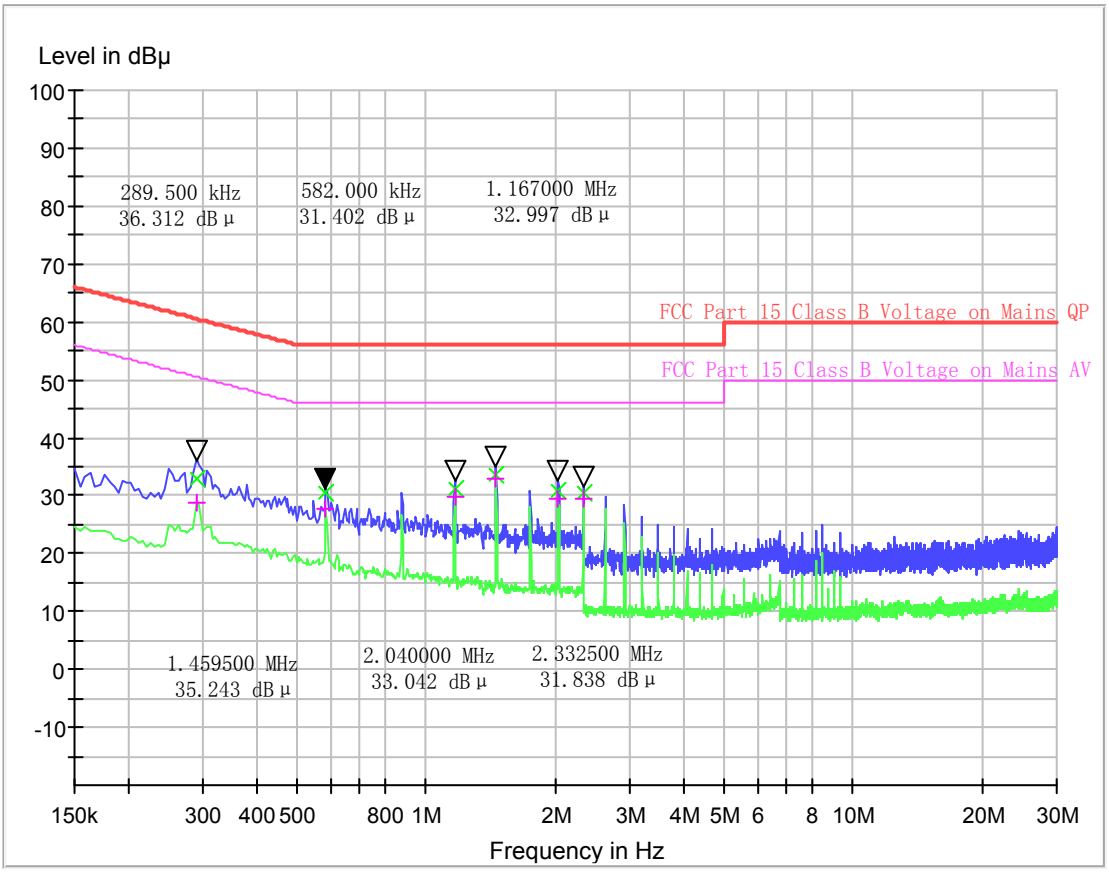
REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor
2. Correction Factor(dB) = Attenuator (dB)+ Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dB µ V)	CAverage (dB µ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB µ V)
0.289500	34.22	29.46	0.1	10.1	26.32	60.5	21.08	50.5
0.582000	30.49	27.95	0.1	10.1	25.51	56.0	18.05	46.0
1.162500	29.74	27.84	0.3	10.6	26.26	56.0	18.16	46.0
1.455000	34.66	33.88	0.3	10.6	21.34	56.0	12.12	46.0
1.743000	30.84	26.86	0.5	10.6	25.16	56.0	19.14	46.0
2.035500	31.09	29.79	0.6	10.7	24.91	56.0	16.21	46.0



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak (dB µ V)	CAverage (dB µ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB µ V)
0.289500	32.93	28.84	0.1	10.1	27.61	60.5	21.70	50.5
0.582000	30.33	27.75	0.1	10.1	25.67	56.0	18.25	46.0
1.167000	31.23	29.76	0.6	10.6	24.77	56.0	16.24	46.0
1.459500	33.73	32.86	0.6	10.6	22.27	56.0	13.14	46.0
2.040000	30.84	29.58	0.8	10.8	25.16	56.0	16.42	46.0
2.332500	30.63	29.37	0.9	10.9	25.37	56.0	16.63	46.0

Test Result: PASS

Note: Correction factor=Cabel loss+ attenuation factor
attenuation factor=10dB

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/spuriousmust 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 15.209limits as below.

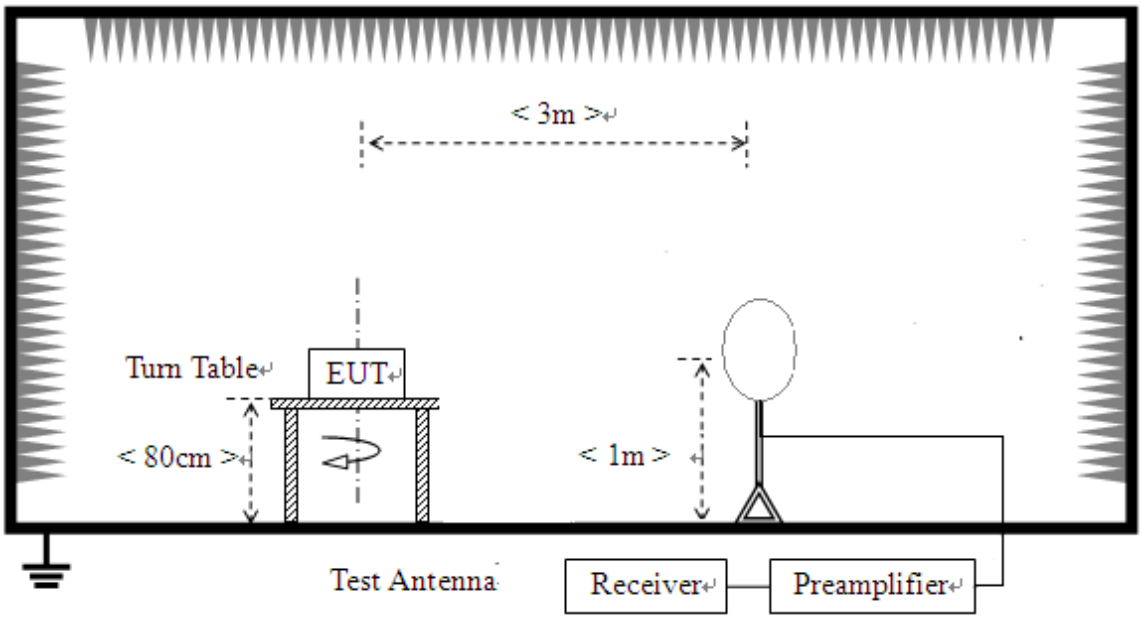
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.10.2. Measuring Instruments

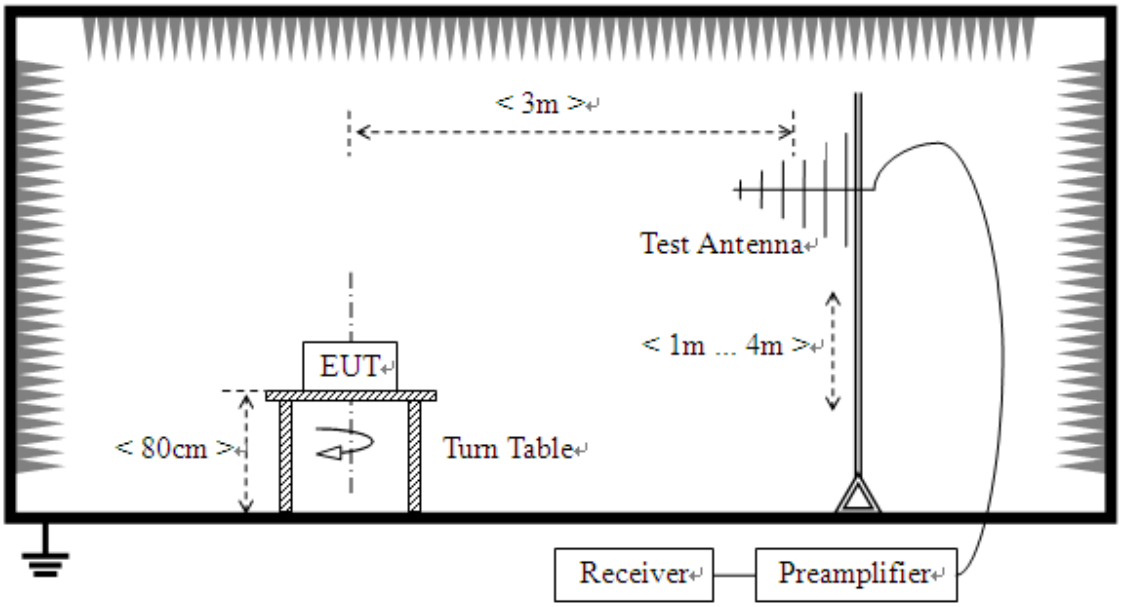
The measuring equipment is listed in the section 3 of this test report.

2.10.3. Test Setup

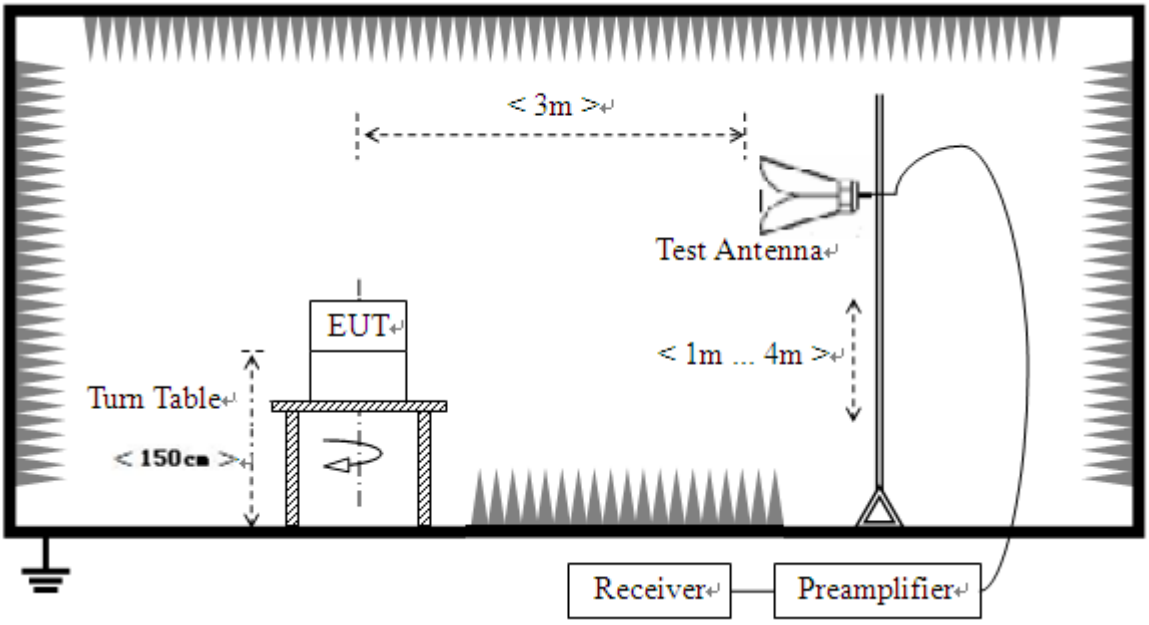
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



2.10.4. Test Procedure

1. The EUT was placed on a turntable 0.8m below 1GHz and 1.5m above 1GHz above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on thetop of a variable height antenna tower.
3. 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.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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)

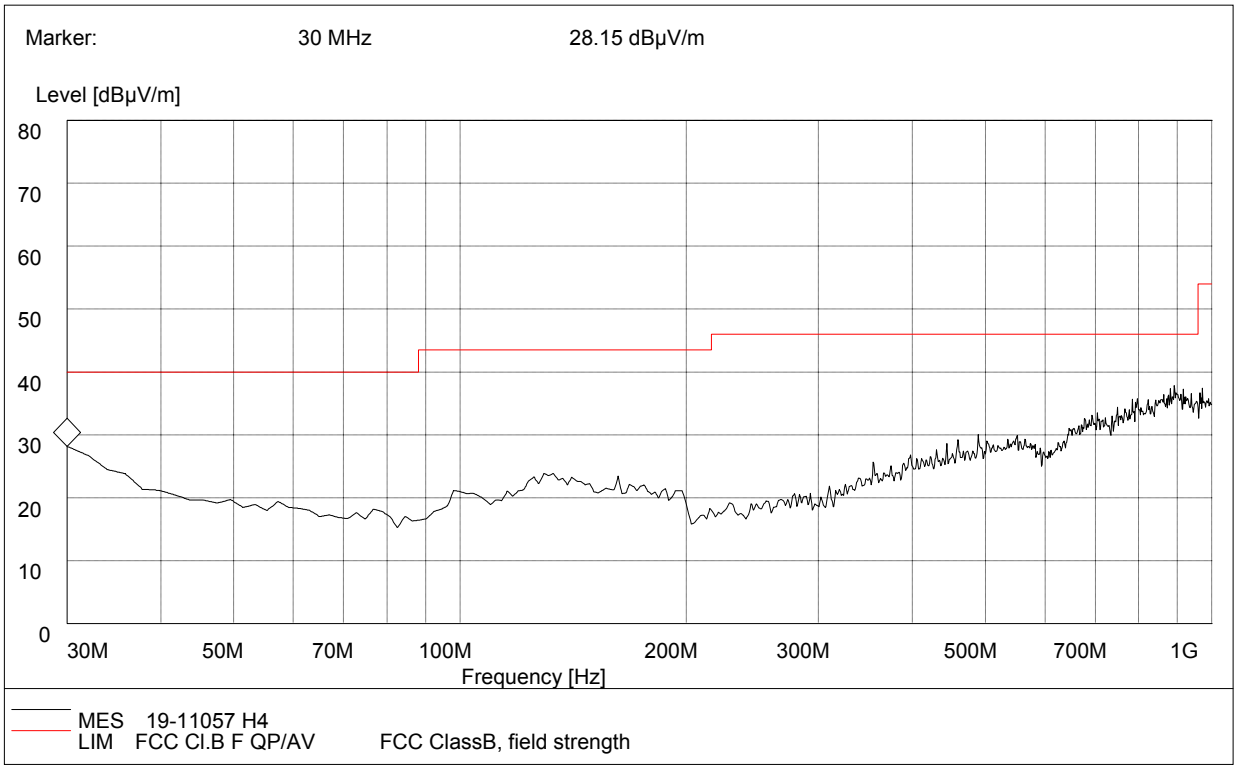
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

2.10.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 KHz to 30MHz

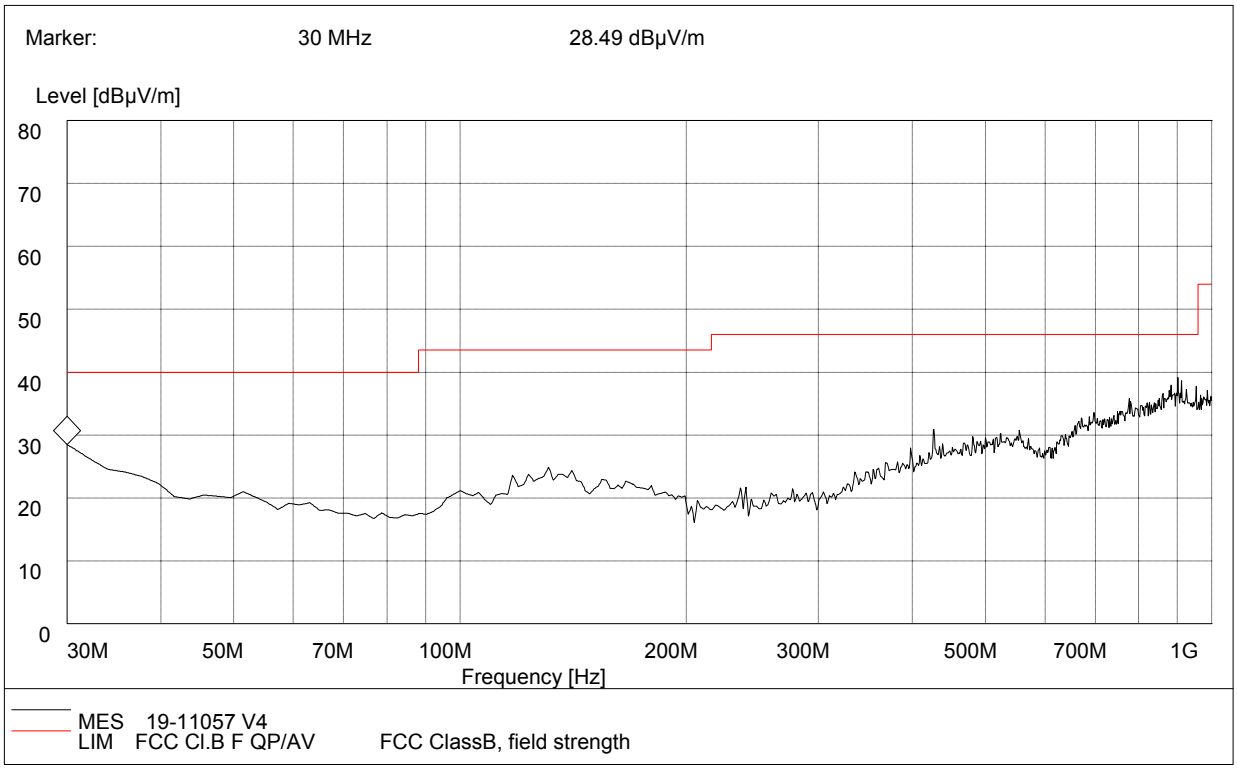
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000MHz



Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Antenna height (cm)	Cable Loss(dB)	ANT. Factor(dB)	Limit (dB µ V/m)	Antenna	Verdict
30	28.15	120.000	100.0	0.3	26.1	40.0	H	Pass
98.65	22.65	120.000	100.0	0.3	26.1	43.5	H	Pass
138.94	24.57	120.000	100.0	0.4	26.4	43.5	H	Pass
367.29	26.68	120.000	100.0	0.4	26.8	46.0	H	Pass
490.37	30.00	120.000	100.0	0.5	27.2	46.0	H	Pass
889.24	36.12	120.000	100.0	0.8	28.7	46.0	H	Pass

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



Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Antenna height (cm)	Cable Loss(dB)	ANT. Factor(dB)	Limit (dB µ V/m)	Antenna	Verdict
30	28.49	120.000	100.0	0.3	26.1	40.0	V	Pass
51.98	21.68	120.000	100.0	0.3	26.1	40.0	V	Pass
142.35	24.58	120.000	100.0	0.4	26.4	43.5	V	Pass
429.66	31.66	120.000	100.0	0.4	26.8	46.0	V	Pass
785.34	34.93	120.000	100.0	0.5	28.3	46.0	V	Pass
901.33	39.32	120.000	100.0	0.5	28.7	46.0	V	Pass

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

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	2390.00	48.19	PK	74.00	-25.81	1.50	180.00	46.89	5.20	28.60	32.50	1.30
2	2390.00	36.45	AV	54.00	-17.55	1.50	180.00	35.15	5.20	28.60	32.50	1.30
3	4804.00	50.32	PK	74.00	-23.68	1.50	180.00	43.92	7.40	30.40	31.40	6.40
4	4804.00	38.21	AV	54.00	-15.79	1.50	180.00	31.81	7.40	30.40	31.40	6.40
5	7206.00	53.26	PK	74.00	-20.74	1.50	180.00	43.96	9.90	31.50	32.10	9.30
6	7206.00	41.37	AV	54.00	-12.63	1.50	180.00	32.07	9.90	31.50	32.10	9.30

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	2390.00	49.67	PK	74.00	-24.33	1.50	300.00	48.37	5.20	28.60	32.50	1.30
2	2390.00	39.35	AV	54.00	-14.65	1.50	300.00	38.05	5.20	28.60	32.50	1.30
3	4804.00	50.11	PK	74.00	-23.89	1.50	300.00	43.71	7.40	30.40	31.40	6.40
4	4804.00	39.99	AV	54.00	-14.01	1.50	300.00	33.59	7.40	30.40	31.40	6.40
5	7206.00	53.06	PK	74.00	-20.94	1.50	300.00	43.76	9.90	31.50	32.10	9.30
6	7206.00	42.02	AV	54.00	-11.98	1.50	300.00	32.72	9.90	31.50	32.10	9.30

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	4882.00	49.98	PK	74.00	-24.02	1.80	280.00	43.58	6.70	31.20	31.50	6.40
2	4882.00	39.66	AV	54.00	-14.34	1.80	280.00	33.26	6.70	31.20	31.50	6.40
3	7323.00	51.27	PK	74.00	-22.73	1.80	280.00	41.87	10.10	31.50	32.30	9.40
4	7323.00	41.13	AV	54.00	-12.87	1.80	280.00	31.73	10.10	31.50	32.30	9.40

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	4882.00	50.33	PK	74.00	-23.67	1.80	300.00	43.93	6.70	31.20	31.50	6.40
2	4882.00	39.09	AV	54.00	-14.91	1.80	300.00	32.69	6.70	31.20	31.50	6.40
3	7323.00	51.64	PK	74.00	-22.36	1.80	300.00	42.24	10.10	31.50	32.30	9.40
4	7323.00	39.84	AV	54.00	-14.16	1.80	300.00	30.44	10.10	31.50	32.30	9.40

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	2483.50	50.32	PK	74.00	-23.68	1.60	120.00	47.72	5.70	28.70	31.80	2.60
2	2483.50	40.21	AV	54.00	-13.79	1.60	120.00	37.61	5.70	28.70	31.80	2.60
3	4960.00	49.65	PK	74.00	-24.35	1.60	120.00	42.95	7.00	31.20	31.50	6.70
4	4960.00	38.52	AV	54.00	-15.48	1.60	120.00	31.82	7.00	31.20	31.50	6.70
5	7440.00	51.24	PK	74.00	-22.76	1.60	120.00	41.74	10.20	31.60	32.40	9.50
6	7440.00	39.26	AV	54.00	-14.74	1.60	120.00	29.76	10.20	31.60	32.40	9.50

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	2483.50	48.88	PK	74.00	-25.12	1.50	200.00	46.28	5.70	28.70	31.80	2.60
2	2483.50	37.86	AV	54.00	-16.14	1.50	200.00	35.26	5.70	28.70	31.80	2.60
3	4960.00	51.03	PK	74.00	-22.97	1.50	200.00	44.33	7.00	31.20	31.50	6.70
4	4960.00	40.93	AV	54.00	-13.07	1.50	200.00	34.23	7.00	31.20	31.50	6.70
5	7440.00	53.98	PK	74.00	-20.02	1.50	200.00	44.48	10.20	31.60	32.40	9.50
6	7440.00	42.92	AV	54.00	-11.08	1.50	200.00	33.42	10.20	31.60	32.40	9.50

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	2390.00	48.98	PK	74.00	-25.02	1.70	70.00	47.68	5.20	28.60	32.50	1.30
2	2390.00	35.03	AV	54.00	-18.97	1.70	70.00	33.73	5.20	28.60	32.50	1.30
3	4804.00	50.14	PK	74.00	-23.86	1.70	70.00	43.74	6.70	31.20	31.50	6.40
4	4804.00	39.04	AV	54.00	-14.96	1.70	70.00	32.64	6.70	31.20	31.50	6.40
5	7206.00	53.64	PK	74.00	-20.36	1.70	70.00	38.74	16.00	30.90	32.00	14.90
6	7206.00	42.60	AV	54.00	-11.40	1.70	70.00	27.70	16.00	30.90	32.00	14.90

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	2390.00	49.98	PK	74.00	-24.02	1.70	210.00	48.68	5.20	28.60	32.50	1.30
2	2390.00	36.84	AV	54.00	-17.16	1.70	210.00	35.54	5.20	28.60	32.50	1.30
3	4804.00	51.74	PK	74.00	-22.26	1.70	210.00	45.34	6.70	31.20	31.50	6.40
4	4804.00	39.76	AV	54.00	-14.24	1.70	210.00	33.36	6.70	31.20	31.50	6.40
5	7206.00	54.33	PK	74.00	-19.67	1.70	210.00	39.43	16.00	30.90	32.00	14.90
6	7206.00	43.28	AV	54.00	-10.72	1.70	210.00	28.38	16.00	30.90	32.00	14.90

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	4882.00	51.10	PK	74.00	-22.90	1.50	310.00	44.70	6.70	31.20	31.50	6.40
2	4882.00	39.36	AV	54.00	-14.64	1.50	310.00	32.96	6.70	31.20	31.50	6.40
3	7323.00	53.65	PK	74.00	-20.35	1.50	310.00	44.25	10.10	31.50	32.30	9.40
4	7323.00	42.50	AV	54.00	-11.50	1.50	310.00	33.10	10.10	31.50	32.30	9.40

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	4882.00	50.48	PK	74.00	-23.52	1.50	190.00	44.08	6.70	31.20	31.50	6.40
2	4882.00	39.42	AV	54.00	-14.58	1.50	190.00	33.02	6.70	31.20	31.50	6.40
3	7323.00	52.47	PK	74.00	-21.53	1.50	190.00	43.07	10.10	31.50	32.30	9.40
4	7323.00	41.43	AV	54.00	-12.57	1.50	190.00	32.03	10.10	31.50	32.30	9.40

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	2483.50	49.98	PK	74.00	-24.02	1.50	203.00	47.38	5.70	28.70	31.80	2.60
2	2483.50	39.51	AV	54.00	-14.49	1.50	203.00	36.91	5.70	28.70	31.80	2.60
3	4960.00	51.65	PK	74.00	-22.35	1.50	203.00	44.95	7.00	31.20	31.50	6.70
4	4960.00	40.29	AV	54.00	-13.71	1.50	203.00	33.59	7.00	31.20	31.50	6.70
5	7440.00	54.33	PK	74.00	-19.67	1.50	203.00	44.83	10.20	31.60	32.40	9.50
6	7440.00	43.18	AV	54.00	-10.82	1.50	203.00	33.68	10.20	31.60	32.40	9.50

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	2483.50	50.64	PK	74.00	-23.36	1.70	230.00	48.04	5.70	28.70	31.80	2.60
2	2483.50	40.31	AV	54.00	-13.69	1.70	230.00	37.71	5.70	28.70	31.80	2.60
3	4960.00	50.35	PK	74.00	-23.65	1.70	230.00	43.65	7.00	31.20	31.50	6.70
4	4960.00	40.39	AV	54.00	-13.61	1.70	230.00	33.69	7.00	31.20	31.50	6.70
5	7440.00	51.78	PK	74.00	-22.22	1.70	230.00	42.28	10.20	31.60	32.40	9.50
6	7440.00	40.62	AV	54.00	-13.38	1.70	230.00	31.12	10.20	31.60	32.40	9.50

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	2390.00	51.35	PK	74.00	-22.65	1.70	210.00	50.05	5.20	28.60	32.50	1.30
2	2390.00	37.71	AV	54.00	-16.29	1.70	210.00	36.41	5.20	28.60	32.50	1.30
3	4804.00	53.62	PK	74.00	-20.38	1.70	210.00	47.22	7.40	30.40	31.40	6.40
4	4804.00	41.77	AV	54.00	-12.23	1.70	210.00	35.37	7.40	30.40	31.40	6.40
5	7206.00	54.22	PK	74.00	-19.78	1.70	210.00	44.92	9.90	31.50	32.10	9.30
6	7206.00	42.24	AV	54.00	-11.76	1.70	210.00	32.94	9.90	31.50	32.10	9.30

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	2390.00	51.33	PK	74.00	-22.67	1.40	220.00	50.03	5.20	28.60	32.50	1.30
2	2390.00	37.99	AV	54.00	-16.01	1.40	220.00	36.69	5.20	28.60	32.50	1.30
3	4804.00	52.19	PK	74.00	-21.81	1.40	220.00	45.79	7.40	30.40	31.40	6.40
4	4804.00	40.54	AV	54.00	-13.46	1.40	220.00	34.14	7.40	30.40	31.40	6.40
5	7206.00	53.03	PK	74.00	-20.97	1.40	220.00	43.73	9.90	31.50	32.10	9.30
6	7206.00	41.24	AV	54.00	-12.76	1.40	220.00	31.94	9.90	31.50	32.10	9.30

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	4882.00	51.32	PK	74.00	-22.68	1.70	210.00	44.92	6.70	31.20	31.50	6.40
2	4882.00	40.29	AV	54.00	-13.71	1.70	210.00	33.89	6.70	31.20	31.50	6.40
3	7323.00	52.69	PK	74.00	-21.31	1.70	210.00	43.29	10.10	31.50	32.30	9.40
4	7323.00	41.52	AV	54.00	-12.48	1.70	210.00	32.12	10.10	31.50	32.30	9.40

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	4882.00	50.00	PK	74.00	-24.00	1.20	210.00	43.60	6.70	31.20	31.50	6.40
2	4882.00	38.73	AV	54.00	-15.27	1.20	210.00	32.33	6.70	31.20	31.50	6.40
3	7323.00	53.24	PK	74.00	-20.76	1.80	220.00	43.84	10.10	31.50	32.30	9.40
4	7323.00	42.04	AV	54.00	-11.96	1.80	220.00	32.64	10.10	31.50	32.30	9.40

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（8DPSK_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	2483.50	47.65	PK	74.00	-26.35	1.70	210.00	45.05	5.70	28.70	31.80	2.60
2	2483.50	36.50	AV	54.00	-17.50	1.70	210.00	33.90	5.70	28.70	31.80	2.60
3	4960.00	52.31	PK	74.00	-21.69	1.70	210.00	45.91	6.70	31.20	31.50	6.40
4	4960.00	41.08	AV	54.00	-12.92	1.70	210.00	34.68	6.70	31.20	31.50	6.40
5	7440.00	53.00	PK	74.00	-21.00	1.70	210.00	38.10	16.00	30.90	32.00	14.90
6	7440.00	41.85	AV	54.00	-12.15	1.70	210.00	26.95	16.00	30.90	32.00	14.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（8DPSK_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	2483.50	48.95	PK	74.00	-25.05	1.60	200.00	46.35	5.70	28.70	31.80	2.60
2	2483.50	37.90	AV	54.00	-16.10	1.60	200.00	35.30	5.70	28.70	31.80	2.60
3	4960.00	51.49	PK	74.00	-22.51	1.60	200.00	45.09	6.70	31.20	31.50	6.40
4	4960.00	40.02	AV	54.00	-13.98	1.60	200.00	33.62	6.70	31.20	31.50	6.40
5	7440.00	53.33	PK	74.00	-20.67	1.60	200.00	38.43	16.00	30.90	32.00	14.90
6	7440.00	41.38	AV	54.00	-12.62	1.60	200.00	26.48	16.00	30.90	32.00	14.90

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

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Receiver	R&S	ESIB7	A0501375	2019.07.30	2020.07.29
2	Power Meter	R&S	NRP-Z31	102872	2019.5.5	2020.05.04
3	TURNTABLE	ETS	2088	2149	N/A	N/A
4	ANTENNA MAST	ETS	2075	2346	N/A	N/A
5	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
6	Horn antenna (18GHz~26.5GHz)	AR	AT4002A	305753	2017.11.10	2020.11.09
7	Amplifer	MILMEGA	80RF1000-250	A140901925	2017.10.09	2020.10.08
8	JS amplifer	AR	25S1G4AM1	A0304248	2017.10.09	2020.10.08
9	High pass filter	Compliance Direction systems	BSU-6	34202	2018.11.11	2019.11.10
13	Horn Antenna	ShwarzBeck	9120D	1012	2018.11.11	2019.11.10
14	Horn Antenna	ShwarzBeck	BBHA9170	25841	2018.11.11	2019.11.10
15	ULTRA-BROADBAND ANTENNA	R&S	HL562	A0304224	2017.07.14	2020.07.13
16	Passive Loop Antenna	R&S	HFH2-Z2	100047	2019.04.26	2022.04.25
17	Temperature chamber	Dongguan gaoda instrument CO.LTD	GD-7005-100	130130101	2019.04.22	2020.04.21
18	Spectrum Analyzer	Keysight	N9030A	A160702554	2018.11.15	2019.11.14
19	Power Supply	R&S	NGMO1	101037	2019.08.03	2020.08.02
20	EMI TEST RECEIVER	KEYSIGHT	ESIB26	A0304218	2019.05.20	2020.05.19
21	LISN	ROHDE&SCHWARZ	ENV216	A140701847	2018.12.10	2019.12.10
22	Cable	MATCHING PAD	W7	/	2019.01.02	2020.01.01

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	1.33	21	Pass
GFSK	2441	DH5	1.31	21	Pass
GFSK	2480	DH5	0.83	21	Pass
pi/4DQPSK	2402	2DH5	0.97	21	Pass
pi/4DQPSK	2441	2DH5	0.98	21	Pass
pi/4DQPSK	2480	2DH5	0.49	21	Pass
8DPSK	2402	3DH5	1.59	21	Pass
8DPSK	2441	3DH5	1.52	21	Pass
8DPSK	2480	3DH5	1.01	21	Pass

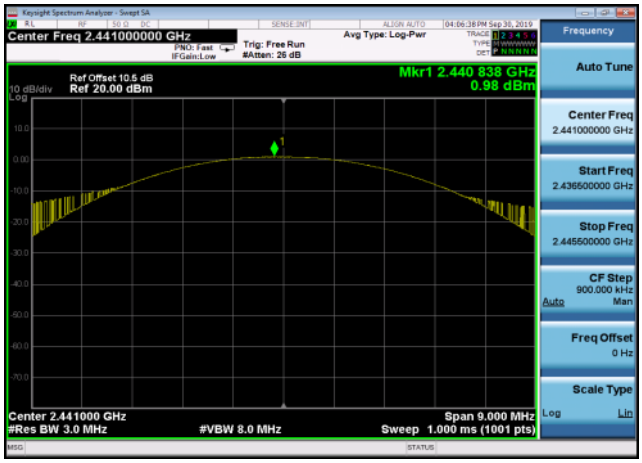
Output Power：GFSK,2402MHz,DH5

Output Power：GFSK,2441MHz,DH5

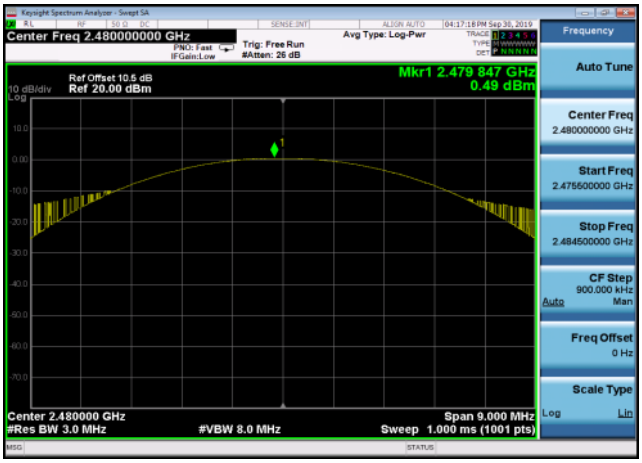
Output Power：GFSK,2480MHz,DH5

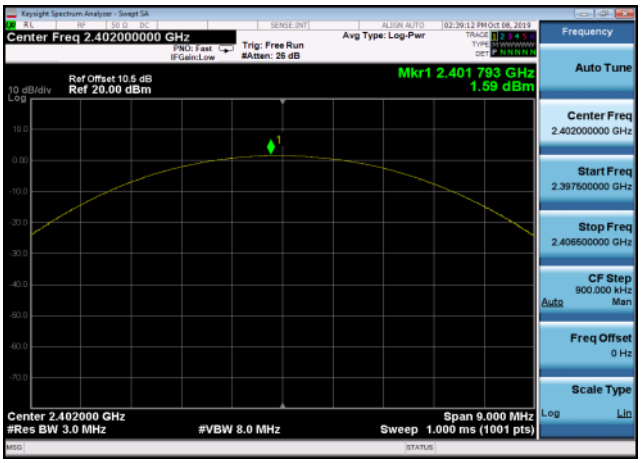
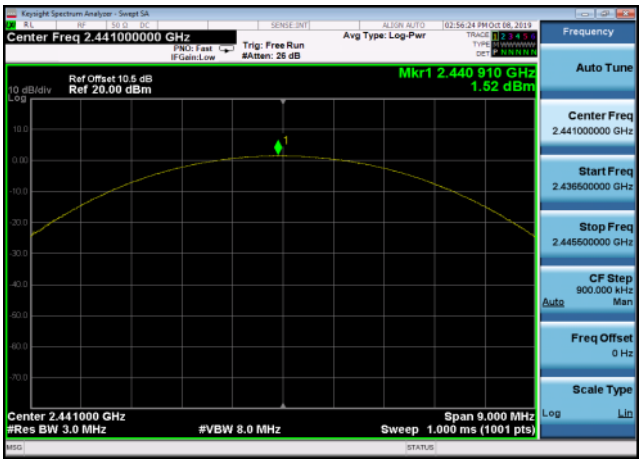
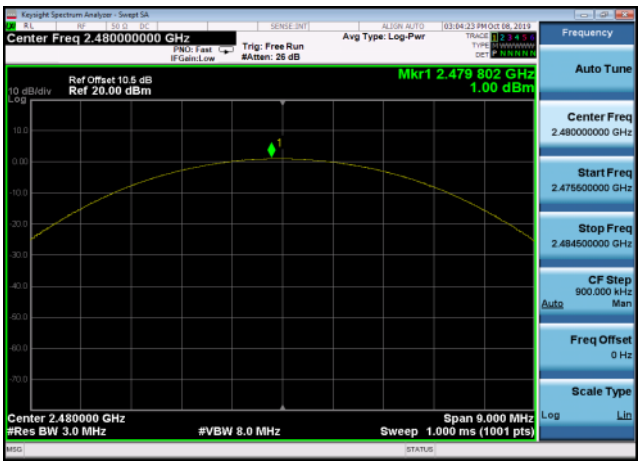
Output Power：DQPSK,2402MHz,2DH5

Output Power：DQPSK,2441MHz,2DH5



Output Power：DQPSK,2480MHz,2DH5

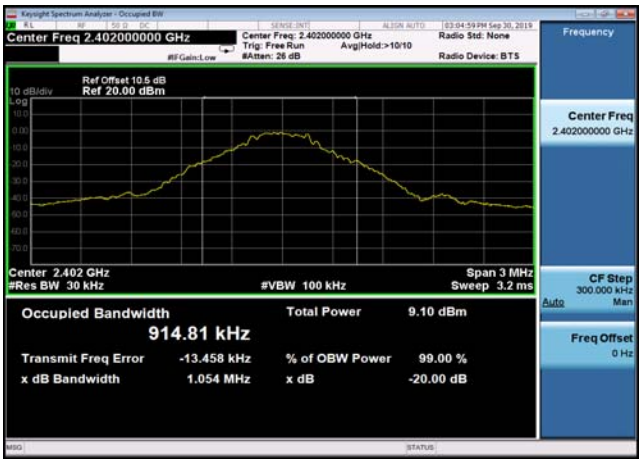


Output Power：8DPSK,2402MHz,3DH5	Output Power：8DPSK,2441MHz,3DH5
	
Output Power：8DPSK,2480MHz,3DH5	
	

20dB Bandwidth
Test Result and Data

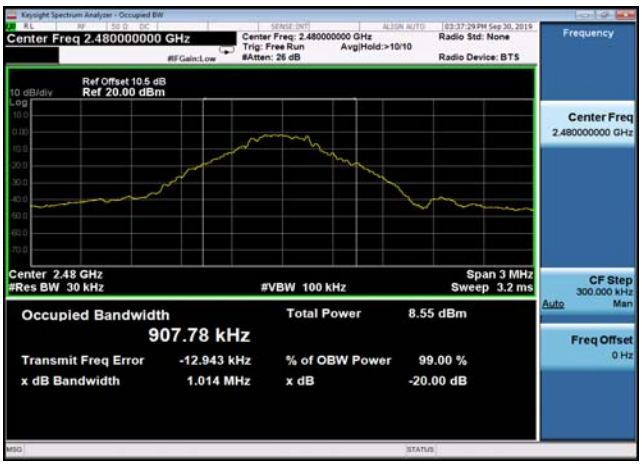
BT Occupied 20dB Bandwidth				
Mode	Test Frequency	Packet Type	-20dB Occupy Bandwidth(KHz)	Result
GFSK	2402	DH5	1054.202	Pass
GFSK	2441	DH5	1015.068	Pass
GFSK	2480	DH5	1013.957	Pass
pi/4DQPSK	2402	2DH5	1285.687	Pass
pi/4DQPSK	2441	2DH5	1285.754	Pass
pi/4DQPSK	2480	2DH5	1285.173	Pass
8DPSK	2402	3DH5	1282.59	Pass
8DPSK	2441	3DH5	1281.684	Pass
8DPSK	2480	3DH5	1280.062	Pass

20dB Bandwidth：GFSK,2402MHz,DH5



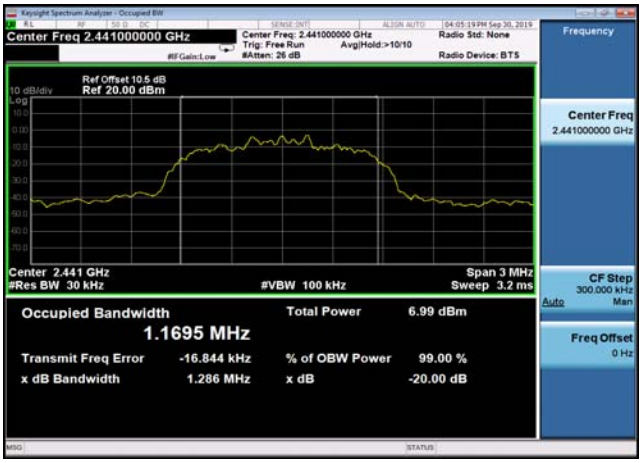
20dB Bandwidth：GFSK,2441MHz,DH5

20dB Bandwidth：GFSK,2480MHz,DH5

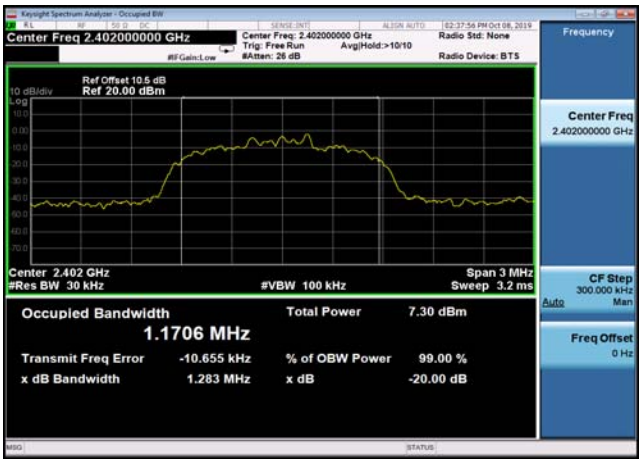
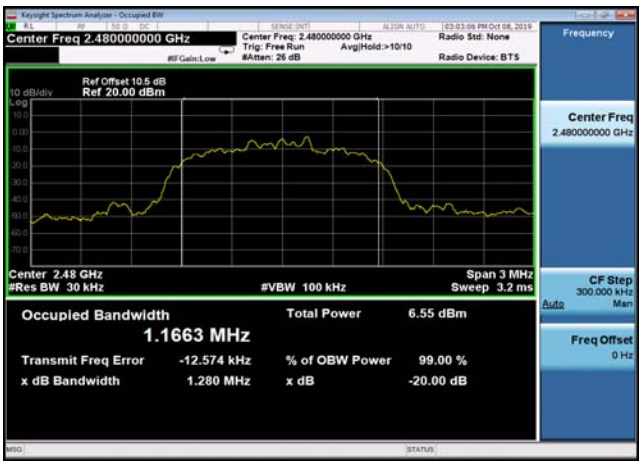


20dB Bandwidth：DQPSK,2402MHz,2DH5

20dB Bandwidth：DQPSK,2441MHz,2DH5



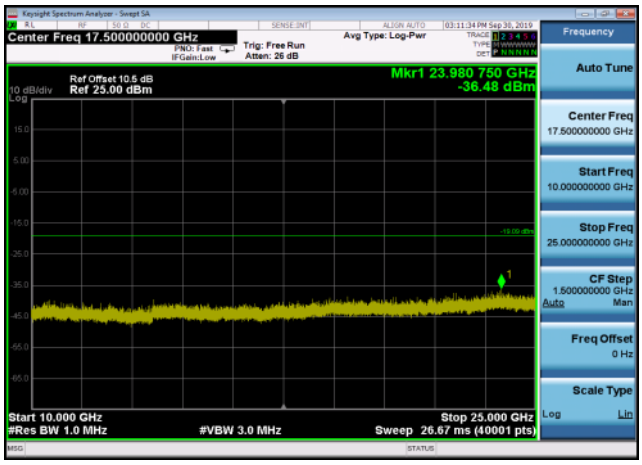
20dB Bandwidth：DQPSK,2480MHz,2DH5

20dB Bandwidth：8DPSK,2402MHz,3DH5	20dB Bandwidth：8DPSK,2441MHz,3DH5
	
20dB Bandwidth：8DPSK,2480MHz,3DH5	
	

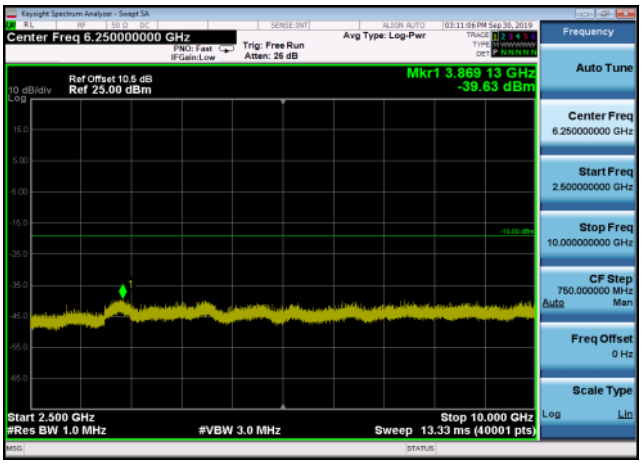
Transmitter Spurious Emission and Bandedge

Test Result and Data

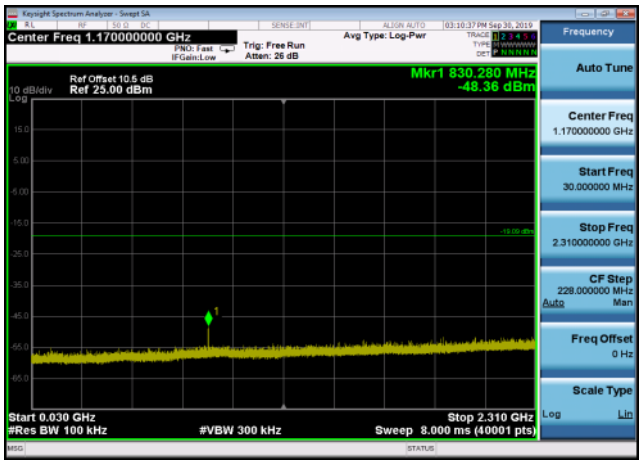
Conducted Emission：GFSK,2402,DH5 ,10000MHz~25000MHz



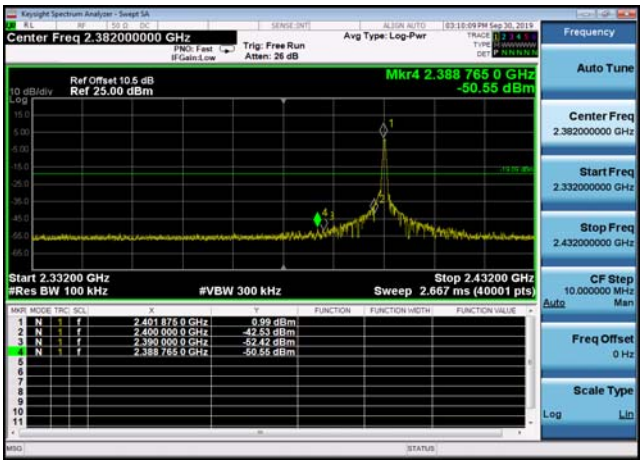
Conducted Emission：GFSK,2402,DH5 ,2500MHz~10000MHz



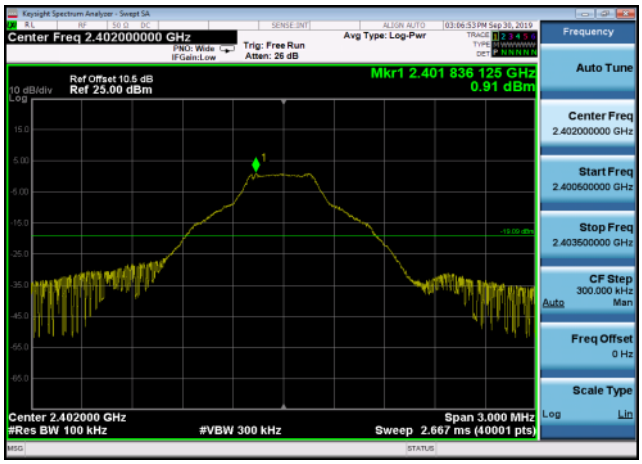
Conducted Emission：GFSK,2402,DH5 ,30MHz~2310MHz



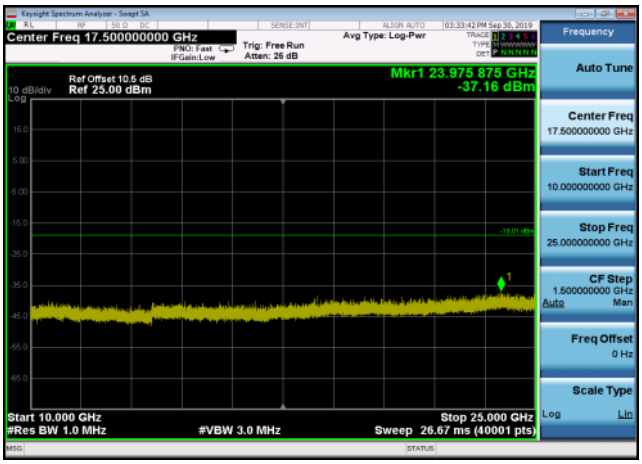
Conducted Emission：GFSK,2402,DH5 ,Band Edge HoppingOFF



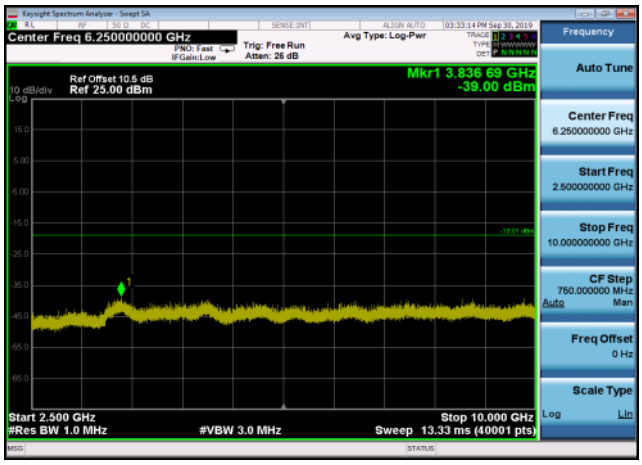
Conducted Emission：GFSK,2402,DH5 ,Reference Level



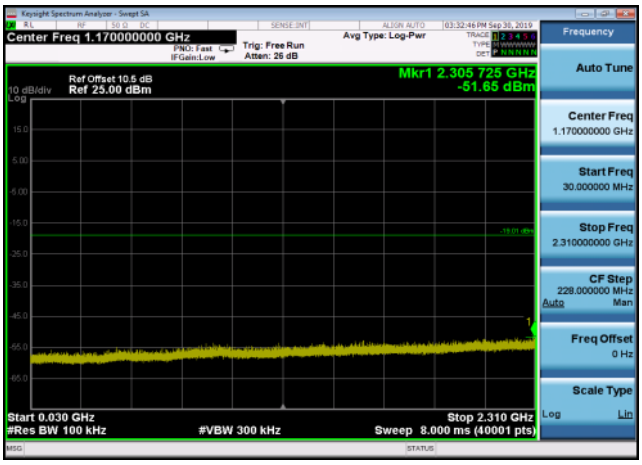
Conducted Emission：GFSK,2441,DH5 ,10000MHz~25000MHz



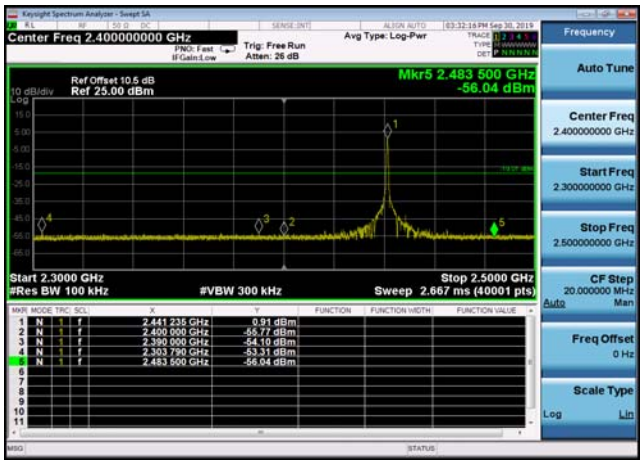
Conducted Emission：GFSK,2441,DH5 ,2500MHz~10000MHz



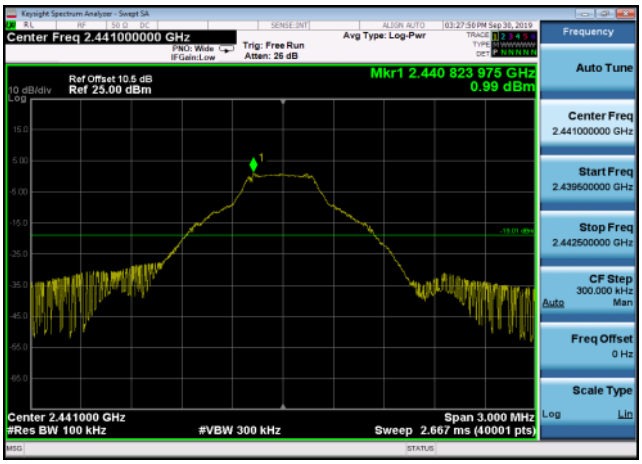
Conducted Emission：GFSK,2441,DH5 ,30MHz~2310MHz



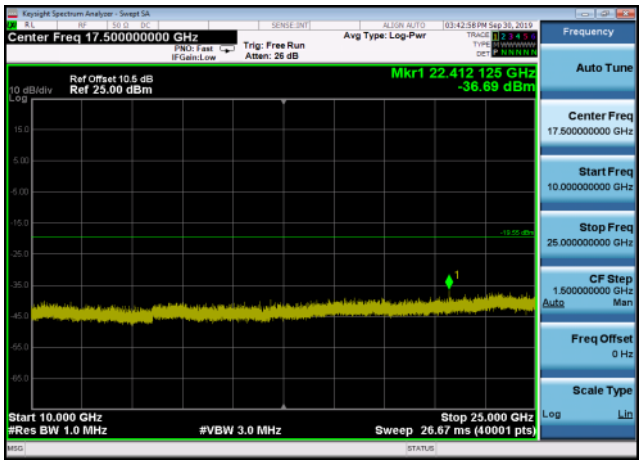
Conducted Emission：GFSK,2441,DH5 ,Band Edge HoppingOFF



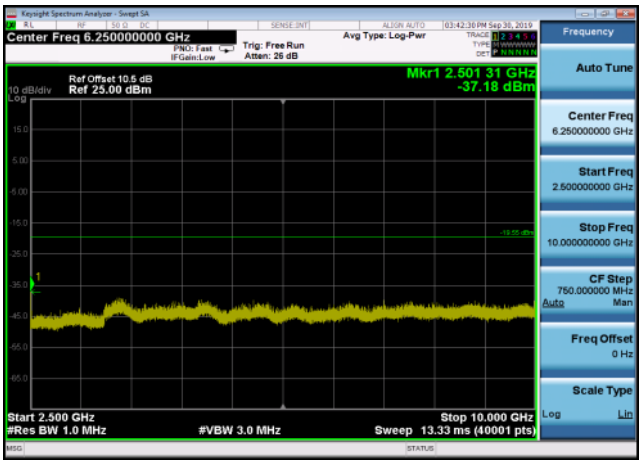
Conducted Emission：GFSK,2441,DH5 ,Reference Level



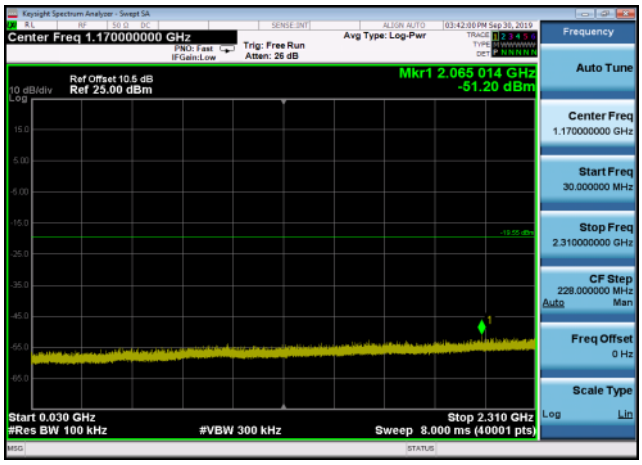
Conducted Emission：GFSK,2480,DH5 ,10000MHz~25000MHz



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

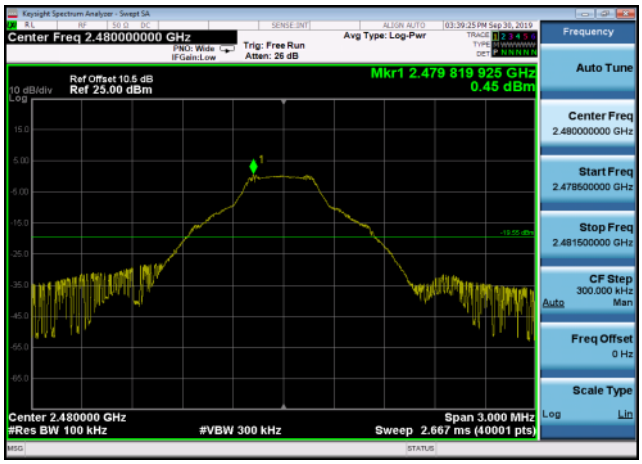


Conducted Emission：GFSK,2480,DH5 ,30MHz~2310MHz

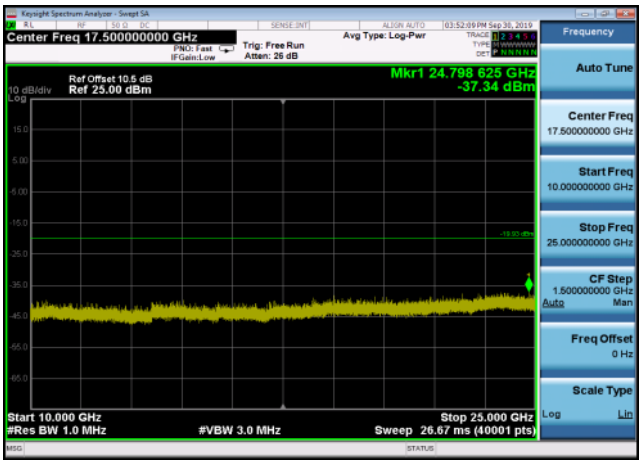


Conducted Emission：GFSK,2480,DH5 ,Band Edge HoppingOFF

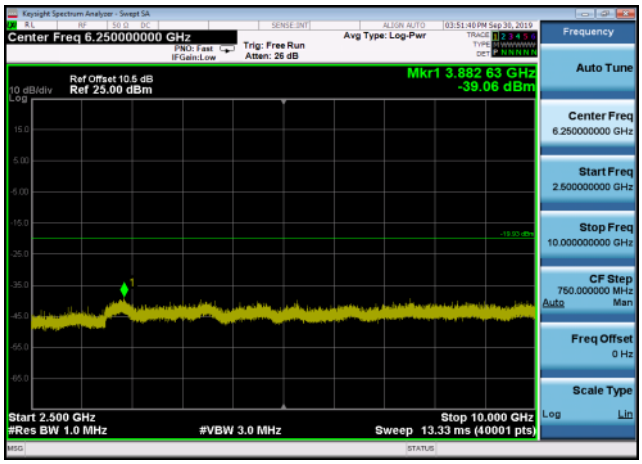
Conducted Emission：GFSK,2480,DH5 ,Reference Level



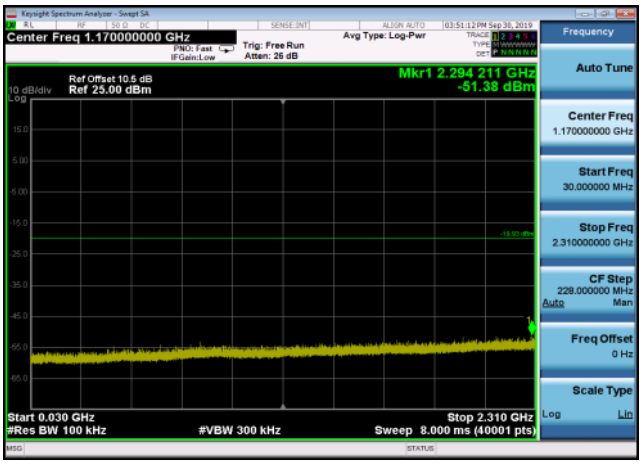
Conducted Emission：DQPSK,2402,2DH5 ,10000MHz~25000MHz



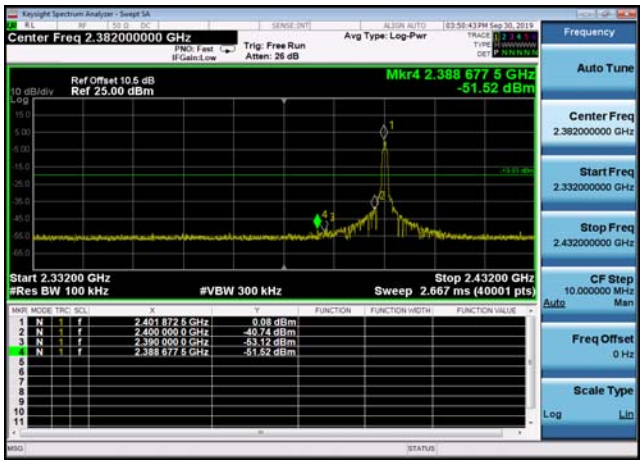
Conducted Emission：DQPSK,2402,2DH5 ,2500MHz~10000MHz



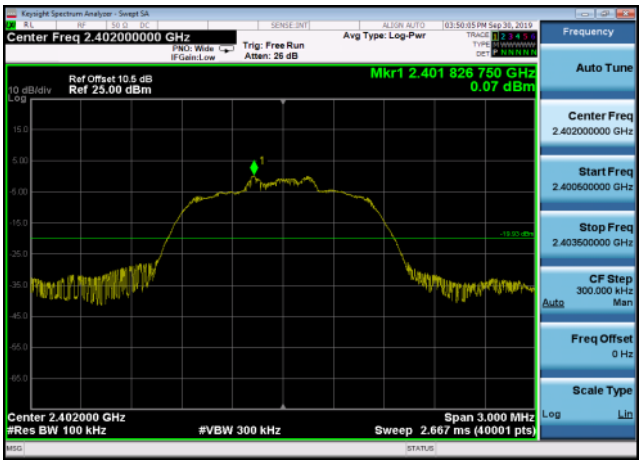
Conducted Emission：DQPSK,2402,2DH5 ,30MHz~2310MHz



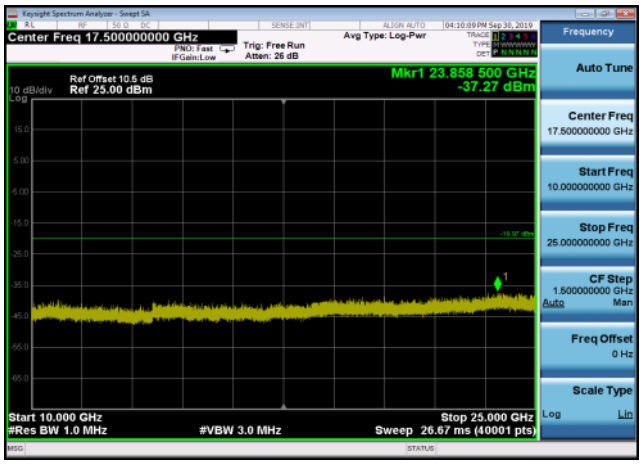
Conducted Emission：DQPSK,2402,2DH5 ,Band Edge HoppingOFF



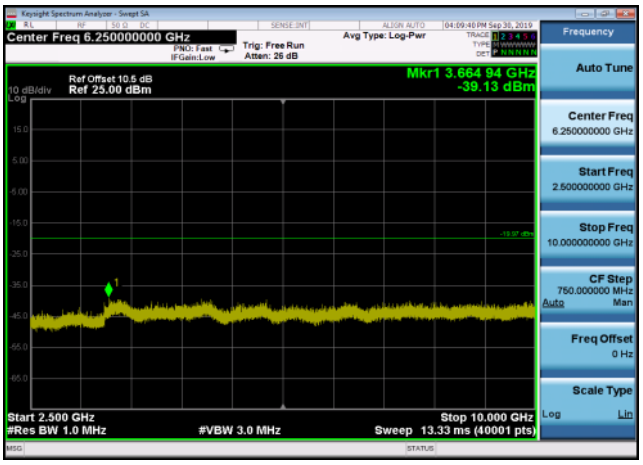
Conducted Emission：DQPSK,2402,2DH5 ,Reference Level



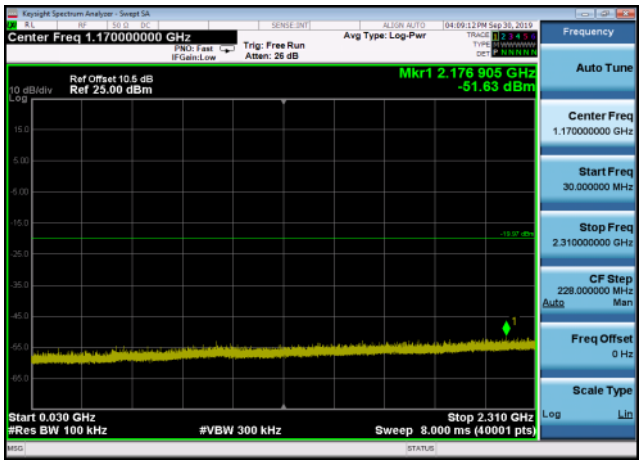
Conducted Emission：DQPSK,2441,2DH5 ,10000MHz~25000MHz



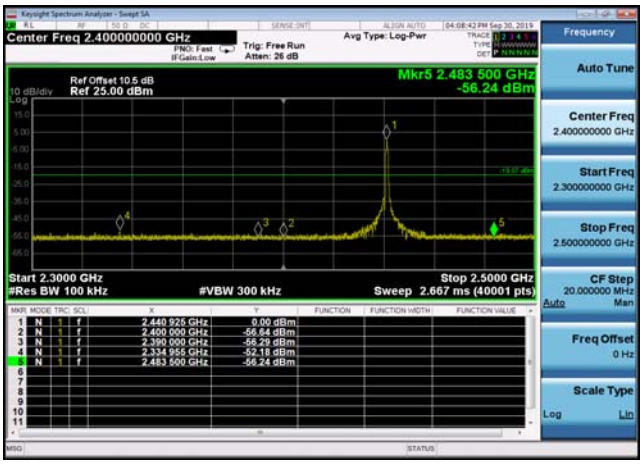
Conducted Emission：DQPSK,2441,2DH5 ,2500MHz~10000MHz



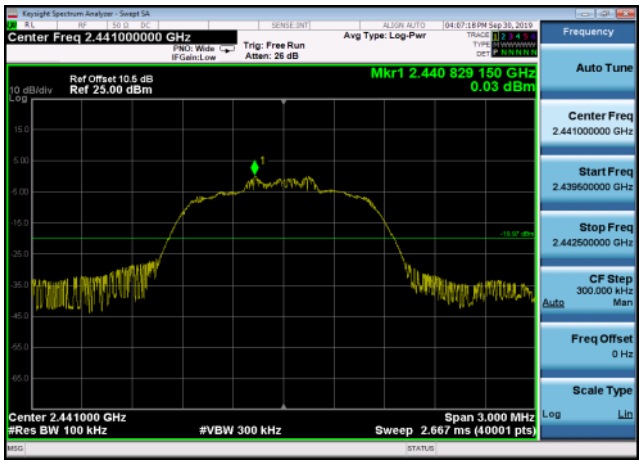
Conducted Emission：DQPSK,2441,2DH5 ,30MHz~2310MHz



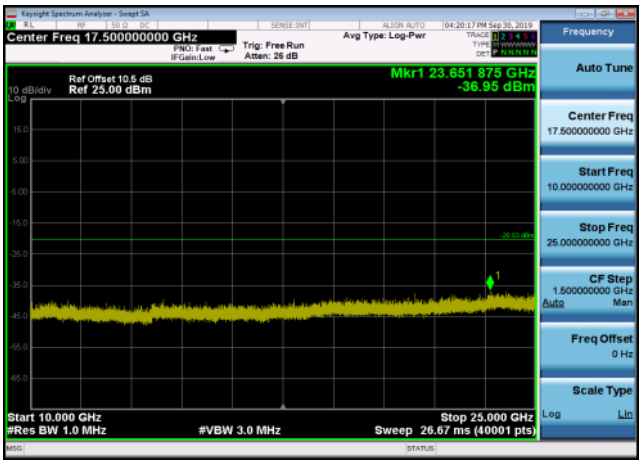
Conducted Emission：DQPSK,2441,2DH5 ,Band Edge HoppingOFF



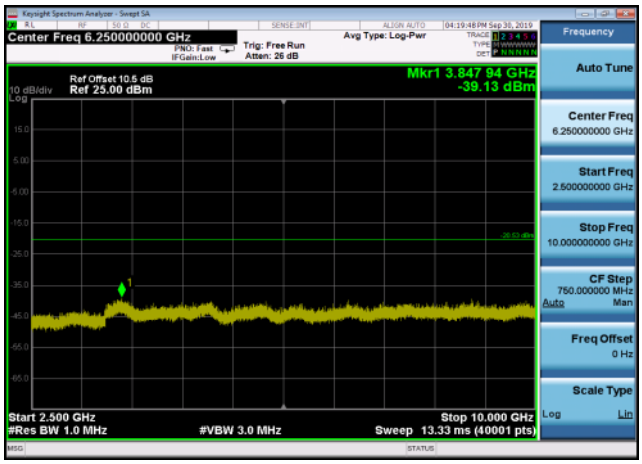
Conducted Emission：DQPSK,2441,2DH5 ,Reference Level



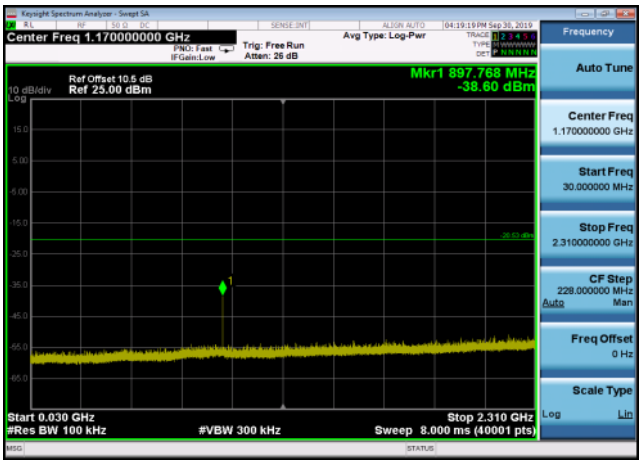
Conducted Emission：DQPSK,2480,2DH5 ,10000MHz~25000MHz



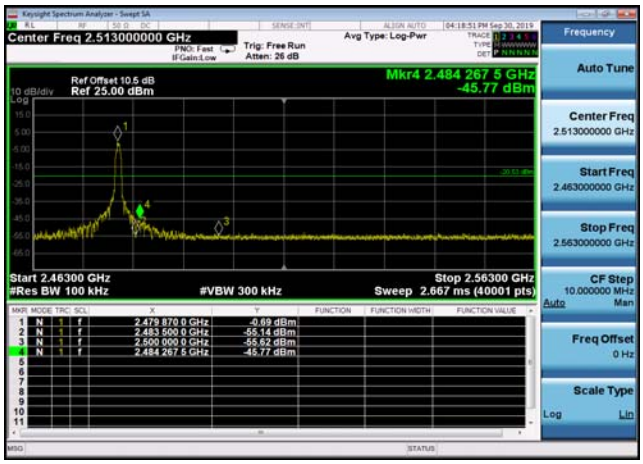
Conducted Emission：DQPSK,2480,2DH5 ,2500MHz~10000MHz



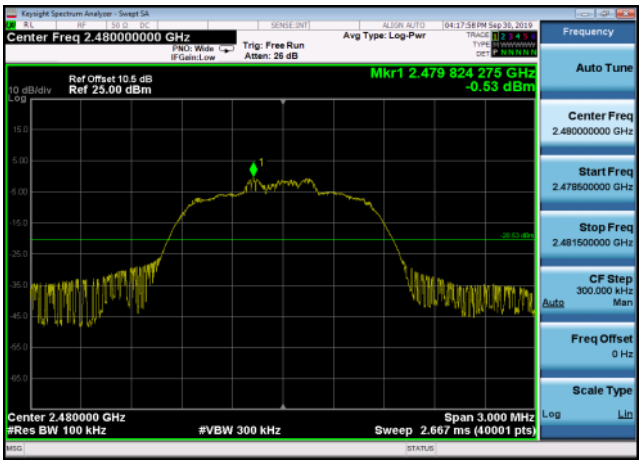
Conducted Emission：DQPSK,2480,2DH5 ,30MHz~2310MHz



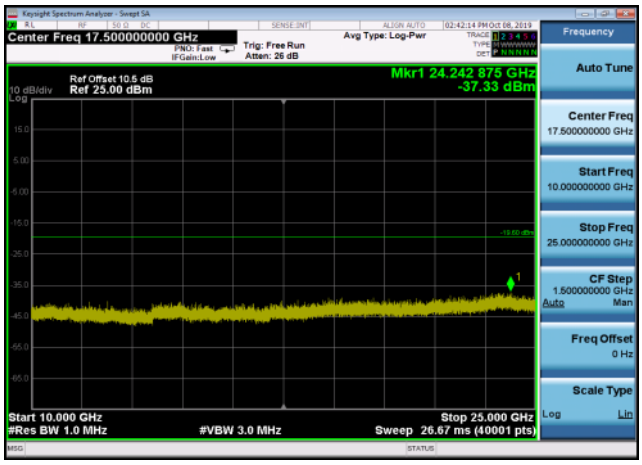
Conducted Emission：DQPSK,2480,2DH5 ,Band Edge HoppingOFF



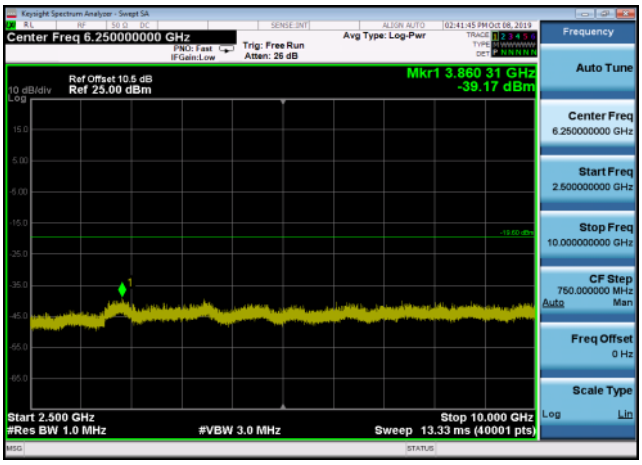
Conducted Emission：DQPSK,2480,2DH5 ,Reference Level



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

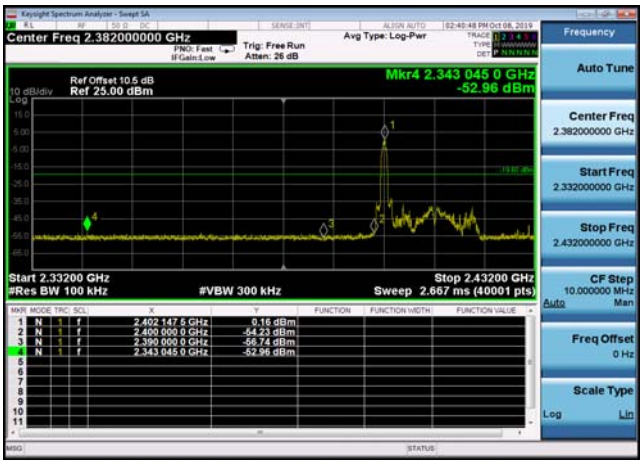


Conducted Emission：8DPSK,2402,3DH5 ,2500MHz~10000MHz

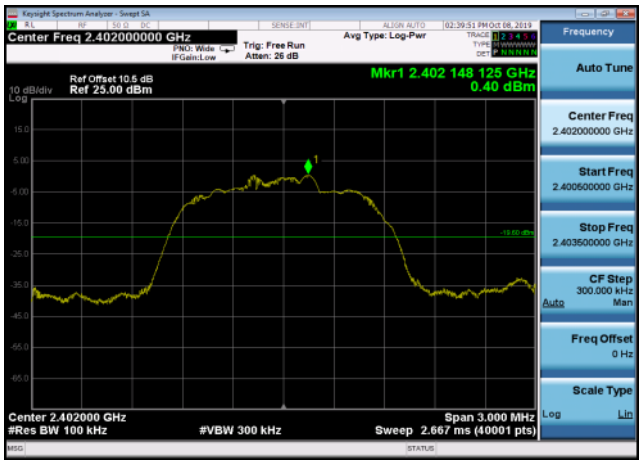


Conducted Emission：8DPSK,2402,3DH5 ,30MHz~2310MHz

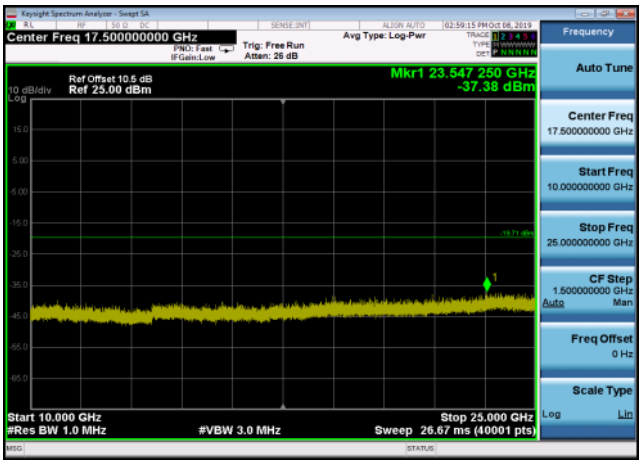
Conducted Emission：8DPSK,2402,3DH5 ,Band Edge HoppingOFF



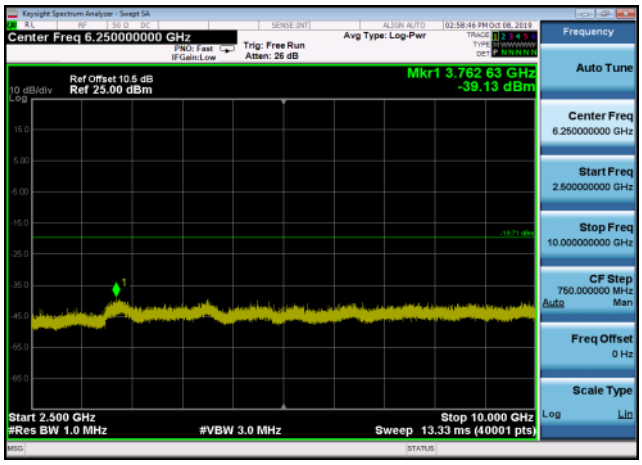
Conducted Emission：8DPSK,2402,3DH5 ,Reference Level



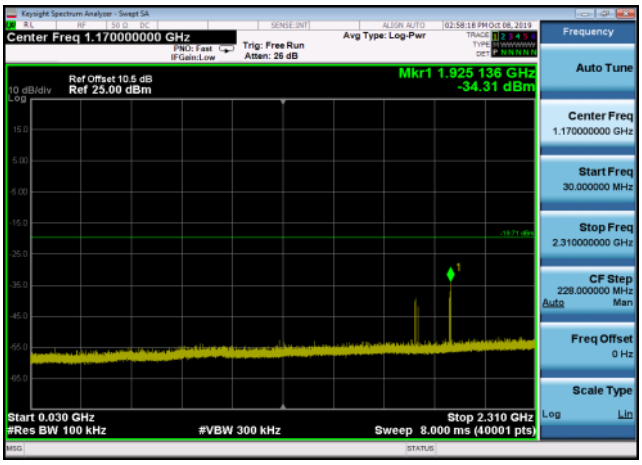
Conducted Emission：8DPSK,2441,3DH5 ,10000MHz~25000MHz



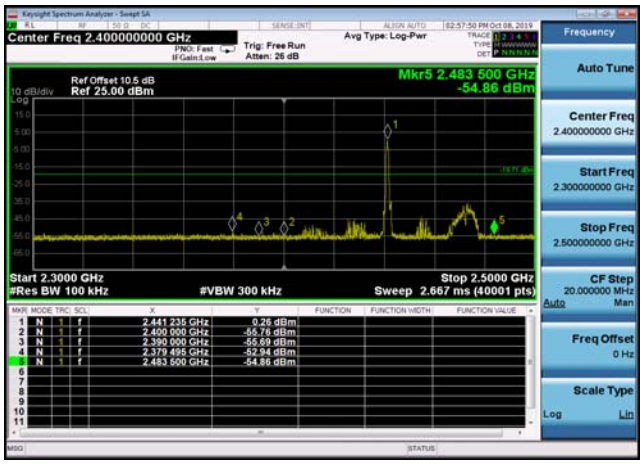
Conducted Emission：8DPSK,2441,3DH5 ,2500MHz~10000MHz



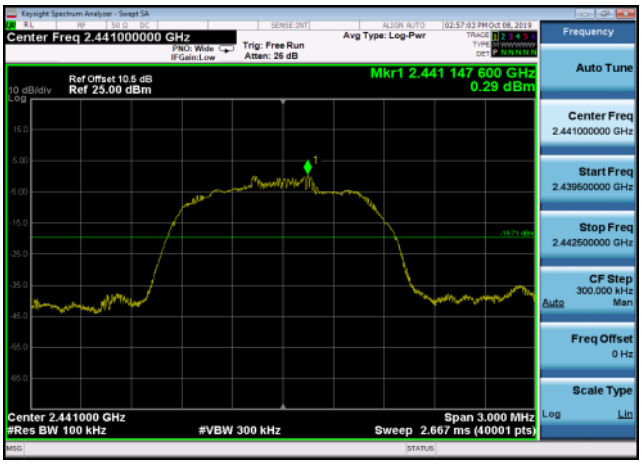
Conducted Emission：8DPSK,2441,3DH5 ,30MHz~2310MHz



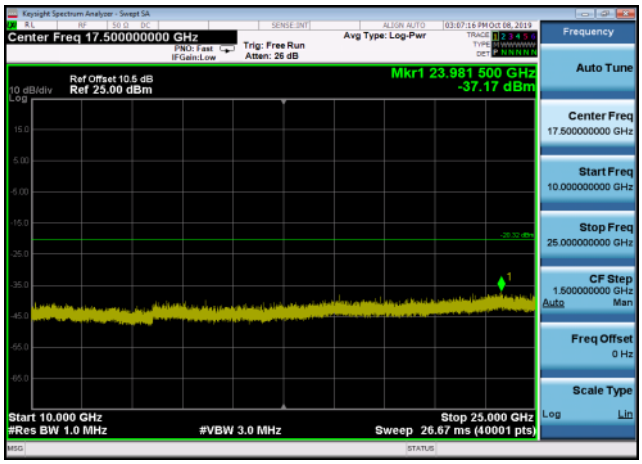
Conducted Emission：8DPSK,2441,3DH5 ,Band Edge HoppingOFF



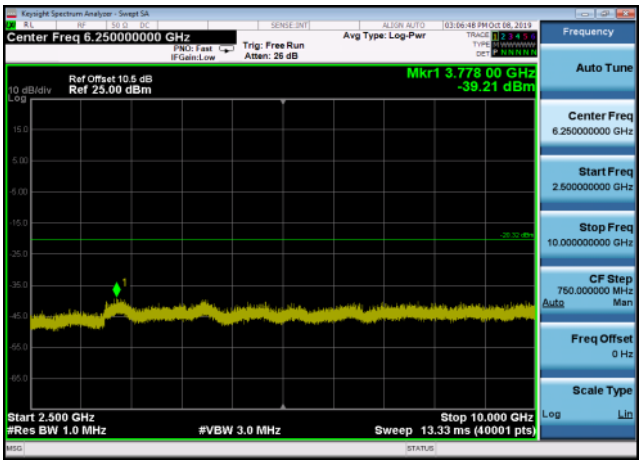
Conducted Emission：8DPSK,2441,3DH5 ,Reference Level

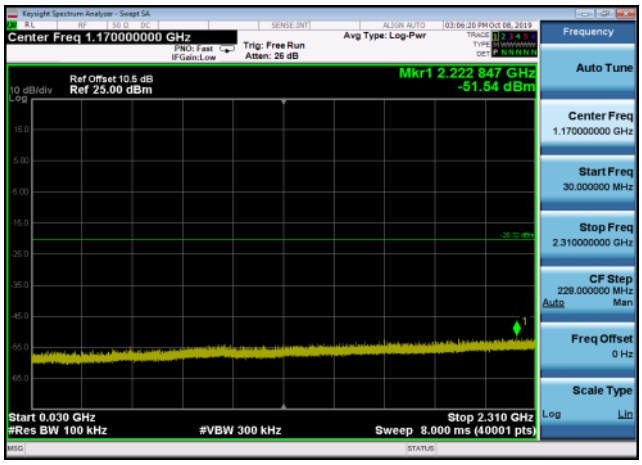
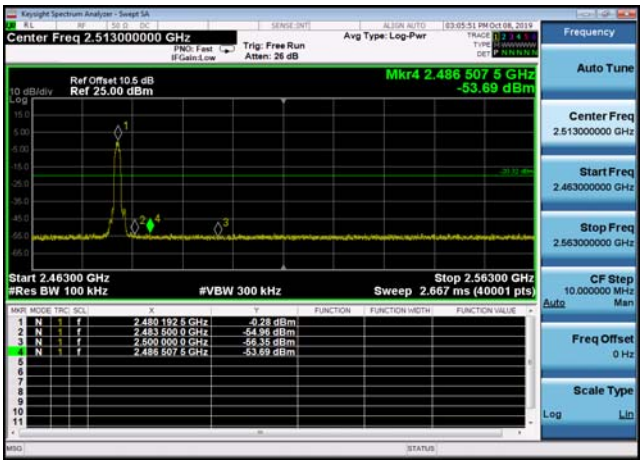
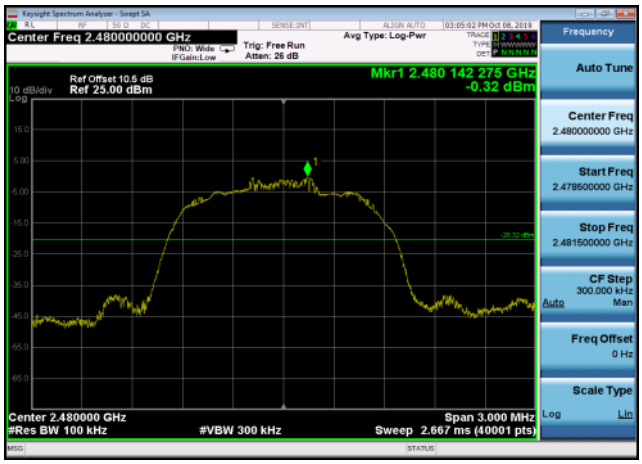


Conducted Emission：8DPSK,2480,3DH5 ,10000MHz~25000MHz

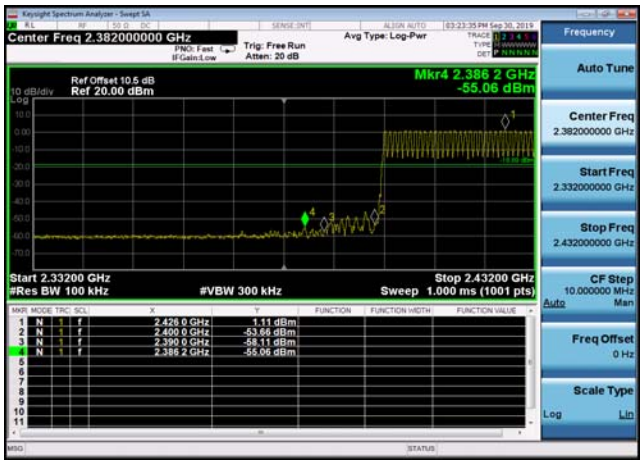
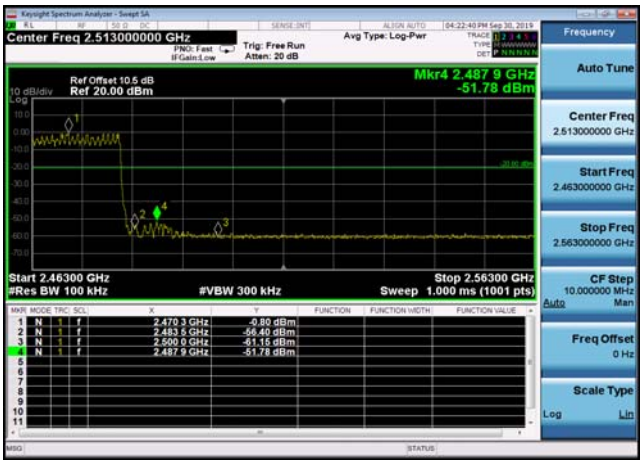


Conducted Emission：8DPSK,2480,3DH5 ,2500MHz~10000MHz



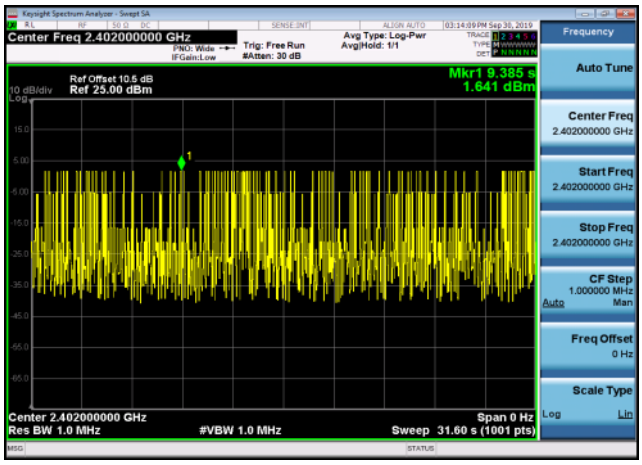
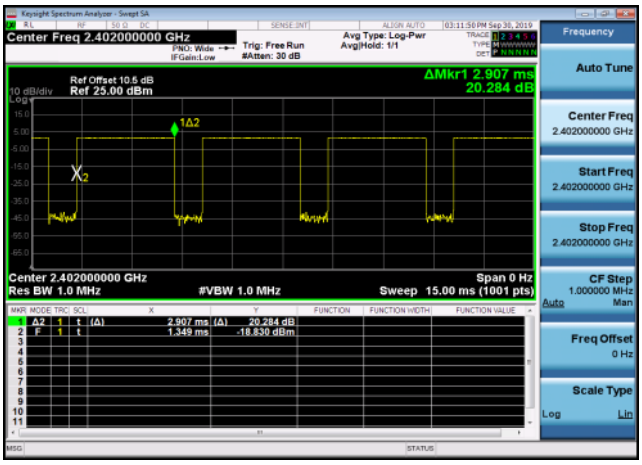
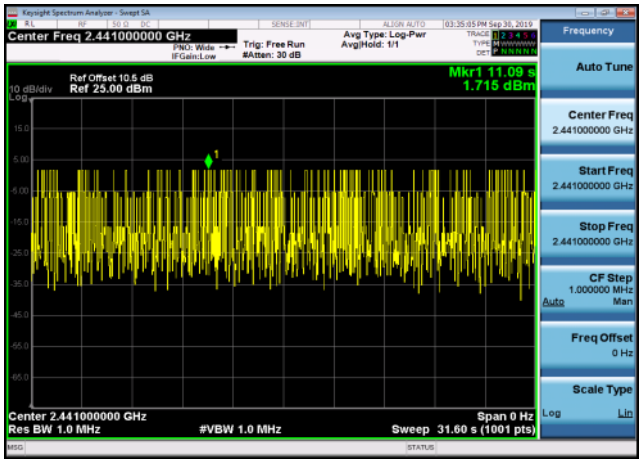
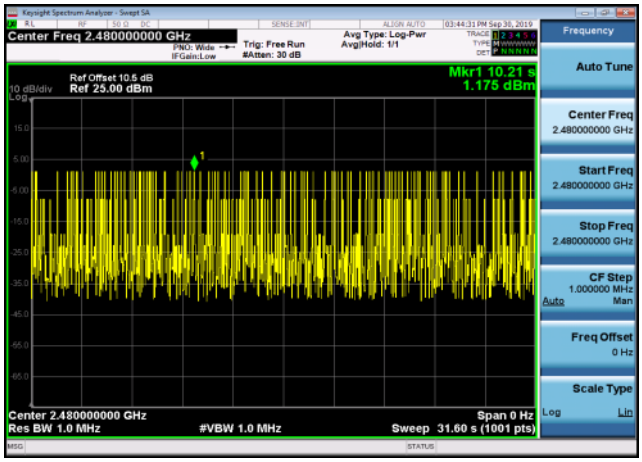
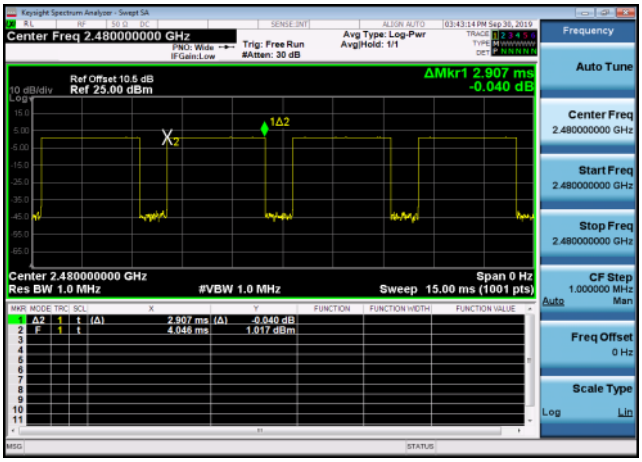
Conducted Emission：8DPSK,2480,3DH5 ,30MHz~2310MHz	Conducted Emission：8DPSK,2480,3DH5 ,Band Edge HoppingOFF
	
Conducted Emission：8DPSK,2480,3DH5 ,Reference Level	
	

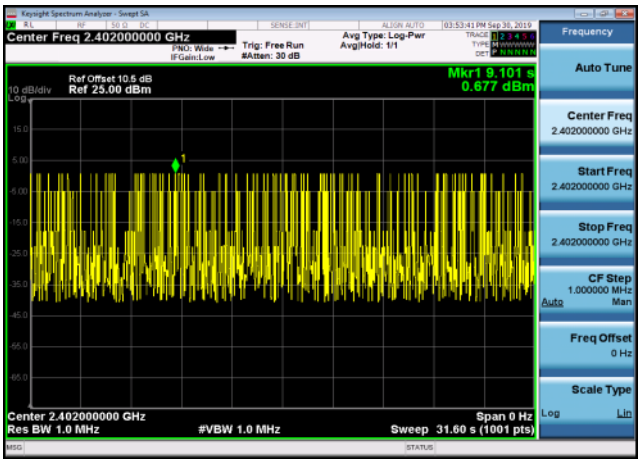
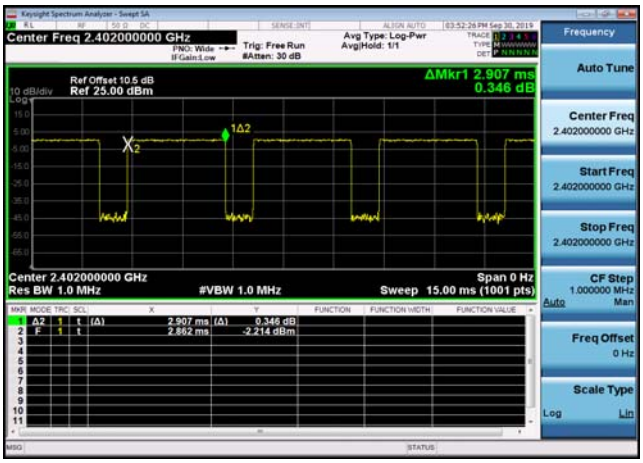
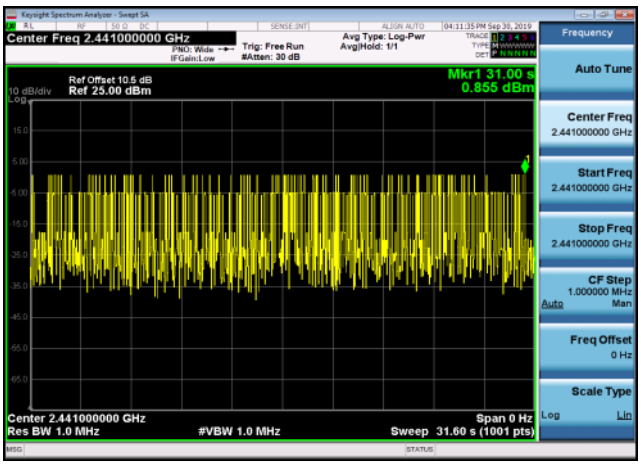
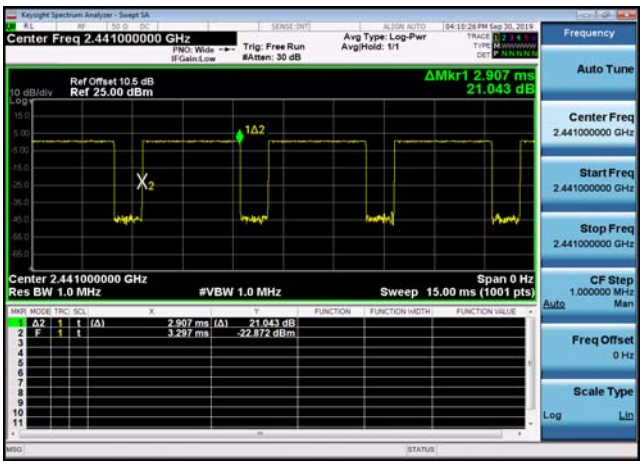
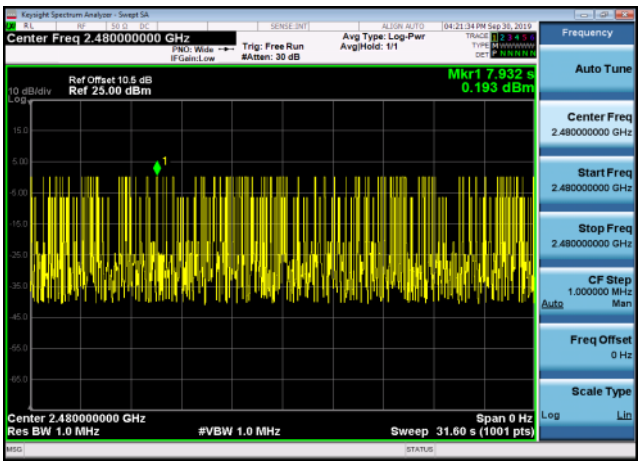
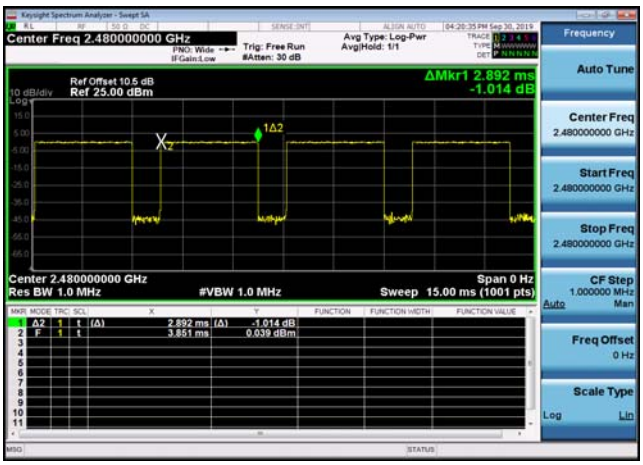
Hopping On Mode

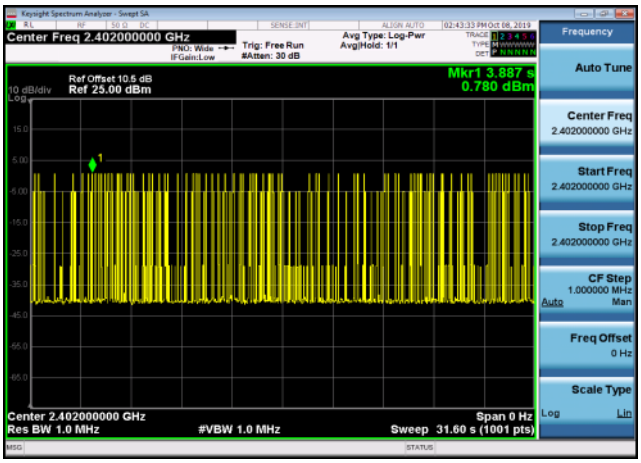
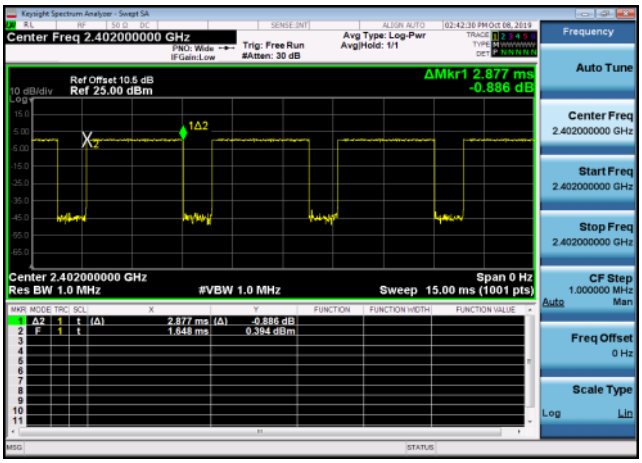
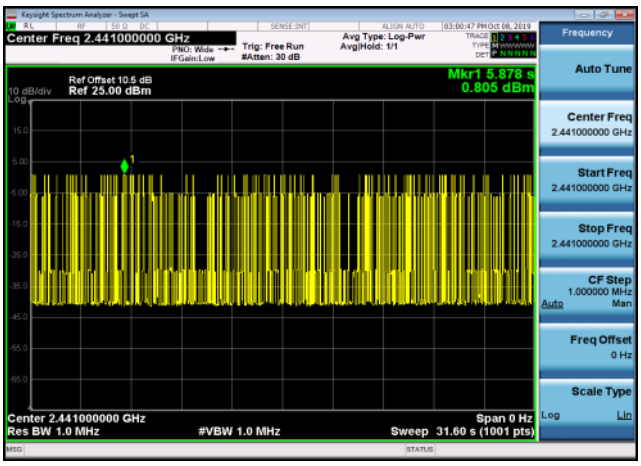
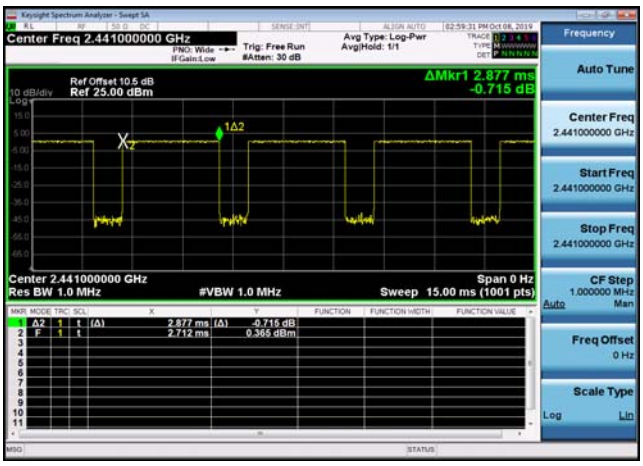
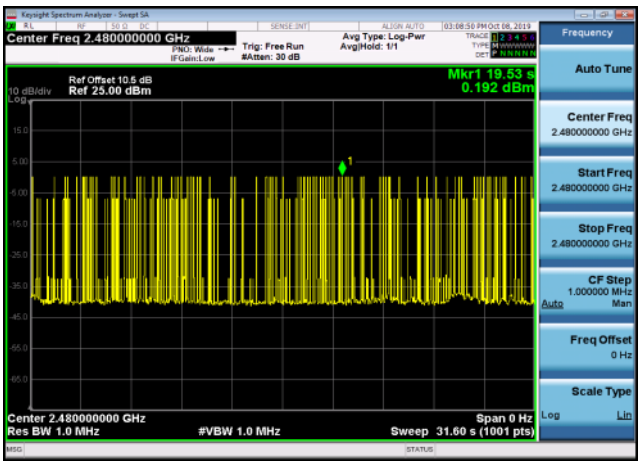
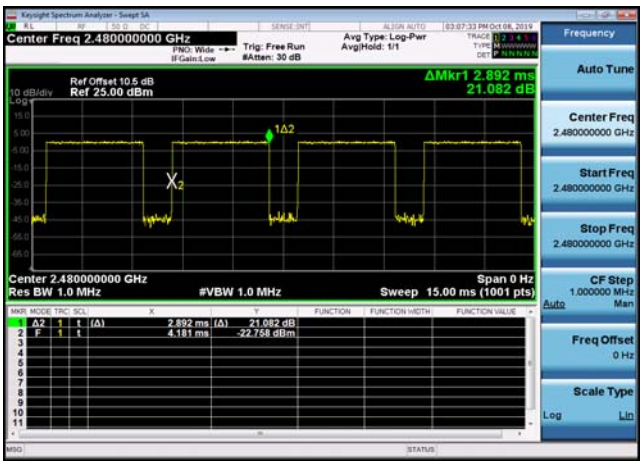
Conducted Emission：GFSK,2402,DH5 ,Band Edge	Conducted Emission：GFSK,2480,DH5 ,Band Edge
	
Conducted Emission：DQPSK,2402,2DH5 ,Band Edge	Conducted Emission：DQPSK,2480,2DH5 ,Band Edge
	
Conducted Emission：8DPSK,2402,3DH5 ,Band Edge	Conducted Emission：8DPSK,2480,3DH5 ,Band Edge

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	2.91	91	264.55	Pass
GFSK	2441	DH5	2.91	90	261.64	Pass
GFSK	2480	DH5	2.91	101	293.62	Pass
pi/4DQPSK	2402	2DH5	2.91	90	261.64	Pass
pi/4DQPSK	2441	2DH5	2.91	91	264.55	Pass
pi/4DQPSK	2480	2DH5	2.89	92	266.07	Pass
8DPSK	2402	3DH5	2.88	85	244.56	Pass
8DPSK	2441	3DH5	2.88	89	256.06	Pass
8DPSK	2480	3DH5	2.89	88	254.51	Pass

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

DQPSK,2402,2DH5,Transmission Number	DQPSK,2402,2DH5,Transmission Time
	
DQPSK,2441,2DH5,Transmission Number	DQPSK,2441,2DH5,Transmission Time
	
DQPSK,2480,2DH5,Transmission Number	DQPSK,2480,2DH5,Transmission Time
	

8DPSK,2402,3DH5,Transmission Number	8DPSK,2402,3DH5,Transmission Time
	
8DPSK,2441,3DH5,Transmission Number	8DPSK,2441,3DH5,Transmission Time
	
8DPSK,2480,3DH5,Transmission Number	8DPSK,2480,3DH5,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	999	⩾702.80	Pass
GFSK	Hopping	DH5	2440.5MHz~2442.5MHz	929.07	⩾676.71	Pass
GFSK	Hopping	DH5	2478.5MHz~2480.5MHz	1042.96	⩾675.97	Pass
pi/4DQPSK	Hopping	2DH5	2401.5MHz~2403.5MHz	1180.82	⩾857.12	Pass
pi/4DQPSK	Hopping	2DH5	2440.5MHz~2442.5MHz	1138.86	⩾857.17	Pass
pi/4DQPSK	Hopping	2DH5	2478.5MHz~2480.5MHz	1190.81	⩾856.78	Pass
8DPSK	Hopping	3DH5	2401.5MHz~2403.5MHz	877.15	⩾855.06	Pass
8DPSK	Hopping	3DH5	2440.5MHz~2442.5MHz	1162.84	⩾854.46	Pass
8DPSK	Hopping	3DH5	2478.5MHz~2480.5MHz	1005	⩾853.37	Pass

Note:the limit is 2/3 of 20dB Badnwidth

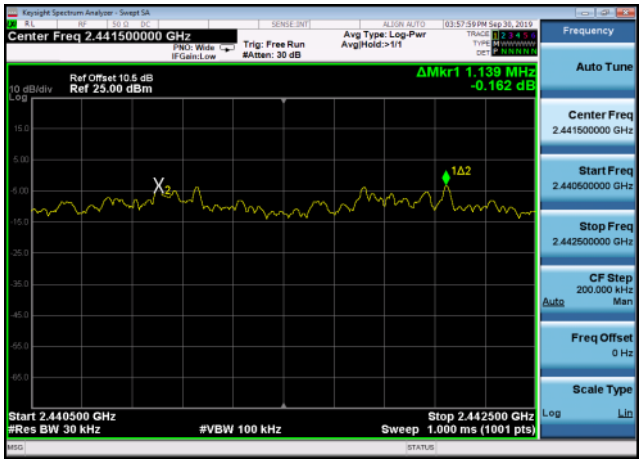
GFSK,HoppingDH5,2401.5~2403.5

GFSK,HoppingDH5,2440.5~2442.5

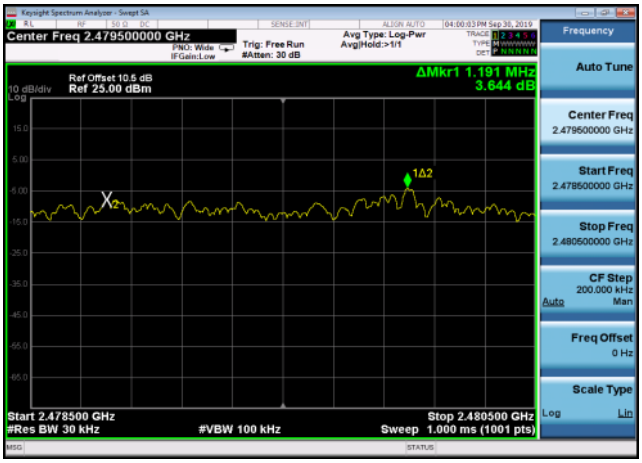
GFSK,HoppingDH5,2478.5~2480.5

DQPSK,Hopping2DH5,2401.5~2403.5

DQPSK,Hopping2DH5,2440.5~2442.5



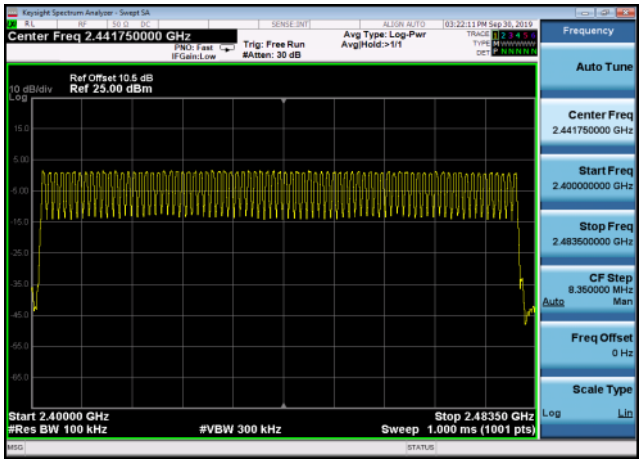
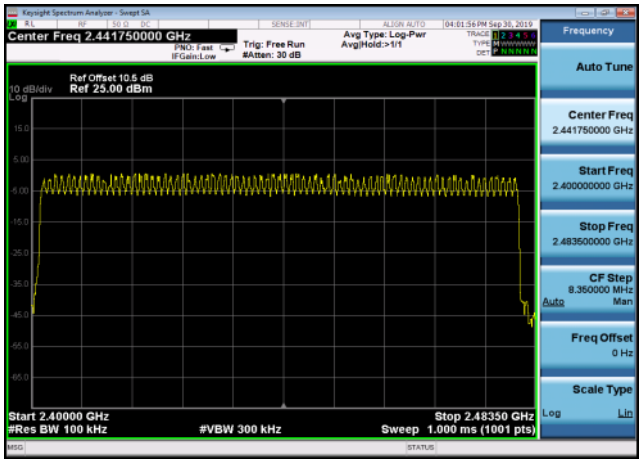
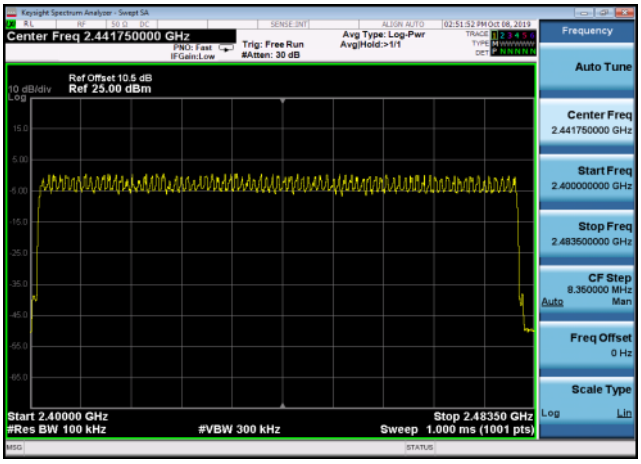
DQPSK,Hopping2DH5,2478.5~2480.5



8DPSK,Hopping3DH5,2401.5~2403.5	8DPSK,Hopping3DH5,2440.5~2442.5
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)	Limit	Result
GFSK	Hopping	DH5	2400~2483.5	⩾15	Pass
pi/4DQPSK	Hopping	2DH5	2400~2483.5	⩾15	Pass
8DPSK	Hopping	3DH5	2400~2483.5	⩾15	Pass

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

** END OF REPORT **