

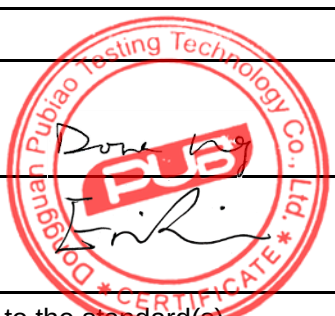
TEST REPORT		
Report Number.:	EP2608091F01	
Date of receipt of test item...:	2026-08-17	
Date (s) of performance of test	2026-08-18 to 2026-10-08	
Date of issue	2026-10-08	
Testing Laboratory name	Dongguan Pubiao Testing Technology Co., Ltd.	
Address	Room 101, Building 1, No.30, Minghua Road, Shijie,Shijie Town, Dongguan,Guangdong, 523250,People's Republic of China	
Applicant's name.....:	Zhuhai Xprinter Electronics Technology Co., Ltd.	
Address	5/F, 1st Workshop, No.613 Huawei Road, Qianshan Industrial Zone, Xiangzhou District, Zhuhai City, Guangdong Province, P.R.China	
Manufacturer's name	Zhuhai Xprinter Electronics Technology Co., Ltd.	
Address	5/F, 1st Workshop, No.613 Huawei Road, Qianshan Industrial Zone, Xiangzhou District, Zhuhai City, Guangdong Province, P.R.China	
Factory's name	Zhuhai Xprinter Electronics Technology Co., Ltd.	
Address	5/F, 1st Workshop, No.613 Huawei Road, Qianshan Industrial Zone, Xiangzhou District, Zhuhai City, Guangdong Province, P.R.China	
Standard(s).....:	FCC 47 CFR Part 15, Subpart C	
Test item description	PORTABLE LABEL PRINTER	
Trade Mark	N/A	
Model/Type reference	XP-F1, F1	
FCC ID	2AWYK-F1	
Summary of Test Results	Pass	
Test Report Form No.....:	47 CFR Parts 15 C	
Master TRF.....:	Dated 2025-11	
Prepared by (+signature).....:	Dora Ning	
Approved by (+signature)	Eric Liu	
The Summary of Test Results based on a technical opinion belongs to the standard(s).		
General disclaimer: This report shall not be reproduced except in full, without the written approval of Dongguan Pubiao Testing Technology Co., Ltd. The test results in the report only apply to the tested sample.		

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Modified Information

Report No.	Revision Data	Summary
EP2608091F01	2026-10-08	Original Version

1 EUT TECHNICAL DESCRIPTION

The following product information is provided by the customer:

Characteristics	Description
Product:	PORTABLE LABEL PRINTER
Model Number:	XP-F1, F1
Difference:	All models are identical to each other except for model name. Here we choose F1 as the test EUT.
Device Type:	Bluetooth V5.0
Data Rate:	1Mbps for BT V5.2 GFSK modulation 2Mbps for BT V5.2 pi/4-DQPSK modulation
Modulation:	GFSK, pi/4-DQPSK
Operating Frequency Range(s):	2402-2480MHz
Number of Channels:	79 channels
Antenna Type:	PCB Antenna
Antenna Gain:	-0.93 dBi
Power supply:	DC 3.7V from Battery DC 5V from USB

Note: for more details, please refer to the User's manual of the EUT.

2 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.247(a)(1)	20 dB Bandwidth	PASS	
15.247(a)(1)	Carrier Frequency Separation	PASS	
15.247(a)(1)	Number of Hopping Frequencies	PASS	
15.247(a)(1)	Average Time of Occupancy (Dwell Time)	PASS	
15.247(b)(1)	Maximum Peak Conducted Output Power	PASS	
15.247(d)	Conducted Spurious Emissions	PASS	
15.247(d) 15.209	Radiated Spurious Emissions	PASS	
15.207	Conducted Emission	PASS	
15.203	Antenna Application	PASS	
15.247 (a) (1)/g/h	Frequency Hopping System	PASS	
NOTE1: N/A (Not Applicable)			
NOTE2: According to FCC KDB 558074 D01 15.247 Meas Guidance v05r02, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2AWYK-F1 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

3 TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 15, Subpart C;
FCC KDB 558074 D01 15.247 Meas Guidance v05r02.

3.2 MEASUREMENT EQUIPMENT USED

3.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
EMI Test Receiver	ROHDE&SCHWARZ	ESCI3	101315	2026-05-18	1year
LISN	ROHDE&SCHWARZ	ENV216	102331	2026-05-18	1year
Test Cable	HUBER+SUHNER	RG 223/U	1-1#	2026-05-18	1year
10 db attenuator	N/A	DC-6G-10DB-N-JK	/	2026-05-18	1year
CE Testing software	EZ	EZ-EMC	/	/	/

3.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	ESPI3	101918	2026-05-18	1year
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50531325	2026-05-18	1year
Preamplifier	ROHDE& SCHWARZ	8447E	2945A02763	2026-05-18	1year
Preamplifier	BOST	BPA-001018G40B	8400019	2026-05-18	1year
Preamplifier	RF system	BPA-018040G45B	26031901	2026-04-22	1year
Bilog Antenna	Schwarzbeck	VULB 9168	01422	2026-03-04	3years
Loop Antenna	SCHWARZBECK	FMZB1519-60 D	1519-60 D-232	2026-04-21	3years
Horn Antenna	antsym	AS-DAH-L1000H1800 0G16/S-NK	antsym	2026-05-18	3years
Horn Antenna	Schwarzbeck	BBHA 9170	F143	2026-04-21	3years
The RF cable	HUBER+SUHNER	RG 223/U	1-3#	2026-05-18	1year
The RF cable	HUBER+SUHNER	RG 223/U	1-4#	2026-05-18	1year
The RF cable	HUBER+SUHNER	RG 223/U	1-5#	2026-05-18	1year
The RF cable	TIMES Microwave Systems	HF290-NMNM-14.00M	844011-0001	2026-04-13	1year

3.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	DUE CAL.
Vector Signal Generater	Agilen	N5182A	MY50142585	2026-05-18	1year
Wideband Radio Communication Tester	ROHDE & SCHWARZ	CMW500	132488-Sz	2026-05-18	1year
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50531325	2026-05-18	1year
DC Power Supper	KEYSIGHT	E3642A	MY41002348	2026-05-18	1year
RF control box	CDKMV	MW100-RFCB	MW210914PB	2026-01-09	1year
Power detection box	CDKMV	MW101-PSB	MW210914PB-2 2	2026-01-09	1year
RF Testing software	MW	MTS 8310	/	/	/

3.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (1Mbps for GFSK modulation, 2Mbps for pi/4-DQPSK modulation) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	...	...
1	2403	40	2442	76	2478
2	2404	41	2443	77	2479
...	...	...	...	78	2480
Note: $f_c = 2402\text{MHz} + (k-1) \times 1\text{MHz}$ $k=1$ to 79					

Test Frequency and channel:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	78	2480

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

Site Description		
Name of Firm	:	Dongguan Pubiao Testing Technology Co., Ltd.
Site Location	:	Room 101, Building 1, No.30, Minghua Road, Shijie, Shijie Town, Dongguan, Guangdong, China.
FCC Designation Number	:	CN1459
Test Firm Registration Number:	:	782062
FCC Test Firm Registration Number	:	7670.01

4.2 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

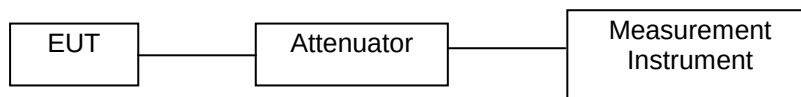
Parameter	Uncertainty
Radio Frequency	2×10^{-5}
Maximum Peak Output Power Test	$\pm 1.19\text{dB}$
Duty cycle	$\pm 2\%$
Conducted Emissions Test	4.26dB
Radiated Emission(30MHz~1GHz)	6.10dB (Below 1GHz)
	6.28dB (Above 1GHz)
Occupied Bandwidth Test	$\pm 4.0\%$
Band Edge Test	$\pm 2.3\%$
Antenna Port Emission	$\pm 3\text{ dB}$
Temperature	0.5°C
Humidity	2%

Measurement Uncertainty for a level of Confidence of 95%

5 SETUP OF EQUIPMENT UNDER TEST

5.1 RADIO FREQUENCY TEST SETUP 1

The Bluetooth component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



5.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024.

Below 30MHz:

The EUT is placed on a turntable 0.8meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

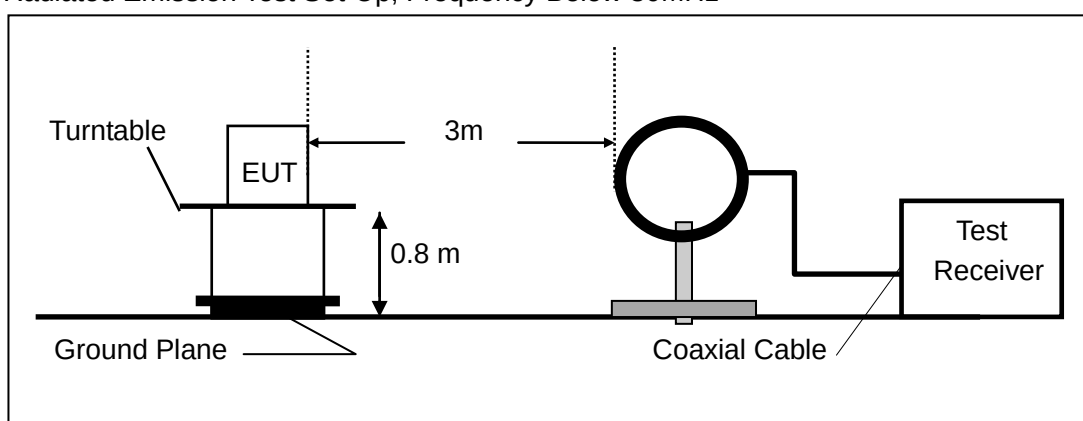
The EUT is placed on a turntable 0.8meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

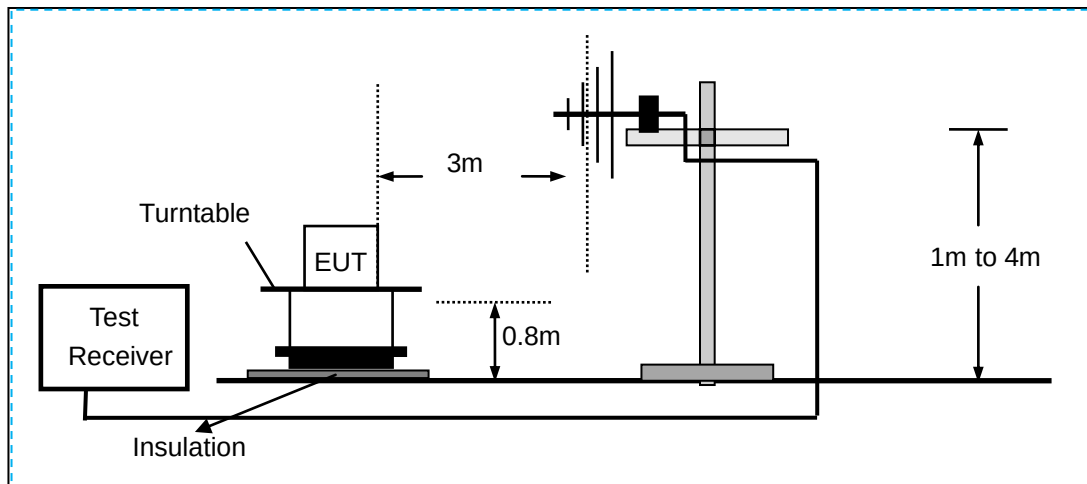
(Note: The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

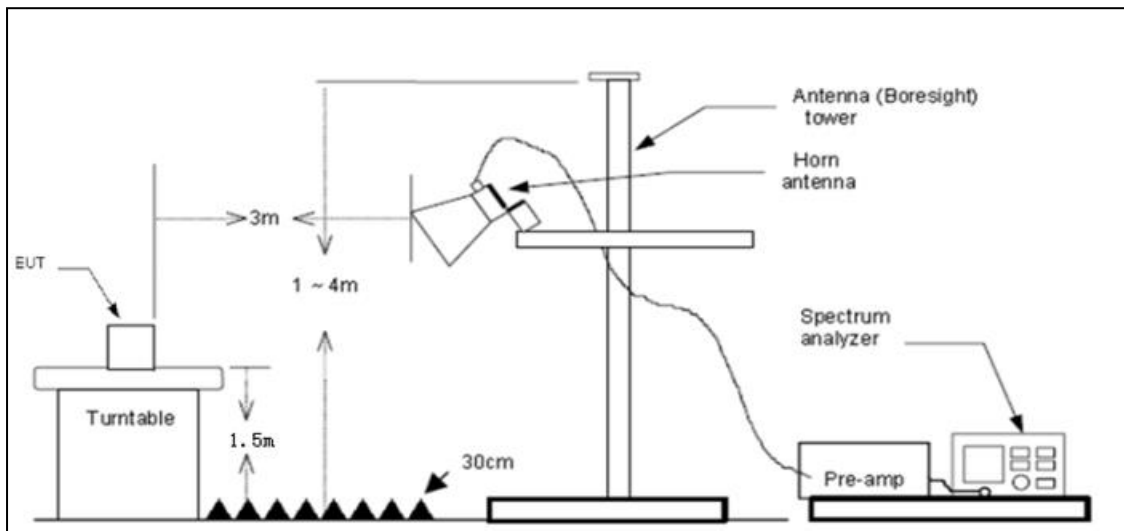
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz



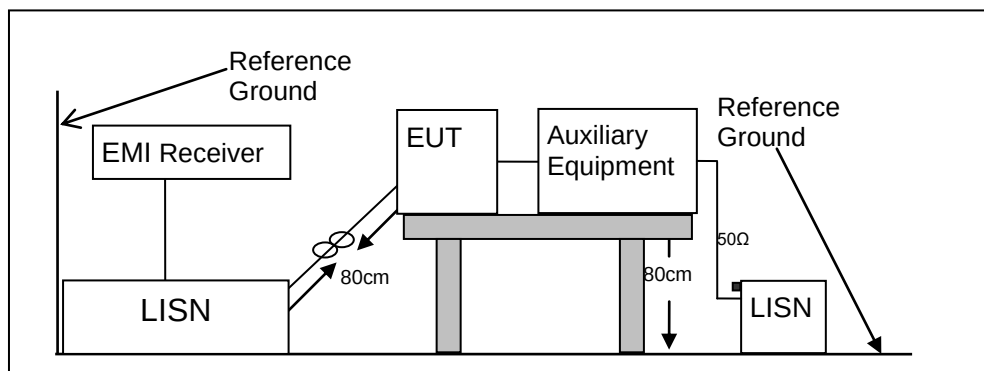
5.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (Perfect Share Mini) must be connected to LISN. The LISN shall be placed 0.8m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

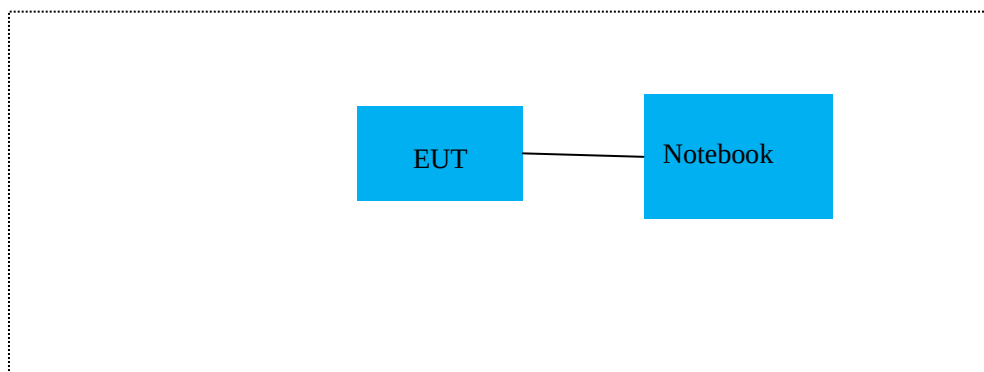
Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2020 + Cor.

1-2023+C63.10a-2024 + Errata to C63.10a-2024 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



5.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



5.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	HUAWEI	MDG-16	2HG BB23A12802356

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

6 TEST REQUIREMENTS

6.1 20DB BANDWIDTH

6.1.1 Applicable Standard

According to FCC Part 15.247(a)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.1.2 Conformance Limit

No limit requirement.

6.1.3 Test Configuration

Test according to clause 5.1 radio frequency test setup 1

6.1.4 Test Procedure

The EUT was operating in Bluetooth mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

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.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 30 kHz.

Set the video bandwidth (VBW) =100 kHz.

Set Span= approximately 1 to 3 times the 20 dB bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the markerdelta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

Measure and record the results in the test report.

Test Results

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Modulation Mode	Channel Number	Channel Frequency (MHz)	Measurement Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	00	2402	0.9292	N/A	PASS
	39	2441	0.9404	N/A	PASS
	78	2480	0.9284	N/A	PASS
pi/4-DQPSK	00	2402	1.222	N/A	PASS
	39	2441	1.261	N/A	PASS
	78	2480	1.245	N/A	PASS
Note: N/A (Not Applicable)					

Test Model 20dB Bandwidth
Channel 0: 2402 MHz GFSK Modulation



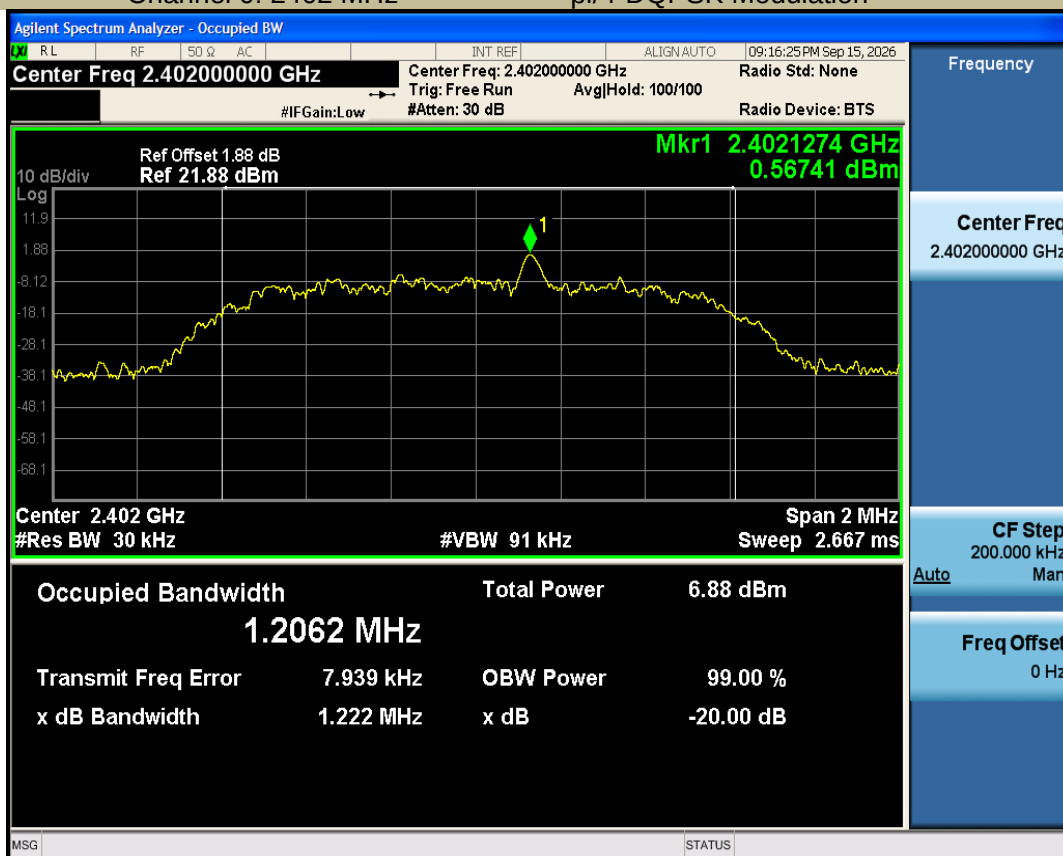
Test Model 20dB Bandwidth
Channel 39: 2441 MHz GFSK Modulation



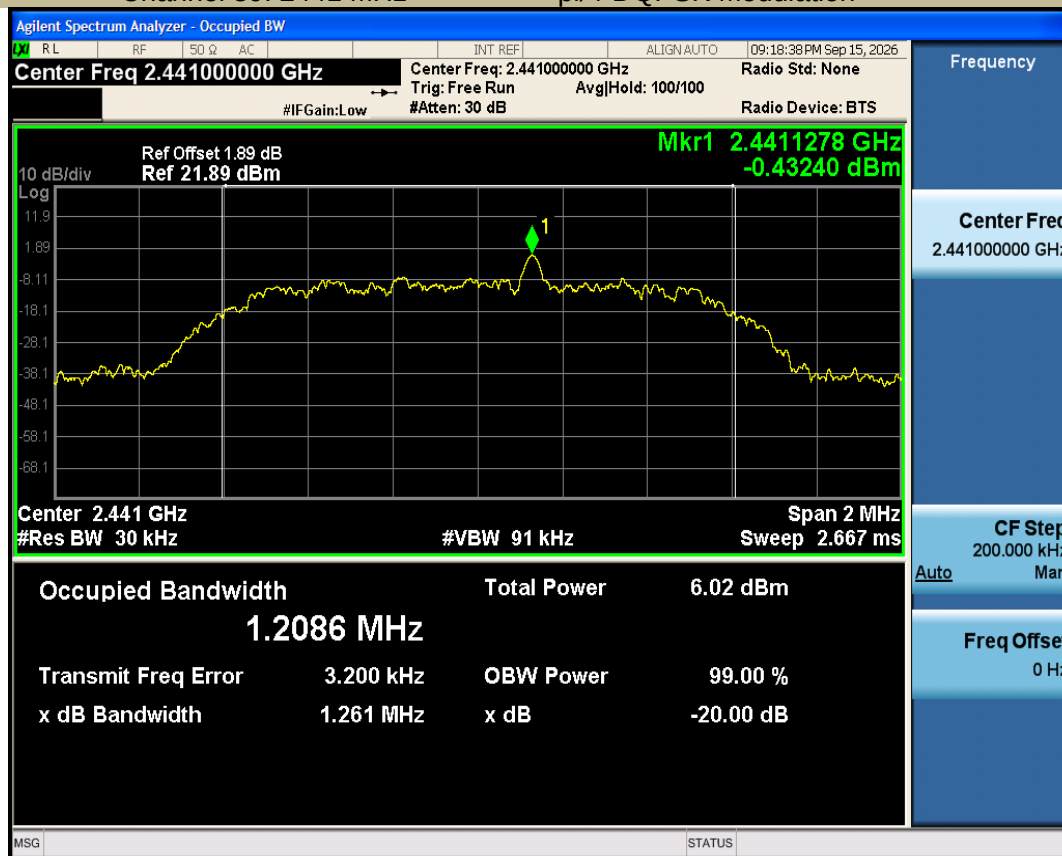
Test Model 20dB Bandwidth
Channel 78: 2480 MHz GFSK Modulation



Test Model 20dB Bandwidth
Channel 0: 2402 MHz pi/4-DQPSK Modulation



Test Model 20dB Bandwidth
Channel 39: 2441 MHz pi/4-DQPSK Modulation



Test Model 20dB Bandwidth
Channel 78: 2480 MHz pi/4-DQPSK Modulation



6.2 DUTY CYCLE

6.2.1 Applicable Standard

According to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024+Errata to C63.10a-2024 clause 11.6

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to help ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e. no transmitter OFF-time is to be considered).

When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this subclause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than +2%; otherwise, the duty cycle is considered to be nonconstant.

The term "maximum power control level" is intended to distinguish between operating power levels of the EUT and differences in power levels of individual symbols that occur with some modulation types such as quadrature amplitude modulation (QAM). During testing, the EUT is not required to transmit continuously its highest possible symbol power level. Rather, it should transmit all the symbols and should do so at the highest power control level (i.e., highest operating power level) of the EUT.

Measurements of duty cycle and transmission duration shall be performed using one of the

- a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
 - 1) Set the center frequency of the instrument to the center frequency of the transmission.
 - 2) Set RBW > OBW if possible; otherwise, set RBW to the largest available value.
 - 3) Set VBW > RBW. Set detector = peak or average.
 - 4) The zero-span measurement method shall not be used unless both RBW and VBW are $>50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7\mu s$.)

6.2.2 Test Results

The manufacturer claims that the duty cycle is greater than 98%.

6.3 CARRIER FREQUENCY SEPARATION

6.3.1 Applicable Standard

According to FCC Part 15.247(a)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.3.2 Conformance Limit

Frequency hopping systems operating in the 2400-2483.5MHz band shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

In case of an output power less than 125mW, the frequency hopping system may have channels separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

6.3.3 Test Configuration

Test according to clause 5.1 radio frequency test setup 1

6.3.4 Test Procedure

■ According to FCC Part15.247(a)(1)

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

VBW: Video (or average) bandwidth (VBW) $\geq$ RBW

Set the span = wide enough to capture the peaks of two adjacent channels

Set Sweep time = auto couple.

Set Detector = peak. Set Trace mode = max hold.

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

Test Results

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

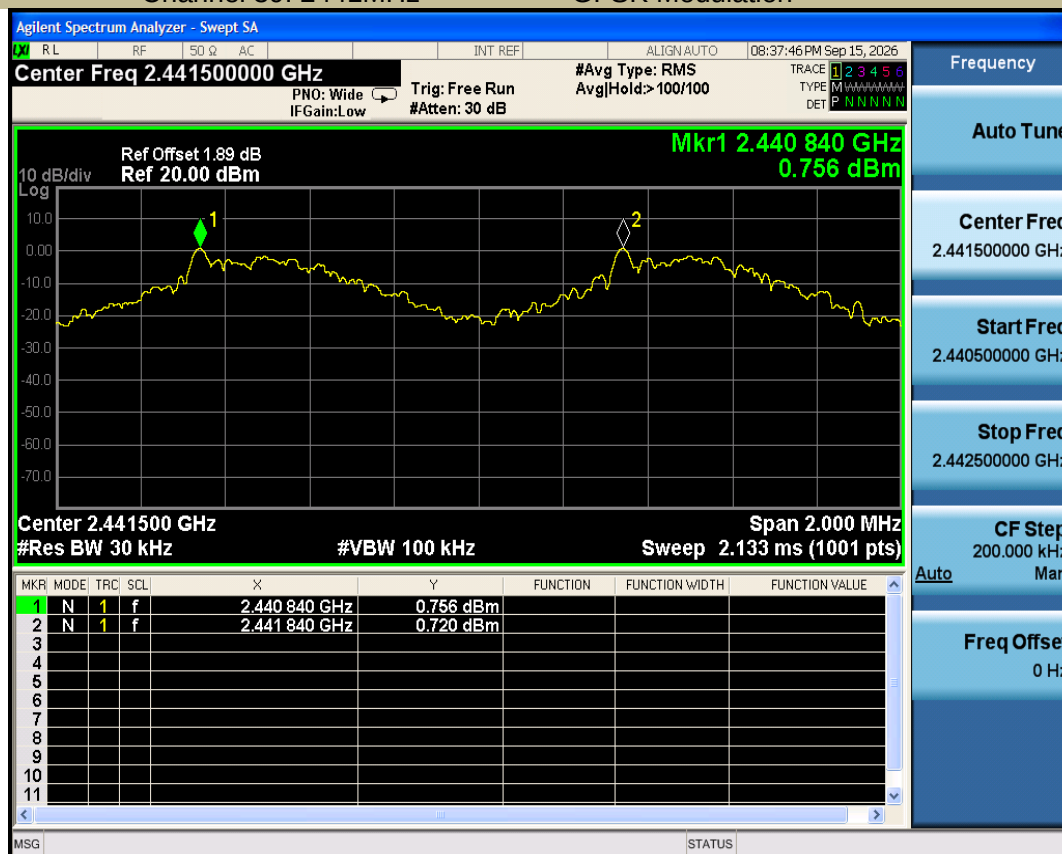
Modulation Mode	Channel Number	Channel Frequency (MHz)	Measurement Bandwidth (kHz)	Limit (kHz)	Verdict
GFSK	0	2402	1000	>619	PASS
	39	2441	1000	>627	PASS
	78	2480	1000	>619	PASS
pi/4-DQPSK	0	2402	1002	>815	PASS
	39	2441	1002	>841	PASS
	78	2480	998	>830	PASS

Note: Limit = 20dB bandwidth * 2/3

Test Model Carrier Frequency Separation
Channel 0: 2402MHz GFSK Modulation



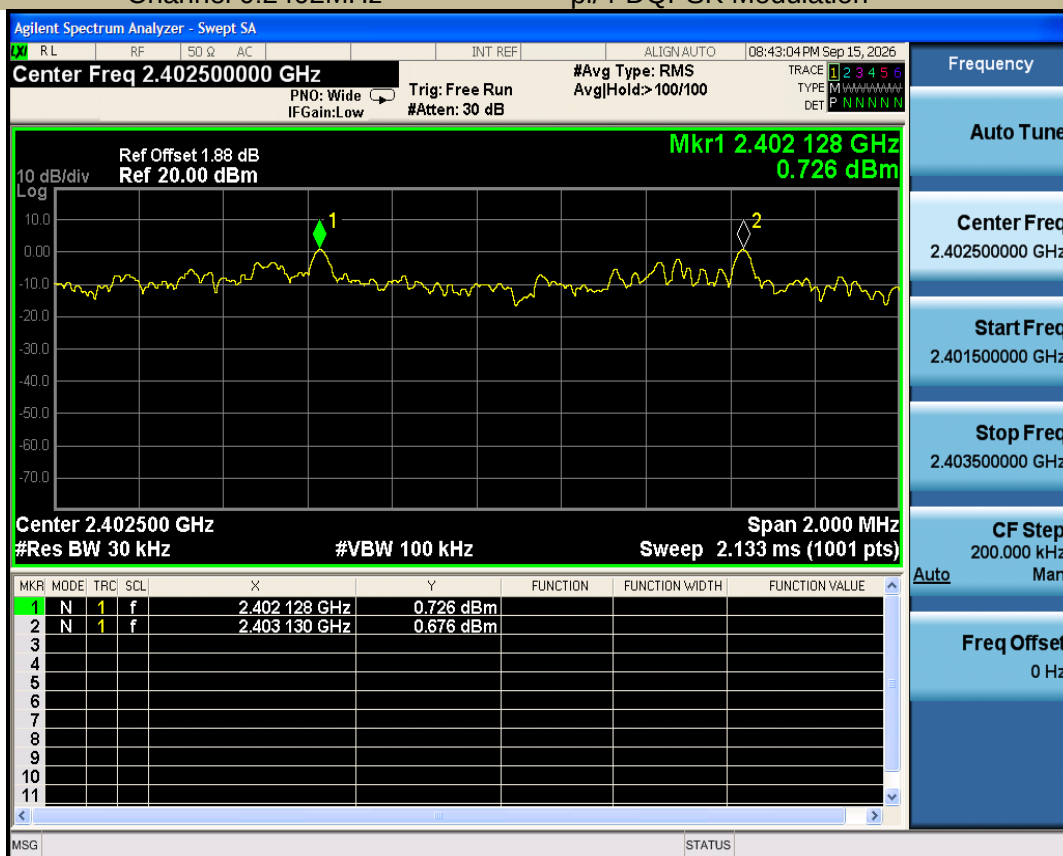
Test Model Carrier Frequency Separation
Channel 39: 2441MHz GFSK Modulation



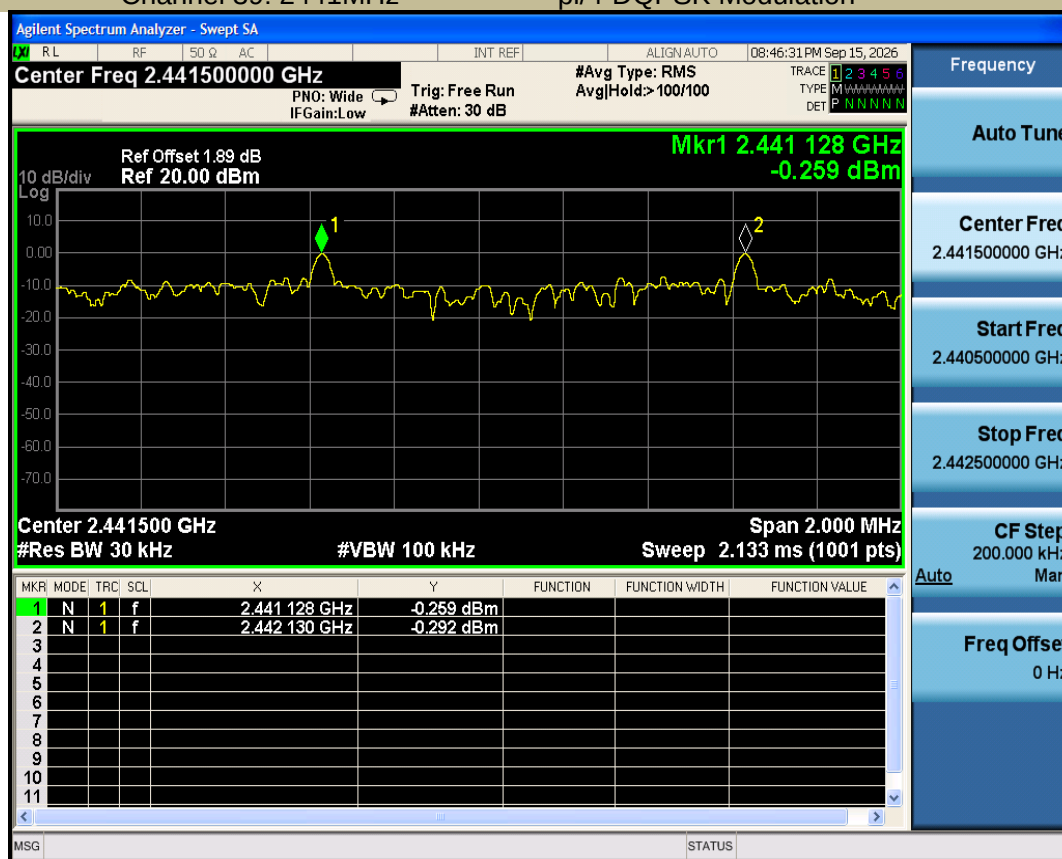
Test Model Carrier Frequency Separation
Channel 78: 2480MHz GFSK Modulation



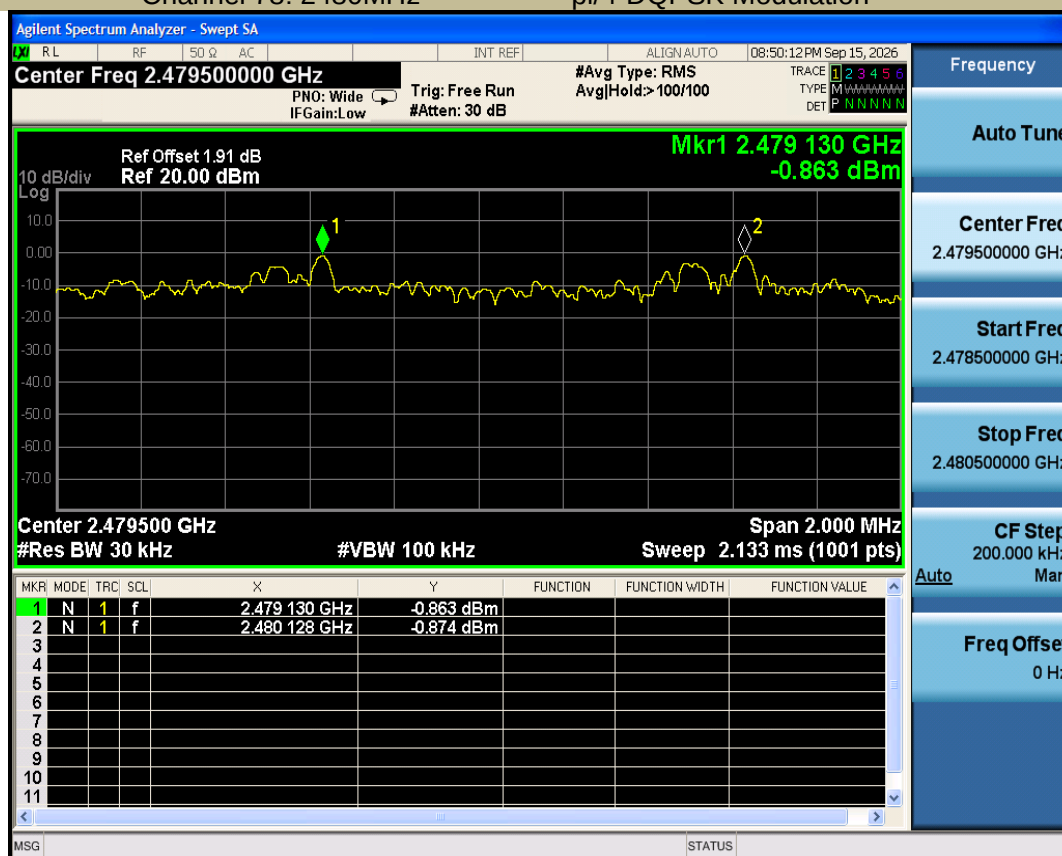
Test Model Carrier Frequency Separation
Channel 0:2402MHz pi/4-DQPSK Modulation



Test Model Carrier Frequency Separation
Channel 39: 2441MHz pi/4-DQPSK Modulation



Test Model Carrier Frequency Separation
Channel 78: 2480MHz pi/4-DQPSK Modulation



6.4 NUMBER OF HOPPING FREQUENCIES

6.4.1 Applicable Standard

According to FCC Part 15.247(a)(1) (iii) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.4.2 Conformance Limit

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

6.4.3 Test Configuration

Test according to clause 5.1 radio frequency test setup 1

6.4.4 Test Procedure

■ According to FCC Part 15.247(a)(1)(iii)

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation (2400-2483.5MHz)

RBW $\geq$ 100KHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

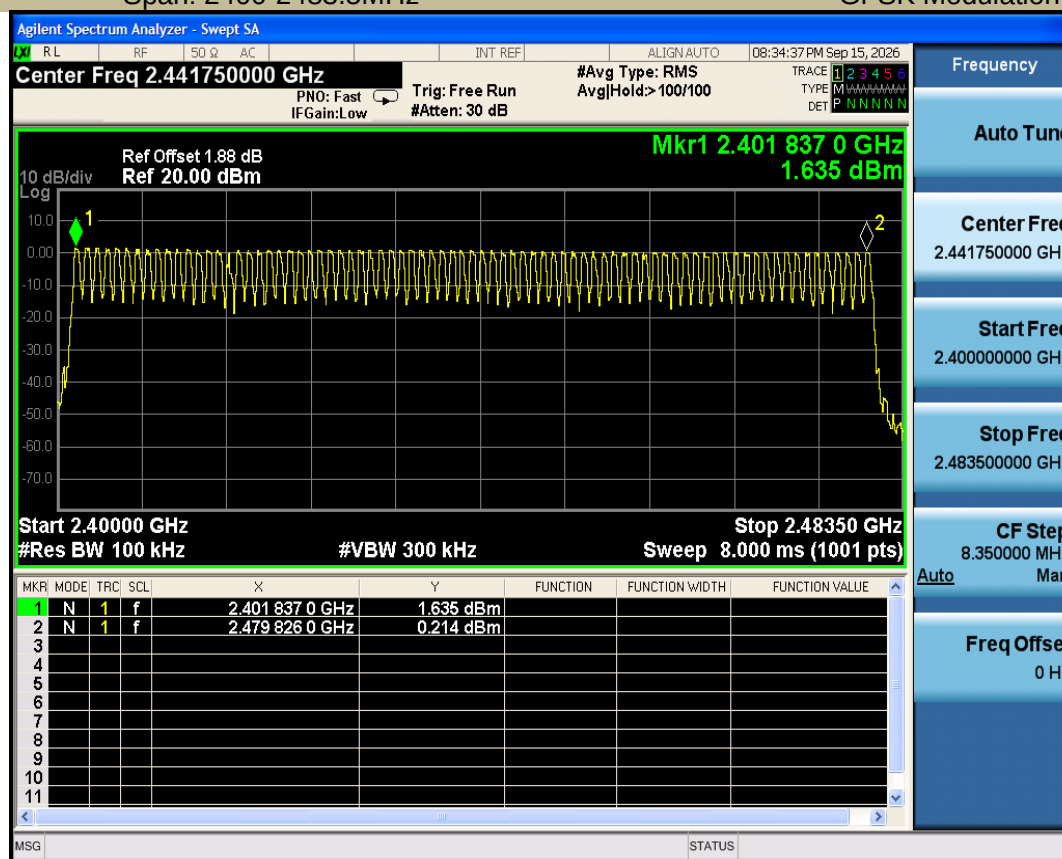
Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies.

Test Results

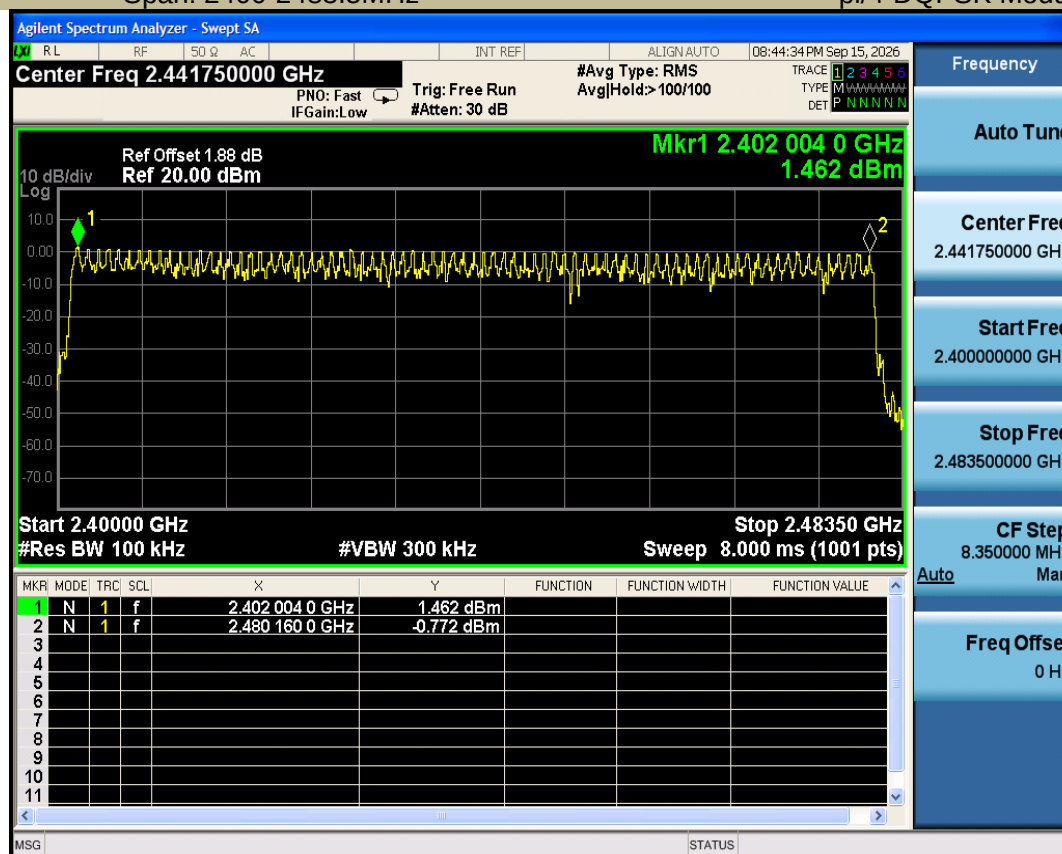
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Modulation Mode	Hopping Channel Frequency Range	Quantity of Hopping Channel	Quantity of Hopping Channel limit
GFSK	2402-2480	79	> 15
pi/4-DQPSK	2402-2480	79	> 15

Test Model Number Of Hopping Frequencies
Span: 2400-2483.5MHz GFSK Modulation



Test Model Number Of Hopping Frequencies
Span: 2400-2483.5MHz pi/4-DQPSK Modulation



6.5 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

6.5.1 Applicable Standard

According to FCC Part 15.247(a)(1)(iii) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.5.2 Conformance Limit

For frequency hopping systems operating in the 2400-2483.5MHz band, the average time of occupancy on any channel shall not be greater than 0.4s within a period of 0.4s multiplied by the number of hopping channels employed.

6.5.3 Test Configuration

Test according to clause 5.1 radio frequency test setup 1

6.5.4 Test Procedure

■ According to FCC Part 15.247(a)(1)(iii)

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = zero span, centered on a hopping channel

RBW = 1 MHz

VBW $\geq$ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

Trace = max hold

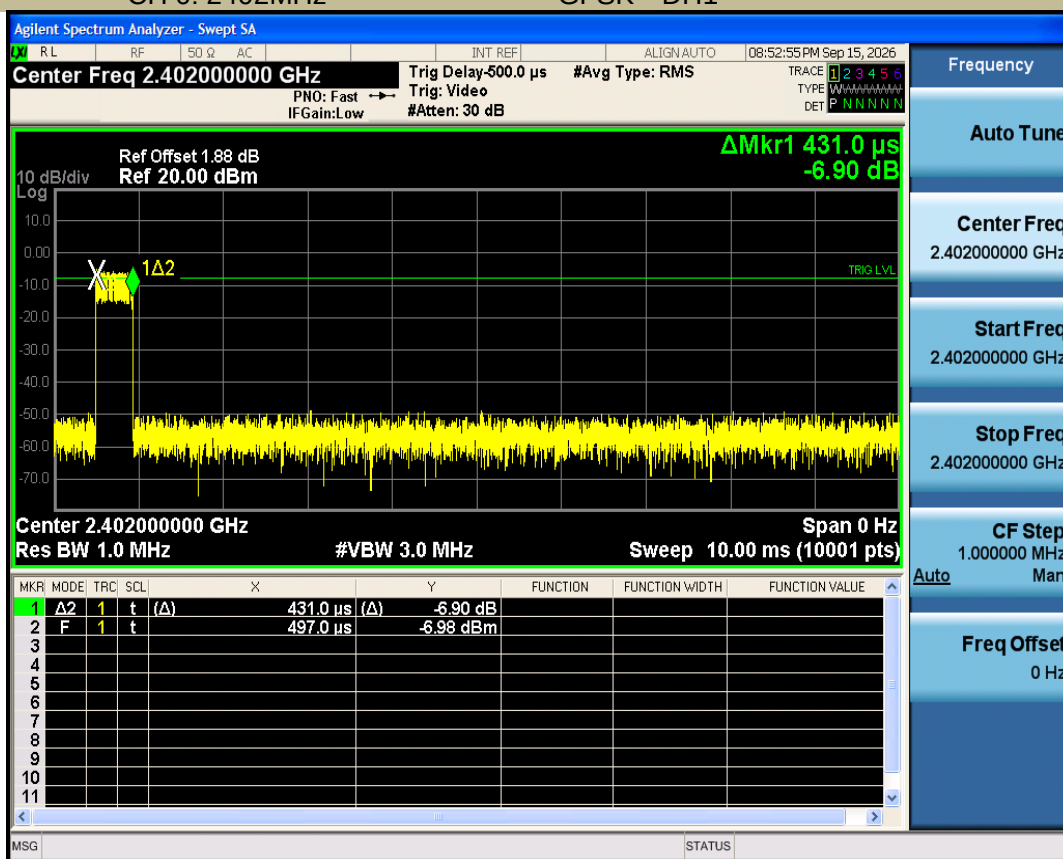
If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section.

6.5.5 Test Results

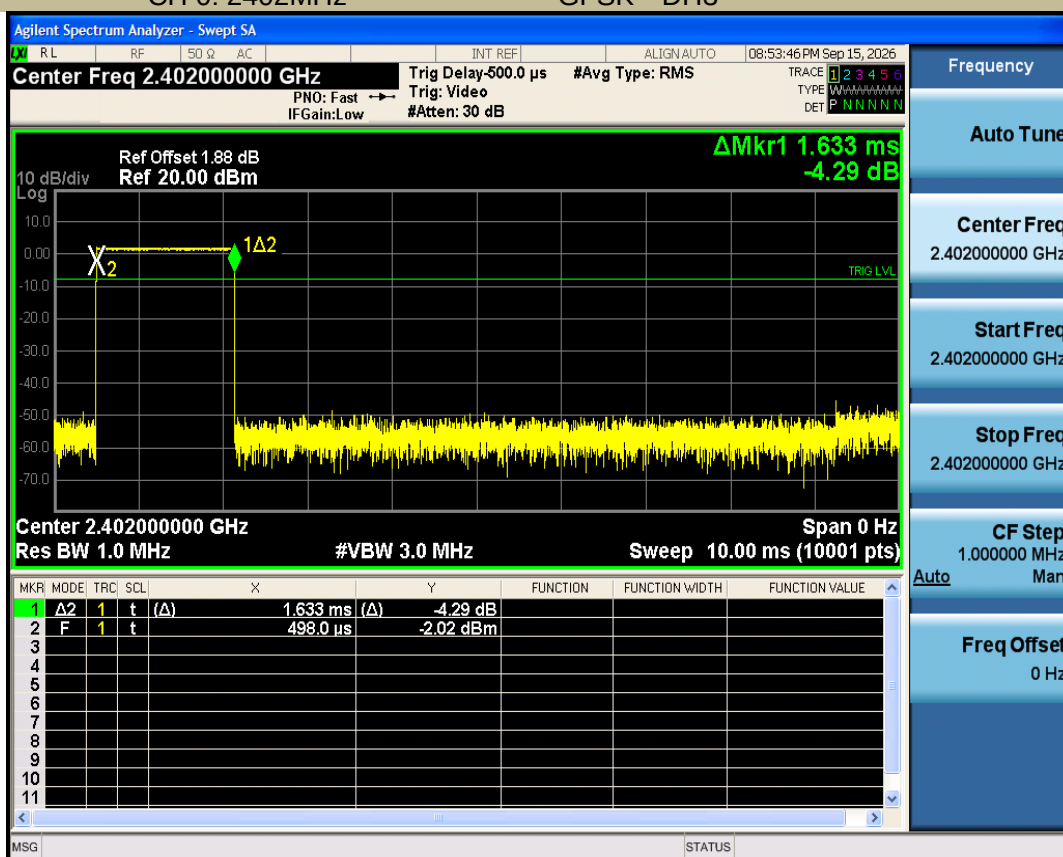
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Modulation Mode	Packet type	Frequency (MHz)	Pulse width (ms)	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	DH1	2402	0.431	137.92	<400	PASS
	DH3	2402	1.633	261.28	<400	PASS
	DH5	2402	2.827	301.55	<400	PASS
pi/4-DQPSK	2-DH1	2402	0.491	157.12	<400	PASS
	2-DH3	2402	1.694	271.04	<400	PASS
	2-DH5	2402	2.883	307.52	<400	PASS
Note: Dwell Time(DH1)=PW*(1600/2/79)*31.6 Dwell Time(DH3)=PW*(1600/4/79)*31.6 Dwell Time(DH5)=PW*(1600/6/79)*31.6						

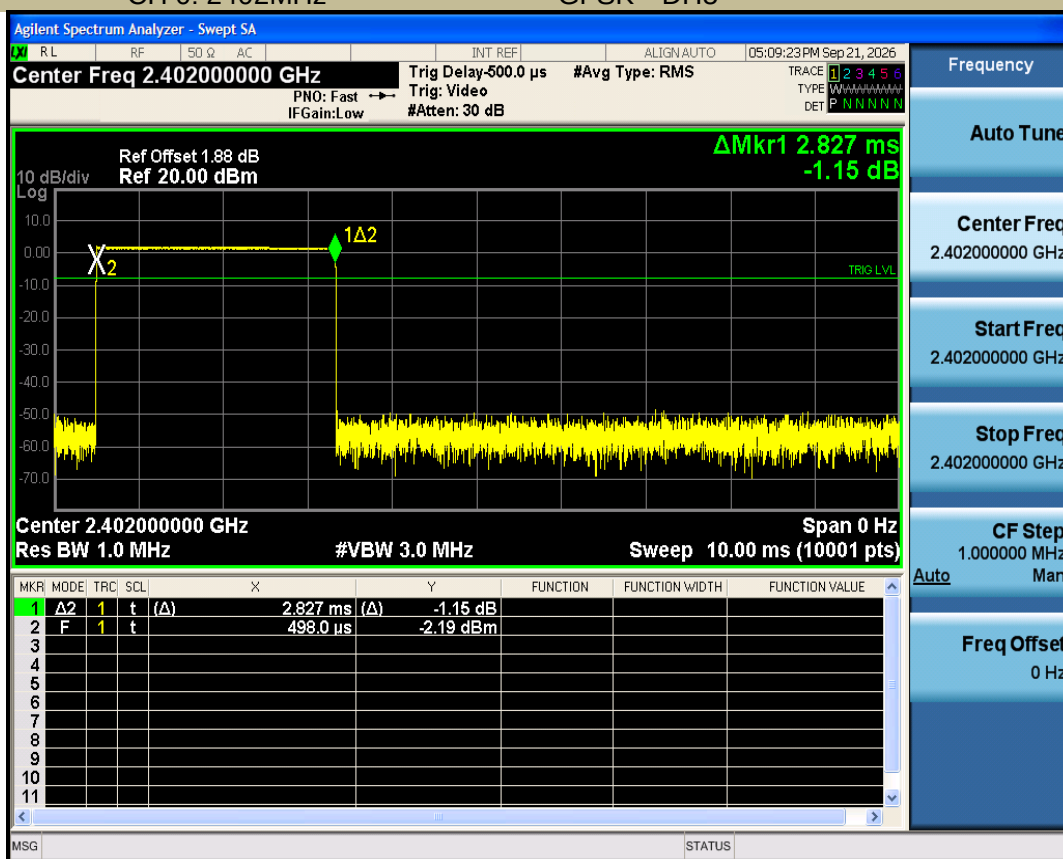
Test Model Average Time Of Occupancy (Dwell Time)
CH 0: 2402MHz GFSK DH1



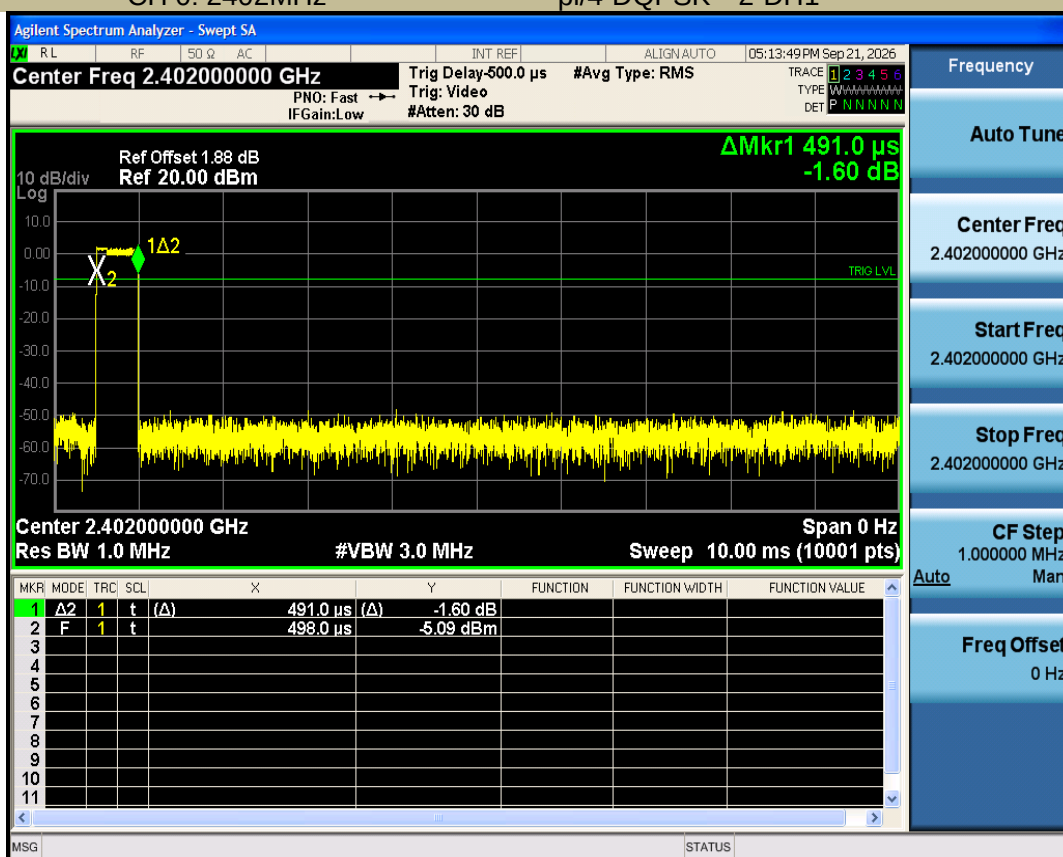
Test Model Average Time Of Occupancy (Dwell Time)
CH 0: 2402MHz GFSK DH3



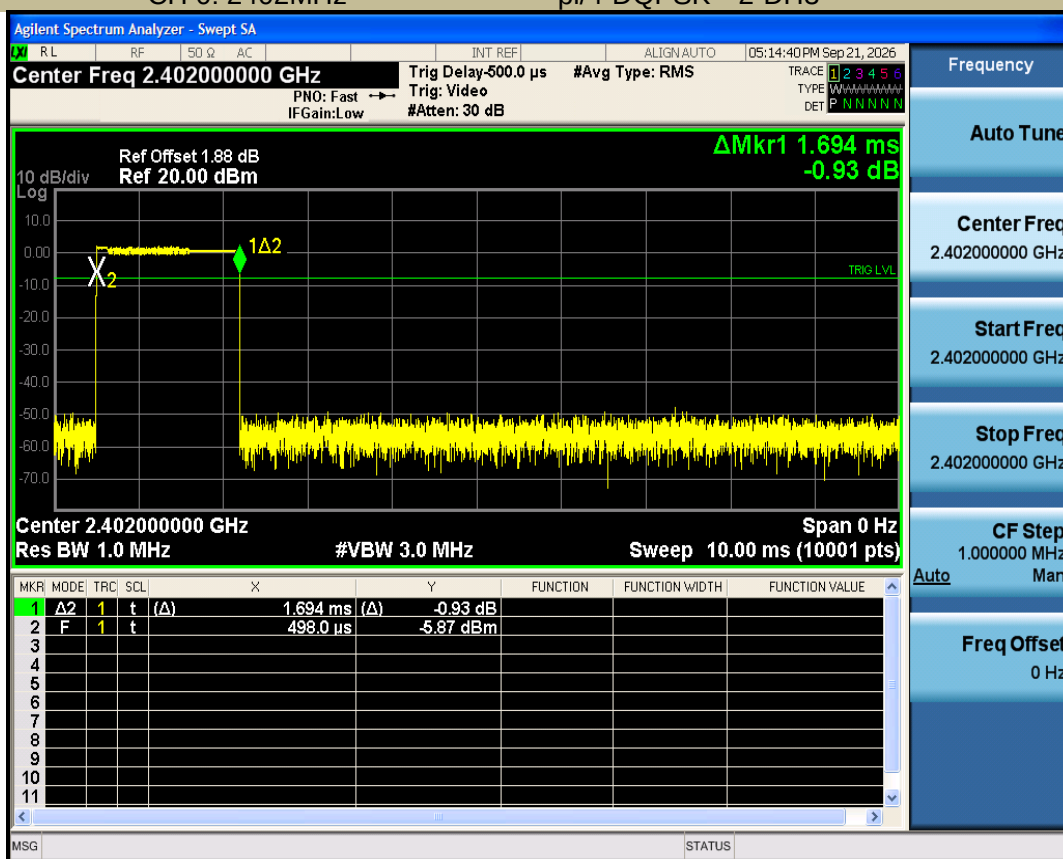
Test Model Average Time Of Occupancy (Dwell Time)
CH 0: 2402MHz GFSK DH5



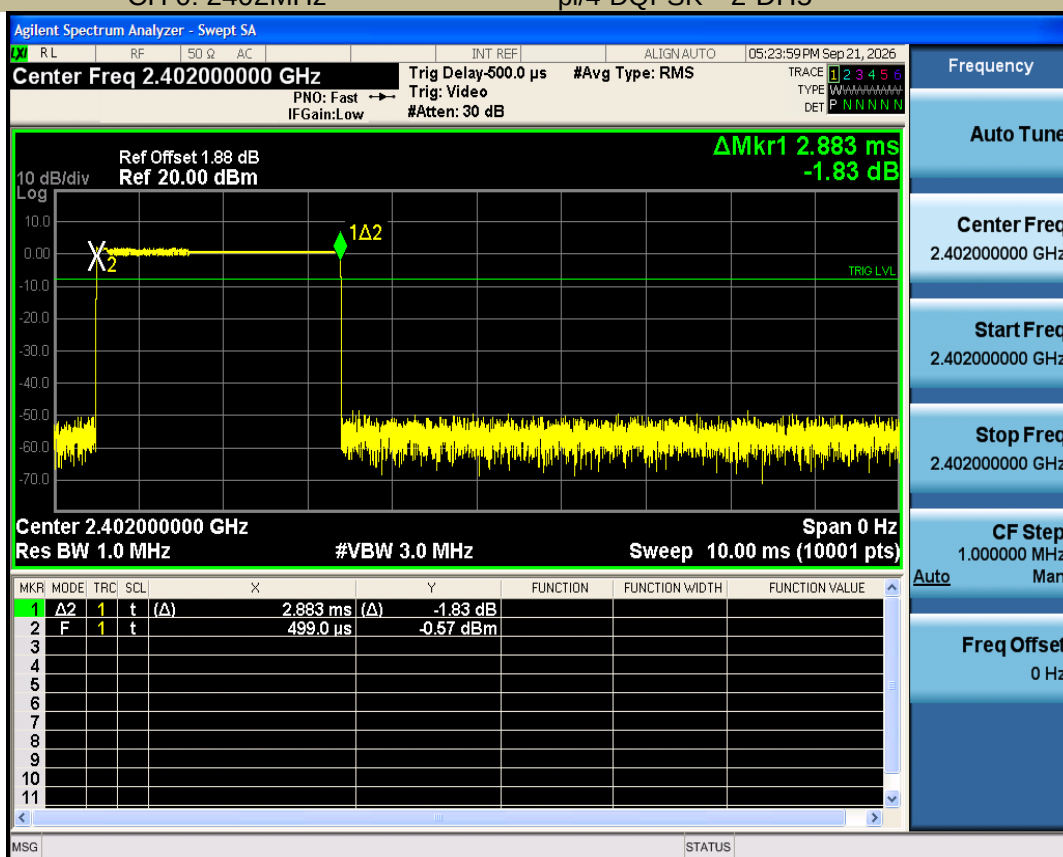
Test Model Average Time Of Occupancy (Dwell Time)
CH 0: 2402MHz pi/4-DQPSK 2-DH1



Test Model Average Time Of Occupancy (Dwell Time)
CH 0: 2402MHz pi/4-DQPSK 2-DH3



Test Model Average Time Of Occupancy (Dwell Time)
CH 0: 2402MHz pi/4-DQPSK 2-DH5



6.6 MAXIMUM PEAK CONDUCTED OUTPUT POWER

6.6.1 Applicable Standard

According to FCC Part 15.247(b)(1) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.6.2 Conformance Limit

The max For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

6.6.3 Test Configuration

Test according to clause 5.1 radio frequency test setup 1

6.6.4 Test Procedure

■ According to FCC Part 15.247(b)(1)

As an alternative to a peak power measurement, compliance with the limit can be based on a measurement of the maximum conducted output power.

Use the following spectrum analyzer settings:

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

Set RBW > the 20 dB bandwidth of the emission being measured

Set VBW ≥ RBW

Set Sweep = auto

Set Detector function = peak

Set Trace = max hold

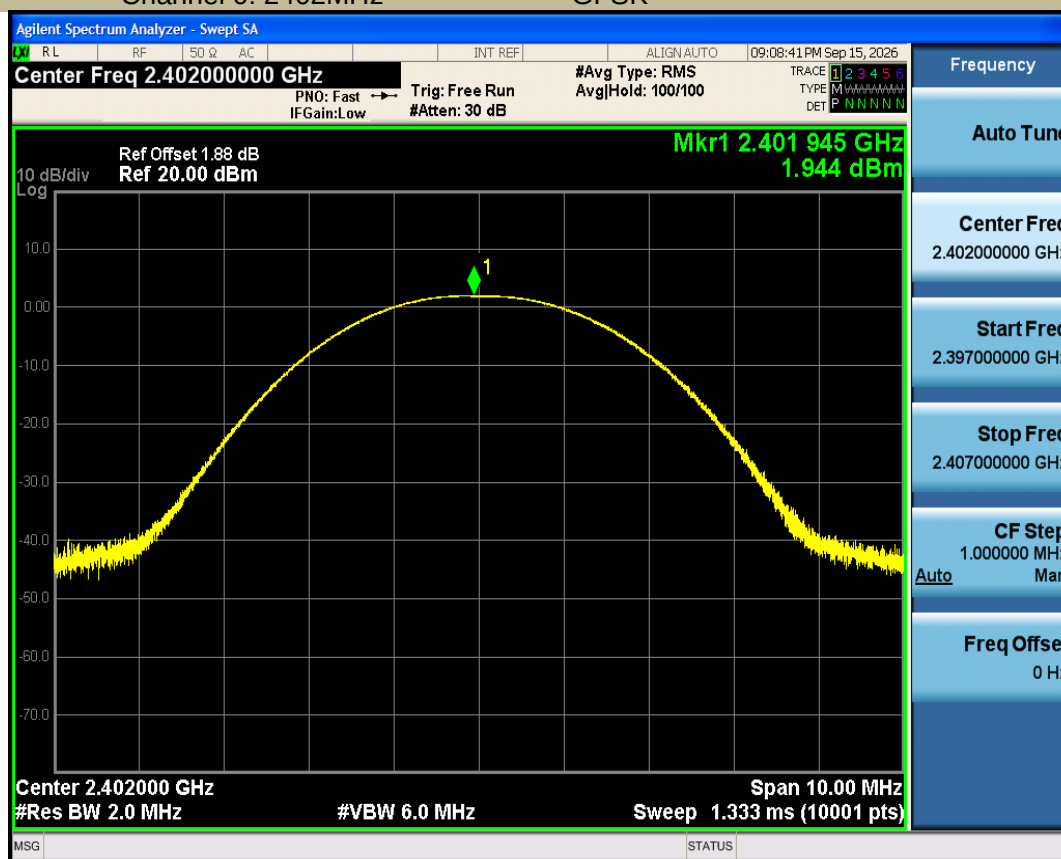
Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission to determine the peak amplitude level.

Test Results

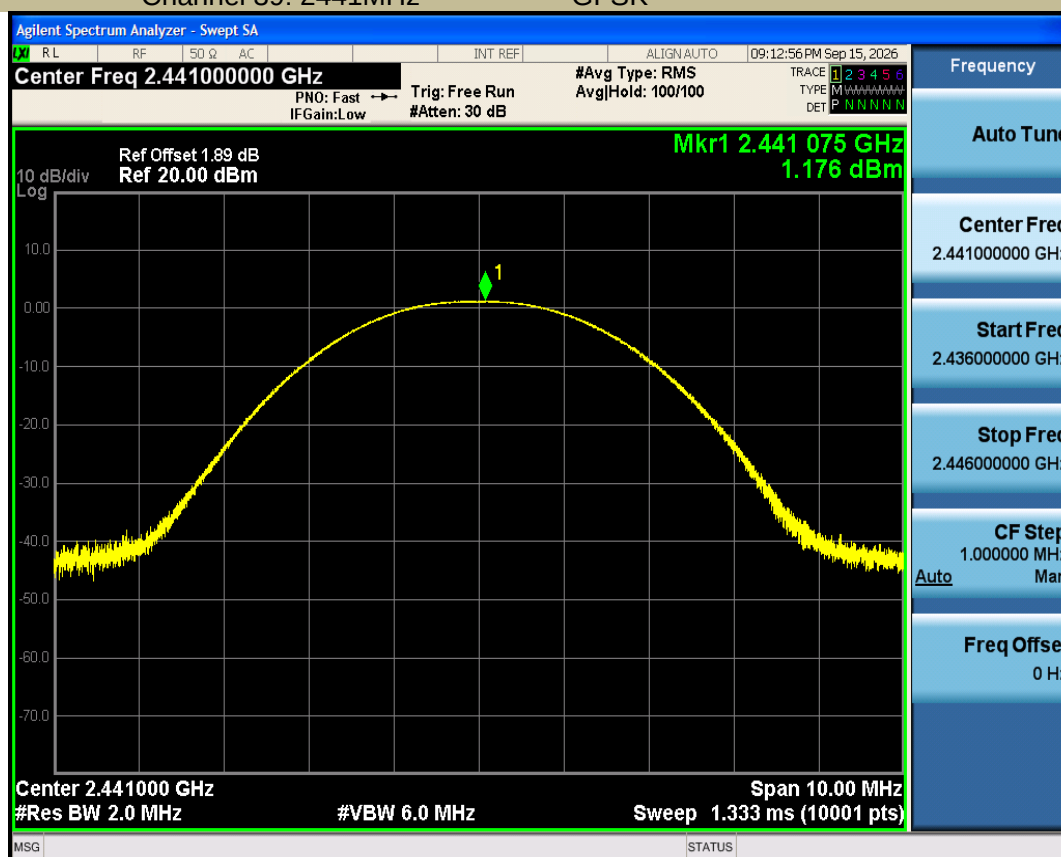
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
GFSK	0	2402	1.94	21	PASS
	39	2441	1.18	21	PASS
	78	2480	0.63	21	PASS
pi/4-DQPSK	0	2402	2.23	21	PASS
	39	2441	1.47	21	PASS
	78	2480	1.01	21	PASS
Note: N/A					

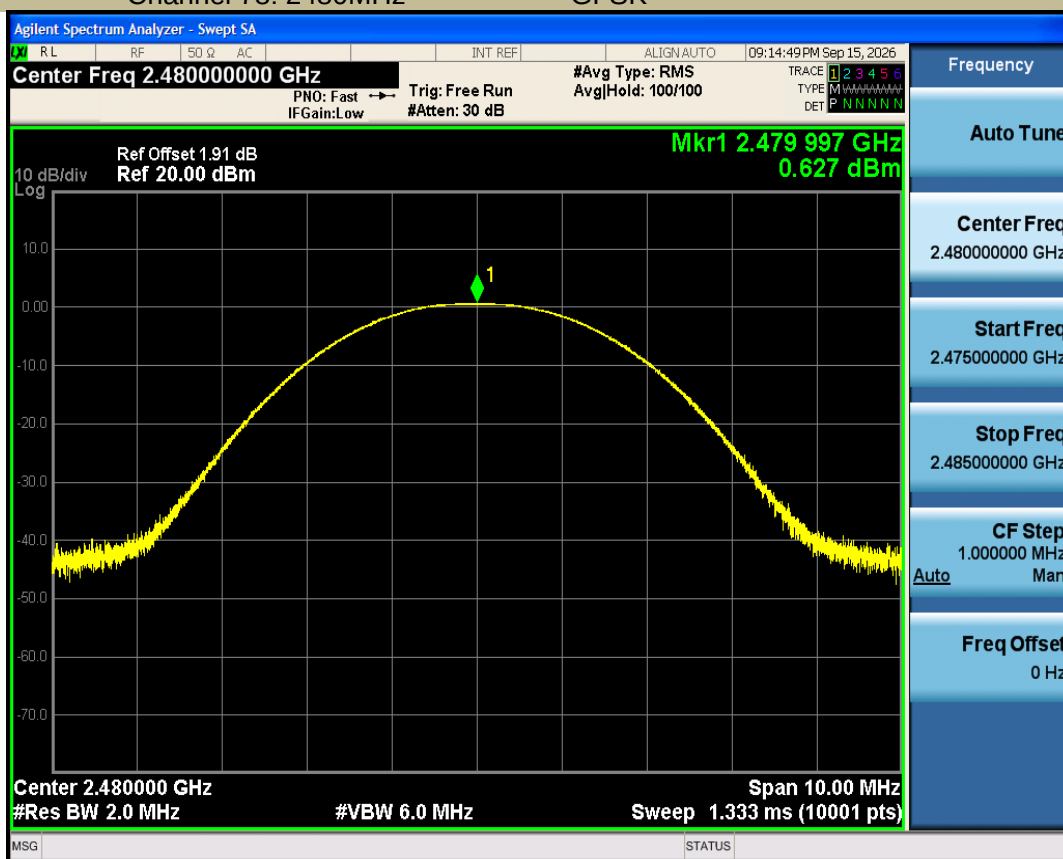
Test Model Maximum Peak Conducted Output Power
Channel 0: 2402MHz GFSK



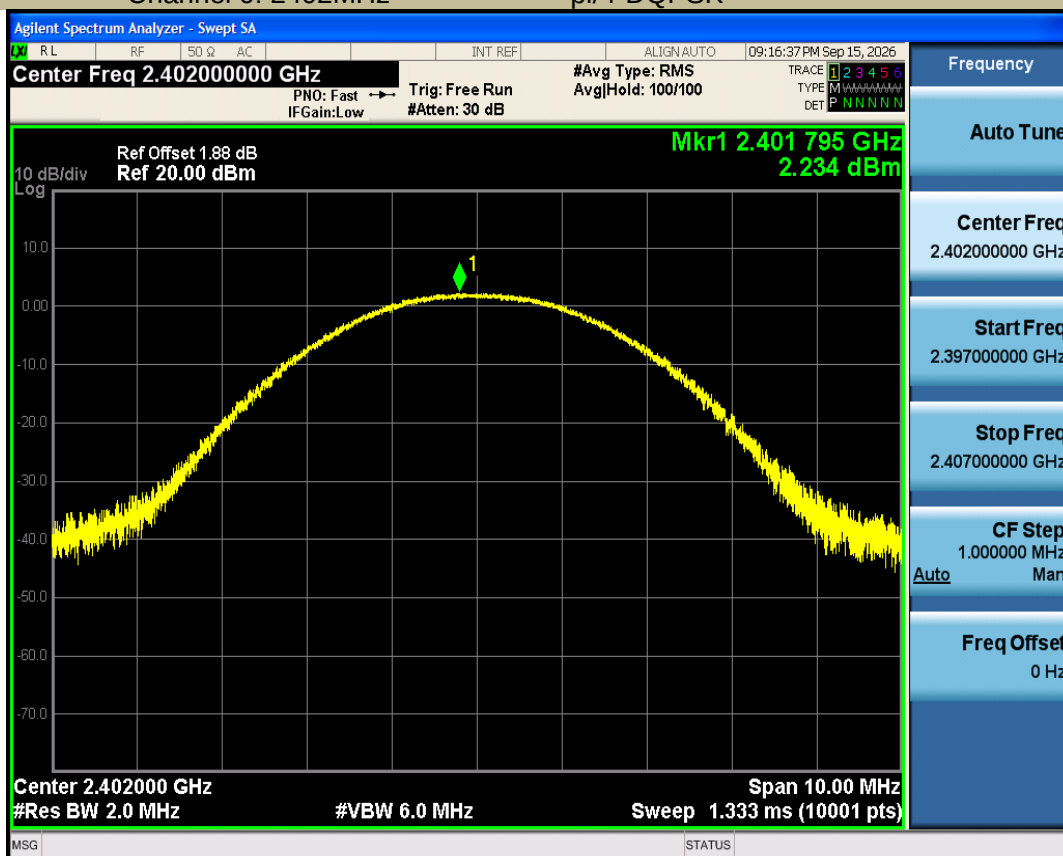
Test Model Maximum Peak Conducted Output Power
Channel 39: 2441MHz GFSK



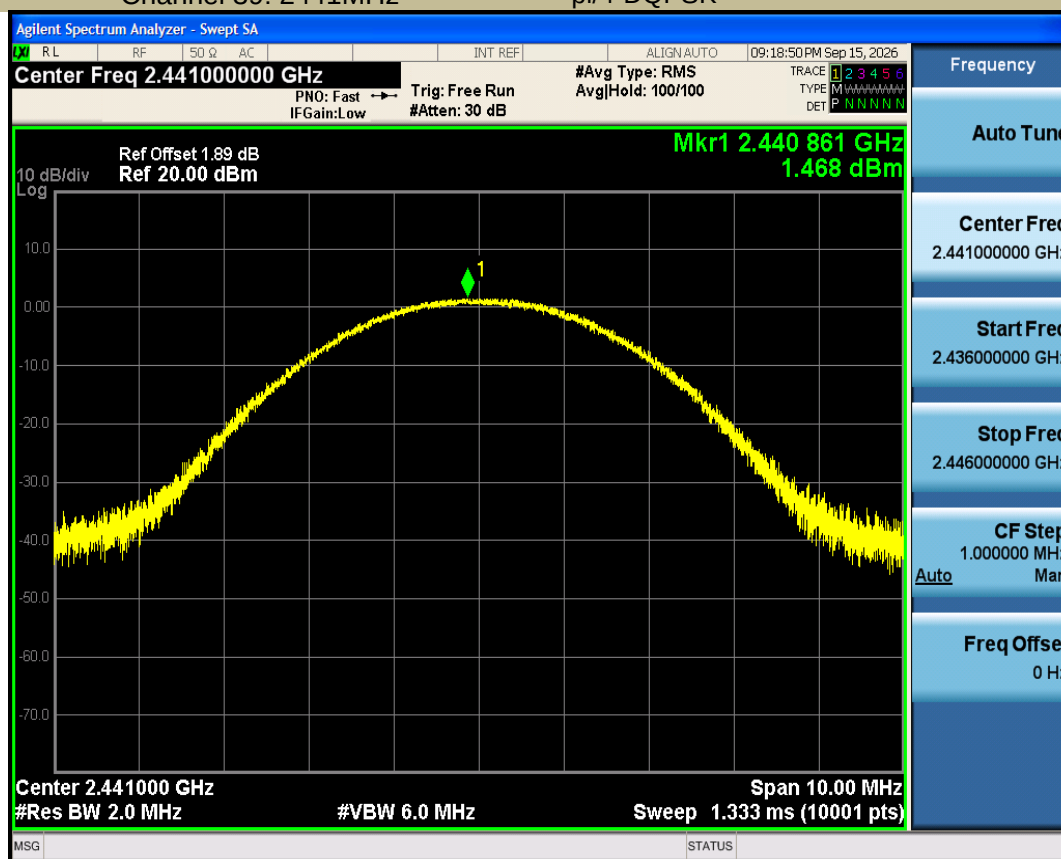
Test Model Maximum Peak Conducted Output Power
Channel 78: 2480MHz GFSK



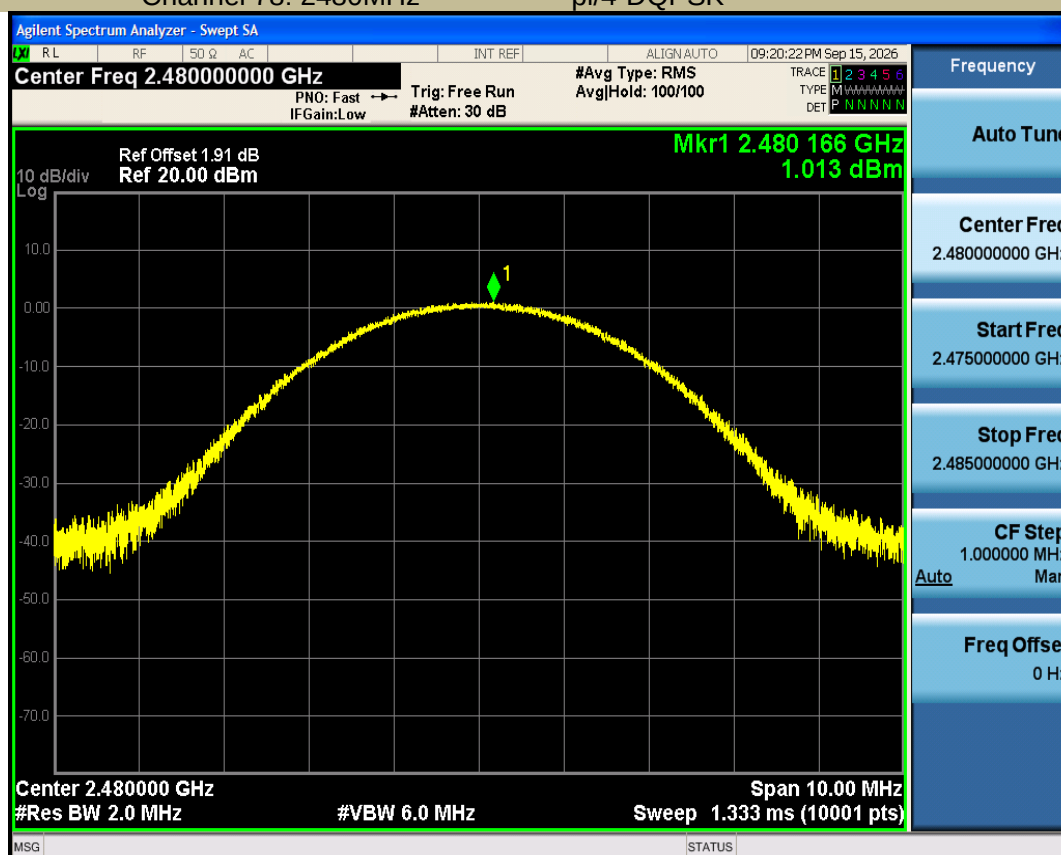
Test Model Maximum Peak Conducted Output Power
Channel 0: 2402MHz pi/4-DQPSK



Test Model	Maximum Peak Conducted Output Power
Channel 39: 2441MHz	pi/4-DOPSK



Test Model	Maximum Peak Conducted Output Power
	Channel 78: 2480MHz pi/4-DPSK



6.7 CONDUCTED SUPRIIOUS EMISSION

6.7.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.7.2 Conformance Limit

According to FCC Part 15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted, provided the transmitter demonstrates compliance with the peak conducted power limits.

6.7.3 Test Configuration

Test according to clause 5.1 radio frequency test setup 1

6.7.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DSS channel center frequency.

Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel.

Set the RBW = 100 kHz. Set the VBW $\geq 3 \times$ RBW.

Set Detector = peak. Set Sweep time = auto couple.

Set Trace mode = max hold. Allow trace to fully stabilize.

Use the peak marker function to determine the maximum Maximum conduceted level.

Note that the channel found to contain the maximum conduceted level can be used to establish the reference level.

■ Band-edge Compliance of RF Conducted Emissions

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation

Set RBW $\geq 1\%$ of the span=100kHz Set VBW $\geq$ RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

■ Conduceted Spurious RF Conducted Emission

Use the following spectrum analyzer settings:

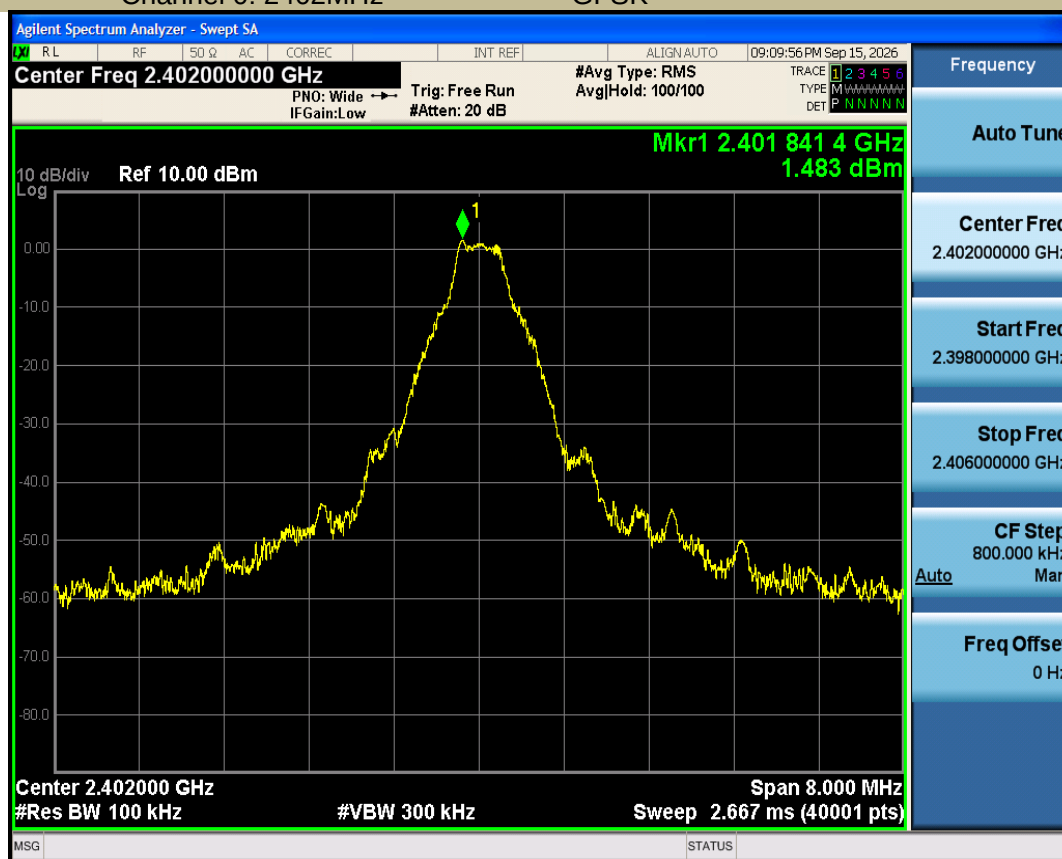
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.(30MHz to 25GHz). Set RBW = 100 kHz Set VBW $\geq$ RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

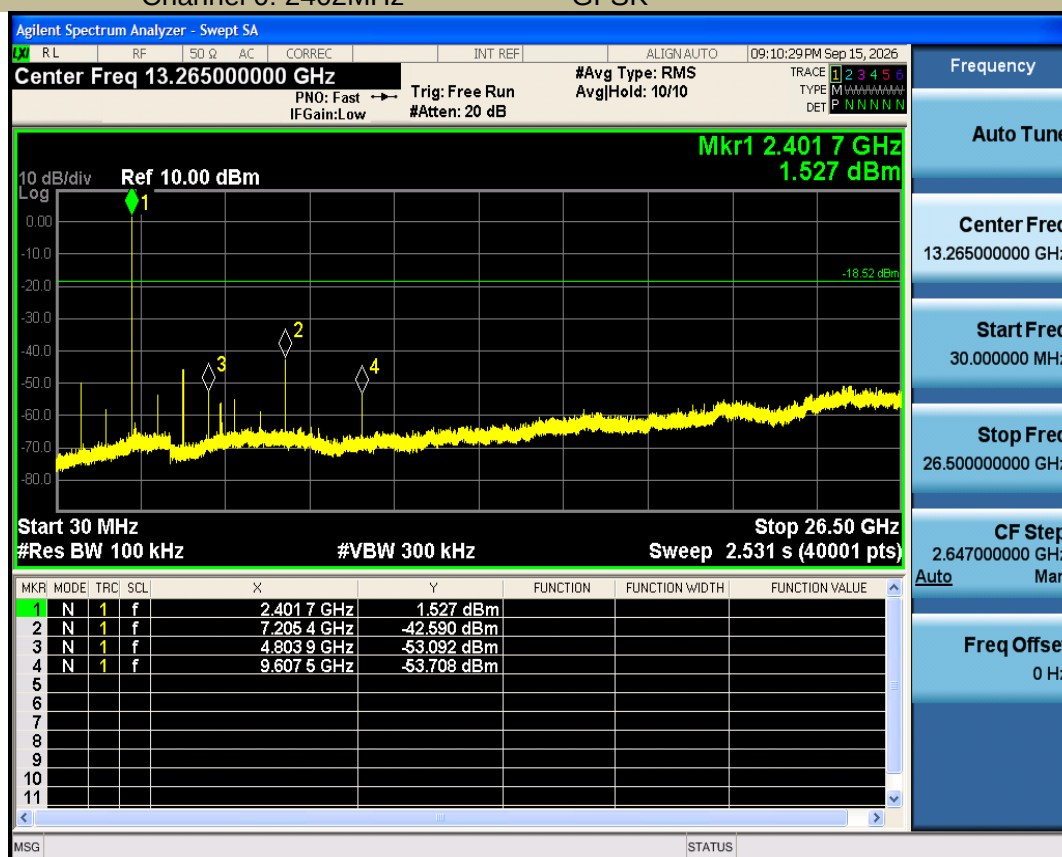
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

6.7.5 Test Results

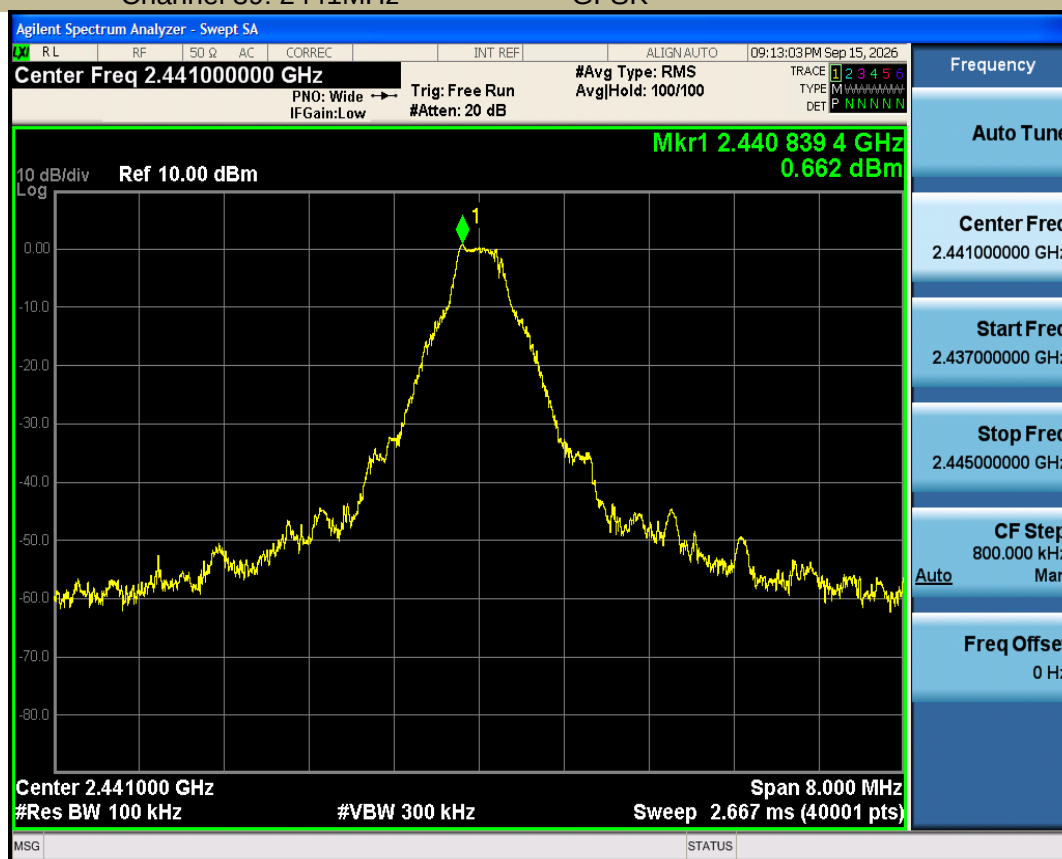
Test Model Maximum Conducted Level RBW=100kHz
Channel 0: 2402MHz GFSK



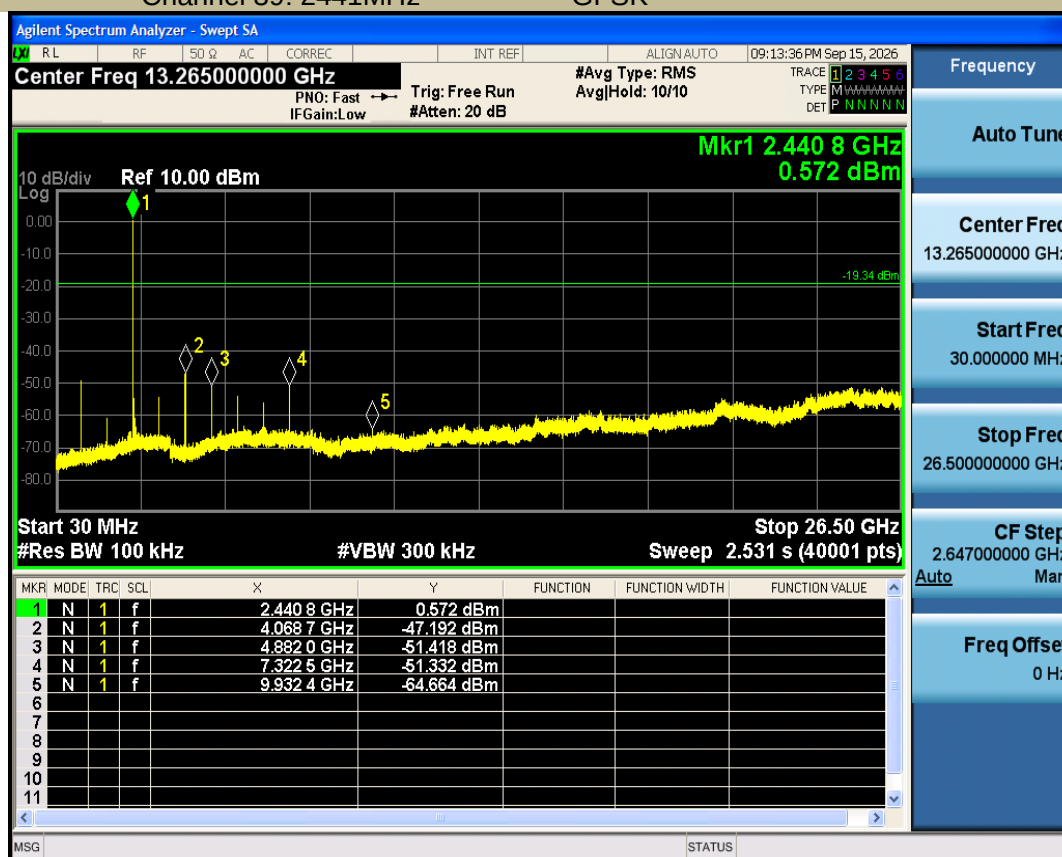
Test Model Conducted Spurious RF Conducted Emission
Channel 0: 2402MHz GFSK



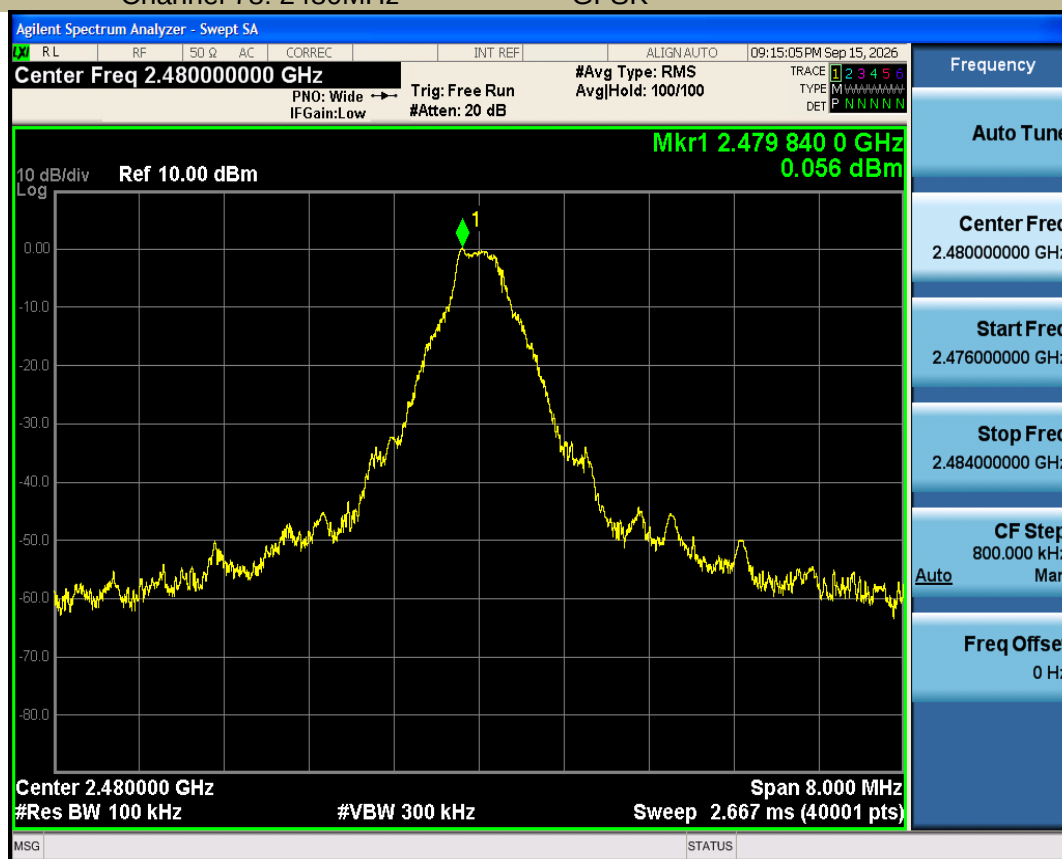
Test Model Maximum Conducted Level RBW=100kHz
Channel 39: 2441MHz GFSK



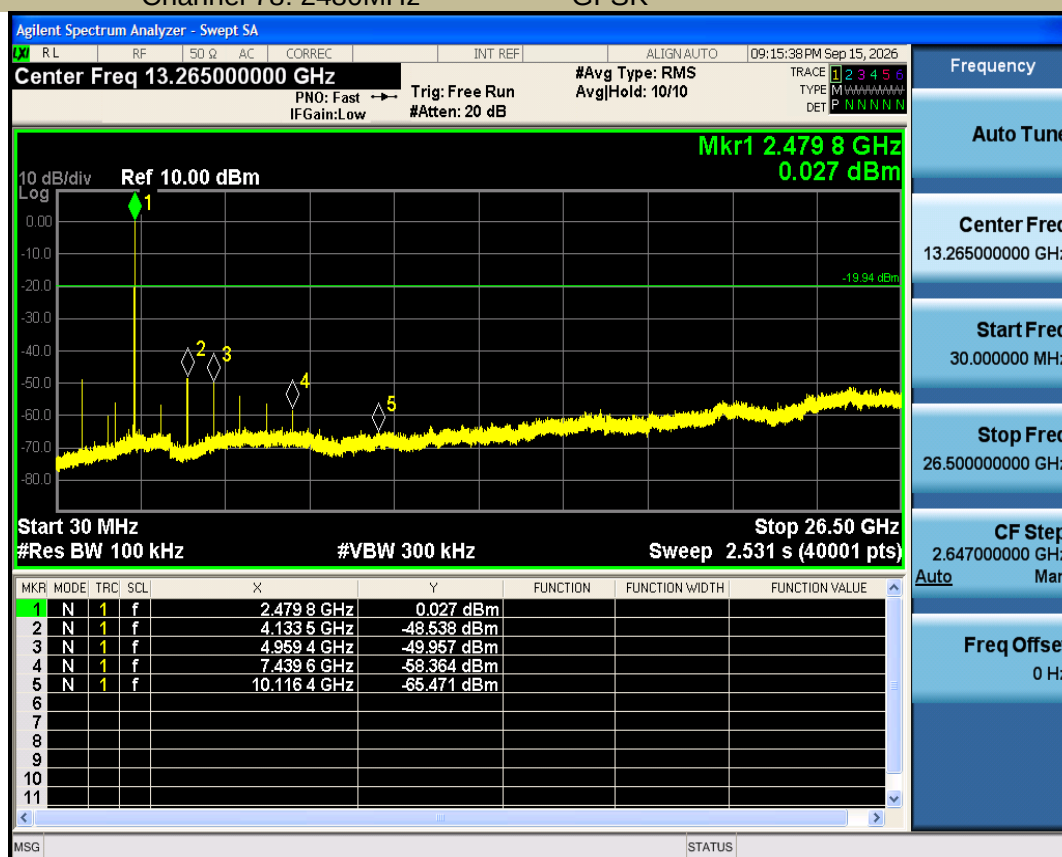
Test Model Conducted Spurious RF Conducted Emission
Channel 39: 2441MHz GFSK



Test Model Maximum Conducted Level RBW=100kHz
Channel 78: 2480MHz GFSK



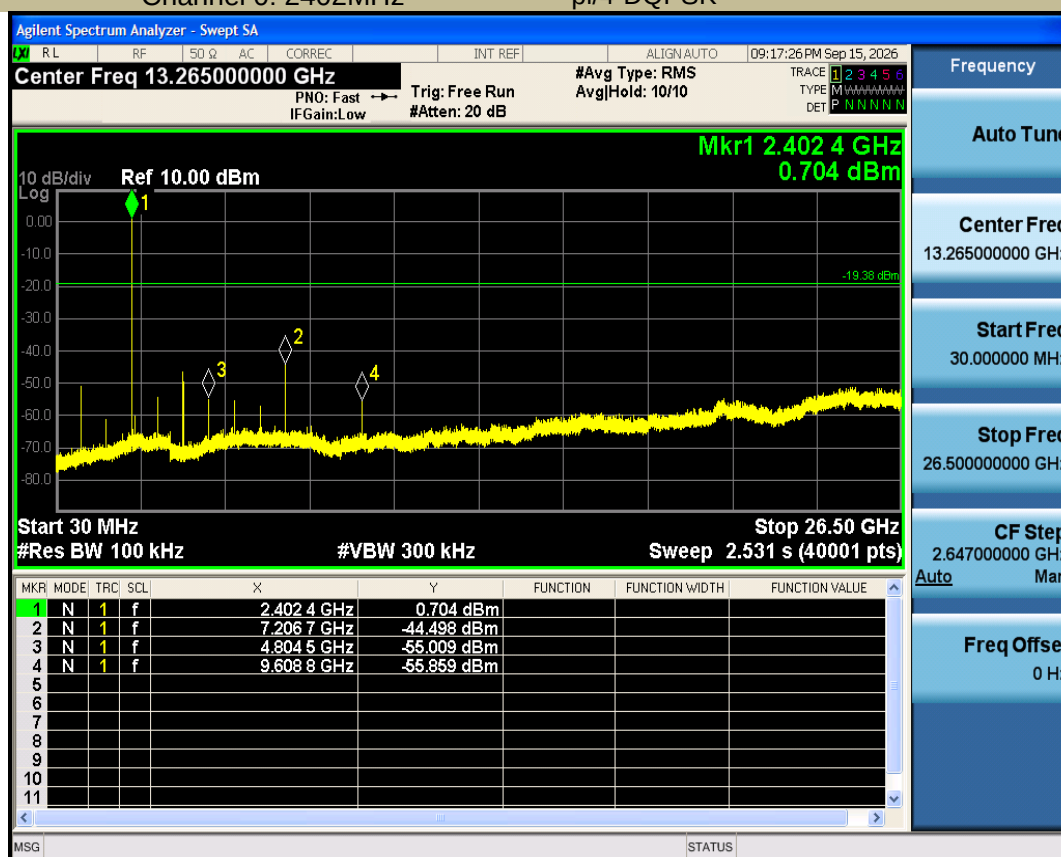
Test Model Conducted Spurious RF Conducted Emission
Channel 78: 2480MHz GFSK



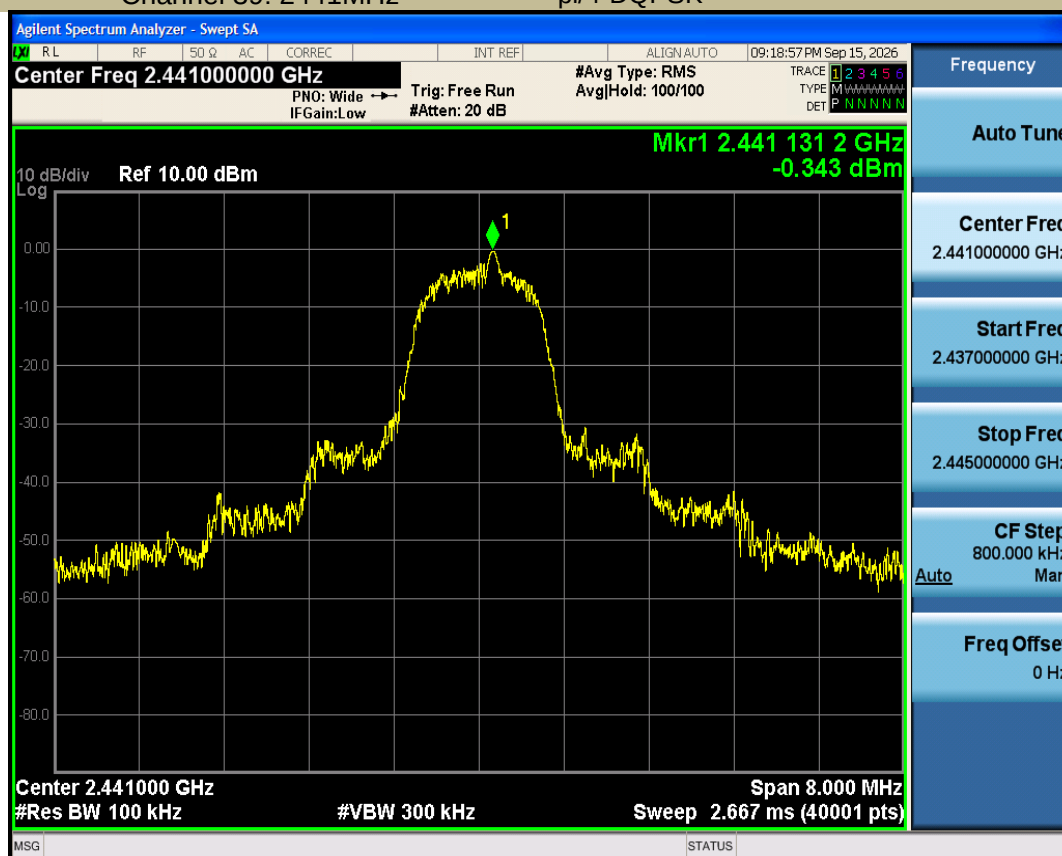
Test Model Maximum Conducted Level RBW=100kHz
Channel 0: 2402MHz pi/4-DQPSK



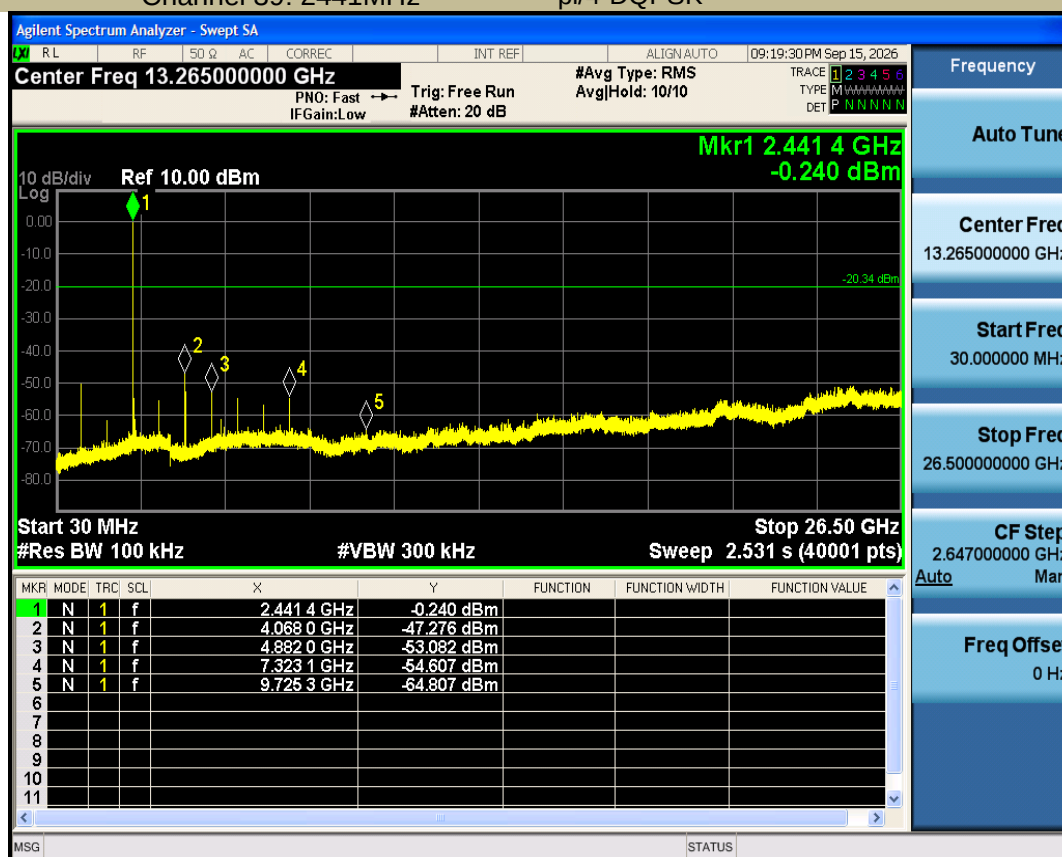
Test Model Conducted Spurious RF Conducted Emission
Channel 0: 2402MHz pi/4-DQPSK



Test Model Maximum Conducted Level RBW=100kHz
Channel 39: 2441MHz pi/4-DQPSK



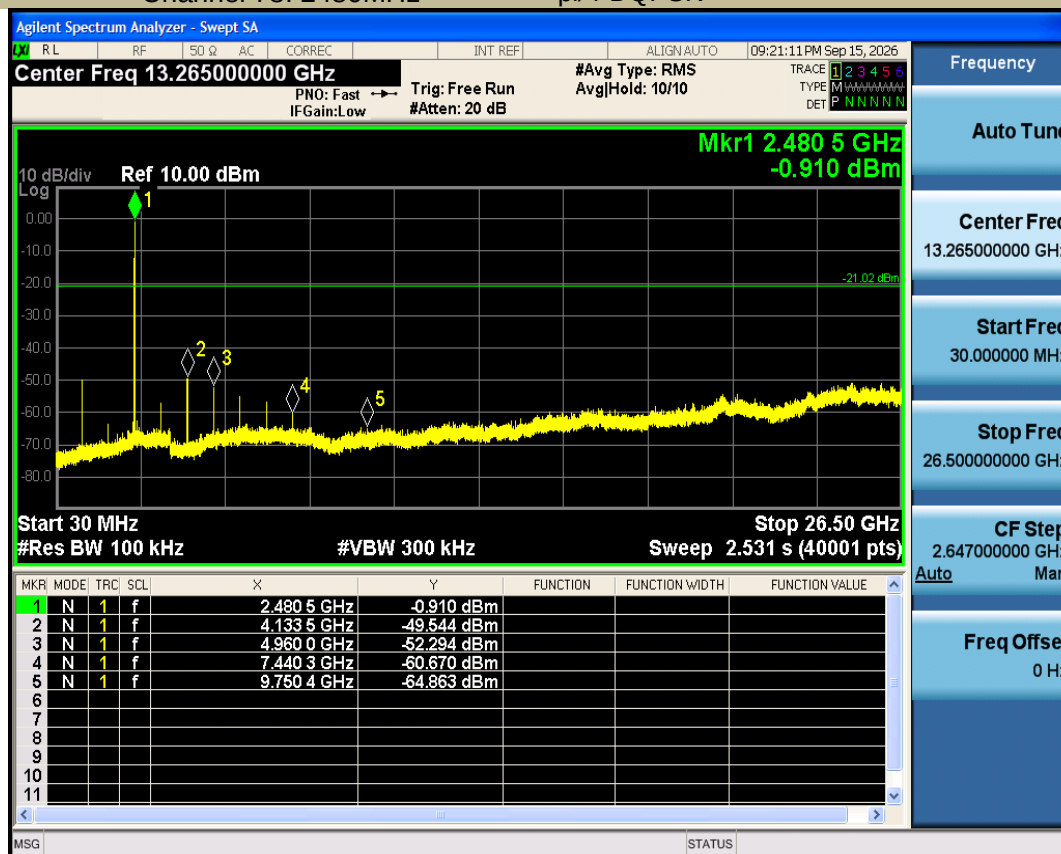
Test Model Conducted Spurious RF Conducted Emission
Channel 39: 2441MHz pi/4-DQPSK



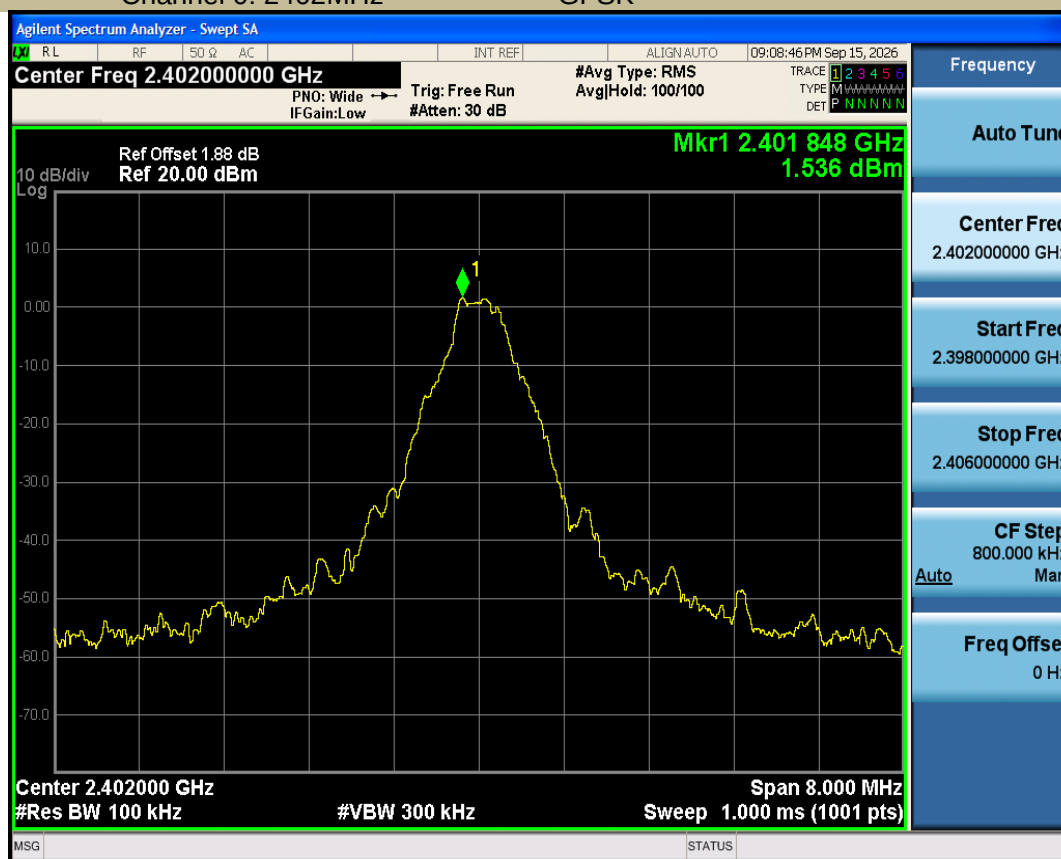
Test Model Maximum Conducted Level RBW=100kHz
Channel 78: 2480MHz pi/4-DQPSK



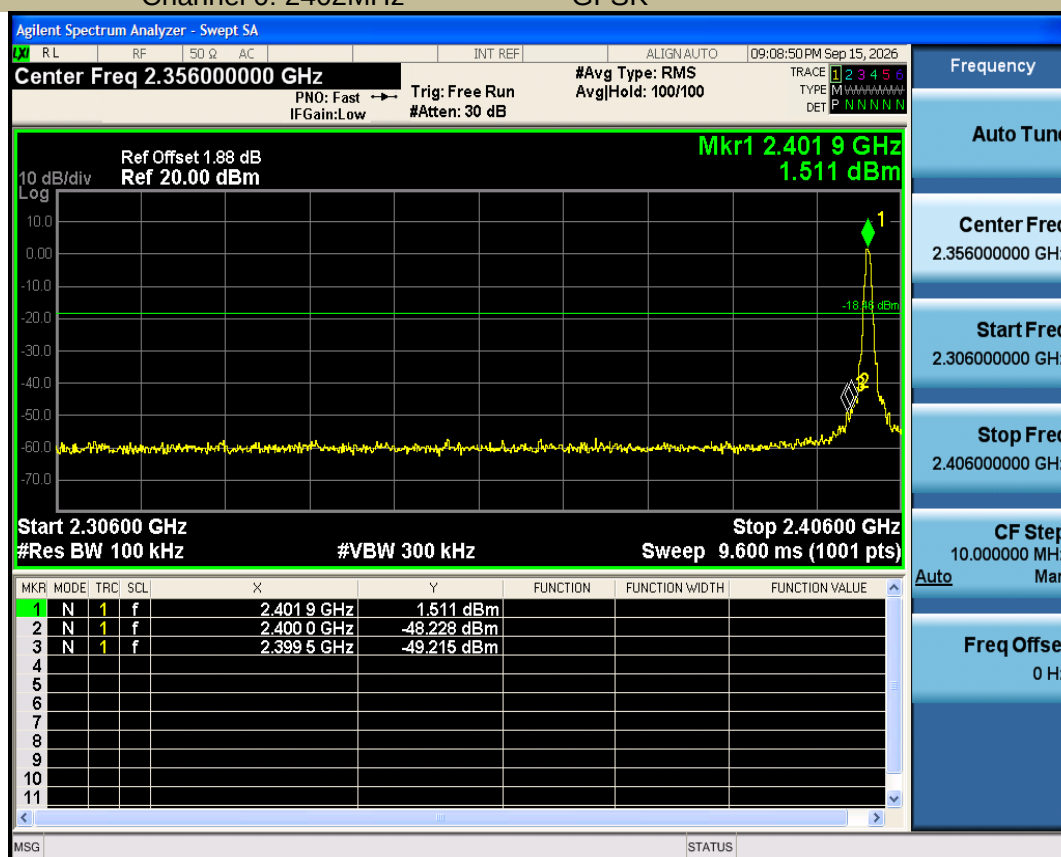
Test Model Conducted Spurious RF Conducted Emission
Channel 78: 2480MHz pi/4-DQPSK



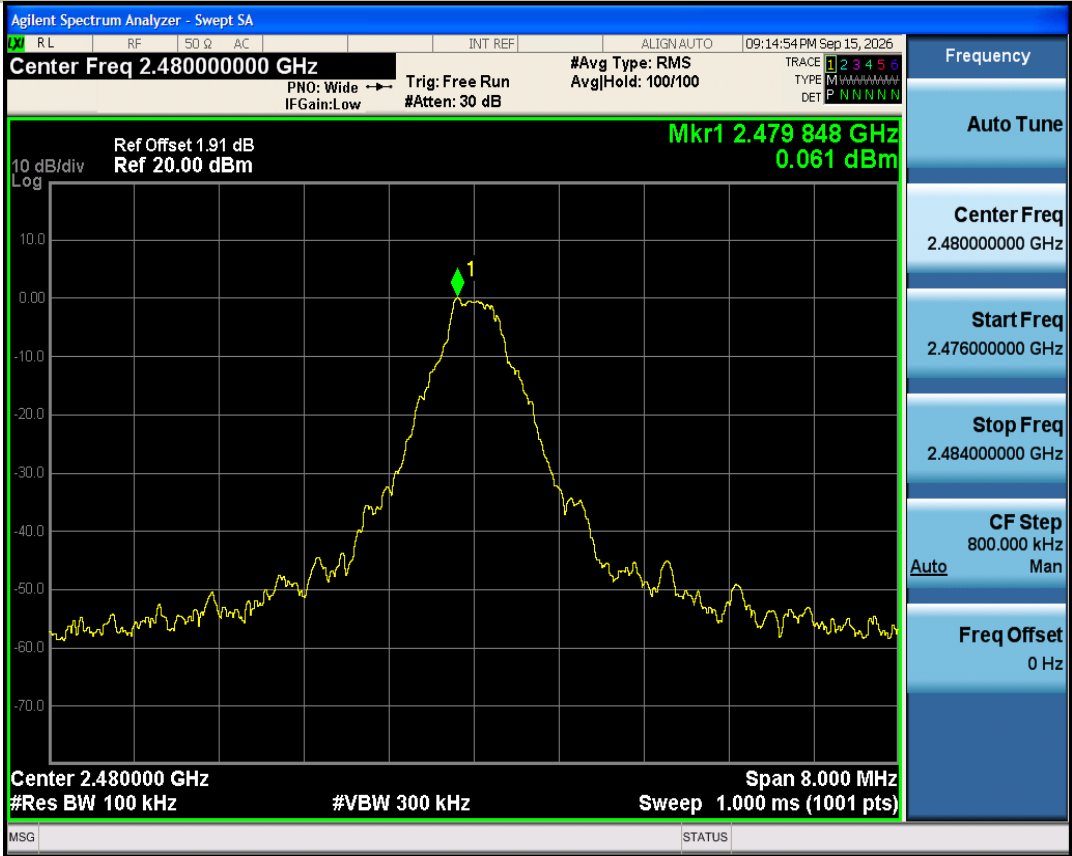
Test Model Maximum Conducted Level RBW=100kHz
Channel 0: 2402MHz GFSK



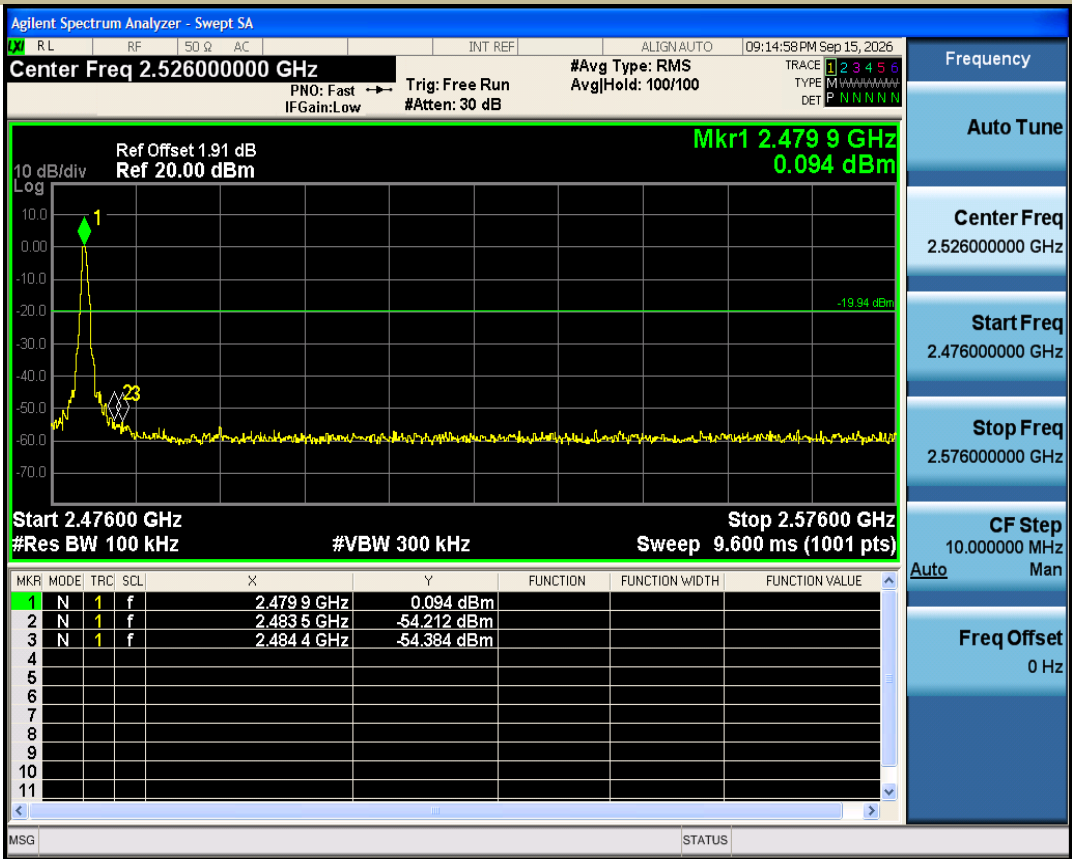
Test Model Band-edge Conducted Emissions
Channel 0: 2402MHz GFSK



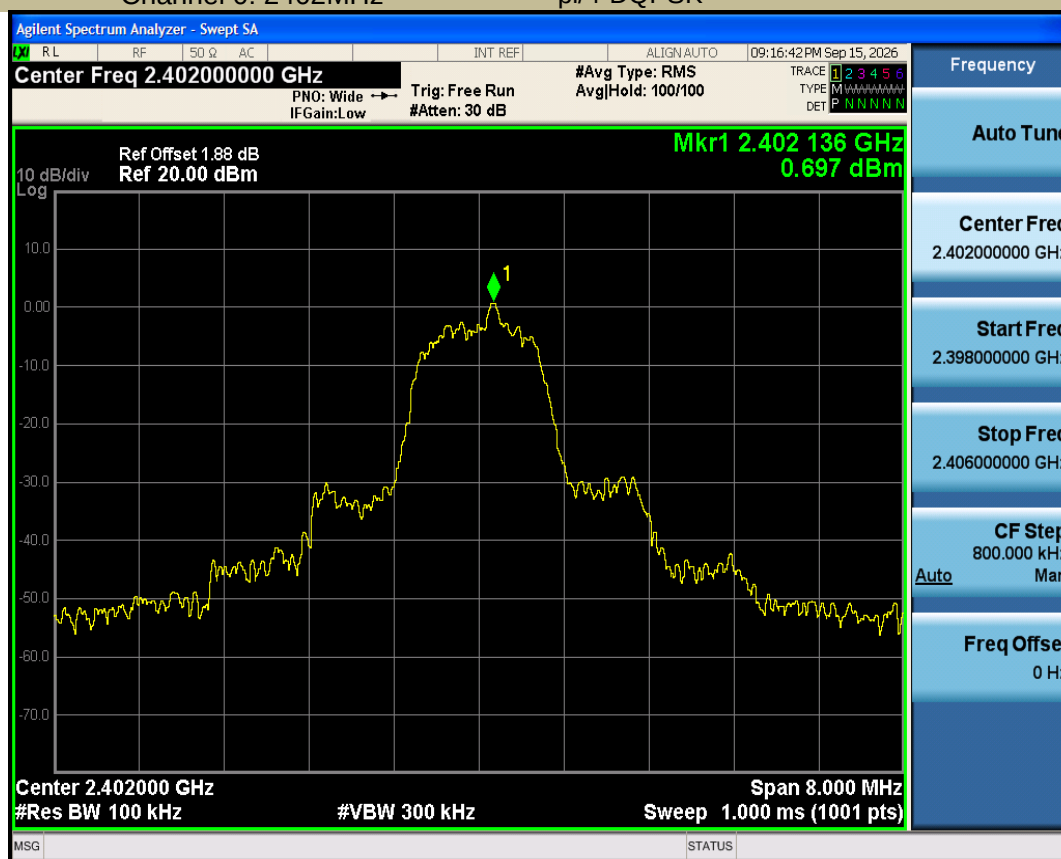
Test Model Maximum Conducted Level RBW=100kHz
Channel 78: 2480MHz GFSK



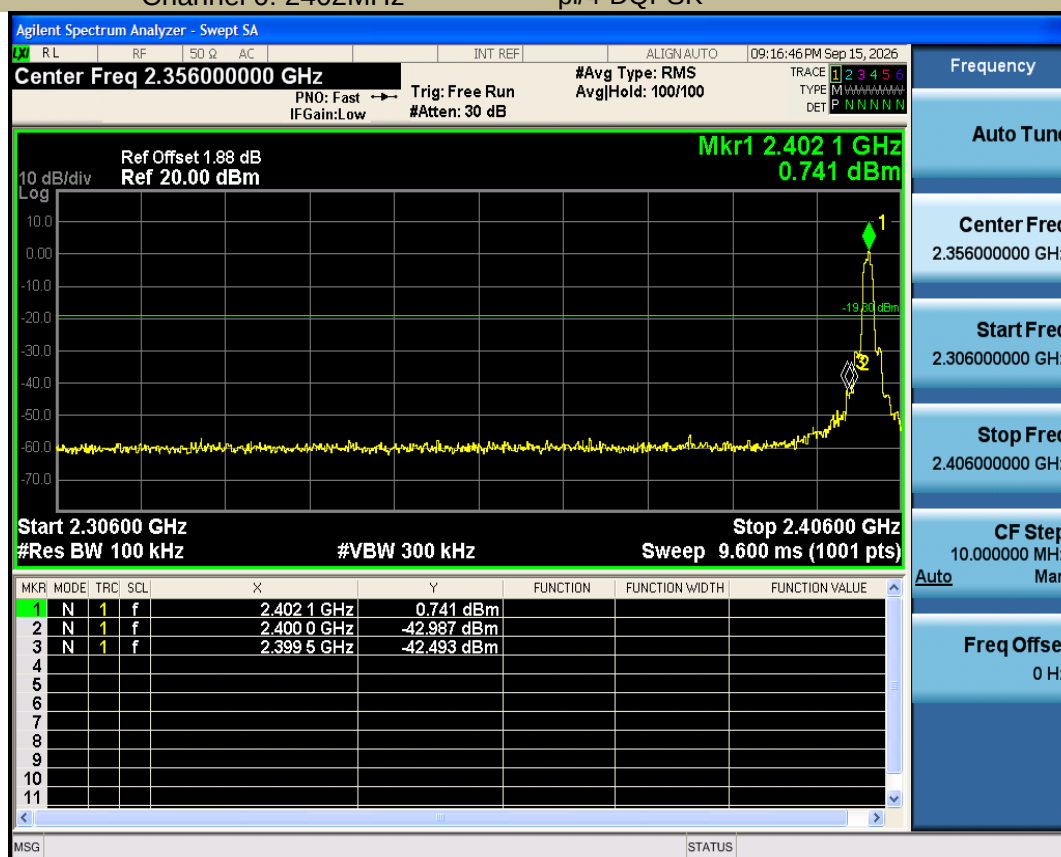
Test Model Band-edge Conducted Emissions
Channel 78: 2480MHz GFSK



Test Model Maximum Conducted Level RBW=100kHz
Channel 0: 2402MHz pi/4-DQPSK



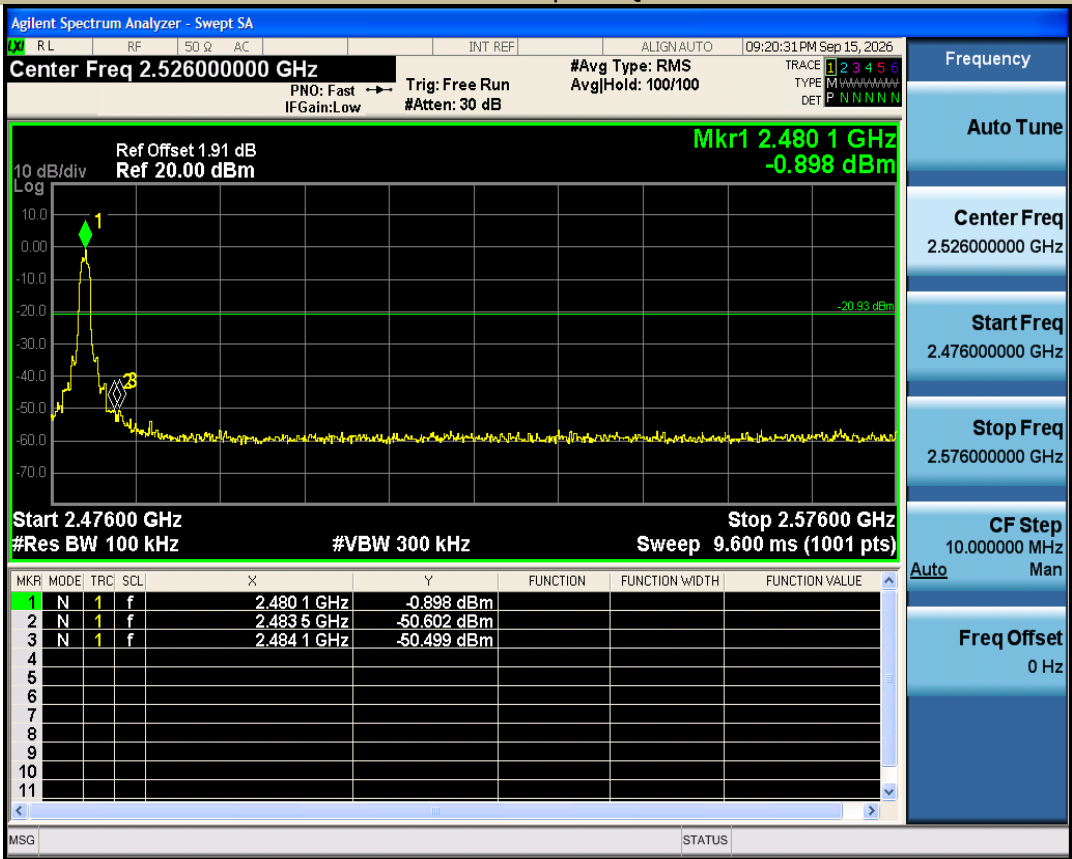
Test Model Band-edge Conducted Emissions
Channel 0: 2402MHz pi/4-DQPSK



Test Model Maximum Conducted Level RBW=100kHz
Channel 78: 2480MHz pi/4-DQPSK



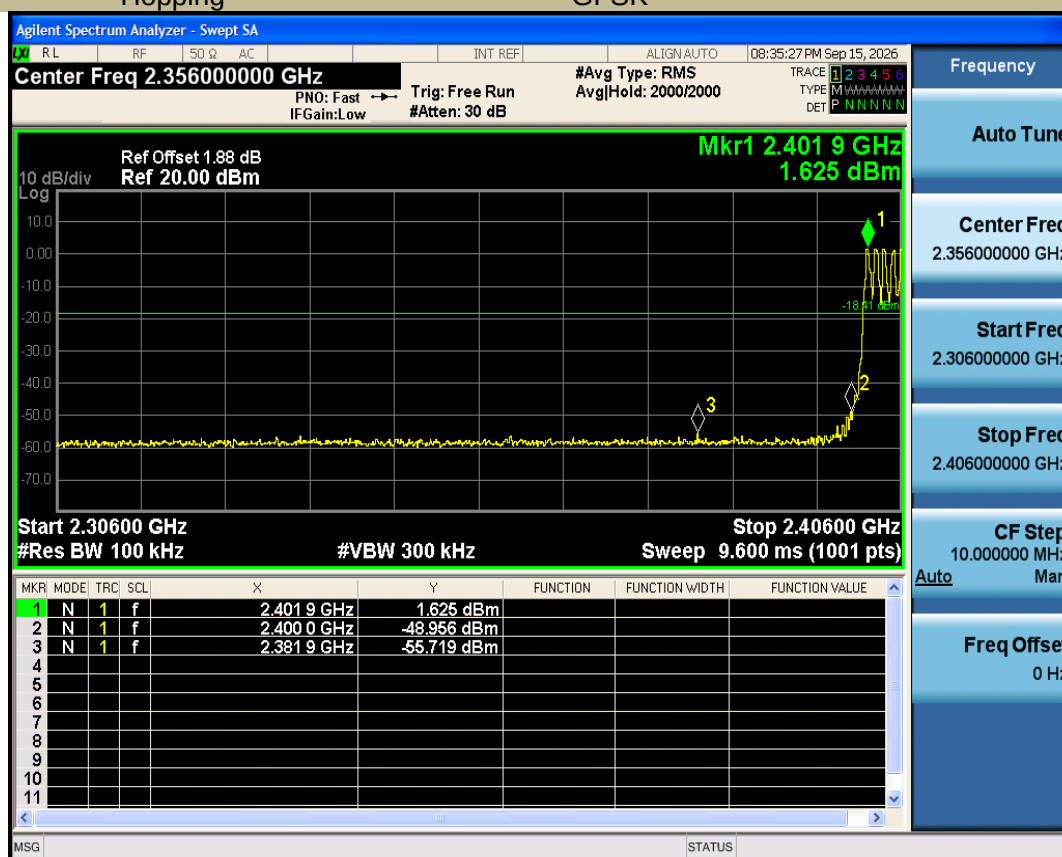
Test Model Band-edge Conducted Emissions
Channel 78: 2480MHz pi/4-DQPSK

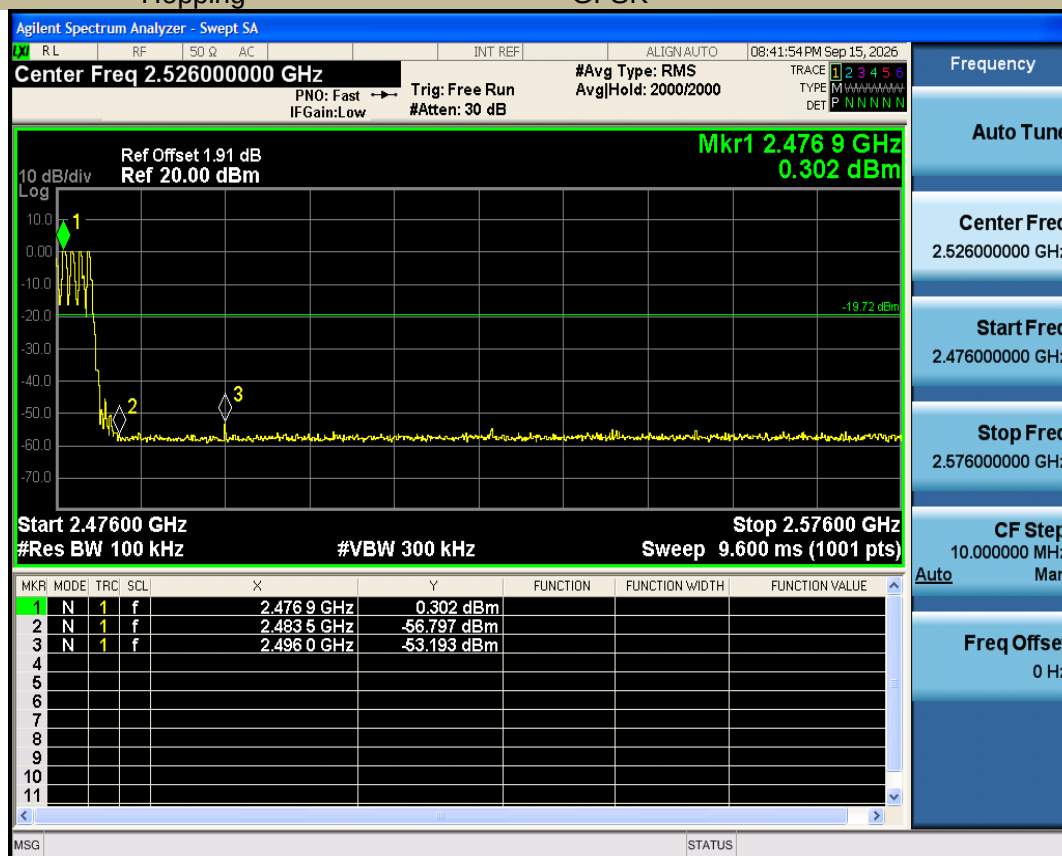


Test Model Maximum Conducted Level RBW=100kHz
Hopping GFSK



Test Model Conducted Spurious RF Conducted Emission
Hopping GFSK



Test Model Band-edge Conducted Emissions
Hopping GFSKTest Model Band-edge Conducted Emissions
Hopping GFSK

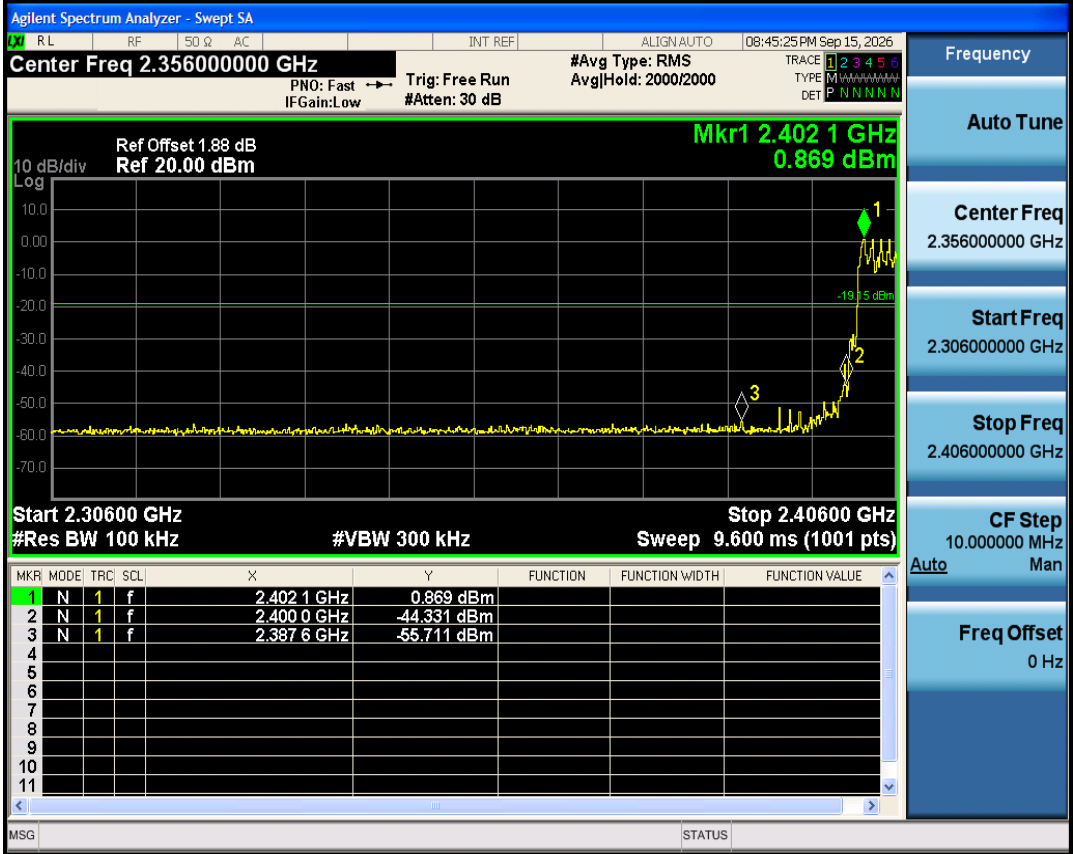
Test Model

Maximum Conduced Level RBW=100kHz
Hoppingpi/4-DQPSK



Test Model

Conduced Spurious RF Conducted Emission
Hoppingpi/4-DQPSK



Test Model

Band-edge Conducted Emissions
Hopping

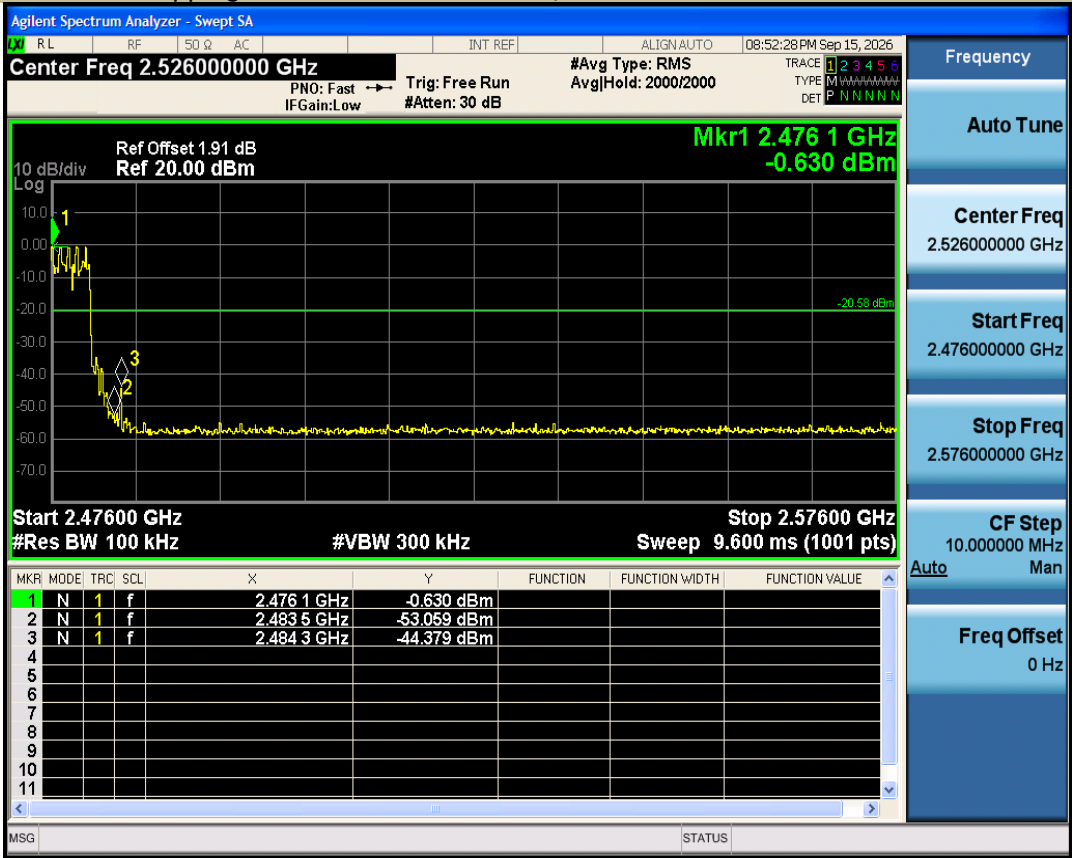
pi/4-DQPSK



Test Model

Band-edge Conducted Emissions
Hopping

pi/4-DQPSK



6.8 RADIATED SPURIOUS EMISSION

6.8.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

6.8.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	1718.8-1722.2	13.25-13.4
6.31175-6.31225	108-121.94	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

6.8.3 Test Configuration

Test according to clause 5.2 radio frequency test setup 2

6.8.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 9kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 200Hz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

6.8.5 Test Results

■ Spurious Emission below 30MHz (9KHz to 30MHz)

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

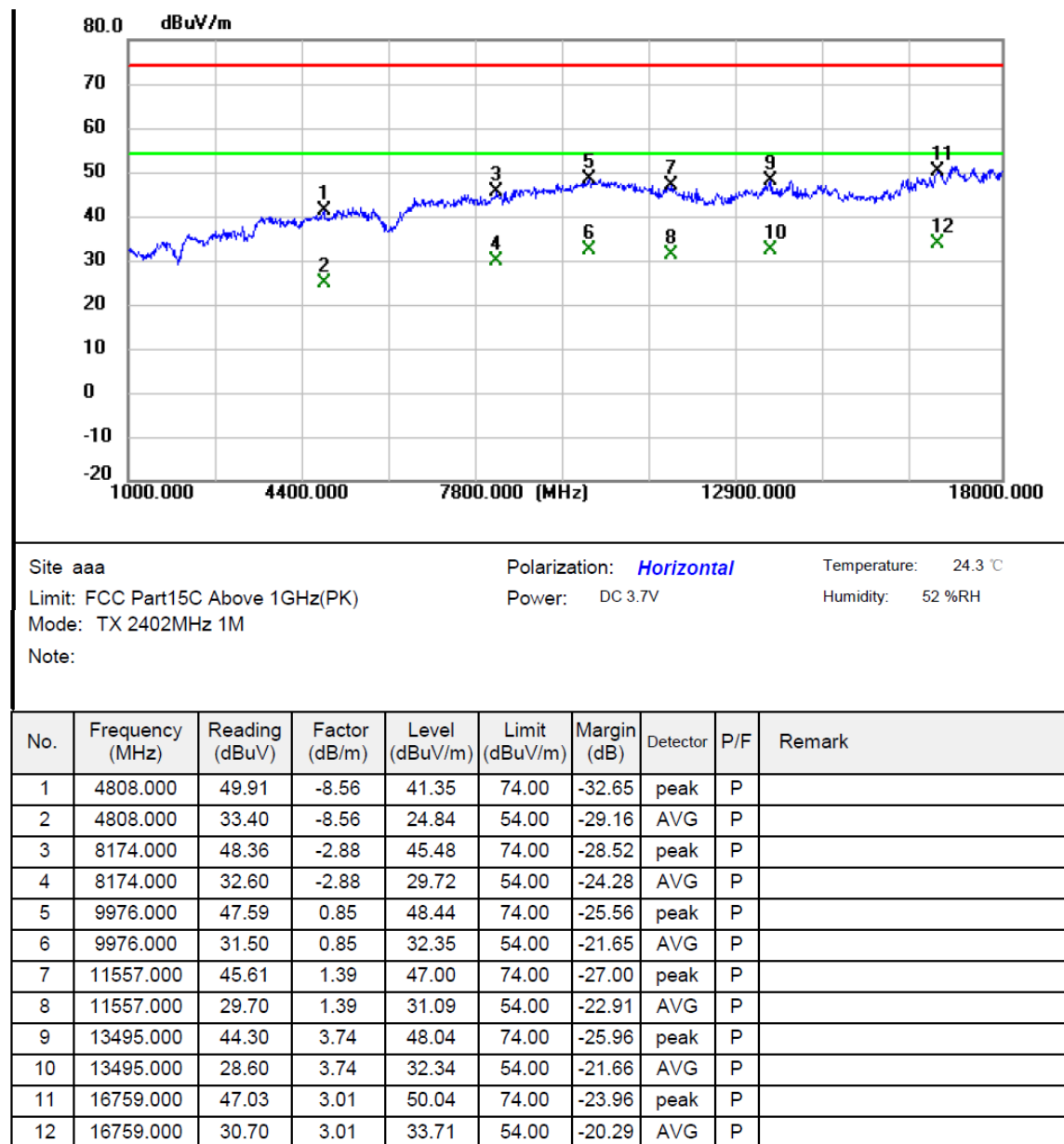
Distance extrapolation factor = $40\log(\text{Specific distance/ test distance})$ (dB);

Limit line = Specific limits(dBuV) + distance extrapolation factor

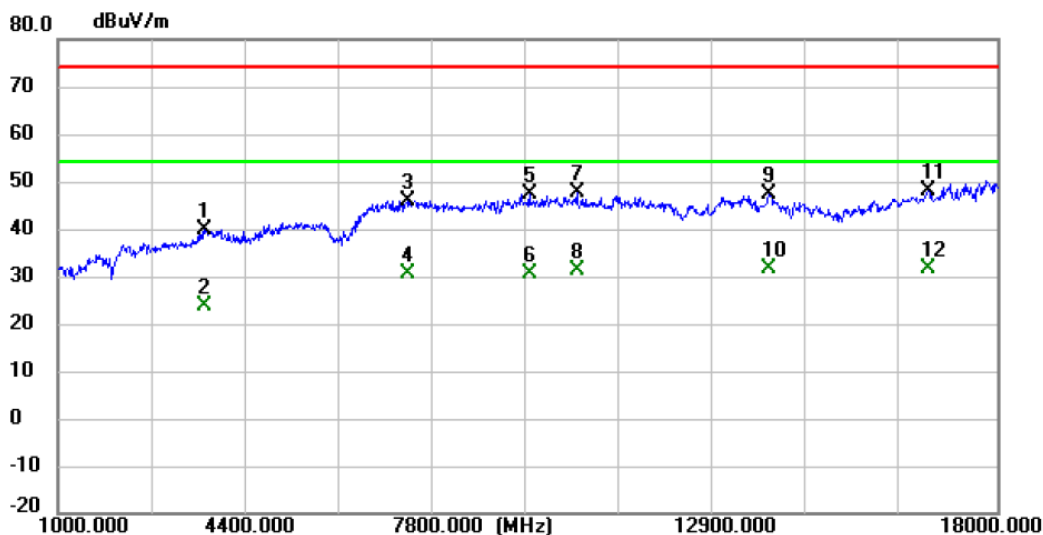
■ Spurious Emission Above 1GHz (1GHz to 25GHz)

All modes were tested and the worst results (GFSK) were recorded in the report

No frequency multiplication occurred during the test, so the evaluation was limited to 18 GHz.



*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Vertical*

Temperature: 24.3 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

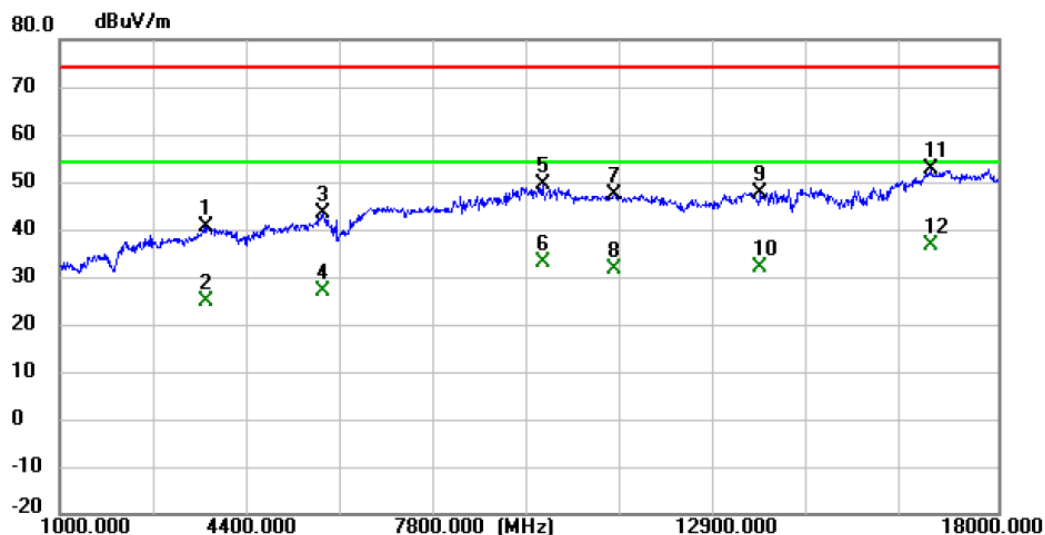
Humidity: 52 %RH

Mode: TX 2402MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3652.000	49.60	-9.71	39.89	74.00	-34.11	peak	P	
2	3652.000	33.40	-9.71	23.69	54.00	-30.31	AVG	P	
3	7324.000	50.27	-4.22	46.05	74.00	-27.95	peak	P	
4	7324.000	34.60	-4.22	30.38	54.00	-23.62	AVG	P	
5	9534.000	46.77	0.46	47.23	74.00	-26.77	peak	P	
6	9534.000	30.10	0.46	30.56	54.00	-23.44	AVG	P	
7	10401.000	47.14	0.58	47.72	74.00	-26.28	peak	P	
8	10401.000	30.70	0.58	31.28	54.00	-22.72	AVG	P	
9	13886.000	44.48	2.87	47.35	74.00	-26.65	peak	P	
10	13886.000	28.60	2.87	31.47	54.00	-22.53	AVG	P	
11	16742.000	45.26	2.94	48.20	74.00	-25.80	peak	P	
12	16742.000	28.70	2.94	31.64	54.00	-22.36	AVG	P	

*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Vertical*

Temperature: 23.8 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

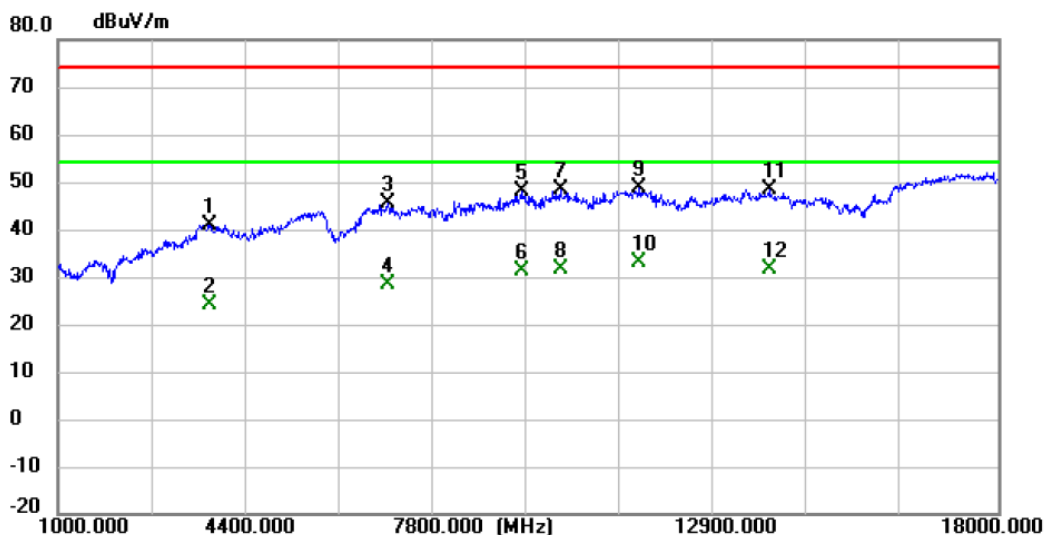
Humidity: 53 %RH

Mode: TX 2441MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3652.000	50.26	-9.71	40.55	74.00	-33.45	peak	P	
2	3652.000	34.50	-9.71	24.79	54.00	-29.21	AVG	P	
3	5760.000	49.57	-6.12	43.45	74.00	-30.55	peak	P	
4	5760.000	33.20	-6.12	27.08	54.00	-26.92	AVG	P	
5	9755.000	49.13	0.47	49.60	74.00	-24.40	peak	P	
6	9755.000	32.70	0.47	33.17	54.00	-20.83	AVG	P	
7	11064.000	46.21	1.24	47.45	74.00	-26.55	peak	P	
8	11064.000	30.50	1.24	31.74	54.00	-22.26	AVG	P	
9	13699.000	44.46	3.29	47.75	74.00	-26.25	peak	P	
10	13699.000	28.70	3.29	31.99	54.00	-22.01	AVG	P	
11	16793.000	49.33	3.18	52.51	74.00	-21.49	peak	P	
12	16793.000	33.40	3.18	36.58	54.00	-17.42	AVG	P	

*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Horizontal*

Temperature: 23.8 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

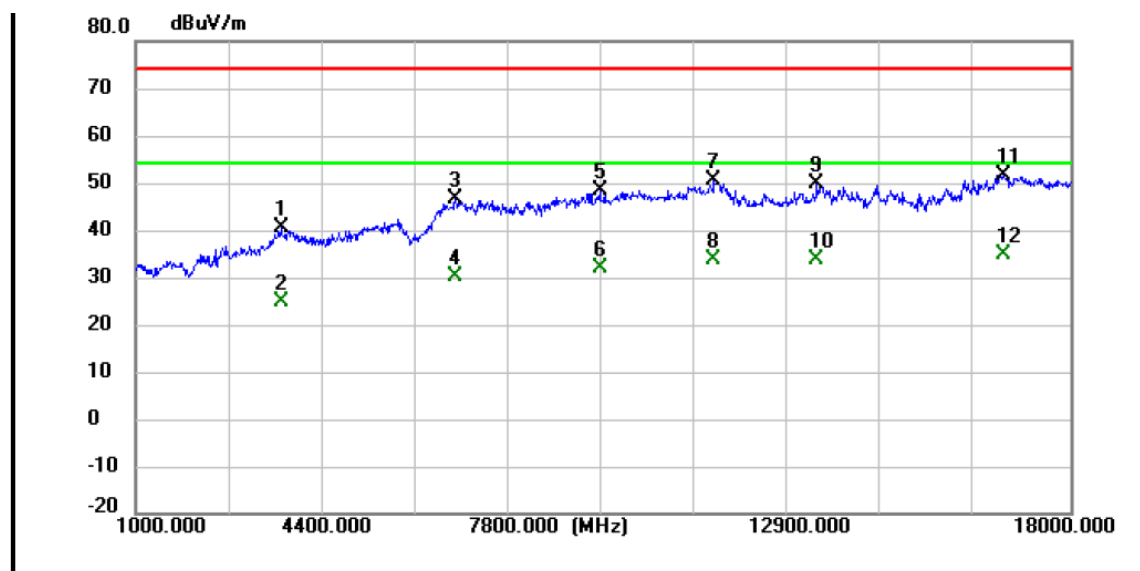
Humidity: 53 %RH

Mode: TX 2441MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3737.000	50.44	-9.61	40.83	74.00	-33.17	peak	P	
2	3737.000	33.70	-9.61	24.09	54.00	-29.91	AVG	P	
3	6967.000	49.63	-4.14	45.49	74.00	-28.51	peak	P	
4	6967.000	32.50	-4.14	28.36	54.00	-25.64	AVG	P	
5	9381.000	47.52	0.48	48.00	74.00	-26.00	peak	P	
6	9381.000	30.80	0.48	31.28	54.00	-22.72	AVG	P	
7	10095.000	47.48	0.82	48.30	74.00	-25.70	peak	P	
8	10095.000	30.70	0.82	31.52	54.00	-22.48	AVG	P	
9	11523.000	47.28	1.46	48.74	74.00	-25.26	peak	P	
10	11523.000	31.60	1.46	33.06	54.00	-20.94	AVG	P	
11	13886.000	45.39	2.87	48.26	74.00	-25.74	peak	P	
12	13886.000	28.70	2.87	31.57	54.00	-22.43	AVG	P	

*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Horizontal*

Temperature: 24.1 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

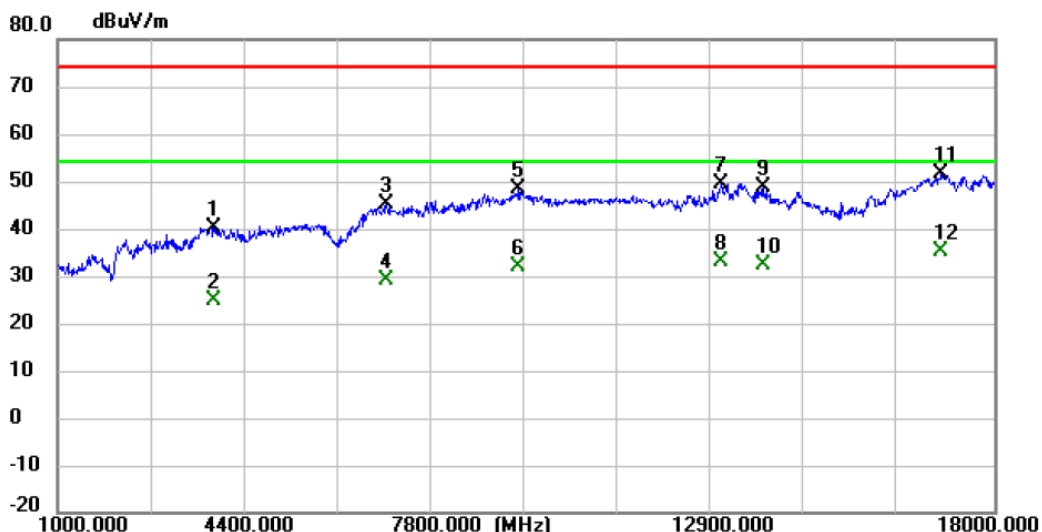
Humidity: 52 %RH

Mode: TX 2480MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3652.000	50.14	-9.71	40.43	74.00	-33.57	peak	P	
2	3652.000	34.60	-9.71	24.89	54.00	-29.11	AVG	P	
3	6814.000	50.86	-4.34	46.52	74.00	-27.48	peak	P	
4	6814.000	34.50	-4.34	30.16	54.00	-23.84	AVG	P	
5	9449.000	47.88	0.55	48.43	74.00	-25.57	peak	P	
6	9449.000	31.40	0.55	31.95	54.00	-22.05	AVG	P	
7	11523.000	48.95	1.46	50.41	74.00	-23.59	peak	P	
8	11523.000	32.30	1.46	33.76	54.00	-20.24	AVG	P	
9	13393.000	46.31	3.48	49.79	74.00	-24.21	peak	P	
10	13393.000	30.10	3.48	33.58	54.00	-20.42	AVG	P	
11	16776.000	48.42	3.10	51.52	74.00	-22.48	peak	P	
12	16776.000	31.70	3.10	34.80	54.00	-19.20	AVG	P	

*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: **Vertical**

Temperature: 24.1 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

Humidity: 52 %RH

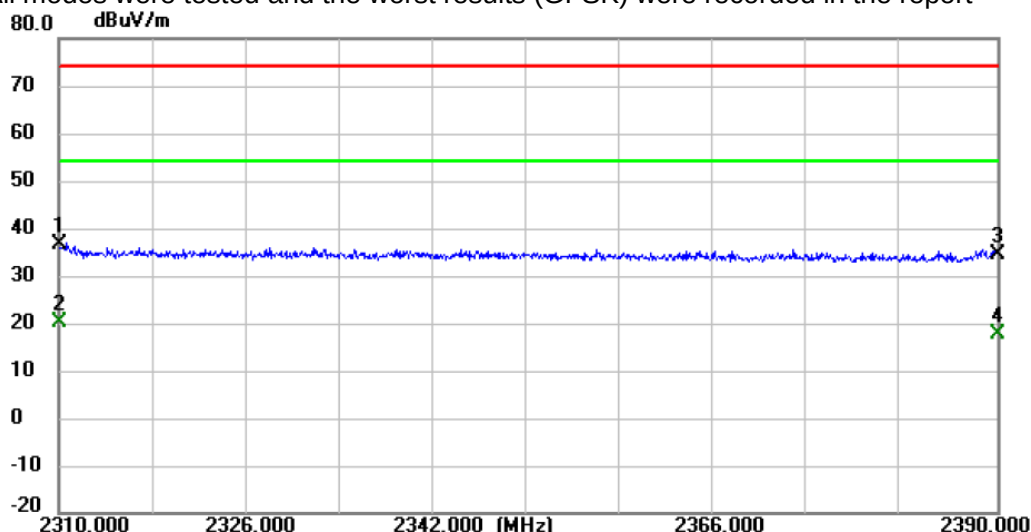
Mode: TX 2480MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3839.000	50.03	-9.69	40.34	74.00	-33.66	peak	P	
2	3839.000	34.60	-9.69	24.91	54.00	-29.09	AVG	P	
3	6967.000	49.44	-4.14	45.30	74.00	-28.70	peak	P	
4	6967.000	33.10	-4.14	28.96	54.00	-25.04	AVG	P	
5	9364.000	48.10	0.39	48.49	74.00	-25.51	peak	P	
6	9364.000	31.70	0.39	32.09	54.00	-21.91	AVG	P	
7	13053.000	46.83	2.64	49.47	74.00	-24.53	peak	P	
8	13053.000	30.40	2.64	33.04	54.00	-20.96	AVG	P	
9	13801.000	45.61	3.06	48.67	74.00	-25.33	peak	P	
10	13801.000	29.30	3.06	32.36	54.00	-21.64	AVG	P	
11	17048.000	47.11	4.32	51.43	74.00	-22.57	peak	P	
12	17048.000	30.70	4.32	35.02	54.00	-18.98	AVG	P	

*:Maximum data x:Over limit !:over margin

- Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz
All modes were tested and the worst results (GFSK) were recorded in the report



Site aaa

Polarization: *Vertical*

Temperature: 24.5 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

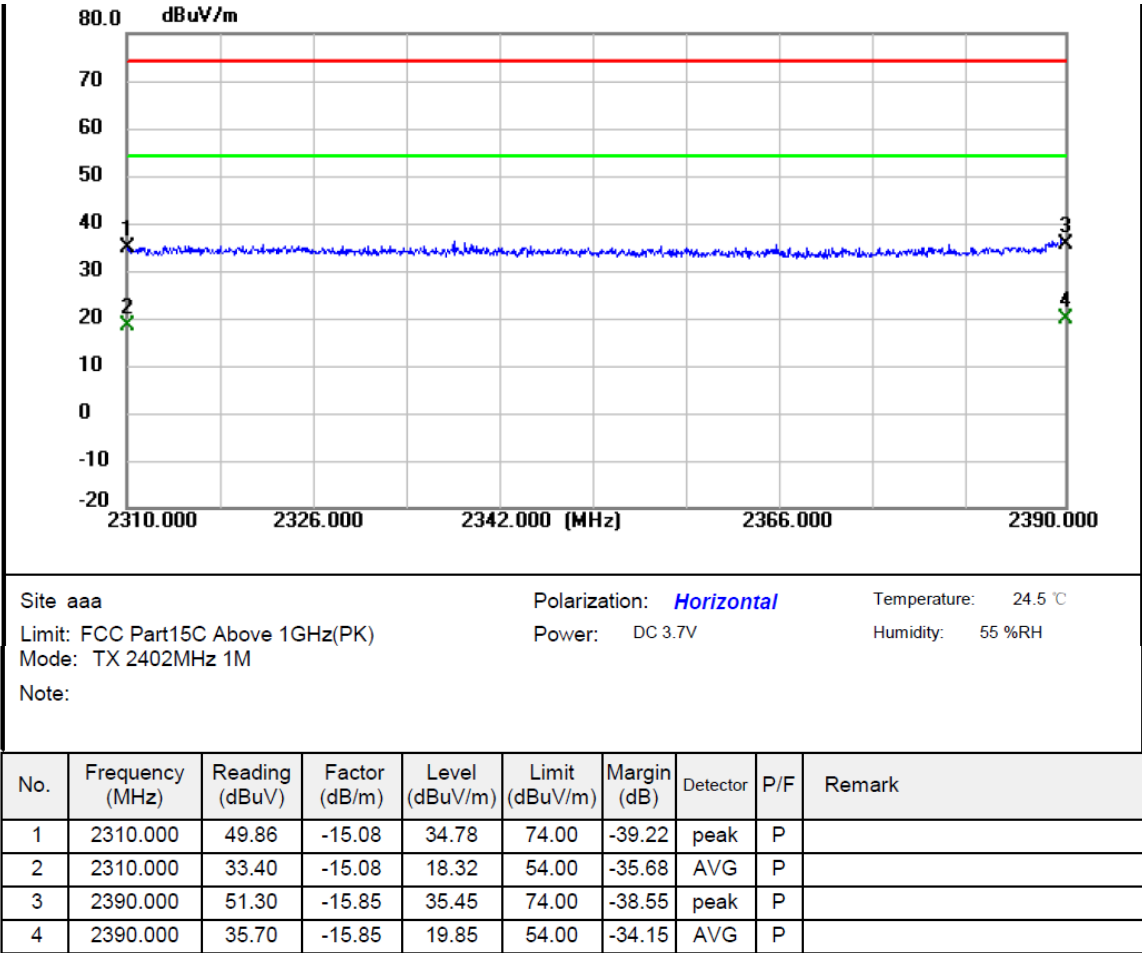
Humidity: 55 %RH

Mode: TX 2402MHz 1M

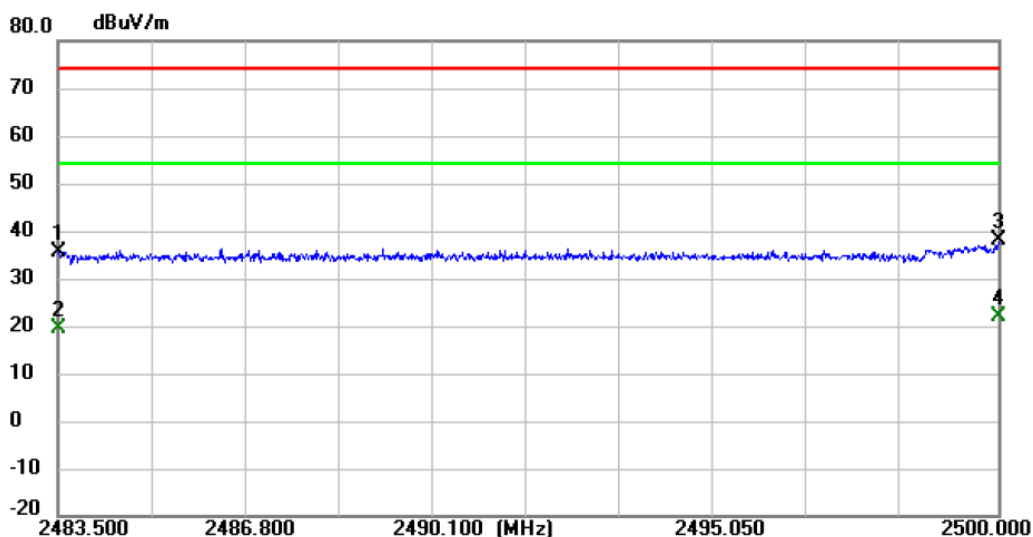
Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2310.000	51.63	-15.08	36.55	74.00	-37.45	peak	P	
2	2310.000	35.30	-15.08	20.22	54.00	-33.78	AVG	P	
3	2390.000	50.28	-15.85	34.43	74.00	-39.57	peak	P	
4	2390.000	33.50	-15.85	17.65	54.00	-36.35	AVG	P	

*:Maximum data x:Over limit !:over margin



*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Horizontal*

Temperature: 24.5 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

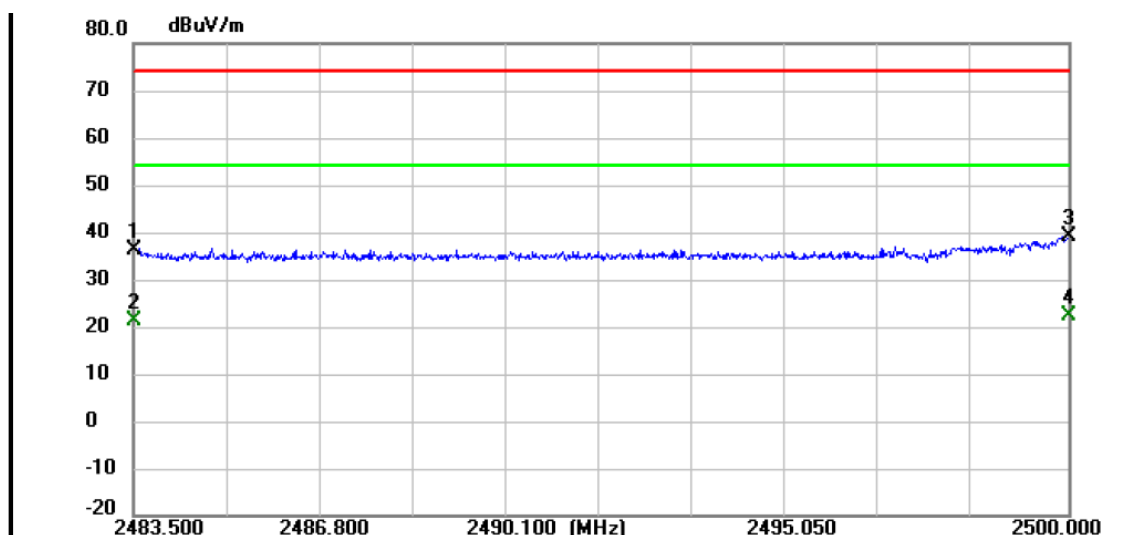
Humidity: 55 %RH

Mode: TX 2480MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	50.62	-15.07	35.55	74.00	-38.45	peak	P	
2	2483.500	34.40	-15.07	19.33	54.00	-34.67	AVG	P	
3	2500.000	52.91	-14.90	38.01	74.00	-35.99	peak	P	
4	2500.000	36.70	-14.90	21.80	54.00	-32.20	AVG	P	

*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Vertical*

Temperature: 24.5 °C

Limit: FCC Part15C Above 1GHz(PK)

Power: DC 3.7V

Humidity: 55 %RH

Mode: TX 2480MHz 1M

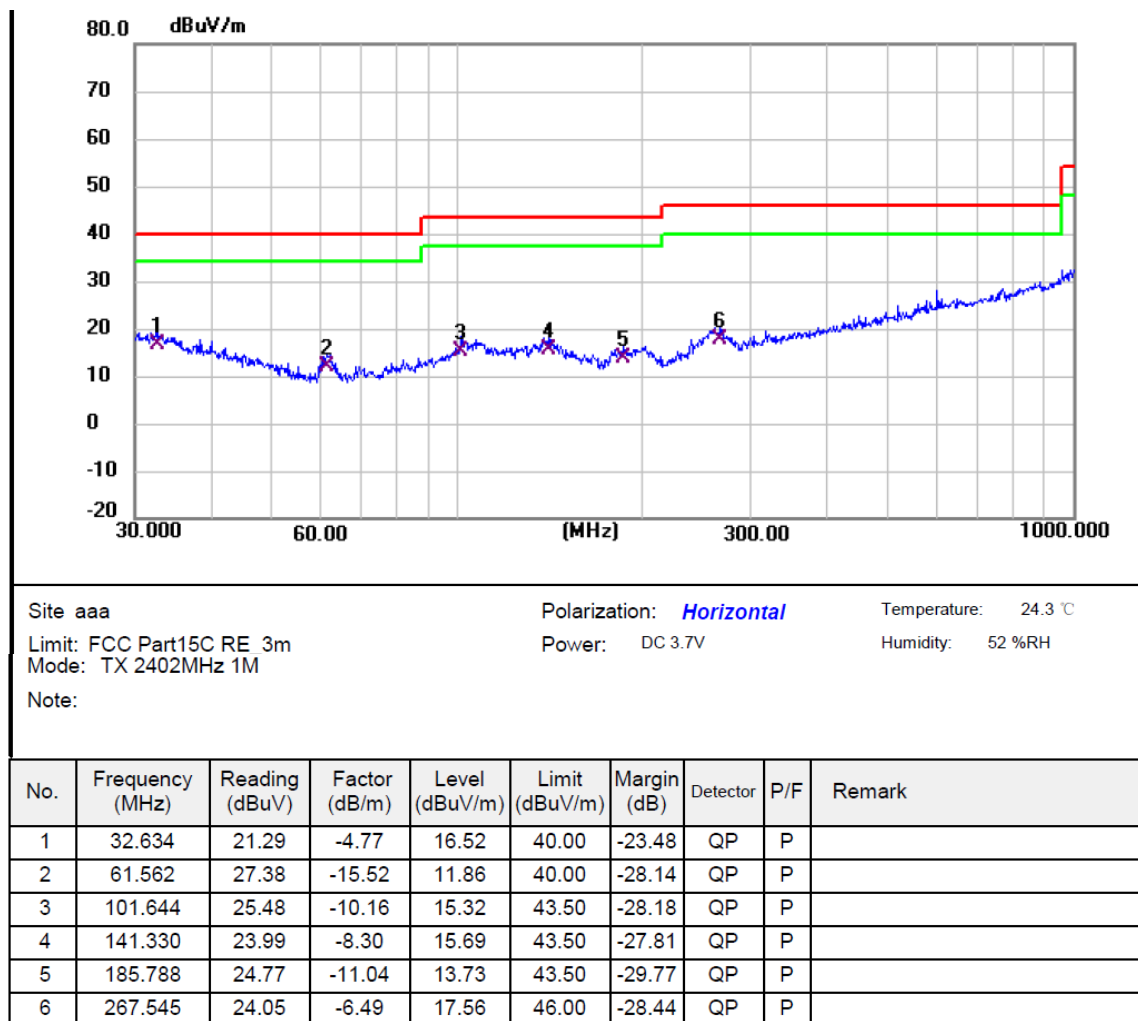
Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	51.19	-15.07	36.12	74.00	-37.88	peak	P	
2	2483.500	36.30	-15.07	21.23	54.00	-32.77	AVG	P	
3	2500.000	53.87	-14.90	38.97	74.00	-35.03	peak	P	
4	2500.000	37.40	-14.90	22.50	54.00	-31.50	AVG	P	

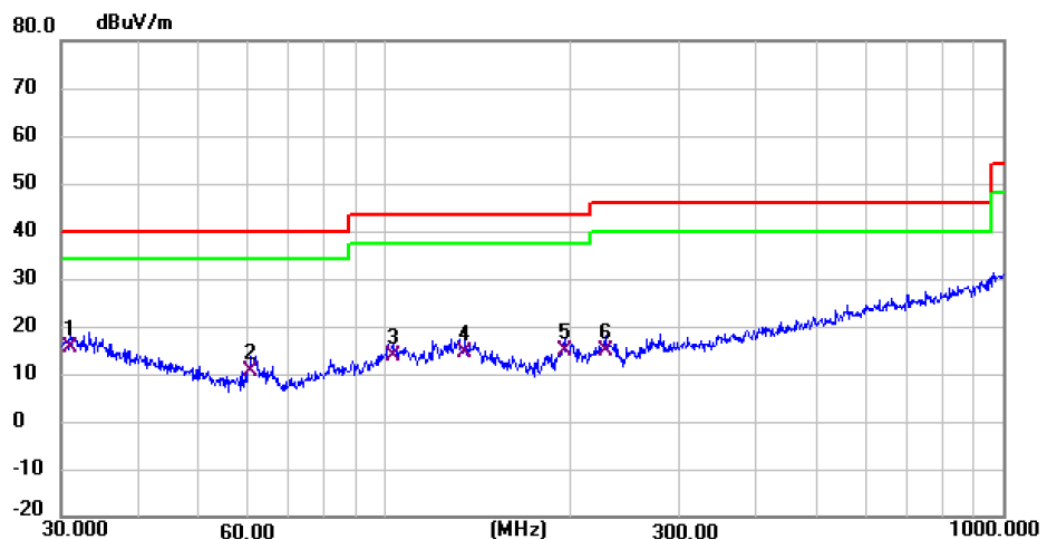
*:Maximum data x:Over limit !:over margin

■ Spurious Emission below 1GHz (30MHz to 1GHz)

All the modulation modes were tested and the worst result (GFSK:2402MHz) was report as below:



*:Maximum data x:Over limit !:over margin



Site aaa

Polarization: *Vertical*

Temperature: 24.3 °C

Limit: FCC Part15C RE_3m

Power: DC 3.7V

Humidity: 52 %RH

Mode: TX 2402MHz 1M

Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	31.071	20.00	-4.54	15.46	40.00	-24.54	QP	P	
2	60.917	26.12	-15.59	10.53	40.00	-29.47	QP	P	
3	103.080	23.67	-10.08	13.59	43.50	-29.91	QP	P	
4	135.032	23.14	-8.56	14.58	43.50	-28.92	QP	P	
5	195.822	26.13	-11.46	14.67	43.50	-28.83	QP	P	
6	227.691	24.56	-9.59	14.97	46.00	-31.03	QP	P	

*:Maximum data x:Over limit !:over margin

6.9 CONDUCTED EMISSION TEST

6.9.1 Applicable Standard

According to FCC Part 15.207(a)

6.9.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

Remark: Test results were obtained from the following equation:

$$\text{Measurement (dB}\mu\text{V)} = \text{LISN Factor (dB)} + \text{Cable Loss (dB)} + \text{Reading (dB}\mu\text{V)}$$

$$\text{Margin (dB)} = \text{Measurement (dB}\mu\text{V)} - \text{Limit (dB}\mu\text{V)}$$

6.9.3 Test Configuration

Test according to clause 5.3 conducted emission test setup

6.9.4 Test Procedure

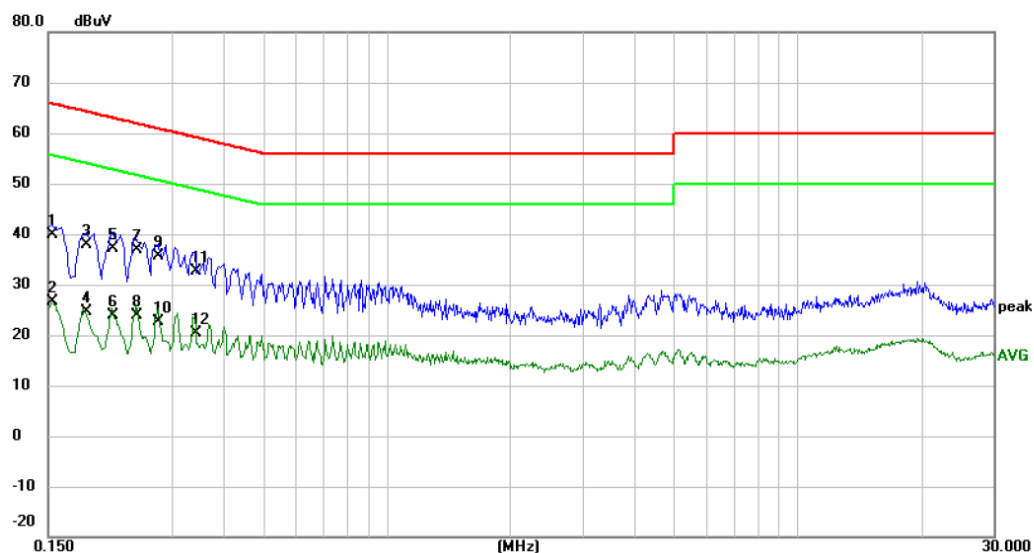
The EUT was placed on a table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Repeat above procedures until all frequency measured were complete.

6.9.5 Test Results

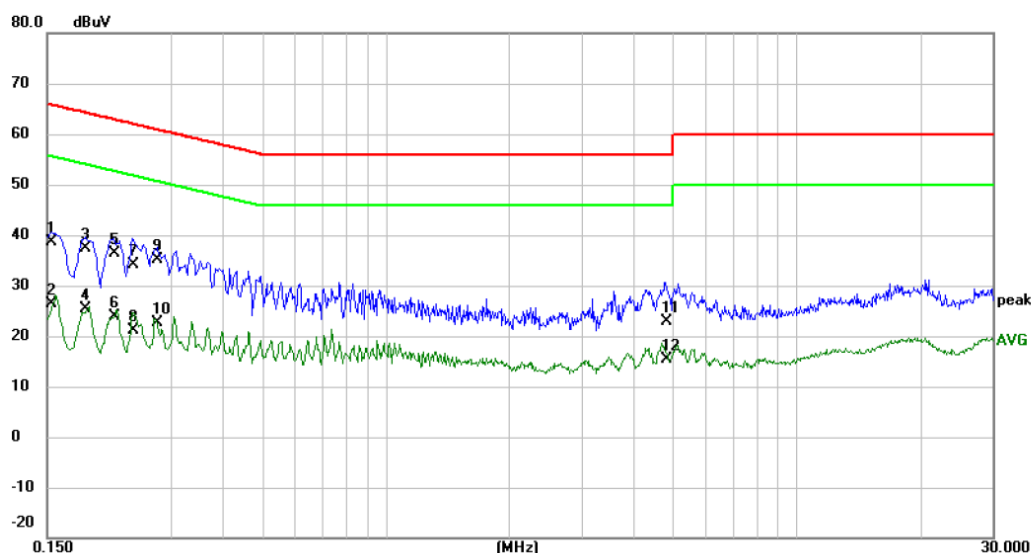
PASS.



Site: Phase: **L1** Temperature: 24.5
 Limit: FCC Part 15C Conduction(QP) Power: AC120V/60Hz Humidity: 55 %
 M/N: F1
 Mode: Communication mode
 Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	20.24	19.53	39.77	65.79	-26.02	QP		
2	0.1539	7.06	19.53	26.59	55.79	-29.20	AVG		
3	0.1860	18.37	19.54	37.91	64.21	-26.30	QP		
4	0.1860	5.15	19.54	24.69	54.21	-29.52	AVG		
5	0.2140	17.69	19.54	37.23	63.05	-25.82	QP		
6	0.2140	4.46	19.54	24.00	53.05	-29.05	AVG		
7	0.2460	17.32	19.53	36.85	61.89	-25.04	QP		
8	0.2460	4.33	19.53	23.86	51.89	-28.03	AVG		
9	0.2779	16.06	19.53	35.59	60.88	-25.29	QP		
10	0.2779	3.14	19.53	22.67	50.88	-28.21	AVG		
11	0.3420	13.17	19.54	32.71	59.15	-26.44	QP		
12	0.3420	0.89	19.54	20.43	49.15	-28.72	AVG		

*:Maximum data x:Over limit !:over margin



Site: Phase: **N** Temperature: 24.5
 Limit: FCC Part 15C Conduction(QP) Power: AC120V/60Hz Humidity: 55 %
 M/N: F1
 Mode: Communication mode
 Note:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	19.14	19.55	38.69	65.79	-27.10	QP		
2	0.1539	6.95	19.55	26.50	55.79	-29.29	AVG		
3	0.1860	17.79	19.55	37.34	64.21	-26.87	QP		
4	0.1860	5.75	19.55	25.30	54.21	-28.91	AVG		
5	0.2180	16.88	19.55	36.43	62.89	-26.46	QP		
6	0.2180	4.34	19.55	23.89	52.89	-29.00	AVG		
7	0.2420	14.59	19.54	34.13	62.03	-27.90	QP		
8	0.2420	1.69	19.54	21.23	52.03	-30.80	AVG		
9	0.2779	15.61	19.54	35.15	60.88	-25.73	QP		
10	0.2779	3.08	19.54	22.62	50.88	-28.26	AVG		
11	4.8220	3.32	19.61	22.93	56.00	-33.07	QP		
12	4.8220	-4.12	19.61	15.49	46.00	-30.51	AVG		

*:Maximum data x:Over limit !:over margin

6.10 ANTENNA APPLICATION

6.10.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), 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.

6.10.2 Result

PASS.

The EUT has 1 antenna: PCB Antenna for BT with classic model, the gain is -0.93 dBi;

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

----- END OF REPORT -----

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