

Project No: TM-2607000496P
Report No.: TMWK2608004129KR

FCC ID: IPH-05040

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RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.247
Product name	Communication Control Unit
Brand Name	GARMIN
Model No.	IMWW27
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10-2020 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Sehni, Hu

Sehni Hu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	September 11, 2026	Initial Issue	ALL	Peggy Tsai

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Garmin International Inc 1200 E. 151st. Street Olathe Kansas 66062 United States
Manufacturer	Garmin International Inc. No. 270, Huaya 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
Equipment	Communication Control Unit
Model No.	IMWW27
Model Discrepancy	N/A
Trade Name	GARMIN
Received Date	August 6, 2026
Date of Test	August 12 ~ 25, 2026
Power Operation	Powered from DC 12V
HW Version	V03
SW Version	1.07

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

1.2 INFORMATION ABOUT THE FHSS CHARACTERISTICS

1.2.1 Pseudorandom Frequency Hopping Sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1 600 hops/s.

1.2.2 Equal Hopping Frequency Use

The channels of this system will be used equally over the long-term distribution of the hopsets.

1.2.3 Example of a 79 hopping sequence in data mode:

02, 05, 31, 24, 20, 10, 43, 36, 30, 23, 40, 06, 21, 50, 44, 09, 71, 78, 01, 13, 73, 07, 70, 72, 35, 62, 42, 11, 41, 08, 16, 29, 60, 15, 34, 61, 58, 04, 67, 12, 22, 53, 57, 18, 27, 76, 39, 32, 17, 77, 52, 33, 56, 46, 37, 47, 64, 49, 45, 38, 69, 14, 51, 26, 79, 19, 28, 65, 75, 54, 48, 03, 25, 66, 05, 16, 68, 74, 59, 63, 55

1.2.4 System Receiver Input Bandwidth

Each channel bandwidth is 1MHz.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

1.2.5 Equipment Description

The Rx input bandwidths shift frequencies in synchronization with the transmitted signals. In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in standard when the transmitter is presented with a continuous data (or information) system.

In accordance with the Bluetooth Industry Standard, the system does not coordinate its channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

1.3 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	1. GFSK for BDR-1Mbps 2. $\pi/4$ -DQPSK for EDR-2Mbps 3. 8DPSK for EDR-3Mbps
Number of channel	79 Channels

Remark:

Refer as ANSI C63.10-2020 for test channels.

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.4 ANTENNA INFORMATION

Antenna Type	☐ PIFA ☐ PCB ☐ Dipole ☒ Chip Antenna
Antenna Brand / Model	INPAQ TECHNOLOGY CO., LTD. / VGAP-CLA-AS-A1
Antenna Gain	1.46 dBi
Antenna Connector	N/A

Notes:

1.The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.5 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	±2.654dB
Channel Bandwidth	±0.216dB
RF output power (Spectrum)	±0.884dB
RF output power (Power Meter + Power sensor)	±0.442dB
Channel Separation	±0.484dB
Conducted Bandedge	±2.104dB
Conducted Spurious Emission	±2.104dB
Radiated Emission_9kHz-30MHz	±2.998dB
Radiated Emission_30MHz-200MHz	±3.308dB
Radiated Emission_200MHz-1GHz	±3.506dB
Radiated Emission_1GHz-6GHz	±4.068dB
Radiated Emission_6GHz-18GHz	±4.120dB
Radiated Emission_18GHz-26GHz	±3.411dB
Radiated Emission_26GHz-40GHz	±3.410dB

Remark:

- 1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.6 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	David Li	-
Radiation	Ben Yang 、Tony Chao	-
RF Conducted	Marco Chan	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC pubic Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.7 INSTRUMENT CALIBRATION

Conducted_FCC/IC/NCC (All)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Cable	Woken	WC12	E	2026-06-25	2027-06-24
Constant Temperature Humidity Chamber	TERCHY	MHG-150LF	930619	2025-10-14	2026-10-13
EXA Signal Analyzer	Keysight	N9010B	MY55460167	2026-06-01	2027-05-31
Power Sensor	Anritsu	MA2411B	1911386	2026-06-23	2027-06-22
Power Meter	Anritsu	ML2496A	2136002	2026-06-23	2027-06-22
DC Blocks	Marvelous Microwave	MVE6411	MVE-001	2026-08-05	2027-08-04
Attenuator	Marvelous Microwave Inc	MVE2213-10	08	2025-11-06	2026-11-05
DC Power Source	GWINSTEK	GPC-3030D	8070184	2025-09-15	2026-09-14
Software	Radio Test Software Ver. 21				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

966A_Radiated					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	Agilent	N9010A	MY52220817	2026-03-13	2027-03-12
Active Loop Antenna	COM-POWER	AL-130	121051	2026-02-04	2027-02-03
Thermo-Hygro Meter	HTC	HTC-1	HTC-D06	2026-05-19	2027-05-18
Bi-Log Antenna	Sunol Sciences	JB3	A030105&532	2026-06-18	2027-06-17
Preamplifier	EMEC	EM330	060609	2026-02-13	2027-02-12
Cable	Huber+Suhner	104PEA	20995+21000+182330	2026-08-05	2027-08-04
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2025-12-19	2026-12-18
Preamplifier	HP	8449B	3008A00965	2025-12-17	2026-12-16
Cable	EMCI	EMC101G	150S0193+230206+230203_20260811	2026-08-11	2027-08-10
Attenuator	Mini-Circuits	BW-S9W5	BWS9W5-09-966A-01	2026-02-05	2027-02-04
High Pass Filters	Titan Microwave	T04H30001800070S01	22011402-4	2026-06-01	2027-05-31
Pre-Amplifier	EMC	EMC184045SE	980860	2025-11-19	2026-11-18
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2025-12-09	2026-12-08
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Software	e3 V9-210616c				

AC Mains Conduction					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI	100064	2026-05-21	2027-05-20
LISN	TESEQ	LN2-16N	22012	2026-02-04	2027-02-03
Cable	Woken	RFC-SMA-100-NMR-084SFL402	MFR-2Y194	2026-03-20	2027-03-19
Software	e3 V9-210616c				

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.

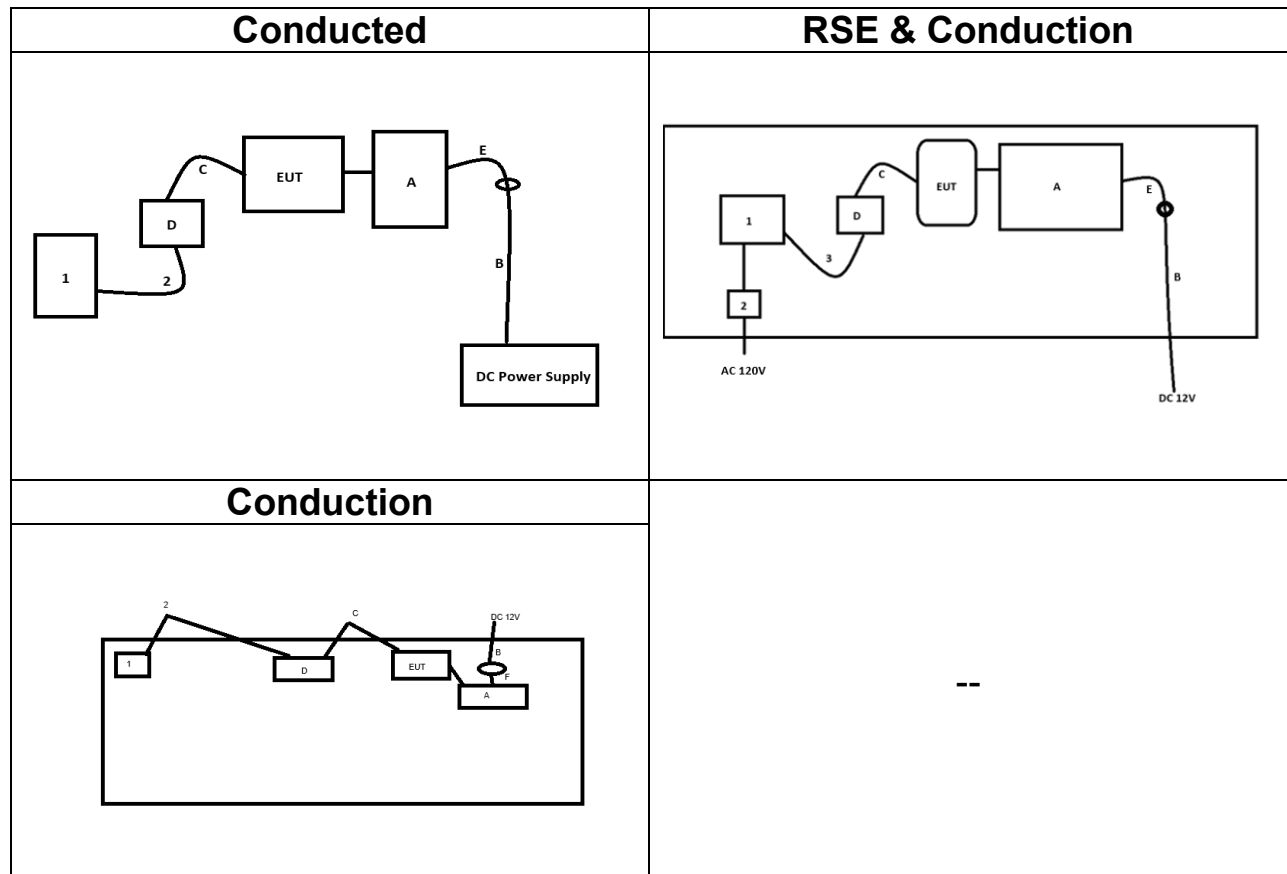
1.8 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment (Conducted)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(B)	Lenovo	T470	N/A	N/A
2	USB-A to Type-C	Xiaomi	SJX10ZM	N/A	N/A
A	Link Card Fixture board	GARMIN	105-04487-00 VER 2	N/A	N/A
B	DC Power Cable	GARMIN	Cable-01	N/A	N/A
C	Flexible Flat Cable	GARMIN	Flexible Flat Cable	N/A	N/A
D	UART to USB adapter board	GARMIN	105-05005-00 VER 2	N/A	N/A
E	UART Adapter Cable, 5-Pin to 6-Pin	GARMIN	UART Adapter Cable, 5-Pin to 6-Pin	N/A	N/A

Support Equipment (Radiated 、Conduction)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(D)	Lenovo	ThinkPad X260	N/A	N/A
2	Adapter	Lenovo	ADLX45DLC3A	N/A	N/A
3	Type-C Cable	Xiaomi	SJX10ZM	N/A	N/A
A	Link Card Fixture board	GARMIN	105-04487-00 VER 2	N/A	N/A
B	DC Power Cable	GARMIN	Cable-01	N/A	N/A
C	Flexible Flat Cable	GARMIN	Flexible Flat Cable	N/A	N/A
D	UART to USB adapter board	GARMIN	105-05005-00 VER 2	N/A	N/A
E	UART Adapter Cable, 5-Pin to 6-Pin	GARMIN	UART Adapter Cable, 5-Pin to 6-Pin	N/A	N/A

1.9 TEST SET UP DIAGRAM



1.10 TEST METHODOLOGY AND APPLIED STANDARDS

The EUT connection corresponds to the surrounding fixture control board.
This EUT use CyBluetool tool to allow the sample to continuously transmit.

CyBluetool v0.1.55.1

1.11 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10-2020, FCC Part 2, FCC Part 15.247, KDB 558074.

2. TEST SUMMERY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	Pass
15.247(a)(1)	4.2	20 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(1)	4.3	Output Power Measurement	Pass
15.247(a)(1)	4.4	Frequency Separation	Pass
15.247(a)(1)(iii)	4.5	Number of Hopping	Pass
15.247(d)	4.6	Conducted Band Edge	Pass
15.247(d)	4.6	Conducted Spurious Emission	Pass
15.247(a)(1)(iii)	4.7	Time of Occupancy	Pass
15.247(d)	4.8	Radiation Band Edge	Pass
15.247(d)	4.8	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	GFSK for BDR-1Mbps (DH5) $\pi/4$ -DQPSK for 2Mbps (2DH5) 8DPSK for EDR-3Mbps (3DH5)
Test Channel Frequencies	GFSK for BDR-1Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz $\pi/4$-DQPSK for 2Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz 8DPSK for EDR-3Mbps: 1.Lowest Channel: 2402MHz 2.Middle Channel: 2441MHz 3.Highest Channel: 2480MHz

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
- 2.The system support GFSK , $\pi/4$ DQPSK ,8DPSK , the $\pi/4$ DQPSK were reduced since the identical parameters with 8dpsk. In the following test items, number of hopping, conducted hopping bandedge, radiated band edge and spurious emissions.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conduction Emission	
Test Condition	AC Power line conduction emission for line and neutral
Power supply Mode	Mode 1: EUT power by Power Supply(DC12V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Power Supply(DC12V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Power Supply(DC12V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

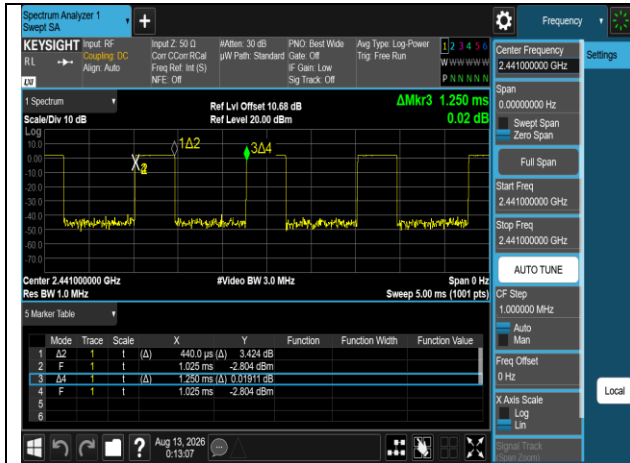
1. The worst mode was record in this test report.
2. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the minimum margin for radiated emission(Bandedge & Harmonic) as worse case.
3. The EUT was pre-scanned in three planes (H, E1, and E2) with two polarizations for radiated emission measurements. The worst-case condition was identified in the E2-plane and recorded in this report.

3.3 EUT DUTY CYCLE

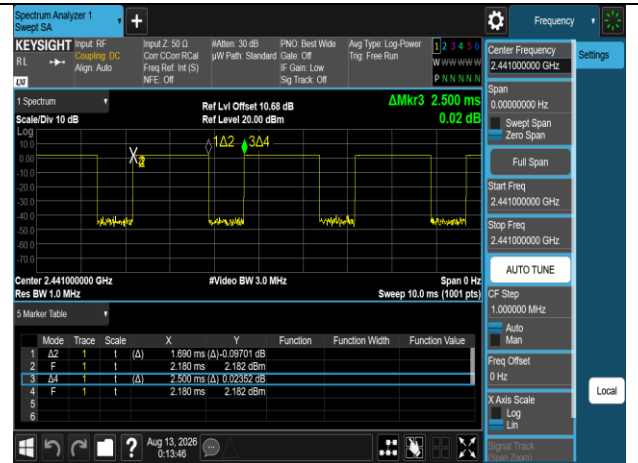
Temperature: 23.3 ~ 23.6°C
Humidity: 59 ~ 61% RH

Test date: August 12 ~ 13, 2026
Tested by: Marco Chan

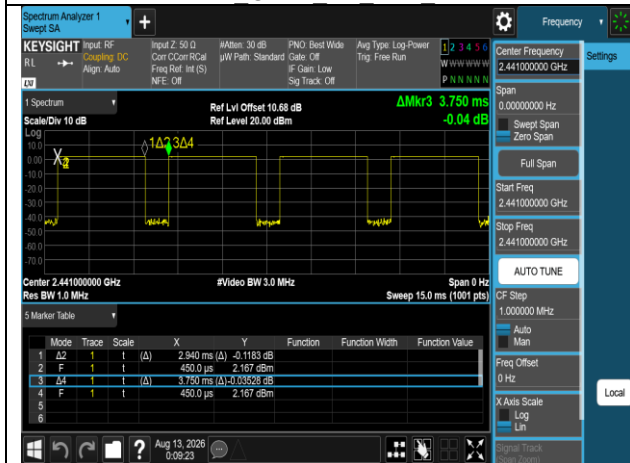
PACKET TYPE	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
DH1	35.20	4.53	2.27	3.00
DH3	67.60	1.70	0.59	1.00
DH5	78.40	1.06	0.34	1.00
2DH1	31.20	5.06	2.56	3.00
2DH3	65.60	1.83	0.61	1.00
2DH5	77.20	1.12	0.35	1.00
3DH1	31.20	5.06	2.56	3.00
3DH3	65.60	1.83	0.61	1.00
3DH5	77.20	1.12	0.35	1.00



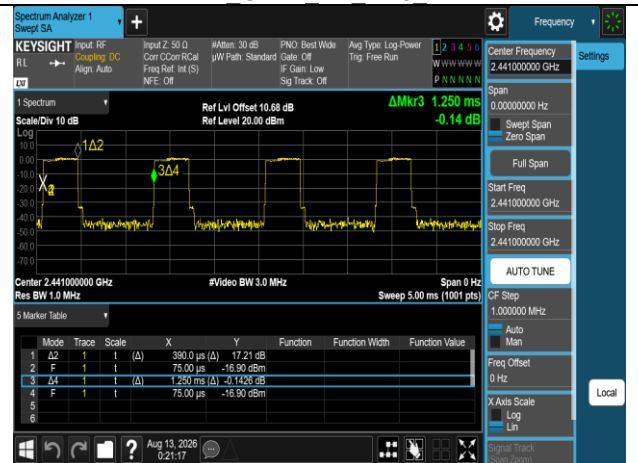
Dwell Time GFSK 1M DH1 2441MHz



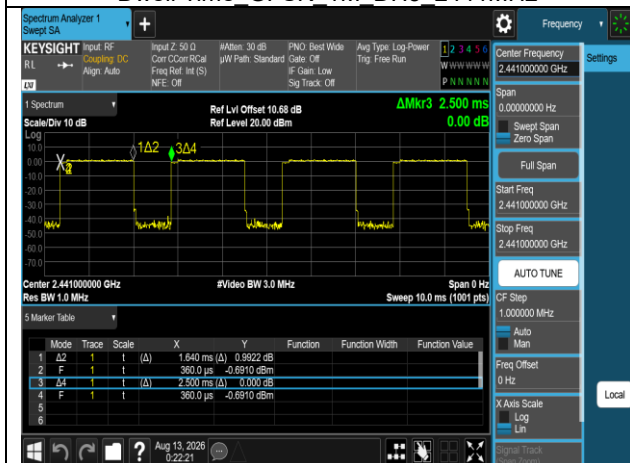
Dwell Time GFSK 1M DH3 2441MHz



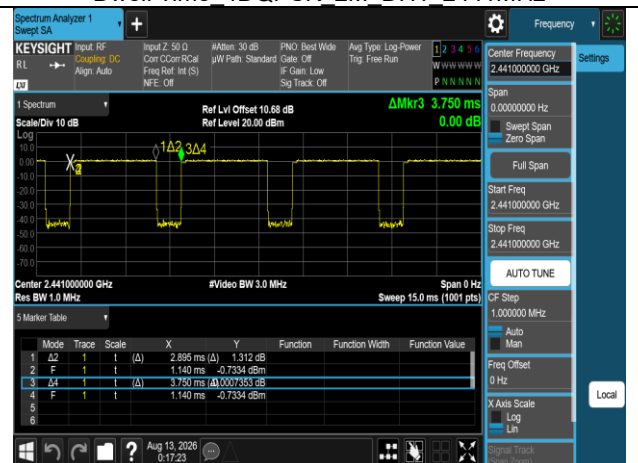
Dwell Time GFSK 1M DH5 2441MHz



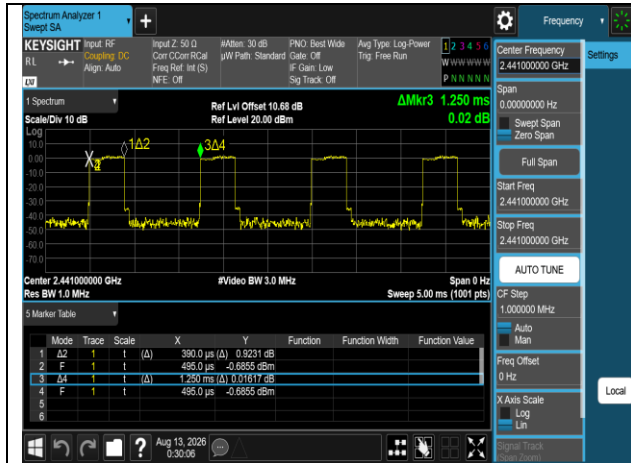
Dwell Time 4DQPSK 2M DH1 2441MHz



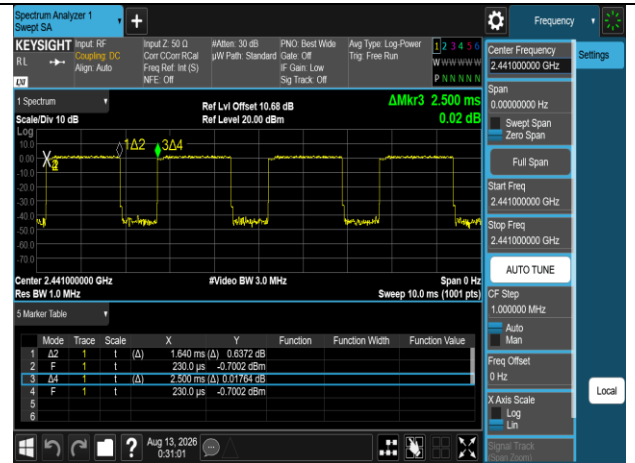
Dwell Time 4DQPSK 2M DH3 2441MHz



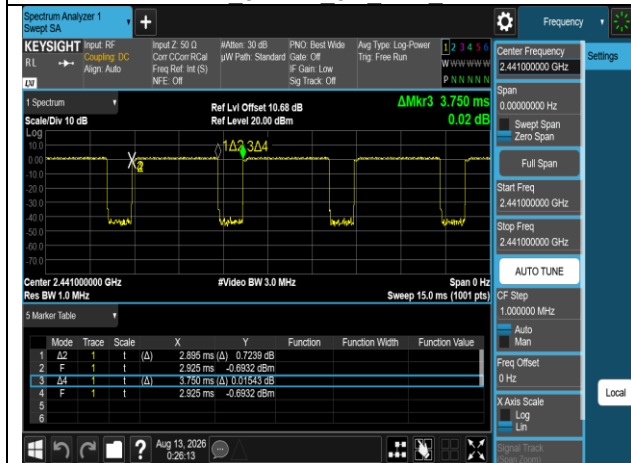
Dwell Time 4DQPSK 2M DH5 2441MHz



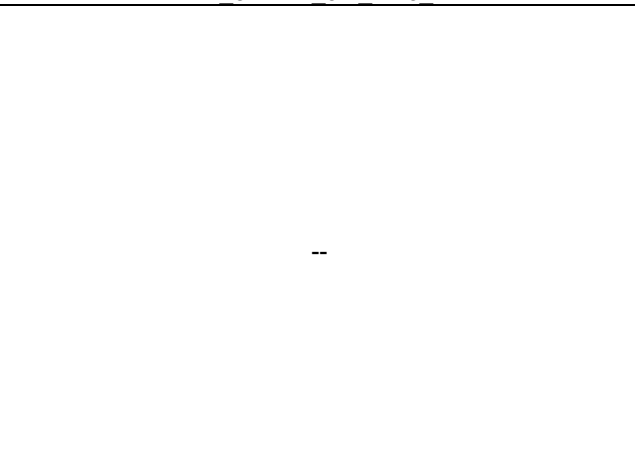
Dwell Time 8DPSK 3M DH1 2441MHz



Dwell Time 8DPSK 3M DH3 2441MHz



Dwell Time 8DPSK 3M DH5 2441MHz



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

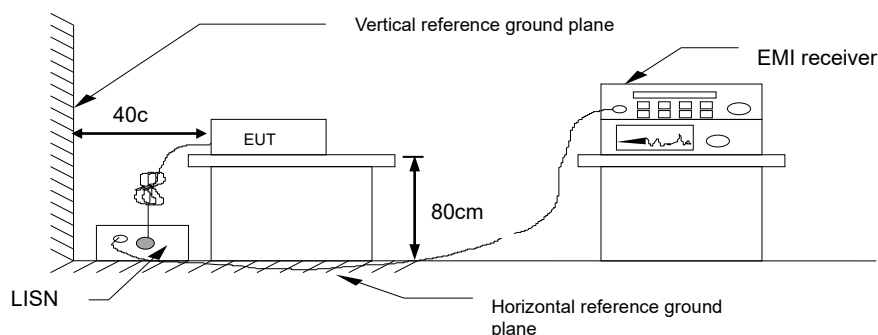
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10-2020,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

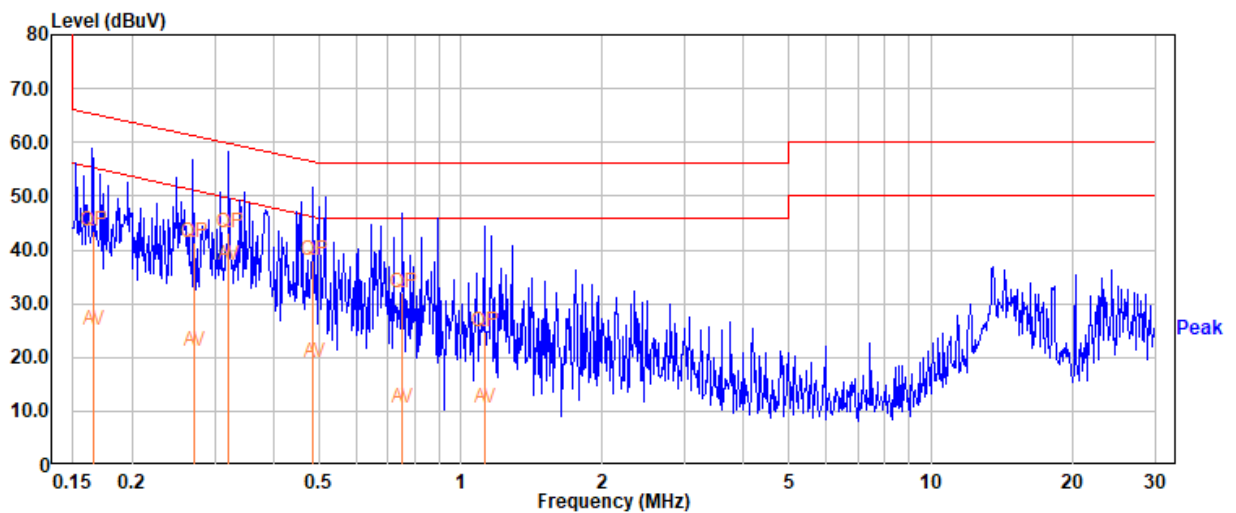
4.1.3 Test Setup



4.1.4 Test Result

Project No : TM-2607000496P
Operation Band : BT
Test Chamber : Conduction
Probe : Line
Note :

Test Date : 2026-08-25
Temp./Humi. : 25°C / 65%
Engineer : David.Li
Test Voltage : AC 120V/60Hz



Trace:						
Freq	Read Level	Factor	Actual FS	Limit	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV	dBuV	dB	PK/QP/AV
0.165	43.41	0.10	43.51	65.19	-21.68	QP
0.165	24.83	0.10	24.93	55.19	-30.26	Average
0.271	41.22	0.09	41.31	61.10	-19.79	QP
0.271	20.99	0.09	21.08	51.10	-30.02	Average
0.321	43.00	0.08	43.08	59.67	-16.59	QP
0.321	37.02	0.08	37.10	49.67	-12.57	Average
0.486	37.84	0.08	37.92	56.23	-18.31	QP
0.486	19.07	0.08	19.15	46.23	-27.08	Average
0.751	31.86	0.09	31.95	56.00	-24.05	QP
0.751	10.58	0.09	10.67	46.00	-35.33	Average
1.126	24.75	0.09	24.84	56.00	-31.16	QP
1.126	10.51	0.09	10.60	46.00	-35.40	Average

Note: 1. Actual FS= Spectrum Read Level + Factor

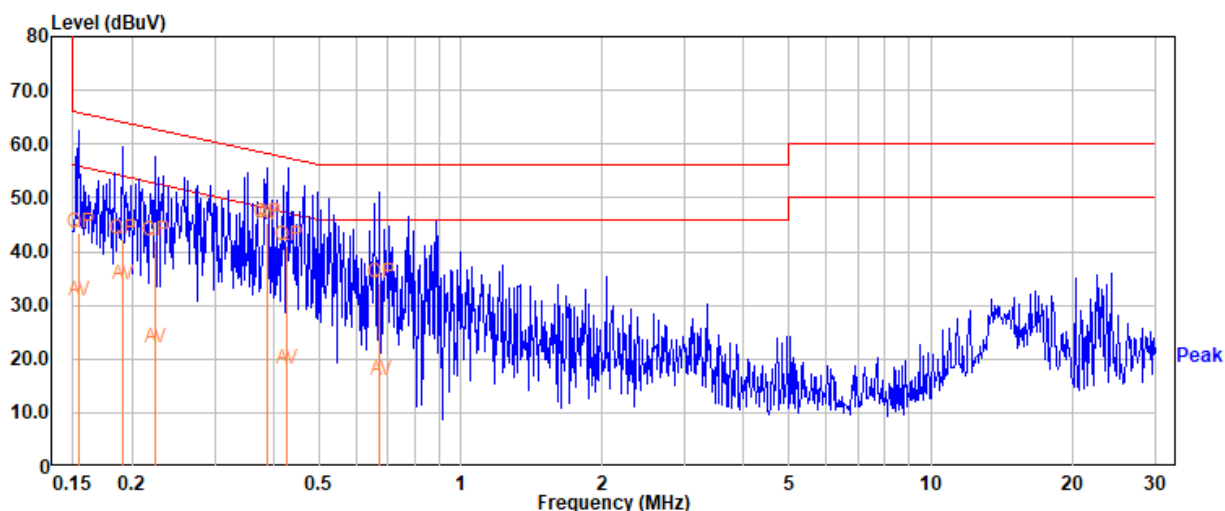
Note: 2. Margin= Actual FS - Limit

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Project No : TM-2607000496P
Operation Band : BT
Test Chamber : Conduction
Probe : Neutral
Note :

Test Date : 2026-08-25
Temp./Humi. : 25°C / 65%
Engineer : David.Li
Test Voltage : AC 120V/60Hz



Trace:						
Freq	Read Level	Factor	Actual FS	Limit	Margin	Detector Mode
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dBuV	dBuV	dB	PK/QP/AV
0.155	43.44	0.12	43.56	65.75	-22.19	QP
0.155	30.54	0.12	30.66	55.75	-25.09	Average
0.191	42.16	0.11	42.27	63.99	-21.72	QP
0.191	33.83	0.11	33.94	53.99	-20.05	Average
0.224	41.76	0.11	41.87	62.68	-20.81	QP
0.224	21.99	0.11	22.10	52.68	-30.58	Average
0.387	45.04	0.10	45.14	58.13	-12.99	QP
0.387	44.74	0.10	44.84	48.13	-3.29	Average
0.428	41.03	0.10	41.13	57.29	-16.16	QP
0.428	18.14	0.10	18.24	47.29	-29.05	Average
0.673	34.13	0.10	34.23	56.00	-21.77	QP
0.673	15.86	0.10	15.96	46.00	-30.04	Average

Note: 1. Actual FS= Spectrum Read Level + Factor

Note: 2. Margin= Actual FS - Limit

4.2 20dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

According to §15.247(a) (1),

20 dB Bandwidth : For reporting purposes only.

Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI C63.10-2020,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 30kHz, VBW = 100kHz and Detector = Peak, to measurement 20 dB Bandwidth and 99% Bandwidth.
4. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup

Refer to section 1.9.

4.2.4 Test Result

Temperature: 23.3 ~ 23.6°C

Test date:

August 12 ~ 13, 2026

Humidity: 59 ~ 61% RH

Tested by:

Marco Chan

20dB BANDWIDTH

GFSK_DH5

CH	20 dB BW (MHz)	2/3 BW (MHz)
0	0.8644	0.58
39	0.8830	0.59
78	0.8634	0.58

$\pi/4$ DQPSK_2DH5

CH	20 dB BW (MHz)	2/3 BW (MHz)
0	1.350	0.90
39	1.350	0.90
78	1.350	0.90

8DPSK_3DH5

CH	20 dB BW (MHz)	2/3 BW (MHz)
0	1.307	0.87
39	1.308	0.87
78	1.307	0.87

BANDWIDTH 99%

GFSK_DH5

CH	99% BW (MHz)
0	0.92508
39	0.92265
78	0.92098

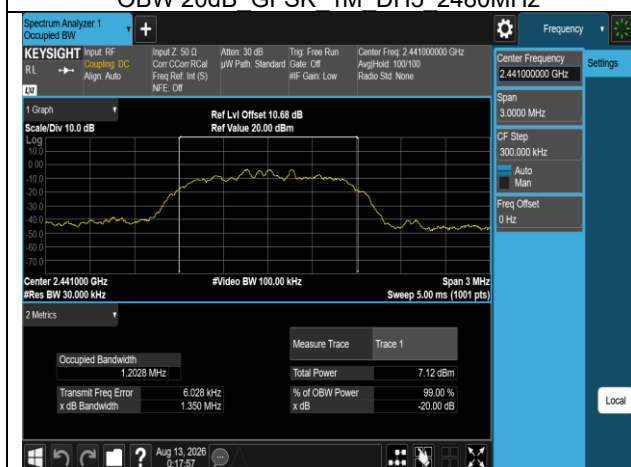
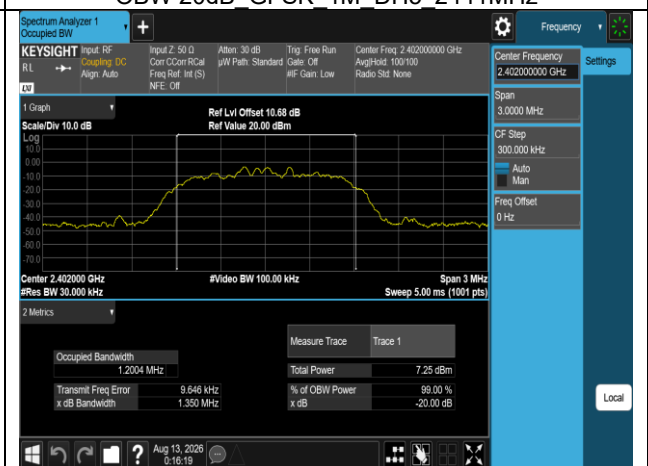
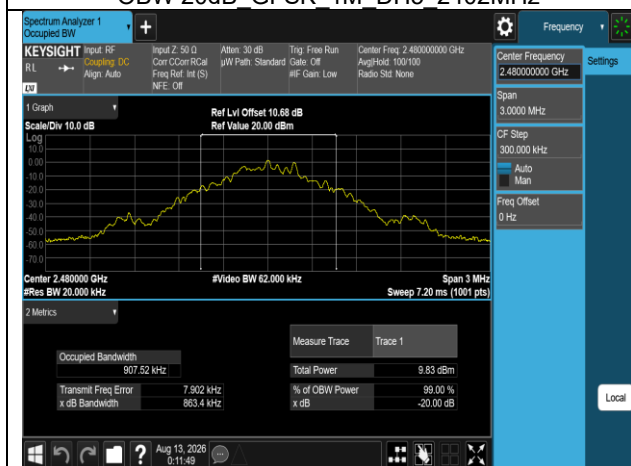
$\pi/4$ DQPSK_2DH5

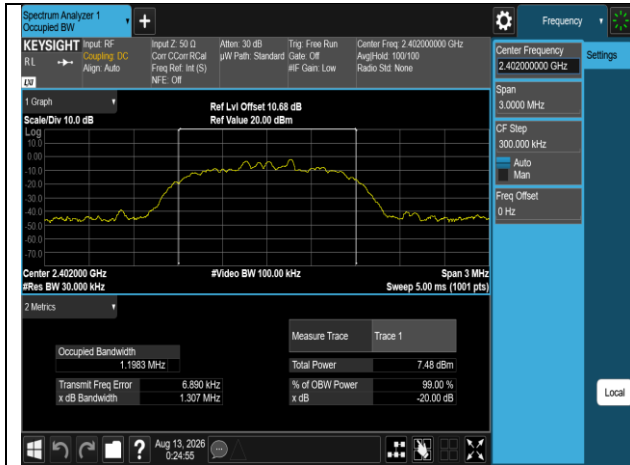
CH	99% BW (MHz)
0	1.1990
39	1.1998
78	1.1989

8DPSK_3DH5

CH	99% BW (MHz)
0	1.1968
39	1.1961
78	1.1971

Test Data 20dB BANDWIDTH

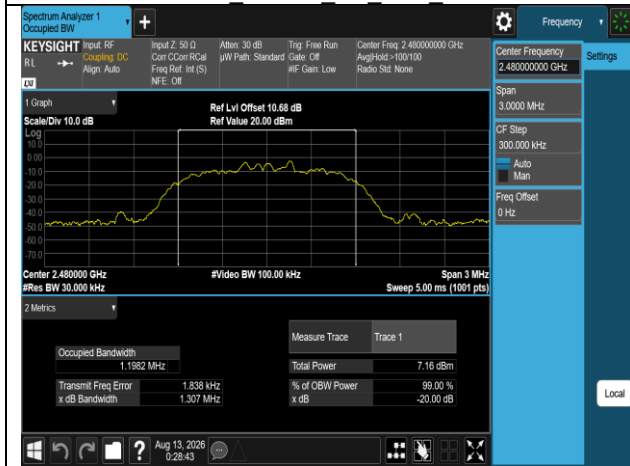




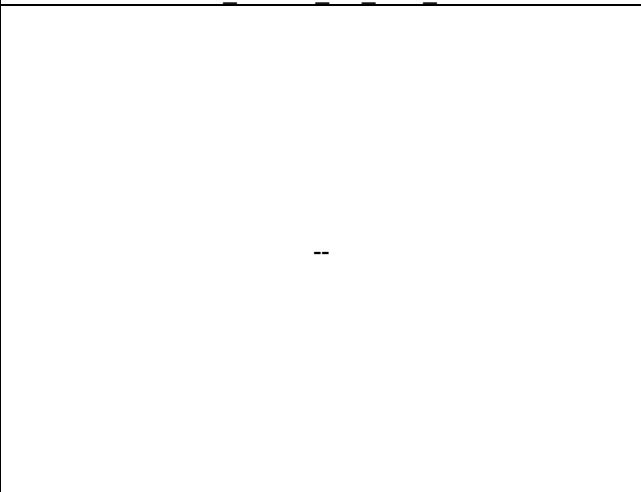
OBW 20dB 8DPSK 3M DH5 2402MHz



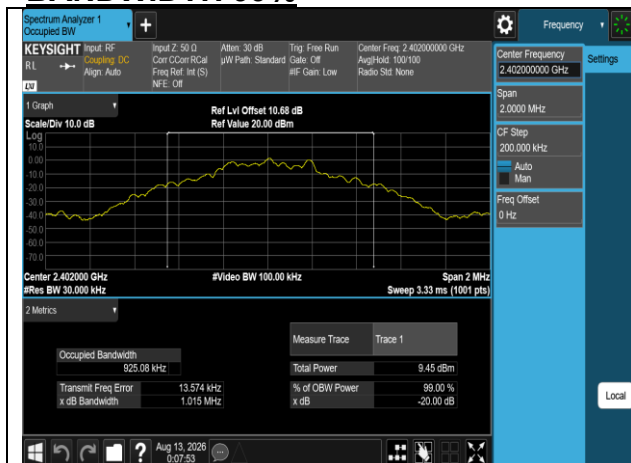
OBW 20dB 8DPSK 3M DH5 2441MHz



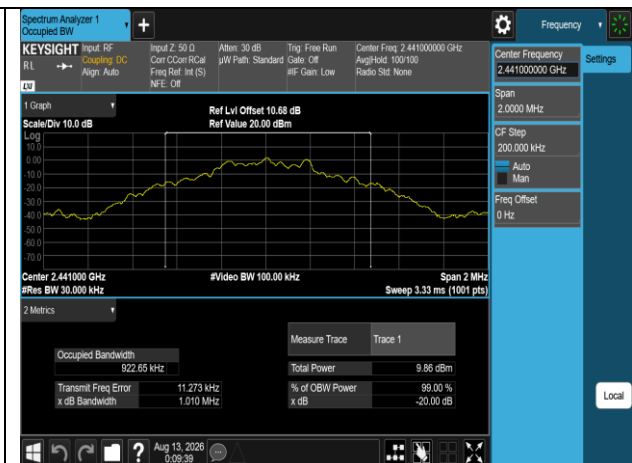
OBW 20dB 8DPSK 3M DH5 2480MHz



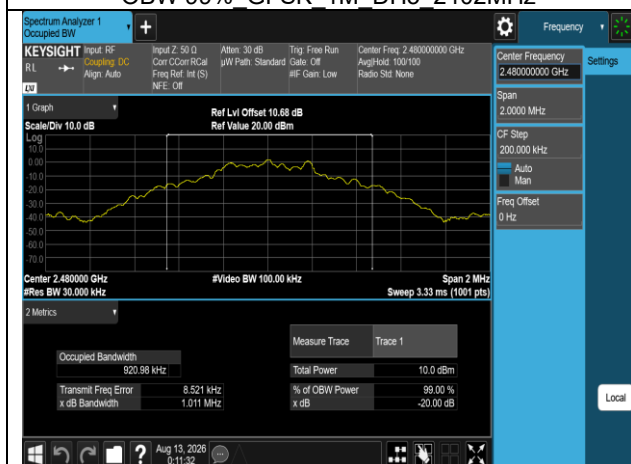
BANDWIDTH 99%



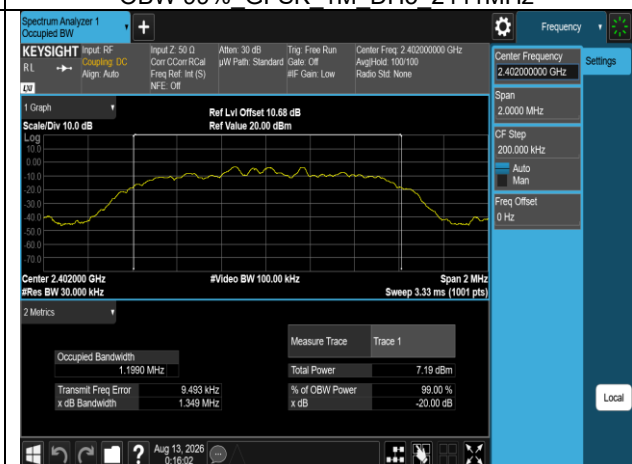
OBW 99% GFSK 1M DH5 2402MHz



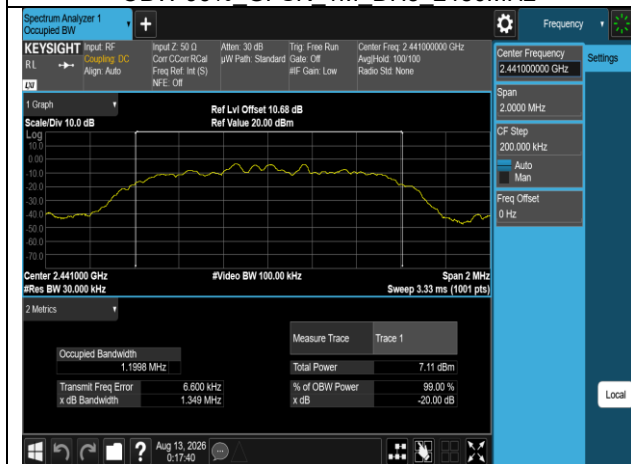
OBW 99% GFSK 1M DH5 2441MHz



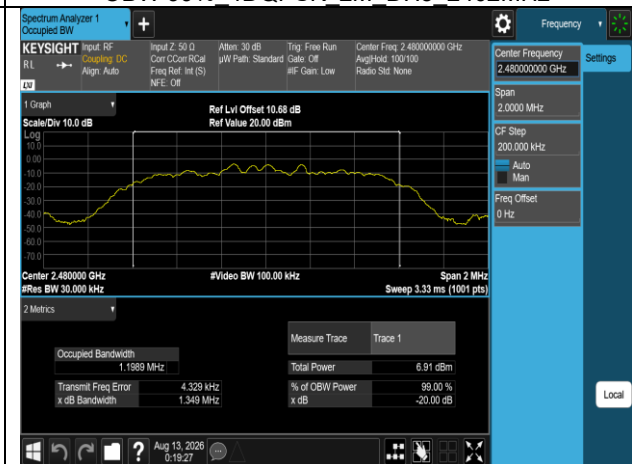
OBW 99% GFSK 1M DH5 2480MHz



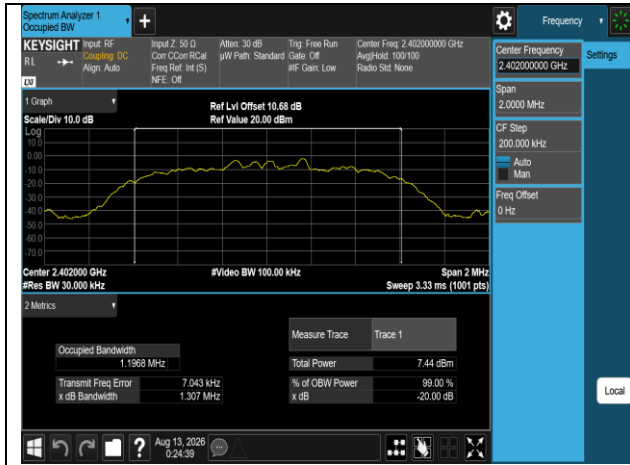
OBW 99% 4DQPSK 2M DH5 2402MHz



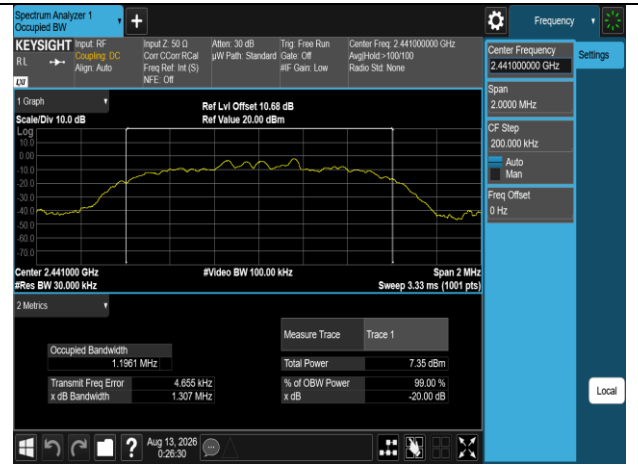
OBW 99% 4DQPSK 2M DH5 2441MHz



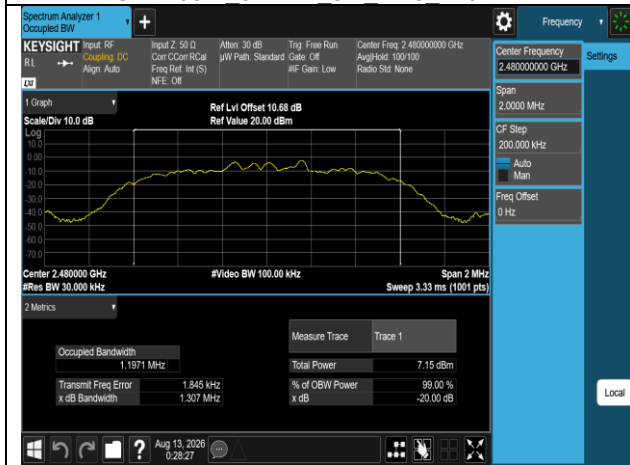
OBW 99% 4DQPSK 2M DH5 2480MHz



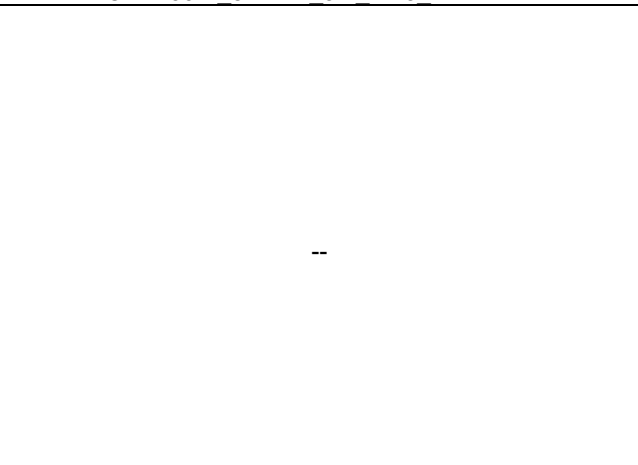
OBW 99% 8DPSK 3M DH5 2402MHz



OBW 99% 8DPSK 3M DH5 2441MHz



OBW 99% 8DPSK 3M DH5 2480MHz



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(a)(1),

Peak output power :

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Limit	☒ Antenna not exceed 6 dBi : 21dBm ☐ Antenna with DG greater than 6 dBi : 21dBm [Limit = 30 – (DG – 6)]
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Average output power : For reporting purposes only.

4.3.2 Test Procedure

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

4.3.3 Test Setup

Refer to section 1.9.

4.3.4 Test Result

Temperature: 23.3 ~ 23.6°C

Humidity: 59 ~ 61% RH

Test date: August 12 ~ 13, 2026

Tested by: Marco Chan

Peak & Average output power :

1M BR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x0	0.91	1.233	1000
39	2441	0x0	1.31	1.352	1000
78	2480	0x0	1.37	1.371	1000

1M BR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x0	0.63	1.155	1000
39	2441	0x0	1.08	1.281	1000
78	2480	0x0	1.13	1.296	1000

2M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x0	1.12	1.294	125
39	2441	0x0	1.04	1.271	125
78	2480	0x0	0.70	1.175	125

2M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x0	-1.58	0.696	125
39	2441	0x0	-1.65	0.685	125
78	2480	0x0	-1.98	0.634	125

3M EDR mode (Peak):

CH	Freq. (MHz)	Power Setting	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x0	1.31	1.352	125
39	2441	0x0	1.27	1.340	125
78	2480	0x0	0.98	1.253	125

3M EDR mode (Average):

CH	Freq. (MHz)	Power Setting	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	0x0	-1.56	0.699	125
39	2441	0x0	-1.62	0.689	125
78	2480	0x0	-1.94	0.640	125

*Note: Avg. output power has been calculated with duty factor.

4.4 FREQUENCY SEPARATION

4.4.1 Test Limit

According to §15.247(a)(1),

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Limit	> two-thirds of the 20 dB bandwidth
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4.4.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set the spectrum analyzer as RBW = 300kHz, VBW = 910kHz, Sweep = auto.
Max hold, mark 3 peaks of hopping channel and record the 3 peaks frequency.

4.4.3 Test Setup

Refer to section 1.9.

4.4.4 Test Result

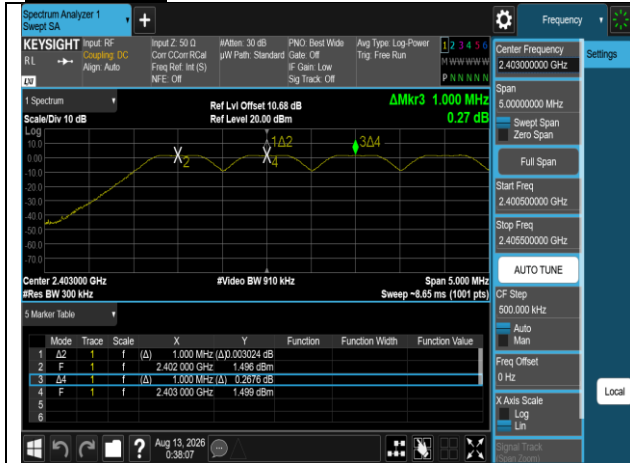
Temperature: 23.3 ~ 23.6°C Test date: August 12 ~ 13, 2026
Humidity: 59 ~ 61% RH Tested by: Marco Chan

Test mode: GFSK_BDR-1Mbps mode / 2402-2480 MHz				
Channel	Frequency (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)	Result
Low	2402	1.000	0.58	PASS
Mid	2441	1.000	0.59	PASS
High	2480	1.000	0.58	PASS

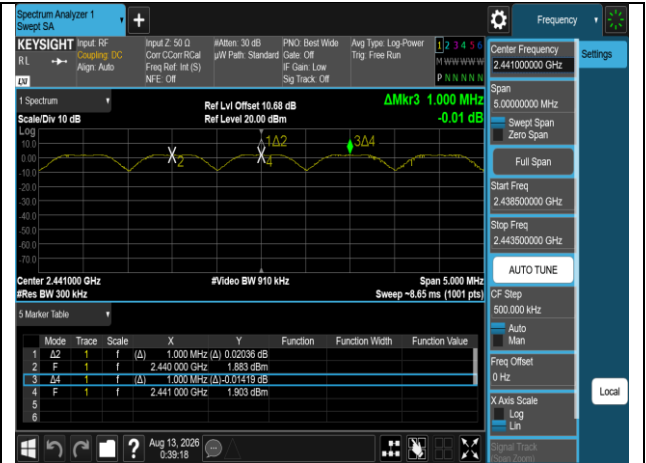
Test mode: $\pi/4$ -DQPSK_2Mbps mode / 2402-2480 MHz				
Channel	Frequency (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)	Result
Low	2402	1.000	0.90	PASS
Mid	2441	1.000	0.90	PASS
High	2480	1.000	0.90	PASS

Test mode: 8DPSK_EDR-3Mbps mode / 2402-2480 MHz				
Channel	Frequency (MHz)	Channel Separation (MHz)	Channel Separation Limits (MHz)	Result
Low	2402	1.000	0.87	PASS
Mid	2441	1.000	0.87	PASS
High	2480	1.000	0.87	PASS

Test Data



GFSK 1M DH5 CH0CH1CH2



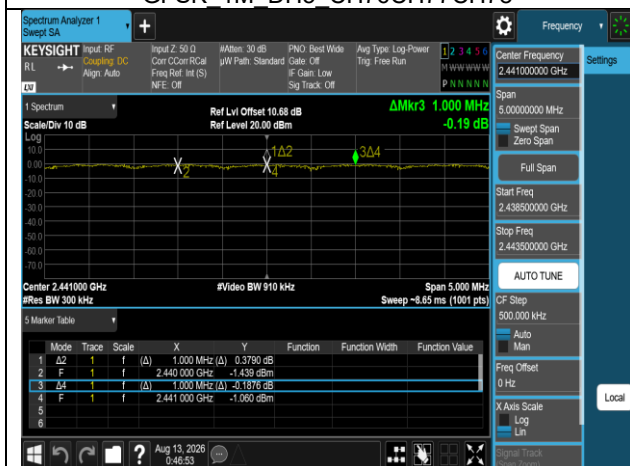
GFSK 1M DH5 CH38CH39CH40



GFSK 1M DH5 CH76CH77CH78



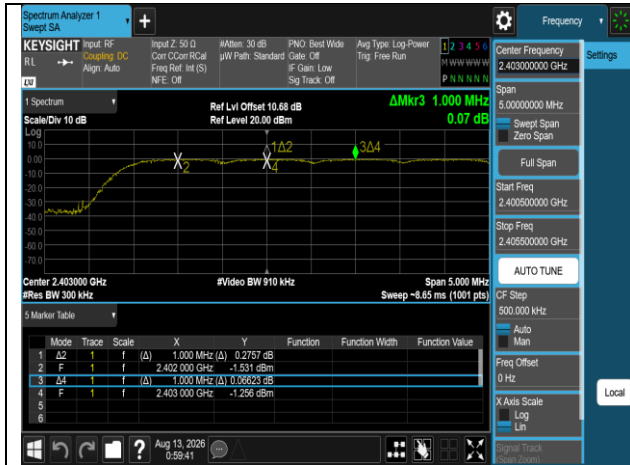
$\pi/4$ DQPSK 2M DH5 CH0CH1CH2



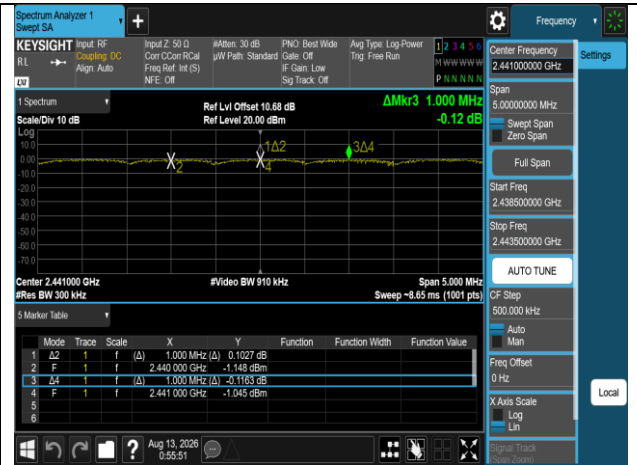
$\pi/4$ DQPSK 2M DH5 CH38CH39CH40



$\pi/4$ DQPSK 2M DH5 CH76CH77CH78



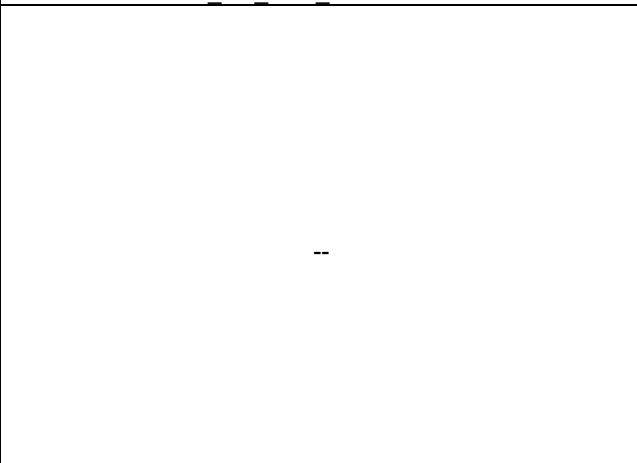
8DPSK 3M DH5 CH0CH1CH2



8DPSK 3M DH5 CH38CH39CH40



8DPSK 3M DH5 CH76CH77CH78



4.5 NUMBER OF HOPPING

4.5.1 Test Limit

According to §15.247(a)(1)(iii),
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

4.5.2 Test Procedure

Test method Refer as ANSI C63.10-2020,
1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set spectrum analyzer Start Freq. = 2400 MHz, Stop Freq. = 2441 MHz, RBW=100KHz, VBW =100kHz for left half.
4. Set spectrum analyzer Start Freq. = 2441 MHz, Stop Freq. = 2483.5 MHz, RBW=100KHz, VBW =100kHz for right half.
5. Max hold, view and count how many channel in the band.

4.5.3 Test Setup

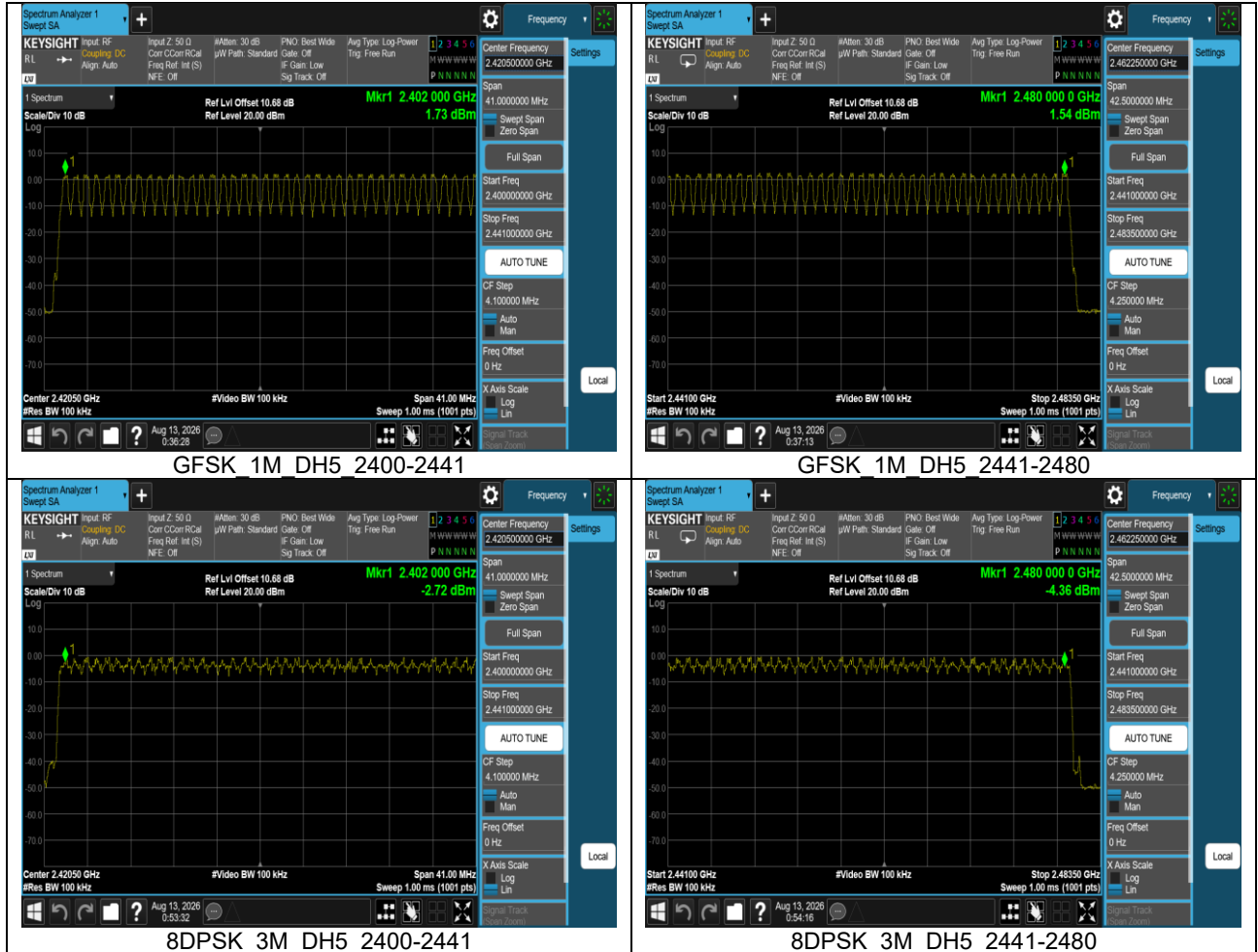
Refer to section 1.9.

4.5.4 Test Result

Temperature:	23.3 ~ 23.6°C	Test date:	August 12 ~ 13, 2026
Humidity:	59 ~ 61% RH	Tested by:	Marco Chan

Number of Hopping				
Mode	Frequency (MHz)	Hopping Channel Number	Hopping Channel Number Limits	Result
BDR-1Mbps	2402-2480	79	15	Pass
EDR-3Mbps	2402-2480	79	15	

Test Data



4.6 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

According to §15.247(d),

Limit	-20 dBc
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4.6.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. The Band Edge at 2.4GHz and 2.4835GHz are investigated with both hopping "ON" and "OFF" modes ".

4.6.3 Test Setup

Refer to section 1.9.

4.6.4 Test Result

Temperature: 23.3 ~ 23.6°C

Humidity: 59 ~ 61% RH

Test date: August 12 ~ 13, 2026

Tested by: Marco Chan

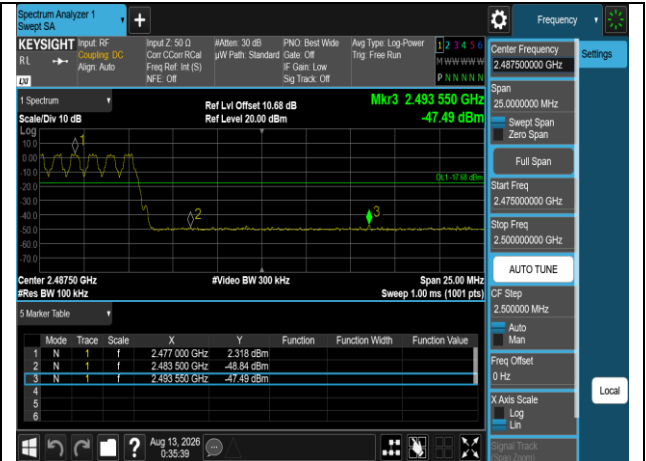
Test Data Band Edge



Hopping Band Edge



Hopping Band Edge GFSK 1M DH5 2402MHz



Hopping Band Edge GFSK 1M DH5 2480MHz

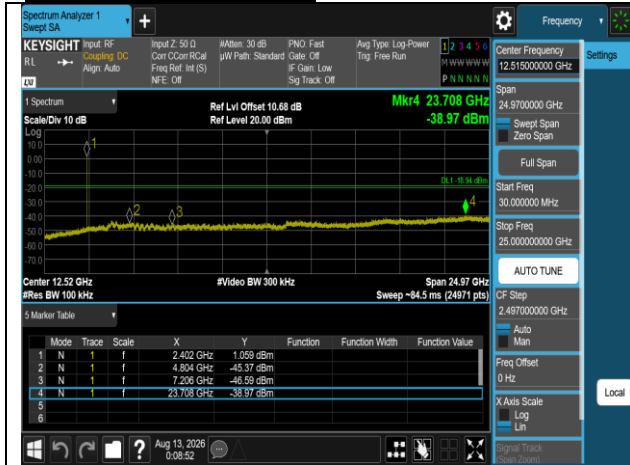


Hopping Band Edge 8DPSK 3M DH5 2402MHz



Hopping Band Edge 8DPSK 3M DH5 2480MHz

Spurious Emission



Spurious Emission GFSK 1M DH5 2402MHz



Spurious Emission GFSK 1M DH5 2441MHz



Spurious Emission GFSK 1M DH5 2480MHz



Spurious Emission 4DQPSK 2M DH5 2402MHz



Spurious Emission 4DQPSK 2M DH5 2441MHz



Spurious Emission 4DQPSK 2M DH5 2480MHz