FCC PART 15.247
TEST REPORT

For

Hangzhou Chipjet Technology Co., Ltd.

4th Floor, Building No.1, No.1180, Bin'an Road, Binjiang District, Hangzhou, Zhejiang, China

FCC ID: 2BE5OLASER-SERIE

Report Type:	**Product Name:**
Original Report	Smart Update Device

Report Number:	RQDA240722001-00B
Report Date:	2024-09-06
Reviewed By:	Bard Liu
Approved By:	Oscar Ye
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu Province, China Tel: +86-512-86175000 Fax: +86-512-88934268 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RQDA240722001-00B	R1V1	2024-09-06	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Hangzhou Chipjet Technology Co., Ltd.
Product Name:	Smart Update Device
Tested Model	ChipStation Home
Series Model:	ChipStation Home Plus
Model Difference:	APP software, see the declaration letter for details
Power Supply:	DC 5V
RF Function:	Classic BT
Operating Band/Frequency:	2402-2480 MHz
Maximum Output Power:	GFSK: -6.20 dBm π/4-DQPSK: -5.48 dBm 8DPSK: -4.79 dBm
Channel Number:	79
Channel Separation:	1 MHz
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Antenna Type:	PCB Antenna
★Maximum Antenna Gain:	2 dBi

Note: The maximum antenna gain was declared by the manufacturer.

All measurement and test data in this report was gathered from production sample serial number: RQDA240722001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-07-22.)

Objective

This test report is prepared for *Hangzhou Chipjet Technology Co., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine Compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and 558074 D01 15.247 Meas Guidance v05r02.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	9 kHz~150 kHz	3.8dB
	150 kHz~30 MHz	3.4dB
	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu Province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) is accredited in accordance with ISO/IEC 17025:2017 by NVLAP (Lab code: 600338-0), and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN5055.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

Channel list:

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

EUT was tested with Channel 0, 39 and 78.

EUT Exercise Software

RF Test Tool: FCC_assist1.0.4

★Power level: 10

Note: The power level was declared by the applicant.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

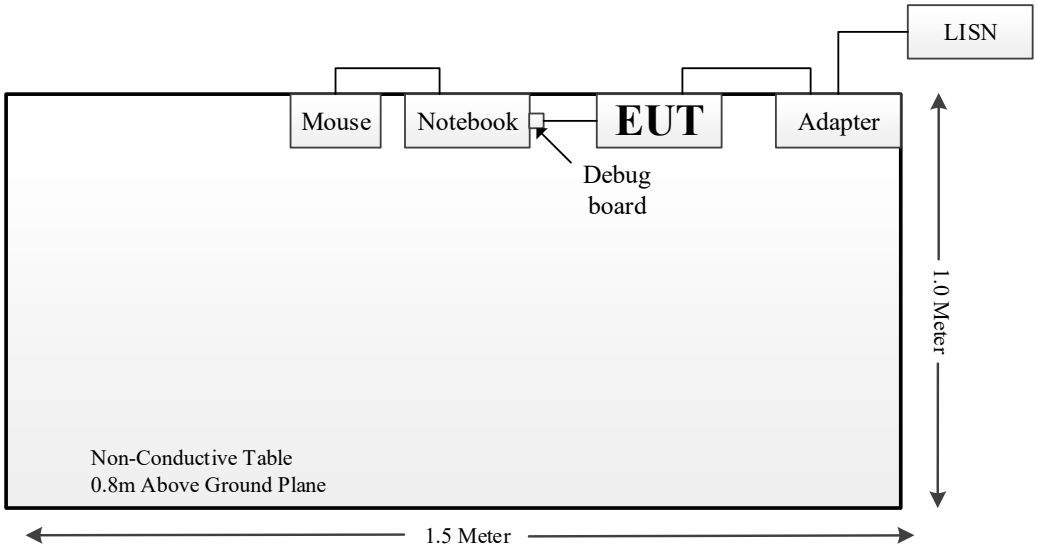
Manufacturer	Description	Model	Serial Number
Power on Tools Co., Ltd.	Adapter 5V 1A	DA-00051000UL001	Unknown
Lenovo	Notebook	Unknown	Unknown
Lenovo	Mouse	Unknown	Unknown

External I/O Cable

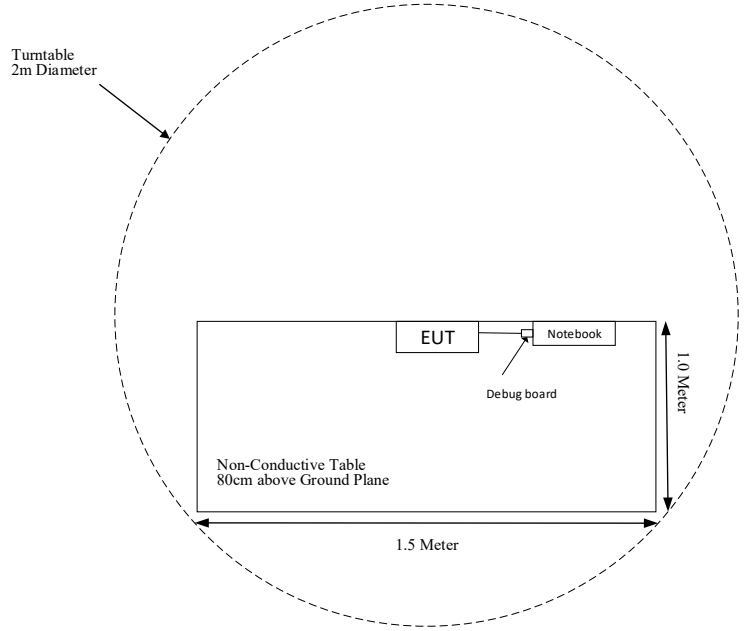
Cable Description	Length (m)	From Port	To Port
Power Cable 1	1.0	AC Source	Adapter
Power Cable 2	0.8	Adapter	EUT
USB Cable 1	0.2	EUT	Debug board
USB Cable 2	1.0	Notebook	Mouse

Block Diagram of Test Setup

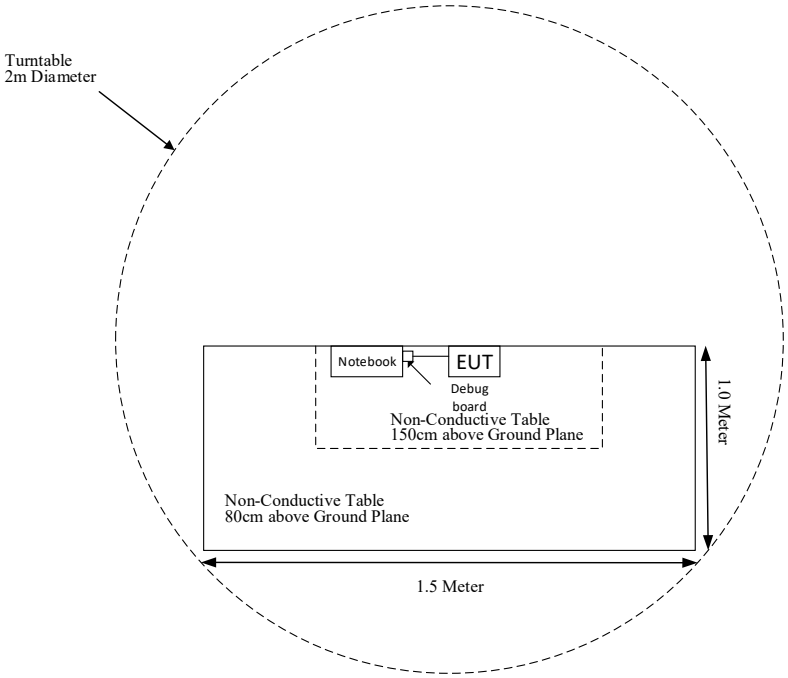
For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber #1)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2024-04-23	2025-04-22
Sunol Sciences	Hybrid Antenna	JB3	A090314-1	2023-11-11	2024-11-10
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Narda	6dB Attenuator	773-6	10690812-2-1	2024-01-12	2025-01-11
Sonoma Instrument	Amplifier	310N	171205	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-8	008	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2024-04-23	2025-04-22
Radiated Emission Test (Chamber #2)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2024-04-25	2025-04-24
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2024-06-27	2025-06-26
ETS-LINDGREN	Horn Antenna	3116	2516	2023-12-08	2024-12-07
A.H.Systems, inc	Amplifier	PAM-0118P（2641-1）	512	2024-04-25	2025-04-24
EM Electronics Corporation	Amplifier	EM18G40G	060726	2024-04-25	2025-04-24
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2024-04-25	2025-04-24
Narda	Attenuator	20dB	020	2024-04-25	2025-04-24
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-11	011	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-12	012	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-13	013	2024-04-23	2025-04-22
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200103	2024-04-24	2025-04-23
Narda	Attenuator	10dB	N/A	2024-04-23	2025-04-22
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	101746	2024-04-23	2025-04-22
Rohde & Schwarz	LISN	ENV216	101115	2024-04-23	2025-04-22
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	0357.8810.54	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-15	015	2024-04-23	2025-04-22

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b)(1)& §2.1093	RF EXPOSURE	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209 & §15.247(d)	Radiated Emissions & Restricted Bands Emission	Compliant
§15.247(a)(1)	20 dB Emission Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges	Compliant

FCC §1.1307(b) & §2.1093 - RF EXPOSURE

Applicable Standard

According to§15.247(i) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v06:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
• f(GHz) is the RF channel transmit frequency in GHz
• Power and distance are rounded to the nearest mW and mm before calculation
• The result is rounded to one decimal place for comparison
• 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

Mode	Frequency Range (MHz)	Max Tune-up Conducted Power		Calculated Distance (mm)	Calculated Value	Threshold (1-g SAR)	SAR Test Exclusion
		(dBm)	(mW)				
Classic BT	2402-2480	-4.5	0.35	5.0	0.11	3.0	Yes

Result: So the standalone SAR evaluation is not necessary.

FCC §15.203 – ANTENNA REQUIREMENT

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. 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.

Antenna Connector Construction

The EUT has a PCB antenna for Bluetooth, and the antenna gain is 2 dBi, which is permanently attached to the unit, fulfill the requirement of this section. Please refer to the EUT photos.

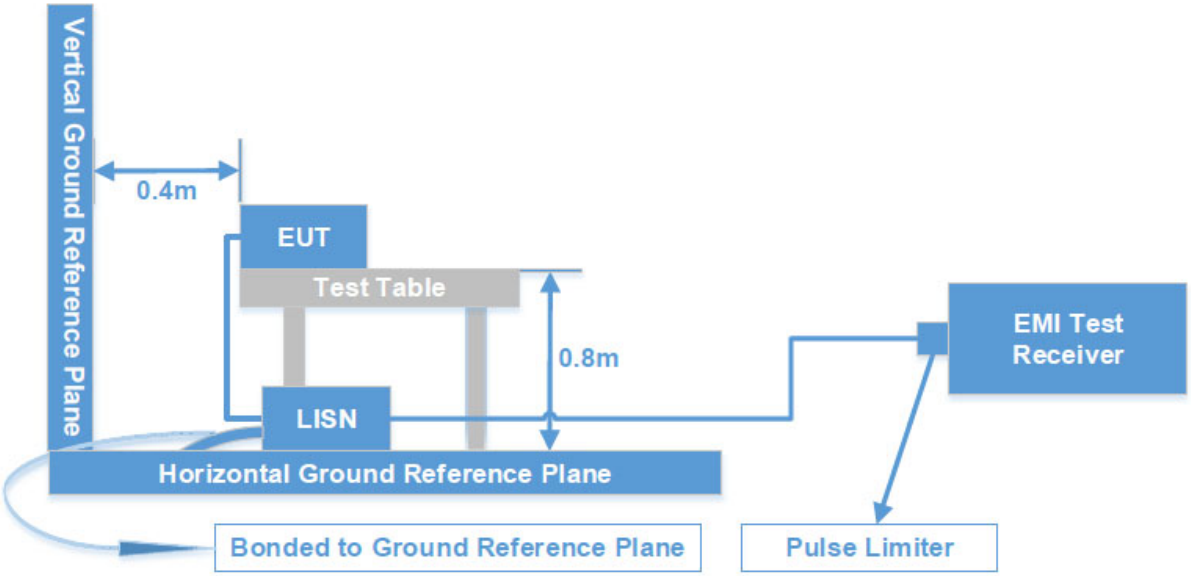
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

Test System Setup



The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW
150 kHz - 30 MHz	9 kHz	30 kHz

Test Procedure

ANSI C63.10-2013 clause 6.2

During the conducted emission test, the EUT or adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Level & Over Limit Calculation

The Level is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
Level (dBμV) = Read level (dBμV) + Factor (dB)

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

Over Limit (dB) = Level (dBμV) - Limit (dBμV)

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data: See Appendix

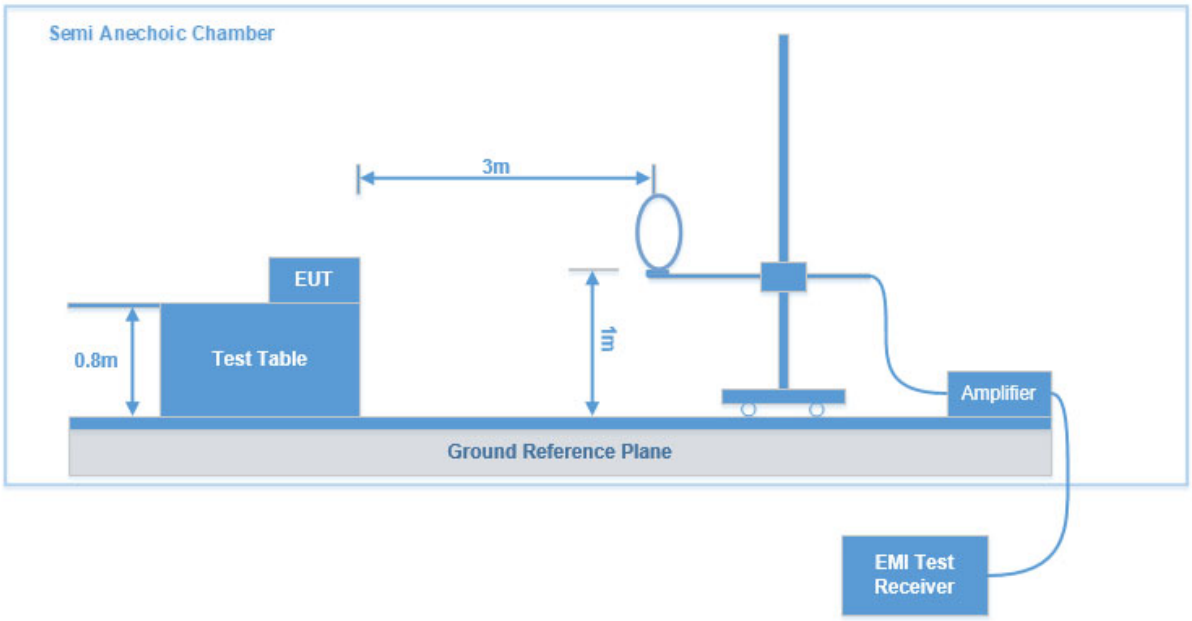
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

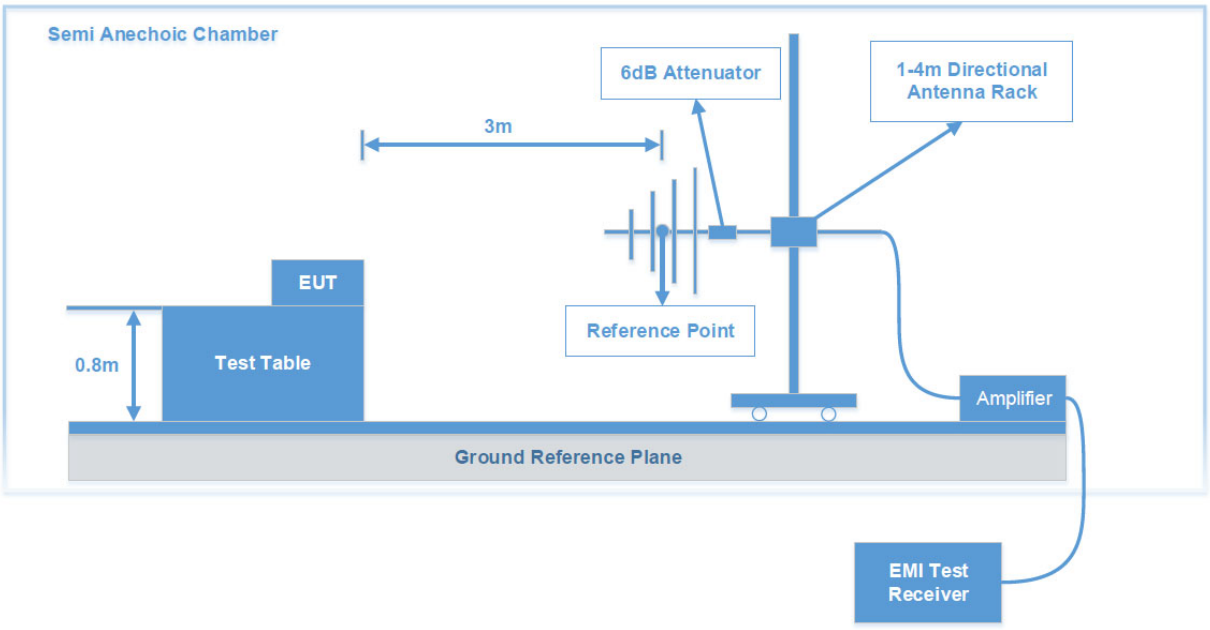
FCC §15.205; §15.209; §15.247(d)

Test System Setup

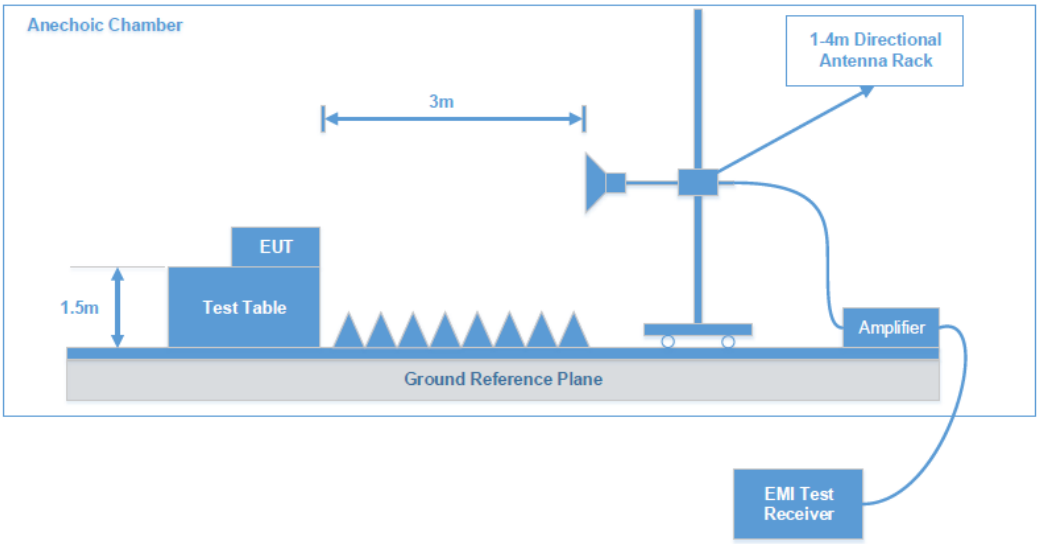
9 kHz - 30 MHz:



30 MHz - 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	VBW	IF B/W	Detector
9 kHz – 150 kHz	200 Hz	1 kHz	200 Hz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	9 kHz	QP/ Average
30 MHz – 1000 MHz	100 kHz	300 kHz	/	Peak
	/	/	120 kHz	QP
Above 1GHz	1MHz	3 MHz	/	Peak
	1MHz	3 MHz	/	Average

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

For 9 kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude (dBμV/m) = Meter Reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

Note: The QuasiPeak (dBμV/m), MaxPeak (dBμV/m), Average (dBμV/m) which shown in the data table are all Corrected Amplitude.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

Test Data: See Appendix

FCC §15.247(a) (1)-CHANNEL SEPARATION TEST

Applicable Standard

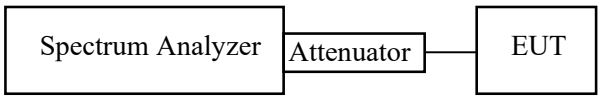
Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that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

Test Procedure
According to ANSI C63.10-2013 Section 7.8.2

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

a. Span: Wide enough to capture the peaks of two adjacent channels.
b. 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.
c. Video (or average) bandwidth (VBW) ≥ RBW.
d. Sweep: Auto.
e. Detector function: Peak.
f. Trace: Max hold.
g. Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.



Test Data: See Appendix

FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH

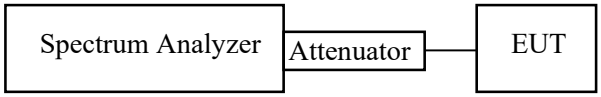
Applicable Standard

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.

Test Procedure

According to ANSI C63.10-2013 Section 6.9.2

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Data: See Appendix

FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

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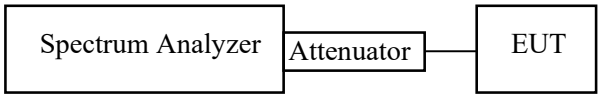
According to ANSI C63.10-2013 Section 7.8.3

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

a. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
b. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
c. VBW ≥ RBW.
d. Sweep: Auto.
e. Detector function: Peak.
f. Trace: Max hold.
g. Allow the trace to stabilize.

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies.



Test Data: See Appendix

FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

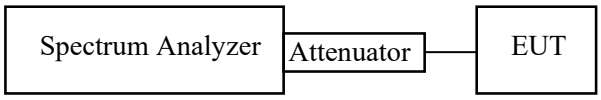
Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

According to ANSI C63.10-2013 Section 7.8.4

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

a. Span: Zero span, centered on a hopping channel.
b. RBW shall be ≤ channel spacing and where possible RBW should be set ≥ 1 / T, where T is the expected dwell time per channel.
c. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
d. Detector function: Peak.
e. Trace: Max hold.



Test Data: See Appendix

FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

Test Procedure

According to ANSI C63.10-2013 Section 7.8.5

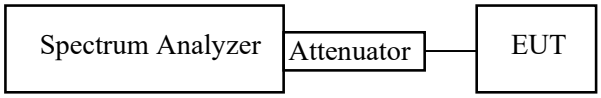
a. Use the following spectrum analyzer settings:
   1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
   2) RBW > 20 dB bandwidth of the emission being measured.
   3) VBW ≥ RBW.
   4) Sweep: Auto.
   5) Detector function: Peak.
   6) Trace: Max hold.

b. Allow trace to stabilize.

c. Use the marker-to-peak function to set the marker to the peak of the emission.

d. The indicated level is the peak output power, after any corrections for external attenuators and cables.

e. A plot of the test results and setup description shall be included in the test report.



Test Data: See Appendix

FCC §15.247(d) - BAND EDGES TESTING

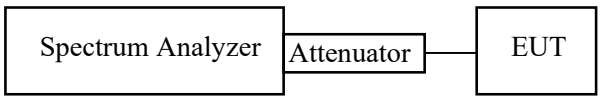
Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 or a radiated measurement, provided the transmitter demonstrates Compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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)).

Test Procedure

According to ANSI C63.10-2013 Section 7.8.6

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Data: See Appendix

EUT PHOTOGRAPHS

Please refer to the attachment EXHIBIT A - EUT EXTERNAL PHOTOGRAPHS and EXHIBIT B - EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment EXHIBIT C - TEST SETUP PHOTOGRAPHS.

APPENDIX - TEST DATA

Environmental Conditions & Test Information

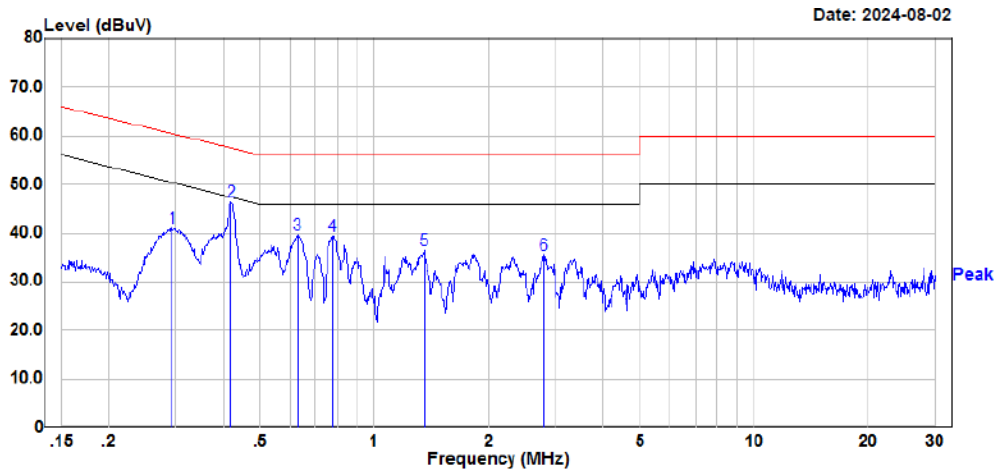
Test Item:	AC LINE CONDUCTED EMISSIONS	RADIATED EMISSIONS			CHANNEL SEPARATION TEST
		9kHz - 1GHz	1 GHz - 18 GHz	18 GHz - 25 GHz	
Test Date:	2024-08-02	2024-07-31	2024-08-02	2024-08-12	2024-07-27
Temperature:	27.7 ℃	24.8 ℃	25.1 ℃	25.3 ℃	24.5 ℃
Relative Humidity:	45 %	51 %	55 %	58 %	51 %
ATM Pressure:	100.6 kPa	100.6 kPa	100.3 kPa	100.4 kPa	100.4 kPa
Test Result:	Pass	Pass	Pass	Pass	Pass
Test Engineer:	Leah Li	Grace Luo	Hugh Wu& Klein Zhu	Hugh Wu	Neil Zhou

Test Item:	20 DB BANDWIDTH TEST	Quantity Of Hopping Channel Test	Time Of Occupancy (Dwell Time)	PEAK OUTPUT POWER MEASUREMENT	BAND EDGES TESTING
Test Date:	2024-07-27	2024-07-27	2024-07-27	2024-07-27	2024-07-27
Temperature:	24.5 ℃	24.5 ℃	24.5 ℃	24.5 ℃	24.5 ℃
Relative Humidity:	51 %	51 %	51 %	51 %	51 %
ATM Pressure:	100.4 kPa	100.4 kPa	100.4 kPa	100.4 kPa	100.4 kPa
Test Result:	Pass	Pass	Pass	Pass	Pass
Test Engineer:	Neil Zhou	Neil Zhou	Neil Zhou	Neil Zhou	Neil Zhou

AC LINE CONDUCTED EMISSIONS

EUT operation mode: Transmitting in 8DPSK Mode high channel (maximum output power mode)

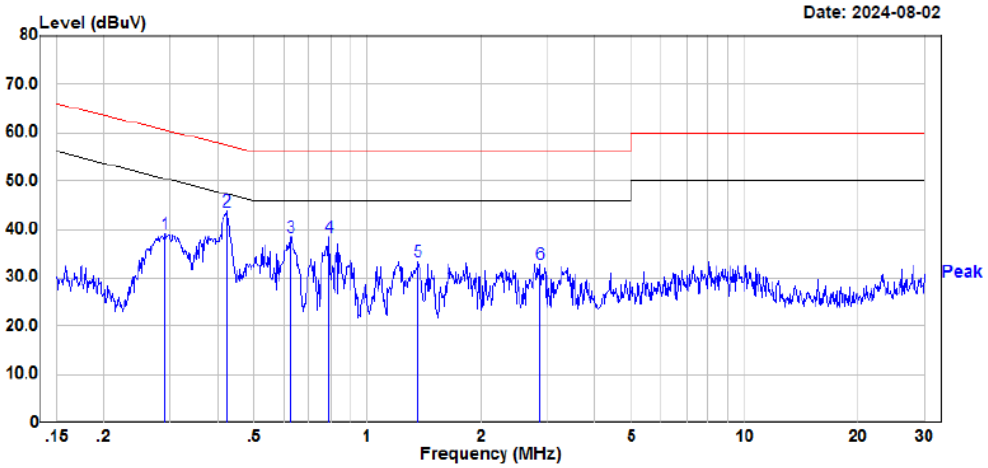
AC 120V/60 Hz, Line




```
Site                : CE
Condition           : limit\FCC Part 15.207
                    : DET:Peak
Project No.         : RQDA240722001
Model               : ChipStation Home
Phase               : L
Voltage             : 120V/60Hz
Mode                : BT
Test Equipment      : ENV216,ESR
Temperature         : 27.7℃
Humidity            : 45%
Atmospheric pressure: 100.6kPa
Test Engineer       : Leah Li
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.294	20.90	20.16	41.06	60.41	-19.35	Peak
2	0.419	26.27	20.21	46.48	57.47	-10.99	Peak
3	0.627	19.47	20.09	39.56	56.00	-16.44	Peak
4	0.777	19.38	19.97	39.35	56.00	-16.65	Peak
5	1.351	16.56	19.90	36.46	56.00	-19.54	Peak
6	2.797	15.37	20.22	35.59	56.00	-20.41	Peak

AC 120V/60 Hz, Neutral




```
Site                : CE
Condition           : limit\FCC Part 15.207
                    : DET:Peak
Project No.         : RQDA240722001
Model               : ChipStation Home
Phase               : N
Voltage             : 120V/60Hz
Mode                : BT
Test Equipment      : ENV216,ESR
Temperature         : 27.7℃
Humidity            : 45%
Atmospheric pressure: 100.6kPa
Test Engineer       : Leah Li
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.290	19.04	20.16	39.20	60.54	-21.34	Peak
2	0.423	23.63	20.21	43.84	57.39	-13.55	Peak
3	0.624	18.42	20.08	38.50	56.00	-17.50	Peak
4	0.789	18.39	19.95	38.34	56.00	-17.66	Peak
5	1.358	13.50	19.91	33.41	56.00	-22.59	Peak
6	2.868	12.77	20.22	32.99	56.00	-23.01	Peak

RADIATED EMISSIONS & RESTRICTED BANDS EMISSIONS

EUT operation mode: Transmitting

After pre-scan in the X, Y and Z axes of orientation, the worst case X axes is below:

9 kHz-30 MHz: *(Transmitting maximum output power 8 DPSK mode and high channel)*

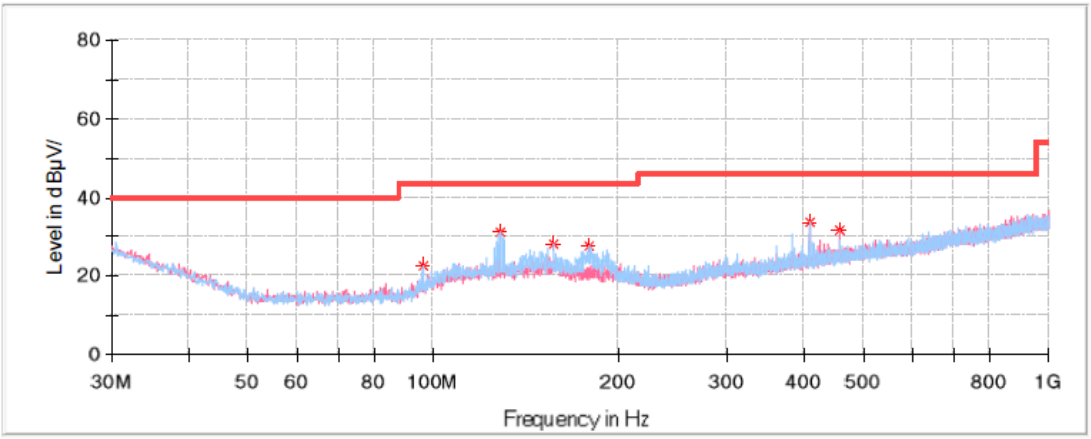
The amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

30 MHz - 1 GHz (Transmitting in maximum output power 8DPSK mode):

Low Channel: 2402 MHz

Common Information

Project No:	RQDA240722001
Test Mode:	Transmitting in BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Grace Luo
Test Date:	2024/7/31



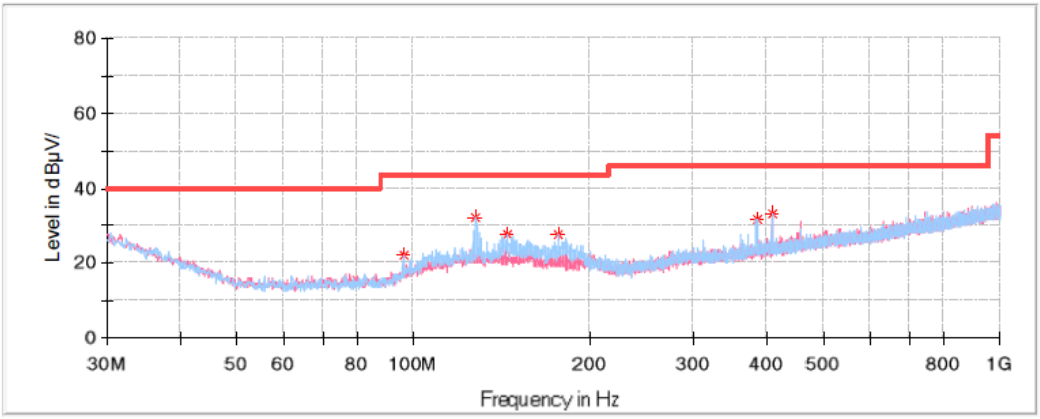
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
95.960000	22.88	43.50	20.62	H	-15.5
128.576250	31.27	43.50	12.23	H	-11.1
156.827500	28.32	43.50	15.18	H	-12.0
179.258750	27.45	43.50	16.05	H	-13.0
407.936250	33.80	46.00	12.20	H	-7.8
455.951250	31.92	46.00	14.08	V	-6.5

Middle Channel: 2441 MHz

Common Information

Project No:	RQDA240722001
Test Mode:	Transmitting in BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Grace Luo
Test Date:	2024/7/31



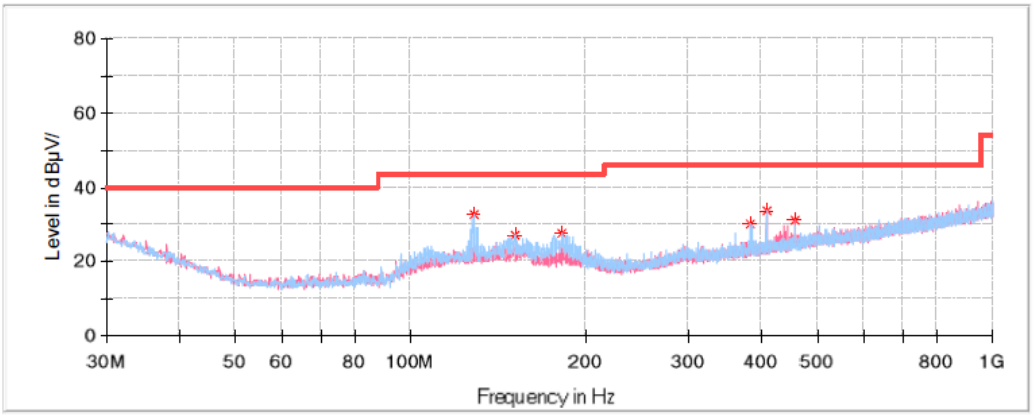
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
95.960000	22.31	43.50	21.19	H	-15.5
127.970000	32.40	43.50	11.10	H	-11.1
144.702500	27.89	43.50	15.61	H	-11.6
176.106250	27.43	43.50	16.07	H	-12.8
384.656250	31.50	46.00	14.50	H	-8.4
407.936250	33.39	46.00	12.61	H	-7.8

High Channel:2480 MHz

Common Information

Project No:	RQDA240722001
Test Mode:	Transmitting in BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Grace Luo
Test Date:	2024/7/31



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
128.576250	32.74	43.50	10.76	H	-11.1
150.643750	27.22	43.50	16.28	H	-11.8
181.683750	27.57	43.50	15.93	H	-12.9
382.716250	30.24	46.00	15.76	H	-8.4
408.057500	33.83	46.00	12.17	H	-7.8
455.951250	31.44	46.00	14.56	V	-6.5

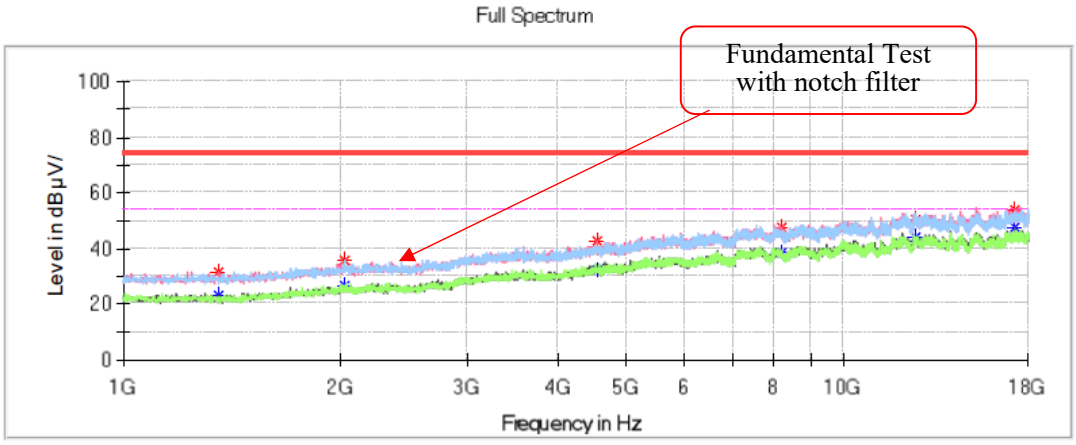
1 GHz - 18 GHz:

GFSK:

Low Channel: 2402 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in GFSK mode low channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



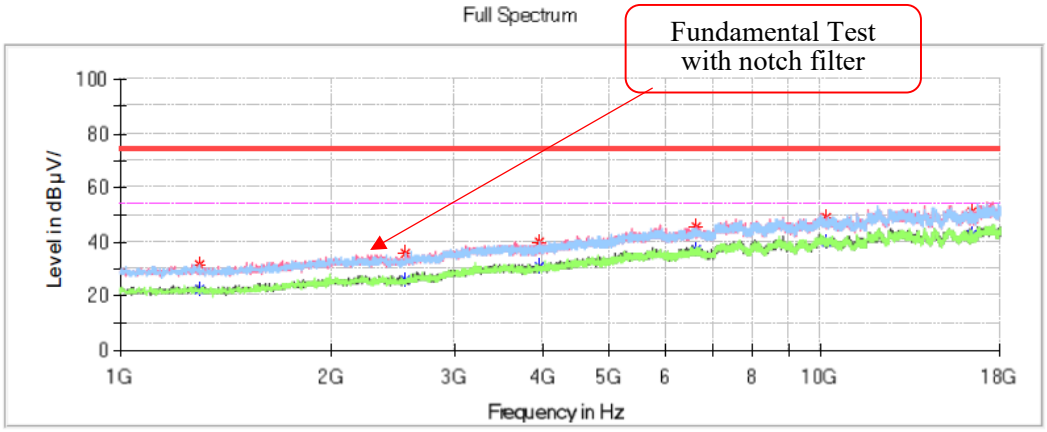
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1358.700000	---	22.89	54.00	31.11	V	-14.9
1358.700000	31.80	---	74.00	42.20	V	-14.9
2026.800000	---	26.90	54.00	27.10	H	-11.7
2026.800000	35.67	---	74.00	38.33	H	-11.7
4530.900000	---	32.27	54.00	21.73	V	-4.1
4530.900000	42.34	---	74.00	31.66	V	-4.1
8172.300000	---	38.59	54.00	15.41	V	4.4
8172.300000	47.77	---	74.00	26.23	V	4.4
12534.500000	50.31	---	74.00	23.69	V	9.7
12534.500000	---	43.82	54.00	10.18	V	9.7
17216.300000	53.55	---	74.00	20.45	V	12.0
17216.300000	---	47.61	54.00	6.39	V	12.0

Middle Channel: 2441 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in GFSK mode middle channel
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Engineer:	Hugh Wu



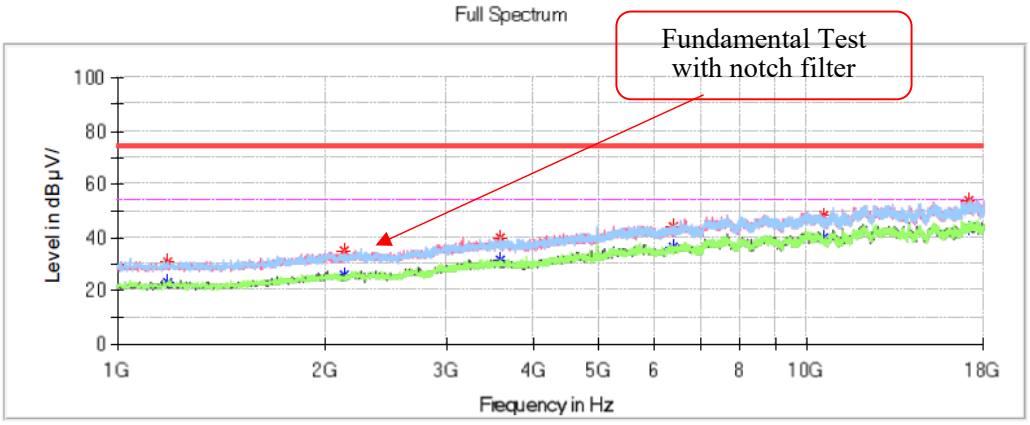
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1294.100000	---	22.37	54.00	31.63	H	-15.0
1294.100000	31.40	---	74.00	42.60	H	-15.0
2552.100000	---	25.94	54.00	28.06	H	-10.0
2552.100000	35.37	---	74.00	38.63	H	-10.0
3964.800000	---	30.97	54.00	23.03	H	-5.9
3964.800000	39.91	---	74.00	34.09	H	-5.9
6637.200000	---	37.18	54.00	16.82	V	1.1
6637.200000	45.29	---	74.00	28.71	V	1.1
10191.900000	---	39.76	54.00	14.24	V	7.1
10191.900000	49.26	---	74.00	24.74	V	7.1
16393.500000	---	42.89	54.00	11.11	V	10.5
16393.500000	50.73	---	74.00	23.27	V	10.5

High Channel: 2480 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in GFSK mode high channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1181.900000	---	22.89	54.00	31.11	H	-15.2
1181.900000	30.46	---	74.00	43.54	H	-15.2
2125.400000	---	26.10	54.00	27.90	V	-11.3
2125.400000	35.23	---	74.00	38.77	V	-11.3
3578.900000	---	31.18	54.00	22.82	H	-6.3
3578.900000	39.86	---	74.00	34.14	H	-6.3
6378.800000	---	36.14	54.00	17.86	V	0.4
6378.800000	44.22	---	74.00	29.78	V	0.4
10528.500000	---	40.09	54.00	13.91	V	7.1
10528.500000	48.51	---	74.00	25.49	V	7.1
17167.000000	---	43.69	54.00	10.31	V	12.0
17167.000000	53.74	---	74.00	20.26	V	12.0

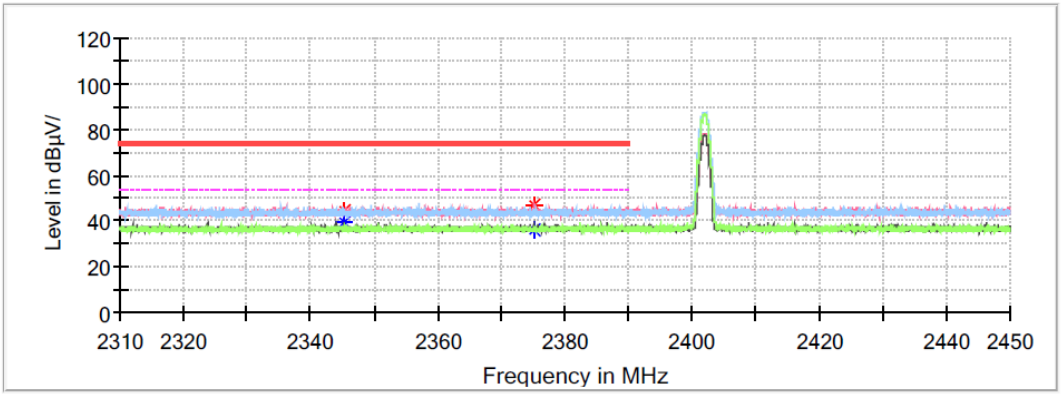
Restricted Bands Emission:

Left Side

Common Information

Project No.:	RQDA240722001
Test Mode:	BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Klein Zhu

Full Spectrum



Critical_Freqs

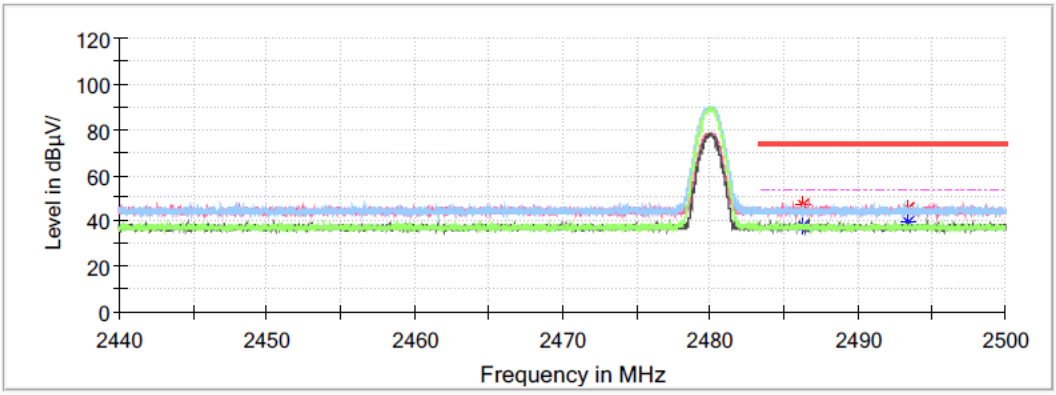
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2345.238000	44.12	---	74.00	29.88	V	-0.7
2345.238000	---	39.80	54.00	14.20	V	-0.7
2375.310000	46.59	---	74.00	27.41	H	-0.6
2375.310000	---	36.50	54.00	17.50	H	-0.6

Right Side

Common Information

Project No.:	RQDA240722001
Test Mode:	BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Klein Zhu

Full Spectrum



Critical_Freqs

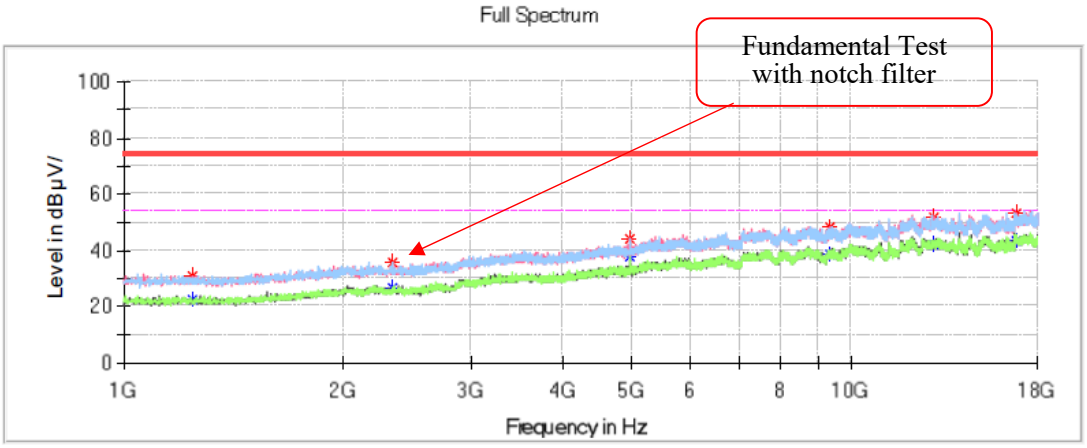
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2486.296000	47.21	---	74.00	26.79	H	-0.2
2486.296000	---	37.40	54.00	16.60	H	-0.2
2493.430000	45.64	---	74.00	28.36	V	-0.2
2493.430000	---	39.43	54.00	14.57	V	-0.2

π/4-DQPSK:

Low Channel: 2402 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in π /4-DQPSK mode low channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



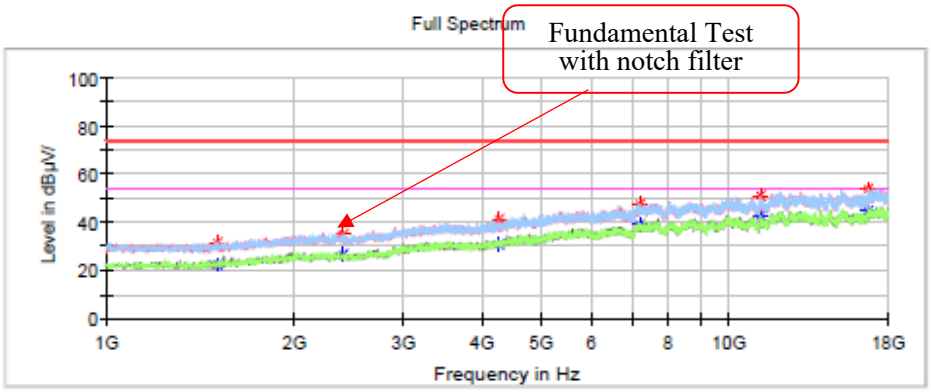
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1243.100000	---	22.66	54.00	31.34	V	-15.1
1243.100000	30.78	---	74.00	43.22	V	-15.1
2336.200000	---	26.27	54.00	27.73	H	-10.7
2336.200000	35.79	---	74.00	38.21	H	-10.7
4955.900000	---	37.51	54.00	16.49	V	-2.6
4955.900000	44.35	---	74.00	29.65	V	-2.6
9330.000000	---	38.49	54.00	15.51	V	5.4
9330.000000	48.04	---	74.00	25.96	V	5.4
12945.900000	---	42.08	54.00	11.92	V	9.7
12945.900000	51.90	---	74.00	22.10	V	9.7
16847.400000	---	43.38	54.00	10.62	V	11.8
16847.400000	53.09	---	74.00	20.91	V	11.8

Middle Channel: 2441 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in π/4-DQPSK mode middle channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



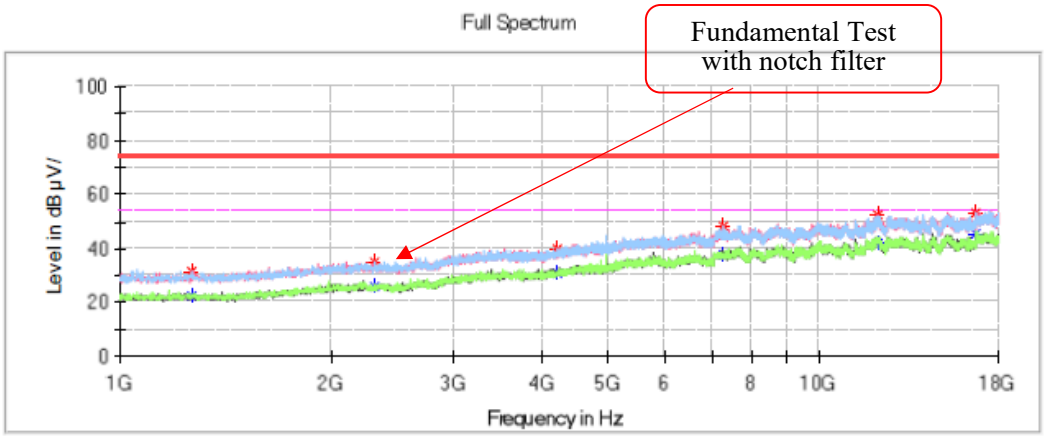
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1508.300000	---	22.48	54.00	31.52	V	-14.7
1508.300000	31.40	---	74.00	42.60	V	-14.7
4257.200000	---	31.06	54.00	22.94	V	-5.1
4257.200000	40.99	---	74.00	33.01	V	-5.1
7174.400000	---	39.00	54.00	15.00	H	3.1
7174.400000	47.24	---	74.00	26.76	H	3.1
11208.500000	---	42.87	54.00	11.13	V	8.0
11208.500000	50.76	---	74.00	23.24	V	8.0
16747.100000	---	44.80	54.00	9.20	V	11.5
16747.100000	53.74	---	74.00	20.26	V	11.5

High Channel: 2480 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in π /4-DQPSK mode high channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1265.200000	---	22.52	54.00	31.48	H	-15.1
1265.200000	31.39	---	74.00	42.61	H	-15.1
2307.300000	---	26.03	54.00	27.97	H	-10.8
2307.300000	35.18	---	74.00	38.82	H	-10.8
4207.900000	---	31.07	54.00	22.93	H	-5.2
4207.900000	39.82	---	74.00	34.18	H	-5.2
7281.500000	---	37.60	54.00	16.40	H	3.3
7281.500000	48.11	---	74.00	25.89	H	3.3
12126.500000	---	42.23	54.00	11.77	V	9.1
12126.500000	52.38	---	74.00	21.62	V	9.1
16748.800000	---	45.60	54.00	8.40	V	11.5
16748.800000	53.44	---	74.00	20.56	V	11.5

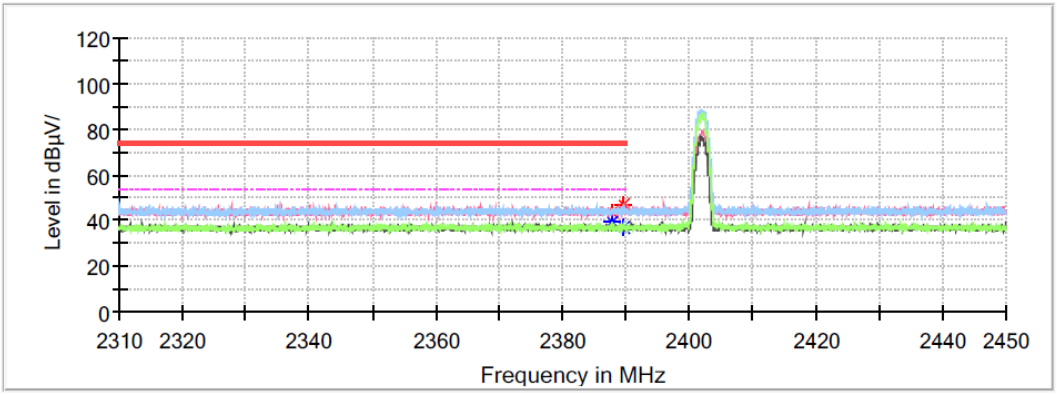
Restricted Bands Emission:

Left Side

Common Information

Project No.:	RQDA240722001
Test Mode:	BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Klein Zhu

Full Spectrum



Critical_Freqs

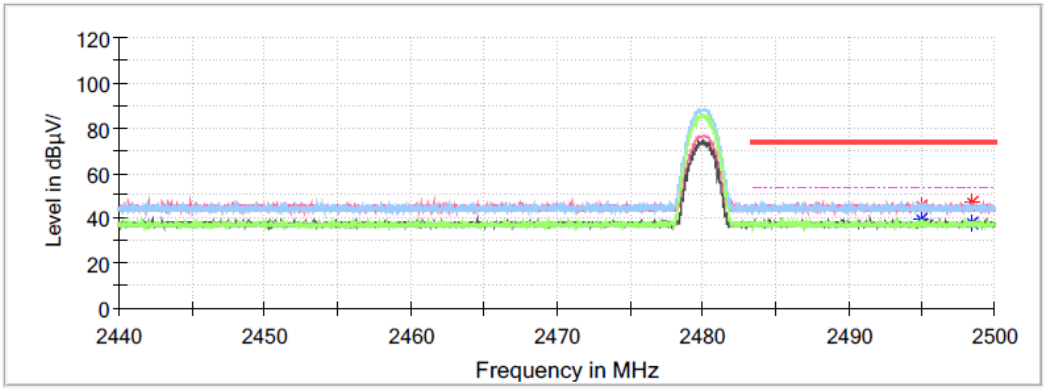
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2387.742000	43.50	---	74.00	30.50	H	-0.6
2387.742000	---	39.56	54.00	14.44	H	-0.6
2389.800000	47.11	---	74.00	26.89	V	-0.6
2389.800000	---	37.30	54.00	16.70	V	-0.6

Right Side

Common Information

Project No.:	RQDA240722001
Test Mode:	BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Klein Zhu

Full Spectrum



Critical_Freqs

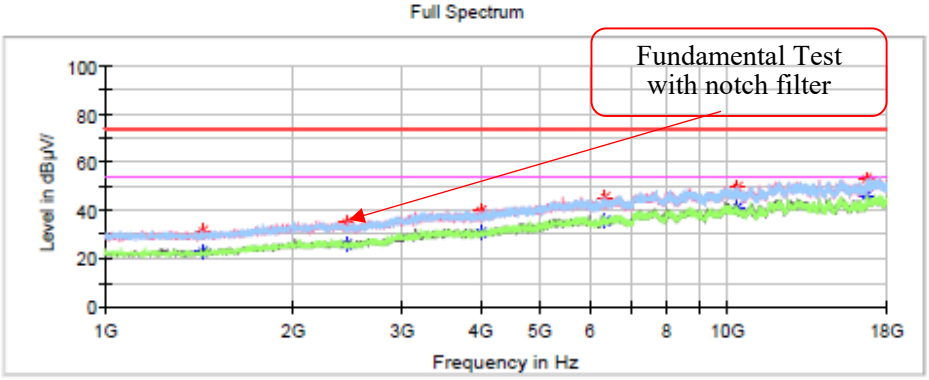
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2494.966000	---	39.71	54.00	14.29	H	-0.2
2494.966000	44.98	---	74.00	29.02	H	-0.2
2498.458000	---	37.52	54.00	16.48	V	-0.2
2498.458000	47.36	---	74.00	26.64	V	-0.2

8DPSK:

Low Channel: 2402 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in 8DPSK mode low channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



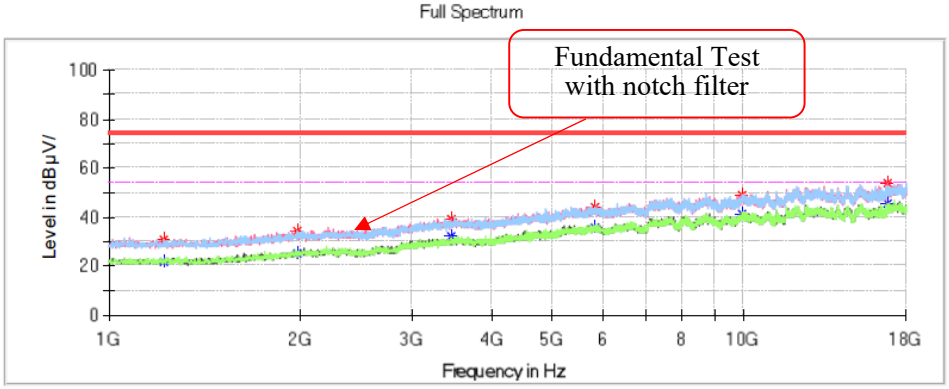
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µV/m)	Average (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Pol	Corr. (dB/m)
1436.900000	---	23.12	54.00	30.88	V	-14.8
1436.900000	31.53	---	74.00	42.47	V	-14.8
4000.500000	---	30.93	54.00	23.07	V	-5.9
4000.500000	39.78	---	74.00	34.22	V	-5.9
6365.200000	---	35.84	54.00	18.16	H	0.4
6365.200000	45.34	---	74.00	28.66	H	0.4
10360.200000	---	41.15	54.00	12.85	H	7.1
10360.200000	49.92	---	74.00	24.08	H	7.1
16759.000000	---	45.93	54.00	8.07	H	11.6
16759.000000	53.04	---	74.00	20.96	H	11.6

Middle Channel: 2441 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in 8DPSK mode middle channel
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Engineer:	Hugh Wu



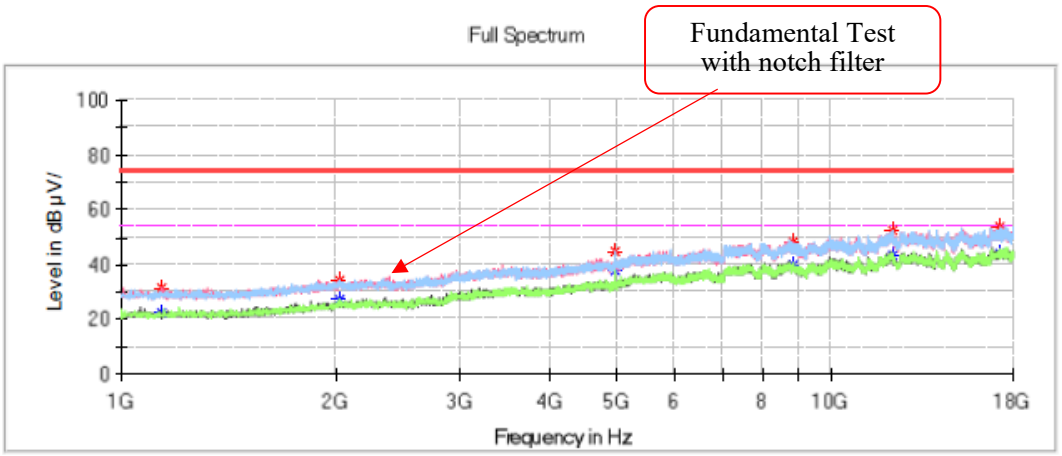
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1221.000000	---	21.42	54.00	32.58	H	-15.1
1221.000000	30.83	---	74.00	43.17	H	-15.1
1972.400000	---	25.12	54.00	28.88	H	-11.9
1972.400000	34.26	---	74.00	39.74	H	-11.9
3463.300000	---	32.28	54.00	21.72	V	-6.5
3463.300000	39.51	---	74.00	34.49	V	-6.5
5816.100000	---	35.45	54.00	18.55	H	-0.1
5816.100000	44.34	---	74.00	29.66	H	-0.1
9931.800000	---	40.96	54.00	13.04	V	6.9
9931.800000	49.24	---	74.00	24.76	V	6.9
16764.100000	---	45.11	54.00	8.89	V	11.6
16764.100000	53.82	---	74.00	20.18	V	11.6

High Channel: 2480 MHz

Common Information

Project No.:	RQDA240722001
Test Mode:	Transmitting in 8DPSK mod high channel
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Hugh Wu



Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1139.400000	---	22.04	54.00	31.96	V	-15.3
1139.400000	31.29	---	74.00	42.71	V	-15.3
2031.900000	---	27.22	54.00	26.78	V	-11.6
2031.900000	34.06	---	74.00	39.94	V	-11.6
4955.900000	44.59	---	74.00	29.41	H	-2.6
4955.900000	---	37.58	54.00	16.42	H	-2.6
8816.600000	---	39.66	54.00	14.34	H	5.4
8816.600000	48.35	---	74.00	25.65	H	5.4
12150.300000	---	43.43	54.00	10.57	H	9.2
12150.300000	52.66	---	74.00	21.34	H	9.2
17252.000000	---	44.40	54.00	9.60	V	11.9
17252.000000	53.97	---	74.00	20.03	V	11.9

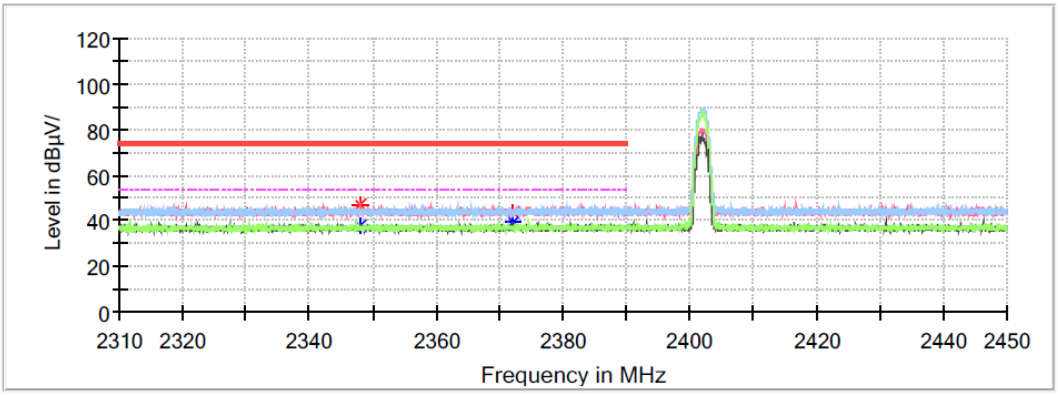
Restricted Bands Emission:

Left Side

Common Information

Project No.:	RQDA240722001
Test Mode:	BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Klein Zhu

Full Spectrum



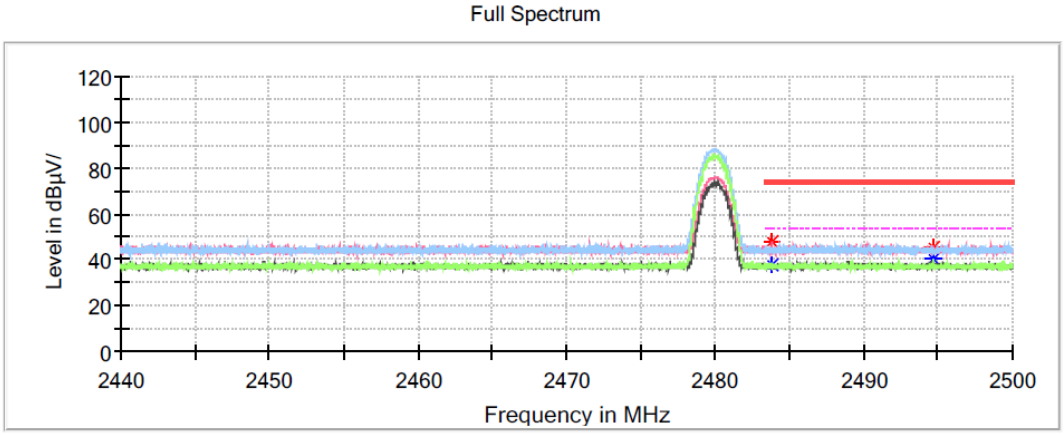
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2348.164000	---	37.45	54.00	16.55	V	-0.7
2348.164000	47.04	---	74.00	26.96	V	-0.7
2372.132000	43.77	---	74.00	30.23	H	-0.6
2372.132000	---	39.20	54.00	14.80	H	-0.6

Right Side

Common Information

Project No.:	RQDA240722001
Test Mode:	BT
Standard:	FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209
Test Engineer:	Klein Zhu

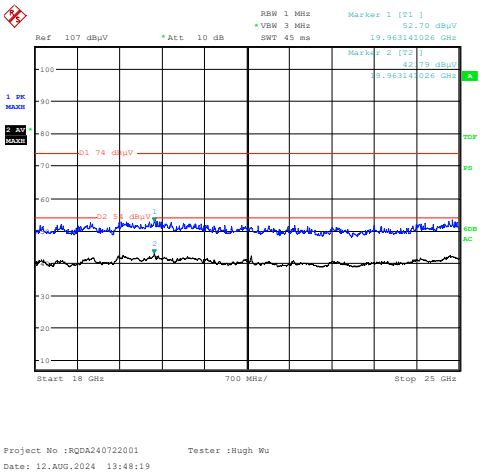


Critical_Freqs

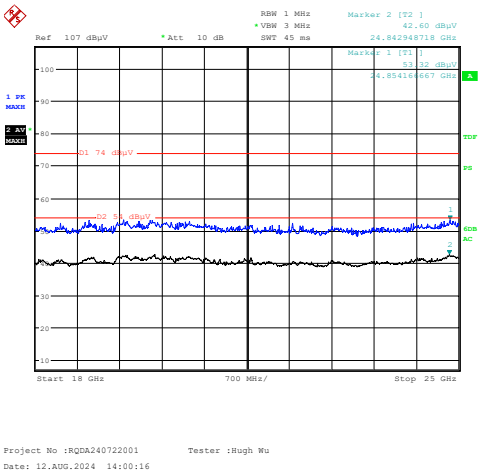
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2483.860000	47.44	---	74.00	26.56	V	-0.3
2483.860000	---	37.44	54.00	16.56	V	-0.3
2494.696000	45.06	---	74.00	28.94	H	-0.2
2494.696000	---	40.07	54.00	13.93	H	-0.2

18 GHz - 25 GHz (8DPSK Mode low channel):

Horizontal



Vertical



Note: The test distance is 3m. The limit is 74dBµV/m(Peak) and 54dBµV/m(Average).

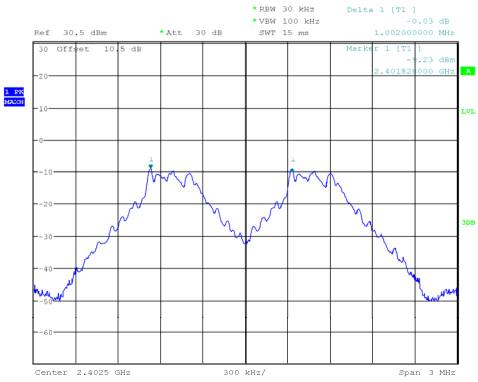
CHANNEL SEPARATION TEST

EUT operation mode: Transmitting

Mode	Channel	Channel frequency (MHz)	Result (MHz)	Limit (MHz)
GFSK	Low	2402-2403	1.002	0.930
	Middle	2441-2442	0.999	0.891
	High	2480-2479	0.999	0.927
π/4 DQPSK	Low	2402-2403	0.999	0.840
	Middle	2441-2442	0.999	0.842
	High	2480-2479	1.002	0.840
8DPSK	Low	2402-2403	0.999	0.832
	Middle	2441-2442	1.002	0.816
	High	2480-2479	1.002	0.818

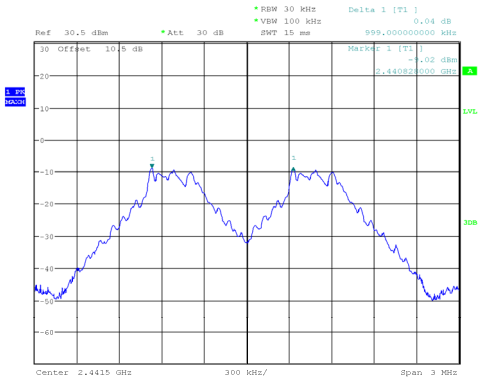
For GFSK, Limit ≥ 20 dB bandwidth
For π/4 DQPSK & 8DPSK, Limit ≥ 20 dB bandwidth * 2/3

BDR (GFSK): Low Channel



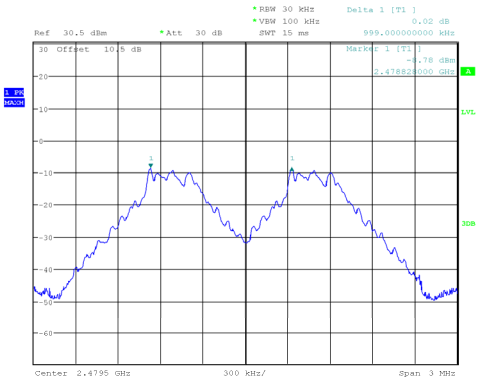
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:20:26

BDR (GFSK): Middle Channel



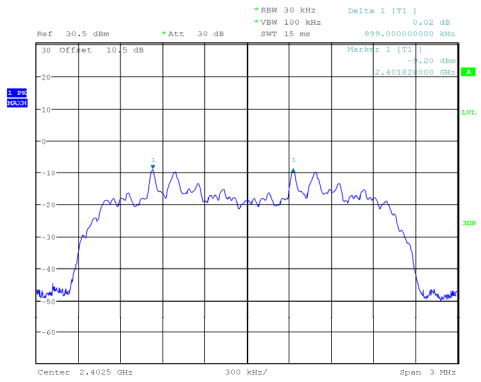
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:28:40

BDR (GFSK): High Channel



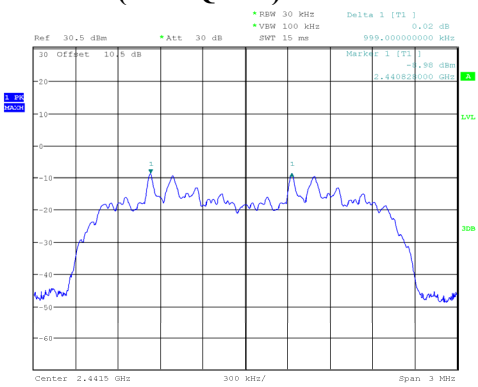
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:38:01

EDR (π/4-DQPSK): Low Channel



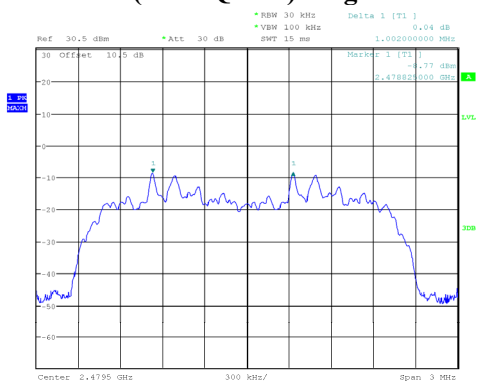
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:01:15

EDR (π/4-DQPSK): Middle Channel



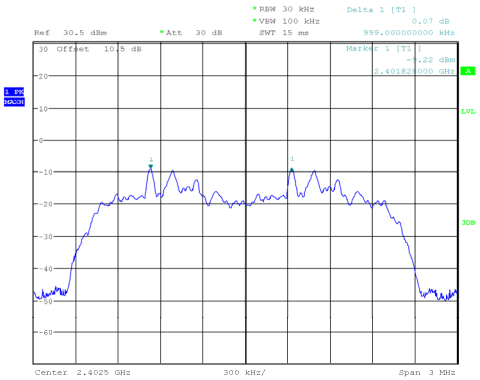
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:28:59

EDR (π/4-DQPSK): High Channel



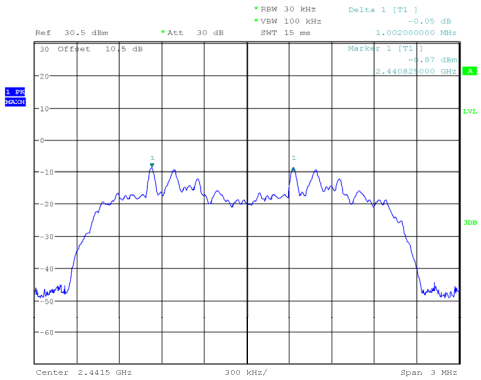
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:38:13

EDR (8DPSK): Low Channel



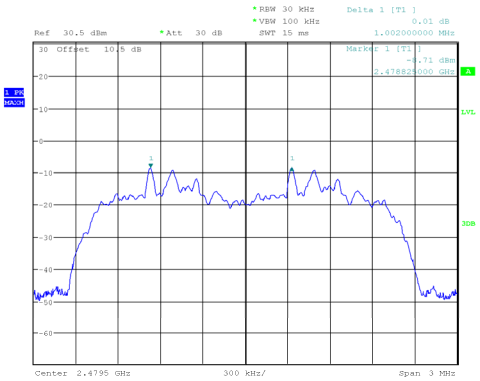
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:21:42

EDR (8DPSK): Middle Channel



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:30:13

EDR (8DPSK): High Channel



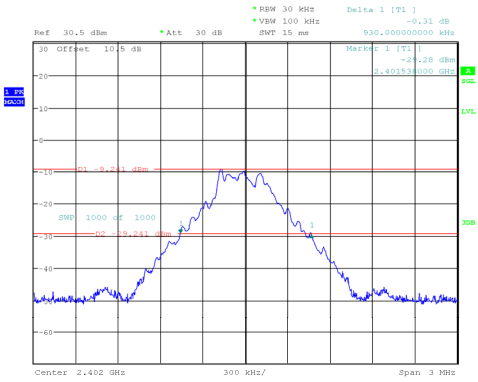
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:38:31

20 dB BANDWIDTH TEST

EUT operation mode: Transmitting

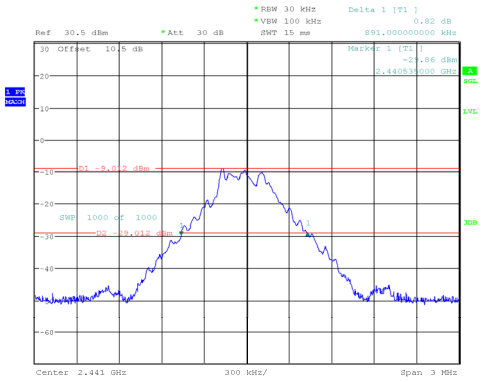
Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.930
	Middle	2441	0.891
	High	2480	0.927
EDR (π/4-DQPSK)	Low	2402	1.260
	Middle	2441	1.263
	High	2480	1.260
EDR (8DPSK)	Low	2402	1.248
	Middle	2441	1.224
	High	2480	1.227

BDR (GFSK): Low Channel



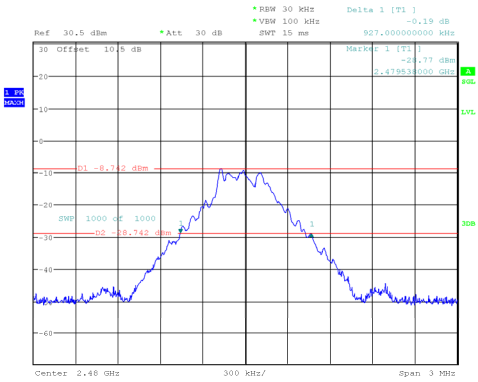
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:14:30

BDR (GFSK): Middle Channel



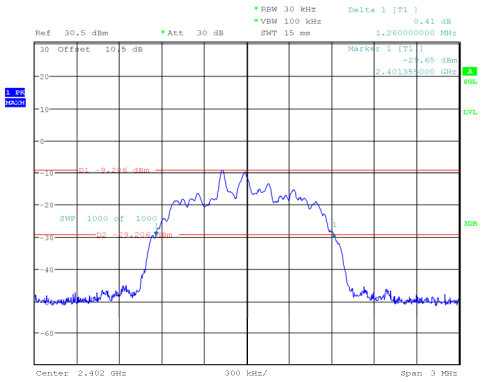
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:21:51

BDR (GFSK): High Channel



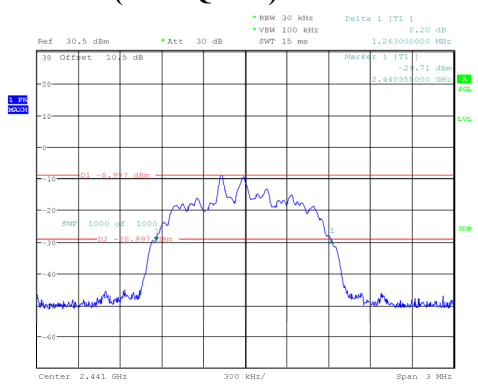
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:29:46

EDR (π/4-DQPSK): Low Channel



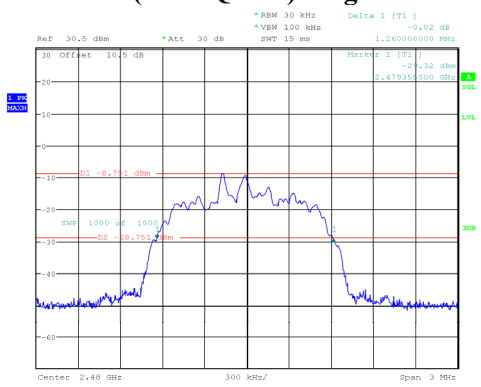
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:55:11

EDR(π/4-DQPSK): Middle Channel



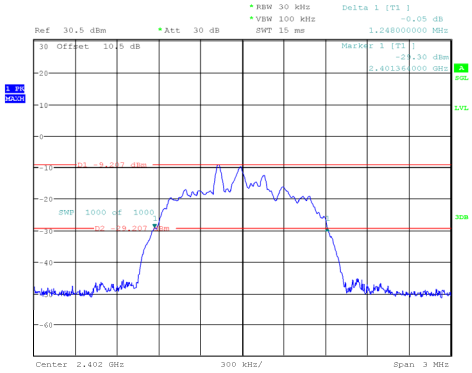
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:04:15

EDR (π/4-DQPSK): High Channel



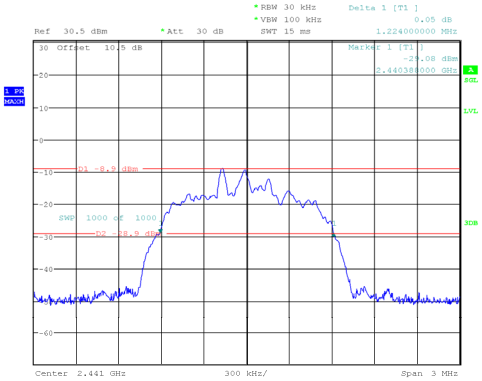
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:30:08

EDR (8DPSK): Low Channel



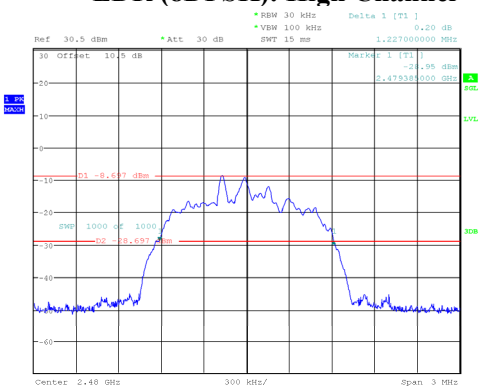
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:16:12

EDR (8DPSK): Middle Channel



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:23:08

EDR (8DPSK): High Channel



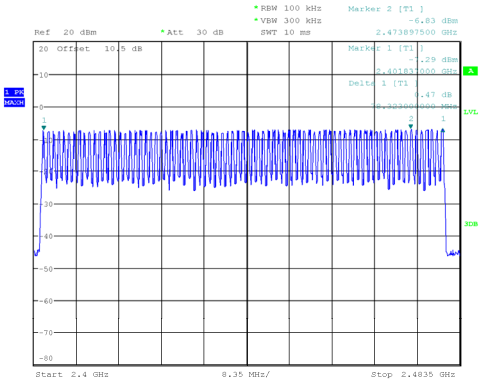
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:31:45

QUANTITY OF HOPPING CHANNEL TEST

EUT operation mode: Hopping

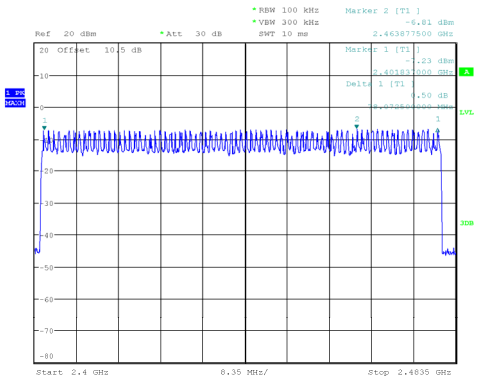
Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥15
EDR (π/4-DQPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15

BDR (GFSK):Number of Hopping Channels



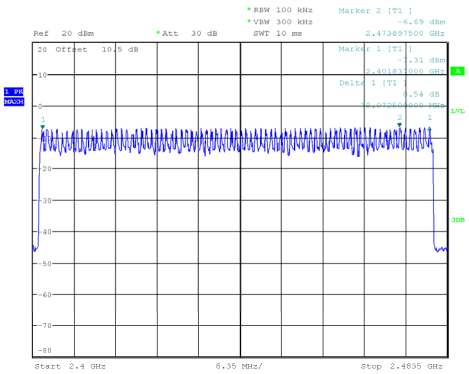
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:47:53

EDR (π/4-DQPSK): Number of Hopping Channels



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 13:52:54

EDR (8DPSK): Number of Hopping Channels



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:48:17

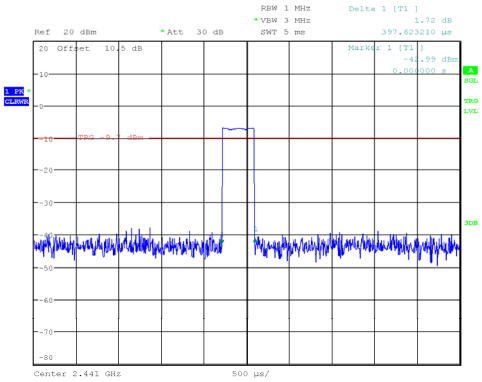
TIME OF OCCUPANCY (DWELL TIME)

EUT operation mode: Hopping

Mode	Pulse width (ms)	Dwell time (s)	Limit (s)	Result
GFSK_Hopping_DH1	0.398	0.127	0.400	Pass
GFSK_Hopping_DH3	1.667	0.267	0.400	Pass
GFSK_Hopping_DH5	2.915	0.311	0.400	Pass
π/4-DQPSK_Hopping_2DH1	0.392	0.125	0.400	Pass
π/4-DQPSK_Hopping_2DH3	1.654	0.265	0.400	Pass
π/4-DQPSK_Hopping_2DH5	2.917	0.311	0.400	Pass
8DPSK_Hopping_3DH1	0.408	0.131	0.400	Pass
8DPSK_Hopping_3DH3	1.658	0.265	0.400	Pass
8DPSK_Hopping_3DH5	2.922	0.312	0.400	Pass

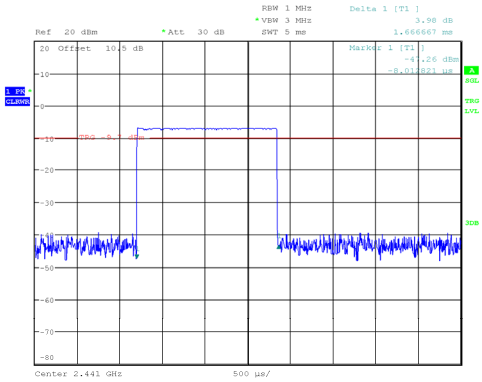
Note:
DH1:Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s
DH3:Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s
DH5:Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s
2DH1: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s
2DH3: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s
2DH5: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s
3DH1: Dwell time=Pulse time (ms) × (1600/2/79) ×31.6 s
3DH3: Dwell time=Pulse time (ms) × (1600/4/79) ×31.6 s
3DH5: Dwell time=Pulse time (ms) × (1600/6/79) ×31.6 s

BDR (GFSK): Pulse time, Middle Channel, DH1



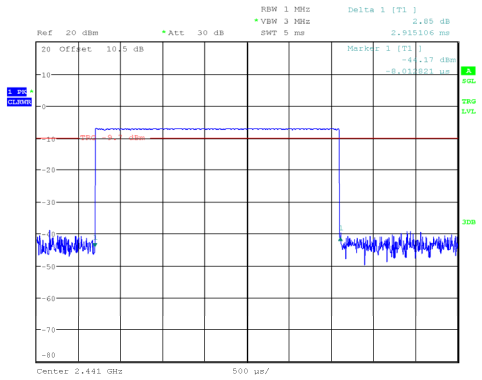
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:50:10

BDR (GFSK): Pulse time, Middle Channel, DH3



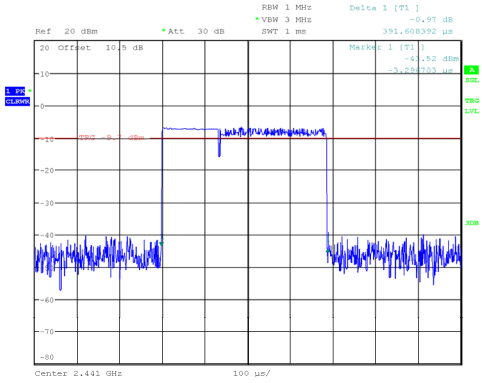
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:52:04

BDR (GFSK): Pulse time, Middle Channel, DH5



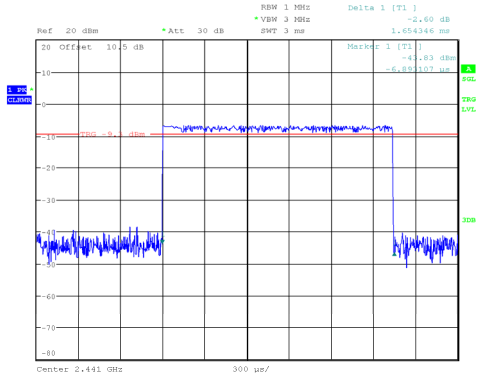
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:53:26

EDR (π/4-DQPSK): Pulse time, Middle Channel, 2DH1



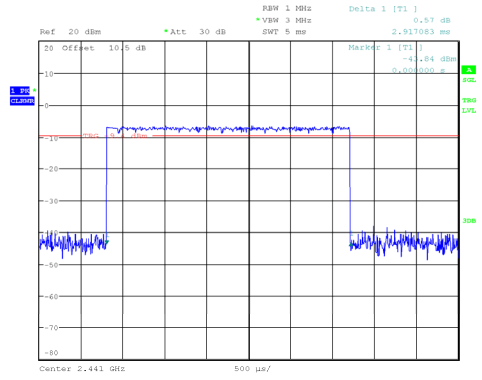
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 15:14:25

EDR (π/4-DQPSK): Pulse time, Middle Channel, 2DH3



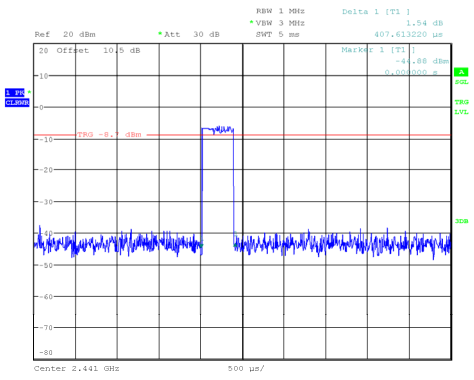
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 15:15:01

EDR (π/4-DQPSK): Pulse time, Middle Channel, 2DH5



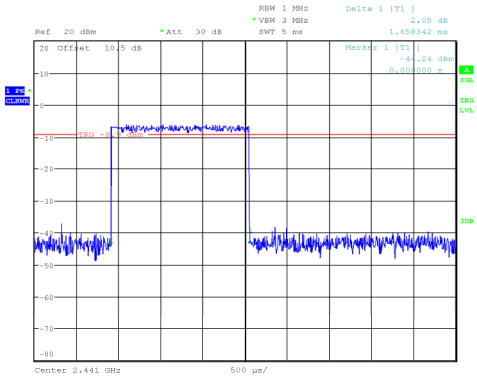
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:14:47

EDR (8DPSK): Pulse time, Middle Channel, 3DH1



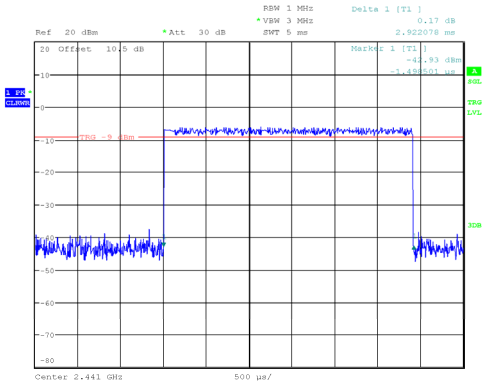
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:50:51

EDR (8DPSK): Pulse time, Middle Channel, 3DH3



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:53:18

EDR (8DPSK): Pulse time, Middle Channel, 3DH5



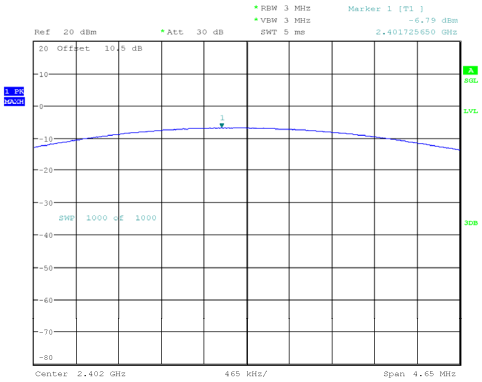
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 15:15:38

PEAK OUTPUT POWER MEASUREMENT

EUT operation mode: Transmitting

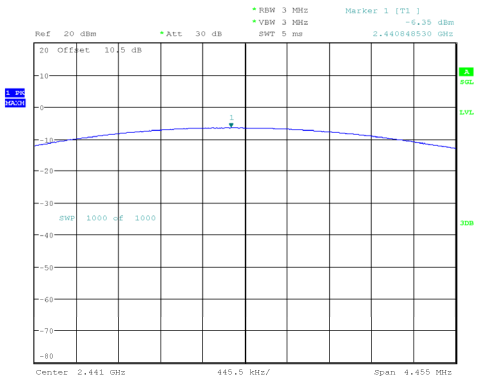
Mode	Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)
GFSK	Low	2402	-6.79	30
	Middle	2441	-6.35	
	High	2480	-6.20	
π/4 DQPSK	Low	2402	-6.01	21
	Middle	2441	-5.77	
	High	2480	-5.48	
8DPSK	Low	2402	-5.34	
	Middle	2441	-5.06	
	High	2480	-4.79	

BDR (GFSK): 2402MHz



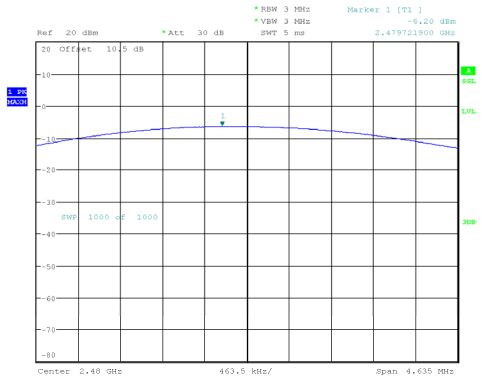
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:19:00

BDR (GFSK): 2441MHz



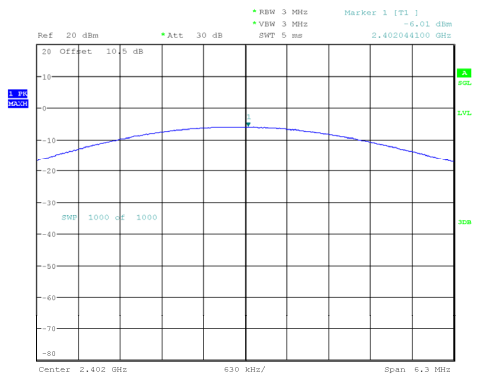
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 5.AUG.2024 19:55:27

BDR (GFSK): 2480MHz



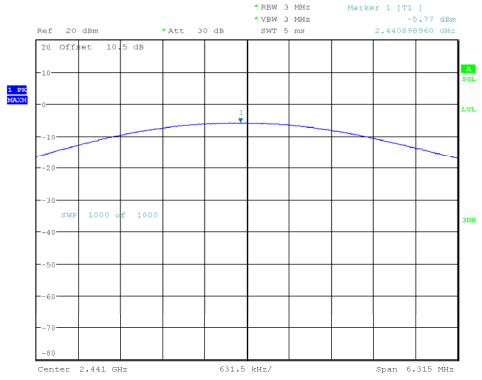
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:34:21

EDR(π/4-DQPSK): 2402MHz



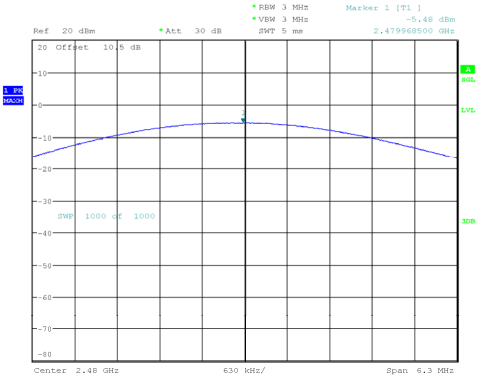
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:59:19

EDR(π/4-DQPSK): 2441MHz



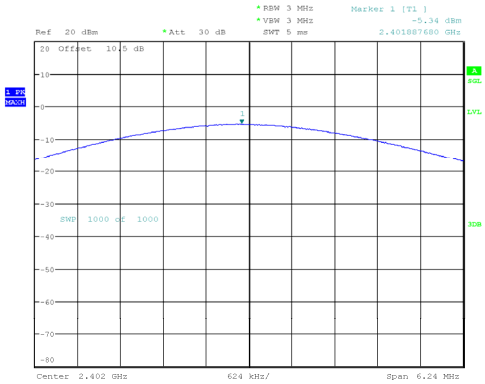
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:11:12

EDR(π/4-DQPSK): 2480MHz



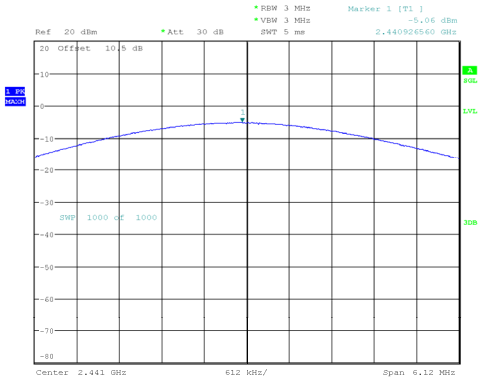
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:35:11

EDR(8DPSK): 2402MHz



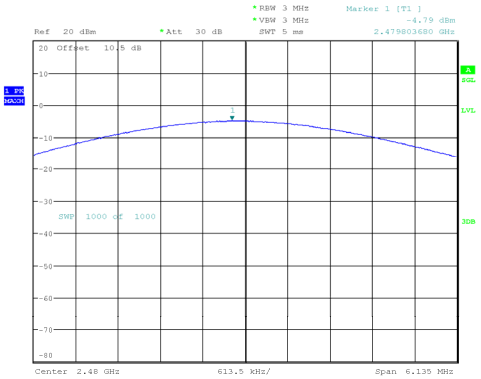
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:20:16

EDR(8DPSK): 2441MHz



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:27:15

EDR(8DPSK): 2480MHz



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:36:36

BAND EDGES

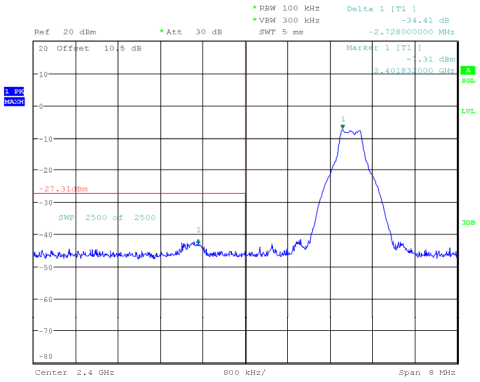
EUT operation mode: Transmitting & Hopping

Test Result: Compliant.

Mode	Channel	Frequency (MHz)	Result (dBc)	Limit (dBc)
GFSK	Low	2402	34.41	20
	High	2480	36.99	
π/4 DQPSK	Low	2402	34.77	
	High	2480	36.98	
8DPSK	Low	2402	34.81	
	High	2480	37.36	
GFSK (Hopping)	Low	2402	34.80	
	High	2480	36.97	
π/4 DQPSK (Hopping)	Low	2402	34.70	
	High	2480	37.44	
8DPSK (Hopping)	Low	2402	35.21	
	High	2480	37.30	

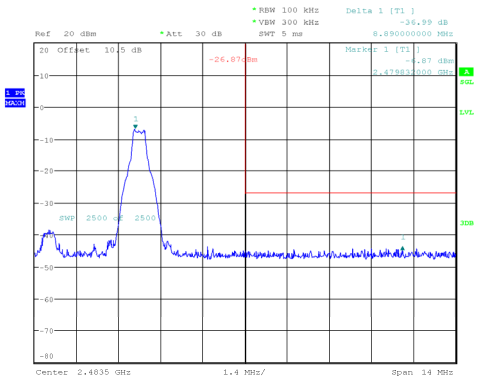
Band Edge

BDR (GFSK): Left Side



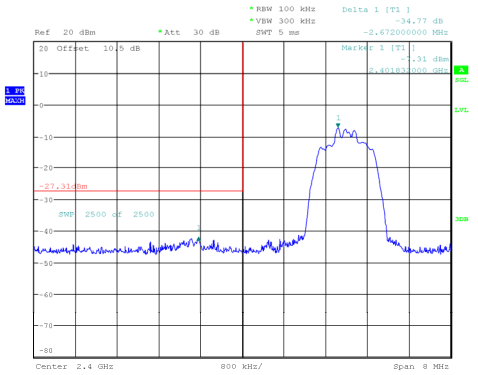
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:16:02

BDR (GFSK): Right Side



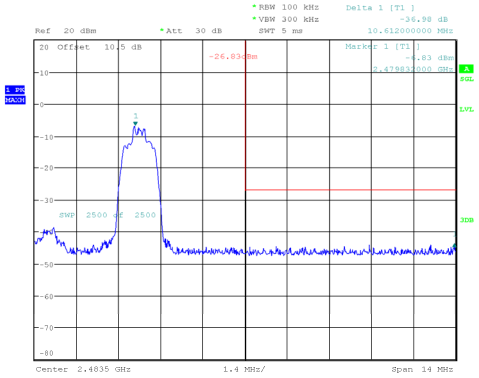
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:31:57

EDR (π/4-DQPSK): Left Side



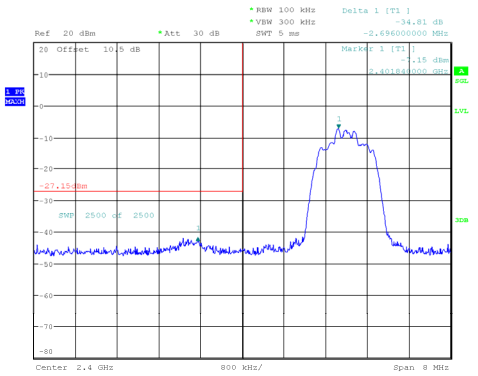
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:56:44

EDR (π/4-DQPSK): Right Side



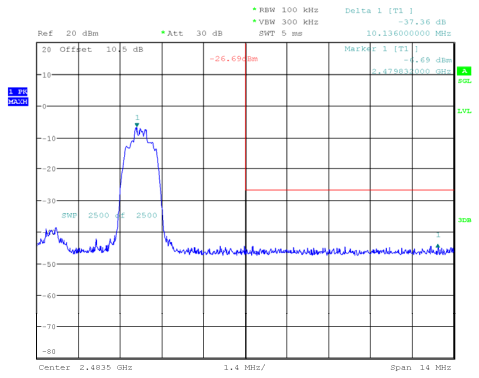
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 11:32:19

EDR (8DPSK): Left Side



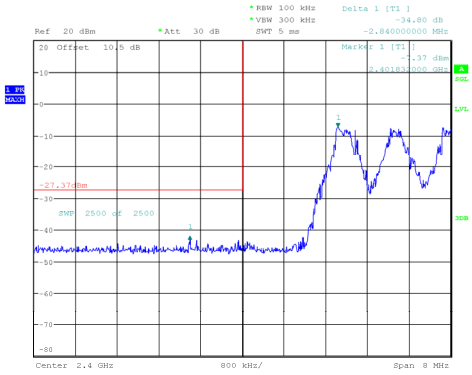
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:17:45

EDR (8DPSK): Right Side



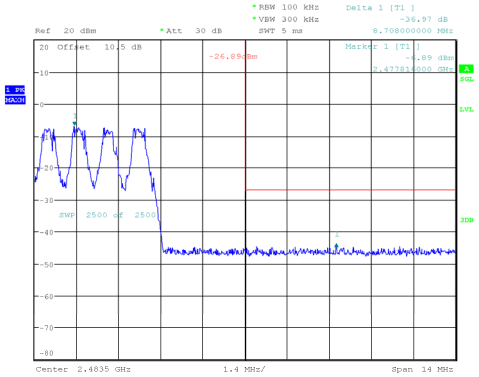
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:33:58

BDR (GFSK): Left Side - Hopping



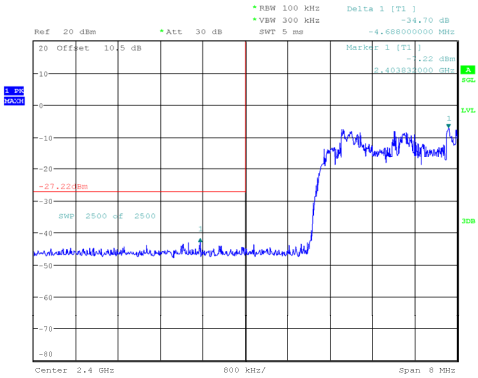
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:40:40

BDR (GFSK): Right Side- Hopping



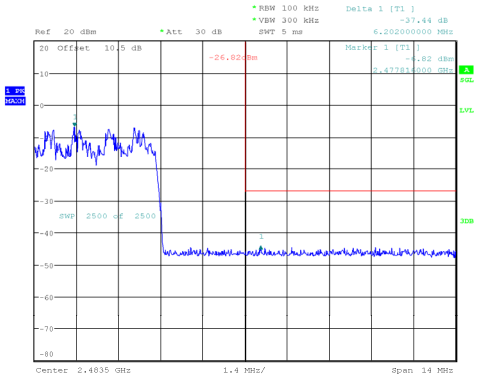
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 10:42:58

EDR (π/4-DQPSK): Left Side- Hopping



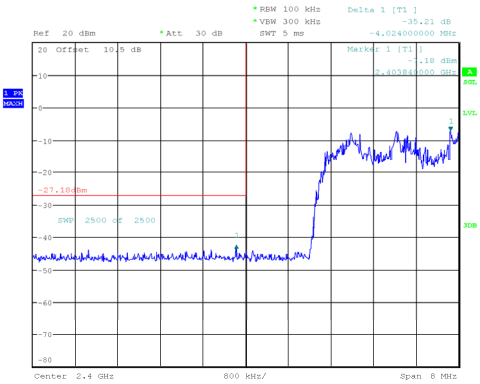
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 13:45:54

EDR (π/4-DQPSK): Right Side- Hopping



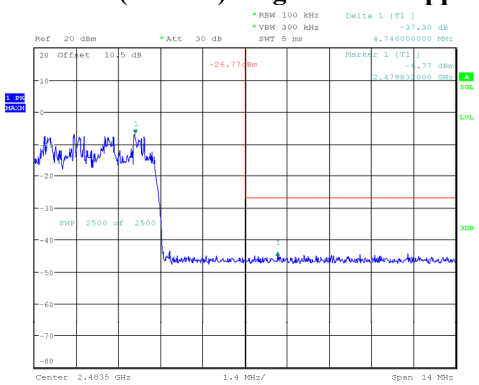
ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 13:48:13

EDR (8DPSK): Left Side- Hopping



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:40:32

EDR (8DPSK): Right Side- Hopping



ProjectNo.:RQDA240722001 Tester:Neil Zhou
Date: 27.JUL.2024 14:42:50

Declarations

1. The laboratory is not responsible for the authenticity of any information provided by the applicant. Information from the applicant that may affect test results is marked with "★".

2. The test data was only valid for the test sample(s).

3. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95.45% confidence interval.

******* END OF REPORT *******