NVLAP TESTING
NVLAP LAB CODE 600338-0

BACL Bay Area Compliance Labs Corp.

FCC PART 15.247
TEST REPORT

For

Shanghai Loostone Information Technology Co., Ltd.

Room 601, Building 9, No. 351, Sizhuan Road, Sijing Town, Songjiang District, Shanghai, China

FCC ID: 2A7ZR-M7AMZ7

Report Type:	**Product Name:**
Original Report	Puremic MagicMic M7

Report Number:	RSHA240311001-00B
Report Date:	2024-04-25
Reviewed By:	Bard Liu
Approved By:	Kyle Xu
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

TABLE OF CONTENTS

REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RSHA240311001-00B	R1V1	2024-04-25	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Shanghai Loostone Information Technology Co., Ltd.
Product Name:	Puremic MagicMic M7
Tested Model:	MS-M7
Power Supply:	DC 5V from USB port or DC 3.7V from battery
Maximum Output Power:	GFSK: 5.37 dBm π/4-DQPSK: 5.27 dBm 8DPSK: 5.42 dBm
RF Function:	Classic BT
Operating Band/Frequency:	2402-2480 MHz
Channel Number:	79
Channel Separation:	1 MHz
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Antenna Type:	PCB Antenna
★Maximum Antenna Gain:	1.3 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: RSHA240311001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-03-11.)

Objective

This test report is prepared for *Shanghai Loostone Information 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: QRCT

★Power level: 9

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

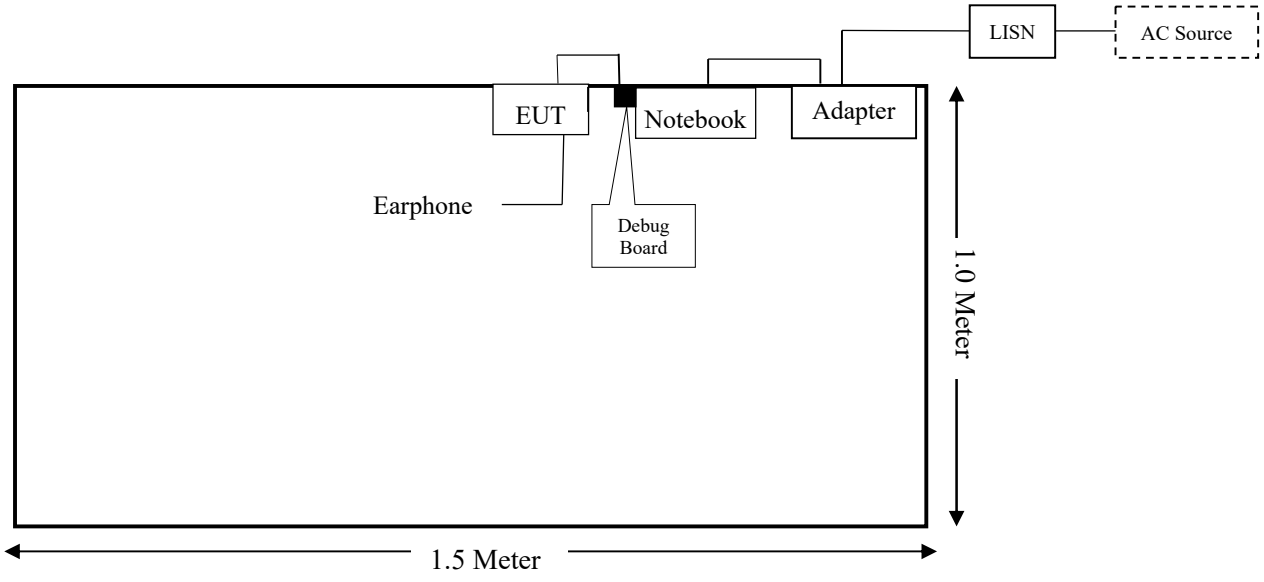
Manufacturer	Description	Model	Serial Number
SHENZHEN TIANYIN ELECTRONICS CO.,LTD	Adapter	TPA-23A050200UU01	/
DELL	Notebook	015K3N	00190-098-766-241
/	Debug board	/	/
/	Earphone	/	/

External I/O Cable

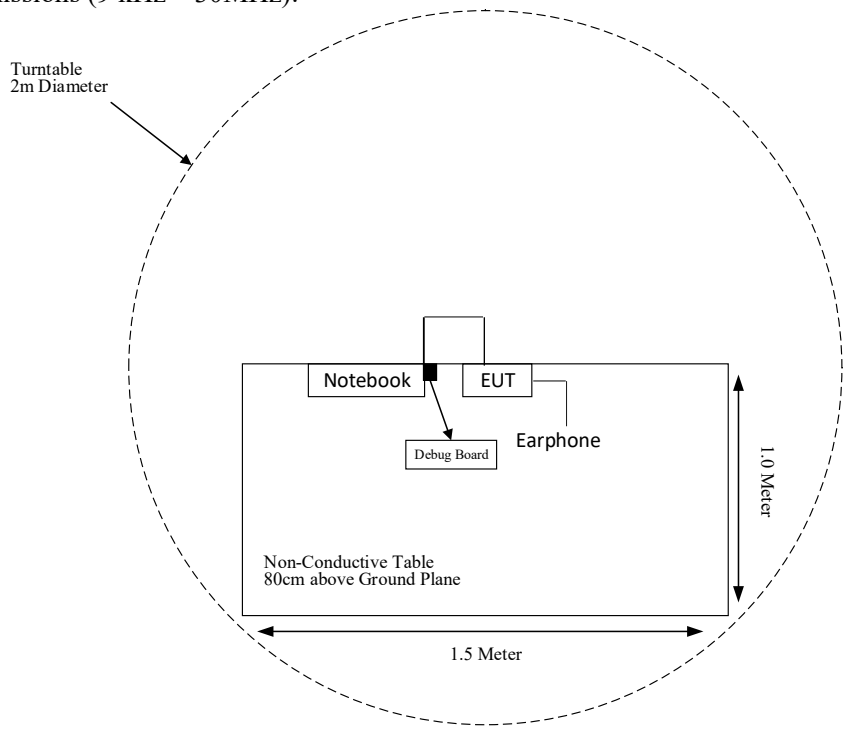
Cable Description	Length (m)	From Port	To Port
Power Cable 1	3.0	Notebook	Adapter
Power Cable 2	3.0	Adapter	LISN/AC source
Data cable	0.3	EUT	Debug board
USB Cable	8.0	Debug board	Notebook

Block Diagram of Test Setup

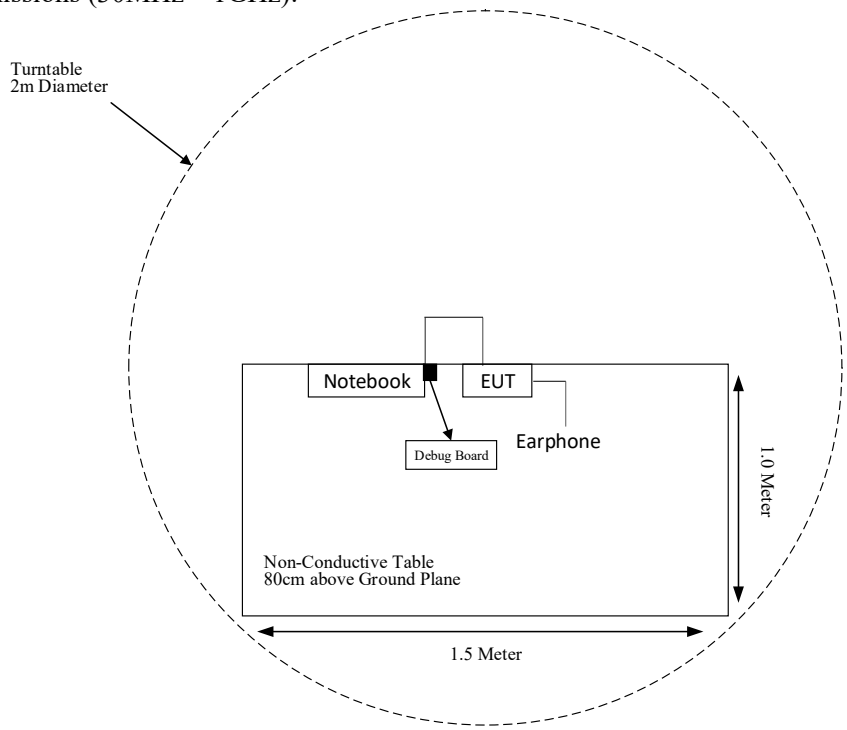
For Conducted Emissions:



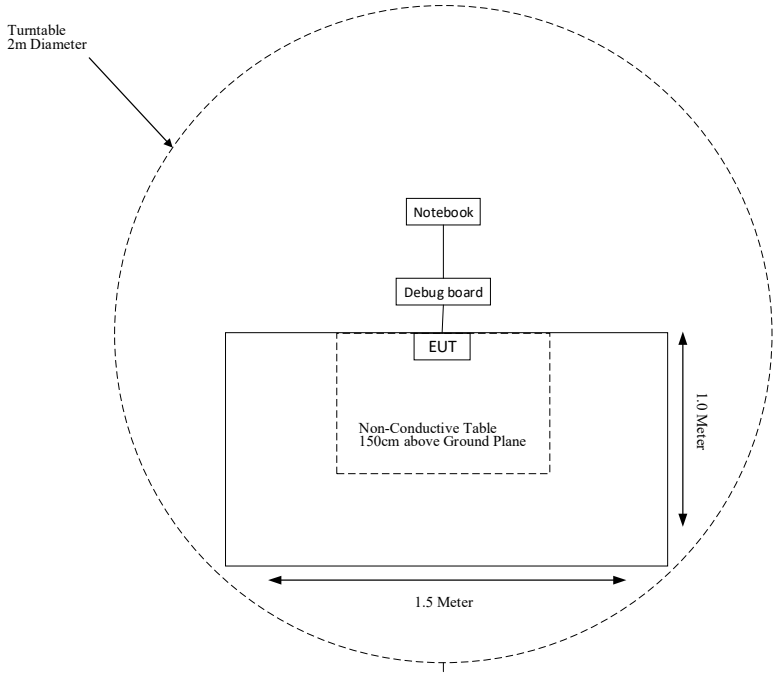
For Radiated Emissions (9 kHz – 30MHz):



For Radiated Emissions (30MHz – 1GHz):



For Radiated Emissions (1GHz – 25GHz):



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	2023-05-23	2024-05-22
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2023-11-11	2024-11-10
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Sonoma Instrument	Pre-amplifier	310N	171205	2023-05-23	2024-05-22
Narda	6 dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2023-05-23	2024-05-22
Radiated Emission Test (Chamber #2)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2023-05-19	2024-05-18
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2023-12-02	2024-12-01
ETS-LINDGREN	Horn Antenna	3116	2516	2023-12-08	2024-12-07
A.H.Systems,inc	Amplifier	PAM-0118P	512	2023-05-23	2024-05-22
SELECTOR	Amplifier	EM18G40G	060726	2023-05-23	2024-05-22
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2023-08-05	2024-08-04
Narda	Attenuator	10dB	010	2023-10-10	2024-10-09
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-11	011	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-12	012	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-13	013	2023-05-23	2024-05-22
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2023-05-23	2024-05-22
Narda	Attenuator	10dB	010	2023-10-10	2024-10-09
XHFDZ	RG178 Coaxial Cable	SMA-178	XHF-1102	Each time	N/A
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	101746	2023-05-23	2024-05-22
Rohde & Schwarz	LISN	ENV216	101115	2023-05-23	2024-05-22
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	0357.8810.54	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-15	015	2023-05-23	2024-05-22

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
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209 & §15.247(d)	Radiated Emissions & Restricted Bands Emissions	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 §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 1.3 dBi, which permanently attached to EUT fulfill the requirement of this section. Please refer to the EUT photos.

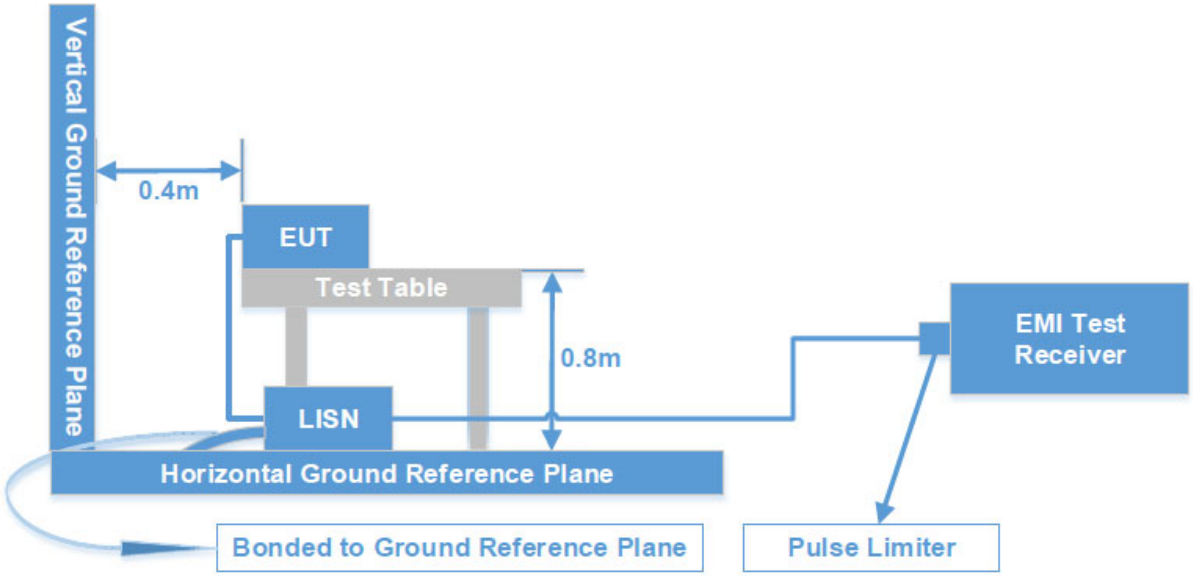
Result: Compliant.

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 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

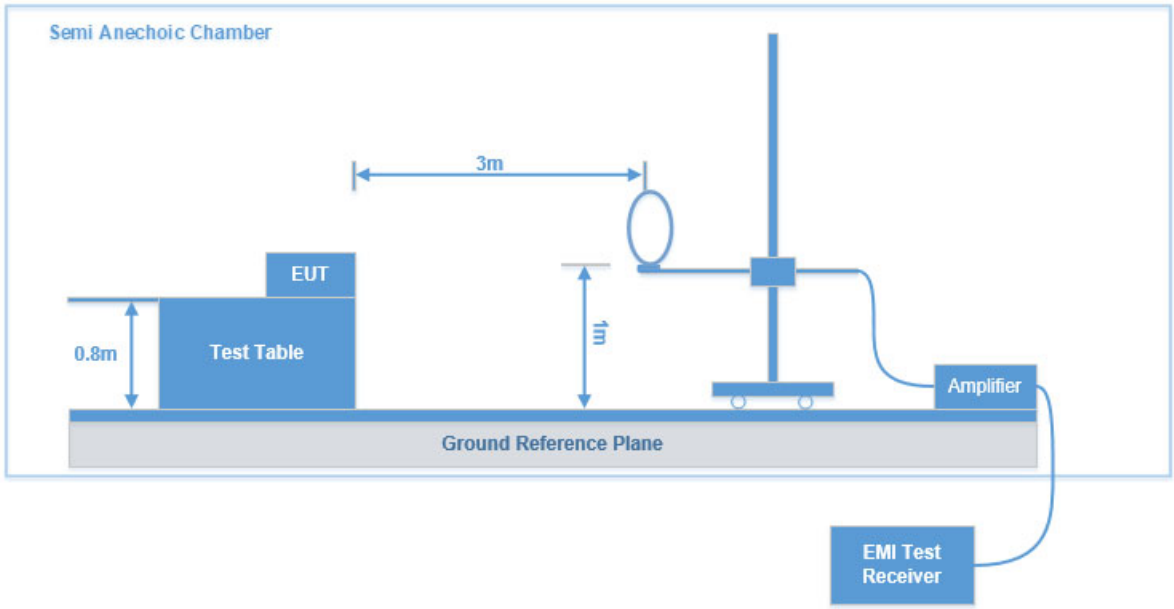
FCC §15.205, §15.209 & §15.247(d) - RADIATED EMISSIONS

Applicable Standard

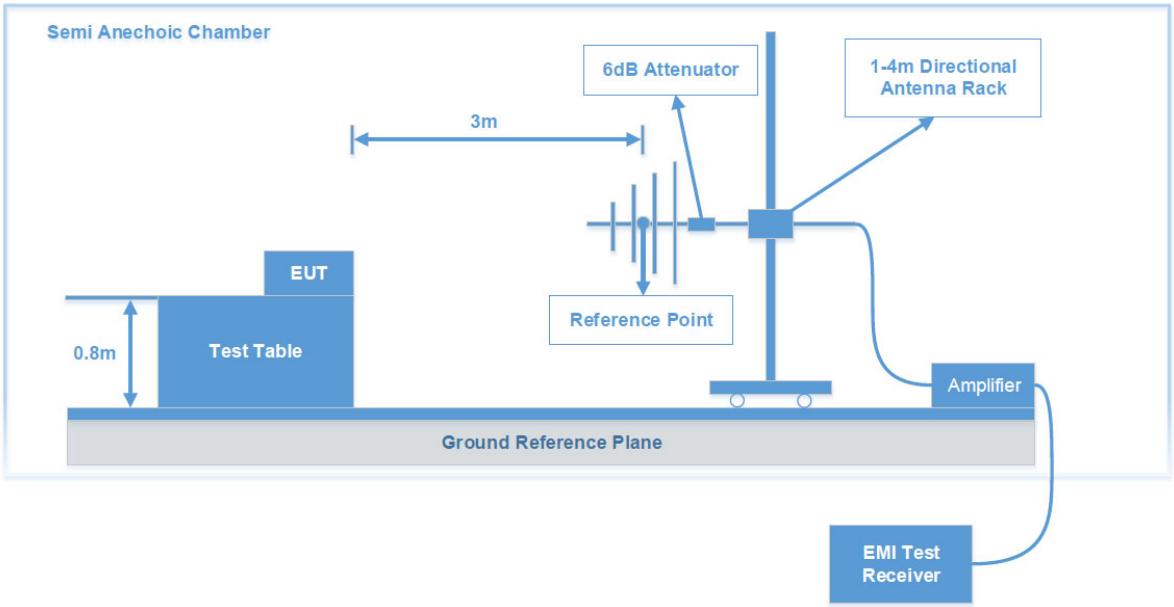
FCC §15.205; §15.209; §15.247(d)

Test System Setup

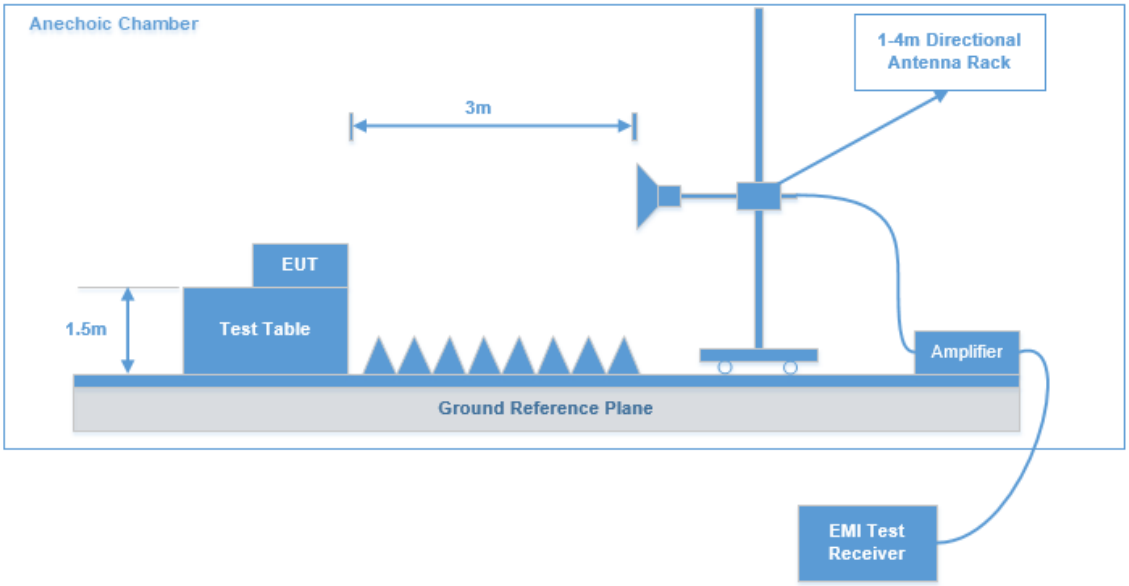
9 kHz-30MHz:



30MHz-1GHz:



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

Note: If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform a QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz-1 GHz except 9–90 kHz, 110–490 kHz, employing an average detector, peak and Average detection modes for frequencies above 1GHz.

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, and Subpart C, section 15.205, 15.209 and 15.247.

Test Data: See Appendix

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

Applicable Standard

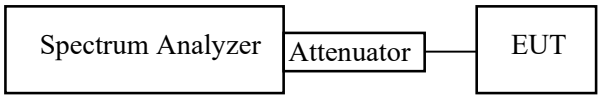
Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that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

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

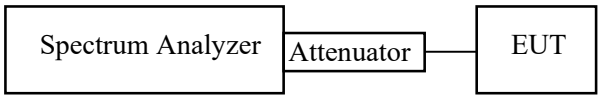
FCC §15.247(a) (1) - 20 dB EMISSION BANDWIDTH

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

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

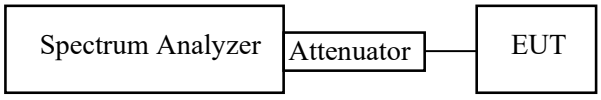
Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress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

Test Procedure

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)

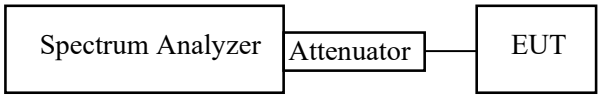
Applicable Standard

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

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

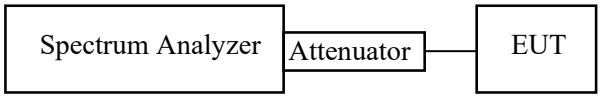
Applicable Standard

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

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

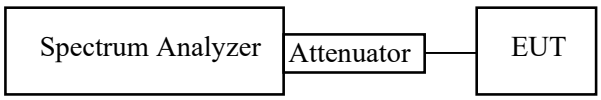
FCC §15.247(d) - BAND EDGES TESTING

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

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

Appendix - TEST DATA

Environmental Conditions & Test Information

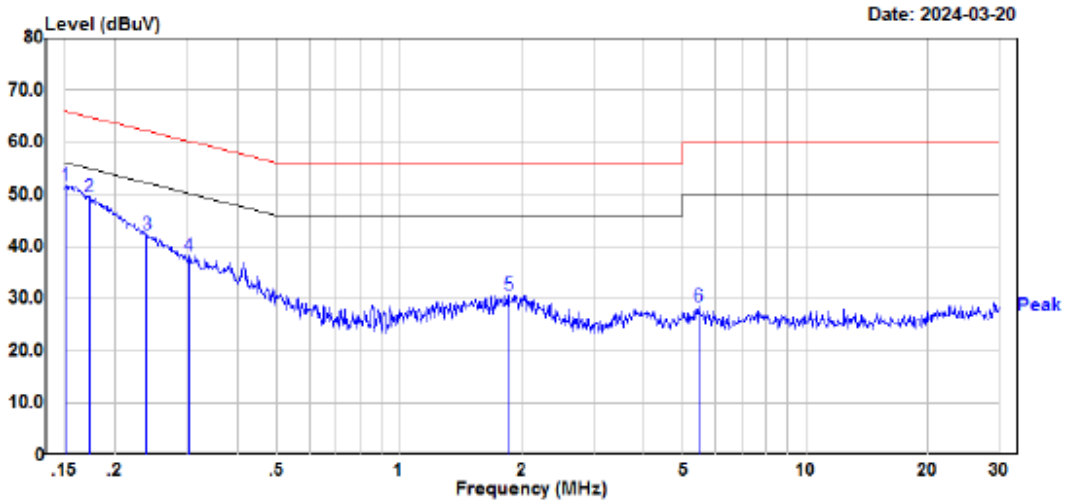
Test Item:	AC LINE CONDUCTED EMISSIONS	RADIATED EMISSIONS		
		9kHz - 1GHz	1 GHz - 18 GHz	18 GHz - 25 GHz
Test Date:	2024-03-20	2024-03-26	2024-03-23	2024-04-18
Temperature:	16.5℃	17.3 ℃	20.3 ℃	17.8 ℃
Relative Humidity:	43 %	56 %	52 %	47 %
ATM Pressure:	102.8kPa	102.0kPa	102.6kPa	102.5kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Frank Liu	Leah Li	Peter Wang	Peter Wang

Test Item:	CHANNEL SEPARATION TEST	20 DB BANDWIDTH TEST		OCCUPIED BANDWIDTH		QUANTITY OF HOPPING CHANNEL TEST
Test Date:	2024-03-18	2024-03-18	2024-03-19	2024-03-18	2024-03-19	2024-03-19
Temperature:	21.3 ℃	21.3 ℃	22.5 ℃	21.3 ℃	22.5 ℃	22.5 ℃
Relative Humidity:	45 %	45 %	45 %	45 %	45 %	45 %
ATM Pressure:	102.3kPa	102.3kPa	102.3kPa	102.3kPa	102.3kPa	102.3kPa
Test Result:	Pass	Pass	Pass	Pass	Pass	Pass
Test Engineer:	Bard Liu	Bard Liu	Bard Liu	Bard Liu	Bard Liu	Bard Liu

Test Item:	TIME OF OCCUPANCY (DWELL TIME)	BAND EDGES TESTING			PEAK OUTPUT POWER MEASUREMENT	
Test Date:	2024-03-21	2024-03-18	2024-03-19	2024-03-21	2024-03-19	2024-03-18
Temperature:	21.6 ℃	21.3 ℃	22.5 ℃	21.6 ℃	22.5 ℃	21.3 ℃
Relative Humidity:	47 %	45 %	45 %	47 %	45 %	45 %
ATM Pressure:	103.5kPa	102.3kPa	102.3kPa	103.5kPa	102.3kPa	102.3kPa
Test Result:	Pass	Pass	Pass	Pass	Pass	Pass
Test Engineer:	Bard Liu	Bard Liu	Bard Liu	Bard Liu	Bard Liu	Bard Liu

AC LINE CONDUCTED EMISSIONS

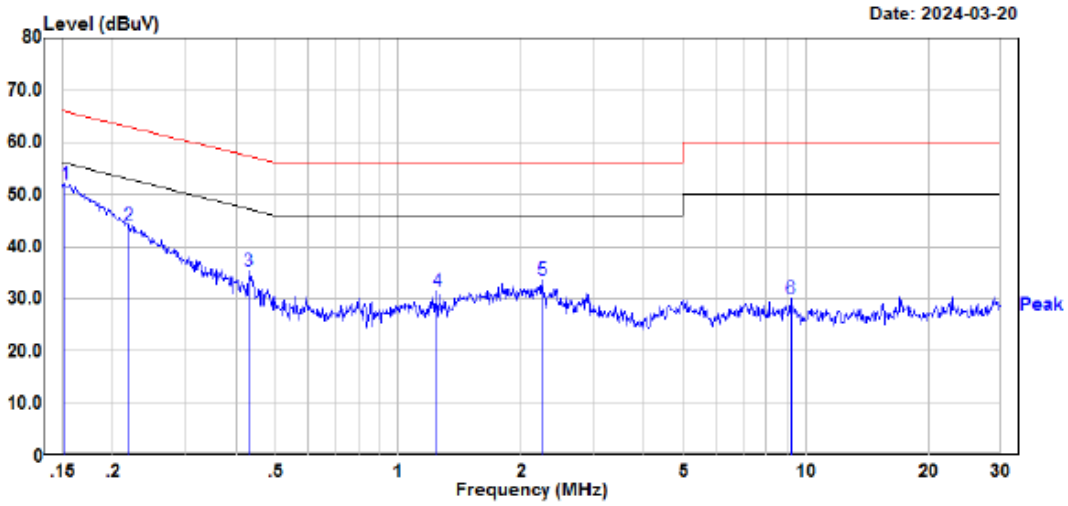
Test Result: Compliant.
EUT operation mode: Transmitting in low channel of 8DPSK mode (maximum output power mode)
Line:




```
Site                : CE
Condition           : limit\FCC Part 15.207.\Class B QP.csv Line
                    : DET:Peak
Project No.         : RSHA240311001
Model               : MS-M7
Phase               : L
Voltage             : 120V/60Hz
Mode                : BT
Test Equipment      : ENV216,ESR
Temperature         : 16.5℃
Humidity            : 43%
Atmospheric pressure: 102.8kPa
Test Engineer       : Frank Liu
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.151	31.80	19.99	51.79	65.96	-14.17	Peak
2	0.172	29.66	20.01	49.67	64.84	-15.17	Peak
3	0.238	22.28	20.04	42.32	62.15	-19.83	Peak
4	0.303	18.24	20.04	38.28	60.16	-21.88	Peak
5	1.859	10.73	19.99	30.72	56.00	-25.28	Peak
6	5.455	8.45	20.12	28.57	60.00	-31.43	Peak

Neutral:




```
Site                : CE
Condition           : limit\FCC Part 15.207\Class B QP.csv Line
                    : DET:Peak
Project No.         : RSHA240311001
Model               : MS-M7
Phase               : N
Voltage             : 120V/60Hz
Mode                : BT
Test Equipment      : ENV216,ESR
Temperature         : 16.5℃
Humidity            : 43%
Atmospheric pressure: 102.8kPa
Test Engineer       : Frank Liu
```

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	31.96	19.99	51.95	65.88	-13.93	Peak
2	0.218	24.01	20.04	44.05	62.90	-18.85	Peak
3	0.429	15.32	20.00	35.32	57.26	-21.94	Peak
4	1.248	11.73	19.73	31.46	56.00	-24.54	Peak
5	2.258	13.59	20.04	33.63	56.00	-22.37	Peak
6	9.161	10.12	19.91	30.03	60.00	-29.97	Peak

RADIATED EMISSIONS

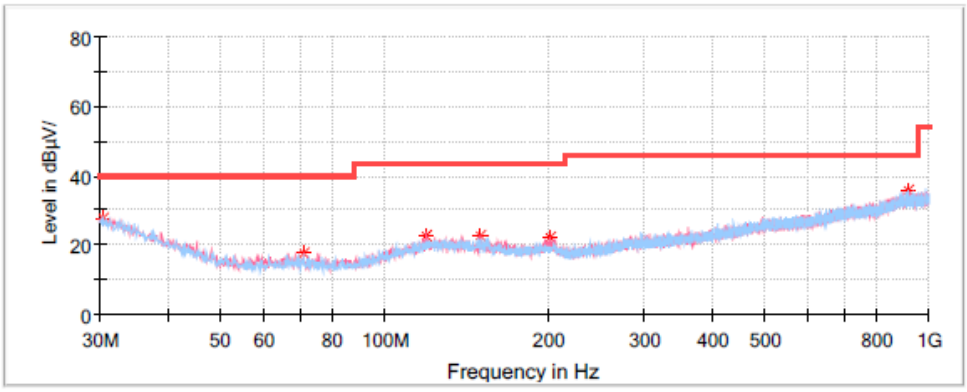
EUT operation mode: Transmitting
After pre-scan in the X, Y and Z axes of orientation, the worst case is below:
9 kHz-30MHz:(*Transmitting in maximum output power mode 8DPSK low channel)*
The amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

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

Low Channel: 2402MHz

Common Information

Project No:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESCI、JB3、310N
Temperature:	17.3℃
Humidity:	56%
Barometric Pressure:	102.0kPa
Test Engineer:	Leah Li
Test Date:	2024/3/26



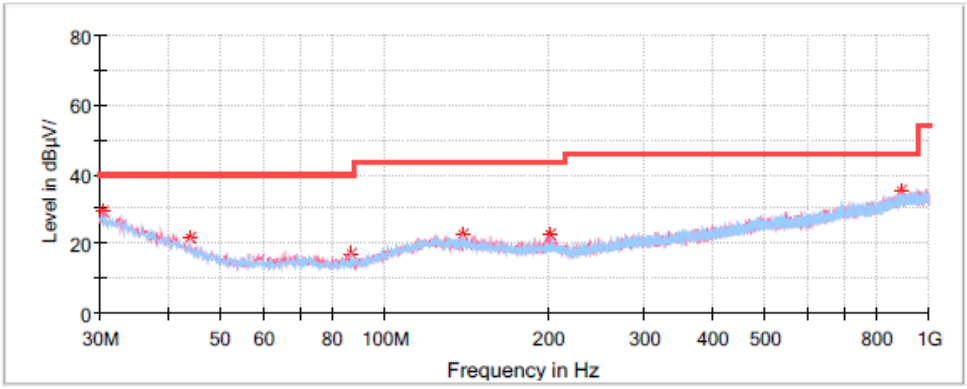
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
30.363750	27.89	40.00	12.11	V	-4.7
71.103750	17.68	40.00	22.32	V	-16.9
119.725000	22.56	43.50	20.94	V	-11.3
150.401250	22.61	43.50	20.89	V	-12.1
201.447500	22.20	43.50	21.30	V	-12.6
915.852500	35.56	46.00	10.44	H	1.4

Middle Channel: 2441MHz

Common Information

Project No:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESCI、JB3、310N
Temperature:	17.3℃
Humidity:	56%
Barometric Pressure:	102.0kPa
Test Engineer:	Leah Li
Test Date:	2024/3/26



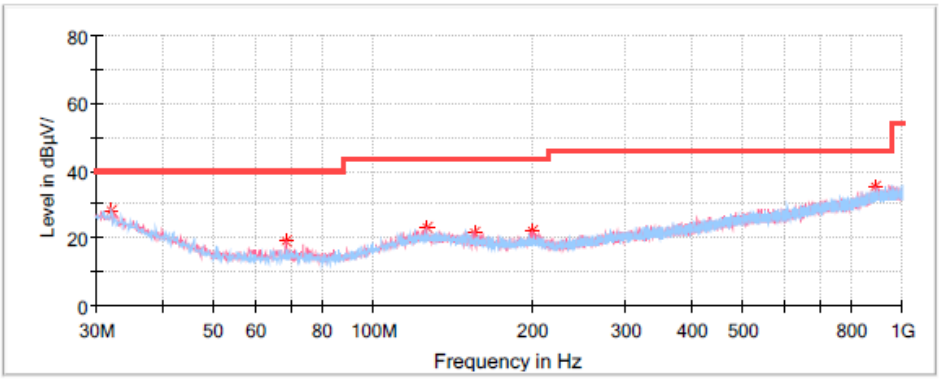
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
30.485000	29.12	40.00	10.88	V	-4.8
43.943750	21.77	40.00	18.23	H	-13.4
87.108750	17.15	40.00	22.85	H	-17.3
138.882500	22.56	43.50	20.94	H	-11.5
201.326250	22.68	43.50	20.82	V	-12.6
887.480000	35.06	46.00	10.94	V	1.0

High Channel: 2480MHz

Common Information

Project No:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESCI、JB3、310N
Temperature:	17.3℃
Humidity:	56%
Barometric Pressure:	102.0kPa
Test Engineer:	Leah Li
Test Date:	2024/3/26



Critical_Freqs

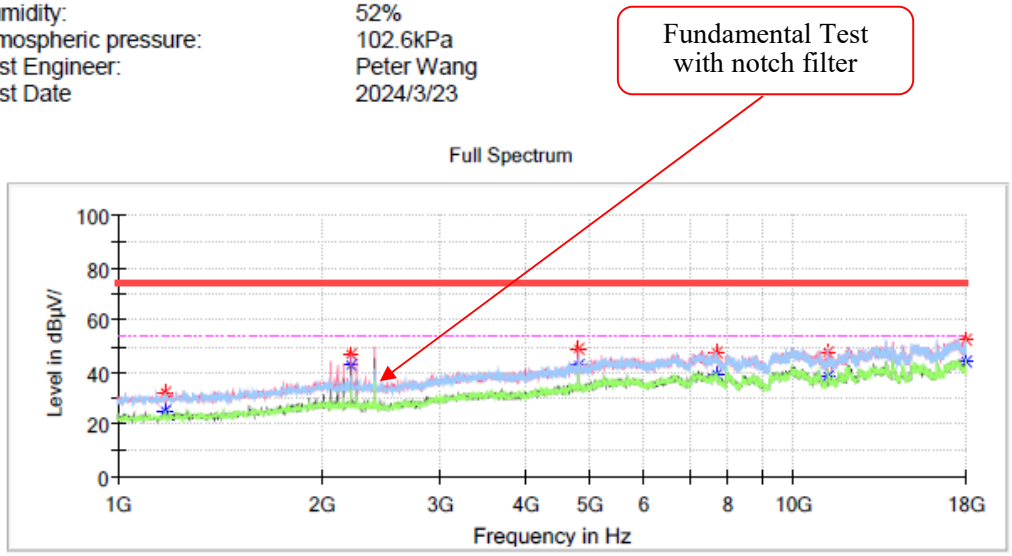
Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
32.061250	28.23	40.00	11.77	H	-5.8
68.436250	19.22	40.00	20.78	V	-16.9
126.515000	23.38	43.50	20.12	V	-11.3
155.130000	21.84	43.50	21.66	V	-12.3
200.598750	22.11	43.50	21.39	V	-12.6
886.025000	35.22	46.00	10.78	V	0.9

1GHz-18GHz:
GFSK:

Low Channel: 2402MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



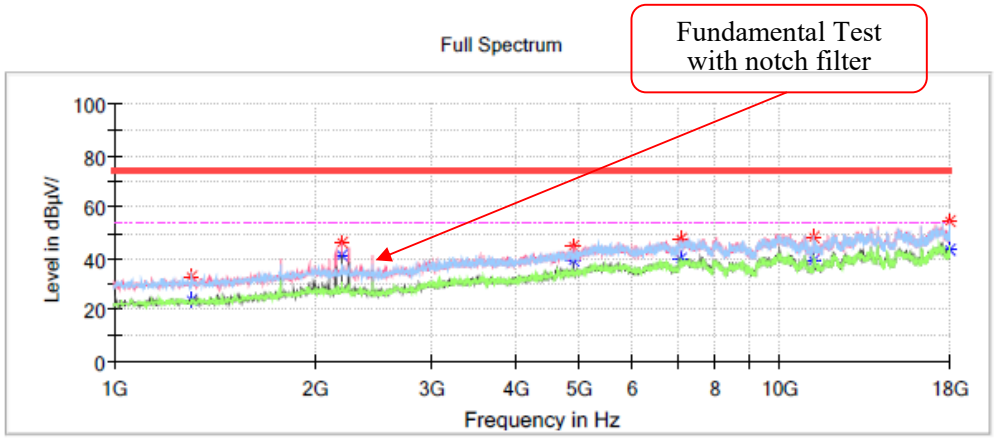
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1176.800000	31.84	---	74.00	42.16	H	-15.0
1176.800000	---	25.11	54.00	28.89	H	-15.0
2208.700000	46.71	---	74.00	27.29	V	-10.2
2208.700000	---	42.38	54.00	11.62	V	-10.2
4802.900000	49.07	---	74.00	24.93	V	-2.2
4802.900000	---	42.83	54.00	11.17	V	-2.2
7699.700000	---	39.07	54.00	14.93	H	4.0
7699.700000	47.28	---	74.00	26.72	H	4.0
11247.600000	---	38.58	54.00	15.42	H	6.8
11247.600000	47.75	---	74.00	26.25	H	6.8
18000.000000	---	44.03	54.00	9.97	V	11.5
18000.000000	52.67	---	74.00	21.33	V	11.5

Middle Channel: 2441MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



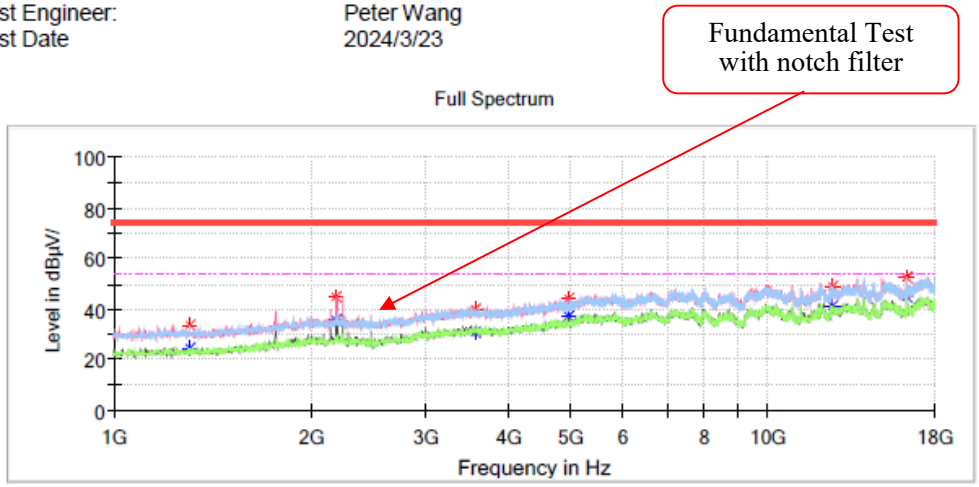
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1309.400000	---	23.87	54.00	30.13	H	-14.5
1309.400000	33.03	---	74.00	40.97	H	-14.5
2200.200000	---	41.05	54.00	12.95	V	-10.2
2200.200000	46.00	---	74.00	28.00	V	-10.2
4881.100000	---	39.11	54.00	14.89	V	-1.8
4881.100000	44.94	---	74.00	29.06	V	-1.8
7084.300000	---	40.18	54.00	13.82	V	3.9
7084.300000	47.80	---	74.00	26.20	V	3.9
11245.900000	---	39.38	54.00	14.62	V	6.8
11245.900000	48.37	---	74.00	25.63	V	6.8
17996.600000	---	43.33	54.00	10.67	V	11.5
17996.600000	54.32	---	74.00	19.68	V	11.5

High Channel: 2480MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



Critical_Freqs

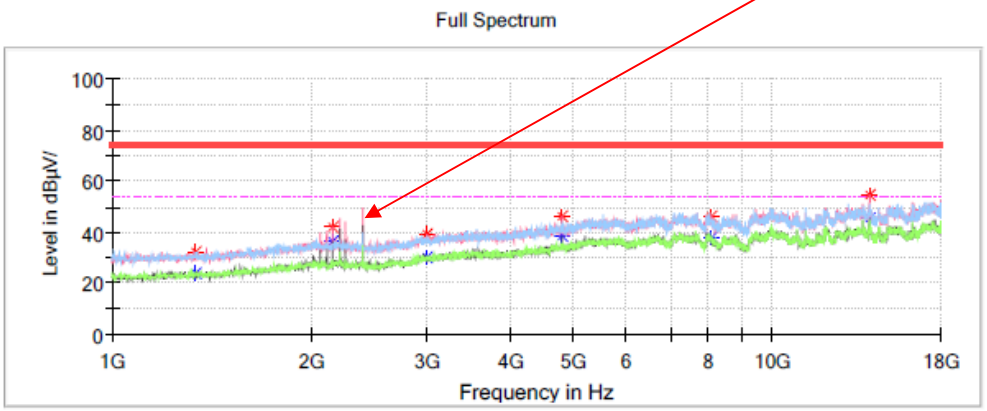
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1307.700000	33.43	---	74.00	40.57	H	-14.5
1307.700000	---	24.77	54.00	29.23	H	-14.5
2190.000000	44.64	---	74.00	29.36	V	-10.3
2190.000000	---	35.40	54.00	18.60	V	-10.3
3560.200000	---	30.93	54.00	23.07	V	-6.0
3560.200000	40.06	---	74.00	33.94	V	-6.0
4959.300000	---	36.79	54.00	17.21	V	-1.4
4959.300000	43.95	---	74.00	30.05	V	-1.4
12539.600000	---	41.44	54.00	12.56	H	8.5
12539.600000	49.13	---	74.00	24.87	H	8.5
16308.500000	52.58	---	74.00	21.42	H	9.7
16308.500000	---	44.79	54.00	9.21	H	9.7

π/4-DQPSK:

Low Channel: 2402MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



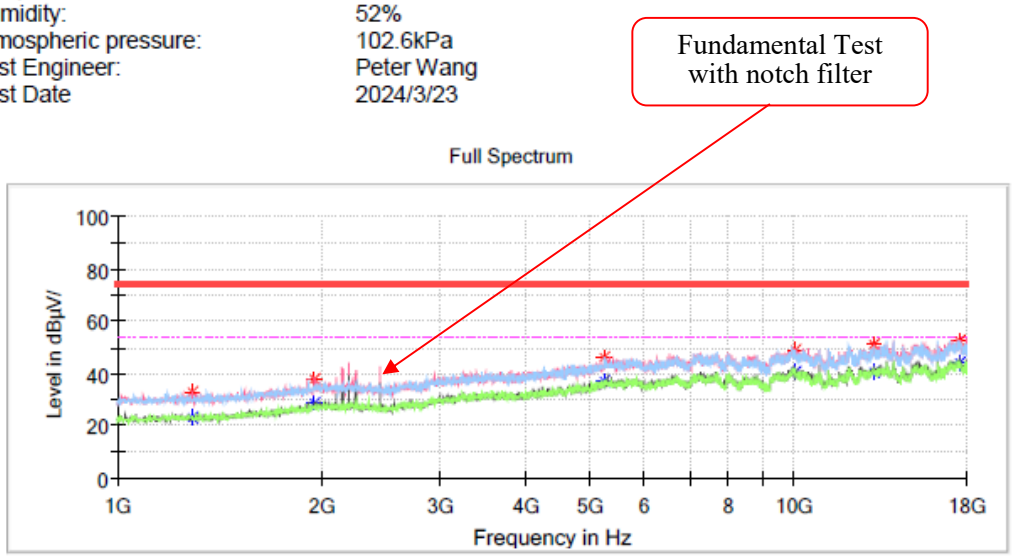
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1340.000000	---	23.76	54.00	30.24	H	-14.4
1340.000000	32.47	---	74.00	41.53	H	-14.4
2161.100000	---	36.41	54.00	17.59	V	-10.3
2161.100000	42.06	---	74.00	31.94	V	-10.3
3004.300000	---	29.99	54.00	24.01	V	-8.0
3004.300000	39.16	---	74.00	34.84	V	-8.0
4802.900000	---	38.62	54.00	15.38	V	-2.2
4802.900000	45.91	---	74.00	28.09	V	-2.2
8068.600000	---	38.01	54.00	15.99	V	3.8
8068.600000	45.83	---	74.00	28.17	V	3.8
14003.300000	---	45.19	54.00	8.81	V	10.5
14003.300000	54.23	---	74.00	19.77	V	10.5

Middle Channel: 2441MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



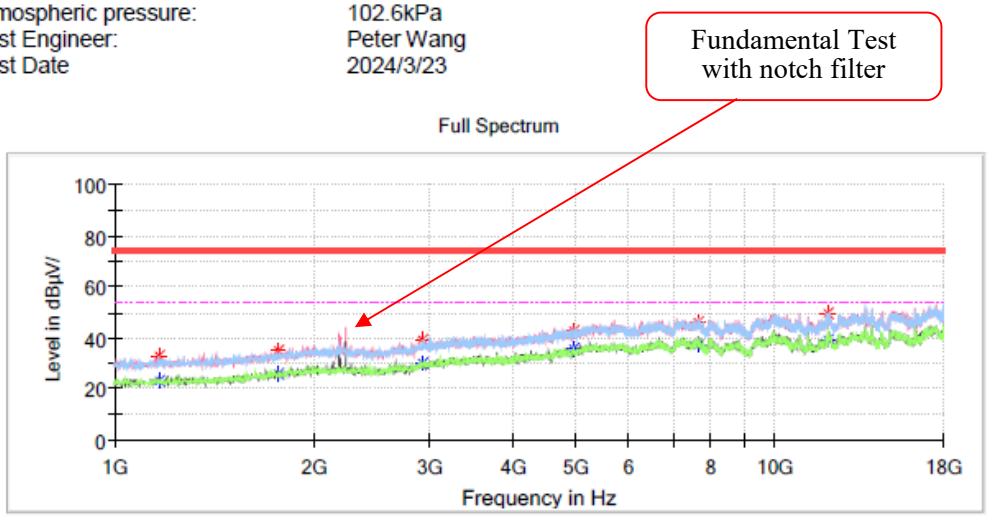
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1287.300000	---	22.80	54.00	31.20	H	-14.6
1287.300000	33.17	---	74.00	40.83	H	-14.6
1958.800000	---	28.66	54.00	25.34	V	-10.8
1958.800000	37.91	---	74.00	36.09	V	-10.8
5246.600000	---	36.89	54.00	17.11	H	-0.2
5246.600000	46.11	---	74.00	27.89	H	-0.2
10027.000000	---	40.52	54.00	13.48	V	7.8
10027.000000	48.87	---	74.00	25.13	V	7.8
13156.700000	---	40.48	54.00	13.52	H	9.6
13156.700000	50.88	---	74.00	23.12	H	9.6
17530.800000	---	44.13	54.00	9.87	V	13.5
17530.800000	52.58	---	74.00	21.42	V	13.5

High Channel: 2480MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



Critical_Freqs

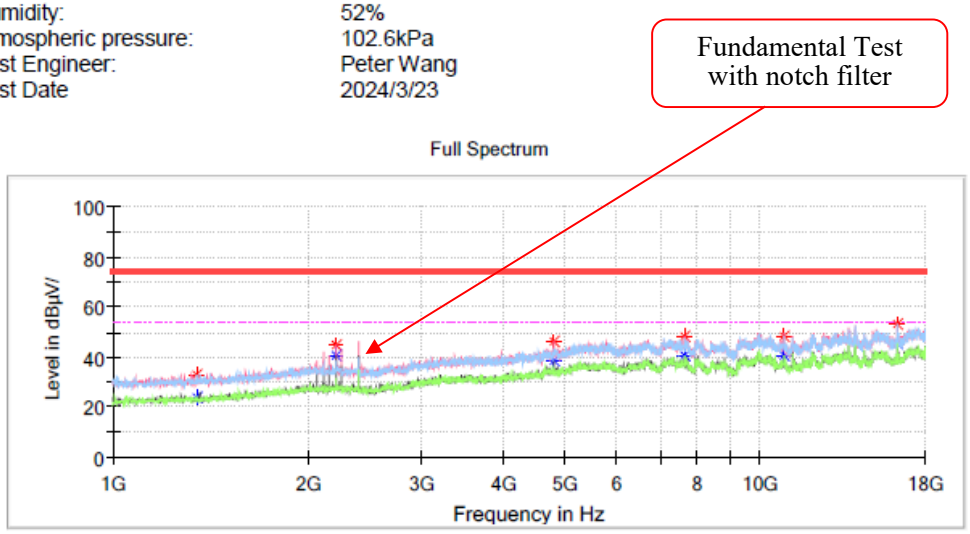
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1164.900000	32.69	---	74.00	41.31	H	-15.0
1164.900000	---	23.07	54.00	30.93	H	-15.0
1770.100000	---	25.96	54.00	28.04	H	-12.1
1770.100000	34.67	---	74.00	39.33	H	-12.1
2927.800000	---	29.83	54.00	24.17	V	-8.3
2927.800000	39.09	---	74.00	34.91	V	-8.3
4959.300000	---	35.51	54.00	18.49	V	-1.4
4959.300000	42.79	---	74.00	31.21	V	-1.4
7669.100000	---	37.25	54.00	16.75	V	4.1
7669.100000	46.23	---	74.00	27.77	V	4.1
12053.400000	---	39.42	54.00	14.58	V	7.0
12053.400000	49.75	---	74.00	24.25	V	7.0

8DPSK:

Low Channel: 2402MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



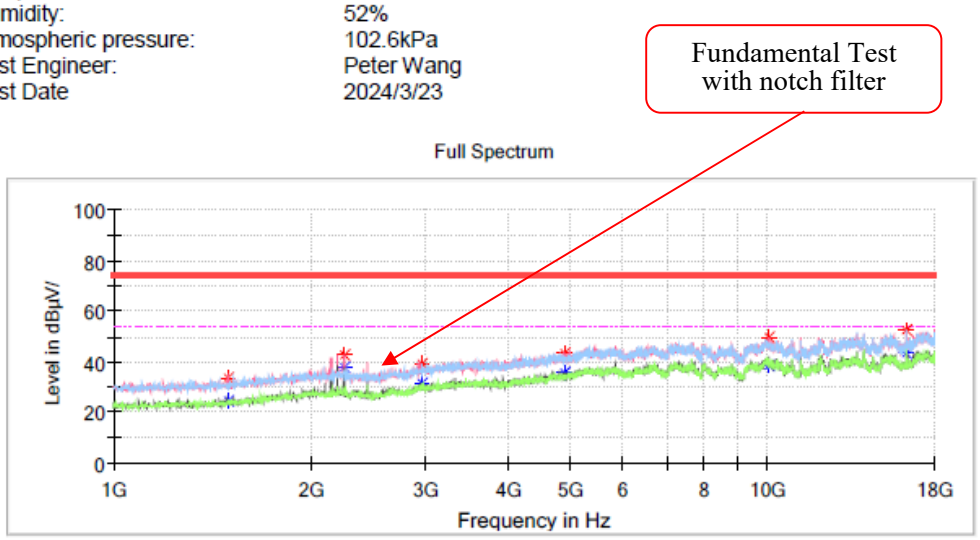
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1350.200000	32.82	---	74.00	41.18	H	-14.4
1350.200000	---	23.67	54.00	30.33	H	-14.4
2208.700000	44.62	---	74.00	29.38	V	-10.2
2208.700000	---	40.33	54.00	13.67	V	-10.2
4802.900000	45.83	---	74.00	28.17	V	-2.2
4802.900000	---	38.81	54.00	15.19	V	-2.2
7638.500000	48.38	---	74.00	25.62	V	4.1
7638.500000	---	40.33	54.00	13.67	V	4.1
10865.100000	48.46	---	74.00	25.54	V	6.6
10865.100000	---	40.68	54.00	13.32	V	6.6
16301.700000	52.88	---	74.00	21.12	H	9.7
16301.700000	---	45.59	54.00	8.41	H	9.7

Middle Channel: 2441MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



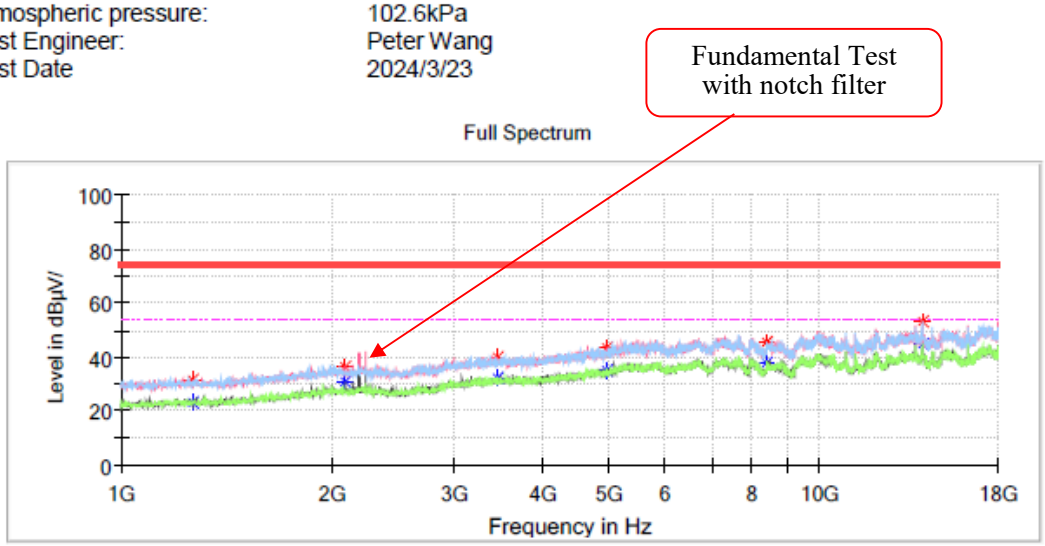
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1493.000000	---	24.34	54.00	29.66	V	-14.0
1493.000000	33.67	---	74.00	40.33	V	-14.0
2247.800000	---	37.93	54.00	16.07	V	-10.2
2247.800000	42.79	---	74.00	31.21	V	-10.2
2953.300000	---	31.72	54.00	22.28	H	-8.2
2953.300000	39.20	---	74.00	34.80	H	-8.2
4881.100000	---	35.52	54.00	18.48	V	-1.8
4881.100000	43.63	---	74.00	30.37	V	-1.8
10064.400000	---	38.62	54.00	15.38	V	7.7
10064.400000	49.55	---	74.00	24.45	V	7.7
16306.800000	---	43.36	54.00	10.64	H	9.7
16306.800000	52.32	---	74.00	21.68	H	9.7

High Channel: 2480MHz

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



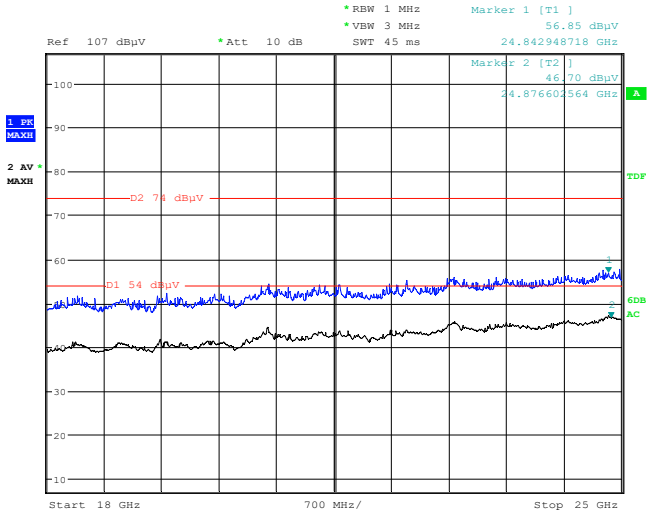
Critical_Freqs

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	31.64	---	74.00	42.36	V	-14.7
1265.200000	---	23.26	54.00	30.74	V	-14.7
2094.800000	36.66	---	74.00	37.34	V	-10.4
2094.800000	---	30.63	54.00	23.37	V	-10.4
3453.100000	---	31.91	54.00	22.09	V	-6.3
3453.100000	39.88	---	74.00	34.12	V	-6.3
4959.300000	---	34.86	54.00	19.14	V	-1.4
4959.300000	43.59	---	74.00	30.41	V	-1.4
8401.800000	---	37.75	54.00	16.25	V	3.9
8401.800000	45.74	---	74.00	28.26	V	3.9
14001.600000	53.00	---	74.00	21.00	H	10.5
14001.600000	---	45.02	54.00	8.98	H	10.5

18GHz-25GHz:

EUT operation mode: Transmitting in middle channel of 8DPSK mode (Worst case)

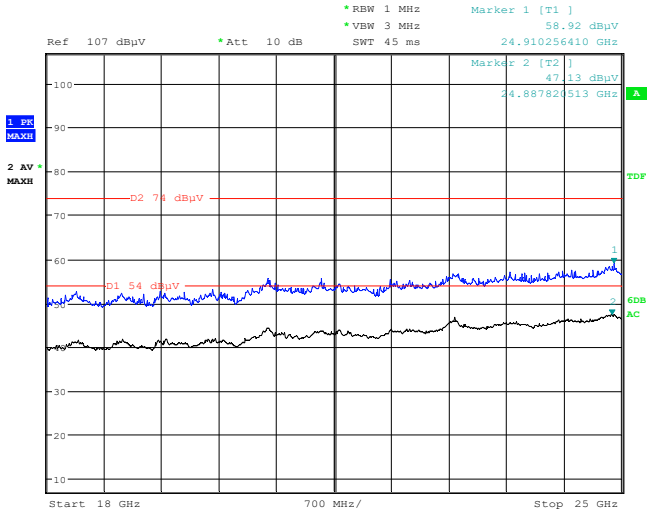
Horizontal



Project No.: RSHA240311001 Tester: Peter Wang

Date: 18.APR.2024 14:11:01

Vertical



Project No.: RSHA240311001 Tester: Peter Wang

Date: 18.APR.2024 14:25:45

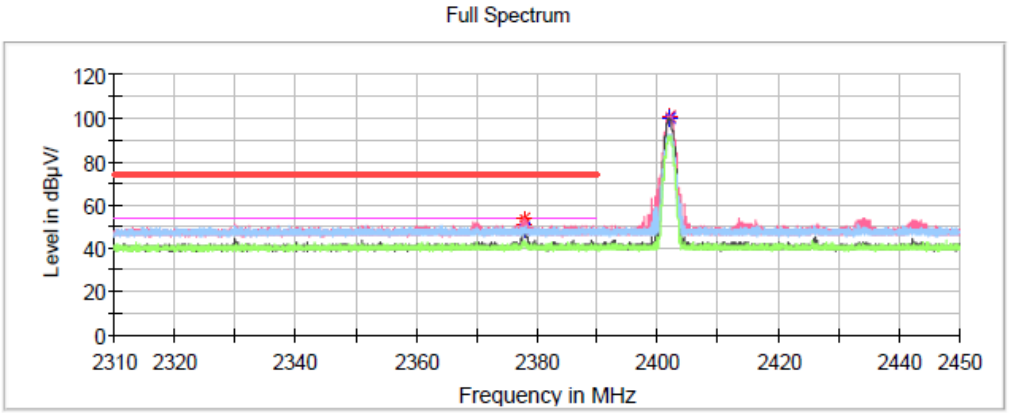
Note: The test distance is 3m. The limit is 74dBµV/m(Peak) and 54dBµV/m(Average).

Band Edge:
GFSK:

Low Channel

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



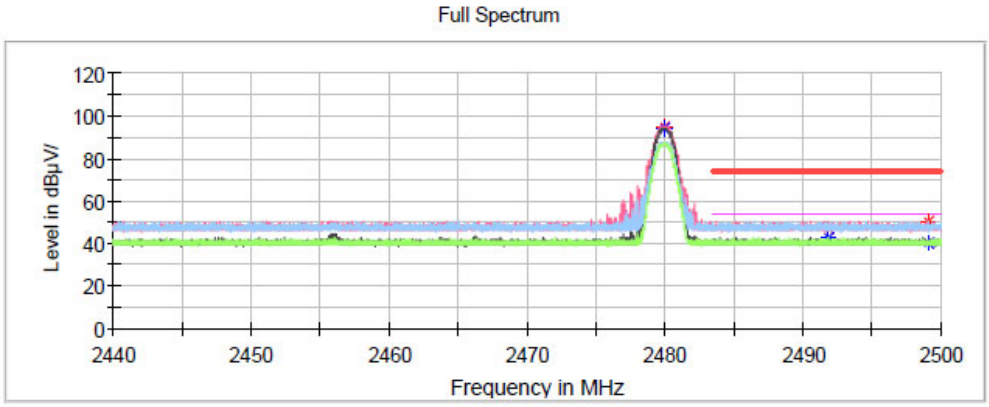
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2377.802000	51.29	---	74.00	22.71	H	0.0
2377.802000	---	49.51	54.00	4.49	H	0.0
2378.012000	53.77	---	74.00	20.23	V	0.0
2378.012000	---	48.63	54.00	5.37	V	0.0

High Channel

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



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)
2491.876000	---	43.22	54.00	10.78	H	0.2
2491.876000	47.34	---	74.00	26.66	H	0.2
2499.142000	---	40.63	54.00	13.37	V	0.2
2499.142000	50.37	---	74.00	23.63	V	0.2

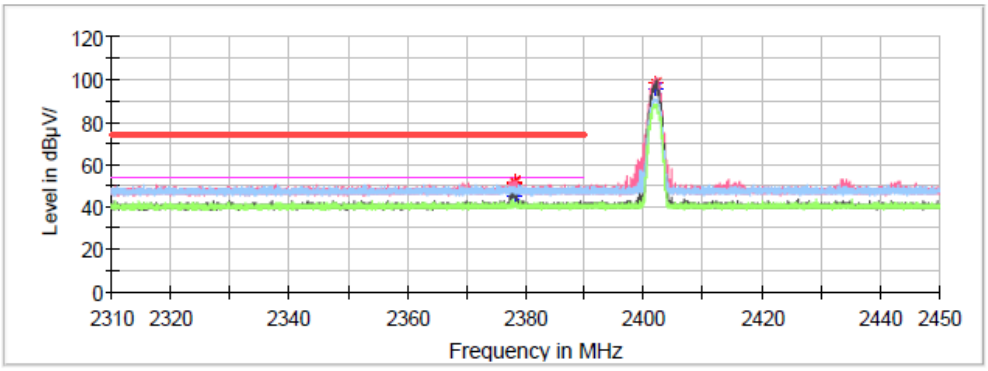
π/4-DQPSK:

Low Channel

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23

Full Spectrum



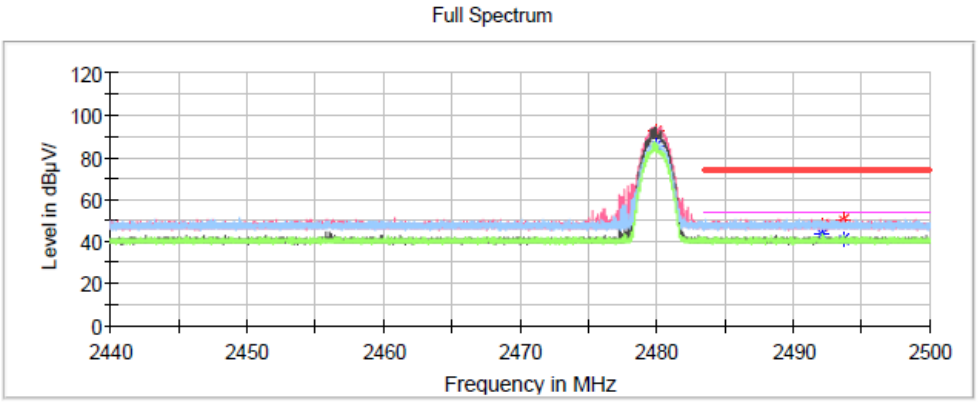
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2378.054000	---	44.95	54.00	9.05	H	0.0
2378.054000	51.98	---	74.00	22.02	H	0.0
2378.222000	---	47.65	54.00	6.35	V	0.0
2378.222000	51.42	---	74.00	22.58	V	0.0

High Channel

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



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)
2492.122000	47.86	---	74.00	26.14	H	0.2
2492.122000	---	43.46	54.00	10.54	H	0.2
2493.724000	50.56	---	74.00	23.44	V	0.2
2493.724000	---	41.34	54.00	12.66	V	0.2

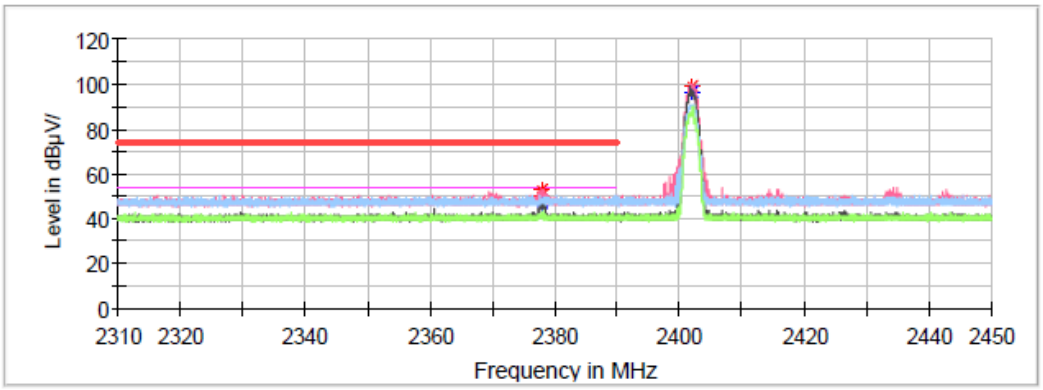
8DPSK:

Low Channel

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23

Full Spectrum



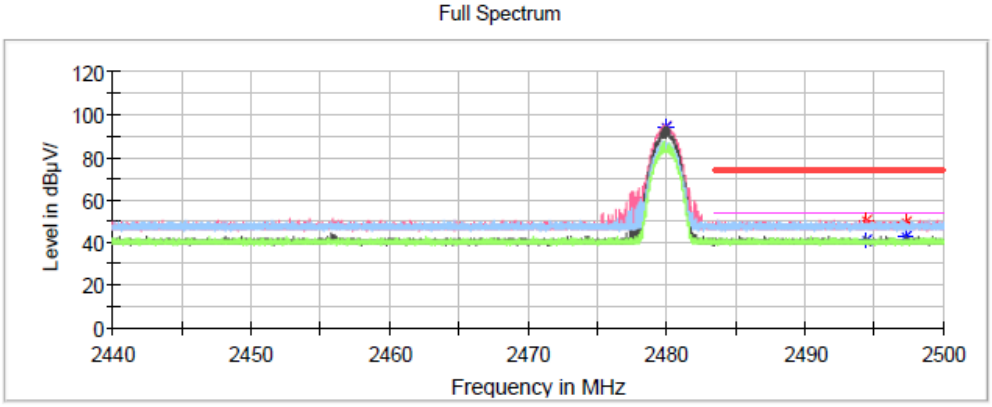
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2377.872000	---	47.59	54.00	6.41	H	0.0
2377.872000	50.32	---	74.00	23.68	H	0.0
2377.942000	---	47.27	54.00	6.73	V	0.0
2377.942000	52.88	---	74.00	21.12	V	0.0

High Channel

Common Information

Project No.:	RSHA240311001
EUT Model:	MS-M7
Test Mode:	BT
Standard:	FCC Part 15.247
Test Equipment:	ESU40,3115,PAM-0118P
Temperature:	20.3℃
Humidity:	52%
Atmospheric pressure:	102.6kPa
Test Engineer:	Peter Wang
Test Date	2024/3/23



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)
2494.384000	50.69	---	74.00	23.31	V	0.2
2494.384000	---	41.00	54.00	13.00	V	0.2
2497.252000	49.22	---	74.00	24.78	V	0.2
2497.252000	---	42.85	54.00	11.15	V	0.2

CHANNEL Separation Test

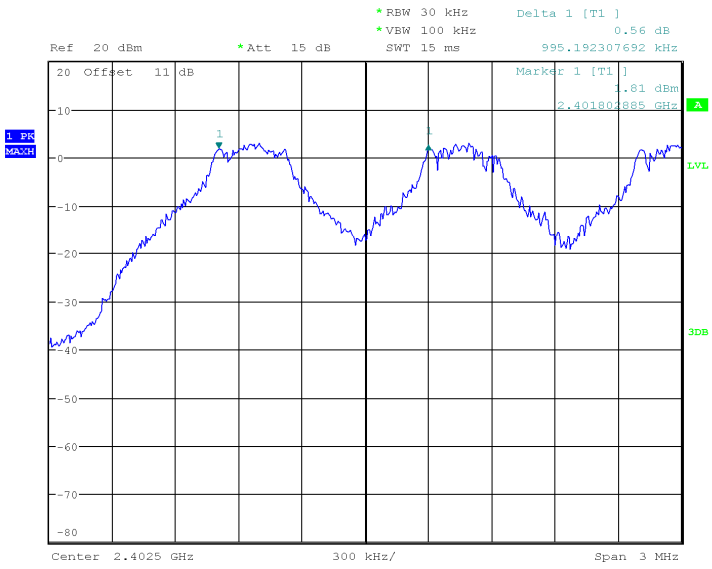
EUT operation mode: Transmitting

Test Result: Compliant.

Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
BDR (GFSK)	Low	2402	0.995	0.635	Pass
	Adjacent	2403			
	Middle	2441	1.004	0.656	Pass
	Adjacent	2442			
	High	2480	1.010	0.621	Pass
	Adjacent	2479			
EDR (π/4-DQPSK)	Low	2402	1.000	0.896	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.877	Pass
	Adjacent	2442			
	High	2480	1.005	0.883	Pass
	Adjacent	2479			
EDR (8DPSK)	Low	2402	0.995	0.893	Pass
	Adjacent	2403			
	Middle	2441	1.000	0.883	Pass
	Adjacent	2442			
	High	2480	1.005	0.872	Pass
	Adjacent	2479			

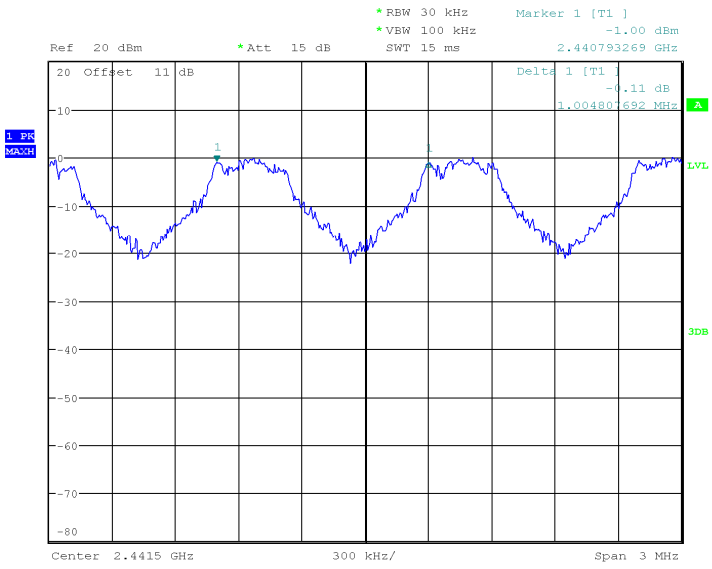
Note: Limit = 20 dB bandwidth*2/3

BDR (GFSK): Low Channel



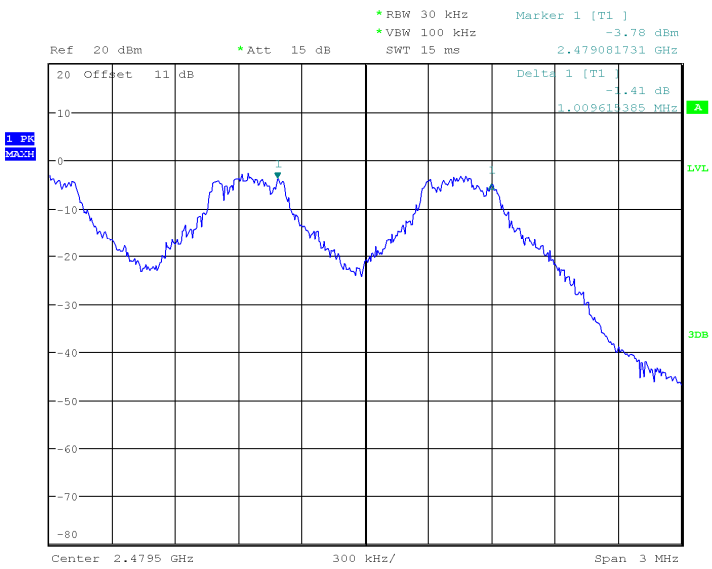
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:58:53

BDR (GFSK): Middle Channel



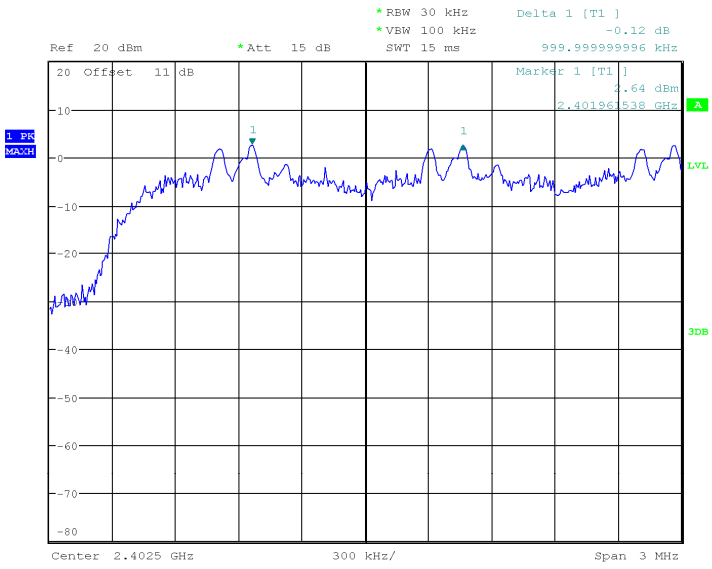
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 20:07:12

BDR (GFSK): High Channel



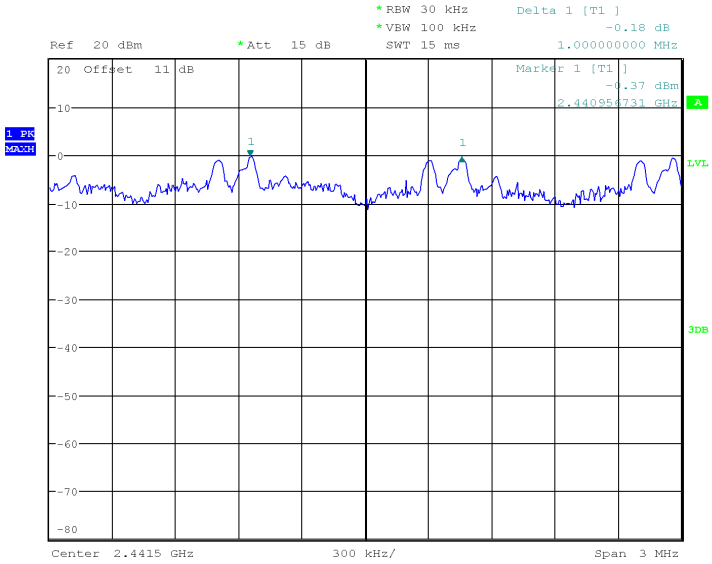
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 20:13:34

EDR (π/4-DQPSK): Low Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 20:00:10

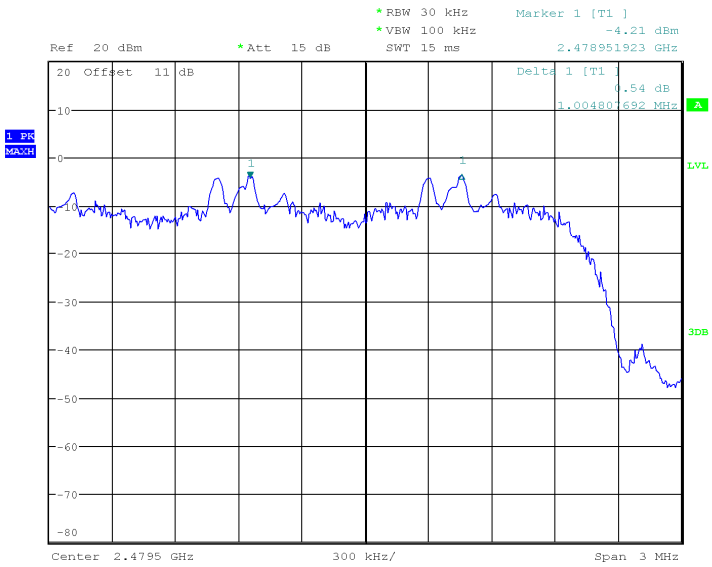
EDR (π/4-DQPSK): Middle Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 20:09:05

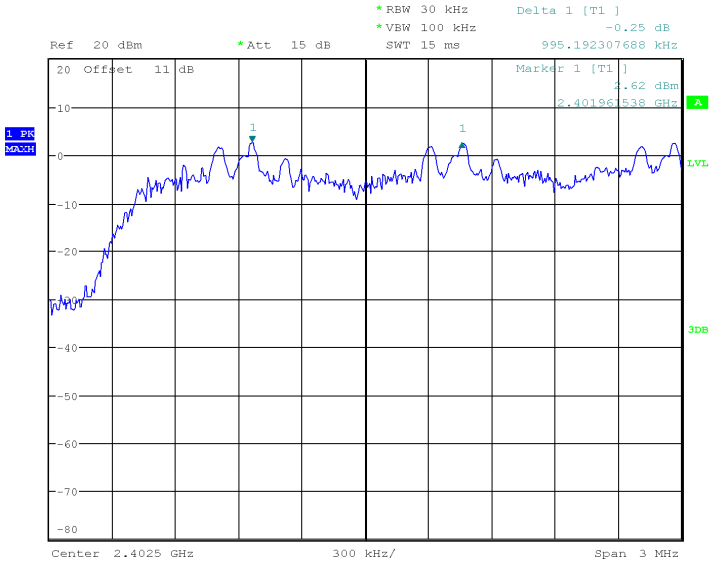
EDR (π/4-DQPSK): High Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 20:12:17

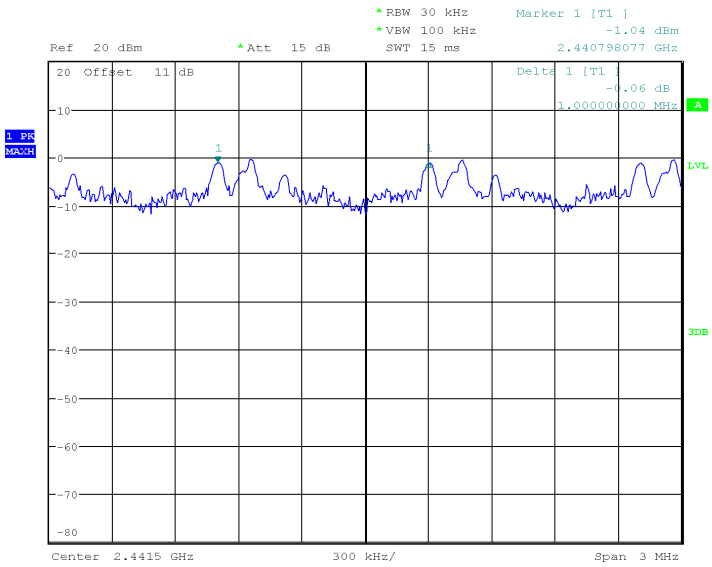
EDR (8DPSK): Low Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 20:01:44

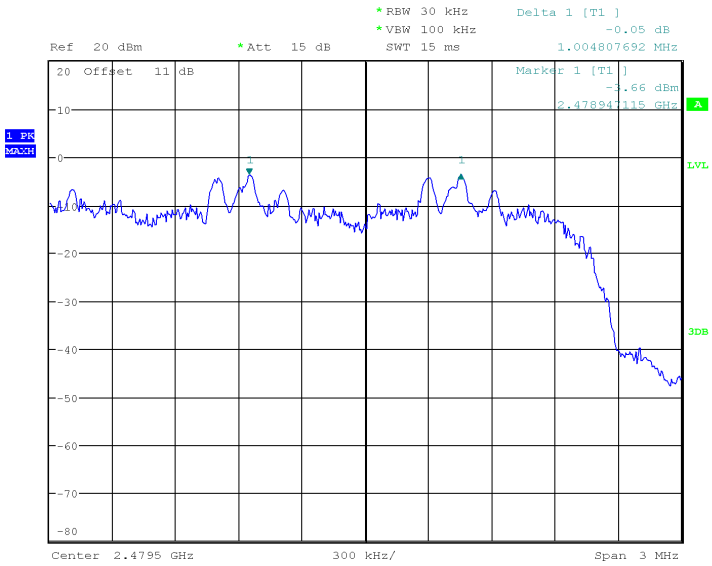
EDR (8DPSK): Middle Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 20:10:14

EDR (8DPSK): High Channel



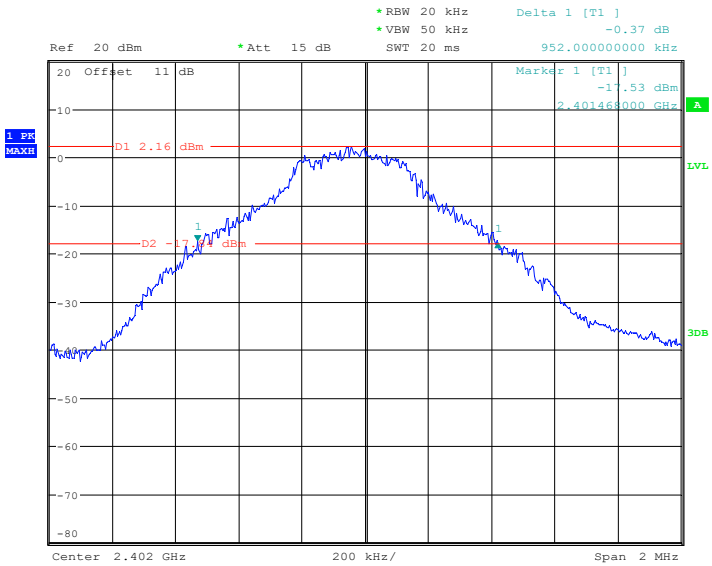
ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 20:11:17

20 dB BANDWIDTH TEST

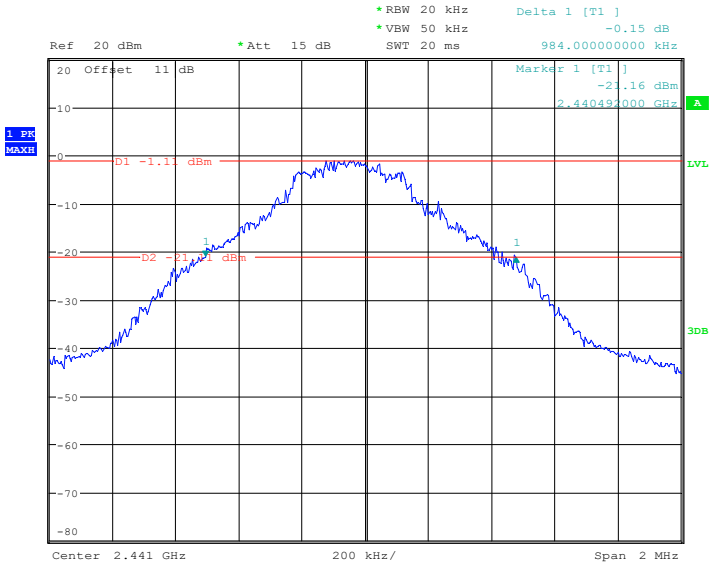
Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.952
	Middle	2441	0.984
	High	2480	0.932
EDR (π/4-DQPSK)	Low	2402	1.344
	Middle	2441	1.316
	High	2480	1.324
EDR (8DPSK)	Low	2402	1.34
	Middle	2441	1.324
	High	2480	1.308

BDR (GFSK): Low Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 18:22:03

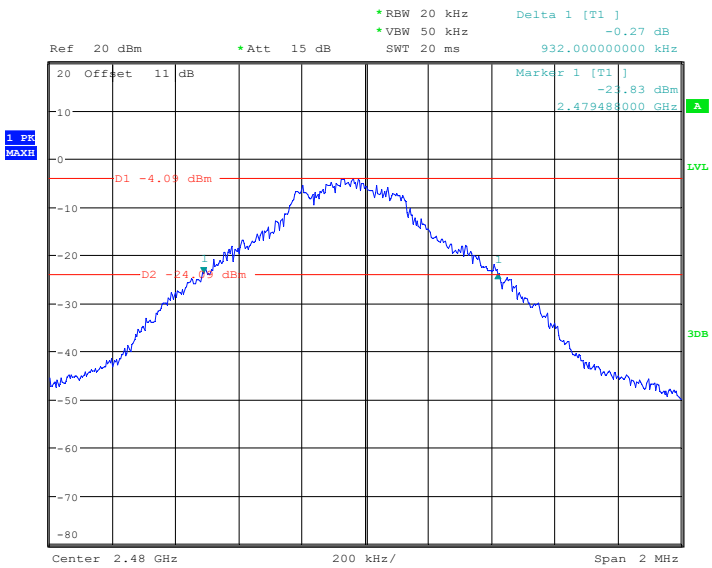
BDR (GFSK): Middle Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 18:27:20

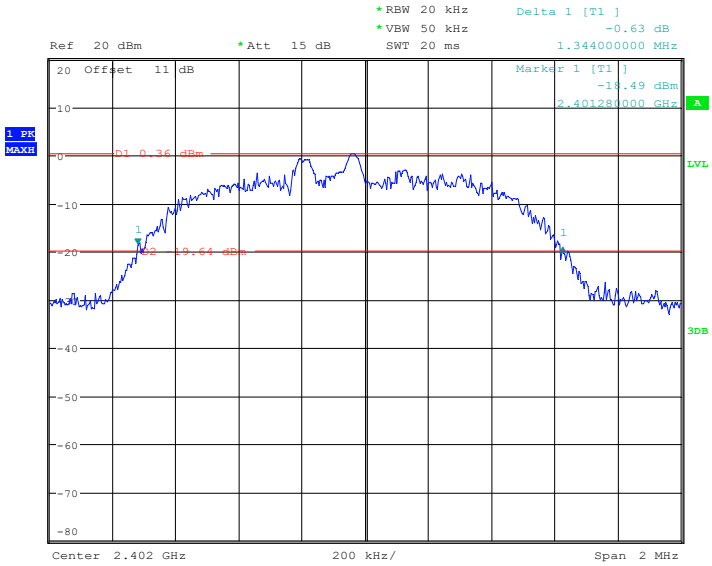
BDR (GFSK): High Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 18:30:43

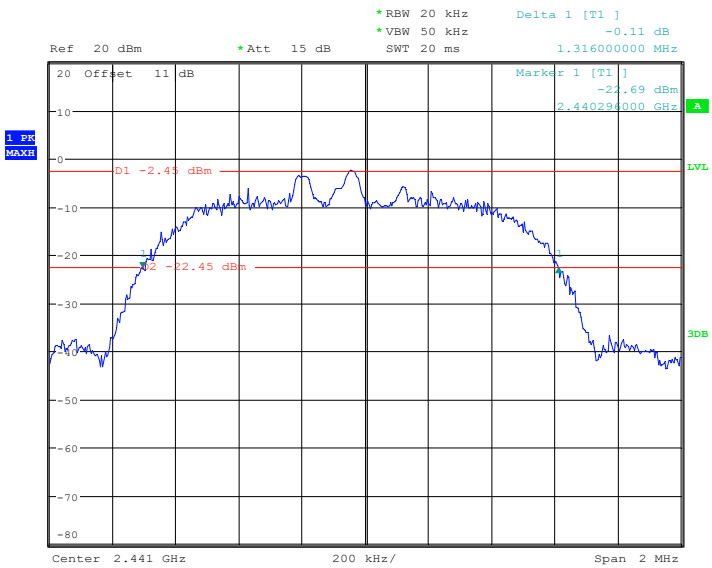
EDR (π/4-DQPSK): Low Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 18.MAR.2024 19:06:43

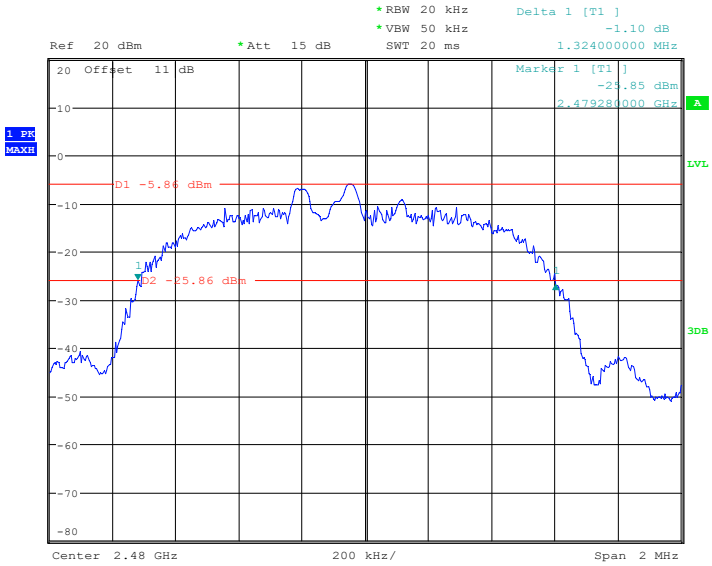
EDR(π/4-DQPSK): Middle Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

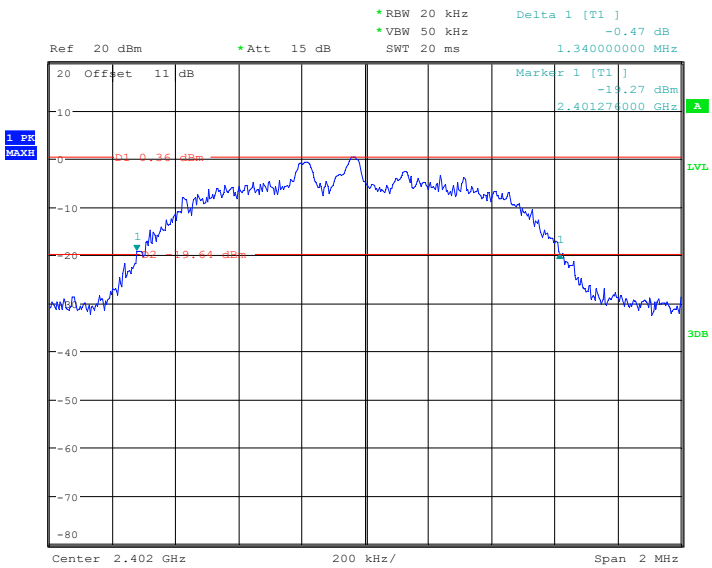
Date: 18.MAR.2024 19:10:43

EDR (π/4-DQPSK): High Channel



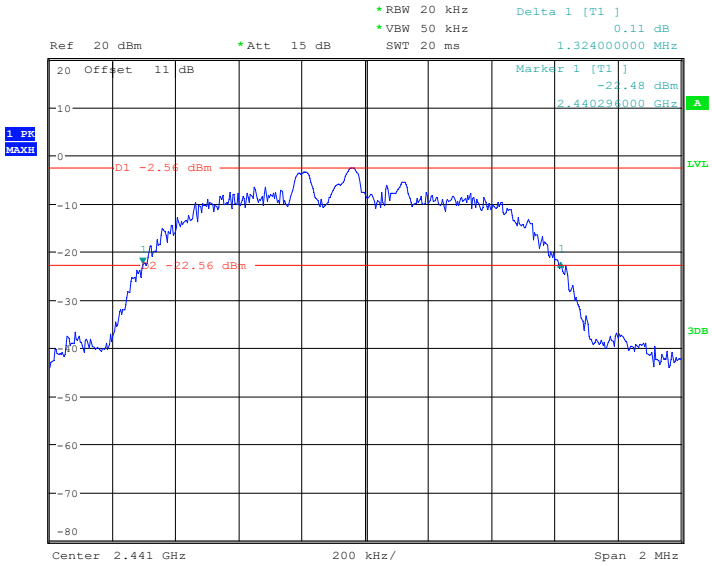
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:14:31

EDR (8DPSK): Low Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 09:31:10

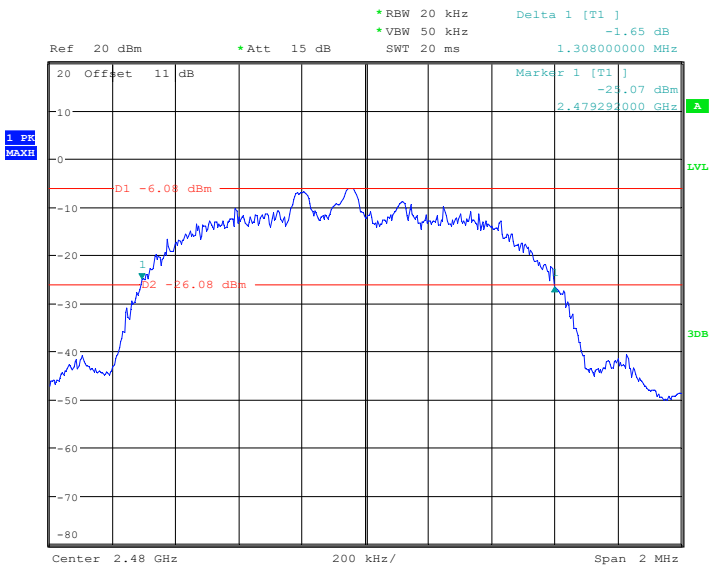
EDR (8DPSK): Middle Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 19.MAR.2024 09:35:37

EDR (8DPSK): High Channel



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 19.MAR.2024 09:50:42

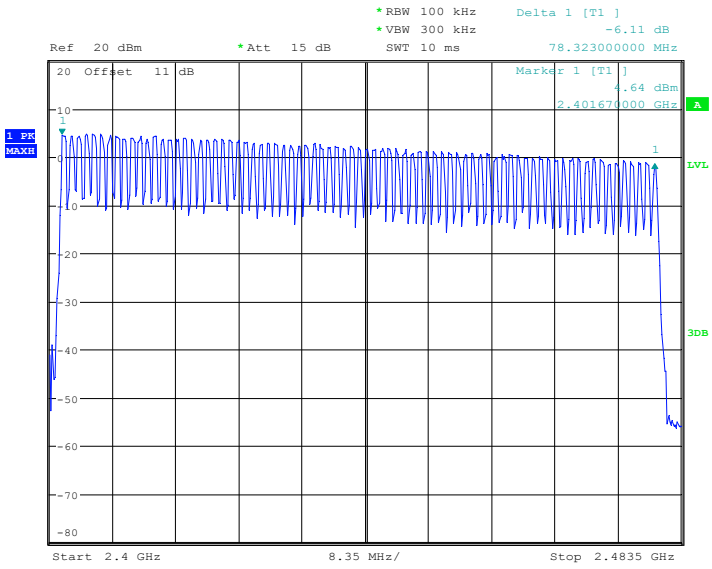
QUANTITY OF HOPPING CHANNEL TEST

EUT operation mode: Hopping

Test Result: Compliant.

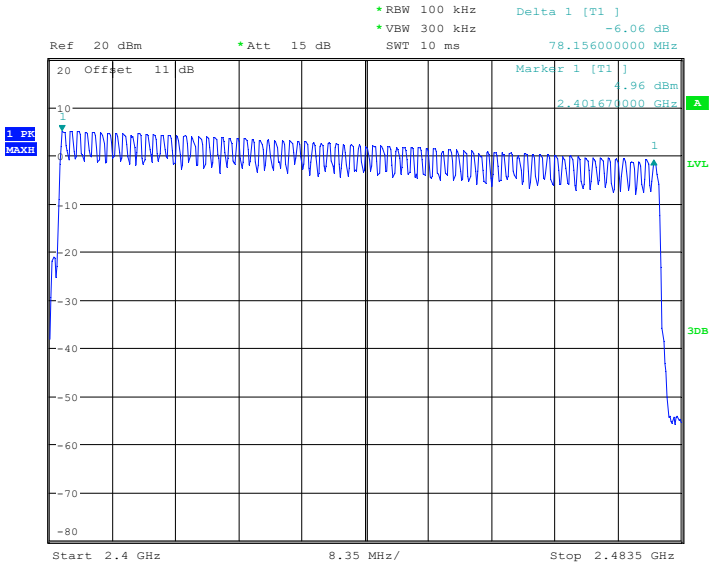
Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥15
EDR (π/4-DQPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15

BDR (GFSK): Number of Hopping Channels



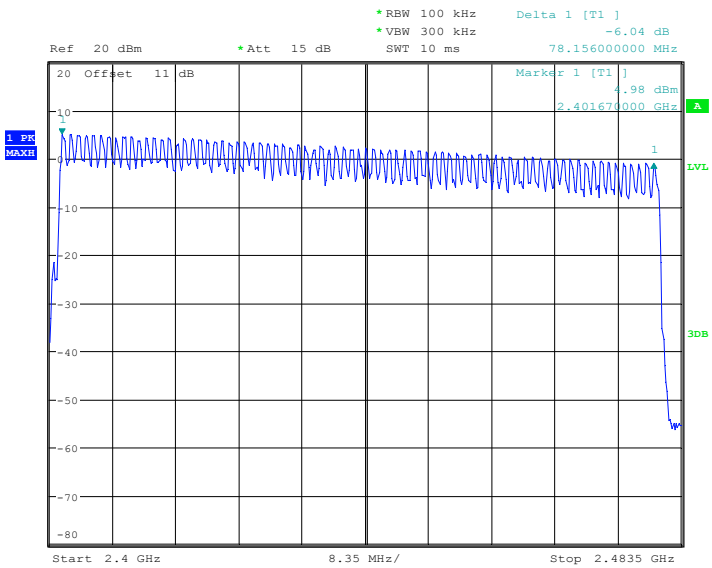
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 13:18:59

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



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 13:32:07

EDR (8DPSK): Number of Hopping Channels



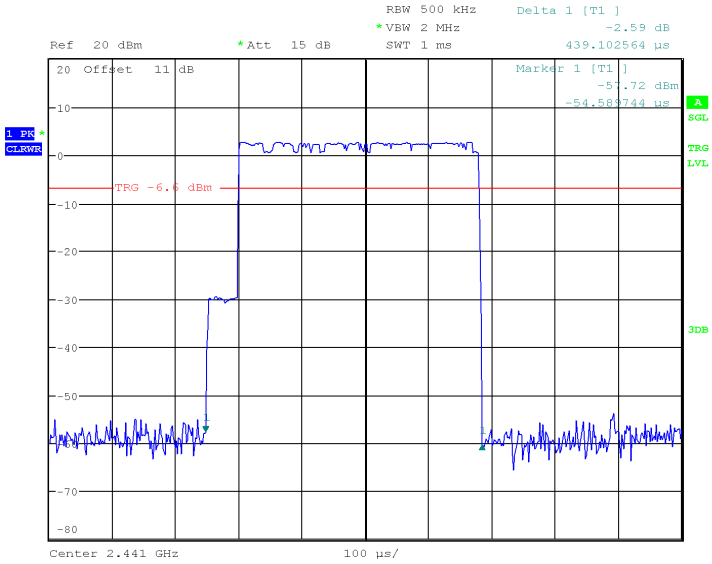
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 13:40:03

TIME OF OCCUPANCY (DWELL TIME)

EUT operation mode: Hopping
Test Result: Compliant.

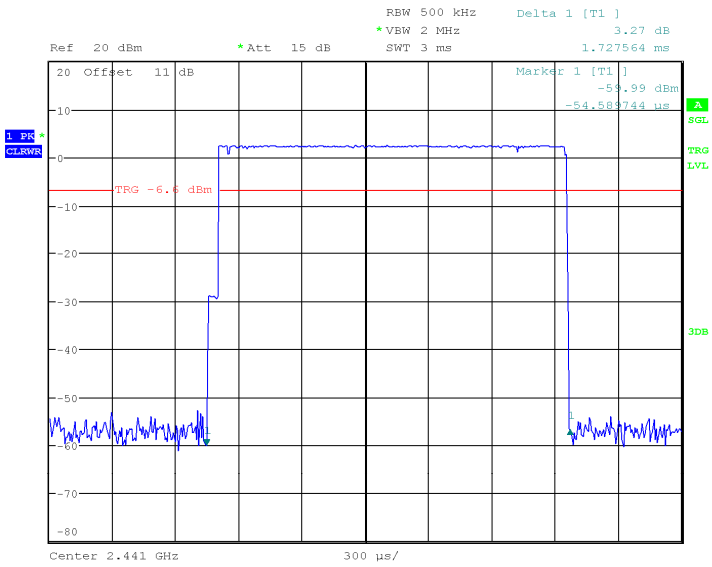
Mode		Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
EDR (GFSK)	DH1	Middle	0.439	0.14	0.4	Pass
		Note: DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	DH3	Middle	1.728	0.276	0.4	Pass
		Note: DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	DH5	Middle	2.978	0.318	0.4	Pass
		Note: DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (π/4-DQPSK)	2DH1	Middle	0.463	0.148	0.4	Pass
		Note: 2DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	2DH3	Middle	1.723	0.276	0.4	Pass
		Note: 2DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	2DH5	Middle	2.978	0.318	0.4	Pass
		Note: 2DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				
EDR (8DPSK)	3DH1	Middle	0.458	0.147	0.4	Pass
		Note:3 DH1:Dwell time = Pulse time*(1600/2/79)*31.6S				
	3DH3	Middle	1.728	0.276	0.4	Pass
		Note: 3DH3:Dwell time = Pulse time*(1600/4/79)*31.6S				
	3DH5	Middle	2.978	0.318	0.4	Pass
		Note: 3DH5:Dwell time = Pulse time*(1600/6/79)*31.6S				

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



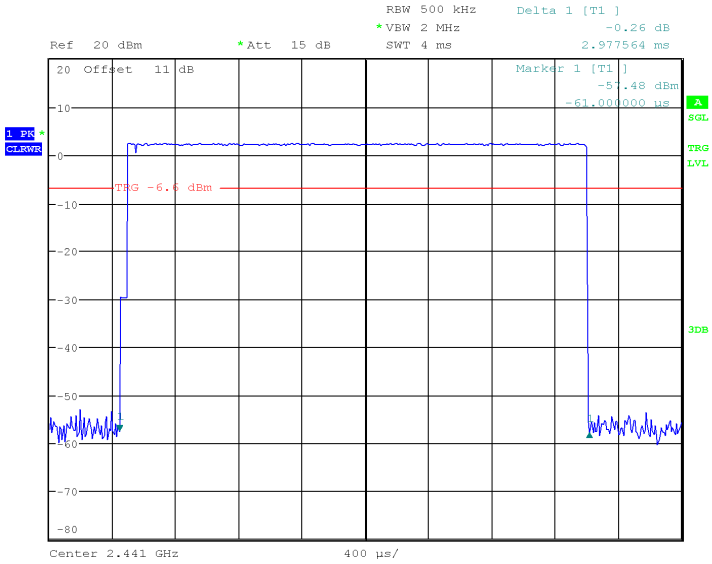
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:09:35

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



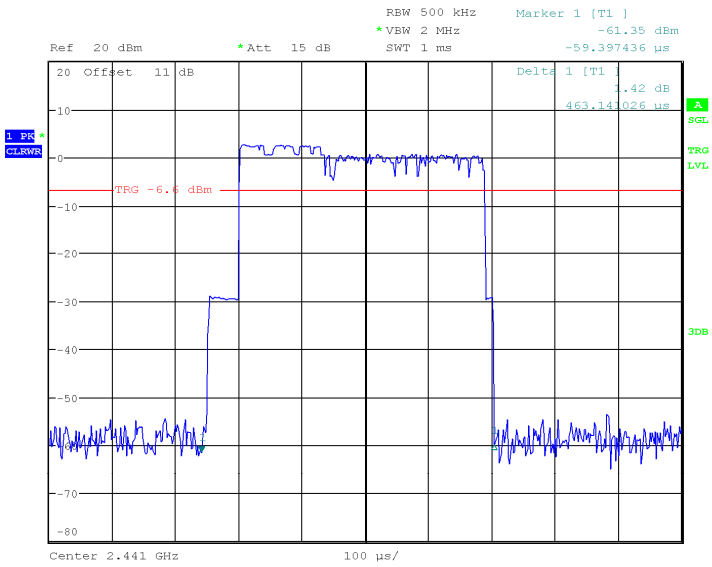
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:16:35

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



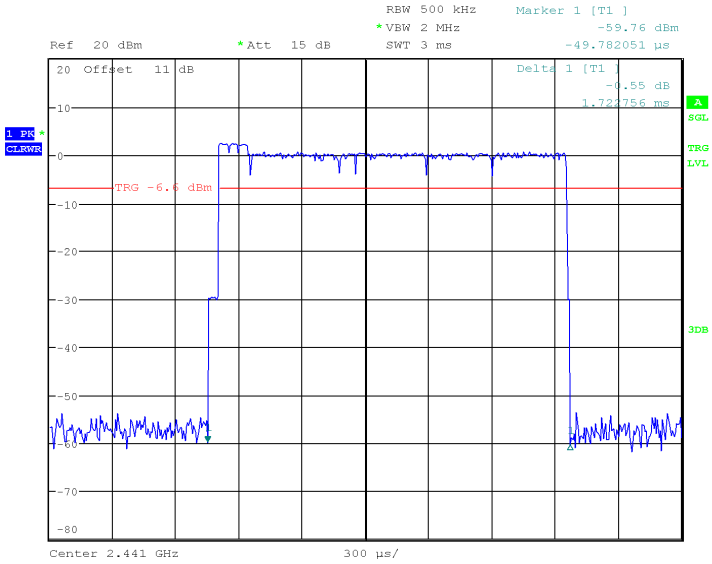
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:20:18

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



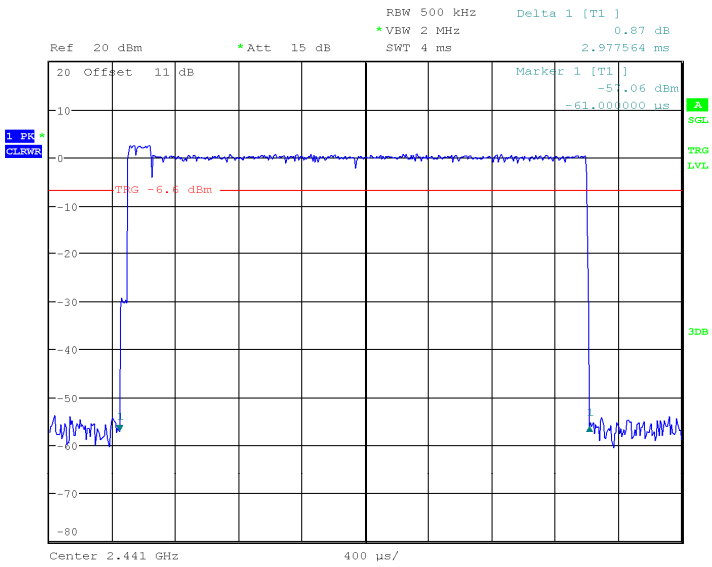
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:14:27

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



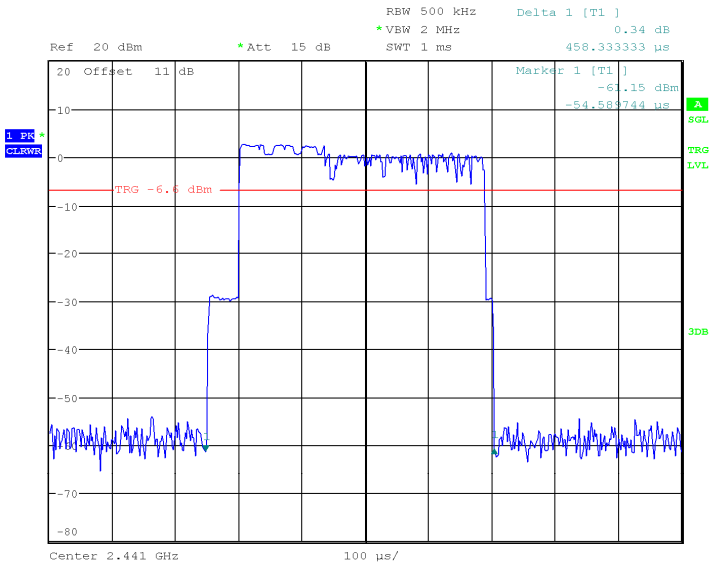
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:18:05

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



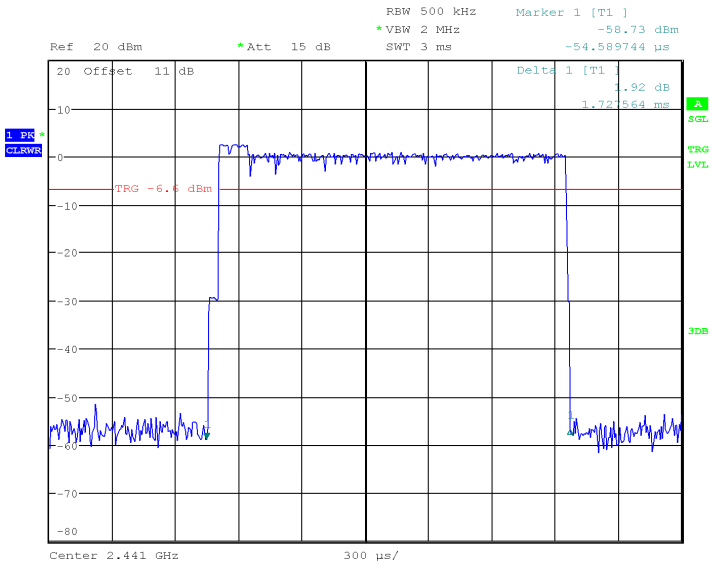
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:20:43

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



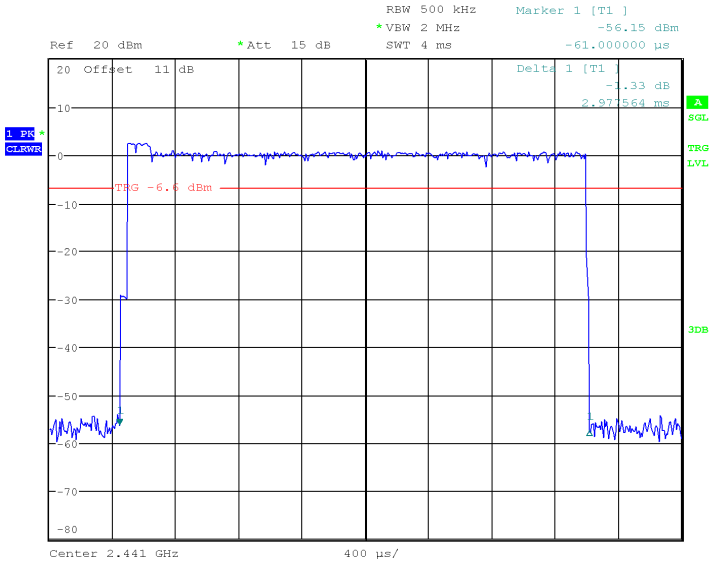
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:15:04

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



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 10:18:56

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



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 21.MAR.2024 10:21:20

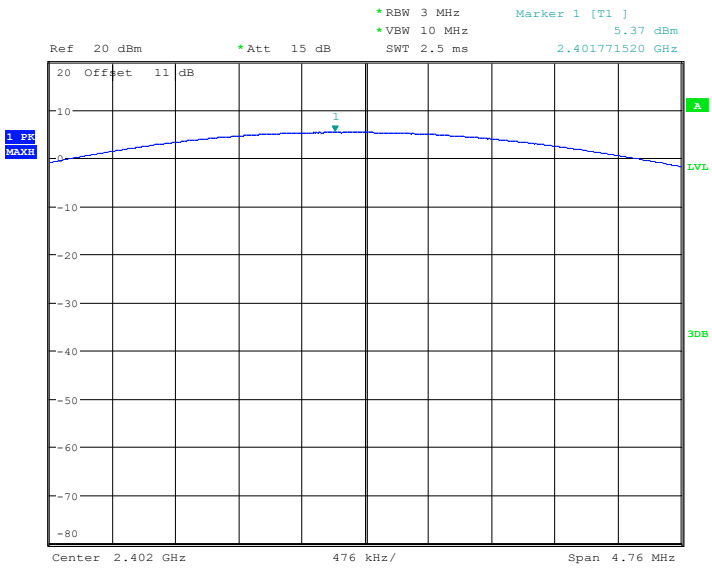
PEAK OUTPUT POWER MEASUREMENT

EUT operation mode: Transmitting

Test Result: Compliant.

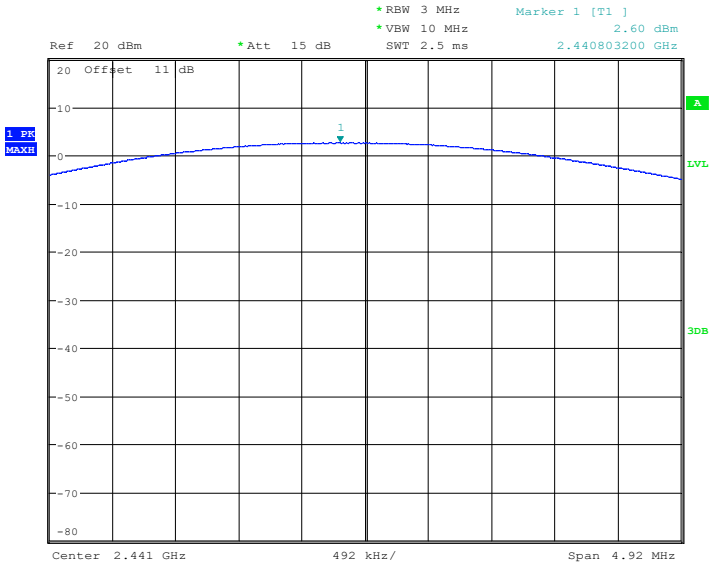
Mode	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)
BDR (GFSK)	2402	5.37	21
	2441	2.6	21
	2480	-0.71	21
EDR (π/4-DQPSK)	2402	5.27	21
	2441	2.51	21
	2480	-0.78	21
EDR (8DPSK)	2402	5.42	21
	2441	2.87	21
	2480	-0.33	21

BDR (GFSK): 2402MHz



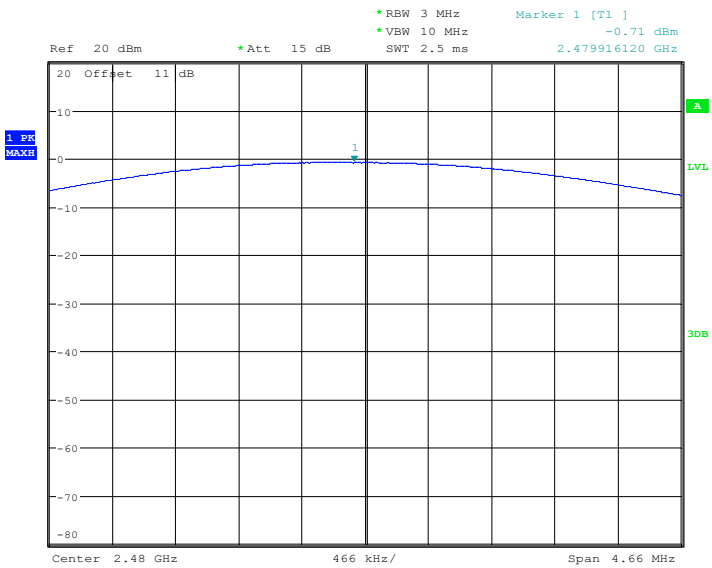
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 18:22:29

BDR (GFSK): 2441MHz



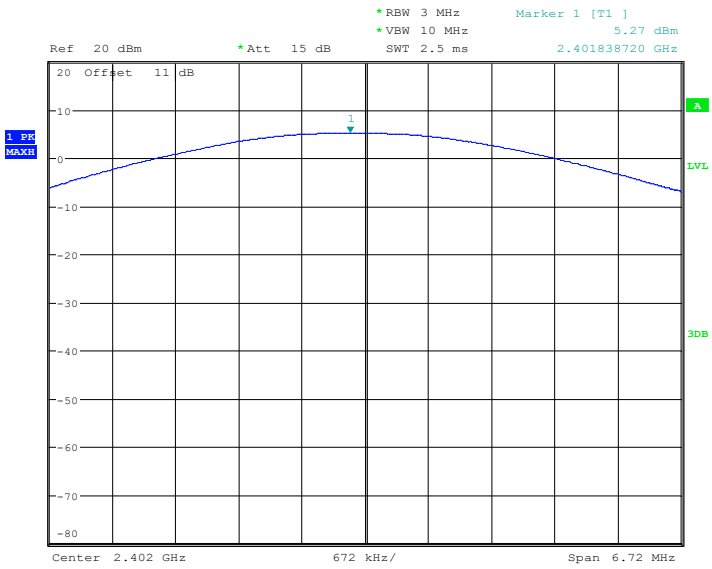
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 18:27:48

BDR (GFSK): 2480MHz



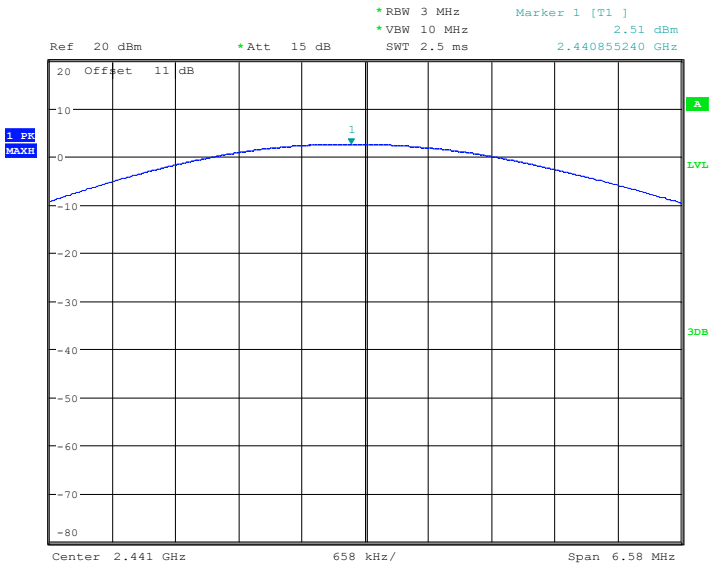
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 18:31:12

EDR(π/4-DQPSK): 2402MHz



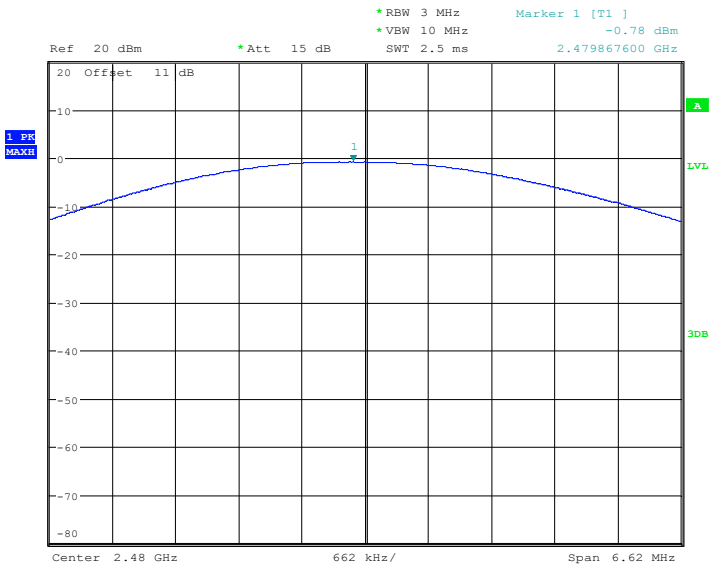
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:07:12

EDR(π/4-DQPSK): 2441MHz



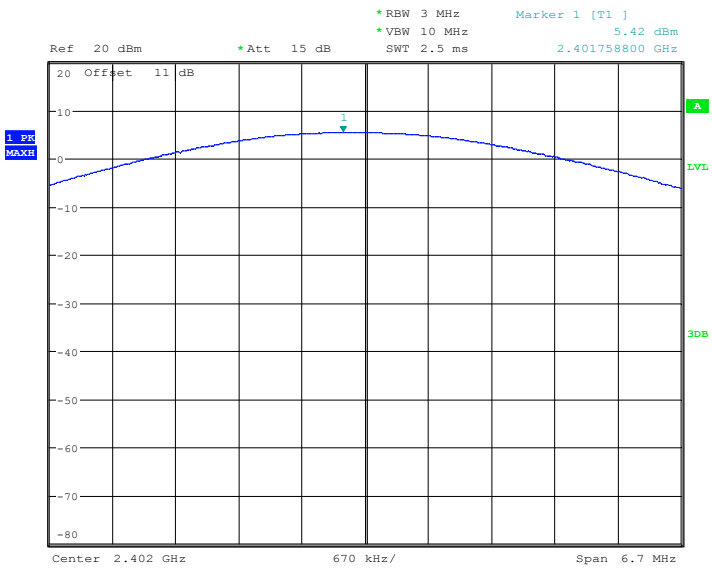
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:11:11

EDR(π/4-DQPSK): 2480MHz



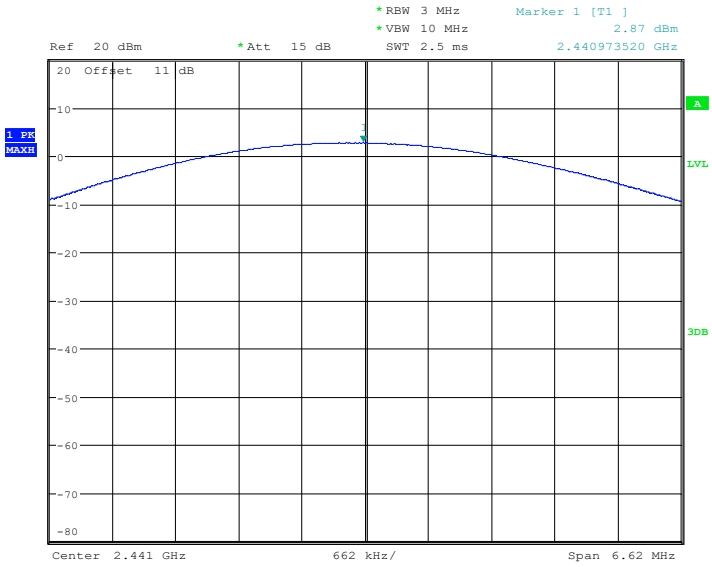
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:15:00

EDR(8DPSK): 2402MHz



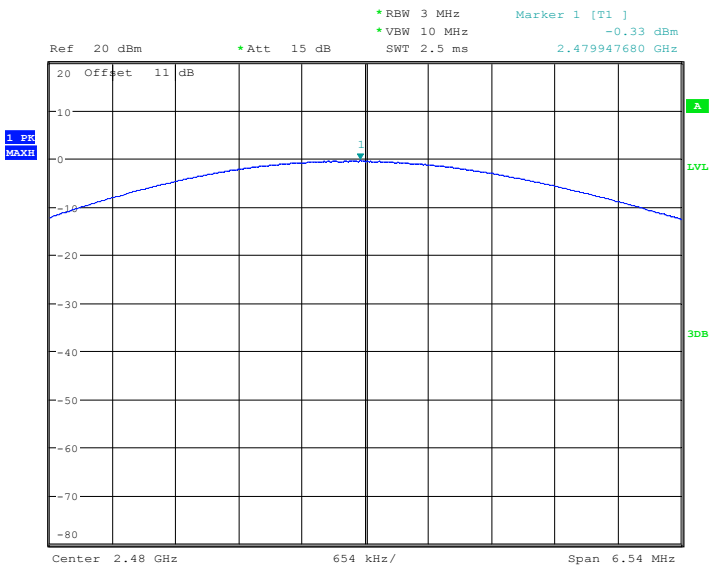
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 09:31:39

EDR(8DPSK): 2441MHz



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 09:36:06

EDR(8DPSK): 2480MHz



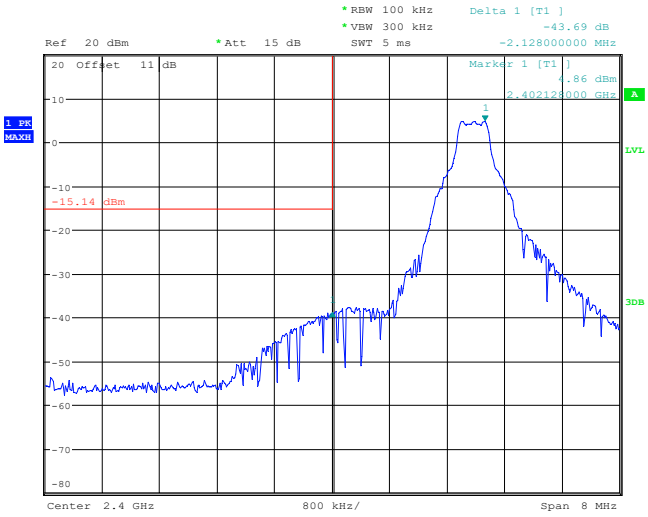
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 19.MAR.2024 09:51:10

BAND EDGES TESTING

EUT operation mode: Transmitting & Hopping
Test Result: Compliant

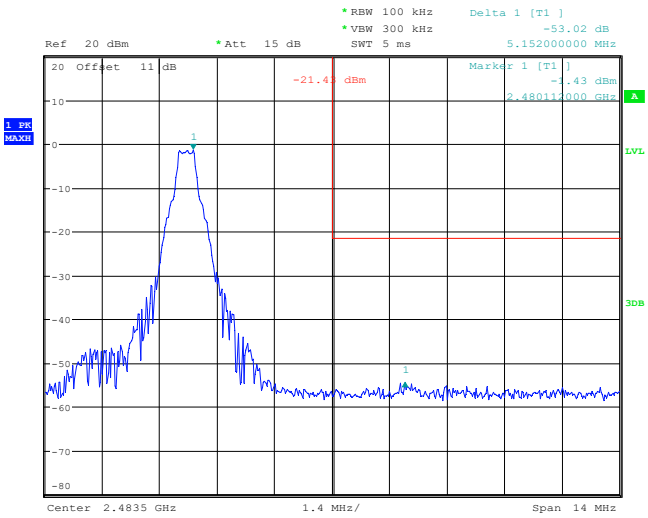
Band Edge

BDR (GFSK): Left Side



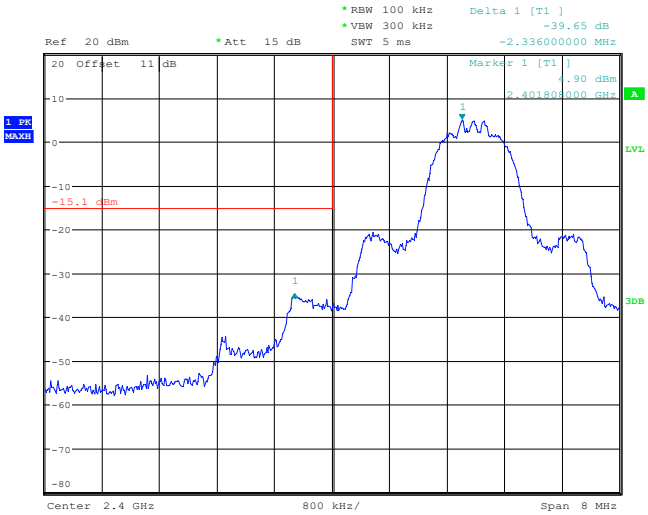
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 18:58:35

BDR (GFSK): Right Side



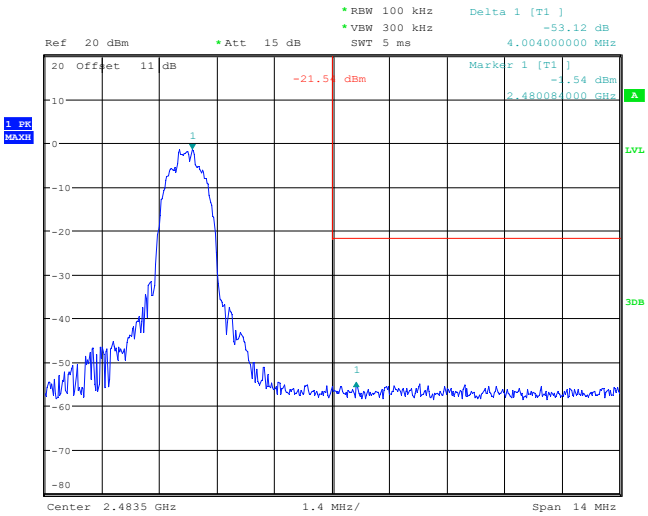
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:03:53

EDR (π/4-DQPSK): Left Side



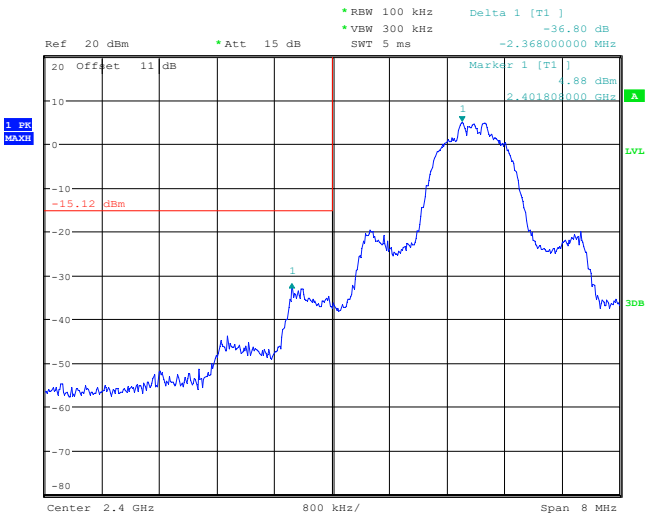
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:28:45

EDR (π/4-DQPSK): Right Side



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 18.MAR.2024 19:34:07

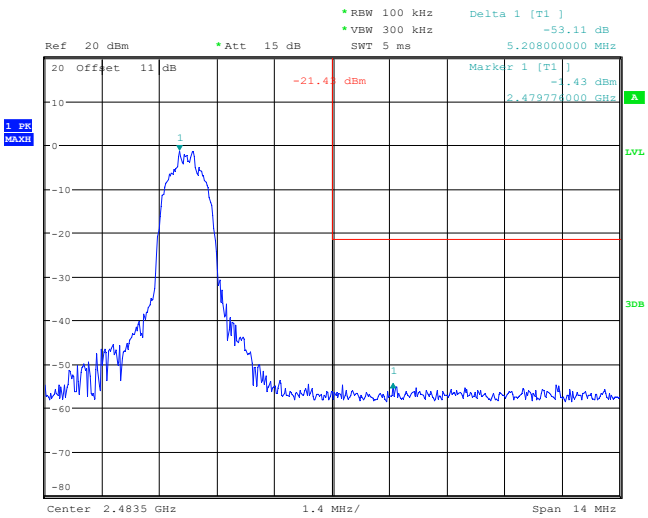
EDR (8DPSK): Left Side



ProjectNo.:RSHA240311001 Tester:Bard Liu

Date: 19.MAR.2024 10:18:14

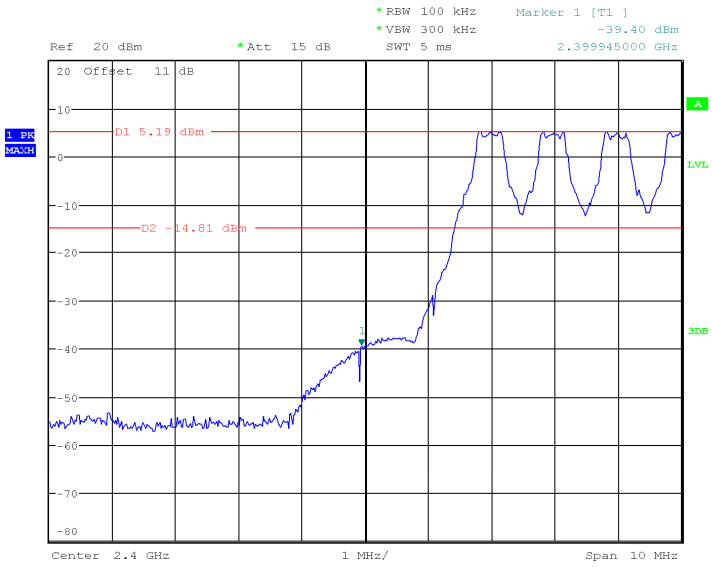
EDR (8DPSK): Right Side



ProjectNo.:RSHA240311001 Tester:Bard Liu

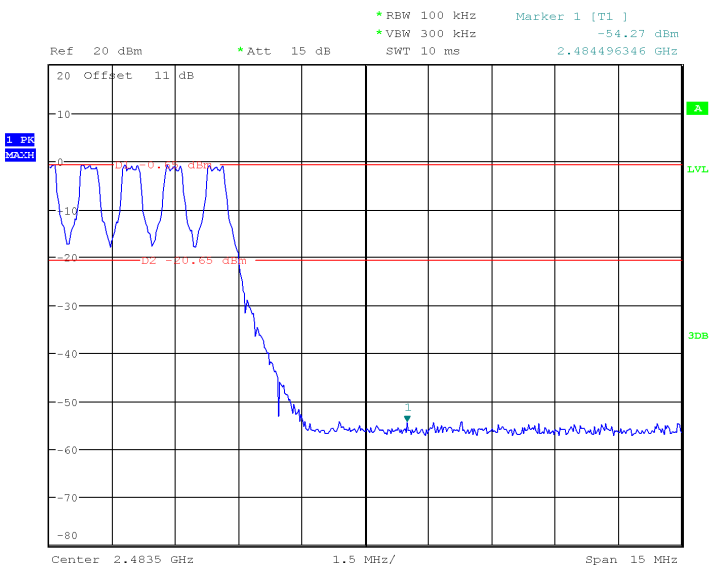
Date: 19.MAR.2024 10:31:00

BDR (GFSK): Left Side - Hopping



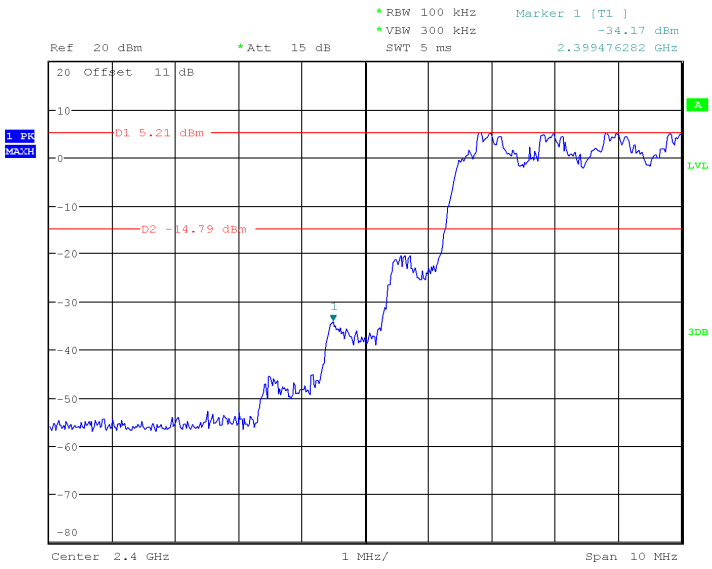
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 11:27:23

BDR (GFSK): Right Side- Hopping



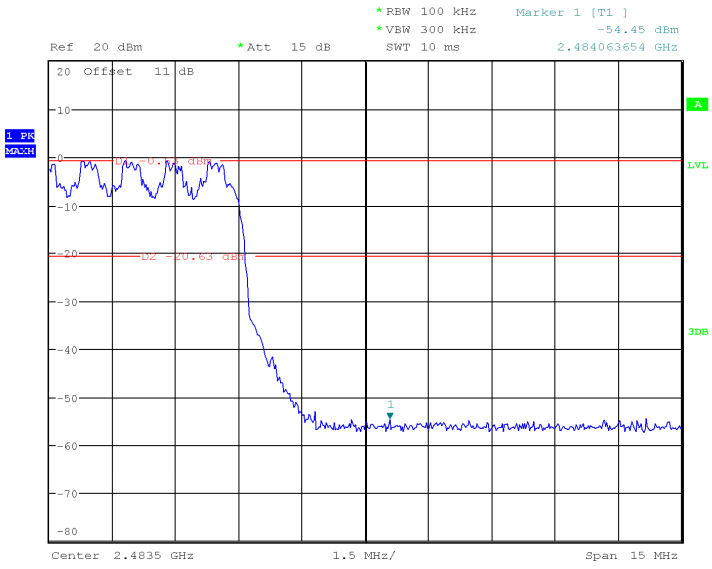
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 11:35:42

EDR (π/4-DQPSK): Left Side - Hopping



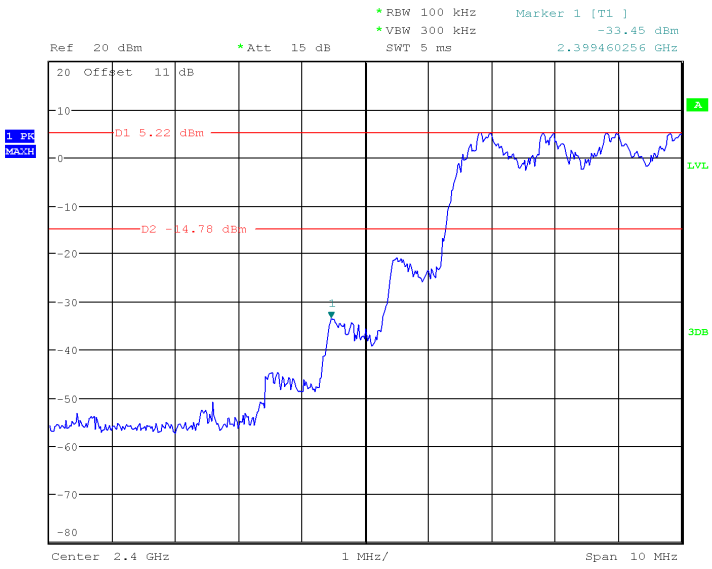
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 11:29:08

EDR (π/4-DQPSK): Right Side- Hopping



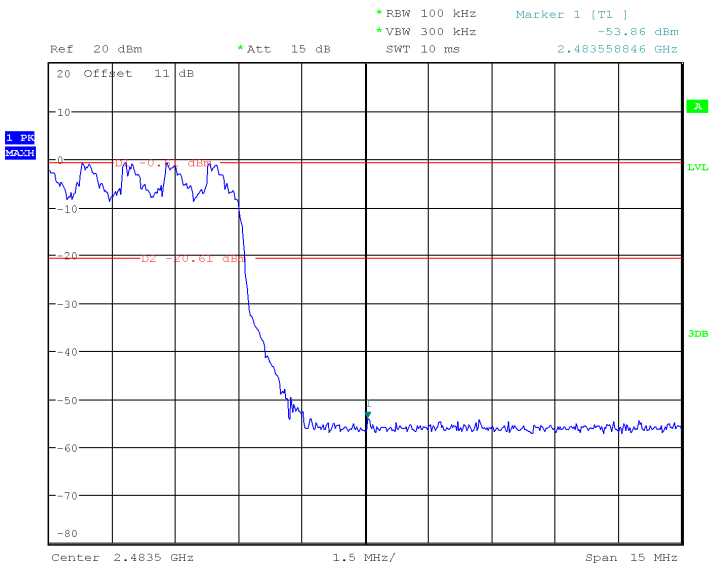
ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 11:34:05

EDR (8DPSK): Left Side- Hopping



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 11:30:29

EDR (8DPSK): Right Side- Hopping



ProjectNo.:RSHA240311001 Tester:Bard Liu
Date: 21.MAR.2024 11:32:35

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.

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 *******