

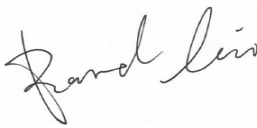
**FCC PART 15.247
TEST REPORT**

For

Tersus GNSS Inc.

Rm 601, Bldg E2, No. 88, Jinjihu Ave, Suzhou, China

FCC ID: 2AMDJ-TREK

Report Type: Original Report	Product Name: GNSS Receiver
Report Number: <u>RS241101001-00B</u>	
Report Date: <u>2025-09-05</u>	
Reviewed By: <u>Bard Liu</u>	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Kunshan). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government.

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RSHA241101001-00B	R1V1	2025-09-05	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Tersus GNSS Inc.
Product Name:	GNSS Receiver
Tested Model:	Oscar Trek
Power Supply:	DC 9-28V charging by adapter or DC 7.4V powered by battery
Maximum Output Power:	GFSK: 2.41 dBm $\pi/4$ -DQPSK: 0.47 dBm 8DPSK: 0.78 dBm
RF Function:	Classic BT
Operating Band/Frequency:	2402-2480 MHz
Channel Number:	79
Channel Separation:	1 MHz
Modulation Type:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Antenna Type:	Patch Antenna
★Maximum Antenna Gain:	4.41dBi

Adapter Information:

Model: NT-120300D1

Input: 100-240V 50/60Hz 1.6A Max

Output: 12V, 3.0A

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: RSHA241101001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-11-01.)

Objective

This test report is prepared for *Tersus GNSS Inc.* 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 C63.10:2020, 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°C
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: secureCrt

★Power level: 0

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

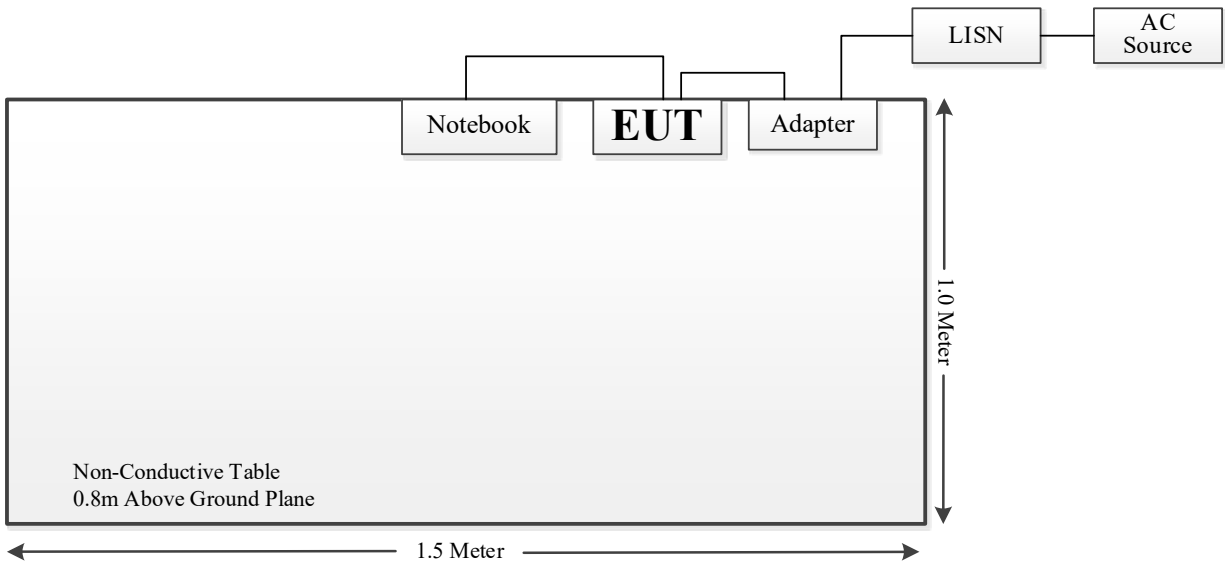
Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	Y7000P2020H	Unknown

External I/O Cable

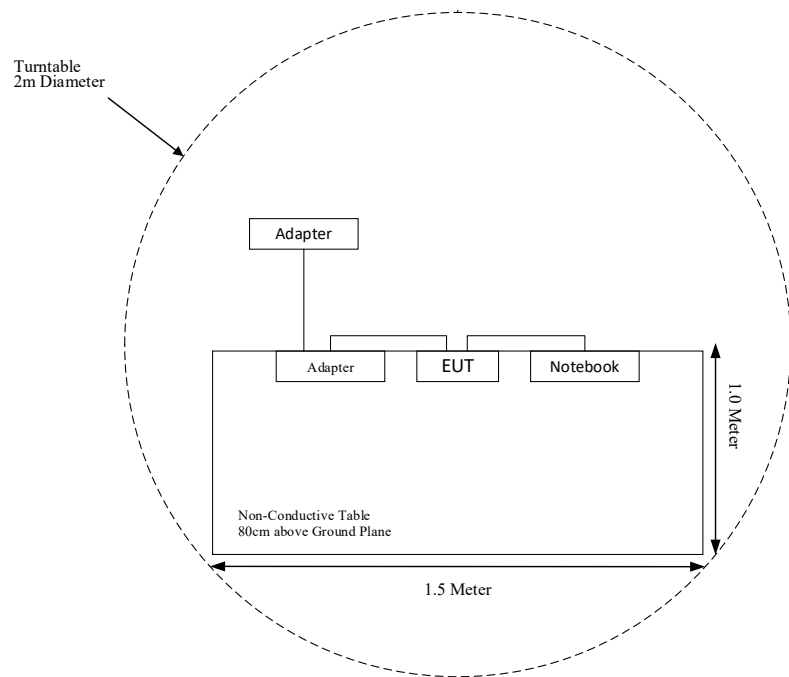
Cable Description	Length (m)	From Port	To Port
Power Cable 1	1.5	EUT	Adapter
Power Cable 2	1.0	Adapter	AC Source
USB Cable	1.5	Notebook	EUT

Block Diagram of Test Setup

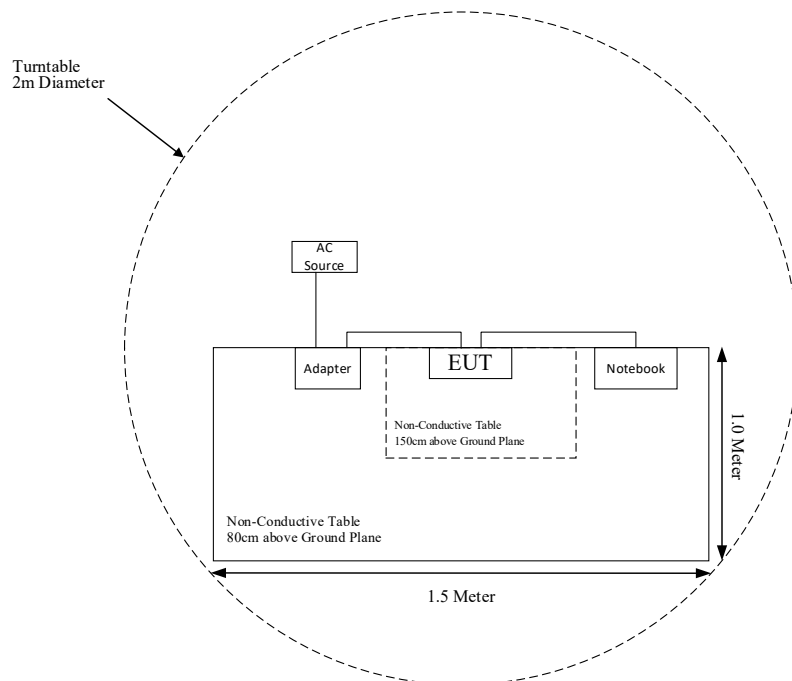
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	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 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

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	Broadband Antenna	JB3	A090314-1	2024-11-08	2027-11-07
Narda	6dB Attenuator	773-6	10690812-2-1	2024-11-08	2027-11-07
BACL	Active Loop Antenna	1313-1A	4041511	2024-11-22	2027-11-21
Sonoma Instrument	Pre-amplifier	310N	171205	2024-04-23	2025-04-22
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
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	100207/040	2024-04-25	2025-04-24
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2024-11-03	2027-11-02
ETS-LINDGREN	Horn Antenna	3116	2516	2024-12-12	2027-12-11
A.H.Systems, inc	Amplifier	PAM-0118P	512	2024-04-25	2025-04-24
SELECTOR	Amplifier	EM18G40G	060726	2024-04-25	2025-04-24
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2024-08-05	2025-08-04
Narda	Attenuator	10dB	010	2024-08-15	2025-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-11	011	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-12	012	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-13	013	2024-04-25	2025-04-24

RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200103	2024-04-25	2025-04-24
Rohde & Schwarz	Spectrum Analyzer	FSU26	200103	2025-04-09	2026-04-08
Narda	Attenuator	10dB	010	2024-08-15	2025-08-14
XHFDZ	RG316 Coaxial Cable	SMA-316	XHF-1175	Each time	N/A
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	101746	2025-04-08	2026-04-07
Rohde & Schwarz	LISN	ENV216	101115	2025-04-08	2026-04-07
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	0357.8810.54	2025-02-20	2026-02-19
MICRO-COAX	Coaxial Cable	Cable-15	015	2025-04-08	2026-04-07

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).

FCC §1.1310 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §2.1091 and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E , H or S (minutes)
0.3- 3.0	614	1.63	(100)*	6
3.0 - 30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculation Data:**General Population/Uncontrolled**

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Output Power*		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
2.4G Wi-Fi	2412-2462	-0.26	0.94	19.0	79.43	20	0.0149	1.00	0.0149
BLE	2402-2480	4.41	2.76	3.0	2.00	20	0.0011	1.00	0.0011
BT	2402-2480	4.41	2.76	2.5	1.78	20	0.0010	1.00	0.0010
5G Wi-Fi	5150-5250	2.18	1.65	13.5	22.39	20	0.0073	1.00	0.0073
	5725-5850	-1.37	0.73	11.0	12.59	20	0.0018	1.00	0.0018
GSM 850	824-849	-0.14	0.97	25.81	381.07	20	0.0734	0.55	0.1336
PCS 1900	1850-1910	1.62	1.45	22.81	190.99	20	0.0551	1.0	0.0551
WCDMA Band 2	1850-1910	1.62	1.45	25.00	316.23	20	0.0912	1.0	0.0912
WCDMA Band 4	1710-1755	0.32	1.08	25.00	316.23	20	0.0679	1.0	0.0679
WCDMA Band 5	824-849	-0.14	0.97	25.00	316.23	20	0.0609	0.55	0.1109
LTE Band 2	1850-1910	1.62	1.45	25.00	316.23	20	0.0912	1.0	0.0912
LTE Band 4	1710-1755	0.32	1.08	25.00	316.23	20	0.0679	1.0	0.0679
LTE Band 5	824-849	-0.14	0.97	25.00	316.23	20	0.0609	0.55	0.1109
LTE Band 7	2500-2570	3.78	2.39	25.00	316.23	20	0.1503	1.0	0.1503
LTE Band 12	699-716	-0.14	0.97	25.00	316.23	20	0.0609	0.47	0.1307
LTE Band 13	777-787	-0.14	0.97	25.00	316.23	20	0.0609	0.52	0.1176
LTE Band 25	1850-1915	1.62	1.45	25.00	316.23	20	0.0912	1.0	0.0912
LTE Band 26	814-849	-0.14	0.97	25.00	316.23	20	0.0609	0.54	0.1122
LTE Band 38	2570-2620	3.78	2.39	25.00	316.23	20	0.1503	1.0	0.1503
LTE Band 41	2496-2690	3.78	2.39	25.00	316.23	20	0.1503	1.0	0.1503

Occupational/Controlled

Mode	Frequency Range (MHz)	Antenna Gain		★Tune-up Output Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
UHF	410-470	2.0	1.58	33.5	2238.72	20	0.7058	1.3667	0.5164

Note:

1. The target output powers are all declared by the Manufacturer.
2. The WWAN module FCC ID: XMR201903EG25G (Grant on: 03/29/2019).
3. Wi-Fi, BLE/BT, WWAN and UHF can transmit simultaneously, the worst condition is as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0149 + 0.0011 + 0.1503 + 0.5164 = 0.6827 < 1.0$$

Result: The device meet FCC MPE at 20 cm distance.

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 have a patch antenna which permanently attached to the unit. fulfill the requirement of this section. Please refer to the EUT photos.

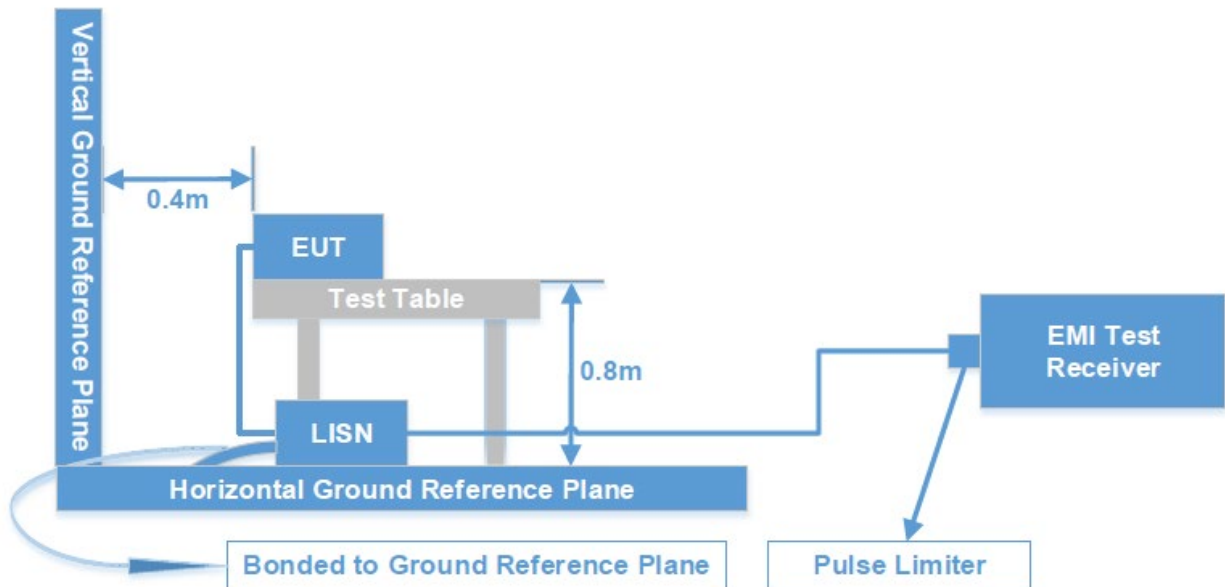
Result: Compliant.

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 C63.10:2020. The related limit was specified in FCC Part 15.207.

EMI Test Receiver Setup

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 C63.10:2020 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:

$$\begin{aligned}\text{Factor (dB)} &= \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)} \\ \text{Level (dB}\mu\text{V)} &= \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)}\end{aligned}$$

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:

$$\text{Over Limit (dB)} = \text{Level (dB}\mu\text{V)} - \text{Limit (dB}\mu\text{V)}$$

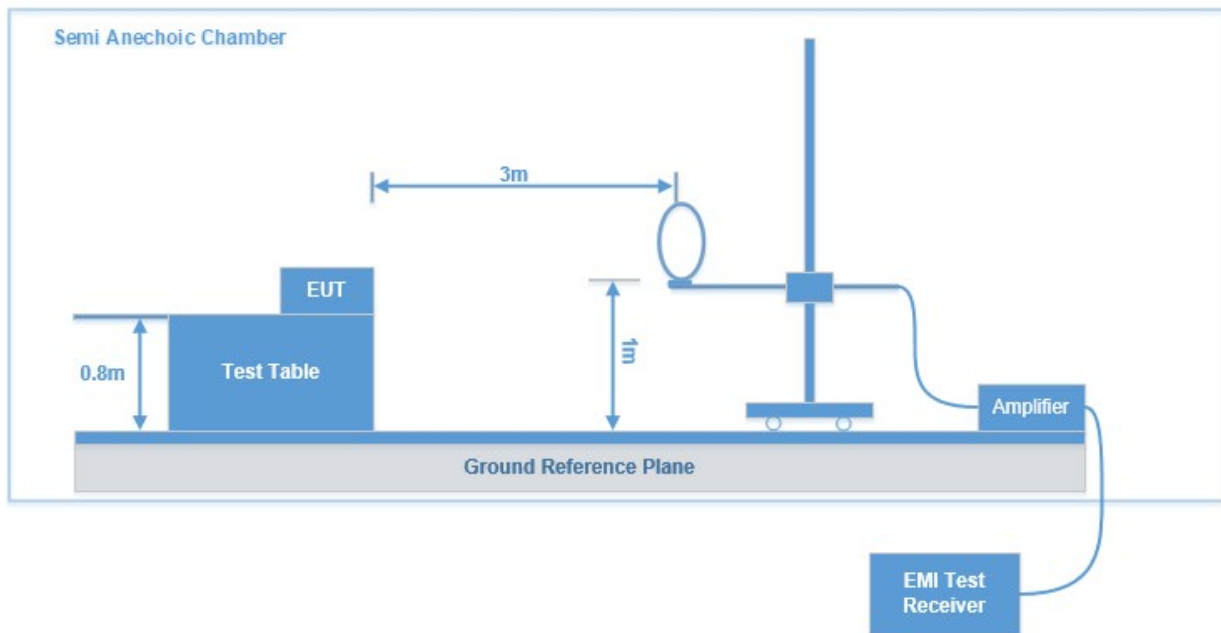
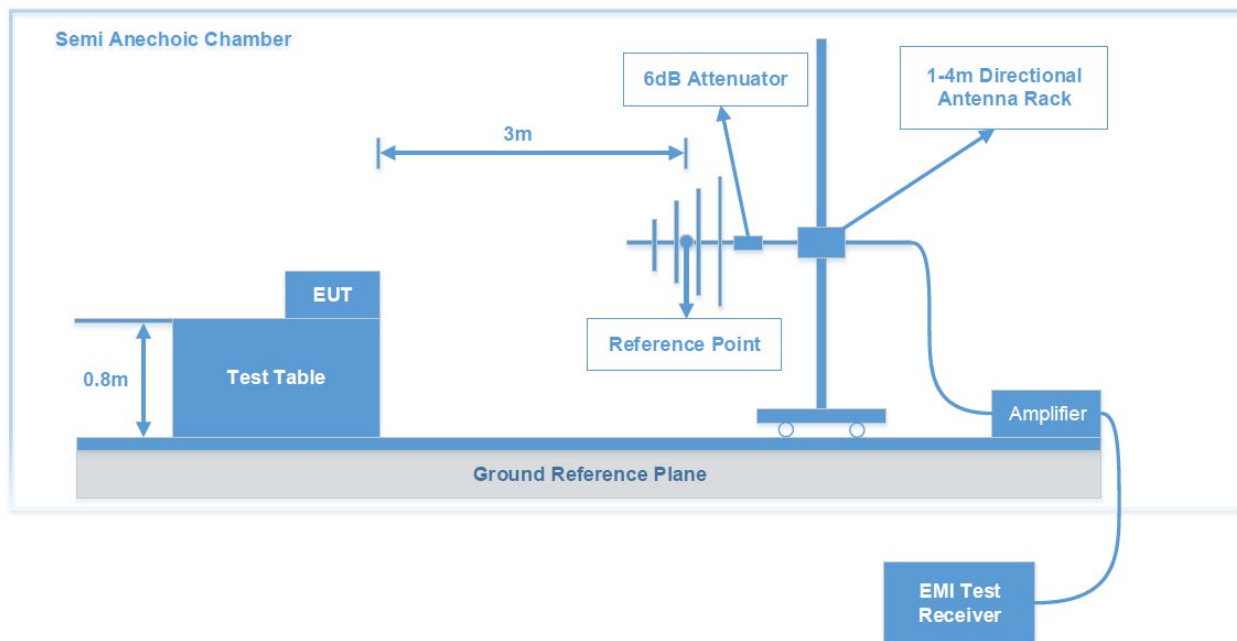
Test Results Summary

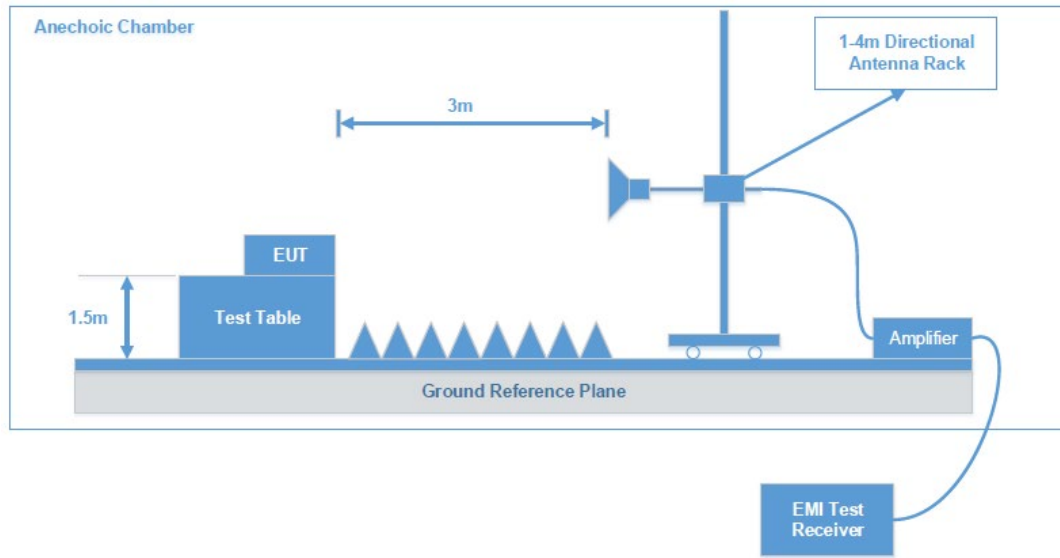
According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

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 C63.10:2020. The specification used was the FCC 15.209 and FCC 15.247 limits.

EMI Test Receiver Setup

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

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

Test Procedure

According to ANSI C63.10:2020 clause 6.4, 6.5 and 6.6.

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 hopping 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.

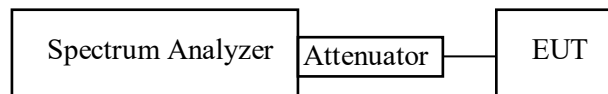
Test Procedure

According to ANSI C63.10:2020 sub-clause 7.8.2

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

- Span: Wide enough to capture the peaks of two adjacent channels.
- RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- Video (or average) bandwidth (VBW) $\geq$ RBW.
- Sweep: Auto.
- Detector function: Peak.
- Trace: Max hold.
- Allow the trace to stabilize.

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



Note: Offset (10.5dB) = Attenuator(10dB) + Cable loss(0.5dB)

Test Data: See Appendix

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

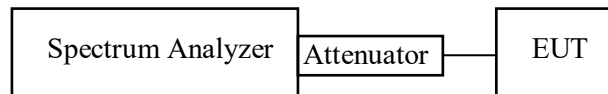
Applicable Standard

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 C63.10:2020 sub-clause 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.



Note: Offset (10.5dB) = Attenuator(10dB) + Cable loss(0.5dB)

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.

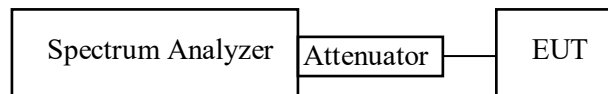
Test Procedure

According to ANSI C63.10:2020 sub-clause 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 $\geq$ 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.



Note: Offset (10.5dB) = Attenuator(10dB) + Cable loss(0.5dB)

Test Data: See Appendix

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

Applicable Standard

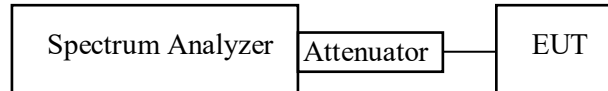
Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions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

Test Procedure

According to ANSI C63.10:2020 sub-clause 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 $\leq$ channel spacing and where possible RBW should be set $\geq 1 / T$, 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.



Note: Offset (10.5dB) = Attenuator(10dB) + Cable loss(0.5dB)

Test Data: See Appendix

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

Applicable Standard

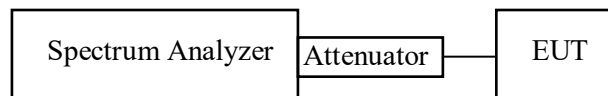
According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125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

Test Procedure

According to ANSI C63.10:2020 sub-clause 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 $\geq$ 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.



Note: Offset (10.5dB) = Attenuator(10dB) + Cable loss(0.5dB)

Test Data: See Appendix

FCC §15.247(d) - BAND EDGES TESTING

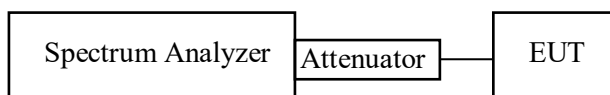
Applicable Standard

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 C63.10:2020 sub-clause 7.8.7

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.



Note: Offset (10.5dB) = Attenuator(10dB) + Cable loss(0.5dB)

Test Data: See Appendix

APPENDIX - TEST DATA

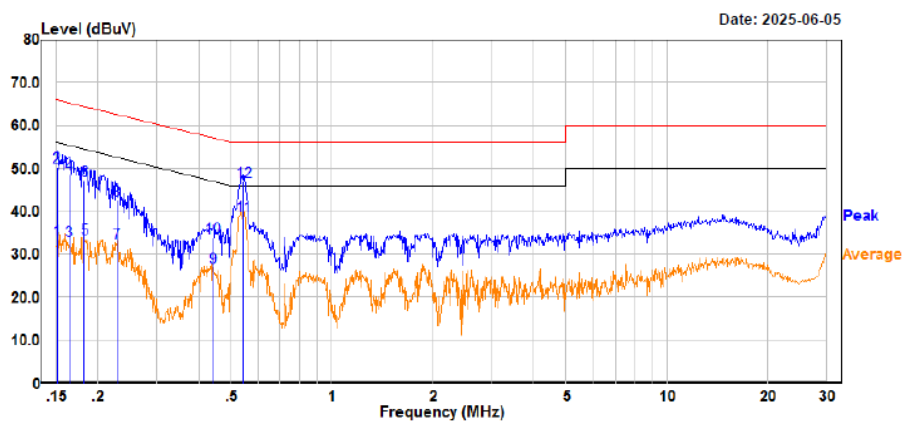
AC LINE CONDUCTED EMISSIONS

Environmental Conditions & Test Information

Test Date:	2025-06-05
Temperature:	24.5 °C
Relative Humidity:	51 %
ATM Pressure:	101.1 kPa
Test Result:	Pass
Test Engineer:	Link Xia

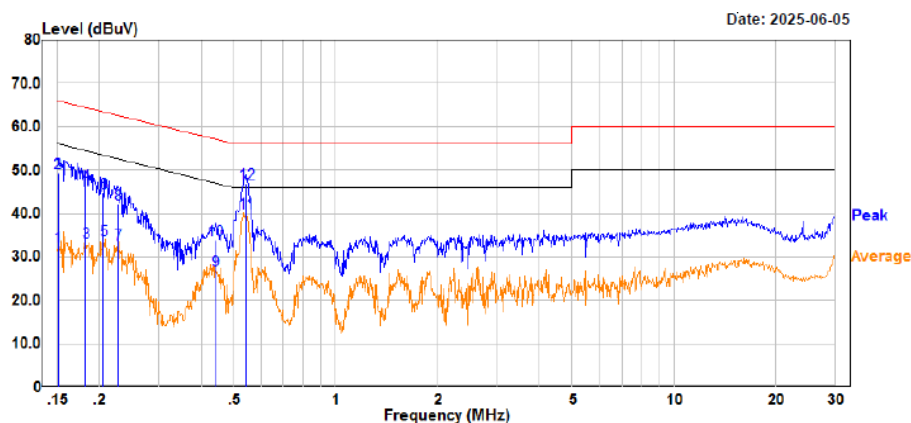
EUT operation mode: Transmitting in GFSK Mode high channel (maximum output power mode)

AC 120V/60 Hz, Line



Site : CE
Condition : limit\FCC PART 15.207
: DET:Peak
Project No. : RSHA241101001
Model : Oscar Trek
Phase : L
Voltage : 120V/60Hz
Mode : BT
Test Equipment : ENV216,ESR3
Receiver Setting : RBW: 9 kHz,Sweep Time: Auto
Temperature : 24.5 °C
Humidity : 51%
Atmospheric pressure: 101.1KPa
Test Engineer : Link Xia

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.151	13.10	20.23	33.33	55.96	-22.63	Average
2	0.151	30.00	20.23	50.23	65.96	-15.73	QP
3	0.164	12.99	20.23	33.22	55.25	-22.03	Average
4	0.164	28.29	20.23	48.52	65.25	-16.73	QP
5	0.182	13.31	20.21	33.52	54.39	-20.87	Average
6	0.182	26.91	20.21	47.12	64.39	-17.27	QP
7	0.228	12.50	20.21	32.71	52.52	-19.81	Average
8	0.228	22.40	20.21	42.61	62.52	-19.91	QP
9	0.440	6.70	20.25	26.95	47.06	-20.11	Average
10	0.440	13.50	20.25	33.75	57.06	-23.31	QP
11	0.543	18.80	20.20	39.00	46.00	-7.00	Average
12	0.543	26.70	20.20	46.90	56.00	-9.10	QP

AC 120V/60 Hz, Neutral

Trace: 1

Site : CE
 Condition : limit\FCC PART 15B\Class B QP.csv Line
 : DET:Peak
 Project No. : RSHA241101001
 Model : Oscar Trek
 Phase : N
 Voltage : 120V/60Hz
 Mode : BT
 Test Equipment : ENV216,ESR3
 Receiver Setting : RBW: 9 kHz,Sweep Time: Auto
 Temperature : 24.5℃
 Humidity : 51%
 Atmospheric pressure: 101.1KPa
 Test Engineer : Link Xia

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV		dB	dBuV	dB	
1	0.151	12.20	20.23	32.43	55.96	-23.53	Average
2	0.151	29.20	20.23	49.43	65.96	-16.53	QP
3	0.182	13.11	20.21	33.32	54.39	-21.07	Average
4	0.182	26.51	20.21	46.72	64.39	-17.67	QP
5	0.205	13.60	20.21	33.81	53.39	-19.58	Average
6	0.205	24.50	20.21	44.71	63.39	-18.68	QP
7	0.227	12.70	20.21	32.91	52.56	-19.65	Average
8	0.227	21.80	20.21	42.01	62.56	-20.55	QP
9	0.440	6.70	20.25	26.95	47.06	-20.11	Average
10	0.440	13.70	20.25	33.95	57.06	-23.11	QP
11	0.543	19.90	20.20	40.10	46.00	-5.90	Average
12	0.543	26.70	20.20	46.90	56.00	-9.10	QP

RADIATED EMISSIONS & RESTRICTED BANDS EMISSIONS

Environmental Conditions & Test Information

Frequency Range:	9kHz - 1GHz		1 GHz - 18 GHz	18 GHz – 25 GHz
Test Date:	2025-09-03	2025-02-10	2024-12-12	2025-02-19
Temperature:	26.1 °C	21.3 °C	26.7 °C	23.6 °C
Relative Humidity:	53 %	60 %	50 %	56 %
ATM Pressure:	100.8 kPa	101.6 kPa	100.8 kPa	102.3 kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Link Xia	Jerry Yan	Destine Hu	Hugh Wu

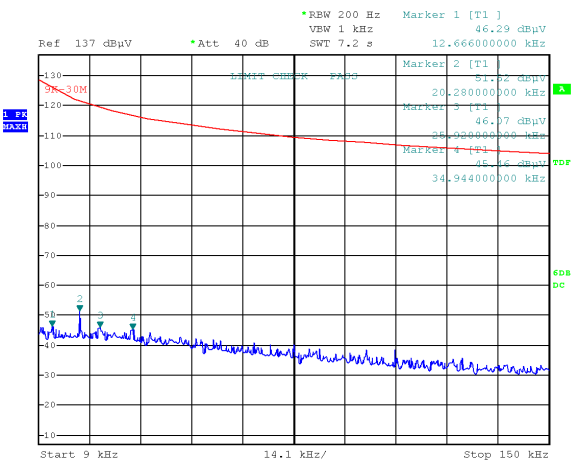
EUT operation mode: Transmitting

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

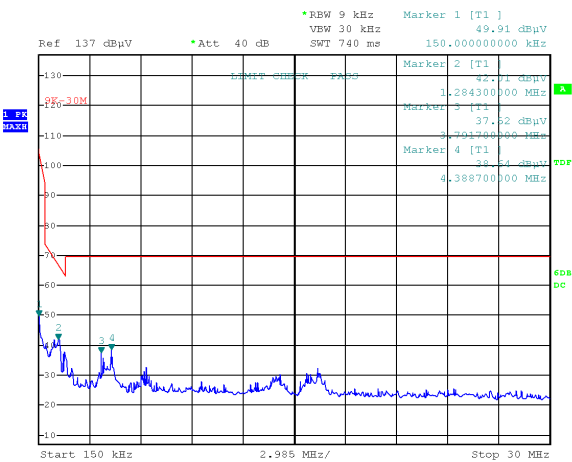
9 kHz-30 MHz: (Transmitting maximum output power GFSK Mode high channel)

Parallel(worst case)

9kHz-150kHz



150kHz-30MHz



Project No.RSHA241101001
Date: 3.SEP.2025 16:37:46

Tester:Link Xia

Project No.RSHA241101001
Date: 3.SEP.2025 16:44:16

Tester:Link Xia

9 kHz - 150 kHz

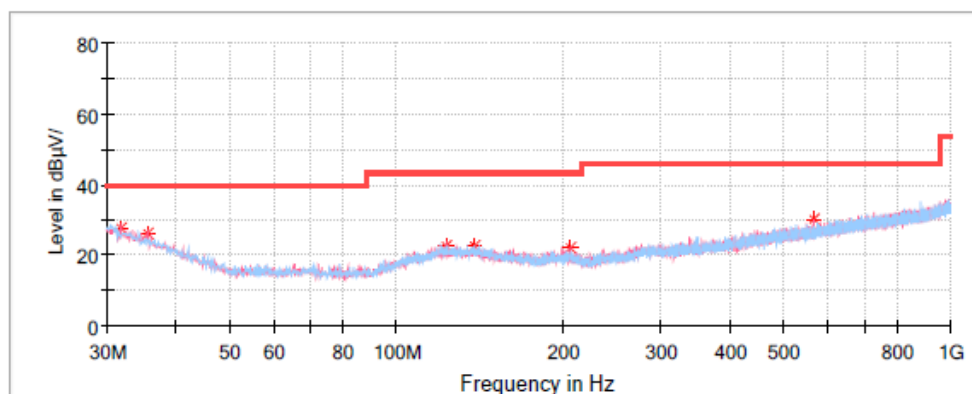
Frequency (MHz)	Corrected Amplitude (dB μ V/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dB μ V/m) @3m	Margin (dB)
0.012666	46.29	PK	-0.52	125.55	79.26
0.020280	51.52	PK	-0.56	121.46	69.94
0.025920	46.07	PK	-0.59	119.33	73.26
0.034944	45.46	PK	-1.40	116.74	71.28

150 kHz - 30 MHz

Frequency (MHz)	Corrected Amplitude (dB μ V/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dB μ V/m) @3m	Margin (dB)
0.15000	49.91	PK	-11.34	104.08	54.17
1.28430	42.01	PK	-28.55	65.43	23.42
3.79170	37.52	PK	-31.81	69.54	32.02
4.38870	38.64	PK	-31.97	69.54	30.90

30 MHz - 1 GHz (Transmitting in maximum output power GFSK mode high channel):**High Channel: 2480 MHz****Common Information**

Project No: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247
Test Equipment: ESCI, JB3, 310N
Receiver Setting: RBW: 100 kHz, VBW: 300 kHz, Sweep Time: Auto
Temperature: 20.3°C
Humidity: 66%
Barometric Pressure: 101.5 kPa
Test Engineer: Jerry Yan
Test Date: 2024/11/16

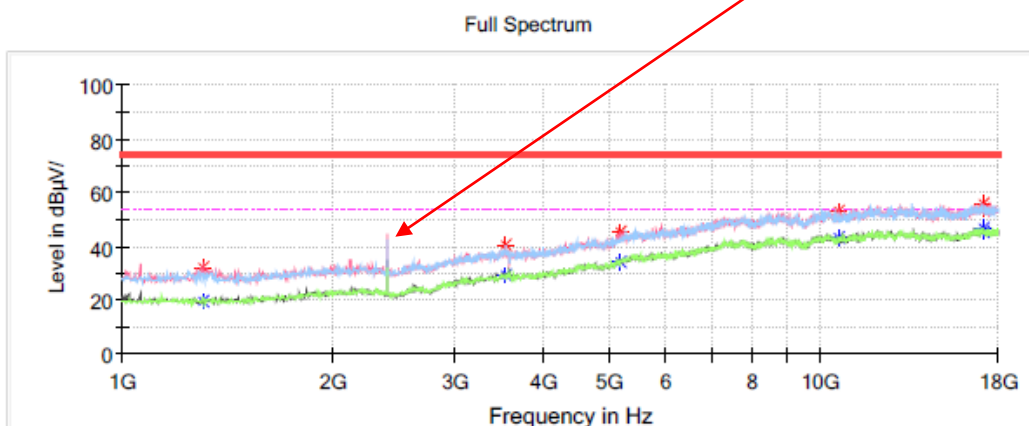
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
31.818750	27.88	40.00	12.12	V	-5.9
35.456250	25.98	40.00	14.02	V	-8.3
122.513750	22.40	43.50	21.10	V	-10.9
138.640000	22.59	43.50	20.91	H	-11.2
205.691250	22.07	43.50	21.43	V	-12.4
567.016250	30.24	46.00	15.76	V	-4.4

1 GHz - 18 GHz:**GFSK:****Low Channel: 2402 MHz****Common Information**

Project No.:	RSHA241101001
EUT Model:	Oscar Trek
Test Mode:	BT
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment:	ESU40,3115,PAM-0118P
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature:	26.7°C
Humidity:	50%
Atmospheric Pressure:	100.8kPa
Test Engineer:	Destine Hu
Test Date:	2024/12/12

Fundamental Test with
Band Reject Filter

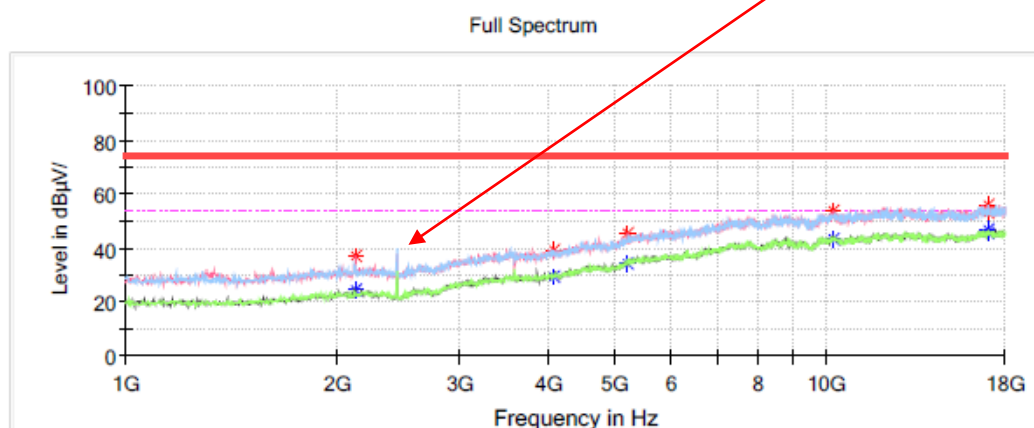
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1306.000000	---	19.88	54.00	34.12	V	-15.0
1306.000000	32.26	---	74.00	41.74	V	-15.0
3546.600000	---	29.53	54.00	24.47	H	-6.3
3546.600000	40.46	---	74.00	33.54	H	-6.3
5168.400000	---	34.12	54.00	19.88	V	-1.7
5168.400000	45.36	---	74.00	28.64	V	-1.7
10656.000000	---	43.12	54.00	10.88	H	7.2
10656.000000	53.48	---	74.00	20.52	H	7.2
17146.600000	---	47.13	54.00	6.87	H	12.1
17146.600000	53.51	---	74.00	20.49	H	12.1
17170.400000	---	45.59	54.00	8.41	V	12.0
17170.400000	56.04	---	74.00	17.96	V	12.0

Middle Channel: 2441 MHz**Common Information**

Project No.: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment: ESU40,3115,PAM-0118P
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature: 26.7°C
Humidity: 50%
Atmospheric Pressure: 100.8kPa
Test Engineer: Destine Hu
Test Date: 2024/12/12

Fundamental Test with
Band Reject Filter

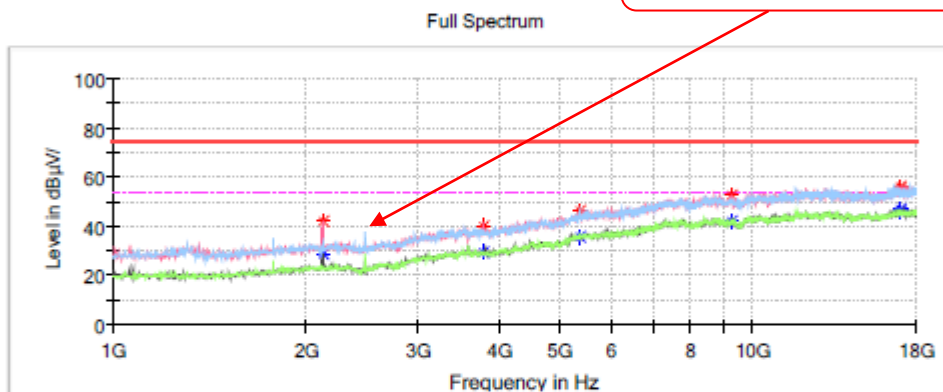
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2132.200000	---	24.45	54.00	29.55	V	-11.3
2132.200000	36.91	---	74.00	37.09	V	-11.3
4080.400000	---	29.67	54.00	24.33	H	-5.6
4080.400000	39.48	---	74.00	34.52	H	-5.6
5202.400000	---	34.40	54.00	19.60	V	-1.6
5202.400000	45.69	---	74.00	28.31	V	-1.6
10241.200000	---	43.51	54.00	10.49	H	7.1
10241.200000	54.05	---	74.00	19.95	H	7.1
16976.600000	56.15	---	74.00	17.85	V	12.2
16976.600000	---	45.12	54.00	8.88	V	12.2
17014.000000	53.34	---	74.00	20.66	H	12.3
17014.000000	---	46.70	54.00	7.30	H	12.3

High Channel: 2480 MHz**Common Information**

Project No.: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment: ESU40,3115,PAM-0118P
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature: 26.7°C
Humidity: 50%
Atmospheric Pressure: 100.8kPa
Test Engineer: Destine Hu
Test Date: 2024/12/12

Fundamental Test with
Band Reject Filter

**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)
2128.800000	---	28.81	54.00	25.19	V	-11.3
2128.800000	42.17	---	74.00	31.83	V	-11.3
3784.600000	---	29.43	54.00	24.57	V	-6.1
3784.600000	39.52	---	74.00	34.48	V	-6.1
5355.400000	---	35.74	54.00	18.26	H	-0.9
5355.400000	46.19	---	74.00	27.81	H	-0.9
9262.000000	---	42.17	54.00	11.83	V	5.4
9262.000000	52.12	---	74.00	21.88	V	5.4
17024.200000	56.08	---	74.00	17.92	V	12.2
17024.200000	---	45.99	54.00	8.01	V	12.2
17044.600000	---	46.78	54.00	7.22	H	12.2
17044.600000	55.47	---	74.00	18.53	H	12.2

$\pi/4$ -DQPSK:

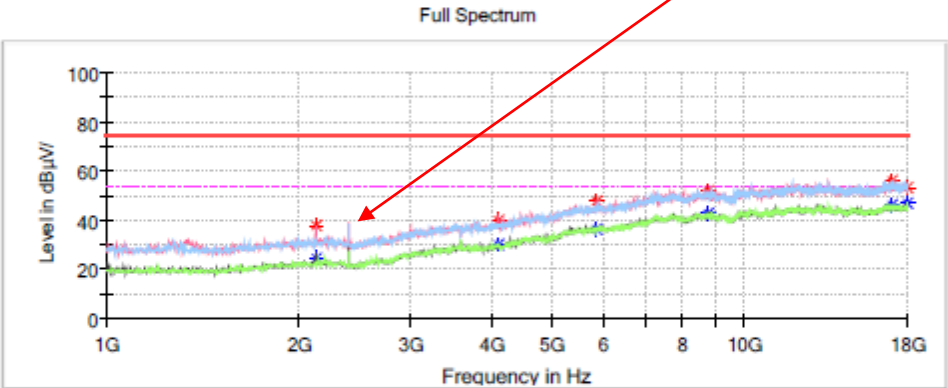
Low Channel: 2402 MHz

Common Information

Project No.:
EUT Model:
Test Mode:
Standard:
Test Equipment:
Receiver Setting:
Temperature:
Humidity:
Atmospheric Pressure:
Test Engineer:
Test Date:

RSHA241101001
Oscar Trek
BT
FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
ESU40,3115,PAM-0118P
RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
26.7°C
50%
100.8kPa
Destine Hu
2024/12/12

Fundamental Test with Band
Reject Filter



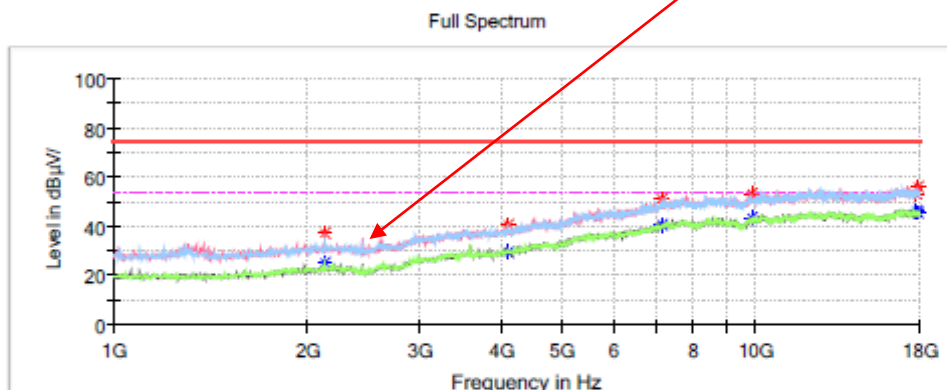
Critical Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2128.800000	---	24.38	54.00	29.62	V	-11.3
2128.800000	37.71	---	74.00	36.29	V	-11.3
4124.600000	---	29.92	54.00	24.08	H	-5.5
4124.600000	39.85	---	74.00	34.15	H	-5.5
5858.600000	---	36.27	54.00	17.73	V	-0.1
5858.600000	47.46	---	74.00	26.54	V	-0.1
8769.000000	---	42.77	54.00	11.23	H	5.4
8769.000000	52.03	---	74.00	21.97	H	5.4
17010.600000	55.91	---	74.00	18.09	H	12.3
17010.600000	---	45.87	54.00	8.13	H	12.3
17979.600000	53.02	---	74.00	20.98	V	11.9
17979.600000	---	46.91	54.00	7.09	V	11.9

Middle Channel: 2441 MHz**Common Information**

Project No.: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment: ESU40,3115,PAM-0118P
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature: 26.7°C
Humidity: 50%
Atmospheric Pressure: 100.8kPa
Test Engineer: Destine Hu
Test Date: 2024/12/12

Fundamental Test with
Band Reject Filter

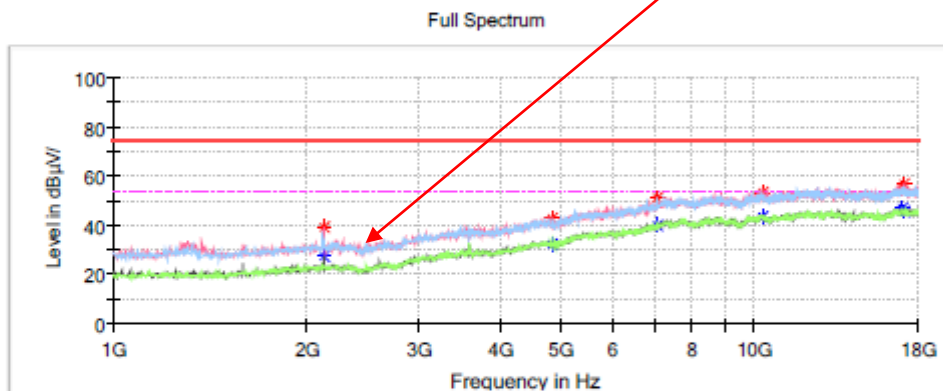
**Critical Freqs**

Frequency (MHz)	MaxPeak (dB µV/m)	Average (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Pol	Corr. (dB/m)
2128.800000	---	25.29	54.00	28.71	V	-11.3
2128.800000	36.72	---	74.00	37.28	V	-11.3
4114.400000	---	29.70	54.00	24.30	V	-5.5
4114.400000	40.84	---	74.00	33.16	V	-5.5
7154.000000	---	40.65	54.00	13.35	H	3.0
7154.000000	51.35	---	74.00	22.65	H	3.0
9860.400000	---	43.11	54.00	10.89	H	6.7
9860.400000	53.23	---	74.00	20.77	H	6.7
17772.200000	---	46.41	54.00	7.59	V	11.8
17772.200000	53.08	---	74.00	20.92	V	11.8
17911.600000	---	45.28	54.00	8.72	H	11.9
17911.600000	56.21	---	74.00	17.79	H	11.9

High Channel: 2480 MHz**Common Information**

Project No.:	RSHA241101001
EUT Model:	Oscar Trek
Test Mode:	BT
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment:	ESU40,3115,PAM-0118P
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature:	26.7°C
Humidity:	50%
Atmospheric Pressure:	100.8kPa
Test Engineer:	Destine Hu
Test Date:	2024/12/12

Fundamental Test with
Band Reject Filter

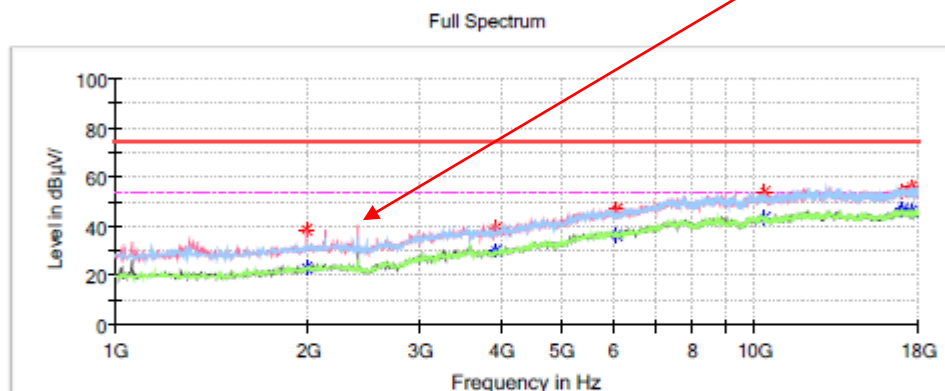
**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2128.800000	38.86	—	74.00	35.14	V	-11.3
2128.800000	—	26.96	54.00	27.04	V	-11.3
4842.000000	—	32.19	54.00	21.81	H	-3.0
4842.000000	42.83	—	74.00	31.17	H	-3.0
7065.600000	—	40.10	54.00	13.90	V	2.8
7065.600000	50.85	—	74.00	23.15	V	2.8
10329.600000	—	43.54	54.00	10.46	H	7.1
10329.600000	53.34	—	74.00	20.66	H	7.1
17020.800000	54.31	—	74.00	19.69	H	12.2
17020.800000	—	47.12	54.00	6.88	H	12.2
17085.400000	—	45.53	54.00	8.47	V	12.2
17085.400000	56.30	—	74.00	17.70	V	12.2

8DPSK:**Low Channel: 2402 MHz****Common Information**

Project No.: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment: ESU40,3115,PAM-0118P
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature: 26.7°C
Humidity: 50%
Atmospheric Pressure: 100.8kPa
Test Engineer: Destine Hu
Test Date: 2024/12/12

Fundamental Test with
Band Reject Filter

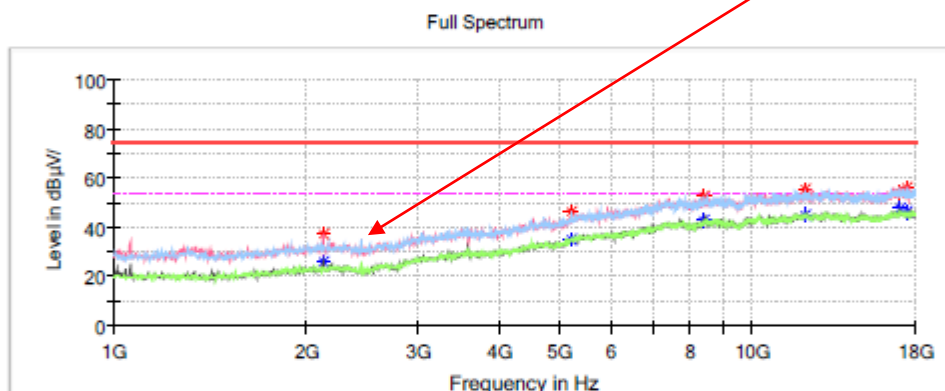
**Critical Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1992.800000	---	23.30	54.00	30.70	V	-11.8
1992.800000	38.13	---	74.00	35.87	V	-11.8
3941.000000	---	29.98	54.00	24.02	V	-6.0
3941.000000	39.35	---	74.00	34.65	V	-6.0
6079.600000	---	36.24	54.00	17.76	V	0.1
6079.600000	46.75	---	74.00	27.25	V	0.1
10367.000000	---	43.53	54.00	10.47	V	7.1
10367.000000	53.74	---	74.00	20.26	V	7.1
16990.200000	---	46.63	54.00	7.37	H	12.3
16990.200000	53.65	---	74.00	20.35	H	12.3
17612.400000	---	46.10	54.00	7.90	H	11.6
17612.400000	55.93	---	74.00	18.07	H	11.6

Middle Channel: 2441 MHz**Common Information**

Project No.:	RSHA241101001
EUT Model:	Oscar Trek
Test Mode:	BT
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment:	ESU40,3115,PAM-0118P
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature:	26.7°C
Humidity:	50%
Atmospheric Pressure:	100.8kPa
Test Engineer:	Destine Hu
Test Date:	2024/12/12

Fundamental Test with
Band Reject Filter

**Critical Freqs**

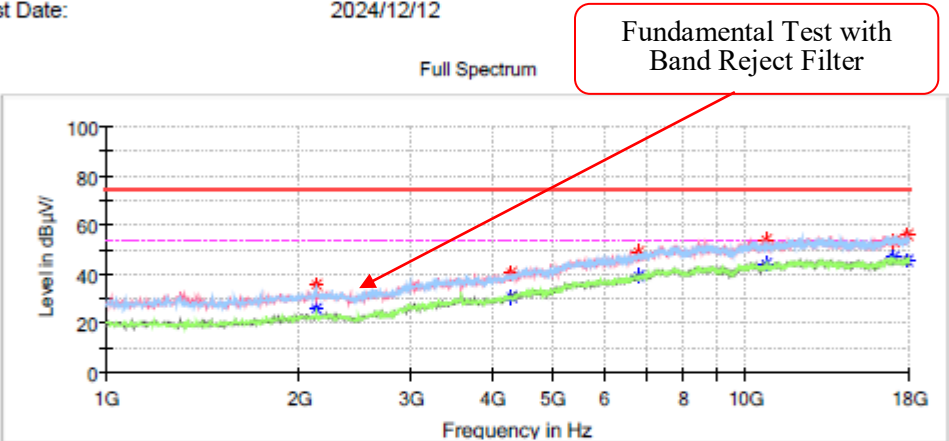
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2125.400000	---	25.56	54.00	28.44	V	-11.3
2125.400000	37.14	---	74.00	36.86	V	-11.3
5216.000000	---	34.73	54.00	19.27	V	-1.5
5216.000000	46.21	---	74.00	27.79	V	-1.5
8398.400000	---	42.70	54.00	11.30	H	5.1
8398.400000	52.31	---	74.00	21.69	H	5.1
12104.400000	---	44.59	54.00	9.41	V	9.1
12104.400000	54.91	---	74.00	19.09	V	9.1
16990.200000	---	47.29	54.00	6.71	V	12.3
16990.200000	53.72	---	74.00	20.28	V	12.3
17408.400000	---	45.89	54.00	8.11	H	11.7
17408.400000	55.69	---	74.00	18.31	H	11.7

High Channel: 2480 MHz

Common Information

Project No.:
EUT Model:
Test Mode:
Standard:
Test Equipment:
Receiver Setting:
Temperature:
Humidity:
Atmospheric Pressure:
Test Engineer:
Test Date:

RSHA241101001
Oscar Trek
BT
FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
ESU40,3115,PAM-0118P
RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
26.7°C
50%
100.8kPa
Destine Hu
2024/12/12



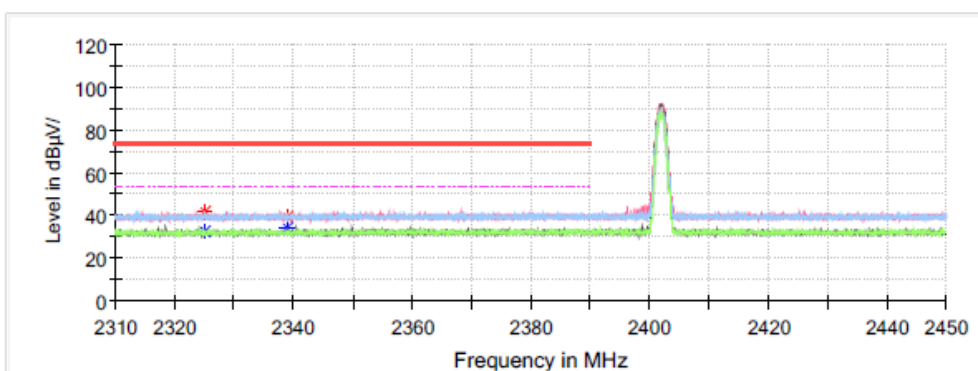
Critical Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2128.800000	---	25.69	54.00	28.31	H	-11.3
2128.800000	35.36	---	74.00	38.64	H	-11.3
4301.400000	---	30.84	54.00	23.16	H	-4.9
4301.400000	40.53	---	74.00	33.47	H	-4.9
6807.200000	---	39.40	54.00	14.60	V	1.8
6807.200000	48.92	---	74.00	25.08	V	1.8
10747.800000	---	44.15	54.00	9.85	V	7.2
10747.800000	53.56	---	74.00	20.44	V	7.2
17037.800000	---	46.55	54.00	7.45	H	12.2
17037.800000	53.05	---	74.00	20.95	H	12.2
17928.600000	---	45.12	54.00	8.88	V	11.9
17928.600000	56.20	---	74.00	17.80	V	11.9

**Band Edge:
GFSK:****Left Side****Common Information**

Project No.:	RSHA241101001
EUT Model:	Oscar Trek
Test Mode:	BT
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment:	ESU40,3115,PAM-0118P
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature:	26.7°C
Humidity:	50%
Atmospheric Pressure:	100.8kPa
Test Engineer:	Destine Hu
Test Date:	2024/12/12

Full Spectrum

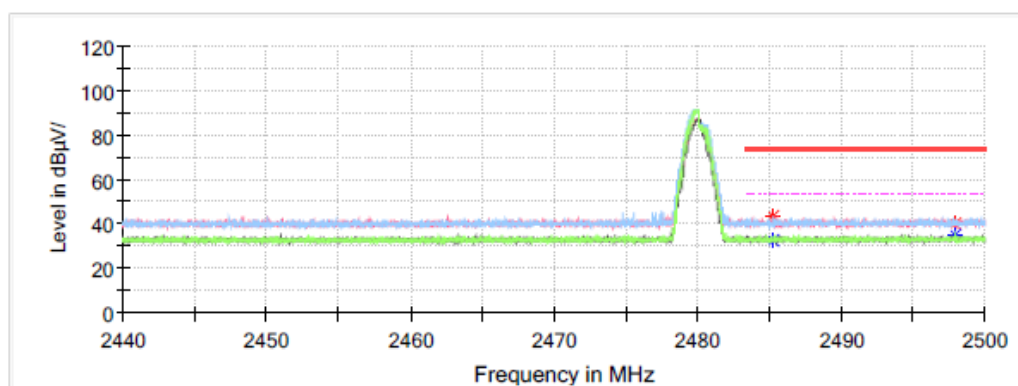
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2325.092000	42.36	---	74.00	31.64	H	-4.8
2325.092000	---	32.47	54.00	21.53	H	-4.8
2338.938000	39.74	---	74.00	34.26	V	-4.7
2338.938000	---	34.65	54.00	19.35	V	-4.7

Right Side**Common Information**

Project No.: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment: ESU40,3115,PAM-0118P
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature: 26.7°C
Humidity: 50%
Atmospheric Pressure: 100.8kPa
Test Engineer: Destine Hu
Test Date: 2024/12/12

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)
2485.210000	43.64	---	74.00	30.36	H	-4.2
2485.210000	---	32.99	54.00	21.01	H	-4.2
2497.990000	39.87	---	74.00	34.13	H	-4.2
2497.990000	---	35.32	54.00	18.68	H	-4.2

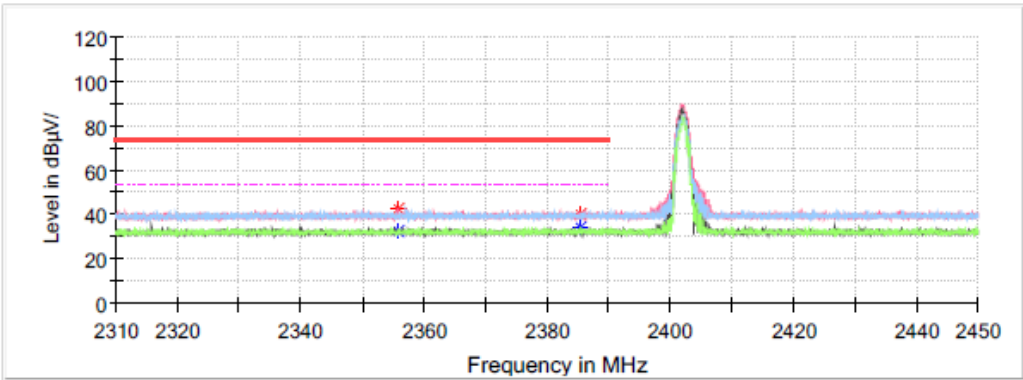
$\pi/4$ -DQPSK:

Left Side

Common Information

Project No.:	RSHA241101001
EUT Model:	Oscar Trek
Test Mode:	BT
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment:	ESU40,3115,PAM-0118P
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature:	26.7℃
Humidity:	50%
Atmospheric Pressure:	100.8kPa
Test Engineer:	Destine Hu
Test Date:	2024/12/12

Full Spectrum



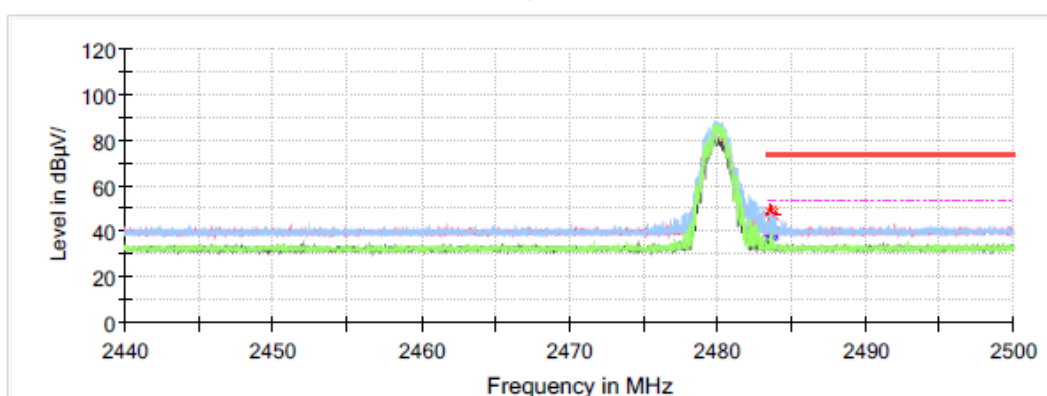
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2355.892000	42.47	---	74.00	31.53	V	-4.7
2355.892000	---	32.60	54.00	21.40	V	-4.7
2385.404000	40.36	---	74.00	33.64	H	-4.6
2385.404000	---	34.30	54.00	19.70	H	-4.6

Right Side**Common Information**

Project No.:	RSHA241101001
EUT Model:	Oscar Trek
Test Mode:	BT
Standard:	FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment:	ESU40,3115,PAM-0118P
Receiver Setting:	RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature:	26.7℃
Humidity:	50%
Atmospheric Pressure:	100.8kPa
Test Engineer:	Destine Hu
Test Date:	2024/12/12

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)
2483.626000	48.86	---	74.00	25.14	H	-4.3
2483.626000	---	38.57	54.00	15.43	H	-4.3
2483.644000	48.17	---	74.00	25.83	H	-4.3
2483.644000	---	39.77	54.00	14.23	H	-4.3

8DPSK:

Left Side

Common Information

Project No.:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Receiver Setting:

Temperature:

Humidity:

Atmospheric Pressure:

Test Engineer:

Test Date:

RSHA241101001

Oscar Trek

BT

FCC Part 15.247& FCC Part 15.205& FCC Part 15.209

ESU40,3115,PAM-0118P

RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto

26.7℃

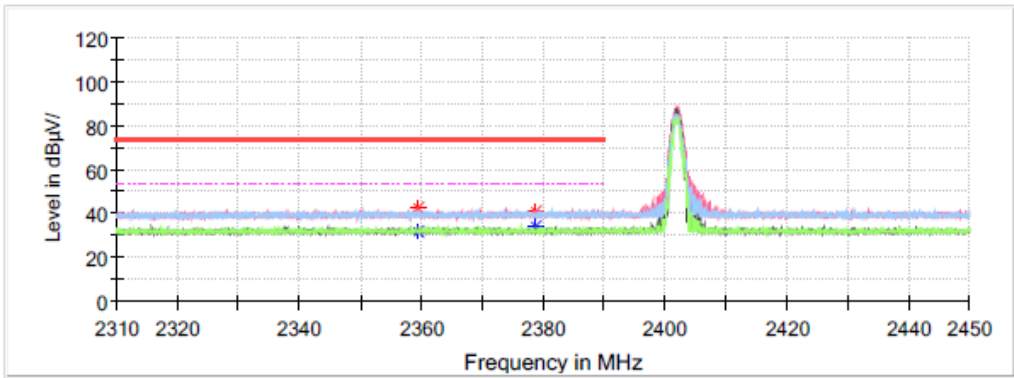
50%

100.8kPa

Destine Hu

2024/12/12

Full Spectrum



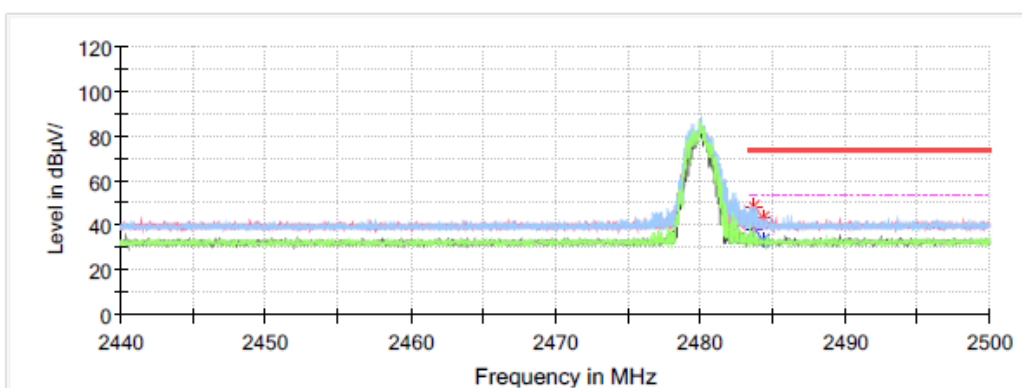
Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2359.546000	42.58	---	74.00	31.42	V	-4.7
2359.546000	---	32.03	54.00	21.97	V	-4.7
2378.684000	40.85	---	74.00	33.15	V	-4.6
2378.684000	---	34.78	54.00	19.22	V	-4.6

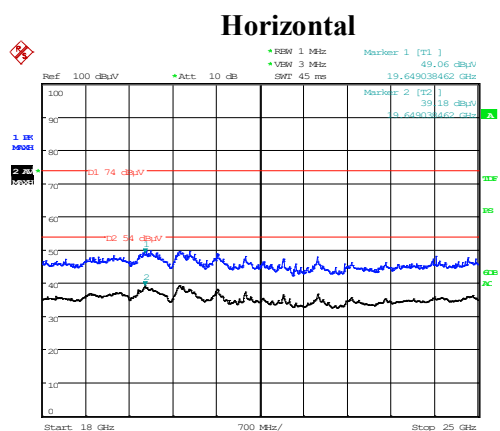
Right Side**Common Information**

Project No.: RSHA241101001
EUT Model: Oscar Trek
Test Mode: BT
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209
Test Equipment: ESU40,3115,PAM-0118P
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto
Temperature: 26.7°C
Humidity: 50%
Atmospheric Pressure: 100.8kPa
Test Engineer: Destine Hu
Test Date: 2024/12/12

Full Spectrum

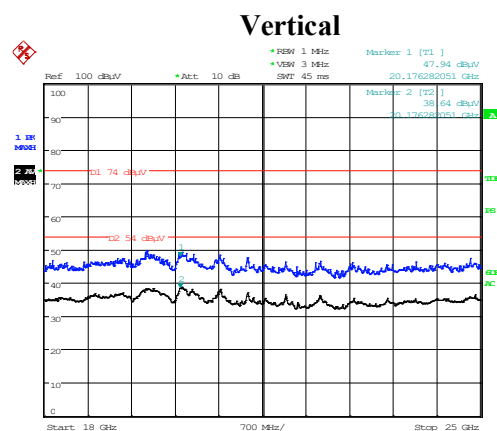
**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2483.698000	---	38.76	54.00	15.24	H	-4.3
2483.698000	48.92	---	74.00	25.08	H	-4.3
2484.322000	---	33.80	54.00	20.20	V	-4.3
2484.322000	43.96	---	74.00	30.04	V	-4.3

18 GHz - 25 GHz (Transmitting maximum output power GFSK Mode high channel):

Project No.: RSHA241101001
 Date: 19.FEB.2025 16:17:32

Tester: Hugh Wu



Project No.: RSHA241101001
 Date: 19.FEB.2025 16:48:27

Tester: Hugh Wu

Frequency (GHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
20.18	---	38.64	54	15.36	V	12.44
20.18	47.94	---	74	26.06	V	12.44
19.65	---	39.18	54	14.82	H	11.27
19.65	49.06	---	74	24.94	H	11.27

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

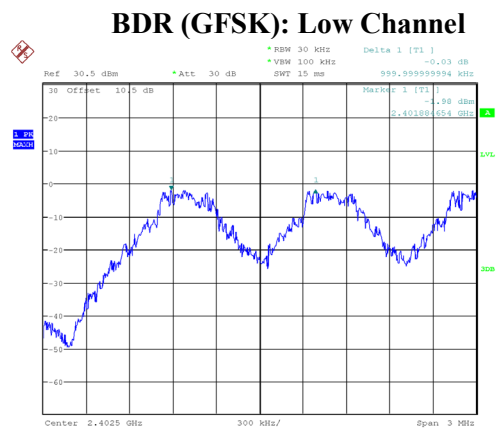
CHANNEL SEPARATION TEST**Environmental Conditions & Test Information**

Test Date:	2025-01-18
Temperature:	22.7 °C
Relative Humidity:	53 %
ATM Pressure:	101.4 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

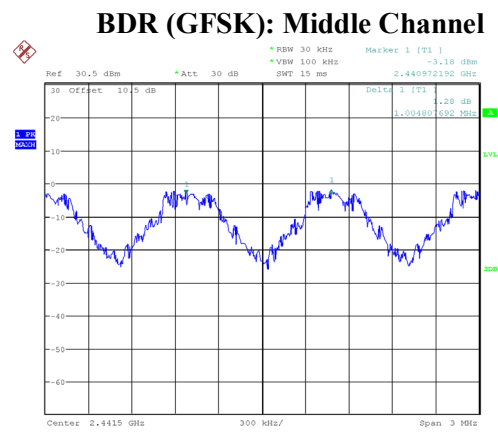
EUT operation mode: Transmitting

Mode	Channel	Result (MHz)	Limit (MHz)	Result
GFSK	Low	1.000	0.862	Pass
	Middle	1.005	0.862	Pass
	High	1.001	0.862	Pass

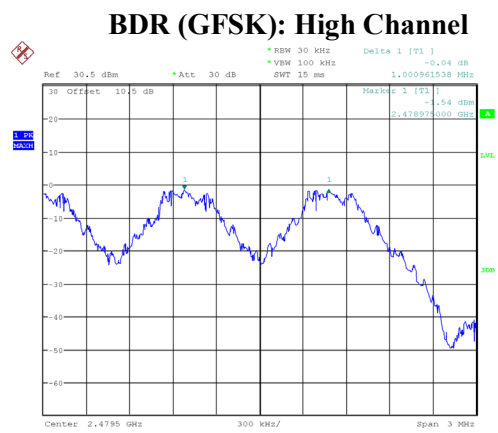
Note: Only GFSK mode result is reported since EDR($\pi/4$ -DQPSK, 8DPSK) has the exact same channel plan.
Limit = 20 dB bandwidth*2/3



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 15:09:02



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 15:13:11



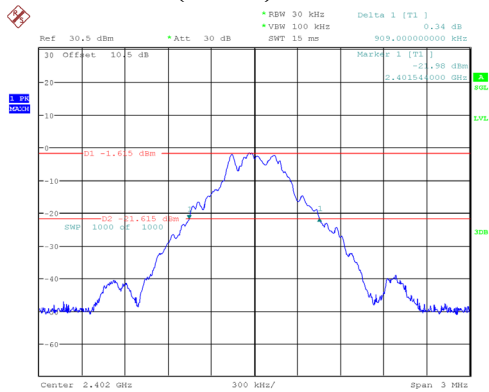
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 15:18:59

20 dB BANDWIDTH TEST**Environmental Conditions & Test Information**

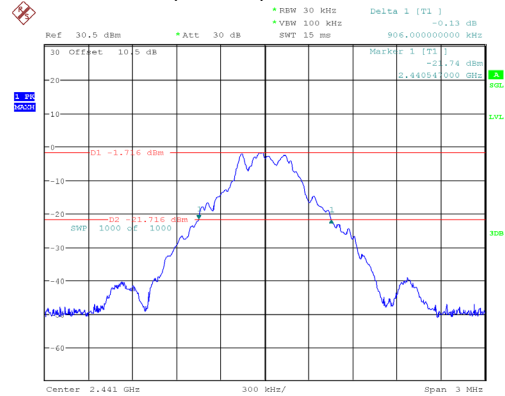
Test Date:	2025-01-18
Temperature:	22.7 °C
Relative Humidity:	53 %
ATM Pressure:	101.4 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

EUT operation mode: Transmitting

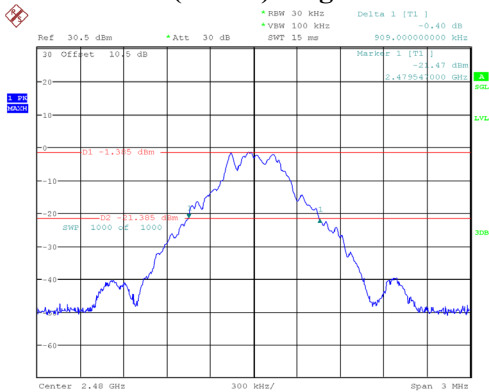
Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
BDR (GFSK)	Low	2402	0.909
	Middle	2441	0.906
	High	2480	0.909
EDR ($\pi/4$-DQPSK)	Low	2402	1.290
	Middle	2441	1.290
	High	2480	1.293
EDR (8DPSK)	Low	2402	1.218
	Middle	2441	1.218
	High	2480	1.218

BDR (GFSK): Low Channel

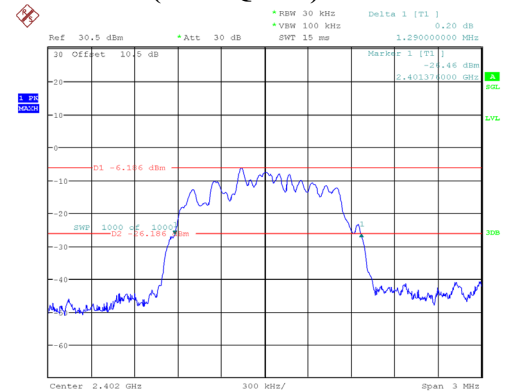
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 09:38:50

BDR (GFSK): Middle Channel

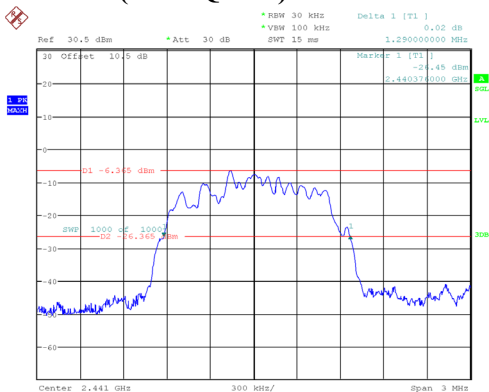
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 09:46:46

BDR (GFSK): High Channel

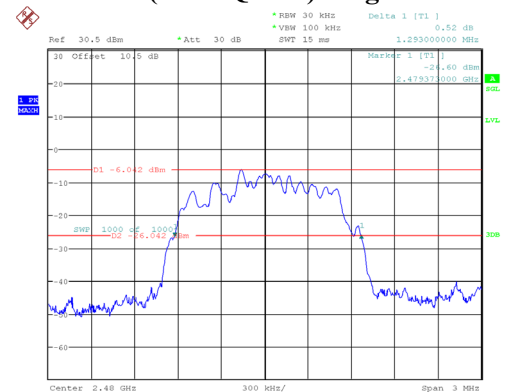
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:05:11

EDR ($\pi/4$ -DQPSK): Low Channel

ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:21:24

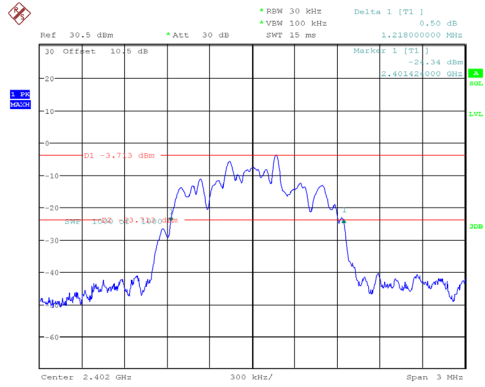
EDR($\pi/4$ -DQPSK): Middle Channel

ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:29:42

EDR ($\pi/4$ -DQPSK): High Channel

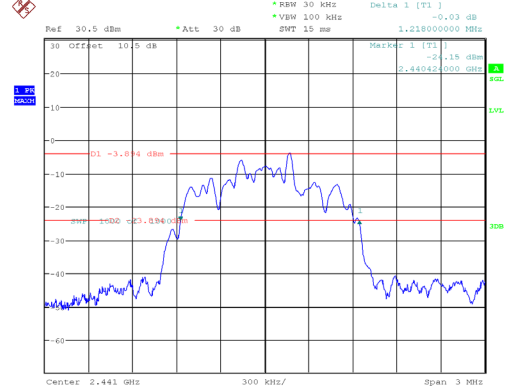
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:57:35

EDR (8DPSK): Low Channel



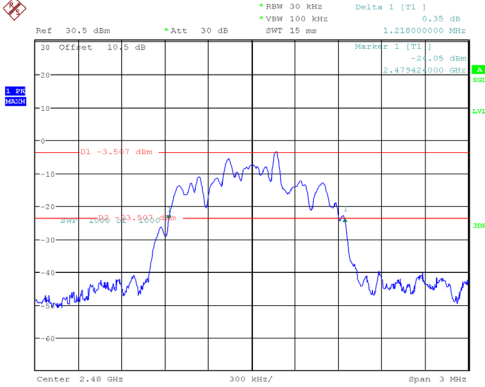
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 11:05:28

EDR (8DPSK): Middle Channel



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 13:39:04

EDR (8DPSK): High Channel



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 13:50:56

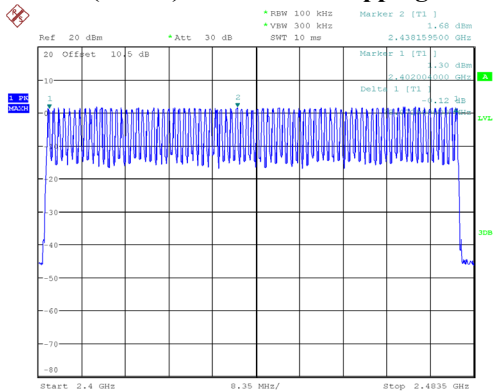
QUANTITY OF HOPPING CHANNEL TEST**Environmental Conditions & Test Information**

Test Date:	2025-01-18
Temperature:	22.7 °C
Relative Humidity:	53 %
ATM Pressure:	101.4 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

EUT operation mode: Hopping

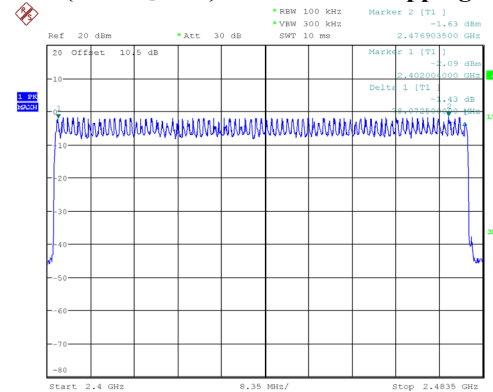
Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
BDR (GFSK)	2400-2483.5	79	≥15
EDR ($\pi/4$ -DQPSK)	2400-2483.5	79	≥15
EDR (8DPSK)	2400-2483.5	79	≥15

BDR (GFSK): Number of Hopping Channels



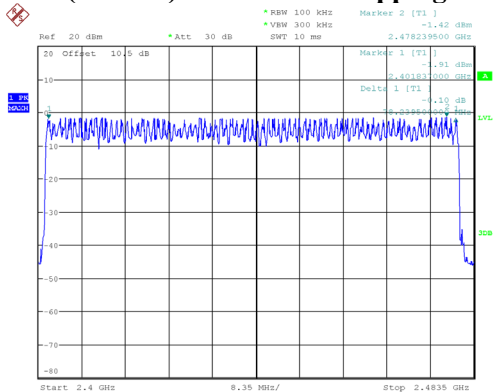
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:14:58

EDR ($\pi/4$ -DQPSK): Number of Hopping Channels



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:38:43

EDR (8DPSK): Number of Hopping Channels



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:45:07

TIME OF OCCUPANCY (DWELL TIME)**Environmental Conditions & Test Information**

Test Date:	2025-01-18
Temperature:	22.7°C
Relative Humidity:	53%
ATM Pressure:	101.4 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

EUT operation mode: Hopping

Mode		Channel	Pulse Width (ms)	Dwell Time (s)	Limit (s)	Result
BDR (GFSK)	DH1	Middle	0.395	0.126	0.4	Pass
	DH3	Middle	1.659	0.265	0.4	Pass
	DH5	Middle	2.930	0.313	0.4	Pass
EDR ($\pi/4$ -DQPSK)	2DH1	Middle	0.396	0.127	0.4	Pass
	2DH3	Middle	1.656	0.265	0.4	Pass
	2DH5	Middle	2.925	0.312	0.4	Pass
EDR (8DPSK)	3DH1	Middle	0.396	0.127	0.4	Pass
	3DH3	Middle	1.653	0.264	0.4	Pass
	3DH5	Middle	2.925	0.312	0.4	Pass

Note:

DH1: Dwell time = Pulse time*(1600/2/79)*31.6S

DH3: Dwell time = Pulse time*(1600/4/79)*31.6S

DH5: Dwell time = Pulse time*(1600/6/79)*31.6S

2DH1: Dwell time = Pulse time*(1600/2/79)*31.6S

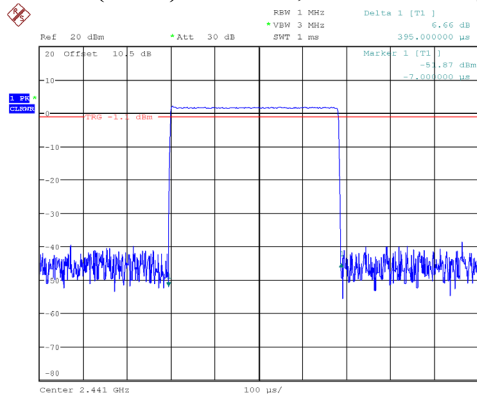
2DH3: Dwell time = Pulse time*(1600/4/79)*31.6S

2DH5: Dwell time = Pulse time*(1600/6/79)*31.6S

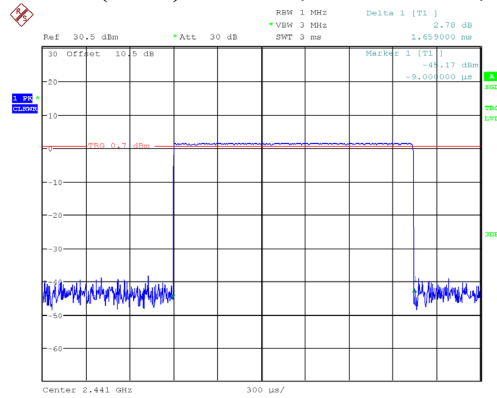
3DH1: Dwell time = Pulse time*(1600/2/79)*31.6S

3DH3: Dwell time = Pulse time*(1600/4/79)*31.6S

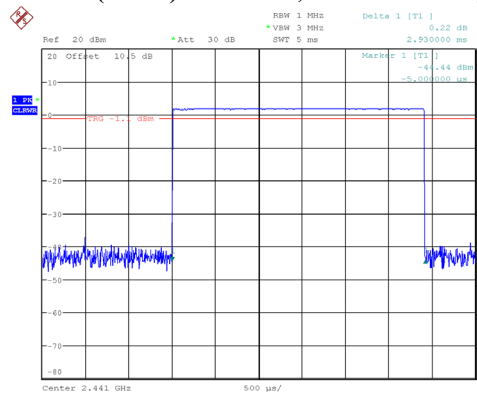
3DH5: Dwell time = Pulse time*(1600/6/79)*31.6S

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

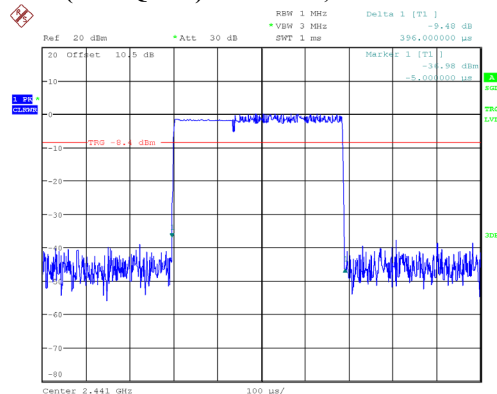
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:24:12

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

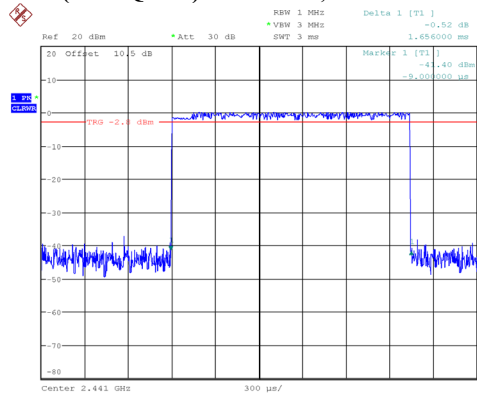
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:49:36

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

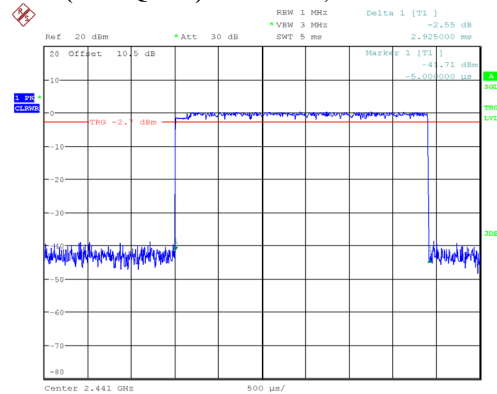
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:32:45

EDR ($\pi/4$ -DQPSK): Pulse time, Middle Channel, 2DH1

ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:39:07

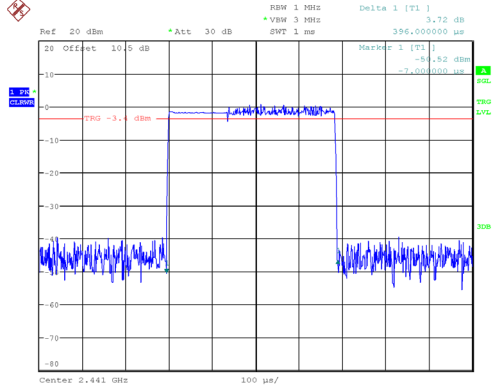
EDR ($\pi/4$ -DQPSK): Pulse time, Middle Channel, 2DH3

ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:40:19

EDR ($\pi/4$ -DQPSK): Pulse time, Middle Channel, 2DH5

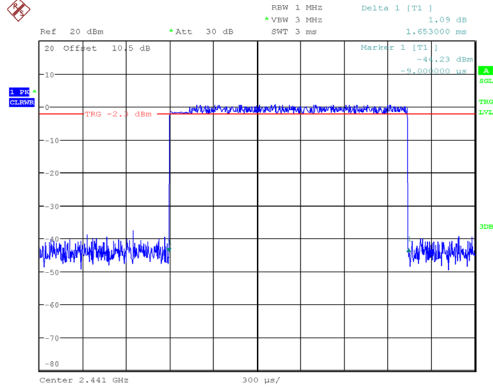
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:41:37

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



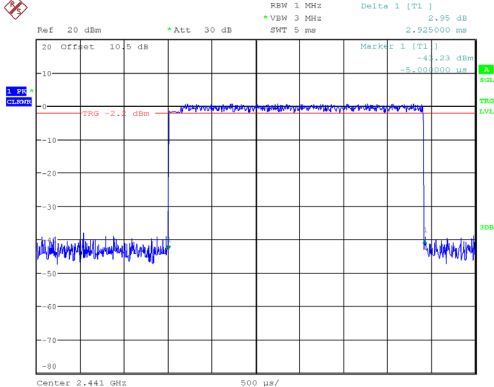
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:45:55

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



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:47:40

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



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:56:15

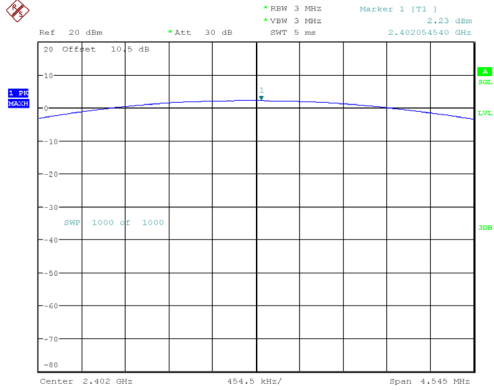
PEAK OUTPUT POWER MEASUREMENT**Environmental Conditions & Test Information**

Test Date:	2025-01-18
Temperature:	22.7 °C
Relative Humidity:	53 %
ATM Pressure:	101.4 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

EUT operation mode: Transmitting

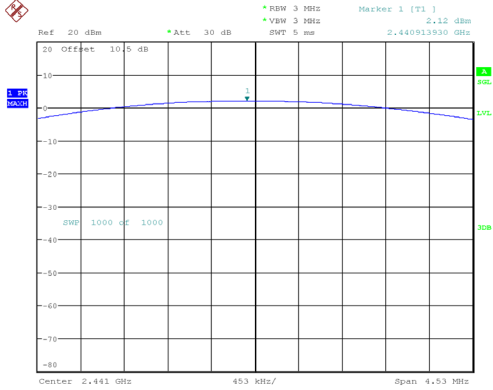
Mode	Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)
GFSK	Low	2402	2.23	21
	Middle	2441	2.12	
	High	2480	2.41	
$\pi/4$ DQPSK	Low	2402	0.35	
	Middle	2441	0.19	
	High	2480	0.47	
8DPSK	Low	2402	0.64	
	Middle	2441	0.45	
	High	2480	0.78	

BDR (GFSK): 2402MHz



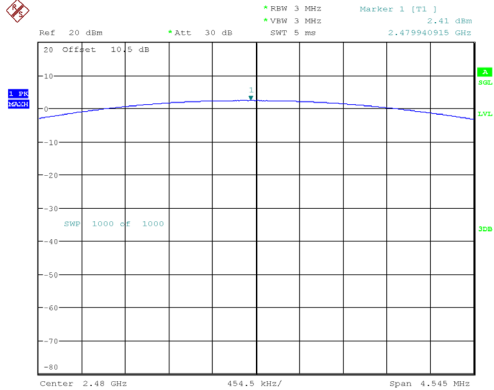
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 09:44:54

BDR (GFSK): 2441MHz



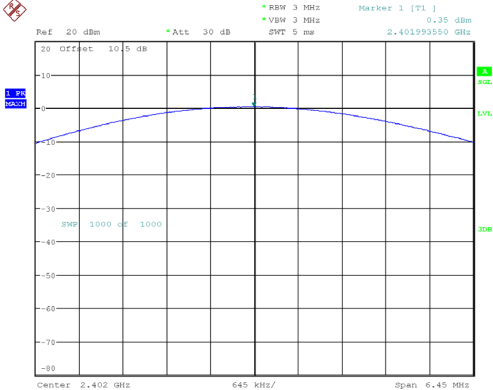
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 09:55:42

BDR (GFSK): 2480MHz



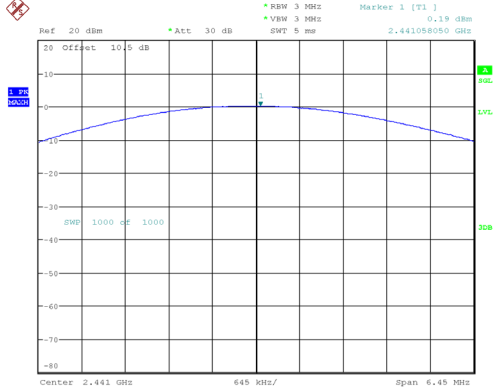
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:19:27

EDR($\pi/4$ -DQPSK): 2402MHz



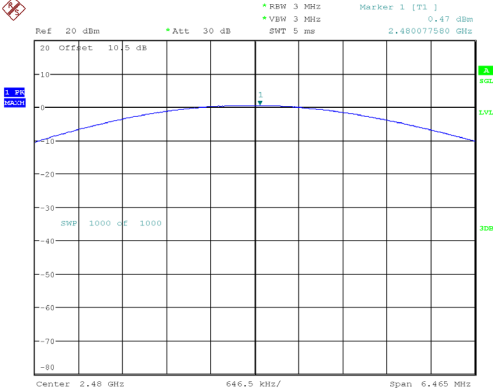
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:27:30

EDR($\pi/4$ -DQPSK): 2441MHz

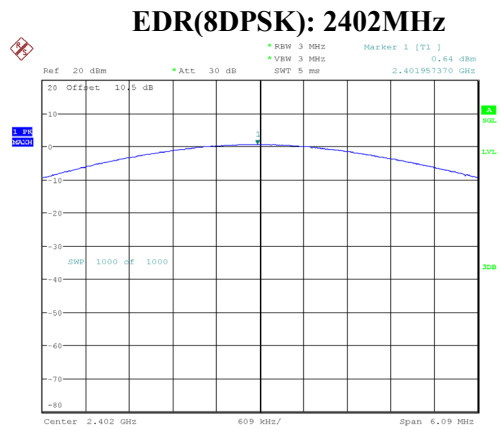


ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 10:53:41

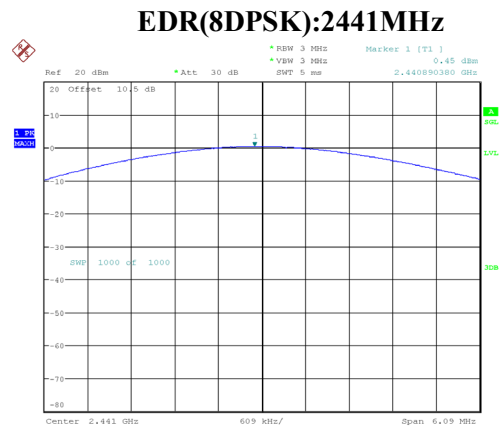
EDR($\pi/4$ -DQPSK): 2480MHz



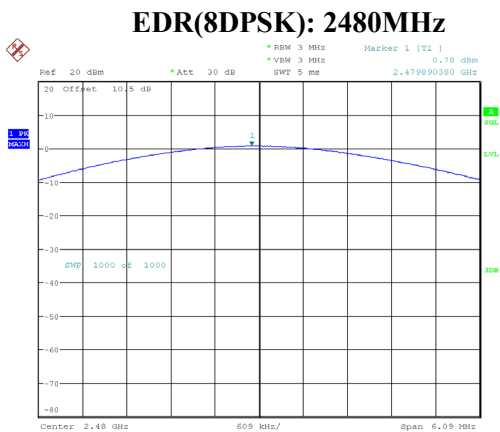
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 11:03:38



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 12:08:19



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 13:49:20



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 18.JAN.2025 14:04:23

BAND EDGES

Environmental Conditions & Test Information

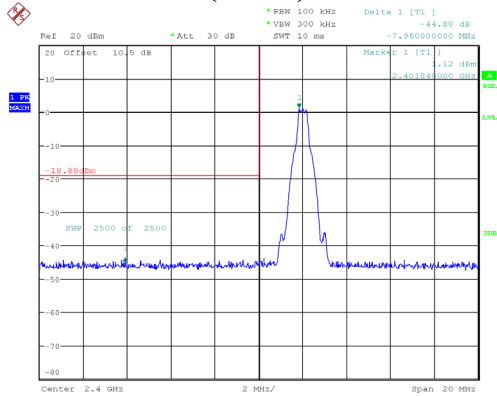
Test Date:	2025-06-06
Temperature:	23.7 °C
Relative Humidity:	60 %
ATM Pressure:	100.5 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

EUT operation mode: Transmitting & Hopping

Test Result: Compliant.

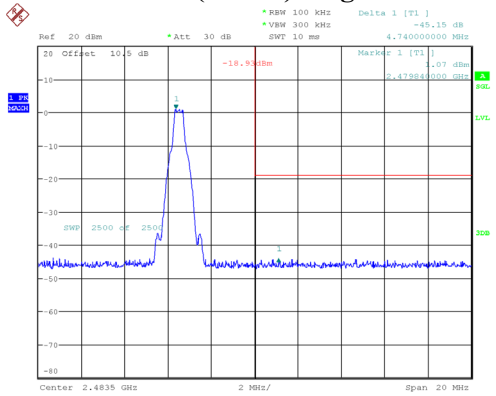
Band Edge

BDR (GFSK): Left Side



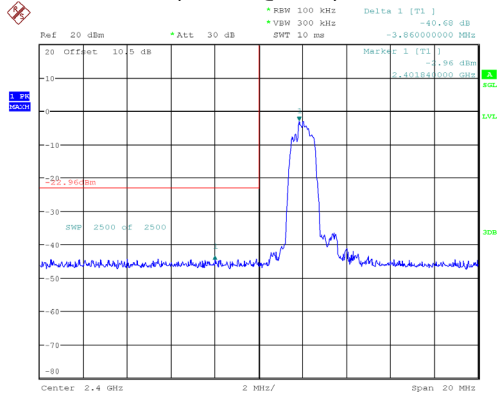
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6 JUN.2025 16:57:12

BDR (GFSK): Right Side



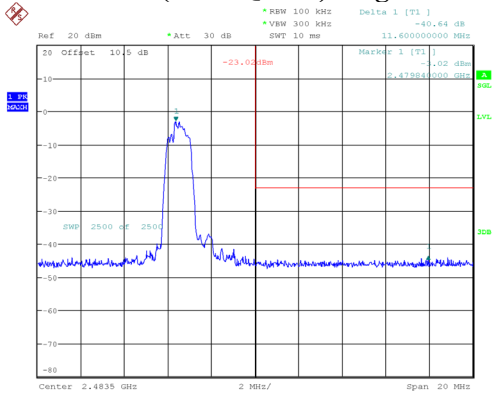
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6 JUN.2025 16:59:59

EDR ($\pi/4$ -DQPSK): Left Side



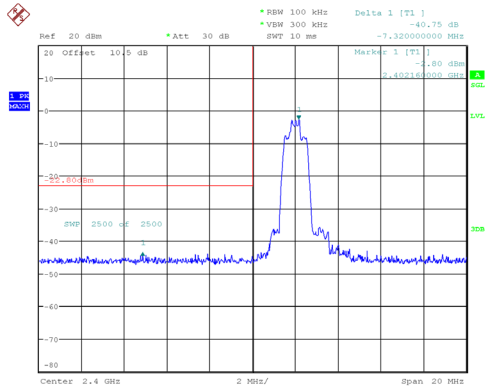
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6 JUN.2025 17:08:54

EDR ($\pi/4$ -DQPSK): Right Side



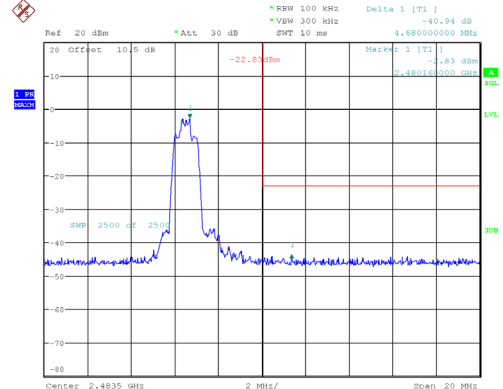
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6 JUN.2025 17:12:11

EDR (8DPSK): Left Side



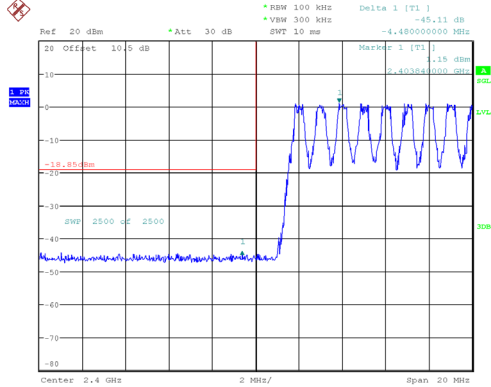
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:21:07

EDR (8DPSK): Right Side



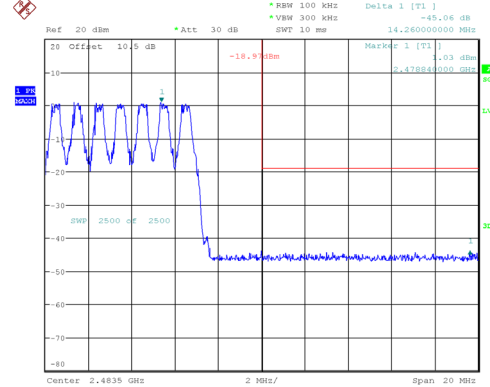
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:24:20

BDR (GFSK): Left Side - Hopping



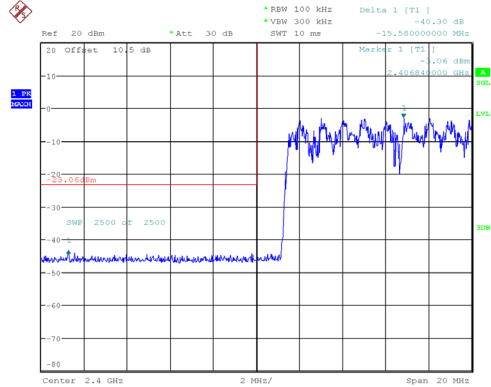
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 16:51:12

BDR (GFSK): Right Side - Hopping



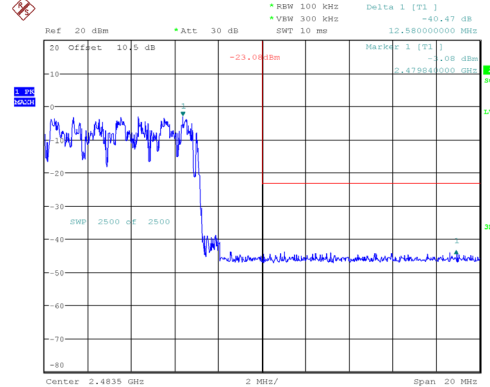
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 16:53:31

EDR ($\pi/4$ -DQPSK): Left Side - Hopping



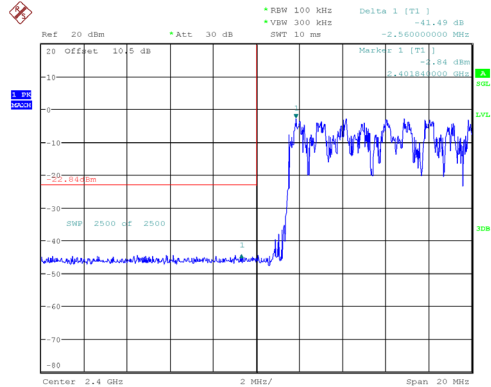
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:03:29

EDR ($\pi/4$ -DQPSK): Right Side - Hopping



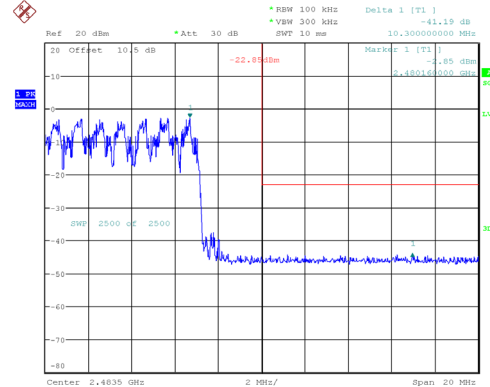
ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:05:53

EDR (8DPSK): Left Side - Hopping



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:15:18

EDR (8DPSK): Right Side - Hopping



ProjectNo.:RSHA241101001 Tester:Neil Zhou
Date: 6.JUN.2025 17:17:42

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 *******