TEST REPORT

Applicant Name:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number:	2401Y99438E-RFB
FCC ID:	2ATZ4-GA20N2
IC:	26074-GA20N2

Test Standard (s)

FCC PART 15.247; RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT 2;
RSS-247 ISSUE 3, AUGUST 2023

Sample Description

Product Type:	Smart phone
Model No.:	PG4RBG100
Multiple Model(s) No.:	FCC: PG4RB100A
Trade Mark:	UMIDIGI
Date Received:	2024-10-17
Issue Date:	2024-12-05

Test Result:	Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Jim Cheng
RF Engineer

Approved By:

Nancy Wang
RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401Y99438E-RFB	Original Report	2024-12-05

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

HVIN	G20-615-U4
FVIN	UMIDIGI_G100_V1.0
Product	Smart phone
Tested Model	PG4RBG100
Multiple Model(s) No.	FCC: PG4RB100A
Frequency Range	2402~2480MHz
Transmit Peak Power	0.18dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification#	1.38dBi (provided by the applicant)
Voltage Range	DC 5V/9V/12V charging from Adapter or DC 3.89V from battery
Sample serial number	2SY1-4 for Conducted and Radiated Emissions Test 2SY1-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	Model: QZ-02002AC00 Input: AC100-240V, 50/60Hz, 0.5A Output: DC 5.0V, 3.0A (15.0W) or DC 9.0V, 2.22A or DC 12.0V, 1.67A(20.0W Max.)
Note: The Multiple models are electrically identical with the test model except for model name and sales channels. Please refer to the declaration letter# for more detail, which was provided by manufacturer.	

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules and RSS-247 Issue 3, August 2023, RSS-GEN Issue 5, Feb. 2021Amendment 2 of the Innovation, Science and Economic Development Canada 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 RSS-247 Issue 3, August 2023, RSS-GEN Issue 5, Feb. 2021Amendment 2 of the Innovation, Science and Economic Development Canada rules.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		109.2kHz(k=2, 95% level of confidence)
RF output power, conducted		0.86dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz-150kHz	3.63dB(k=2, 95% level of confidence)
	150kHz-30MHz	3.66dB(k=2, 95% level of confidence)
Radiated Emissions	0.009MHz~30MHz	3.60dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	5.32dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	5.43dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	5.77dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.73dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.34dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.40dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.64dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0023.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	**2402**	40	2442
1	2403	41	2443
2	2404	42	2444
…	…	…	…
…	…	…	…
36	2438	75	2477
37	2439	76	2478
38	2440	77	2479
39	**2441**	**78**	**2480**
EUT was tested with Channel 0, 39 and 78.			

EUT Exercise Software

Exercise Software#	N/A
Power Level#	6

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

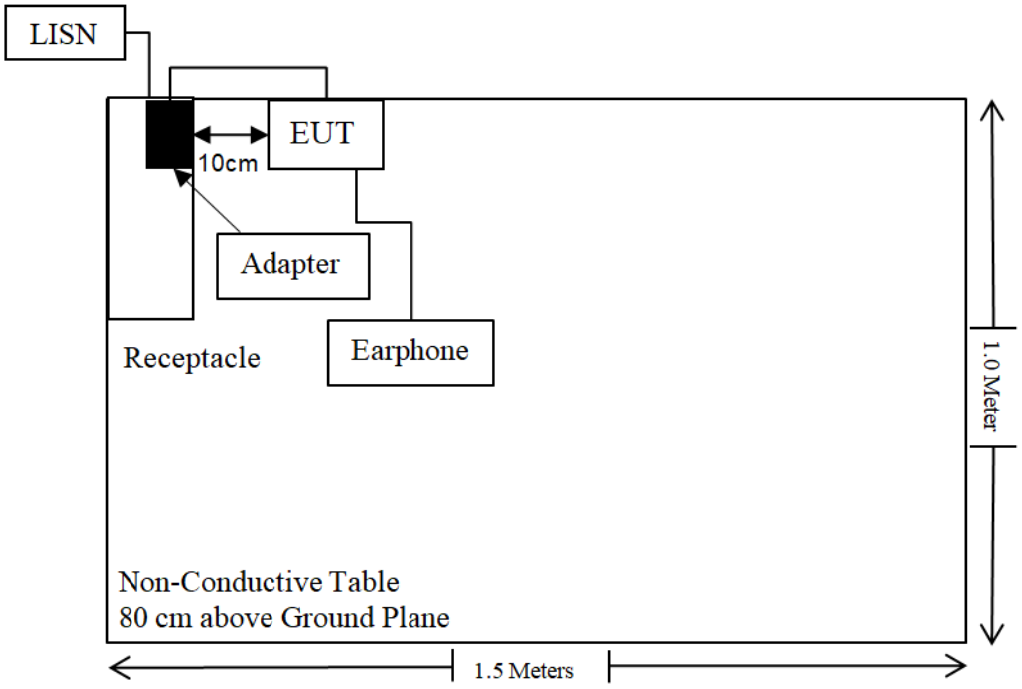
Manufacturer	Description	Model	Serial Number
unknown	Earphone	unknown	unknown
unknown	Receptacle	unknown	unknown

External I/O Cable

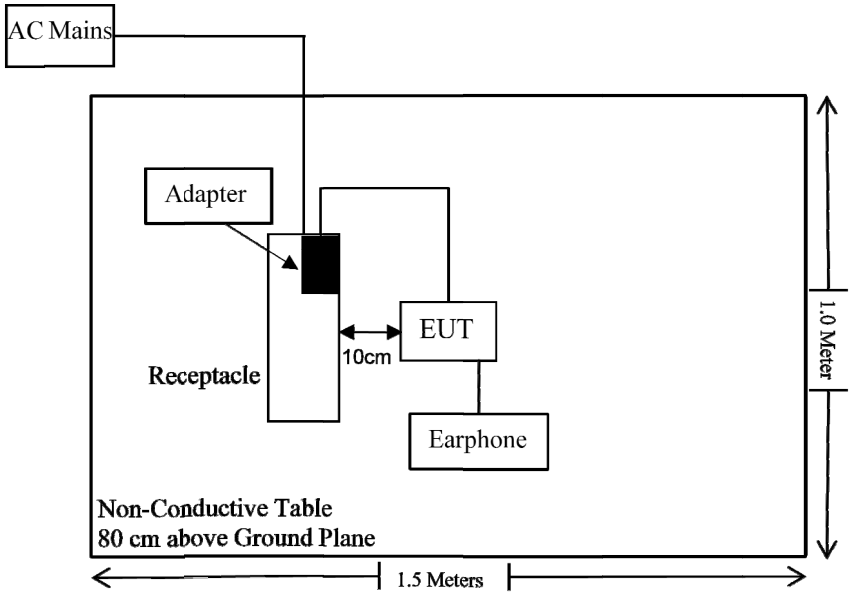
Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	0.8	EUT	Adapter
Shielded Un-detachable AC Cable	1.5	Receptacle	LISN/AC Mains
Un-shielding Detachable Audio Cable	1.0	Earphone	EUT

Block Diagram of Test Setup

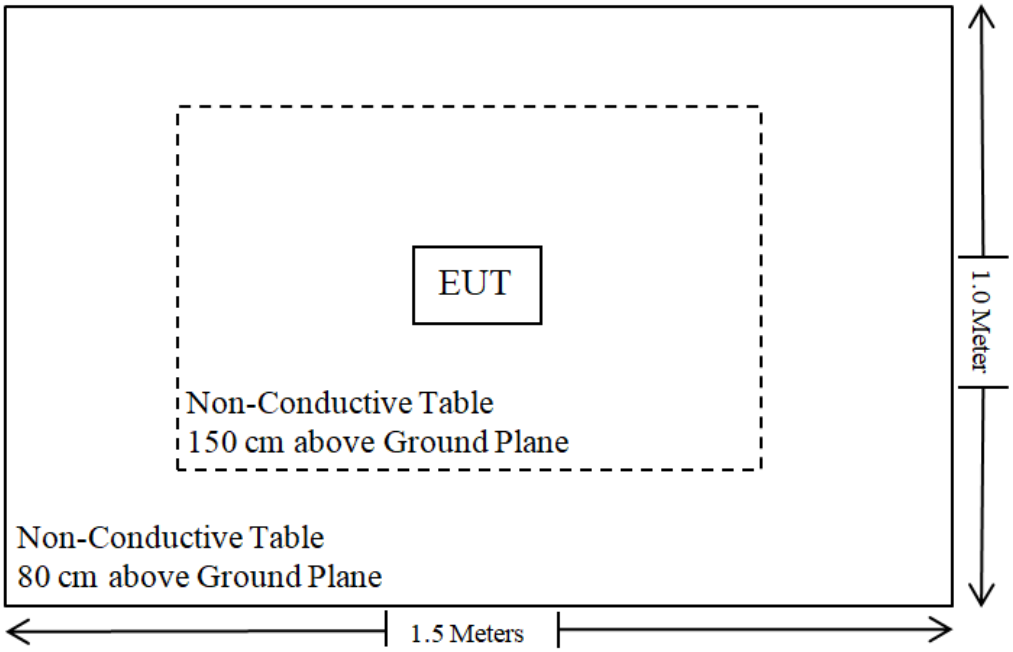
For Conducted Emissions:



For Radiated Emissions below 1GHz:



For Radiated Emissions above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	RSS Rules	Description of Test	Result
FCC §15.203	RSS-Gen §6.8	Antenna Requirement	Compliant
FCC §15.207(a)	RSS-Gen §8.8	AC Line Conducted Emissions	Compliant
FCC §15.205, §15.209, §15.247(d)	RSS-247 § 5.5, RSS-GEN § 8.10	Radiated Emissions	Compliant
FCC §15.247(a)(1)	RSS-247 § 5.1(a), RSS-GEN § 6.7	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliant
FCC §15.247(a)(1)	RSS-247 § 5.1 (b)	Channel Separation Test	Compliant
FCC §15.247(a)(1)(iii)	RSS-247 § 5.1 (d)	Time of Occupancy (Dwell Time)	Compliant
FCC §15.247(a)(1)(iii)	RSS-247 § 5.1 (d)	Quantity of hopping channel Test	Compliant
FCC §15.247(b)(1)	RSS-247 § 5.1(b) &§ 5.4(b)	Peak Output Power Measurement	Compliant
FCC §15.247(d)	RSS-247 § 5.5	Band edges	Compliant
C63.10 §11.6	C63.10 §11.6	Duty Cycle	/

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2024/01/16	2025/01/15
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2024/05/21	2025/05/20
Rohde & Schwarz	LISN	ENV216	101613	2024/01/16	2025/01/15
Unknown	CE Cable	Unknown	UF A210B-1-0720-504504	2024/05/21	2025/05/20
Audix	EMI Test software	E3	191218(V9)	NCR	NCR

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber Cable 1	F-03-EM236	2024/06/18	2025/06/17
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Unknown	Cable	PNG214	1354	2024/05/21	2025/05/20
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Rohde&Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
Unknown	RF Cable	KMSE	0735	2024/06/18	2025/06/17
Unknown	RF Cable	UFA147	219661	2024/06/18	2025/06/17
Unknown	RF Cable	XH750A-N	J-10M	2024/06/18	2025/06/17
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	2024/06/18	2025/06/17
A.H.System	Pre-amplifier	PAM-1840VH	190	2024/06/18	2025/06/17
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2024/06/18	2025/06/17
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV40-N	102259	2024/01/16	2025/01/15
Unknown	10dB Attenuator	Unknown	F-03-EM190	2024/06/27	2025/06/26

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

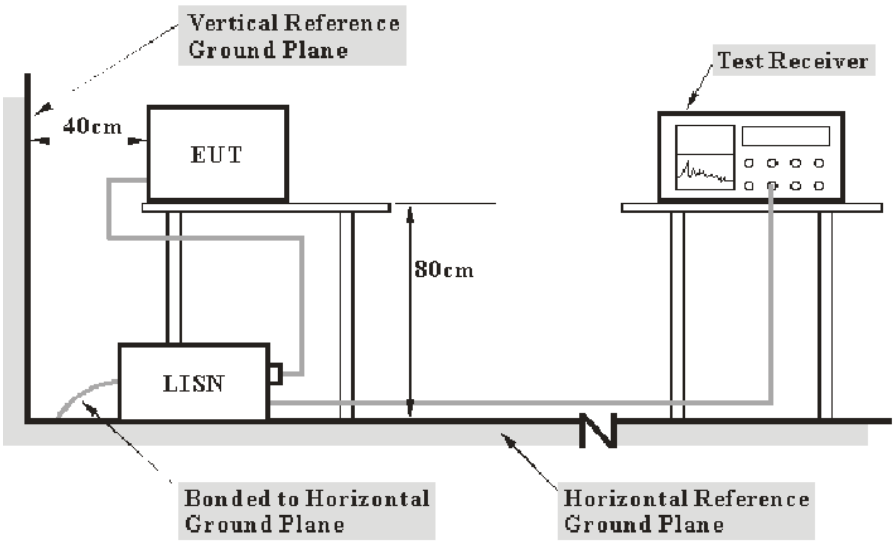
REQUIREMENTS AND TEST PROCEDURES

AC Line Conducted Emissions

Applicable Standard

FCC §15.207(a), RSS-GEN § 8.8

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

The spacing between the peripherals was 10 cm.

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	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

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

All final data was recorded in the Quasi-peak and average detection mode.

Factor & Over Limit Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

Factor = LISN VDF + Cable Loss

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 below the limit. The equation for calculation is as follows:

Over Limit = Level – Limit
Level = Read Level + Factor

Note: The term "cable loss" refers to the combination of a cable and a 10dB transient limiter (attenuator).

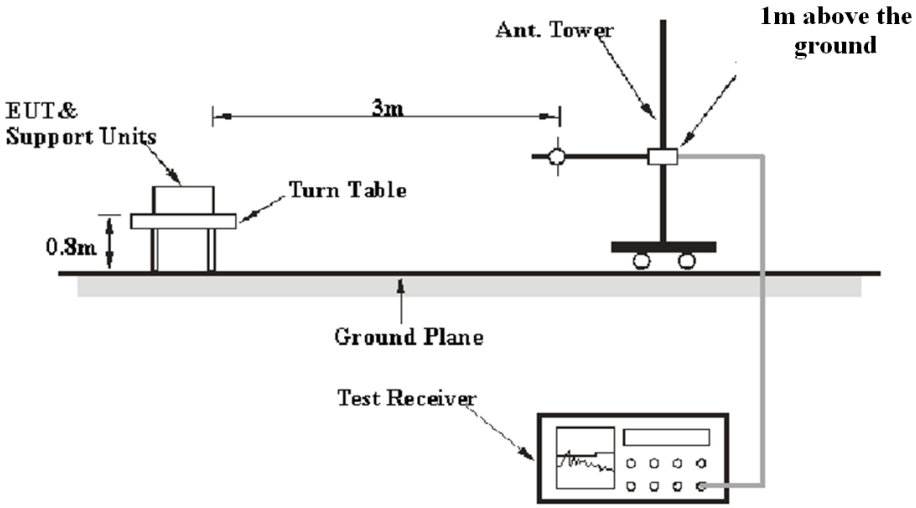
Radiated Emissions

Applicable Standard

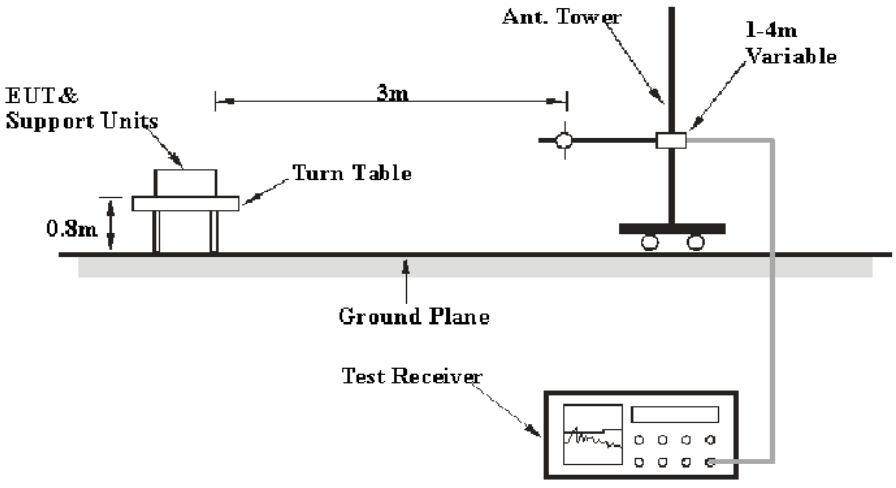
FCC §15.205; §15.209; §15.247(d); RSS-247§ 5.5; RSS-GEN § 8.10

EUT Setup

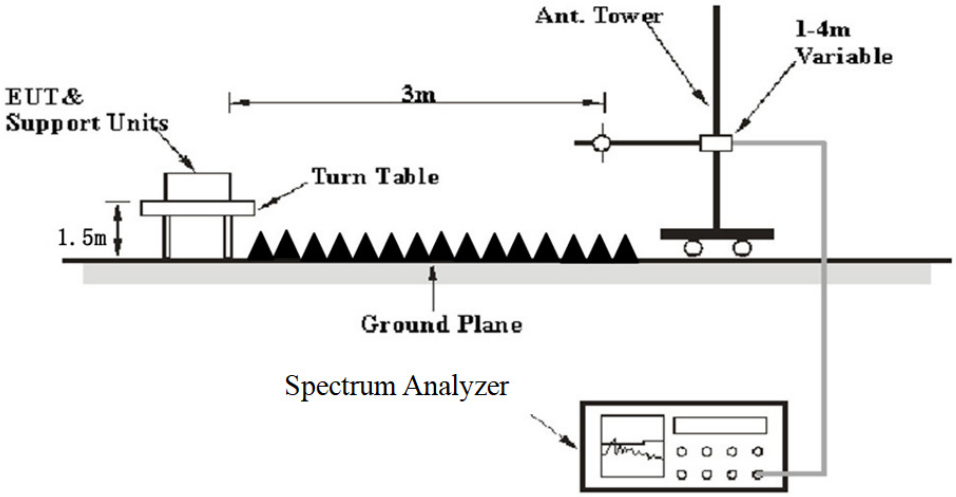
9 kHz-30MHz:



30MHz-1GHz:



Above 1GHz:



The radiated emission performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, FCC 15.247, RSS-247, RSS-Gen limits.

EMI Test Receiver & Spectrum Analyzer Setup

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	/	/	200 Hz	QP
	300 Hz	1 kHz	/	PK
150 kHz – 30 MHz	/	/	9 kHz	QP
	10 kHz	30 kHz	/	PK
30 MHz – 1000 MHz	/	/	120 kHz	QP
	100 kHz	300 kHz	/	PK
Above 1 GHz	Harmonics & Band Edge			
	1MHz	3 MHz	/	PK
	Average Emission Level=Peak Emission Level+20*log(Duty cycle)			
	Other Emissions			
	1MHz	3 MHz	/	PK
	1MHz	≥10 Hz	/	Average

For Duty cycle measurement:

Use the duty cycle factor correction factor method per 15.35(c).
Duty cycle=On time/100milliseconds, On time=N1*L1+N2*L2+…Nn-1*Ln-1+Nn*Ln,
Where N1 is number of type 1 pulses, L1 is length of type 1 pulse, etc.

Test Procedure

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

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz, peak and average detection modes for frequencies above 1 GHz.

For 9 kHz-30MHz, the report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground-parallel) unless the margin is greater than 20 dB.

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

All emissions under the average limit and under the noise floor have not recorded in the report.

Factor & Over Limit/Margin Calculation

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

Factor = Antenna Factor + Cable Loss - Amplifier Gain

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

Over Limit/Margin = Level/Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

20 dB Emission Bandwidth & 99% Occupied Bandwidth

According to FCC §15.247(a) (1):

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

According to RSS-247 § 5.1 (a), RSS-GEN § 6.7:

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the "20 dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated 20 dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.7 & Clause 6.9.2

The following conditions shall be observed for measuring the occupied bandwidth and 20 dB bandwidth:

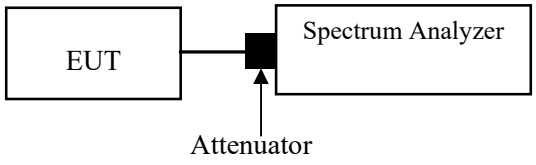
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / 20 dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / 20 dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).



Channel Separation Test

According to FCC §15.247(a) (1):

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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

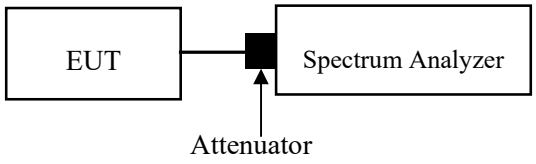
According to RSS-247 § 5.1 (b):

Frequency hopping systems (FHSs) 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, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.2

1. Set the EUT in transmitting mode, max hold the channel.
2. Set the adjacent channel of the EUT and max hold another trace.
3. Measure the channel separation.



Quantity of Hopping Channel Test

Applicable Standard

According to FCC §15.247(a) (1) (iii):

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.

According to RSS-247 § 5.1 (d):

Frequency hopping systems (FHSS) operating in the band 2400-2483.5 MHz shall use at least 15 hopping 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. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

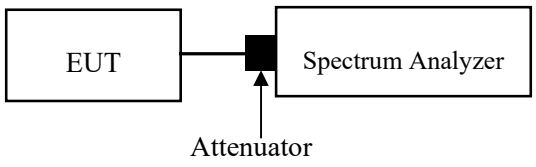
Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.3

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the max-hold function record the quantity of the channel.



Time of Occupancy (Dwell Time)

Applicable Standard

According to FCC §15.247(a) (1) (iii):

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.

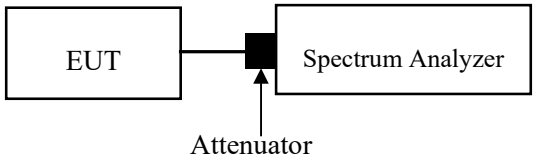
According to RSS-247 § 5.1 (d):

Frequency hopping systems (FHSs) operating in the band 2400-2483.5 MHz shall use at least 15 hopping 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. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.4

1. The EUT was worked in channel hopping.
2. Set the RBW to: 1MHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 0Hz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Recorded the time of single pulses



Peak Output Power Measurement

Applicable Standard

According to FCC §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.

According to RSS-247§ 5.1(b) &§ 5.4(b):

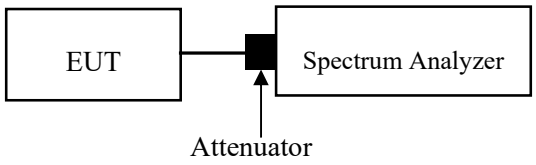
For frequency hopping systems (FHSs) operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W (see Section 5.4(e) for exceptions).

Frequency hopping systems (FHSs) 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, FHSs operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.5

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Note: A short RF cable with low cable loss connected to the EUT antenna port,which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable loss

Band Edges

Applicable Standard

According to FCC §15.247(d).

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)).

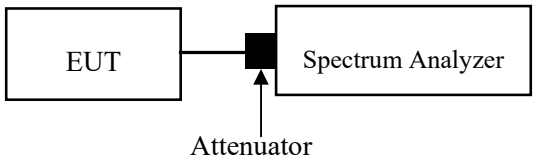
According to RSS-247 § 5.5.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(e), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.6 & Clause 6.10

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.



ANTENNA REQUIREMENT

Applicable Standard

According to § 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 user of a standard antenna jack or electrical connector is prohibited.

Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be res ponsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device’s antenna shall be stated, based on a measurement or on data from the antenna’s manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device. Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal antenna arrangement which was permanently attached for Bluetooth and the maximum antenna gain# is 1.38dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	Antenna Gain#	Impedance	Frequency Range
FPC	1.38dBi	50Ω	2.4~2.5GHz

Result: Compliant

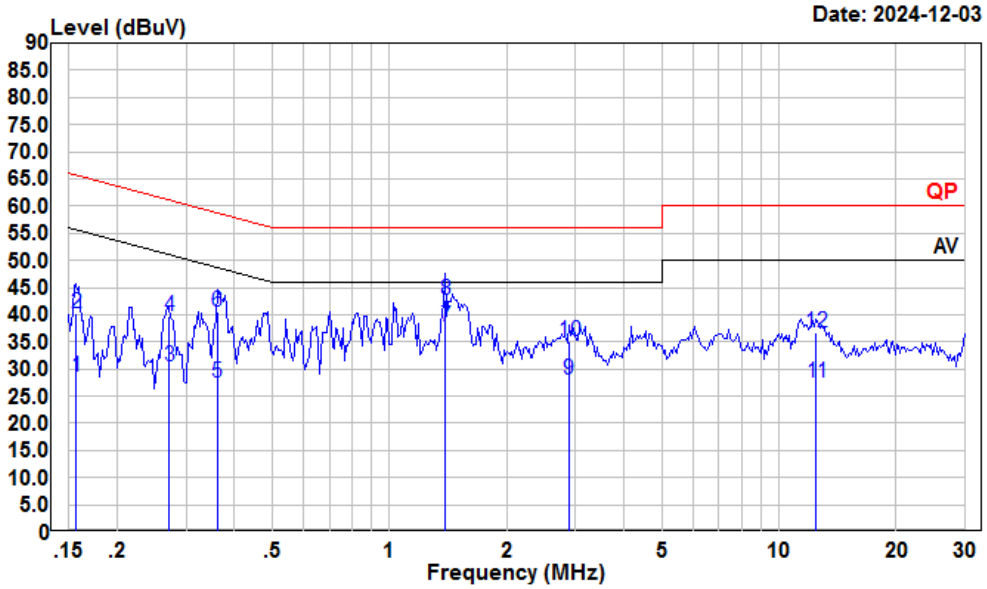
TEST DATA AND RESULTS

AC Line Conducted Emissions

Environmental Conditions

Temperature (℃)	24	**Relative Humidity (%)**	55
ATM Pressure (kPa)	101	**Test engineer**	Macy.shi
Test date	2024.12.03		
EUT operation mode	Transmitting(Maximum output power mode, EDR (π/4-DQPSK) Middle Channel)		

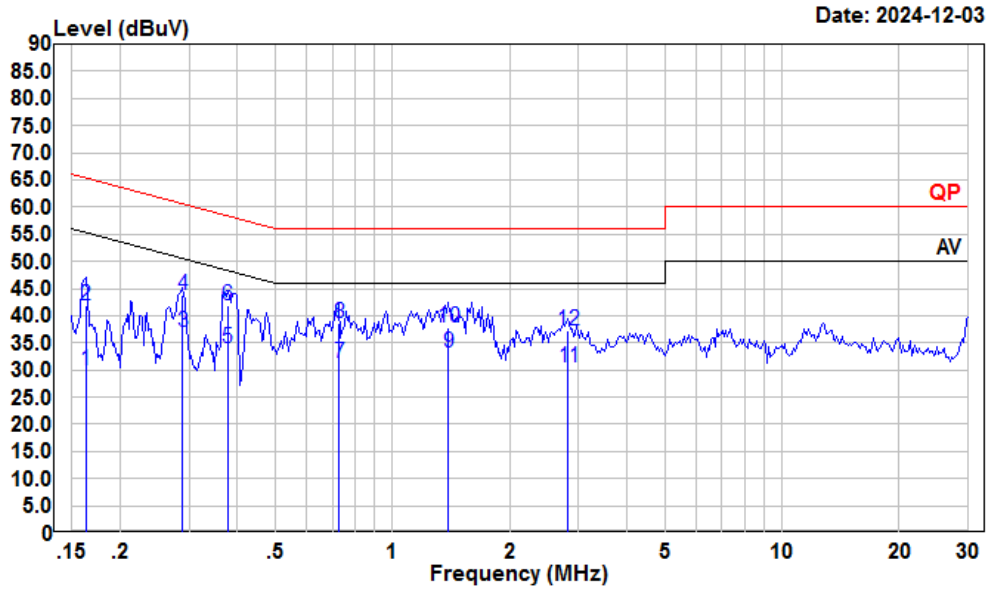
AC 120V 60 Hz, Line



Condition: Line
Project : 2401Y99438E-RF
tester : Macy.shi
Note : Transmitting
Detector : RBW:9KHz VBW:Auto SWT:Auto

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.156	7.43	28.44	10.89	10.12	55.65	-27.21	Average
2	0.156	19.28	40.29	10.89	10.12	65.65	-25.36	QP
3	0.272	9.56	30.35	10.70	10.09	51.07	-20.72	Average
4	0.272	18.80	39.59	10.70	10.09	61.07	-21.48	QP
5	0.361	6.80	27.53	10.61	10.12	48.69	-21.16	Average
6	0.361	19.85	40.58	10.61	10.12	58.69	-18.11	QP
7	1.388	17.23	37.87	10.49	10.15	46.00	-8.13	Average
8	1.388	22.04	42.68	10.49	10.15	56.00	-13.32	QP
9	2.884	7.46	28.08	10.44	10.18	46.00	-17.92	Average
10	2.884	14.53	35.15	10.44	10.18	56.00	-20.85	QP
11	12.449	6.62	27.43	10.60	10.21	50.00	-22.57	Average
12	12.449	15.83	36.64	10.60	10.21	60.00	-23.36	QP

AC 120V 60 Hz, Neutral



Condition: Neutral
Project : 2401Y99438E-RF
tester : Macy.shi
Note : Transmitting
Detector : RBW:9KHz VBW:Auto SWT:Auto

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.163	9.39	30.04	10.54	10.11	55.30	-25.26	Average
2	0.163	21.27	41.92	10.54	10.11	65.30	-23.38	QP
3	0.289	16.49	37.11	10.52	10.10	50.54	-13.43	Average
4	0.289	23.07	43.69	10.52	10.10	60.54	-16.85	QP
5	0.377	13.16	33.88	10.61	10.11	48.34	-14.46	Average
6	0.377	21.26	41.98	10.61	10.11	58.34	-16.36	QP
7	0.727	10.30	31.16	10.72	10.14	46.00	-14.84	Average
8	0.727	17.67	38.53	10.72	10.14	56.00	-17.47	QP
9	1.388	12.24	33.05	10.66	10.15	46.00	-12.95	Average
10	1.388	16.86	37.67	10.66	10.15	56.00	-18.33	QP
11	2.824	9.88	30.46	10.40	10.18	46.00	-15.54	Average
12	2.824	16.58	37.16	10.40	10.18	56.00	-18.84	QP

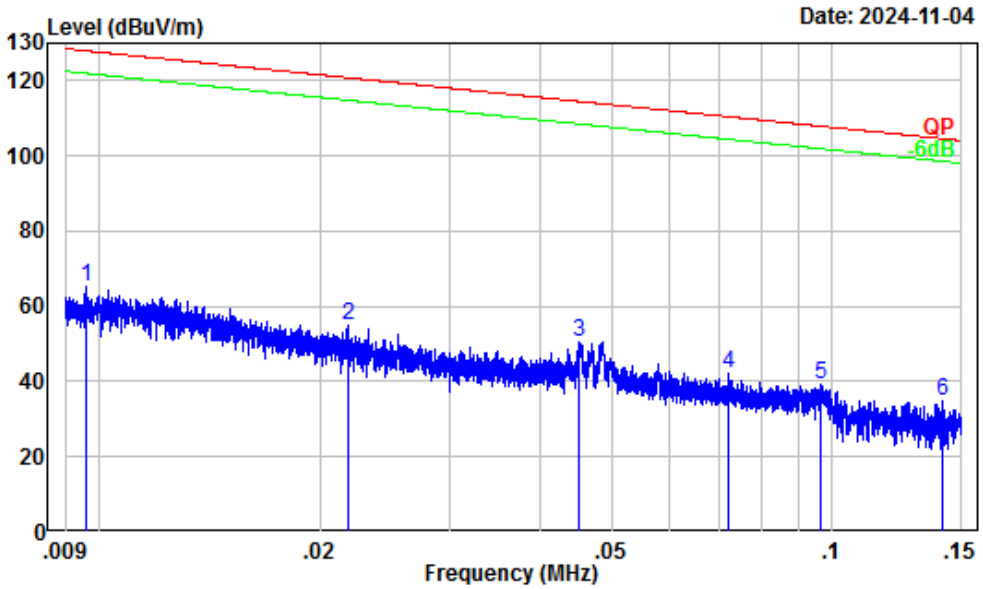
Radiated Emissions

Environmental Conditions

Temperature (°C)	24-25	**Relative Humidity (%)**	50-55
ATM Pressure (kPa):	101	**Test engineer:**	Anson Su&Karl Xu
Test date:	2024/11/04-2024/11/16		
EUT operation mode:	Below 1GHz: Transmitting(Maximum output power mode, EDR (π/4-DQPSK) Middle Channel) Above 1GHz: Transmitting(Maximum output power mode, EDR (π/4-DQPSK))		
Note:	After pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation were recorded. The spurious emission from 9 kHz-30MHz of IC RSS-Gen standard, the unit of final result on the test plots are dBμV/m, so the limit should be added by 51,5 dB from dBμA/m to dBμV/m. For the radiated spurious emission below 30MHz, only the worst case (perpendicular) was recorded.		

Below 1GHz:

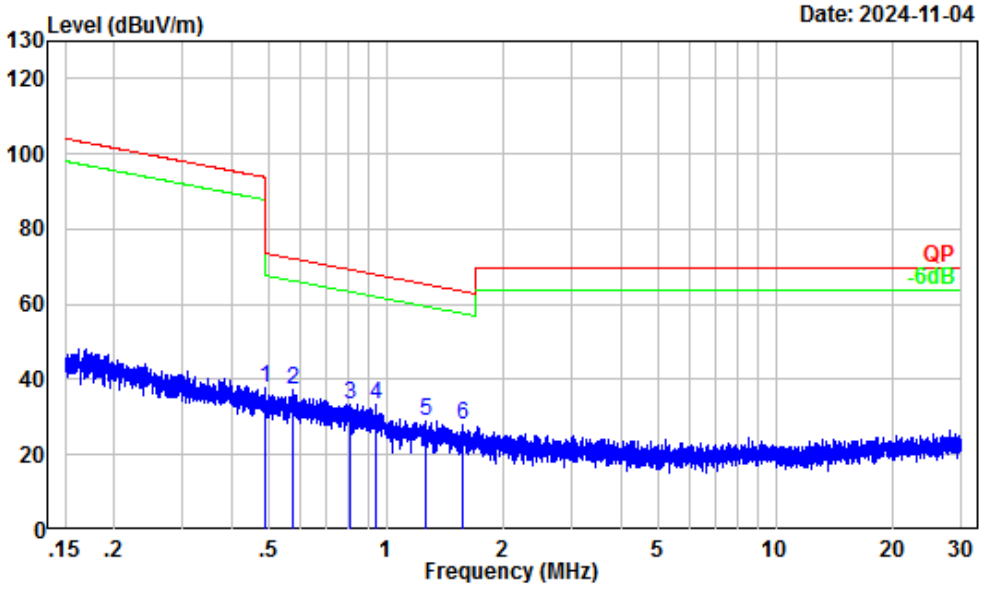
9kHz-150kHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : BT Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	38.01	27.37	65.38	127.97	-62.59	Peak
2	0.02	31.60	23.20	54.80	120.79	-65.99	Peak
3	0.05	24.16	26.35	50.51	114.53	-64.02	Peak
4	0.07	20.10	22.02	42.12	110.45	-68.33	Peak
5	0.10	17.40	21.92	39.32	107.92	-68.60	Peak
6	0.14	15.14	19.65	34.79	104.62	-69.83	Peak

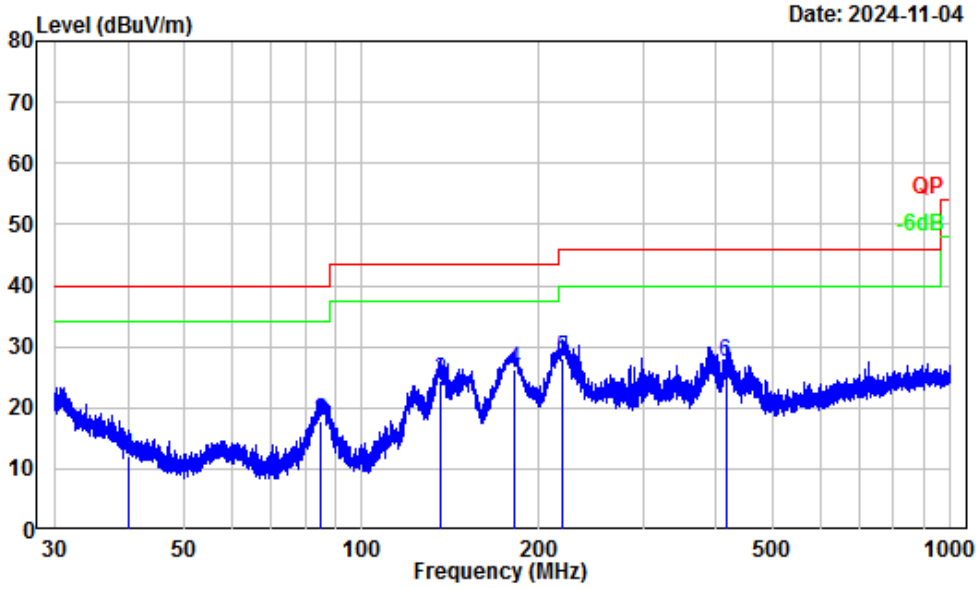
150kHz-30MHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : BT Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.49	3.73	34.09	37.82	93.83	-56.01	Peak
2	0.58	2.56	34.55	37.11	72.35	-35.24	Peak
3	0.81	-0.18	33.53	33.35	69.34	-35.99	Peak
4	0.94	-1.12	34.24	33.12	68.05	-34.93	Peak
5	1.27	-2.52	31.70	29.18	65.37	-36.19	Peak
6	1.57	-3.56	31.43	27.87	63.49	-35.62	Peak

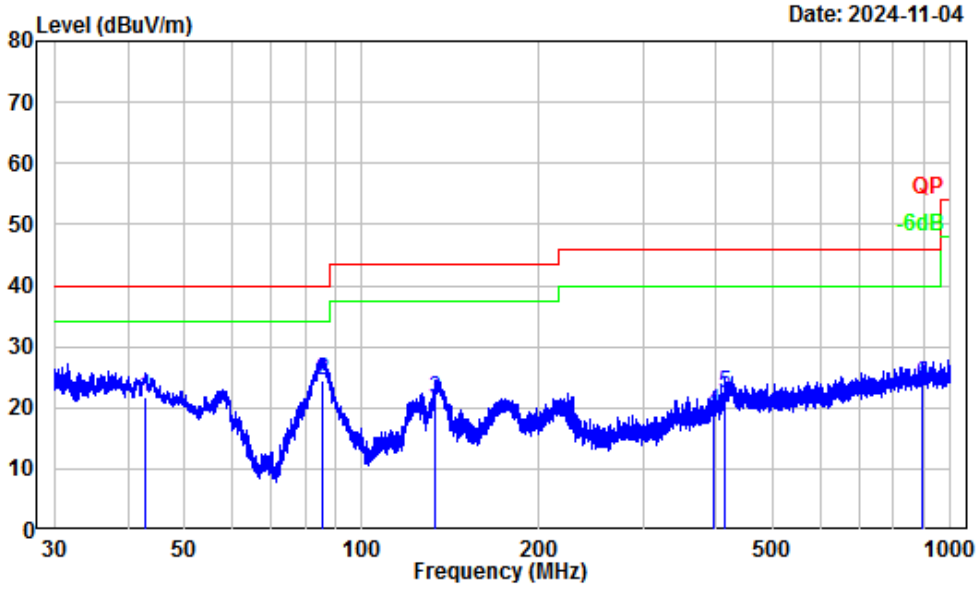
30MHz-1GHz_Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: 2401Y99438E-RF
Test Mode : BT Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	40.26	-12.55	24.71	12.16	40.00	-27.84	QP
2	84.89	-18.09	36.01	17.92	40.00	-22.08	QP
3	136.28	-11.60	36.20	24.60	43.50	-18.90	QP
4	181.52	-13.77	39.89	26.12	43.50	-17.38	QP
5	218.79	-14.20	42.14	27.94	46.00	-18.06	QP
6	415.09	-8.01	35.36	27.35	46.00	-18.65	QP

30MHz-1GHz_Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number: 2401Y99438E-RF
Test Mode : BT Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	42.77	-14.42	36.16	21.74	40.00	-18.26	QP
2	85.52	-18.08	42.66	24.58	40.00	-15.42	QP
3	133.03	-11.40	32.78	21.38	43.50	-22.12	QP
4	396.42	-8.58	28.04	19.46	46.00	-26.54	QP
5	414.18	-8.03	30.30	22.27	46.00	-23.73	QP
6	896.60	-1.31	25.28	23.97	46.00	-22.03	QP

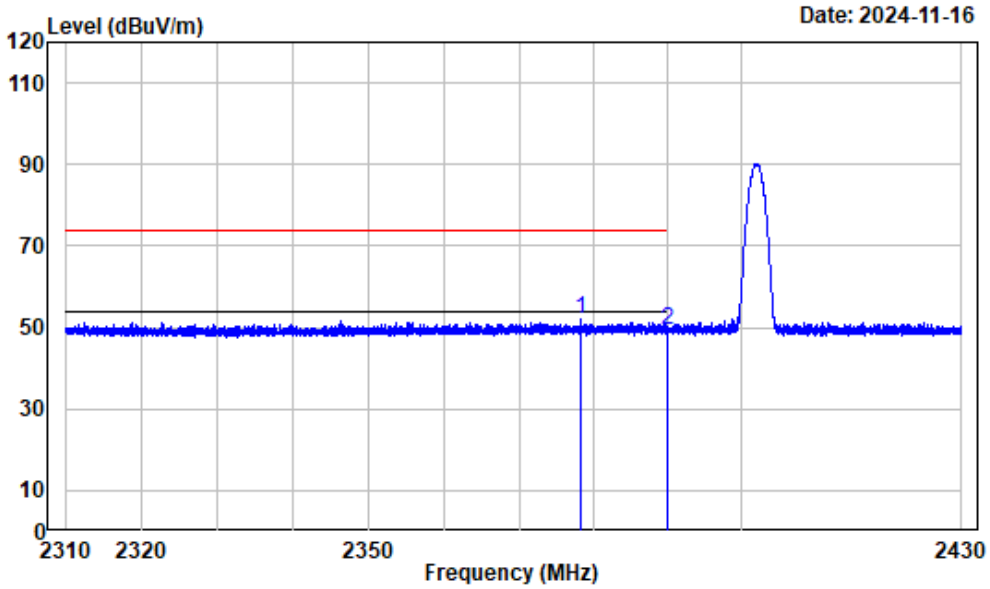
Above 1GHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave					
Low Channel							
4804	46.81	PK	H	1.69	48.5	74	-25.50
4804	46.65	PK	V	1.69	48.34	74	-25.66
Middle Channel							
4880	47.02	PK	H	1.69	48.71	74	-25.29
4880	47.34	PK	V	1.69	49.03	74	-24.97
High Channel							
4960	47.53	PK	H	2.69	50.22	74	-23.78
4960	48.44	PK	V	2.69	51.13	74	-22.87

Note:
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.
The test result of peak was less than the limit of average, so just peak values were recorded.

Test plots

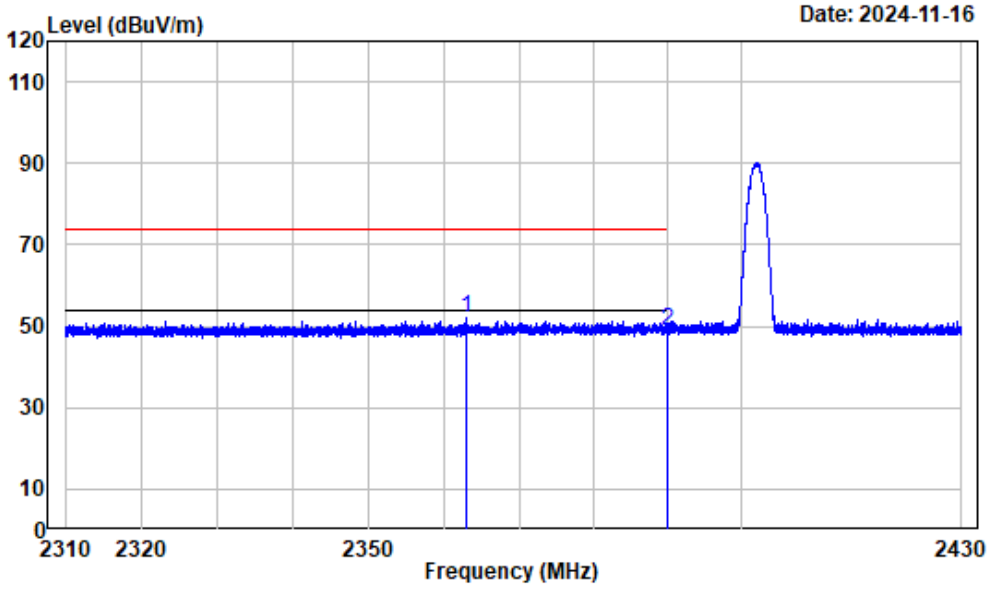
Left Band edge_ Horizontal



Condition : Horizontal
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2402

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2378.184	-3.19	55.27	52.08	74.00	-21.92	Peak
2	2390.000	-3.20	52.75	49.55	74.00	-24.45	Peak

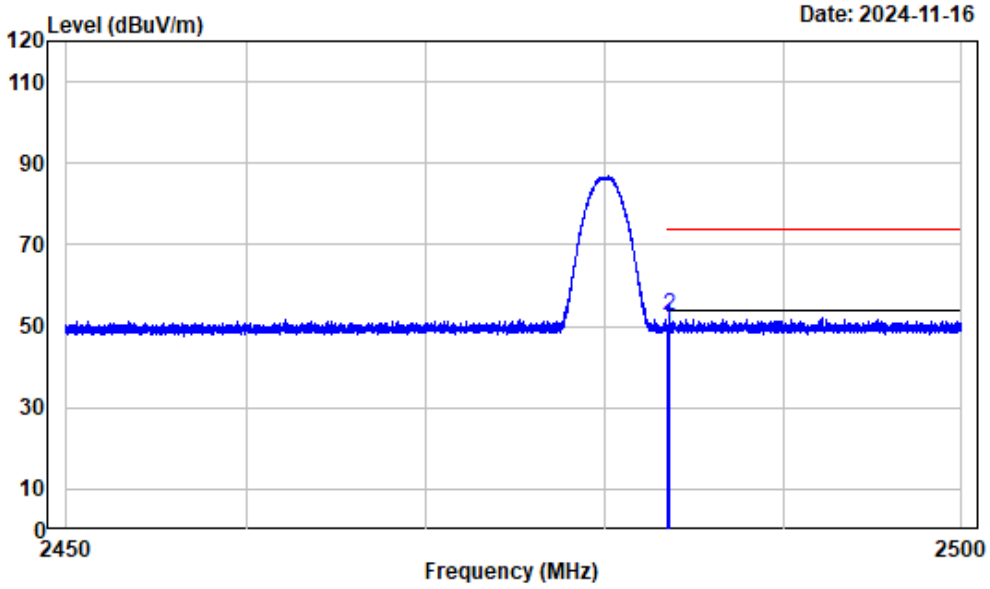
Left Band Edge_ Vertical



Condition : Vertical
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2402

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2362.837	-3.17	55.14	51.97	74.00	-22.03	Peak
2	2390.000	-3.20	52.26	49.06	74.00	-24.94	Peak

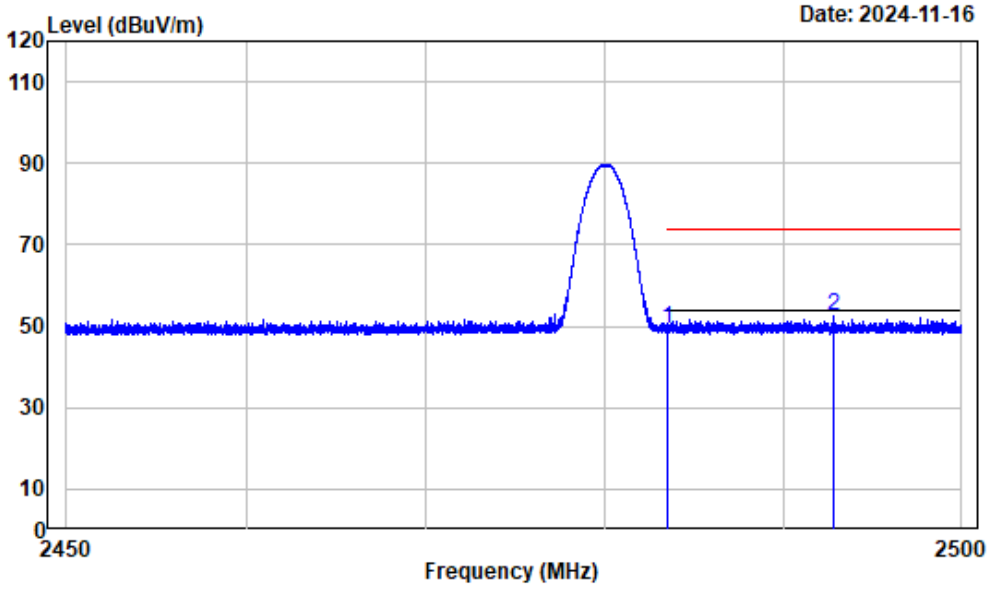
Right Band Edge_ Horizontal



Condition : Horizontal
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.500	-3.17	52.86	49.69	74.00	-24.31	Peak
2	2483.604	-3.17	55.71	52.54	74.00	-21.46	Peak

Right Band Edge_ Vertical

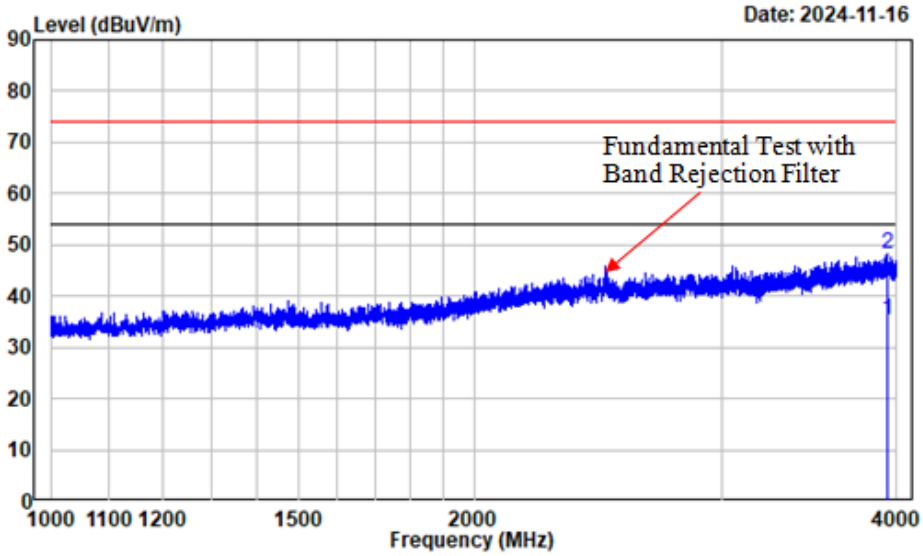


Condition : Vertical
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.500	-3.17	52.50	49.33	74.00	-24.67	Peak
2	2492.805	-3.19	55.67	52.48	74.00	-21.52	Peak

Listed with the worst harmonic margin test plot:

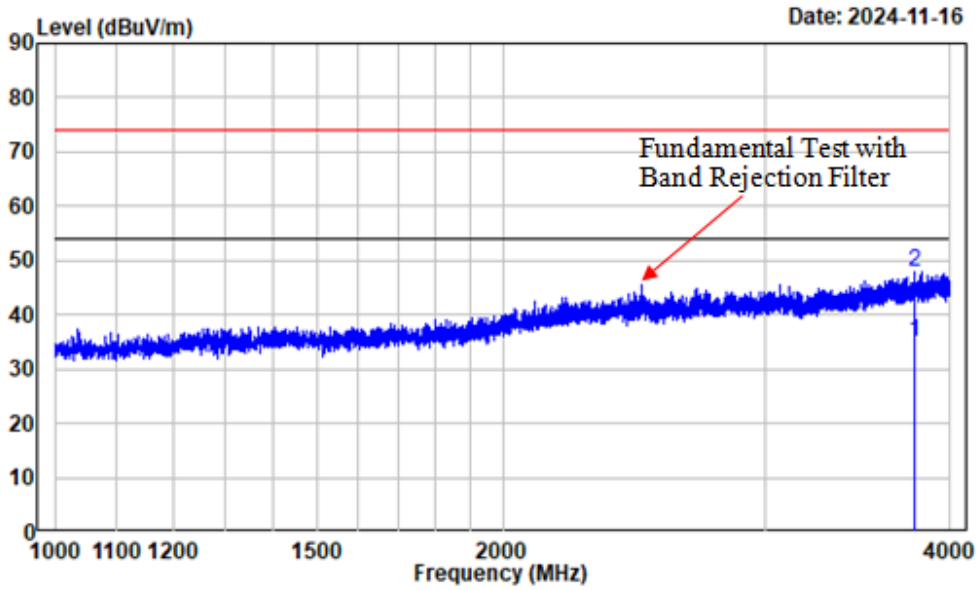
1-4GHz_Horizontal



Condition : Horizontal
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	3942.618	-0.22	35.66	35.44	54.00	-18.56	Average
2	3942.618	-0.22	48.31	48.09	74.00	-25.91	Peak

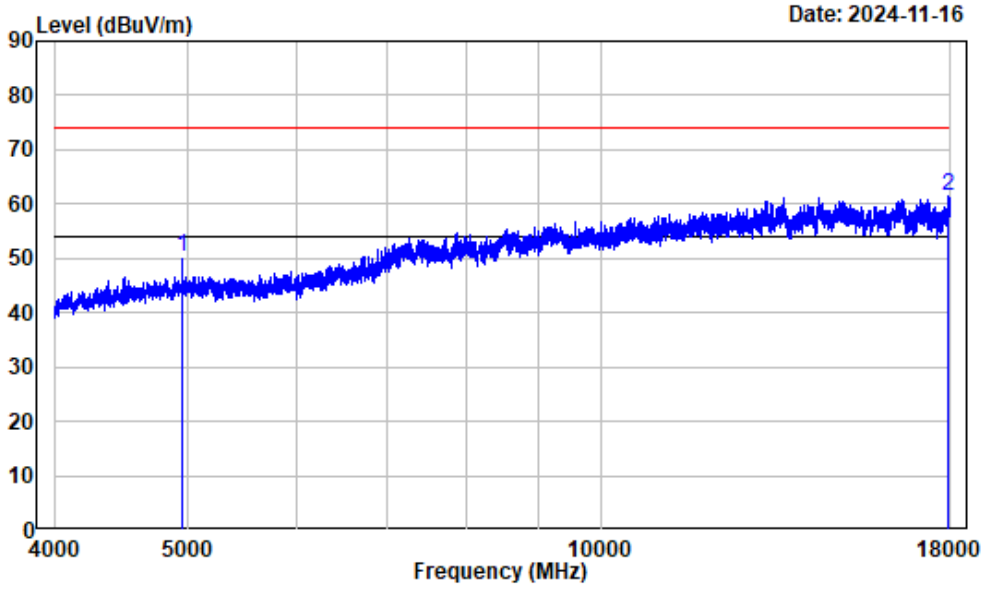
1-4GHz_Vertical



Condition : Vertical
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	3787.723	-0.77	35.72	34.95	54.00	-19.05	Average
2	3787.723	-0.77	48.75	47.98	74.00	-26.02	Peak

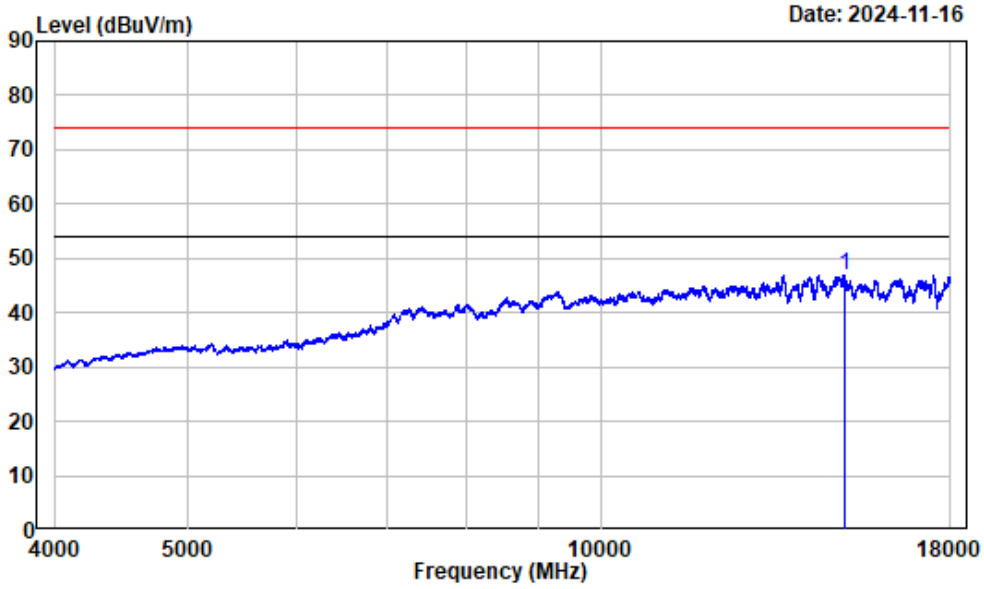
4-18GHz_Horizontal_Peak



Condition : Horizontal
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4960.000	2.69	47.53	50.22	74.00	-23.78	Peak
2	17942.240	24.21	37.20	61.41	74.00	-12.59	Peak

4-18GHz_Horizontal_Average

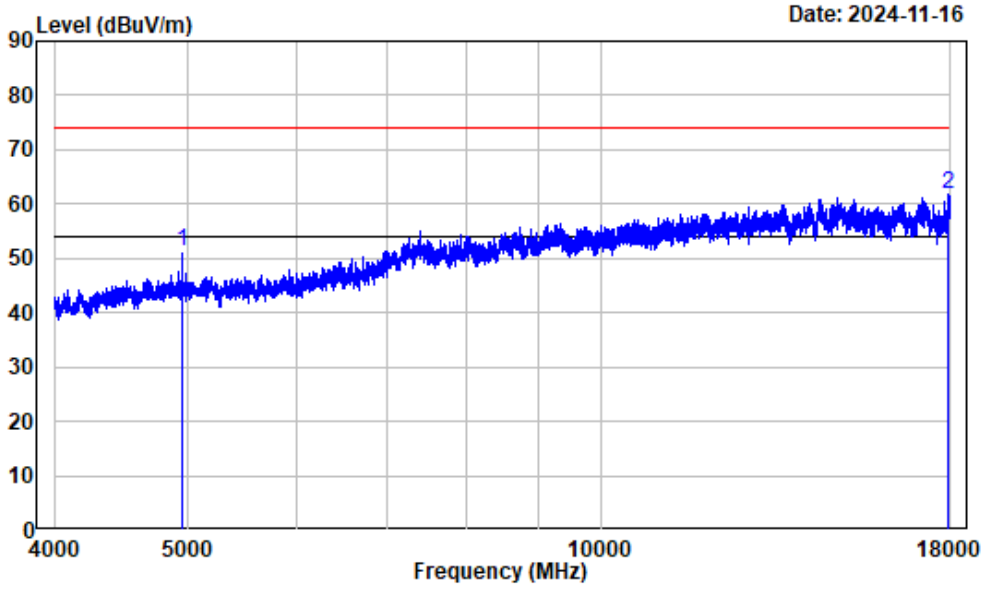


Condition : Horizontal
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480_AV

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	15068.380	16.00	30.98	46.98	54.00	-7.02	Average

Note: Spectrum Analyzer Setting: RBW=1MHz, VBW=5kHz

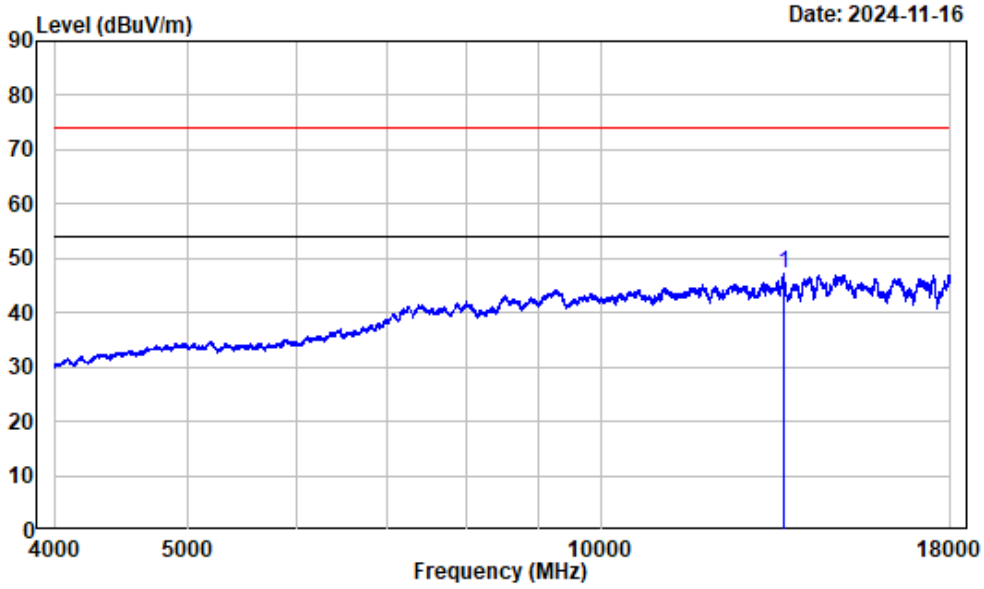
4-18GHz_Vertical_Peak



Condition : Vertical
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4960.000	2.69	48.44	51.13	74.00	-22.87	Peak
2	17942.240	24.21	37.70	61.91	74.00	-12.09	Peak

4-18GHz_Vertical_Average

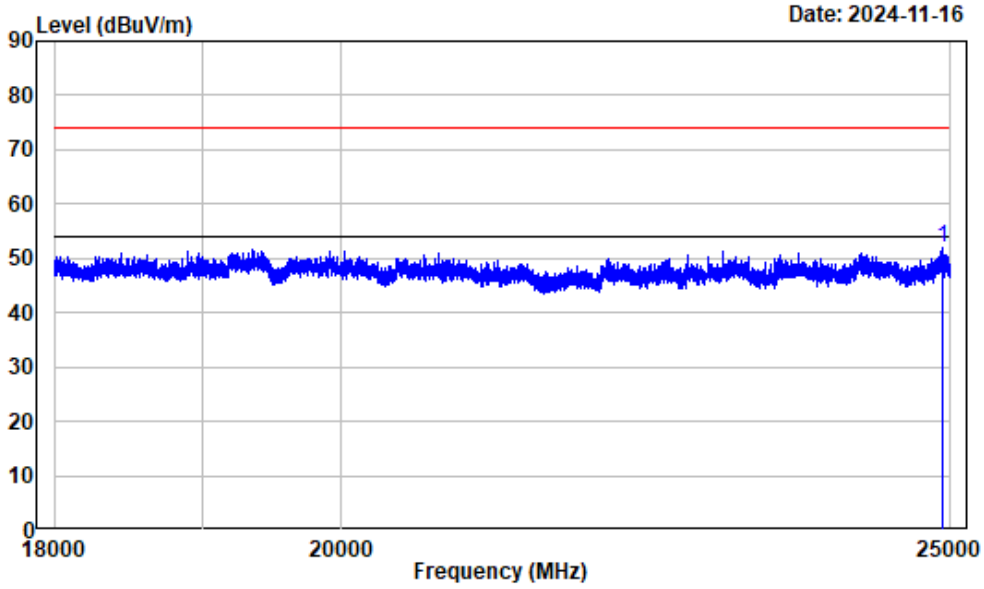


Condition : Vertical
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480_AV

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	13605.200	15.25	31.83	47.08	54.00	-6.92	Average

Note: Spectrum Analyzer Setting: RBW=1MHz, VBW=5kHz

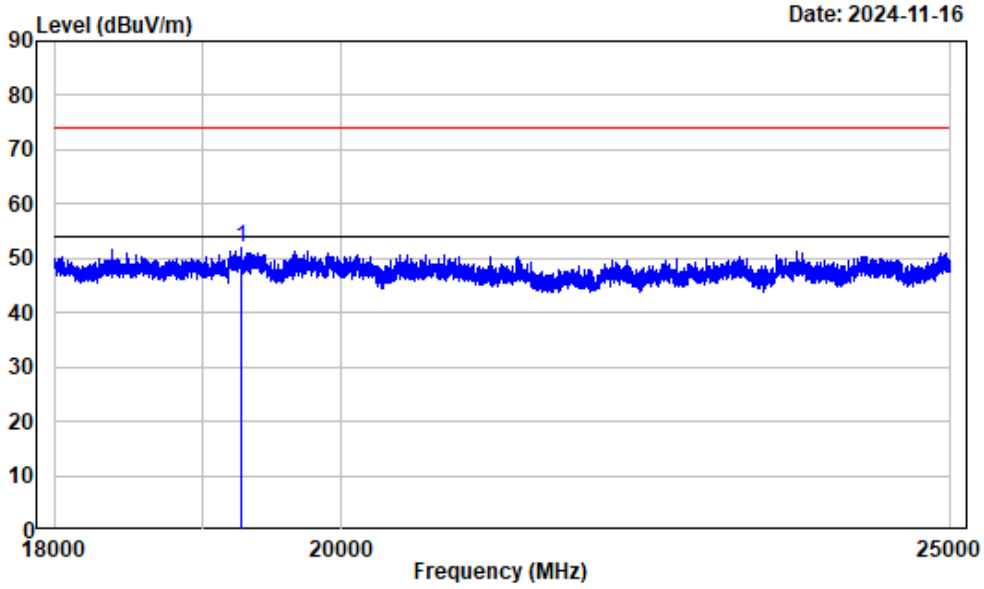
18-25GHz_Horizontal



Condition : Horizontal
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	24929.120	16.98	34.84	51.82	74.00	-22.18	Peak

18-25GHz_Vertical



Condition : Vertical
Project Number: 2401Y99438E-RF
Tester : Karl Xu
Note : BT_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	19275.040	15.24	36.67	51.91	74.00	-22.09	Peak

20 dB Emission Bandwidth

Test Information:

Sample No.:	2SY1-1	**Test Date:**	2024/11/08
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	N/A

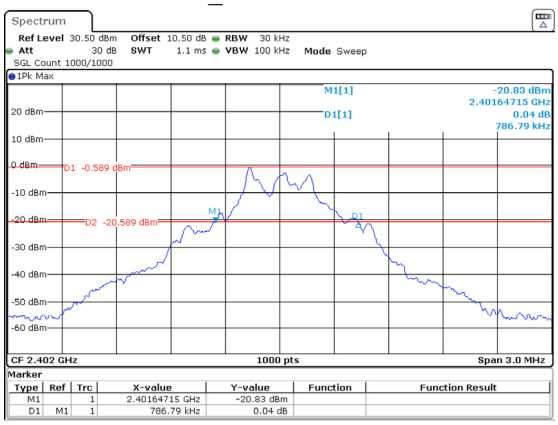
Environmental Conditions:

Temperature: (°C):	25	**Relative Humidity: (%)**	46	**ATM Pressure: (kPa)**	101

Test Data:

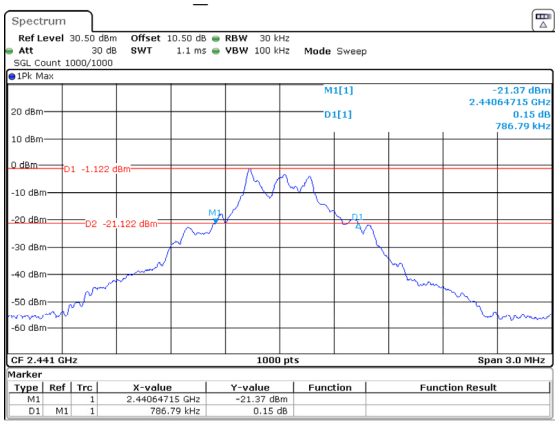
Mode	Channel	Result (MHz)	Verdict
DH1	Low Channel	0.787	Pass
	Middle Channel	0.787	Pass
	High Channel	0.787	Pass
2DH1	Low Channel	1.117	Pass
	Middle Channel	1.120	Pass
	High Channel	1.117	Pass
3DH1	Low Channel	**1.174**	Pass
	Middle Channel	1.171	Pass
	High Channel	**1.174**	Pass

DH1_Low 0.787MHz



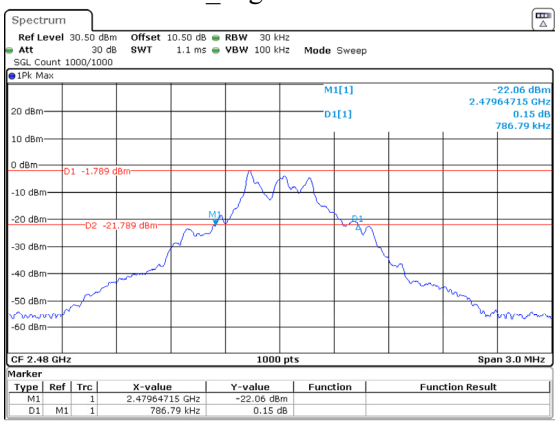
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:25:40

DH1_Middle 0.787MHz



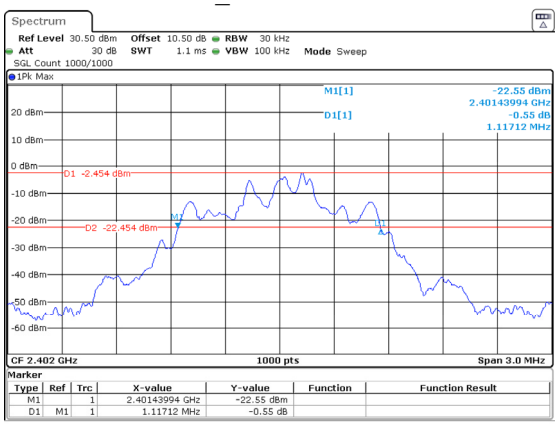
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:26:01

DH1_High 0.787MHz



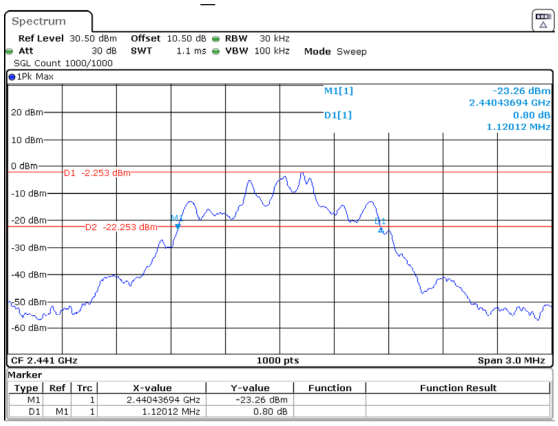
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:26:25

2DH1_Low 1.117MHz



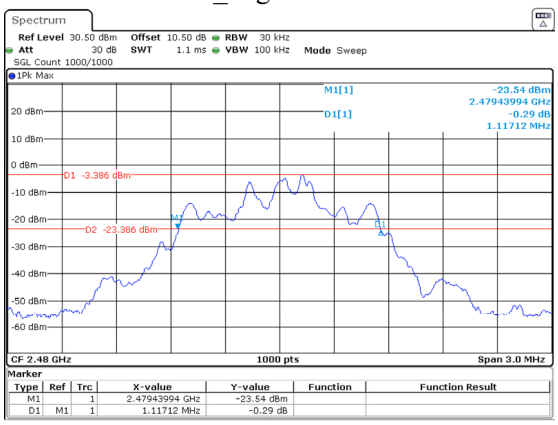
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:31:05

2DH1_Middle 1.120MHz



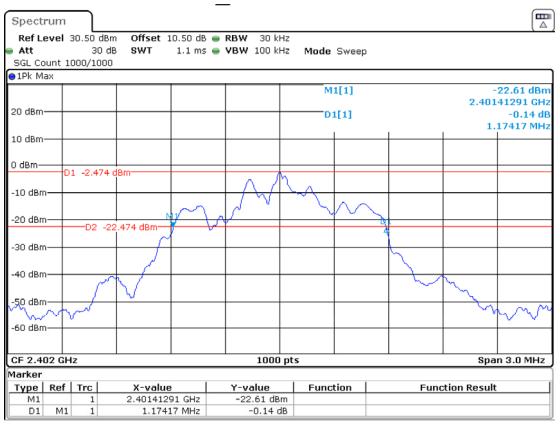
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:27:29

2DH1_High 1.117MHz



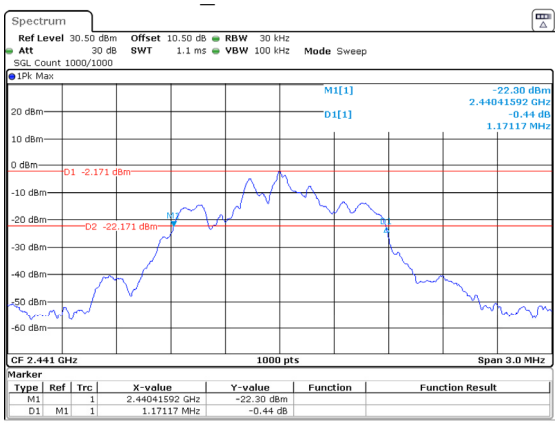
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:27:52

3DH1_Low 1.174MHz



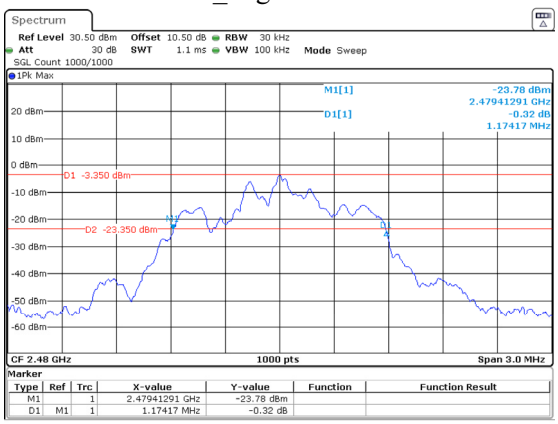
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:28:21

3DH1_Middle 1.171MHz



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:29:53

3DH1_High 1.174MHz



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:29:06

99% Occupied Bandwidth

Test Information:

Sample No.:	2SY1-1	**Test Date:**	2024/11/20
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	N/A

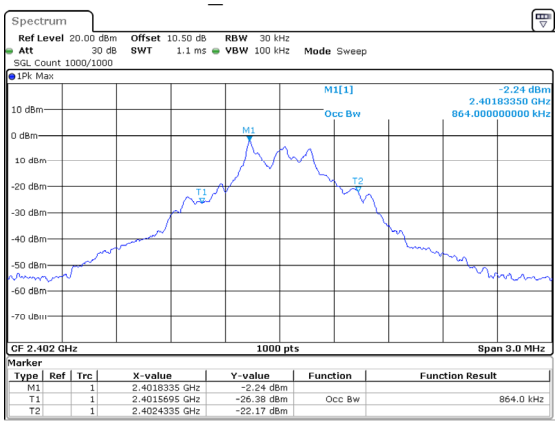
Environmental Conditions:

Temperature: (°C):	25	**Relative Humidity: (%)**	46	**ATM Pressure: (kPa)**	101

Test Data:

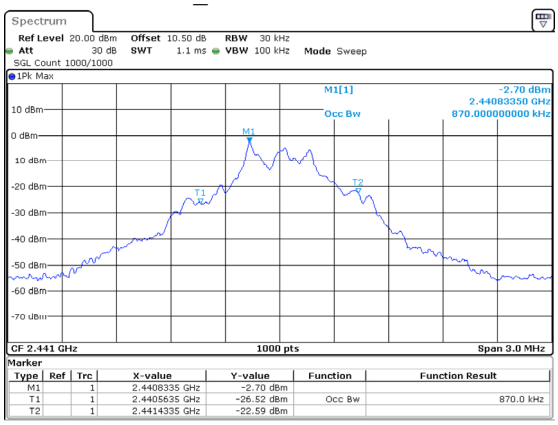
Mode	Channel	99% OBW (MHz)
DH1	Low Channel	0.864
	Middle Channel	0.870
	High Channel	0.867
2DH1	Low Channel	1.074
	Middle Channel	1.077
	High Channel	1.077
3DH1	Low Channel	**1.119**
	Middle Channel	**1.119**
	High Channel	**1.119**

DH1_Low 0.864MHz



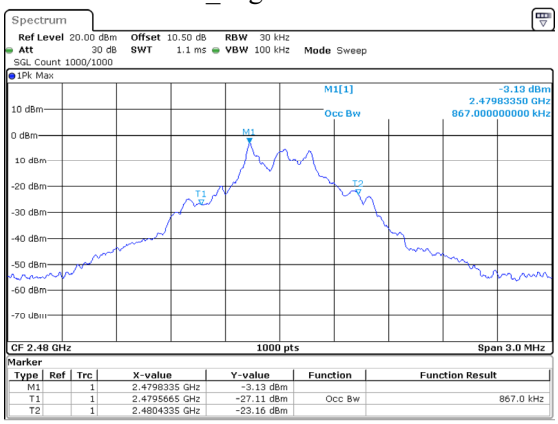
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:13:38

DH1_Middle 0.870MHz



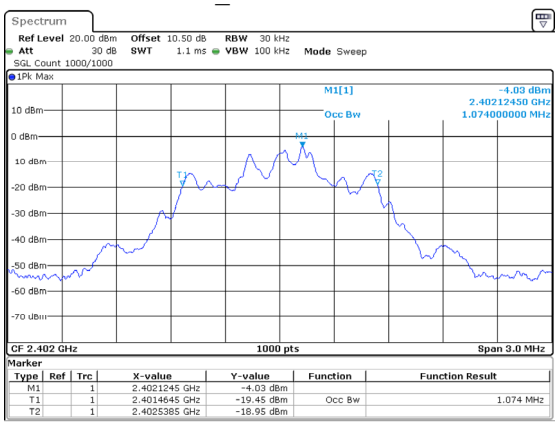
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:13:54

DH1_High 0.867MHz



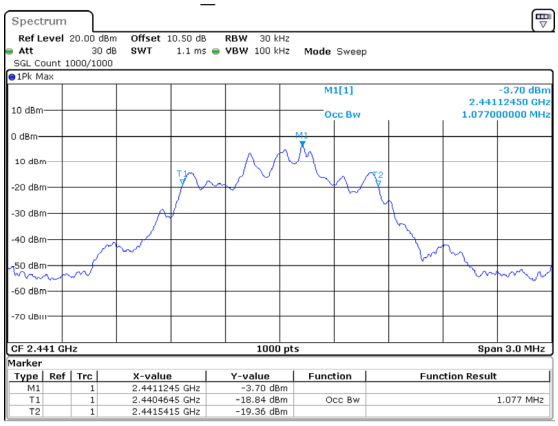
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:14:10

2DH1_Low 1.074MHz



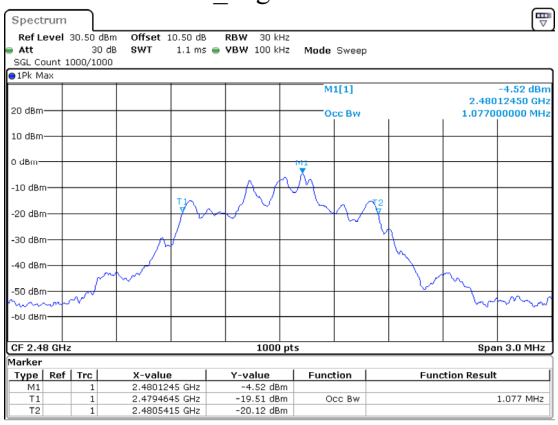
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:15:10

2DH1_Middle 1.077MHz



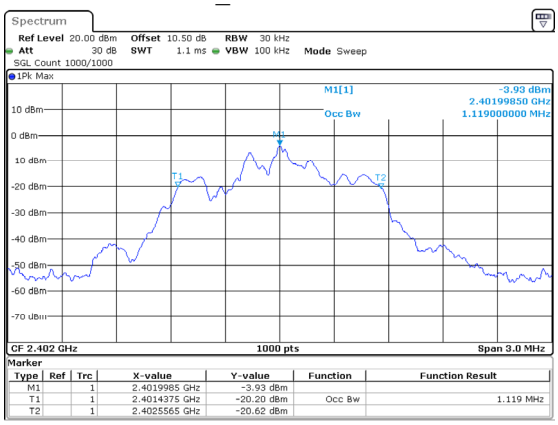
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:15:31

2DH1_High 1.077MHz



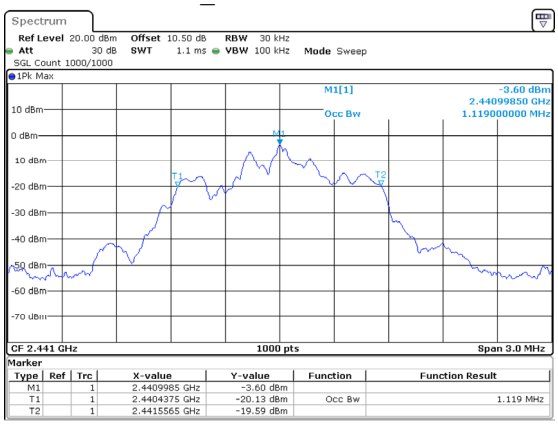
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:16:00

3DH1_Low 1.119MHz



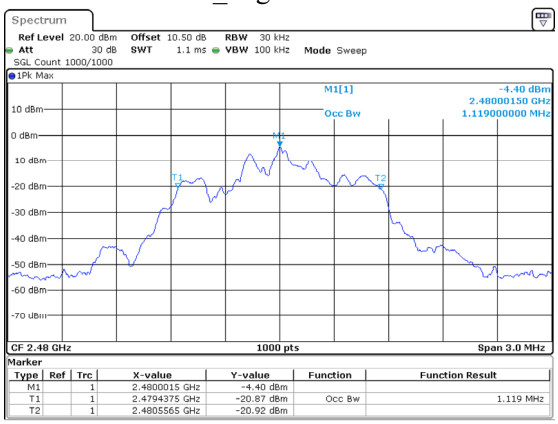
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:16:20

3DH1_Middle 1.119MHz



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:16:38

3DH1_High 1.119MHz



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 20.NOV.2024 18:16:57

Channel Separation

Test Information:

Sample No.:	2SY1-1	**Test Date:**	2024/10/30
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	Pass

Environmental Conditions:

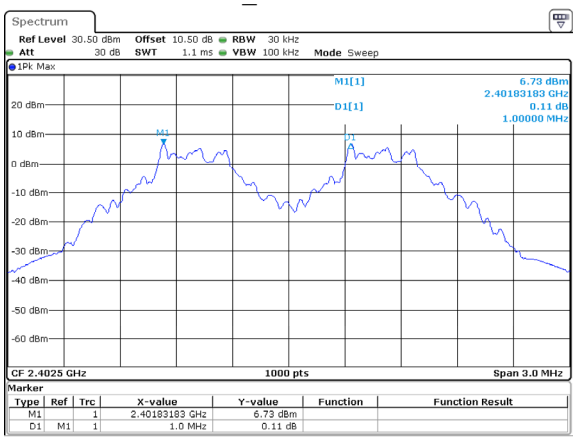
Temperature: (°C):	25	**Relative Humidity: (%)**	45	**ATM Pressure: (kPa)**	101

Test Data:

Mode	Channel	Result (MHz)	Limit (MHz)	Verdict
DH1	Low Channel	1	0.783	Pass
	Middle Channel	1	0.781	Pass
	High Channel	**1.003**	0.783	Pass

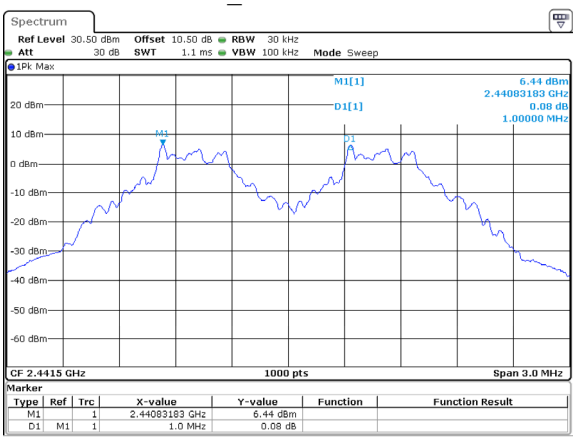
Note: Only the BDR (DH1 GFSK) mode result is reported since EDR 2DH1 (π/4-DQPSK) and EDR 3DH1 (8DPSK) modes have the exact same channel plan, and the limit is the maximum 20dB bandwidth *2/3

DH1_Low 1MHz



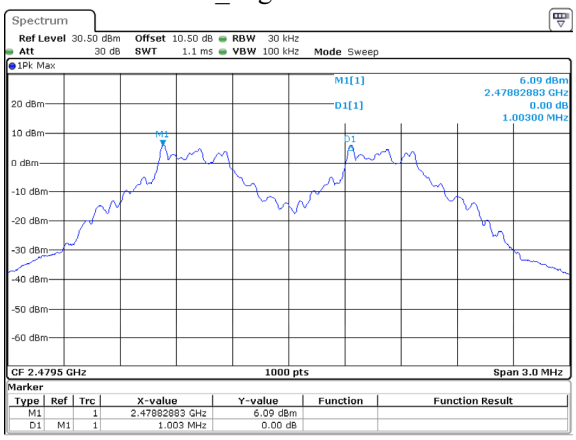
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 30.OCT.2024 22:36:26

DH1_Middle 1MHz



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 30.OCT.2024 22:37:21

DH1_High 1.003MHz



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 30.OCT.2024 22:44:03

Number of Hopping Frequency

Test Information:

Sample No.:	2SY1-1	**Test Date:**	2024/11/08
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	Pass

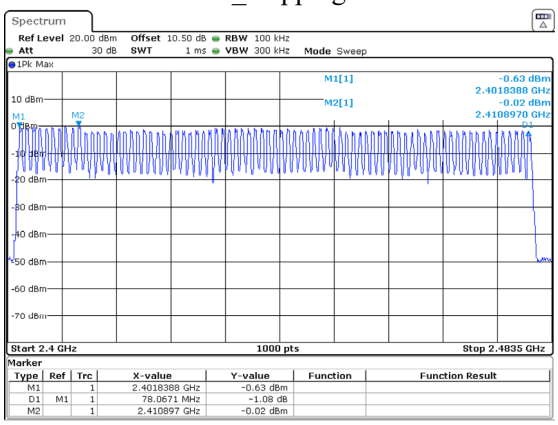
Environmental Conditions:

Temperature: (°C):	25	**Relative Humidity: (%)**	46	**ATM Pressure: (kPa)**	101

Test Data:

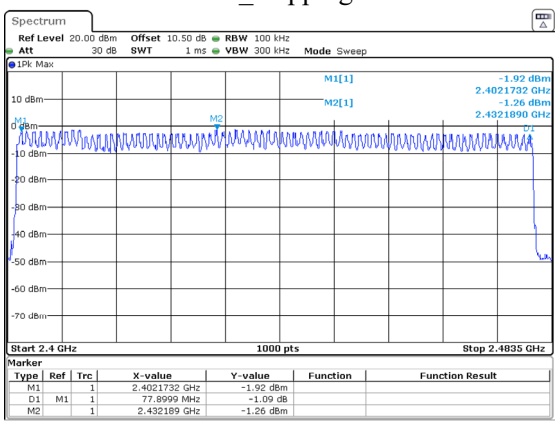
Mode	Channel	Result	Limit	Verdict
DH1	Hopping Channel	**79**	15	Pass
2DH1	Hopping Channel	**79**	15	Pass
3DH1	Hopping Channel	**79**	15	Pass

DH1_Hopping 79



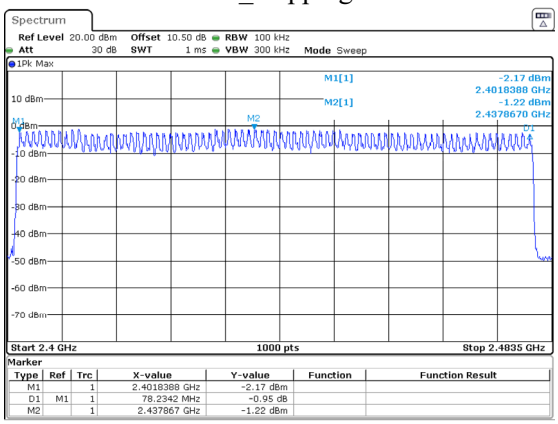
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:53:27

2DH1_Hopping 79



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:54:48

3DH1_Hopping 79



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:56:33

Maximum Conducted Output Power

Test Information:

Sample No.:	2SY1-1	**Test Date:**	2024/11/08
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	Pass

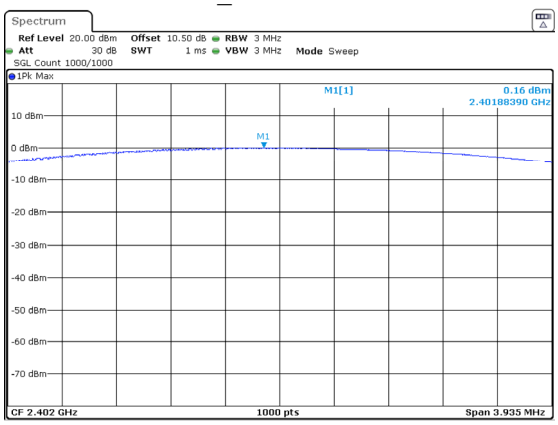
Environmental Conditions:

Temperature: (°C):	25	**Relative Humidity: (%)**	46	**ATM Pressure: (kPa)**	101

Test Data:

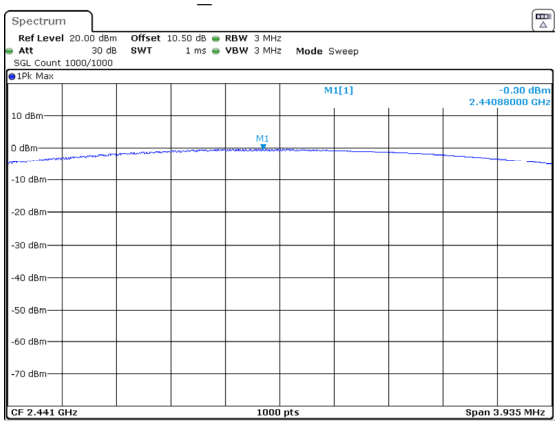
Mode	Channel	Result (dBm)	Limit (dBm)	EIRP (dBm)	EIRP limit (dBm)	Verdict
DH1	Low Channel	0.16	21.00	1.54	36	Pass
	Middle Channel	-0.30	21.00	1.08	36	Pass
	High Channel	-1.03	21.00	0.35	36	Pass
2DH1	Low Channel	-0.10	21.00	1.28	36	Pass
	Middle Channel	**0.18**	21.00	1.56	36	Pass
	High Channel	-0.93	21.00	0.45	36	Pass
3DH1	Low Channel	-0.15	21.00	1.23	36	Pass
	Middle Channel	0.16	21.00	1.54	36	Pass
	High Channel	-0.92	21.00	0.46	36	Pass

DH1_Low 0.16dBm



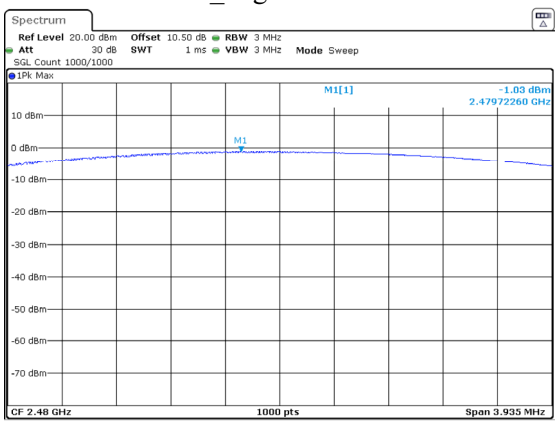
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:51:41

DH1_Middle -0.30dBm



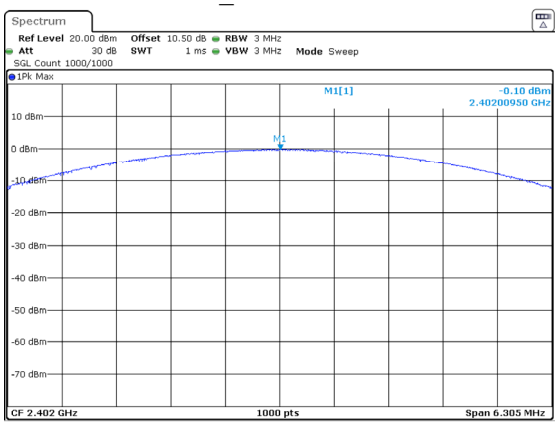
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:52:11

DH1_High -1.03dBm



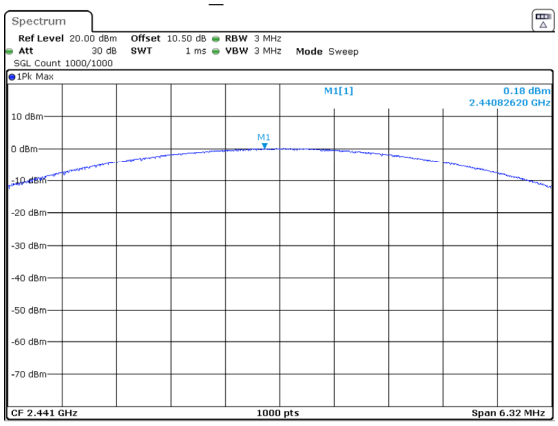
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:52:33

2DH1_Low -0.10dBm



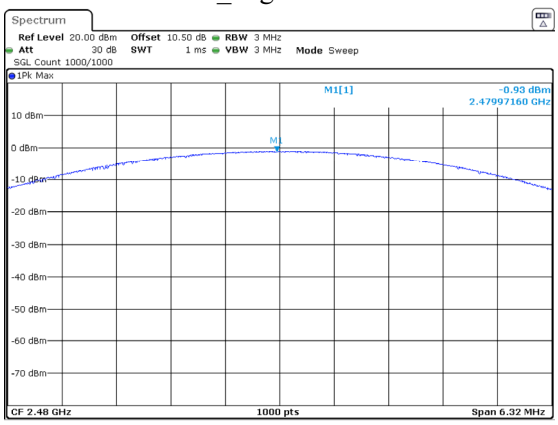
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:22:38

2DH1_Middle 0.18dBm



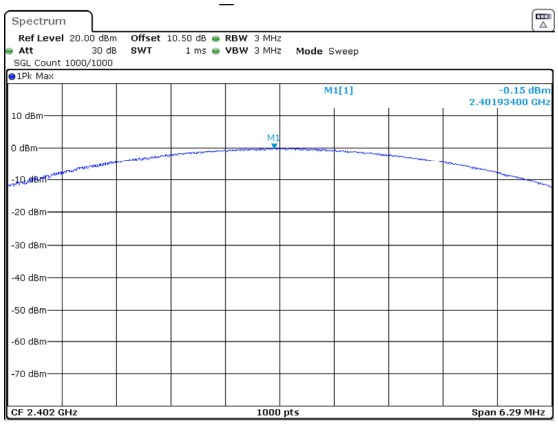
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:23:08

2DH1_High -0.93dBm



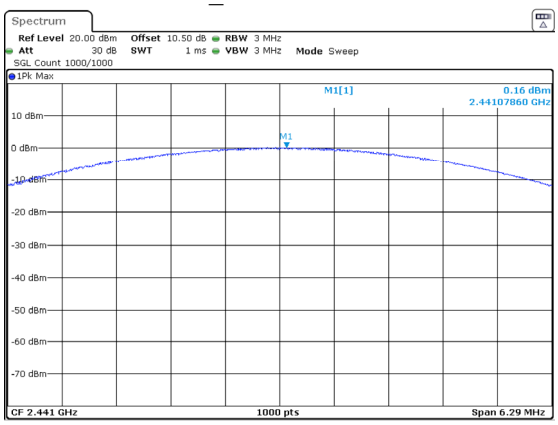
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:23:35

3DH1_Low -0.15dBm



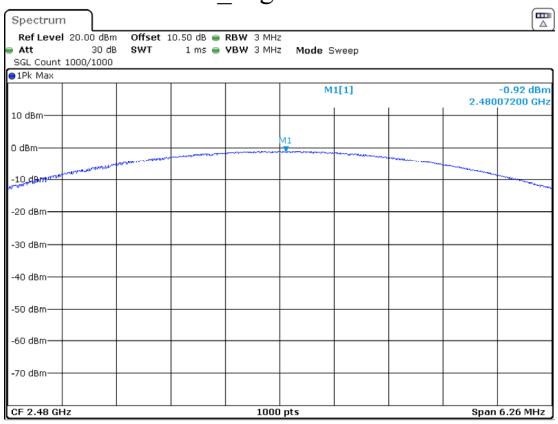
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:24:02

3DH1_Middle 0.16dBm



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:24:25

3DH1_High -0.92dBm



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:24:45

100 kHz Bandwidth of Frequency Band Edge

Test Information:

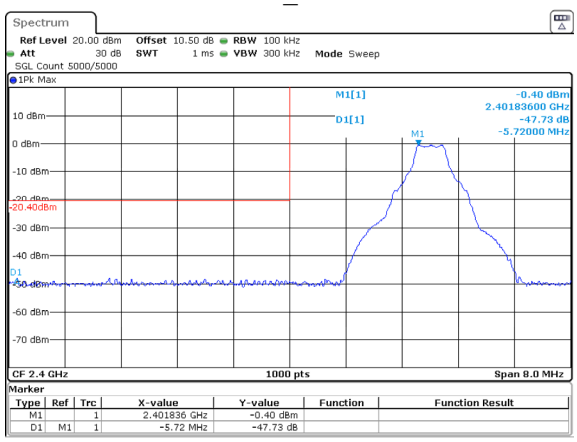
Sample No.:	2SY1-1	**Test Date:**	2024/11/08~2024/12/03
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C):	25-27	**Relative Humidity: (%)**	46-48	**ATM Pressure: (kPa)**	101

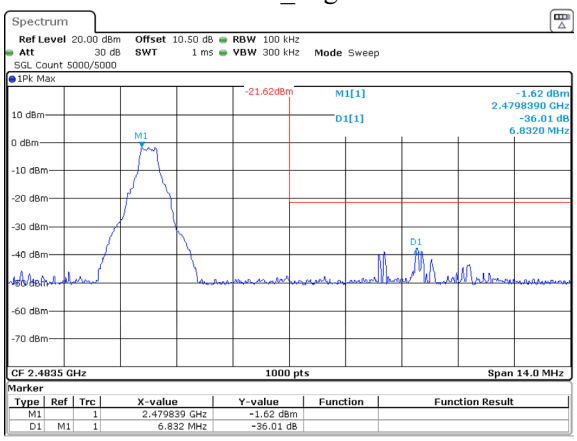
Test Data:

DH1_Low



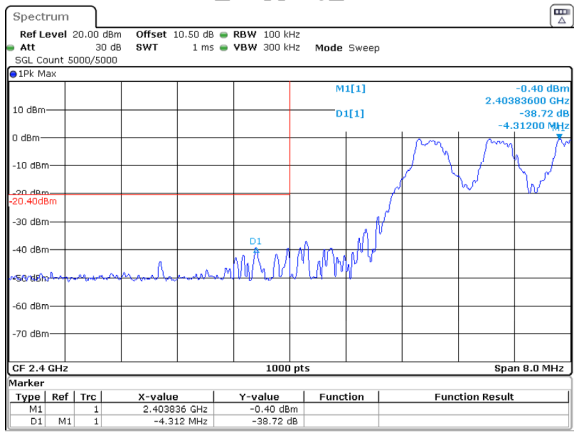
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 03:02:22

DH1_High



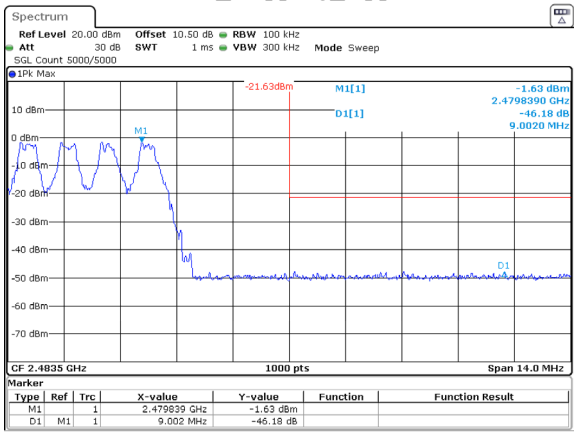
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 03:03:42

DH1_Hopping_Lower



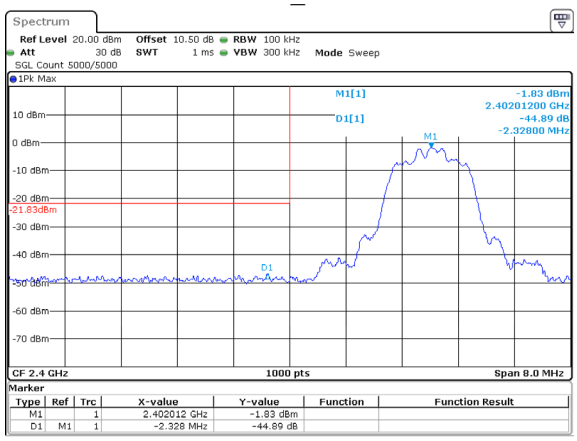
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 02:58:55

DH1_Hopping_Upper



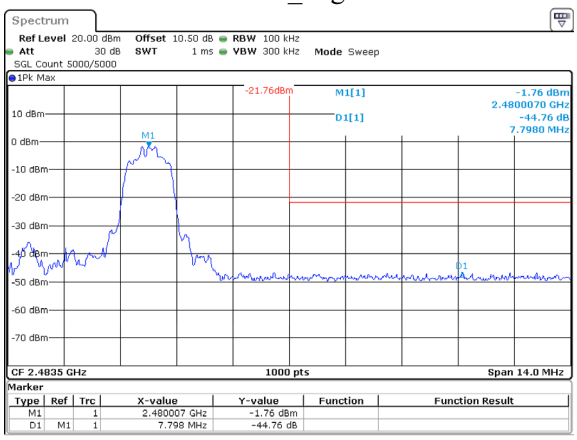
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 8.NOV.2024 03:00:17

2DH1_Low



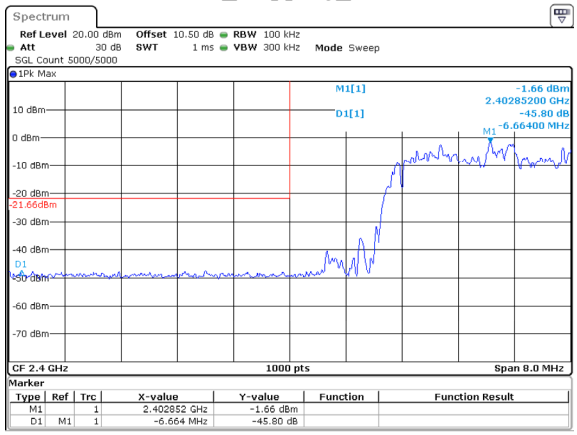
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:54:42

2DH1_High



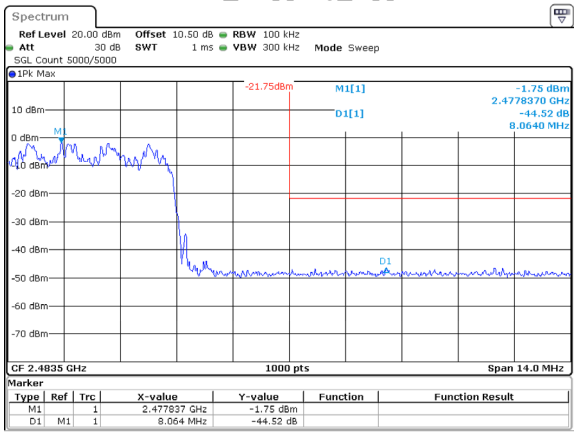
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:55:26

2DH1_Hopping_Lower



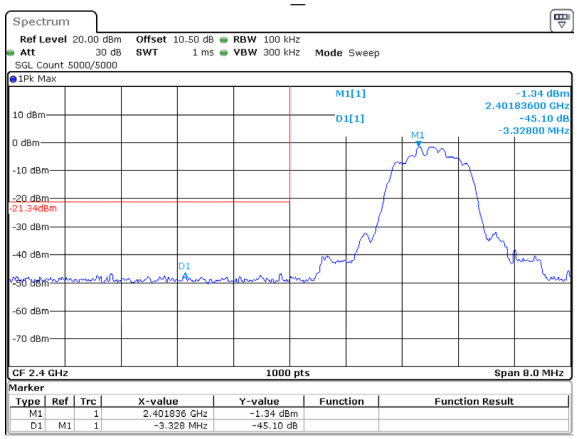
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:52:26

2DH1_Hopping_Upper



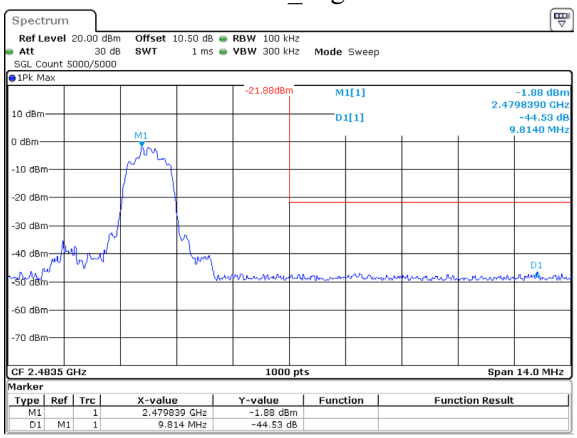
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:52:58

3DH1_Low



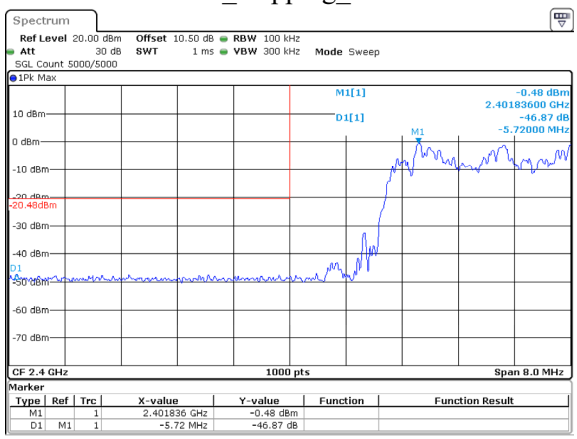
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:56:20

3DH1_High



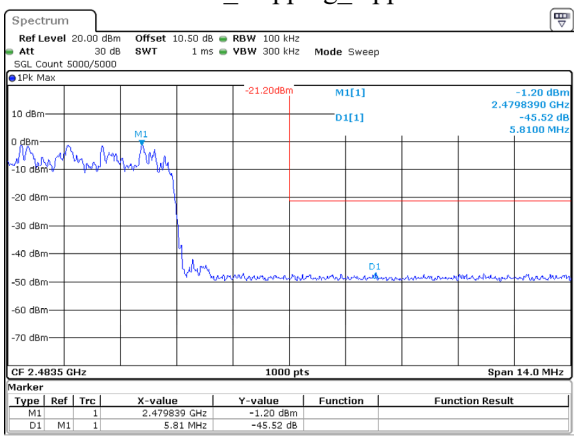
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:57:01

3DH1_Hopping_Lower



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:50:43

3DH1_Hopping_Upper



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 22:51:22

Time of Occupancy (dwell time)

Test Information:

Sample No.:	2SY1-1	**Test Date:**	2024/12/03
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Allen Bai	**Test Result:**	Pass

Environmental Conditions:

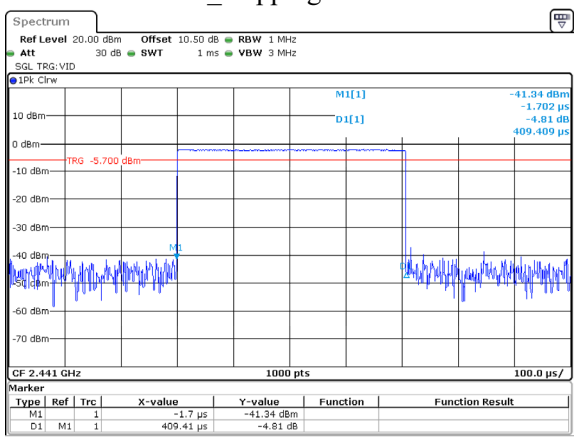
Temperature: (°C):	25	**Relative Humidity: (%)**	46	**ATM Pressure: (kPa)**	101

Test Data:

Mode	Channel	Pulse width (ms)	Dwell time (s)	Limit (s)	Verdict
DH1	Hopping Channel	0.409	0.131	0.400	Pass
DH3	Hopping Channel	1.682	0.269	0.400	Pass
DH5	Hopping Channel	**2.928**	0.312	0.400	Pass
2DH1	Hopping Channel	0.403	0.129	0.400	Pass
2DH3	Hopping Channel	1.670	0.267	0.400	Pass
2DH5	Hopping Channel	**2.928**	0.312	0.400	Pass
3DH1	Hopping Channel	0.400	0.128	0.400	Pass
3DH3	Hopping Channel	1.661	0.266	0.400	Pass
3DH5	Hopping Channel	2.918	0.311	0.400	Pass

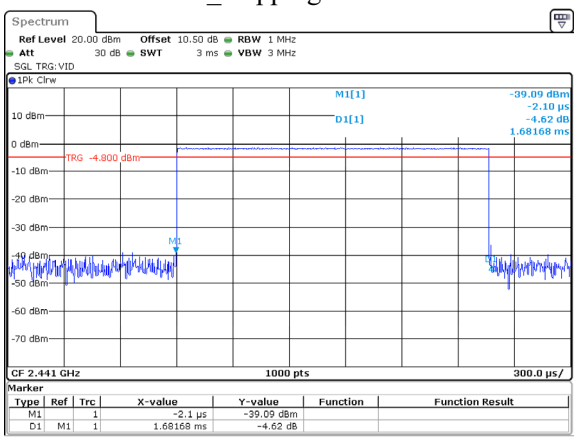
Note:
DH1:Dwell time=Pulse width (ms) × (1600/2/79) ×31.6 s
DH3:Dwell time=Pulse width (ms) × (1600/4/79) ×31.6 s
DH5:Dwell time=Pulse width (ms) × (1600/6/79) ×31.6 s
2DH1: Dwell time=Pulse width (ms) × (1600/2/79) ×31.6 s
2DH3: Dwell time=Pulse width (ms) × (1600/4/79) ×31.6 s
2DH5: Dwell time=Pulse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

DH1_Hopping 0.409ms



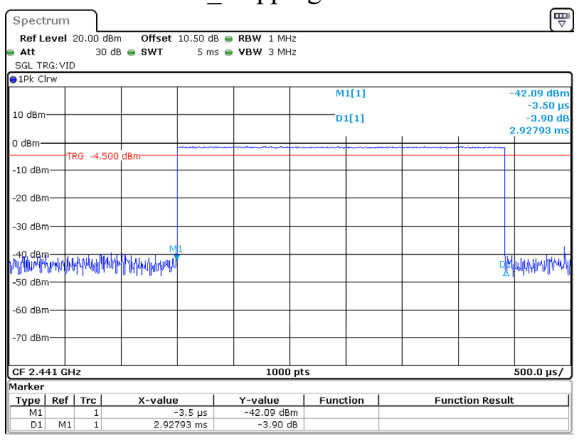
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:19:48

DH3_Hopping 1.682ms



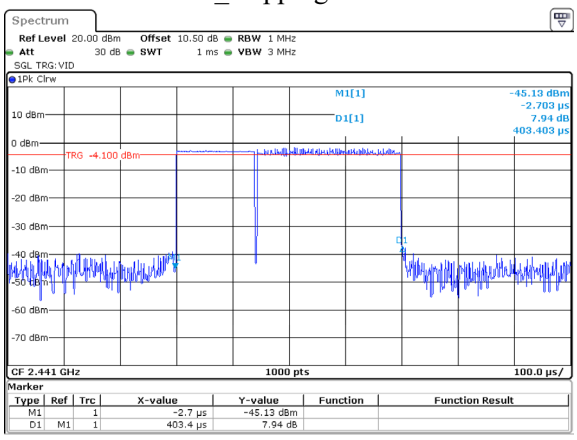
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:20:25

DH5_Hopping 2.928ms



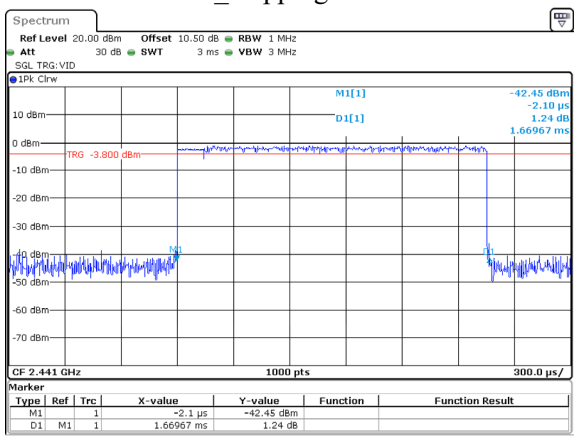
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:20:50

2DH1_Hopping 0.403ms



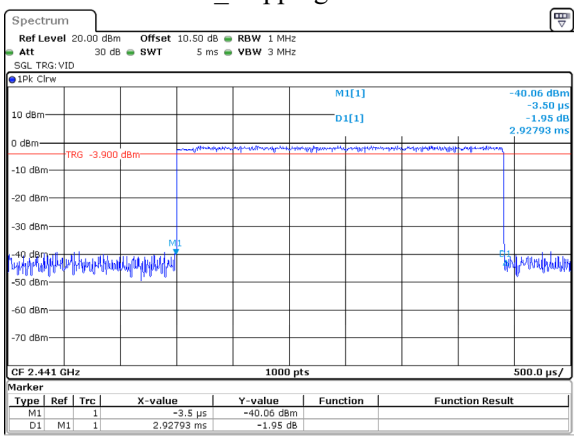
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:28:04

2DH3_Hopping 1.670ms



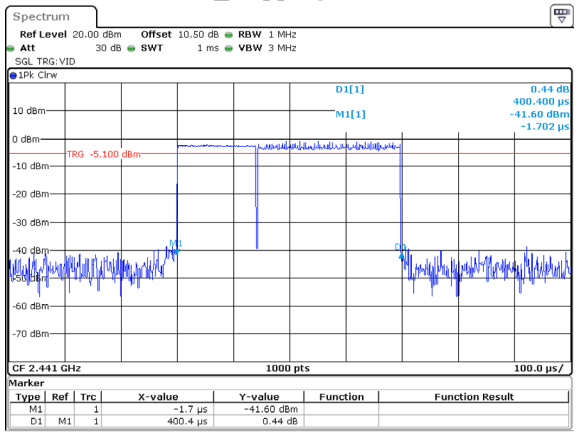
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:21:57

2DH5_Hopping 2.928ms



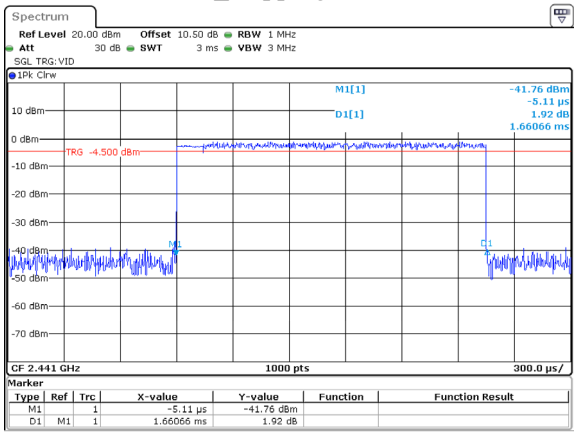
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:22:31

3DH1_Hopping 0.400ms



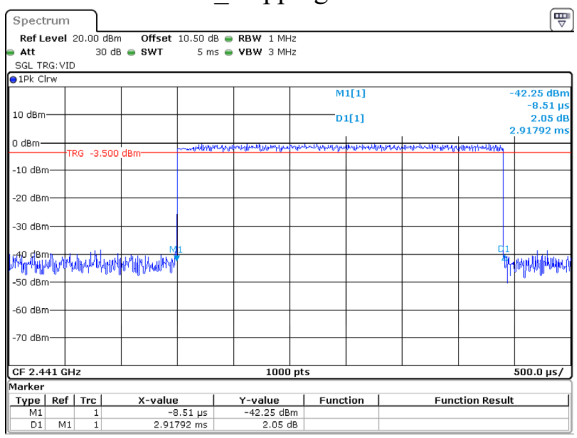
ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:23:47

3DH3_Hopping 1.661ms



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:24:25

3DH5_Hopping 2.918ms



ProjectNo.:2401Y99438E-RF Tester:Allen Bai
Date: 3.DEC.2024 23:25:03

EUT PHOTOGRAPHS

Please refer to the attachment 2401Y99438E-RF External photo and 2401Y99438E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401Y99438E-RFC Test Setup photo.

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