TEST REPORT

Applicant Name:	AGRES SISTEMAS ELETRONICOS S.A.
Address:	Av. Com. Franco, 6720 - Uberaba, Curitiba, PR, Brazil
Report Number:	SZ1240110-02250E-RF-00A
FCC ID:	2BDDS-AG-ST122

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	Smart Antenna
Model No.:	AG-ST122
Multiple Model(s) No.:	N/A
Trade Mark:	AGRES
Date Received:	2024/01/10
Issue Date:	2024/07/08

Test Result:	Pass▲

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

Prepared and Checked By:

April Zhang

April Zhang
RF Engineer

Approved By:

Michelle Zeng

Michelle Zeng
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.

This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "▼".

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1240110-02250E-RF-00A	Original Report	2024/07/08

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smart Antenna
Tested Model	AG-ST122
Multiple Model(s)	N/A
Frequency Range	Bluetooth: 2402~2480MHz
Transmit Peak Power	-4.64 dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification#	-0.49dBi (provided by the applicant)
Voltage Range	DC 9-36V from DC power
Sample serial number	2GF7-3 for Radiated Emissions Test 2GF7-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	N/A

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission rules.

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

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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		±5%
RF Frequency		213.55 Hz(k=2, 95% level of confidence)
RF output power, conducted		0.72 dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.75 dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz-150kHz	3.94dB(k=2, 95% level of confidence)
	150kHz-30MHz	3.84dB(k=2, 95% level of confidence)
Radiated Emissions	9kHz - 30MHz	3.30dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	4.48dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	4.55dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	4.85dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.05dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.35dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.44dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.16dB(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.

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

"BT98XRF TOOL V1.2"# exercise software was used and the power level is 0#. The software and power level was provided by the applicant.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

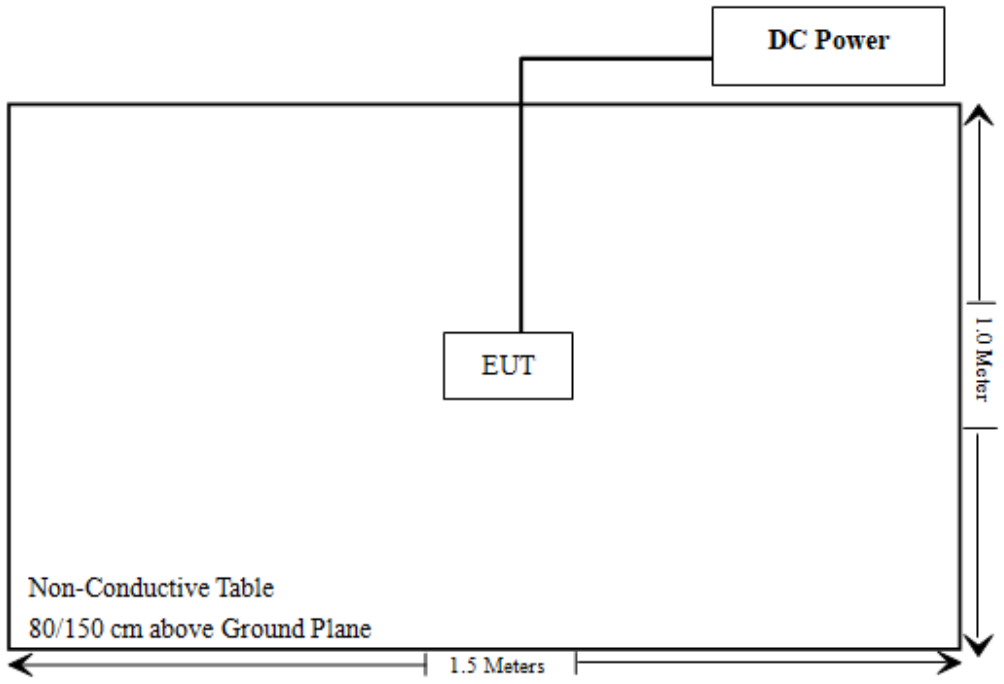
Manufacturer	Description	Model	Serial Number
TDK-Lambda	DC Power	Z60-14-L-C	LOC-728A186-0009

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielded Detachable DC Cable	1.2	EUT	DC Power

Block Diagram of Test Setup

For Radiated Emissions:



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
§15.247 (i), §1.1307(b)(3)(i)(A)& §2.1091	RF Exposure	Compliant
FCC §15.203	Antenna Requirement	Compliant
FCC §15.207(a)	AC Line Conducted Emissions	Not Applicable
FCC §15.205, §15.209, §15.247(d)	Radiated Emissions	Compliant
FCC §15.247(a)(1)	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliant
FCC §15.247(a)(1)	Channel Separation Test	Compliant
FCC §15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
FCC §15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
FCC §15.247(b)(1)	Peak Output Power Measurement	Compliant
FCC §15.247(d)	Band edges	Compliant

Not Applicable: The EUT do not operate from the AC power lines.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2023/06/08	2024/06/07
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2024/07/19
ETS	Passive Loop Antenna	6512	29604	2023/07/07	2024/07/06
Unknown	Cable	Chamber Cable 1	F-03-EM236	2023/08/03	2024/08/02
Unknown	Cable	Chamber Cable 4	EC-007	2023/08/03	2024/08/02
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2023/04/18	2024/04/17
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2023/06/29	2024/06/28
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2024/07/25
Unknown	RF Cable	KMSE	0735	2023/10/08	2024/10/07
Unknown	RF Cable	UFA147	219661	2023/10/08	2024/10/07
Unknown	RF Cable	XH750A-N	J-10M	2023/10/08	2024/10/07
MICRO-TRONICS	2.8G Passband filter	HPM50111	F-03-EM217	2023/08/03	2024/08/02
A.H.System	Pre-amplifier	PAM-1840VH	190	2023/08/02	2024/08/01
Electro-Mechanics Co	Horn Antenna	3116	2026	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2023/08/03	2024/08/02
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
RF Conducted Test					
Tonscend	RF control Unit	JS0806-2	19D8060154	2023/09/06	2024/09/05
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40	101473	2024/01/16	2025/01/15
Agilent	USB wideband power sensor	U2021XA	MY52350001	2023/06/08	2024/06/07
Unknown	10dB Attenuator	Unknown	F-03-EM190	2023/07/04	2024/07/03

*** 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).

§1.1307(b)(3)(i)(A)&§2.1091 –RF EXPOSURE

Applicable Standard

According to FCC §2.1091 and §1.1307(b) (3), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D04 Interim General RF Exposure Guidance

1-mW Test Exemption:

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

Result

For worst case:

Mode	Frequency (MHz)	Antenna Gain#	Maximum Tune up conducted power		Exemption Limit (mW)	Test Exemption
			dBm	mW		
Bluetooth	2402-2480	-0.49	-4.00	0.40	1	Yes
BLE	2402-2480	-0.49	-2.00	0.63	1	Yes

Note: The tune up conducted power and antenna gain was provided by the applicant

Result: Compliant

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has an internal antenna arrangement, which was permanently attached, the antenna gain[#] is -0.49dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant

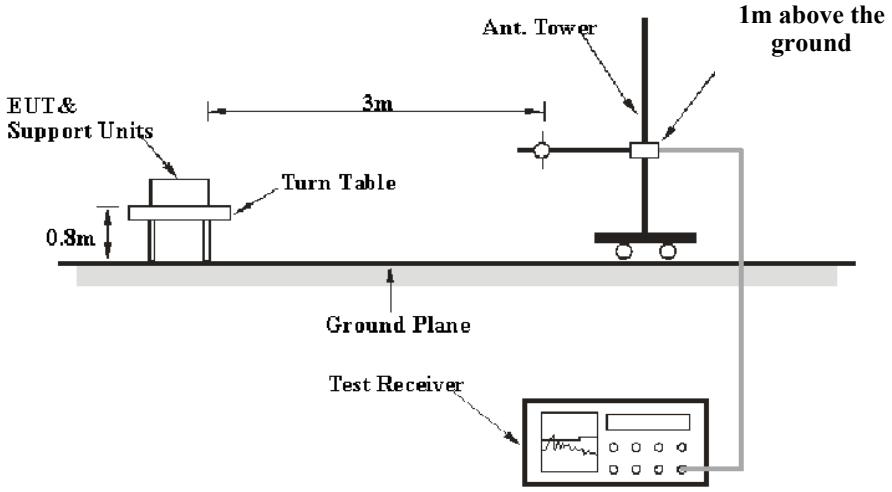
FCC §15.205, §15.209 & §15.247(d) - RADIATED EMISSIONS

Applicable Standard

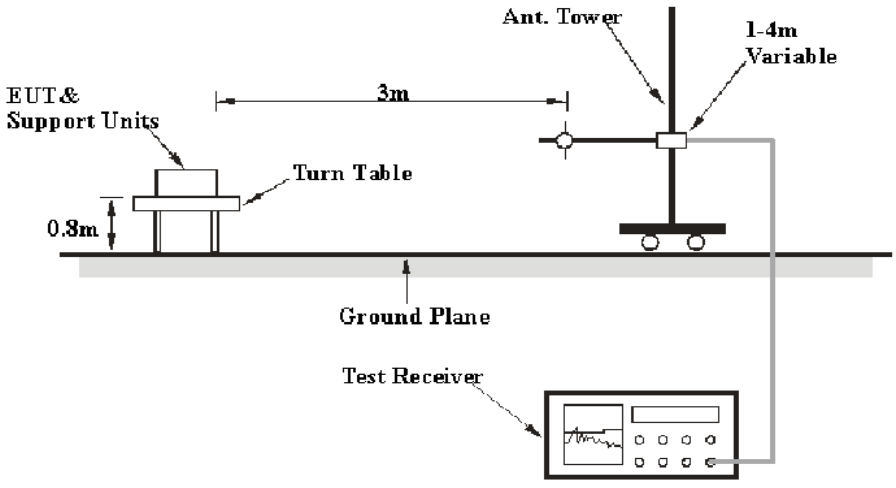
FCC §15.205; §15.209; §15.247(d)

EUT Setup

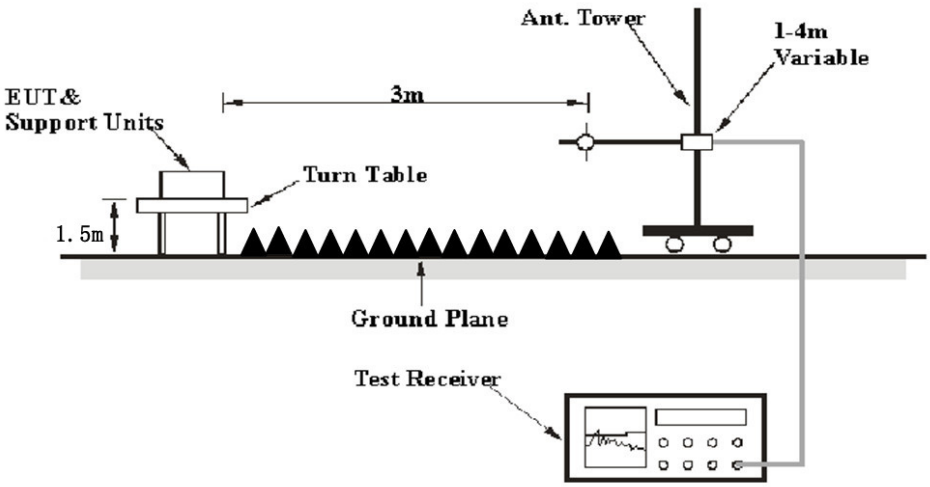
9 kHz-30MHz:



30MHz-1GHz:



Above 1GHz:



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

EMI Test Receiver & 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	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

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

Test Data

Environmental Conditions

Temperature:	22~25.4 ℃
Relative Humidity:	51~54 %
ATM Pressure:	101.0 kPa

The testing was performed by Anson Su on 2024-02-21 for below 1GHz and Tyler Wu on 2024-02-27 to 2024-07-05 for above 1GHz.

Test mode: Transmitting

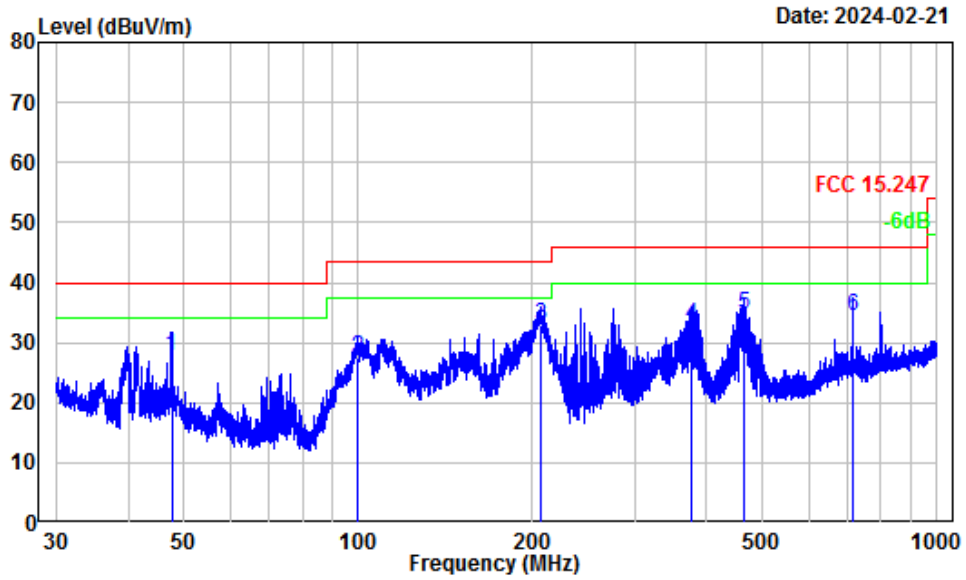
Note: After pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation were recorded.

9 kHz-30MHz: *(Maximum output power mode, EDR Mode (8DPSK) middle channel)*

For the radiated spurious emission below 30MHz, the emissions are 20dB below the limit or the noise floor which are not recorded.

30MHz-1GHz: *(Maximum output power mode, EDR (8DPSK) middle channel)*

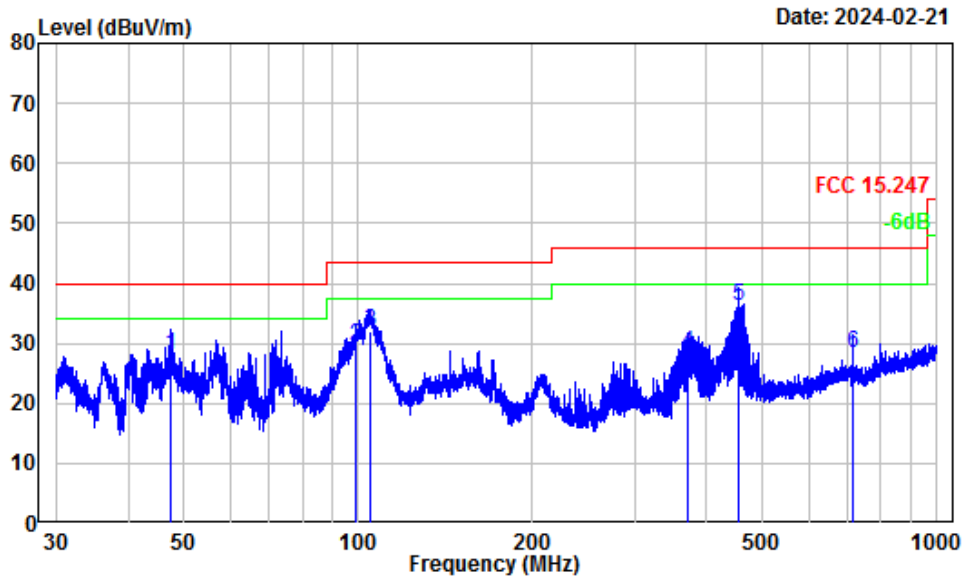
Horizontal



Site : chamber
Condition : 3m Horizontal
Project Number: SZ1240110-02250E-RF
Note : BT
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	47.55	-15.16	42.80	27.64	40.00	-12.36	QP
2	99.79	-13.79	41.19	27.40	43.50	-16.10	QP
3	206.49	-11.14	44.08	32.94	43.50	-10.56	QP
4	376.60	-8.53	41.51	32.98	46.00	-13.02	QP
5	462.75	-5.48	40.14	34.66	46.00	-11.34	QP
6	717.31	-1.57	36.05	34.48	46.00	-11.52	QP

Vertical



Site : chamber
Condition : 3m Vertical
Project Number: SZ1240110-02250E-RF
Note : BT
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	47.39	-16.04	44.23	28.19	40.00	-11.81	QP
2	99.01	-15.44	44.97	29.53	43.50	-13.97	QP
3	104.86	-13.83	45.94	32.11	43.50	-11.39	QP
4	370.38	-9.10	37.62	28.52	46.00	-17.48	QP
5	455.31	-6.02	42.28	36.26	46.00	-9.74	QP
6	715.43	-1.99	30.35	28.36	46.00	-17.64	QP

Above 1GHz:

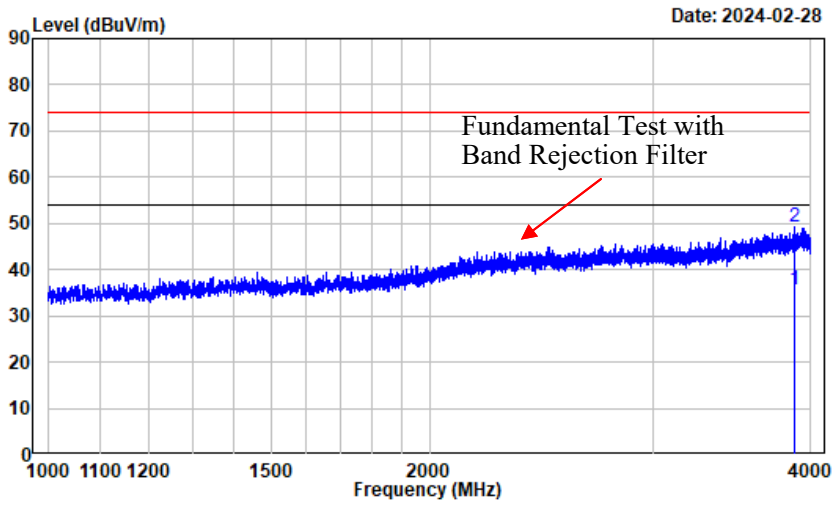
Frequency (MHz)	Receiver		Rx Antenna Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave					
GFSK							
Low Channel 2402MHz							
4804.00	53.67	PK	H	2.42	56.09	74	-17.91
4804.00	48.23	AV	H	2.42	50.65	54	-3.35
4804.00	52.31	PK	V	2.42	54.73	74	-19.27
4804.00	47.06	AV	V	2.42	49.48	54	-4.52
Middle Channel 2441MHz							
4882.00	54.16	PK	H	2.58	56.74	74	-17.26
4882.00	48.37	AV	H	2.58	50.95	54	-3.05
4882.00	53.28	PK	V	2.58	55.86	74	-18.14
4882.00	47.41	AV	V	2.58	49.99	54	-4.01
High Channel 2480MHz							
4960.00	51.15	PK	H	2.68	53.83	74	-20.17
4960.00	44.58	AV	H	2.68	47.26	54	-6.74
4960.00	50.39	PK	V	2.68	53.07	74	-20.93
4960.00	43.26	AV	V	2.68	45.94	54	-8.06
π/4-DQPSK							
Low Channel 2402MHz							
4804.00	54.08	PK	H	2.42	56.50	74	-17.50
4804.00	44.02	AV	H	2.42	46.44	54	-7.56
4804.00	53.27	PK	V	2.42	55.69	74	-18.31
4804.00	43.16	AV	V	2.42	45.58	54	-8.42
Middle Channel 2441MHz							
4882.00	54.26	PK	H	2.58	56.84	74	-17.16
4882.00	44.35	AV	H	2.58	46.93	54	-7.07
4882.00	53.17	PK	V	2.58	55.75	74	-18.25
4882.00	43.08	AV	V	2.58	45.66	54	-8.34
High Channel 2480MHz							
4960.00	50.86	PK	H	2.68	53.54	74	-20.46
4960.00	40.08	AV	H	2.68	42.76	54	-11.24
4960.00	49.47	PK	V	2.68	52.15	74	-21.85
4960.00	39.25	AV	V	2.68	41.93	54	-12.07

Frequency (MHz)	Receiver		Rx Antenna Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
8DPSK							
Low Channel 2402MHz							
4804.00	53.78	PK	H	2.42	56.20	74	-17.80
4804.00	43.95	AV	H	2.42	46.37	54	-7.63
4804.00	53.02	PK	V	2.42	55.44	74	-18.56
4804.00	43.26	AV	V	2.42	45.68	54	-8.32
Middle Channel 2441MHz							
4882.00	54.03	PK	H	2.58	56.61	74	-17.39
4882.00	44.48	AV	H	2.58	47.06	54	-6.94
4882.00	53.27	PK	V	2.58	55.85	74	-18.15
4882.00	44.19	AV	V	2.58	46.77	54	-7.23
High Channel 2480MHz							
4960.00	50.94	PK	H	2.68	53.62	74	-20.38
4960.00	39.91	AV	H	2.68	42.59	54	-11.41
4960.00	50.15	PK	V	2.68	52.83	74	-21.17
4960.00	39.08	AV	V	2.68	41.76	54	-12.24

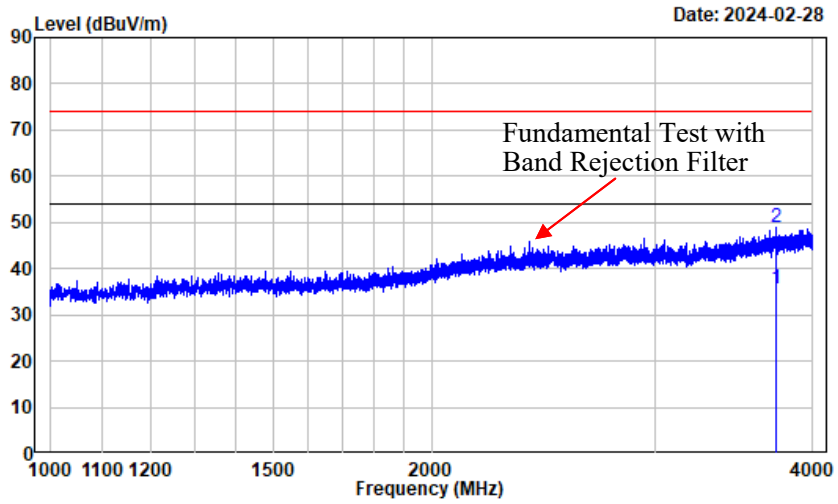
Note:
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude/Level = Factor + Reading
Margin = Corrected Amplitude/Level - Limit
The other spurious emission which is in the noise floor level was not recorded.

Listed with the worst harmonic margin test plot:

Pre-scan, GFSK Middle Channel (worst case)

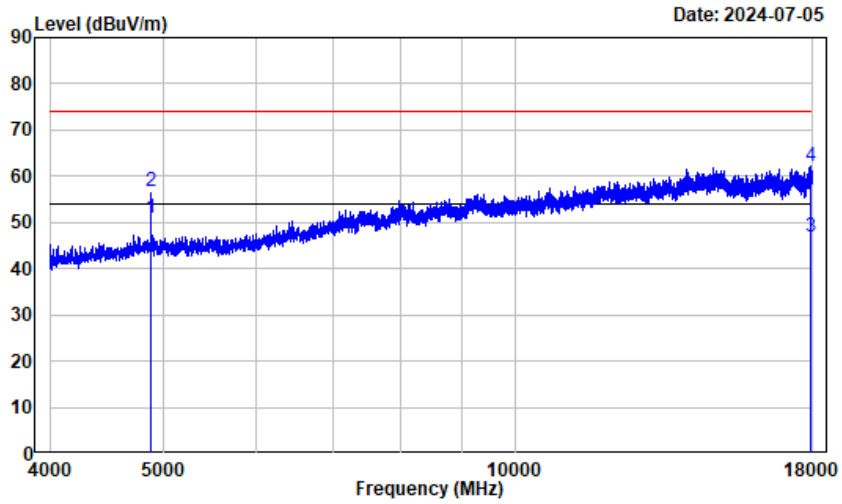
Horizontal	
1-4GHz	 Project No. : SZ1240110-02250E Tester : Tyler Polarization: Horizontal Note : Transmitting Listed with the worst harmonic : margin test plot (BDR Mode Middle channel)

	Freq	Factor	Read Level	Limit Level	Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	3883.750	-0.61	36.39	35.78	54.00	Average	-18.22
2	3883.750	-0.61	49.77	49.16	74.00	Peak	-24.84

Vertical	
1-4GHz	

Project No. : SZ1240110-02250E
Tester : Tyler
Polarization: Vertical
Note : Transmitting Listed with the worst harmonic
: margin test plot (BDR Mode Middle channel)

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	3746.125	-0.93	36.62	35.69	54.00	Average	-18.31
2	3746.125	-0.93	49.83	48.90	74.00	Peak	-25.10

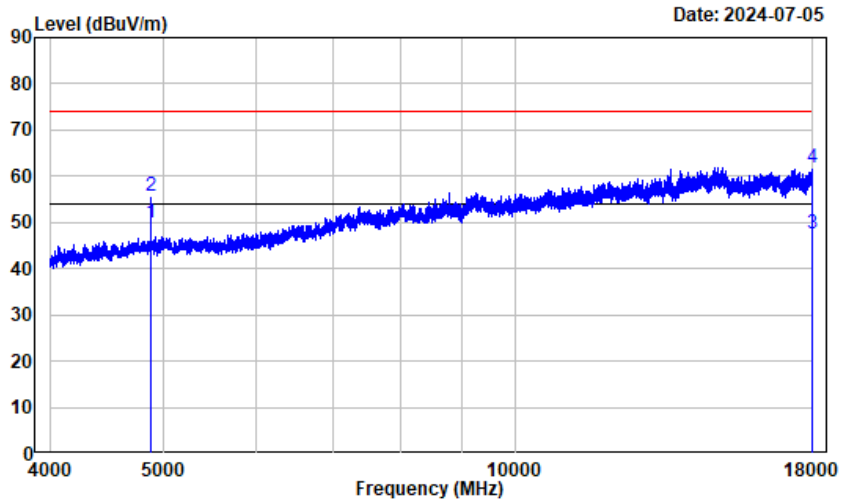
Horizontal	
4-18GHz	

Project No. : SZ1240110-02250E
Tester : Tyler
Polarization: Horizontal
Note : Transmitting Listed with the worst harmonic
: margin test plot (BDR Mode Middle channel)

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4882.000	2.58	48.37	50.95	54.00	-3.05	Average
2	4882.000	2.58	54.16	56.74	74.00	-17.26	Peak
3	17931.750	24.13	22.79	46.92	54.00	-7.08	Average
4	17931.750	24.13	37.92	62.05	74.00	-11.95	Peak

Vertical

4-18GHz

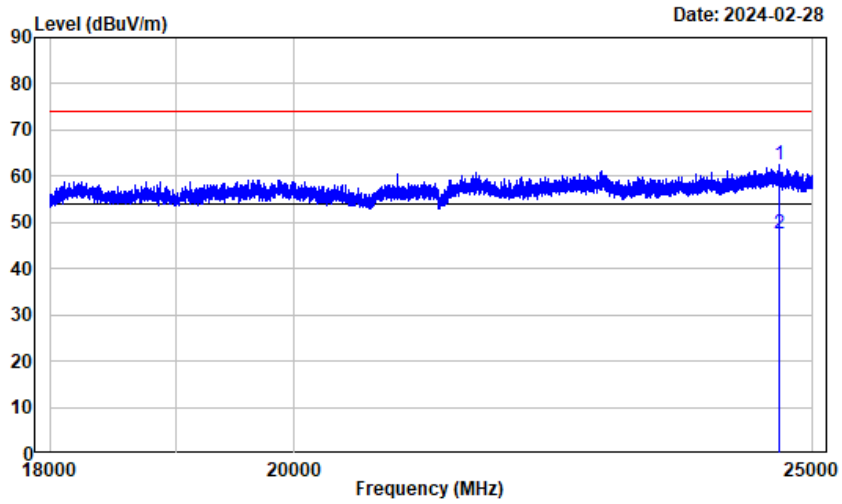


Project No. : SZ1240110-02250E
Tester : Tyler
Polarization: Vertical
Note : Transmitting Listed with the worst harmonic
: margin test plot (BDR Mode Middle channel)

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4882.000	2.58	47.41	49.99	54.00	-4.01	Average
2	4882.000	2.58	53.28	55.86	74.00	-18.14	Peak
3	18000.000	24.62	23.06	47.68	54.00	-6.32	Average
4	18000.000	24.62	37.16	61.78	74.00	-12.22	Peak

Horizontal

18-25GHz

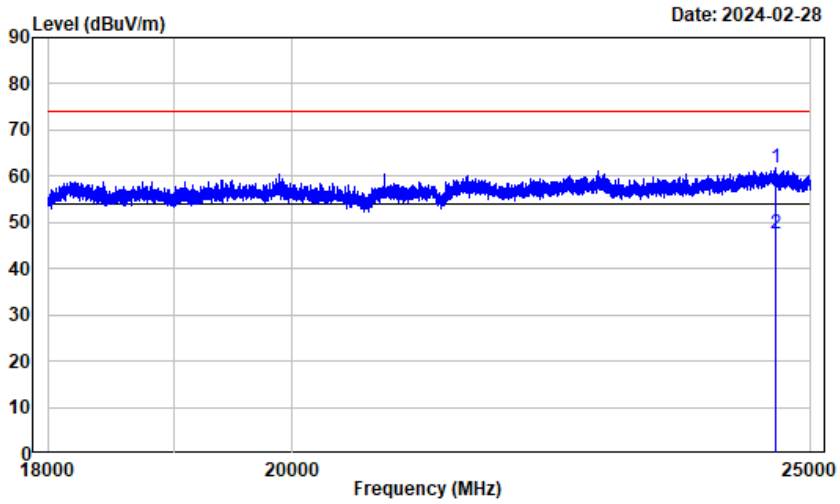


Project No. : SZ1240110-02250E
Tester : Tyler
Polarization: Horizontal
Note : Transmitting Listed with the worst harmonic
: margin test plot (BDR Mode Middle channel)

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	24649.130	18.81	43.75	62.56	74.00	Peak	-11.44
2	24649.130	18.81	28.90	47.71	54.00	Average	-6.29

Vertical

18-25GHz

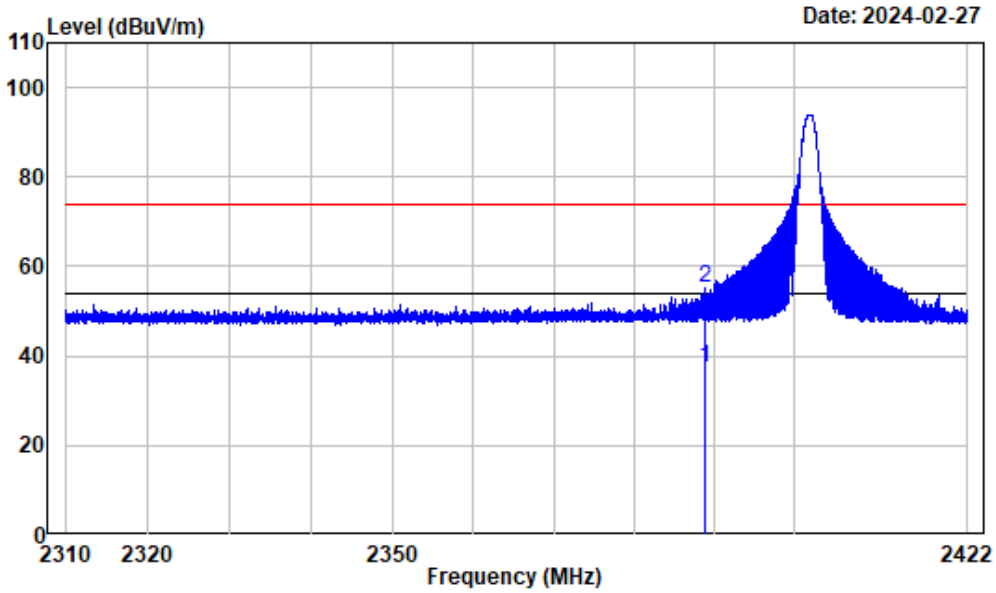


Project No. : SZ1240110-02250E
Tester : Tyler
Polarization: Vertical
Note : Transmitting Listed with the worst harmonic
: margin test plot (BDR Mode Middle channel)

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	24622.880	18.85	42.96	61.81	74.00	Peak	-12.19
2	24622.880	18.85	28.77	47.62	54.00	Average	-6.38

Test plots for Band Edge Measurements (Radiated):

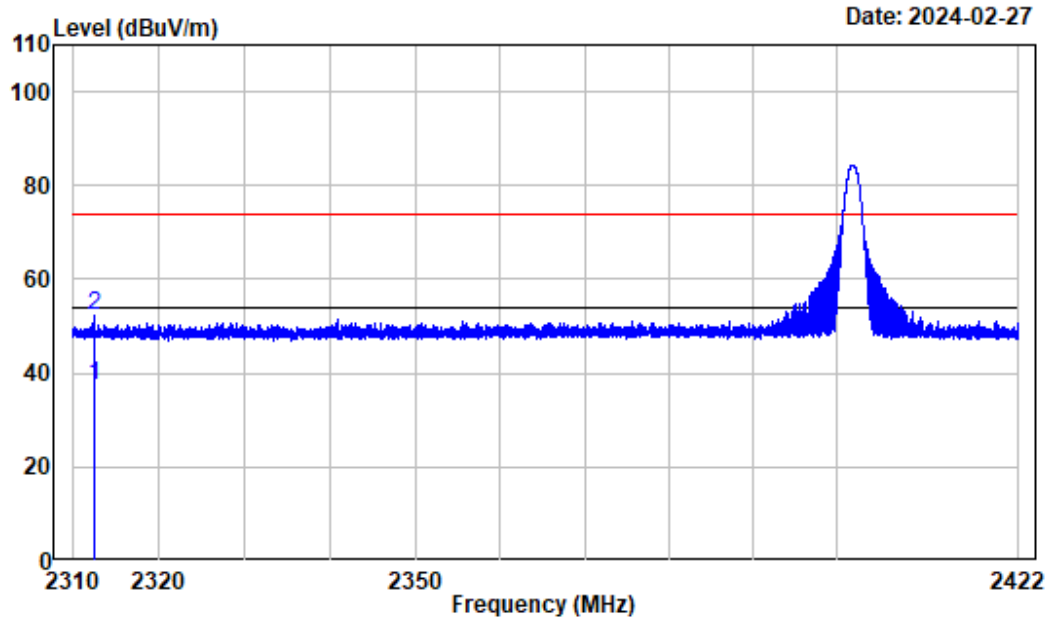
GFSK			
Test Channel:	**2402MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(1DH5)_2402

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2388.974	-3.20	40.47	37.27	54.00	Average	-16.73
2	2388.974	-3.20	58.39	55.19	74.00	peak	-18.81

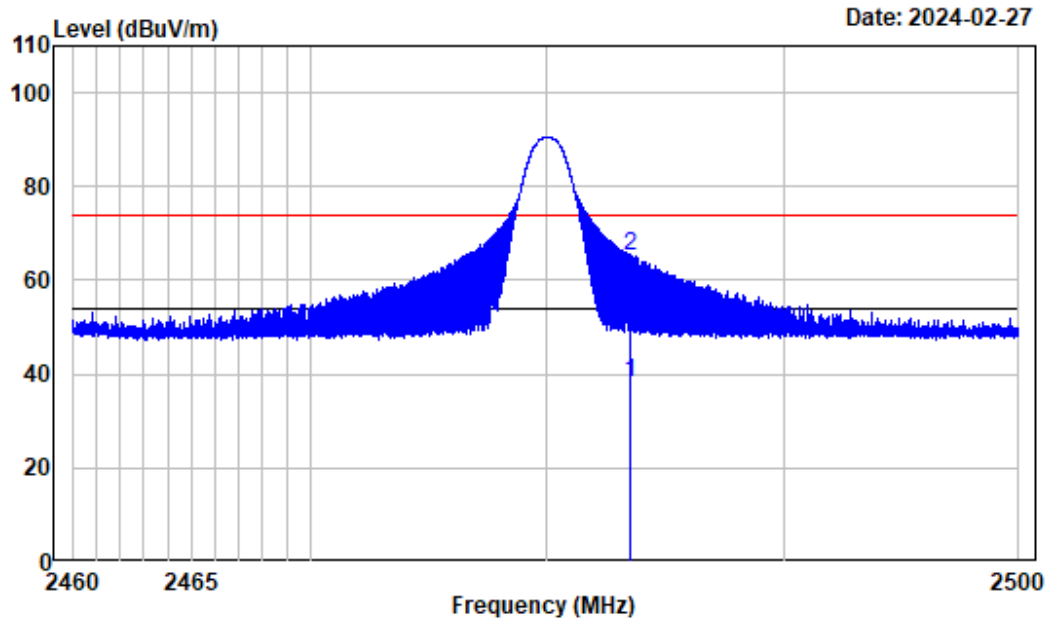
GFSK			
Test Channel:	**2402MHz**	**Ant. Polar. :**	**Vertical**



Condition : Vertical
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(1DH5)_2402

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2312.618	-3.11	40.41	37.30	54.00	Average	-16.70
2	2312.618	-3.11	55.24	52.13	74.00	peak	-21.87

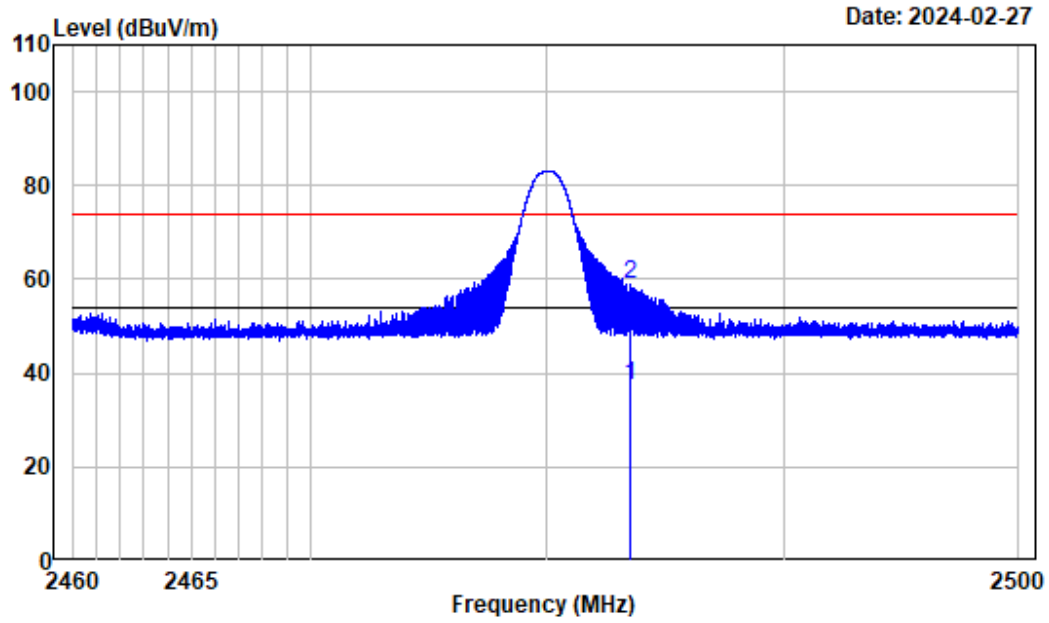
GFSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(1DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2483.530	-3.17	41.31	38.14	54.00	Average	-15.86
2	2483.530	-3.17	68.42	65.25	74.00	peak	-8.75

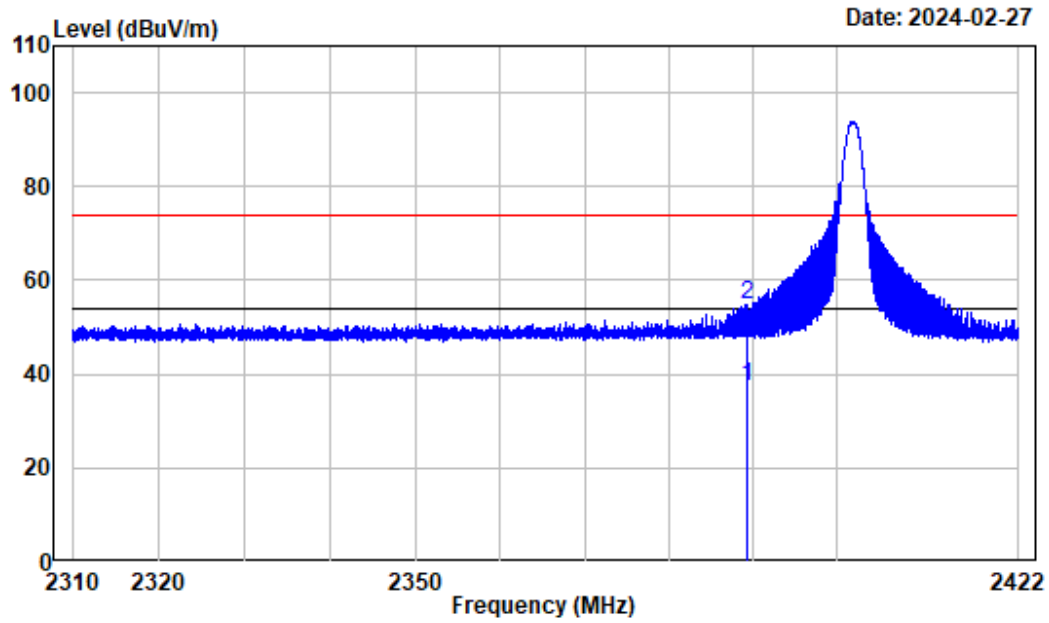
GFSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Vertical**



Condition : Vertical
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(1DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2483.520	-3.17	40.71	37.54	54.00	Average	-16.46
2	2483.520	-3.17	62.18	59.01	74.00	peak	-14.99

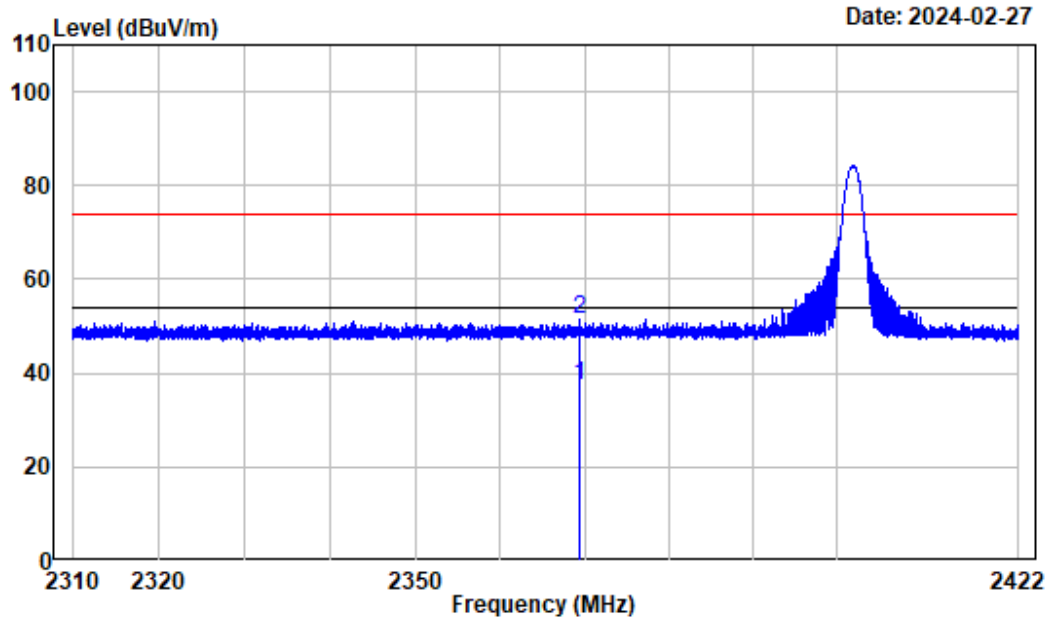
π/4-DQPSK			
Test Channel:	**2402MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(2DH5)_2402

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2389.324	-3.20	40.47	37.27	54.00	Average	-16.73
2	2389.324	-3.20	57.97	54.77	74.00	peak	-19.23

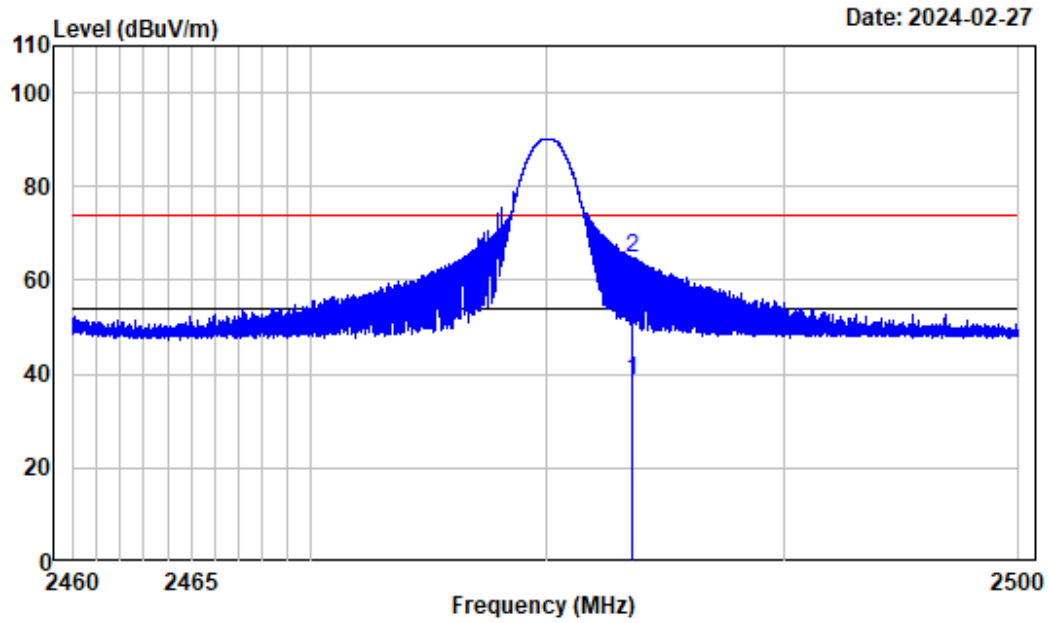
π/4-DQPSK			
Test Channel:	**2402MHz**	**Ant. Polar. :**	**Vertical**



Condition : Vertical
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(2DH5)_2402

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2369.486	-3.17	40.41	37.24	54.00	Average	-16.76
2	2369.486	-3.17	54.79	51.62	74.00	peak	-22.38

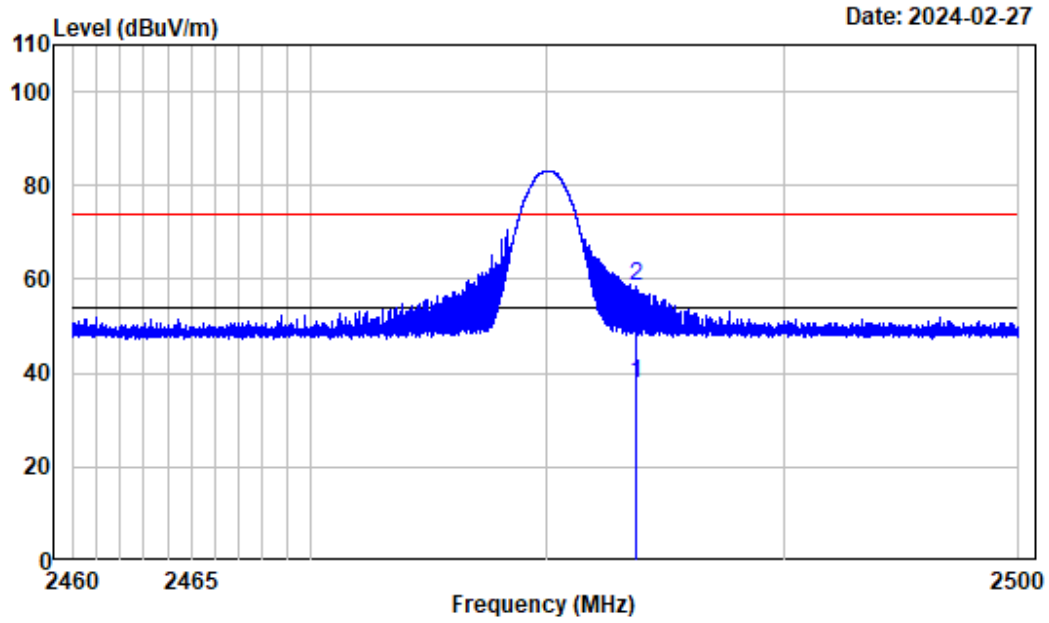
π/4-DQPSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(2DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2483.555	-3.17	41.93	38.76	54.00	Average	-15.24
2	2483.555	-3.17	68.11	64.94	74.00	peak	-9.06

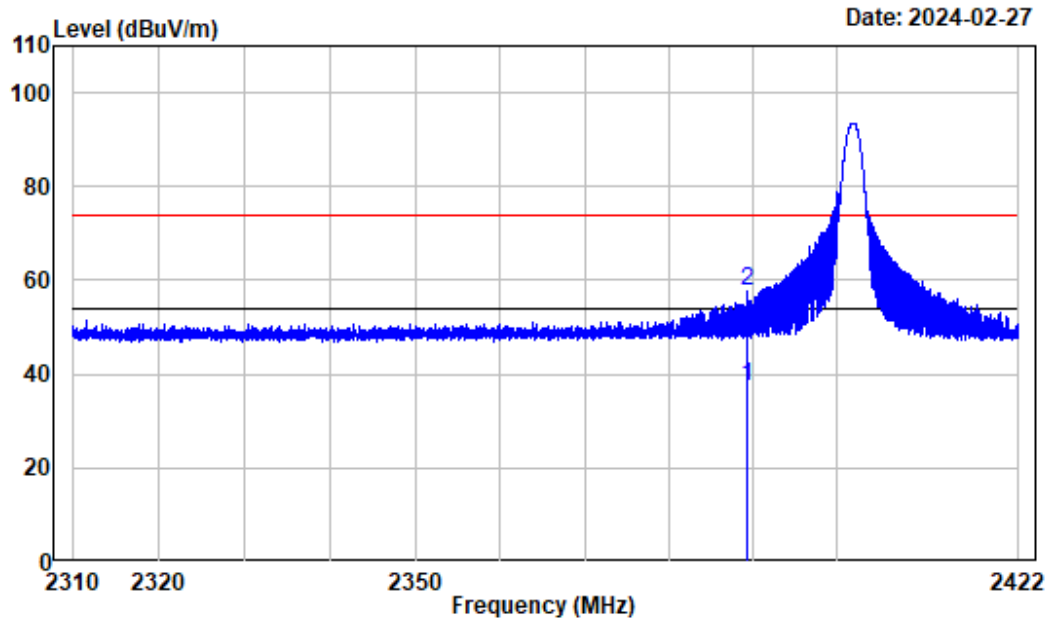
π/4-DQPSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Vertical**



Condition : Vertical
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(2DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2483.735	-3.17	40.89	37.72	54.00	Average	-16.28
2	2483.735	-3.17	61.52	58.35	74.00	peak	-15.65

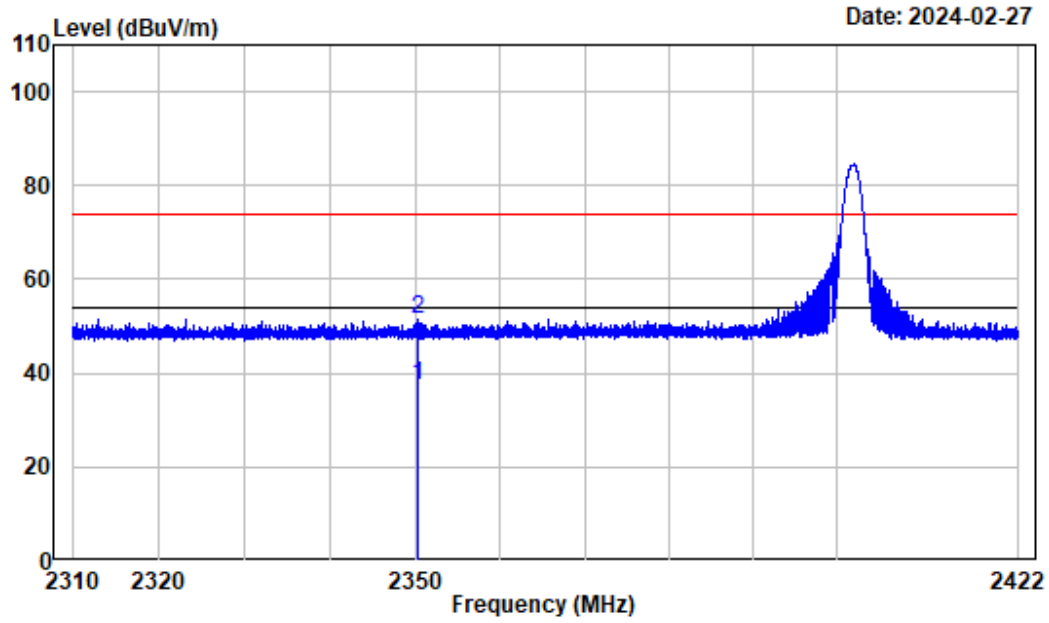
8DPSK			
Test Channel:	**2402MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(3DH5)_2402

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2389.408	-3.20	40.52	37.32	54.00	Average	-16.68
2	2389.408	-3.20	60.73	57.53	74.00	peak	-16.47

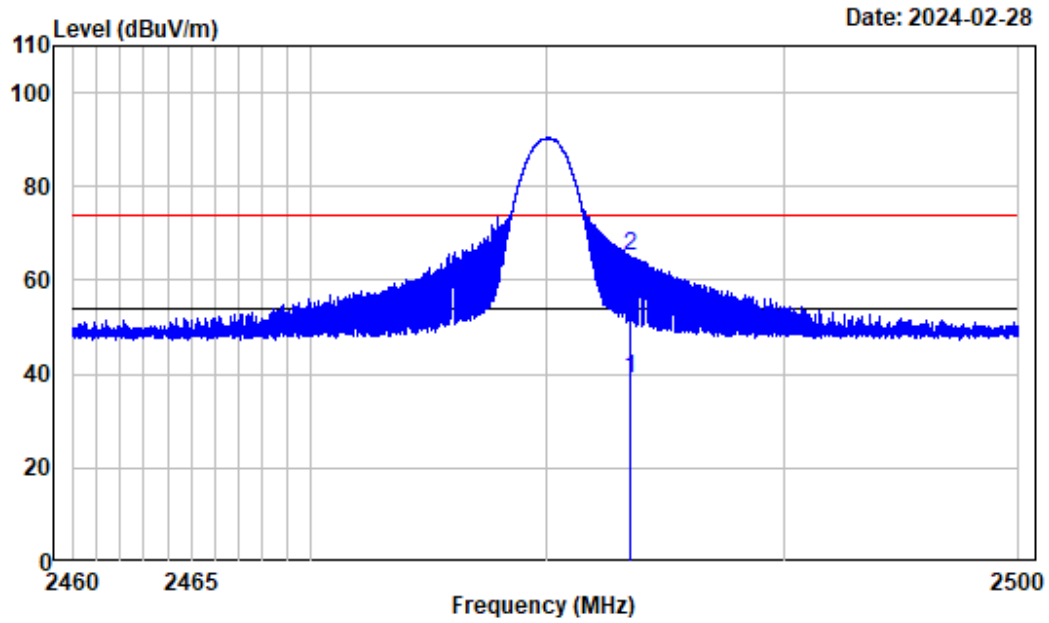
8DPSK			
Test Channel:	**2402MHz**	**Ant. Polar. :**	**Vertical**



Condition : Vertical
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(3DH5)_2402

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2350.236	-3.15	40.41	37.26	54.00	Average	-16.74
2	2350.236	-3.15	54.53	51.38	74.00	peak	-22.62

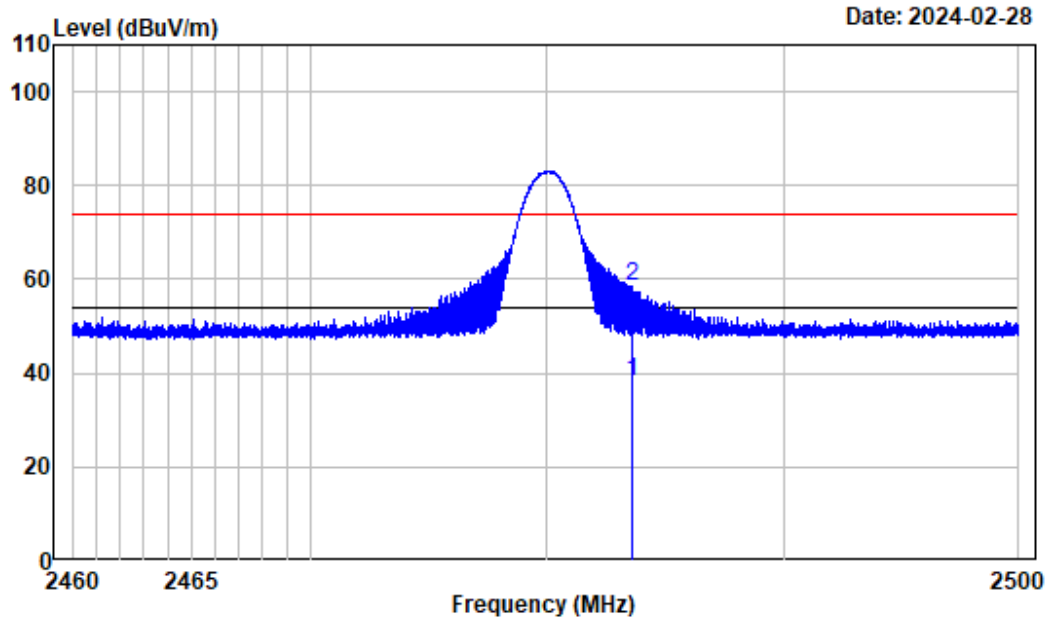
8DPSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(3DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2483.545	-3.17	42.02	38.85	54.00	Average	-15.15
2	2483.545	-3.17	68.47	65.30	74.00	peak	-8.70

8DPSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Vertical**



Condition : Vertical
Project No.: SZ1240110-02250E
Tester : Tyler
Note : BT(3DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Remark	Over Limit
	MHz	dB/m	dBuV	dBuV/m	dBuV/m		dB
1	2483.560	-3.17	41.17	38.00	54.00	Average	-16.00
2	2483.560	-3.17	61.55	58.38	74.00	peak	-15.62

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

Applicable Standard

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

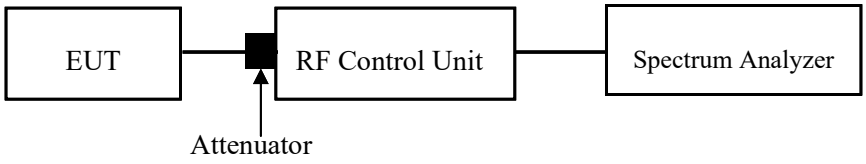
Test Procedure

Test Method: ANSI C63.10-2013 Clause 7.8.2

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

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

Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined.



Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	38 %
ATM Pressure:	101.0 kPa

The testing was performed by Tom Liu on 2024-02-27.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) - 20 dB EMISSION BANDWIDTH & 99% OCCUPIED 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

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.

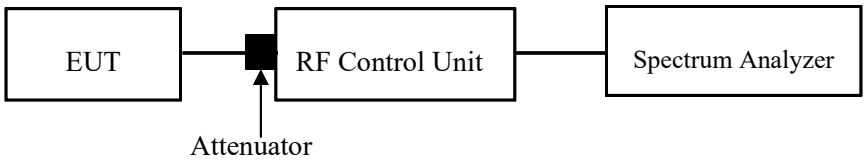
• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• 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 nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW/ 20dB bandwidth and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.

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).



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	38 %
ATM Pressure:	101.0 kPa

The testing was performed by Tom Liu on 2024-02-27.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the 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

Test Method: ANSI C63.10-2013 Clause 7.8.3

a) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.

b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

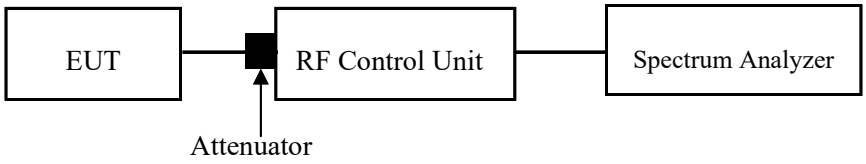
c) VBW ≥ RBW.

d) Sweep: Auto.

e) Detector function: Peak.

f) Trace: Max hold.

It might prove necessary to break the span up into sub ranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels.



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	38 %
ATM Pressure:	101.0 kPa

The testing was performed by Tom Liu on 2024-02-27.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the 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

Test Method: ANSI C63.10-2013 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 ⩽ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
d) Detector function: Peak.
e) Trace: Max hold.

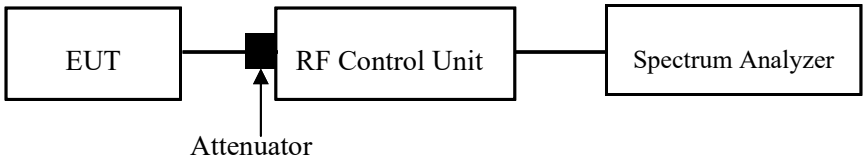
Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) =(number of hops on spectrum analyzer) × (period specified in the requirements / analyzer sweep time)

The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.

The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	38 %
ATM Pressure:	101.0 kPa

The testing was performed by Tom Liu on 2024-02-27.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

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

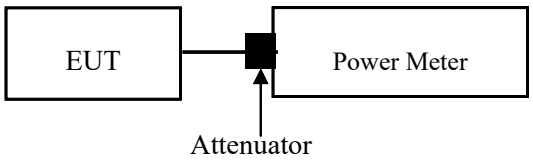
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 7.8.5

1. Place the EUT on a bench and set it 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.



Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	38 %
ATM Pressure:	101.0 kPa

The testing was performed by Tom Liu on 2024-02-27.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(d) § 5.5 - BAND EDGES TESTING

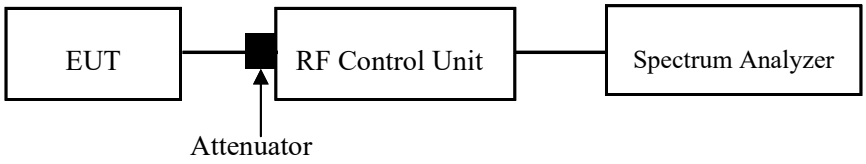
Applicable Standard

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

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.



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	38 %
ATM Pressure:	101.0 kPa

The testing was performed by Tom Liu on 2024-02-27.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

EUT PHOTOGRAPHS

Please refer to the attachment SZ1240110-02250E-RF External photo and SZ1240110-02250E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment SZ1240110-02250E-RF Test Setup photo.

APPENDIX

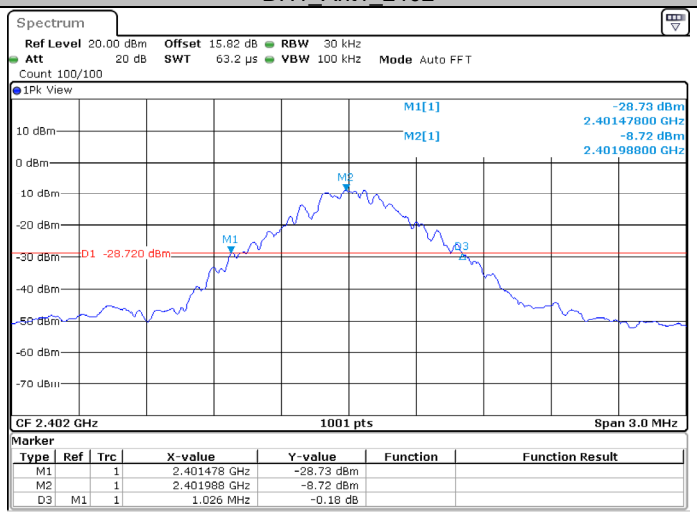
Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.026	2401.48	2402.50	---	---
		2441	0.981	2440.52	2441.50	---	---
		2480	0.957	2479.55	2480.50	---	---
2DH1	Ant1	2402	1.296	2401.36	2402.66	---	---
		2441	1.302	2440.36	2441.66	---	---
		2480	1.299	2479.36	2480.66	---	---
3DH1	Ant1	2402	1.302	2401.36	2402.66	---	---
		2441	1.302	2440.36	2441.66	---	---
		2480	1.302	2479.36	2480.66	---	---

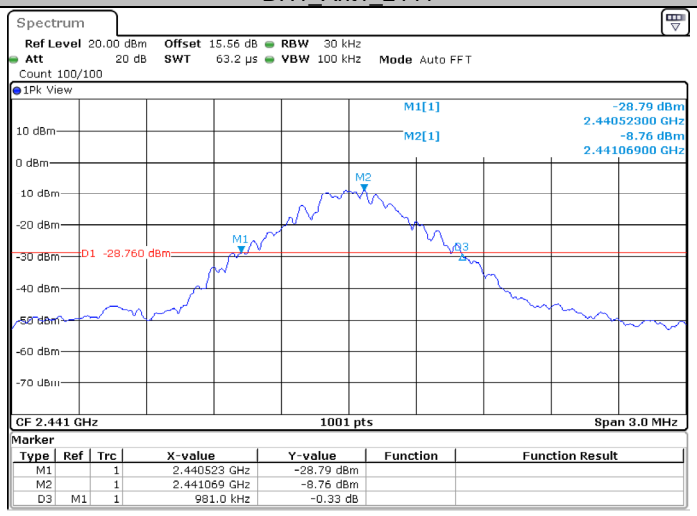
Test Graphs

DH1_Ant1_2402



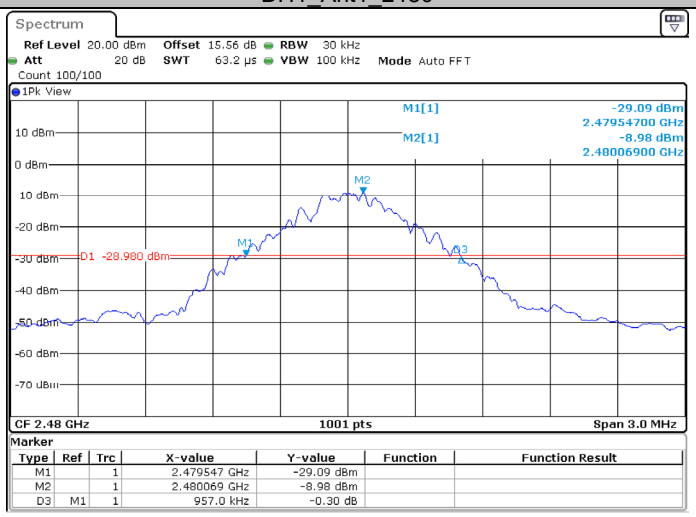
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:23:11

DH1_Ant1_2441



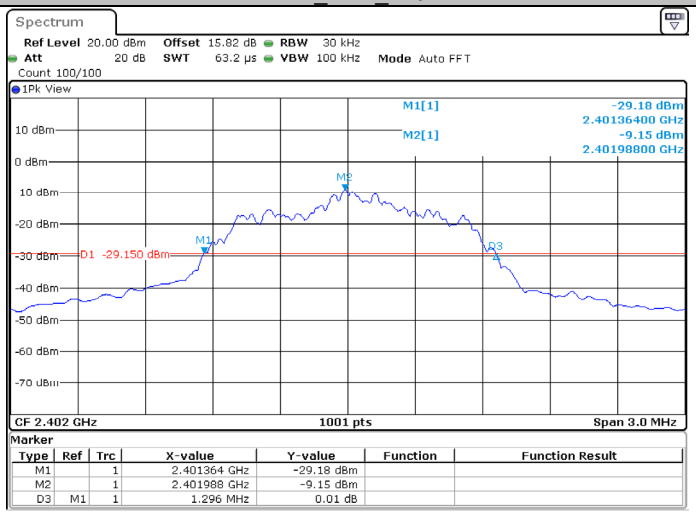
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:22:43

DH1_Ant1_2480



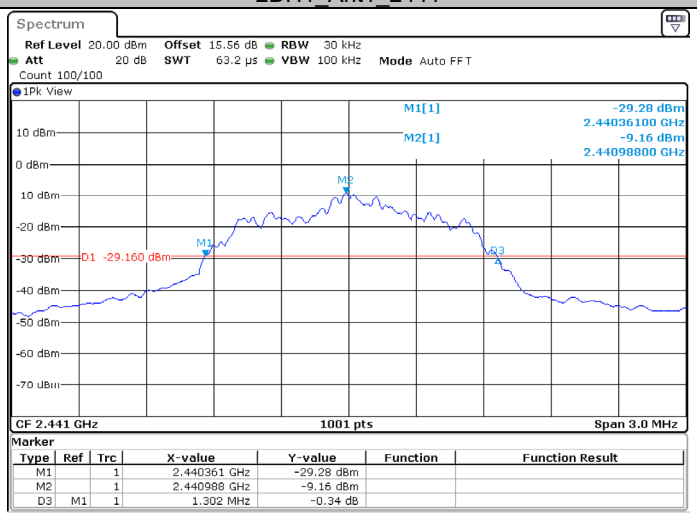
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:20:40

2DH1_Ant1_2402



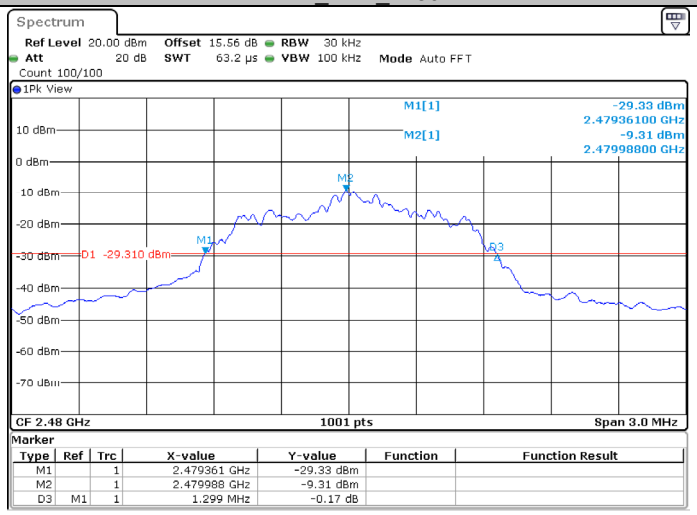
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:24:10

2DH1_Ant1_2441



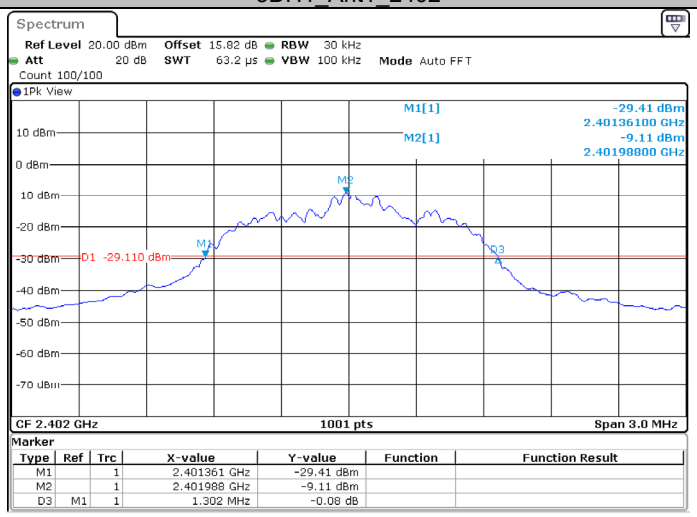
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:25:12

2DH1_Ant1_2480



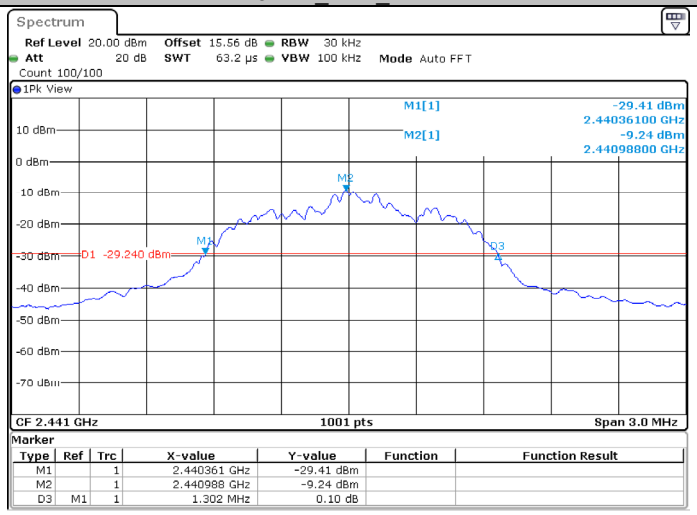
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:25:40

3DH1_Ant1_2402



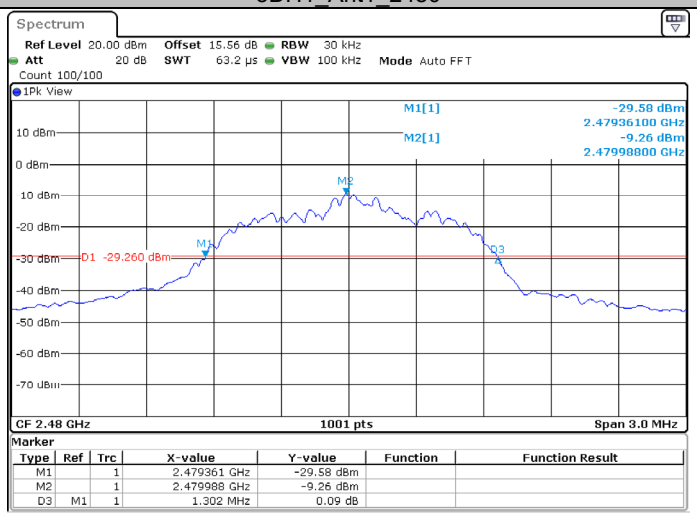
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:26:31

3DH1_Ant1_2441



ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:27:59

3DH1_Ant1_2480



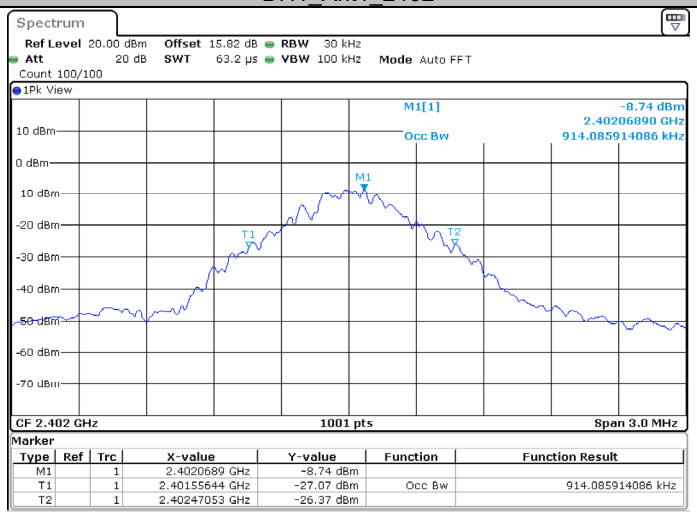
Appendix B: Occupied Channel Bandwidth

Test Result

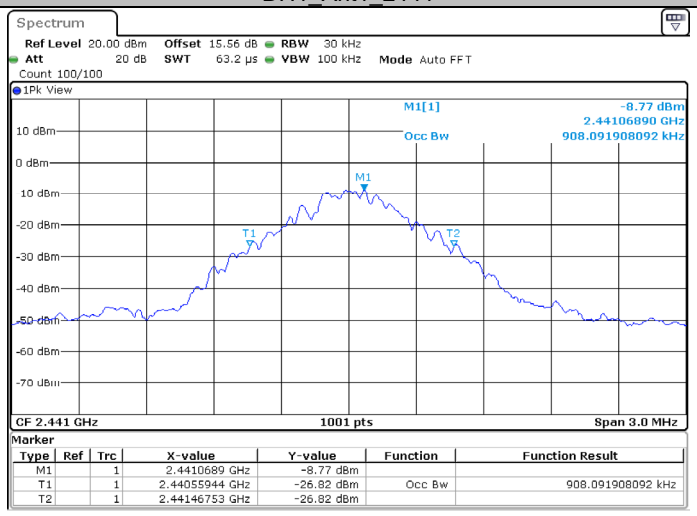
Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.914	2401.5564	2402.4705	---	---
		2441	0.908	2440.5594	2441.4675	---	---
		2480	0.908	2479.5594	2480.4675	---	---
2DH1	Ant1	2402	1.190	2401.4096	2402.5994	---	---
		2441	1.187	2440.4096	2441.5964	---	---
		2480	1.193	2479.4066	2480.5994	---	---
3DH1	Ant1	2402	1.208	2401.3946	2402.6024	---	---
		2441	1.214	2440.3946	2441.6084	---	---
		2480	1.217	2479.3916	2480.6084	---	---

Test Graphs

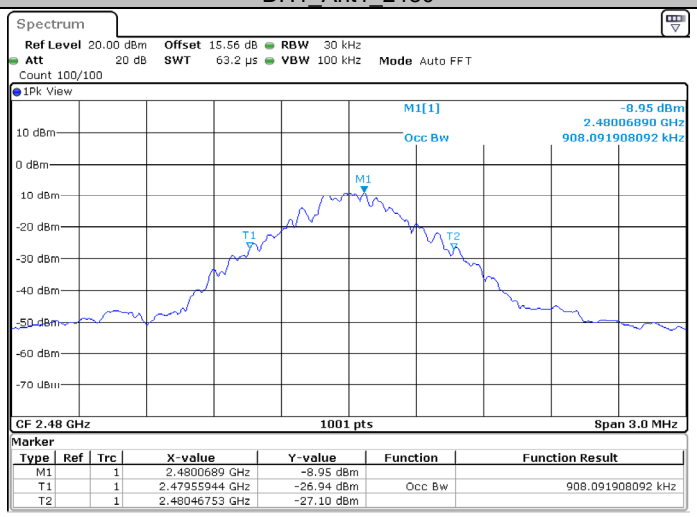
DH1_Ant1_2402



DH1_Ant1_2441

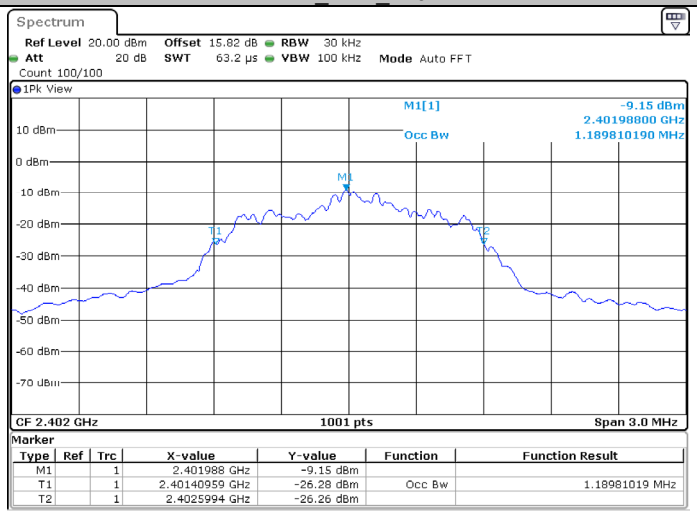


DH1_Ant1_2480



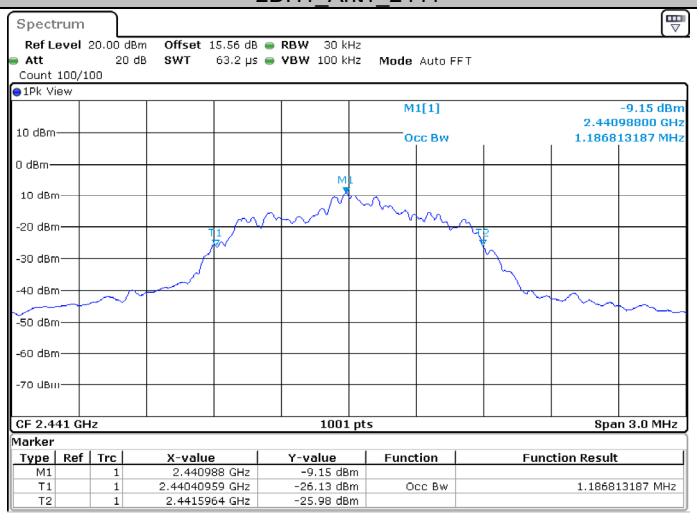
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:20:45

2DH1_Ant1_2402



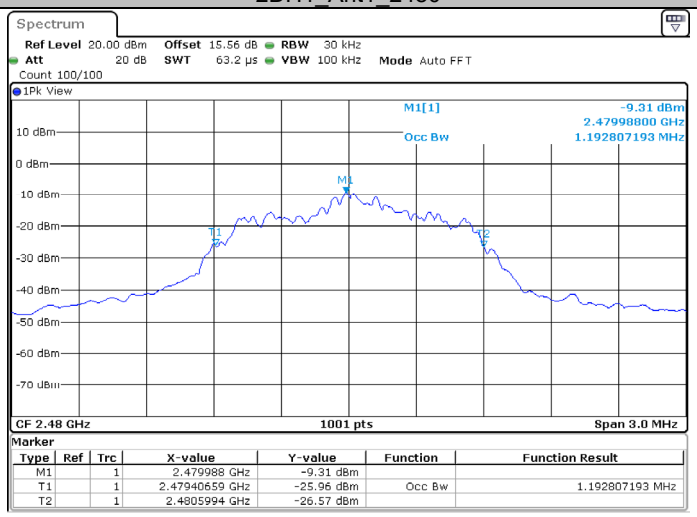
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:24:15

2DH1_Ant1_2441



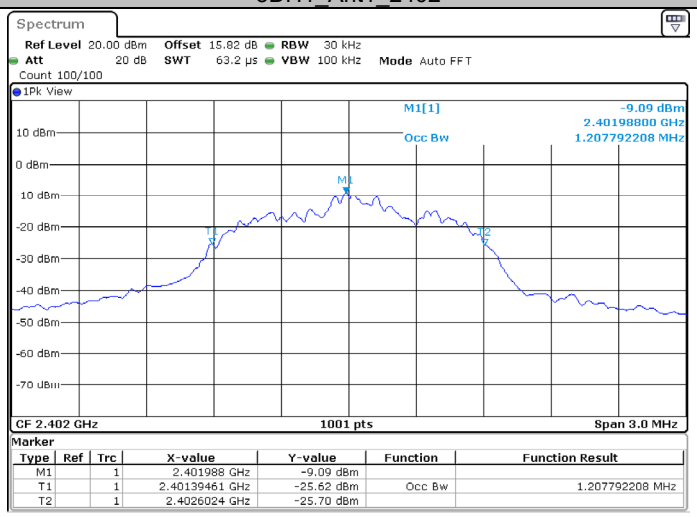
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:25:18

2DH1_Ant1_2480



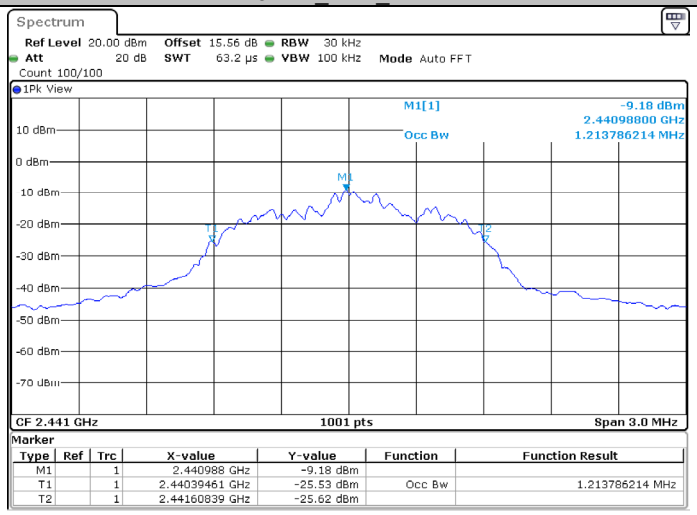
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:25:46

3DH1_Ant1_2402



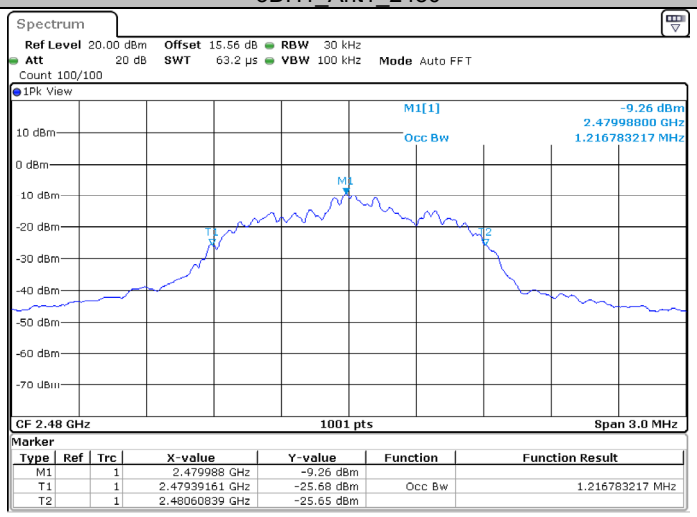
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:26:36

3DH1_Ant1_2441



ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:28:04

3DH1_Ant1_2480



Appendix C: Maximum conducted output power

Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH1	Ant1	2402	-5.11	≤20.97	PASS
		2441	-5.14	≤20.97	PASS
		2480	-5.21	≤20.97	PASS
2DH1	Ant1	2402	-4.84	≤20.97	PASS
		2441	-4.83	≤20.97	PASS
		2480	-4.91	≤20.97	PASS
3DH1	Ant1	2402	-4.65	≤20.97	PASS
		2441	-4.64	≤20.97	PASS
		2480	-4.70	≤20.97	PASS

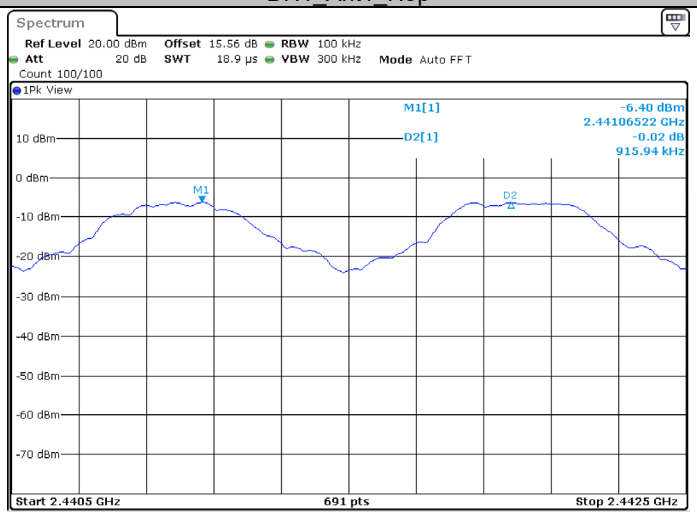
Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	0.916	≥0.654	PASS
2DH1	Ant1	Hop	1.006	≥0.868	PASS
3DH1	Ant1	Hop	0.994	≥0.868	PASS

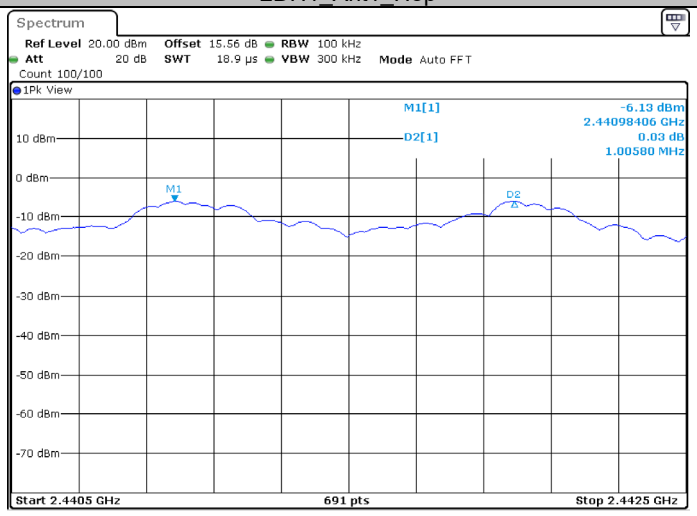
Test Graphs

DH1_Ant1_Hop



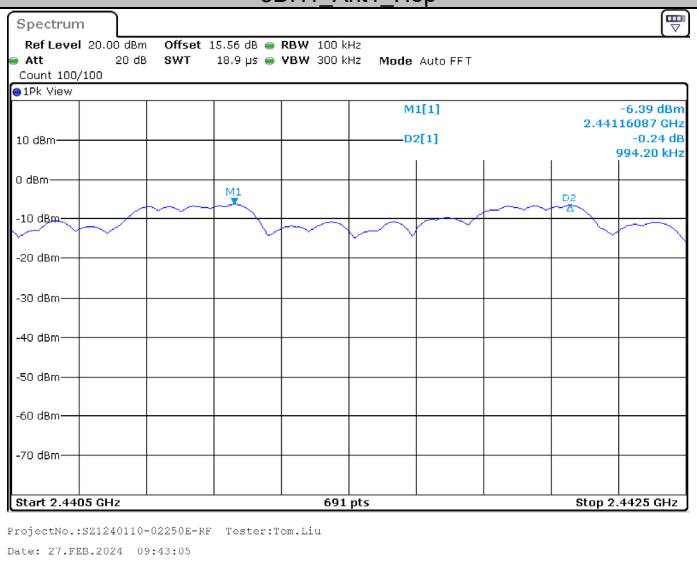
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:31:29

2DH1_Ant1_Hop



ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:36:37

3DH1_Ant1_Hop



Appendix E: Time of occupancy

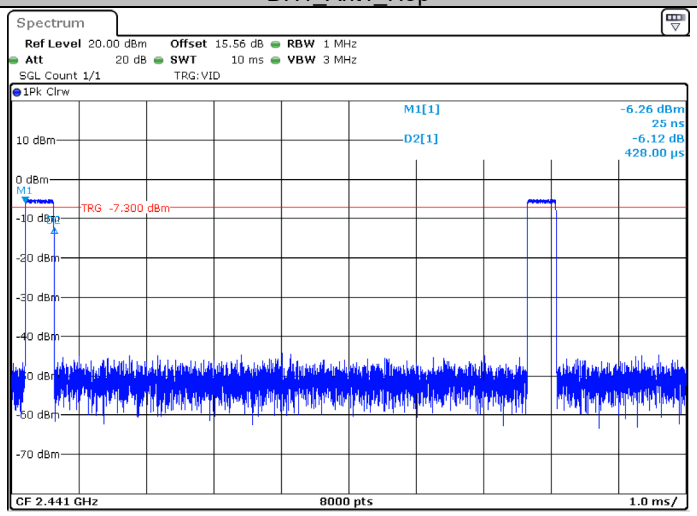
Test Result

Test Mode	Antenna	Frequency[MHz]	Pulse width (ms)	Dwell time (s)	Limit[s]	Verdict
DH1	Ant1	Hop	0.428	0.137	≤0.4	PASS
DH3	Ant1	Hop	1.620	0.259	≤0.4	PASS
DH5	Ant1	Hop	2.813	0.300	≤0.4	PASS
2DH1	Ant1	Hop	0.486	0.156	≤0.4	PASS
2DH3	Ant1	Hop	1.679	0.269	≤0.4	PASS
2DH5	Ant1	Hop	2.872	0.306	≤0.4	PASS
3DH1	Ant1	Hop	0.414	0.132	≤0.4	PASS
3DH3	Ant1	Hop	1.659	0.265	≤0.4	PASS
3DH5	Ant1	Hop	2.745	0.293	≤0.4	PASS

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

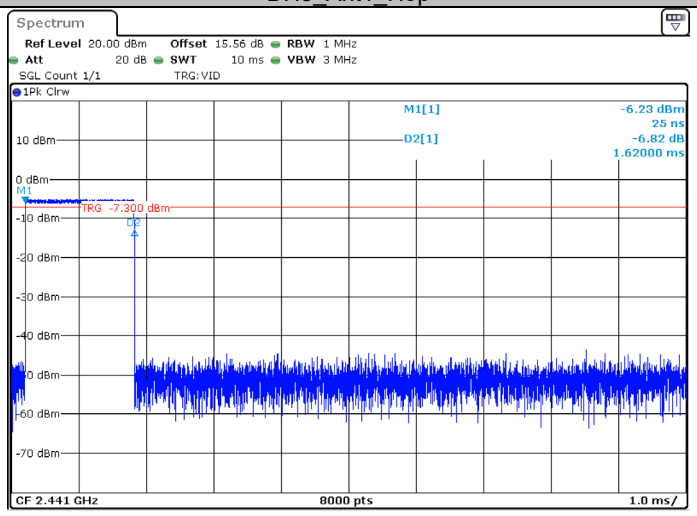
Test Graphs

DH1_Ant1_Hop



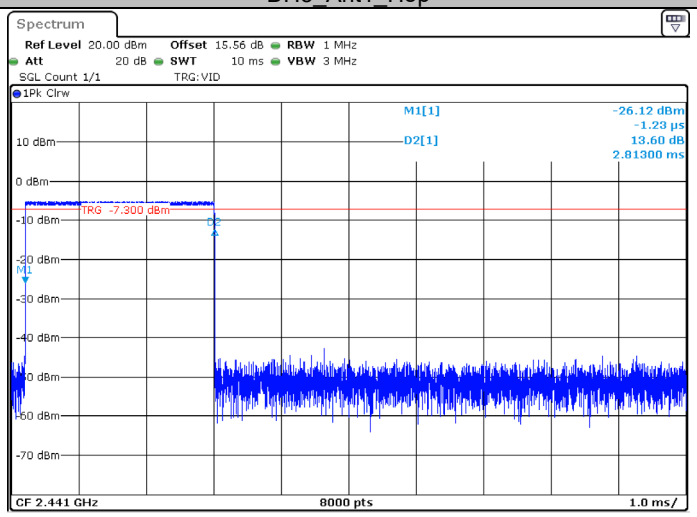
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:32:41

DH3_Ant1_Hop



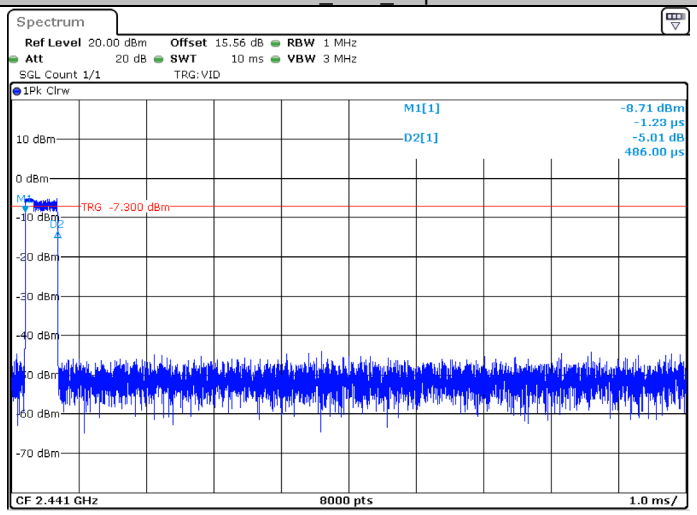
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:33:34

DH5_Ant1_Hop



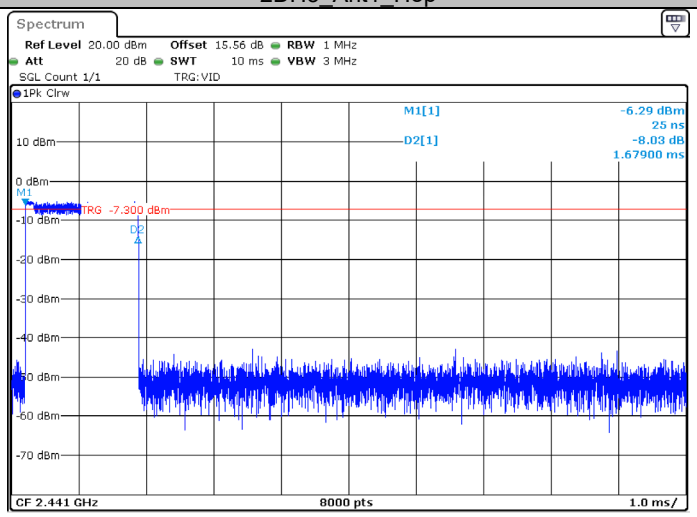
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:34:58

2DH1_Ant1_Hop



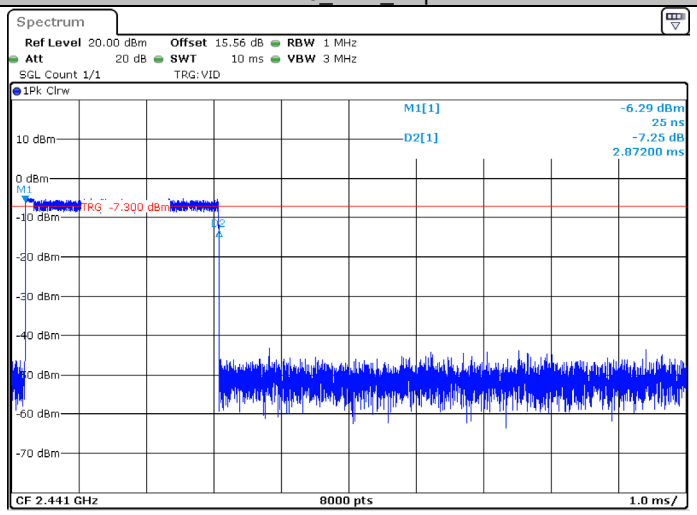
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:37:40

2DH3_Ant1_Hop



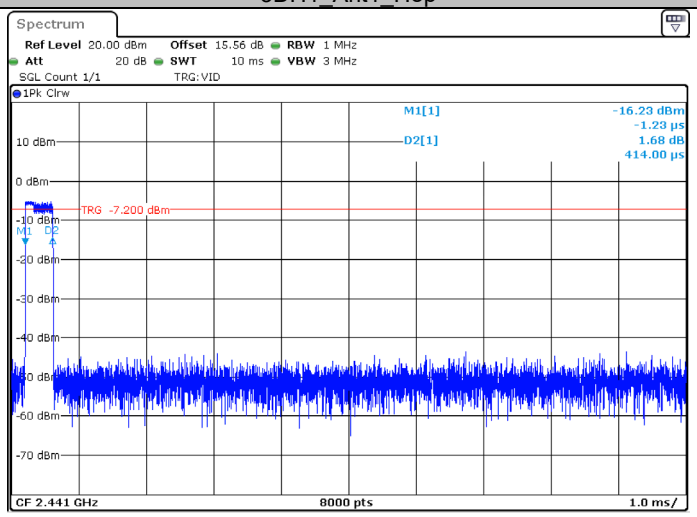
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:38:46

2DH5_Ant1_Hop

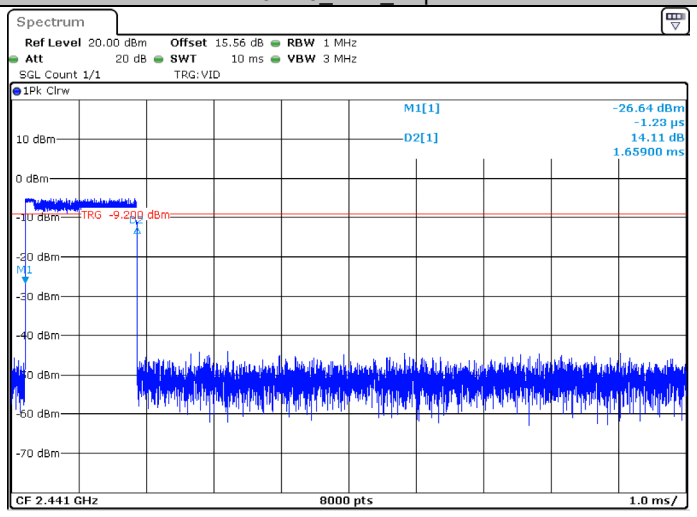


ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:39:44

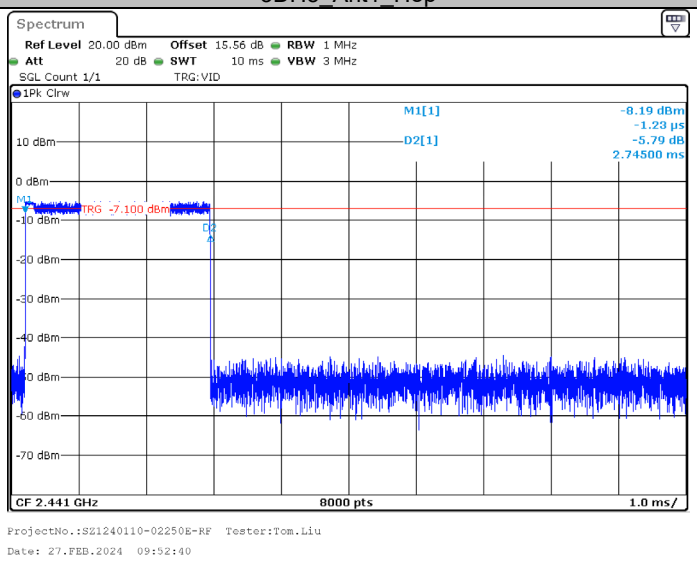
3DH1_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop



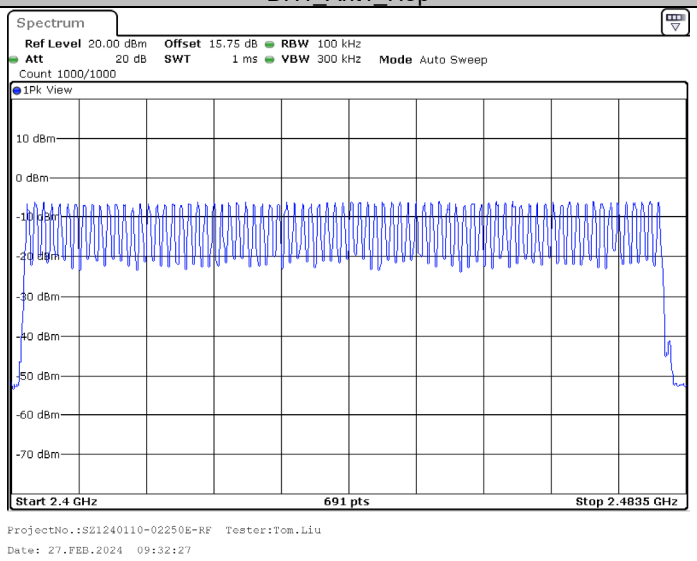
Appendix F: Number of hopping channels

Test Result

Test Mode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	≥15	PASS
2DH1	Ant1	Hop	79	≥15	PASS
3DH1	Ant1	Hop	79	≥15	PASS

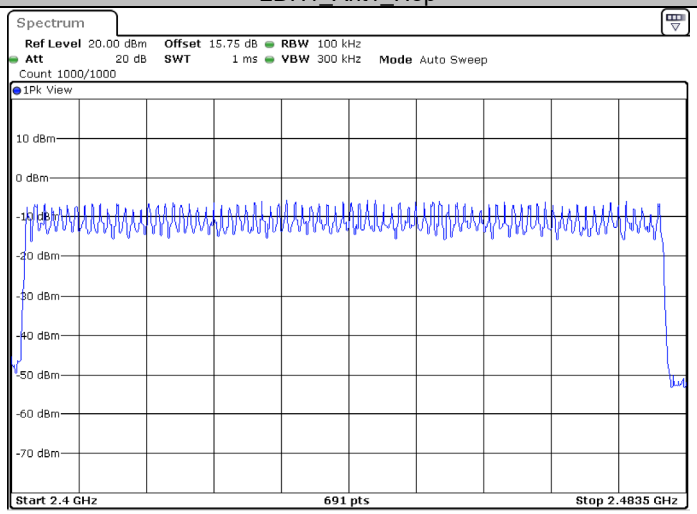
Test Graphs

DH1_Ant1_Hop



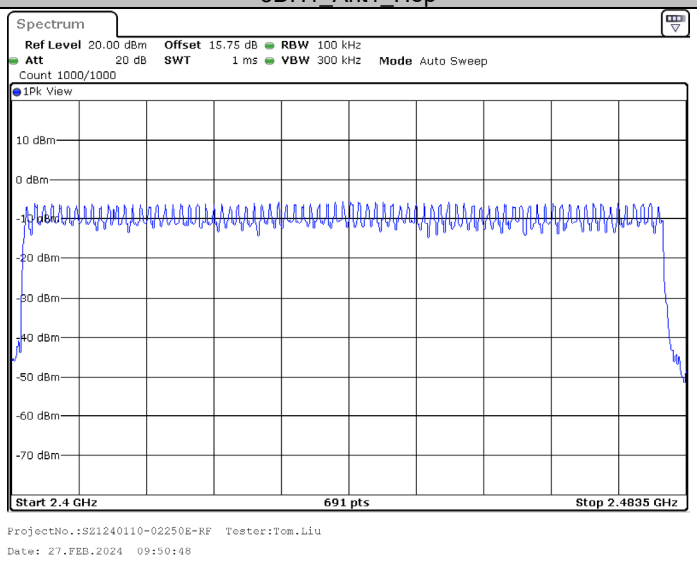
ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:32:27

2DH1_Ant1_Hop



ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:37:25

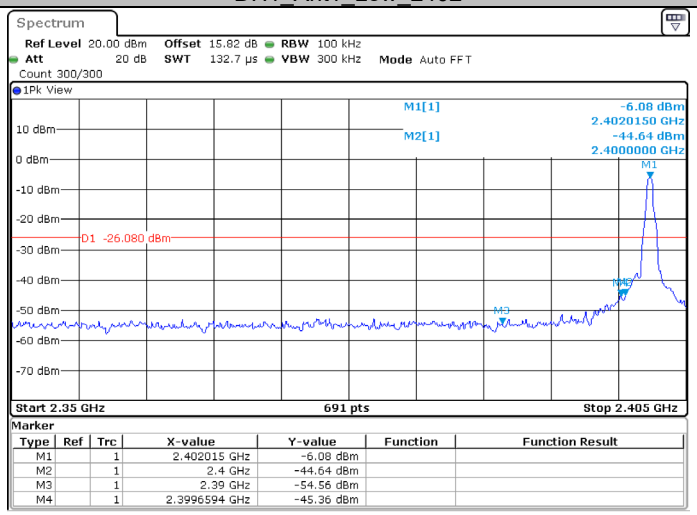
3DH1_Ant1_Hop



Appendix G: Band edge measurements

Test Graphs

DH1_Ant1_Low_2402

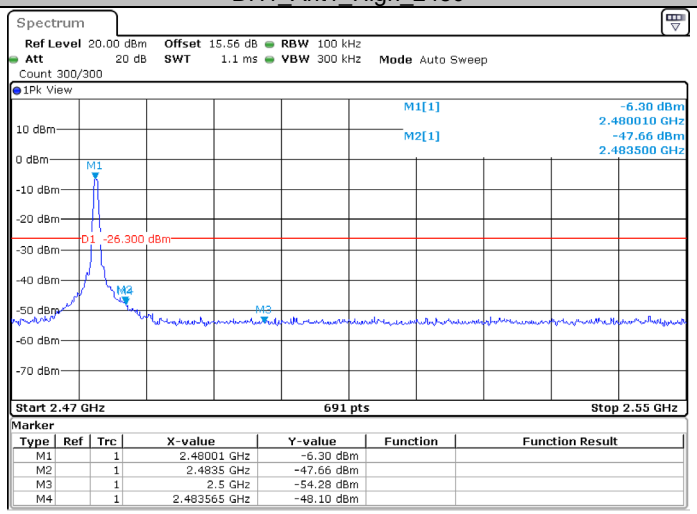


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402015 GHz	-6.08 dBm		
M2		1	2.4 GHz	-44.64 dBm		
M3		1	2.39 GHz	-54.56 dBm		
M4		1	2.3996594 GHz	-45.36 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:23:26

DH1_Ant1_High_2480

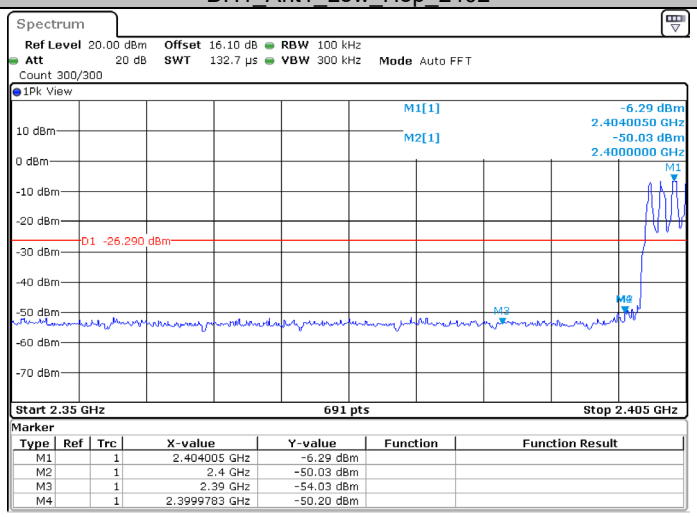


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-6.30 dBm		
M2		1	2.4835 GHz	-47.66 dBm		
M3		1	2.5 GHz	-54.28 dBm		
M4		1	2.483565 GHz	-48.10 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:21:18

DH1_Ant1_Low_Hop_2402

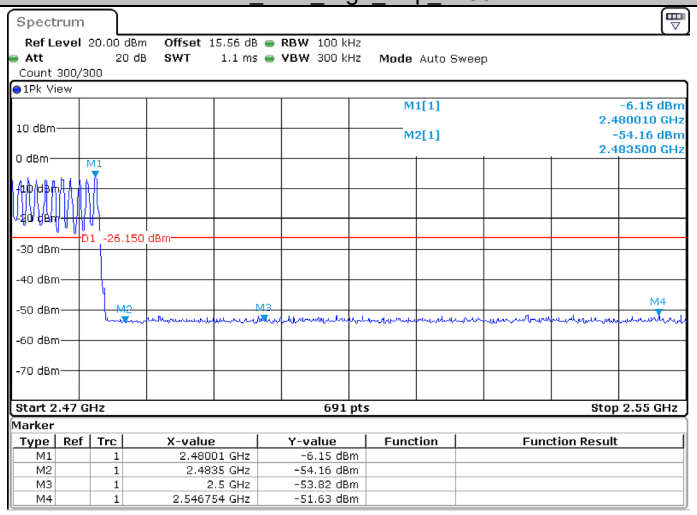


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.404005 GHz	-6.29 dBm		
M2		1	2.4 GHz	-50.03 dBm		
M3		1	2.39 GHz	-54.03 dBm		
M4		1	2.3999783 GHz	-50.20 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:30:56

DH1_Ant1_High_Hop_2480

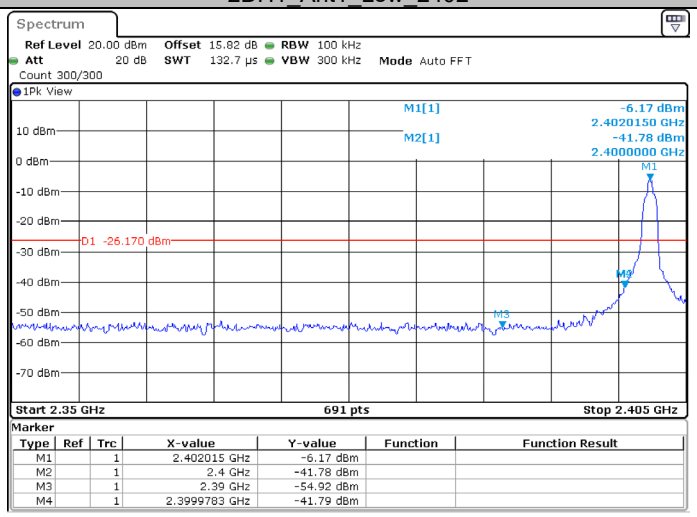


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-6.15 dBm		
M2		1	2.4835 GHz	-54.16 dBm		
M3		1	2.5 GHz	-53.82 dBm		
M4		1	2.546754 GHz	-51.63 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:33:12

2DH1_Ant1_Low_2402

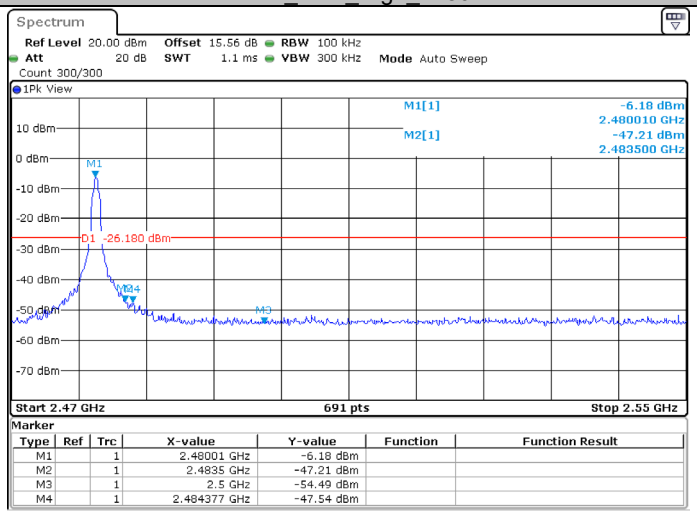


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402015 GHz	-6.17 dBm		
M2		1	2.4 GHz	-41.78 dBm		
M3		1	2.39 GHz	-54.92 dBm		
M4		1	2.3999783 GHz	-41.79 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:24:24

2DH1_Ant1_High_2480

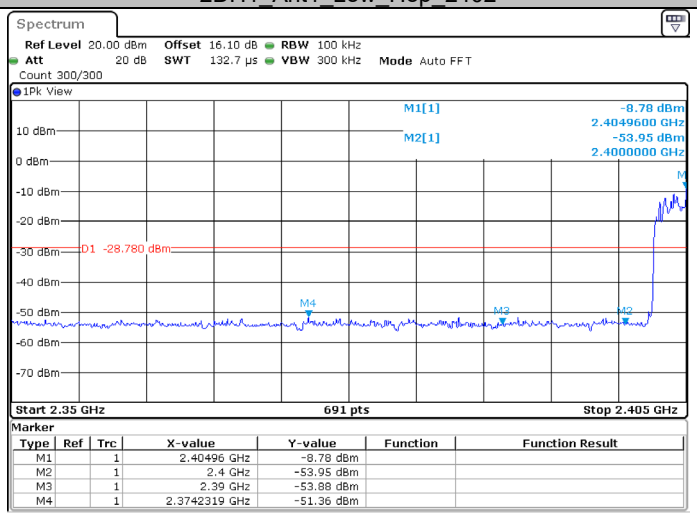


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-6.18 dBm		
M2		1	2.4835 GHz	-47.21 dBm		
M3		1	2.5 GHz	-54.49 dBm		
M4		1	2.484377 GHz	-47.54 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:26:12

2DH1_Ant1_Low_Hop_2402

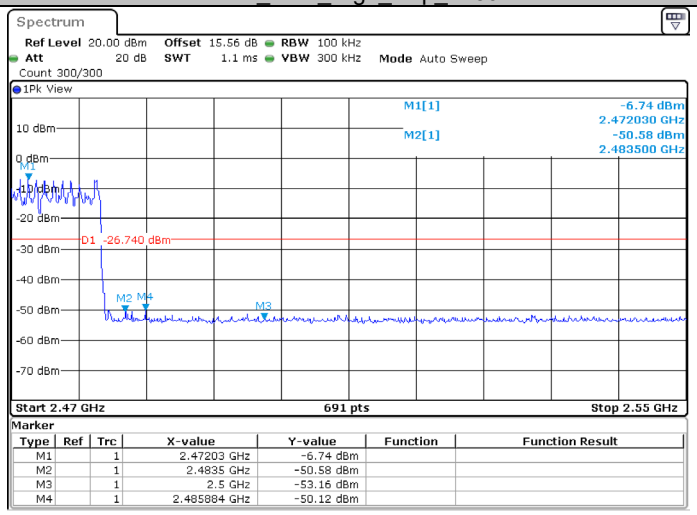


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40496 GHz	-8.78 dBm		
M2		1	2.4 GHz	-53.95 dBm		
M3		1	2.39 GHz	-53.88 dBm		
M4		1	2.3742319 GHz	-51.36 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:36:00

2DH1_Ant1_High_Hop_2480

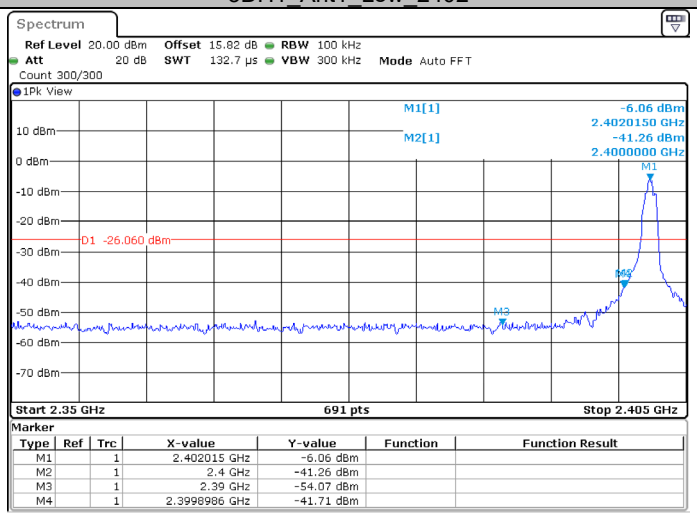


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47203 GHz	-6.74 dBm		
M2		1	2.4835 GHz	-50.58 dBm		
M3		1	2.5 GHz	-53.16 dBm		
M4		1	2.485084 GHz	-50.12 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:38:17

3DH1_Ant1_Low_2402

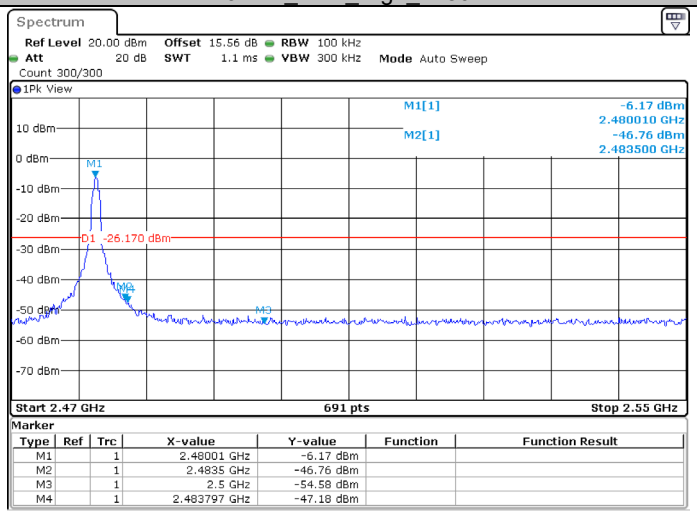


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402015 GHz	-6.06 dBm		
M2		1	2.4 GHz	-41.26 dBm		
M3		1	2.39 GHz	-54.07 dBm		
M4		1	2.3998986 GHz	-41.71 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:26:45

3DH1_Ant1_High_2480

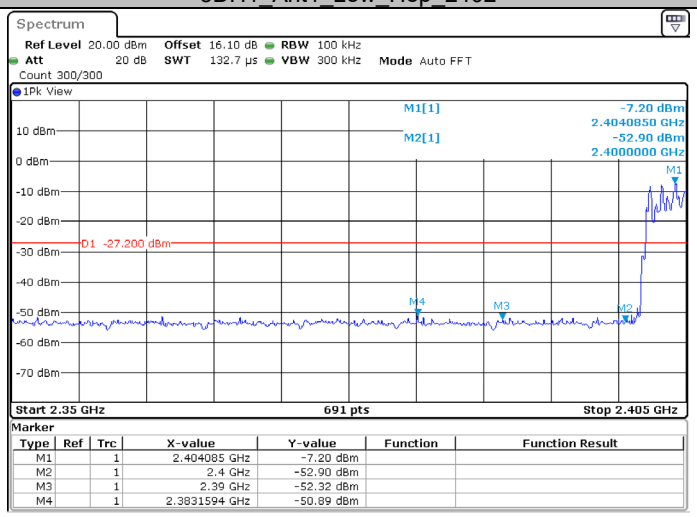


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-6.17 dBm		
M2		1	2.4835 GHz	-46.76 dBm		
M3		1	2.5 GHz	-54.58 dBm		
M4		1	2.483797 GHz	-47.18 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:28:49

3DH1_Ant1_Low_Hop_2402

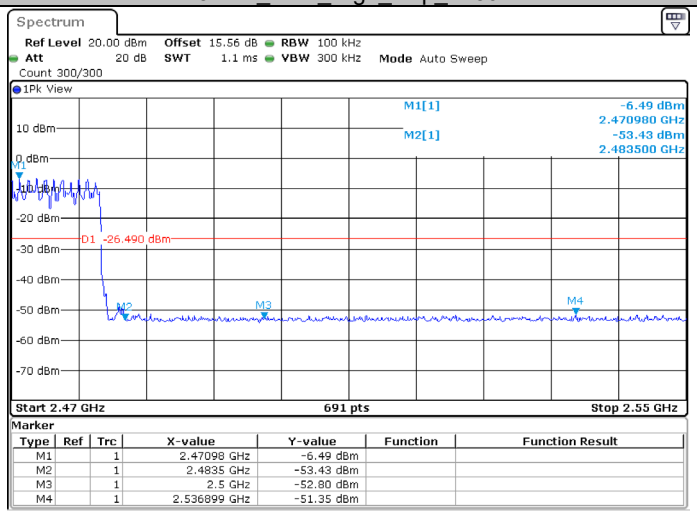


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.404085 GHz	-7.20 dBm		
M2		1	2.4 GHz	-52.90 dBm		
M3		1	2.39 GHz	-52.32 dBm		
M4		1	2.3831594 GHz	-50.89 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:42:10

3DH1_Ant1_High_Hop_2480



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47098 GHz	-6.49 dBm		
M2		1	2.4835 GHz	-53.43 dBm		
M3		1	2.5 GHz	-52.80 dBm		
M4		1	2.536899 GHz	-51.35 dBm		

ProjectNo.:SZ1240110-02250E-RF Tester:Tom.Liu
Date: 27.FEB.2024 09:45:34

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