TEST REPORT

Applicant Name:	FCC: VTech Telecommunications Ltd IC: VTECH TELECOMMUNICATIONS LIMITED
Address:	FCC: 23/F Tai Ping Ind Center Block 1 57 Ting Kok Rd Tai Po NT, Hong Kong IC: BL.1 23/F Tai Ping Industr Ctr. 57 Ting Kok Road Tai Po, NT Hongkong
Report Number:	SZ1240205-08015E-RFB
FCC ID:	EW780-3409-00
IC:	1135B-80340900

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:	DECT 6.0 cordless phone
Model No.:	LS6331-2
Multiple Model(s) No.:	FCC: LS6331,LS6331-3,LS6331-4,LS6331-5,LS633Z-XY IC: LS6331,LS6331-3,LS6331-4,LS6331-5
Trade Mark:	VTech
Date Received:	2024/02/05
Issue Date:	2024/05/21

Test Result:	Pass▲

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

Prepared and Checked By:

Mike Xiao

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.

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

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1240205-08015E-RFB	Original Report	2024/05/21

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

HVIN	35-202328BS
FVIN	N/A
Product	DECT 6.0 cordless phone
Tested Model	LS6331-2
Multiple Model(s)	FCC: LS6331,LS6331-3,LS6331-4,LS6331-5,LS633Z-XY IC: LS6331,LS6331-3,LS6331-4,LS6331-5
Frequency Range	Bluetooth: 2402-2480MHz
Transmit Power	4.08dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification#	0dBi (provided by the applicant)
Voltage Range	DC6V from adapter
Sample serial number	2HNJ-9 for Conducted and Radiated Emissions Test 2HNJ-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	Adapter 1 Model: VT05UUS06040 Input: AC 100-120V, 60Hz, 0.15A Output: DC 6.0V, 0.4A Adapter 2 Model: A318-060040W-US1 Input: AC 100-120V, 50/60Hz, 0.15A Output: DC 6.0V, 0.4A Adapter 3 Model: DSA-3PFM-05 BUS 060040 Input: AC 100-120V, 50/60Hz, 0.15A Output: DC 6.0V, 0.4A, 2.4W Adapter 4 Model: E004-1A060040VU Input: AC 100-120V, 50/60Hz, 0.1A Output: DC 6.0V, 0.4A Adapter 5 Model: GQ06-060040-ZU Input: AC 100-120V, 50/60Hz, 0.15A Output: DC 6.0V, 0.4A
Note: The Multiple models are electrically identical with the test model except for Color, Model number, Package type and the number of Handset and Charger. 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		±5%
RF output power, conducted		0.72 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.

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

"UniTool 4v91 RTLBTAPP#" exercise software was used and the power level is Default#. The software and power level was provided by the manufacturer.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

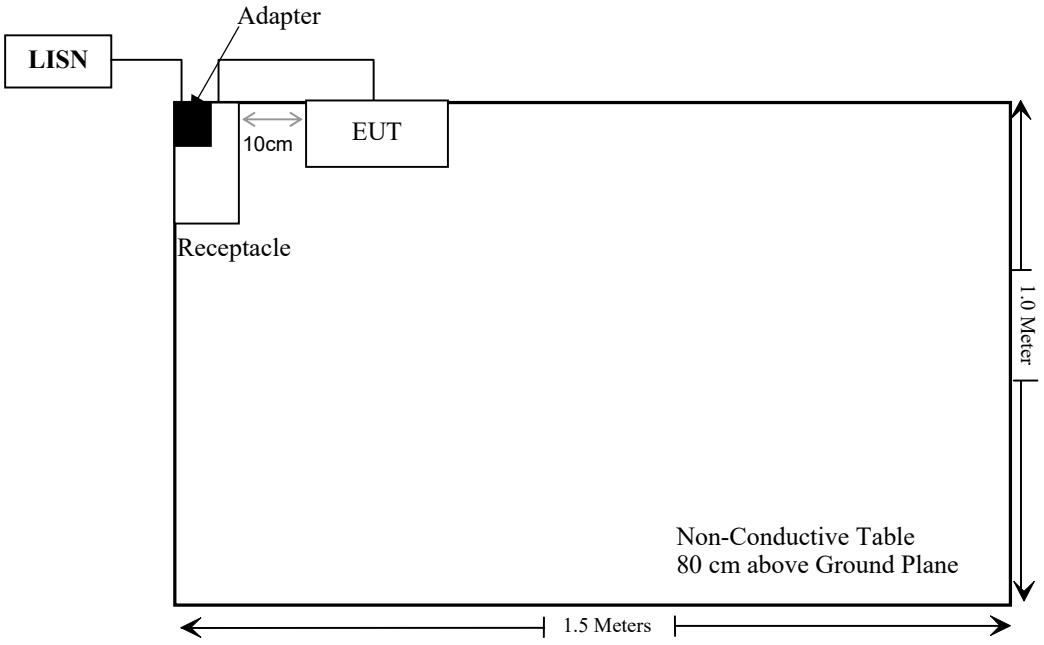
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

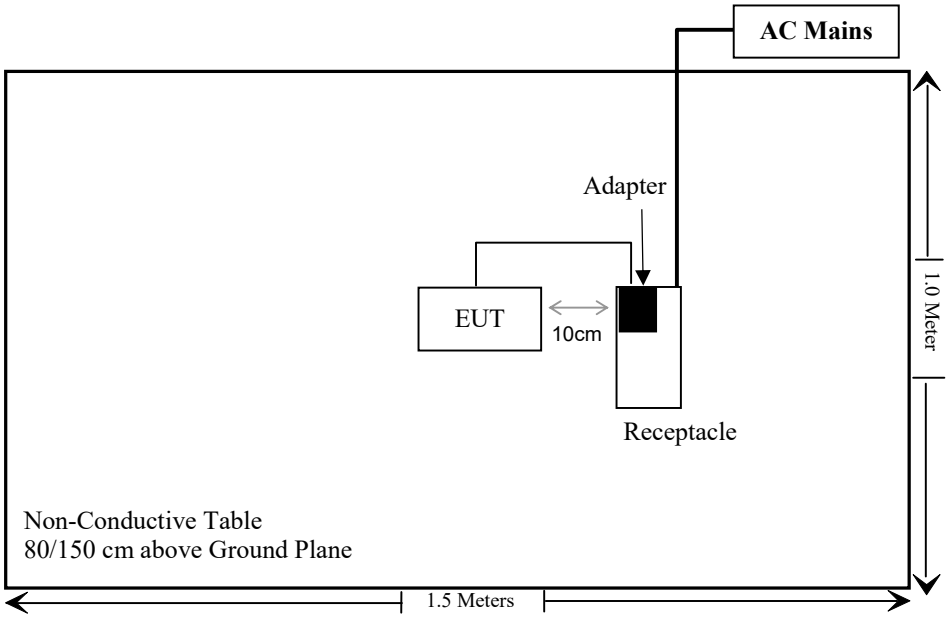
Cable Description	Length (m)	From Port	To
Un-shielding Detachable DC Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For Conducted Emissions:



For Radiated Emissions below 1GHz:



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
§ 15.247 (i), §2.1091	Maximum Permissible Exposure(MPE)	Compliant
RSS-102 § 2.5.2	Exemption Limits for Routine Evaluation – RF Exposure Evaluation	Compliant
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

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	LISN	ENV216	101613	2024/01/16	2025/01/15
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2023/08/03	2024/08/02
Audix	EMI Test software	E3	191218	NCR	NCR
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
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2023/04/18	2024/04/17
COM-POWER	Pre-amplifier	PA-122	181919	2023/06/29	2024/06/28
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
SNSD	2.4G Band Reject filter	BSF2402-2480MN-0898-001	2.4G filter	2023/08/03	2024/08/02
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
A.H.System	Pre-amplifier	PAM-1840VH	190	2023/08/03	2024/08/02
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
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
MARCONI	10dB Attenuator	6534/3	2942	2023/07/04	2024/07/03
Micro-Tronics	RF Cable	8082135	W1113	2023/07/04	2024/07/03
Micro-Tronics	RF Cable	8082176	W6102	2023/07/04	2024/07/03
Micro-Tronics	RF Cable	8082176	W6111	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).

FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain#		Tune up conducted power#		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2402-2480	0	1.0	4.5	2.82	20	0.0006	1

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

The BT and DECT cannot transmit at same time.

Result: Compliant

RSS-102 § 2.5.2 –EXEMPTION LIMITS FOR ROUTINE EVALUATION-RF EXPOSURE EVALUATION

Applicable Standard

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:
• below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance). In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Result

The max tune-up conducted output power is 4.5dBm, antenna gain is 0dBi.
Time-averaged maximum e.i.r.p. of the device is 4.5dBm + 0dBi = 4.5dBm =0.003 W

The worst case is f = 2402 MHz:
The limit is $1.31 \times 10^{-2} f^{0.6834}$ W=2.68W

0.003W<2.68W

Note: The BT and DECT cannot transmit at same time.

So the RF Exposure evaluation can be exempted.

FCC §15.203 & RSS-GEN §6.8 – 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.

According to FCC § 15.203, 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 0dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	Antenna Gain[#]	Impedance	Frequency Range
PCB	0dBi	50Ω	2.4~2.5GHz

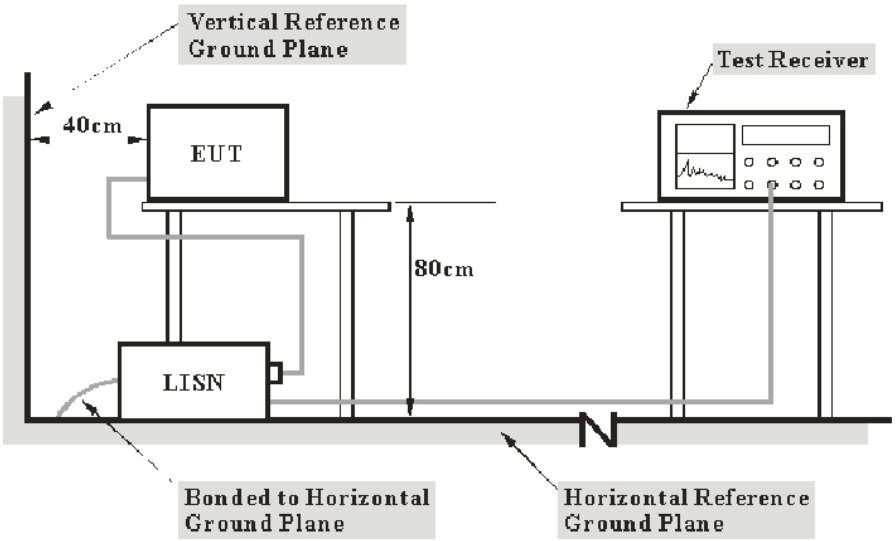
Result: Compliant

FCC §15.207 (a) & RSS-GEN § 8.8 – 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).

Test Data

Environmental Conditions

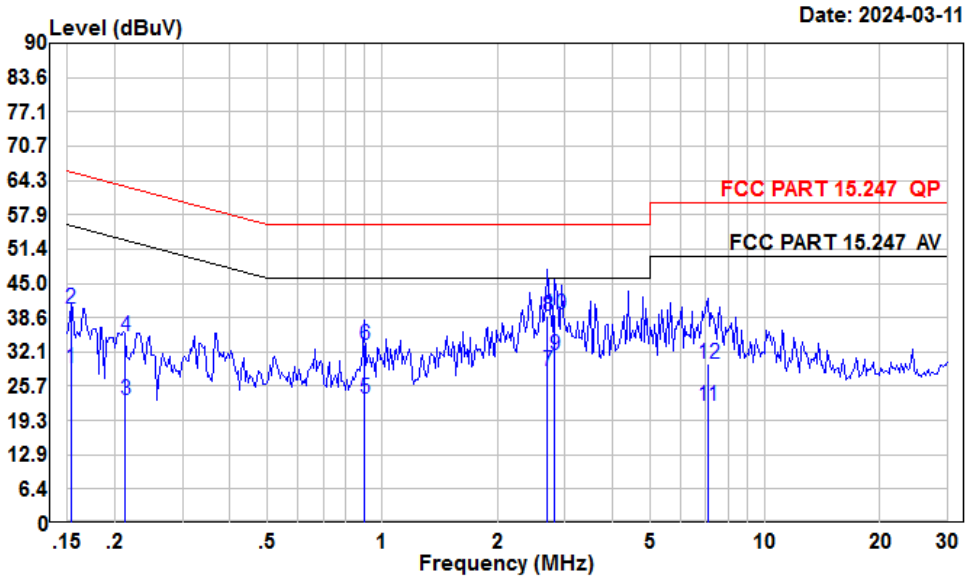
Temperature:	22 ℃
Relative Humidity:	67 %
ATM Pressure:	101 kPa

The testing was performed by Macy Shi on 2024-03-09 and 2024-03-11.

EUT operation mode: Transmitting (Maximum output power mode 8DPSK high channel)

For Adapter VT05UUS06040

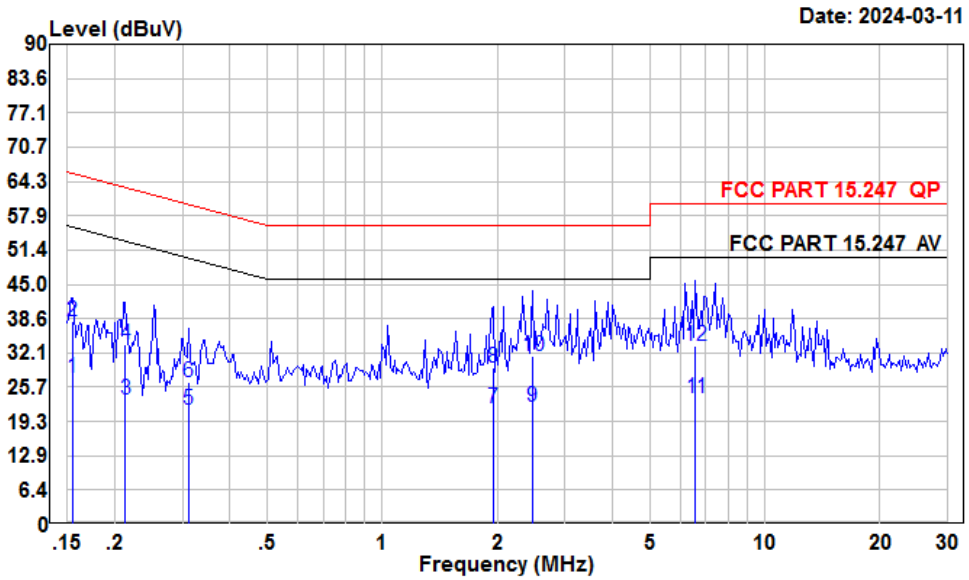
AC 120V/60 Hz, Line



Condition: Line
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.15	8.25	29.00	10.60	10.15	55.82	-26.82	Average
2	0.15	19.63	40.38	10.60	10.15	65.82	-25.44	QP
3	0.21	2.40	23.13	10.61	10.12	53.10	-29.97	Average
4	0.21	14.30	35.03	10.61	10.12	63.10	-28.07	QP
5	0.90	2.63	23.50	10.70	10.17	46.00	-22.50	Average
6	0.90	12.55	33.42	10.70	10.17	56.00	-22.58	QP
7	2.71	7.70	28.64	10.71	10.23	46.00	-17.36	Average
8	2.71	17.84	38.78	10.71	10.23	56.00	-17.22	QP
9	2.82	10.60	31.55	10.70	10.25	46.00	-14.45	Average
10	2.82	18.20	39.15	10.70	10.25	56.00	-16.85	QP
11	7.10	1.01	22.02	10.79	10.22	50.00	-27.98	Average
12	7.10	8.95	29.96	10.79	10.22	60.00	-30.04	QP

AC 120V/60 Hz, Neutral

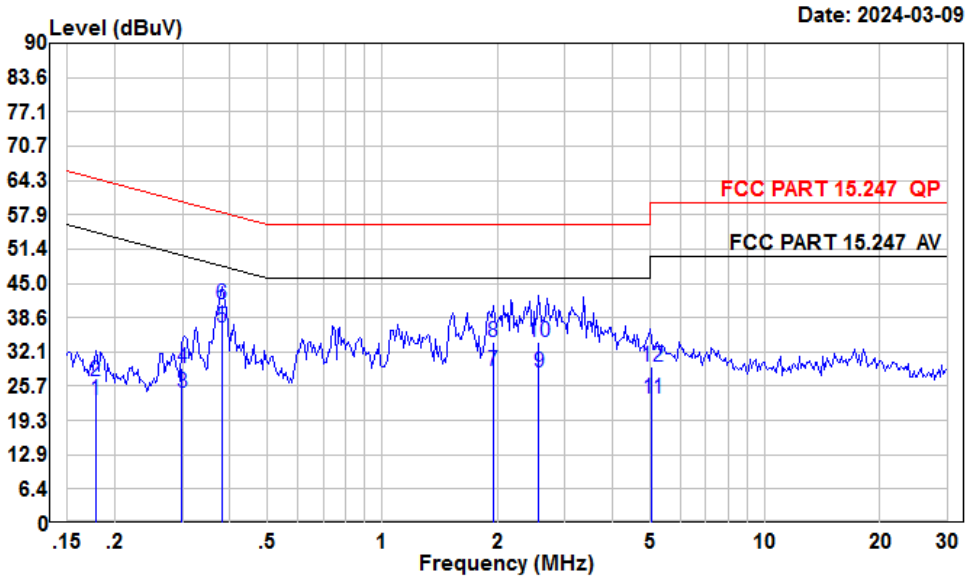


Condition: Neutral
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.15	6.86	27.59	10.58	10.15	55.74	-28.15	Average
2	0.15	17.40	38.13	10.58	10.15	65.74	-27.61	QP
3	0.21	2.93	23.47	10.42	10.12	53.10	-29.63	Average
4	0.21	13.28	33.82	10.42	10.12	63.10	-29.28	QP
5	0.31	0.79	21.47	10.55	10.13	49.93	-28.46	Average
6	0.31	5.87	26.55	10.55	10.13	59.93	-33.38	QP
7	1.95	1.19	21.79	10.42	10.18	46.00	-24.21	Average
8	1.95	8.78	29.38	10.42	10.18	56.00	-26.62	QP
9	2.46	1.48	22.09	10.40	10.21	46.00	-23.91	Average
10	2.46	10.90	31.51	10.40	10.21	56.00	-24.49	QP
11	6.59	2.79	23.68	10.67	10.22	50.00	-26.32	Average
12	6.59	12.50	33.39	10.67	10.22	60.00	-26.61	QP

For Adapter A318-060040W-US1

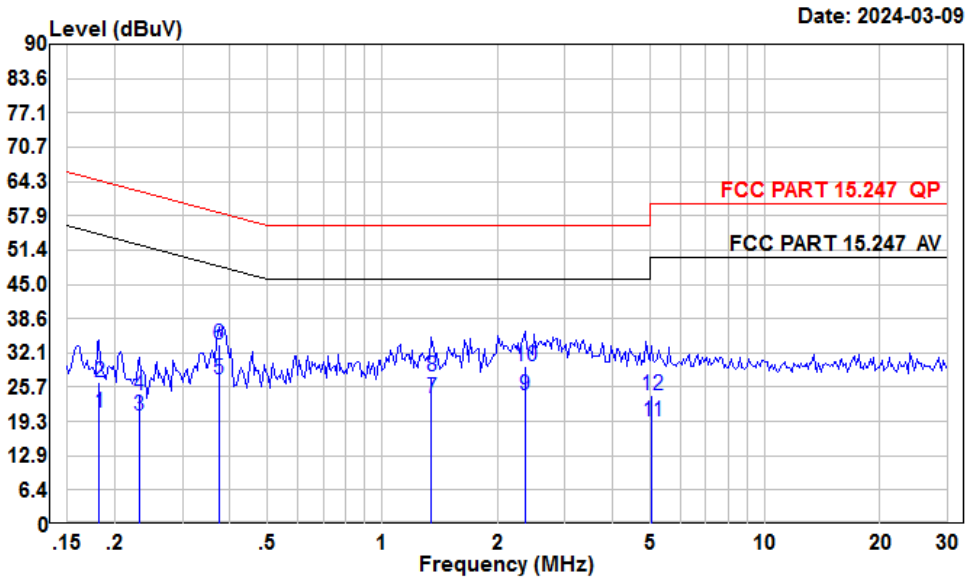
AC 120V/60 Hz, Line



Condition: Line
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.18	2.12	23.09	10.84	10.13	54.59	-31.50	Average
2	0.18	5.66	26.63	10.84	10.13	64.59	-37.96	QP
3	0.30	3.80	24.59	10.67	10.12	50.28	-25.69	Average
4	0.30	8.37	29.16	10.67	10.12	60.28	-31.12	QP
5	0.38	15.98	36.77	10.59	10.20	48.25	-11.48	Average
6	0.38	20.19	40.98	10.59	10.20	58.25	-17.27	QP
7	1.95	7.90	28.67	10.59	10.18	46.00	-17.33	Average
8	1.95	13.31	34.08	10.59	10.18	56.00	-21.92	QP
9	2.57	7.65	28.36	10.49	10.22	46.00	-17.64	Average
10	2.57	13.38	34.09	10.49	10.22	56.00	-21.91	QP
11	5.06	2.80	23.40	10.38	10.22	50.00	-26.60	Average
12	5.06	8.82	29.42	10.38	10.22	60.00	-30.58	QP

AC 120V/60 Hz, Neutral

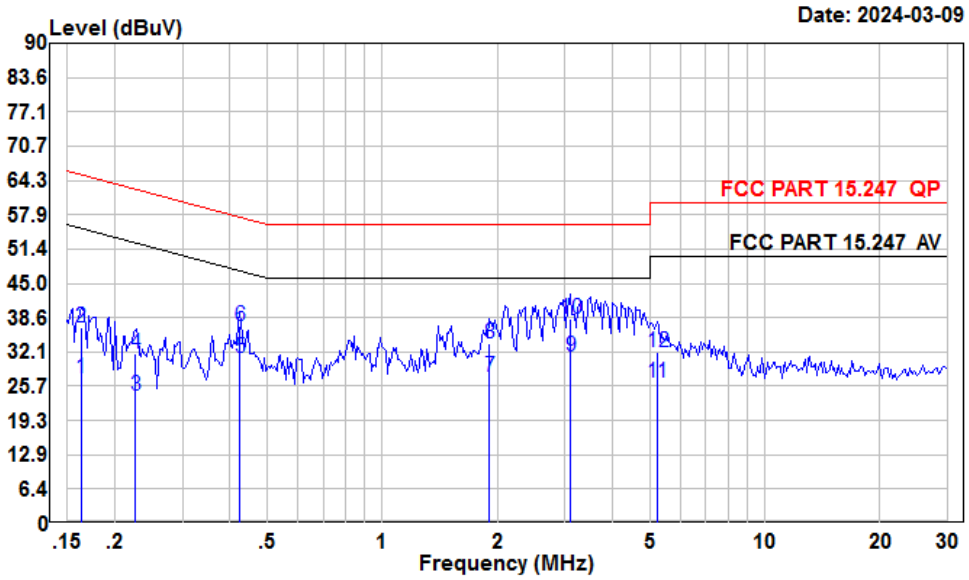


Condition: Neutral
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.18	0.38	20.98	10.47	10.13	54.42	-33.44	Average
2	0.18	5.95	26.55	10.47	10.13	64.42	-37.87	QP
3	0.23	-0.28	20.34	10.45	10.17	52.39	-32.05	Average
4	0.23	3.57	24.19	10.45	10.17	62.39	-38.20	QP
5	0.37	6.40	27.19	10.60	10.19	48.43	-21.24	Average
6	0.37	13.04	33.83	10.60	10.19	58.43	-24.60	QP
7	1.35	3.01	23.75	10.69	10.05	46.00	-22.25	Average
8	1.35	6.90	27.64	10.69	10.05	56.00	-28.36	QP
9	2.36	3.73	24.33	10.40	10.20	46.00	-21.67	Average
10	2.36	9.07	29.67	10.40	10.20	56.00	-26.33	QP
11	5.06	-1.54	19.21	10.53	10.22	50.00	-30.79	Average
12	5.06	3.33	24.08	10.53	10.22	60.00	-35.92	QP

For Adapter DSA-3PFM-05 BUS 060040

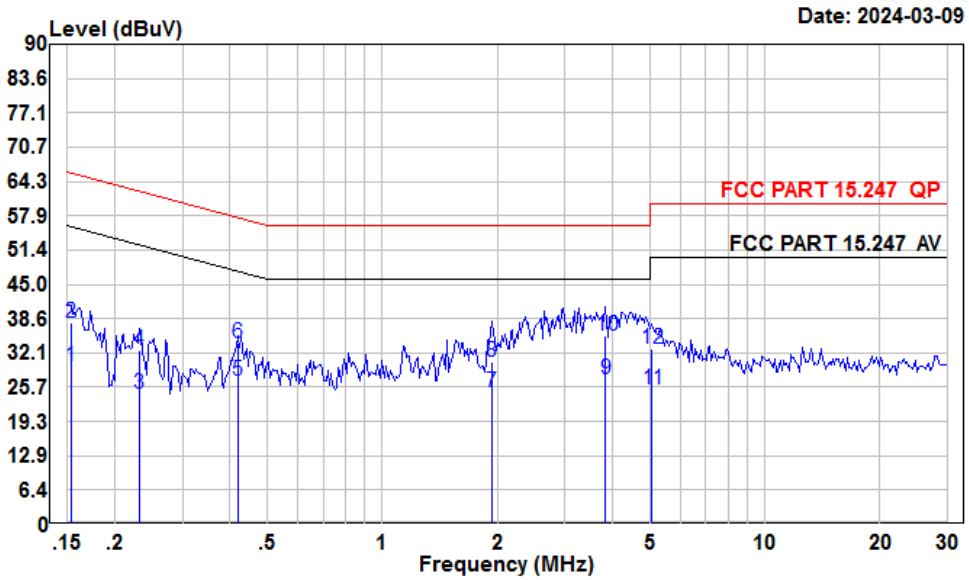
AC 120V/60 Hz, Line



Condition: Line
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.16	6.09	27.11	10.87	10.15	55.30	-28.19	Average
2	0.16	15.77	36.79	10.87	10.15	65.30	-28.51	QP
3	0.23	2.96	23.87	10.76	10.15	52.57	-28.70	Average
4	0.23	11.02	31.93	10.76	10.15	62.57	-30.64	QP
5	0.42	10.23	30.98	10.55	10.20	47.37	-16.39	Average
6	0.42	16.11	36.86	10.55	10.20	57.37	-20.51	QP
7	1.91	6.70	27.46	10.59	10.17	46.00	-18.54	Average
8	1.91	12.98	33.74	10.59	10.17	56.00	-22.26	QP
9	3.11	10.64	31.32	10.41	10.27	46.00	-14.68	Average
10	3.11	17.78	38.46	10.41	10.27	56.00	-17.54	QP
11	5.22	5.65	26.27	10.40	10.22	50.00	-23.73	Average
12	5.22	11.48	32.10	10.40	10.22	60.00	-27.90	QP

AC 120V/60 Hz, Neutral

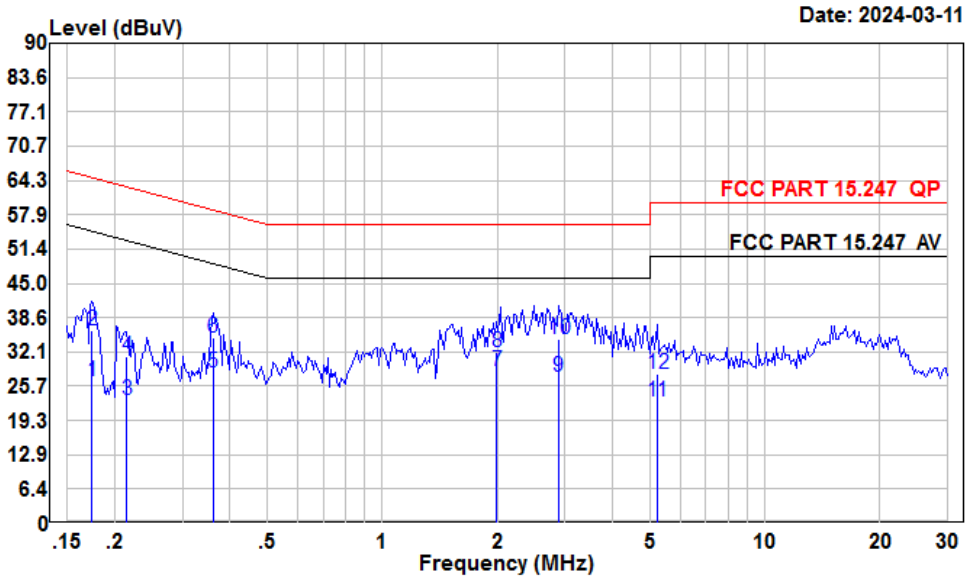


Condition: Neutral
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.15	8.85	29.59	10.59	10.15	55.82	-26.23	Average
2	0.15	16.93	37.67	10.59	10.15	65.82	-28.15	QP
3	0.23	3.75	24.37	10.45	10.17	52.39	-28.02	Average
4	0.23	12.12	32.74	10.45	10.17	62.39	-29.65	QP
5	0.42	6.16	27.01	10.64	10.21	47.46	-20.45	Average
6	0.42	13.14	33.99	10.64	10.21	57.46	-23.47	QP
7	1.93	4.20	24.80	10.43	10.17	46.00	-21.20	Average
8	1.93	9.86	30.46	10.43	10.17	56.00	-25.54	QP
9	3.84	6.59	27.25	10.40	10.26	46.00	-18.75	Average
10	3.84	14.76	35.42	10.40	10.26	56.00	-20.58	QP
11	5.06	4.68	25.43	10.53	10.22	50.00	-24.57	Average
12	5.06	12.26	33.01	10.53	10.22	60.00	-26.99	QP

For Adapter E004-1A060040VU

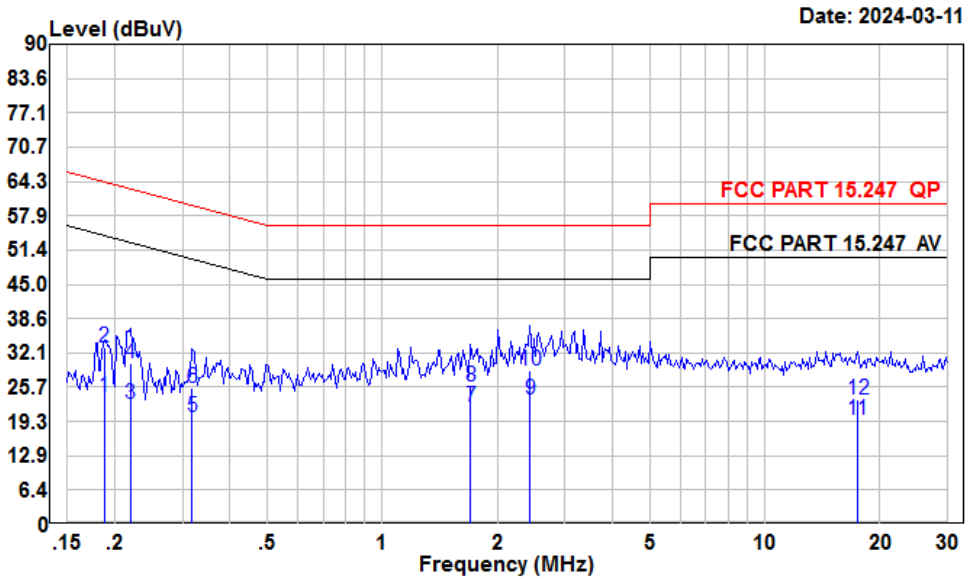
AC 120V/60 Hz, Line



Condition: Line
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.17	5.77	26.76	10.85	10.14	54.77	-28.01	Average
2	0.17	15.16	36.15	10.85	10.14	64.77	-28.62	QP
3	0.22	2.21	23.12	10.78	10.13	53.01	-29.89	Average
4	0.22	10.27	31.18	10.78	10.13	63.01	-31.83	QP
5	0.36	7.48	28.26	10.61	10.17	48.69	-20.43	Average
6	0.36	14.00	34.78	10.61	10.17	58.69	-23.91	QP
7	1.99	7.75	28.54	10.60	10.19	46.00	-17.46	Average
8	1.99	11.26	32.05	10.60	10.19	56.00	-23.95	QP
9	2.88	6.71	27.41	10.44	10.26	46.00	-18.59	Average
10	2.88	13.78	34.48	10.44	10.26	56.00	-21.52	QP
11	5.22	2.14	22.76	10.40	10.22	50.00	-27.24	Average
12	5.22	7.36	27.98	10.40	10.22	60.00	-32.02	QP

AC 120V/60 Hz, Neutral

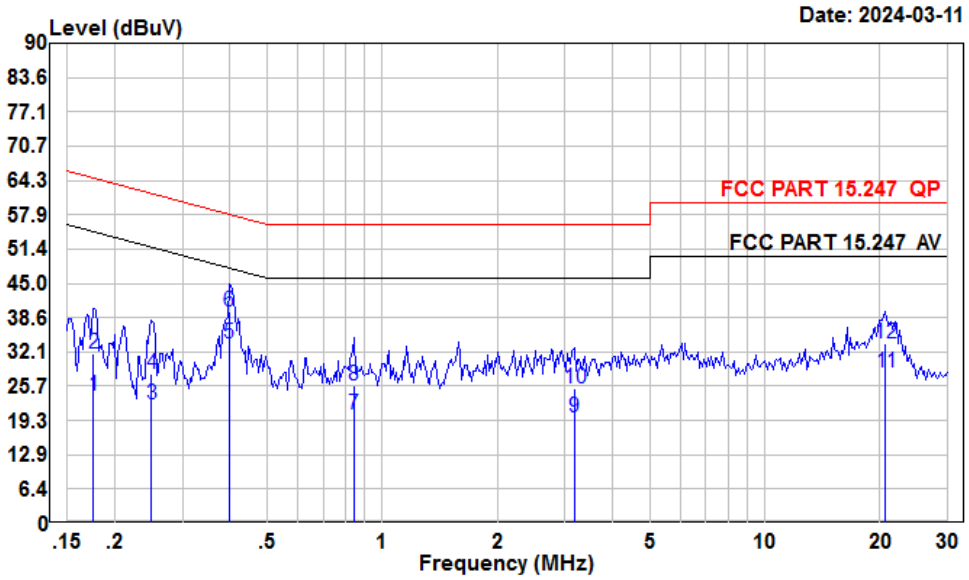


Condition: Neutral
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.19	3.36	23.93	10.45	10.12	54.15	-30.22	Average
2	0.19	12.61	33.18	10.45	10.12	64.15	-30.97	QP
3	0.22	2.09	22.66	10.43	10.14	52.83	-30.17	Average
4	0.22	9.69	30.26	10.43	10.14	62.83	-32.57	QP
5	0.32	-0.67	20.01	10.55	10.13	49.75	-29.74	Average
6	0.32	4.81	25.49	10.55	10.13	59.75	-34.26	QP
7	1.70	1.43	22.06	10.52	10.11	46.00	-23.94	Average
8	1.70	5.14	25.77	10.52	10.11	56.00	-30.23	QP
9	2.44	2.77	23.38	10.40	10.21	46.00	-22.62	Average
10	2.44	8.15	28.76	10.40	10.21	56.00	-27.24	QP
11	17.48	-1.21	19.64	10.75	10.10	50.00	-30.36	Average
12	17.48	2.67	23.52	10.75	10.10	60.00	-36.48	QP

For Adapter GQ06-060040-ZU

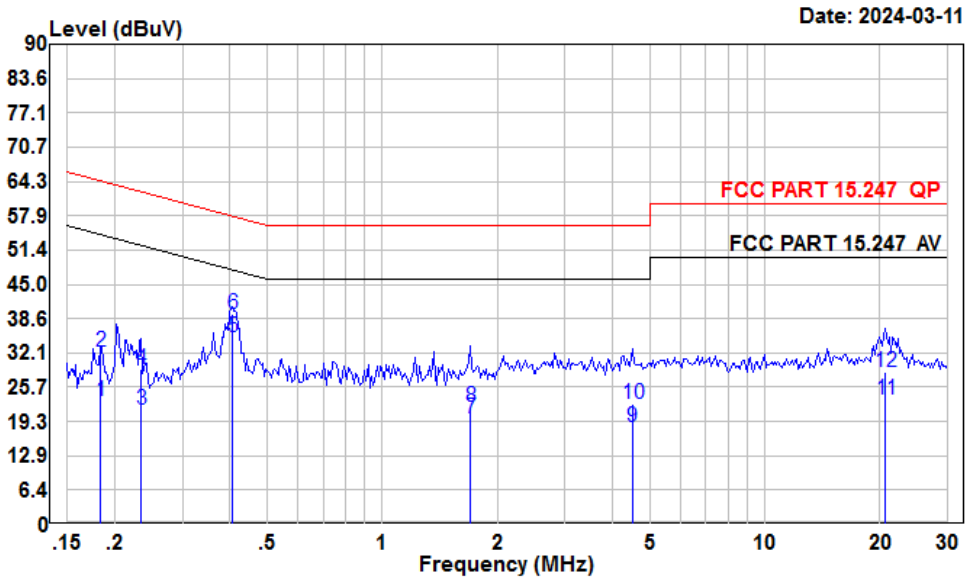
AC 120V/60 Hz, Line



Condition: Line
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.18	2.87	23.85	10.84	10.14	54.68	-30.83	Average
2	0.18	10.76	31.74	10.84	10.14	64.68	-32.94	QP
3	0.25	1.32	22.26	10.73	10.21	51.78	-29.52	Average
4	0.25	7.06	28.00	10.73	10.21	61.78	-33.78	QP
5	0.40	12.83	33.63	10.58	10.22	47.90	-14.27	Average
6	0.40	19.00	39.80	10.58	10.22	57.90	-18.10	QP
7	0.84	-0.30	20.32	10.45	10.17	46.00	-25.68	Average
8	0.84	5.14	25.76	10.45	10.17	56.00	-30.24	QP
9	3.17	-0.70	19.97	10.40	10.27	46.00	-26.03	Average
10	3.17	4.64	25.31	10.40	10.27	56.00	-30.69	QP
11	20.70	7.39	28.39	10.87	10.13	50.00	-21.61	Average
12	20.70	12.61	33.61	10.87	10.13	60.00	-26.39	QP

AC 120V/60 Hz, Neutral



Condition: Neutral
Project : SZ1240205-08015E-RF
Tester : Macy shi
Note : BT

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.18	2.51	23.09	10.46	10.12	54.33	-31.24	Average
2	0.18	11.73	32.31	10.46	10.12	64.33	-32.02	QP
3	0.23	0.74	21.36	10.45	10.17	52.30	-30.94	Average
4	0.23	8.43	29.05	10.45	10.17	62.30	-33.25	QP
5	0.41	14.34	35.19	10.63	10.22	47.73	-12.54	Average
6	0.41	18.71	39.56	10.63	10.22	57.73	-18.17	QP
7	1.70	-0.73	19.90	10.52	10.11	46.00	-26.10	Average
8	1.70	1.43	22.06	10.52	10.11	56.00	-33.94	QP
9	4.50	-2.54	18.16	10.46	10.24	46.00	-27.84	Average
10	4.50	1.98	22.68	10.46	10.24	56.00	-33.32	QP
11	20.70	2.47	23.28	10.68	10.13	50.00	-26.72	Average
12	20.70	7.83	28.64	10.68	10.13	60.00	-31.36	QP

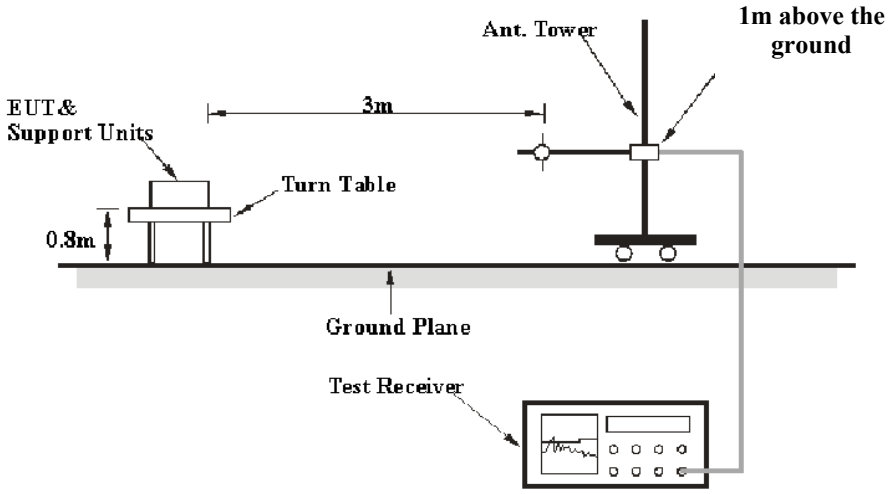
FCC §15.209, §15.205 & §15.247(D) & RSS-247§ 5.5 - SPURIOUS EMISSIONS

Applicable Standard

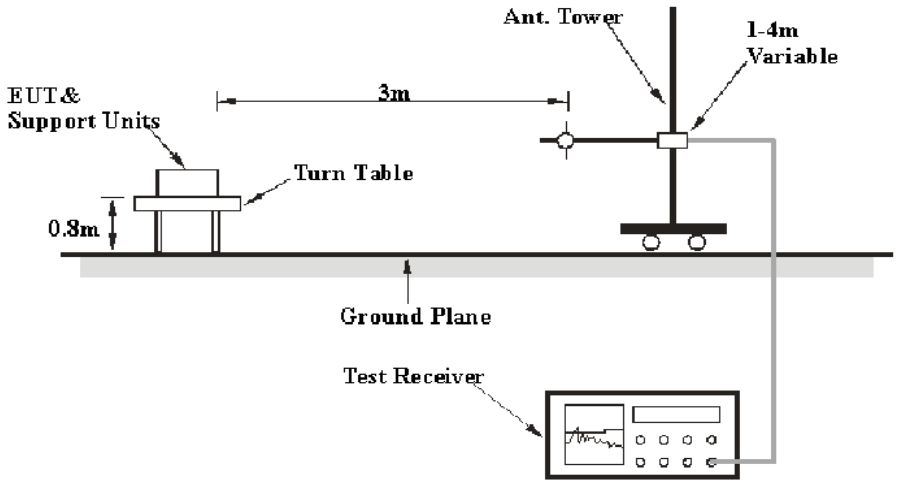
FCC §15.205; §15.209; §15.247(d); RSS-247§ 5.5; RSS-GEN § 8.10

EUT Setup

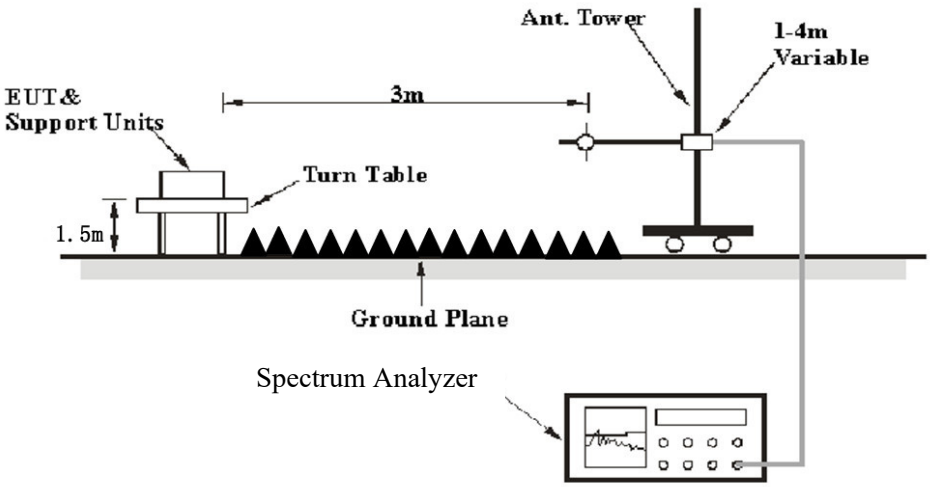
9 kHz-30MHz:



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

Test Data

Environmental Conditions

Temperature:	22~25.3 ℃
Relative Humidity:	50~54 %
ATM Pressure:	101 kPa

The testing was performed by Anson Su on 2024-03-12 for below 1GHz and Tyler Wu on 2024-04-01 and Dylan Yang on 2024-05-21 for above 1GHz.

EUT operation mode: Transmitting

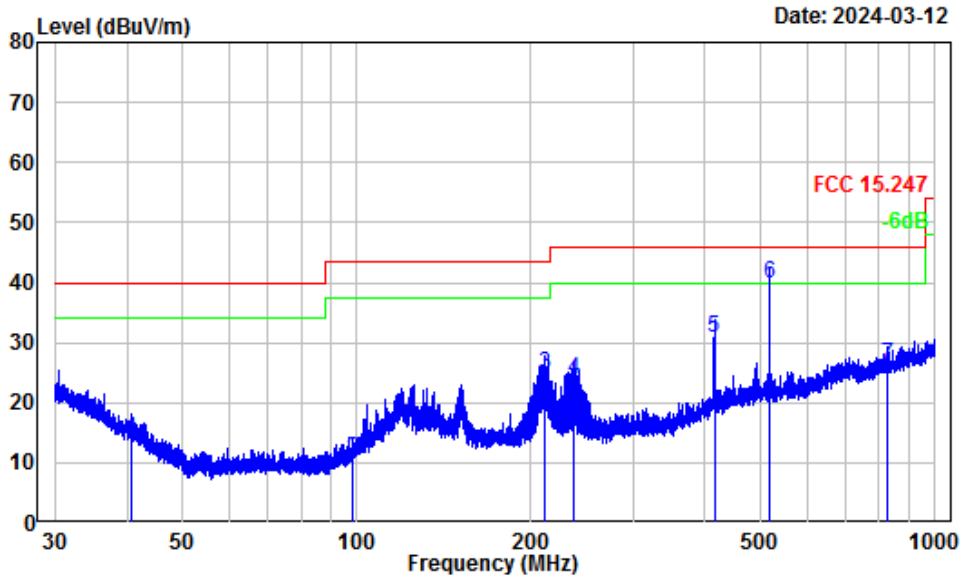
Note 1: Pre-scan in the X, Y and Z axes of orientation, the worst case of orientation was recorded.

Note 2: For the spurious radiated emission below 30MHz, the emissions are 20dB below the limit which are not recorded for the 8DPSK high channel mode.

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

For Adapter VT05UUS06040

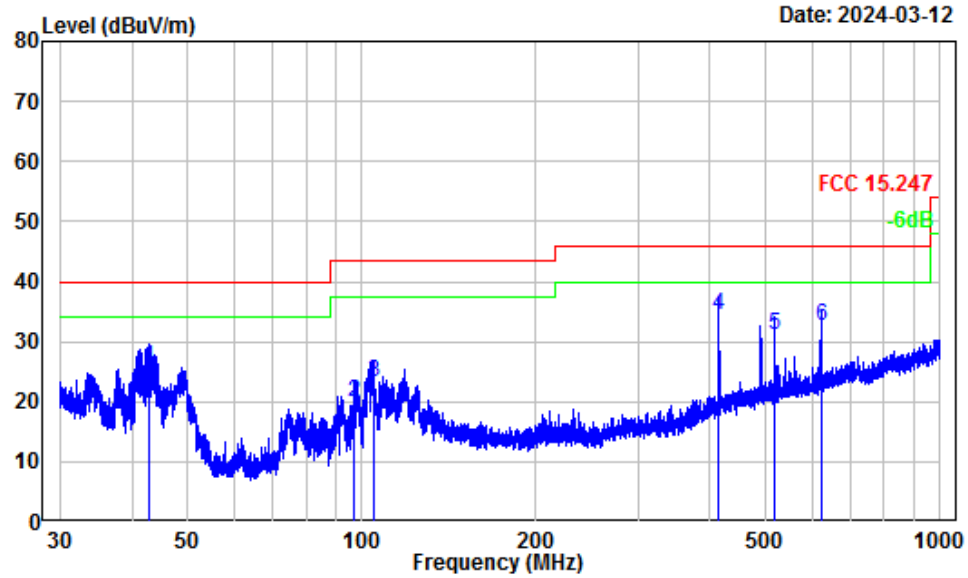
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: SZ1240205-08015E-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	40.77	-10.89	24.92	14.03	40.00	-25.97	QP
2	98.49	-14.16	24.70	10.54	43.50	-32.96	QP
3	210.97	-11.21	35.83	24.62	43.50	-18.88	QP
4	237.48	-11.65	35.57	23.92	46.00	-22.08	QP
5	415.09	-6.84	37.60	30.76	46.00	-15.24	QP
6	518.61	-4.87	44.61	39.74	46.00	-6.26	QP
7	829.67	-0.11	26.44	26.33	46.00	-19.67	QP

Vertical

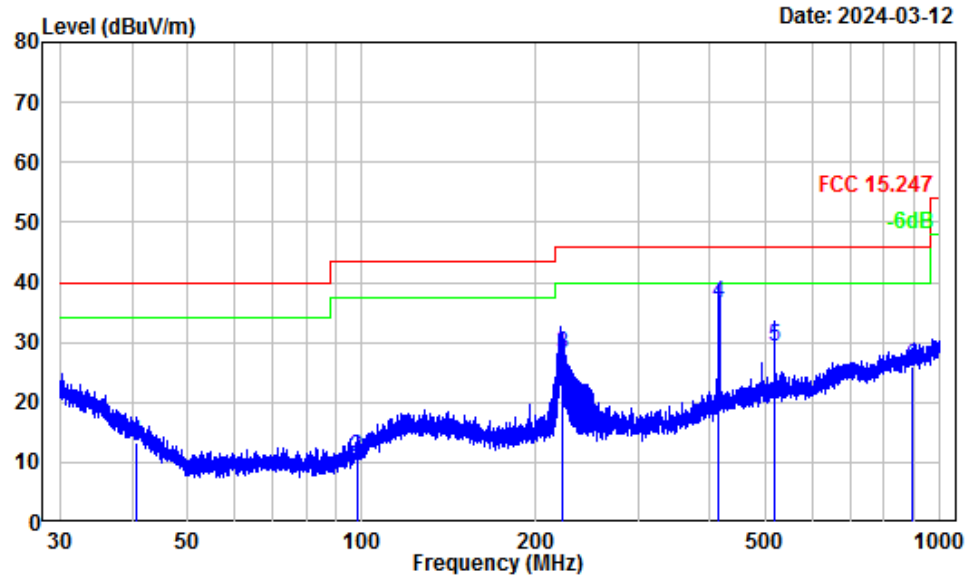


Site : Chamber A
Condition : 3m Vertical
Project Number: SZ1240205-08015E-RF
Note : BT
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	42.86	-13.51	39.21	25.70	40.00	-14.30	QP
2	97.16	-15.84	35.75	19.91	43.50	-23.59	QP
3	104.54	-13.92	37.30	23.38	43.50	-20.12	QP
4	414.90	-7.13	41.59	34.46	46.00	-11.54	QP
5	518.16	-5.11	36.10	30.99	46.00	-15.01	QP
6	622.34	-3.74	36.33	32.59	46.00	-13.41	QP

For Adapter A318-060040W-US1

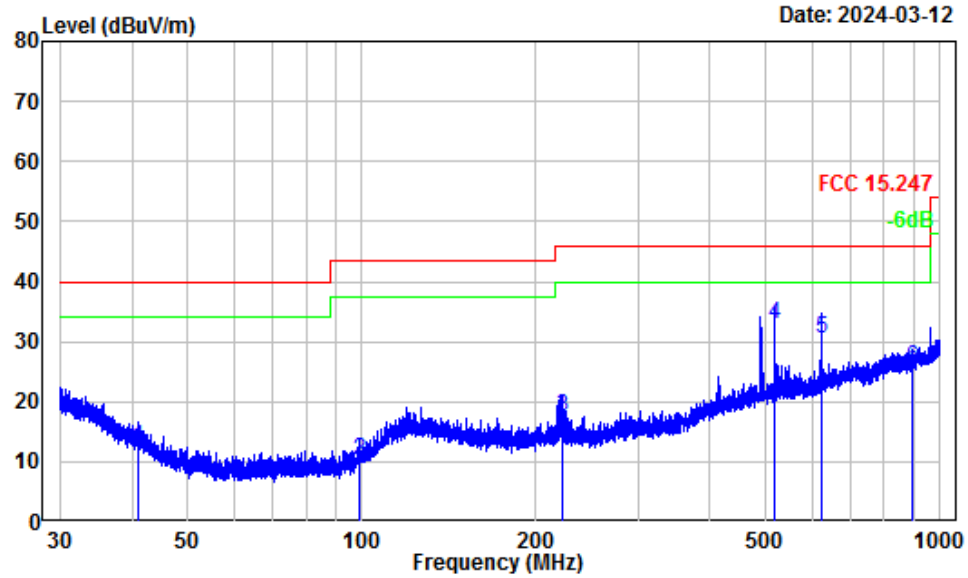
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: SZ1240205-08015E-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	40.70	-10.84	24.26	13.42	40.00	-26.58	QP
2	97.93	-14.32	25.15	10.83	43.50	-32.67	QP
3	222.07	-11.39	39.60	28.21	46.00	-17.79	QP
4	414.54	-6.85	43.47	36.62	46.00	-9.38	QP
5	518.38	-4.88	34.31	29.43	46.00	-16.57	QP
6	893.47	0.90	25.08	25.98	46.00	-20.02	QP

Vertical

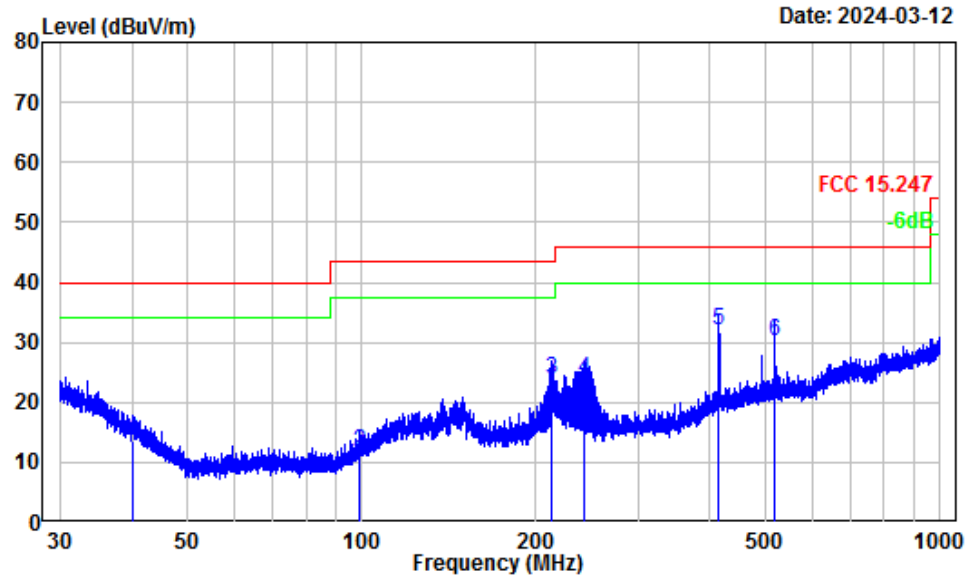


Site : Chamber A
Condition : 3m Vertical
Project Number: SZ1240205-08015E-RF
Note : BT
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	41.04	-12.48	24.98	12.50	40.00	-27.50	QP
2	99.27	-15.39	25.63	10.24	43.50	-33.26	QP
3	222.07	-12.24	29.86	17.62	46.00	-28.38	QP
4	517.02	-5.12	38.02	32.90	46.00	-13.10	QP
5	622.34	-3.74	34.10	30.36	46.00	-15.64	QP
6	894.25	0.52	25.14	25.66	46.00	-20.34	QP

For Adapter DSA-3PFM-05 BUS 060040

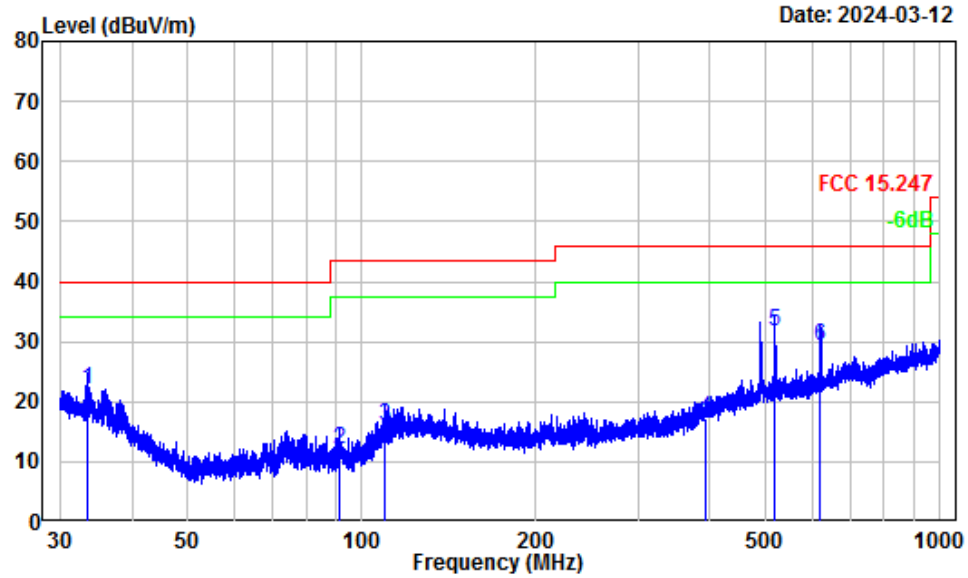
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: SZ1240205-08015E-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	40.06	-10.43	24.08	13.65	40.00	-26.35	QP
2	98.70	-14.10	25.73	11.63	43.50	-31.87	QP
3	213.02	-11.24	34.97	23.73	43.50	-19.77	QP
4	241.57	-11.71	35.57	23.86	46.00	-22.14	QP
5	414.54	-6.85	38.82	31.97	46.00	-14.03	QP
6	518.61	-4.87	35.10	30.23	46.00	-15.77	QP

Vertical

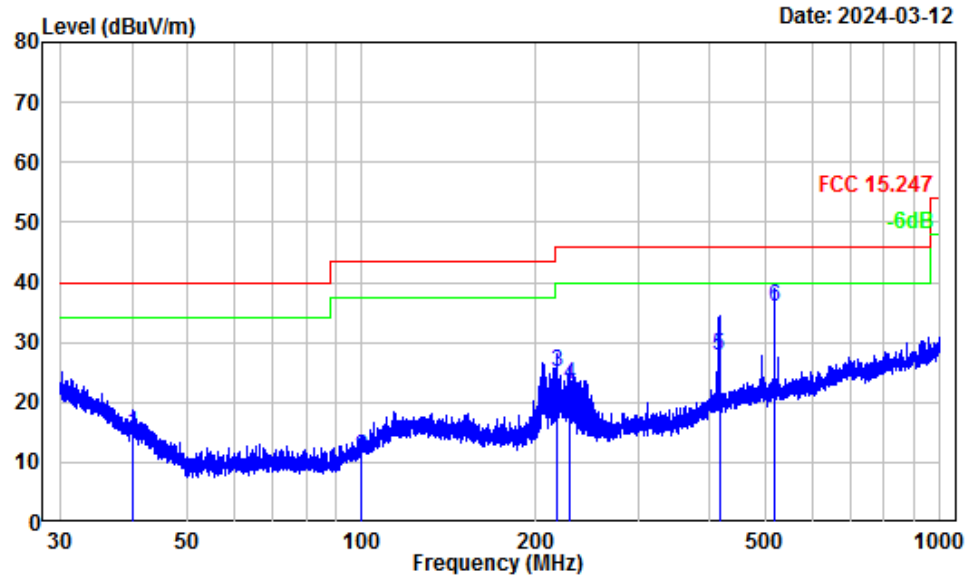


Site : Chamber A
Condition : 3m Vertical
Project Number: SZ1240205-08015E-RF
Note : BT
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	33.53	-7.83	30.00	22.17	40.00	-17.83	QP
2	91.62	-17.02	28.95	11.93	43.50	-31.57	QP
3	109.80	-12.40	28.51	16.11	43.50	-27.39	QP
4	392.61	-7.95	25.06	17.11	46.00	-28.89	QP
5	518.38	-5.11	36.76	31.65	46.00	-14.35	QP
6	621.80	-3.76	33.00	29.24	46.00	-16.76	QP

For Adapter E004-1A060040VU

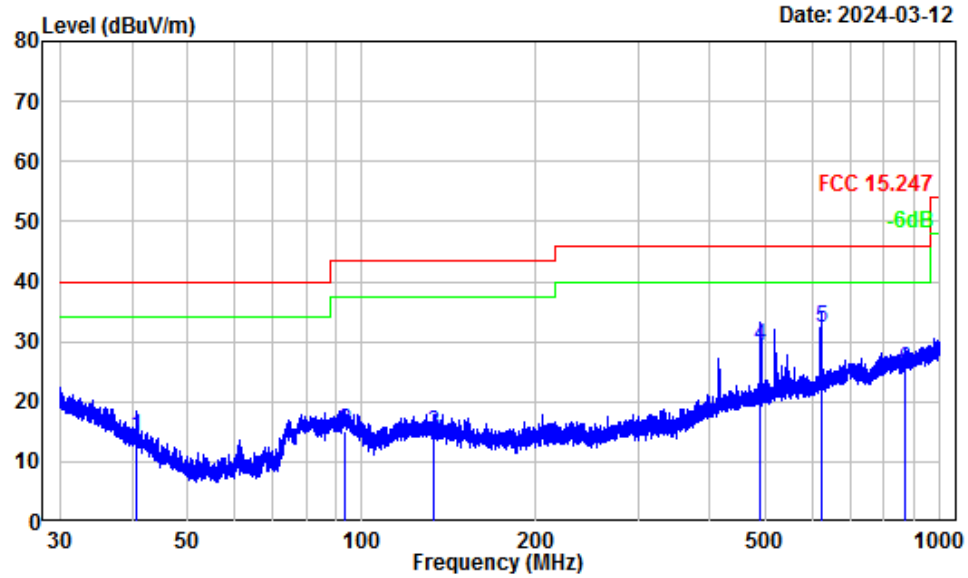
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: SZ1240205-08015E-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	40.13	-10.47	25.13	14.66	40.00	-25.34	QP
2	99.53	-13.87	24.80	10.93	43.50	-32.57	QP
3	216.97	-11.31	36.23	24.92	46.00	-21.08	QP
4	229.29	-11.51	34.45	22.94	46.00	-23.06	QP
5	415.09	-6.84	34.60	27.76	46.00	-18.24	QP
6	518.38	-4.88	40.95	36.07	46.00	-9.93	QP

Vertical

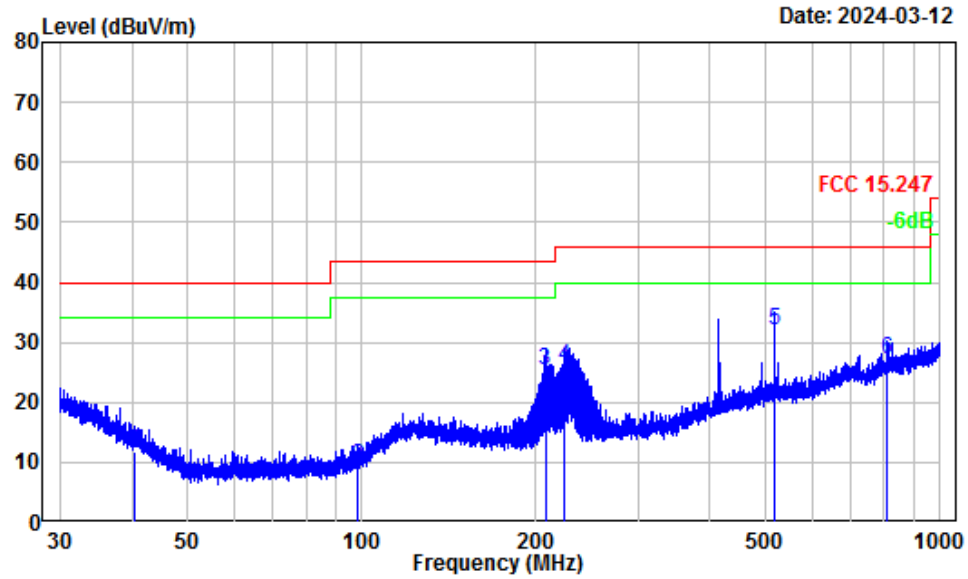


Site : Chamber A
Condition : 3m Vertical
Project Number: SZ1240205-08015E-RF
Note : BT
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	40.83	-12.36	26.68	14.32	40.00	-25.68	QP
2	93.48	-16.61	31.85	15.24	43.50	-28.26	QP
3	132.69	-10.93	25.75	14.82	43.50	-28.68	QP
4	489.67	-5.43	34.60	29.17	46.00	-16.83	QP
5	622.07	-3.74	36.00	32.26	46.00	-13.74	QP
6	870.27	0.18	25.31	25.49	46.00	-20.51	QP

For Adapter GQ06-060040-ZU

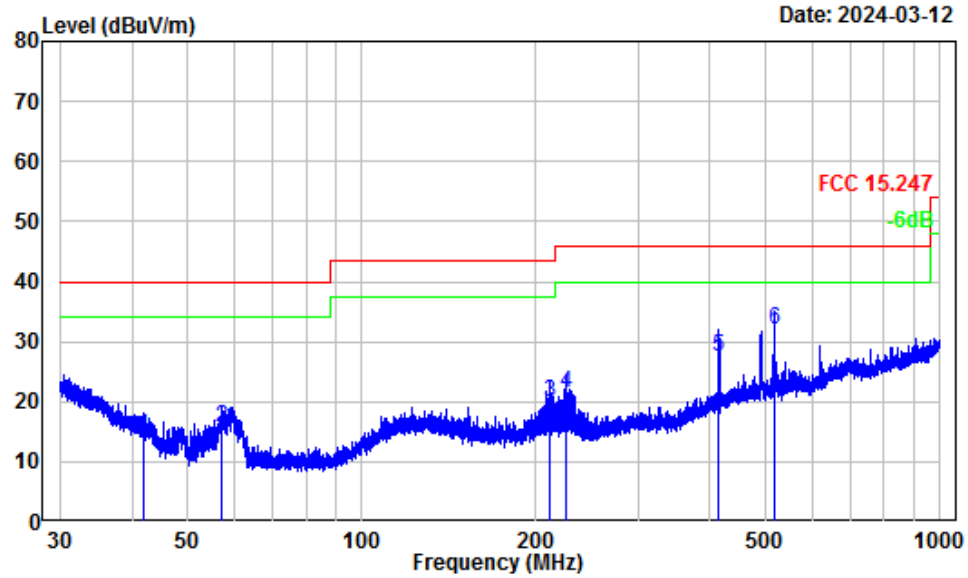
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: SZ1240205-08015E-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	40.33	-10.60	22.43	11.83	40.00	-28.17	QP
2	98.27	-14.22	23.61	9.39	43.50	-34.11	QP
3	207.49	-11.15	36.61	25.46	43.50	-18.04	QP
4	224.13	-11.42	37.36	25.94	46.00	-20.06	QP
5	518.16	-4.88	37.02	32.14	46.00	-13.86	QP
6	811.69	-0.38	27.55	27.17	46.00	-18.83	QP

Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number: SZ1240205-08015E-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	41.93	-12.99	27.09	14.10	40.00	-25.90	QP
2	57.04	-17.55	33.30	15.75	40.00	-24.25	QP
3	210.97	-12.23	32.23	20.00	43.50	-23.50	QP
4	225.21	-12.24	33.55	21.31	46.00	-24.69	QP
5	414.54	-7.14	34.59	27.45	46.00	-18.55	QP
6	518.16	-5.11	37.22	32.11	46.00	-13.89	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					
Worst case GFSK							
Low Channel 2402MHz							
2311.79	54.34	PK	H	-3.03	51.31	74	-22.69
2311.79	55.06	PK	V	-3.03	52.03	74	-21.97
4804.00	46.34	PK	H	2.42	48.76	74	-25.24
4804.00	46.36	PK	V	2.42	48.78	74	-25.22
Middle Channel 2441MHz							
4882.00	47.15	PK	H	2.58	49.73	74	-24.27
4882.00	46.47	PK	V	2.58	49.05	74	-24.95
High Channel 2480MHz							
2483.68	56.65	PK	H	-3.17	53.48	74	-20.52
2493.70	54.01	PK	V	-3.19	50.82	74	-23.18
4960.00	47.71	PK	H	2.68	50.39	74	-23.61
4960.00	46.39	PK	V	2.68	49.07	74	-24.93

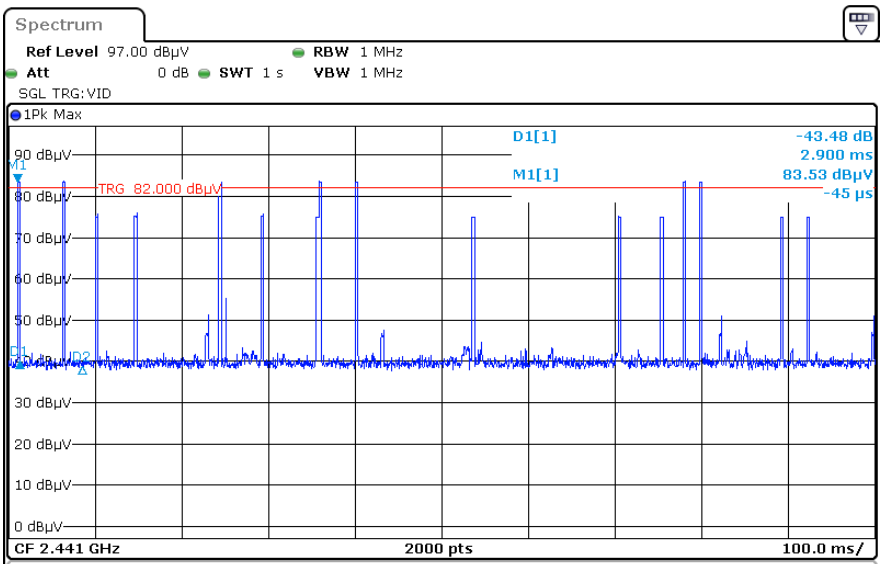
Field Strength of Average							
Frequency (MHz)	**Peak Measurement @3m (dBμV/m)**	**Polar (H/V)**	**Duty Cycle Correction Factor (dB)**	**Corrected Ampitude (dBμV/m)**	**Limit (dBμV/m)**	**Margin (dB)**	**Comment**
Low Channel 2402MHz							
2311.79	51.31	H	-24.73	26.58	54	-27.42	Bandedge
2311.79	52.03	V	-24.73	27.3	54	-26.7	Bandedge
4804.00	48.76	H	-24.73	24.03	54	-29.97	Harmonic
4804.00	48.78	V	-24.73	24.05	54	-29.95	Harmonic
Middle Channel 2441MHz							
4882.00	49.73	H	-24.73	25	54	-29.00	Harmonic
4882.00	49.05	V	-24.73	24.32	54	-29.68	Harmonic
High Channel 2480MHz							
2483.68	53.48	H	-24.73	28.75	54	-25.25	Bandedge
2493.70	50.82	V	-24.73	26.09	54	-27.91	Bandedge
4960.00	50.39	H	-24.73	25.66	54	-28.34	Harmonic
4960.00	49.07	V	-24.73	24.34	54	-29.66	Harmonic

Note:

Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected. Amplitude = Factor + Reading
Margin = Corrected. Amplitude - Limit
Average level= Peak level+ Duty Cycle Corrected Factor

Duty cycle = Ton/100ms = 2.90*2/100=0.058
Duty Cycle Corrected Factor = 20lg (Duty cycle) = 20lg0.058 = -24.73

Duty cycle

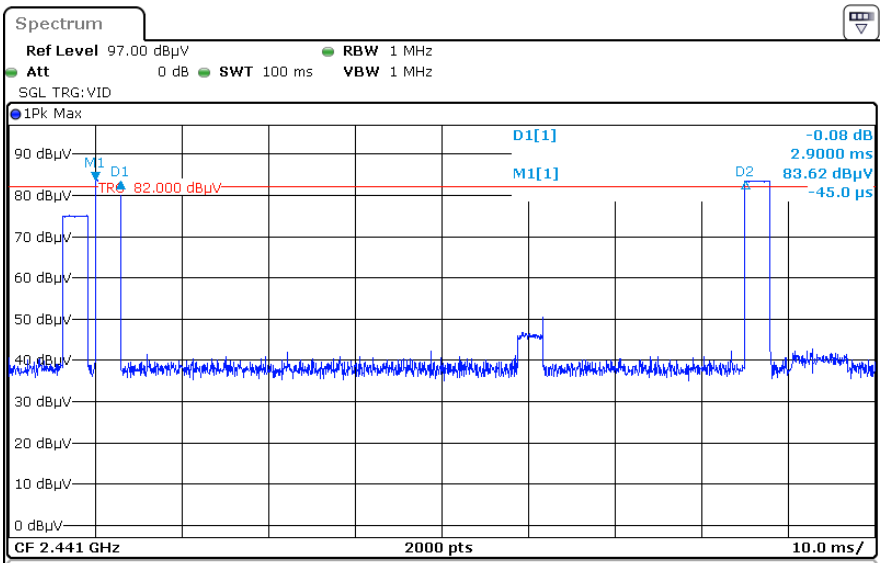


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	-45.0 µs	83.53 dBµV		
D1	M1	1	2.9 ms	-43.48 dB		
D2	M1	1	75.088 ms	-44.86 dB		

ProjectNo.:SZ1240205-08015E-RF Tester:Dylan.Yang

Date: 21.MAY.2024 11:50:59



Marker

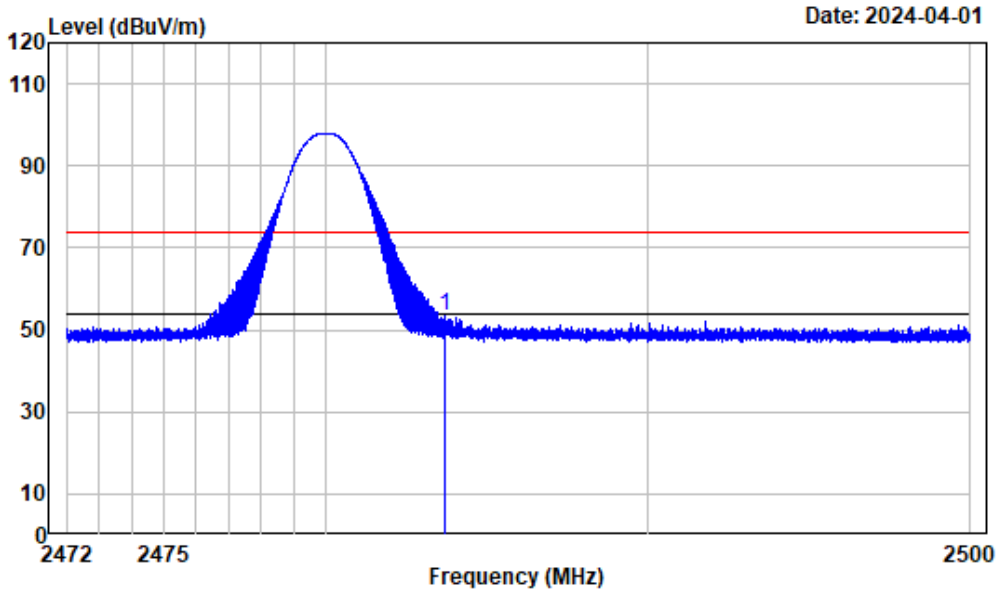
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	-45.0 µs	83.62 dBµV		
D1	M1	1	2.9 ms	-0.08 dB		
D2	M1	1	75.0875 ms	-0.11 dB		

ProjectNo.:SZ1240205-08015E-RF Tester:Dylan.Yang

Date: 21.MAY.2024 11:50:30

Test plots for Band Edge Measurements (Radiated):

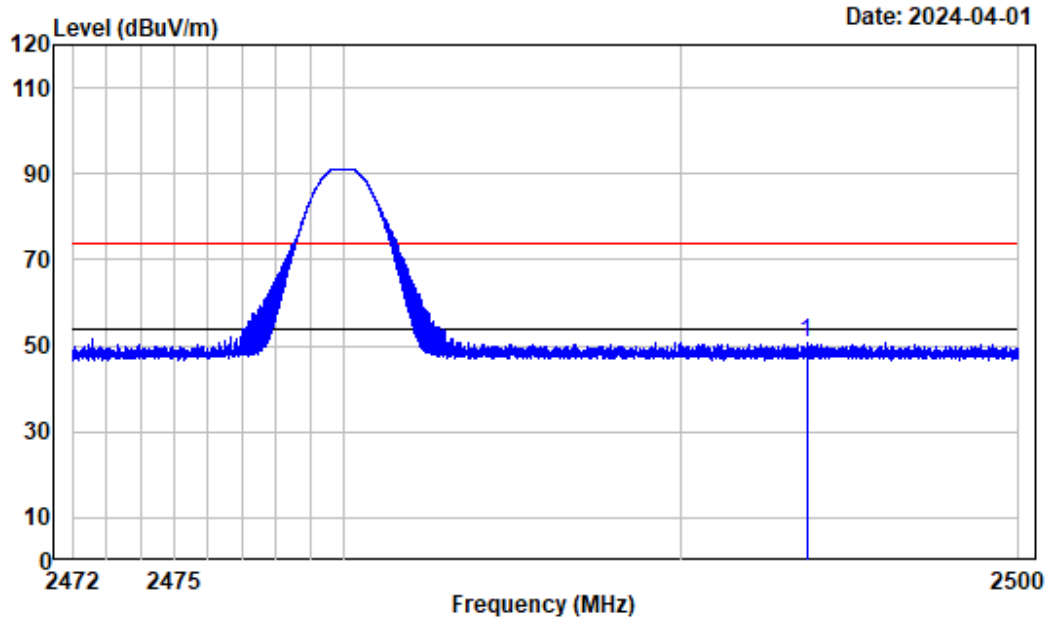
GFSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Horizontal**



Condition : Horizontal
Project No.: SZ1240205-08015E
Tester : Tyler
Note : BT(1DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.679	-3.17	56.65	53.48	74.00	-20.52	peak

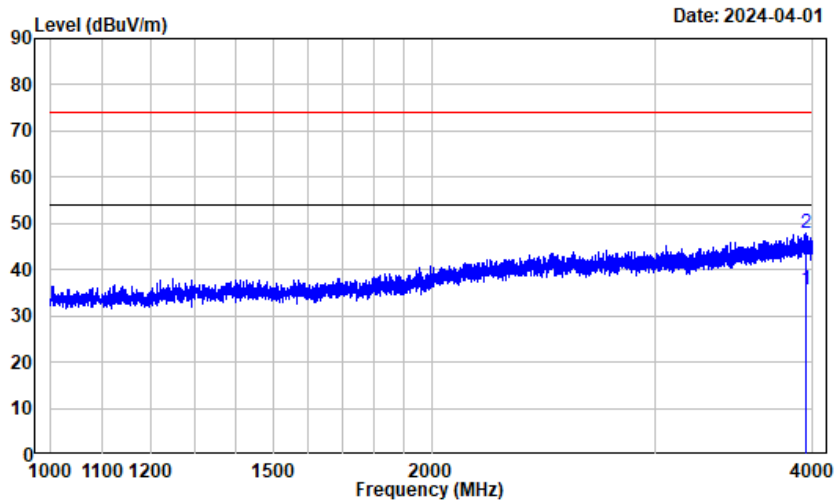
GFSK			
Test Channel:	**2480MHz**	**Ant. Polar. :**	**Vertical**



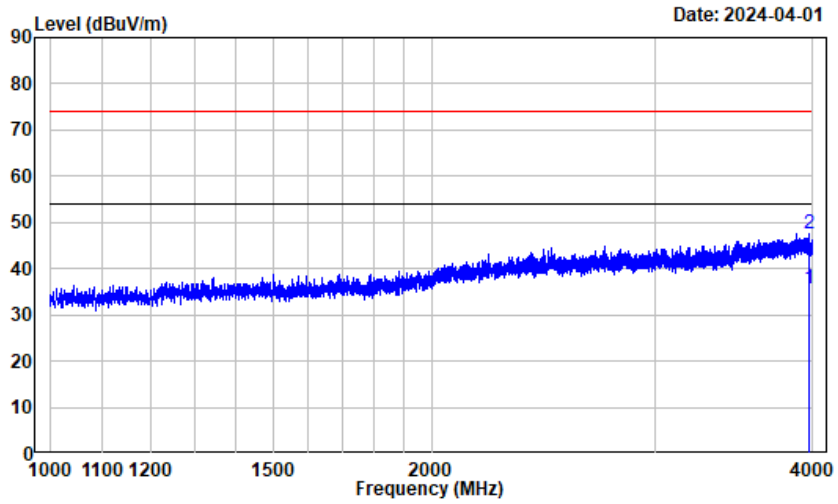
Condition : Vertical
Project No.: SZ1240205-08015E
Tester : Tyler
Note : BT(1DH5)_2480

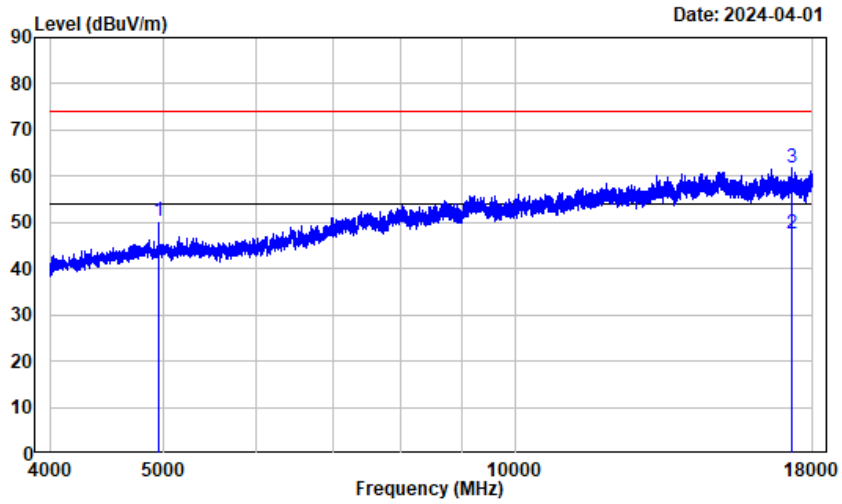
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2493.700	-3.19	54.01	50.82	74.00	-23.18	peak

Test plots for Harmonic Measurements: (GFSK High channel)

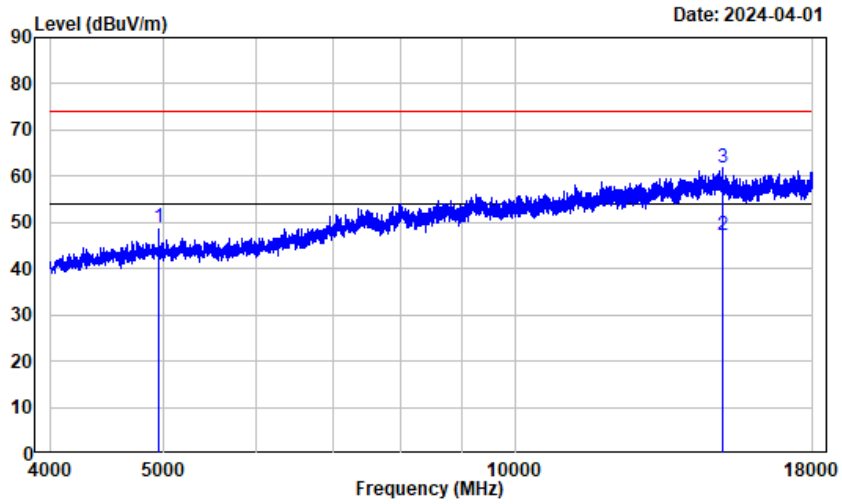
Horizontal	
1-4GHz	 Condition : Horizontal Project No.: SZ1240205-08015E Tester : Tyler Note : BT(1DH5)_2480

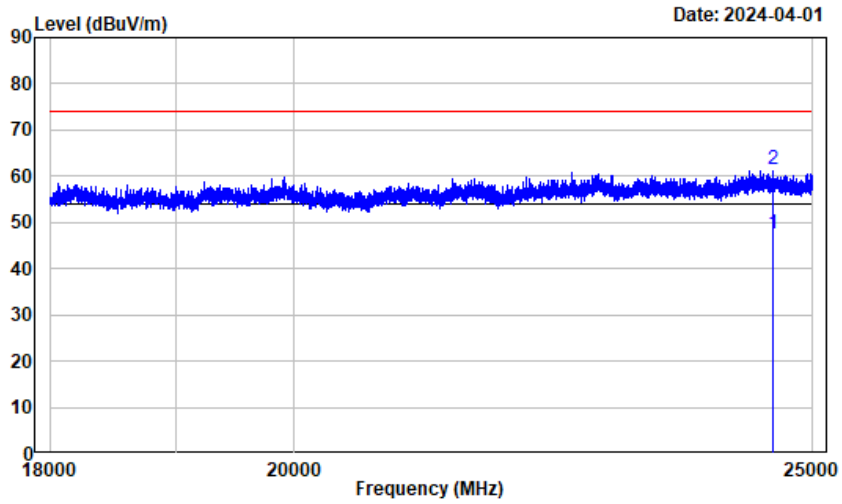
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	3950.125	-0.16	35.89	35.73	54.00	-18.27	Average
2	3950.125	-0.16	48.05	47.89	74.00	-26.11	Peak

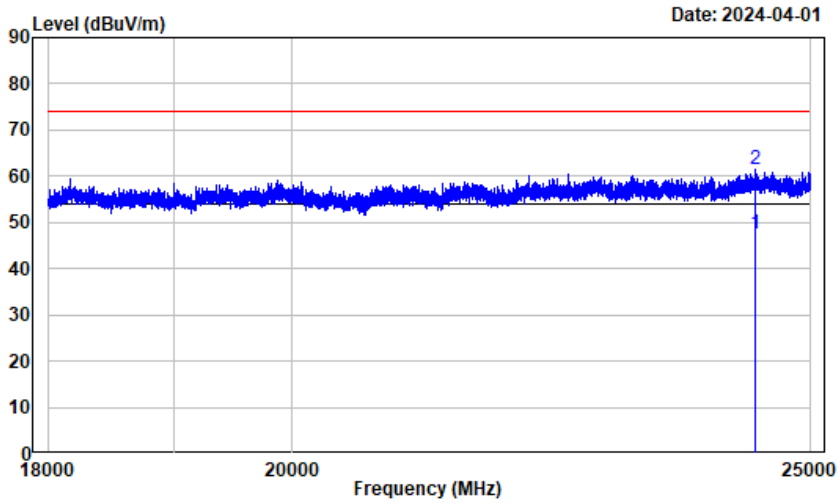
Vertical	
1-4GHz	 Condition : Vertical Project No.: SZ1240205-08015E Tester : Tyler Note : BT(1DH5)_2480 | | Freq | Factor | Read Level | Level | Limit Line | Over Limit | Remark | | | MHz | dB/m | dBuV | dBuV/m | dBuV/m | dB | | | 1 | 3970.375 | -0.19 | 35.90 | 35.71 | 54.00 | -18.29 | Average | | 2 | 3970.375 | -0.19 | 47.61 | 47.42 | 74.00 | -26.58 | Peak |

Horizontal	
4-18GHz	 Condition : Horizontal Project No.: SZ1240205-08015E Tester : Tyler Note : BT(1DH5)_2480

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4960.000	2.68	47.71	50.39	74.00	-23.61	Peak
2	17263.250	19.08	28.37	47.45	54.00	-6.55	Average
3	17263.250	19.08	42.66	61.74	74.00	-12.26	Peak

Vertical	
4-18GHz	 Condition : Vertical Project No.: SZ1240205-08015E Tester : Tyler Note : BT(1DH5)_2480 Freq / Factor / Read Level / Level / Limit Line / Over Limit / Remark 1 4960.000 MHz 2.68 dB/m 46.39 dBuV 49.07 dBuV/m 74.00 dBuV/m -24.93 dB Peak 2 15082.750 15.94 31.38 47.32 54.00 -6.68 Average 3 15082.750 15.94 45.72 61.66 74.00 -12.34 Peak

Horizontal	
18-25GHz	 Condition : Horizontal Project No.: SZ1240205-08015E Tester : Tyler Note : BT(1DH5)_2480 Freq / Factor / Read Level / Level / Limit Line / Over Limit / Remark MHz / dB/m / dBuV / dBuV/m / dBuV/m / dB 1 24574.710 18.90 28.81 47.71 54.00 -6.29 Average 2 24574.710 18.90 42.41 61.31 74.00 -12.69 Peak

Vertical	
18-25GHz	 Condition : Vertical Project No.: SZ1240205-08015E Tester : Tyler Note : BT(1DH5)_2480 Freq / Factor / Read Level / Level / Limit Line / Over Limit / Remark MHz / dB/m / dBuV / dBuV/m / dBuV/m / dB 1 24408.450 18.79 28.84 47.63 54.00 -6.37 Average 2 24408.450 18.79 42.70 61.49 74.00 -12.51 Peak

FCC §15.247(a) (1) & RSS-247 § 5.1 (b) -CHANNEL SEPARATION TEST

Applicable Standard

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.

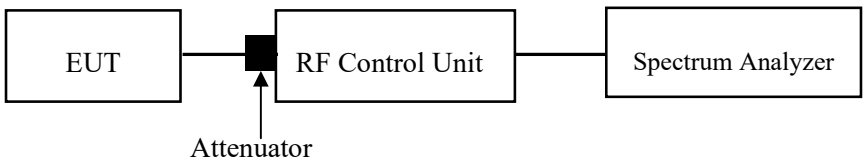
According to RSS-247 § 5.1 (b):

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.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Lee Li on 2024-04-01.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) & RSS-247 § 5.1 (a), RSS-GEN § 6.7 – 20 dB EMISSION BANDWIDTH & 99% OCCUPIED BANDWIDTH

Applicable Standard

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:

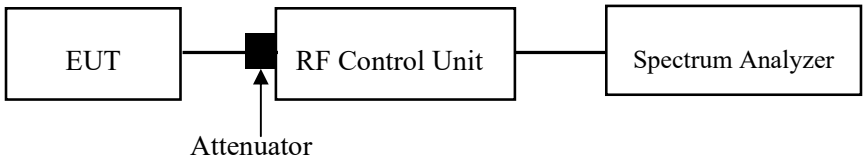
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• 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).



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Lee Li on 2024-04-01.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) (iii) & RSS-247 § 5.1 (d) - 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.

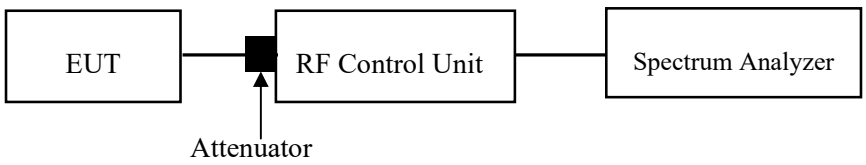
Test Procedure

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.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Lee Li on 2024-04-01.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) (iii) & RSS-247 § 5.1 (d) - 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.

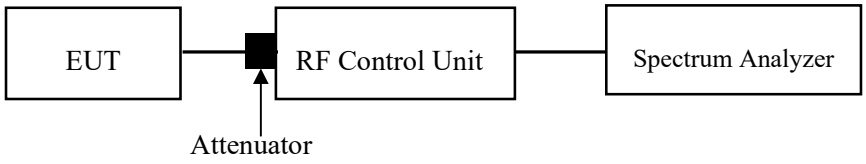
According to RSS-247 § 5.1 (d):

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



Note 1: A period time=0.4*79=31.6(S), Result=BurstWidth*Totalhops
Note 2: Totalhops=Hopping Number in 3.16s*10
Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s(Second high signals were other channel)

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Lee Li on 2024-04-01.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(b) (1) & RSS-247§ 5.1(b) &§ 5.4(b) - 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.

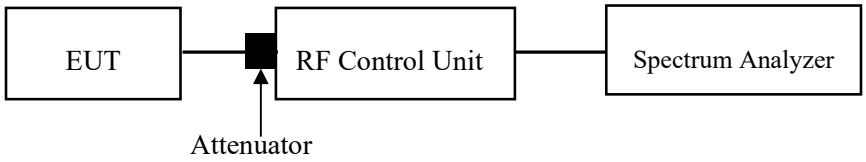
According to RSS-247§ 5.1(b) &§ 5.4(b):

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.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Lee Li on 2024-04-01.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(d) & RSS-247 § 5.5 - BAND EDGES TESTING

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)).

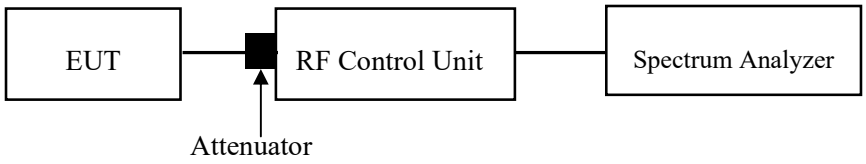
According to RSS-247 § 5.5.

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.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Lee Li on 2024-04-01.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

EUT PHOTOGRAPHS

Please refer to the attachment SZ1240205-08015E-RF External photo and SZ1240205-08015E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment SZ1240205-08015E-RFB Test Setup photo.

APPENDIX

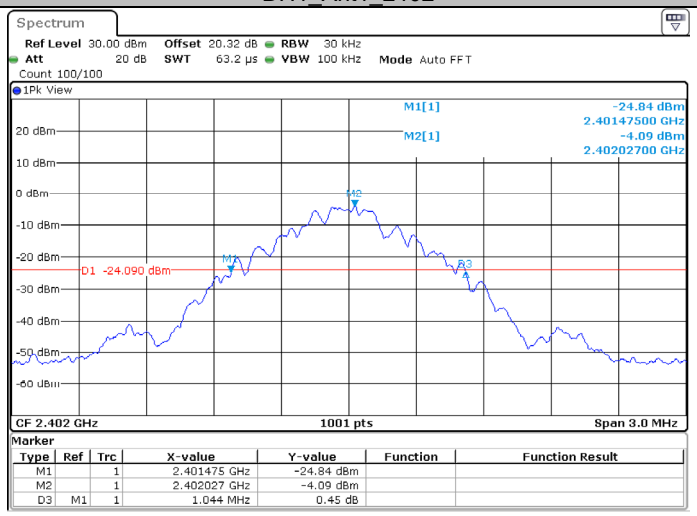
Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Channel	20db EBW[MHz]
DH1	Ant1	2402	1.04
		2441	1.04
		2480	1.04
2DH1	Ant1	2402	1.36
		2441	1.36
		2480	1.37
3DH1	Ant1	2402	1.31
		2441	1.31
		2480	1.31

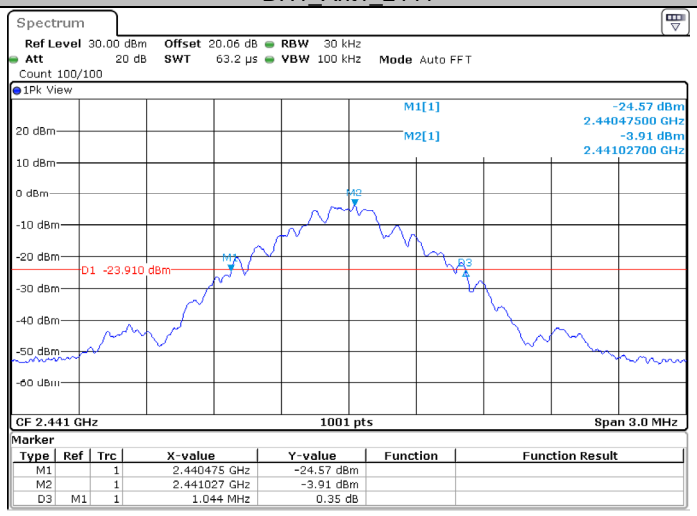
Test Graphs

DH1_Ant1_2402



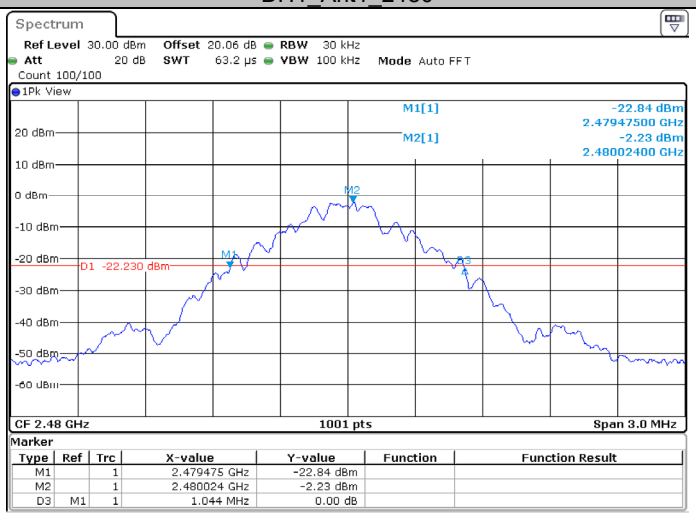
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:15:21

DH1_Ant1_2441



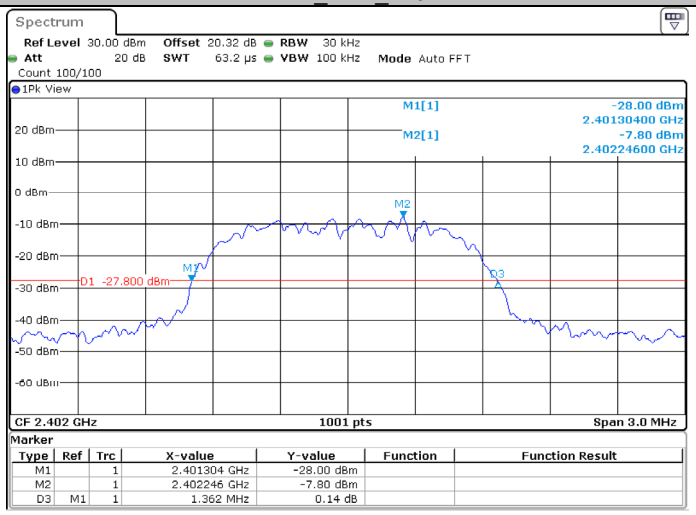
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:17:26

DH1_Ant1_2480



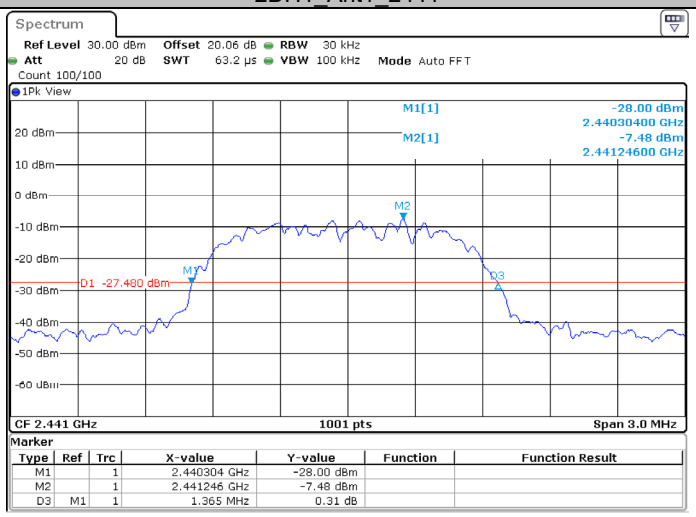
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:18:26

2DH1_Ant1_2402



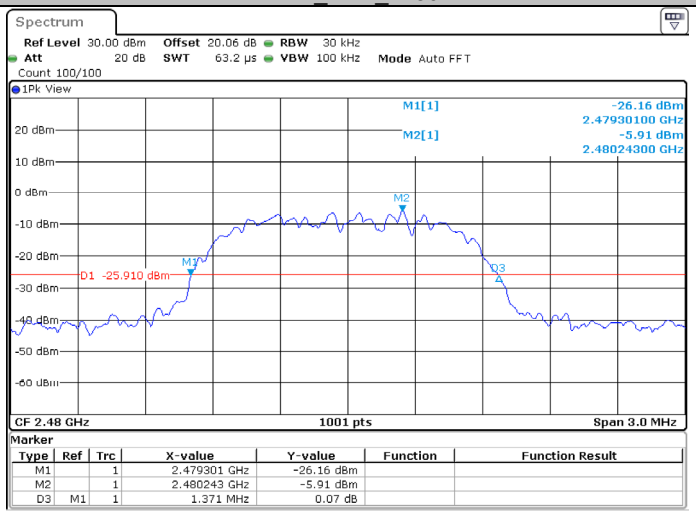
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:20:33

2DH1_Ant1_2441



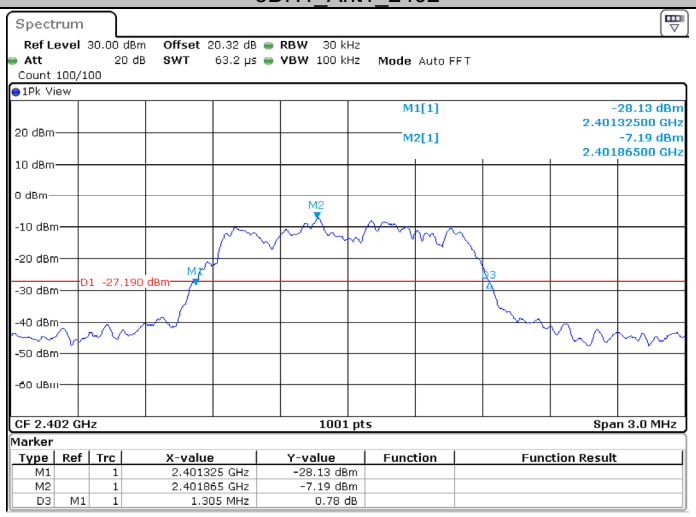
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:23:55

2DH1_Ant1_2480



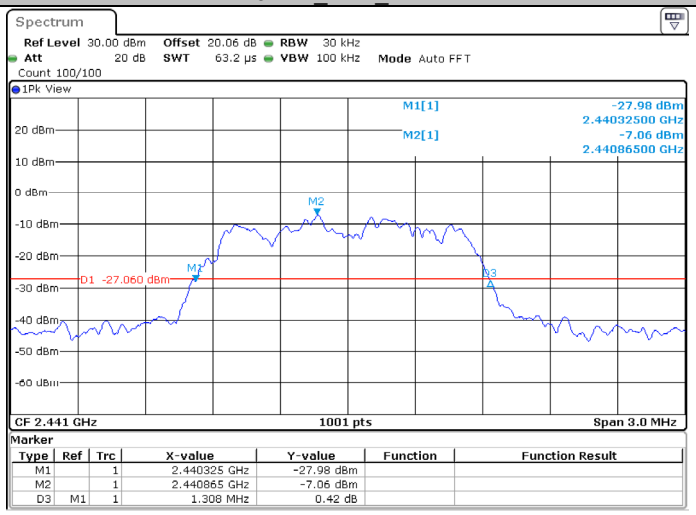
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:25:56

3DH1_Ant1_2402



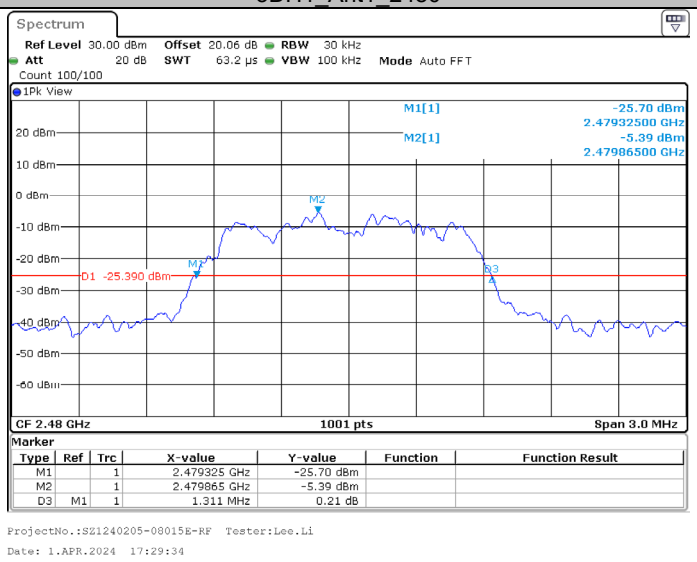
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:27:20

3DH1_Ant1_2441



ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:28:32

3DH1_Ant1_2480



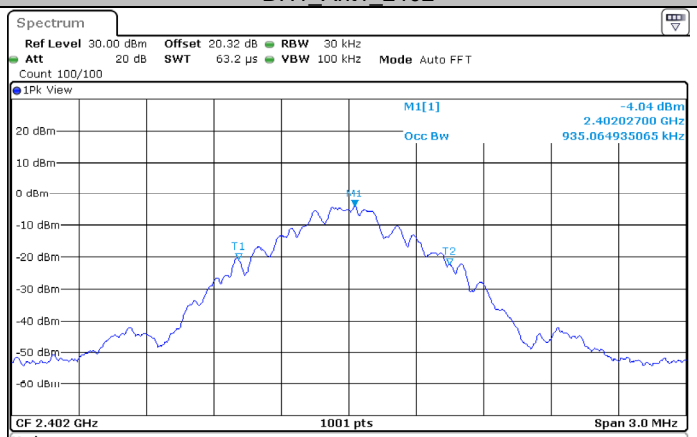
Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Channel	OCB [MHz]
DH1	Ant1	2402	0.935
		2441	0.935
		2480	0.935
2DH1	Ant1	2402	1.205
		2441	1.205
		2480	1.205
3DH1	Ant1	2402	1.190
		2441	1.190
		2480	1.193

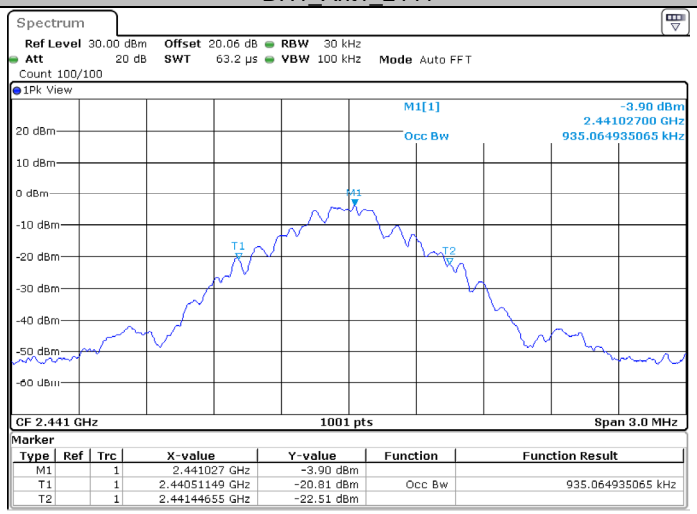
Test Graphs

DH1_Ant1_2402



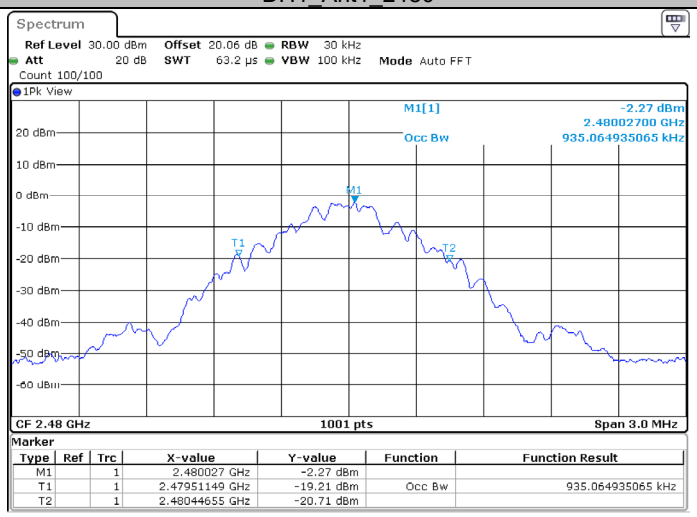
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:15:27

DH1_Ant1_2441



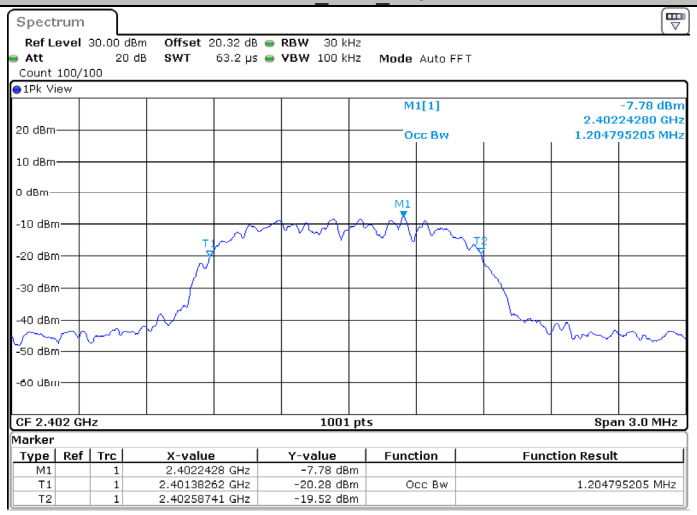
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:17:31

DH1_Ant1_2480



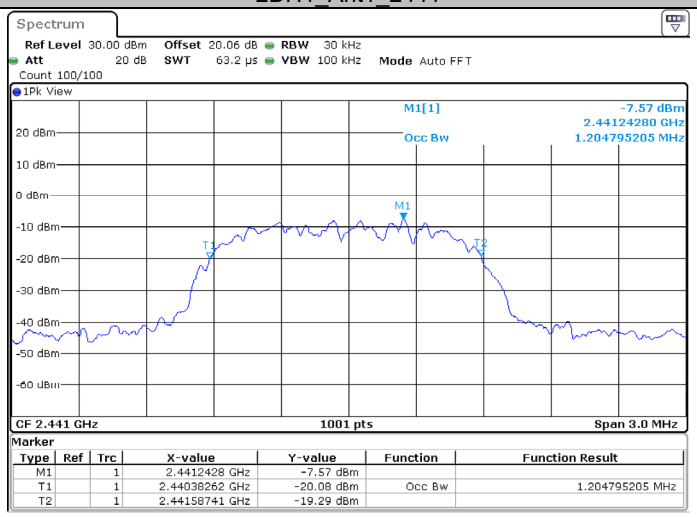
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:18:32

2DH1_Ant1_2402



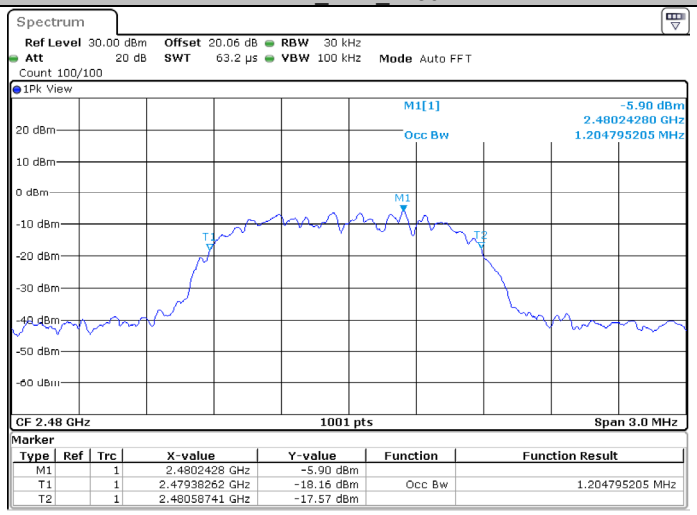
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:20:39

2DH1_Ant1_2441



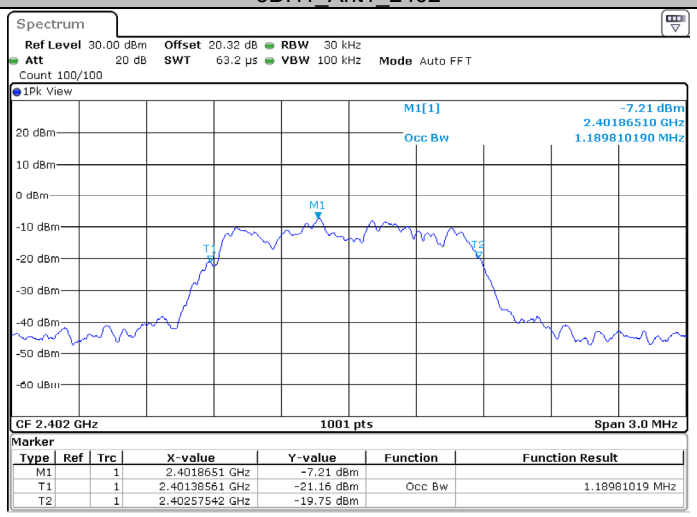
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:24:00

2DH1_Ant1_2480



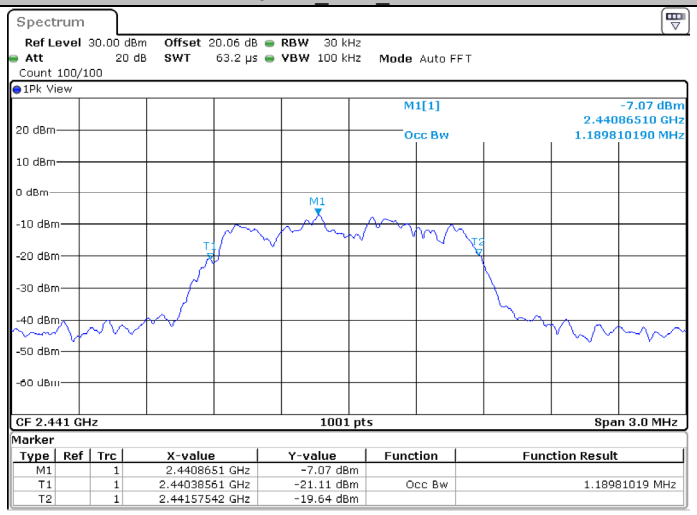
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:26:02

3DH1_Ant1_2402



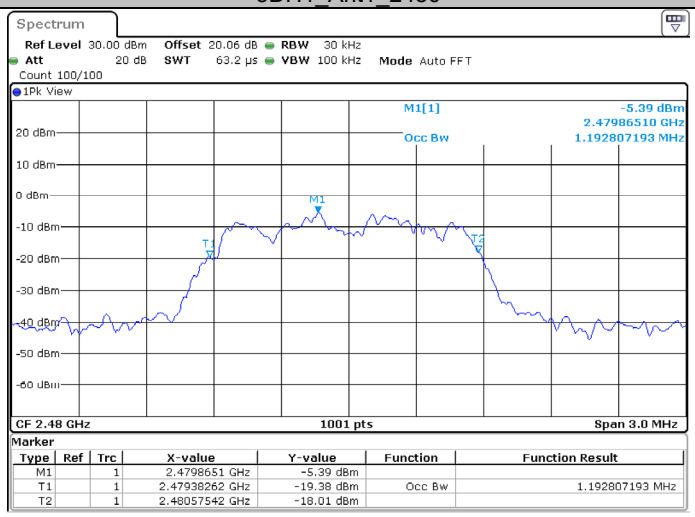
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:27:26

3DH1_Ant1_2441



ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:28:37

3DH1_Ant1_2480



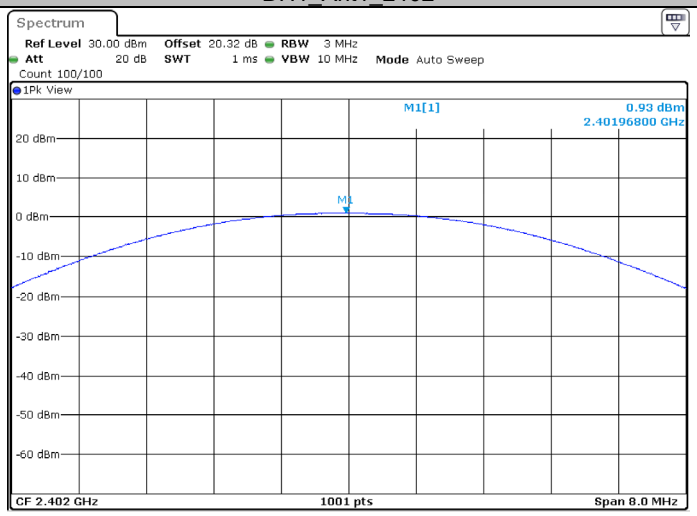
Appendix C: Maximum conducted Peak output power

Test Result

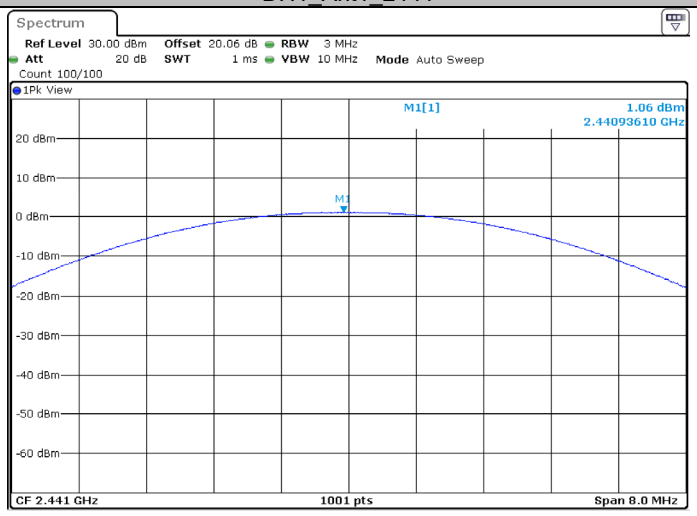
Test Mode	Antenna	Channel	Conducted Power[dBm]	Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
DH1	Ant1	2402	0.93	≤20.97	0.93	≤36	PASS
		2441	1.06	≤20.97	1.06	≤36	PASS
		2480	2.65	≤20.97	2.65	≤36	PASS
2DH1	Ant1	2402	2.18	≤20.97	2.18	≤36	PASS
		2441	2.40	≤20.97	2.40	≤36	PASS
		2480	3.88	≤20.97	3.88	≤36	PASS
3DH1	Ant1	2402	2.41	≤20.97	2.41	≤36	PASS
		2441	2.56	≤20.97	2.56	≤36	PASS
		2480	4.08	≤20.97	4.08	≤36	PASS

Test Graphs

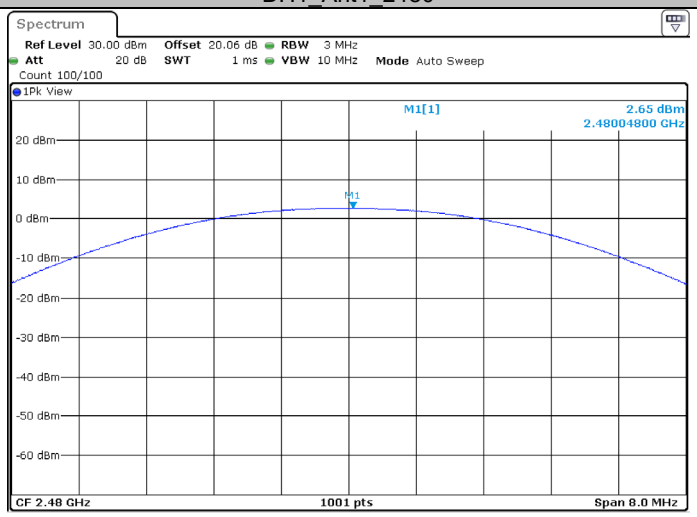
DH1_Ant1_2402



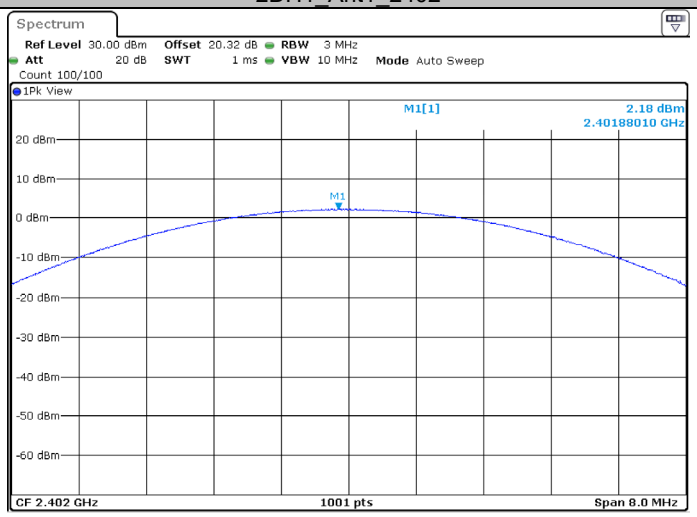
DH1_Ant1_2441



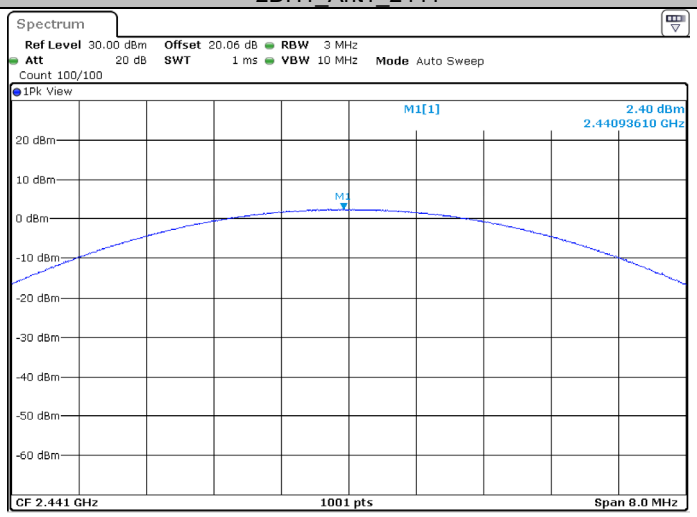
DH1_Ant1_2480



2DH1_Ant1_2402

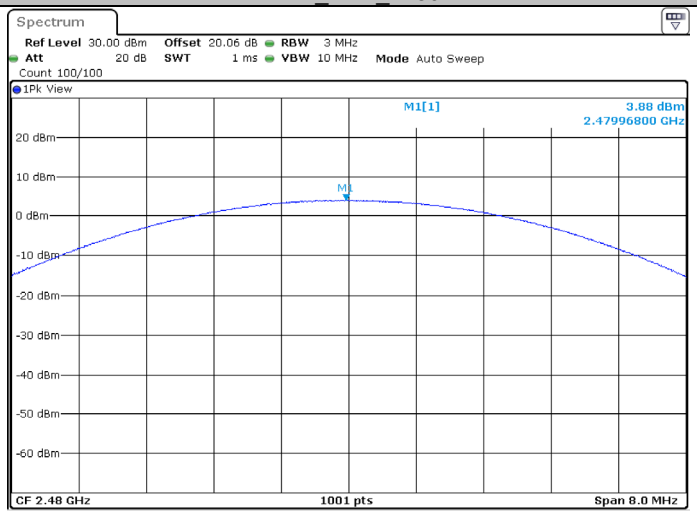


2DH1_Ant1_2441



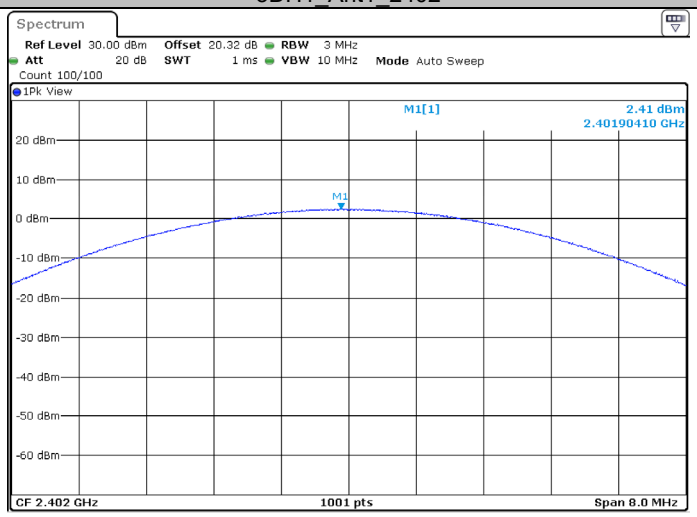
ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:24:16

2DH1_Ant1_2480

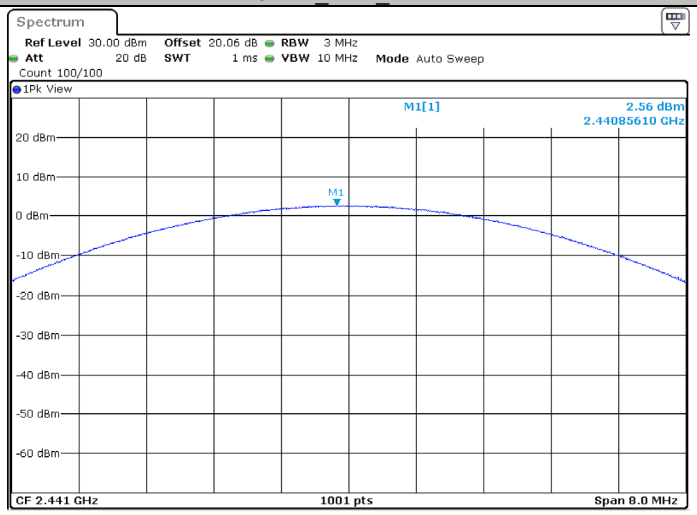


ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:26:19

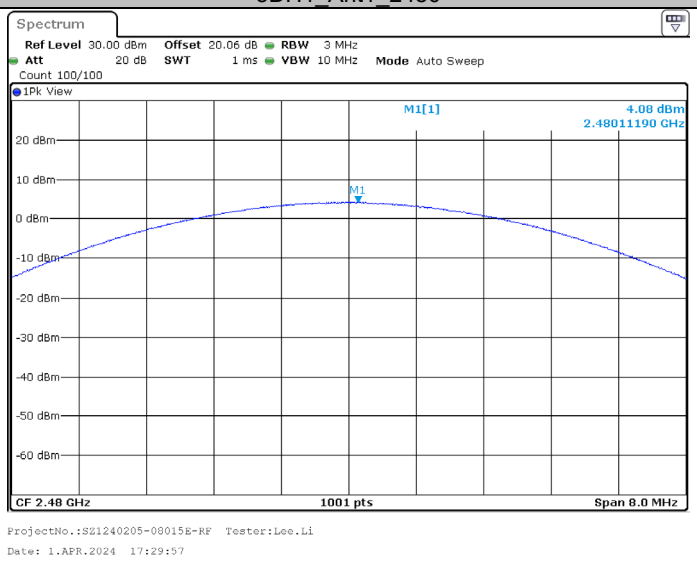
3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480



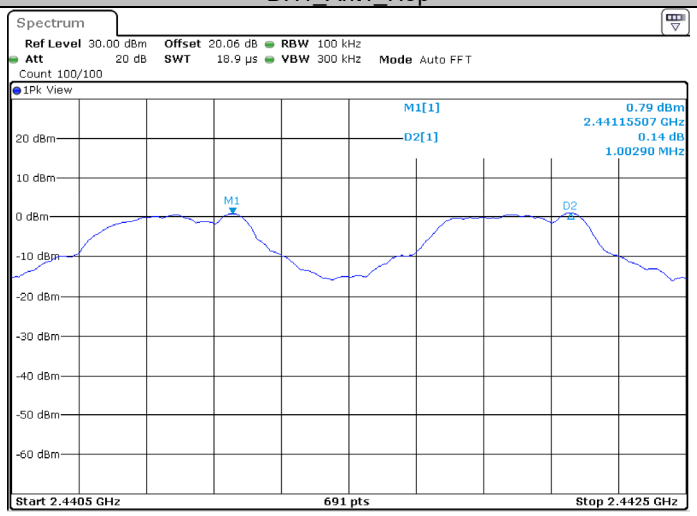
Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	1.003	≥0.693	PASS
2DH1	Ant1	Hop	1.003	≥0.913	PASS
3DH1	Ant1	Hop	1	≥0.873	PASS

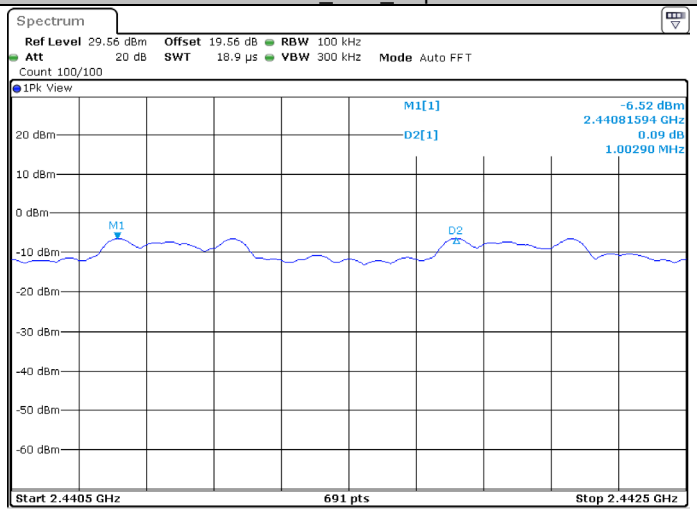
Test Graphs

DH1_Ant1_Hop



ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 17:35:38

2DH1_Ant1_Hop



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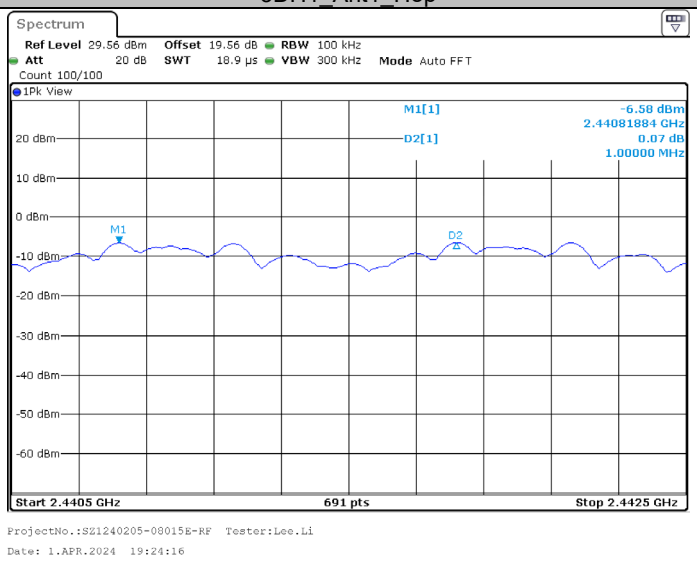
3DH1_Ant1_Hop



Appendix E: Time of occupancy

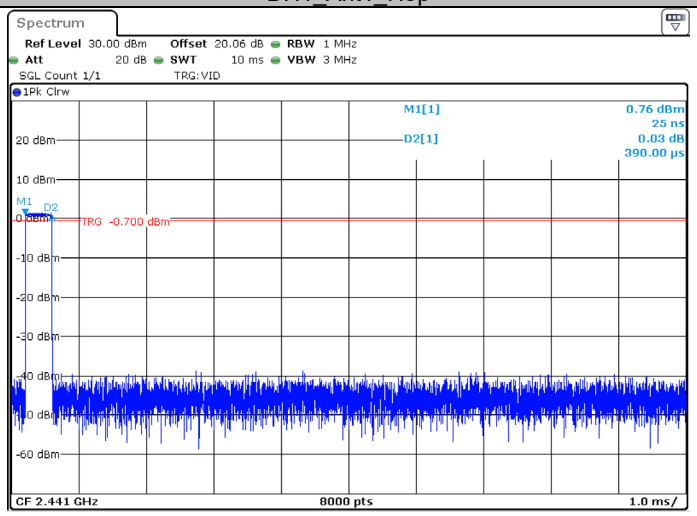
Test Result

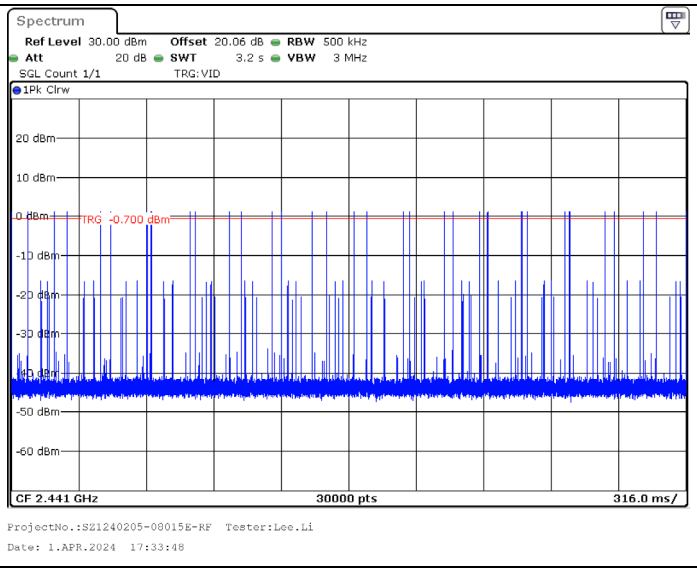
Test Mode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.390	320	0.125	≤0.4	PASS
DH3	Ant1	Hop	1.639	180	0.295	≤0.4	PASS
DH5	Ant1	Hop	2.879	130	0.374	≤0.4	PASS
2DH1	Ant1	Hop	0.409	330	0.135	≤0.4	PASS
2DH3	Ant1	Hop	1.654	180	0.298	≤0.4	PASS
2DH5	Ant1	Hop	2.893	120	0.347	≤0.4	PASS
3DH1	Ant1	Hop	0.401	320	0.128	≤0.4	PASS
3DH3	Ant1	Hop	1.653	170	0.281	≤0.4	PASS
3DH5	Ant1	Hop	2.895	110	0.318	≤0.4	PASS

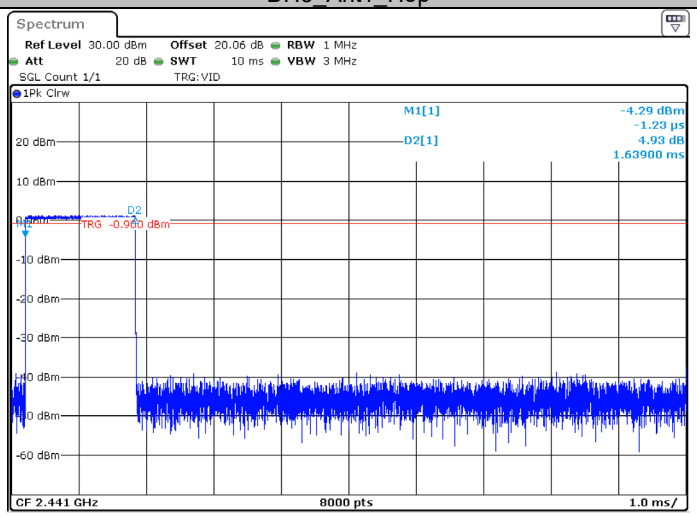
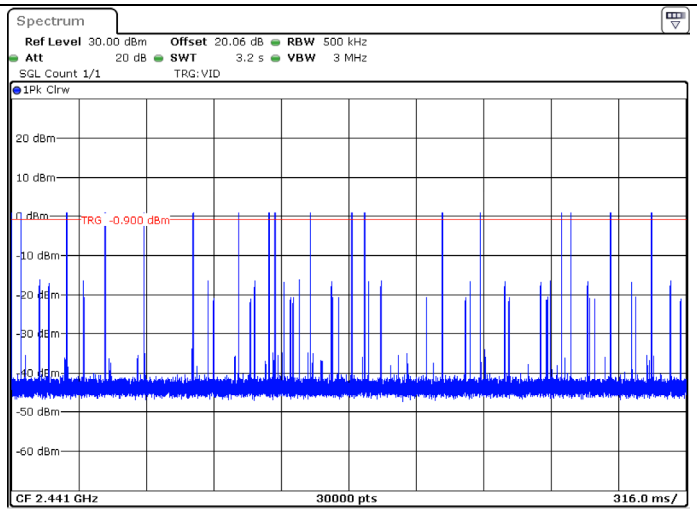
Note 1: A period time=0.4*79=31.6(S), Result=BurstWidth*Totalhops
Note 2: Totalhops=Hopping Number in 3.16s*10
Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s(Second high signals were other channel)

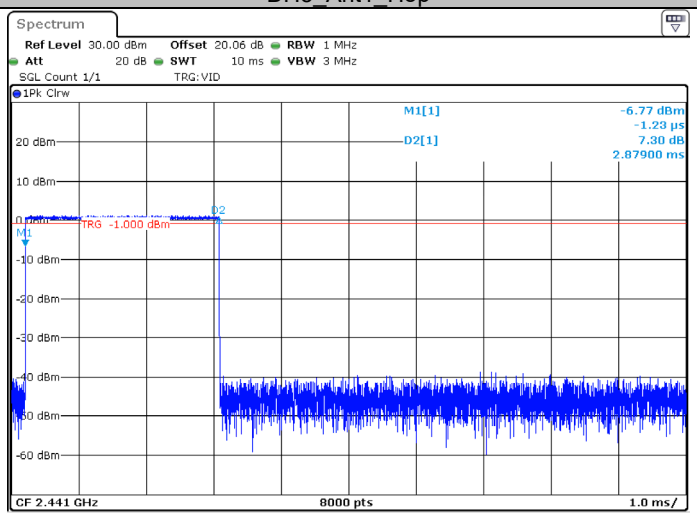
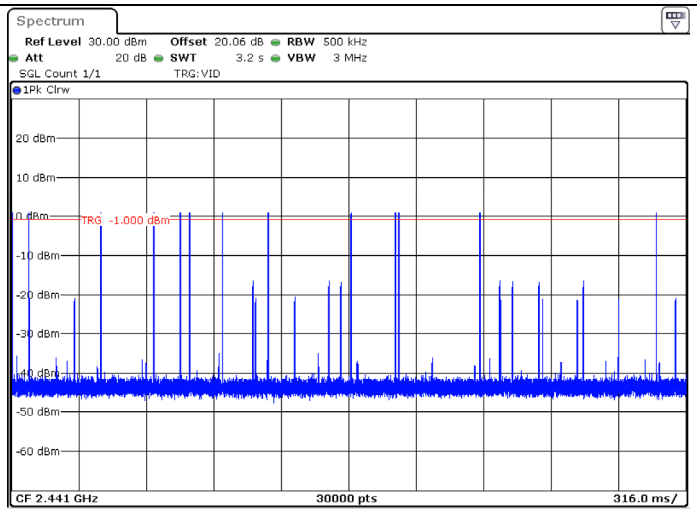
Test Graphs

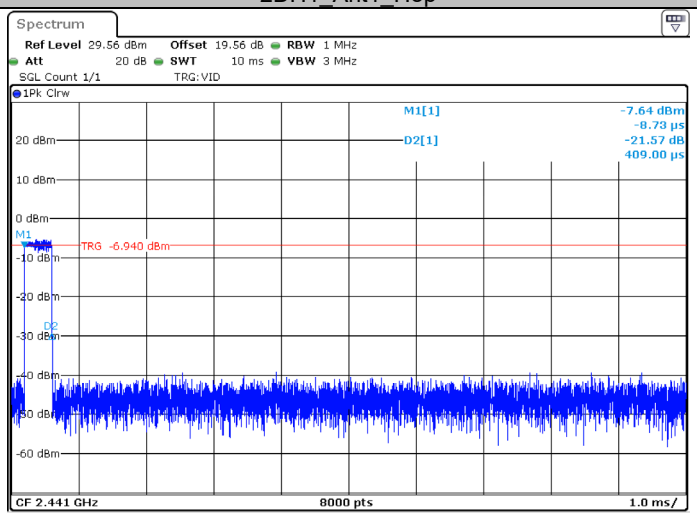
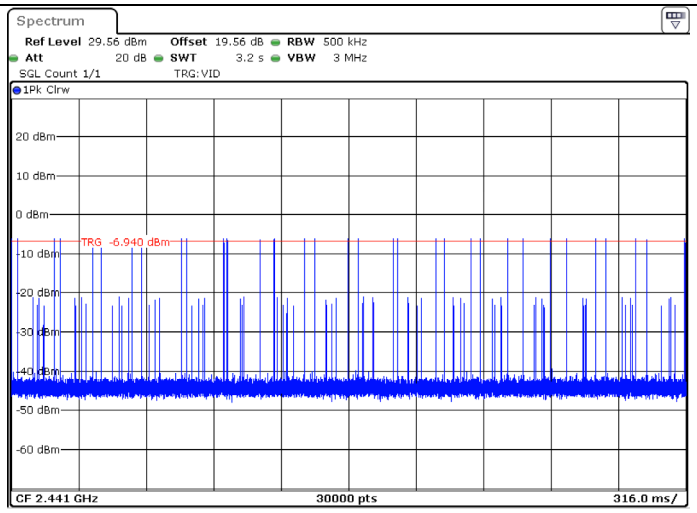
DH1_Ant1_Hop

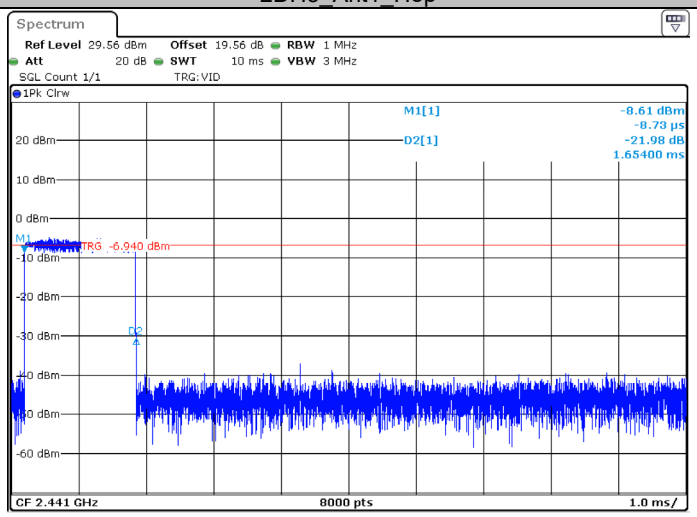
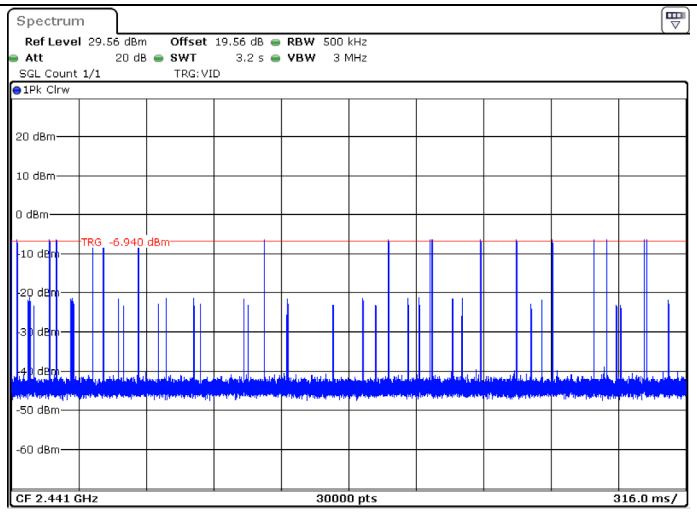


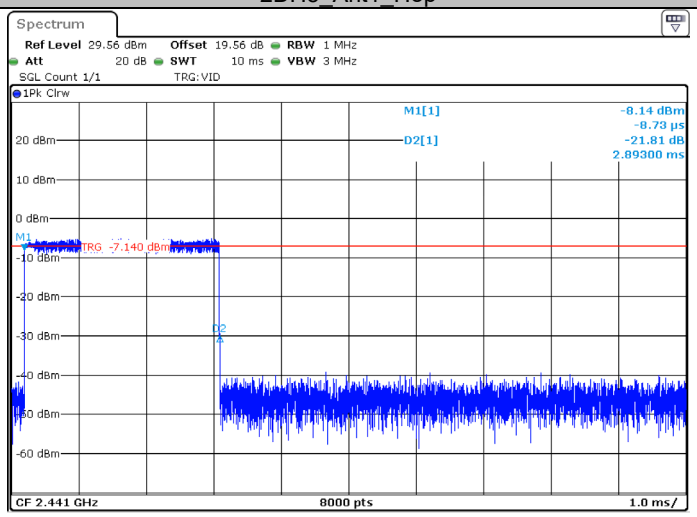
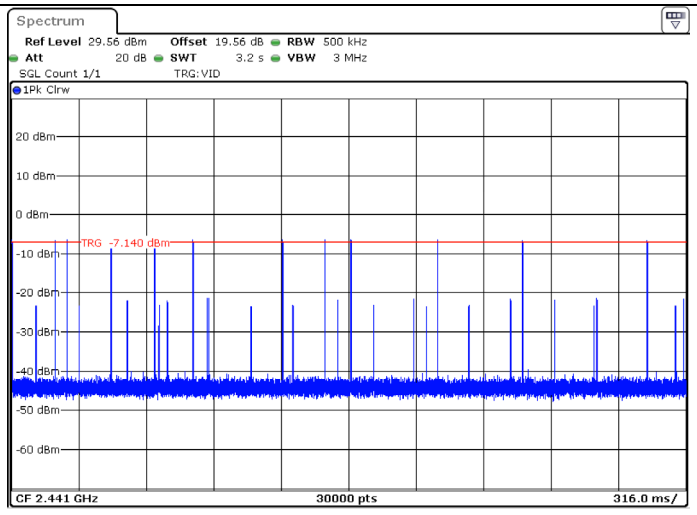


DH3_Ant1_Hop
 Spectrum Ref Level 30.00 dBm Offset 20.06 dB RBW 1 MHz Att 20 dB SWT 10 ms VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw M1[1] -4.29 dBm -1.23 µs D2[1] 4.93 dB 1.63900 ms 20 dBm 10 dBm D2 TRG -0.900 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 2.441 GHz 8000 pts 1.0 ms/ ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li Date: 1.APR.2024 17:39:06
 Spectrum Ref Level 30.00 dBm Offset 20.06 dB RBW 500 kHz Att 20 dB SWT 3.2 s VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw 20 dBm 10 dBm TRG -0.900 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 2.441 GHz 30000 pts 316.0 ms/ ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li Date: 1.APR.2024 17:39:11

DH5_Ant1_Hop
 Spectrum Ref Level 30.00 dBm Offset 20.06 dB RBW 1 MHz Att 20 dB SWT 10 ms VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw M1[1] -6.77 dBm -1.23 µs D2[1] 7.30 dB 2.87900 ms TRG -1.000 dBm CF 2.441 GHz 8000 pts 1.0 ms/ ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li Date: 1.APR.2024 17:45:17
 Spectrum Ref Level 30.00 dBm Offset 20.06 dB RBW 500 kHz Att 20 dB SWT 3.2 s VBW 3 MHz SGL Count 1/1 TRG:VID 1Pk Clrw TRG -1.000 dBm CF 2.441 GHz 30000 pts 316.0 ms/ ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li Date: 1.APR.2024 17:45:22

2DH1_Ant1_Hop
 ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li Date: 1.APR.2024 19:18:22
 ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li Date: 1.APR.2024 19:18:27

2DH3_Ant1_Hop
   

2DH5_Ant1_Hop



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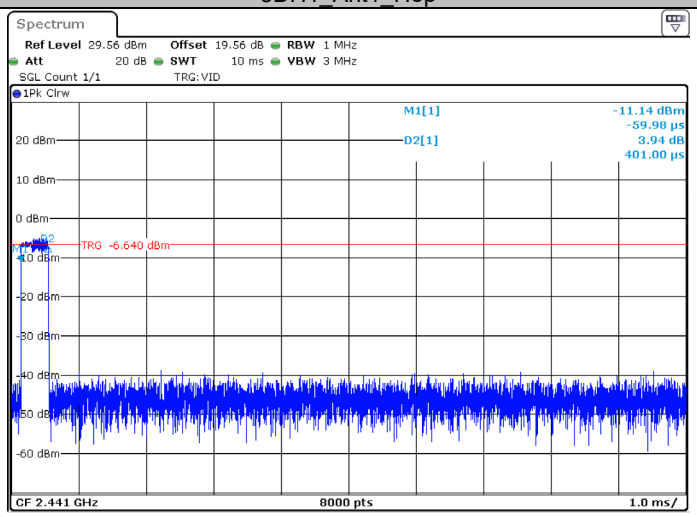
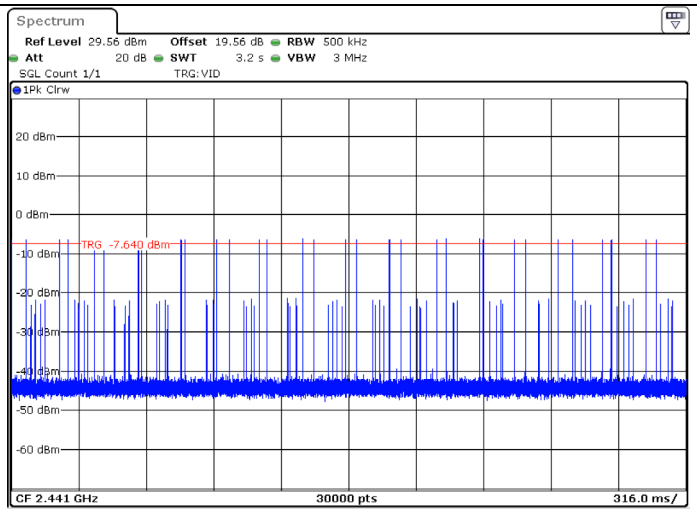
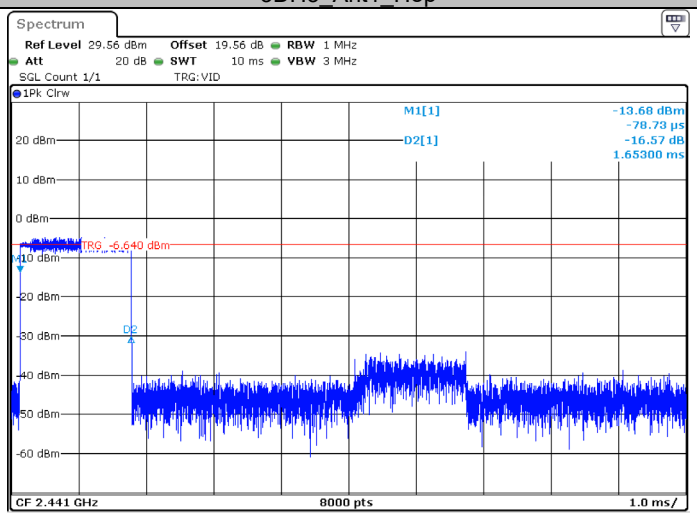
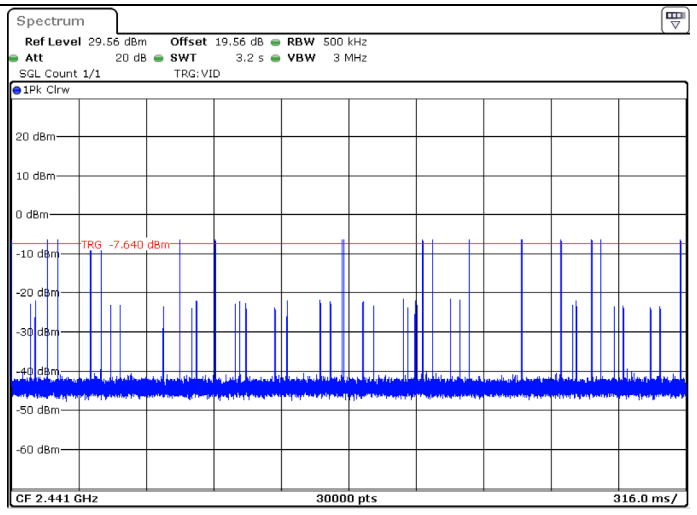
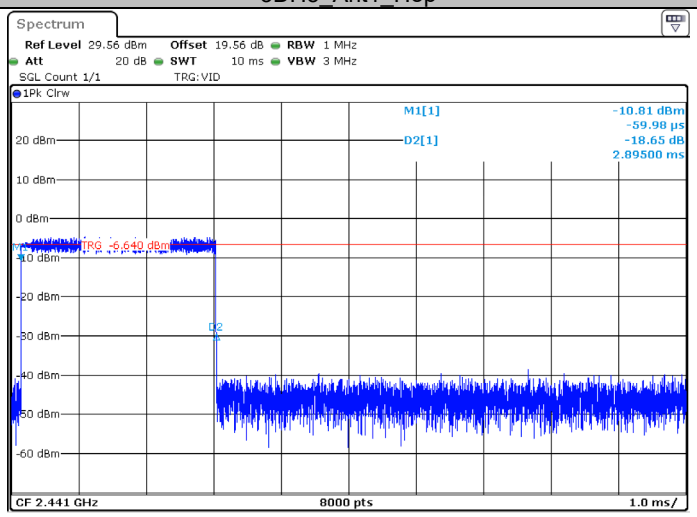
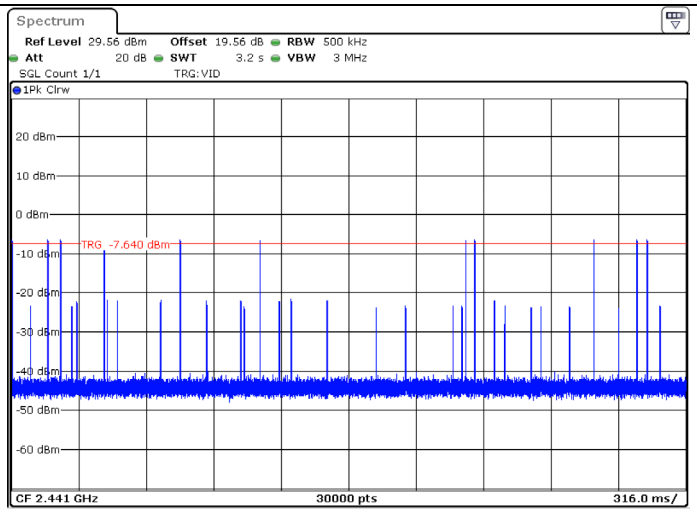



3DH3_Ant1_Hop



3DH5_Ant1_Hop



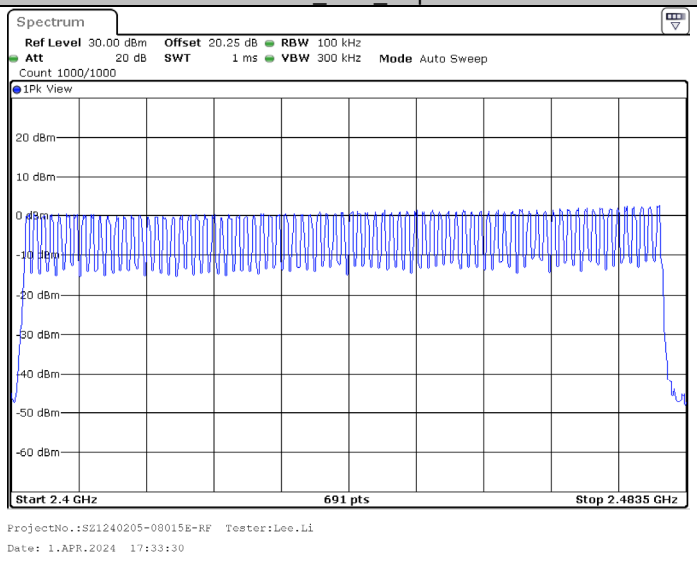
Appendix F: Number of hopping channels

Test Result

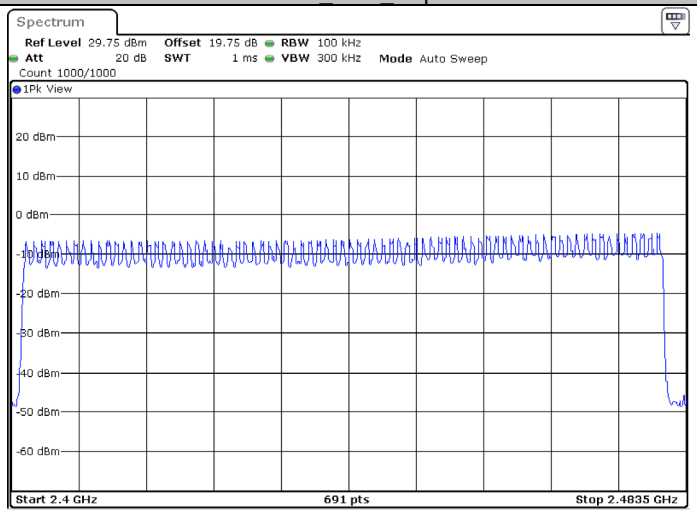
Test Mode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	≥15	PASS
2DH1	Ant1	Hop	79	≥15	PASS
3DH1	Ant1	Hop	79	≥15	PASS

Test Graphs

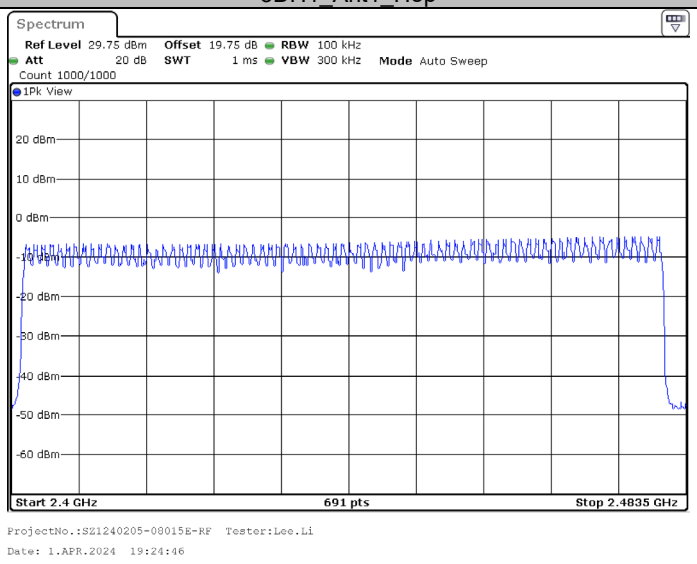
DH1_Ant1_Hop



2DH1_Ant1_Hop



3DH1_Ant1_Hop



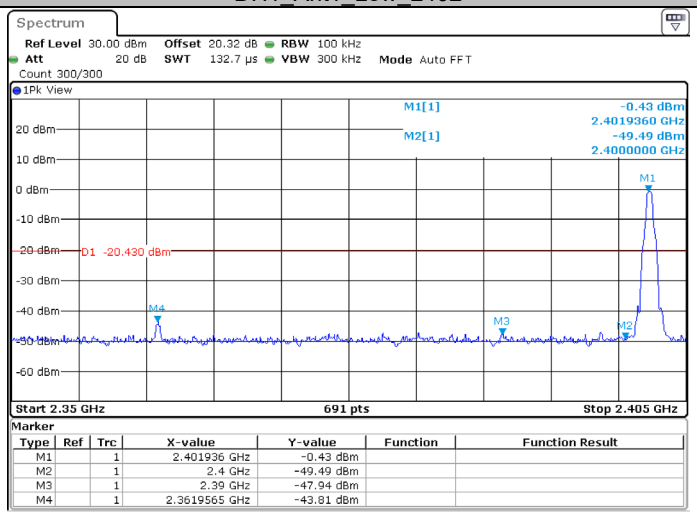
Appendix G: Band edge measurements

Test Result

Test Mode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	-0.43	-43.81	≤-20.43	PASS
		High	2480	1.55	-42.64	≤-18.45	PASS
		Low	Hop_2402	0.87	-44.46	≤-19.13	PASS
		High	Hop_2480	2.28	-41.94	≤-17.72	PASS
2DH1	Ant1	Low	2402	-2.65	-45.98	≤-22.65	PASS
		High	2480	-0.69	-44.89	≤-20.69	PASS
		Low	Hop_2402	-6.17	-46.73	≤-26.17	PASS
		High	Hop_2480	-5.08	-46.53	≤-25.08	PASS
3DH1	Ant1	Low	2402	-3.00	-45.94	≤-23	PASS
		High	2480	-0.98	-44.99	≤-20.98	PASS
		Low	Hop_2402	-7.04	-46.59	≤-27.04	PASS
		High	Hop_2480	-5.00	-46.27	≤-25	PASS

Test Graphs

DH1_Ant1_Low_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401936 GHz	-0.43 dBm		
M2		1	2.4 GHz	-49.49 dBm		
M3		1	2.39 GHz	-47.94 dBm		
M4		1	2.3619565 GHz	-43.81 dBm		

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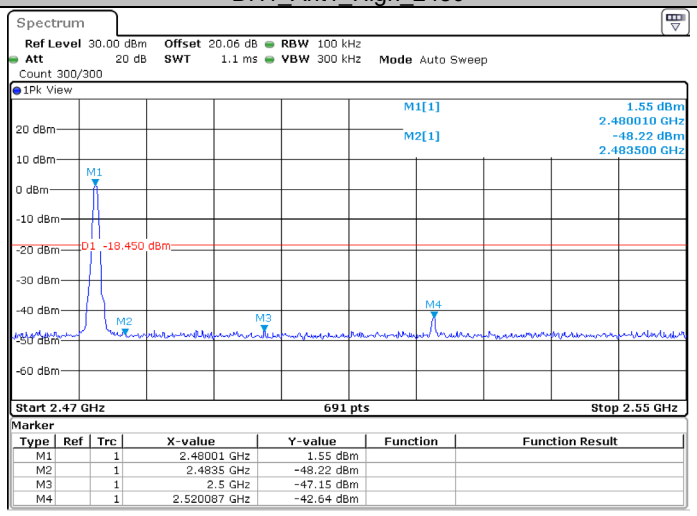
DH1_Ant1_High_2480



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	1.55 dBm		
M2		1	2.4835 GHz	-48.22 dBm		
M3		1	2.5 GHz	-47.15 dBm		
M4		1	2.520087 GHz	-42.64 dBm		

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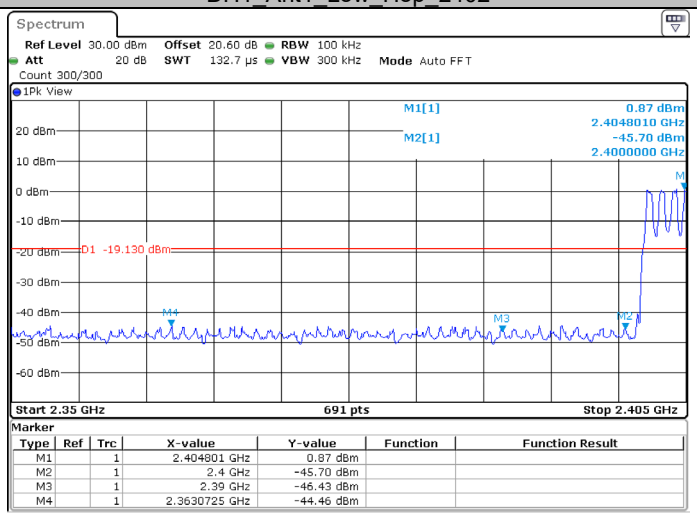
DH1_Ant1_Low_Hop_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.404801 GHz	0.87 dBm		
M2		1	2.4 GHz	-45.70 dBm		
M3		1	2.39 GHz	-46.43 dBm		
M4		1	2.3630725 GHz	-44.46 dBm		

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DH1_Ant1_High_Hop_2480

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47677 GHz	2.28 dBm		
M2		1	2.4835 GHz	-47.96 dBm		
M3		1	2.5 GHz	-44.44 dBm		
M4		1	2.511043 GHz	-41.94 dBm		

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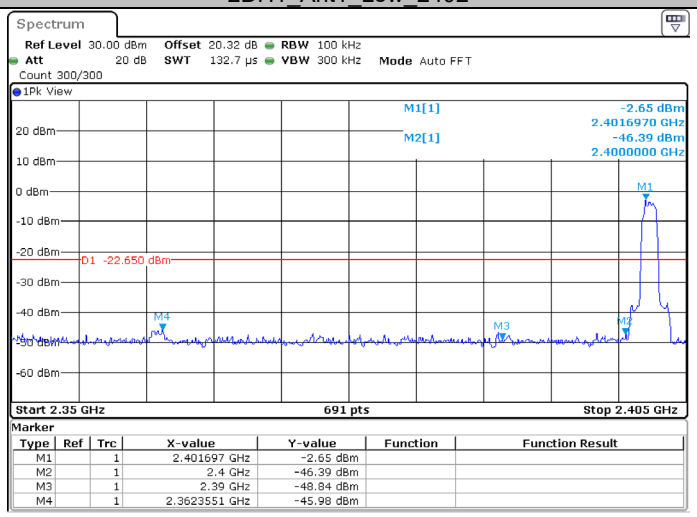
2DH1_Ant1_Low_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401697 GHz	-2.65 dBm		
M2		1	2.4 GHz	-46.39 dBm		
M3		1	2.39 GHz	-48.84 dBm		
M4		1	2.3623551 GHz	-45.98 dBm		

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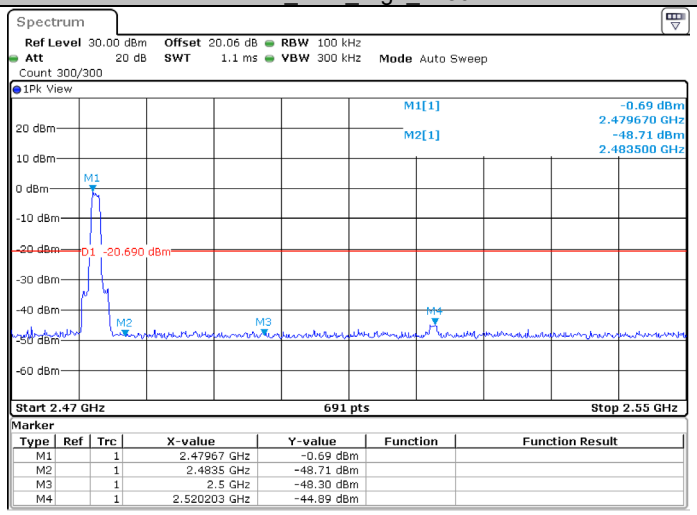
2DH1_Ant1_High_2480



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47967 GHz	-0.69 dBm		
M2		1	2.4835 GHz	-48.71 dBm		
M3		1	2.5 GHz	-48.30 dBm		
M4		1	2.520203 GHz	-44.89 dBm		

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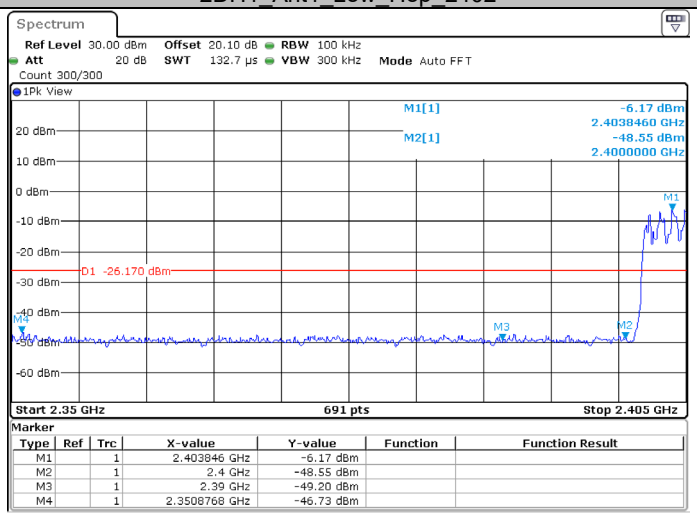
2DH1_Ant1_Low_Hop_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.403846 GHz	-6.17 dBm		
M2		1	2.4 GHz	-48.55 dBm		
M3		1	2.39 GHz	-49.20 dBm		
M4		1	2.3508768 GHz	-46.73 dBm		

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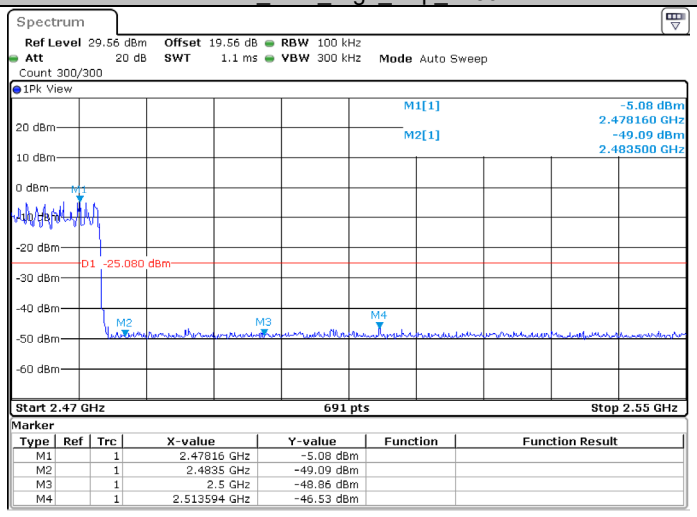
2DH1_Ant1_High_Hop_2480



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Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47816 GHz	-5.08 dBm		
M2		1	2.4835 GHz	-49.09 dBm		
M3		1	2.5 GHz	-48.86 dBm		
M4		1	2.513594 GHz	-46.53 dBm		

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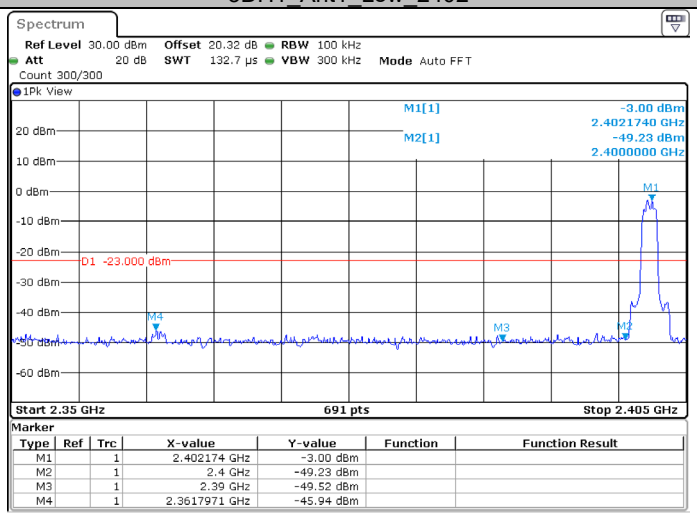
3DH1_Ant1_Low_2402



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402174 GHz	-3.00 dBm		
M2		1	2.4 GHz	-49.23 dBm		
M3		1	2.39 GHz	-49.52 dBm		
M4		1	2.3617971 GHz	-45.94 dBm		

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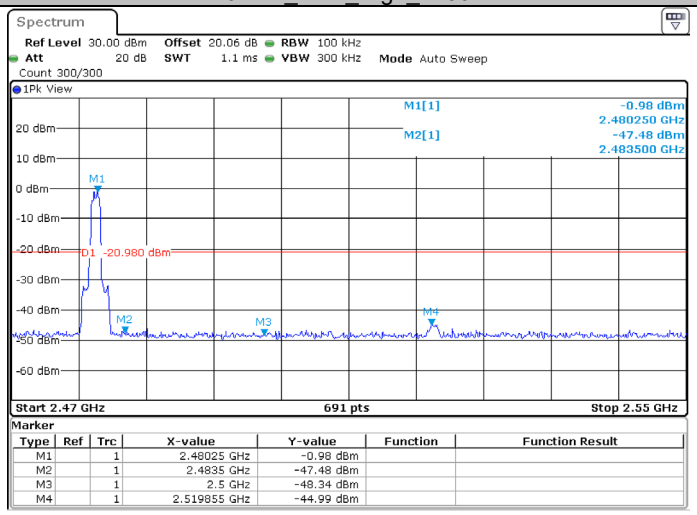
3DH1_Ant1_High_2480



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Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48025 GHz	-0.98 dBm		
M2		1	2.4835 GHz	-47.48 dBm		
M3		1	2.5 GHz	-48.34 dBm		
M4		1	2.519855 GHz	-44.99 dBm		

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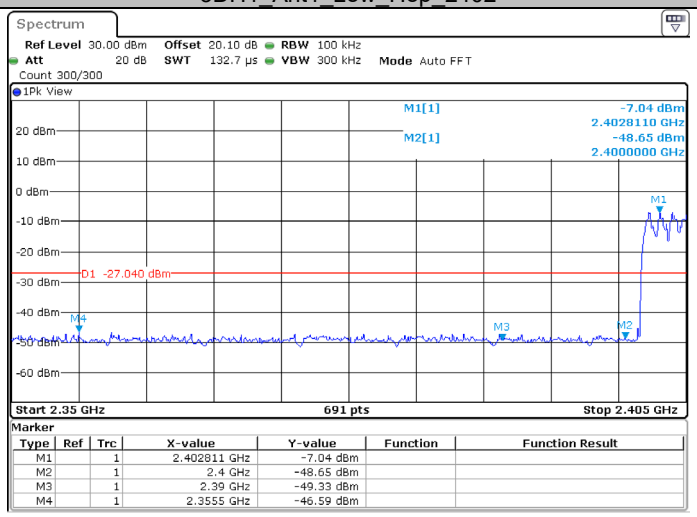
3DH1_Ant1_Low_Hop_2402



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Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402811 GHz	-7.04 dBm		
M2		1	2.4 GHz	-48.65 dBm		
M3		1	2.39 GHz	-49.33 dBm		
M4		1	2.3555 GHz	-46.59 dBm		

ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
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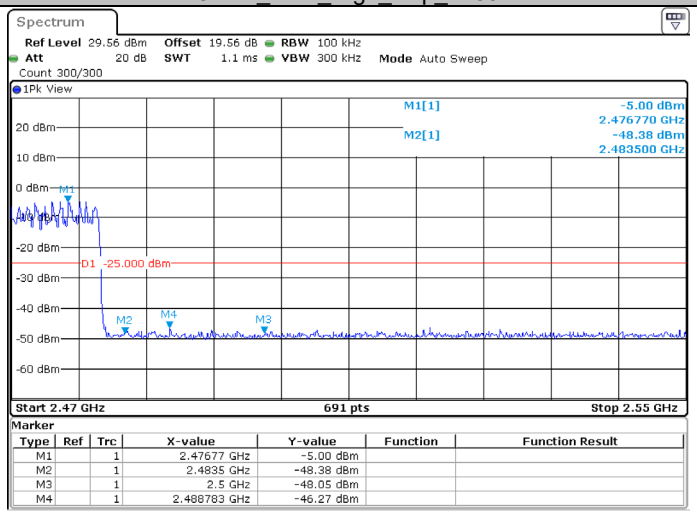
3DH1_Ant1_High_Hop_2480



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Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47677 GHz	-5.00 dBm		
M2		1	2.4835 GHz	-48.38 dBm		
M3		1	2.5 GHz	-48.05 dBm		
M4		1	2.488783 GHz	-46.27 dBm		

ProjectNo.:SZ1240205-08015E-RF Tester:Lee.Li
Date: 1.APR.2024 19:27:17

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