FCC TEST REPORT

FCC ID:2A9HZ-PA21-EDU

Product Name	:	BLUETOOTH PA SYSTEM
Model Name	:	PA21-EDU
Brand Name	:	CALIFONE
Report No.	:	PTC22080106603E-FC01
Sample ID	:	PTC22080106603E-FC01#

Prepared for

NATIONAL PUBLIC SEATING

149 ENTIN ROAD CLIFTON NJ 07014

Prepared by

Dongguan Precise Testing & Certification Co., Ltd.

Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

1TEST RESULT CERTIFICATION

Applicant's name	:	NATIONAL PUBLIC SEATING
Address	:	149 ENTIN ROAD CLIFTON NJ 07014
Manufacture's name	:	NINGBO RIXING ELECTRONICS CO.,LTD
Address	:	No. 495 SHIDAI ROAD, WUXIANG TOWN, NINGBO,CHINA
Product name	:	BLUETOOTH PA SYSTEM
Model name	:	PA21-EDU
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10:2013
Test Date	:	Sept. 04, 2022 to Sept. 18, 2022
Date of Issue	:	Sept. 19, 2022
Test Result	:	Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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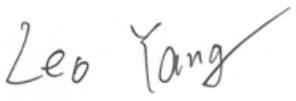
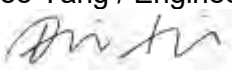
Test Engineer:



Leo Yang / Engineer

Technical Manager:



Ronnie Liu / Manager

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Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
Conduct Emission	15.207	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Antenna Requirement	15.203	PASS

Remark:

1. The EUT is powered by full-charged battery during the test.

3 TEST FACILITY

Precise Testing & Certification Co., Ltd.

Address: Building 1, No.6 Tongxin Road, Dongcheng Street, Dongguan,China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

Designation Number：CN1219

4 General Information

4.1 General Description of E.U.T.

Product Name	:	BLUETOOTH PA SYSTEM
Model Name	:	PA21-EDU
Bluetooth Version	:	BT 5.0
Operating frequency	:	2402-2480MHz
Numbers of Channel	:	79 channels
Antenna Type	:	Internal PCB Antenna
Antenna Gain	:	-0.68dBi
Type of Modulation	:	GFSK, Π/4-DQPSK, 8DPSK
Power supply	:	AC100-240V 50/60Hz and DC 12V（ battery model:TC12-7.5)
Hardware Version	:	V1.0
Software Version	:	V1.0

4.2 Test Mode

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonics of the highest fundamental frequency or to 40 GHz, whichever is lower).

The EUT has been tested under TX operating condition.

This EUT is a FHSS system, were conducted to determine the final configuration from all possible combinations. We use software control the EUT, Let EUT hopping on and transmit with highest power, all the modes GFSK, Π/4-DQPSK, 8DPSK have been tested. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	-	-

EUT was tested with channel 0, 39, 78.

5 Equipment During Test

5.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Last calibration	Calibration Due	Calibration period
MXA Signal Analyzer	Agilent	N9020A	MY56070279	Aug. 20, 2022	Aug. 19, 2023	1 year
Coaxial Cable	CDS	79254	46107086	Aug. 20, 2022	Aug. 19, 2023	1 year
Power Meter	Anritsu	ML2495A	0949003	Aug. 20, 2022	Aug. 19, 2023	1 year
Power Sensor	Anritsu	MA2411B	0917017	Aug. 20, 2022	Aug. 19, 2023	1 year
Spectrum Analyzer	Rohde&Schwarz	FSU26	1166.1660.26	Aug. 20, 2022	Aug. 19, 2023	1 year
Scope	Tektronix	TDS3032B	B014131	Aug. 21, 2022	Aug. 20, 2023	1 year
DC power	eTOMENS	eTM-1560	--	Aug. 21, 2022	Aug. 20, 2023	1 year

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Last calibration	Calibration Due	Calibration period
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Aug. 20, 2022	Aug. 19, 2023	1 year
Loop Antenna	Schwarzbeck	FMZB 1519	012	Aug. 20, 2022	Aug. 19, 2023	1 year
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	Aug. 20, 2022	Aug. 19, 2023	1 year
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	Aug. 20, 2022	Aug. 19, 2023	1 year
Cable	Schwarzbeck	PLF-100	549489	Aug. 20, 2022	Aug. 19, 2023	1 year
Spectrum Analyzer	Agilent	E4407B	MY45109572	Aug. 20, 2022	Aug. 19, 2023	1 year
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	Aug. 20, 2022	Aug. 19, 2023	1 year
Power Amplifier	LUNAR EM	LNA1G18-40	J1010000008 1	Aug. 20, 2022	Aug. 19, 2023	1 year
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-181	Aug. 20, 2022	Aug. 19, 2023	1 year
Amplifier	SCHWARZBECK	BBV 9721	9721-205	Aug. 20, 2022	Aug. 19, 2023	1 year

Cable	H+S	CBL-26	N/A	Aug. 20, 2022	Aug. 19, 2023	1 year
RF Cable	R&S	R204	R21X	Aug. 20, 2022	Aug. 19, 2023	1 year

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Last calibration	Calibration Due	Calibration period
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Aug. 20, 2022	Aug. 19, 2023	1 year
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	Aug. 20, 2022	Aug. 19, 2023	1 year
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	Aug. 20, 2022	Aug. 19, 2023	1 year

5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9kHz~30MHz)	±2.54dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

5.3 Description of Support Units

Equipment	Model No.	Series No.
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6 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method:	:	ANSI C63.10:2013
Test Result:	:	PASS
Frequency Range:	:	150kHz to 30MHz
Class/Severity:	:	Class B
Detector:	:	Peak for pre-scan (9kHz Resolution Bandwidth)

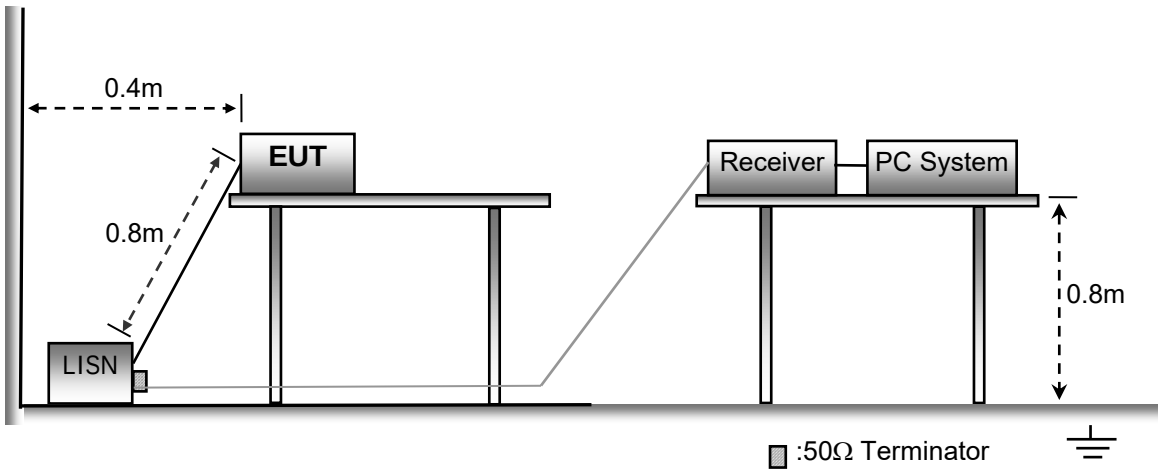
6.1 E.U.T. Operation

Operating Environment **:**

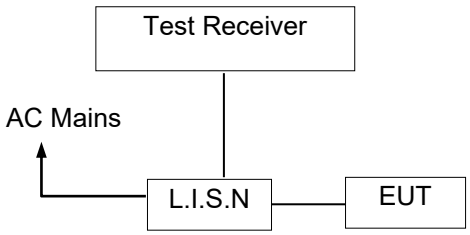
Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa
Test Voltage	:	AC 120V/60Hz

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10: 2013



6.3 Test SET-UP (Block Diagram of Configuration)



6.4 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.

2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

3. Repeat above procedures until all frequency measured was complete.

6.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies
2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

6.6 Measurement Description

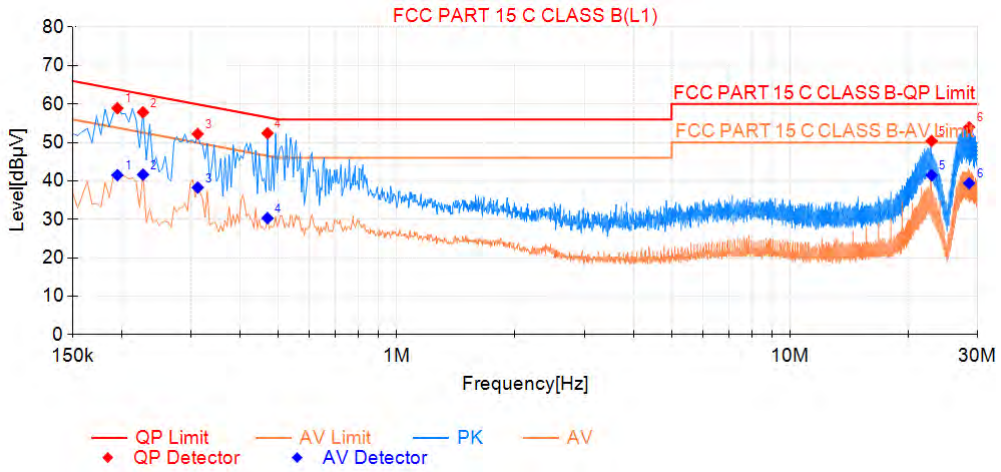
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.7 Conducted Emission Test Result

Pass.

All the modulation modes were tested with 120V and 230V and the data of the worst mode (AC 120V/60Hz, GFSK TX 2402MHz) are recorded in the following pages and the others modulation methods do not exceed the limits.

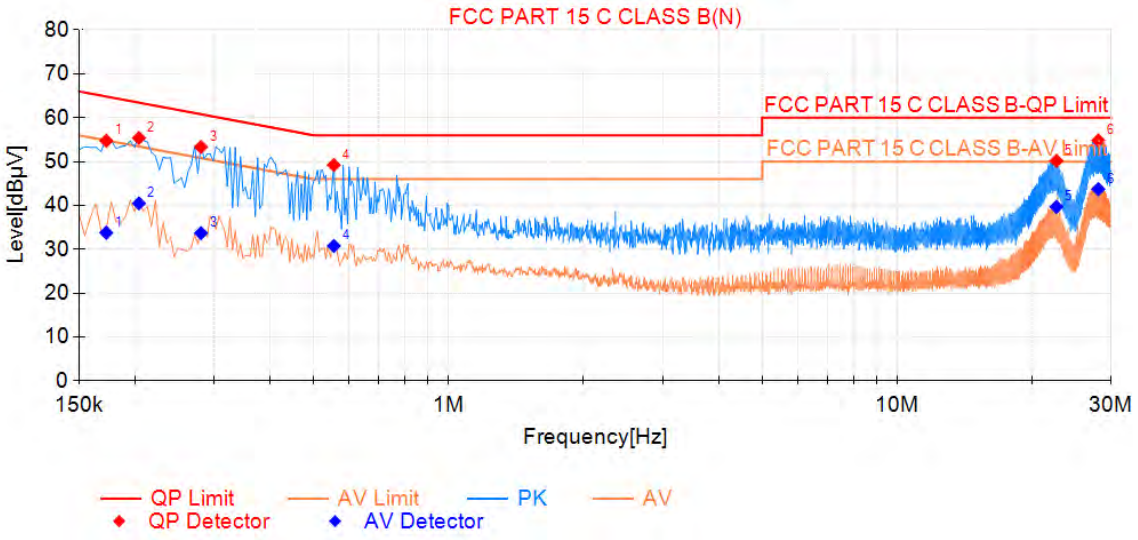
Line -120V/60Hz:



Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.195	58.91	63.82	4.91	41.51	53.82	12.31	PASS
2	0.227	57.86	62.58	4.72	41.65	52.58	10.93	PASS
3	0.312	52.22	59.92	7.70	38.28	49.92	11.64	PASS
4	0.470	52.43	56.52	4.09	30.32	46.52	16.20	PASS
5	22.920	50.42	60.00	9.58	41.48	50.00	8.52	PASS
6	28.536	53.96	60.00	6.04	39.40	50.00	10.60	PASS

Remark:Emission Level=Reading+Cable Loss+LISN Factor

Neutral -120V/60Hz:



Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.173	54.75	64.84	10.09	33.79	54.84	21.05	PASS
2	0.204	55.39	63.45	8.06	40.48	53.45	12.97	PASS
3	0.281	53.33	60.80	7.47	33.70	50.80	17.10	PASS
4	0.555	49.22	56.00	6.78	30.77	46.00	15.23	PASS
5	22.655	50.18	60.00	9.82	39.68	50.00	10.32	PASS
6	28.091	54.83	60.00	5.17	43.72	50.00	6.28	PASS

Remark:Emission Level=Reading+Cable Loss+LISN Factor

7 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method : ANSI C63.10:2013

Test Result : PASS

Measurement Distance : 3m

Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment :

Temperature : 23.5 °C

Humidity : 51.1 % RH

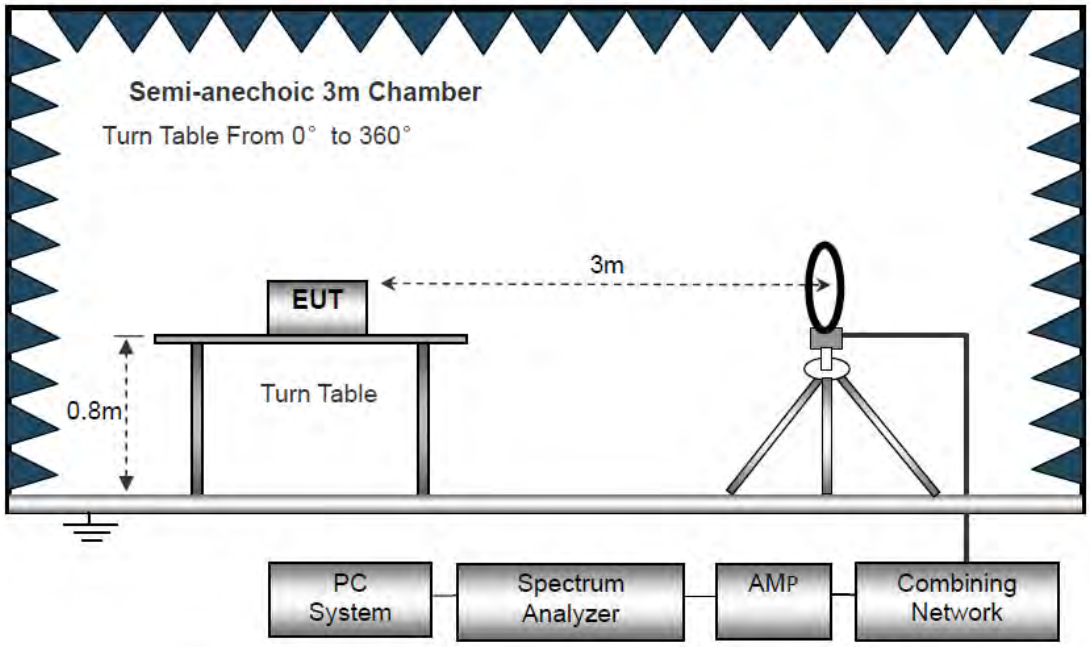
Atmospheric Pressure : 101.2kPa

Test Voltage : AC 120V 60Hz

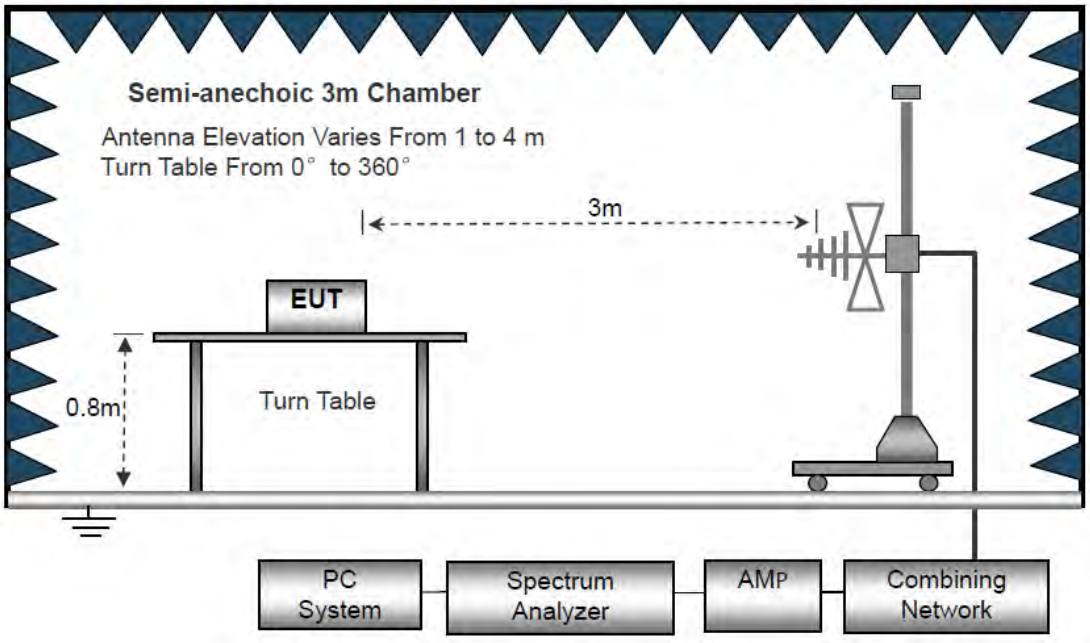
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

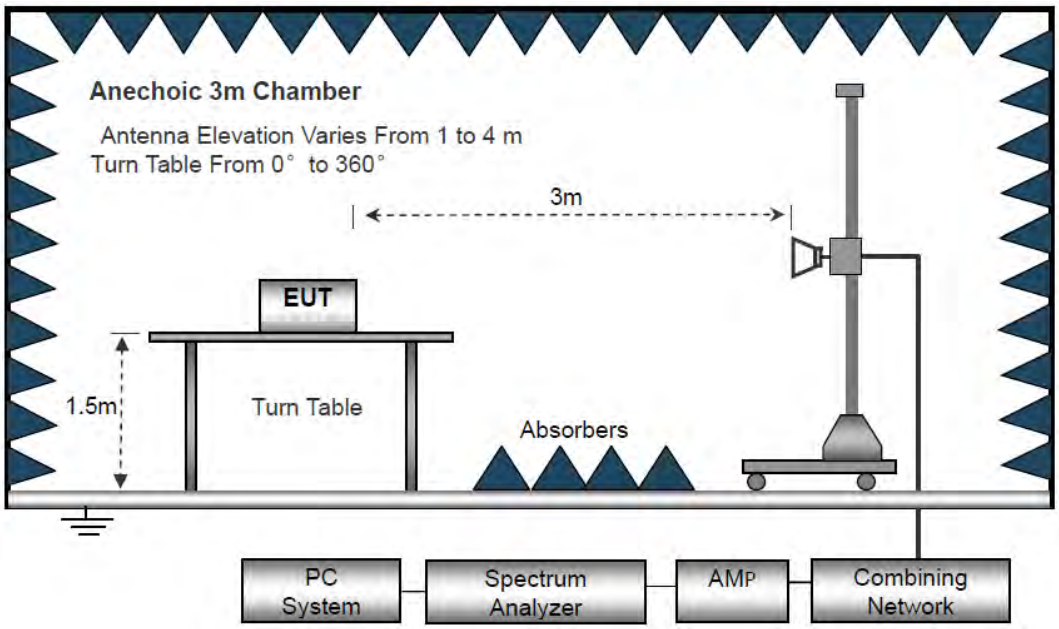
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2013.

2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.

7. Test Procedure of measurement (For Above 1GHz):

1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).

2) Change the antenna polarization and repeat 1) with vertical polarization.

3) Make a hardcopy of the spectrum.

4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.

5) Change the analyser mode to Clear/ Write and found the cone of emission.

6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.

7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.

8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

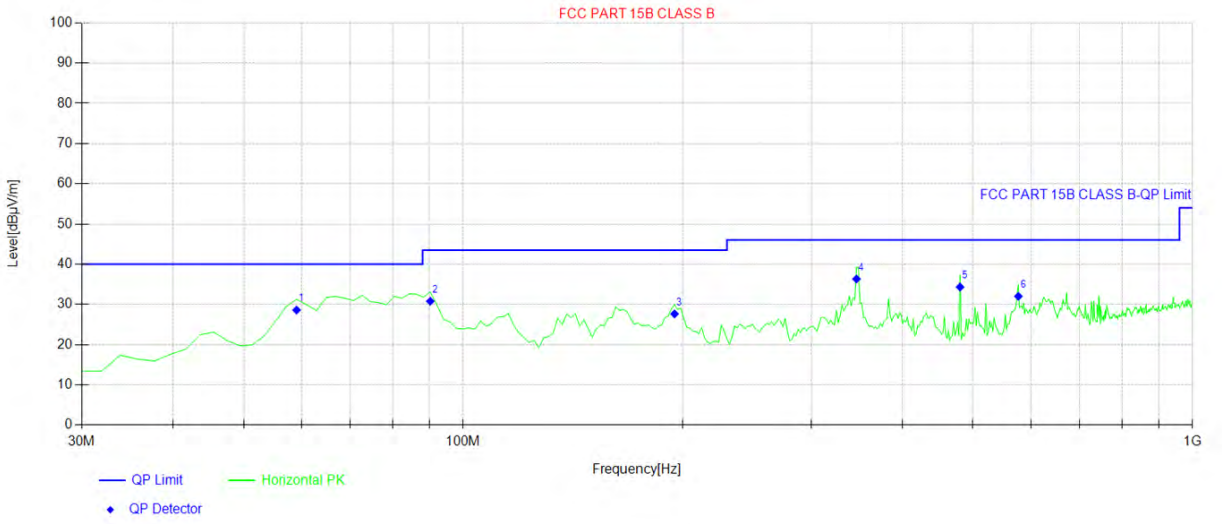
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

Please refer to the following test plots:

All the modulation modes were tested the data of the worst mode (GFSK TX 2402MHz) are recorded in the following pages and the others modulation methods do not exceed the limits.

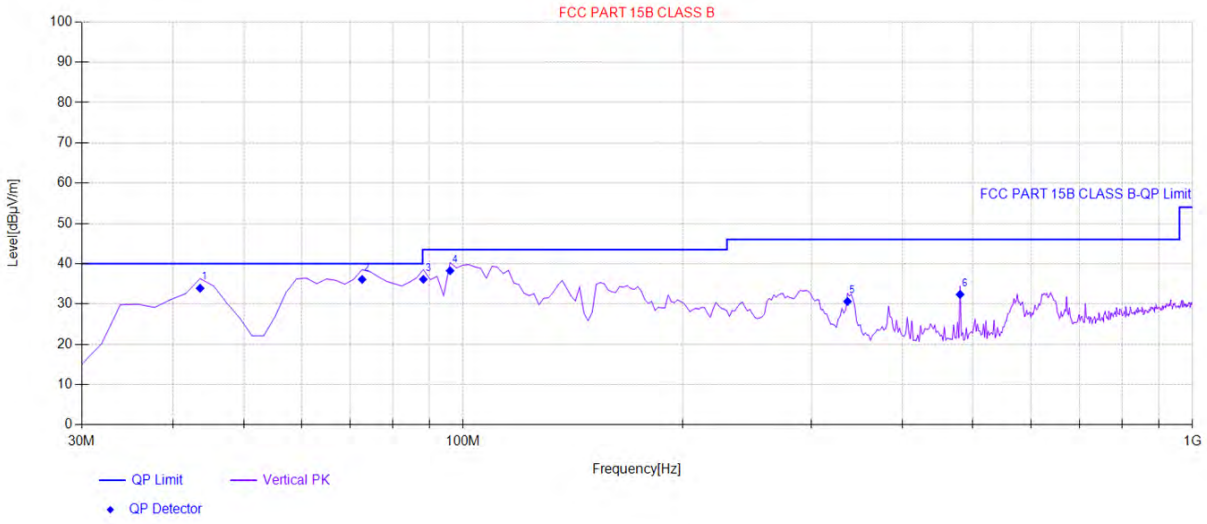
Test plot for Horizontal: GFSK(2402MHz)



Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	59.10	46.46	-17.85	28.61	40.00	11.39	Horizontal
2	90.14	51.45	-20.64	30.81	43.50	12.69	Horizontal
3	194.90	46.1	-18.46	27.64	43.50	15.86	Horizontal
4	346.22	50.68	-14.35	36.33	46.00	9.67	Horizontal
5	480.08	45.69	-11.36	34.33	46.00	11.67	Horizontal
6	577.08	40.89	-8.87	32.02	46.00	13.98	Horizontal

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Test plot for Vertical: GFSK(2402MHz)



Final Data List[QP]							
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	43.58	51.45	-17.55	33.90	40.00	6.10	Vertical
2	72.68	56.11	-20.00	36.11	40.00	3.89	Vertical
3	88.20	56.92	-20.78	36.14	43.50	7.36	Vertical
4	95.96	58.44	-20.19	38.25	43.50	5.25	Vertical
5	336.52	45.14	-14.51	30.63	46.00	15.37	Vertical
6	480.08	43.74	-11.36	32.38	46.00	13.62	Vertical

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Test Frequency 1GHz-25GHz

Low Channel (2402MHz) Worst case GFSK

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4824	29.75	AV	V	8.18	10.46	10.43	37.96	54	-16.04
4824	30.26	AV	H	8.18	10.46	10.43	38.47	54	-15.53
4824	32.14	PK	V	8.18	10.46	10.43	40.35	74	-33.65
4824	35.29	PK	H	8.18	10.46	10.43	43.5	74	-30.5
14859	30.26	AV	V	9.22	11.05	12.36	38.17	54	-15.83
14859	31.47	AV	H	9.22	11.05	12.36	39.38	54	-14.62
14859	34.29	PK	V	9.22	11.05	12.36	42.2	74	-31.8
14859	36.28	PK	H	9.22	11.05	12.36	44.19	74	-29.81

Middle Channel (2441MHz) Worst case π/4-DQPSK

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882	28.43	AV	V	7.86	9.73	10.75	35.27	54	-18.73
4882	30.12	AV	H	7.86	9.73	10.75	36.96	54	-17.04
4882	32.69	PK	V	7.86	9.73	10.75	39.53	74	-34.47
4882	35.06	PK	H	7.86	9.73	10.75	41.9	74	-32.1
15896	29.43	AV	V	8.25	10.29	11.23	36.74	54	-17.26
15896	30.27	AV	H	8.25	10.29	11.23	37.58	54	-16.42
15896	33.29	PK	V	8.25	10.29	11.23	40.6	74	-33.4
15896	35.74	PK	H	8.25	10.29	11.23	43.05	74	-30.95

High Channel (2480MHz) Worst case GFSK

Frequency (MHz)	S.A Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4960	29.35	AV	V	8.23	9.86	11.46	35.98	54	-18.02
4960	30.22	AV	H	8.23	9.86	11.46	36.85	54	-17.15
4960	33.37	PK	V	8.23	9.86	11.46	40	74	-34
4960	36.29	PK	H	8.23	9.86	11.46	42.92	74	-31.08
15483	30.29	AV	V	9.32	10.24	12.09	37.76	54	-16.24
15483	32.48	AV	H	9.32	10.24	12.09	39.95	54	-14.05
15483	35.98	PK	V	9.32	10.24	12.09	43.45	74	-30.55
15483	37.29	PK	H	9.32	10.24	12.09	44.76	74	-29.24

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
Margin=Emission Level-Limit

8 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

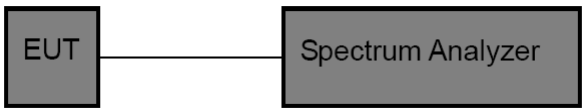
8.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.2 TEST PROCEDURE

For Conducted Test

1. The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100KHz. The video bandwidth is set to 300KHz.
2. Test setup



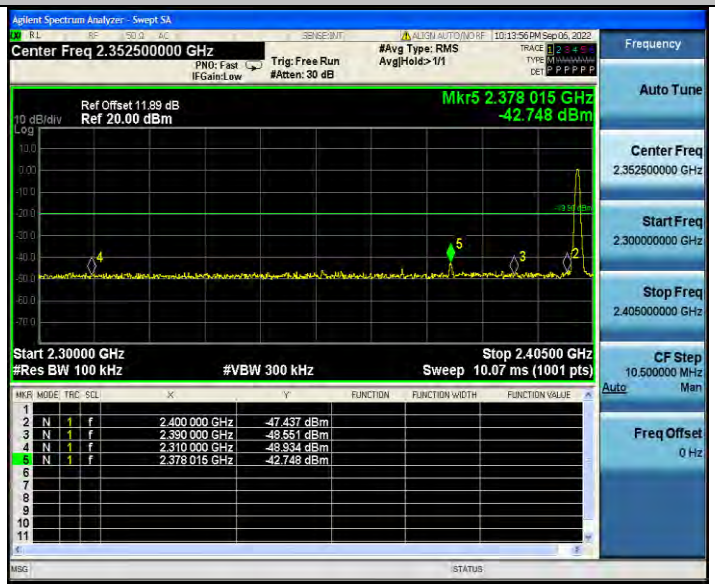
3. The spectrum from 30MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

EMI Test Receiver	Setting
Attenuation	Auto
RBW	100KHz
VBW	300KHz
Detector	Peak
Trace	Max hold

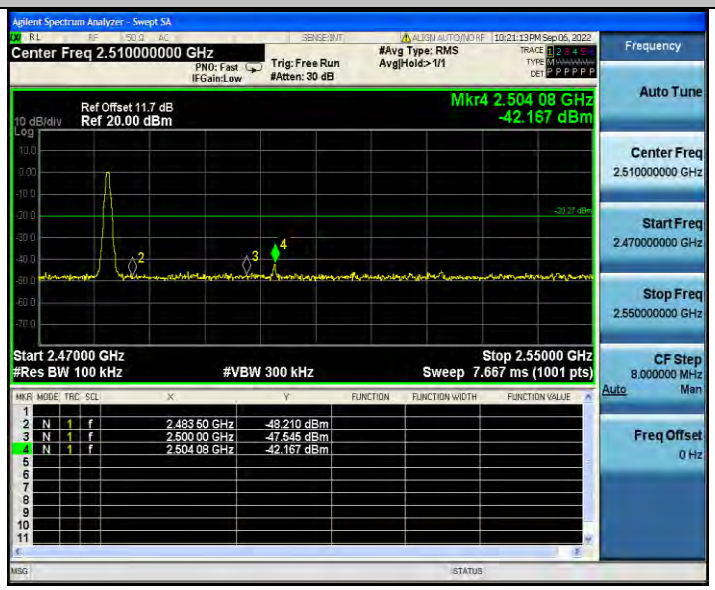
8.3 TEST RESULTS

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	0.10	-42.75	≤-19.9	PASS
		High	2480	-0.27	-42.17	≤-20.27	PASS
		Low	Hop_2402	-0.10	-44.01	≤-20.1	PASS
		High	Hop_2480	-0.01	-44.45	≤-20.01	PASS
2DH5	Ant1	Low	2402	0.06	-45.51	≤-19.94	PASS
		High	2480	-0.04	-44.04	≤-20.04	PASS
		Low	Hop_2402	-2.04	-44.75	≤-22.04	PASS
		High	Hop_2480	-0.73	-45.09	≤-20.73	PASS
3DH5	Ant1	Low	2402	0.34	-44.52	≤-19.66	PASS
		High	2480	-0.03	-45.19	≤-20.03	PASS
		Low	Hop_2402	-3.65	-45.19	≤-23.65	PASS
		High	Hop_2480	-3.06	-45.28	≤-23.06	PASS

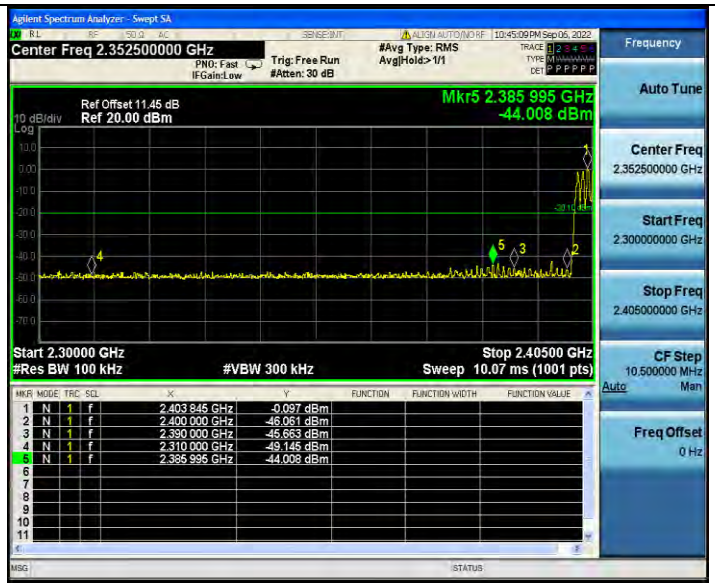
DH5_Ant1_Low_2402



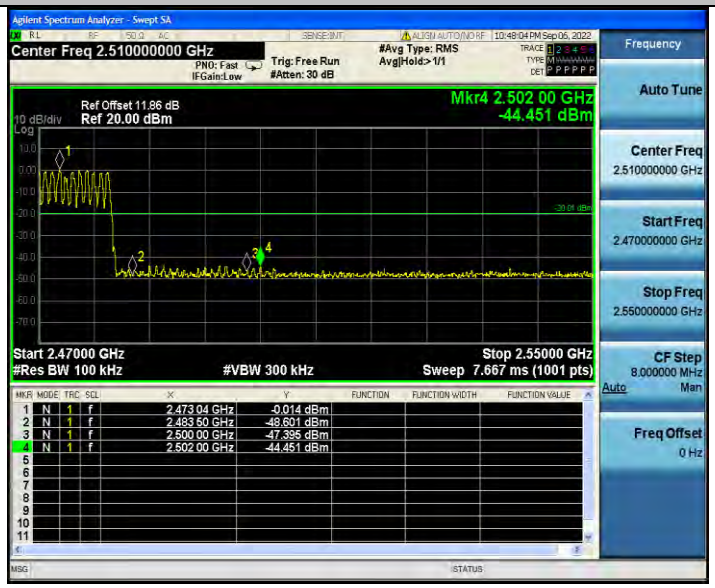
DH5_Ant1_High_2480



DH5_Ant1_Low_Hop_2402

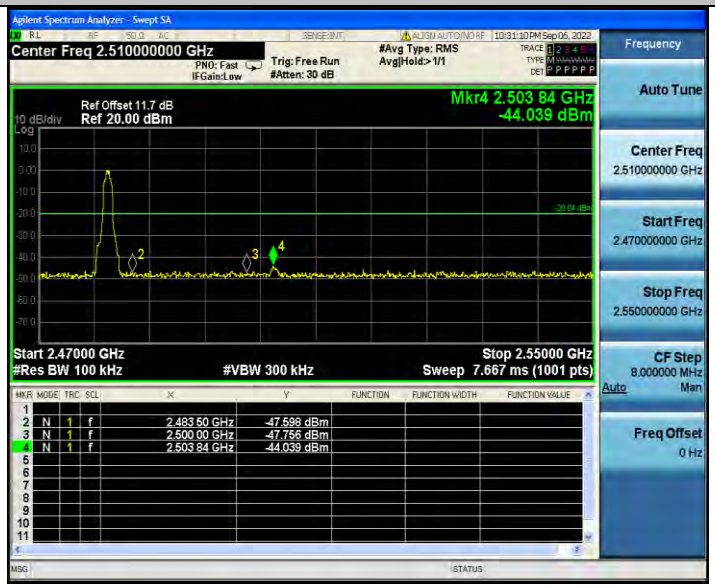


DH5_Ant1_High_Hop_2480

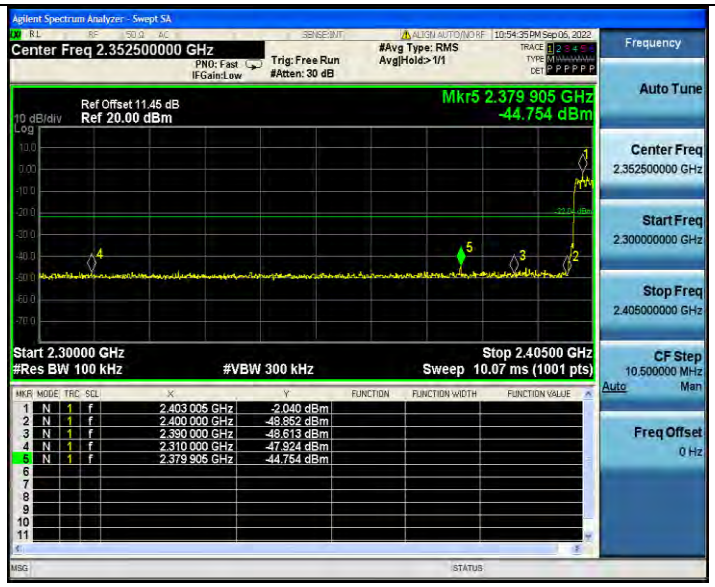


2DH5_Ant1_Low_2402

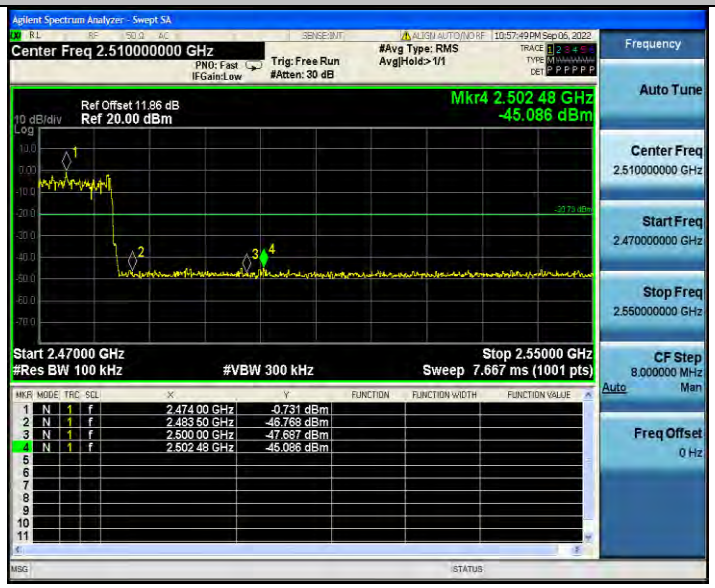
2DH5_Ant1_High_2480



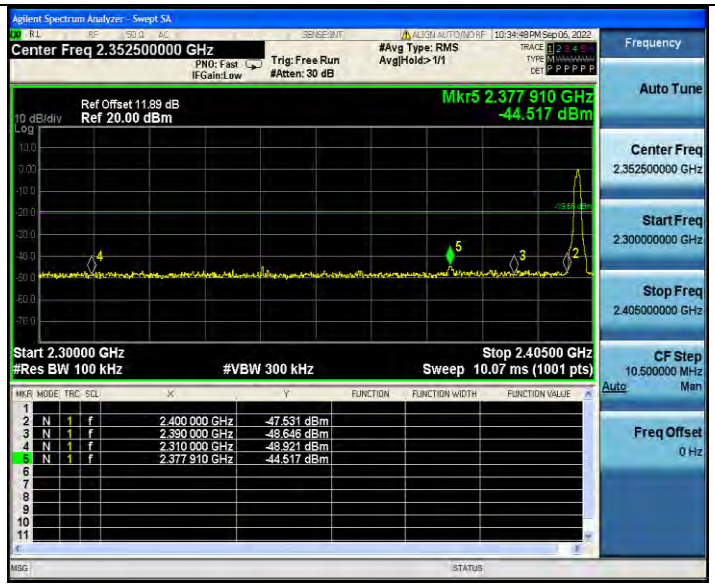
2DH5_Ant1_Low_Hop_2402



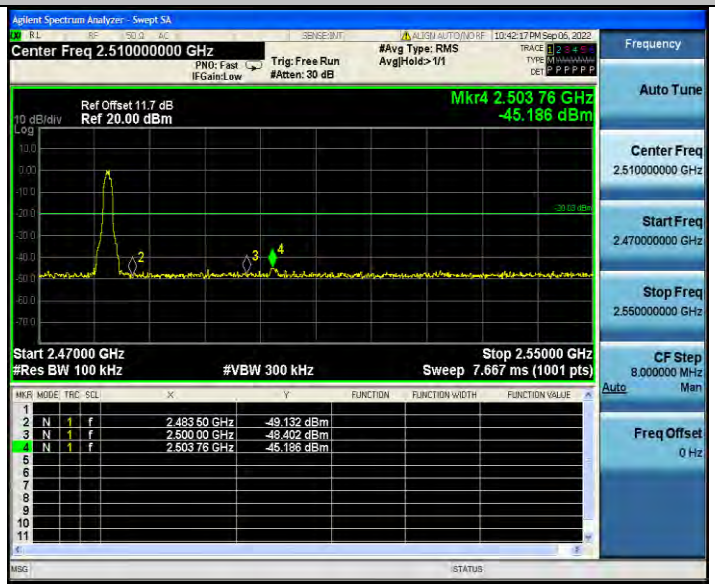
2DH5_Ant1_High_Hop_2480



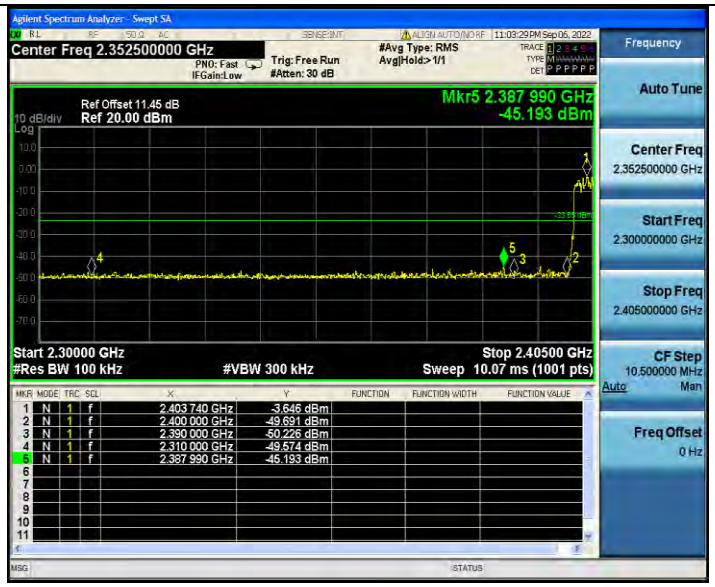
3DH5_Ant1_Low_2402



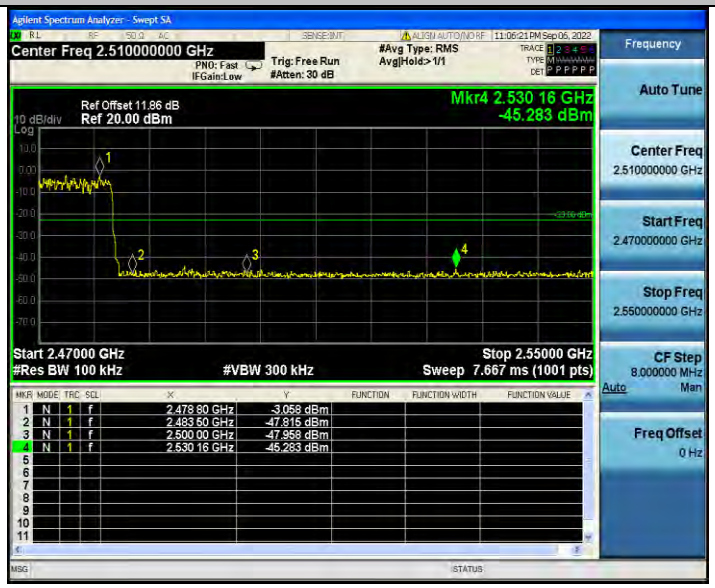
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



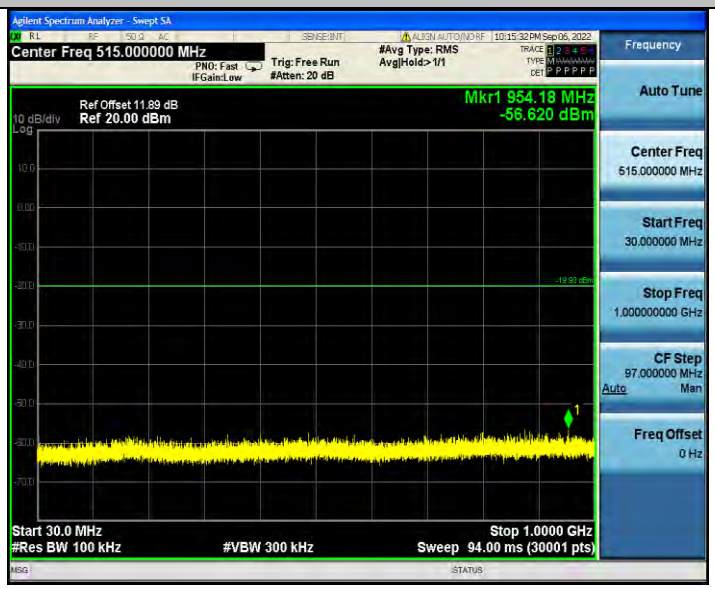
Conduct spurious emissions

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	0.10	-56.62	≤-19.9	PASS
			1000~26500	0.10	-41.82	≤-19.9	PASS
		2441	30~1000	0.15	-56.36	≤-19.85	PASS
			1000~26500	0.15	-42.52	≤-19.85	PASS
		2480	30~1000	-0.27	-57.39	≤-20.27	PASS
			1000~26500	-0.27	-42.51	≤-20.27	PASS
2DH5	Ant1	2402	30~1000	0.06	-56.87	≤-19.94	PASS
			1000~26500	0.06	-41.77	≤-19.94	PASS
		2441	30~1000	0.23	-56.12	≤-19.77	PASS
			1000~26500	0.23	-42.16	≤-19.77	PASS
		2480	30~1000	-0.04	-56.55	≤-20.04	PASS
			1000~26500	-0.04	-42.44	≤-20.04	PASS
3DH5	Ant1	2402	30~1000	0.34	-57.26	≤-19.66	PASS
			1000~26500	0.34	-42.33	≤-19.66	PASS
		2441	30~1000	0.36	-57.03	≤-19.64	PASS
			1000~26500	0.36	-42.03	≤-19.64	PASS
		2480	30~1000	-0.03	-56.09	≤-20.03	PASS
			1000~26500	-0.03	-41.41	≤-20.03	PASS

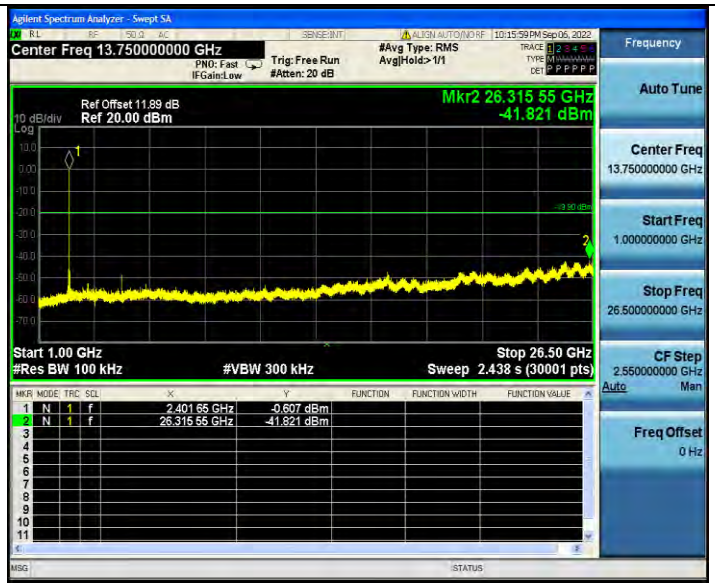
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	0.10	-56.62	≤-19.9	PASS
			1000~26500	0.10	-41.82	≤-19.9	PASS
		2441	30~1000	0.15	-56.36	≤-19.85	PASS
			1000~26500	0.15	-42.52	≤-19.85	PASS
		2480	30~1000	-0.27	-57.39	≤-20.27	PASS

			1000~26500	-0.27	-42.51	≤-20.27	PASS
2DH5	Ant1	2402	30~1000	0.06	-56.87	≤-19.94	PASS
			1000~26500	0.06	-41.77	≤-19.94	PASS
		2441	30~1000	0.23	-56.12	≤-19.77	PASS
			1000~26500	0.23	-42.16	≤-19.77	PASS
		2480	30~1000	-0.04	-56.55	≤-20.04	PASS
			1000~26500	-0.04	-42.44	≤-20.04	PASS
3DH5	Ant1	2402	30~1000	0.34	-57.26	≤-19.66	PASS
			1000~26500	0.34	-42.33	≤-19.66	PASS
		2441	30~1000	0.36	-57.03	≤-19.64	PASS
			1000~26500	0.36	-42.03	≤-19.64	PASS
		2480	30~1000	-0.03	-56.09	≤-20.03	PASS
			1000~26500	-0.03	-41.41	≤-20.03	PASS

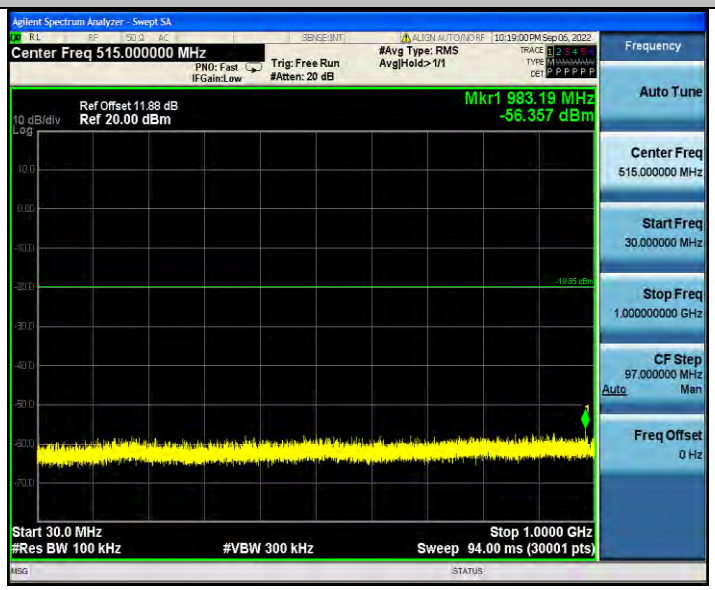
DH5_Ant1_2402_30~1000



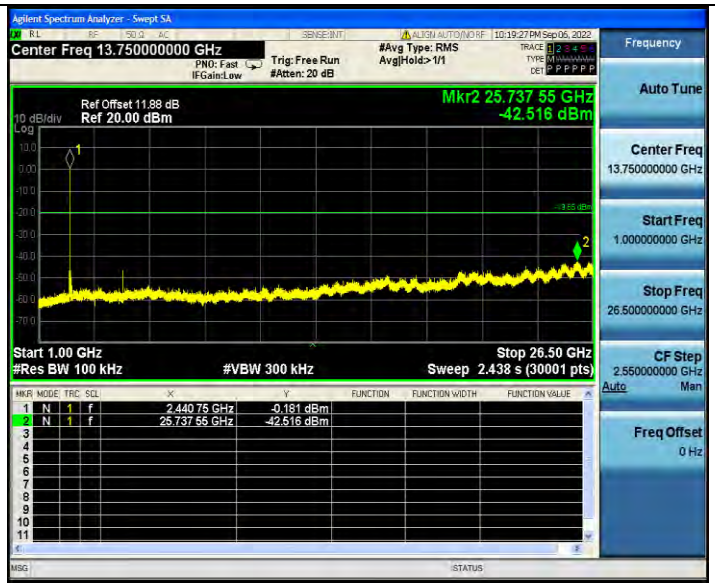
DH5_Ant1_2402_1000~26500



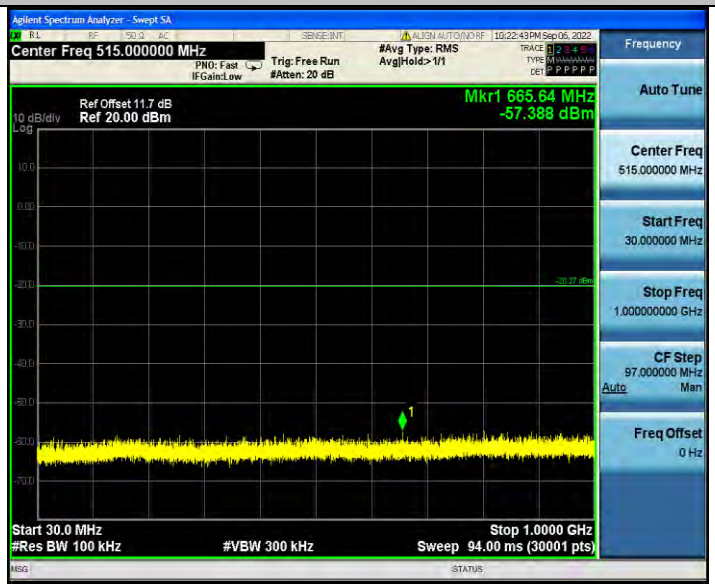
DH5_Ant1_2441_30~1000



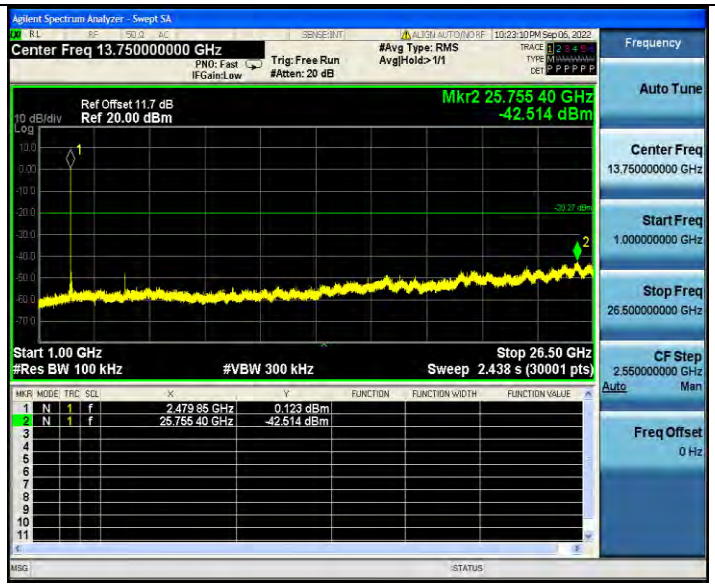
DH5_Ant1_2441_1000~26500



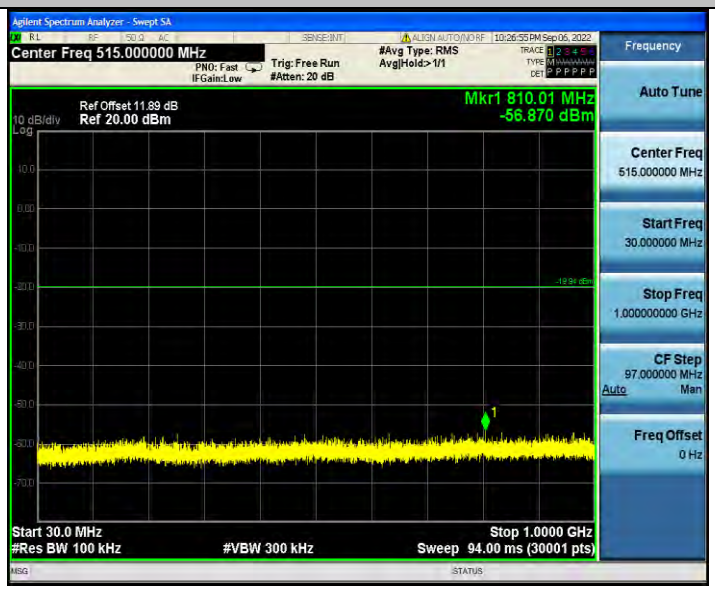
DH5_Ant1_2480_30~1000



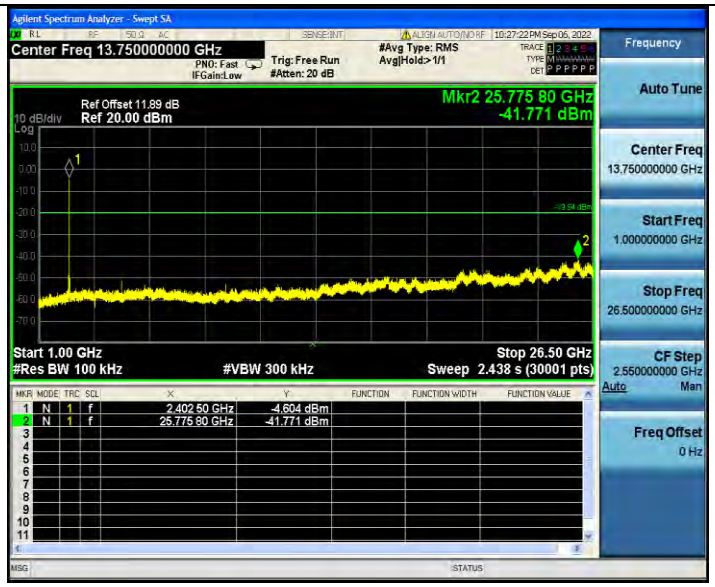
DH5_Ant1_2480_1000~26500



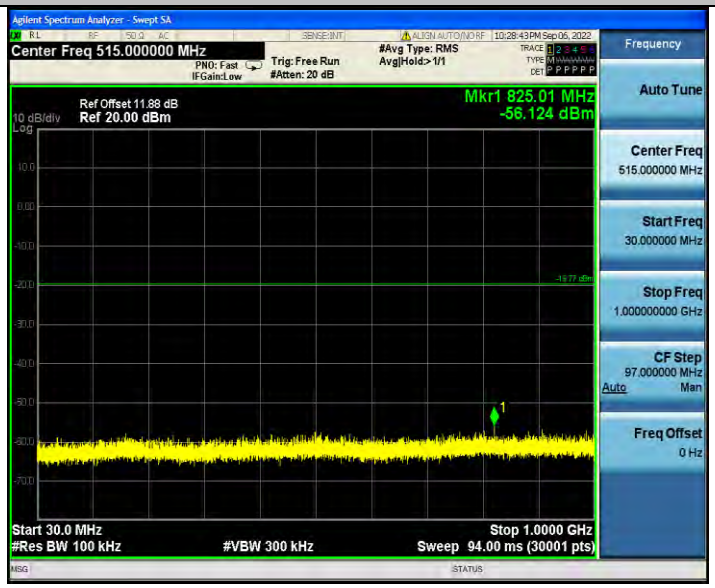
2DH5_Ant1_2402_30~1000



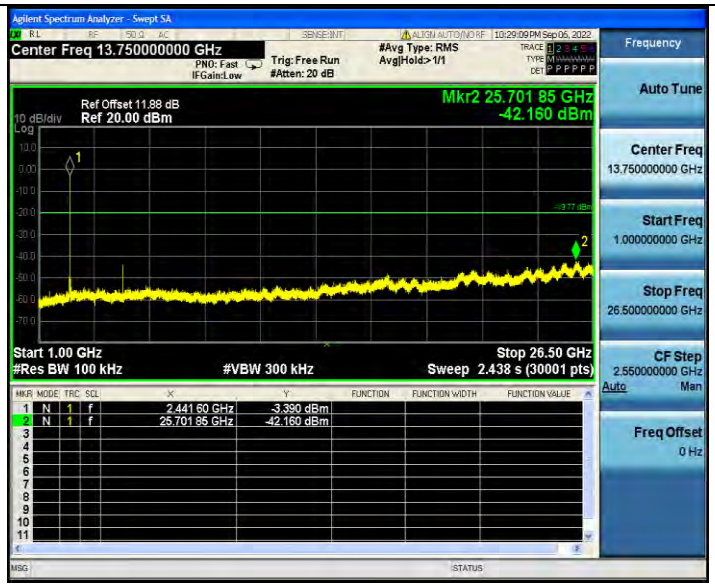
2DH5_Ant1_2402_1000~26500



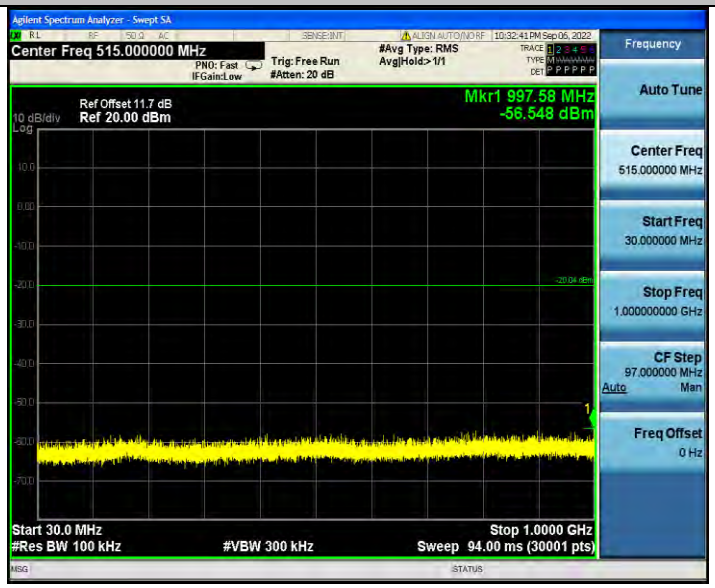
2DH5_Ant1_2441_30~1000



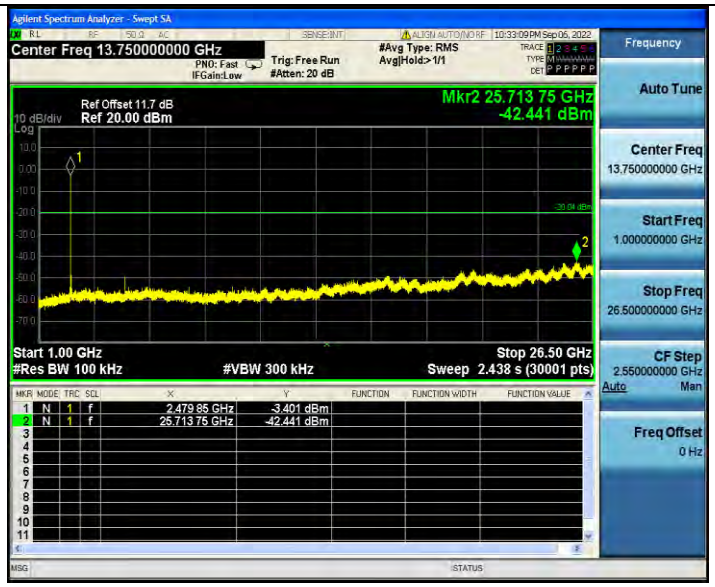
2DH5_Ant1_2441_1000~26500



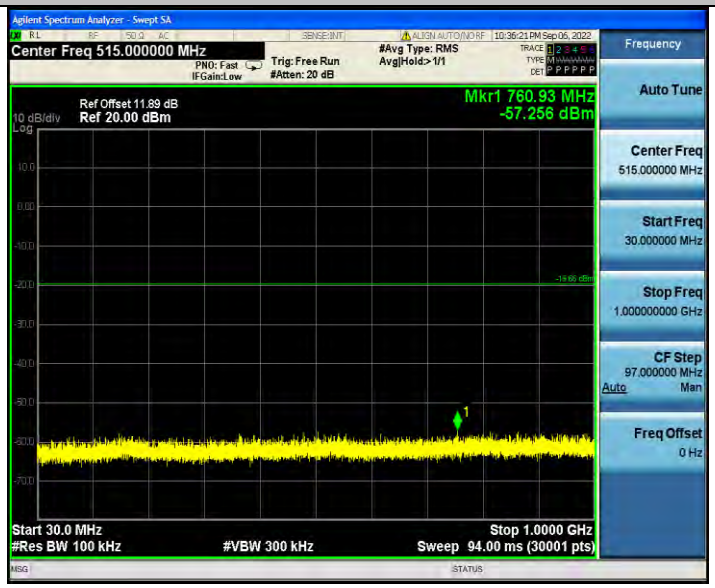
2DH5_Ant1_2480_30~1000



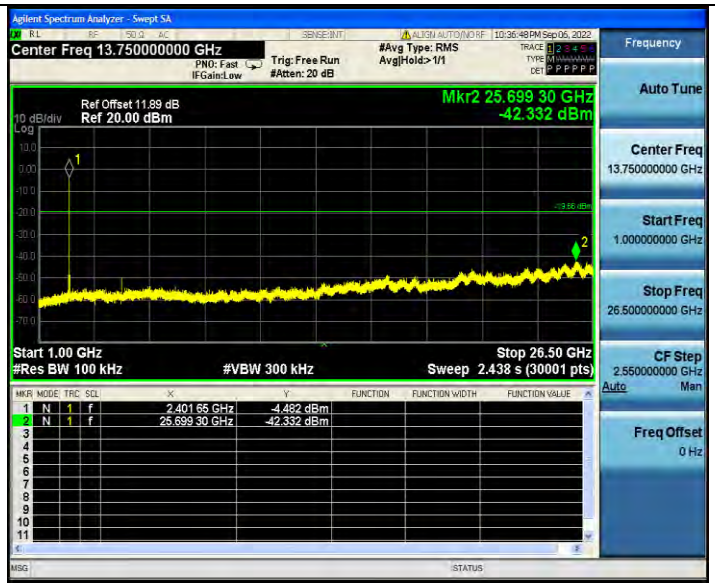
2DH5_Ant1_2480_1000~26500



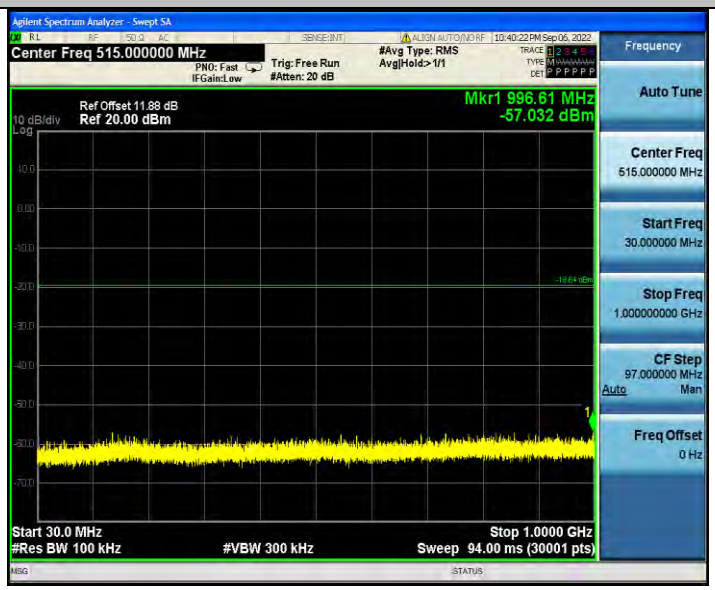
3DH5_Ant1_2402_30~1000



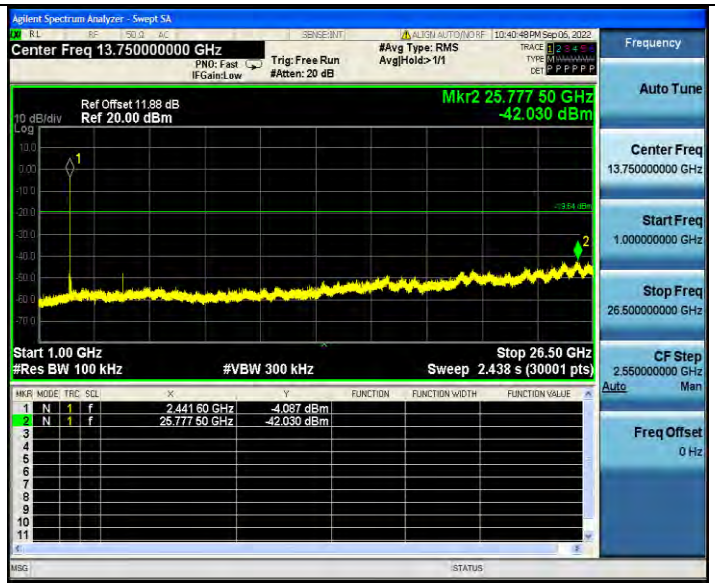
3DH5_Ant1_2402_1000~26500



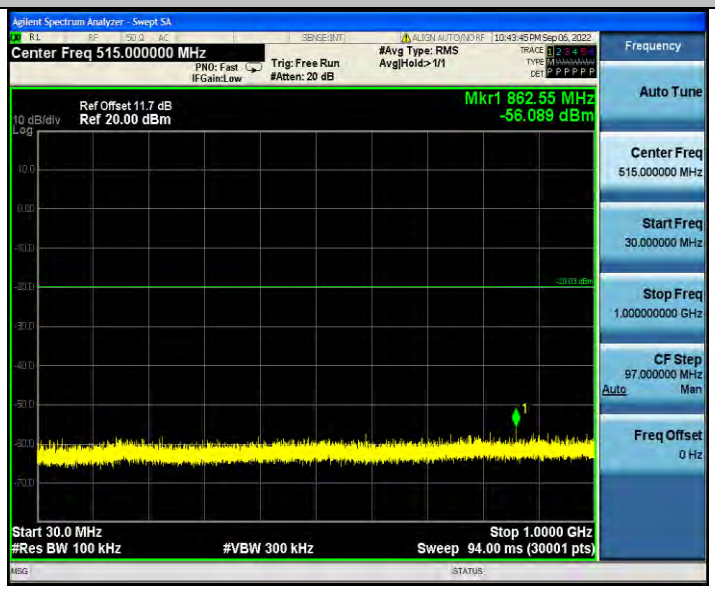
3DH5_Ant1_2441_30~1000



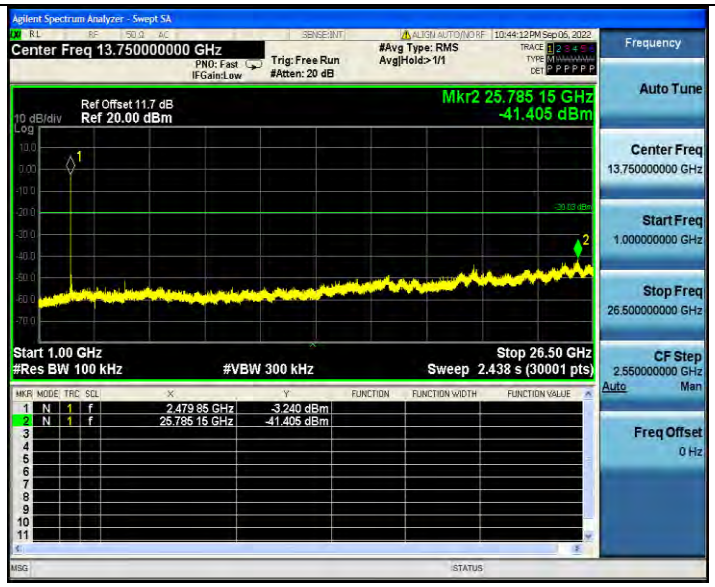
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

TestMode	Antenna	ChName	Frequency[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-45.84	≤-41.20	49.36	≤54	PASS
				AV	2378.015	-42.45	≤-41.20	52.75	≤54	PASS
				AV	2390.000	-45.33	≤-41.20	49.87	≤54	PASS
				Peak	2310.000	-36.22	≤-21.20	58.98	≤74	PASS
				Peak	2378.435	-32.71	≤-21.20	62.49	≤74	PASS
				Peak	2390.000	-35.59	≤-21.20	59.61	≤74	PASS
		High	2480	AV	2483.500	-45.17	≤-41.20	50.03	≤54	PASS
				AV	2498.400	-45.14	≤-41.20	50.06	≤54	PASS

				AV	2500.000	-45.17	≤-41.20	50.03	≤54	PASS
				Peak	2483.500	-35.07	≤-21.20	60.13	≤74	PASS
				Peak	2491.200	-33.11	≤-21.20	62.09	≤74	PASS
				Peak	2500.000	-34.84	≤-21.20	60.36	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-36.56	≤-21.20	58.64	≤74	PASS
				Peak	2389.460	-33.99	≤-21.20	61.21	≤74	PASS
				Peak	2390.000	-35.79	≤-21.20	59.41	≤74	PASS
		High	Hop_2480	Peak	2483.500	-34.85	≤-21.20	60.35	≤74	PASS
				Peak	2494.000	-32.7	≤-21.20	62.50	≤74	PASS
				Peak	2500.000	-34.83	≤-21.20	60.37	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-45.82	≤-41.20	49.38	≤54	PASS
				AV	2378.015	-43.31	≤-41.20	51.89	≤54	PASS
				AV	2390.000	-45.3	≤-41.20	49.90	≤54	PASS
				Peak	2310.000	-36.11	≤-21.20	59.09	≤74	PASS
				Peak	2378.435	-32.98	≤-21.20	62.22	≤74	PASS
				Peak	2390.000	-35.26	≤-21.20	59.94	≤74	PASS
		High	2480	AV	2483.500	-45.14	≤-41.20	50.06	≤54	PASS
				AV	2496.880	-45.13	≤-41.20	50.07	≤54	PASS
				AV	2500.000	-45.14	≤-41.20	50.06	≤54	PASS

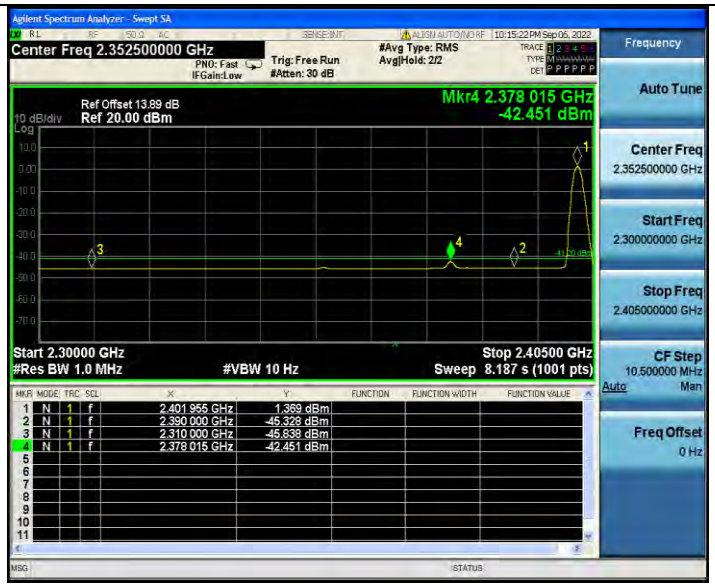
				Peak	2483.500	-35.36	≤-21.20	59.84	≤74	PASS
				Peak	2493.920	-33.76	≤-21.20	61.44	≤74	PASS
				Peak	2500.000	-35.05	≤-21.20	60.15	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-36.87	≤-21.20	58.33	≤74	PASS
				Peak	2366.150	-34.02	≤-21.20	61.18	≤74	PASS
				Peak	2390.000	-35.71	≤-21.20	59.49	≤74	PASS
		High	Hop_2480	Peak	2483.500	-35.63	≤-21.20	59.57	≤74	PASS
				Peak	2498.480	-33.72	≤-21.20	61.48	≤74	PASS
				Peak	2500.000	-34.8	≤-21.20	60.40	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-45.83	≤-41.20	49.37	≤54	PASS
				AV	2378.015	-43.26	≤-41.20	51.94	≤54	PASS
				AV	2390.000	-45.33	≤-41.20	49.87	≤54	PASS
				Peak	2310.000	-35.22	≤-21.20	59.98	≤74	PASS
				Peak	2377.595	-33.33	≤-21.20	61.87	≤74	PASS
				Peak	2390.000	-35.84	≤-21.20	59.36	≤74	PASS
		High	2480	AV	2483.500	-45.11	≤-41.20	50.09	≤54	PASS
				AV	2483.520	-45.11	≤-41.20	50.09	≤54	PASS
				AV	2500.000	-45.12	≤-41.20	50.08	≤54	PASS
				Peak	2483.500	-35.16	≤-21.20	60.04	≤74	PASS

				Peak	2484.880	-33.82	≤-21.20	61.38	≤74	PASS
				Peak	2500.000	-35.42	≤-21.20	59.78	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-37.22	≤-21.20	57.98	≤74	PASS
				Peak	2377.910	-33.8	≤-21.20	61.40	≤74	PASS
				Peak	2390.000	-35.96	≤-21.20	59.24	≤74	PASS
		High	Hop_2480	Peak	2483.500	-35.44	≤-21.20	59.76	≤74	PASS
				Peak	2498.080	-32.7	≤-21.20	62.50	≤74	PASS
				Peak	2500.000	-36	≤-21.20	59.20	≤74	PASS

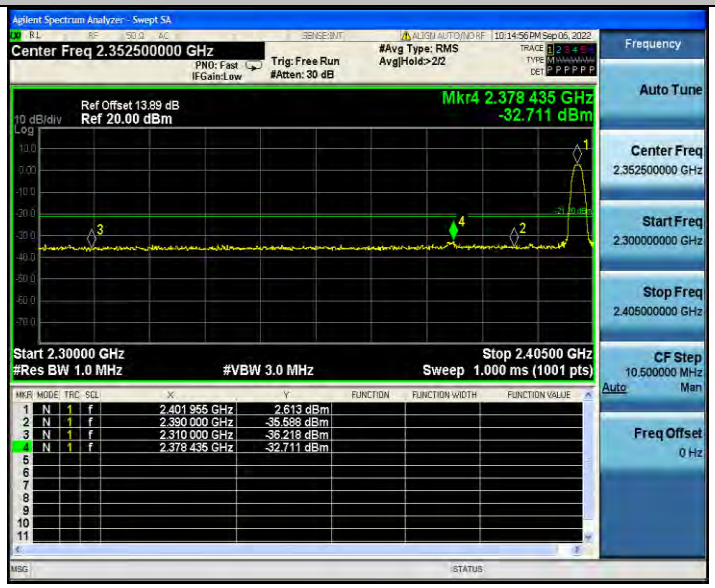
Note：

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

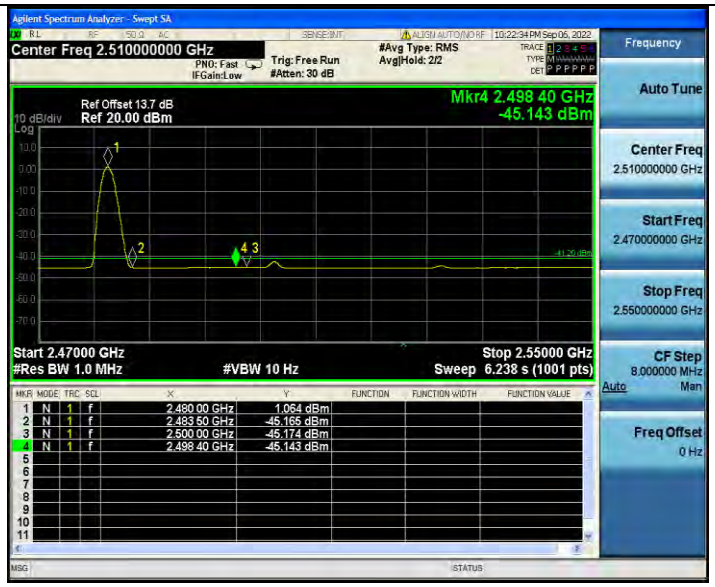
DH5_Ant1_Low_2402_AV



DH5_Ant1_Low_2402_Peak



DH5_Ant1_High_2480_AV



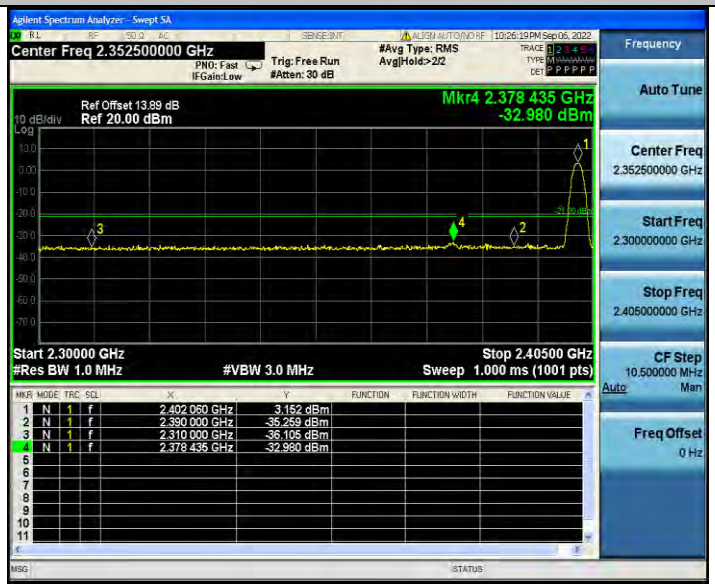
DH5_Ant1_High_2480_Peak

DH5_Ant1_Low_Hop_2402_Peak

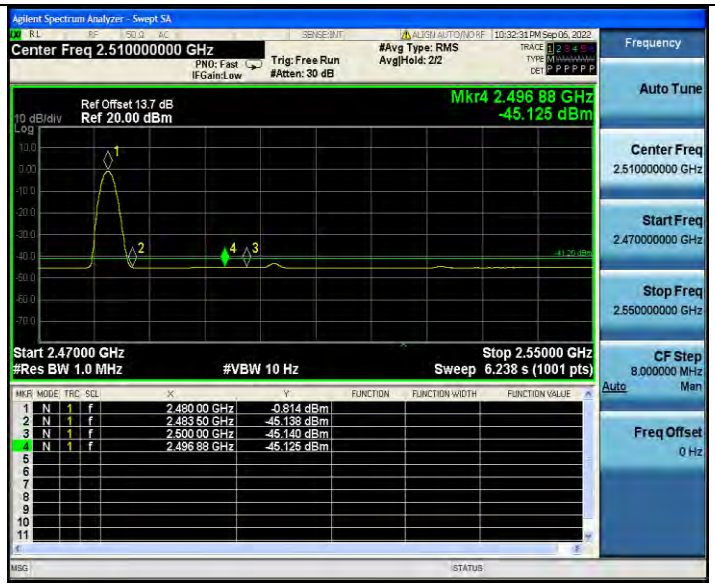
DH5_Ant1_High_Hop_2480_Peak

2DH5_Ant1_Low_2402_AV

2DH5_Ant1_Low_2402_Peak



2DH5_Ant1_High_2480_AV



2DH5_Ant1_High_2480_Peak

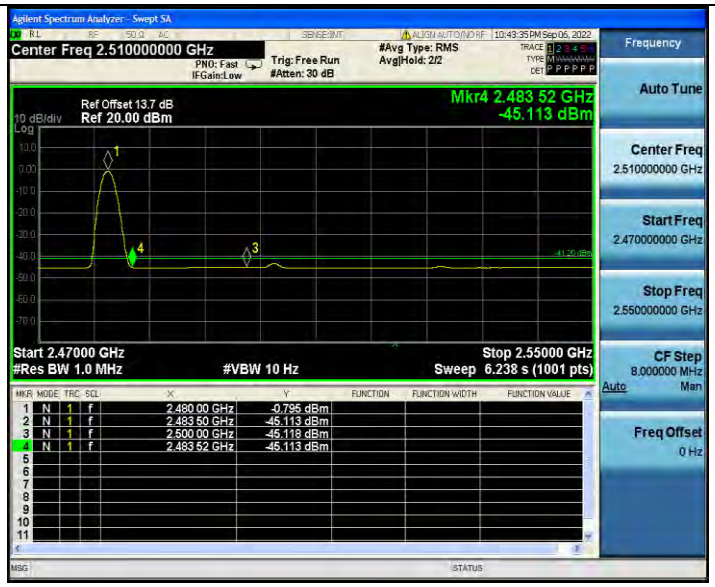
2DH5_Ant1_Low_Hop_2402_Peak

2DH5_Ant1_High_Hop_2480_Peak

3DH5_Ant1_Low_2402_AV

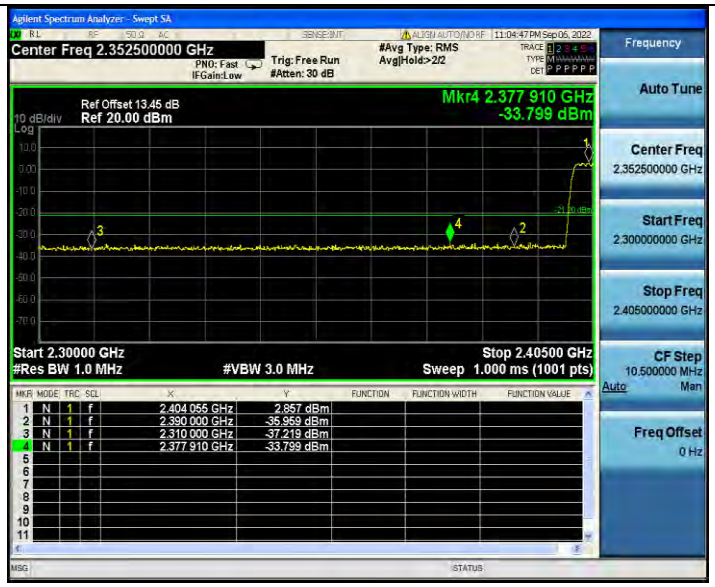
3DH5_Ant1_Low_2402_Peak

3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak

3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

9 20 dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

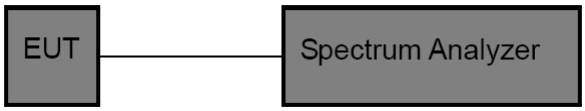
Test Method : ANSI C63.10:2013

9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW =30kHz, VBW = 100kHz

3. Test setup



9.2 Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.044	2401.472	2402.516	---	---
		2441	1.071	2440.448	2441.519	---	---
		2480	1.071	2479.451	2480.522	---	---
2DH5	Ant1	2402	1.338	2401.328	2402.666	---	---
		2441	1.347	2440.325	2441.672	---	---
		2480	1.365	2479.319	2480.684	---	---
3DH5	Ant1	2402	1.302	2401.346	2402.648	---	---
		2441	1.308	2440.343	2441.651	---	---
		2480	1.305	2479.337	2480.642	---	---

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Occupied Channel Bandwidth

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.96433	2401.509	2402.473	---	---
		2441	0.95911	2440.511	2441.470	---	---
		2480	0.96847	2479.509	2480.478	---	---
2DH5	Ant1	2402	1.2414	2401.384	2402.625	---	---
		2441	1.2182	2440.393	2441.611	---	---
		2480	1.2502	2479.379	2480.630	---	---
3DH5	Ant1	2402	1.2123	2401.390	2402.602	---	---
		2441	1.2245	2440.384	2441.608	---	---
		2480	1.2230	2479.383	2480.606	---	---

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 11.7 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.479847 GHz
-3.4500 dBm
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
1.2230 MHz
Total Power
6.25 dBm
Transmit Freq Error
-5.264 kHz
OBW Power
99.00 %
x dB Bandwidth
1.411 MHz
x dB
-26.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz

10 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band eploying at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt (30dBm). For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Refer to the result “Number of Hopping Frequency” of this document. The 0.125watts (20.97 dBm) limit applies.

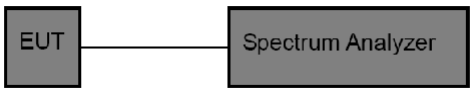
10.1Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyser: RBW = 3MHz. VBW =8MHz. Sweep = auto; Detector Function = Peak.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

4. Test setup

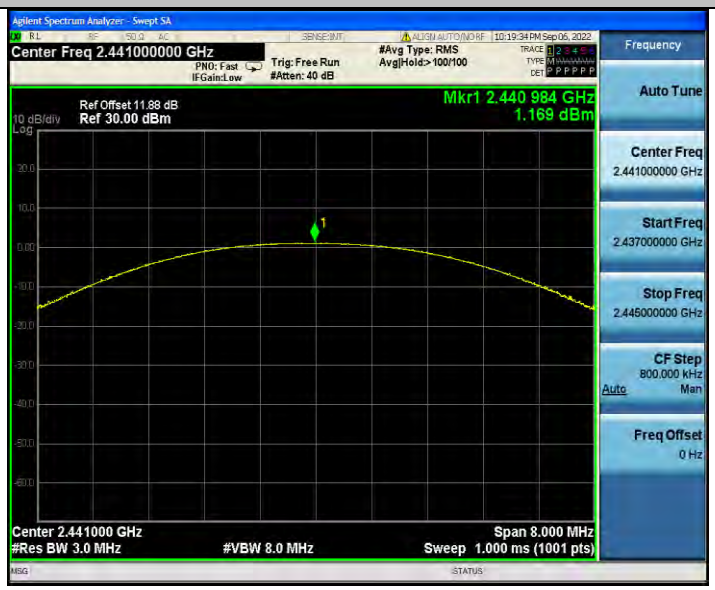


10.2Test Result

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	1.06	≤20.97	PASS
		2441	1.17	≤20.97	PASS
		2480	0.79	≤20.97	PASS
2DH5	Ant1	2402	1.74	≤20.97	PASS
		2441	1.78	≤20.97	PASS
		2480	1.48	≤20.97	PASS
3DH5	Ant1	2402	2.19	≤20.97	PASS
		2441	2.17	≤20.97	PASS
		2480	1.82	≤20.97	PASS

DH5_Ant1_2402

DH5_Ant1_2441



DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>100/100
10:44:19 PM Sep 05, 2022
Frequency
Ref Offset 11.7 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.480 224 GHz
1.824 dBm
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.476000000 GHz
Stop Freq
2.484000000 GHz
CF Step
800.000 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.000 ms (1001 pts)
MSG
STATUS

11 Hopping Channel Separation

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5MHz 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 1W.
Test Mode	:	Hopping

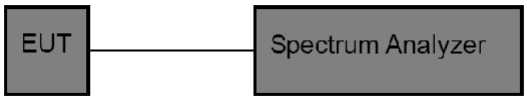
11.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 30KHz. VBW =100KHz, Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

4. Test setup



11.2 Test Result

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.016	≥0.714	PASS
2DH5	Ant1	Hop	1.178	≥0.910	PASS
3DH5	Ant1	Hop	1.136	≥0.872	PASS

DH5_Ant1_Hop

2DH5_Ant1_Hop

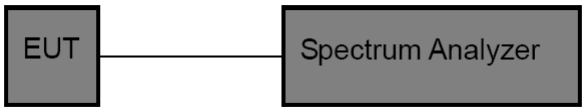
3DH5_Ant1_Hop

12 Number of Hopping Frequency

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode	:	Hopping(GFSK)

12.1 Test Procedure

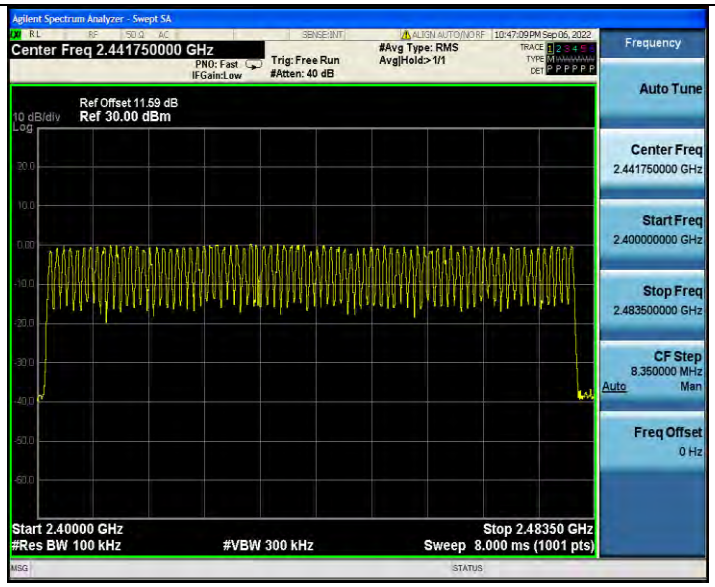
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW = 300KHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.483GHz. Sweep=auto;
5. Test setup



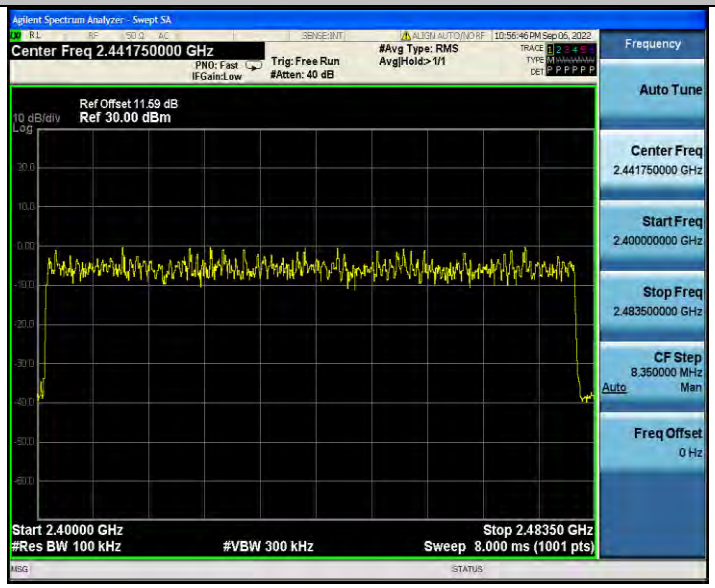
12.2 Test Result

TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

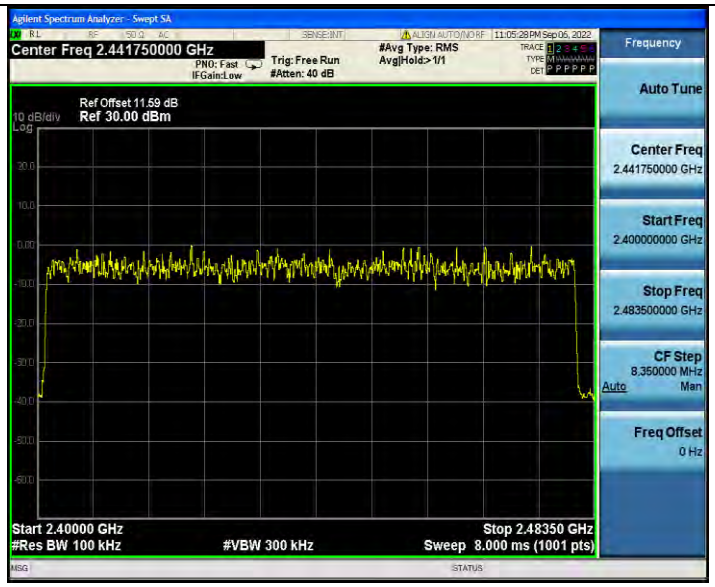
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>1/1
11:05:28 PM Sep 05, 2022
Frequency
Auto Tune
Ref Offset 11.59 dB
10 dB/div
Log
Ref 30.00 dBm
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (1001 pts)

13 Dwell Time

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 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.
Test Mode	:	The worst case(π/4-DQPSK) was recorded

13.1 Test Procedure

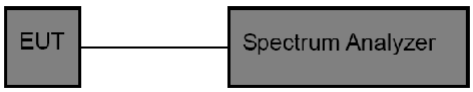
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0. Centred on a hopping channel;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

5. Test setup



13.2 Test Result

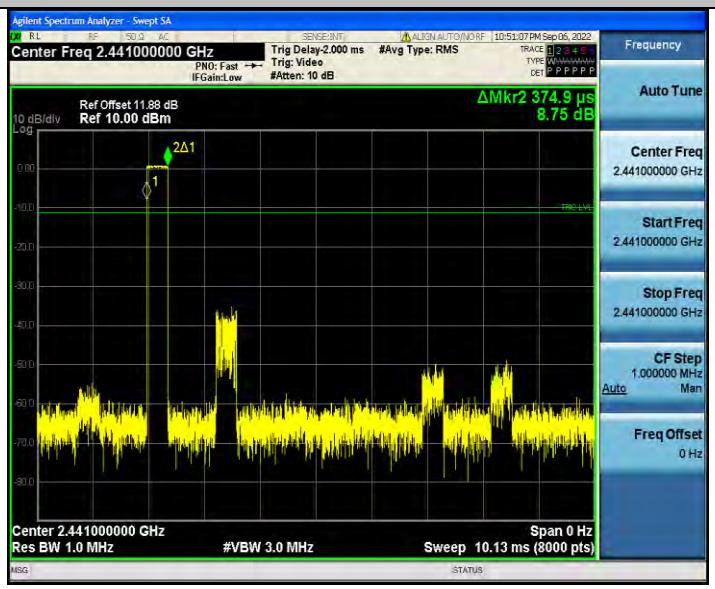
TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.37	320	0.12	≤0.4	PASS
DH3	Ant1	Hop	1.63	160	0.261	≤0.4	PASS
DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
2DH1	Ant1	Hop	0.39	320	0.123	≤0.4	PASS
2DH3	Ant1	Hop	1.64	160	0.262	≤0.4	PASS
2DH5	Ant1	Hop	2.88	106.67	0.308	≤0.4	PASS
3DH1	Ant1	Hop	0.39	320	0.123	≤0.4	PASS

3DH3	Ant1	Hop	1.64	160	0.262	≤0.4	PASS
3DH5	Ant1	Hop	2.89	106.67	0.308	≤0.4	PASS

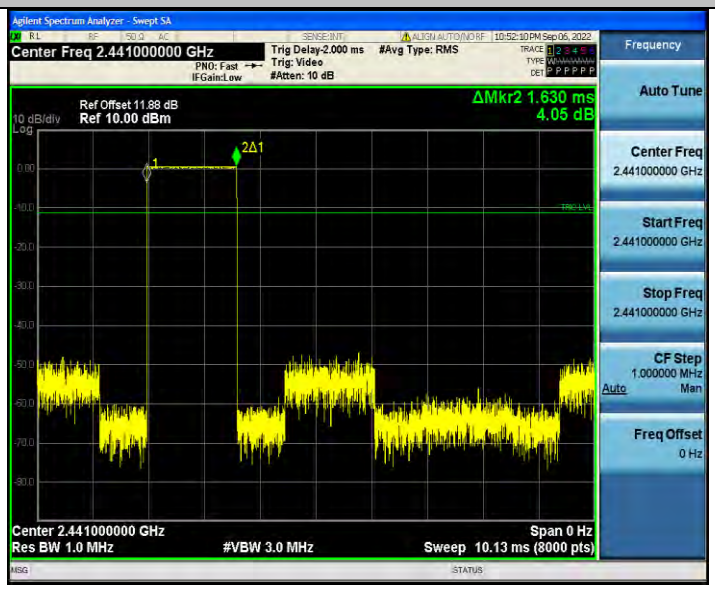
Note:

1. Dwell Time= BurstWidth * TotalHops.

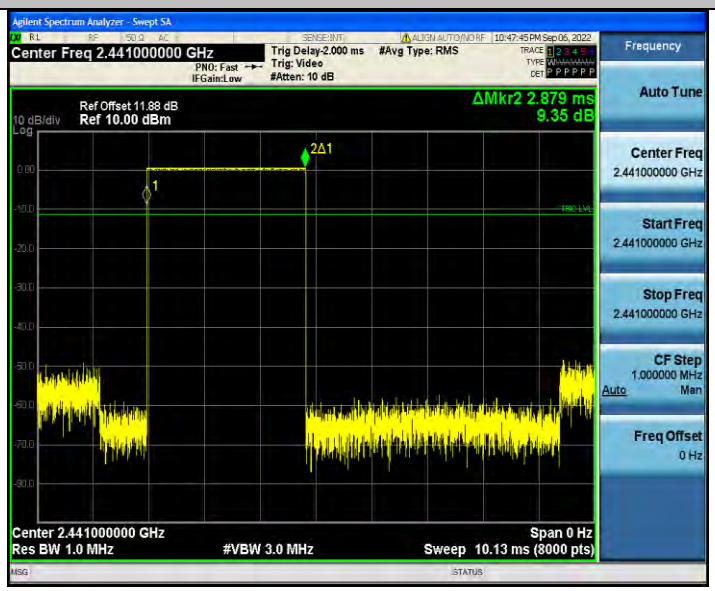
DH1_Ant1_Hop



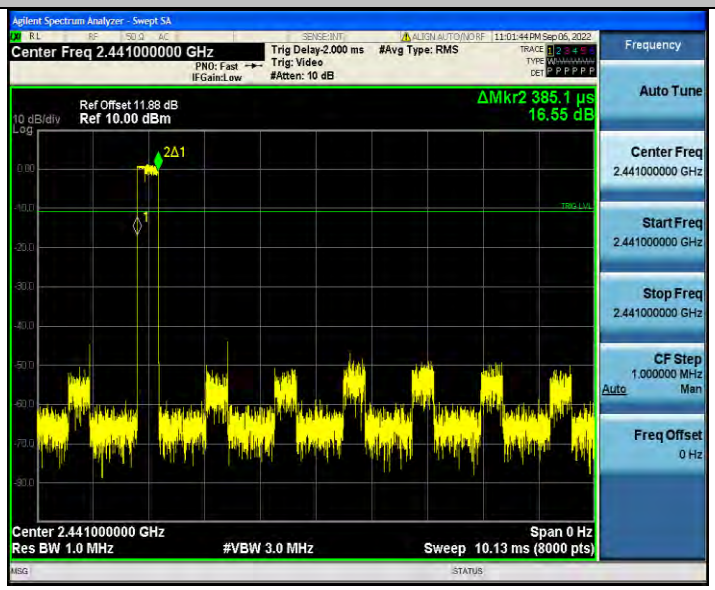
DH3_Ant1_Hop



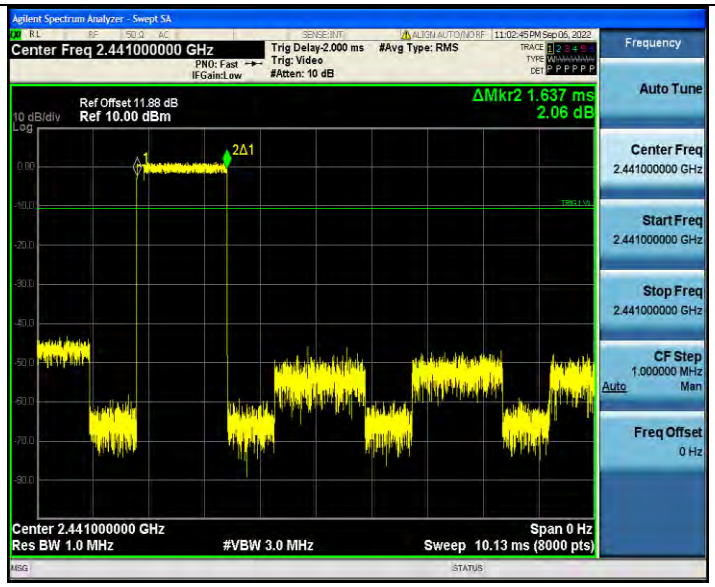
DH5_Ant1_Hop



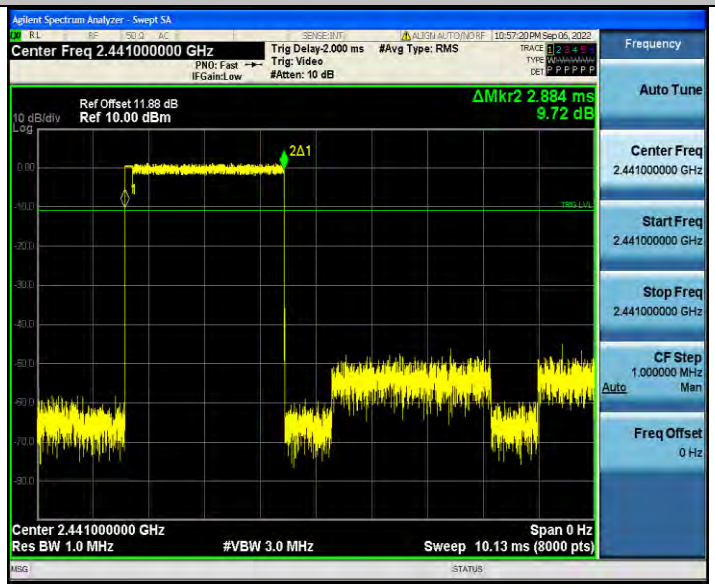
2DH1_Ant1_Hop



2DH3_Ant1_Hop

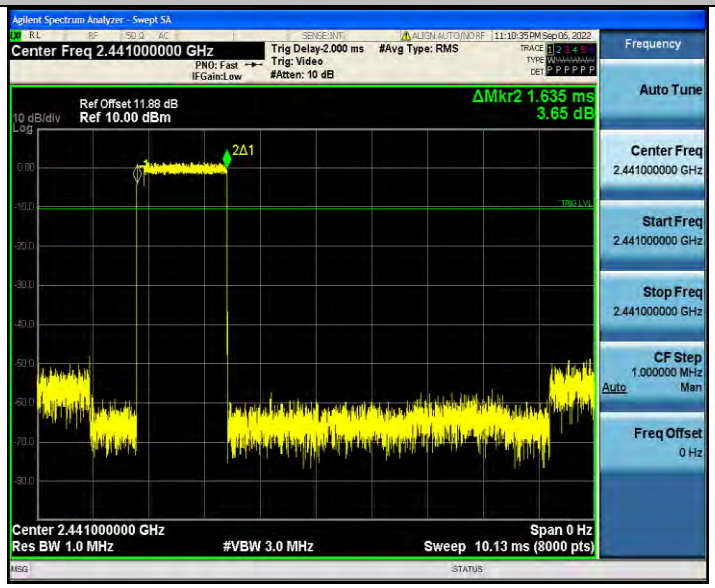


2DH5_Ant1_Hop

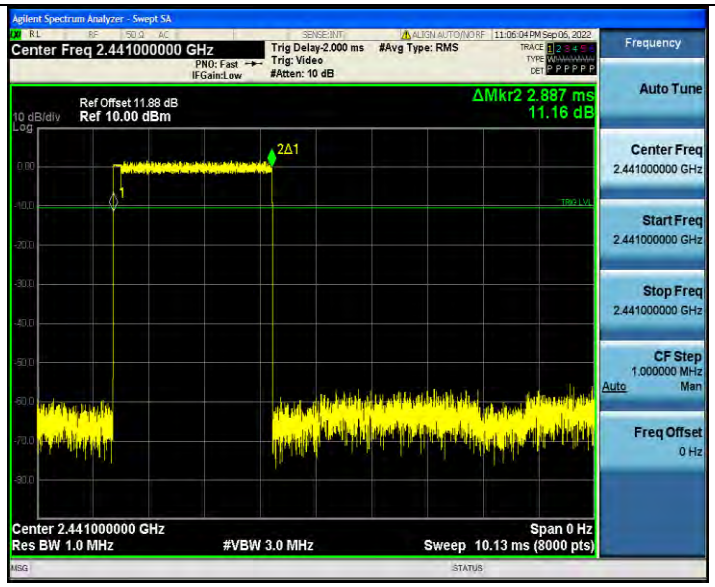


3DH1_Ant1_Hop

3DH3_Ant1_Hop



3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 10 dB
#Avg Type: RMS
11:06:04 PM Sep 05, 2022
Frequency
Ref Offset 11.88 dB
10 dB/div
Ref 10.00 dBm
Log
ΔMkr2 2.887 ms
11.16 dB
2Δ1
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
MSG
STATUS

14 Antenna Requirement

14.1 Antenna Requirement

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

14.2 Result

The EUT'S antenna, permanent attached antenna, is Internal Antenna. The antenna's gain is -0.68dBi and meets the requirement.

********THE END REPORT********