FCC TEST REPORT

FCC ID: 2BA79-X6

Product Name	:	WIRELESS EARBUDS
Model Name	:	X6,X1,X5,X9,X10,X11,X12,X13,X15,X16,X18,X28,G40,G42,G16
Brand Name	:	--
Report No.	:	PTC23042404201E-FC01
Sample Id	:	PTC23042404201E-01#

Prepared for

Shenzhen Yolax Acoustics Co.,Ltd.

2F, Building 5,Hebei Industrial Area,Hualian Community,Longhua Street,Longhua,Shenzhen,China

Prepared by

Precise Testing & Certification Co., Ltd.

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1TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen Yolax Acoustics Co.,Ltd.
Address	:	2F, Building 5,Hebei Industrial Area,Hualian Community,Longhua Street,Longhua,Shenzhen,China
Manufacture's name	:	Shenzhen Yolax Acoustics Co.,Ltd.
Address	:	2F, Building 5,Hebei Industrial Area,Hualian Community,Longhua Street,Longhua,Shenzhen,China
Product name	:	WIRELESS EARBUDS
Model name	:	X6,X1,X5,X9,X10,X11,X12,X13,X15,X16,X18,X28,G40,G42,G16
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10:2013
Test Date	:	Apr.22, 2023 to May. 14, 2023
Date of Issue	:	May. 15, 2023
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:

Simon Pu / Engineer

Technical Manager:

Ronnie Liu / Manager

Contents

Page

1TEST RESULT CERTIFICATION **2**

2 TEST SUMMARY **5**

3 TEST FACILITY **6**

4 GENERAL INFORMATION **7**

4.1 GENERAL DESCRIPTION OF E.U.T. 7

4.2 TEST MODE 8

5 EQUIPMENT DURING TEST **12**

5.1 EQUIPMENTS LIST 12

5.2 MEASUREMENT UNCERTAINTY 14

5.3 DESCRIPTION OF SUPPORT UNITS 15

6 CONDUCTED EMISSION **16**

6.1 E.U.T. OPERATION 16

6.2 EUT SETUP 16

6.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) 17

6.4 MEASUREMENT PROCEDURE: 17

6.5 CONDUCTED EMISSION LIMIT 17

6.6 MEASUREMENT DESCRIPTION 17

6.7 CONDUCTED EMISSION TEST RESULT 17

7 RADIATED SPURIOUS EMISSIONS **20**

7.1 EUT OPERATION 20

7.2 TEST SETUP 21

7.3 SPECTRUM ANALYZER SETUP 22

7.4 TEST PROCEDURE 23

7.5 SUMMARY OF TEST RESULTS 24

8 CONDUCTED BAND EDGE EMISSION **28**

8.1 REQUIREMENT 28

8.2 TEST PROCEDURE 28

8.3 TEST RESULTS 29

9 20 DB BANDWIDTH MEASUREMENT **47**

9.1 TEST PROCEDURE 47
9.2 TEST RESULT 47
10 MAXIMUM PEAK OUTPUT POWER 52
10.1 TEST PROCEDURE 52
10.2 TEST RESULT 52
11 HOPPING CHANNEL SEPARATION 55
11.1 TEST PROCEDURE 55
11.2 TEST RESULT 56
12 NUMBER OF HOPPING FREQUENCY 57
12.1 TEST PROCEDURE 57
12.2 TEST RESULT 57
13 DWELL TIME 59
13.1 TEST PROCEDURE 59
13.2 TEST RESULT 59
14 ANTENNA REQUIREMENT 62
14.1 ANTENNA REQUIREMENT 62
14.2 RESULT 62
15 TEST PHOTOS 63
16 EUT PHOTOS 65

2 Test Summary

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

3 TEST FACILITY

Precise Testing & Certification Co., Ltd.

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

FCC Registration Number: 790290

Designation Number：CN1219

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

CAB identifier: CN0080

4 General Information

4.1 General Description of E.U.T.

Product Name	:	WIRELESS EARBUDS
Model Name	:	X6,X1,X5,X9,X10,X11,X12,X13,X15,X16,X18,X28,G40,G42,G16
Bluetooth Version	:	5.3
Operating frequency	:	2402-2480MHz
Numbers of Channel	:	79 channels
Type of Modulation	:	GFSK, Π/4-DQPSK
Antenna Type	:	Chip Antenna
Antenna Gain	:	1.32 dBi
Power supply	:	DC 3.7V 35mAH lion battery
Hardware Version	:	V1.2
Software Version	:	V1.2

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 have been tested. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test.

Channel List:

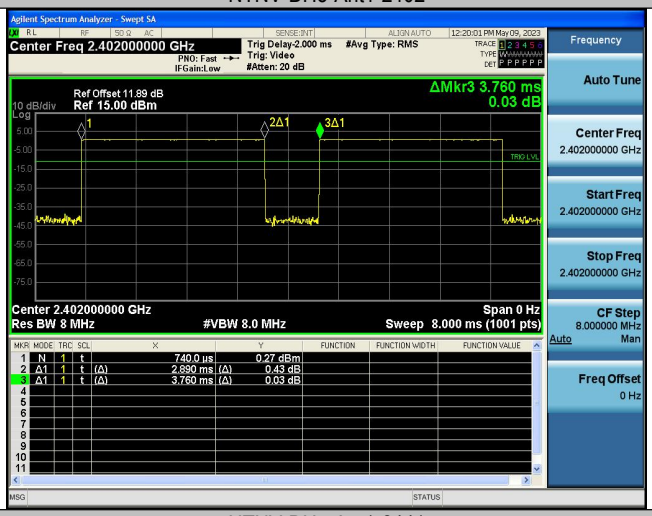
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	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.

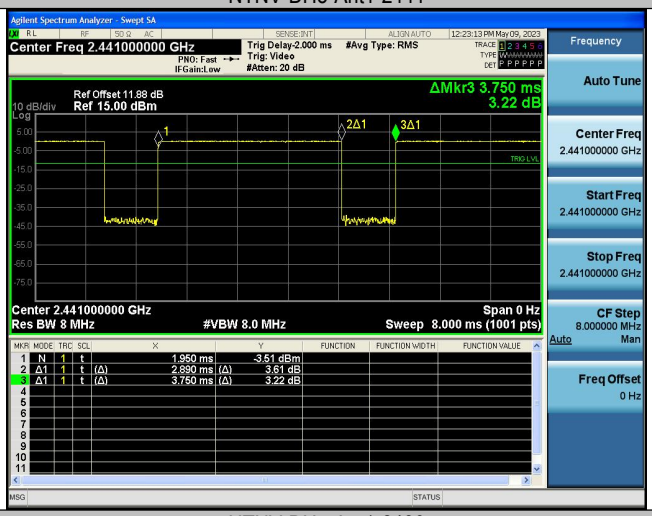
Duty Cycle

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.89	3.76	76.86	1.14
DH5	Ant1	2441	2.89	3.75	77.07	1.13
DH5	Ant1	2480	2.89	3.75	77.07	1.13
2DH5	Ant1	2402	2.89	3.75	77.07	1.13
2DH5	Ant1	2441	2.89	3.76	76.86	1.14
2DH5	Ant1	2480	2.89	3.75	77.07	1.13

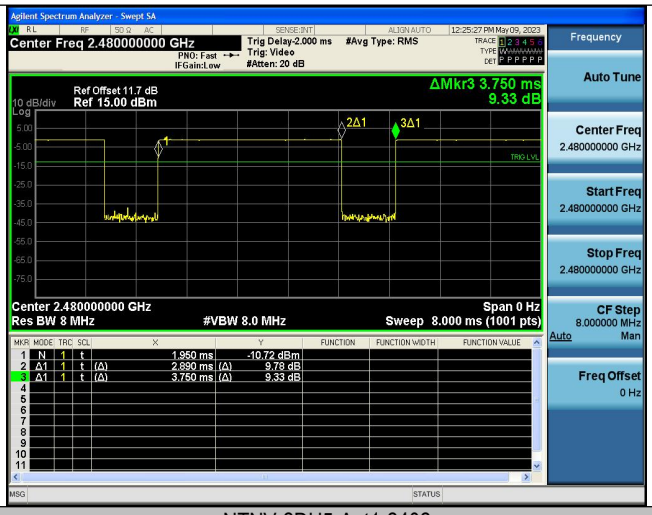
NTNV-DH5-Ant1-2402



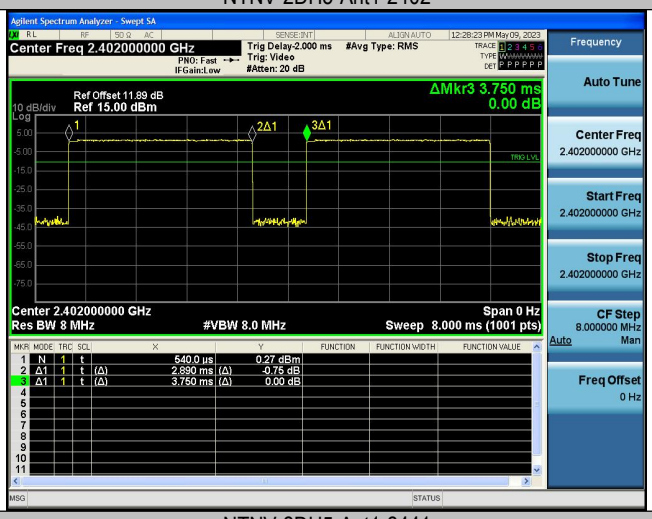
NTNV-DH5-Ant1-2441



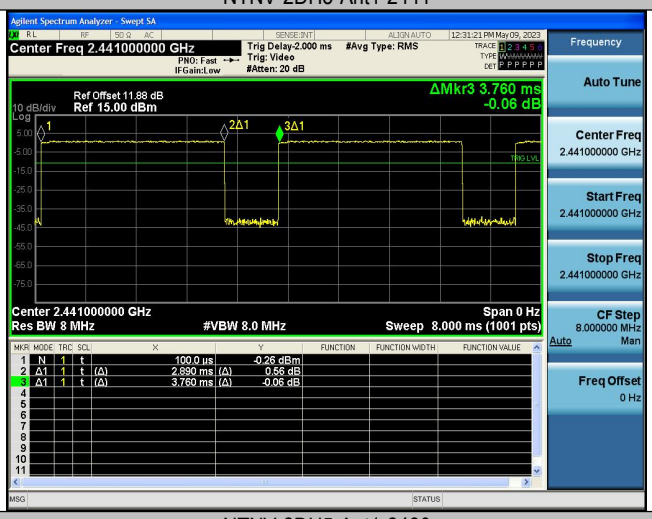
NTNV-DH5-Ant1-2480



NTNV-2DH5-Ant1-2402



NTNV-2DH5-Ant1-2441



NTNV-2DH5-Ant1-2480

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
12:33:38 PM May 09, 2023
Ref Offset 11.7 dB
10 dB/div
Ref 15.00 dBm
ΔMkr3 3.750 ms
17.85 dB
Center 2.480000000 GHz
Span 0 Hz
Res BW 8 MHz
#VBW 8.0 MHz
Sweep 8.000 ms (1001 pts)
1 N 1 t 1.700 ms -29.74 dBm
2 Δ1 1 t (Δ) 2.890 ms (Δ) 28.97 dB
3 Δ1 1 t (Δ) 3.750 ms (Δ) 17.85 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.480000000 GHz
Stop Freq
2.480000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz

5 Equipment During Test

5.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Aug21,2023
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug21,2023
Antenna Connector	Florida RF Labs	N/A	RF01#	N/A	Aug21,2023
Scope	Tektronix	TDS3032B	B014131	300MHz BW; 2 way scope	Aug21,2023
DC power	eTOMENS	eTM-1560	--	15V 60A	Aug21,2023
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug21,2023
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug21,2023

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.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug21,2023
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug21,2023
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Aug21,2023
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Aug21,2023
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Aug21,2023
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug21,2023
High NOISE AMPLIFIER	ZHINAN	ZN3380C	15002	10KHz-18GHz	Aug21,2023
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug21,2023
Spectrum Analyzer	Rohde&Schwarz	FSVR40	101003	10Hz-40GHz	Aug21,2023

Horn Antenna	SCHWARZBECK	BBHA9170	01066	15GHZ-40GHZ	Aug21,2023
Preamplifier	SCHWARZBECK	BBV-9721	81	18GHZ-40GHZ	Aug21,2023
Test S/W	Tonscend	JS32-RE/4.0.0.0			

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	L2-16B	000WX31025	9KHz-300MHz	Aug21,2023
Artificial Mains Network	Rohde&Schwarz	ENV216	102453	9KHz-300MHz	Aug21,2023
Test S/W	Tonscend	JS32-CE/4.0.0.3			

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(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.
adaptor	MDY-10-EX	--

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)

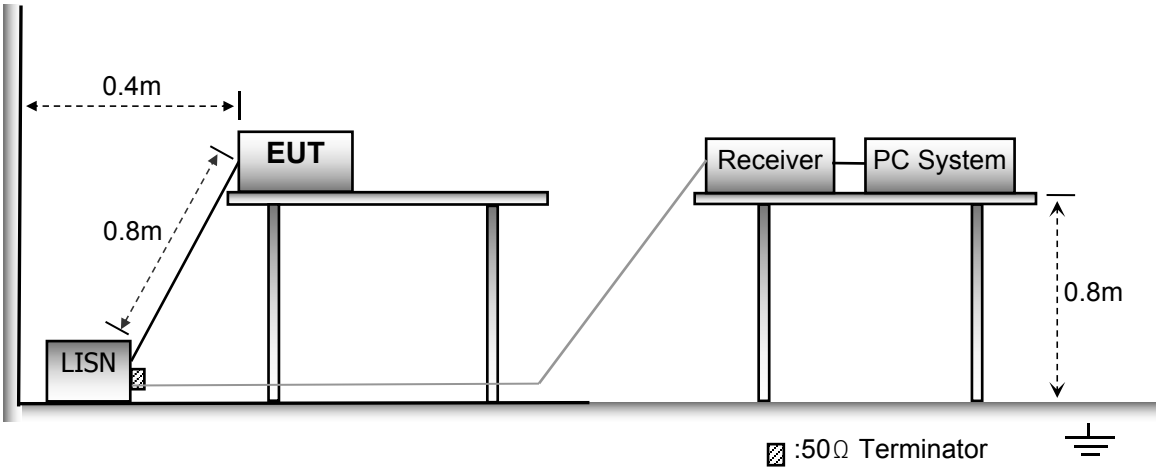
6.1 E.U.T. Operation

Operating Environment **:**

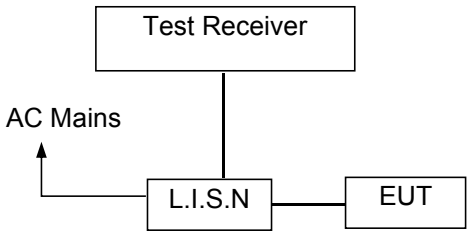
Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa
Test Voltage	:	AC 120V/60Hz

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

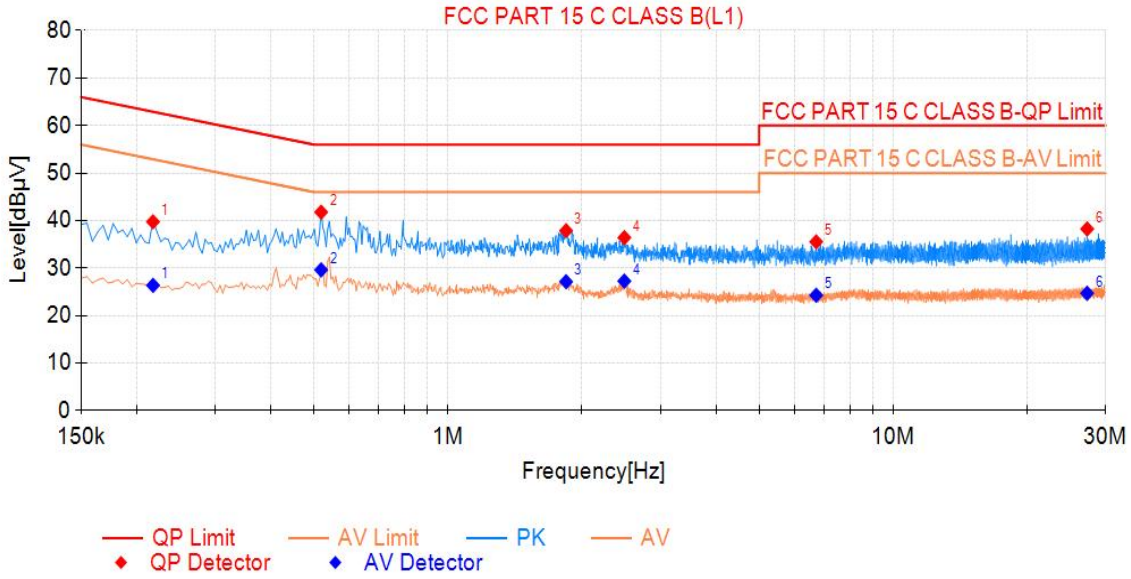
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.7 Conducted Emission Test Result

Pass.

All the modulation modes were tested 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.

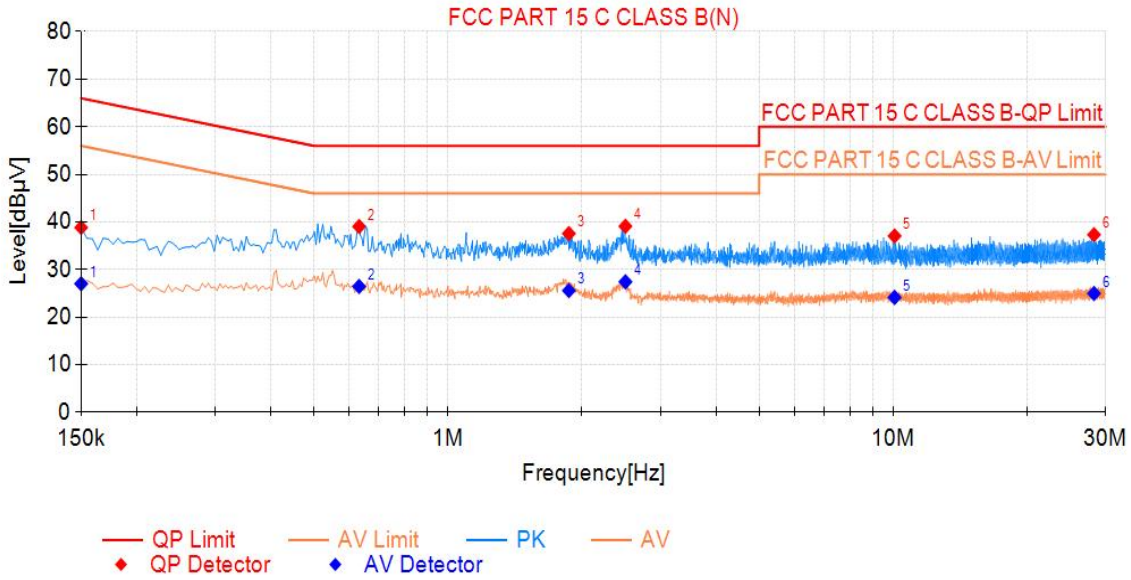
Line -120V/60Hz:



Final Data List								
NO.	Freq. [MHz]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Verdict
1	0.218	39.75	62.91	23.16	26.37	52.91	26.54	PASS
2	0.519	41.78	56.00	14.22	29.63	46.00	16.37	PASS
3	1.842	37.88	56.00	18.12	27.14	46.00	18.86	PASS
4	2.490	36.42	56.00	19.58	27.27	46.00	18.73	PASS
5	6.716	35.55	60.00	24.45	24.29	50.00	25.71	PASS
6	27.272	38.25	60.00	21.75	24.71	50.00	25.29	PASS

Note: Level= Reading + Cable Loss + Factor

Neutral -120V/60Hz:



Final Data List								
NO.	Freq. [MHz]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Verdict
1	0.150	38.84	66.00	27.16	27.02	56.00	28.98	PASS
2	0.632	39.06	56.00	16.94	26.46	46.00	19.54	PASS
3	1.869	37.57	56.00	18.43	25.59	46.00	20.41	PASS
4	2.504	39.11	56.00	16.89	27.43	46.00	18.57	PASS
5	10.073	37.06	60.00	22.94	24.15	50.00	25.85	PASS
6	28.257	37.33	60.00	22.67	24.98	50.00	25.02	PASS

Note: Level= Reading + Cable Loss + 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

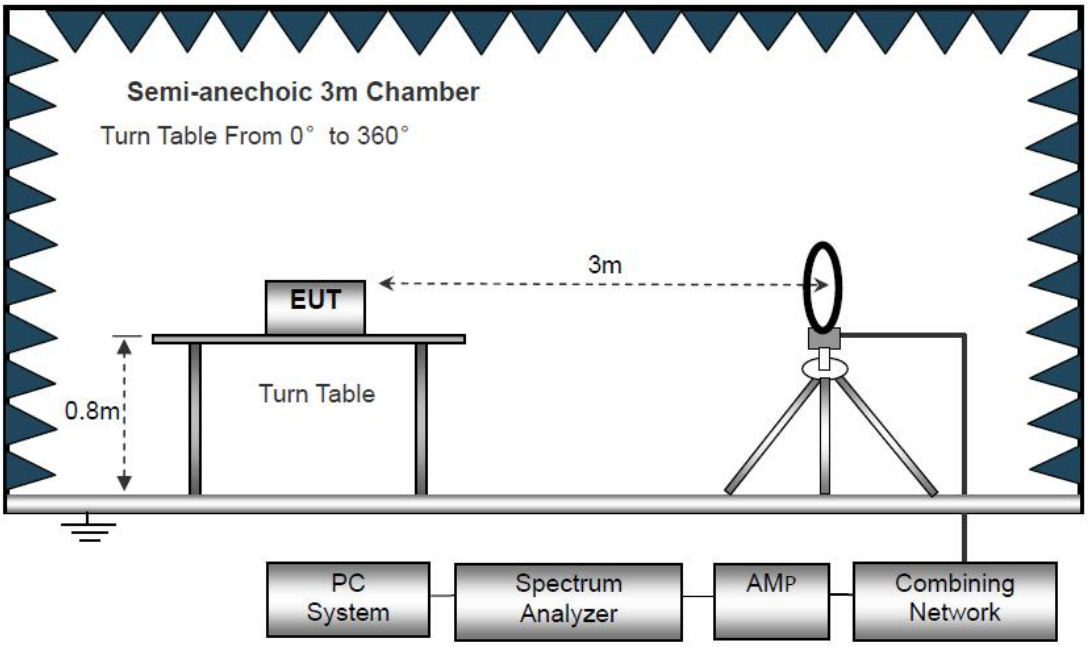
Atmospheric Pressure : 101.2kPa

Test Voltage : DC 3.7V Lion battery

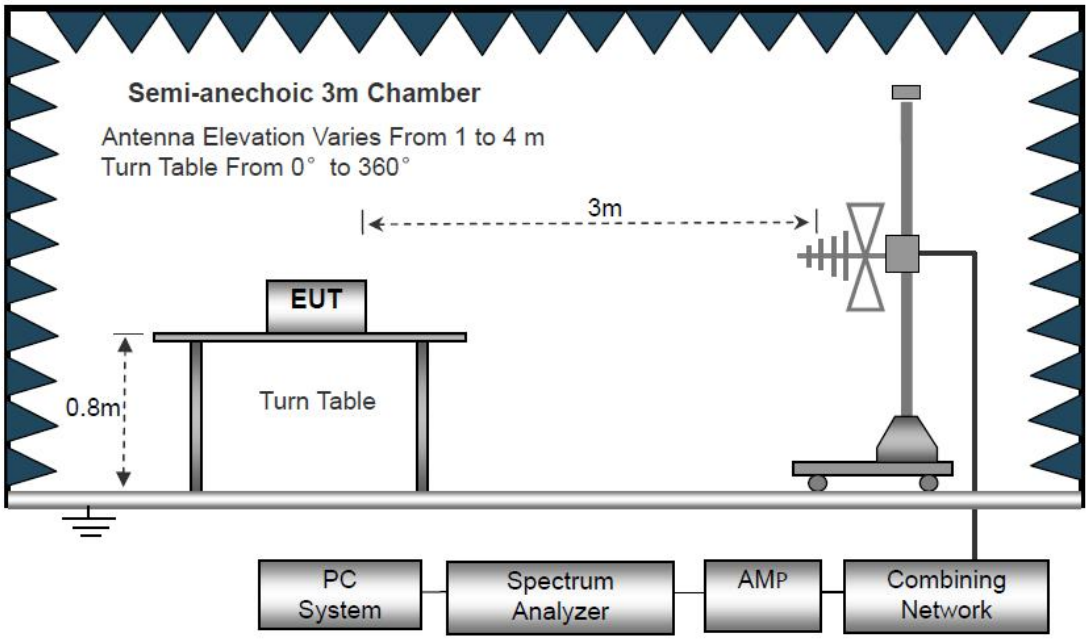
7.2 Test Setup

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

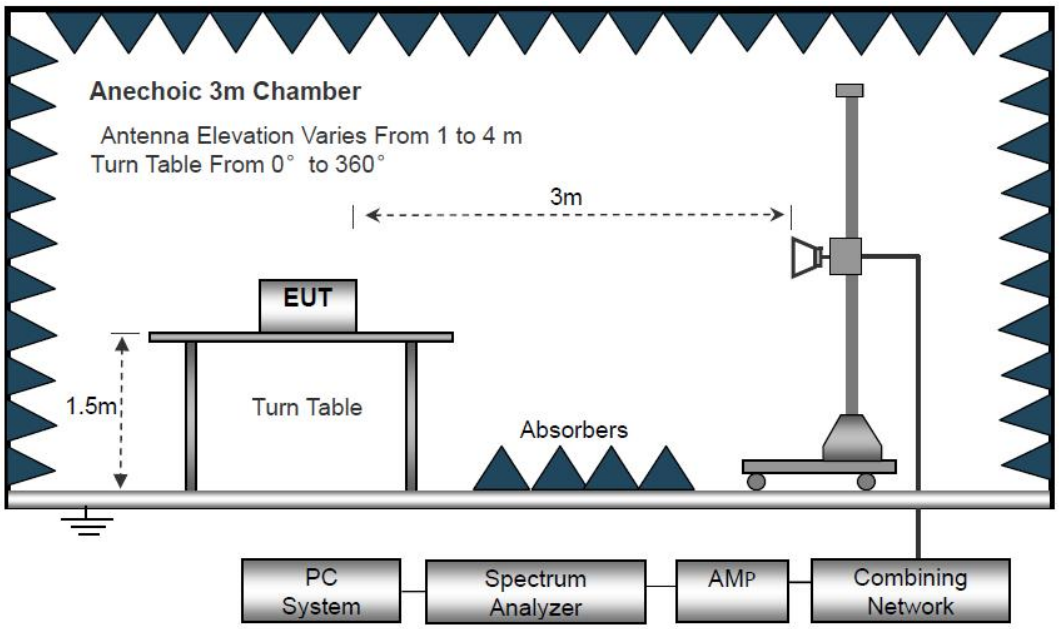
The test setup for emission measurement below 30MHz.



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.

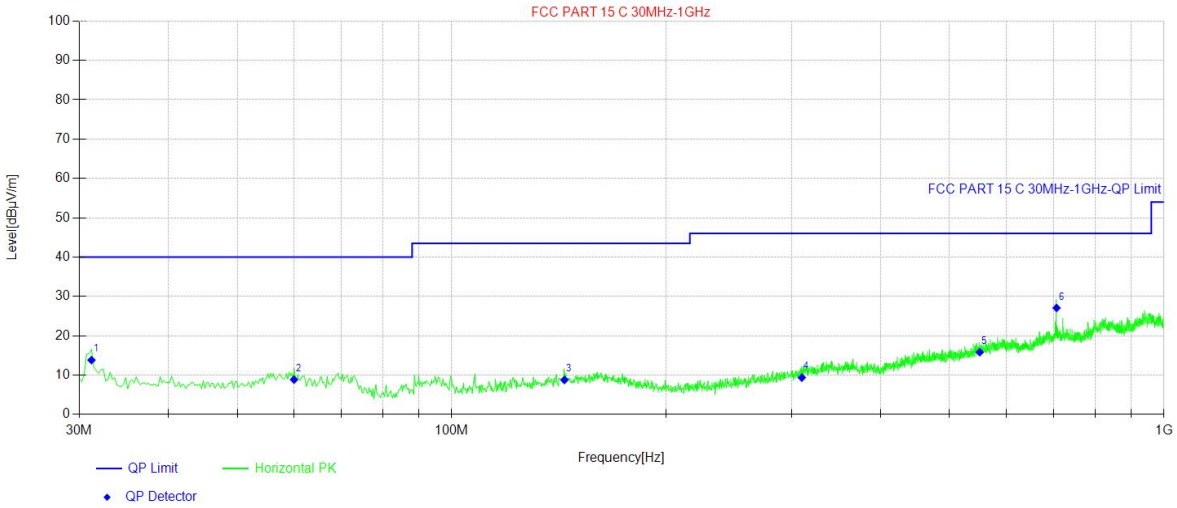
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

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.

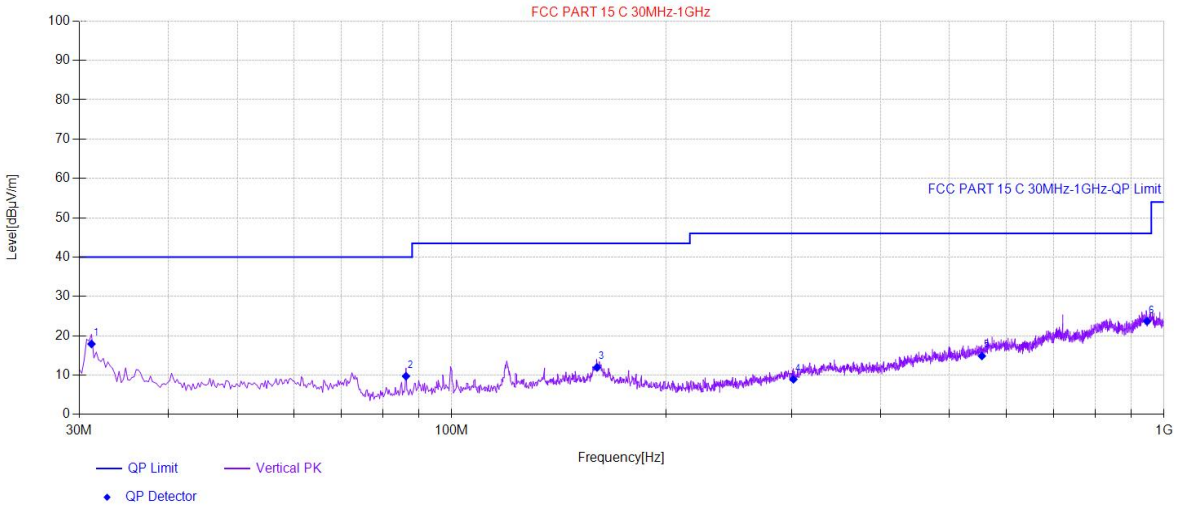
Test plot for Horizontal: GFSK(2402MHz)



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	Verdict
1	31.21	32.09	-18.27	13.82	40.00	26.18	Horizontal	PASS
2	60.07	26.67	-17.81	8.86	40.00	31.14	Horizontal	PASS
3	143.98	25.25	-16.46	8.79	43.50	34.71	Horizontal	PASS
4	310.09	24.53	-15.15	9.38	46.00	36.62	Horizontal	PASS
5	551.13	25.21	-9.37	15.84	46.00	30.16	Horizontal	PASS
6	706.58	33.52	-6.44	27.08	46.00	18.92	Horizontal	PASS

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	Verdict
1	31.21	36.19	-18.27	17.92	40.00	22.08	Vertical	PASS
2	86.26	30.64	-20.91	9.73	40.00	30.27	Vertical	PASS
3	159.98	27.8	-15.85	11.95	43.50	31.55	Vertical	PASS
4	301.84	24.34	-15.40	8.94	46.00	37.06	Vertical	PASS
5	555.01	24.19	-9.32	14.87	46.00	31.13	Vertical	PASS
6	946.65	25.97	-2.27	23.70	46.00	22.30	Vertical	PASS

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 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)
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 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. 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

For Restricted Band, When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz:

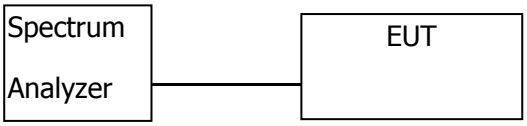
EMI Test Receiver	Setting
Attenuation	Auto
RBW	1MHz
VBW	3MHz
Detector	Peak

Trace	Max hold

For Non-Restricted Band, When spectrum scanned above 1GHz setting resolution bandwidth 100KHz, video bandwidth 300KHz:

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

Set up:

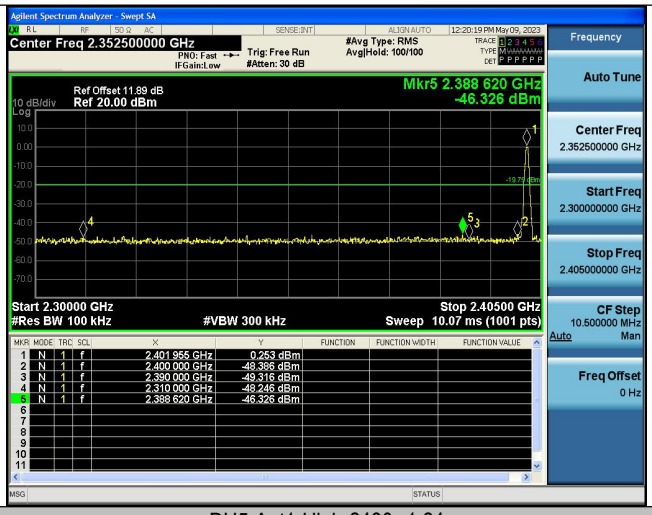


8.3 TEST RESULTS

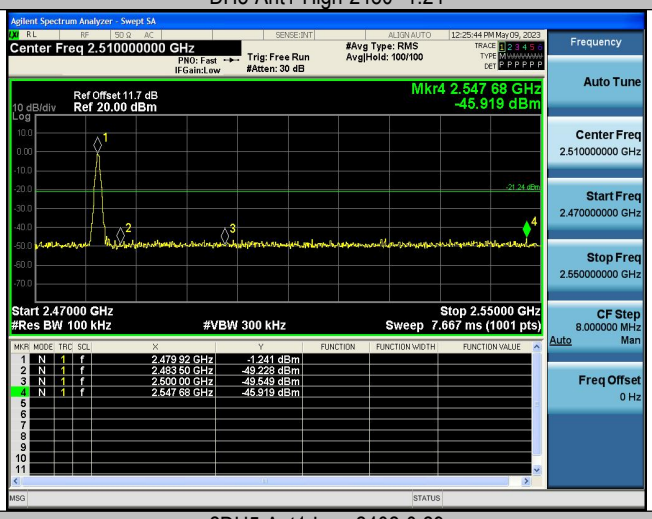
Band edge measurements

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	0.25	-46.33	≤-19.75	PASS
DH5	Ant1	High	2480	-1.24	-45.92	≤-21.24	PASS
2DH5	Ant1	Low	2402	0.29	-46.53	≤-19.71	PASS
2DH5	Ant1	High	2480	-1.32	-45.72	≤-21.32	PASS
DH5	Ant1	Low	Hop_2402	-0.19	-47.42	≤-20.19	PASS
DH5	Ant1	High	Hop_2480	-0.90	-45.45	≤-20.9	PASS
2DH5	Ant1	Low	Hop_2402	-1.20	-46.67	≤-21.2	PASS
2DH5	Ant1	High	Hop_2480	-2.28	-45.96	≤-22.28	PASS

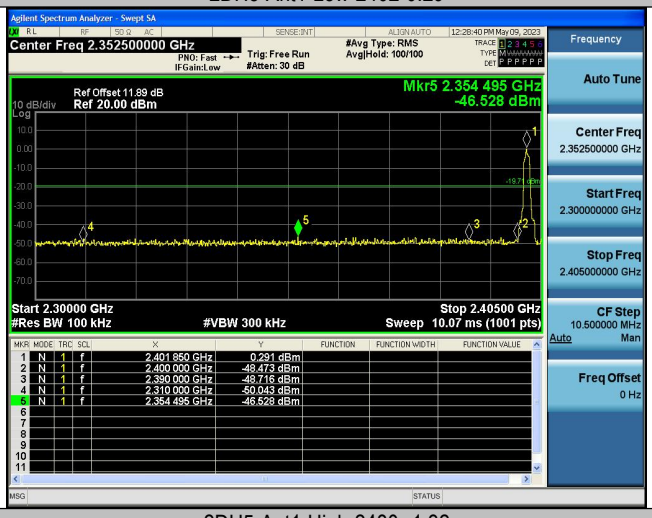
DH5-Ant1-Low-2402-0.25



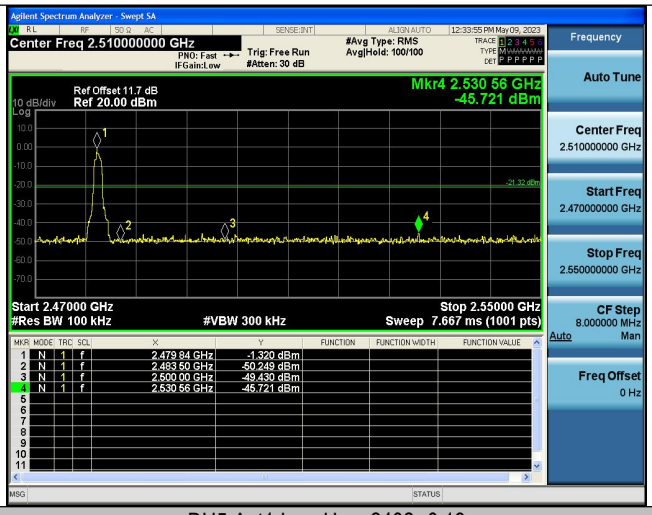
DH5-Ant1-High-2480--1.24



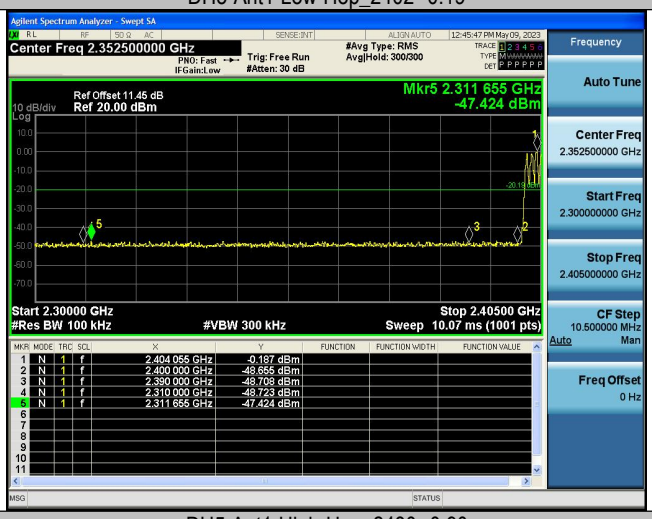
2DH5-Ant1-Low-2402-0.29



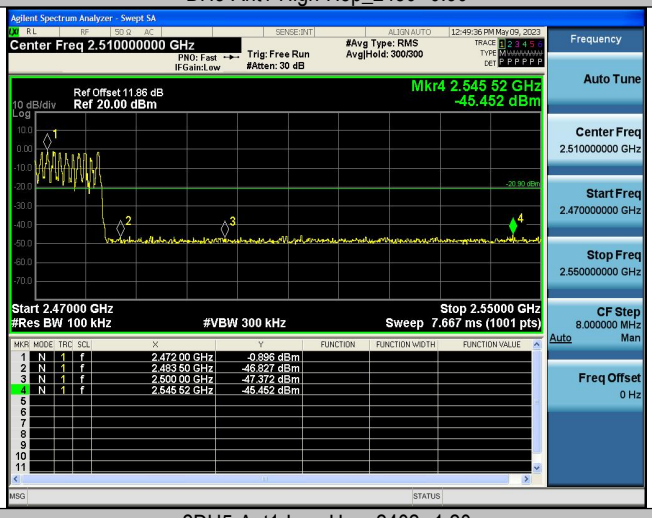
2DH5-Ant1-High-2480--1.32



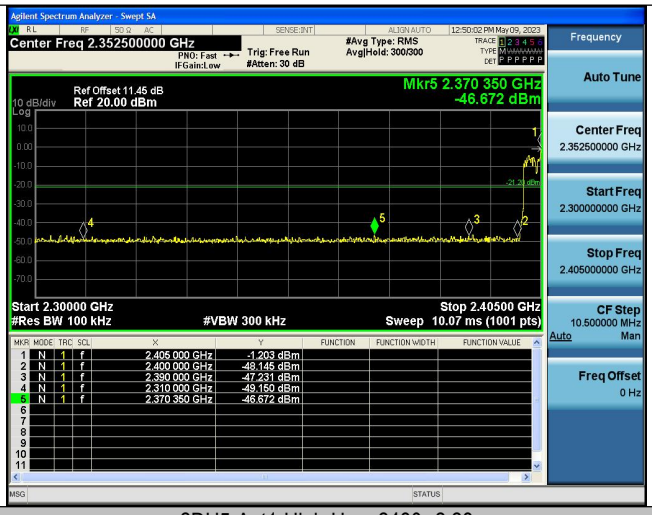
DH5-Ant1-Low-Hop_2402--0.19



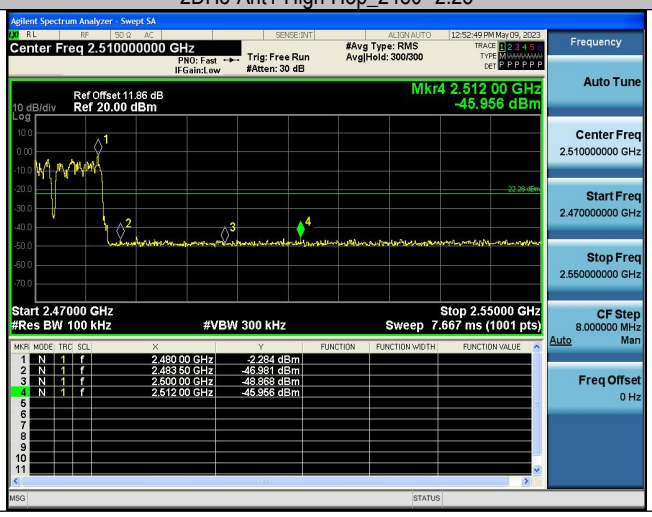
DH5-Ant1-High-Hop_2480--0.90



2DH5-Ant1-Low-Hop_2402--1.20



2DH5-Ant1-High-Hop_2480--2.28



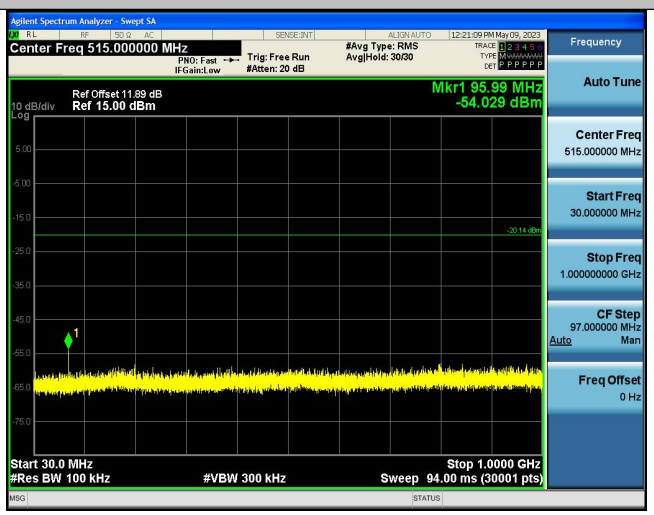
For Conduct spurious emissions

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	0~Reference	-0.14	-0.14	---	PASS
DH5	Ant1	2402	30~1000	-0.14	-54.03	≤-20.14	PASS
DH5	Ant1	2402	1000~26500	-0.14	-38.56	≤-20.14	PASS
DH5	Ant1	2441	0~Reference	-0.72	-0.72	---	PASS
DH5	Ant1	2441	30~1000	-0.72	-56.71	≤-20.72	PASS
DH5	Ant1	2441	1000~26500	-0.72	-41.21	≤-20.72	PASS
DH5	Ant1	2480	0~Reference	-1.75	-1.75	---	PASS
DH5	Ant1	2480	30~1000	-1.75	-54.91	≤-21.75	PASS
DH5	Ant1	2480	1000~26500	-1.75	-41.06	≤-21.75	PASS
2DH5	Ant1	2402	0~Reference	-2.77	-2.77	---	PASS
2DH5	Ant1	2402	30~1000	-2.77	-52.85	≤-22.77	PASS
2DH5	Ant1	2402	1000~26500	-2.77	-41.17	≤-22.77	PASS
2DH5	Ant1	2441	0~Reference	-3.85	-3.85	---	PASS
2DH5	Ant1	2441	30~1000	-3.85	-58.35	≤-23.85	PASS

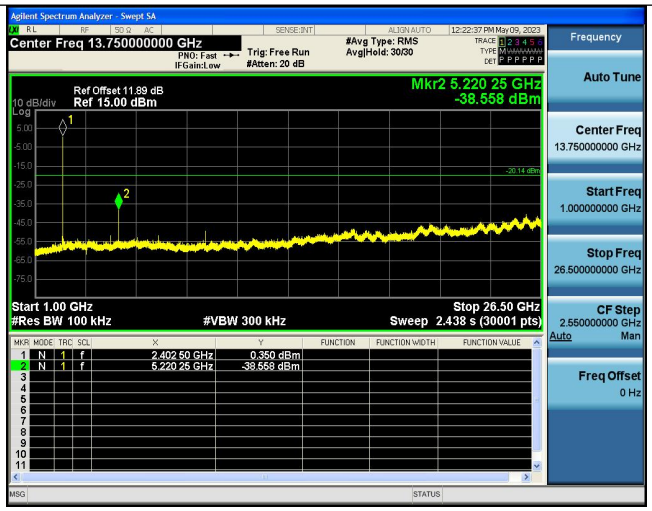
2DH5	Ant1	2441	1000~26500	-3.85	-41.8	≤-23.85	PASS
2DH5	Ant1	2480	0~Reference	-4.47	-4.47	---	PASS
2DH5	Ant1	2480	30~1000	-4.47	-57.76	≤-24.47	PASS
2DH5	Ant1	2480	1000~26500	-4.47	-42.2	≤-24.47	PASS

DH5-Ant1-2402-0~Reference--0.14

DH5-Ant1-2402-30~1000--0.14

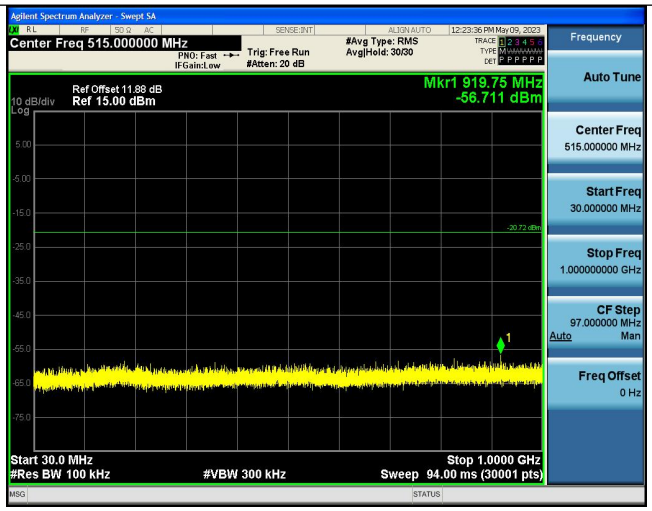


DH5-Ant1-2402-1000~26500--0.14



DH5-Ant1-2441-0~Reference--0.72

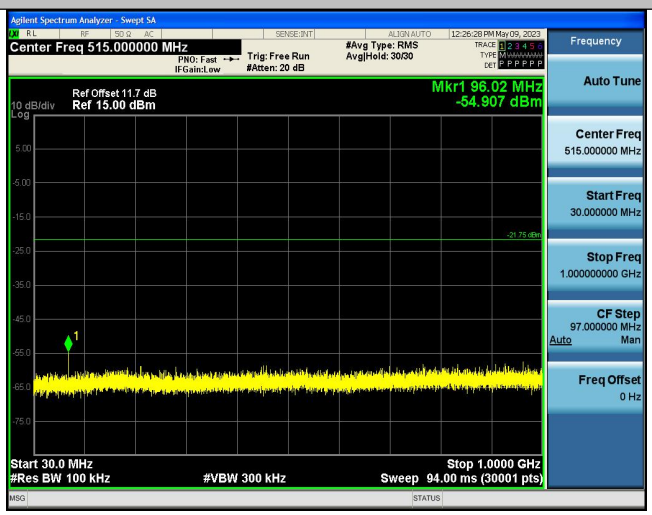
DH5-Ant1-2441-30~1000--0.72



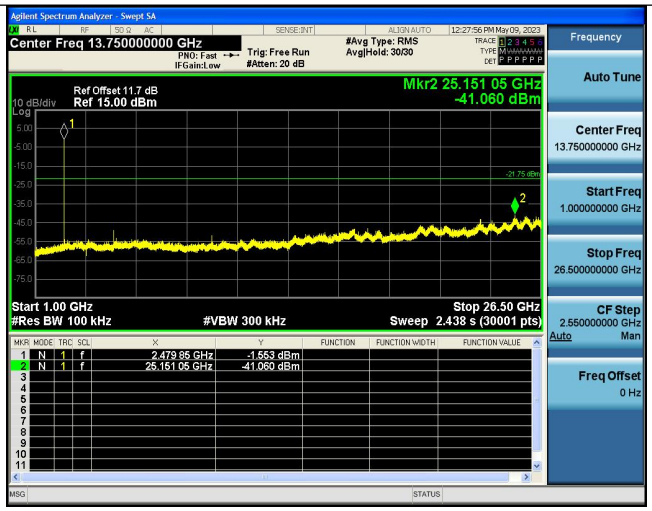
DH5-Ant1-2441-1000~26500--0.72

DH5-Ant1-2480-0~Reference--1.75

DH5-Ant1-2480-30~1000--1.75

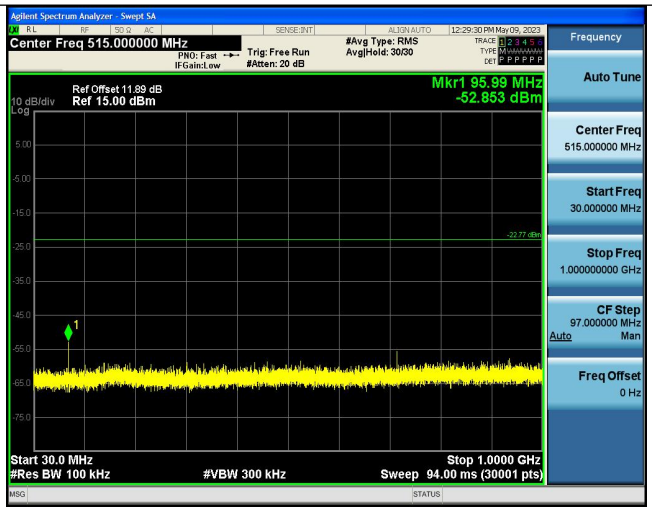


DH5-Ant1-2480-1000~26500--1.75

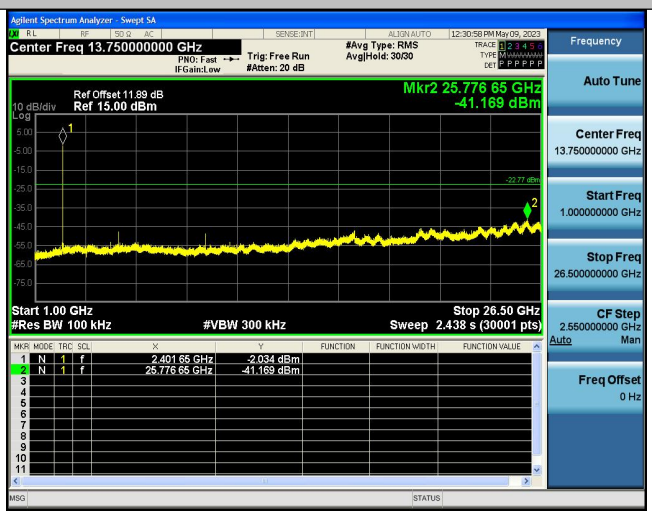


2DH5-Ant1-2402-0~Reference--2.77

2DH5-Ant1-2402-30~1000--2.77

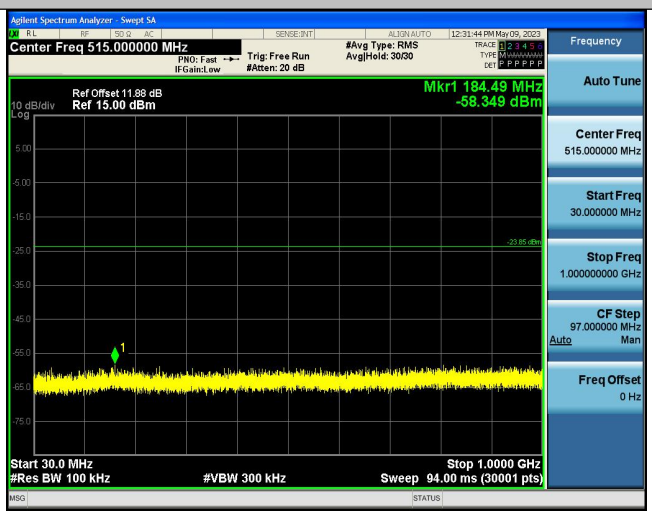


2DH5-Ant1-2402-1000~26500--2.77



2DH5-Ant1-2441-0~Reference--3.85

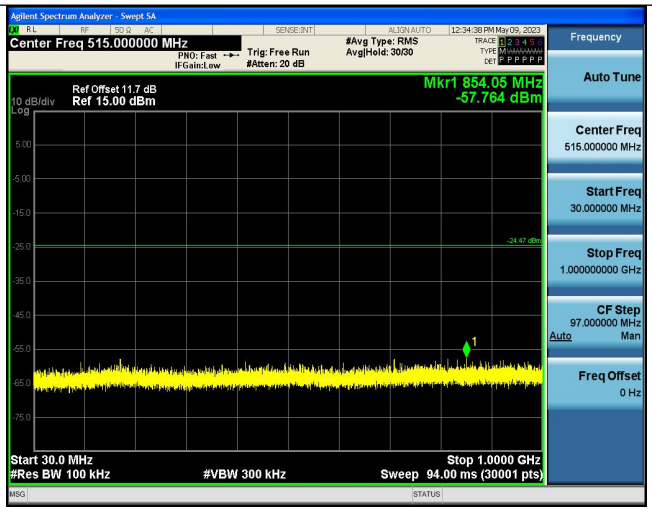
2DH5-Ant1-2441-30~1000--3.85



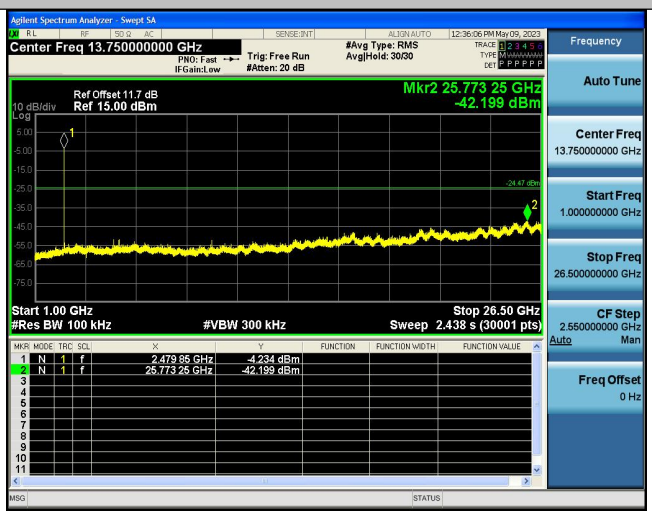
2DH5-Ant1-2441-1000~26500--3.85

2DH5-Ant1-2480-0~Reference--4.47

2DH5-Ant1-2480-30~1000--4.47



2DH5-Ant1-2480-1000~26500--4.47



Emissions in Restricted Bands

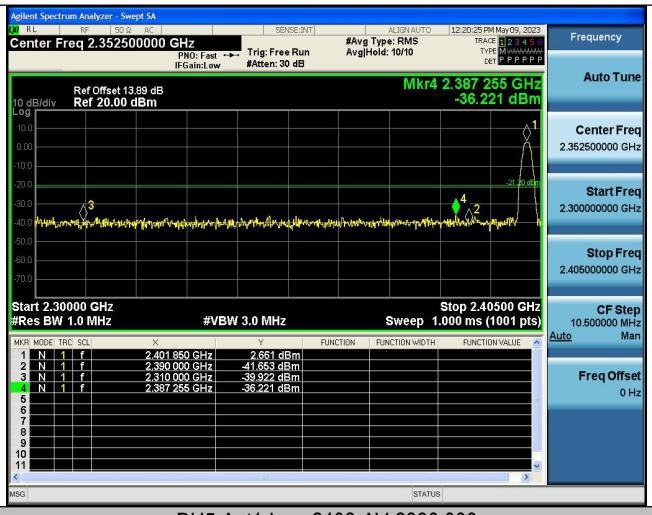
TestMode	Antenna	ChName	Frequency[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	Peak	2390.000	-41.65	≤-21.20	53.55	≤74	PASS
DH5	Ant1	Low	2402	Peak	2310.000	-39.92	≤-21.20	55.28	≤74	PASS
DH5	Ant1	Low	2402	Peak	2387.255	-36.22	≤-21.20	58.98	≤74	PASS
DH5	Ant1	Low	2402	AV	2390.000	-44.81	≤-41.20	50.39	≤54	PASS
DH5	Ant1	Low	2402	AV	2310.000	-45.35	≤-41.20	49.85	≤54	PASS
DH5	Ant1	Low	2402	AV	2383.790	-44.42	≤-41.20	50.78	≤54	PASS

DH5	Ant1	High	2480	Peak	2483.500	-39.78	≤-21.20	55.42	≤74	PASS
DH5	Ant1	High	2480	Peak	2500.000	-39.7	≤-21.20	55.50	≤74	PASS
DH5	Ant1	High	2480	Peak	2494.800	-35.69	≤-21.20	59.51	≤74	PASS
DH5	Ant1	High	2480	AV	2483.500	-45.04	≤-41.20	50.16	≤54	PASS
DH5	Ant1	High	2480	AV	2500.000	-44.6	≤-41.20	50.60	≤54	PASS
DH5	Ant1	High	2480	AV	2498.000	-44.49	≤-41.20	50.71	≤54	PASS
2DH5	Ant1	Low	2402	Peak	2390.000	-37.83	≤-21.20	57.37	≤74	PASS
2DH5	Ant1	Low	2402	Peak	2310.000	-40.51	≤-21.20	54.69	≤74	PASS
2DH5	Ant1	Low	2402	Peak	2363.105	-36.02	≤-21.20	59.18	≤74	PASS
2DH5	Ant1	Low	2402	AV	2390.000	-44.68	≤-41.20	50.52	≤54	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-45.33	≤-41.20	49.87	≤54	PASS
2DH5	Ant1	Low	2402	AV	2380.535	-44.4	≤-41.20	50.80	≤54	PASS
2DH5	Ant1	High	2480	Peak	2483.500	-38.54	≤-21.20	56.66	≤74	PASS
2DH5	Ant1	High	2480	Peak	2500.000	-40.1	≤-21.20	55.10	≤74	PASS
2DH5	Ant1	High	2480	Peak	2493.040	-35.79	≤-21.20	59.41	≤74	PASS
2DH5	Ant1	High	2480	AV	2483.500	-45.02	≤-41.20	50.18	≤54	PASS
2DH5	Ant1	High	2480	AV	2500.000	-44.55	≤-41.20	50.65	≤54	PASS
2DH5	Ant1	High	2480	AV	2499.920	-44.45	≤-41.20	50.75	≤54	PASS
DH5	Ant1	Low	Hop_2402	Peak	2390.000	-37.43	≤-21.20	57.77	≤74	PASS
DH5	Ant1	Low	Hop_2402	Peak	2310.000	-38.16	≤-21.20	57.04	≤74	PASS
DH5	Ant1	Low	Hop_2402	Peak	2324.150	-34.78	≤-21.20	60.42	≤74	PASS
DH5	Ant1	High	Hop_2480	Peak	2483.500	-36.78	≤-21.20	58.42	≤74	PASS
DH5	Ant1	High	Hop_2480	Peak	2500.000	-37.59	≤-21.20	57.61	≤74	PASS
DH5	Ant1	High	Hop_2480	Peak	2484.800	-34.3	≤-21.20	60.90	≤74	PASS
2DH5	Ant1	Low	Hop_2402	Peak	2390.000	-36.45	≤-21.20	58.75	≤74	PASS
2DH5	Ant1	Low	Hop_2402	Peak	2310.000	-37.34	≤-21.20	57.86	≤74	PASS
2DH5	Ant1	Low	Hop_2402	Peak	2327.615	-34.88	≤-21.20	60.32	≤74	PASS
2DH5	Ant1	High	Hop_2480	Peak	2483.500	-36.64	≤-21.20	58.56	≤74	PASS
2DH5	Ant1	High	Hop_2480	Peak	2500.000	-36.98	≤-21.20	58.22	≤74	PASS
2DH5	Ant1	High	Hop_2480	Peak	2495.760	-34.44	≤-21.20	60.76	≤74	PASS

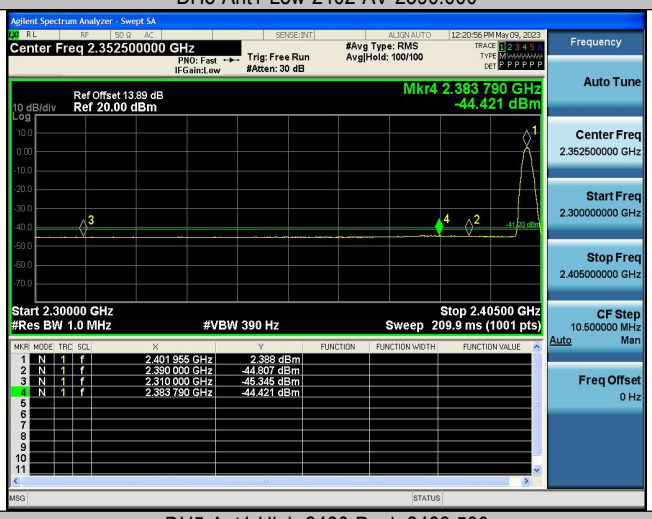
Note:

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.

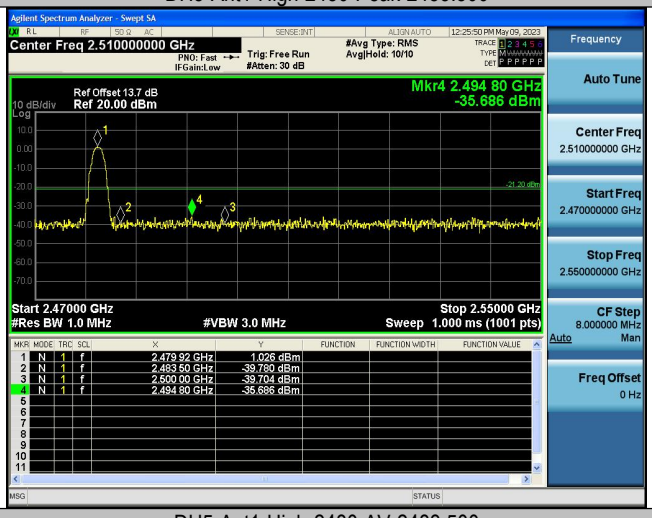
DH5-Ant1-Low-2402-Peak-2390.000



DH5-Ant1-Low-2402-AV-2390.000



DH5-Ant1-High-2480-Peak-2483.500



DH5-Ant1-High-2480-AV-2483.500