



RADIO TEST REPORT

Report No.: SHATBL2203027W03

Applicant:

FrSky Electronic Co., Ltd.

Address:

F-4, Building C, Zhongxiu Technology Park, No.3 Yuanxi Road, Wuxi,
214125, Jiangsu, China

Product Name : Tandem digital radio system

Brand Name : FRSKY

Model Name : TANDEM X18

Series Model : TANDEM X18S, TANDEM X18SE, TANDEM X18PRO

Test Standard : FCC Part 15.247

FCC ID : XYFTDX18HDSP

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TEST RESULT CERTIFICATION

Applicant.....: FrSky Electronic Co., Ltd.

Address.....: F-4, Building C, Zhongxiu Technology Park, No.3 Yuanxi Road,
Wuxi, 214125, Jiangsu, China

Manufacturer's Name.....: FrSky Electronic Co., Ltd.

Address.....: F-4, Building C, Zhongxiu Technology Park, No.3 Yuanxi Road,
Wuxi, 214125, Jiangsu, China

Product Description

Product Name.....: Tandem digital radio system

Brand Name: FRSKY

Model Name.....: TANDEM X18

Series Model.....: TANDEM X18S, TANDEM X18SE, TANDEM X18PRO

Test Standards.....: FCC Part 15.247

Test Procedure.....: ANSI C63.10-2013

This device described above has been tested by ATBL, 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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Date of receipt of test item.....: 23 Mar. 2022

Date (s) of performance of tests.: 23 Mar. 2022~28 Apr. 2022

Date of Issue.....: 28 Apr. 2022

Test Result.....: Pass

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Eric liu

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Ghost Li.

(Ghost Li)

Authorized Signatory :

Terry yang

(Terry yang)



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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	28 Apr. 2022	SHATBL2203027W03	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part15.247,Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.247(a)(1)	Hopping Channel Separation	PASS	--
15.247(a)(1)&(b)(1)	Output Power	PASS	--
15.209	Radiated Spurious Emission	PASS	--
15.247(d)	Conducted Spurious & Band Edge Emission	PASS	--
15.247(a)(1)(iii)	Number of Hopping Frequency	PASS	--
15.247(a)(1)(iii)	Dwell Time	PASS	--
15.247(a)(1)	Bandwidth	PASS	--
15.205	Restricted bands of operation	PASS	--
Part 15.247(d)/part 15.209(a)	Band Edge Emission	PASS	--
15.203	Antenna Requirement	PASS	--

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report.

(2)All tests are according to ANSI C63.10-2013.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Tandem digital radio system	
Trade Name	FRSKY	
Model Name	TANDEM X18	
Series Model	TANDEM X18S, TANDEM X18SE, TANDEM X18PRO	
Model Difference	Different product models only represent different appearance and color of products	
Product Description	The EUT is a Tandem digital radio system	
	Frequency range	2400-2483.5MHz
	Modulation Type:	FSK
	Number Of Channel:	47
	Antenna Designation:	Please refer to the Note 3.
	AntennaGain (dBi):	2.2 dBi
Channel List	Please refer to the Note 2.	
Power Rating	DC 6.5 ~ 8.4V	
Hardware version number	1.0.0	
Software versionnumber	ETHOS 1.1.1	
Connecting I/O Port(s)	Please refer to the Note 1.	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405.47	17	2429.47	33	2453.47
2	2406.97	18	2430.97	34	2454.97
3	2408.47	19	2432.47	35	2456.47
4	2409.97	20	2433.97	36	2457.97
5	2411.47	21	2435.47	37	2459.47
6	2412.97	22	2436.97	38	2460.97
7	2414.47	23	2438.47	39	2462.47
8	2415.97	24	2439.97	40	2463.97
9	2417.47	25	2441.47	41	2465.47
10	2418.97	26	2442.97	42	2466.97
11	2420.47	27	2444.47	43	2468.47
12	2421.97	28	2445.97	44	2469.97
13	2423.47	29	2447.47	45	2471.47
14	2424.97	30	2448.97	46	2472.97
15	2426.47	31	2450.47	47	2474.47
16	2427.97	32	2451.97	/	/

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	FRSKY	TANDEM X18	Single-band Antenna	N/A	2.2	Antenna

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Modulation
Mode 1	TX CH1	FSK
Mode 2	TX CH24	FSK
Mode 3	TX CH47	FSK
Mode 4	Hopping	FSK

Note:

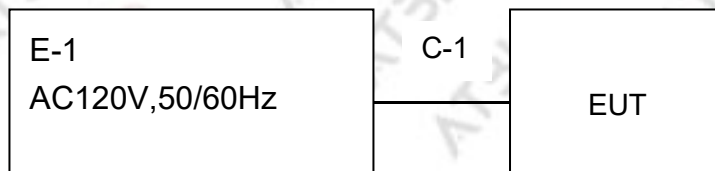
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

For Conducted Emission

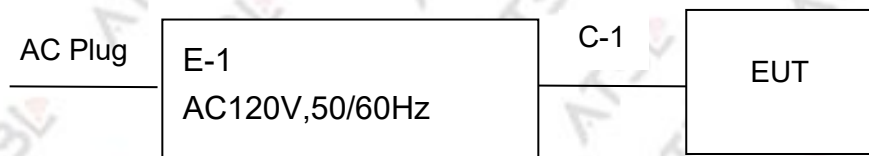
Test Case	
Conducted Emission	Mode 5 : Keeping TX

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



Conduction Emission Test



2.4 LABORATORY INFORMATION

Company Name:	Shanghai ATBL Technology Co., Ltd.
Address:	Building 8, No.160 Basheng Road, Waigaoqiao Free Trade Zone, Pudong New Area, Shanghai
Telephone:	+86(0)21-51298625
The FCC Registration Number (FRN):	0031025281
A2LA Number:	6184.01
CNAS Number:	CNAS L14531

2.5 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.962\text{dB}$
2	Conducted spurious emissions	$\pm 2.986\text{dB}$
3	All emissions, radiated 30MHz-1GHz	$\pm 2.49\text{dB}$
4	All emissions, radiated 1GHz-18GHz	$\pm 3.50\text{dB}$
5	Occupied bandwidth	$\pm 2.336\text{dB}$
6	Power spectral density	$\pm 0.866\text{dB}$

2.6 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.7 EQUIPMENTS LIST

2.7.1 Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Management number	Calibrated until
Test Receiver	R&S	ESCI	100469	SHATBL-E003	2022.07.13
Spectrum Analyzer	Agilent	N9020A	MY50200811	SHATBL-E017	2022.07.13
Bilog Antenna	SCHWARZBECK	VLUB 9168	01174	SHATBL-E008	2023.09.27
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	SHATBL-E009	2023.09.27
Pre-Amplifier (0.1M-3GHz)	JPT	JPA-10M1G35	21010100035001	SHATBL-E005	2022.10.07
Pre-Amplifier (1G-18GHz)	JPT	JPA0118-55-303A	1910001800055000	SHATBL-E006	2022.07.13
Temperature & Humidity	DeLi	DeLi	N/A	SHATBL-E016	2022.10.08
Antenna/Turntable Controller	Brilliant	N/A	N/A	SHATBL-E007	N/A
Test SW	FALA	EMC-RI(Ver.4A2)		SHATBL-E046	N/A

2.7.2 Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Management number	Calibration date
Test Receiver	R&S	ESPI	101679	SHATBL-E012	2022.07.13
LISN	R&S	ENV216	101300	SHATBL-E013	2022.07.13
LISN	R&S	ENV216	100333	SHATBL-E041	2023.03.08
Temperature & Humidity	DeLi	DeLi	N/A	SHATBL-E015	2022.10.07
Test SW	FALA	EZ-EMC(Ver.EMC-CON3A1.1)		SHATBL-E044	N/A

2.7.3 RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	equipment number	Calibrated until
MIMO Power measurement test Set	DARE	RPR3006W	16I00054SN016	SHATBL-W006	2022.10.07
			RPR6W-20001005	SHATBL-W013	2022.10.07
Signal Analyzer	Agilent	N9020A	MY57300196	SHATBL-W004	2022.10.07
Signal Generator	Agilent	N5182B	MY46240556	SHATBL-W005	2022.10.07
Wireless Communications Test Set	R&S	CMW500	101331	SHATBL-W007	2022.10.07
Temperature & Humidity	Deli	deli	N/A	SHATBL-W011	2022.10.07
Attenuator	Agilent	8494B	DC-18G	SHATBL-W009	2022.10.07
Attenuator	Agilent	8496B	DC-18G	SHATBL-W010	2022.10.07
power splitter	MNK	MPD-DC/6-2S	62315 G51	SHATBL-W015	2022.10.07
			62315 G52	SHATBL-W016	2022.10.07
Filter	Chengdu kangmaiwei	ZBSF-C2400-2483.5-T3	N/A	SHATBL-W021	N/A
Constant temperature and humidity box	KSON	THS-B6C-150	6159K	SHATBL-W019	2023.01.17
Test SW	FALA	LZ-RF(Ver.LzRF-03A3.1)		SHATBL-W020	N/A

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Conducted Emissionlimit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of “*” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

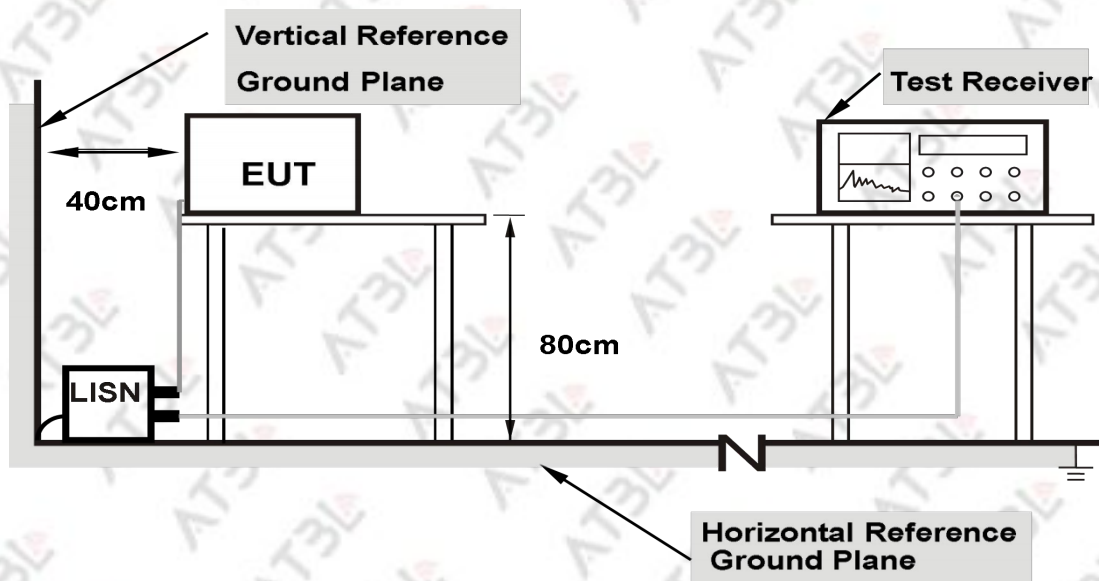
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN is at least 80 cm from the nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULT

Note: The EUT is powered by DC, this test item is not applicable.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission falls within the Restricted band specified on Part 15.205 (a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5

12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AV
Start Frequency	9 KHz/150KHz(Peak/QP/AV)
Stop Frequency	150KHz/30MHz(Peak/QP/AV)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz); 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted band)	1MHz / 3MHz(Peak) 1 MHz/1/T MHz(AVG)

For Restricted band

Spectrum Parameter	Setting
Detector	Peak/AV
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz Upper Band Edge: 2475to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

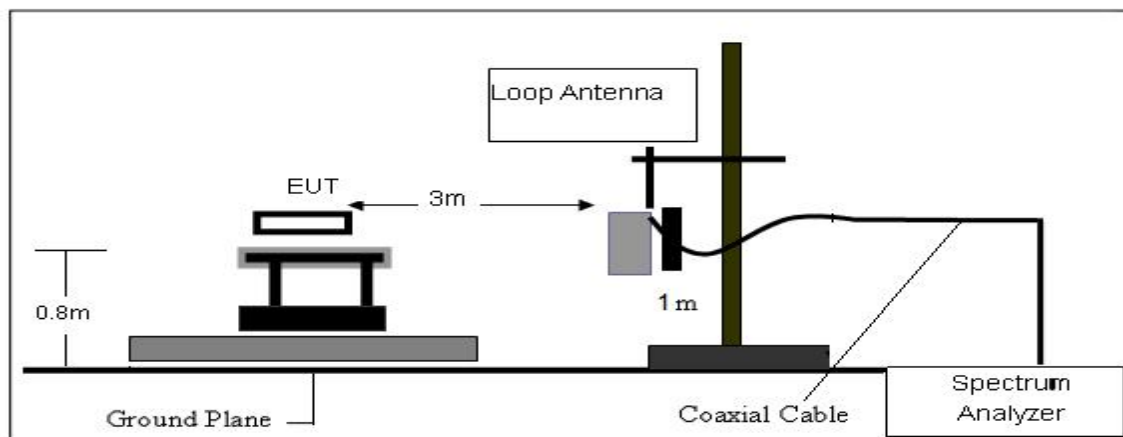
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.3 DEVIATION FROM TEST STANDARD

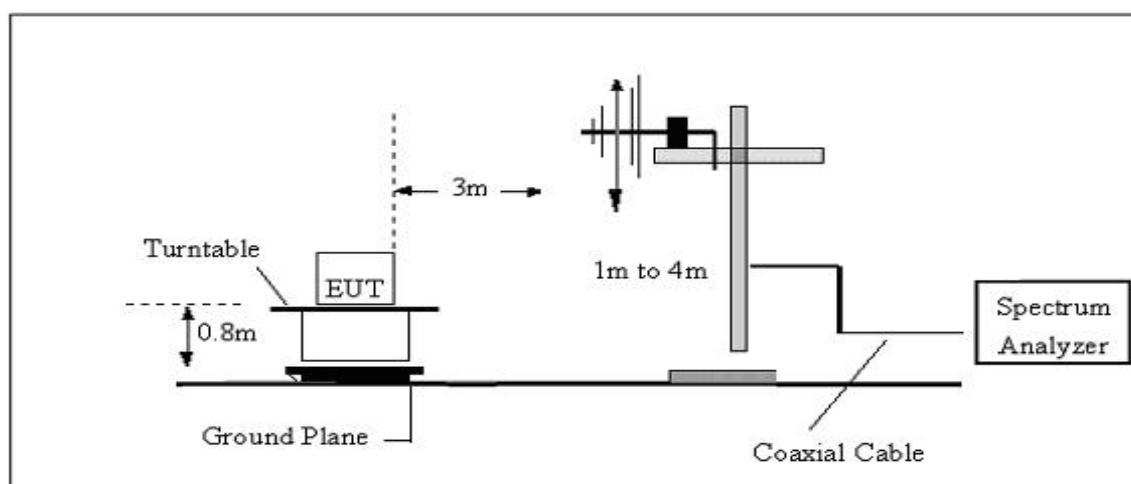
No deviation.

3.2.4 TESTSETUP

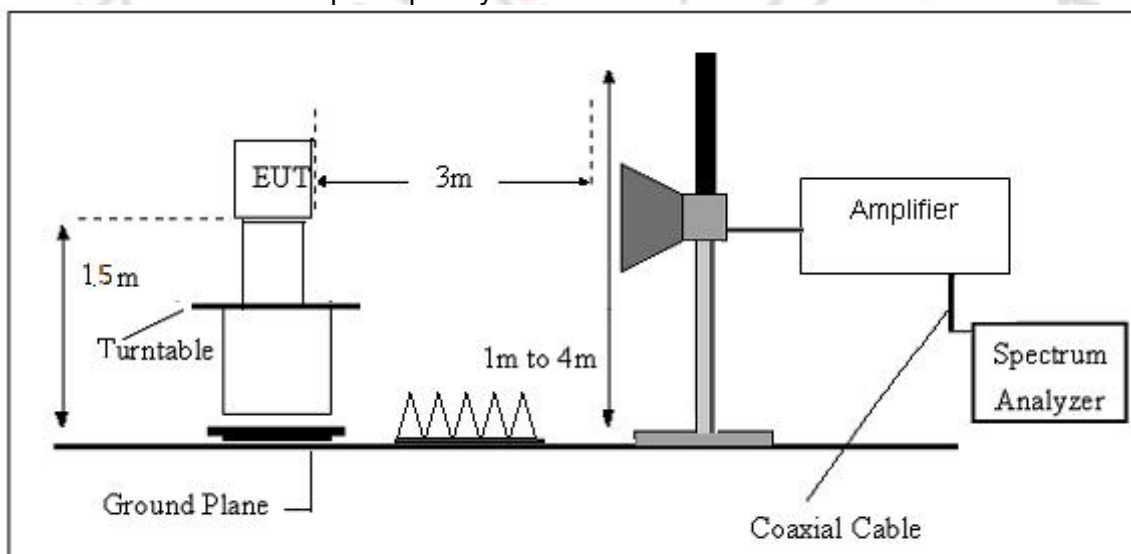
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

Please refer to section 3.1.4 of this report.

3.2.6 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Factor (dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$

3.2.7 TEST RESULTS

(9KHz-30MHz)

Temperature:	23.3(C)	Relative Humidity:	61%RH
Test Voltage:	AC120V	Test Mode:	TX Mode

Freq.	Reading	Limit	Margin	State	Test Result
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F	
--	--	--	--	--	PASS
--	--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);

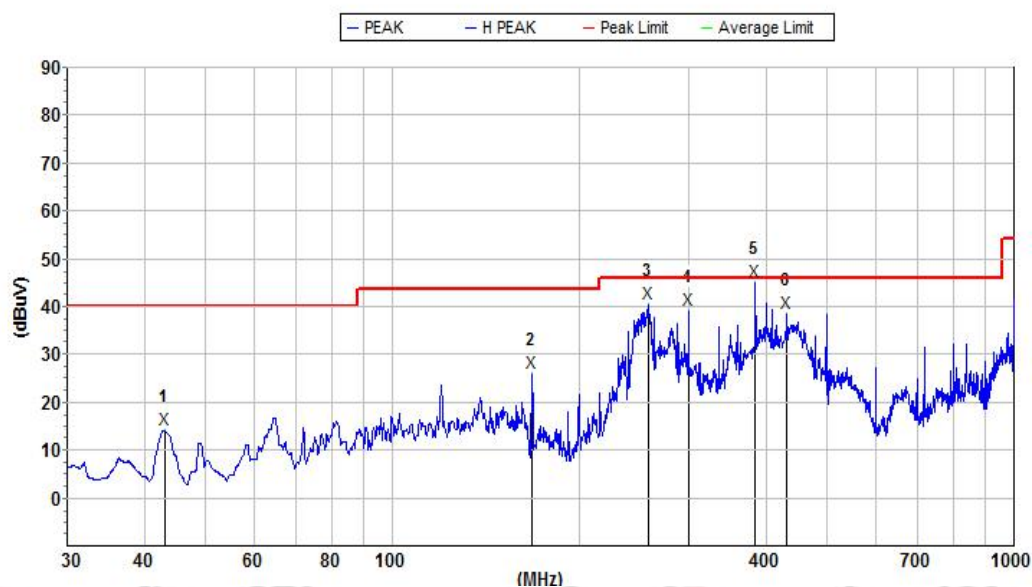
Limit line = specific limits (dBuV) + distance extrapolation factor.

(30MHz-1000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Horizontal
Test Mode:	Mode 1		

Remark:

- Margin = Result (Result =Reading + Factor)-Limit
- Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal



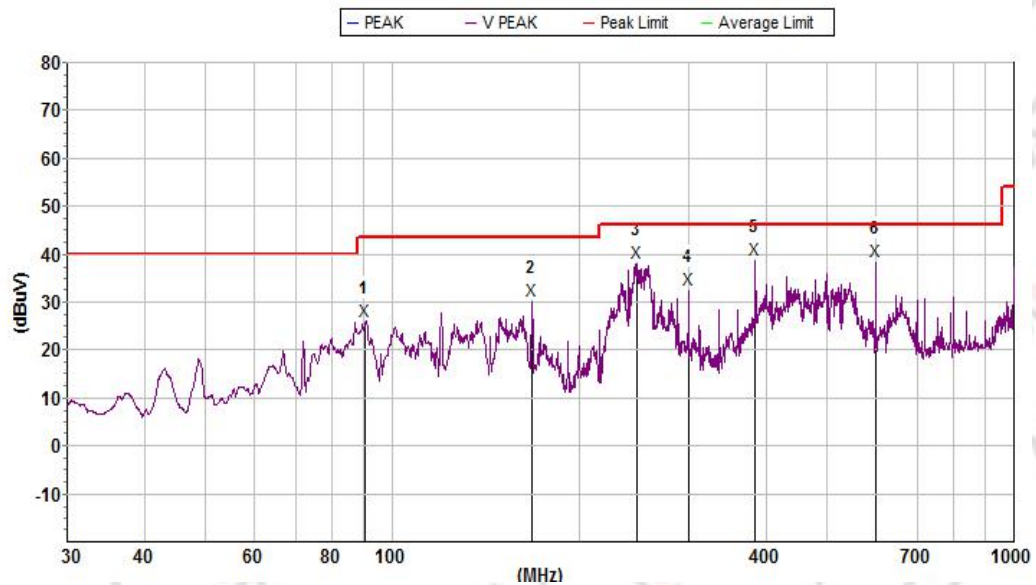
Mk.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
1	43.050457	14.2	40.0	25.8	13.9	32.5	0.8	H
2	168.118752	26.2	43.5	17.3	13.4	32.9	1.7	H
3	257.873886	40.5	46.0	5.5	11.7	32.8	2.6	H
4	299.841092	39.3	46.0	6.7	12.8	32.7	2.7	H
5	383.931815	45.1	46.0	0.9	13.7	32.4	2.7	H
6	431.787972	38.7	46.0	7.3	14.1	32.4	2.7	H

(30MHz-1000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Vertical
Test Mode:	Mode 1		

Remark:

1.Margin = Result (Result =Reading + Factor)–Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal


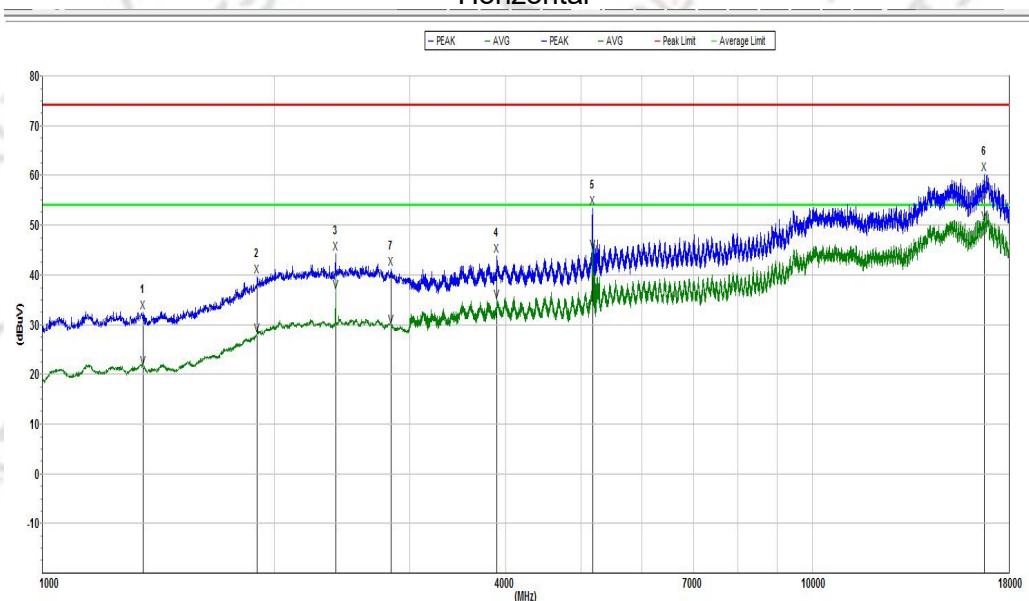
Mk.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
1	90.537409	26.2	43.5	17.3	9.5	32.9	1.1	V
2	168.118752	30.3	43.5	13.2	13.4	32.9	1.7	V
3	247.681894	38.1	46.0	7.9	11.6	32.8	2.6	V
4	299.841092	32.6	46.0	13.4	12.8	32.7	2.7	V
5	383.931815	38.9	46.0	7.1	14.4	32.4	2.7	V
6	599.321287	38.5	46.0	7.5	18.3	32.4	3.3	V

1000MHz-18000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Horizontal
Test Mode:	Mode 1		

Remark:

1.Margin = Result (Result =Reading + Factor)-Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1353.000000	32.6	74.0	41.4	20.8	57.3	2.3	H
2	1901.000000	39.7	74.0	34.3	21.8	51.5	2.6	H
3	2404.000000	44.4	74.0	29.6	22.8	50.2	2.8	H
4	3888.750000	44.0	74.0	30.0	24.3	50.2	3.2	H
5	5185.500000	53.5	74.0	20.5	24.8	49.2	3.8	H
6	16710.000000	60.2	74.0	13.8	30.9	47.6	6.8	H
Avg								
1	1353.000000	21.4	54.0	32.6	20.8	57.3	2.3	H
2	1901.000000	27.9	54.0	26.1	21.8	51.5	2.6	H
3	2404.000000	36.7	54.0	17.3	22.8	50.2	2.8	H
4	3888.750000	34.8	54.0	19.2	24.3	50.2	3.2	H
5	5185.500000	44.7	54.0	9.3	24.8	49.2	3.8	H
6	16710.000000	50.4	54.0	3.6	30.9	47.6	6.8	H

(1000MHz-18000MHz)

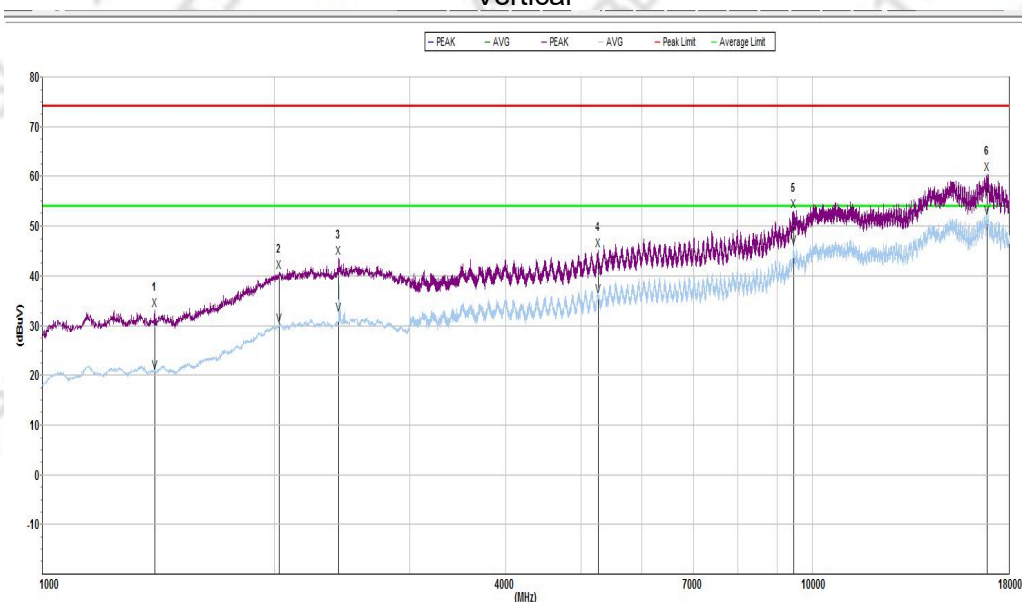
Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Vertical
Test Mode:	Mode 1		

Remark:

1.Margin = Result (Result =Reading + Factor)–Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Vertical



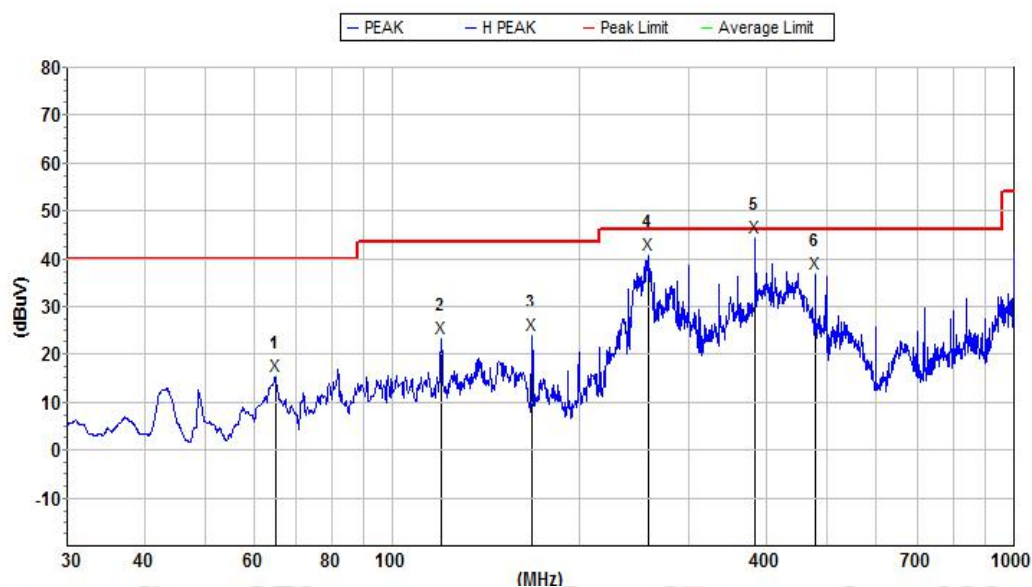
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1399.000000	33.1	74.0	40.9	20.9	57.3	2.4	V
2	2030.000000	40.8	74.0	33.2	22.2	50.1	2.7	V
3	2427.000000	43.7	74.0	30.3	23.2	50.2	2.8	V
4	5265.000000	45.3	74.0	28.7	25.5	49.1	3.8	V
5	9456.750000	53.0	74.0	21.0	27.8	48.6	5.4	V
6	16839.750000	60.5	74.0	13.5	31.4	47.4	6.8	V
Avg								
1	1399.000000	20.8	54.0	33.2	20.9	57.3	2.4	V
2	2030.000000	30.2	54.0	23.8	22.2	50.1	2.7	V
3	2427.000000	32.3	54.0	21.7	23.2	50.2	2.8	V
4	5265.000000	36.1	54.0	17.9	25.5	49.1	3.8	V
5	9456.750000	45.8	54.0	8.2	27.8	48.6	5.4	V
6	16839.750000	51.7	54.0	2.3	31.4	47.4	6.8	V

(30MHz-1000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Horizontal
Test Mode:	Mode 2		

Remark:

1.Margin = Result (Result =Reading + Factor)-Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal


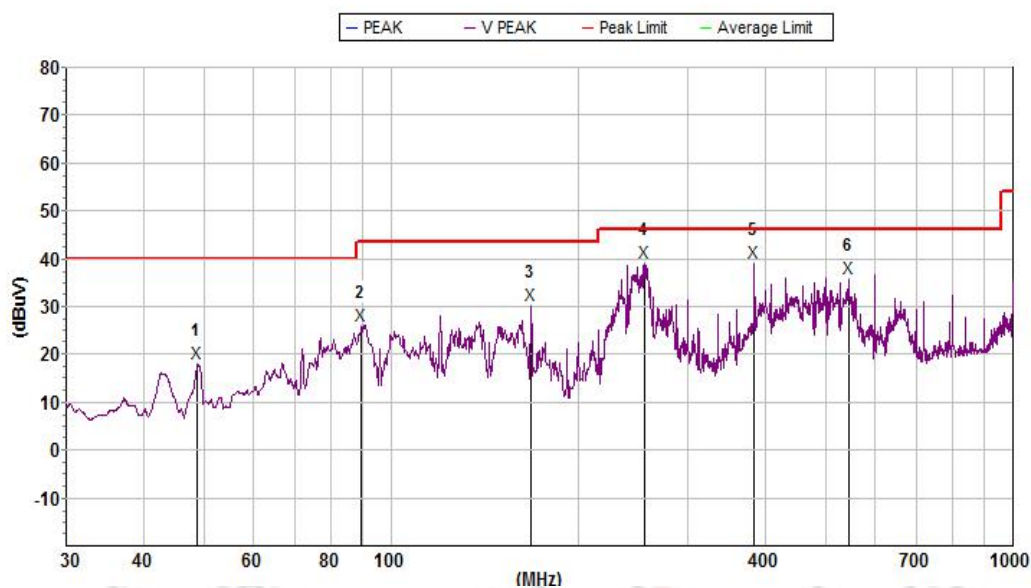
Mk.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
1	64.886534	15.5	40.0	24.5	11.8	32.8	0.8	H
2	120.065933	23.4	43.5	20.1	12.2	32.9	1.4	H
3	168.118752	24.0	43.5	19.5	13.4	32.9	1.7	H
4	258.779723	40.9	46.0	5.1	11.8	32.8	2.6	H
5	383.931815	44.6	46.0	1.4	13.7	32.4	2.7	H
6	479.685845	36.9	46.0	9.1	14.6	32.4	2.8	H

(30MHz-1000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Vertical
Test Mode:	Mode 2		

Remark:

3. Margin = Result (Result =Reading + Factor)–Limit

4. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Vertical


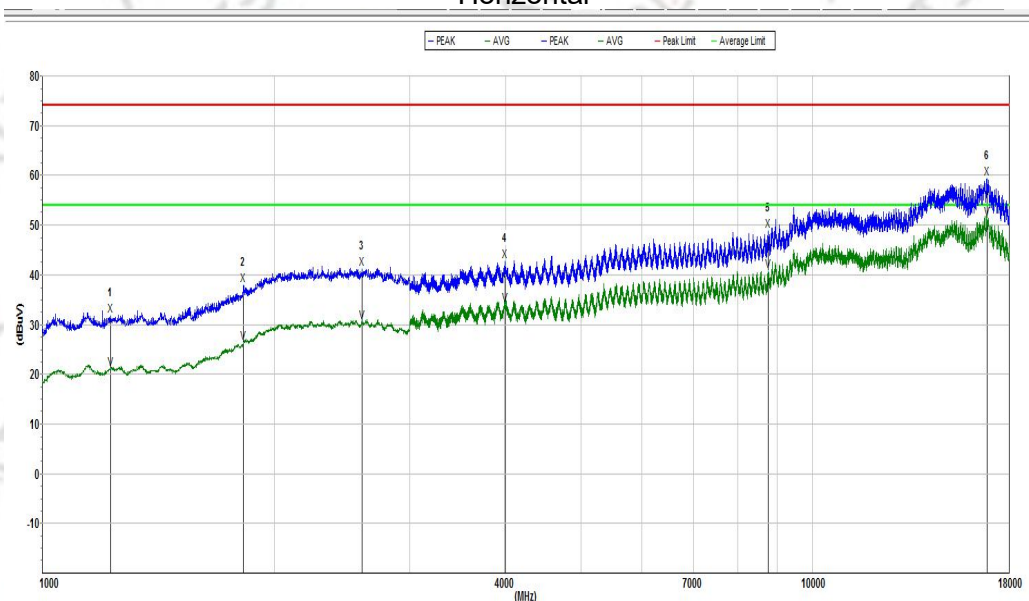
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
1	48.842895	18.1	40.0	21.9	13.6	32.6	0.8	V
2	89.589977	26.2	43.5	17.3	9.4	32.9	1.1	V
3	168.118752	30.4	43.5	13.1	13.4	32.9	1.7	V
4	256.071713	39.1	46.0	6.9	11.7	32.8	2.6	V
5	383.931815	39.1	46.0	6.9	14.4	32.4	2.7	V
6	543.274222	36.0	46.0	10.0	17.3	32.4	3.1	V

(1000MHz-18000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Horizontal
Test Mode:	Mode 2		

Remark:

1.Margin = Result (Result =Reading + Factor)-Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal


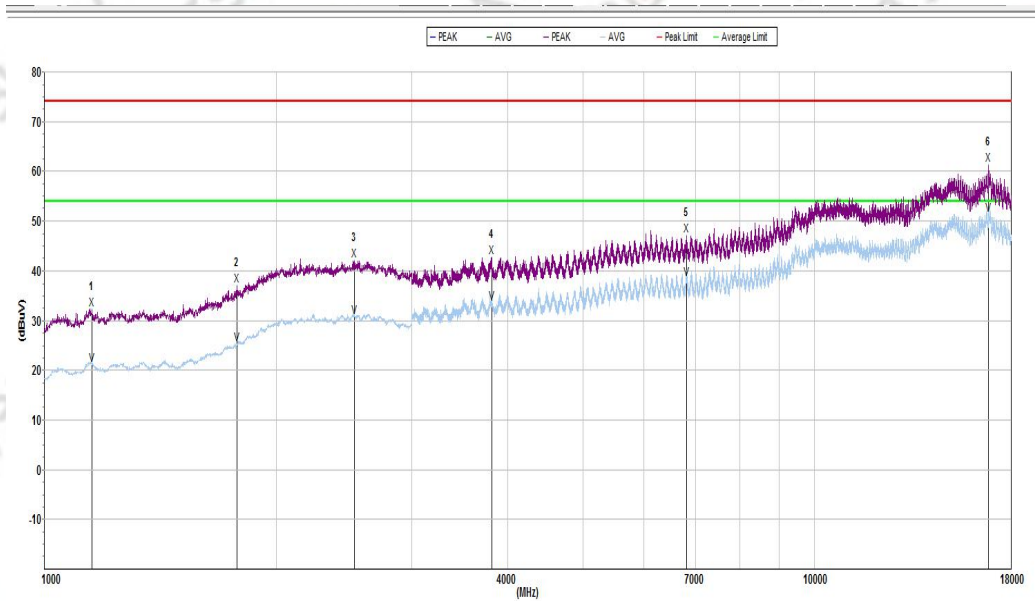
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1227.000000	31.8	74.0	42.2	20.7	57.3	2.3	H
2	1824.000000	38.0	74.0	36.0	21.7	52.6	2.6	H
3	2601.000000	41.3	74.0	32.7	23.1	50.5	2.9	H
4	3989.250000	42.7	74.0	31.3	24.3	50.1	3.3	H
5	8754.750000	48.9	74.0	25.1	26.7	48.6	5.2	H
6	16833.000000	59.5	74.0	14.5	30.9	47.4	6.8	H
Avg								
1	1227.000000	21.1	54.0	32.9	20.7	57.3	2.3	H
2	1824.000000	26.4	54.0	27.6	21.7	52.6	2.6	H
3	2601.000000	30.5	54.0	23.5	23.1	50.5	2.9	H
4	3989.250000	34.1	54.0	19.9	24.3	50.1	3.3	H
5	8754.750000	40.8	54.0	13.2	26.7	48.6	5.2	H
6	16833.000000	51.3	54.0	2.7	30.9	47.4	6.8	H

(1000MHz-18000MHz)

Temperature:	23.3°C	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Vertical
Test Mode:	Mode 2		

Remark:

1.Margin = Result (Result =Reading + Factor)–Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Vertical


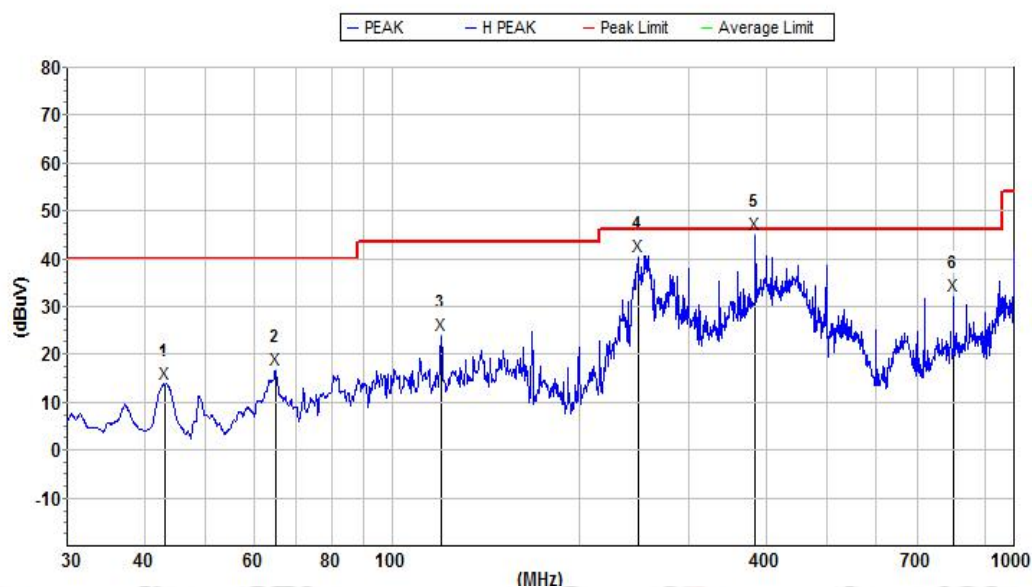
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1154.000000	32.4	74.0	41.6	20.8	57.3	2.2	V
2	1780.000000	37.1	74.0	36.9	21.7	53.3	2.6	V
3	2527.000000	42.1	74.0	31.9	23.4	50.3	2.8	V
4	3807.000000	42.9	74.0	31.1	24.7	50.3	3.2	V
5	6819.750000	47.1	74.0	26.9	26.0	48.9	4.3	V
6	16828.500000	61.4	74.0	12.6	31.4	47.4	6.8	V
Avg								
1	1154.000000	21.2	54.0	32.8	20.8	57.3	2.2	V
2	1780.000000	25.3	54.0	28.7	21.7	53.3	2.6	V
3	2527.000000	30.8	54.0	23.2	23.4	50.3	2.8	V
4	3807.000000	33.6	54.0	20.4	24.7	50.3	3.2	V
5	6819.750000	38.5	54.0	15.5	26.0	48.9	4.3	V
6	16828.500000	51.4	54.0	2.6	31.4	47.4	6.8	V

(30MHz-1000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Horizontal
Test Mode:	Mode 3		

Remark:

- Margin = Result (Result =Reading + Factor)-Limit
- Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal



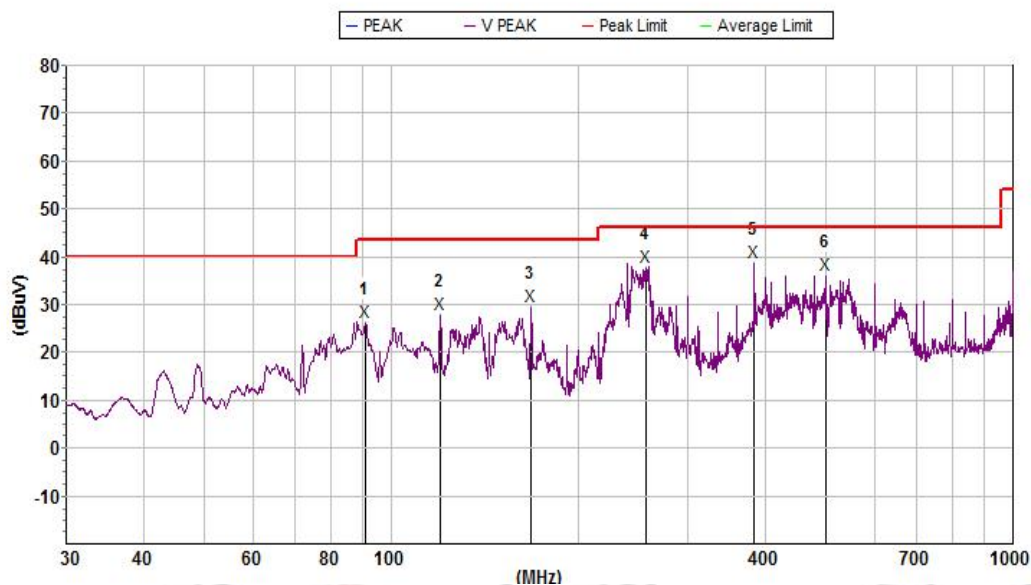
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
1	43.050457	14.0	40.0	26.0	13.9	32.5	0.8	H
2	64.886534	16.7	40.0	23.3	11.8	32.8	0.8	H
3	120.065933	24.0	43.5	19.5	12.2	32.9	1.4	H
4	248.551929	40.6	46.0	5.4	11.6	32.8	2.6	H
5	383.931815	45.2	46.0	0.8	13.7	32.4	2.7	H
6	798.979728	32.3	46.0	13.7	18.3	32.1	3.6	H

(30MHz-1000MHz)

Temperature:	23.3°C	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Vertical
Test Mode:	Mode 3		

Remark:

1.Margin = Result (Result =Reading + Factor)-Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Vertical


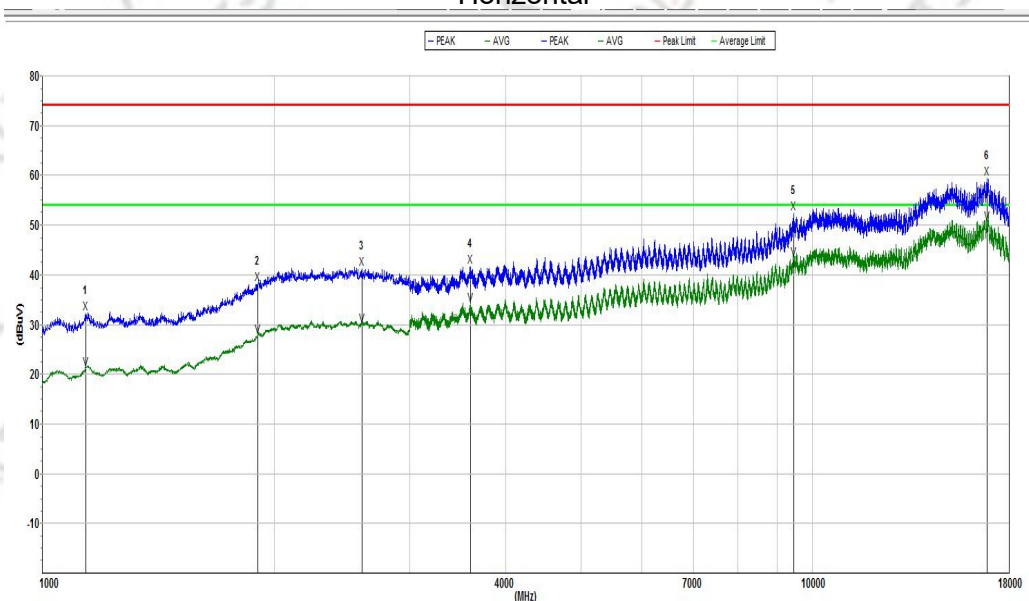
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
1	91.014875	26.5	43.5	17.0	9.5	32.9	1.1	V
2	120.065933	27.9	43.5	15.6	12.2	32.9	1.4	V
3	168.118752	29.7	43.5	13.8	13.4	32.9	1.7	V
4	256.971220	37.8	46.0	8.2	11.7	32.8	2.6	V
5	383.931815	38.9	46.0	7.1	14.4	32.4	2.7	V
6	499.424690	36.2	46.0	9.8	16.5	32.5	2.8	V

(1000MHz-18000MHz)

Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Horizontal
Test Mode:	Mode 3		

Remark:

1.Margin = Result (Result =Reading + Factor)-Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
Horizontal


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1138.000000	32.3	74.0	41.7	20.7	57.3	2.2	H
2	1903.000000	38.1	74.0	35.9	21.8	51.5	2.6	H
3	2600.000000	41.2	74.0	32.8	23.1	50.5	2.9	H
4	3593.250000	41.7	74.0	32.3	24.2	50.4	3.2	H
5	9446.250000	52.5	74.0	21.5	27.2	48.6	5.4	H
6	16835.250000	59.5	74.0	14.5	30.9	47.4	6.8	H
Avg								
1	1138.000000	21.2	54.0	32.8	20.7	57.3	2.2	H
2	1903.000000	27.7	54.0	26.3	21.8	51.5	2.6	H
3	2600.000000	30.0	54.0	24.0	23.1	50.5	2.9	H
4	3593.250000	34.1	54.0	19.9	24.2	50.4	3.2	H
5	9446.250000	43.3	54.0	10.7	27.2	48.6	5.4	H
6	16835.250000	50.5	54.0	3.5	30.9	47.4	6.8	H

(1000MHz-18000MHz)

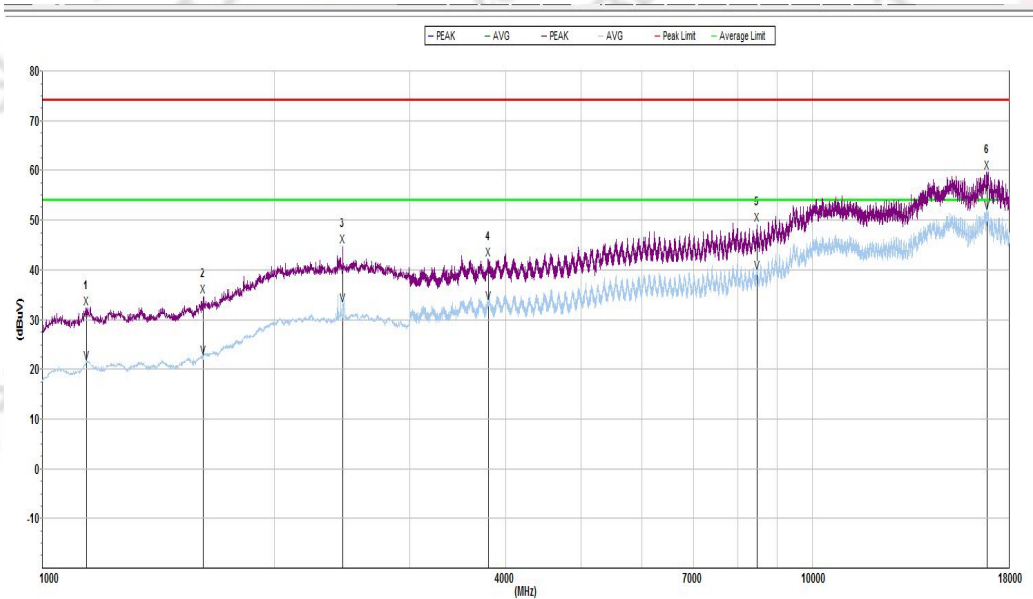
Temperature:	23.3℃	Relative Humidity:	60%RH
Test Voltage:	DC 7.4V	Phase:	Vertical
Test Mode:	Mode 3		

Remark:

1.Margin = Result (Result =Reading + Factor)–Limit

2.Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Vertical



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1141.000000	32.4	74.0	41.6	20.7	57.3	2.2	V
2	1619.000000	34.6	74.0	39.4	21.3	55.6	2.5	V
3	2456.000000	44.7	74.0	29.3	23.3	50.2	2.8	V
4	3796.500000	42.2	74.0	31.8	24.7	50.3	3.2	V
5	8464.500000	49.1	74.0	24.9	27.1	48.6	5.1	V
6	16842.000000	59.7	74.0	14.3	31.4	47.4	6.8	V
Avg								
1	1141.000000	21.4	54.0	32.6	20.7	57.3	2.2	V
2	1619.000000	22.4	54.0	31.6	21.3	55.6	2.5	V
3	2456.000000	32.9	54.0	21.1	23.3	50.2	2.8	V
4	3796.500000	33.5	54.0	20.5	24.7	50.3	3.2	V
5	8464.500000	39.5	54.0	14.5	27.1	48.6	5.1	V
6	16842.000000	51.5	54.0	2.5	31.4	47.4	6.8	V

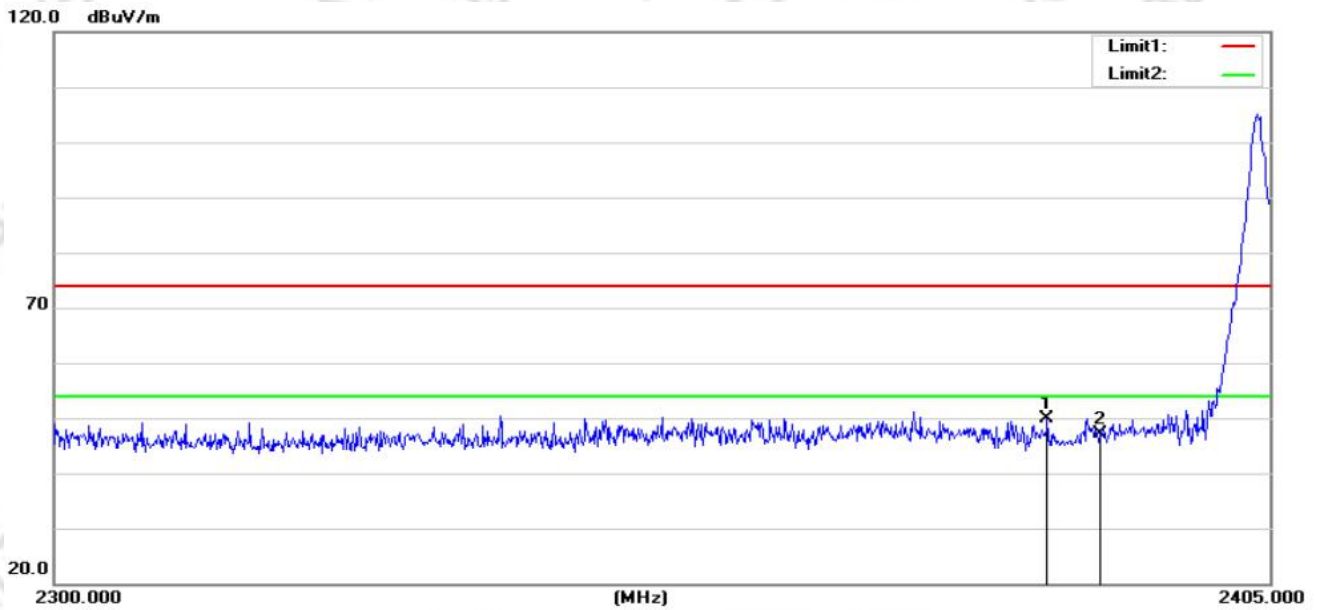
Note:

1.Other 18G-25G Emission detected are more than 20dB below the limit.

3.2.6 TEST RESULTS (BAND EDGE REQUIREMENTS)

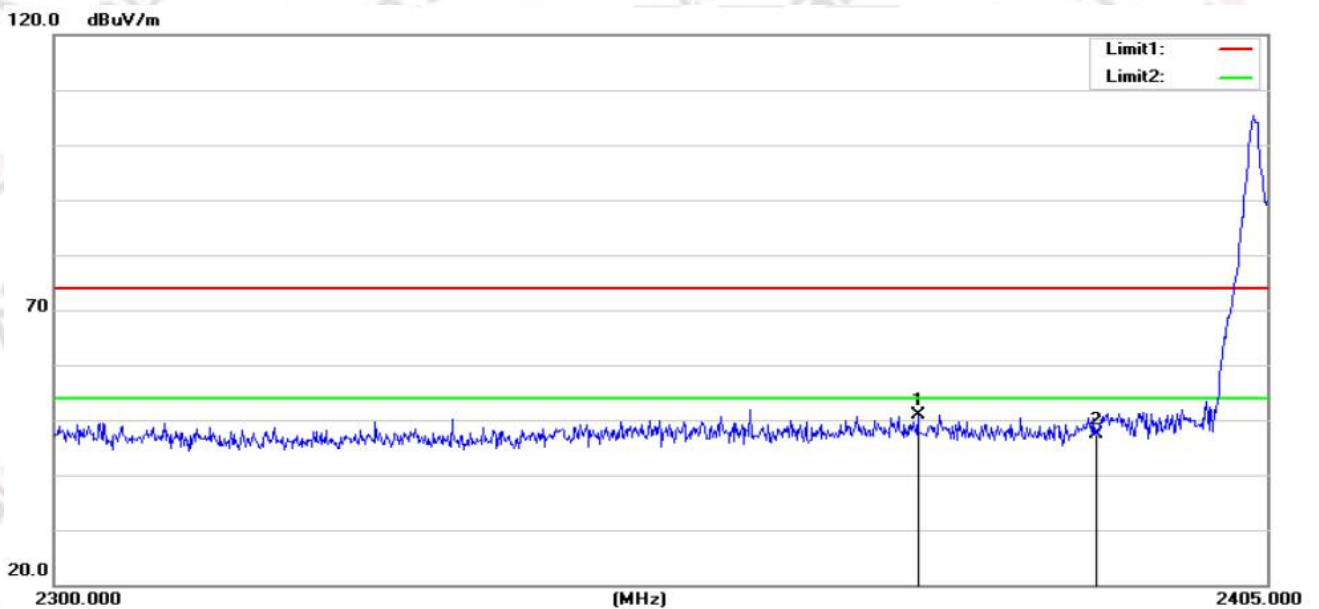
Low

Horizontal



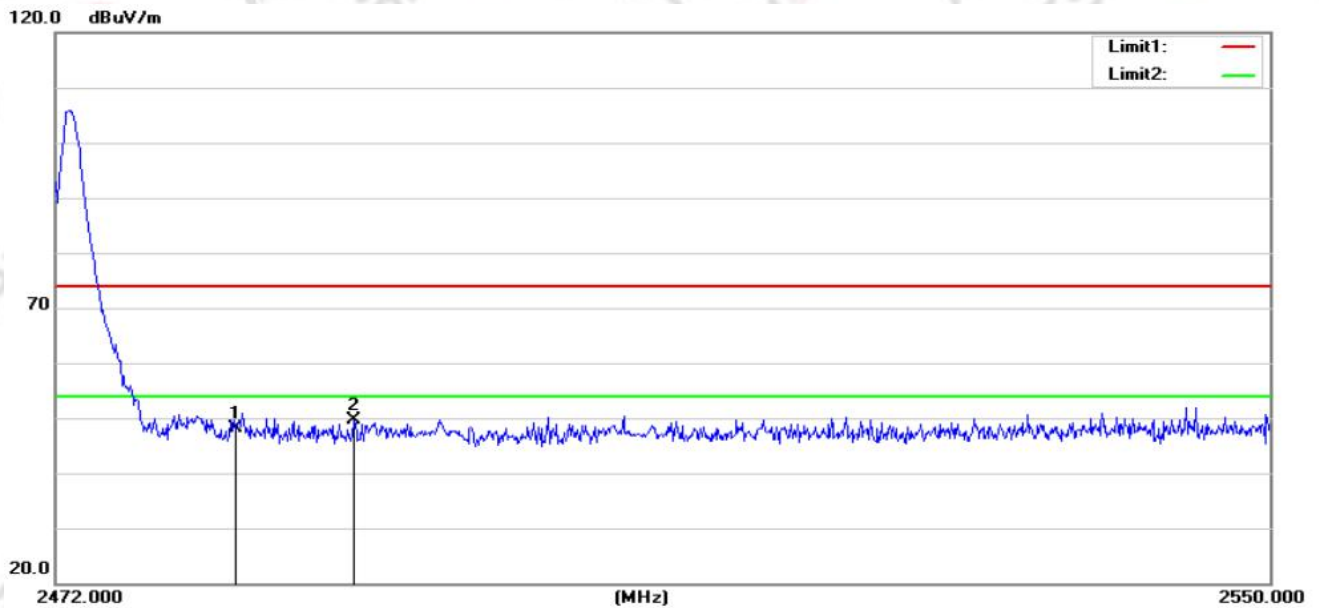
Mk.	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak								
1	2385.470	47.47	74.0	-26.53	22.7	50.2	2.8	H
2	2390.000	44.83	74.0	-29.17	22.8	50.2	2.8	H

Vertical



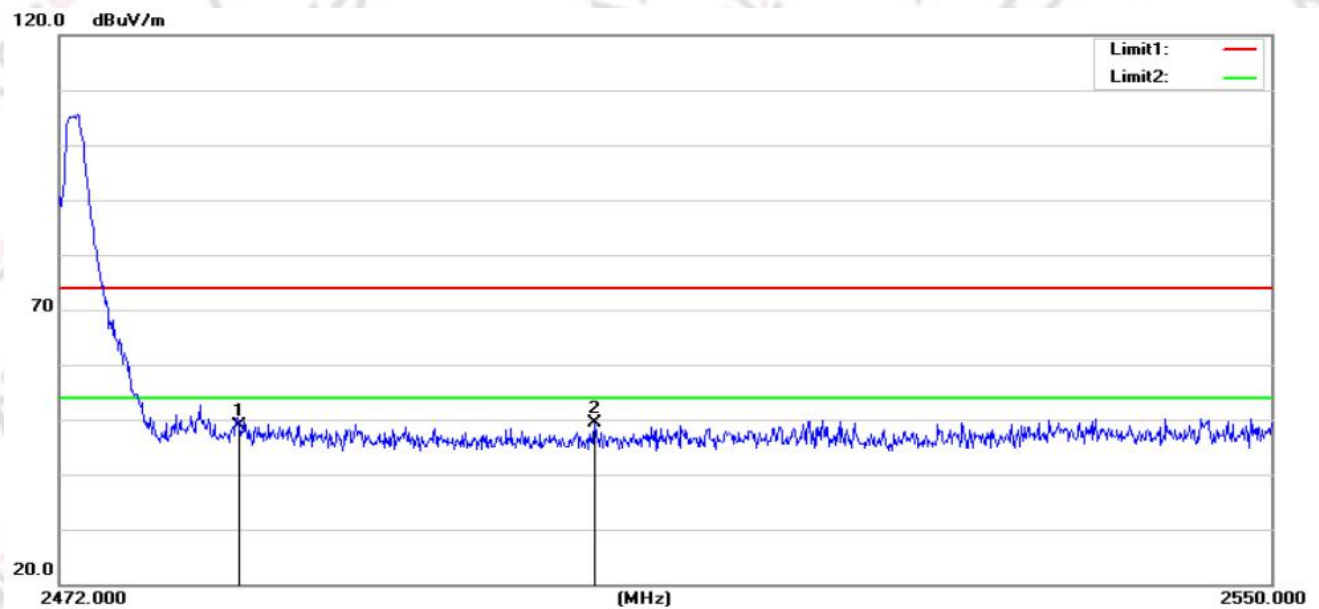
Mk.	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak								
1	2374.340	49.68	74.0	-24.32	22.7	50.2	2.8	V
2	2390.000	46.37	74.0	-27.63	22.8	50.2	2.8	V

High Horizontal



Mk.	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak								
1	2483.500	47.50	74.0	-26.5	23.0	50.2	2.8	H
2	2491.032	48.21	74.0	-25.79	23.1	50.2	2.8	H

Vertical



Mk.	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak								
1	2483.500	48.17	74.0	-25.83	23.0	50.2	2.8	V
2	2506.242	48.84	74.0	-25.16	23.1	50.2	2.8	V

Remark: All modes have been tested, and only the worst modes are shown in this report.

4. CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 LIMIT

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.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 – 2407 MHz Upper Band Edge: 2475 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Hopping Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300– 2403 MHz Upper Band Edge: 2479 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 TEST SETUP



The EUT is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Tune the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, the span is set to be greater than RBW.

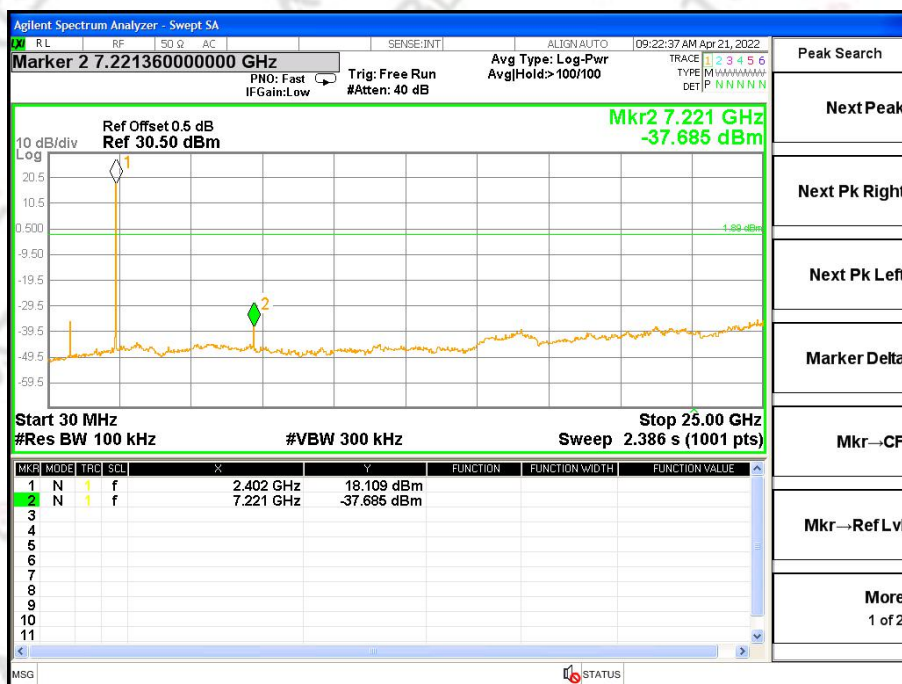
4.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

4.5 TEST RESULTS

Temperature:	25°C	Relative Humidity:	50%
Test Mode:	Mode1/2/3	Test Voltage:	DC 7.4V

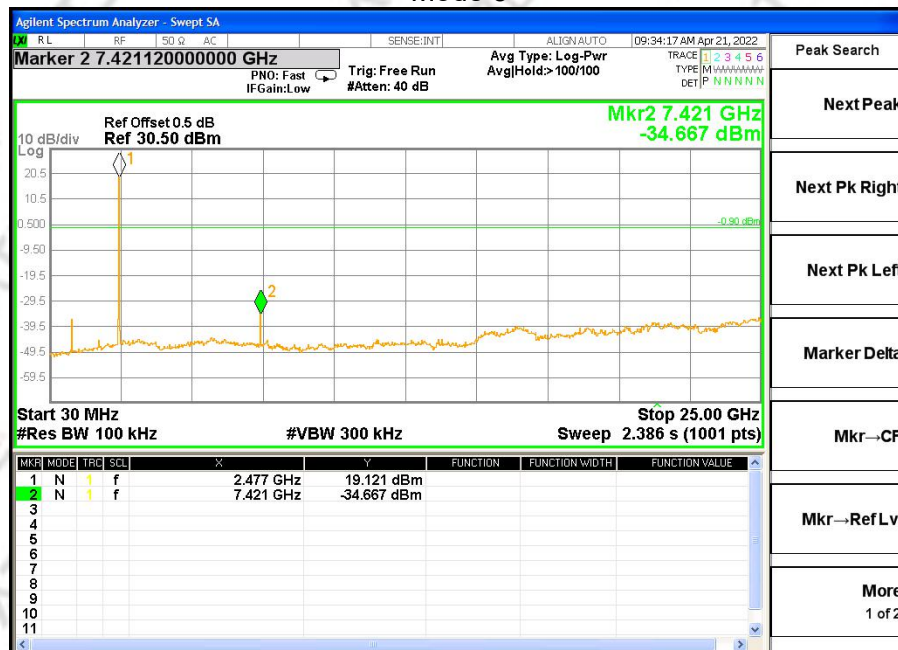
Mode 1



Mode 2

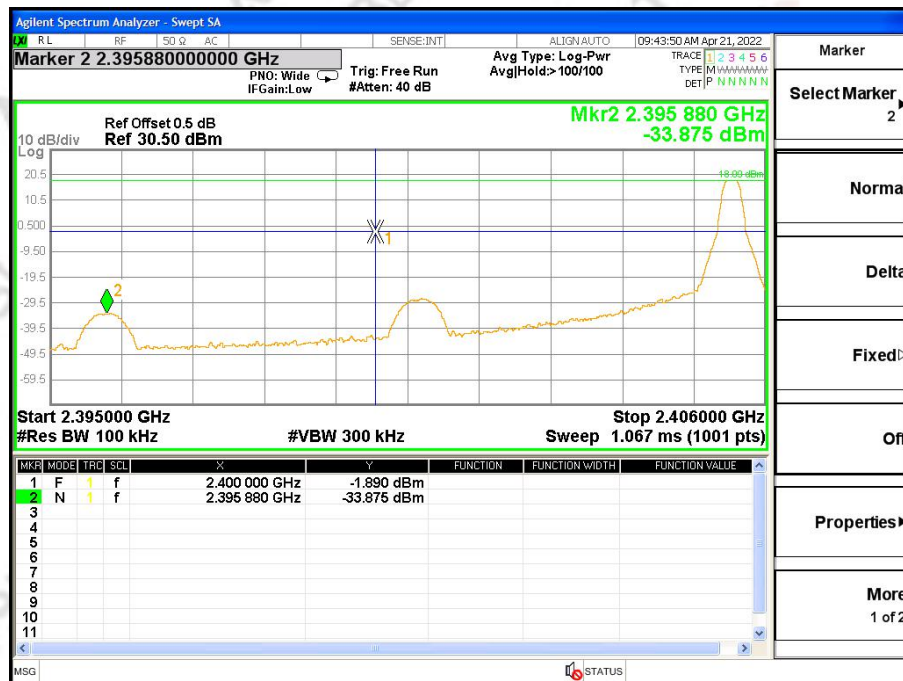


Mode 3

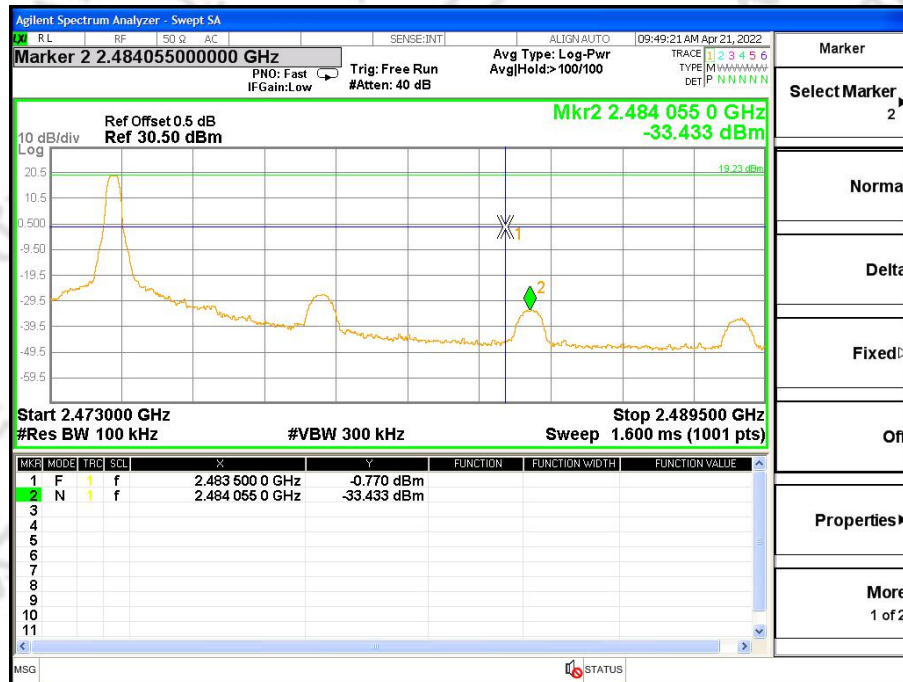


For Band edge(it's also the reference level for conducted spurious emission)

Mode 1

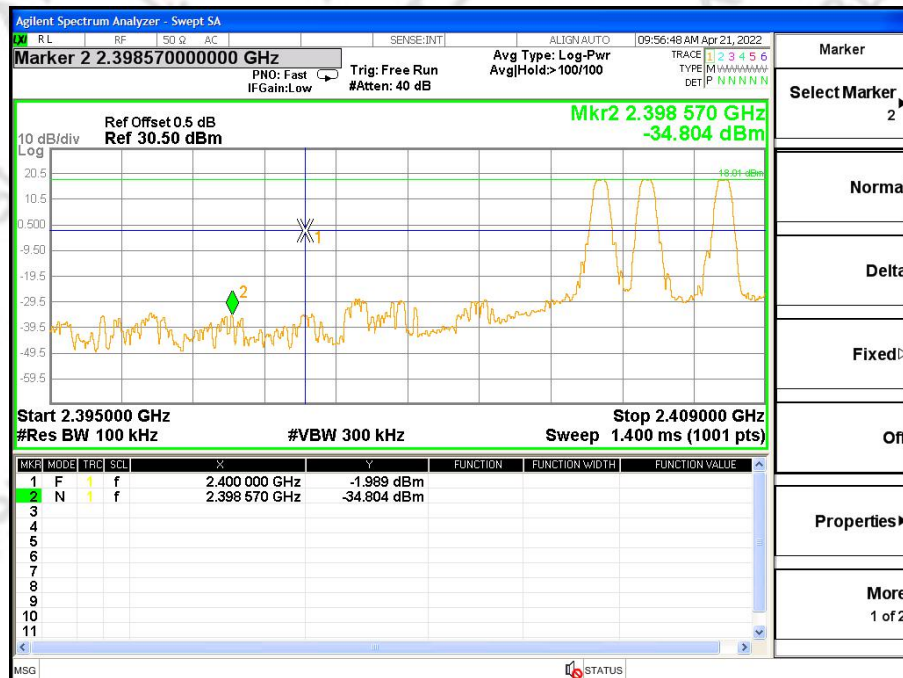


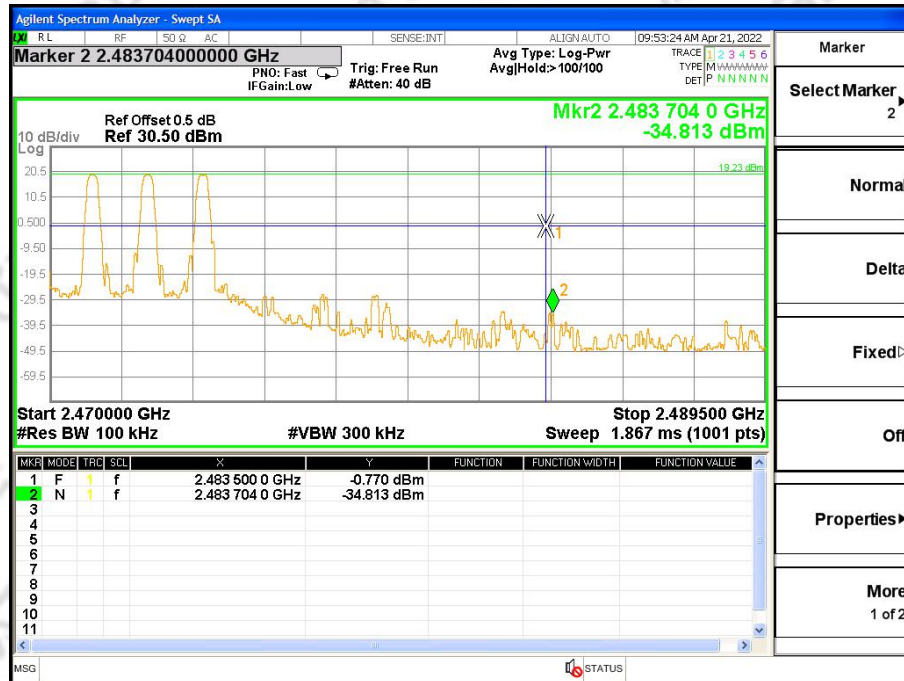
Mode 3



For Hopping Band edge

Mode 4





5. NUMBER OF HOPPING CHANNEL

5.1 LIMIT

FCC Part 15.247, Subpart C				
Section	Test Item	Limit	FrequencyRange (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥ 15	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating FrequencyRange
RB	300KHz
VB	300KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW= 300KHz, VBW=300KHz, Sweep time = Auto.

5.3 TEST SETUP



5.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

5.5 TEST RESULTS

Temperature:	25℃	Relative Humidity:	60%
Test Mode:	Mode 4	Test Voltage:	DC 7.5V

Number of Hopping Channel

47

Hopping channel



6. AVERAGE TIME OF OCCUPANCY

6.1 LIMIT

FCC Part 15.247, Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

6.2 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer.
- Set RBW = 1MHz/VBW = 3MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots RX, 1 time slot TX). So the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.
- DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots RX, 1 time slot TX). So the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot RX, 1 time slot TX). So the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.

6.3 TEST SETUP



6.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

6.5 TEST RESULTS

Temperature:	25℃	Relative Humidity:	50%
Test Mode:	Mode 1/2/3	Test Voltage:	DC 7.4V

Frequency (MHz)	Pulse time(ms)	Number of pulses	Dwell Time(s)	Limits(s)
2405.47	2.9	57	0.165	0.4
2439.97	2.9	57	0.165	0.4
2474.47	2.9	57	0.165	0.4

Agilent Spectrum Analyzer - Sweep SA

RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 01:16:07 PM Apr 29, 2022

Sweep Time 18.80 s Avg Type: Log-Pwr

PN0: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

TRACE 1 2 3 4 5 6
TYPE W W W W W W W W
DET N N N N N N N N

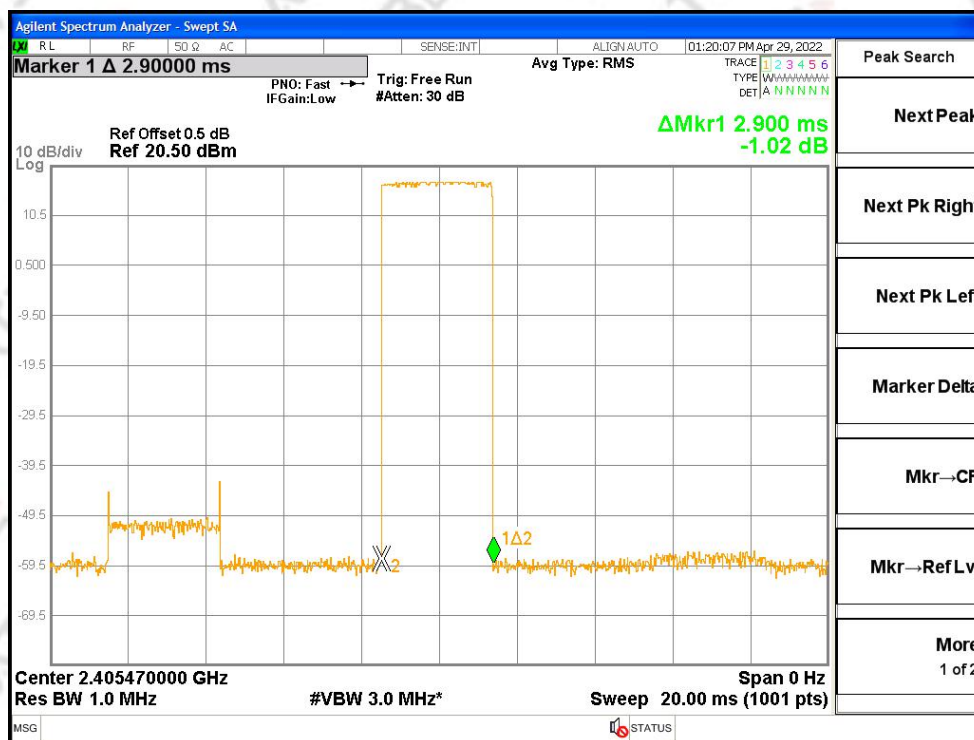
Ref Offset 0.5 dB
Ref 20.50 dBm

10 dB/div
Log

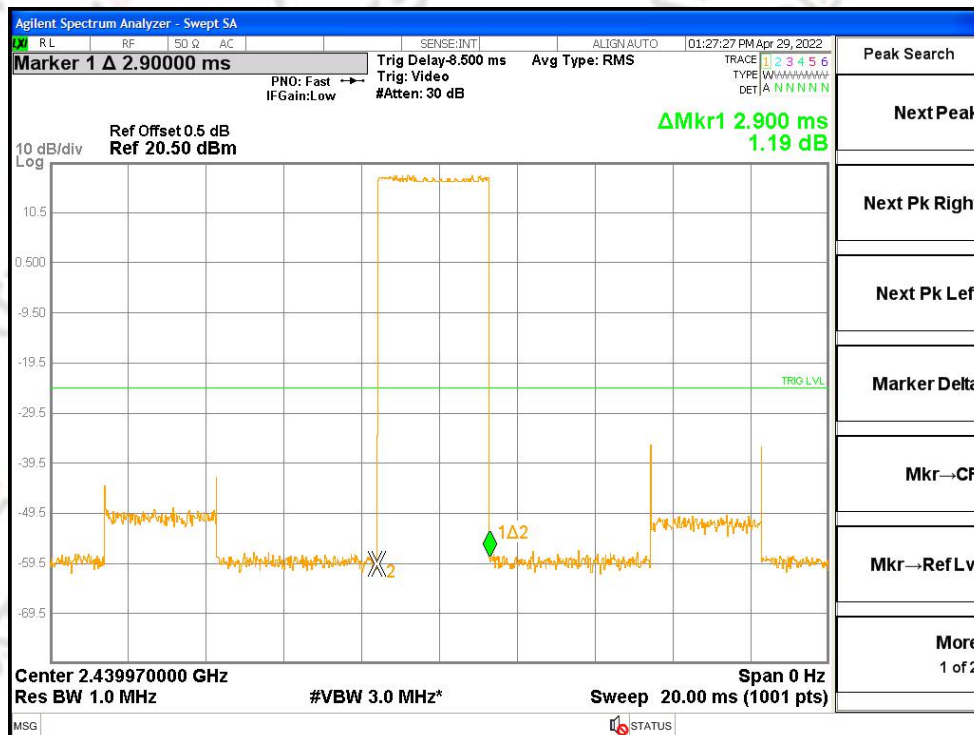
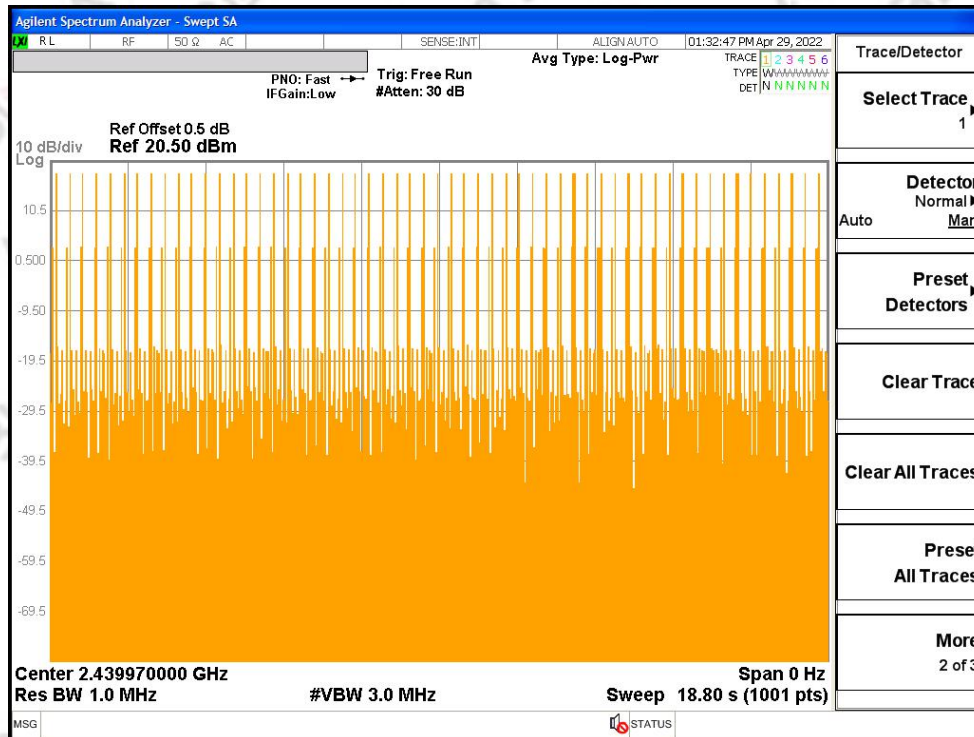
Center 2.405470000 GHz
Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.80 s (1001 pts) Span 0 Hz

MSG STATUS

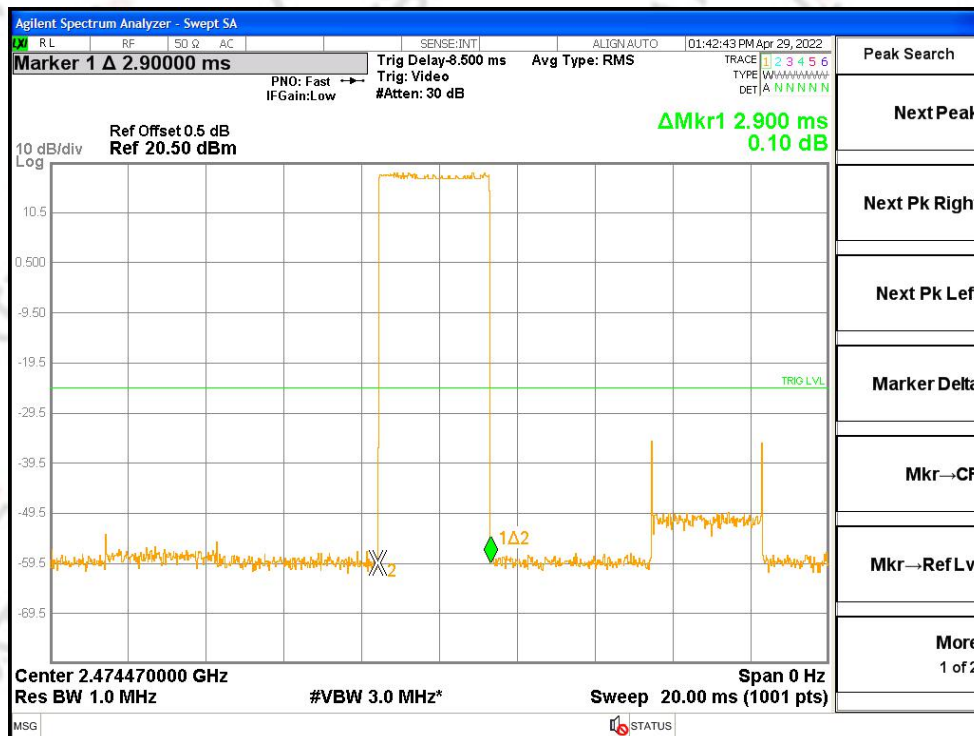
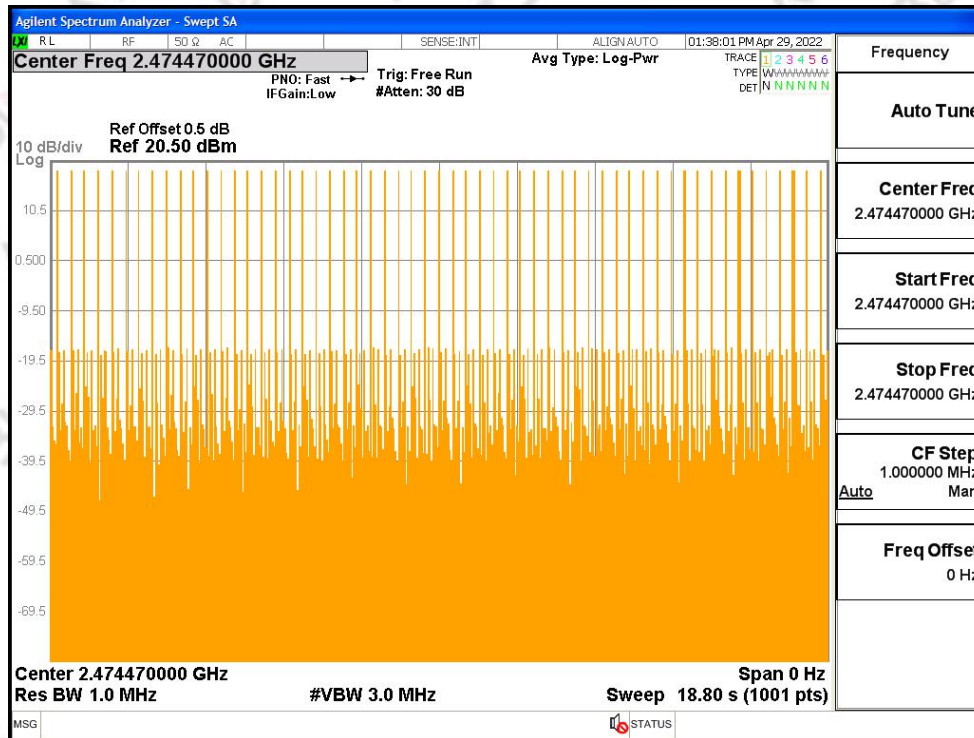
Sweep/Control
Sweep Time 18.80 s
Sweep Setup
Gate [Off, LO]
Points 1001



Mode 2



Mode 3



7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 LIMIT

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 2400-2483.5 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.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> 20 dB Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.2 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

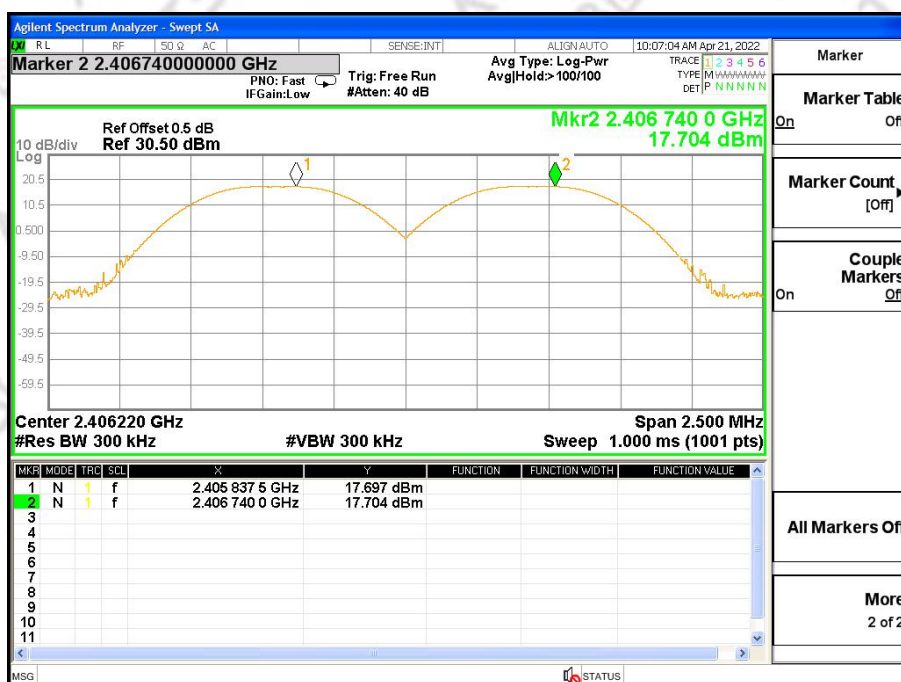
7.5 TEST RESULTS

Temperature:	25°C	Relative Humidity:	50%
Test Mode:	Mode 4	Test Voltage:	DC 7.5V

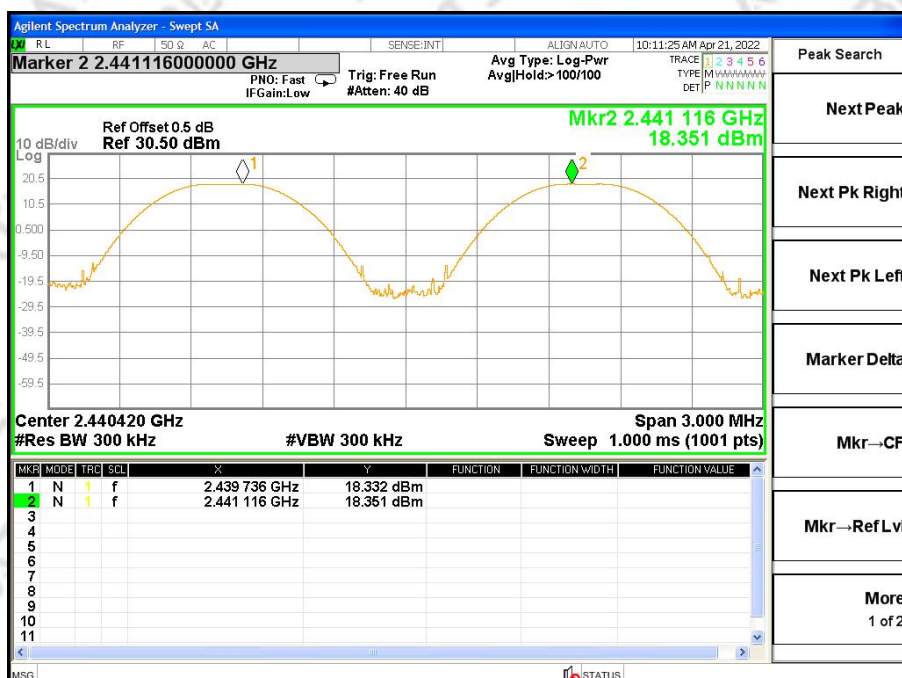
Frequency	Mark1 Frequency (MHz)	Mark2 Frequency (MHz)	Ch. Separation (MHz)	Limit (MHz)	Result
2405.47 MHz	2405.8375	2406.740	0.9025	0.2768	Complies
2439.97 MHz	2439.736	2441.116	1.38	0.2770	Complies
2474.47 MHz	2472.730	2474.230	1.5	0.2765	Complies

For FSK: Ch. Separation Limits: > 20dB bandwidth

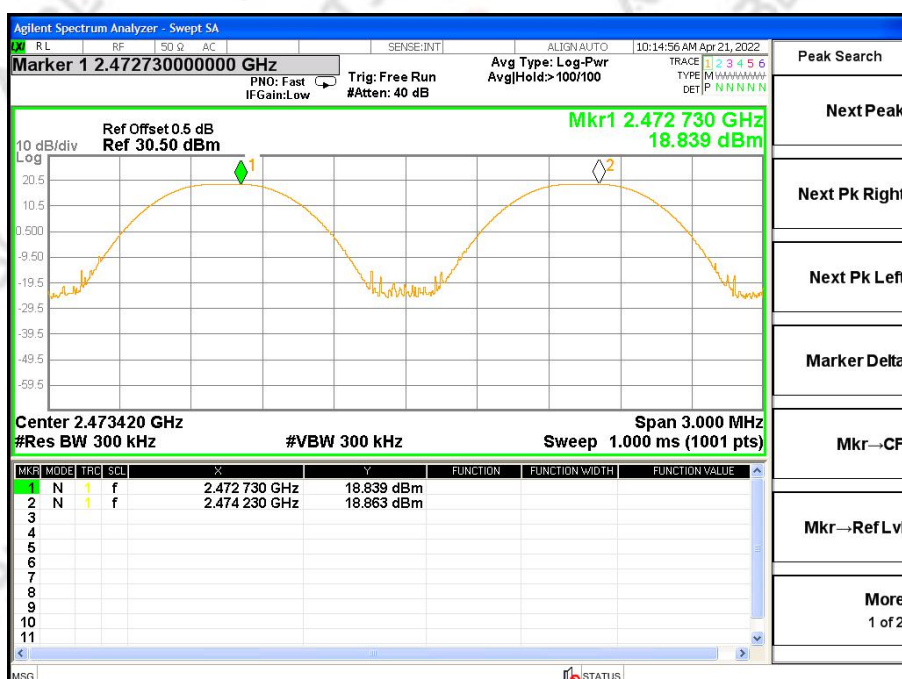
2405.47 MHz



2439.97 MHz



2474.47 MHz



8. BANDWIDTH TEST

8.1 LIMIT

FCC Part15 15.247,Subpart C				
Section	Test Item	Limit	FrequencyRange (MHz)	Result
15.247(a)(1)	Bandwidth	(20 dB Bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

8.3 TEST SETUP



8.4 EUT OPERATION CONDITIONS

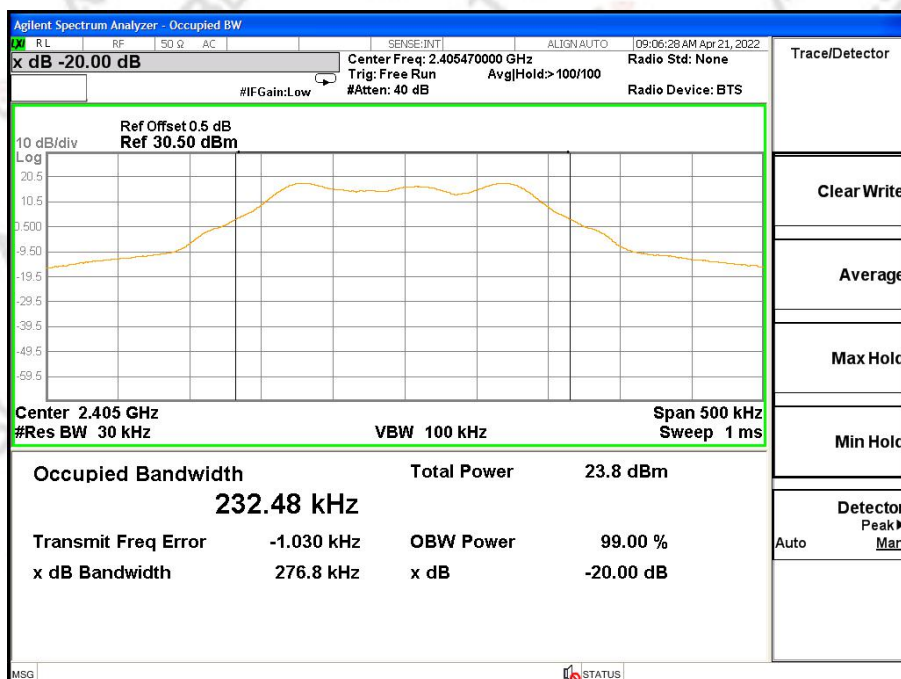
Please refer to section 3.1.4 of this report.

8.5 TEST RESULTS

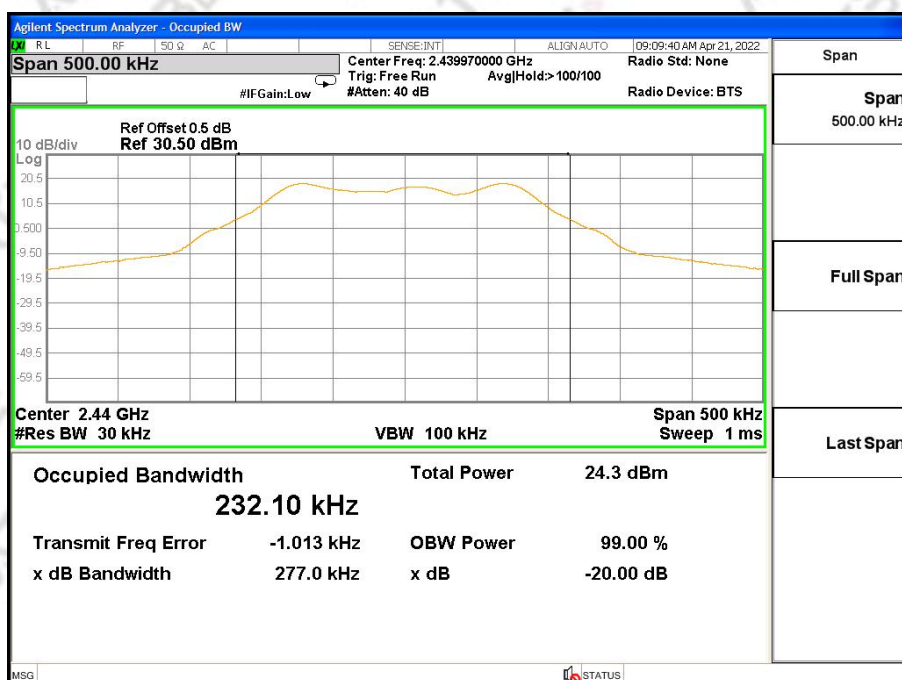
Temperature:	25°C	Relative Humidity:	50%
Test Mode:	Mode 1/2/3	Test Voltage:	DC 7.4V

Frequency	20dB Bandwidth (MHz)	Result
2405.47 MHz	0.2768	PASS
2439.97 MHz	0.277	PASS
2474.47 MHz	0.2765	PASS

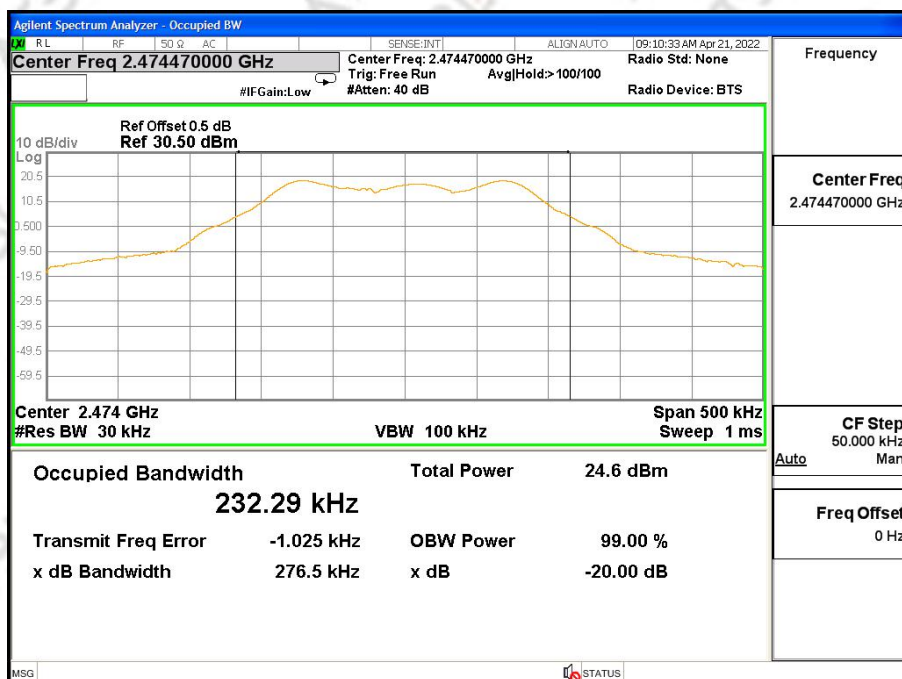
2405.47 MHz



2439.97 MHz



2474.47 MHz



9. OUTPUT POWER TEST

9.1 LIMIT

FCC Part 15.247				
Section	Test Item	Limit	FrequencyRange (MHz)	Result
15.247 (a)(1)&(b)(1)	Output Power	1 W or 0.125W	2400-2483.5	PASS
		if channel separation > 2/3 bandwidth provided the systems operate with an output power no greater than 125 mW (20.97dBm)		

9.2 TEST PROCEDURE

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

a) Use the following spectrum analyzer settings:

- 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW ≥ RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

e) A plot of the test results and setup description shall be included in the test report.

NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DSS bandwidth and shall use a fast-responding diode detector.

9.3 TEST SETUP



9.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

9.5 TEST RESULTS

Temperature:	25°C	Relative Humidity:	50%
Test Mode:	Mode 1/2/3	Test Voltage:	DC 7.4V

Mode	Channel Number	Frequency (MHz)	Peak Power	Average Power	Limit
			(dBm)	(dBm)	(dBm)
FSK(1M)	1	2405.47	18.57	16.41	30.00
	24	2439.97	18.25	17.08	30.00
	47	2474.47	19.07	18.14	30.00

Note:the channel separation >20dB bandwidth

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2 EUT ANTENNA

The EUT antenna is Single-band Antenna. It comply with the standard requirement.

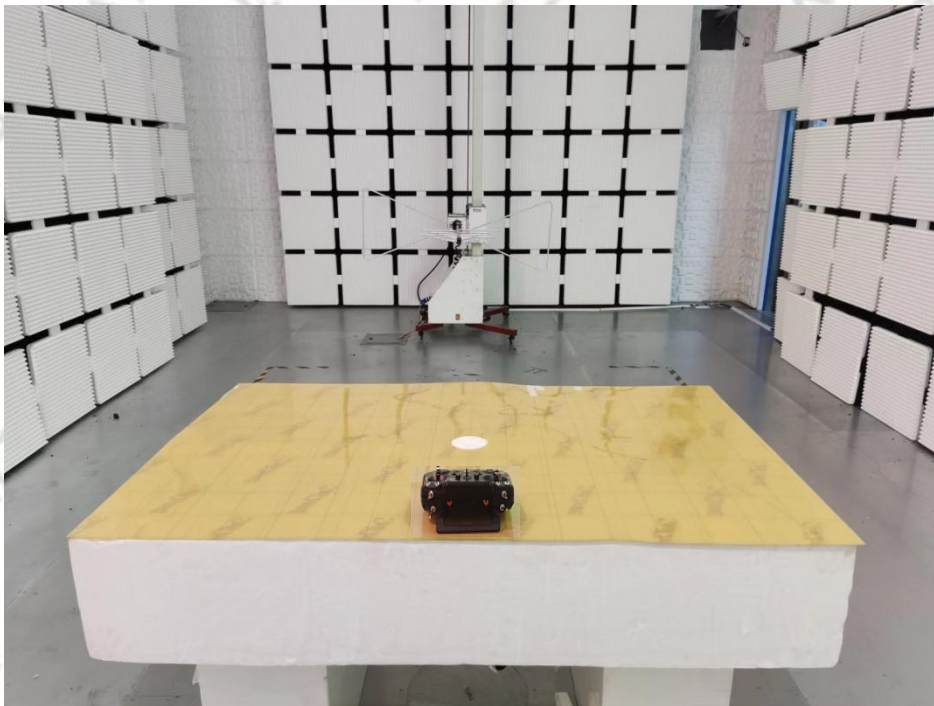
APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

Conducted for RF



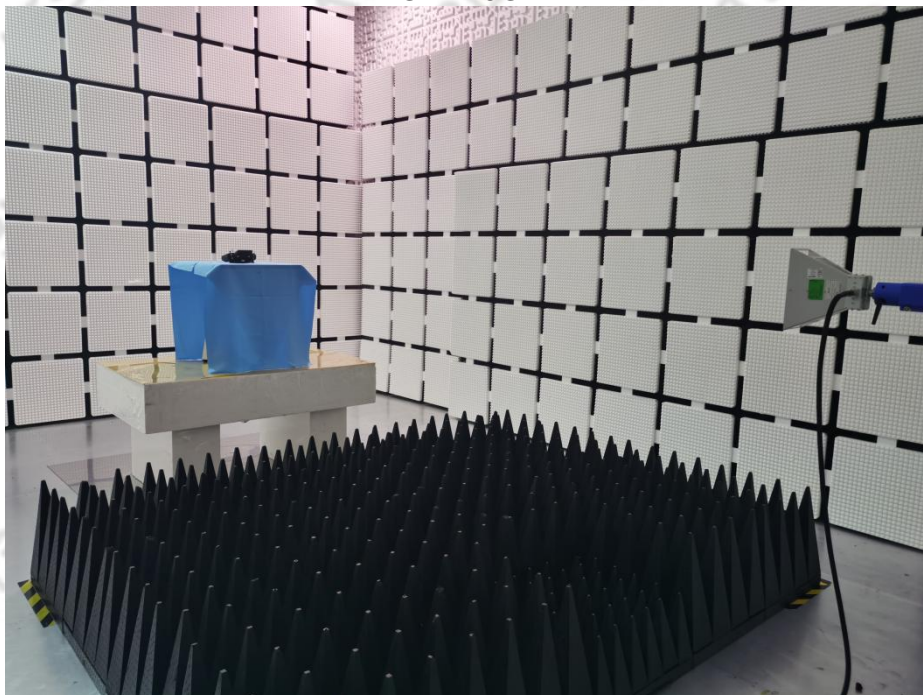
Radiation Emission
30MHz-1000MHz



Radiated Spurious Emission
30MHz-1000MHz



1GHz-18GHz



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