TEST REPORT

Verified Code: 385782

Report No.:	E202101295124-3	**Application No.:**	E202101295124
Client:	DMAI,Inc.		
Address:	10940 Wilshire Blvd #1100, Los Angeles, CA 90024, USA		
Sample Description:	Education tablet,a preschool learning system		
Model:	X4C-US21		
Test Specification:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES: Subpart C Intentional Radiators		
Receipt Date:	2021-02-20		
Test Date:	2021-03-02 to 2021-03-24		
Issue Date:	2021-05-17		
Test Result:	Pass		

Prepared By:	**Reviewed By:**	**Approved By:**
Test Engineer	Technical Manager	Manager
Xie Fang	Wu Haoting	GUANGZHOU GRG METROLOGY & TEST CO.,LTD. GRGTEST APPROVED(03)

Other Aspects:

Note: Note

Abbreviations: *ok / P = passed; fail / F = failed; n.a. / N = not applicable;*

The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.

DIRECTIONS OF TEST

1. **This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.**

2. **The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.**

3. **If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.**

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
CFR 47, FCC Part 15 Subpart C (§15.247)	Antenna Requirement	Section 15.247 (b)(1)	Note [1]
	20dB Bandwidth	Section 15.247(a)(1)	PASS
	Carrier Frequencies Separated	Section 15.247(a)(1)	PASS
	Hopping Channel Number	Section 15.247(a)(1)(ii)	PASS
	Dwell Time	Section 15.247(a)(1)(iii)	PASS
	Maximum Peak Output Power	Section 15.247(b)(1)	PASS
	Conducted Emission	Section 15.207	PASS
	Conducted band edges and Spurious Emission (30MHz to 25GHz)	Section 15.209 &15.247(d)	PASS
	Radiated Spurious Emission (30MHz to 25GHz)	Section 15.209 &15.247(d)	PASS
	Restricted bands of operation	Section 15.247 (d) &15.205	PASS

Note [1]: The EUT antenna is internal antenna. Max antenna gain is 2.8dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section

2. GENERAL DESCRIPTION OF EUT

2.1. APPLICANT

Name:	DMAI,Inc.
Address:	10940 Wilshire Blvd #1100, Los Angeles, CA 90024, USA

2.2. MANUFACTURER

Name:	DMAI,Inc.
Address:	10940 Wilshire Blvd #1100, Los Angeles, CA 90024, USA

2.3. FACTORY

Name :	Shenzhen Valley Ventures Inc
Address :	9F-10F, Block 4, Cloud Park, Xuegang North Road, Bantian Street, Longgang district Shenzhen, 518129, China

2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Education tablet,a preschool learning system
Model No.:	X4C-US21
Adding Model:	/
Trade Name:	AILA Sit & Play™ Animal Island Learning Adventure™ DMAI™
FCC ID:	2AYDJ-X4C-US21
Power Supply:	DC5V power supplied by adapter
Adapter Specification:	Model: AS1201A-0502000USU Input: 100-240V~50/60Hz 0.35A Max Output: 5V ⎓ 2000mA
Frequency Range:	2402MHz~2480MHz
Transmit Power:	DH5: 5.499dBm 2DH5: 4.805dBm 3DH5: 4.780dBm
Type of Modulation:	FHSS (GFSK for 1Mbps, π/4-DQPSK for 2Mbps,8DPSK for 3Mbps)
Antenna Specification:	FPC antenna 2.8dBi gain (Max.)
Temperature Range:	0℃~40℃
Hardware	MT8168-P71-V1.1

Version:

Software Version: ys_mssi_t_64_userdebug_10_QP1A.190711.020mp3v4104 test-keys

Sample No: E202101295124-0002

Note: The adapter have two color of appearance: White,Green.

2.5. TEST OPERATION MODE

Mode No.	Description of the modes
1	Bluetooth fixed frequency transmitting (DH5+2DH5+3DH5)

2.6. LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
/	/	/	/	/
Cable				
/	/	/	/	/

Test software:

Software version	Test level

3. LABORATORY AND ACCREDITATIONS

3.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co,. Ltd.

Add : Address: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China

P.C. : 518000

Tel : 0755-61180008

Fax : 0755-61180008

3.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA	A2LA(Certificate #:2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

3.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	30MHz~1000MHz	4.30dB
		1GHz~18GHz	5.60dB
		18GHz~26GHz	3.65dB
		26GHz~40GHz	4.00dB
	Vertical	30MHz~1000MHz	4.30dB
		1GHz~18GHz	5.60dB
		18GHz~26GHz	3.65dB
		26GHz~40GHz	4.00dB
Conduction Emission		9 kHz ~ 150 kHz	2.80dB
		150 kHz ~ 10 MHz	2.80dB
		10 MHz ~ 30 MHz	2.20dB

This uncertainty represents an expanded uncertainty factor of k=2.

4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conducted Emissions				
EMI TEST RECEIVER	R&S	ESCI	100783	2021-10-08
LISN(EUT)	R&S	ENV216	101543	2022-03-21
Test S/W	EZ	CCS-3A1-CE	/	/
Hopping Channel Number				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Dwell Time				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Radiated Spurious Emission& Restricted bands of operation				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Bilog Antenna	Schwarzbeck	VULB 9163	01279	2022-02-25
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	02143	2021-12-27
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2021-11-05
Amplifier	Tonscend	TAP9E6343	AP20E806065	2021-06-28
Amplifier	Tonscend	TAP01018048	AP20E8060075	2021-06-28
Amplifier	Tonscend	TAP184050	AP20E806071	2021-06-15
Test S/W	Tonscend	JS32-RE/2.5.2.4		
20 dB Bandwidth				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Maximum Peak Output Power				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Conducted band edges and Spurious Emission				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16
Carrier Frequencies Separated				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2021-05-16

Note: The calibration interval of the above test instruments is 12 months.

5. TEST RESULTS

5.1. E.U.T. TEST CONDITIONS

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

EUT channels and frequencies list:

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
50	2452	63	2465	76	2478
51	2453	64	2466	77	2479
52	2454	65	2467	78	2480
53	2455	66	2468	/	/
54	2456	67	2469	/	/

Test frequency is the lowest channel: 0 channel(2402MHz), middle channel: 39 channel(2441MHz) and highest channel: 78 channel(2480MHz)

5.2. 20dB BANDWIDTH

5.2.1. LIMITS

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.

5.2.2. TEST PROCEDURES

1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
2) Set the spectrum analyzer as RBW=30 kHz, VBW=100 kHz, Span=3MHz, Sweep = auto. Allow the trace to stabilize, record 20dB bandwidth value
3) Repeat until all the test channels are investigated.

5.2.3. TEST SETUP

5.2.4. TEST RESULTS

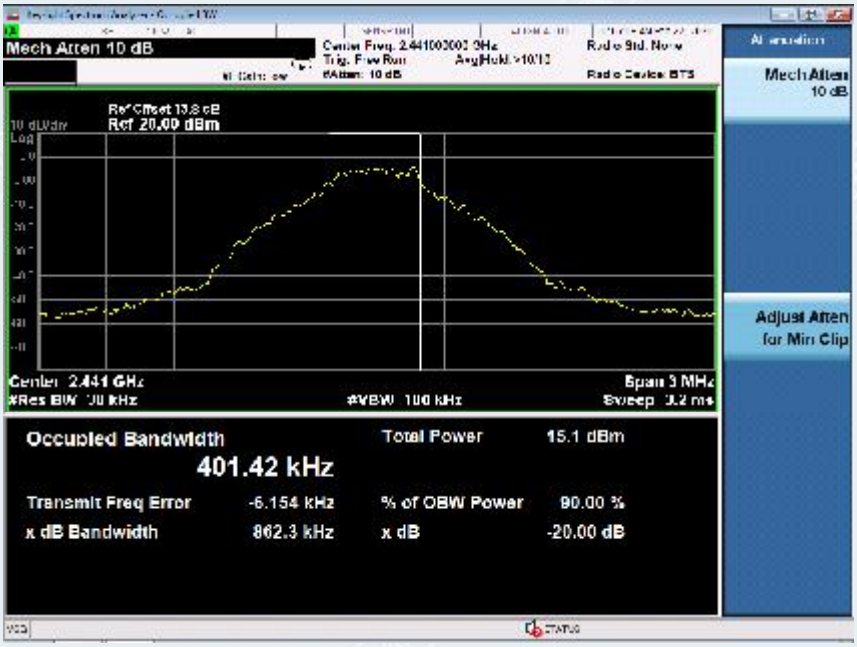
Test mode	Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
DH5	Low	2402	863.3
	Mid	2441	862.3
	High	2480	862.9
Test mode	**Channel**	**Frequency (MHz)**	**20 dB Bandwidth (kHz)**
2DH5	Low	2402	1260.0
	Mid	2441	1261.0
	High	2480	1262.0
Test mode	**Channel**	**Frequency (MHz)**	**20 dB Bandwidth (kHz)**
3DH5	Low	2402	1257.0
	Mid	2441	1258.0
	High	2480	1258.0

Result plot as follows:

DH5

Low Channel

Mid Channel



High Channel

2DH5

Low Channel

Mid Channel

High Channel

3DH5

Low Channel

Mid Channel

High Channel

5.3. CARRIER FREQUENCIES SEPARATED

5.3.1. LIMITS

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.

5.3.2. TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2) Set center frequency of spectrum analyzer = middle of hopping channel.
3) Set the spectrum analyzer as RBW=30kHz, VBW=30kHz, Adjust Span to 2 MHz, Sweep = auto
4) Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

5.3.3. TEST SETUP

5.3.4. TEST RESULTS

DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.004	575.5	> Two-thirds of the 20 dB Bandwidth	Pass

2DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
0.996	841.3	> Two-thirds of the 20 dB Bandwidth	Pass

3DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.002	838.7	> Two-thirds of the 20 dB Bandwidth	Pass

Result plot as follows:

DH5

Measurement of Channel Separation

20 dB bandwidth(CH Low)

2DH5

Measurement of Channel Separation

20 dB bandwidth(CH High)

3DH5

Measurement of Channel Separation

20 dB bandwidth(CH High)

Test result: The unit does meet the FCC requirements.

5.4. HOPPING CHANNEL NUMBER

5.4.1. LIMITS

Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

5.4.2. TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2) Set the spectrum analyzer as RBW, VBW=300kHz,
3) Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

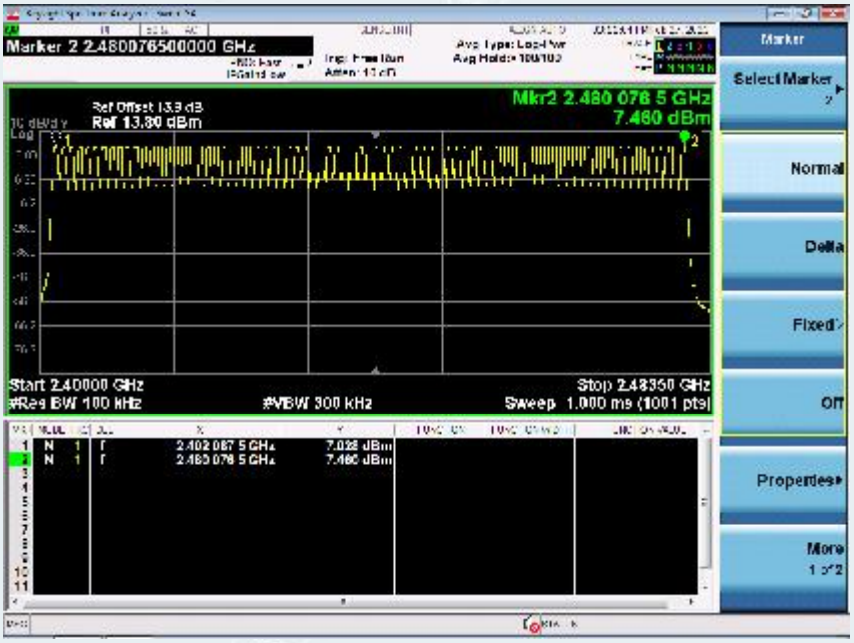
5.4.3. TEST SETUP

5.4.4. TEST RESULTS

Result (No. of CH)	Limit (No. of CH)	Result
79	>15	PASS

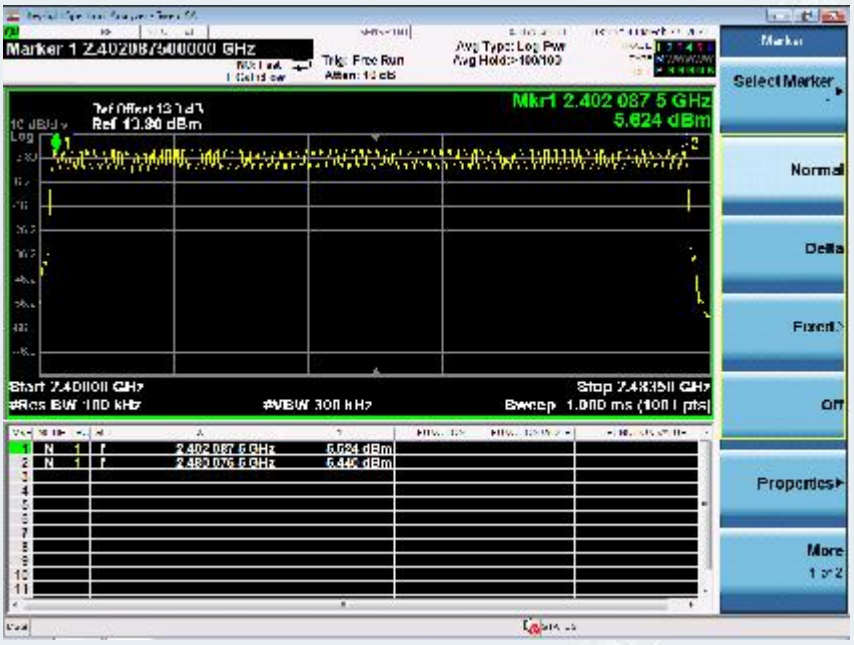
GFSK

2.400 GHz – 2.4835 GHz



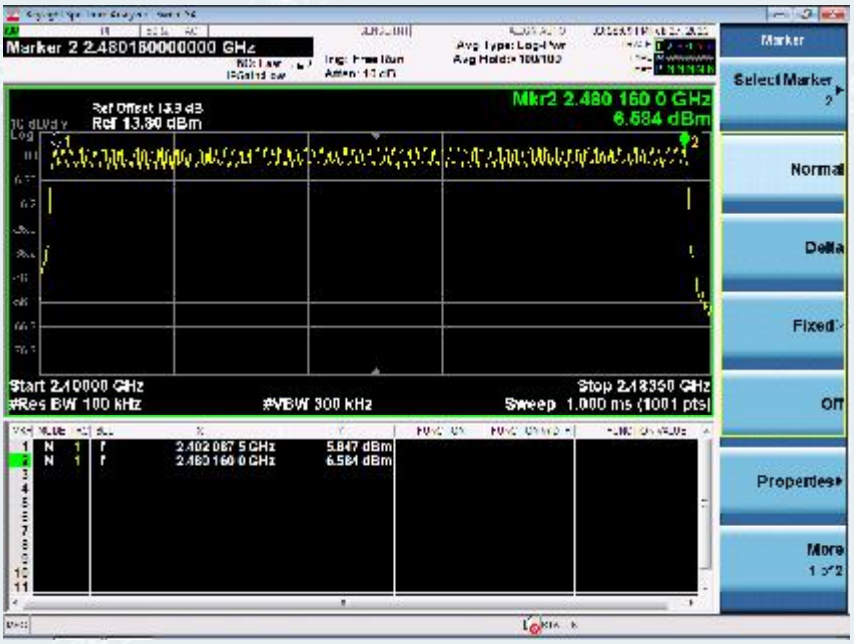
π/4-DQPSK

2.400 GHz 2.4835 GHz



8DPSK

2.400 GHz – 2.4835 GHz



Test result: The unit does meet the FCC requirements.

5.5. DWELL TIME

5.5.1. LIMITS

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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

5.5.2. TEST PROCEDURES

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. centered on a hopping channel;
3) Set RBW = 1MHz and VBW = 1MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
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). An oscilloscope may be used instead of a spectrum analyzer.

5.5.3. TEST SETUP

5.5.4. TEST RESULTS

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

GFSK: Mid Channel (2.441GHz)

DH1	time slot=	0.391	(ms)*	(1600/(2*79))	*	31.6	=	125.12	ms
DH3	time slot=	1.650	(ms)*	(1600/(4*79))	*	31.6	=	264.00	ms
DH5	time slot=	2.908	(ms)*	(1600/(6*79))	*	31.6	=	310.19	ms

π/4-DQPSK: Mid Channel (2.441GHz)

2DH1	time slot=	0.396	(ms)*	(1600/(2*79))	*	31.6	=	126.72	ms
2DH3	time slot=	1.660	(ms)*	(1600/(4*79))	*	31.6	=	265.60	ms
2DH5	time slot=	2.908	(ms)*	(1600/(6*79))	*	31.6	=	310.19	ms

8DPSK: Mid Channel (2.441GHz)

3DH1	time slot=	0.402	(ms)*	(1600/(2*79))	*	31.6	=	128.64	ms
3DH3	time slot=	1.659	(ms)*	(1600/(4*79))	*	31.6	=	265.44	ms
3DH5	time slot=	2.904	(ms)*	(1600/(6*79))	*	31.6	=	309.76	ms

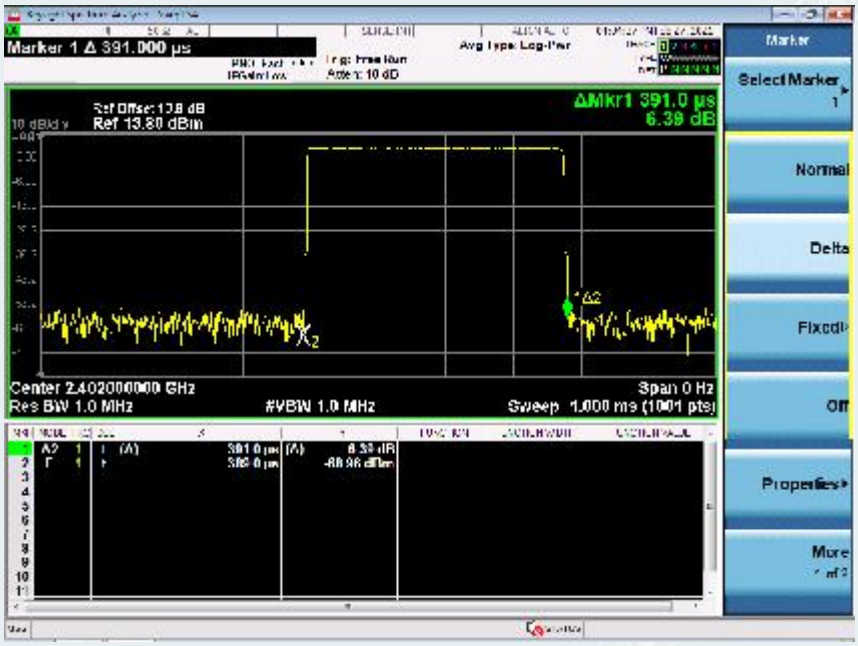
The results are not greater than 0.4 seconds.
The unit does meet the requirements.

Please refer the graph as below:

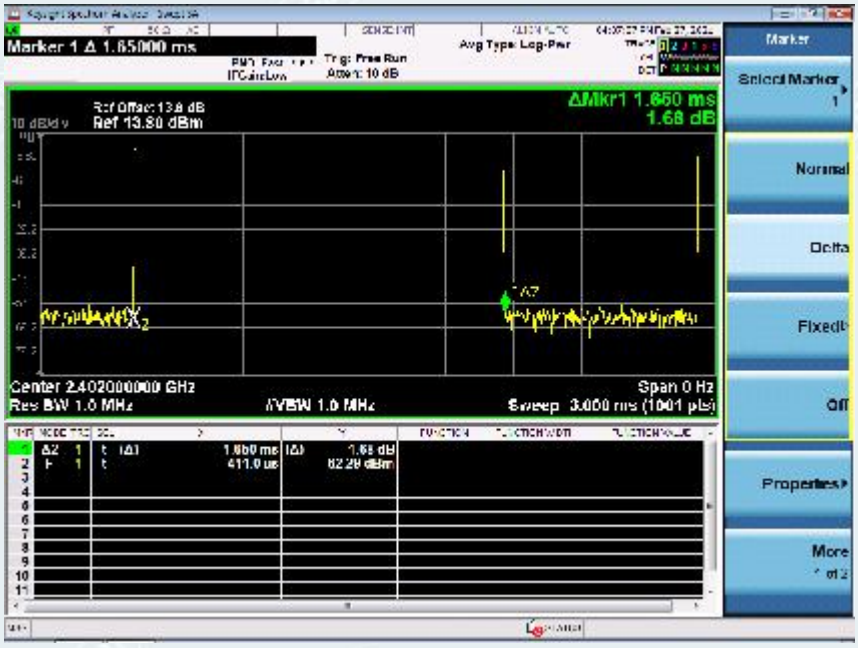
GFSK

Mid Channel (2.402GHz)

DH1



DH3

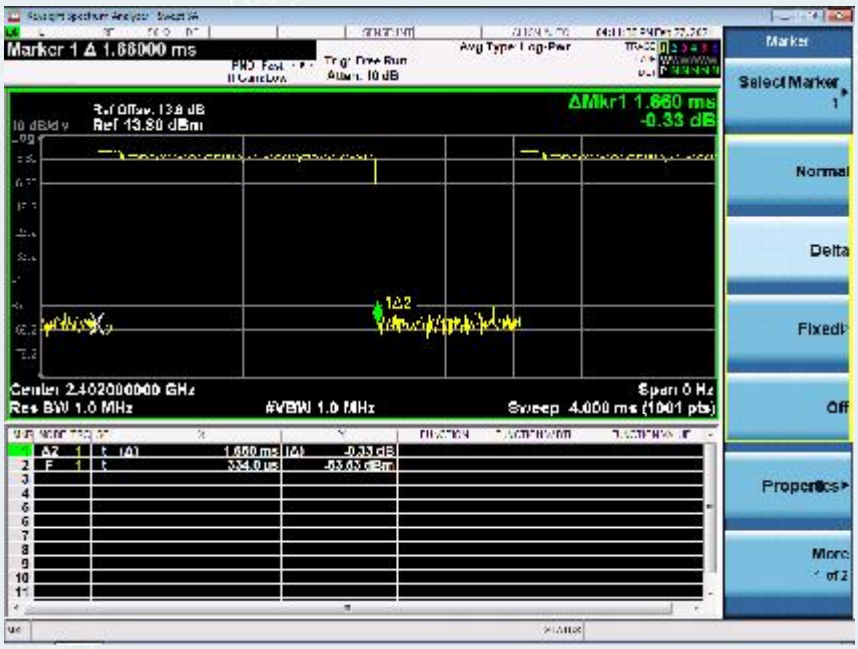


DH5

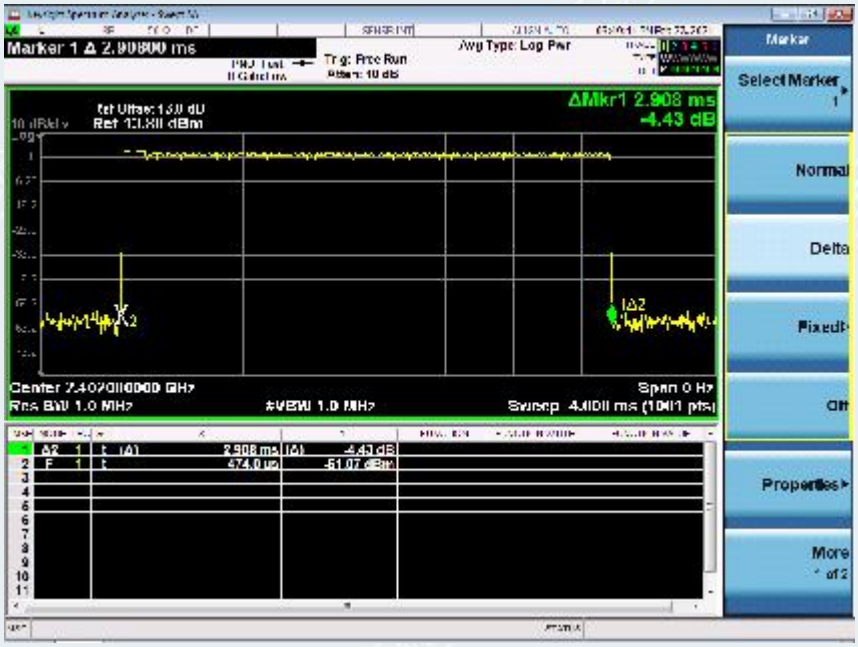
π/4-DQPSK
Mid Channel (2.402GHz)
2DH1

Mid Channel (2.402GHz)

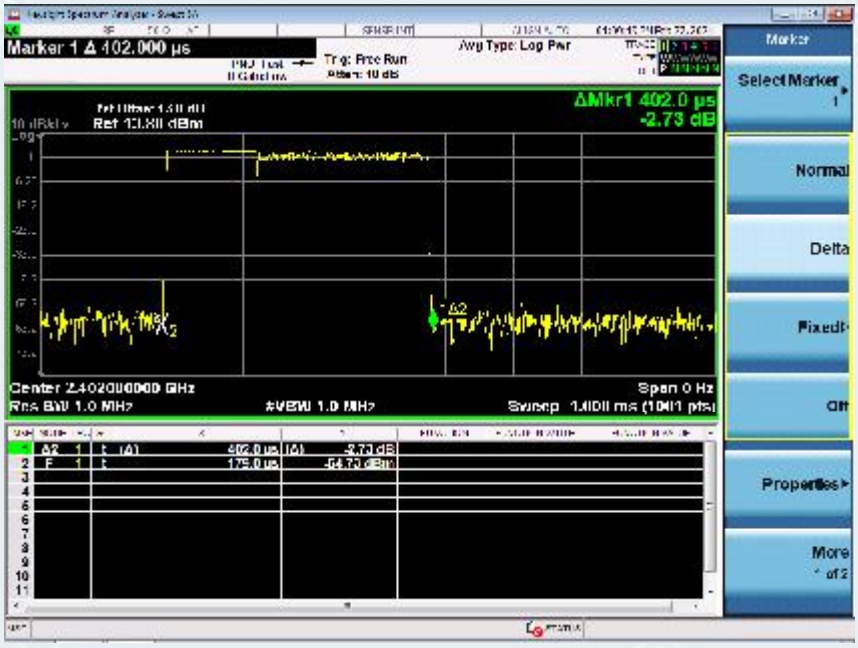
2DH3



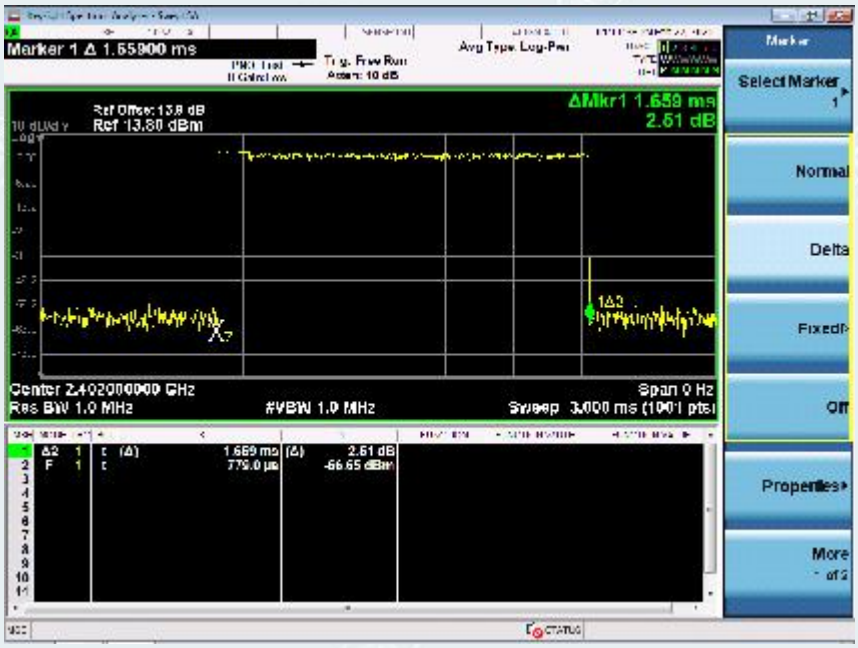
2DH5



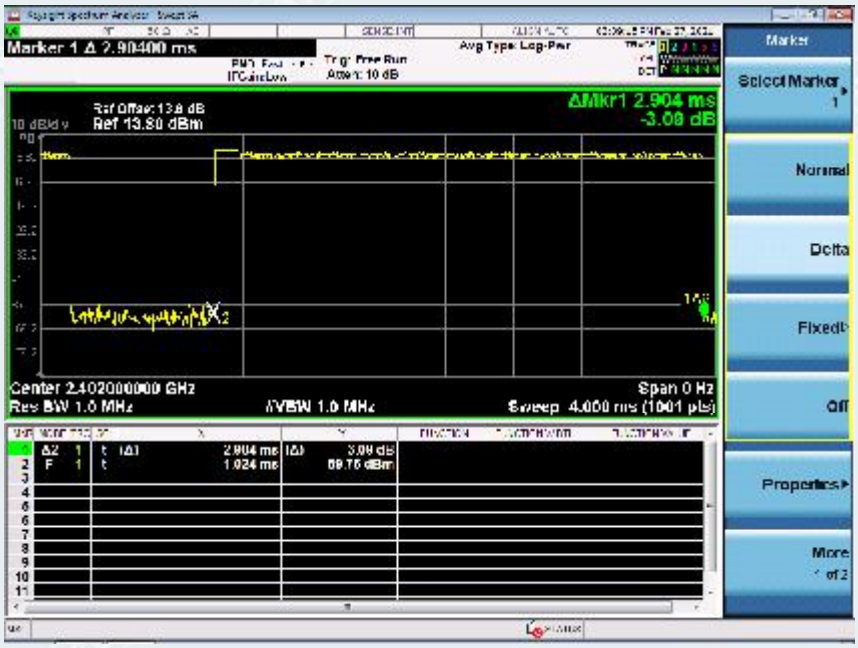
8DPSK
Mid Channel (2.402GHz)
3DH1



3DH3



3DH5


Marker 1 Δ 2.90400 ms
Trig: Free Run
Avg Type: Log-Pwr
Atten: 10 dB
Ref Offset 13.8 dB
10 dB/div Ref 13.80 dBm
ΔMkr1 2.904 ms
-3.09 dB
Center 2.402000000 GHz
Span 0 Hz
Res BW 1.0 MHz
VBW 1.0 MHz
Sweep 4.000 ms (1001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More

5.6. CONDUCTED EMISSION MEASUREMENT

5.6.1. LIMITS

Frequency range	Limits (dBμV)	
	Quasi-peak	Average
150kHz ~ 0.5MHz	66~56	56~46
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

5.6.2. TEST PROCEDURES

Procedure of Preliminary Test

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

– Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:

1) Place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or

2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;

– All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;

The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.

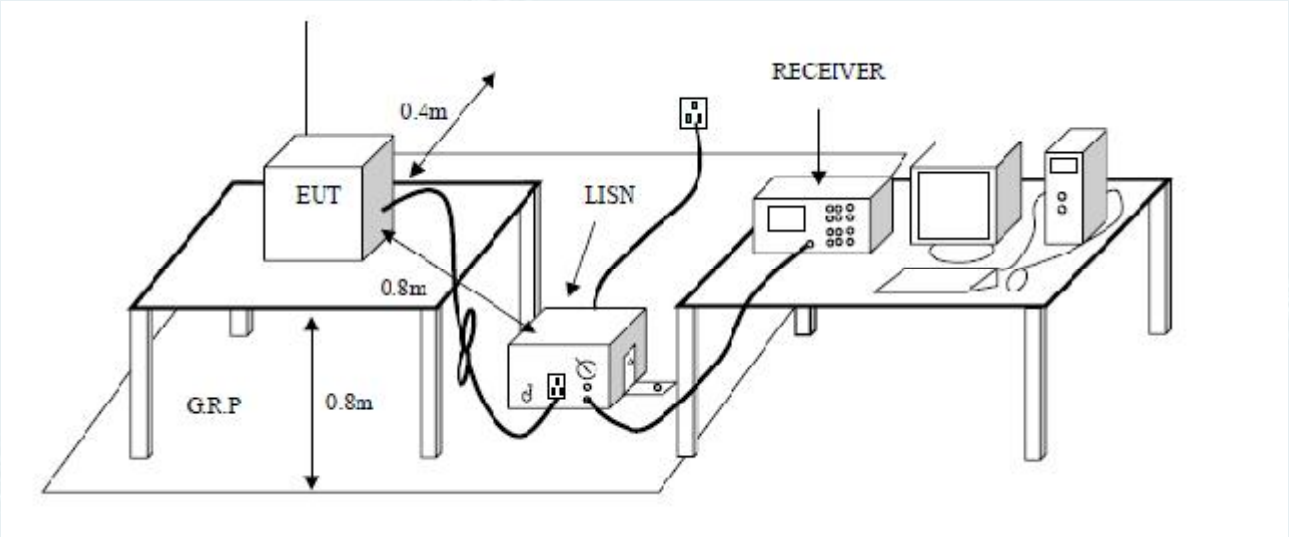
I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

5.6.3. TEST SETUP



5.6.4. DATA SAMPLE

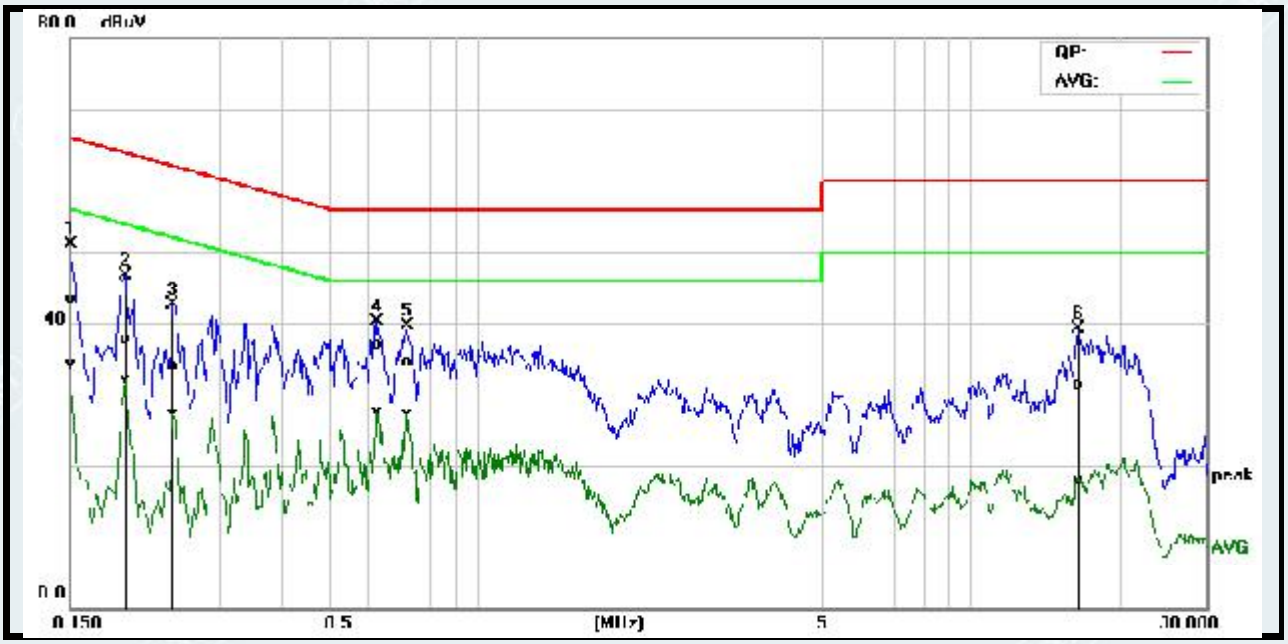
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

5.6.5. TEST RESULTS

EUT Name	Education tablet,a preschool learning system	Model	X4C-US21
Environmental Conditions	24.6℃/54%RH	Test Mode	Mode 1
Power supply	AC120V/60Hz	Tested By	Chen Xiaocong
Test Date	2021-03-15	Sample No.	E202101295124-0002

DH5 2402MHz

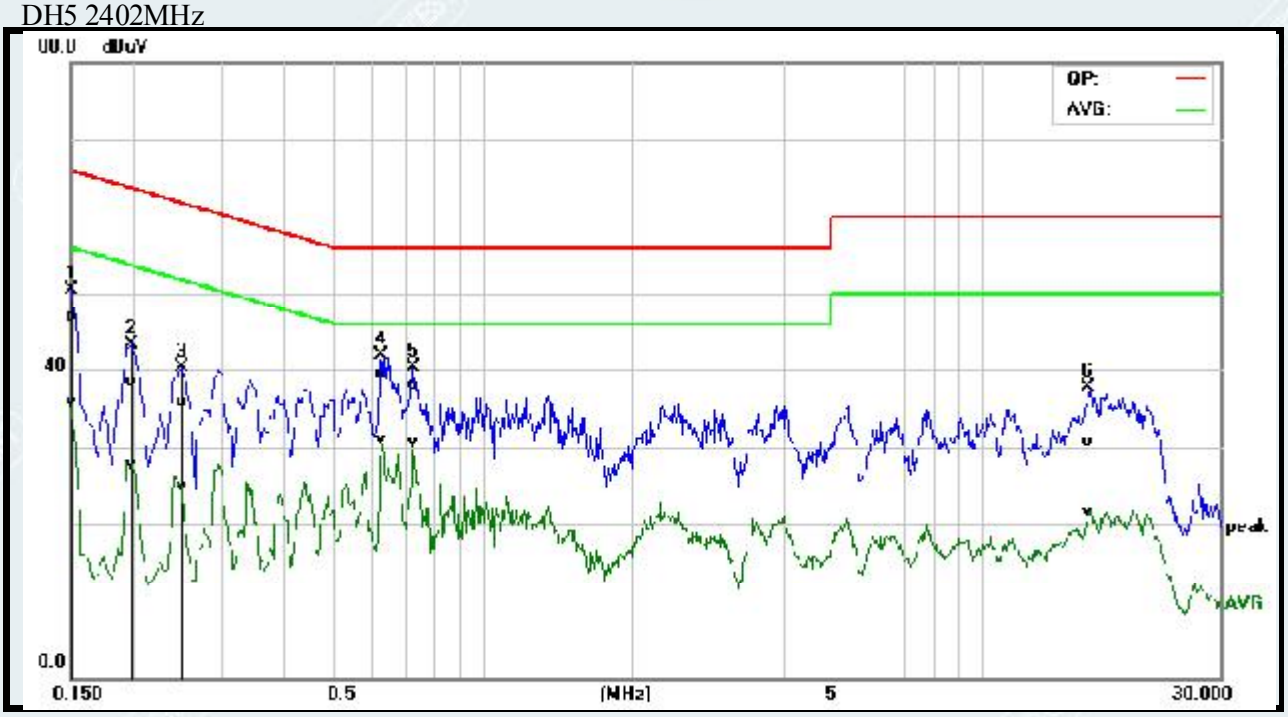


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1500	33.79	24.57	9.61	43.40	34.18	65.99	56.00	-22.59	-21.82	Pass
2	0.1940	28.09	22.48	9.61	37.70	32.09	63.86	53.86	-26.16	-21.77	Pass
3	0.2420	24.39	17.76	9.61	34.00	27.37	62.02	52.03	-28.02	-24.66	Pass
4*	0.6300	27.39	17.99	9.61	37.00	27.60	56.00	46.00	-19.00	-18.40	Pass
5	0.7220	24.89	17.73	9.61	34.50	27.34	56.00	46.00	-21.50	-18.66	Pass
6	16.5459	21.50	8.08	9.80	31.30	17.88	60.00	50.00	-28.70	-32.12	Pass

Note: *L = Live Line*

EUT Name	Education tablet,a preschool learning system	Model	X4C-US21
Environmental Conditions	24.6℃/54%RH	Test Mode	Mode 1
Power supply	AC120V/60Hz	Tested By	Chen Xiaocong
Test Date	2021-03-15	Sample No.	E202101295124-0002

DH5 2402MHz



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1500	37.30	26.12	9.60	46.90	35.72	65.99	56.00	-19.09	-20.28	Pass
2	0.1980	29.00	18.16	9.60	38.60	27.76	63.69	53.69	-25.09	-25.93	Pass
3	0.2500	26.40	15.27	9.60	36.00	24.87	61.75	51.76	-25.75	-26.89	Pass
4*	0.6300	29.99	21.27	9.61	39.60	30.88	56.00	46.00	-16.40	-15.12	Pass
5	0.7300	28.59	20.84	9.61	38.20	30.45	56.00	46.00	-17.80	-15.55	Pass
6	16.3580	20.89	11.60	9.81	30.70	21.41	60.00	50.00	-29.30	-28.59	Pass

Note: N = Neutral Line.

5.7. MAXIMUM PEAK OUTPUT POWER

5.7.1. LIMITS

Regulation 15.247 (b)(1)For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

5.7.2. TEST PROCEDURES

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 = 3 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak.
3) Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

5.7.3. TEST SETUP

5.7.4. TEST RESULTS

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	5.176	20.97	Peak	Pass
Middle	2.441	5.499			Pass
Highest	2.480	5.437			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	4.373	20.97	Peak	Pass
Middle	2.441	4.805			Pass
Highest	2.480	4.742			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	4.379	20.97	Peak	Pass
Middle	2.441	4.762			Pass
Highest	2.480	4.780			Pass

Test result: The unit does meet the FCC requirements.

5.8. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

5.8.1. LIMITS

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.8.2. TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
2) Set the spectrum analyzer: RBW =100KHz; VBW =300KHz, Span = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
3) Measure and record the results in the test report.
4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5) Measurements are made over the 9 kHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels. No emission found between lowest internal used/generated frequency to 10MHz，it is only recorded 10MHz to 26GHz.

5.8.3. TEST SETUP

5.8.4. TEST RESULTS

The unit does meet the FCC requirements.

Test result plot as follows:

Hopping Off

DH5

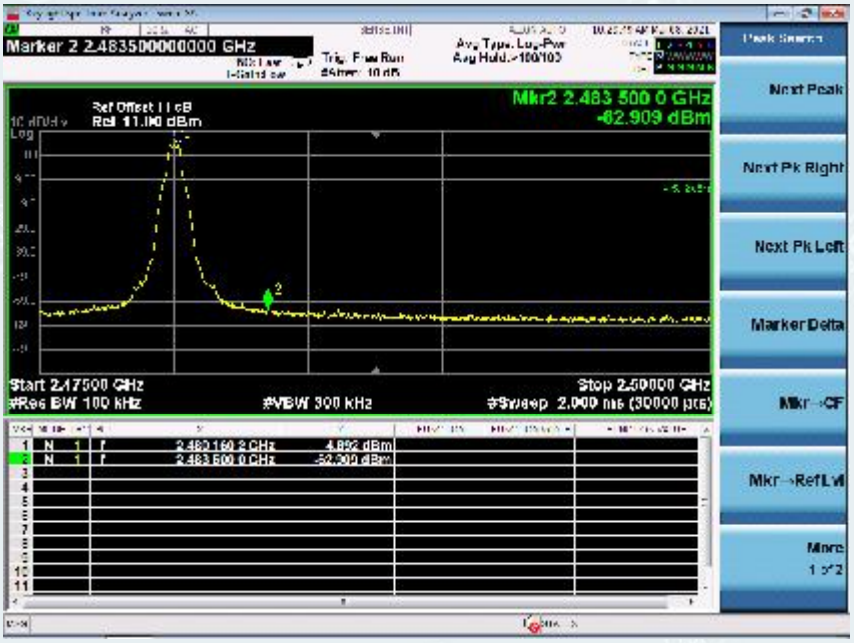
CH Low (30MHz ~26.5GHz)

CH Low (2.31GHz ~2.41GHz)

CH Mid (30MHz ~26.5GHz)

CH High (30MHz ~26.5GHz)

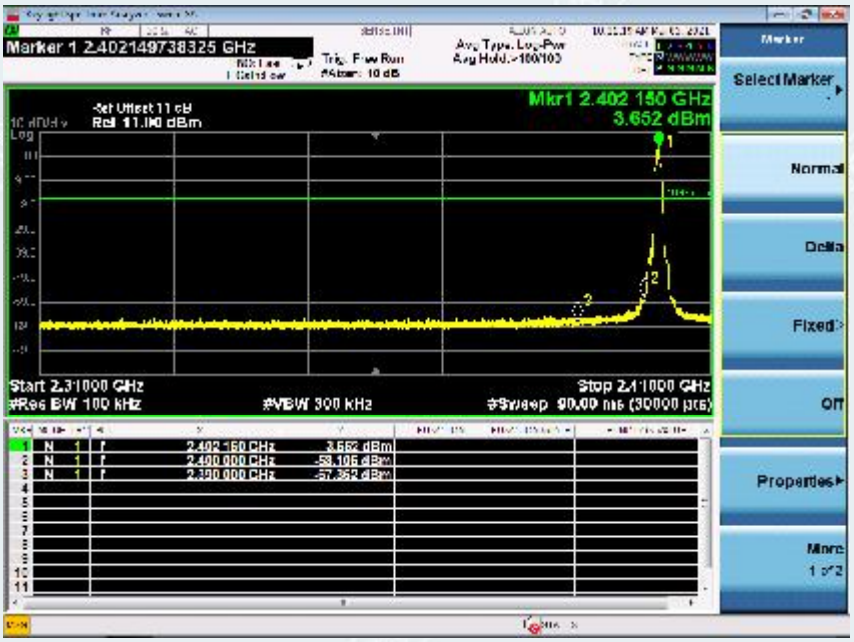
CH High (2.475GHz ~ 2.5GHz)



2DH5

CH Low (30MHz ~26.5GHz)

CH Low (2.31GHz ~2.41GHz)



CH Mid (30MHz ~26.5GHz)

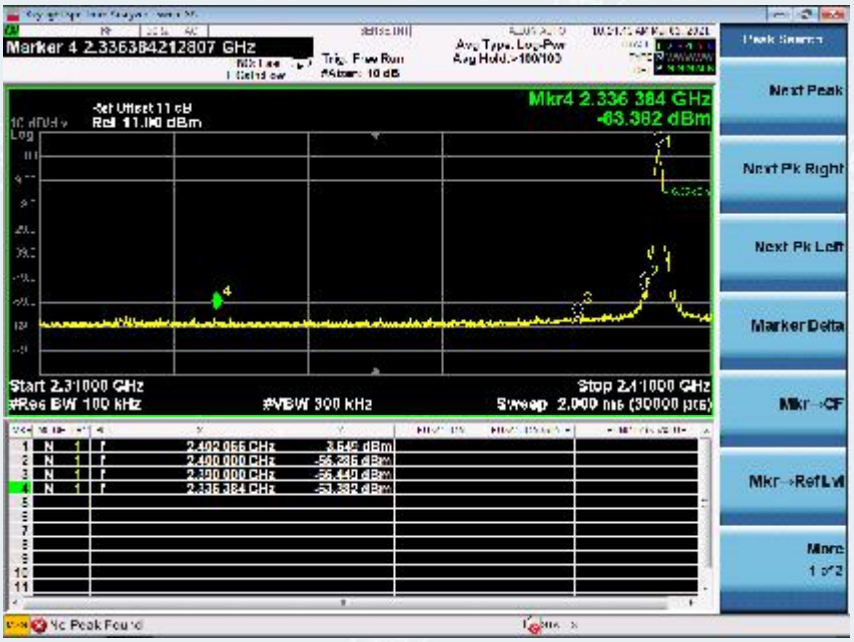
CH High (30MHz ~26.5GHz)

CH High (2.475GHz ~ 2.5GHz)

3DH5

CH Low (30MHz ~26.5GHz)

CH Low (2.31GHz ~2.41GHz)



CH Mid (30MHz ~26.5GHz)

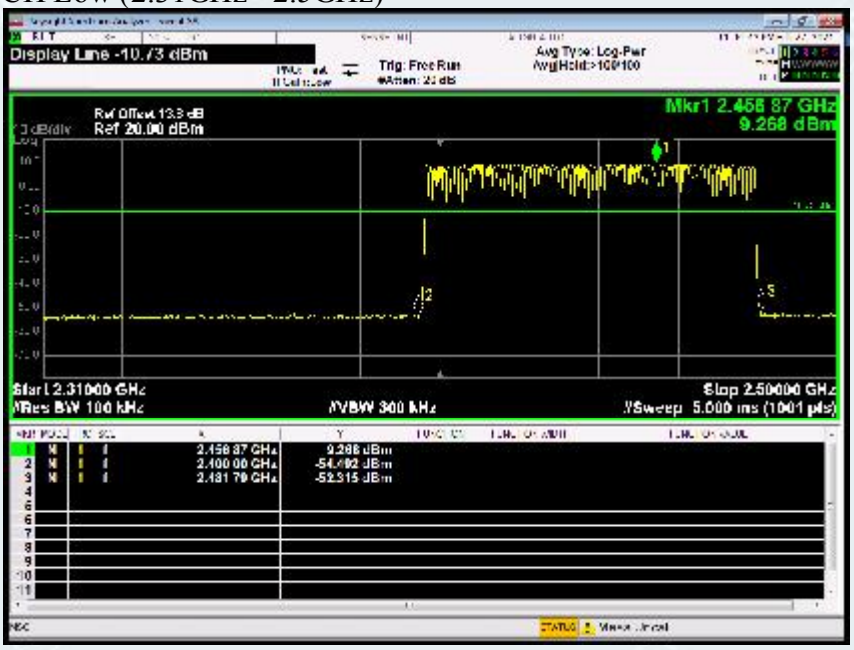
CH High (30MHz ~26.5GHz)

CH High (2.475GHz ~ 2.5GHz)

Hopping On

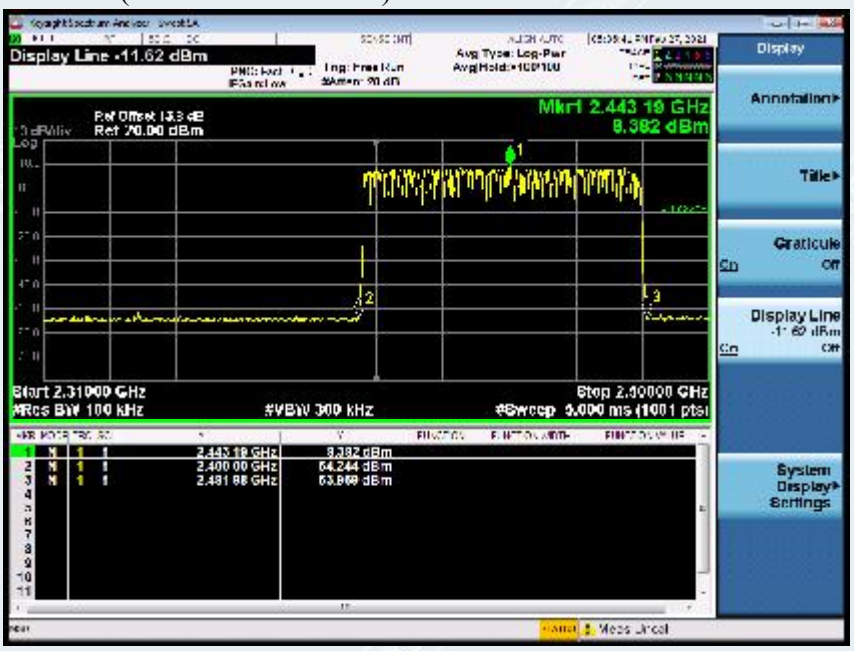
GFSK

CH Low (2.31GHz ~2.5GHz)



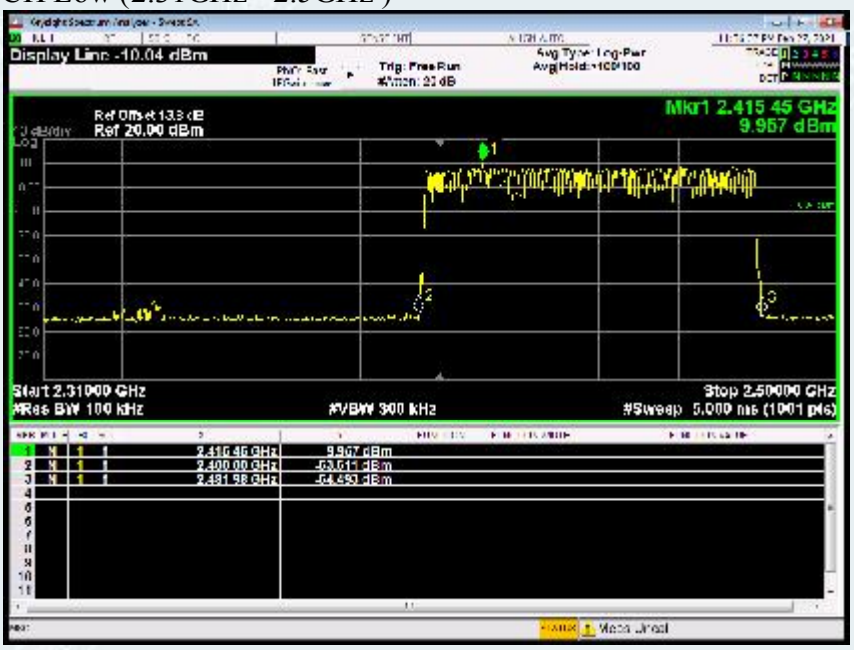
π/4-DQPSK

CH Low (2.31GHz ~2.5GHz)



8DPSK

CH Low (2.31GHz ~2.5GHz)



5.9. RADIATED SPURIOUS EMISSIONS

5.9.1. LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	53.8~88.5
0.490-1.705	24000/F(kHz)	30	43~53.8
1.705-30.0	30	30	49.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE: (1) The lower limit shall apply at the transition frequencies.
NOTE: (2) Above 18G Limit=74+20log(3/1)=83.54 (dB μV/m).

5.9.2. TEST PROCEDURES

1) The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6) If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported.
   Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

5.9.3. TEST SETUP

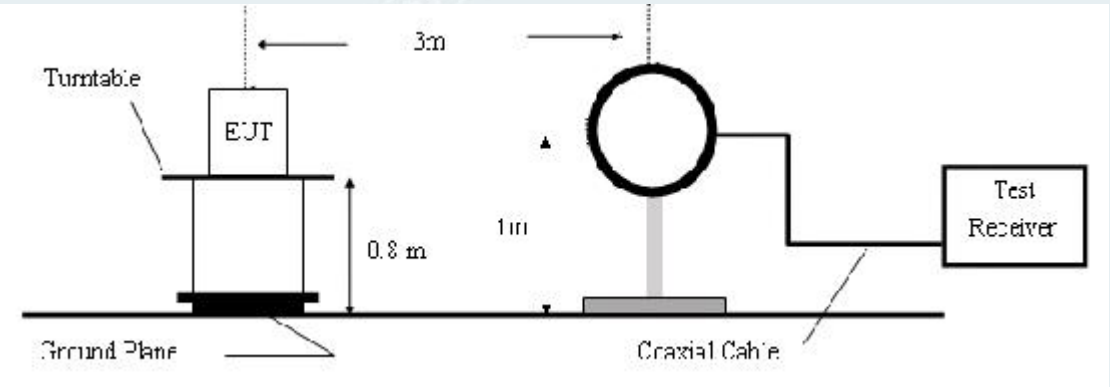


Figure 1. 9 KHz to 30MHz radiated emissions test configuration

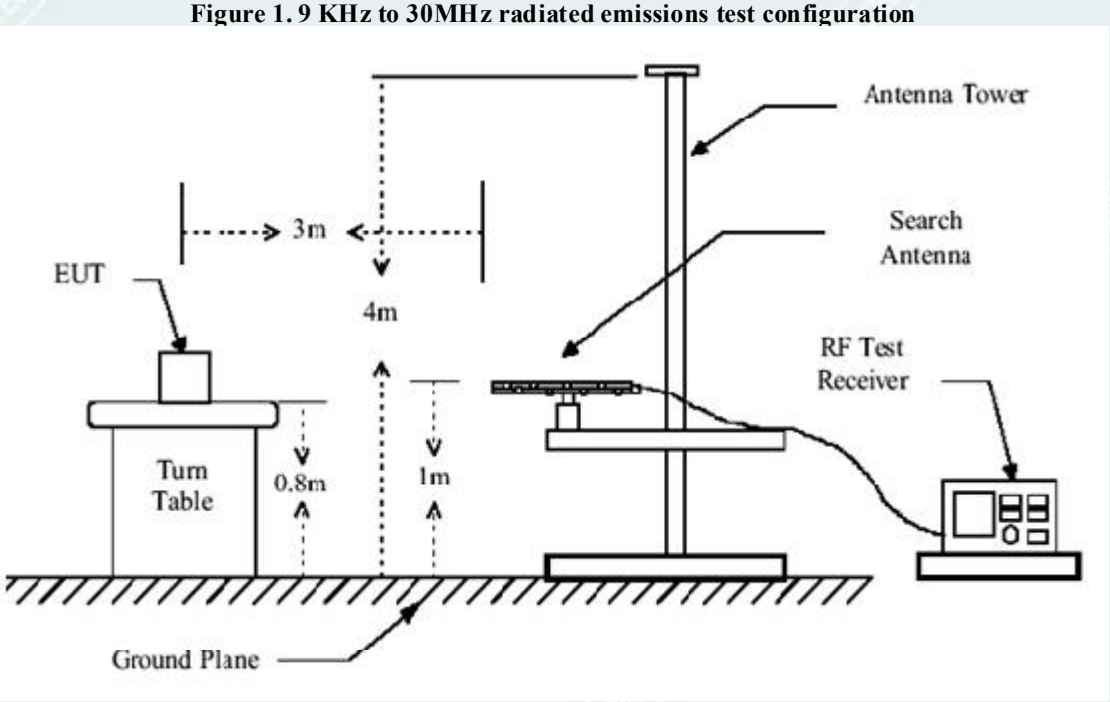


Figure 2. 30MHz to 1GHz radiated emissions test configuration

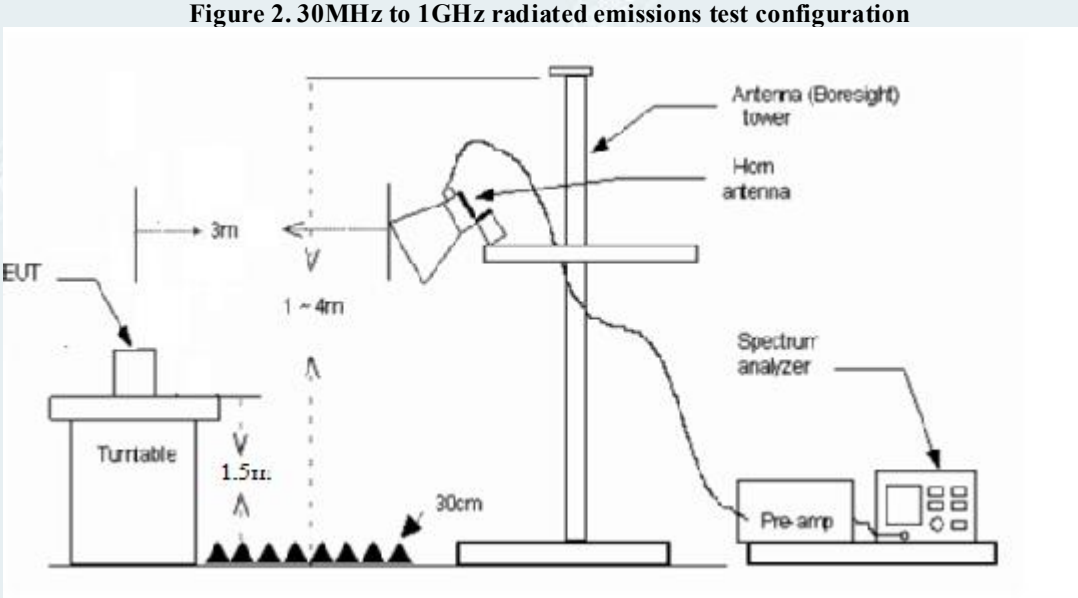


Figure 3. Above 1GHz radiated emissions test configuration

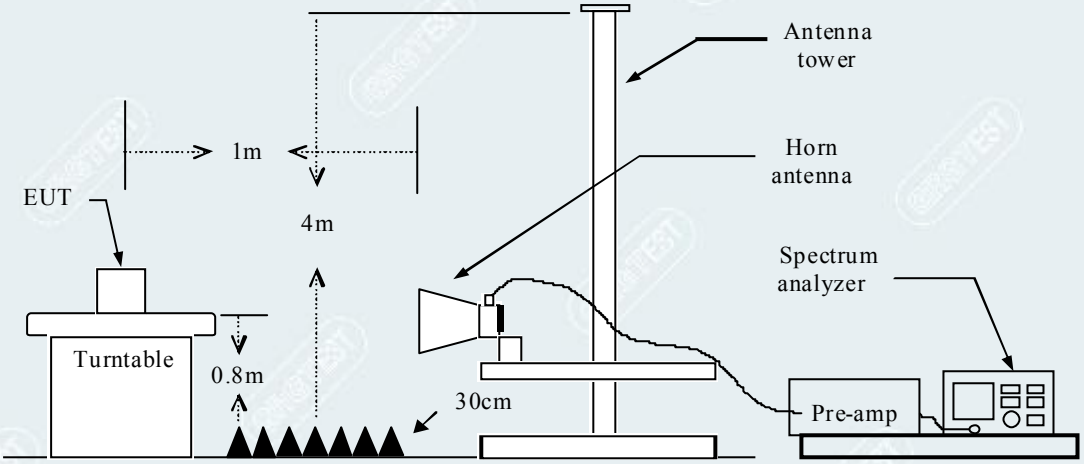


Figure 4. Above 18GHz radiated emissions test configuration

5.9.4. DATA SAMPLE

30MHz to 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	37.06	-15.48	21.58	40.00	-18.42	QP	Vertical

Above 1 GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	65.45	-11.12	54.33	74.00	-19.67	peak	Vertical
xxx	xxx	63.00	-11.12	51.88	54.00	-2.12	AVG	Vertical
xxx	xxx	57.83	-11.57	46.26	83.50	37.24	peak	Vertical

Frequency (MHz) = Emission frequency in MHz

Ant.Pol. (H/V) = Antenna polarization

Reading (dBuV) = Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Remark Result (dBuV/m) – Limit (dBuV/m)

Peak = Peak Reading

QP = Quasi-peak Reading

AVG = Average Reading

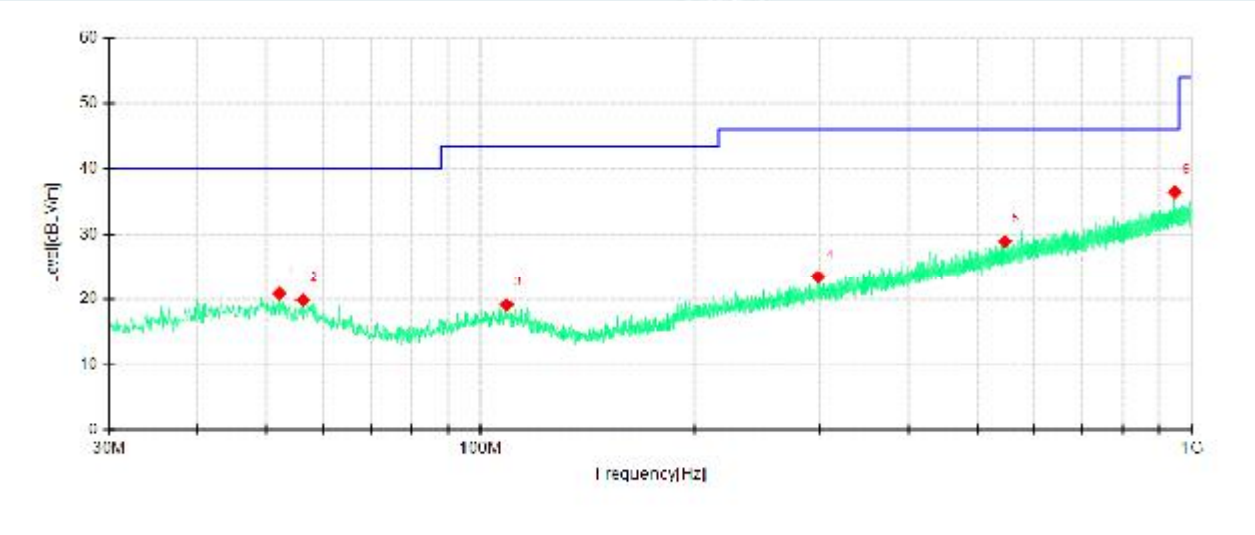
5.9.5. TEST RESULTS

30MHz to 1GHz:

Mode: TX

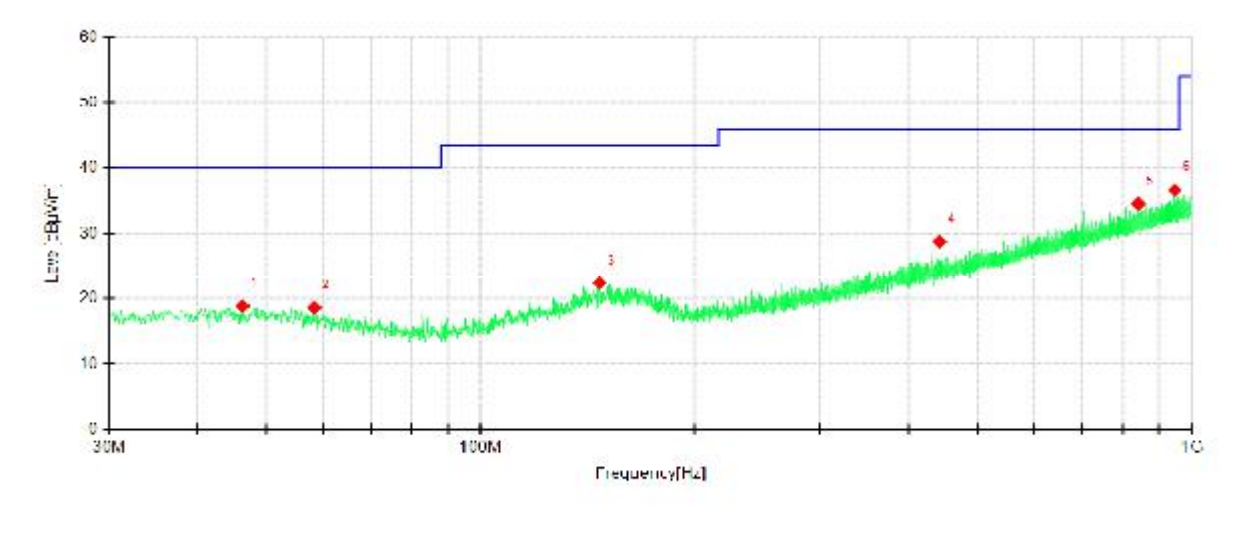
Lowest channel (2402MHz) Date: 2021-03-24

Polarity Horizontal



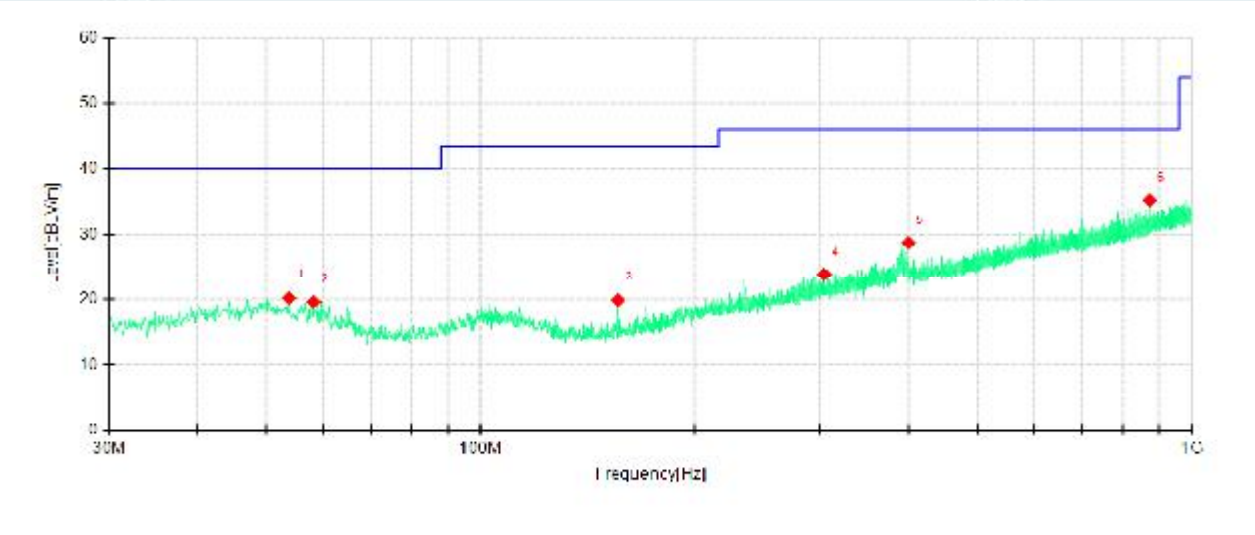
Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.0675	48.61	20.88	-27.73	40.00	19.12	100	309	Horizontal
2	56.1900	48.06	19.80	-28.26	40.00	20.20	200	65	Horizontal
3	108.8125	48.15	19.11	-29.04	43.50	24.39	200	72	Horizontal
4	298.4475	48.64	23.42	-25.22	46.00	22.58	100	335	Horizontal
5	546.1613	48.53	28.88	-19.65	46.00	17.12	100	216	Horizontal
6	946.6500	50.05	36.42	-13.63	46.00	9.58	100	359	Horizontal

Mode: TX
Lowest channel (2402MHz) Date: 2021-03-24
Polarity Vertical



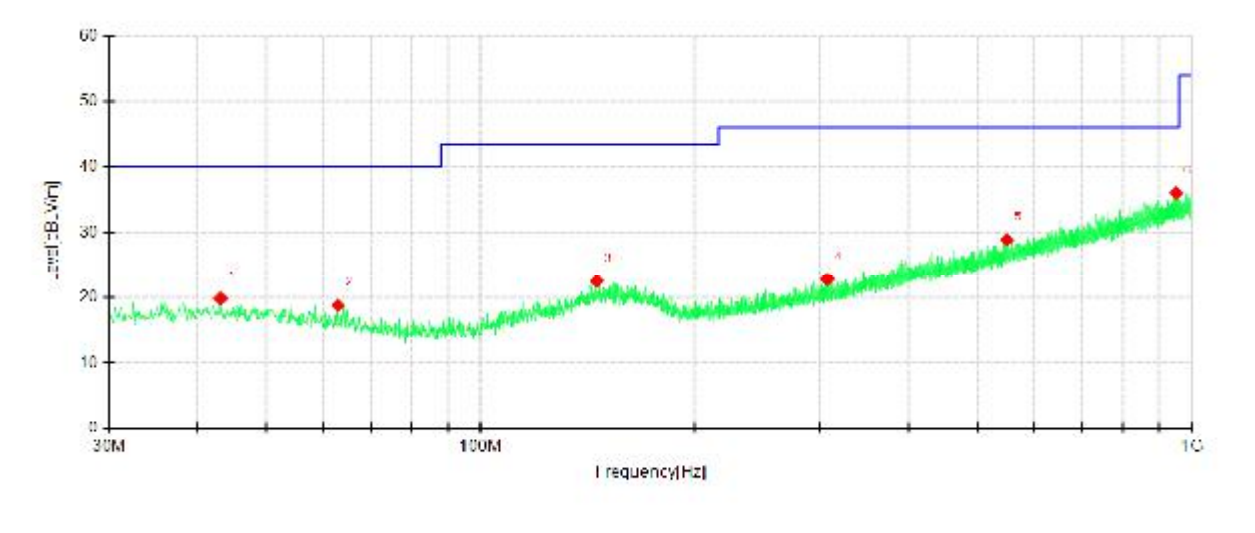
Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.2475	47.60	18.84	-28.76	40.00	21.16	200	64	Vertical
2	58.3725	48.17	18.62	-29.55	40.00	21.38	100	193	Vertical
3	147.1275	48.27	22.38	-25.89	43.50	21.12	200	13	Vertical
4	442.0075	50.88	28.81	-22.07	46.00	17.19	100	253	Vertical
5	840.6775	49.02	34.56	-14.46	46.00	11.44	200	184	Vertical
6	946.6500	49.61	36.68	-12.93	46.00	9.32	100	213	Vertical

Mode: TX
Highest channel (2480MHz) Date: 2021-03-24
Polarity Horizontal



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	53.7650	48.13	20.18	-27.95	40.00	19.82	200	125	Horizontal
2	58.2513	48.11	19.59	-28.52	40.00	20.41	100	216	Horizontal
3	155.9788	51.15	19.88	-31.27	43.50	23.62	100	89	Horizontal
4	304.1463	48.98	23.86	-25.12	46.00	22.14	100	329	Horizontal
5	399.6913	51.70	28.74	-22.96	46.00	17.26	100	302	Horizontal
6	872.5663	49.95	35.24	-14.71	46.00	10.76	100	341	Horizontal

Mode: TX
Highest channel (2480MHz) Date: 2021-03-24
Polarity Vertical



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	43.0950	48.54	19.86	-28.68	40.00	20.14	200	145	Vertical
2	62.9800	48.76	18.75	-30.01	40.00	21.25	100	322	Vertical
3	145.6725	48.43	22.44	-25.99	43.50	21.06	100	309	Vertical
4	307.2988	48.50	22.77	-25.73	46.00	23.23	200	285	Vertical
5	550.0413	48.68	28.89	-19.79	46.00	17.11	200	218	Vertical
6	951.3788	48.88	36.00	-12.88	46.00	10.00	200	165	Vertical

Remark:

1 No emission found between lowest internal used/generated frequency to 30MHz.
2 Pre-scan all mode and recorded the worst case results in this report (TX-High Channel(1Mbps)
3 Measuring frequencies from 9kHz to the 1GHz.
4 Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak/Quasi-peak detector mode.
5 Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
6 The IF bandwidth of SPA between 30MHz to 1GHz was 120kHz.

Above 1GHz-18GHz:

Mode: TX/ DH5
Lowest channel (2402MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1247.7500	60.49	36.21	-24.28	74.00	37.79	100	105	Horizontal
2	1300.0000	62.78	38.71	-24.07	74.00	35.29	100	105	Horizontal
3	4095.0000	59.17	44.23	-14.94	74.00	29.77	200	21	Horizontal
4	4803.7500	52.85	42.12	-10.73	74.00	31.88	100	255	Horizontal
5	6387.7500	51.74	43.76	-7.98	74.00	30.24	200	75	Horizontal
6	9405.7500	47.44	47.69	0.25	74.00	26.31	100	217	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	62.41	38.34	-24.07	74.00	35.66	100	105	Vertical
2	1352.0000	62.55	38.68	-23.87	74.00	35.32	100	105	Vertical
3	1752.5000	62.16	39.64	-22.52	74.00	34.36	100	135	Vertical
4	2145.0000	58.83	37.13	-21.70	74.00	36.87	200	318	Vertical
5	4803.7500	52.27	41.54	-10.73	74.00	32.46	200	255	Vertical
6	7149.7500	50.33	45.63	-4.70	74.00	28.37	100	255	Vertical

Mode: TX/ DH5
Middle channel (2441MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1299.7500	61.26	37.19	-24.07	74.00	36.81	100	105	Horizontal
2	4094.2500	57.01	42.06	-14.95	74.00	31.94	200	255	Horizontal
3	4881.7500	51.06	40.23	-10.83	74.00	33.77	200	92	Horizontal
4	6146.2500	51.31	43.32	-7.99	74.00	30.68	100	165	Horizontal
5	7138.5000	50.64	45.60	-5.04	74.00	28.40	200	182	Horizontal
6	9398.2500	47.48	47.81	0.33	74.00	26.19	100	0	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	62.38	38.31	-24.07	74.00	35.69	100	360	Vertical
2	2145.0000	59.00	37.30	-21.70	74.00	36.70	100	105	Vertical
3	4095.0000	57.50	42.56	-14.94	74.00	31.44	200	255	Vertical
4	4881.7500	53.25	42.42	-10.83	74.00	31.58	200	255	Vertical
5	7746.0000	49.43	46.11	-3.32	74.00	27.89	100	255	Vertical
6	8991.0000	48.50	47.38	-1.12	74.00	26.62	200	102	Vertical

Mode: TX/ DH5
Highest channel (2480MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	61.85	37.78	-24.07	74.00	36.22	100	105	Horizontal
2	3000.7500	56.59	39.07	-17.52	74.00	34.93	100	255	Horizontal
3	3557.2500	55.82	39.13	-16.69	74.00	34.87	100	166	Horizontal
4	4960.5000	51.14	40.23	-10.91	74.00	33.77	200	255	Horizontal
5	8169.0000	48.78	45.94	-2.84	74.00	28.06	200	90	Horizontal
6	9385.5000	47.15	47.29	0.14	74.00	26.71	200	108	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.2500	62.43	38.36	-24.07	74.00	35.64	100	360	Vertical
2	1770.5000	60.02	37.64	-22.38	74.00	36.36	200	126	Vertical
3	2144.7500	58.97	37.27	-21.70	74.00	36.73	200	105	Vertical
4	4959.7500	53.68	42.77	-10.91	74.00	31.23	200	1	Vertical
5	5882.2500	52.14	43.32	-8.82	74.00	30.68	100	59	Vertical
6	7753.5000	49.70	46.45	-3.25	74.00	27.55	100	42	Vertical

Mode: TX/ 2DH5
Lowest channel (2402MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	61.81	37.74	-24.07	74.00	36.26	100	105	Horizontal
2	1775.2500	59.00	36.66	-22.34	74.00	37.34	100	171	Horizontal
3	4094.2500	56.89	41.94	-14.95	74.00	32.06	100	34	Horizontal
4	4803.0000	51.45	40.72	-10.73	74.00	33.28	100	255	Horizontal
5	5703.0000	51.62	42.47	-9.15	74.00	31.53	100	217	Horizontal
6	9393.7500	47.12	47.38	0.26	74.00	26.62	100	255	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	61.87	37.80	-24.07	74.00	36.20	100	359	Vertical
2	1768.5000	60.86	38.47	-22.39	74.00	35.53	200	170	Vertical
3	3714.7500	55.34	39.63	-15.71	74.00	34.37	200	20	Vertical
4	4095.7500	56.33	41.40	-14.93	74.00	32.60	200	1	Vertical
5	4803.0000	51.22	40.49	-10.73	74.00	33.51	200	255	Vertical
6	9713.2500	47.48	47.84	0.36	74.00	26.16	200	246	Vertical

Mode: TX/ 2DH5
Middle channel (2441MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.2500	61.70	37.63	-24.07	74.00	36.37	100	105	Horizontal
2	3069.0000	56.50	38.60	-17.90	74.00	35.40	100	145	Horizontal
3	4095.7500	56.44	41.51	-14.93	74.00	32.49	100	35	Horizontal
4	4881.7500	50.59	39.76	-10.83	74.00	34.24	100	255	Horizontal
5	6170.2500	51.62	43.51	-8.11	74.00	30.49	200	255	Horizontal
6	7139.2500	50.74	45.73	-5.01	74.00	28.27	100	255	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1248.0000	61.25	36.98	-24.27	74.00	37.02	200	347	Vertical
2	1300.0000	62.65	38.58	-24.07	74.00	35.42	100	105	Vertical
3	4094.2500	55.46	40.51	-14.95	74.00	33.49	200	31	Vertical
4	4882.5000	52.07	41.24	-10.83	74.00	32.76	200	255	Vertical
5	7158.0000	50.65	45.99	-4.66	74.00	28.01	100	46	Vertical
6	8586.0000	49.01	46.76	-2.25	74.00	27.24	200	161	Vertical

Mode: TX/ 2DH5
Highest channel (2480MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	63.48	39.41	-24.07	74.00	34.59	100	105	Horizontal
2	4096.5000	56.73	41.81	-14.92	74.00	32.19	200	255	Horizontal
3	5302.5000	51.98	41.54	-10.44	74.00	32.46	100	138	Horizontal
4	6274.5000	51.21	43.15	-8.06	74.00	30.85	200	255	Horizontal
5	7751.2500	49.08	45.83	-3.25	74.00	28.17	200	255	Horizontal
6	9697.5000	47.22	47.68	0.46	74.00	26.32	200	255	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1299.7500	62.56	38.49	-24.07	74.00	35.51	100	105	Vertical
2	1819.7500	59.90	37.84	-22.06	74.00	36.16	100	105	Vertical
3	4094.2500	56.03	41.08	-14.95	74.00	32.92	200	30	Vertical
4	4959.7500	52.22	41.31	-10.91	74.00	32.69	200	255	Vertical
5	7180.5000	50.51	45.92	-4.59	74.00	28.08	100	0	Vertical
6	7755.7500	49.70	46.46	-3.24	74.00	27.54	200	228	Vertical

Mode: TX/ 3DH5
Lowest channel (2402MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	63.21	39.14	-24.07	74.00	34.86	100	105	Horizontal
2	3690.7500	55.23	39.48	-15.75	74.00	34.52	100	210	Horizontal
3	4096.5000	54.85	39.93	-14.92	74.00	34.07	200	255	Horizontal
4	4803.0000	51.39	40.66	-10.73	74.00	33.34	100	256	Horizontal
5	7161.0000	49.62	44.97	-4.65	74.00	29.03	100	256	Horizontal
6	9403.5000	47.39	47.68	0.29	74.00	26.32	100	36	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1299.7500	62.71	38.64	-24.07	74.00	35.36	100	105	Vertical
2	2144.7500	58.60	36.90	-21.70	74.00	37.10	100	105	Vertical
3	4094.2500	57.66	42.71	-14.95	74.00	31.29	200	255	Vertical
4	4993.5000	51.72	41.04	-10.68	74.00	32.96	200	255	Vertical
5	7179.0000	50.03	45.44	-4.59	74.00	28.56	100	256	Vertical
6	8984.2500	48.49	47.30	-1.19	74.00	26.70	100	78	Vertical

Mode: TX/ 3DH5
Middle channel (2441MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.0000	61.85	37.78	-24.07	74.00	36.22	100	105	Horizontal
2	3410.2500	55.54	38.63	-16.91	74.00	35.37	100	12	Horizontal
3	4093.5000	56.20	41.24	-14.96	74.00	32.76	200	45	Horizontal
4	5666.2500	52.00	42.58	-9.42	74.00	31.42	100	255	Horizontal
5	7151.2500	49.53	44.84	-4.69	74.00	29.16	100	255	Horizontal
6	7753.5000	49.36	46.11	-3.25	74.00	27.89	100	255	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1300.2500	62.62	38.55	-24.07	74.00	35.45	100	105	Vertical
2	1352.2500	61.71	37.84	-23.87	74.00	36.16	100	105	Vertical
3	4094.2500	59.00	44.05	-14.95	74.00	29.95	200	0	Vertical
4	5100.7500	51.52	40.78	-10.74	74.00	33.22	100	21	Vertical
5	7157.2500	49.64	44.97	-4.67	74.00	29.03	200	255	Vertical
6	8043.0000	50.20	47.05	-3.15	74.00	26.95	200	154	Vertical

Mode: TX/ 3DH5
Highest channel (2480MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1247.7500	61.87	37.59	-24.28	74.00	36.41	100	105	Horizontal
2	1300.0000	62.93	38.86	-24.07	74.00	35.14	100	105	Horizontal
3	3798.7500	54.93	39.71	-15.22	74.00	34.29	100	255	Horizontal
4	6361.5000	51.25	43.03	-8.22	74.00	30.97	100	5	Horizontal
5	7181.2500	50.19	45.61	-4.58	74.00	28.39	100	164	Horizontal
6	7942.5000	49.85	46.29	-3.56	74.00	27.71	200	19	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1248.2500	61.98	37.71	-24.27	74.00	36.29	200	105	Vertical
2	1299.7500	62.55	38.48	-24.07	74.00	35.52	100	105	Vertical
3	4096.5000	56.33	41.41	-14.92	74.00	32.59	200	255	Vertical
4	4959.7500	51.82	40.91	-10.91	74.00	33.09	200	255	Vertical
5	5874.0000	51.59	42.78	-8.81	74.00	31.22	200	199	Vertical
6	8976.7500	48.34	47.08	-1.26	74.00	26.92	100	49	Vertical

Above 18GHz-26.5GHz:

Recorded the worst case results in this report (DH5)

Mode: TX/ DH5

Lowest channel (2402MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18358.2750	57.59	46.05	-11.54	83.50	37.45	100	340	Horizontal
2	18977.9250	58.48	47.36	-11.12	83.50	36.14	100	274	Horizontal
3	20403.8000	56.99	46.44	-10.55	83.50	37.06	100	198	Horizontal
4	21802.0500	56.08	46.13	-9.95	83.50	37.37	100	358	Horizontal
5	23741.7500	55.30	46.78	-8.52	83.50	36.72	100	236	Horizontal
6	25469.3750	55.08	47.27	-7.81	83.50	36.23	100	135	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18265.6250	57.83	46.26	-11.57	83.50	37.24	100	2	Vertical
2	18964.7500	57.74	46.61	-11.13	83.50	36.89	100	249	Vertical
3	19958.4000	57.04	46.18	-10.86	83.50	37.32	100	249	Vertical
4	20501.1250	56.26	45.77	-10.49	83.50	37.73	100	236	Vertical
5	21396.1750	55.98	45.88	-10.10	83.50	37.62	100	33	Vertical
6	23281.9000	55.08	46.27	-8.81	83.50	37.23	100	97	Vertical

Mode: TX/ DH5

Highest channel (2480MHz) Date: 2021-03-18

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18420.7500	57.66	46.14	-11.52	83.50	37.36	100	222	Horizontal
2	19137.7250	57.79	46.71	-11.08	83.50	36.79	100	159	Horizontal
3	20428.0250	55.81	45.28	-10.53	83.50	38.22	100	90	Horizontal
4	21096.5500	56.07	45.78	-10.29	83.50	37.72	100	185	Horizontal
5	22674.1500	55.42	46.22	-9.20	83.50	37.28	100	303	Horizontal
6	23842.0500	55.26	46.84	-8.42	83.50	36.66	100	341	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18424.1500	57.91	46.39	-11.52	83.50	37.11	100	18	Vertical
2	18913.3250	57.31	46.13	-11.18	83.50	37.37	100	108	Vertical
3	20528.3250	56.14	45.67	-10.47	83.50	37.83	100	251	Vertical
4	22051.9500	55.91	46.00	-9.91	83.50	37.50	100	96	Vertical
5	22777.8500	55.67	46.58	-9.09	83.50	36.92	100	146	Vertical
6	25788.5500	55.97	47.85	-8.12	83.50	35.65	100	159	Vertical

Test result: The unit does meet the requirements.

5.10. RESTRICTED BANDS OF OPERATION

5.10.1. LIMITS

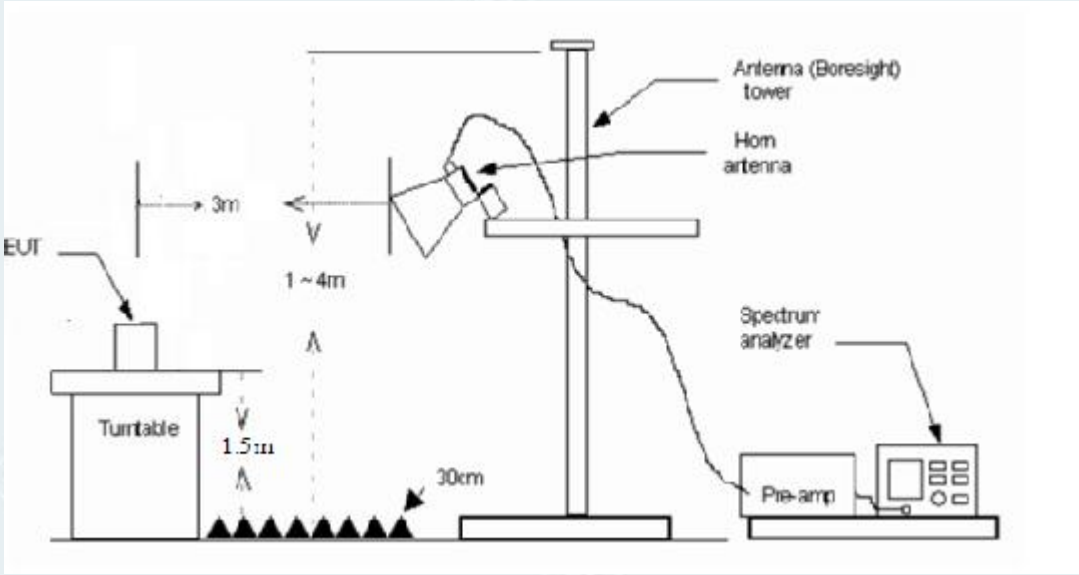
Section 15.247(d) In addition, Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 -	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.69525	960 - 1240	7.25 - 7.75
4.125 - 4.128	16.80425 -	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	16.80475	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	25.5 - 25.67	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	37.5 - 38.25	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	73 - 74.6	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	74.8 - 75.2	2200 - 2300	14.47 - 14.5
8.291 - 8.294	108 - 121.94	2310 - 2390	15.35 - 16.2
8.362 - 8.366	123 - 138	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	149.9 - 150.05	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.52475 -	3260 - 3267	23.6 - 24.0
12.29 - 12.293	156.52525	3332 - 3339	31.2 - 31.8
12.51975 -	156.7 - 156.9	3345.8 - 3358	36.43 - 36.5
12.52025	162.0125 - 167.17	3600 - 4400	
12.57675 -	167.72 - 173.2		
12.57725	240 - 285		
13.36 - 13.41	322 - 335.4		

5.10.2. TEST PROCEDURES

1) The EUT is placed on a turntable, which is 1.5m above the ground plane.
2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4) Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   a) PEAK: RBW=1MHz / VBW=1MHz / Sweep=AUTO
   b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO
5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

5.10.3. TEST SETUP



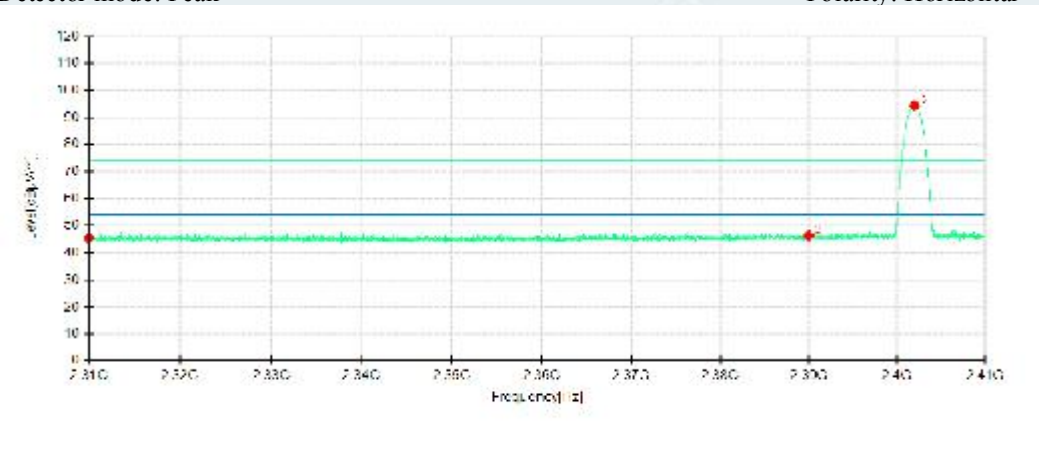
5.10.4. TEST RESULTS

DH5

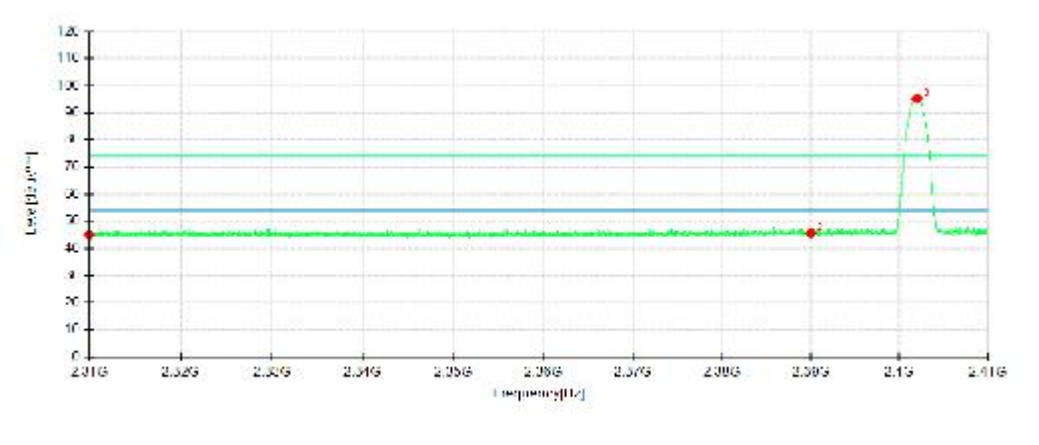
Lowest Channel

Channel 2402MHz

Detector mode: Peak Polarity: Horizontal

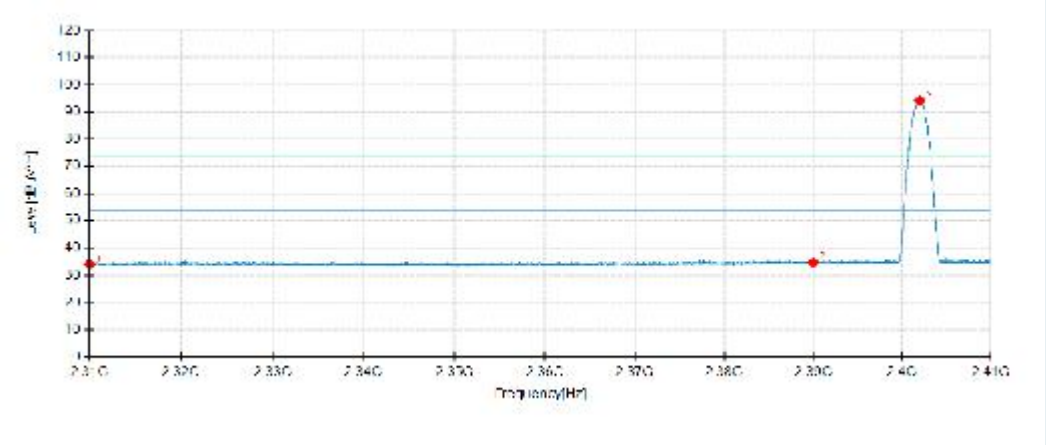


Detector mode: Peak Polarity: Vertical

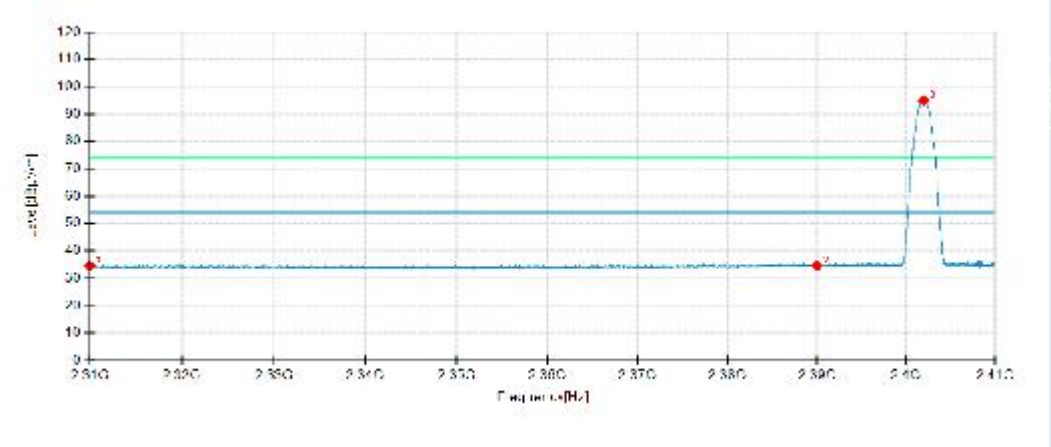


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	42.43	45.42	2.99	74.00	28.58	200	109	Horizontal	/
2	2390.0000	43.11	46.30	3.19	74.00	27.70	200	275	Horizontal	/
3	2401.9875	91.09	94.44	3.35	74.00	-20.44	100	218	Horizontal	No limit
1	2310.0000	42.01	45.00	2.99	74.00	29.00	100	287	Vertical	/
2	2390.0000	42.45	45.64	3.19	74.00	28.36	200	195	Vertical	/
3	2401.9875	91.95	95.30	3.35	74.00	-21.30	200	257	Vertical	No limit

Lowest Channel
Channel 2402MHz
Detector mode: Average Polarity: Horizontal

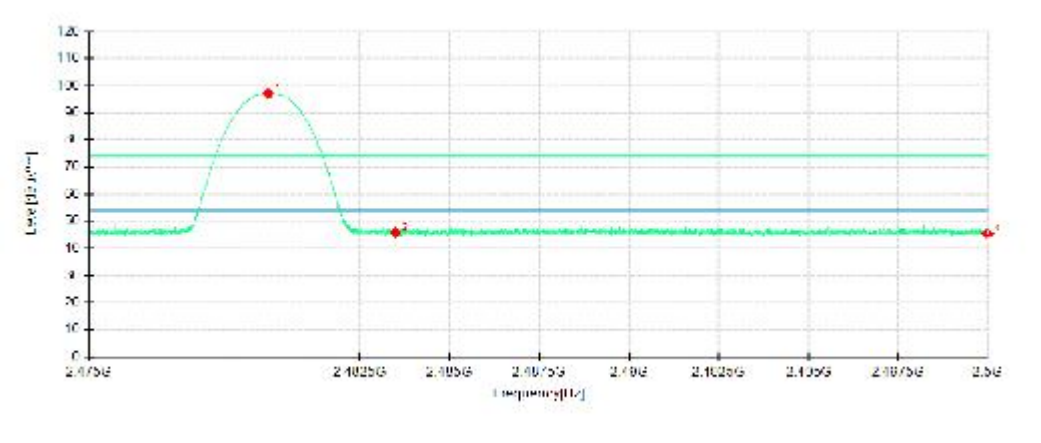


Detector mode: Average Polarity: Vertical

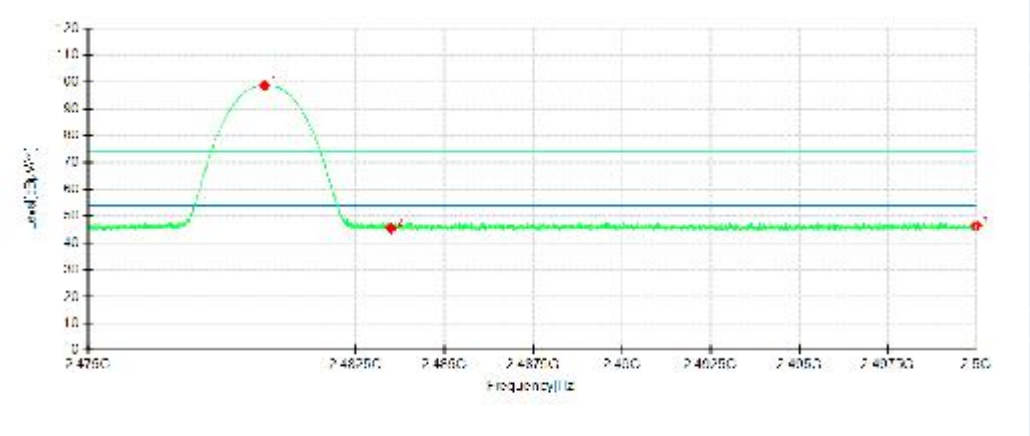


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	31.02	34.01	2.99	54.00	19.99	100	220	Horizontal	/
2	2390.0000	31.47	34.66	3.19	54.00	19.34	200	236	Horizontal	/
3	2401.9750	90.83	94.18	3.35	54.00	-40.18	100	220	Horizontal	No limit
1	2310.0000	31.54	34.53	2.99	54.00	19.47	200	31	Vertical	/
2	2390.0000	31.38	34.57	3.19	54.00	19.43	200	299	Vertical	/
3	2401.9500	91.64	94.99	3.35	54.00	-40.99	200	257	Vertical	No limit

Highest Channel
Channel 2480MHz
Detector mode: Peak Polarity: Horizontal

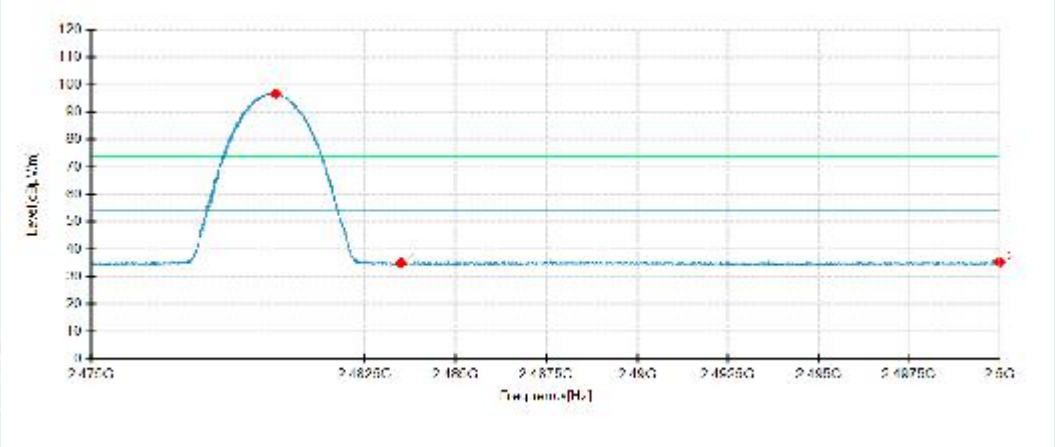


Detector mode: Peak Polarity: Vertical

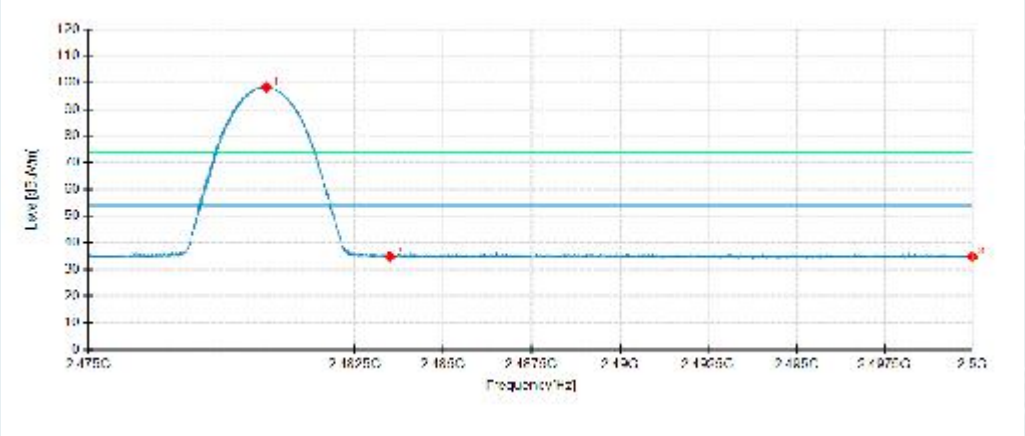


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2479.9625	93.50	97.05	3.55	74.00	-23.05	100	220	Horizontal	No limit
2	2483.5000	42.25	45.81	3.56	74.00	28.19	100	111	Horizontal	/
3	2500.0000	41.82	45.40	3.58	74.00	28.60	100	193	Horizontal	/
1	2479.9469	95.00	98.55	3.55	74.00	-24.55	200	249	Vertical	No limit
2	2483.5000	42.02	45.58	3.56	74.00	28.42	100	15	Vertical	/
3	2500.0000	42.94	46.52	3.58	74.00	27.48	200	304	Vertical	/

Highest Channel
Channel 2480MHz
Detector mode: Average Polarity: Horizontal



Detector mode: Average Polarity: Vertical



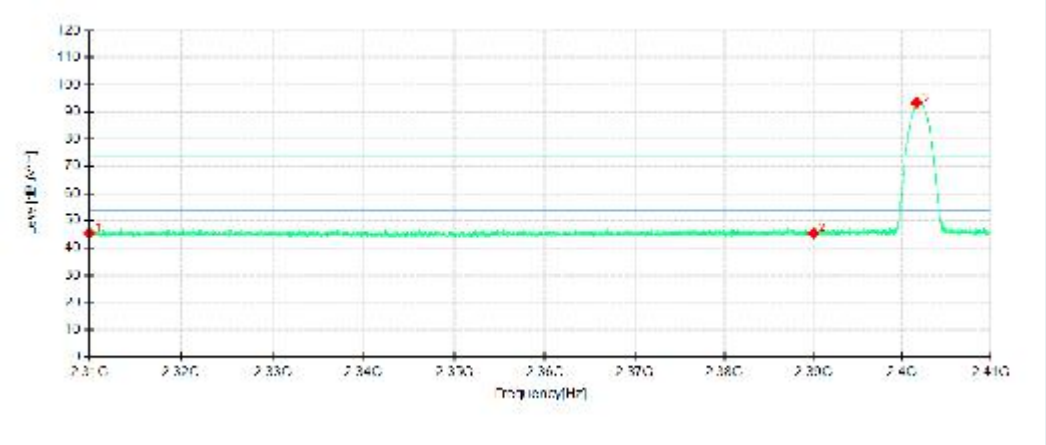
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2480.0625	93.12	96.67	3.55	54.00	-42.67	100	219	Horizontal	No limit
2	2483.5000	31.43	34.99	3.56	54.00	19.01	200	249	Horizontal	/
3	2500.0000	31.81	35.39	3.58	54.00	18.61	100	349	Horizontal	/
1	2480.0156	94.67	98.22	3.55	54.00	-44.22	200	249	Vertical	No limit
2	2483.5000	31.27	34.83	3.56	54.00	19.17	200	297	Vertical	/
3	2500.0000	31.17	34.75	3.58	54.00	19.25	100	336	Vertical	/

2DH5

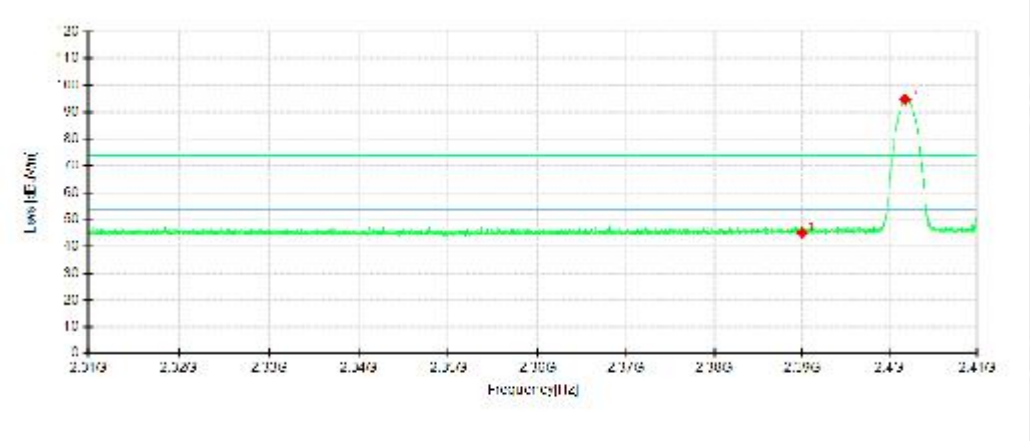
Lowest Channel

Channel 2402MHz

Detector mode: Peak Polarity: Horizontal

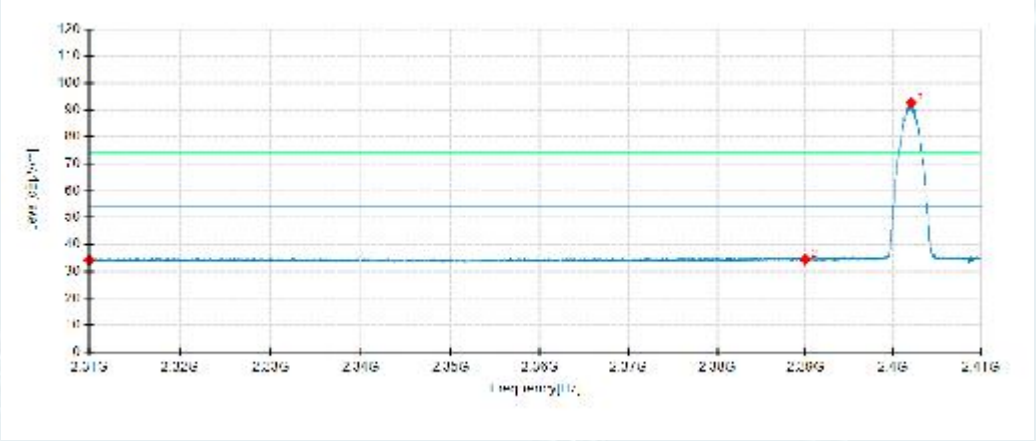


Detector mode: Peak Polarity: Vertical

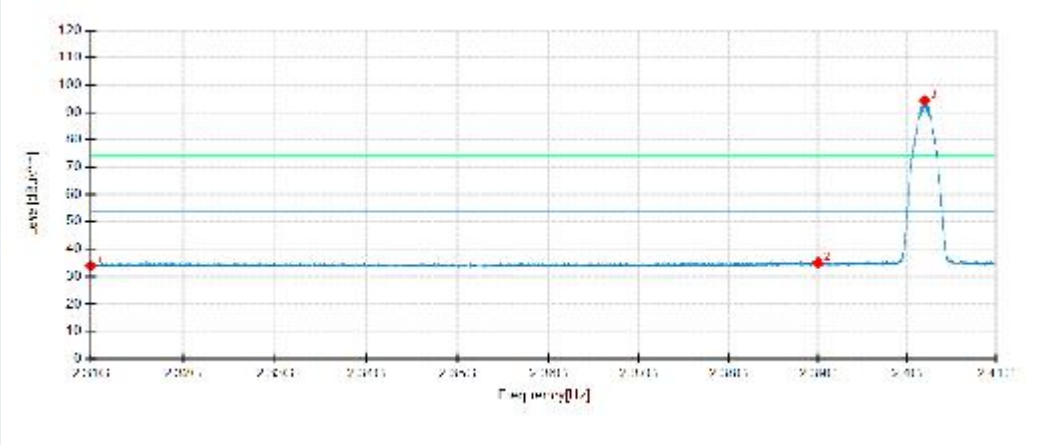


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	42.56	45.55	2.99	74.00	28.45	200	250	Horizontal	/
2	2390.0000	42.26	45.45	3.19	74.00	28.55	200	161	Horizontal	/
3	2401.6375	90.00	93.35	3.35	74.00	-19.35	100	219	Horizontal	No limit
1	2390.0000	41.90	45.09	3.19	74.00	28.91	100	281	Vertical	/
2	2401.8000	91.36	94.71	3.35	74.00	-20.71	200	256	Vertical	No limit

Lowest Channel
Channel 2402MHz
Detector mode: Average Polarity: Horizontal

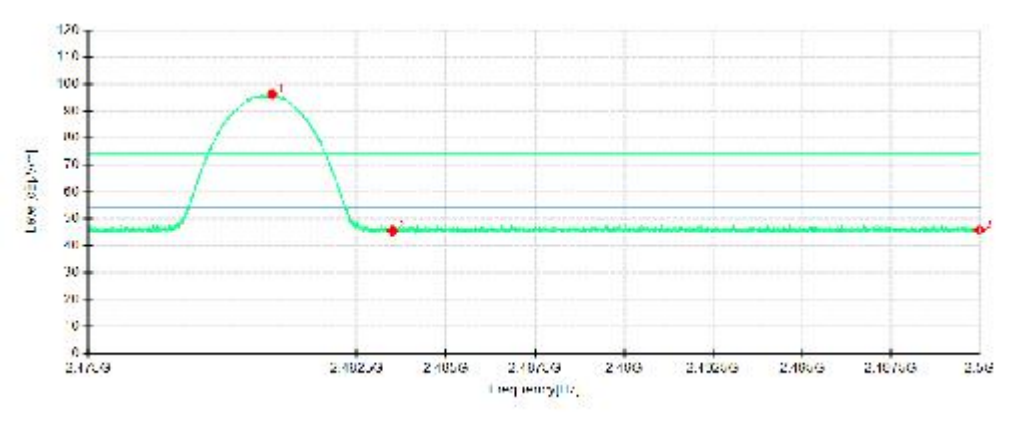


Detector mode: Average Polarity: Vertical

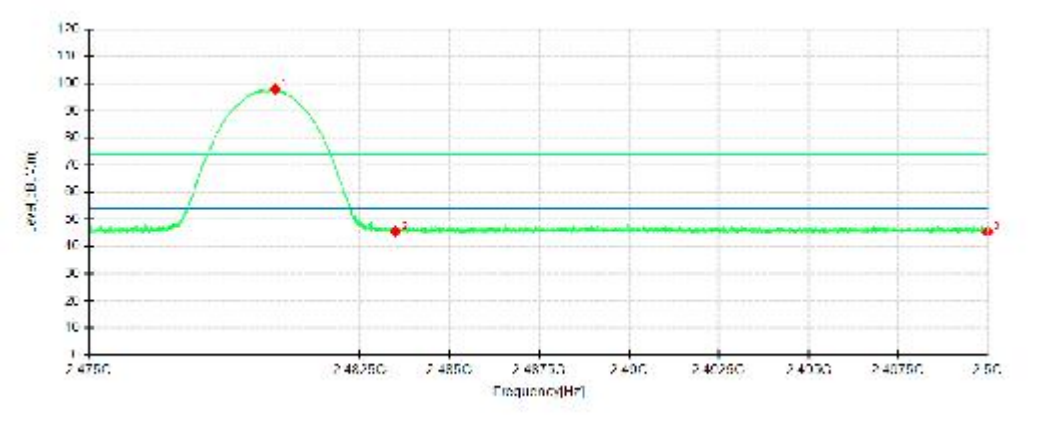


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	31.25	34.24	2.99	54.00	19.76	100	294	Horizontal	/
2	2390.0000	31.32	34.51	3.19	54.00	19.49	200	255	Horizontal	/
3	2402.0500	89.31	92.66	3.35	54.00	-38.66	100	226	Horizontal	No limit
1	2310.0000	30.98	33.97	2.99	54.00	20.03	200	134	Vertical	/
2	2390.0000	31.81	35.00	3.19	54.00	19.00	200	250	Vertical	/
3	2401.9500	91.07	94.42	3.35	54.00	-40.42	200	256	Vertical	No limit

Highest Channel
Channel 2480MHz
Detector mode: Peak Polarity: Horizontal

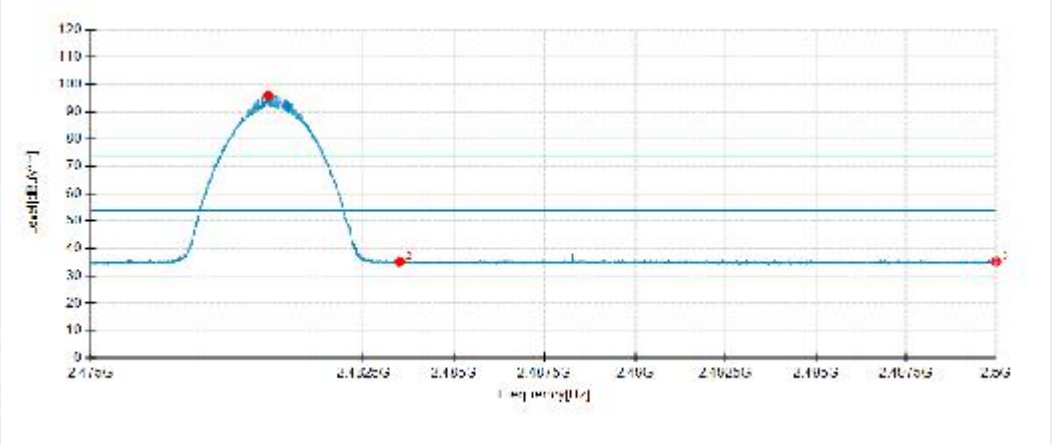


Detector mode: Peak Polarity: Vertical

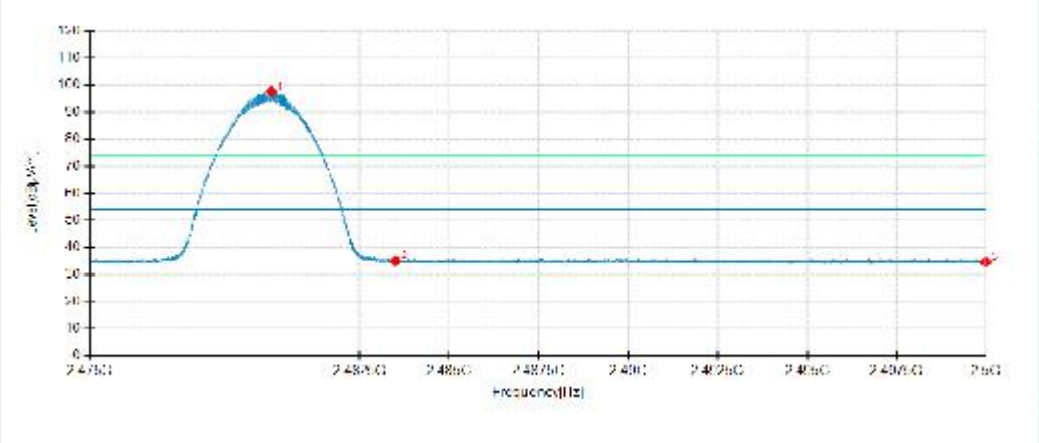


No.	Frequency MHz	Reading dB μV/m	Level dB μV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2480.1375	92.76	96.31	3.55	74.00	-22.31	100	223	Horizontal	No limit
2	2483.5000	42.07	45.63	3.56	74.00	28.37	100	106	Horizontal	/
3	2500.0000	42.33	45.91	3.58	74.00	28.09	200	50	Horizontal	/
1	2480.1594	94.34	97.89	3.55	74.00	-23.89	200	246	Vertical	No limit
2	2483.5000	42.00	45.56	3.56	74.00	28.44	200	212	Vertical	/
3	2500.0000	41.80	45.38	3.58	74.00	28.62	100	181	Vertical	/

Highest Channel
Channel 2480MHz
Detector mode: Average Polarity: Horizontal



Detector mode: Average Polarity: Vertical



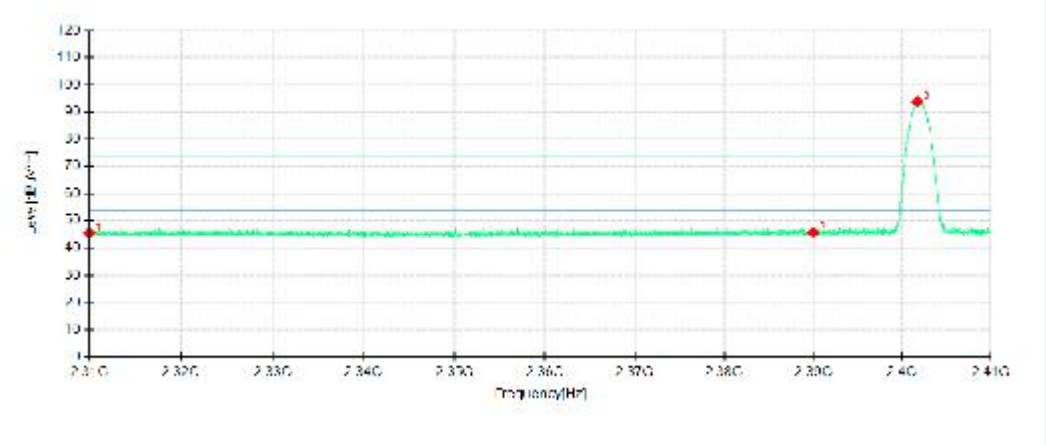
No.	Frequency MHz	Reading dB μV/m	Level dB μV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2479.8813	92.29	95.84	3.55	54.00	-41.84	100	229	Horizontal	No limit
2	2483.5000	31.55	35.11	3.56	54.00	18.89	100	174	Horizontal	/
3	2500.0000	31.59	35.17	3.58	54.00	18.83	200	302	Horizontal	/
1	2480.0500	93.97	97.52	3.55	54.00	-43.52	200	240	Vertical	No limit
2	2483.5000	31.55	35.11	3.56	54.00	18.89	200	118	Vertical	/
3	2500.0000	31.03	34.61	3.58	54.00	19.39	100	18	Vertical	/

3DH5

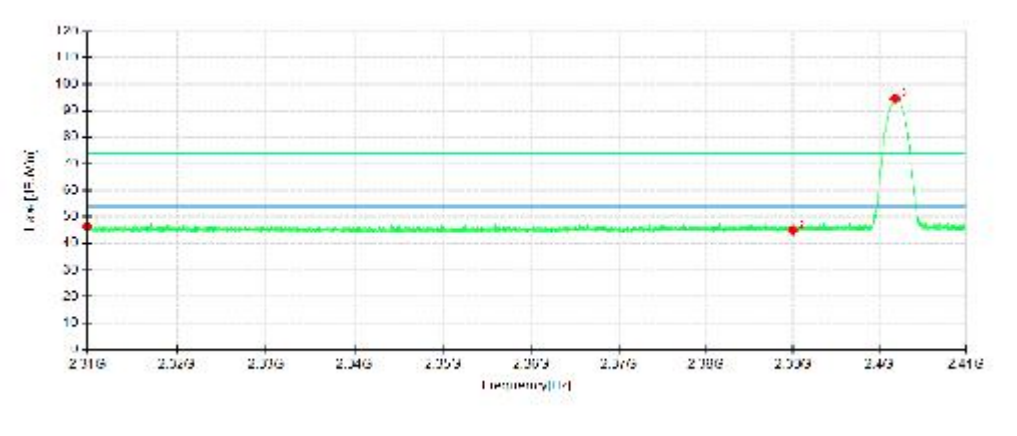
Lowest Channel

Channel 2402MHz

Detector mode: Peak Polarity: Horizontal

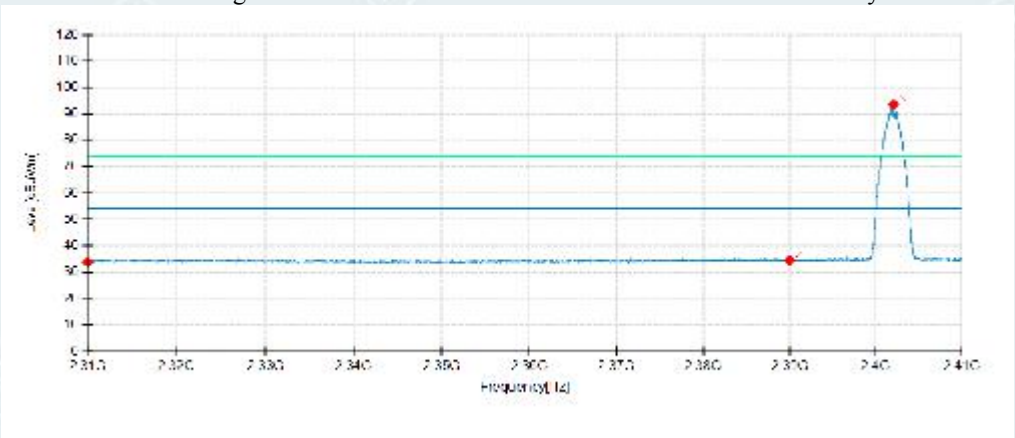


Detector mode: Peak Polarity: Vertical

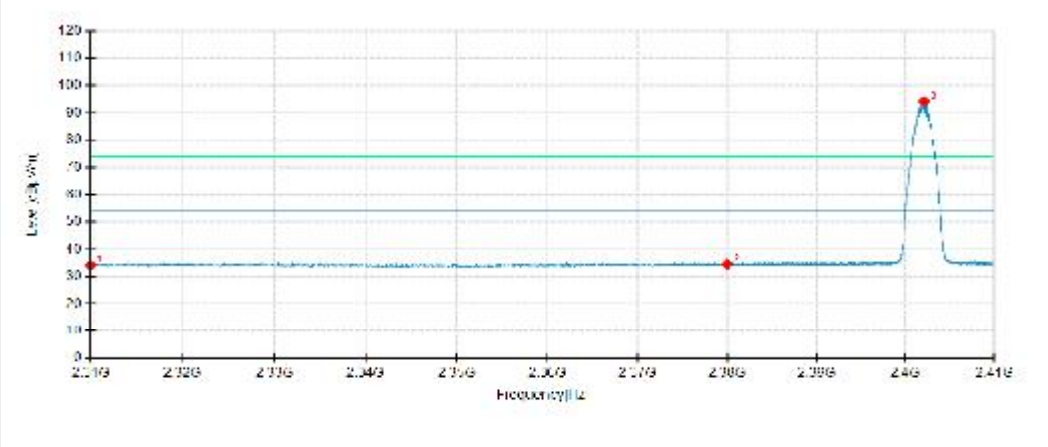


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	42.60	45.59	2.99	74.00	28.41	200	240	Horizontal	/
2	2390.0000	42.57	45.76	3.19	74.00	28.24	100	140	Horizontal	/
3	2401.7250	90.42	93.77	3.35	74.00	-19.77	100	222	Horizontal	No limit
1	2310.0000	43.42	46.41	2.99	74.00	27.59	100	31	Vertical	/
2	2390.0000	41.78	44.97	3.19	74.00	29.03	200	349	Vertical	/
3	2401.8000	91.30	94.65	3.35	74.00	-20.65	200	247	Vertical	No limit

Lowest Channel
Channel 2402MHz
Detector mode: Average Polarity: Horizontal

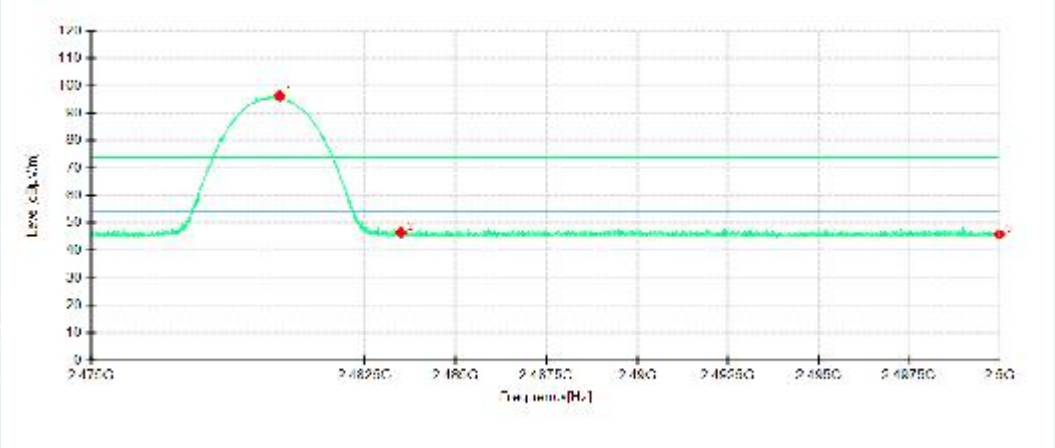


Detector mode: Average Polarity: Vertical

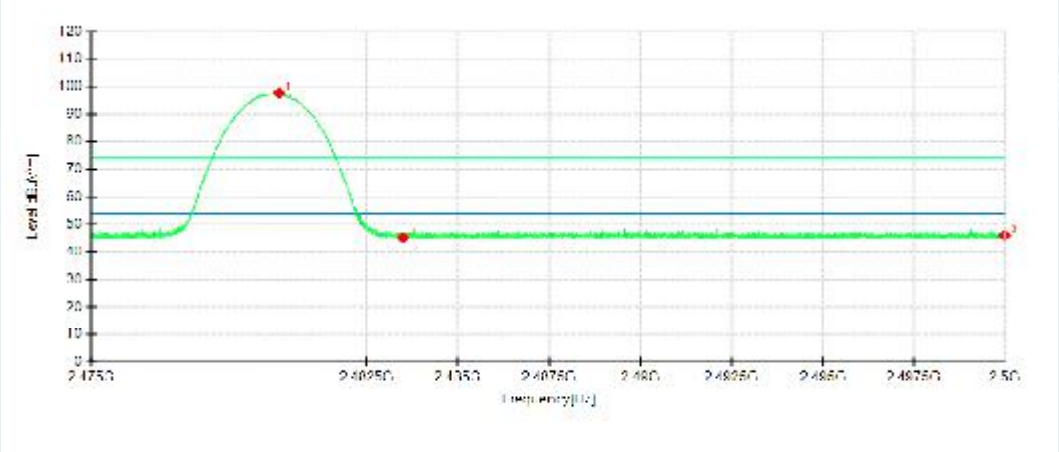


No.	Frequency MHz	Reading dB µV/m	Level dB µV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2310.0000	30.88	33.87	2.99	54.00	20.13	200	199	Horizontal	/
2	2390.0000	31.41	34.60	3.19	54.00	19.40	100	147	Horizontal	/
3	2402.0875	90.09	93.44	3.35	54.00	-39.44	100	216	Horizontal	No limit
1	2310.0000	31.13	34.12	2.99	54.00	19.88	100	305	Vertical	/
2	2380.0000	31.49	34.52	3.03	54.00	19.48	100	356	Vertical	/
3	2402.0875	90.85	94.20	3.35	54.00	-40.20	200	247	Vertical	No limit

Highest Channel
Channel 2480MHz
Detector mode: Peak Polarity: Horizontal

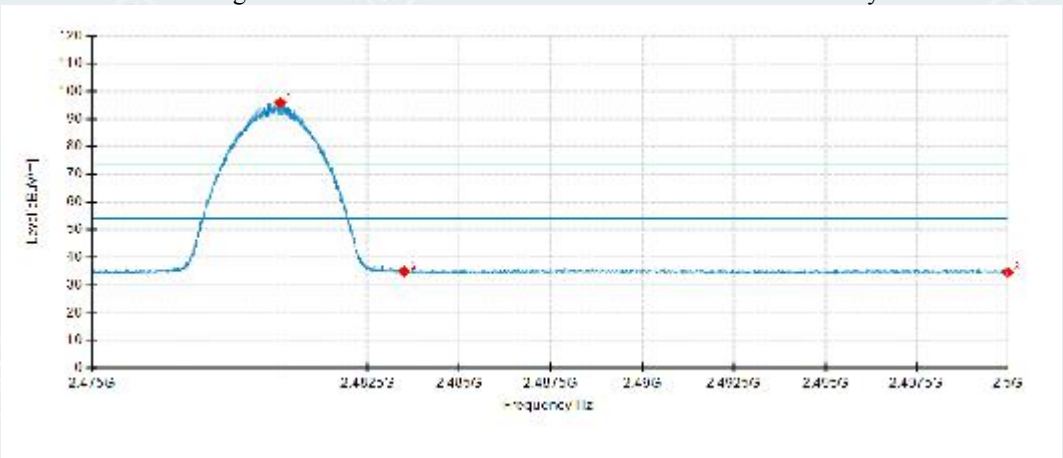


Detector mode: Peak Polarity: Vertical

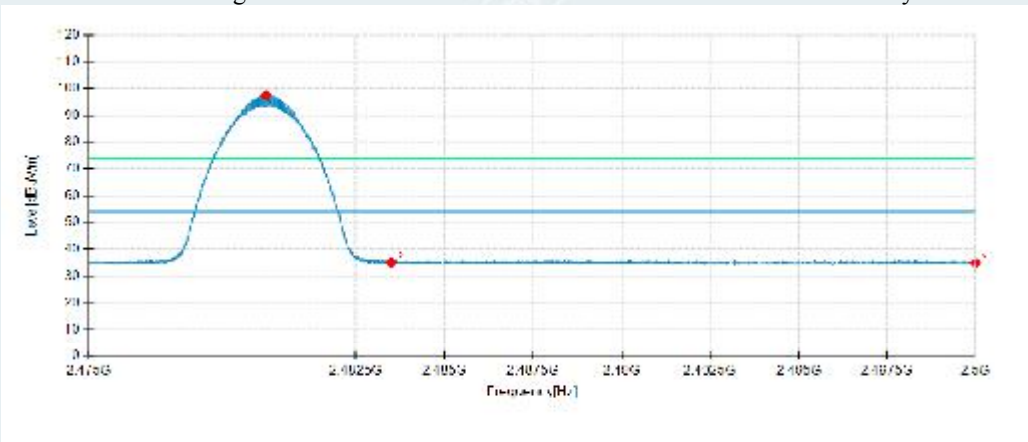


No.	Frequency MHz	Reading dB μV/m	Level dB μV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2480.1688	92.72	96.27	3.55	74.00	-22.27	100	229	Horizontal	No limit
2	2483.5000	43.03	46.59	3.56	74.00	27.41	200	220	Horizontal	/
3	2500.0000	42.33	45.91	3.58	74.00	28.09	100	351	Horizontal	/
1	2480.1156	94.16	97.71	3.55	74.00	-23.71	200	247	Vertical	No limit
2	2483.5000	41.71	45.27	3.56	74.00	28.73	100	271	Vertical	/
3	2500.0000	42.54	46.12	3.58	74.00	27.88	200	145	Vertical	/

Highest Channel
Channel 2480MHz
Detector mode: Average Polarity: Horizontal



Detector mode: Average Polarity: Vertical



No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Comment
1	2480.1219	92.37	95.92	3.55	54.00	-41.92	100	228	Horizontal	No limit
2	2483.5000	31.37	34.93	3.56	54.00	19.07	100	160	Horizontal	/
3	2500.0000	31.04	34.62	3.58	54.00	19.38	100	18	Horizontal	/
1	2479.9719	93.90	97.45	3.55	54.00	-43.45	200	245	Vertical	No limit
2	2483.5000	31.46	35.02	3.56	54.00	18.98	200	349	Vertical	/
	2500.0000	31.25	34.83	3.58	54.00	19.17	200	342	Vertical	/

Remark: Max field strength in 3m distance. No any other emission which falls in restricted bands can be detected and be reported.

----------This is the last page of the report. ----------