

Test Report

Verified code: 824630

Report No.: E202112276794-13

Customer: NunoErin, LLC

Address: 533 Commerce Street, Jackson MS 39201 USA

Sample Name: Wall mount tablet

Sample Model: UCTBWM-15.6

Receive Sample Date: Dec.29,2021

Test Date: Dec.31,2021 ~ Apr.21,2022

Reference Document: CFR 47, FCC Part 15 Subpart C
RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators

Test Result: Pass

Prepared by: *Wen. Wen*

Reviewed by:

Jiang Tao

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Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-05-27

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202112276794-13	Original Issue	2022-04-27

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
FCC 47 CFR Part 15 Subpart C (15.247) ANSI C63.10-2013 KDB 558074 D01 15.247 measurement guidance v05r02	Antenna Requirement	Section 15.203	PASS
	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	Section 15.209 &15.247(d)	PASS
	Radiated Spurious Emission	Section 15.247(d) &15.205 &15.209	PASS
	Restricted bands of operation	Section 15.247(d) &15.205 &15.209	PASS

The EUT antenna is Internal antenna. Max Antenna gain is 3dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: NunoErin, LLC
Address: 533 Commerce Street, Jackson MS 39201 USA

2.2 MANUFACTURER

Name: Chengdu Vantron Technology Co., Ltd.
Address: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

2.3 FACTORY

Name: Chengdu Vantron Technology Co., Ltd.
Address: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Wall mount tablet
Model No.: UCTBWM-15.6
Adding Model: /
Trade Name: NunoErin
FCC ID: 2A5VA- UCTBWM156
Rating: Input: 100-240V~ 50/60Hz 1.0A
Frequency Band: 2402MHz~2480MHz
Transmit Power: GFSK: 8.02dBm
 $\pi/4$ -DQPSK: 6.31dBm
8DPSK: 6.51dBm
Type of Modulation: FHSS (GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8DPSK for 3Mbps)
Antenna Specification: Internal antenna with 3dBi gain (Max)
Temperature Range: 0°C~ 50°C
Hardware Version: V2.0
Software Version: Android 10
Sample No: E202112276794-0001

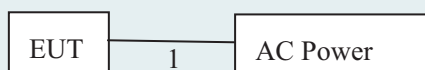
2.5 TEST OPERATION MODE

Mode No.	Description of the modes
1	Bluetooth(BT) fixed frequency transmitting

2.6 LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
/	/	/	/	/
Cable				
1	AC cable	/	/	Unshield 0.38m

2.7 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

Software version	Test level
Ampak RF testTool	0

2.8 DUTY CYCLE

Environment: 23.1°C/53%RH
Tested By: Qin Tingting

Voltage: AC 120V/60Hz
Date: 2022-02-21

Test Mode	Antenna	Frequency (MHz)	ON Time [ms]	Period [ms]	DC [%]	T [s]
DH5	Ant1	2441	2.90	3.76	77.13	0.002900
2DH5	Ant1	2441	2.89	3.75	77.07	0.002890
3DH5	Ant1	2441	2.89	3.75	77.07	0.002890

DH5_2441MHz



2DH5_2441MHz



3DH5_2441MHz



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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 : No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District
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P.C. : 518110

Tel : 0755-61180008

Fax : 0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	A2LA(Certificate #2861.01)
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The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897, CAB identifier:CN0069)
USA	FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site,
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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	9kHz~30MHz	4.46dB
		30MHz~1000MHz	4.30dB
		1GHz~18GHz	5.60dB
		18GHz~26.5GHz	3.65dB
	Vertical	9kHz~30MHz	4.46dB
		30MHz~1000MHz	4.30dB
		1GHz~18GHz	5.60dB
		18GHz~26.5GHz	3.65dB

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78 dB
Occupied channel bandwidth	0.4 dB
Unwanted emission, conducted	0.68 dB
Humidity	6 %
Temperature	2 °C

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

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4. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Hopping Channel Number				
Spectrum Analyzer	Agilent	N9010A	MY55370330	2022-11-08
Dwell Time				
Spectrum Analyzer	R&S	FSV30	104381	2022-12-10
Conducted Emissions				
TEST RECEIVER	R&S	ESCI	100783	2022-09-13
LISN(EUT)	R&S	ENV216	101543	2022-09-14
EZ-EMC	EZ	CCS-3A1-CE	/	/
Radiated Spurious Emission&Restricted bands of operation				
Test S/W	EZ	CCS-03A1	/	/
Loop Antenna	TESEQ	HLA6121	52599	2023-04-02
Test Receiver	R&S	ESR7	102444	2022-09-21
Preamplifier	EMEC	EM330	I00426	2023-03-05
Bi-log Antenna	Schwarzbeck	VULB9160	VULB9160-3401	2022-10-27
Spectrum Analyzer	Agilent	N9020B	MY57120179	2022-08-08
Horn Antenna	Schwarzbeck	BBHA9120D (1201)	02143	2022-10-22
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2022-10-16
Amplifier	Tonscend	TAP01018048	AP20E8060075	2022-05-09
Amplifier	Tonscend	TAP184050	AP20E806071	2022-05-17
Test S/W	Tonscend	JS36-RE/2.5.1.5		
20 dB Bandwidth				
Spectrum Analyzer	Agilent	N9010A	MY55370330	2022-11-08
Maximum Peak Output Power				
Pulse power sensor	Anritsu	MA2411B	1126150	2023-03-01
Power meter	Anritsu	ML2495A	1204003	2023-02-28
Conducted band edges and Spurious Emission				
Spectrum Analyzer	Agilent	N9010A	MY55370330	2022-11-08
Carrier Frequencies Separated				
Spectrum Analyzer	Agilent	N9010A	MY55370330	2022-11-08

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

5. EUT TEST CONDITIONS

Type of antenna:

Internal antenna

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
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
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

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 frequency(2402MHz), middle channel: 39 frequency (2441MHz) and highest channel: 78 frequency(2480MHz)

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6. CONDUCTED EMISSION MEASUREMENT

6.1 LIMITS

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

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.

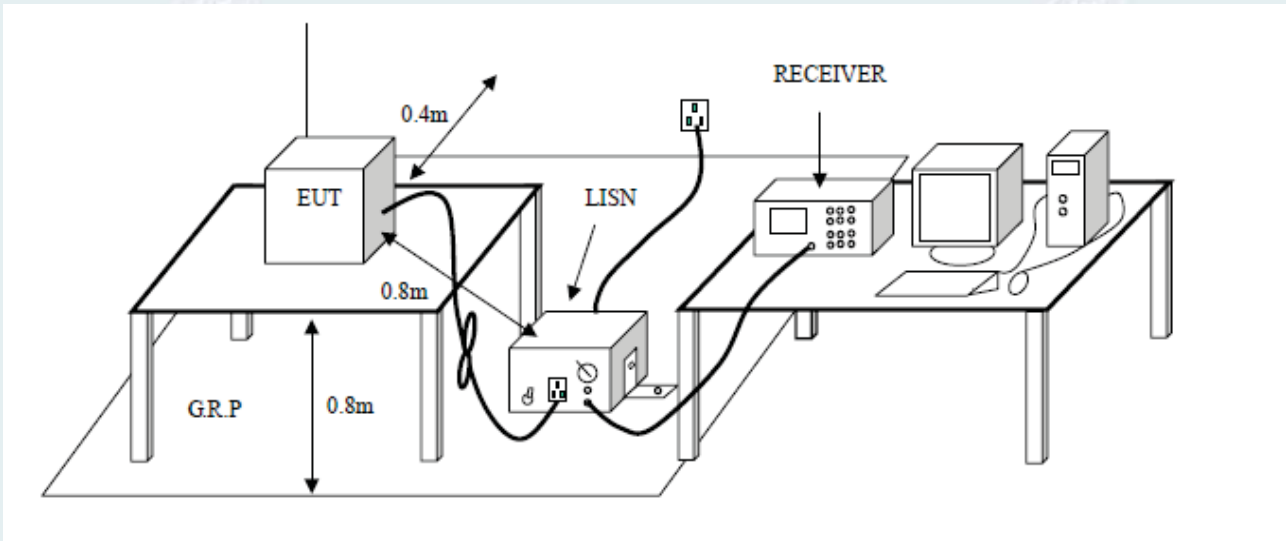
The test mode(s) described in Item 2.5 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.5 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference 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.

6.3 TEST SETUP



6.4 DATA SAMPLE

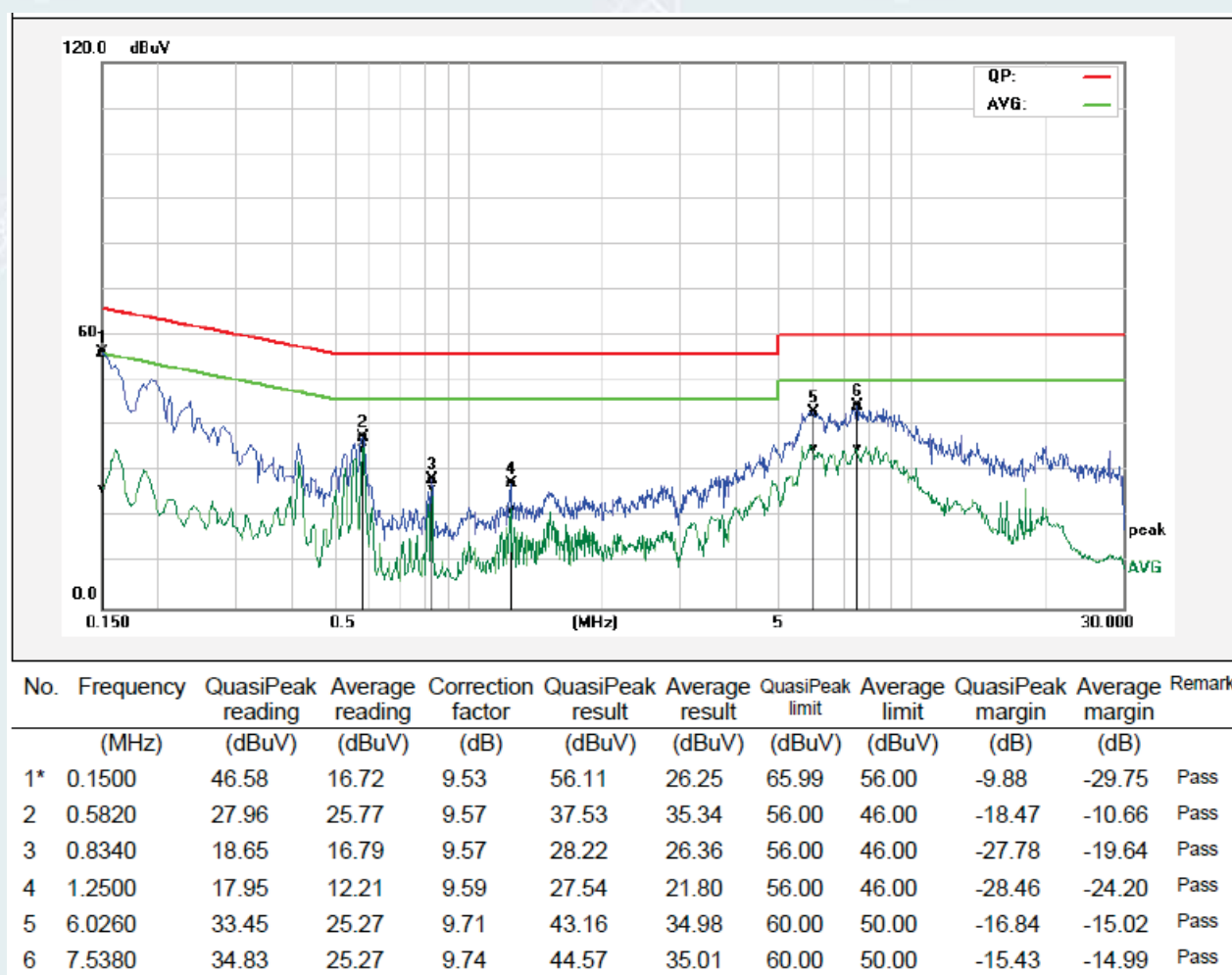
Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62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

6.5 TEST RESULTS

EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	22.5°C/45%RH	Test Mode	DH5 2402MHz
Tested By	Zeng Xianglong	Line	L
Tested Date	2022-02-14	Test Voltage	AC120V/60Hz

(The chart below shows the highest readings taken from the final data.)

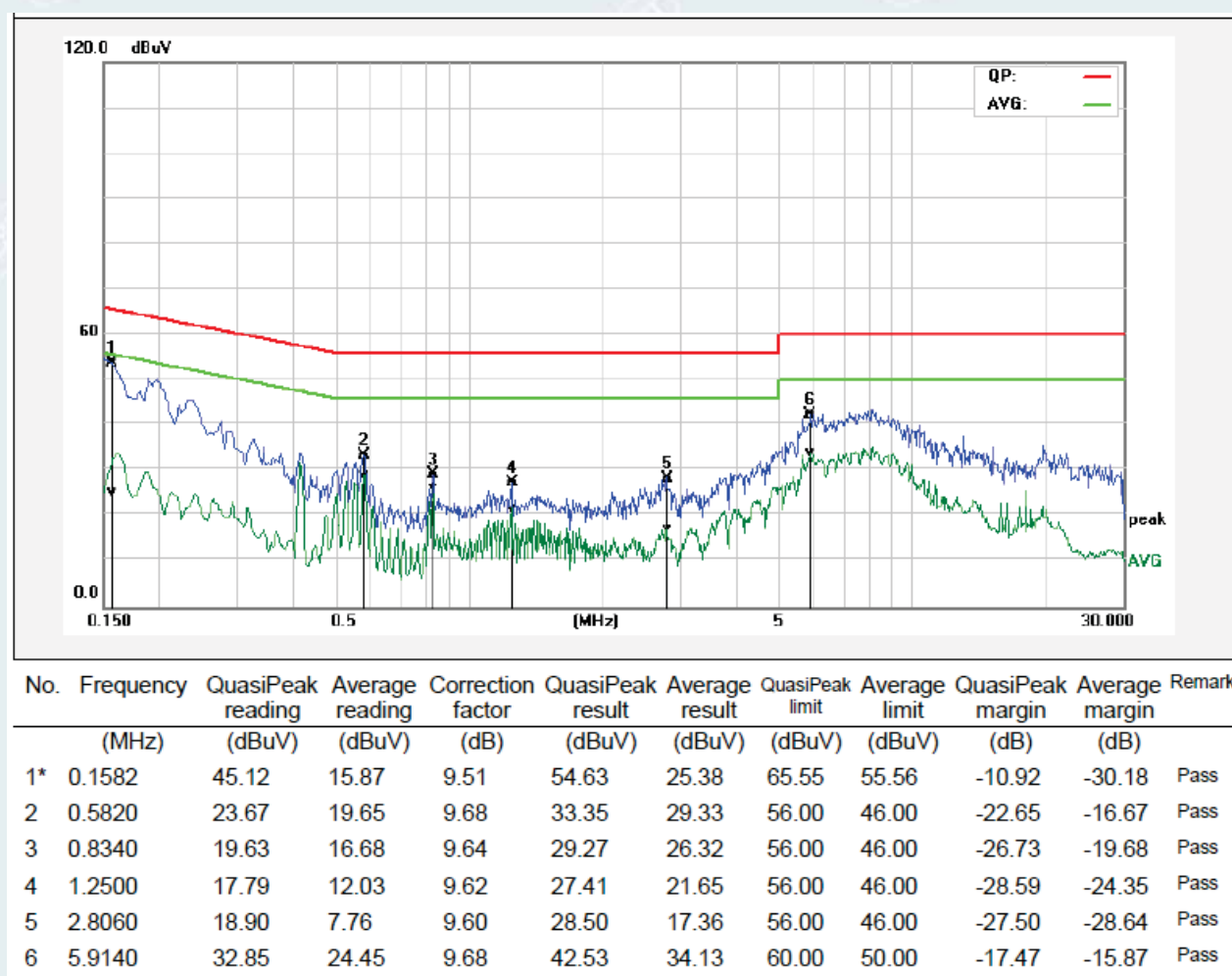


REMARKS: L = Live Line

Pre-scan all mode and recorded the worst case results in this report (TX-Low Channel(1Mbps))

EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	22.5°C/45%RH	Test Mode	DH5 2402MHz
Tested By	Zeng Xianglong	Line	N
Tested Date	2022-02-14	Test Voltage	AC120V/60Hz

(The chart below shows the highest readings taken from the final data.)



REMARKS: N = Neutral Line.

Pre-scan all mode and recorded the worst case results in this report (TX-Low Channel(1Mbps))

7. 20dB BANDWIDTH

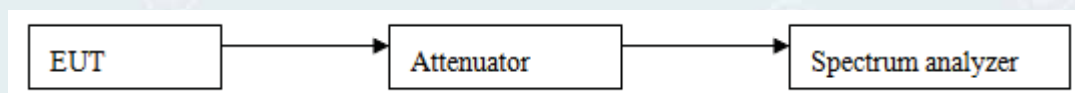
7.1 LIMITS

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.

7.2 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=20 kHz, VBW=62 kHz, Span=3MHz, Sweep = auto. Allow the trace to stabilize, record 20dB bandwidth value.
- 3) Repeat until all the test channels are investigated.

7.3 TEST SETUP



7.4 TEST RESULTS

Environment: 23.1°C/53%RH
 Tested By: Qin Tingting

Voltage: AC 120V/60Hz
 Date: 2022-01-14

Test mode	Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
DH5	Lowest	2402	942
	Middle	2441	942
	Highest	2480	942
2DH5	Lowest	2402	1347
	Middle	2441	1350
	Highest	2480	1344
3DH5	Lowest	2402	1320
	Middle	2441	1296
	Highest	2480	1299

Result plot as follows:

DH5

Lowest Channel



Middle Channel



Highest Channel



2DH5

Lowest Channel



Middle Channel



Highest Channel



3DH5
Lowest Channel



Middle Channel



Highest Channel



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8. CARRIER FREQUENCIES SEPARATED

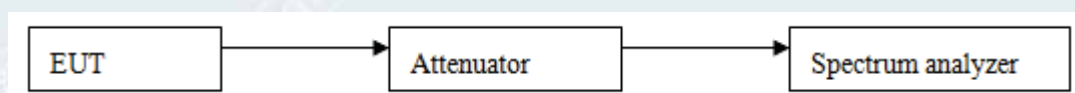
8.1 LIMITS

1) 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.

8.2 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=100kHz, VBW=300kHz, Adjust Span to 3 MHz, Sweep = auto.
- 4) Use the marker-delta function to mark hopping channel carrier frequencies and record the channel separation.

8.3 TEST SETUP



8.4 TEST RESULTS

Environment: 23.1°C/53%RH
 Tested By: Qin Tingting

Voltage: AC 120V/60Hz
 Date: 2022-01-04

DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.008	672	> Two-thirds of the 20 dB Bandwidth	Pass

2DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.022	896	> Two-thirds of the 20 dB Bandwidth	Pass

3DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.004	864	> Two-thirds of the 20 dB Bandwidth	Pass

Result plot as follows:

DH5

Measurement of Channel Separation



2DH5

Measurement of Channel Separation



3DH5

Measurement of Channel Separation



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9. HOPPING CHANNEL NUMBER

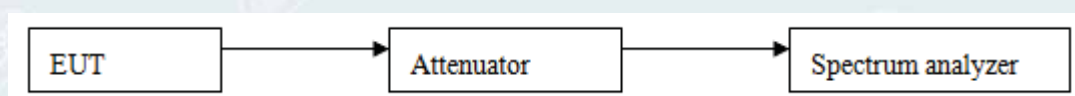
9.1 LIMITS

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

9.2 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=100kHz, VBW=300kHz.
- 3) Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

9.3 TEST SETUP



9.4 TEST RESULTS

Environment: 23.1°C/53%RH

Tested By: Qin Tingting

Voltage: AC 120V/60Hz

Date: 2022-01-04

GFSK

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

$\pi/4$ -DQPSK

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

8DPSK

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

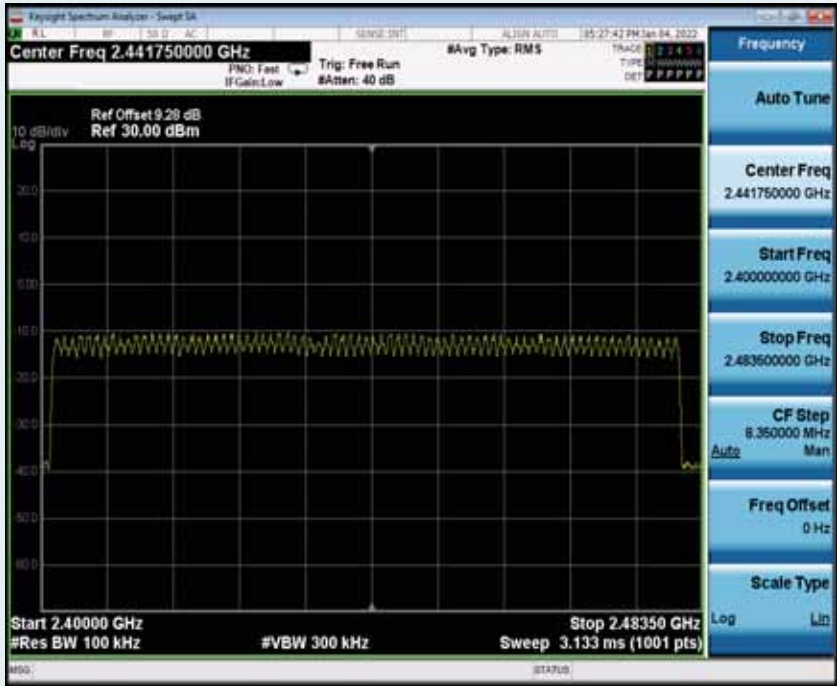
GFSK

2.400 GHz – 2.4835 GHz



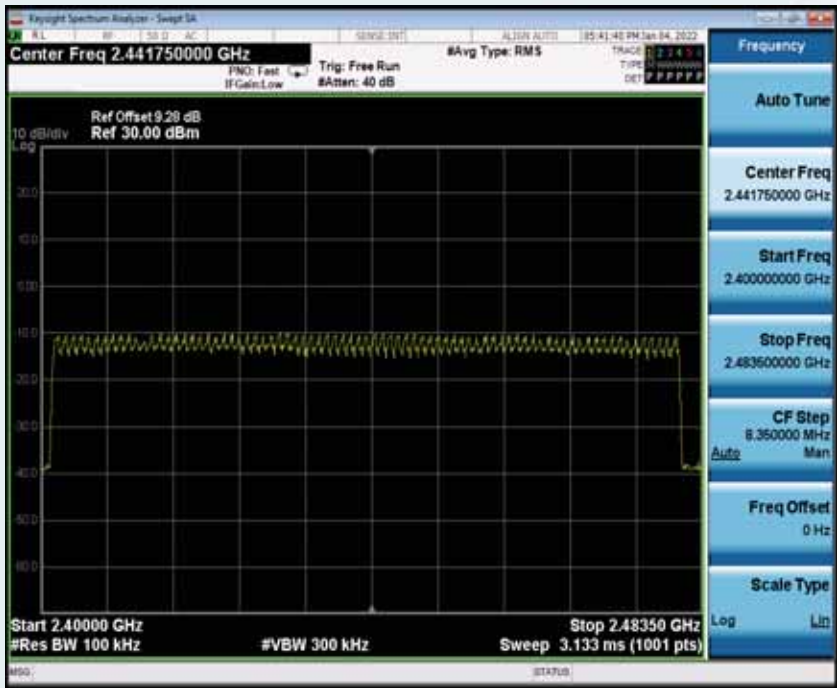
$\pi/4$ -DQPSK

2.400 GHz – 2.4835 GHz



8DPSK

2.400 GHz – 2.4835 GHz



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10. DWELL TIME

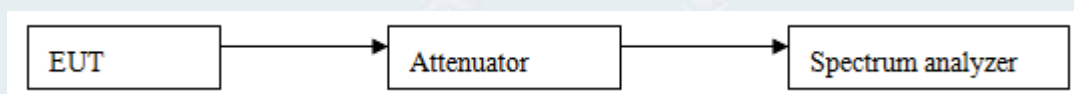
10.1 LIMITS

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.

10.2 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 = 3MHz. 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.
- 5) DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.
- 6) DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- 7) DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.

10.3 TEST SETUP



10.4 TEST RESULTS

Environment: 23.1°C/53%RH
 Tested By: Qin Tingting

Voltage: AC 120V/60Hz
 Date: 2022-01-04

The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

GFSK: Middle Channel (2.441GHz)

DH1	time slot=	0.38	(ms)*	$(1600/(2*79))$	*	31.6	=	122	ms
DH3	time slot=	1.63	(ms)*	$(1600/(4*79))$	*	31.6	=	261	ms
DH5	time slot=	2.87	(ms)*	$(1600/(6*79))$	*	31.6	=	306	ms

$\pi/4$ -DQPSK: Middle Channel (2.441GHz)

2DH1	time slot=	0.39	(ms)*	$(1600/(2*79))$	*	31.6	=	125	ms
2DH3	time slot=	1.63	(ms)*	$(1600/(4*79))$	*	31.6	=	261	ms
2DH5	time slot=	2.87	(ms)*	$(1600/(6*79))$	*	31.6	=	306	ms

8DPSK: Middle Channel (2.441GHz)

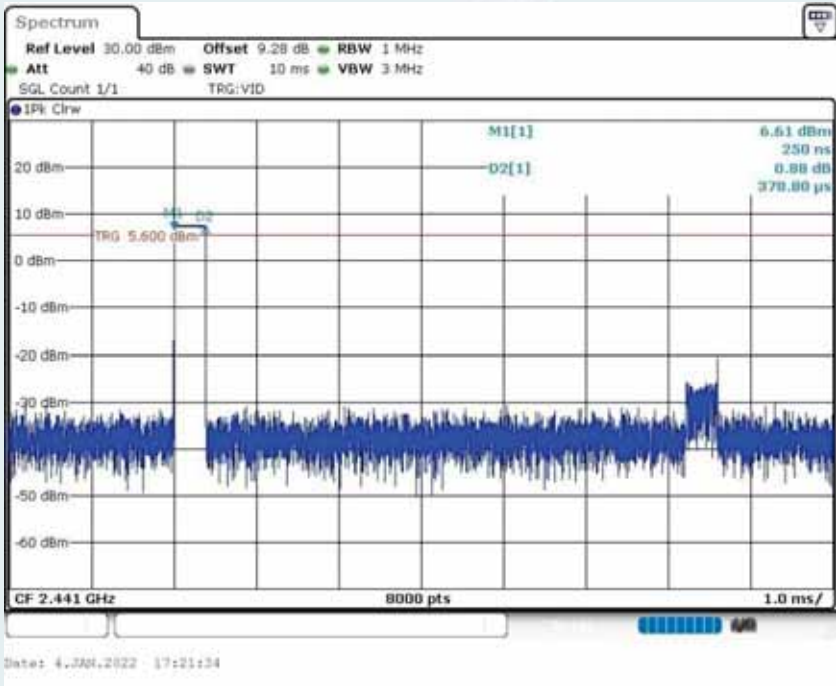
3DH1	time slot=	0.39	(ms)*	$(1600/(2*79))$	*	31.6	=	125	ms
3DH3	time slot=	1.63	(ms)*	$(1600/(4*79))$	*	31.6	=	261	ms
3DH5	time slot=	2.87	(ms)*	$(1600/(6*79))$	*	31.6	=	306	ms

The results are not greater than 0.4 seconds.

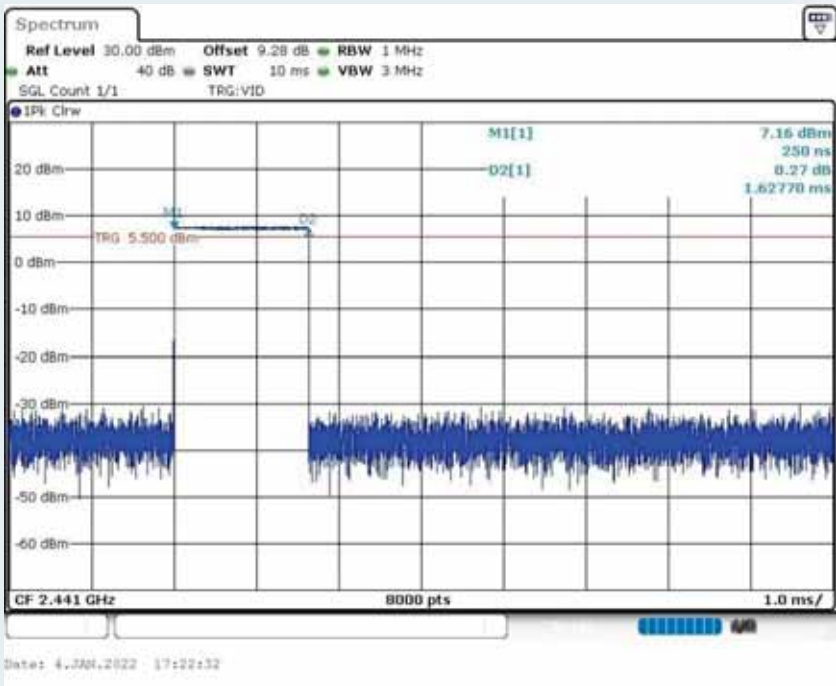
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Please refer the graph as below:

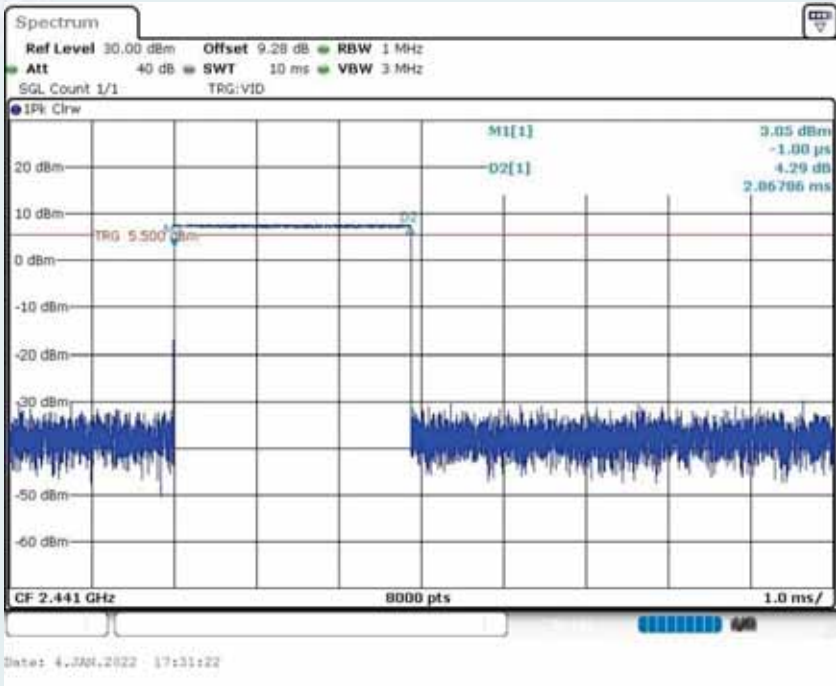
GFSK
Middle Frequency (2.441GHz)
DH1



DH3

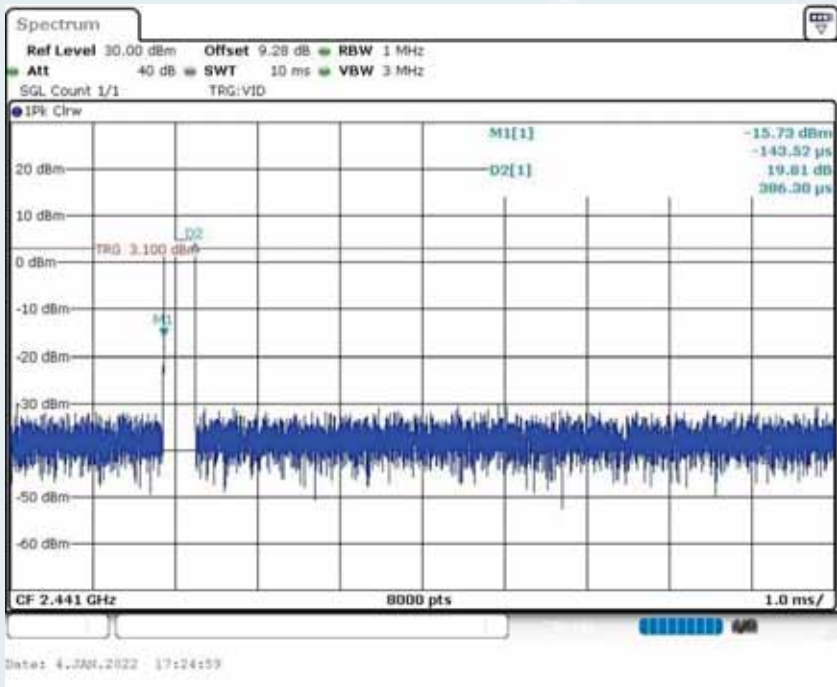


DH5

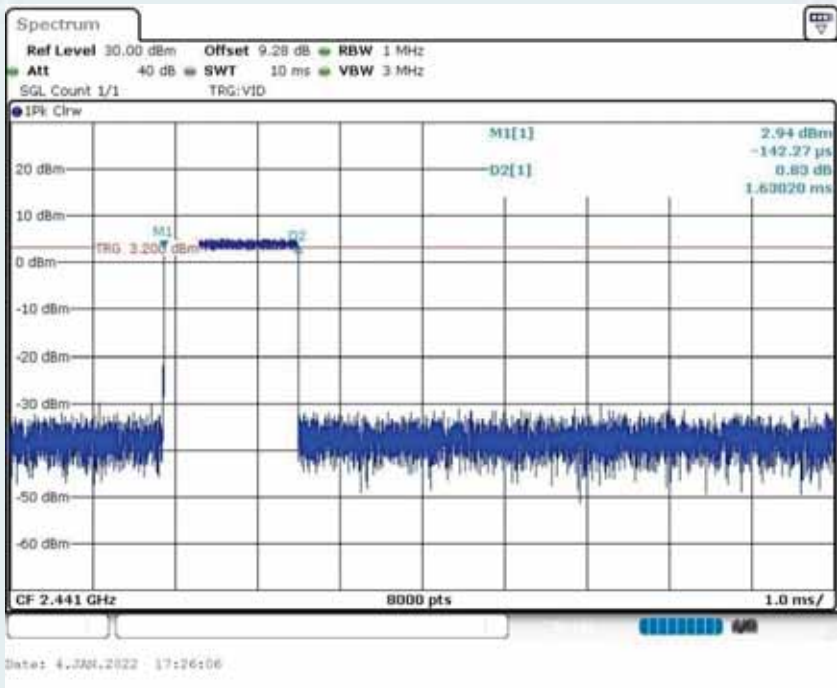


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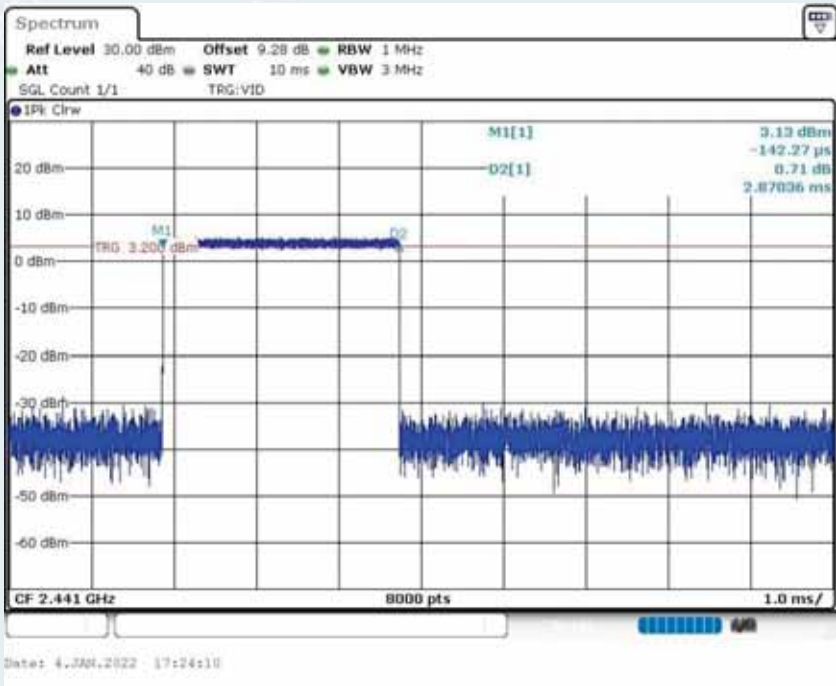
$\pi/4$ -DQPSK
Middle Frequency (2.441GHz)
2DH1



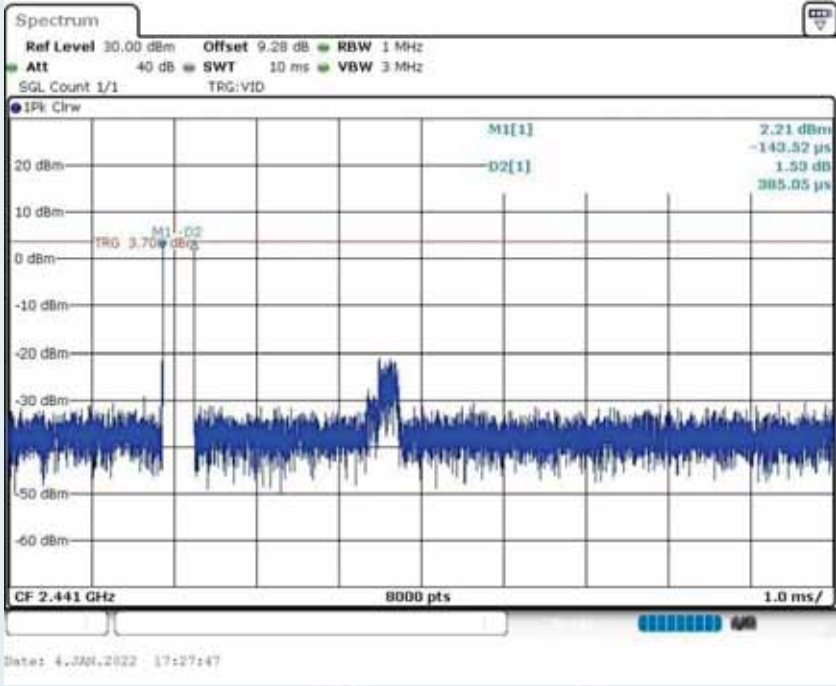
Mid Frequency (2.441GHz)
2DH3



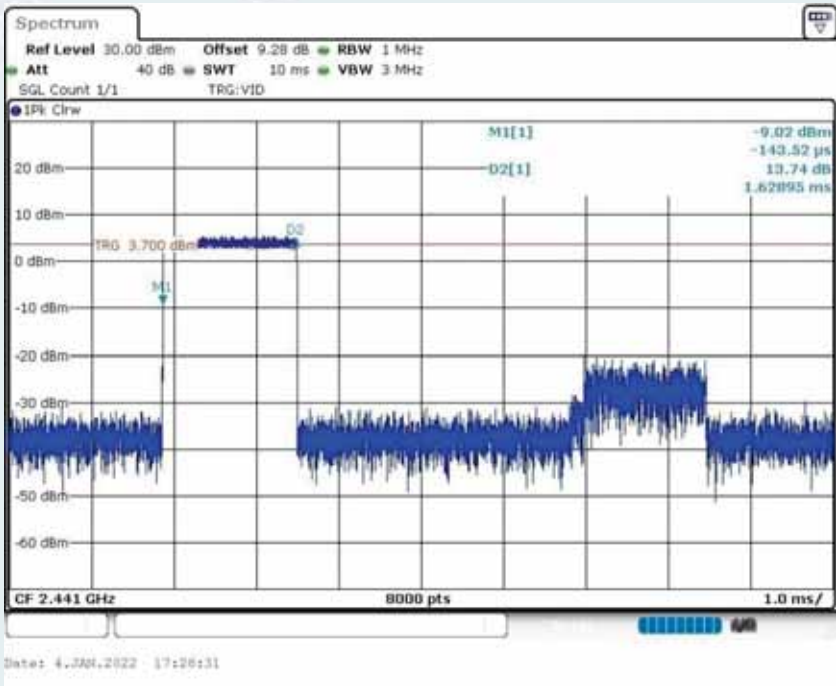
2DH5



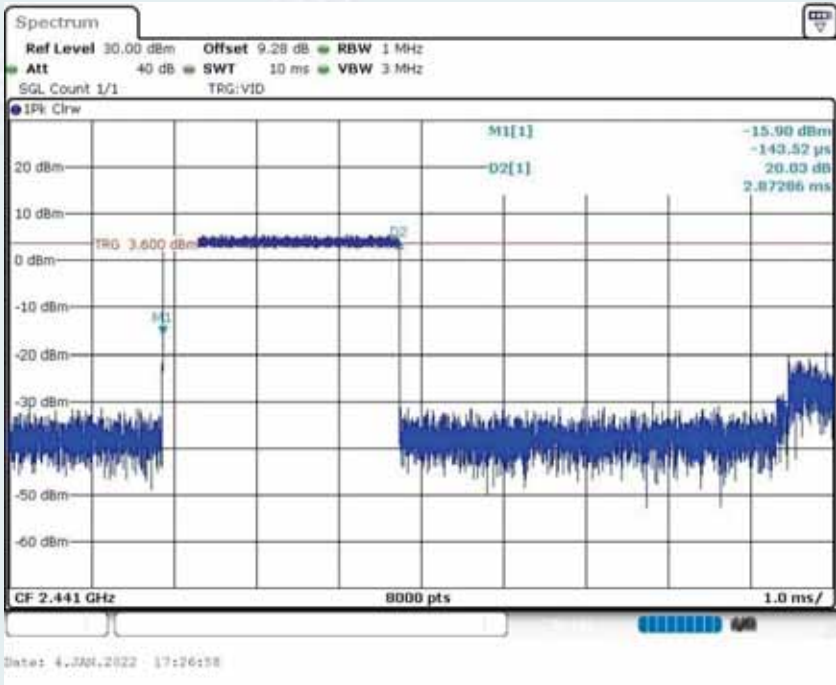
8DPSK
Middle Frequency (2.441GHz)
3DH1



3DH3



3DH5



11. MAXIMUM PEAK OUTPUT POWER

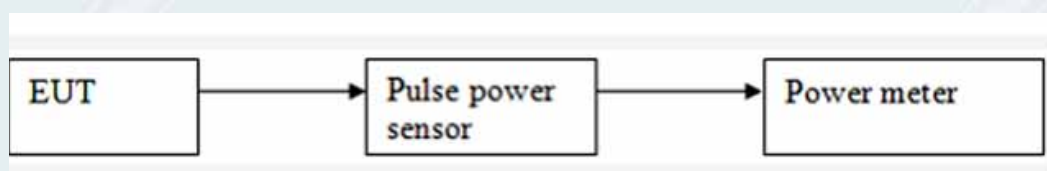
11.1 LIMITS

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.

11.2 TEST PROCEDURES

- 1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the power meter and enable the EUT transmit continuously.
- 2) Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

11.3 TEST SETUP



11.4 TEST RESULTS

Environment: 23.1°C/53%RH

Tested By: Qin Tingting

Voltage: AC 120V/60Hz

Date: 2022-02-21 to 2022-04-18

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/Average	Pass/Fail
Lowest	2.402	7.21	20.97	Peak	Pass
Middle	2.441	8.02			Pass
Highest	2.480	7.90			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/Average	Pass/Fail
Lowest	2.402	5.79	20.97	Peak	Pass
Middle	2.441	6.31			Pass
Highest	2.480	6.25			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	5.91	20.97	Peak	Pass
Middle	2.441	6.51			Pass
Highest	2.480	6.35			Pass

----- The following blanks -----

12. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

12.1 LIMITS

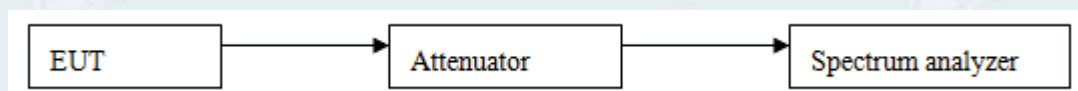
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

12.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 15.247 measurement guidance v05r02.

- 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, Frequency range = 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.

12.3 TEST SETUP



----- The following blanks -----

12.4 TEST RESULTS

Environment: 23.1℃/53%RH
Tested By: Qin Tingting

Voltage: AC 120V/60Hz
Date: 2022-02-21

Test result plot as follows:

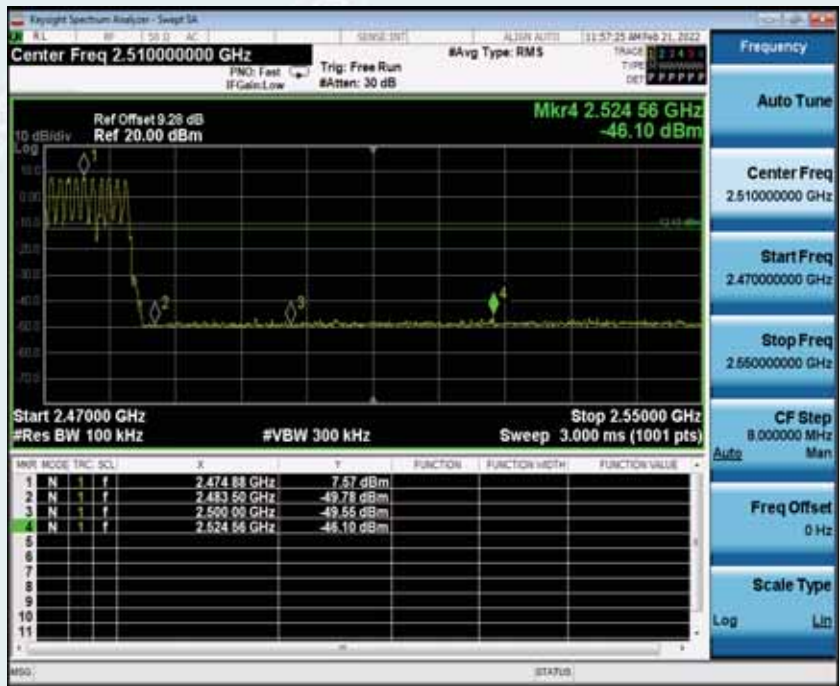
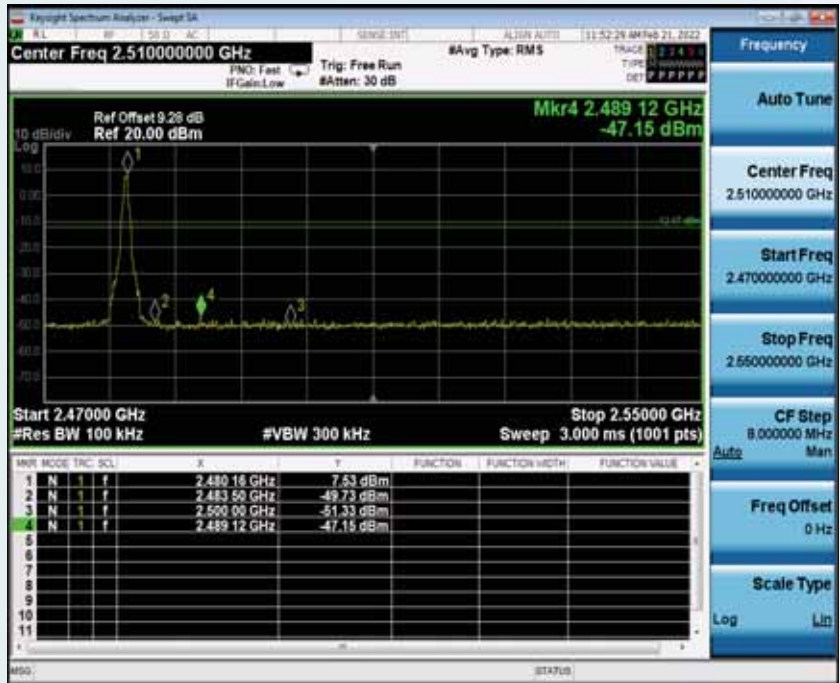
Band Edges

DH5

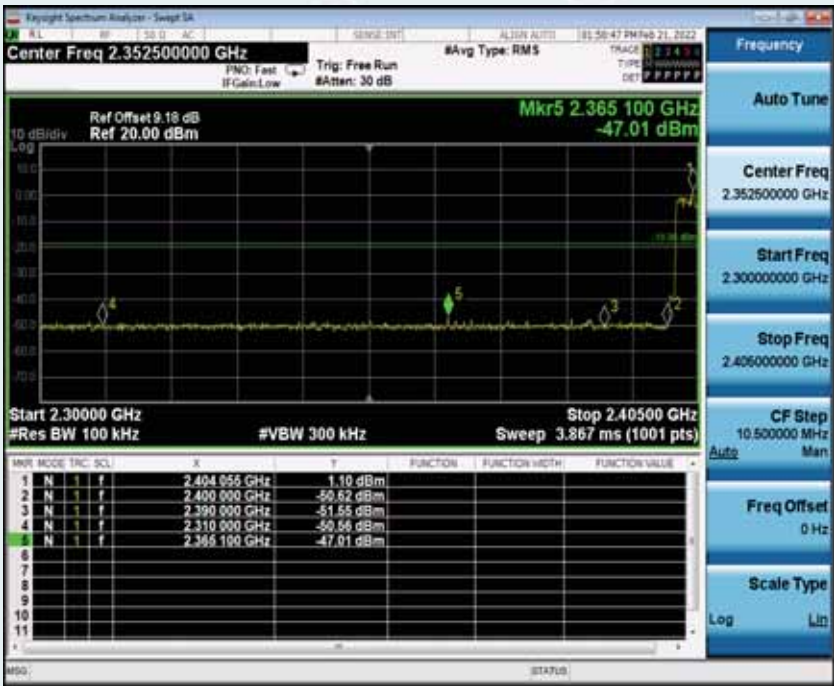
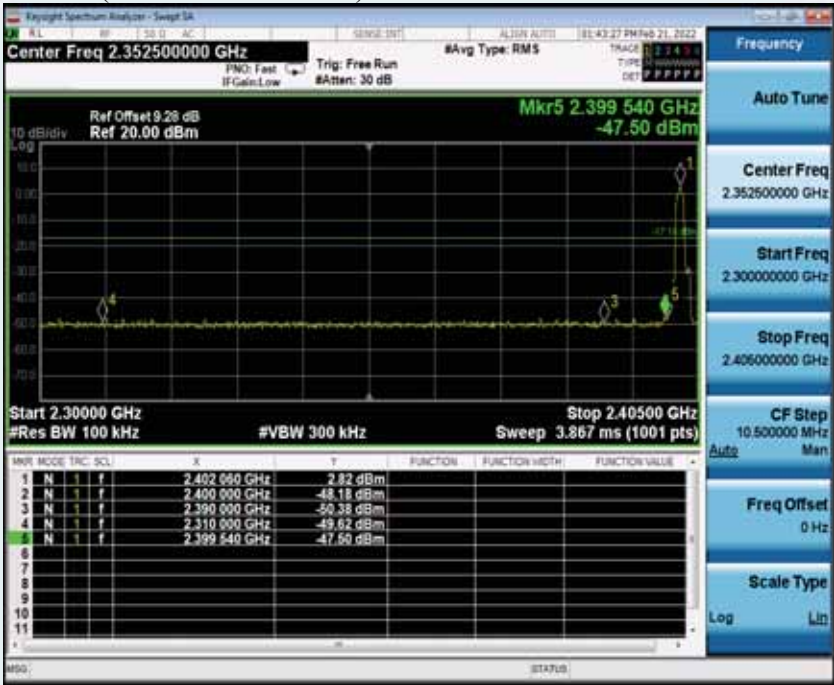
CH Low (2.30GHz ~2.405GHz)



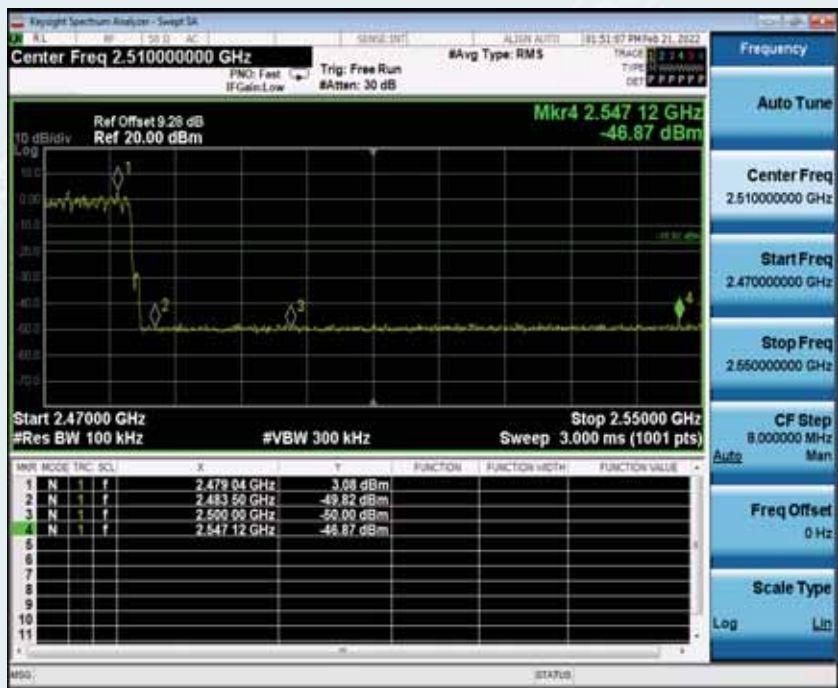
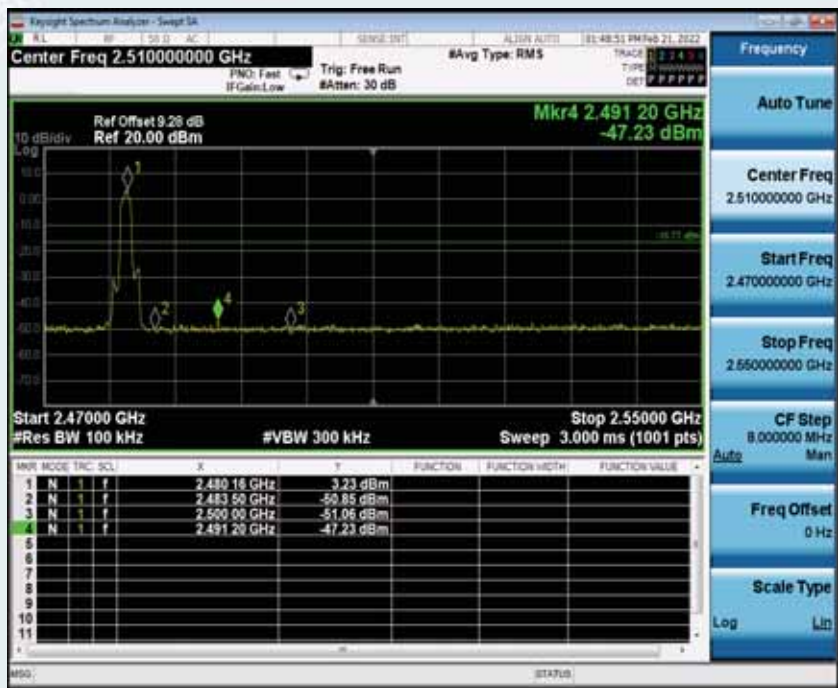
CH High (2.47GHz ~ 2.55GHz)



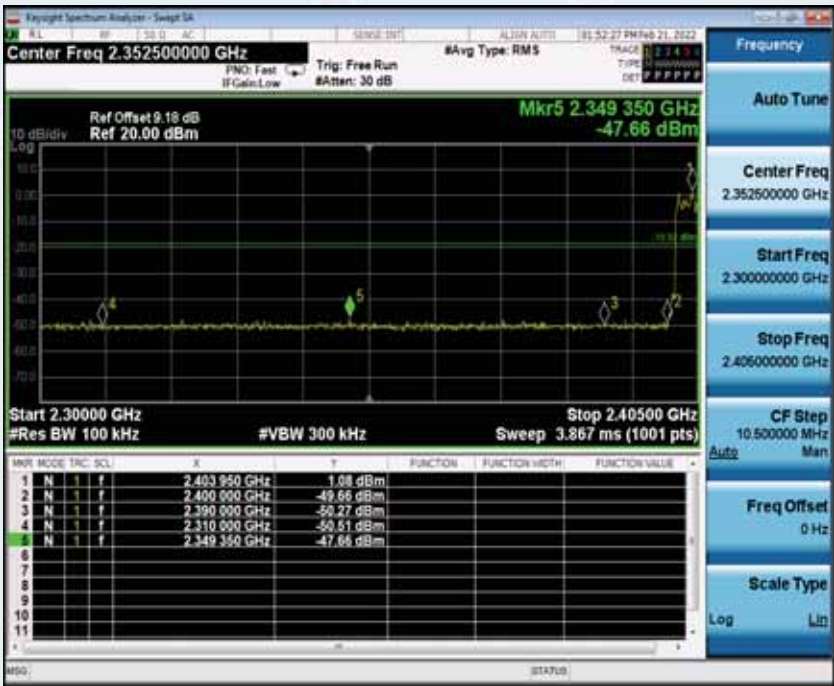
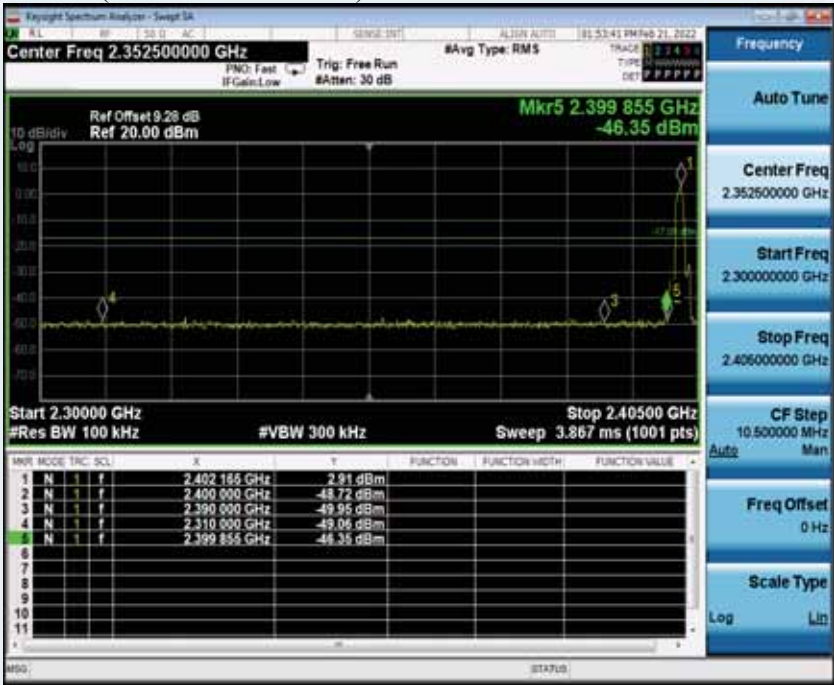
2DH5
CH Low (2.30GHz ~2.405GHz)



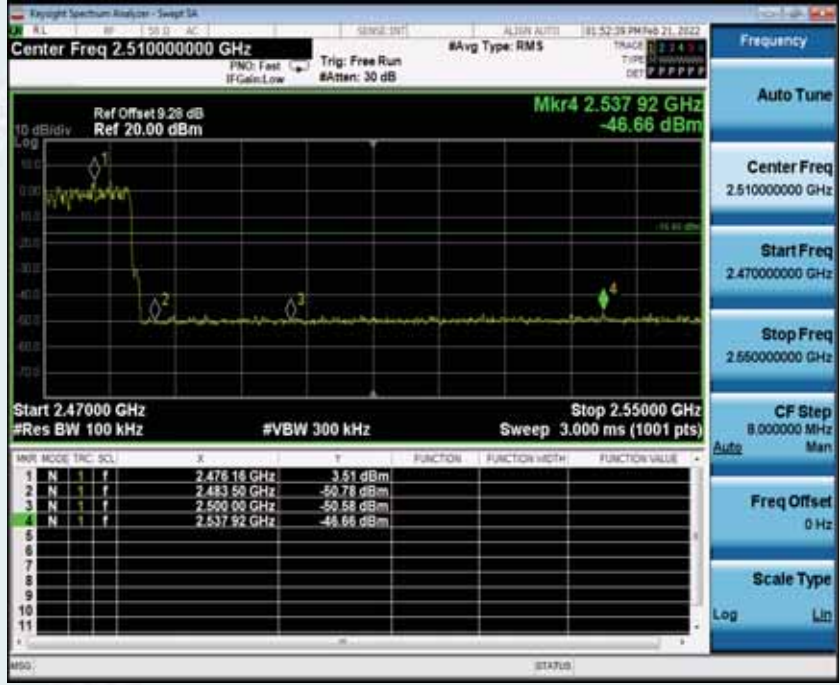
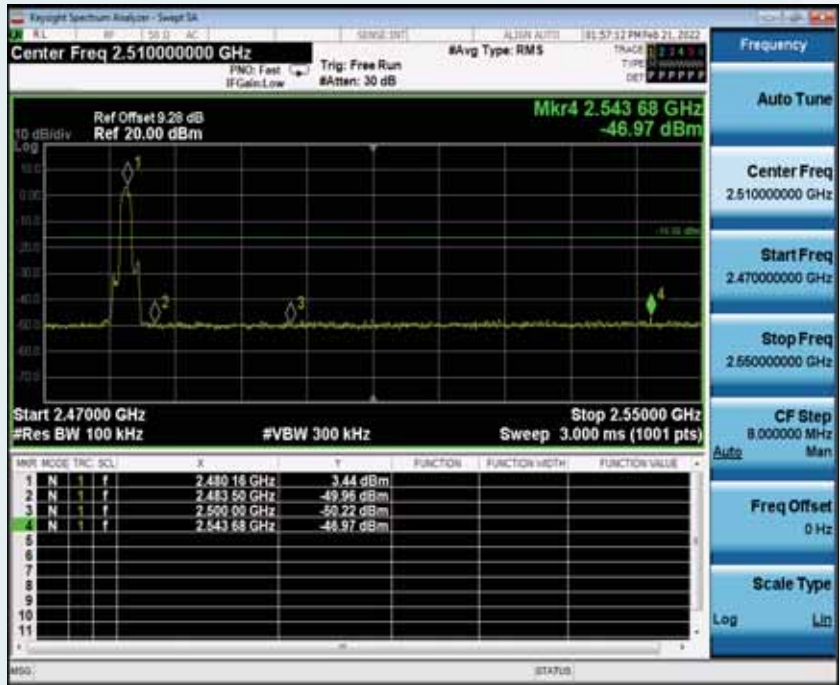
CH High (2.47GHz ~ 2.55GHz)



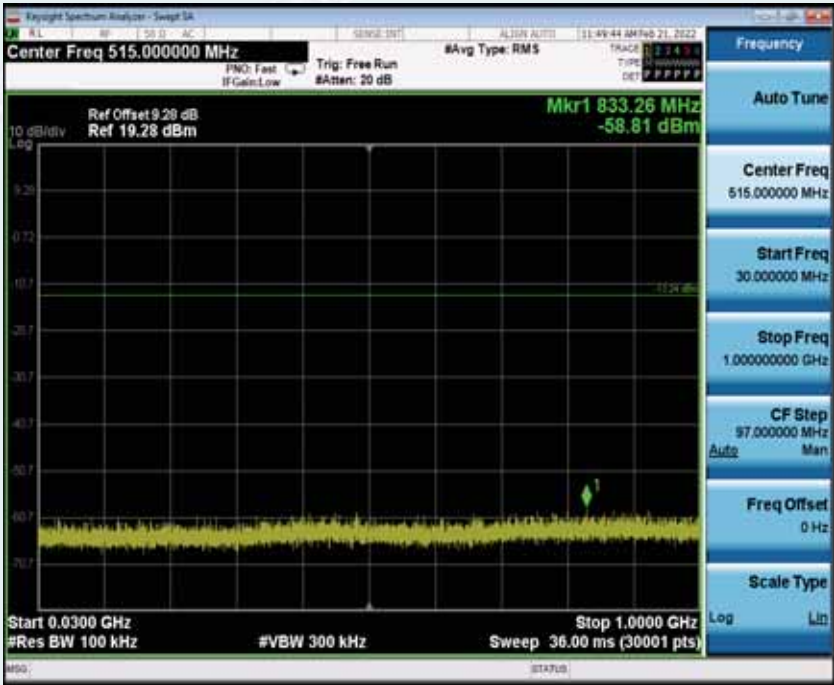
3DH5
CH Low (2.30GHz ~2.405GHz)



CH High (2.47GHz ~ 2.55GHz)



Spurious Emissions
DH5
CH Low



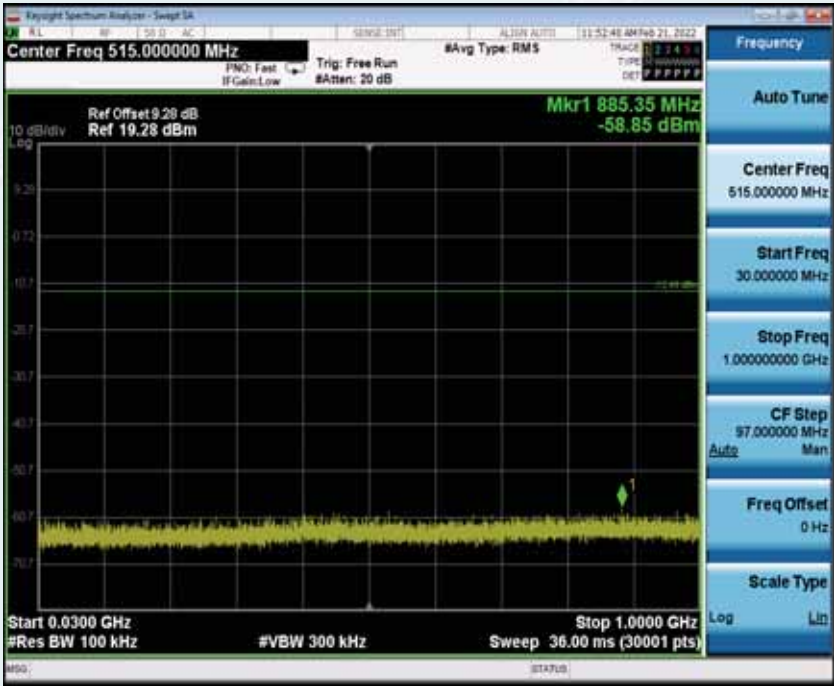


CH Mid





CH High

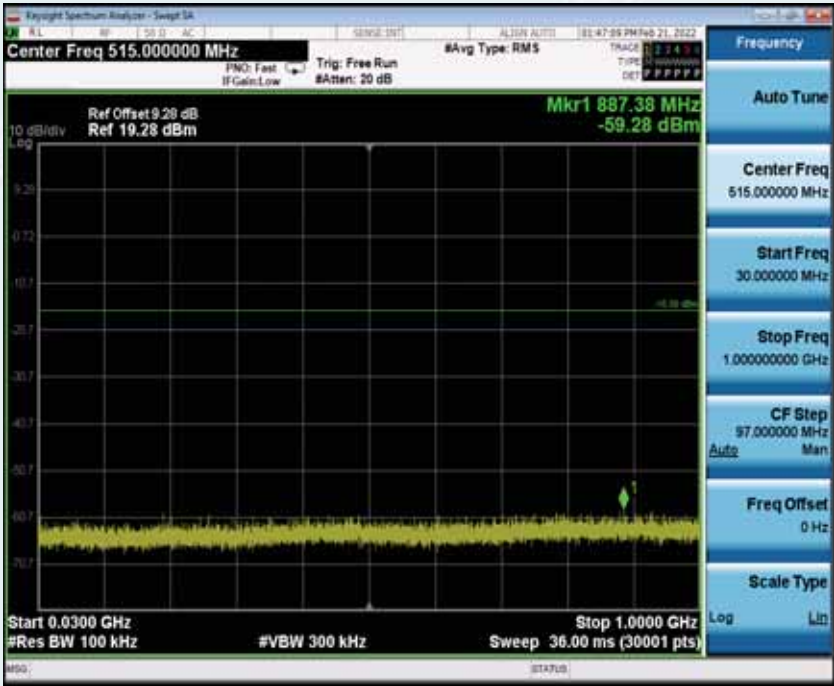


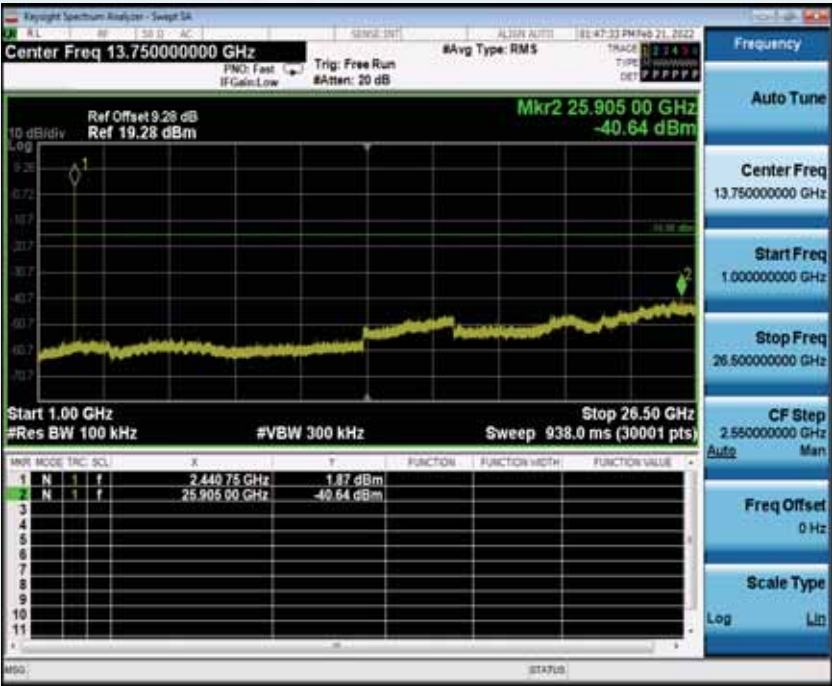


2DH5
CH Low



CH Mid



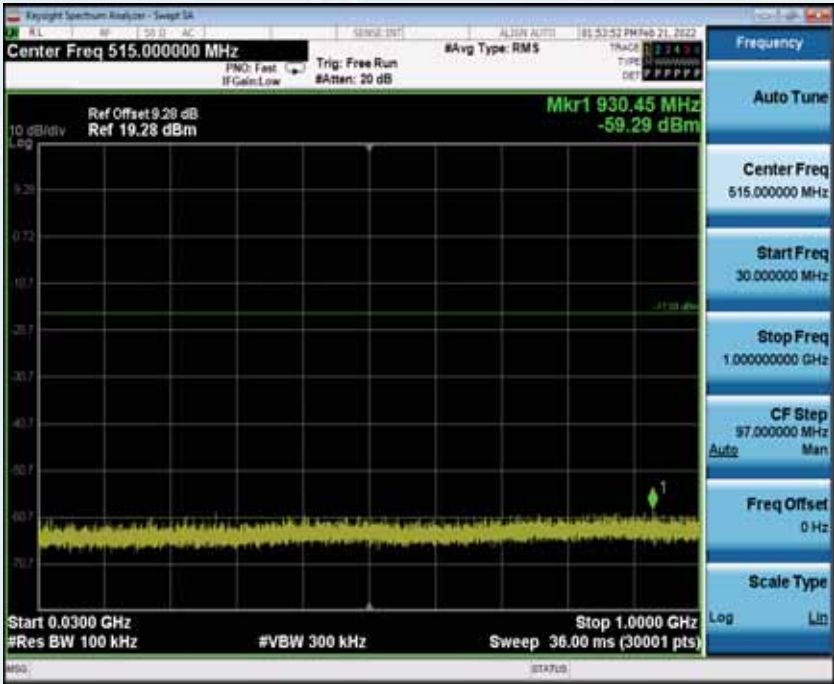


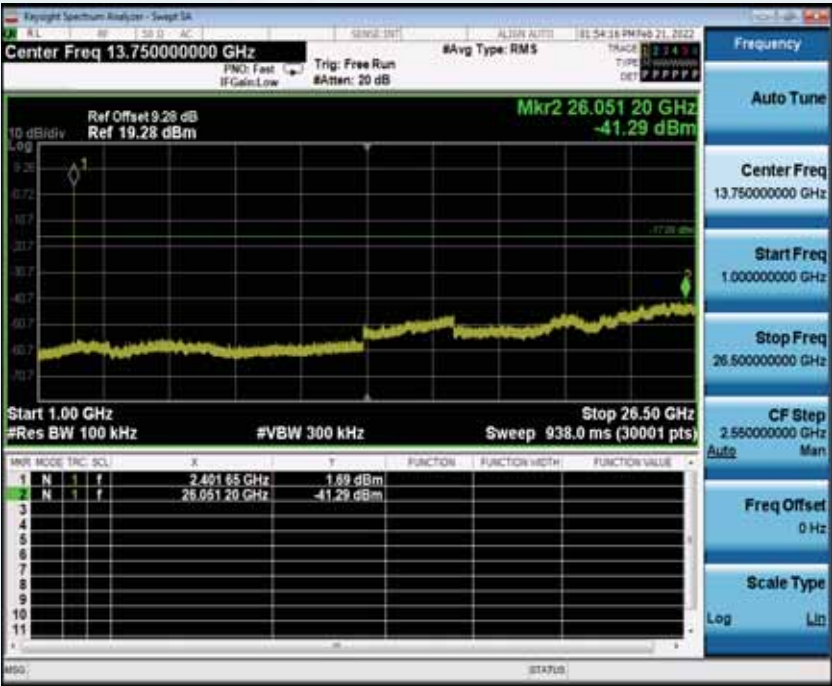
CH High





3DH5
CH Low



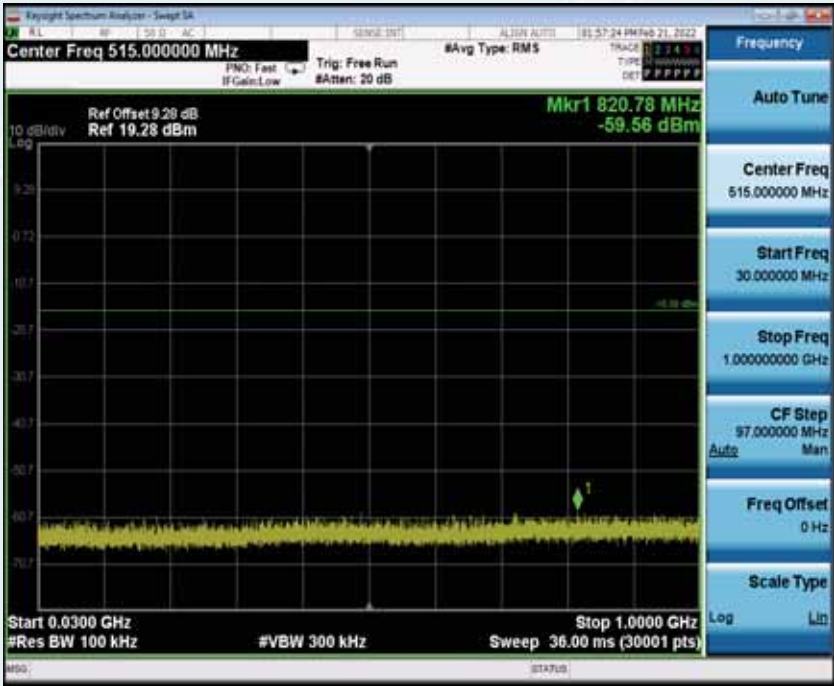


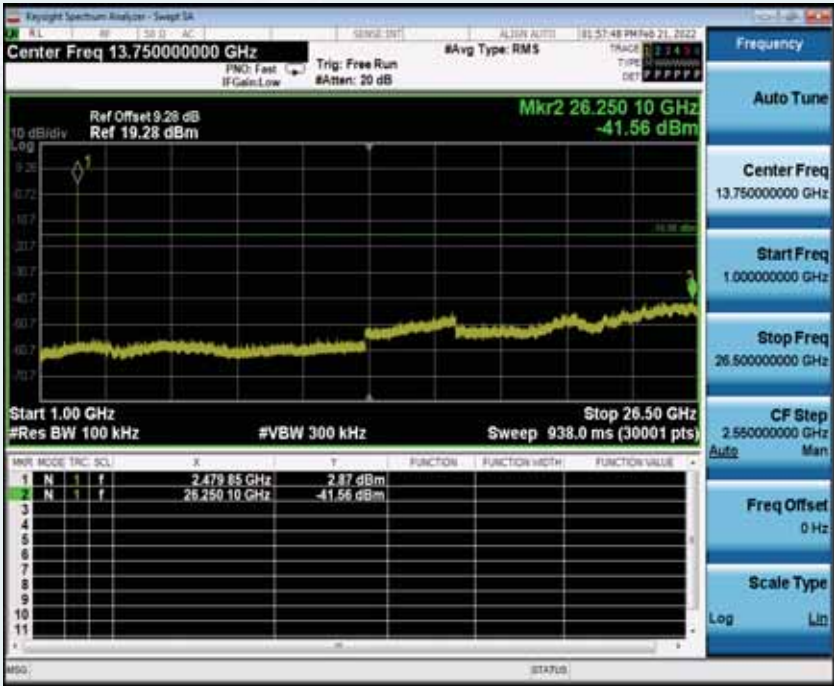
CH Mid





CH High





----- The following blanks -----

13. RADIATED SPURIOUS EMISSIONS

13.1 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($\mu\text{V/m}$)	Measurement distance(m)	Quasi-peak(dB $\mu\text{V/m}$)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5~93.8
0.490-1.705	24000/F(kHz)	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE:

- (1) The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.
- (2) The lower limit shall apply at the transition frequencies.
- (3) Above 18GHz test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dB $\mu\text{V/m}$).
The Avg Limit=54+20*log(3/1)=63.54 (dB $\mu\text{V/m}$).

13.2 TEST PROCEDURES

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Pre measurement:

- The turntable rotates from 0° to 360°.
- The antenna height is 1.0 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QP detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0° to 360° .

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 4 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0° to 360° and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Pre measurement:

--- The turntable rotates from 0° to 360°.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 4 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable rotates from 0° to 360° and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Pre measurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE:

(a).The frequency from 9kHz to 150kHz, Set RBW=300Hz(for Peak & AVG), VBW=300Hz(for Peak & AVG). The frequency from 150kHz to 30MHz, Set RBW=9kHz, VBW=9kHz, (for QP Detector).

(b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, VBW=300kHz, (for QP Detector).

(c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz,VBW=3MHz.

(d). The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW $\leq$ RBW/100 (i.e., 10kHz) but not less than 10Hz. Where duty cycle is defined in section 2.8.

----- The following blanks -----

13.3 TEST SETUP

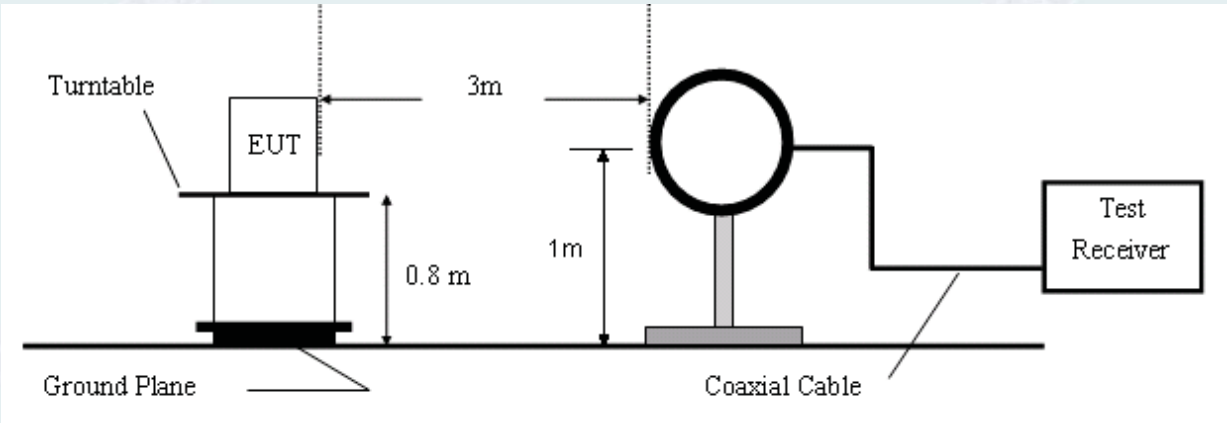


Figure 1. 9kHz to 30MHz radiated emissions test configuration

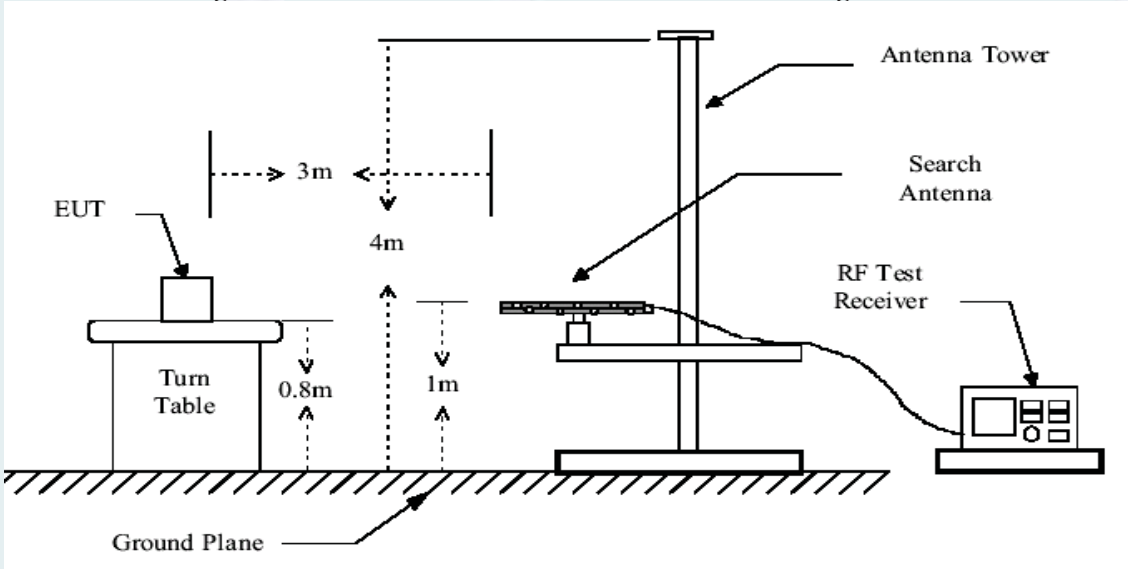


Figure 2. 30MHz to 1GHz radiated emissions test configuration

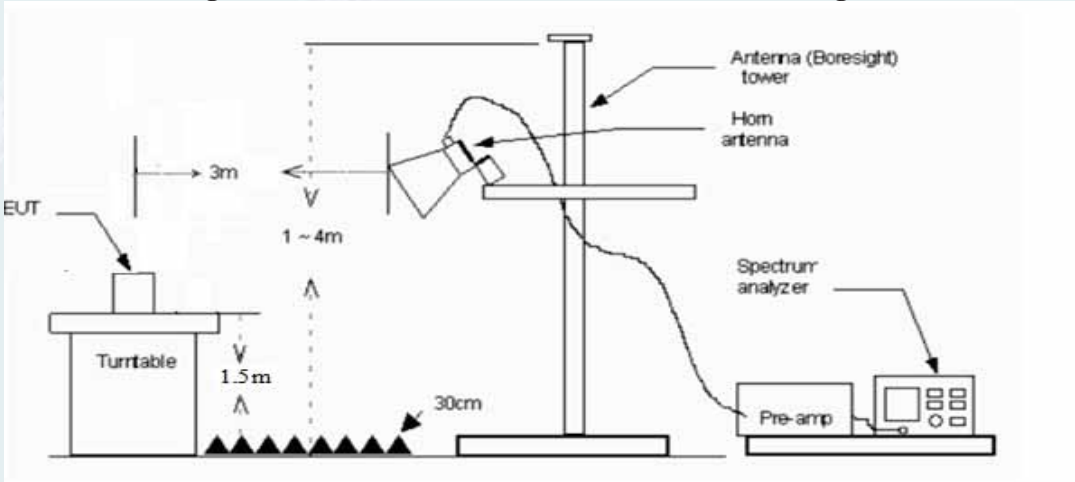


Figure 3. 1GH to 18GHz radiated emissions test configuration

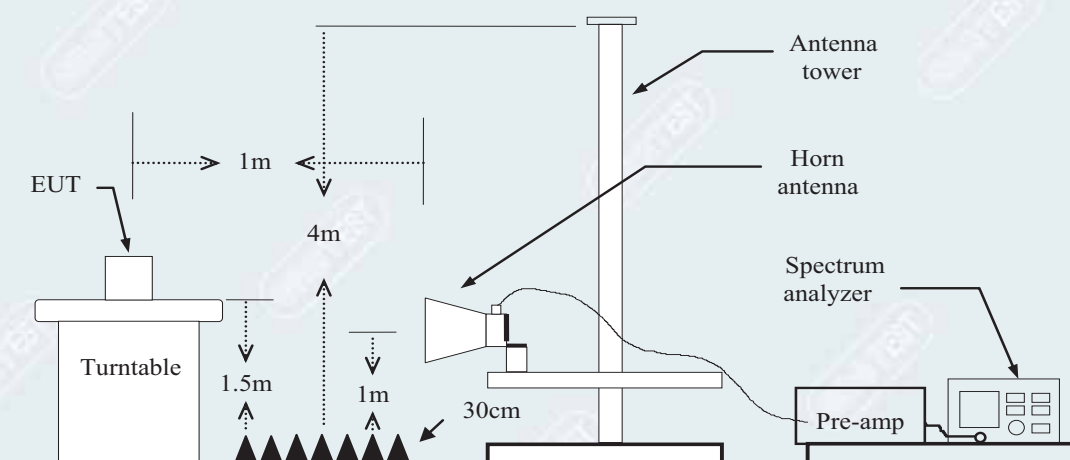


Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

13.4 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

1GHz to 18GHz

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

Above 18GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Pole
xxx	xxx	68.86	57.66	-11.20	83.54	25.88	peak	Vertical
xxx	xxx	68.89	-11.20	57.69	63.54	5.85	AVG	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

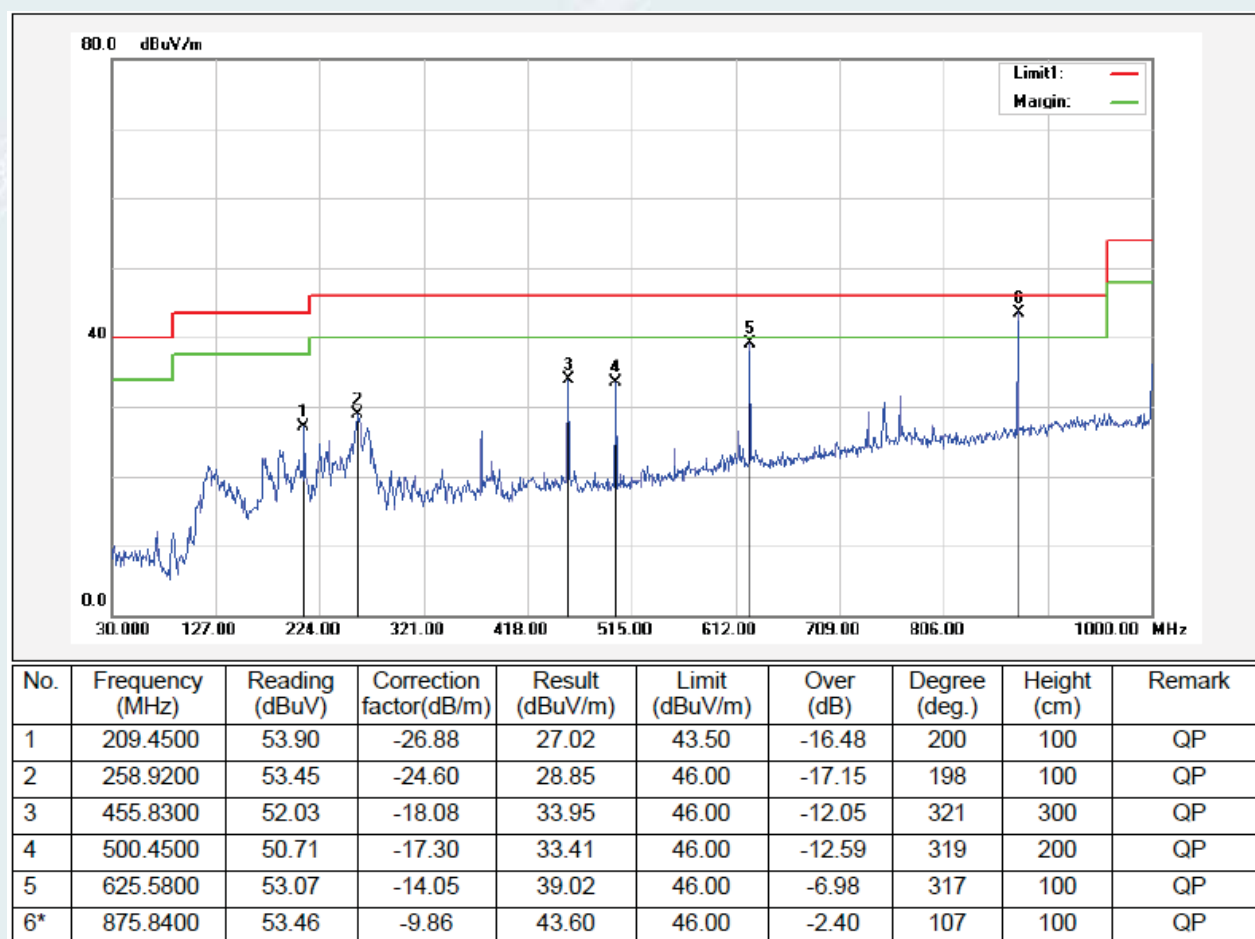
QP = Quasi-peak Reading

AVG = Average Reading

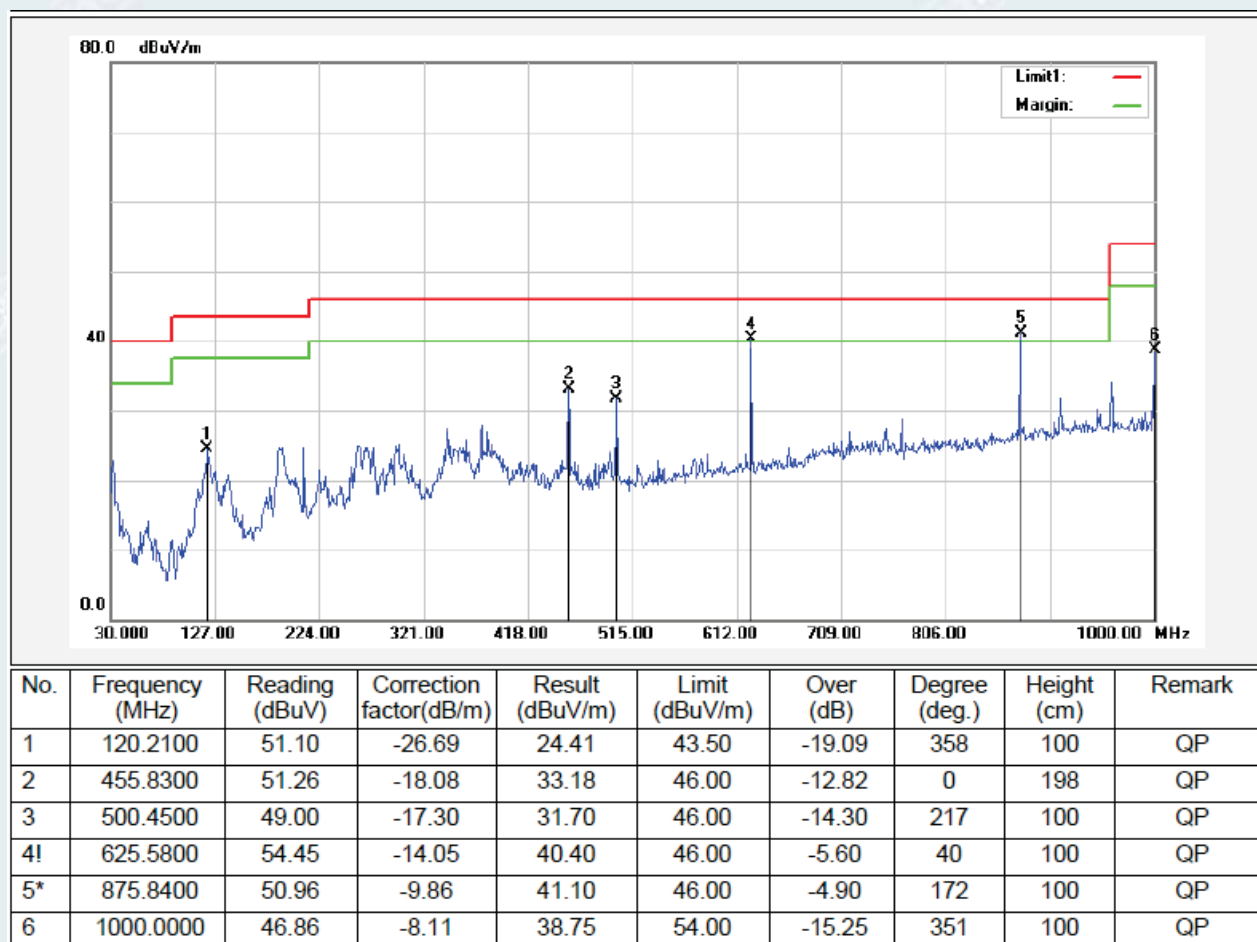
13.5 TEST RESULTS

Below 1GHz:

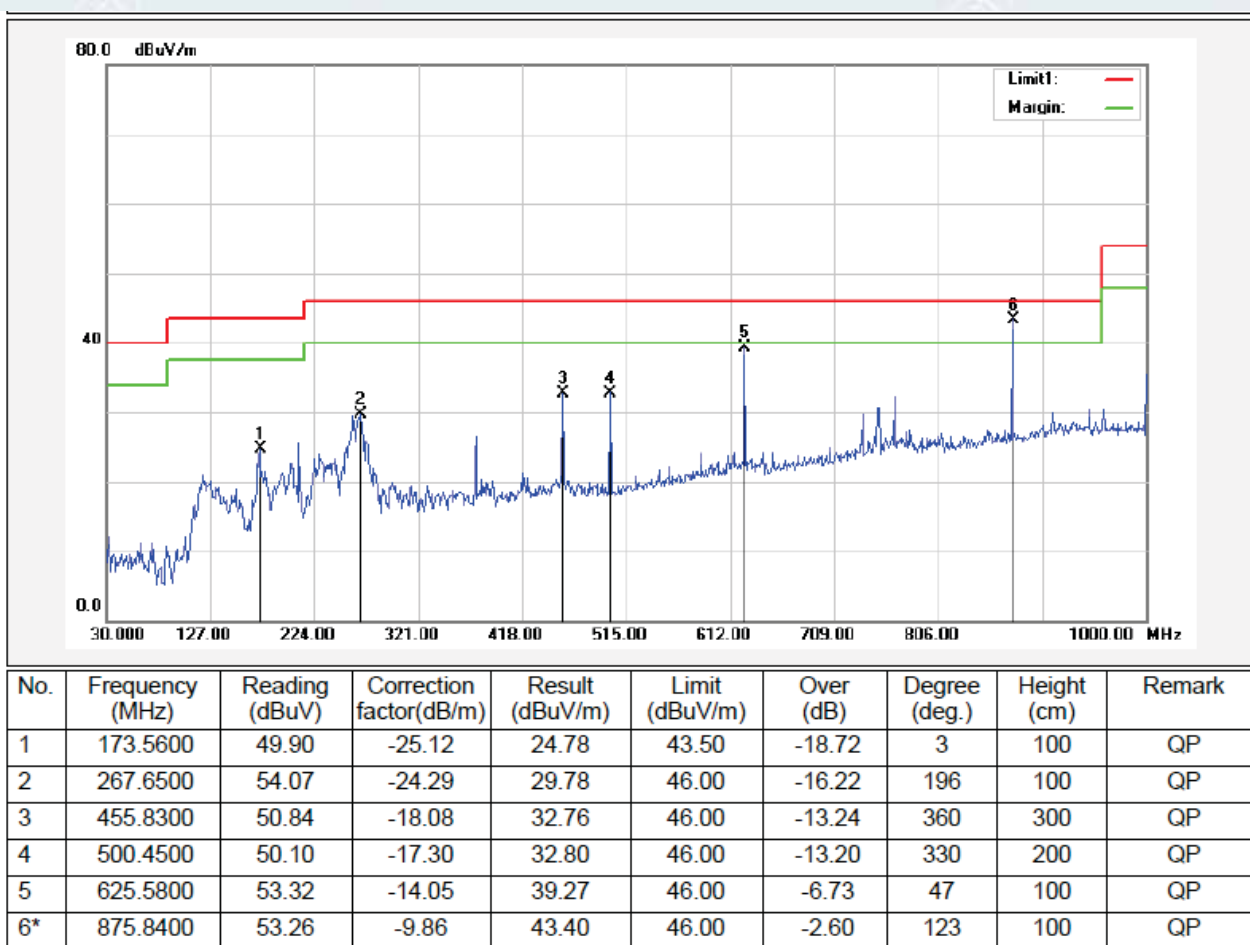
EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	25.1℃ / 55 %RH	Test Voltage	AC 120V/60Hz
Test Mode	TX/DH5(2402MHz)	Polarity	Horizontal
Tested By	Tang Shenghui	Tested Date	2022-01-06



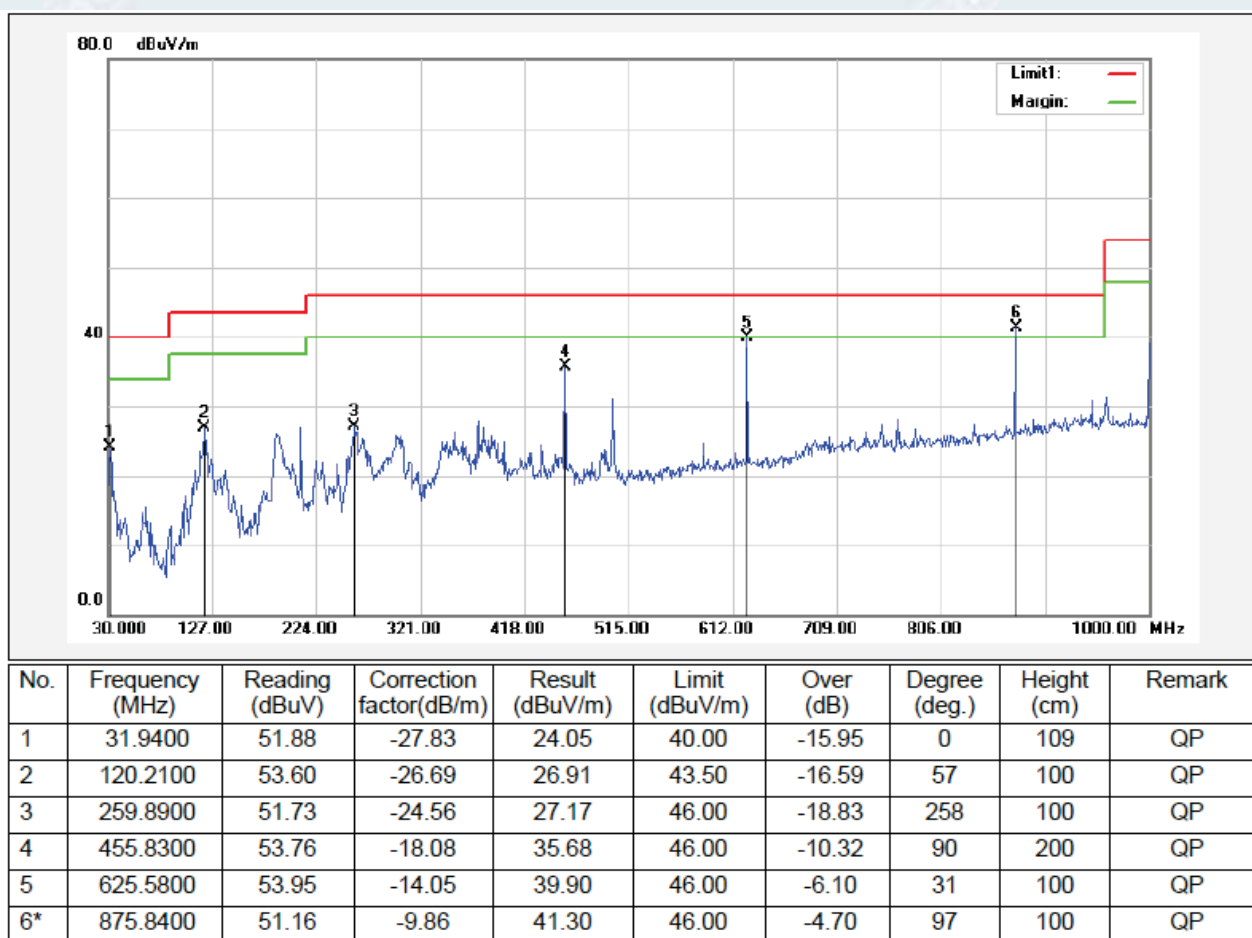
EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	25.1℃ / 55 %RH	Test Voltage	AC 120V/60Hz
Test Mode	TX/DH5(2402MHz)	Polarity	Vertical
Tested By	Tang Shenghui	Tested Date	2022-01-06



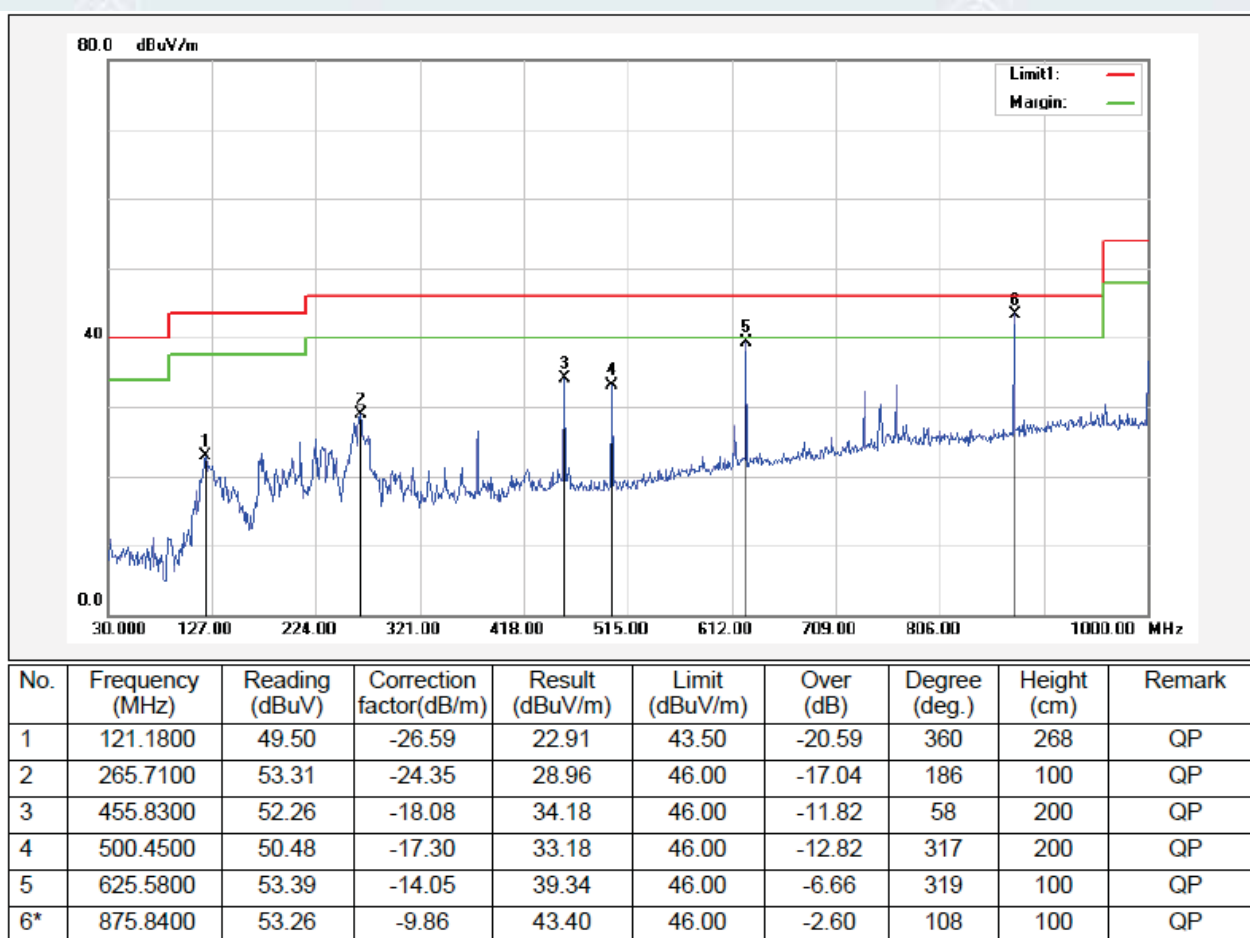
EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	25.1°C / 55 %RH	Test Voltage	AC 120V/60Hz
Test Mode	TX/DH5(2441MHz)	Polarity	Horizontal
Tested By	Tang Shenghui	Tested Date	2022-01-06



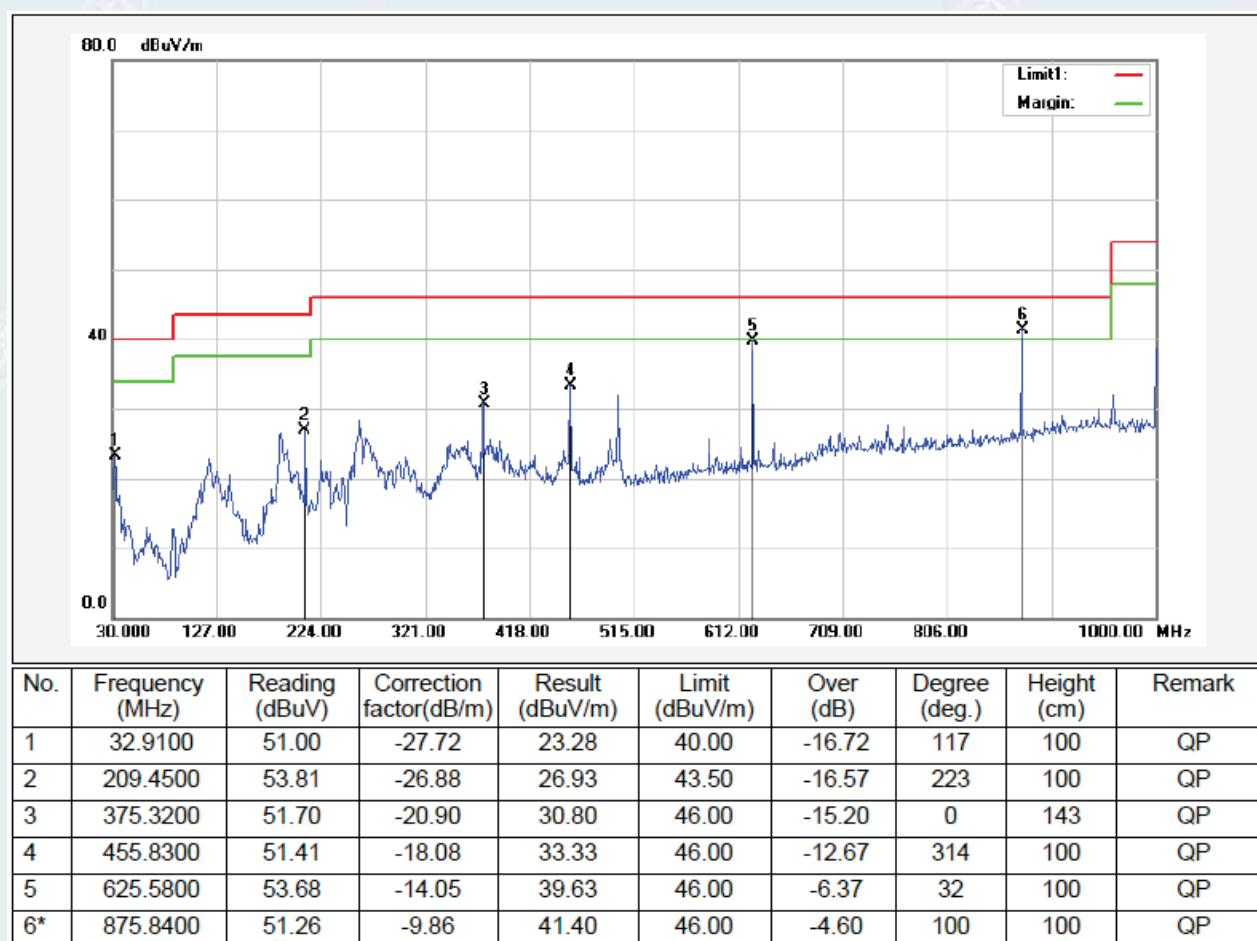
EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	25.1℃ / 55 %RH	Test Voltage	AC 120V/60Hz
Test Mode	TX/DH5(2441MHz)	Polarity	Vertical
Tested By	Tang Shenghui	Tested Date	2022-01-06



EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	25.1℃ / 55 %RH	Test Voltage	AC 120V/60Hz
Test Mode	TX/DH5(2480MHz)	Polarity	Horizontal
Tested By	Tang Shenghui	Tested Date	2022-01-06



EUT Name	Wall mount tablet	Model	UCTBWM-15.6
Environmental Conditions	25.1°C / 55 %RH	Test Voltage	AC 120V/60Hz
Test Mode	TX/DH5(2480MHz)	Polarity	Vertical
Tested By	Tang Shenghui	Tested Date	2022-01-06

**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 (DH5).
- 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:

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Mode: DH5

Lowest Frequency (2402MHz)

Test Engineer:

Test Voltage:

Environmental:

Date: 2022-01-07

Lu Qiang

AC 120V/60Hz

25°C /60%RH

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1139.7675	69.69	45.04	-24.65	74.00	28.96	200	8	Horizontal
2	1359.7950	66.48	42.79	-23.69	74.00	31.21	100	21	Horizontal
3	1618.8274	65.45	42.68	-22.77	74.00	31.32	100	351	Horizontal
4	2279.9100	66.22	45.97	-20.25	74.00	28.03	100	21	Horizontal
5	3196.8996	63.37	47.47	-15.90	74.00	26.53	100	339	Horizontal
6	4803.9755	55.72	45.94	-9.78	74.00	28.06	200	22	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	1140.0175	70.67	46.02	-24.65	74.00	27.98	200	336	Vertical
2	1372.0465	72.42	48.79	-23.63	74.00	25.21	200	29	Vertical
3	2279.9100	67.27	47.02	-20.25	74.00	26.98	100	29	Vertical
4	3193.1491	63.26	47.28	-15.98	74.00	26.72	200	331	Vertical
5	4108.2635	58.61	44.80	-13.81	74.00	29.20	100	30	Vertical
6	4803.9755	56.29	46.51	-9.78	74.00	27.49	200	47	Vertical

----- The following blanks -----

Mode: DH5
 Middle Frequency (2441MHz)
 Test Engineer:
 Test Voltage:
 Environmental:

Date: 2022-01-07
 Lu Qiang
 AC 120V/60Hz
 25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1140.5176	69.35	44.71	-24.64	74.00	29.29	200	358	Horizontal
2	1378.0473	67.23	43.63	-23.60	74.00	30.37	200	37	Horizontal
3	1614.5768	65.73	42.92	-22.81	74.00	31.08	200	358	Horizontal
4	2280.4101	66.70	46.46	-20.24	74.00	27.54	100	14	Horizontal
5	3191.2739	62.46	46.44	-16.02	74.00	27.56	200	8	Horizontal
6	7763.0954	48.83	46.91	-1.92	74.00	27.09	100	330	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	1140.5176	68.22	43.58	-24.64	74.00	30.42	200	22	Vertical
2	1374.5468	67.32	43.70	-23.62	74.00	30.30	200	360	Vertical
3	1596.5746	66.11	43.19	-22.92	74.00	30.81	100	353	Vertical
4	2280.6601	66.74	46.50	-20.24	74.00	27.50	100	14	Vertical
5	3193.1491	63.55	47.57	-15.98	74.00	26.43	200	330	Vertical
6	7785.5982	49.36	47.49	-1.87	74.00	26.51	200	315	Vertical

----- The following blanks -----

Mode: DH5
Highest Frequency (2480MHz)
Test Engineer:
Test Voltage:
Environmental:

Date: 2022-01-07
Lu Qiang
AC 120V/60Hz
25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1141.0176	69.66	45.02	-24.64	74.00	28.98	200	4	Horizontal
2	1371.2964	71.04	47.41	-23.63	74.00	26.59	200	46	Horizontal
3	1618.5773	65.78	43.00	-22.78	74.00	31.00	100	359	Horizontal
4	2281.4102	66.00	45.76	-20.24	74.00	28.24	100	30	Horizontal
5	3195.0244	62.54	46.60	-15.94	74.00	27.40	200	330	Horizontal
6	4102.6378	57.43	43.57	-13.86	74.00	30.43	200	13	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	1140.5176	70.83	46.19	-24.64	74.00	27.81	100	359	Vertical
2	1357.7947	68.83	45.13	-23.70	74.00	28.87	200	1	Vertical
3	1596.3245	67.85	44.94	-22.91	74.00	29.06	200	360	Vertical
4	2279.9100	70.84	50.59	-20.25	74.00	23.41	100	38	Vertical
5	3193.1491	63.57	47.59	-15.98	74.00	26.41	200	11	Vertical
6	4108.2635	57.03	43.22	-13.81	74.00	30.78	200	125	Vertical

----- The following blanks -----

Mode: 2DH5
 Lowest Frequency (2402MHz)
 Test Engineer:
 Test Voltage:
 Environmental:

Date: 2022-01-07
 Lu Qiang
 AC 120V/60Hz
 25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1367.5459	71.77	48.12	-23.65	74.00	25.88	200	281	Horizontal
2	2280.9101	68.26	48.02	-20.24	74.00	25.98	200	224	Horizontal
3	3187.5234	57.56	41.45	-16.11	74.00	32.55	200	69	Horizontal
4	4108.2635	62.10	48.29	-13.81	74.00	25.71	200	158	Horizontal
5	7781.8477	49.02	47.14	-1.88	74.00	26.86	200	94	Horizontal
6	11356.0445	44.47	49.21	4.74	74.00	24.79	200	330	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	1140.0175	71.01	46.36	-24.65	74.00	27.64	200	353	Vertical
2	1369.5462	69.31	45.67	-23.64	74.00	28.33	100	330	Vertical
3	2278.1598	66.88	46.62	-20.26	74.00	27.38	100	14	Vertical
4	3191.2739	62.53	46.51	-16.02	74.00	27.49	100	13	Vertical
5	4803.9755	56.42	46.64	-9.78	74.00	27.36	200	37	Vertical
6	7204.2755	50.50	47.33	-3.17	74.00	26.67	100	53	Vertical

----- The following blanks -----

Mode: 2DH5
 Middle Frequency (2441MHz)
 Test Engineer:
 Test Voltage:
 Environmental:

Date: 2022-01-07
 Lu Qiang
 AC 120V/60Hz
 25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1367.7960	71.18	47.53	-23.65	74.00	26.47	200	356	Horizontal
2	2282.1603	65.53	45.30	-20.23	74.00	28.70	100	192	Horizontal
3	3185.6482	58.71	42.56	-16.15	74.00	31.44	100	85	Horizontal
4	4106.3883	57.52	43.69	-13.83	74.00	30.31	200	249	Horizontal
5	6000.3750	52.50	45.01	-7.49	74.00	28.99	200	44	Horizontal
6	7755.5944	51.04	49.10	-1.94	74.00	24.90	100	158	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	1367.2959	69.17	45.52	-23.65	74.00	28.48	100	15	Vertical
2	1619.8275	65.39	42.62	-22.77	74.00	31.38	100	353	Vertical
3	2280.6601	68.13	47.89	-20.24	74.00	26.11	200	14	Vertical
4	3196.8996	62.56	46.66	-15.90	74.00	27.34	200	331	Vertical
5	4106.3883	59.37	45.54	-13.83	74.00	28.46	100	28	Vertical
6	4880.8601	53.43	43.54	-9.89	74.00	30.46	200	1	Vertical

----- The following blanks -----

Mode: 2DH5
 Highest Frequency (2480MHz)
 Test Engineer:
 Test Voltage:
 Environmental:

Date: 2022-01-07
 Lu Qiang
 AC 120V/60Hz
 25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.0460	70.29	46.64	-23.65	74.00	27.36	200	69	Horizontal
2	2276.9096	66.06	45.79	-20.27	74.00	28.21	200	199	Horizontal
3	3198.7748	57.59	41.73	-15.86	74.00	32.27	100	90	Horizontal
4	4108.2635	57.23	43.42	-13.81	74.00	30.58	200	224	Horizontal
5	5501.5627	51.68	42.56	-9.12	74.00	31.44	100	65	Horizontal
6	7704.9631	49.56	46.81	-2.75	74.00	27.19	200	346	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	1140.7676	71.80	47.16	-24.64	74.00	26.84	200	29	Vertical
2	1374.7969	70.24	46.62	-23.62	74.00	27.38	100	360	Vertical
3	1613.3267	67.12	44.30	-22.82	74.00	29.70	100	359	Vertical
4	2280.1600	66.78	46.53	-20.25	74.00	27.47	100	46	Vertical
5	3191.2739	62.71	46.69	-16.02	74.00	27.31	200	13	Vertical
6	7440.5551	51.06	47.35	-3.71	74.00	26.65	200	21	Vertical

----- The following blanks -----

Mode: 3DH5
Lowest Frequency (2402MHz)
Test Engineer:
Test Voltage:
Environmental:

Date: 2022-01-07
Lu Qiang
AC 120V/60Hz
25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.2960	71.95	48.30	-23.65	74.00	25.70	100	217	Horizontal
2	2280.1600	67.74	47.49	-20.25	74.00	26.51	200	193	Horizontal
3	2609.9512	63.95	44.79	-19.16	74.00	29.21	200	62	Horizontal
4	3189.3987	59.26	43.19	-16.07	74.00	30.81	100	117	Horizontal
5	4112.0140	56.78	43.00	-13.78	74.00	31.00	200	249	Horizontal
6	7187.3984	50.08	46.93	-3.15	74.00	27.07	100	346	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	1140.7676	70.54	45.90	-24.64	74.00	28.10	200	14	Vertical
2	1371.5464	71.60	47.97	-23.63	74.00	26.03	100	4	Vertical
3	1616.5771	66.92	44.13	-22.79	74.00	29.87	100	1	Vertical
4	2279.9100	65.97	45.72	-20.25	74.00	28.28	100	22	Vertical
5	3195.0244	62.60	46.66	-15.94	74.00	27.34	200	338	Vertical
6	4108.2635	57.58	43.77	-13.81	74.00	30.23	200	13	Vertical

----- The following blanks -----

Mode: 3DH5
 Middle Frequency (2441MHz)
 Test Engineer:
 Test Voltage:
 Environmental:

Date: 2022-01-07
 Lu Qiang
 AC 120V/60Hz
 25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1140.0175	62.18	37.53	-24.65	74.00	36.47	100	346	Horizontal
2	1368.0460	72.74	49.09	-23.65	74.00	24.91	200	62	Horizontal
3	2283.9105	66.21	45.99	-20.22	74.00	28.01	200	201	Horizontal
4	3193.1491	58.98	43.00	-15.98	74.00	31.00	100	119	Horizontal
5	4102.6378	60.53	46.67	-13.86	74.00	27.33	200	241	Horizontal
6	7196.7746	50.47	47.34	-3.13	74.00	26.66	200	323	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	1197.5247	68.61	44.08	-24.53	74.00	29.92	100	22	Vertical
2	1368.0460	69.99	46.34	-23.65	74.00	27.66	100	360	Vertical
3	1625.0781	65.50	42.78	-22.72	74.00	31.22	100	4	Vertical
4	2279.9100	66.63	46.38	-20.25	74.00	27.62	100	14	Vertical
5	3195.0244	64.02	48.08	-15.94	74.00	25.92	200	12	Vertical
6	4098.8874	57.94	44.05	-13.89	74.00	29.95	100	352	Vertical

----- The following blanks -----

Mode: 3DH5
 Highest Frequency (2480MHz)
 Test Engineer:
 Test Voltage:
 Environmental:

Date: 2022-01-07
 Lu Qiang
 AC 120V/60Hz
 25°C /60%RH

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1368.7961	70.11	46.46	-23.65	74.00	27.54	200	359	Horizontal
2	2284.6606	66.02	45.81	-20.21	74.00	28.19	200	202	Horizontal
3	2594.1993	63.35	44.10	-19.25	74.00	29.90	100	79	Horizontal
4	3196.8996	59.05	43.15	-15.90	74.00	30.85	100	86	Horizontal
5	4108.2635	56.53	42.72	-13.81	74.00	31.28	200	224	Horizontal
6	7223.0279	50.22	46.84	-3.38	74.00	27.16	100	314	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	1140.0175	70.21	45.56	-24.65	74.00	28.44	100	14	Vertical
2	1376.7971	69.56	45.95	-23.61	74.00	28.05	200	38	Vertical
3	1614.0768	66.28	43.47	-22.81	74.00	30.53	200	360	Vertical
4	2276.4096	66.21	45.93	-20.28	74.00	28.07	100	14	Vertical
5	3195.0244	62.79	46.85	-15.94	74.00	27.15	200	338	Vertical
6	4106.3883	57.19	43.36	-13.83	74.00	30.64	200	13	Vertical

Remark:

- 1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2 The amplitude of 18GHz to 26.5GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
- 3 Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 4 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

14. RESTRICTED BANDS OF OPERATION

14.1 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 - 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	2655 - 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	
13.36 - 13.41			

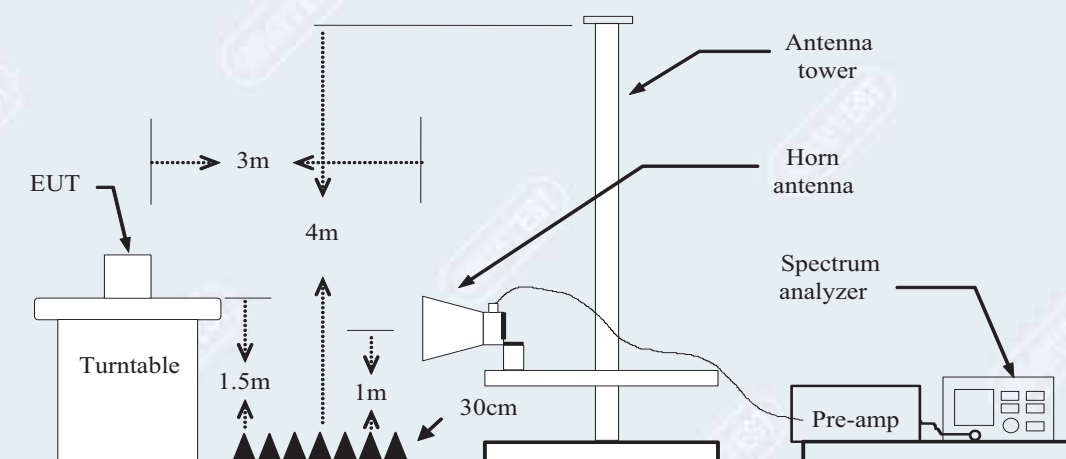
Frequency (MHz)	Quasi-peak(μ V/m)	Measurement distance(m)	Quasi-peak(dB μ V/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5~93.8
0.490-1.705	24000/F(kHz)	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

14.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance.

- 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) The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=3MHz.
 - b) The frequency above 1GHz, for Avg detector: Set RBW=1MHz, if the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW $\leq$ RBW/100 (i.e., 10kHz) but not less than 10Hz, Where duty cycle is defined in section 2.8.
- 5) Repeat the procedures until all the PEAK and AVERAGE versus polarization are measured.

14.3 TEST SETUP



----- The following blanks -----

14.4 TEST RESULTS

Equipment:	Wall mount tablet	Test Date	2022-01-07
Model No.:	UCTBWM-15.6	Test Engineer:	Lu Qiang
Test Voltage:	AC 120V/60Hz	Environment:	25℃/60%RH

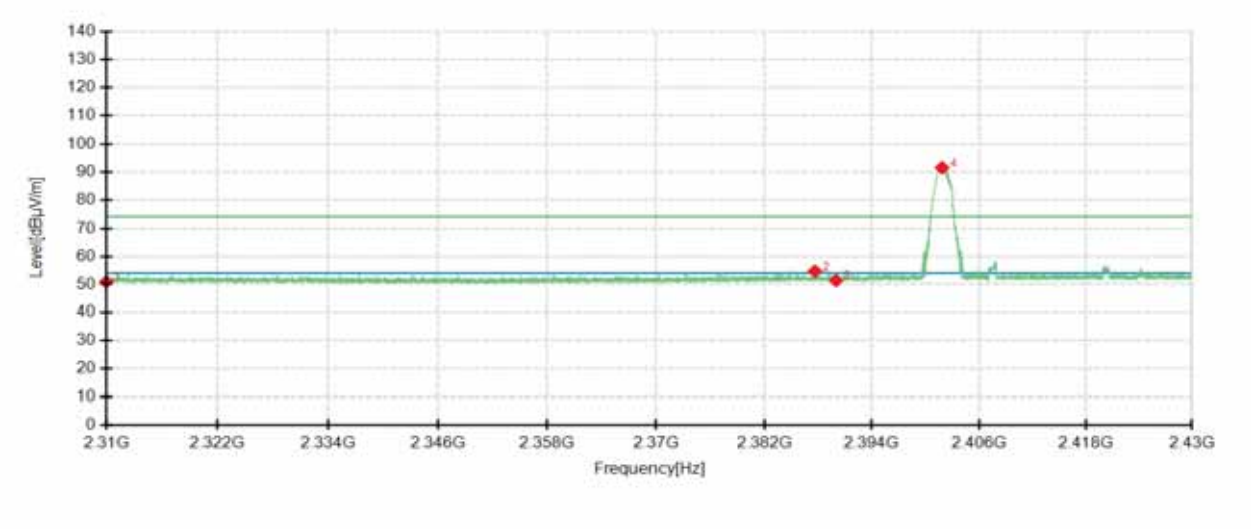
DH5

Lowest Channel

Frequency 2402MHz

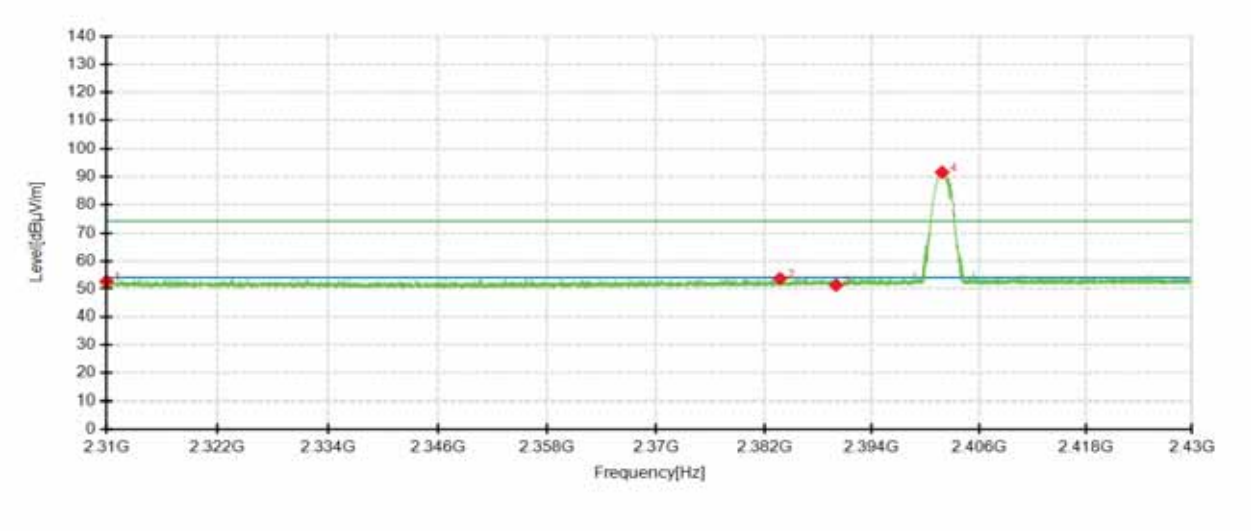
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



No.	Frequency MHz	Reading dB μ V/m	Level dB μ V/m	Factor dB	Limit dB μ V/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	47.36	50.84	3.48	74.00	23.16	200	218	Horizontal	/
2	2387.6400	50.93	54.70	3.77	74.00	19.30	200	218	Horizontal	/
3	2390.0000	47.50	51.31	3.81	74.00	22.69	100	336	Horizontal	/
4	2401.8600	87.59	91.58	3.99	74.00	-17.58	100	142	Horizontal	No limit
1	2310.0000	49.16	52.64	3.48	74.00	21.36	100	138	Vertical	/
2	2383.7550	49.92	53.62	3.70	74.00	20.38	200	211	Vertical	/
3	2390.0000	47.42	51.23	3.81	74.00	22.77	100	37	Vertical	/
4	2401.8600	87.62	91.61	3.99	74.00	-17.61	100	23	Vertical	No limit

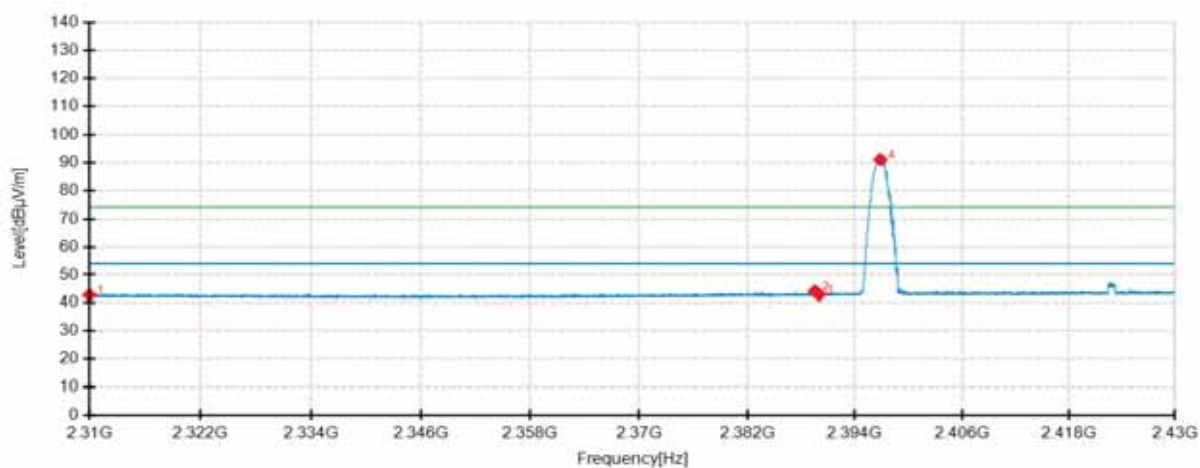
----- The following blanks -----

Lowest Channel

Frequency 2402MHz

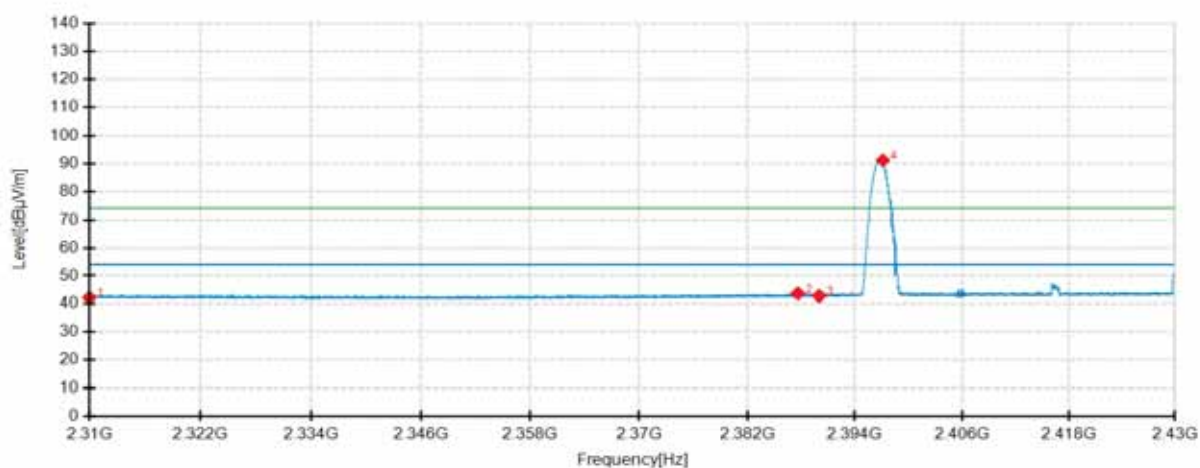
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



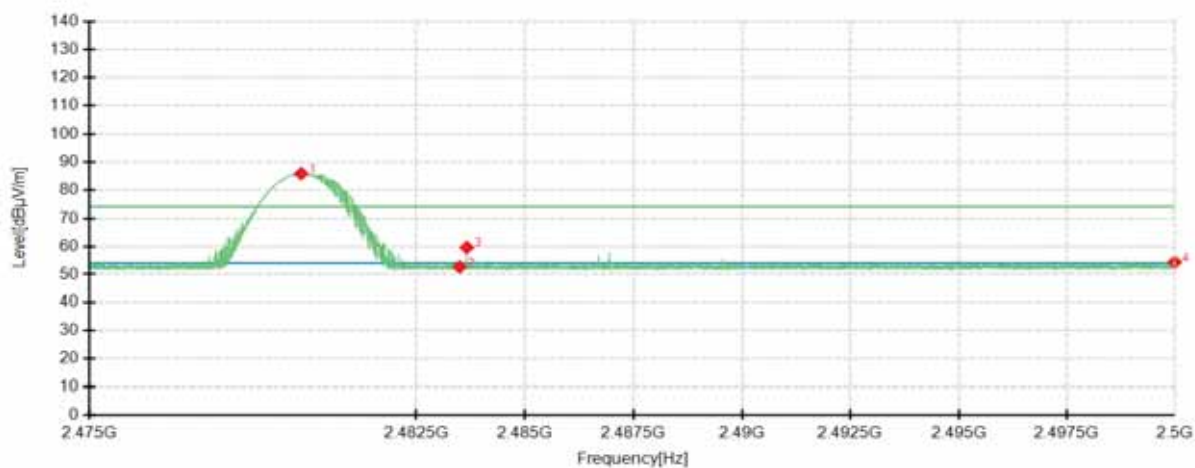
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	39.25	42.73	3.48	54.00	11.27	200	218	Horizontal	/
2	2389.5300	40.29	44.09	3.80	54.00	9.91	200	218	Horizontal	/
3	2390.0000	39.10	42.91	3.81	54.00	11.09	200	125	Horizontal	/
4	2396.8350	87.19	91.12	3.93	54.00	-37.12	100	142	Horizontal	No limit
1	2310.0000	38.70	42.18	3.48	54.00	11.82	100	63	Vertical	/
2	2387.6400	39.90	43.67	3.77	54.00	10.33	100	218	Vertical	/
3	2390.0000	38.99	42.80	3.81	54.00	11.20	100	177	Vertical	/
4	2397.1200	87.32	91.25	3.93	54.00	-37.25	100	22	Vertical	No limit

Highest Channel

Frequency 2480MHz

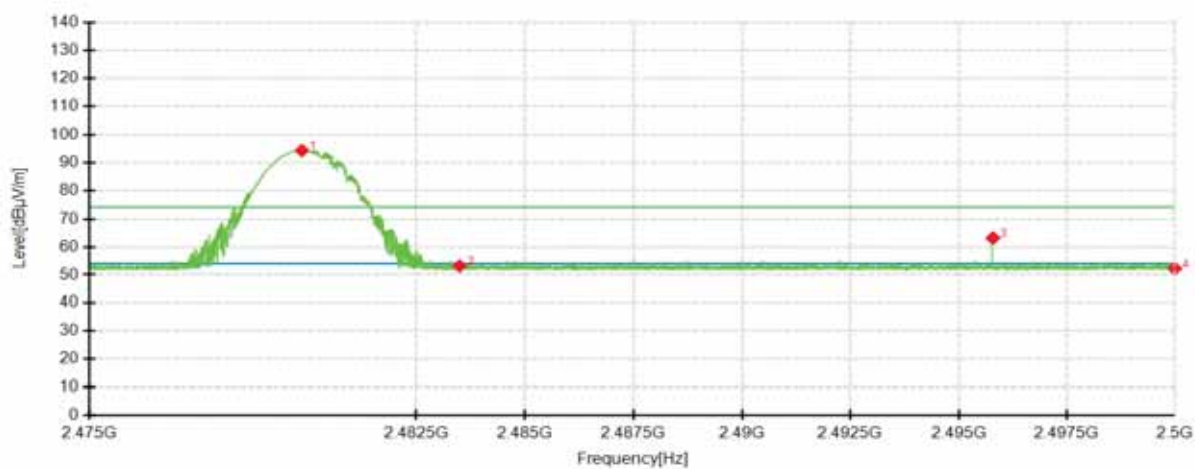
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



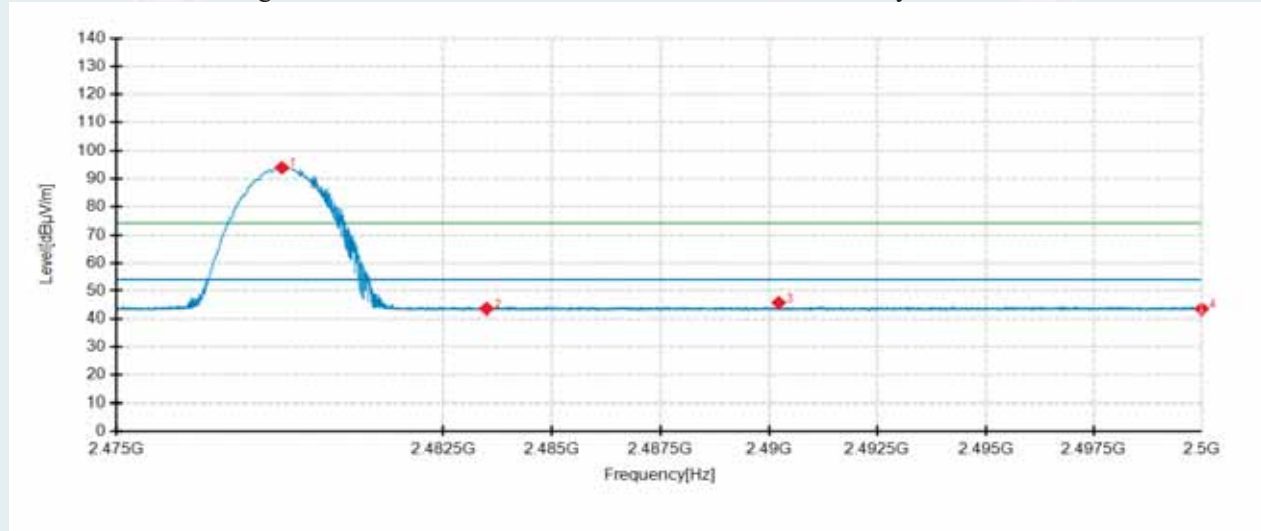
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.8594	81.52	85.84	4.32	74.00	-11.84	100	142	Horizontal	No limit
2	2483.5000	48.32	52.65	4.33	74.00	21.35	100	142	Horizontal	/
3	2483.6656	55.28	59.61	4.33	74.00	14.39	100	309	Horizontal	/
4	2500.0000	50.01	54.39	4.38	74.00	19.61	100	336	Horizontal	/
1	2479.8750	90.09	94.41	4.32	74.00	-20.41	100	30	Vertical	No limit
2	2483.5000	48.79	53.12	4.33	74.00	20.88	100	218	Vertical	/
3	2495.7938	58.83	63.20	4.37	74.00	10.80	100	0	Vertical	/
4	2500.0000	47.83	52.21	4.38	74.00	21.79	200	163	Vertical	/

Highest Channel

Frequency 2480MHz

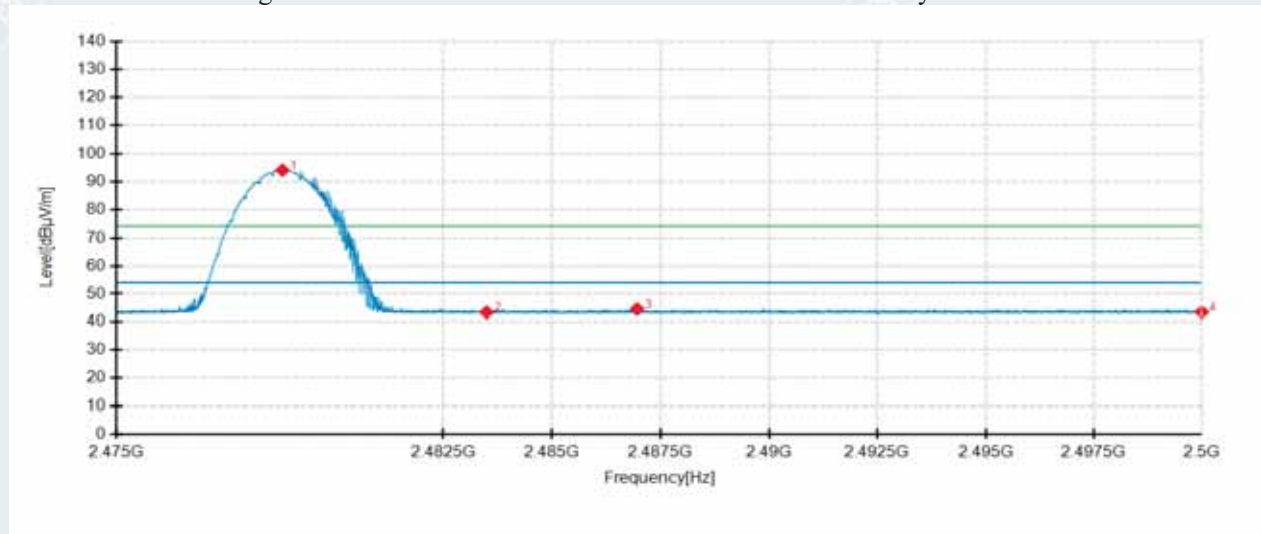
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



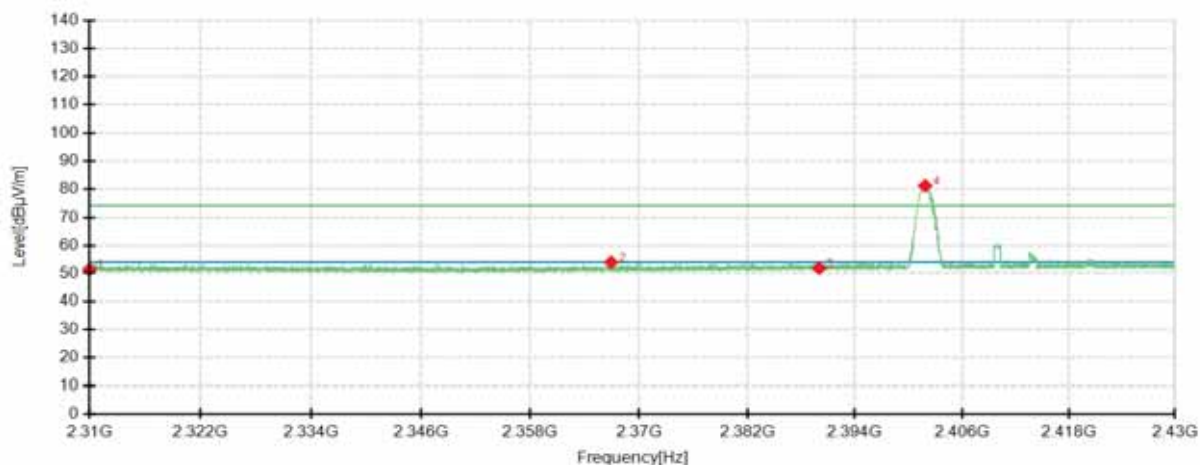
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2478.7969	89.66	93.98	4.32	54.00	-39.98	100	142	Horizontal	No limit
2	2483.5000	39.21	43.54	4.33	54.00	10.46	200	218	Horizontal	/
3	2490.2250	41.30	45.65	4.35	54.00	8.35	100	249	Horizontal	/
4	2500.0000	39.07	43.45	4.38	54.00	10.55	200	83	Horizontal	/
1	2478.8063	89.85	94.17	4.32	54.00	-40.17	100	32	Vertical	No limit
2	2483.5000	39.03	43.36	4.33	54.00	10.64	200	182	Vertical	/
3	2486.9625	40.15	44.49	4.34	54.00	9.51	100	218	Vertical	/
4	2500.0000	39.09	43.47	4.38	54.00	10.53	200	235	Vertical	/

2DH5**Lowest Channel**

Frequency 2402MHz

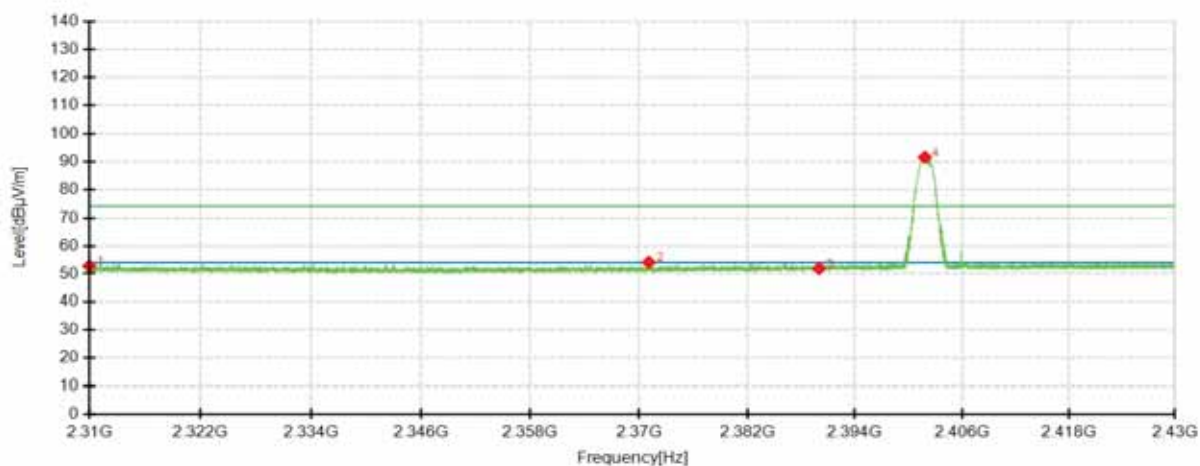
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



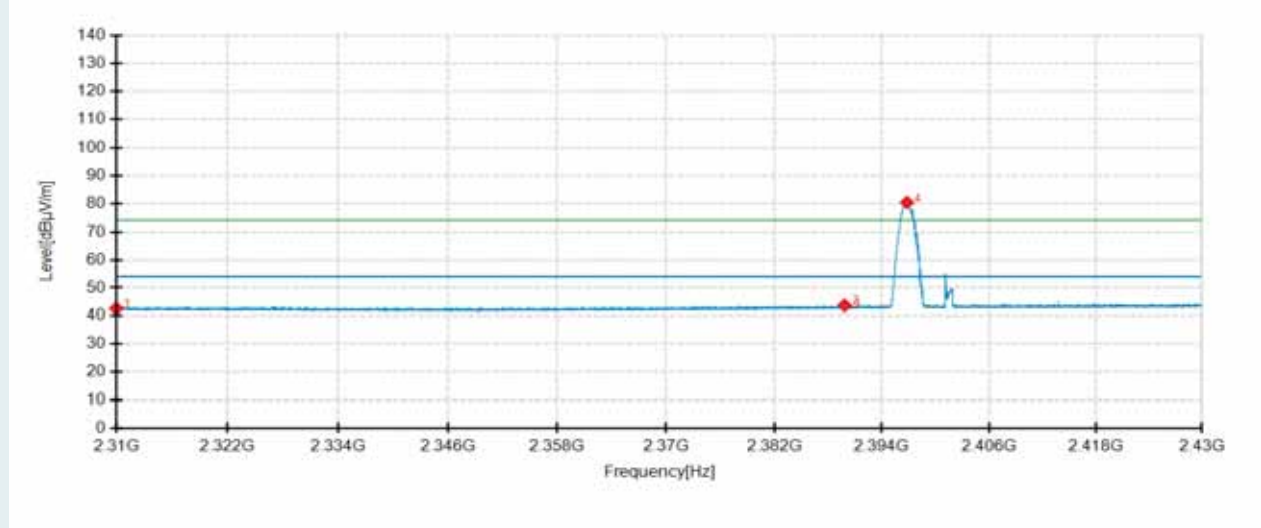
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	47.88	51.36	3.48	74.00	22.64	200	218	Horizontal	/
2	2366.9250	50.53	53.95	3.42	74.00	20.05	100	142	Horizontal	/
3	2390.0000	48.01	51.82	3.81	74.00	22.18	100	325	Horizontal	/
4	2401.8600	77.14	81.13	3.99	74.00	-7.13	100	142	Horizontal	No limit
1	2310.0000	49.27	52.75	3.48	74.00	21.25	100	109	Vertical	/
2	2371.0800	50.59	54.08	3.49	74.00	19.92	200	149	Vertical	/
3	2390.0000	48.09	51.90	3.81	74.00	22.10	100	218	Vertical	/
4	2401.8300	87.61	91.60	3.99	74.00	-17.60	100	21	Vertical	No limit

Lowest Channel

Frequency 2402MHz

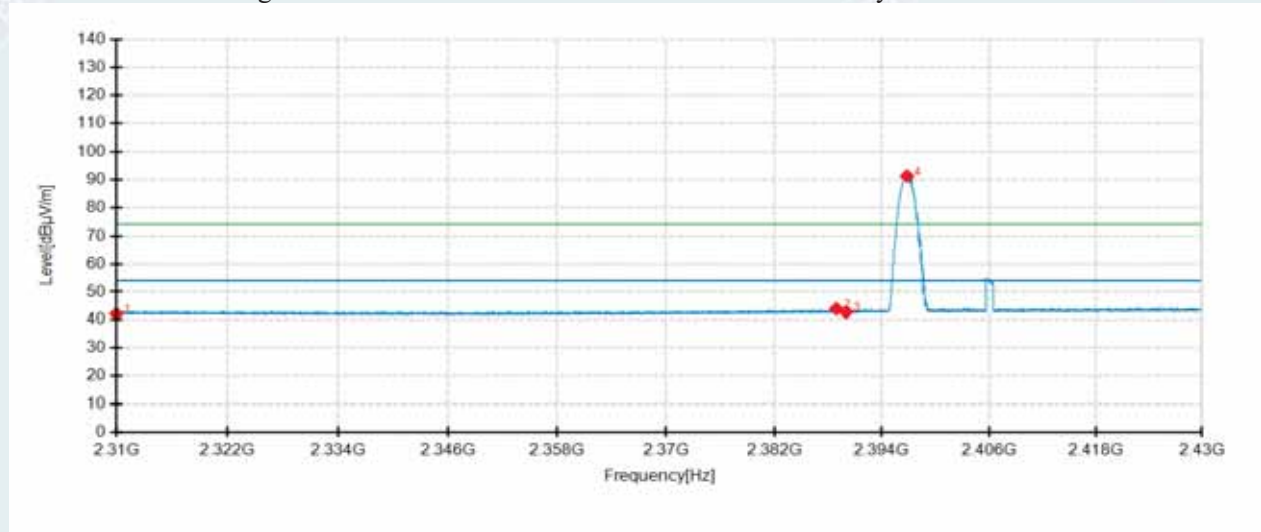
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



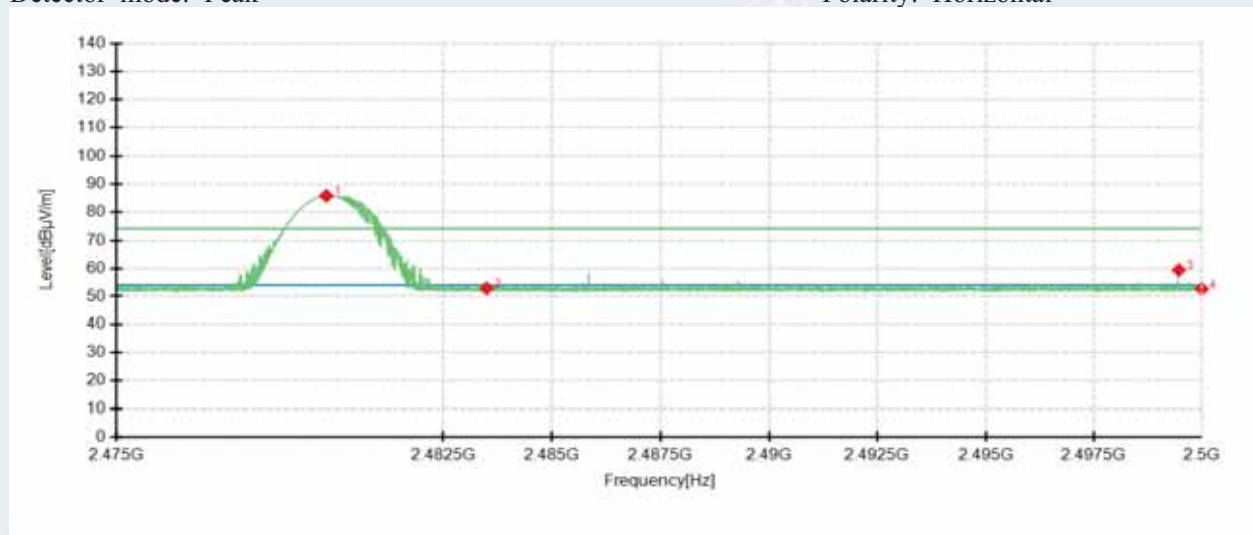
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	39.09	42.57	3.48	54.00	11.43	100	142	Horizontal	/
2	2389.8300	39.88	43.69	3.81	54.00	10.31	200	218	Horizontal	/
3	2390.0000	38.65	42.46	3.81	54.00	11.54	200	164	Horizontal	/
4	2396.8050	76.43	80.36	3.93	54.00	-26.36	100	142	Horizontal	No limit
1	2310.0000	38.63	42.11	3.48	54.00	11.89	200	344	Vertical	/
2	2388.9150	40.07	43.86	3.79	54.00	10.14	200	223	Vertical	/
3	2390.0000	38.97	42.78	3.81	54.00	11.22	200	142	Vertical	/
4	2396.8050	87.41	91.34	3.93	54.00	-37.34	100	24	Vertical	No limit

Highest Channel

Frequency 2480MHz

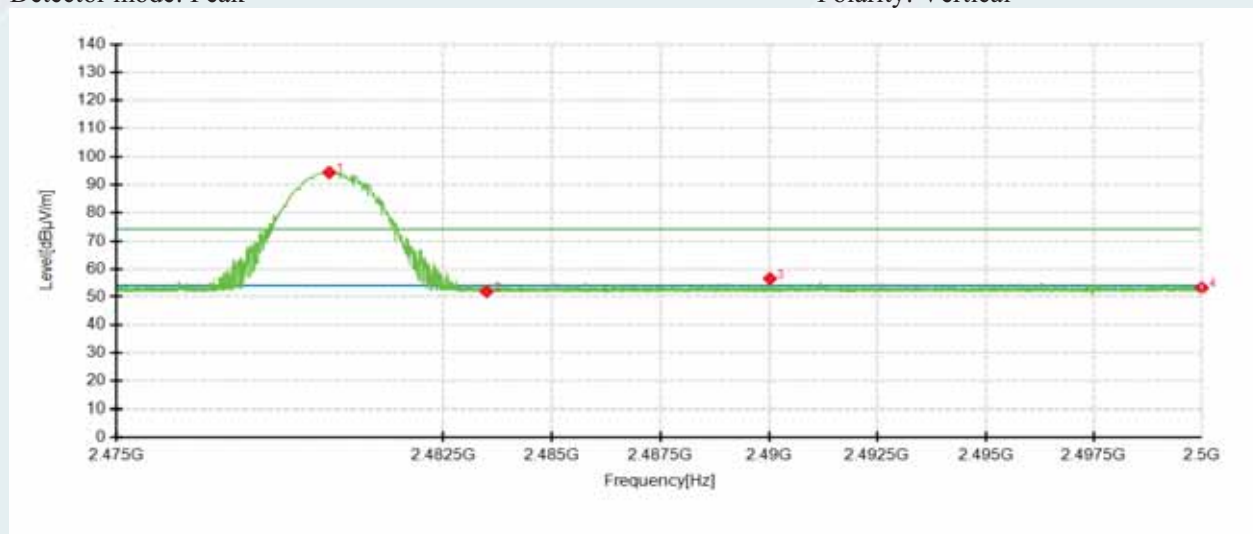
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



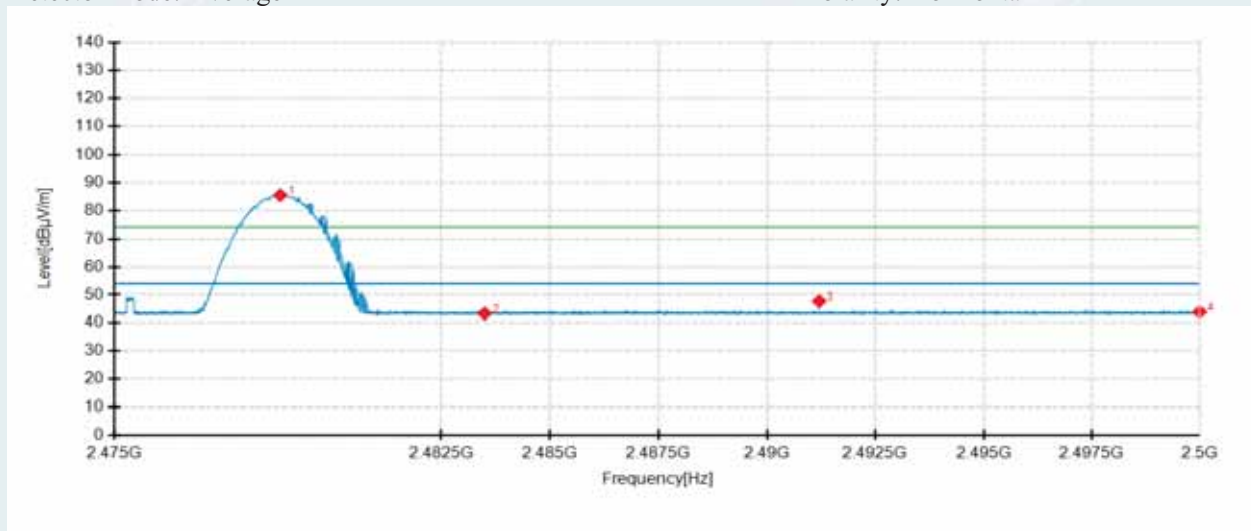
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.8156	81.45	85.77	4.32	74.00	-11.77	100	142	Horizontal	No limit
2	2483.5000	48.51	52.84	4.33	74.00	21.16	200	218	Horizontal	/
3	2499.4688	55.00	59.38	4.38	74.00	14.62	100	142	Horizontal	/
4	2500.0000	48.24	52.62	4.38	74.00	21.38	200	150	Horizontal	/
1	2479.8813	90.10	94.42	4.32	74.00	-20.42	100	29	Vertical	No limit
2	2483.5000	47.51	51.84	4.33	74.00	22.16	200	337	Vertical	/
3	2490.0219	52.12	56.47	4.35	74.00	17.53	100	62	Vertical	/
4	2500.0000	48.79	53.17	4.38	74.00	20.83	100	22	Vertical	/

Highest Channel

Frequency 2480MHz

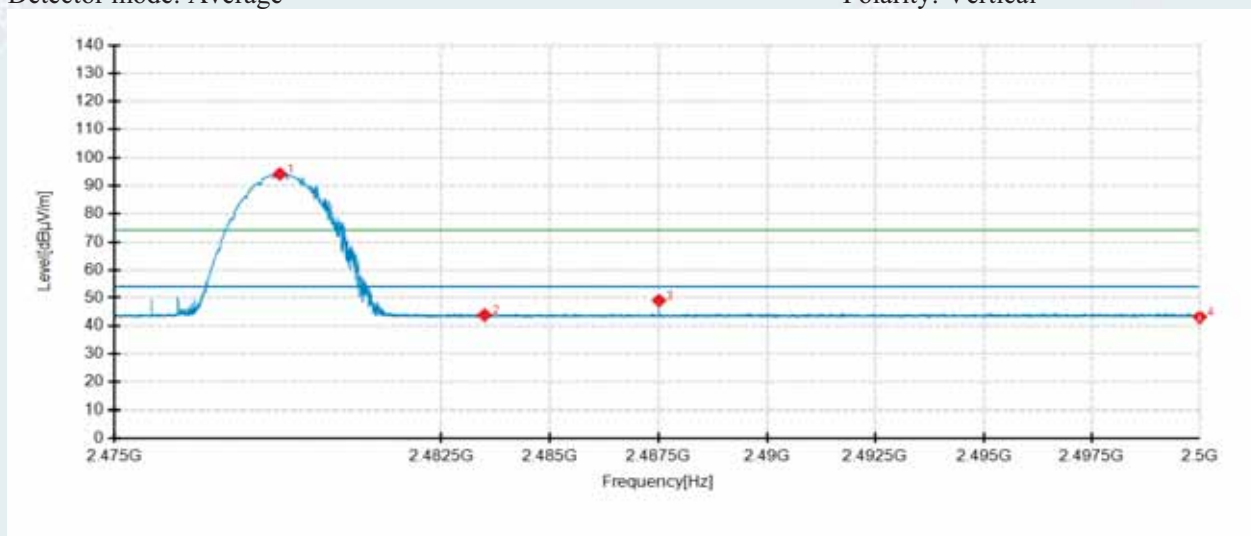
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



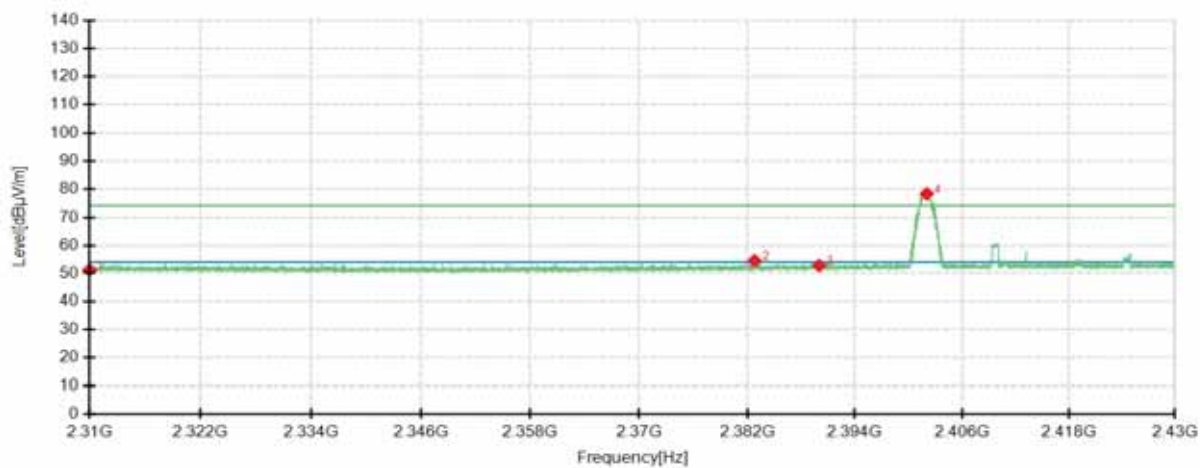
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2478.8031	81.20	85.52	4.32	54.00	-31.52	100	142	Horizontal	No limit
2	2483.5000	38.97	43.30	4.33	54.00	10.70	200	218	Horizontal	/
3	2491.2031	43.33	47.68	4.35	54.00	6.32	200	218	Horizontal	/
4	2500.0000	39.49	43.87	4.38	54.00	10.13	200	218	Horizontal	/
1	2478.7938	89.95	94.27	4.32	54.00	-40.27	100	32	Vertical	No limit
2	2483.5000	39.41	43.74	4.33	54.00	10.26	200	142	Vertical	/
3	2487.5125	44.62	48.96	4.34	54.00	5.04	100	25	Vertical	/
4	2500.0000	38.73	43.11	4.38	54.00	10.89	100	218	Vertical	/

3DH5**Lowest Channel**

Frequency 2402MHz

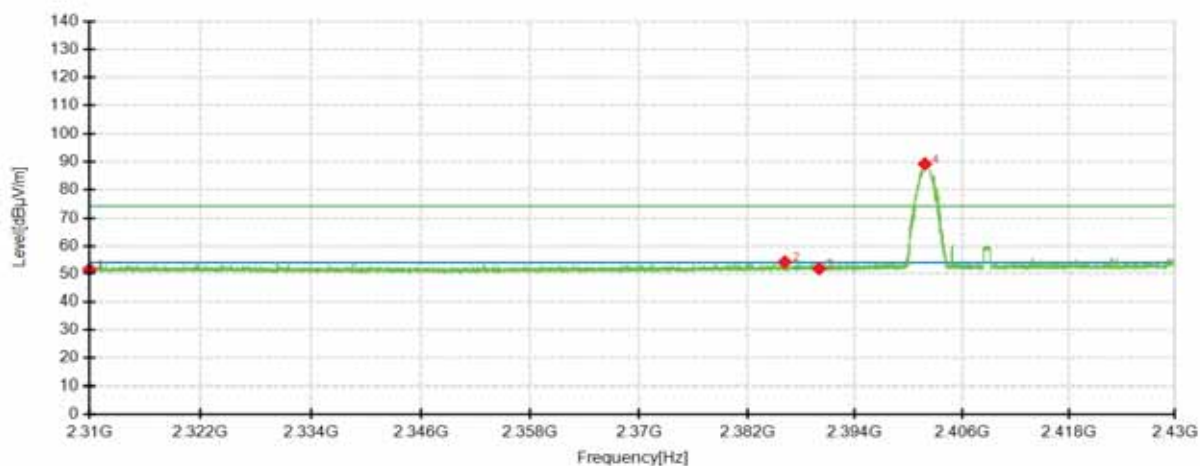
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



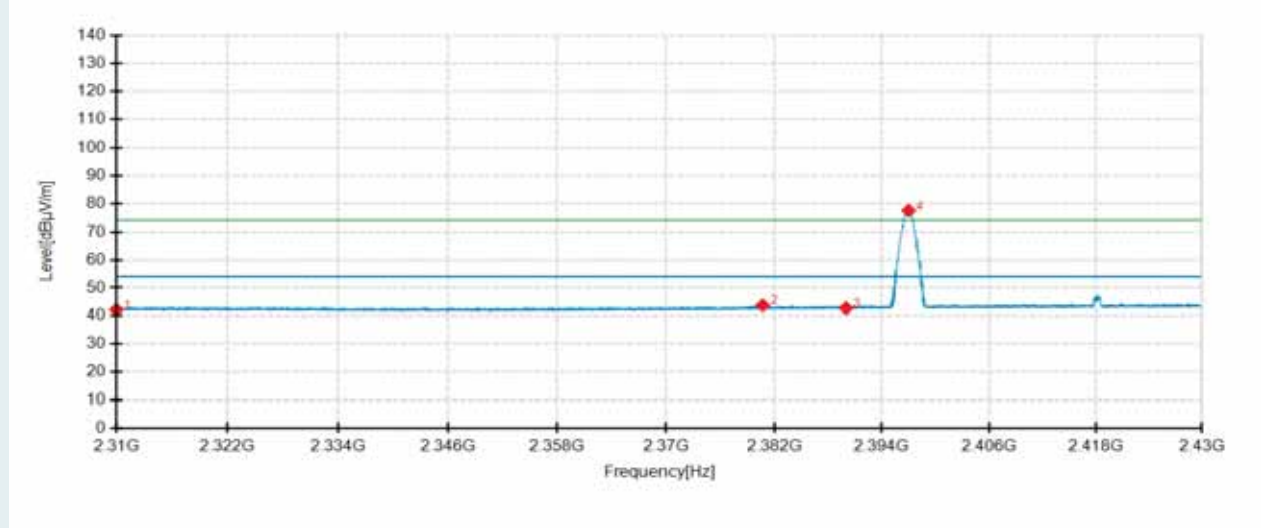
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	47.67	51.15	3.48	74.00	22.85	200	151	Horizontal	/
2	2382.8100	50.78	54.47	3.69	74.00	19.53	200	96	Horizontal	/
3	2390.0000	48.94	52.75	3.81	74.00	21.25	100	325	Horizontal	/
4	2402.0400	74.22	78.21	3.99	74.00	-4.21	100	142	Horizontal	No limit
1	2310.0000	48.01	51.49	3.48	74.00	22.51	200	249	Vertical	/
2	2386.1850	50.43	54.18	3.75	74.00	19.82	100	143	Vertical	/
3	2390.0000	47.93	51.74	3.81	74.00	22.26	100	95	Vertical	/
4	2401.8300	85.22	89.21	3.99	74.00	-15.21	100	22	Vertical	No limit

Lowest Channel

Frequency 2402MHz

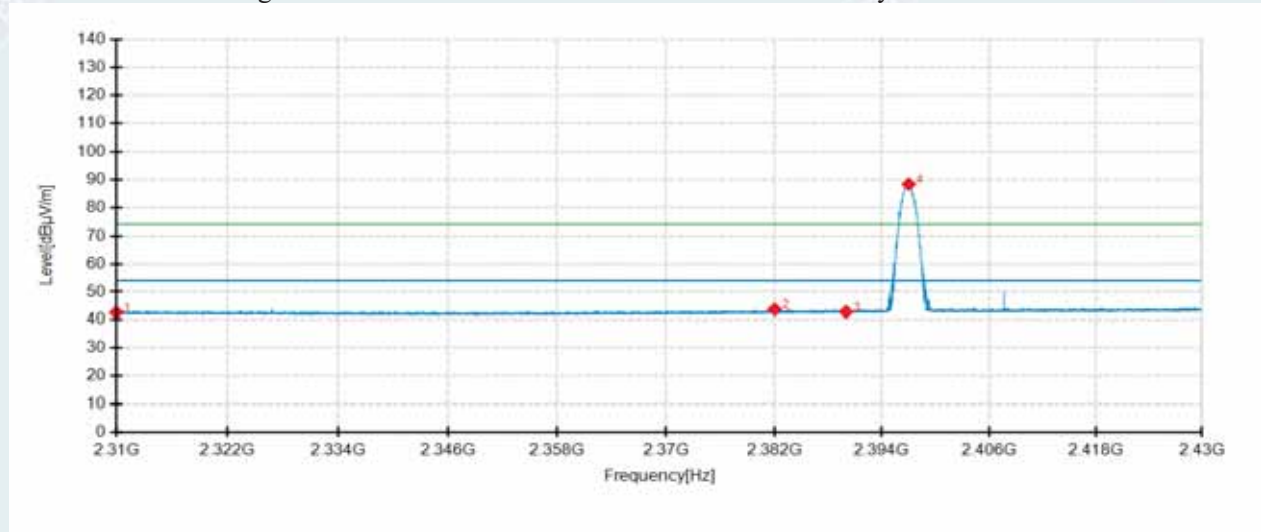
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



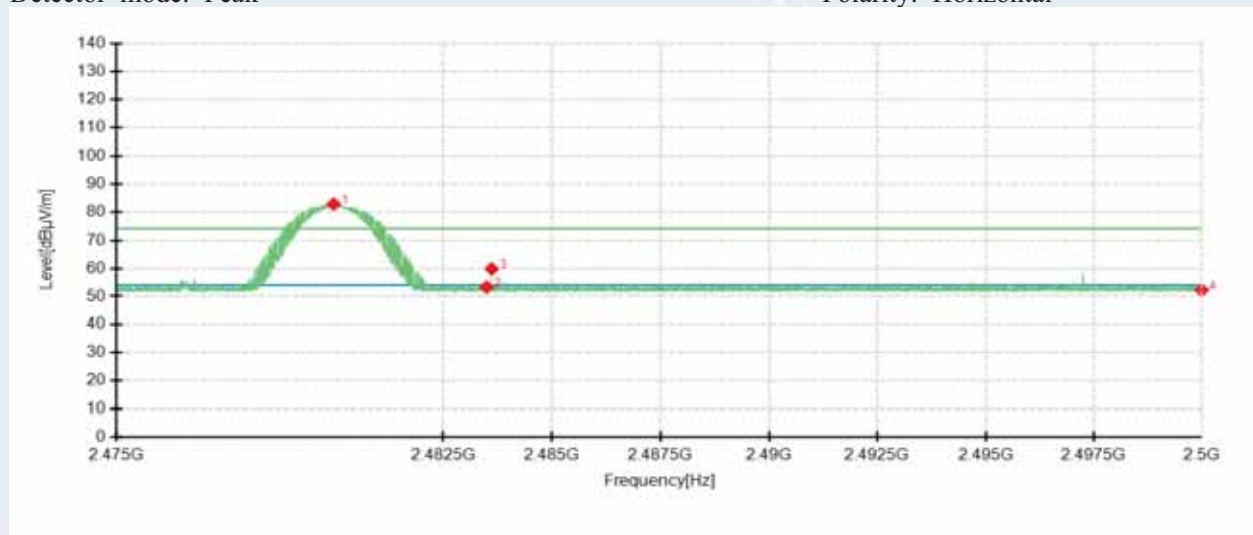
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	38.66	42.14	3.48	54.00	11.86	100	176	Horizontal	/
2	2380.7100	40.05	43.70	3.65	54.00	10.30	100	349	Horizontal	/
3	2390.0000	38.93	42.74	3.81	54.00	11.26	200	0	Horizontal	/
4	2396.9850	73.55	77.48	3.93	54.00	-23.48	100	142	Horizontal	No limit
1	2310.0000	39.13	42.61	3.48	54.00	11.39	200	202	Vertical	/
2	2382.0450	40.04	43.71	3.67	54.00	10.29	200	202	Vertical	/
3	2390.0000	39.03	42.84	3.81	54.00	11.16	100	32	Vertical	/
4	2397.0000	84.48	88.41	3.93	54.00	-34.41	100	25	Vertical	No limit

Highest Channel

Frequency 2480MHz

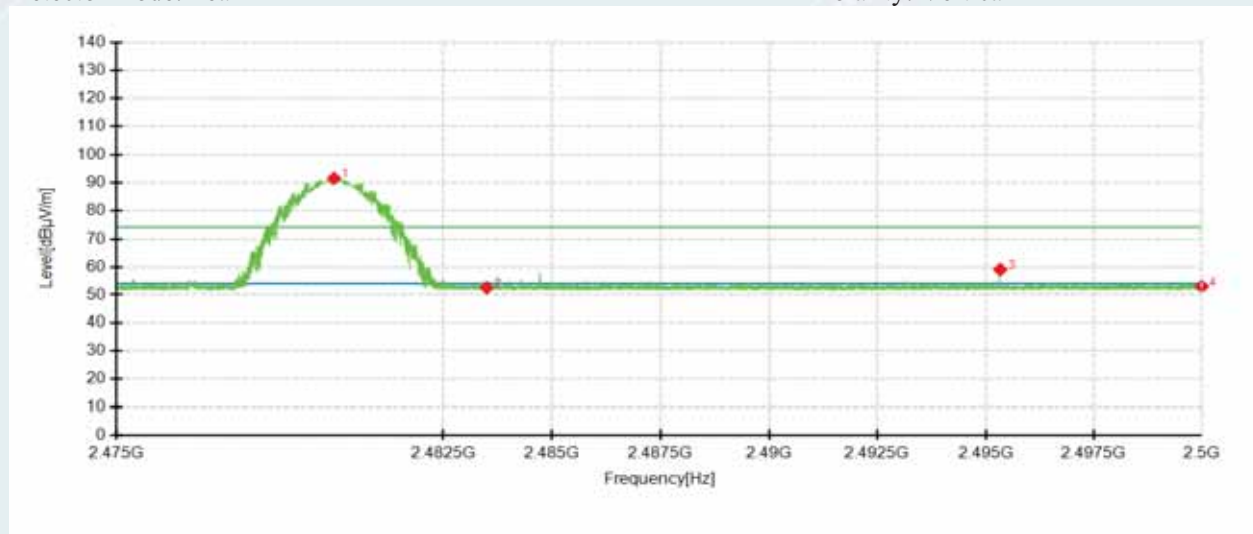
Detector mode: Peak

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical



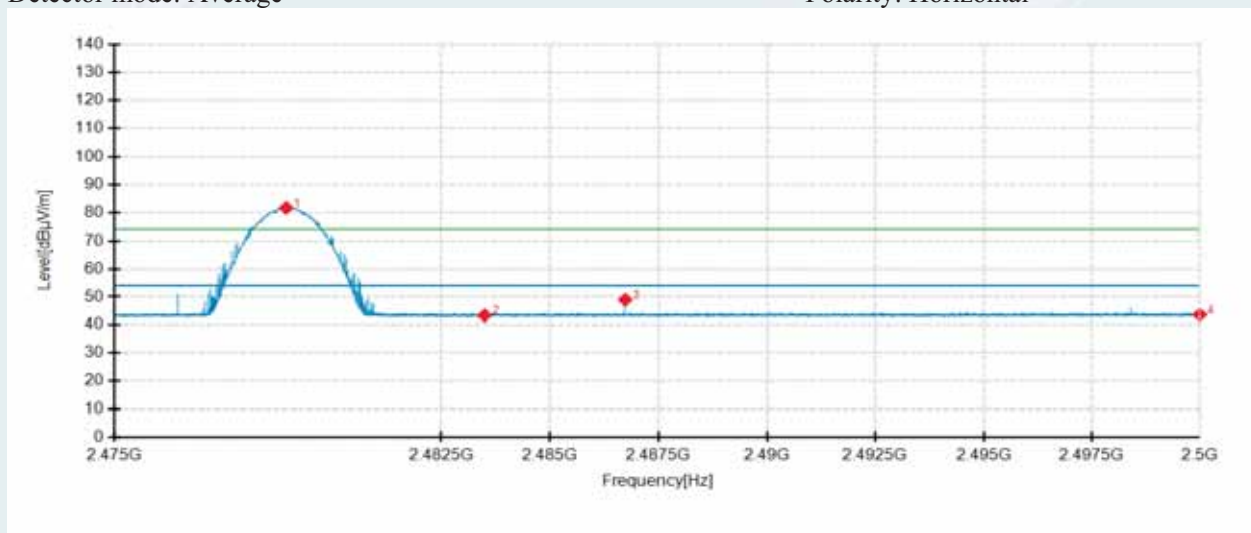
No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.9844	78.46	82.78	4.32	74.00	-8.78	100	142	Horizontal	No limit
2	2483.5000	48.92	53.25	4.33	74.00	20.75	200	218	Horizontal	/
3	2483.6156	55.50	59.83	4.33	74.00	14.17	200	218	Horizontal	/
4	2500.0000	47.84	52.22	4.38	74.00	21.78	200	49	Horizontal	/
1	2479.9938	87.27	91.59	4.32	74.00	-17.59	100	29	Vertical	No limit
2	2483.5000	48.16	52.49	4.33	74.00	21.51	200	142	Vertical	/
3	2495.3375	54.71	59.08	4.37	74.00	14.92	100	83	Vertical	/
4	2500.0000	48.57	52.95	4.38	74.00	21.05	200	271	Vertical	/

Highest Channel

Frequency 2480MHz

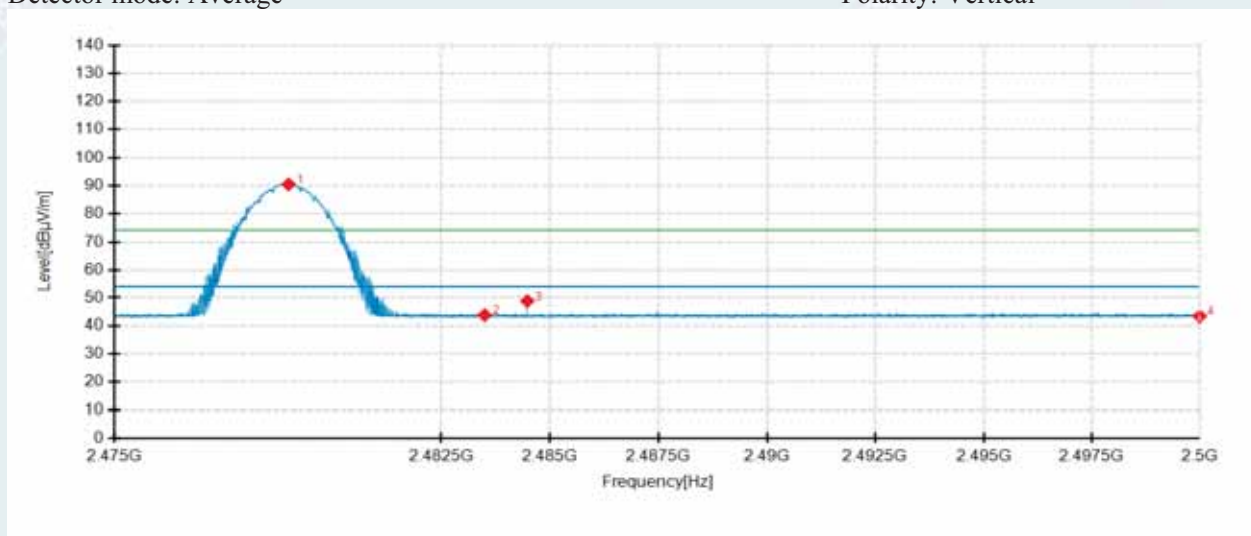
Detector mode: Average

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical



No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2478.9406	77.30	81.62	4.32	54.00	-27.62	100	142	Horizontal	No limit
2	2483.5000	39.01	43.34	4.33	54.00	10.66	100	195	Horizontal	/
3	2486.7344	44.56	48.90	4.34	54.00	5.10	100	142	Horizontal	/
4	2500.0000	39.21	43.59	4.38	54.00	10.41	200	71	Horizontal	/
1	2478.9969	86.16	90.48	4.32	54.00	-36.48	100	37	Vertical	No limit
2	2483.5000	39.40	43.73	4.33	54.00	10.27	100	185	Vertical	/
3	2484.4813	44.47	48.80	4.33	54.00	5.20	100	218	Vertical	/
4	2500.0000	39.01	43.39	4.38	54.00	10.61	100	31	Vertical	/

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

APPENDIX A. PHOTOGRAPH OF THE TEST CONNECTION DIAGRAM

Please refer to the attached document E202112276794-Test photo-15.6.

APPENDIX B. PHOTOGRAPH OF THE EUT

Please refer to the attached document E202112276794-EUT photo-15.6.

----- End of Report -----