

Test Report

Verified code: 800084

Report No.: E20230328398101-8

Customer: Neusoft Group (Dalian) Co., Ltd.

Address: No.901-7 Huangpu Road, Ganjingzi District,Dalian City, Liaoning Province, China

Sample Name: MEDIA HEADUNIT

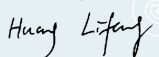
Sample Model: INM2004MD

Receive Sample Date: Apr.06,2023

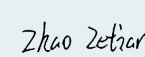
Test Date: Apr.12,2023 ~ May.19,2023

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

Test Result: Pass

Prepared by: Huang Lifang


Reviewed by: Wu Haoting


Approved by: Zhao Zetian


GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2023-06-14

GRG METROLOGY & TEST GROUP CO., LTD.

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Statement

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2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.
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5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20230328398101-8	Original Issue	2023-05-25

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1. TEST RESULT SUMMARY

FCC 47 CFR Part 15 Subpart C 15.247, ANSI C63.10-2013 KDB 558074 D01 15.247 measurement guidance v05r02			
Standard	Item	Limit / Severity	Result
FCC 47 CFR Part 15 Subpart C (15.247)	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)(iii)	PASS
	Dwell Time	Section 15.247(a)(1)(iii)	PASS
	Maximum Peak Output Power	Section 15.247(b)(1)	PASS
	Conducted band edges and Spurious Emission	Section 15.209 &15.247(d)	PASS
	Radiated Spurious Emission	Section 15.209 &15.247(d)	PASS
	Restricted bands of operation	Section 15.247 (d) &15.205	PASS

Note: The EUT antenna is PCB antenna. Max Antenna gain is 1.83dBi .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: Neusoft Group (Dalian) Co., Ltd.
Address: No.901-7 Huangpu Road, Ganjingzi District,Dalian City, Liaoning Province, China

2.2 MANUFACTURER

Name: Neusoft Group (Dalian) Co., Ltd.
Address: No.901-7 Huangpu Road, Ganjingzi District,Dalian City, Liaoning Province, China

2.3 FACTORY

Name: Qingdao Daesung Electronic Co., Ltd.
Address: No. 37, Mengshahe 1 Road, Jimo Zone Qingdao, Shandong, 266200 China

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: MEDIA HEADUNIT
Model No.: INM2004MD
Adding Model: /
Trade Name: INEOS
FCC ID: 2AZAX-INM2004MD
Power supply: DC 13.5V,10A
Frequency Range: 2402MHz~2480MHz
Transmit Power: GFSK:2.04 dBm
 $\pi/4$ -DQPSK:5.62dBm
8DPSK:5.57dBm
Type of Modulation: GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps,8DPSK for 3Mbps
Antenna Specification: 1.83dBi
Temperature Range: -40℃~+85℃

Hardware Version: EE-0000002***

Software Version: SW-0000000***

Sample No: E20230328398101-0001, E20230328398101-0006

Note: The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

2.5 TEST OPERATION MODE

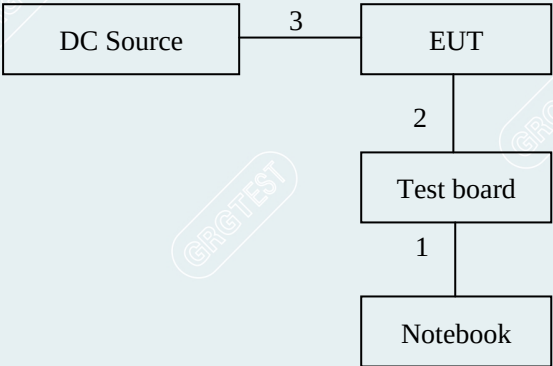
Mode No.	Description of the modes
1	Bluetooth(BT) fixed frequency transmitting

2.6 LOCAL SUPPORTIVE

Name of equipment	Manufacturer	Model	Serial number	Note
Notebook	LENOVO	TianYi 310-14ISK	MP18DLC6	/
DC Source	Keysight	E36131A	/	/
Test board	/	/	/	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	VGA to USB cable	1	No	0	1.0m
2	DC cable	1	No	0	0.2m
3	DC cable	1	No	0	1.5m

2.7 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

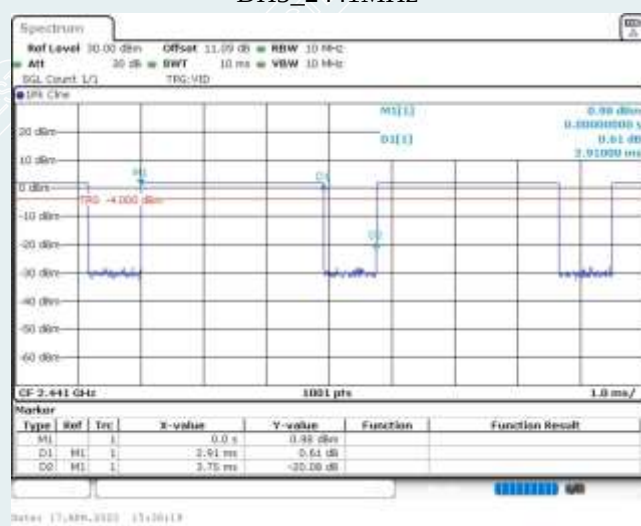
Software version	Test level
Teraterm	DH5: 07 2DH5: 08 3DH5: 08

2.8 DUTY CYCLE

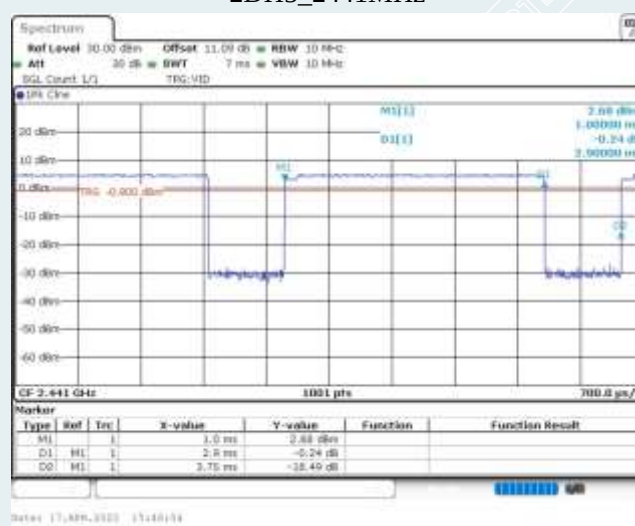
EUT Name	MEDIA HEADUNIT	Model	INM2004MD
Environmental Conditions	22.6°C/56%RH/101.0kPa	Test Voltage	DC 13.5V
Tested By	Qin Tingting	Tested Date	2023-04-17

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	DC [%]	T [s]
DH5	Ant1	2441	2.91	3.75	77.60	0.00291
2DH5	Ant1	2441	2.90	3.75	77.33	0.00290
3DH5	Ant1	2441	2.89	3.74	77.27	0.00289

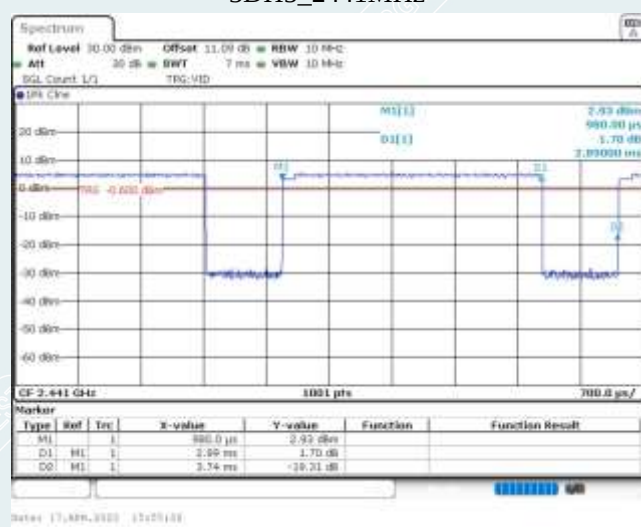
DH5_2441MHz



2DH5_2441MHz



3DH5_2441MHz



3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

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

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 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 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,
<http://www.grgtest.com>

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4. 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	5.1dB ¹⁾
		30MHz~200MHz	4.5dB ¹⁾
		200MHz~1000MHz	4.4dB ¹⁾
		1GHz~18GHz	5.6dB ¹⁾
		18GHz~26.5GHz	3.7dB ¹⁾
	Vertical	9kHz~30MHz	5.1dB ¹⁾
		30MHz~200MHz	4.4dB ¹⁾
		200MHz~1000MHz	4.5dB ¹⁾
		1GHz~18GHz	5.6dB ¹⁾
		18GHz~26.5GHz	3.7dB ¹⁾
Conduction Emission		150kHz~30MHz	3.40dB ¹⁾

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

Note:

¹⁾ This uncertainty represents an expanded uncertainty expressed at approximately the 95%.

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

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5. 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	2023-08-28
LISN(EUT)	R&S	ENV216	101543	2023-09-13
Test S/W	EZ	CCS-3A1-CE		
Hopping Channel Number				
Spectrum Analyzer	R&S	FSV30	104381	2023-11-17
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2023-11-17
Dwell Time				
Spectrum Analyzer	R&S	FSV30	104381	2023-11-17
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2023-11-17
Radiated Spurious Emission&Restricted bands of operation				
Preamplifier	SHIRONG ELECTRONIC	DLNA-30M1G-G41	20200928002	2023-08-19
Bi-log Antenna	Schwarzbeck	VULB9160	VULB9160-3402	2023-10-23
Loop Antenna	Schwarzbeck	FMZB 1513-60	1513-60-56	2023-08-06
Test Receiver	R&S	ESR26	101758	2023-10-27
Horn Antenna	Schwarzbeck	BBHA9120D	02143	2023-10-15
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-497	2023-10-14
Amplifier	Tonscend	TAP01018048	AP20E8060075	2024-04-11
Amplifier	Tonscend	TAP184050	AP20E806071	2024-04-16
Amplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G40	20200928005	2023-08-27
Test S/W	Tonscend	JS32-RE/5.0.0		
20 dB Bandwidth				
Spectrum Analyzer	R&S	FSV30	104381	2023-11-17
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2023-11-17

Maximum Peak Output Power				
Pulse power sensor	Anristu	MA2411B	1126150	2024-02-12
Power meter	Anristu	ML2495A	1204003	2024-02-12
Conducted band edges and Spurious Emission				
Spectrum Analyzer	R&S	FSV30	104381	2023-11-17
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2023-11-17
Carrier Frequencies Separated				
Spectrum Analyzer	R&S	FSV30	104381	2023-11-17
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2023-11-17

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

6. E.U.T. TEST CONDITIONS

Type of antenna: PCB

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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7. 20dB BANDWIDTH

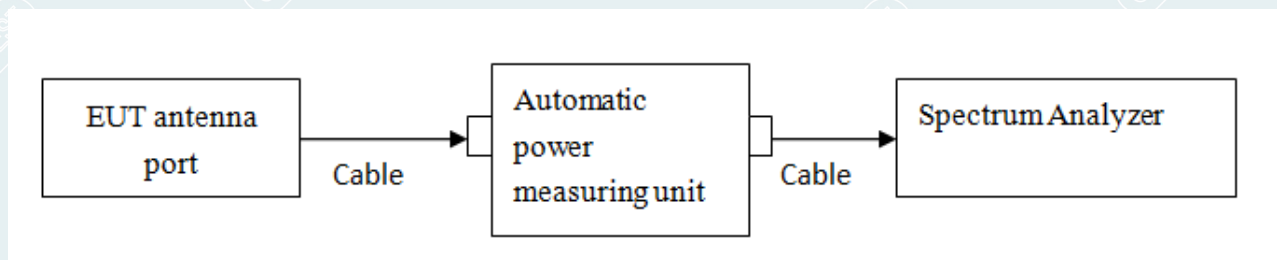
7.1 LIMITS

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=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.

7.3 TEST SETUP



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7.4 TEST RESULTS

Environment: 22.6°C/56%RH/101.0kPa
Tested By:Qin Tingting

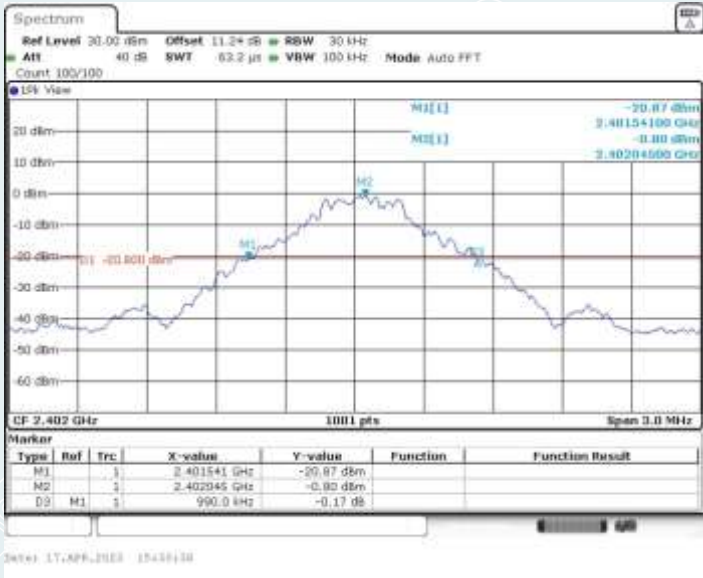
Voltage:DC 13.5V
Date: 2023-04-17

Test Mode	Antenna	Channel	Frequency [MHz]	20 dB Bandwidth [MHz]
DH5	Ant1	Lowest	2402	0.99
		Middle	2441	1.04
		Highest	2480	1.03
2DH5	Ant1	Lowest	2402	1.34
		Middle	2441	1.34
		Highest	2480	1.33
3DH5	Ant1	Lowest	2402	1.25
		Middle	2441	1.31
		Highest	2480	1.32

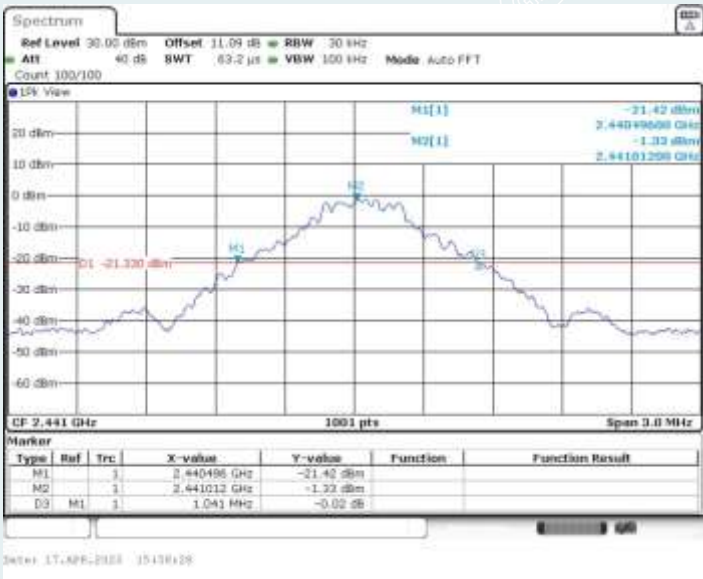
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Test Graphs

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

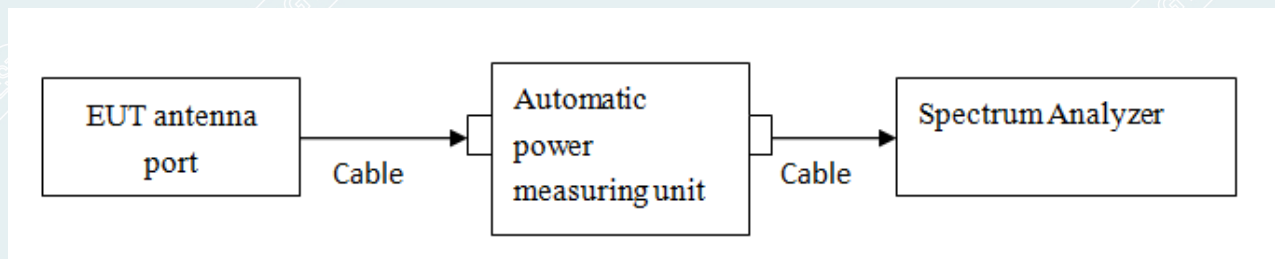
8.1 LIMITS

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 2MHz, Sweep = auto
- 4) Use the marker-delta function to mark hopping channel carrier frequencies and record the channel separation.

8.3 TEST SETUP



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

8.4 TEST RESULTS

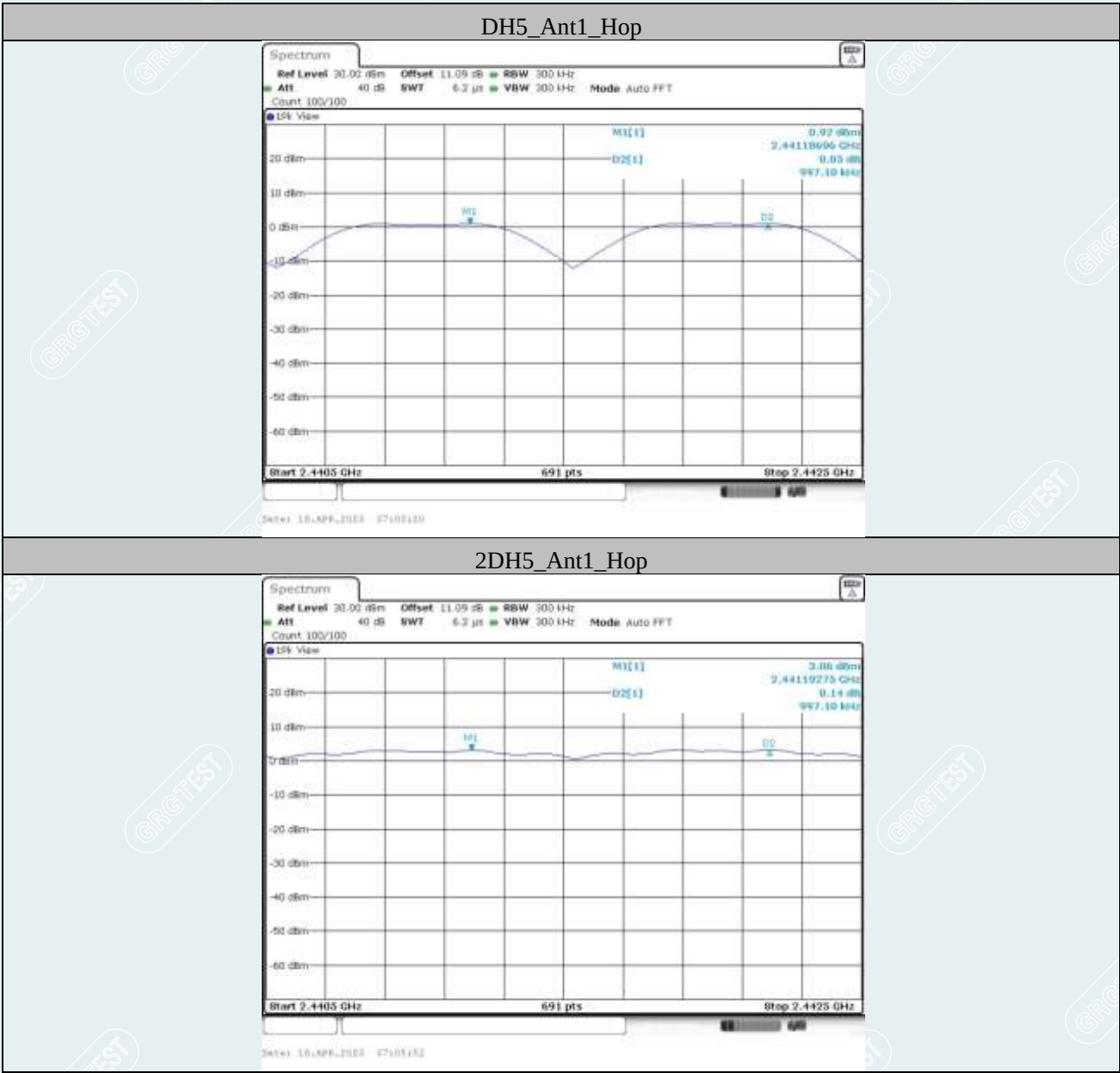
Environment: 22.6°C/56%RH/101.0kPa
Tested By:Qin Tingting

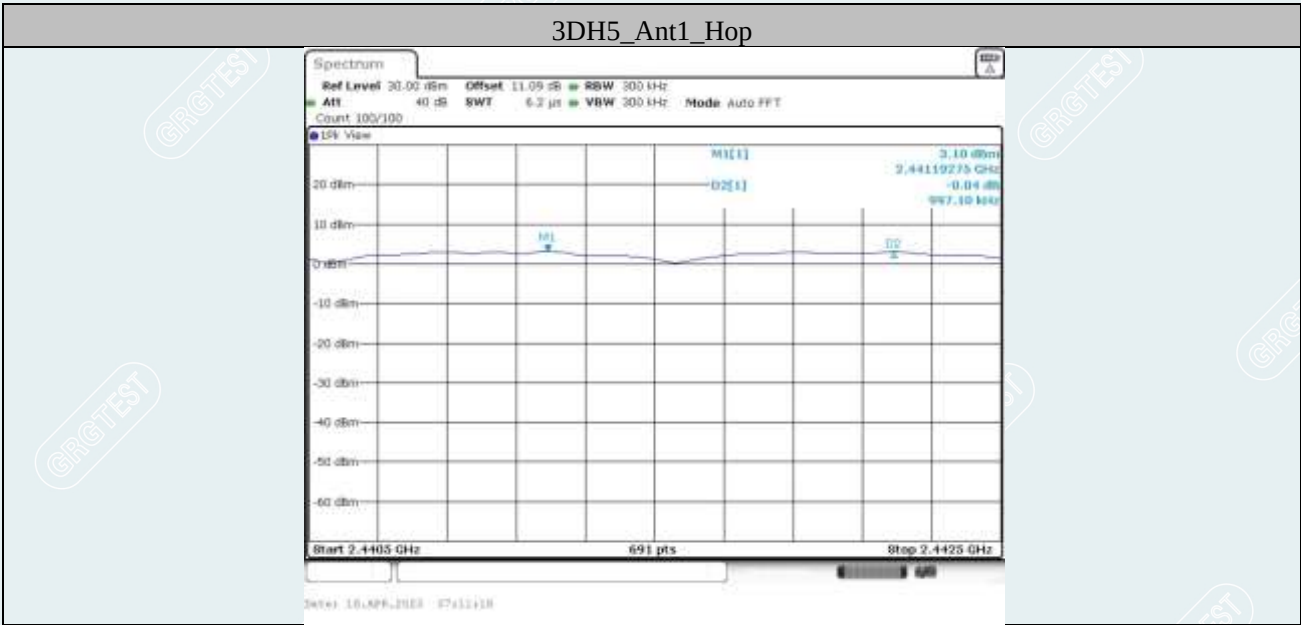
Voltage:DC 13.5V
Date: 2023-04-18

Test Mode	Antenna	Freq[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.997	≥0.693	PASS
2DH5	Ant1	Hop	0.997	≥0.893	PASS
3DH5	Ant1	Hop	0.997	≥0.880	PASS

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Test Graphs





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9. HOPPING CHANNEL NUMBER

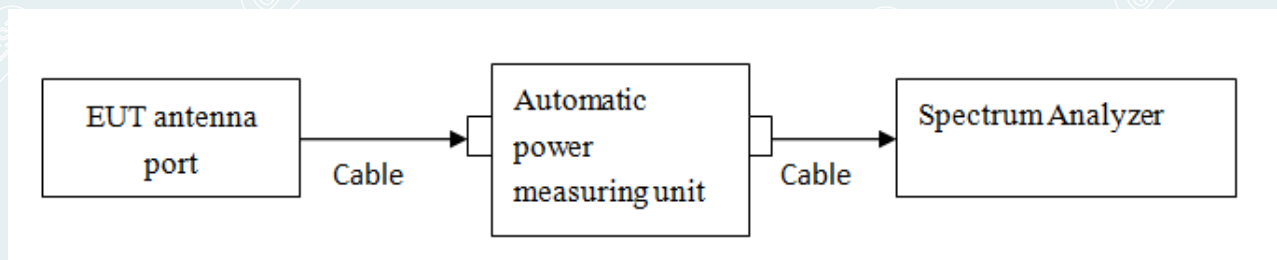
9.1 LIMITS

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

9.3 TEST SETUP



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

9.4 TEST RESULTS

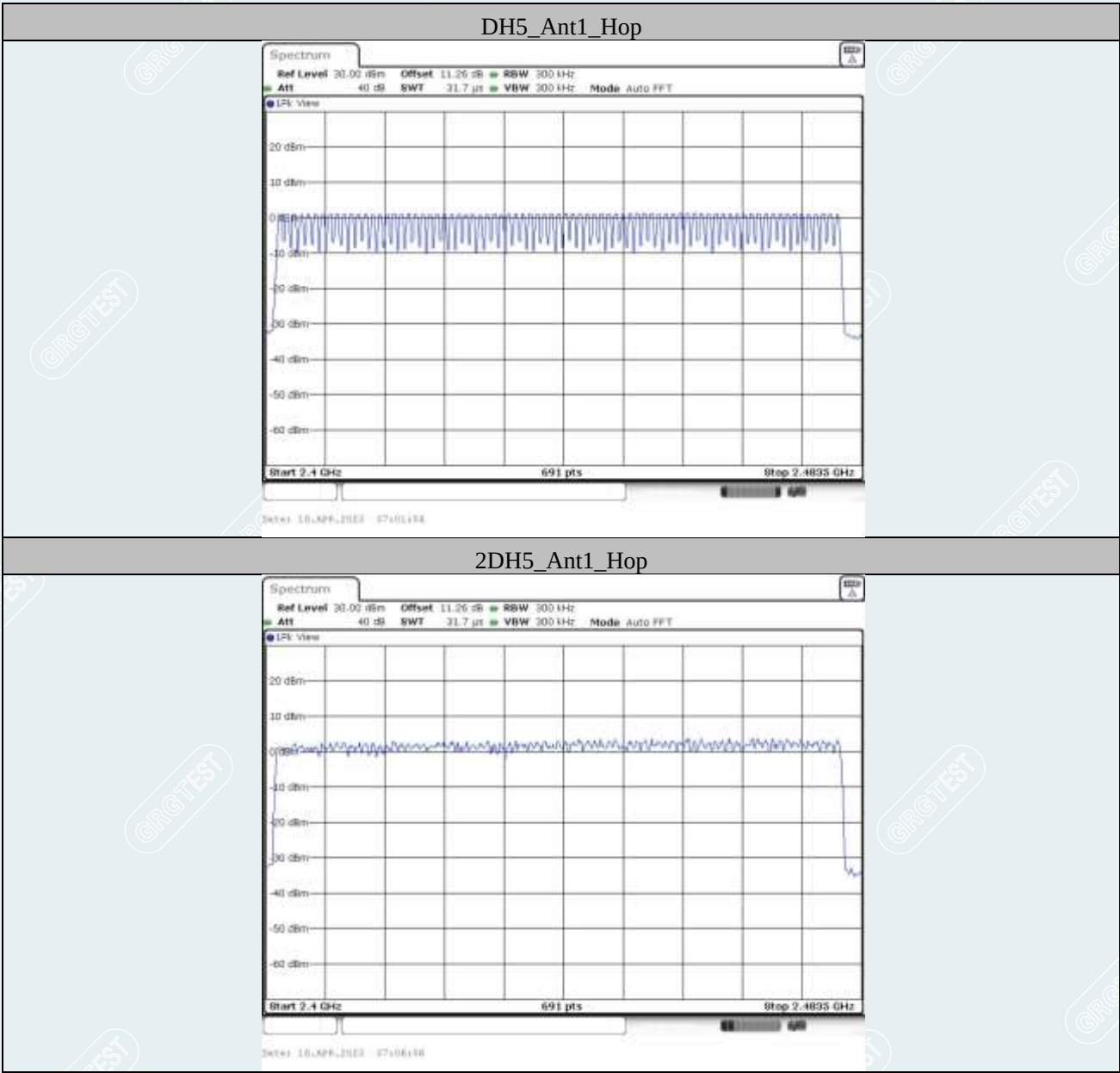
Environment: 22.6°C/56%RH/101.0kPa
Tested By:Qin Tingting

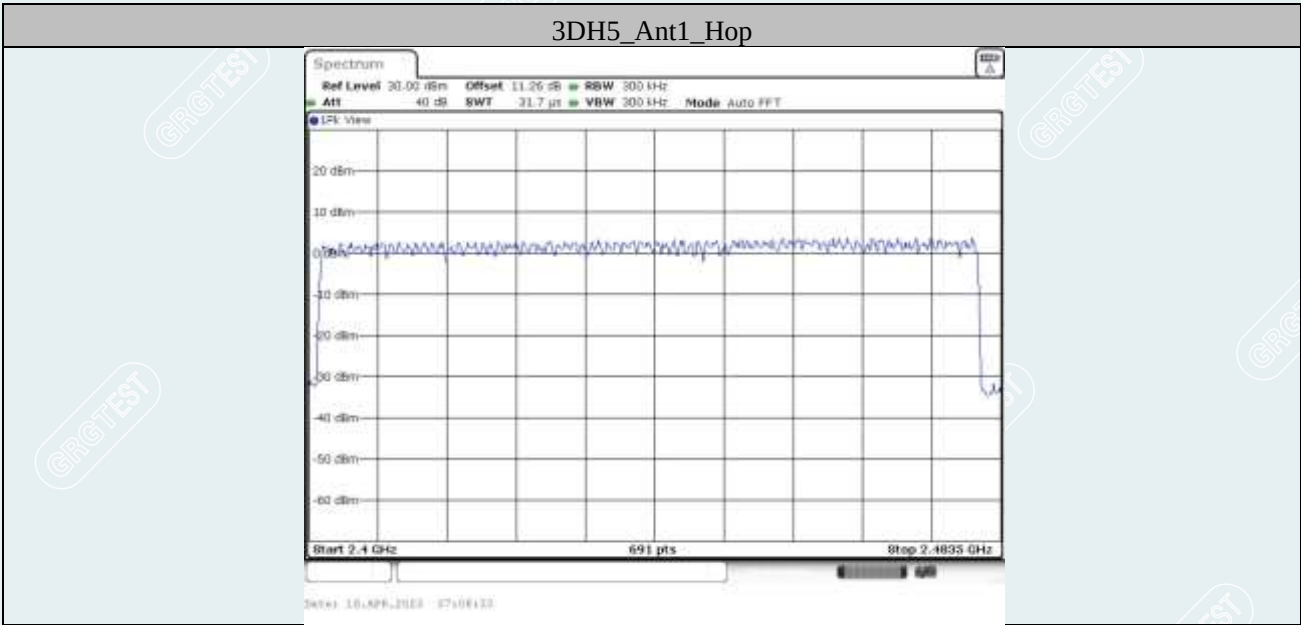
Voltage:DC 13.5V
Date: 2023-04-18

Test Mode	Antenna	Freq[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

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Test Graphs





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10. DWELL TIME

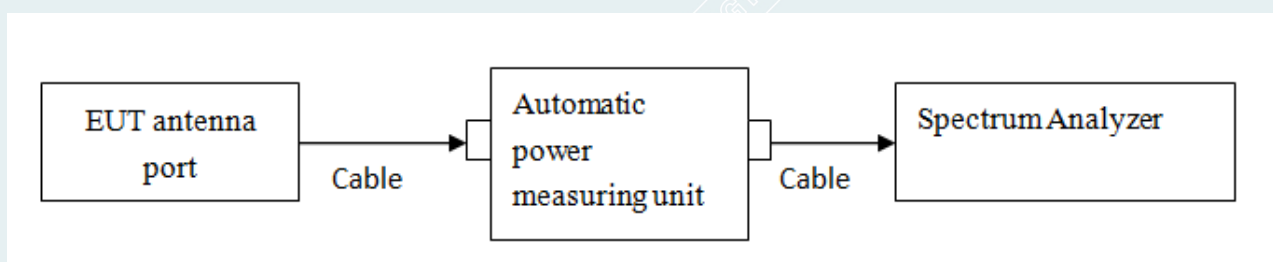
10.1 LIMITS

Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5MHz 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 = Clear Write;
- 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



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10.4 TEST RESULTS

Environment: 22.6°C/56%RH/101.0kPa

Tested By:Qin Tingting

Voltage:DC 13.5V

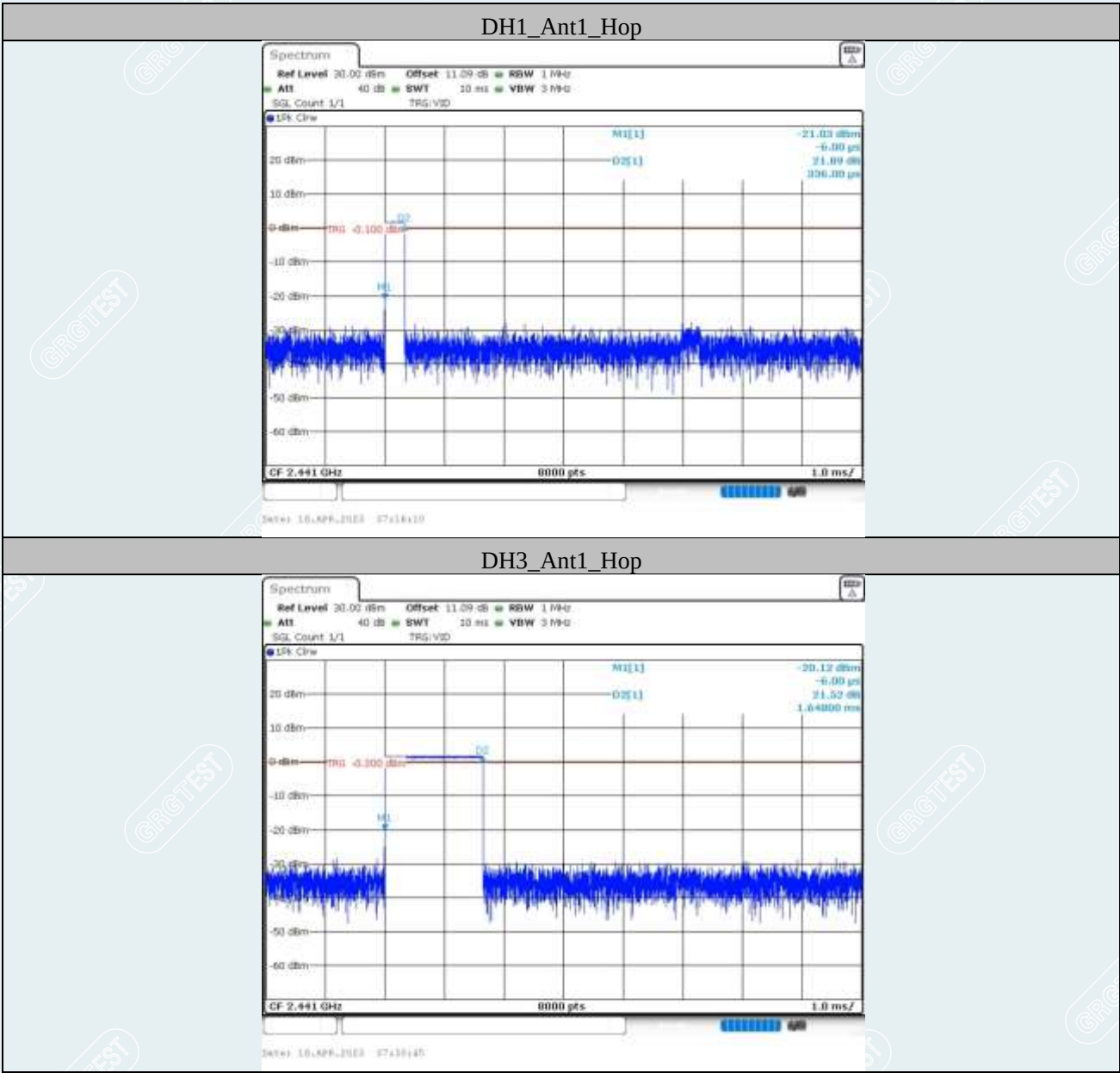
Date: 2023-04-18

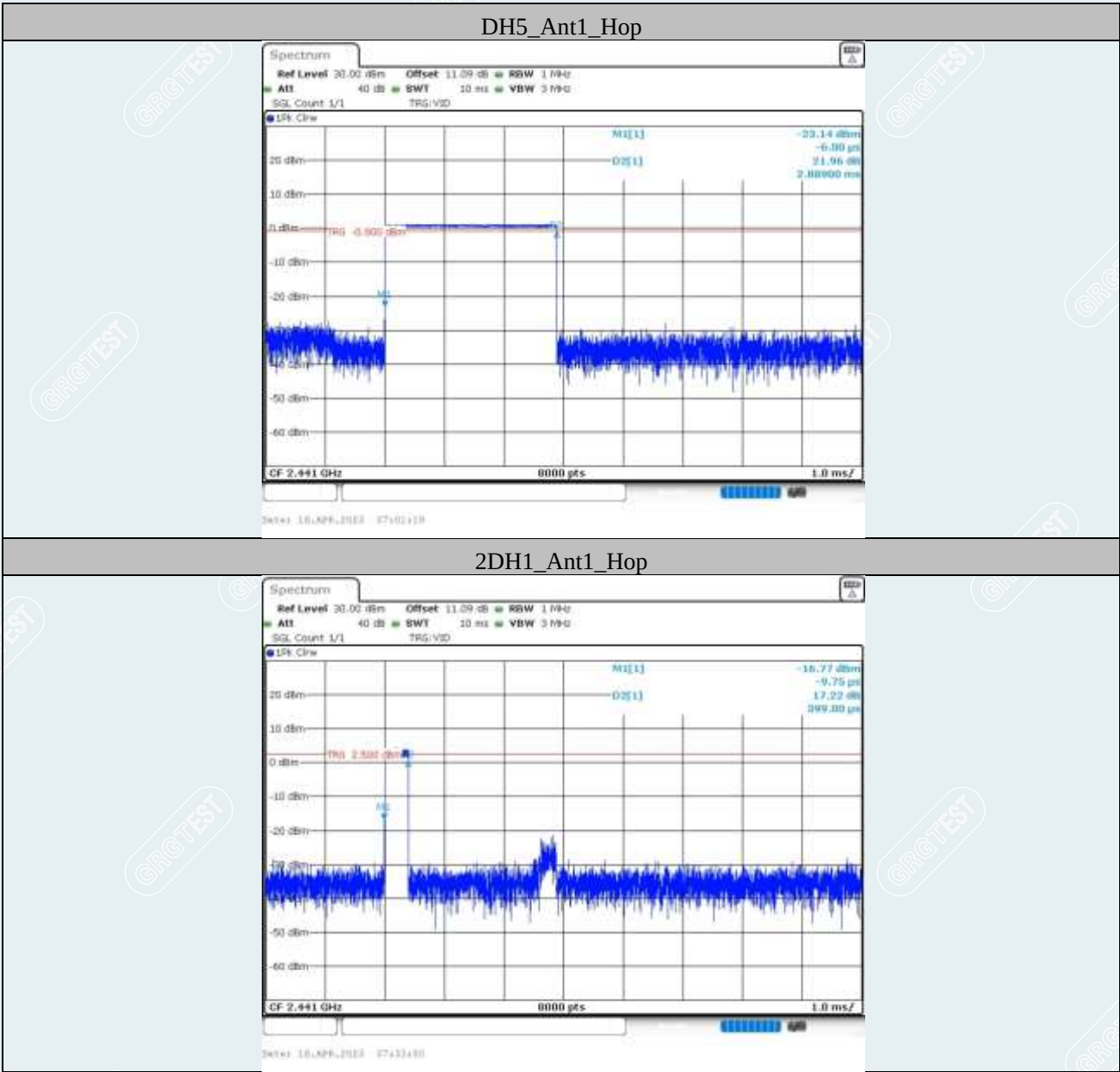
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

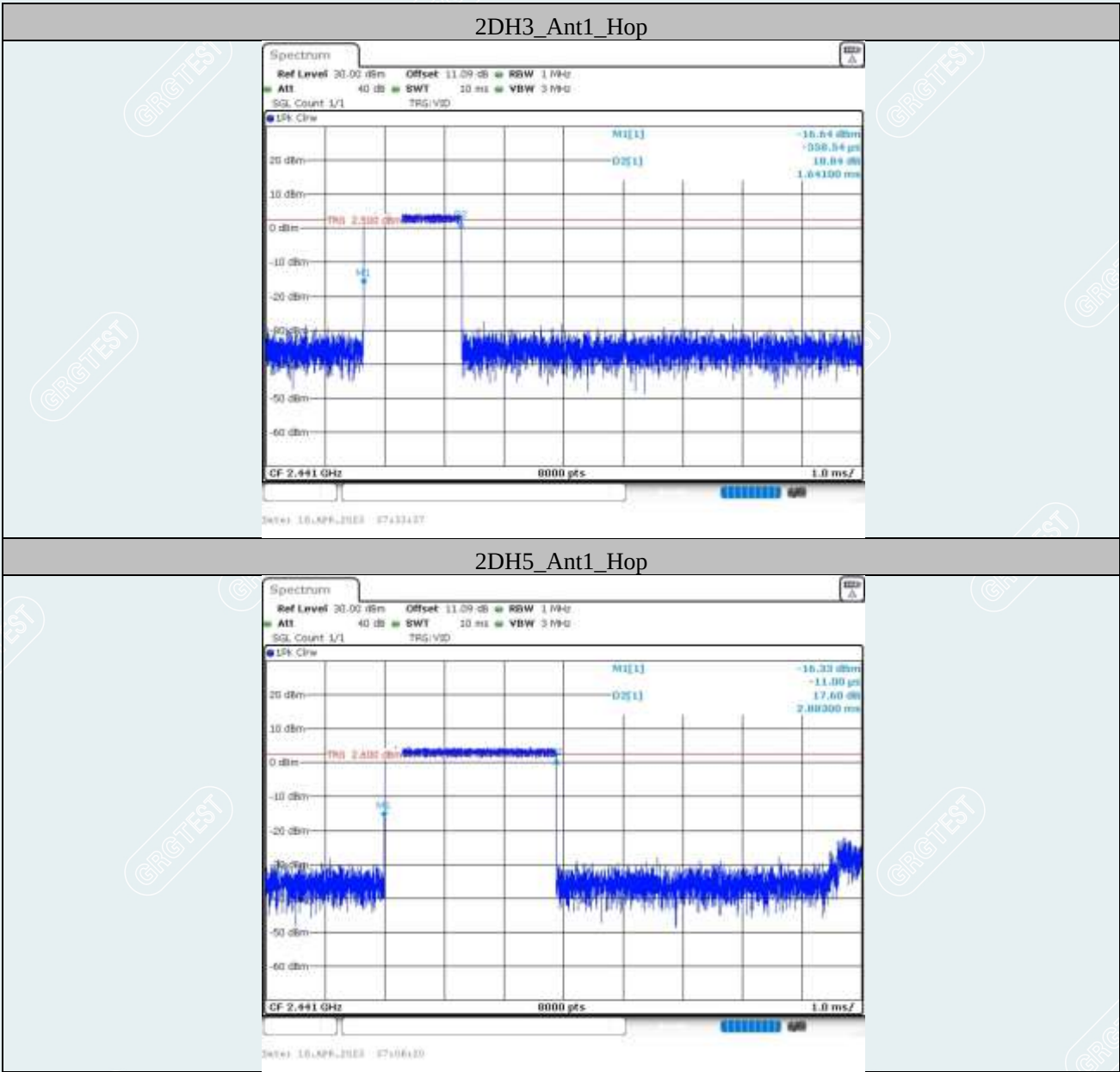
Test Mode	Antenna	Freq[MHz]	Burst Width [ms]	Total Hops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.336	320	0.108	≤0.4	PASS
DH3	Ant1	Hop	1.648	160	0.264	≤0.4	PASS
DH5	Ant1	Hop	2.889	106.67	0.308	≤0.4	PASS
2DH1	Ant1	Hop	0.399	320	0.128	≤0.4	PASS
2DH3	Ant1	Hop	1.641	160	0.263	≤0.4	PASS
2DH5	Ant1	Hop	2.883	106.67	0.308	≤0.4	PASS
3DH1	Ant1	Hop	0.396	320	0.127	≤0.4	PASS
3DH3	Ant1	Hop	1.638	160	0.262	≤0.4	PASS
3DH5	Ant1	Hop	2.882	106.67	0.307	≤0.4	PASS

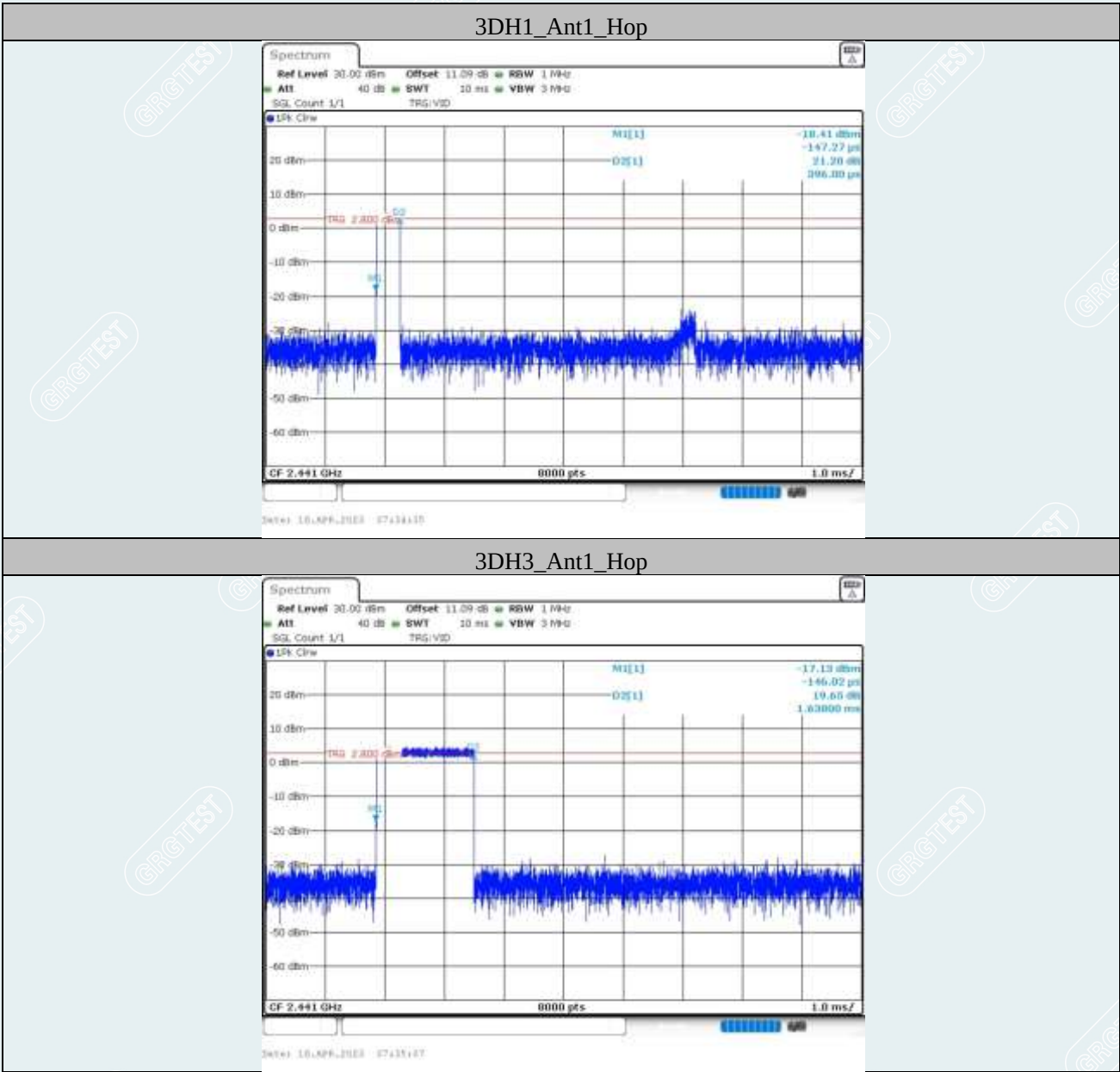
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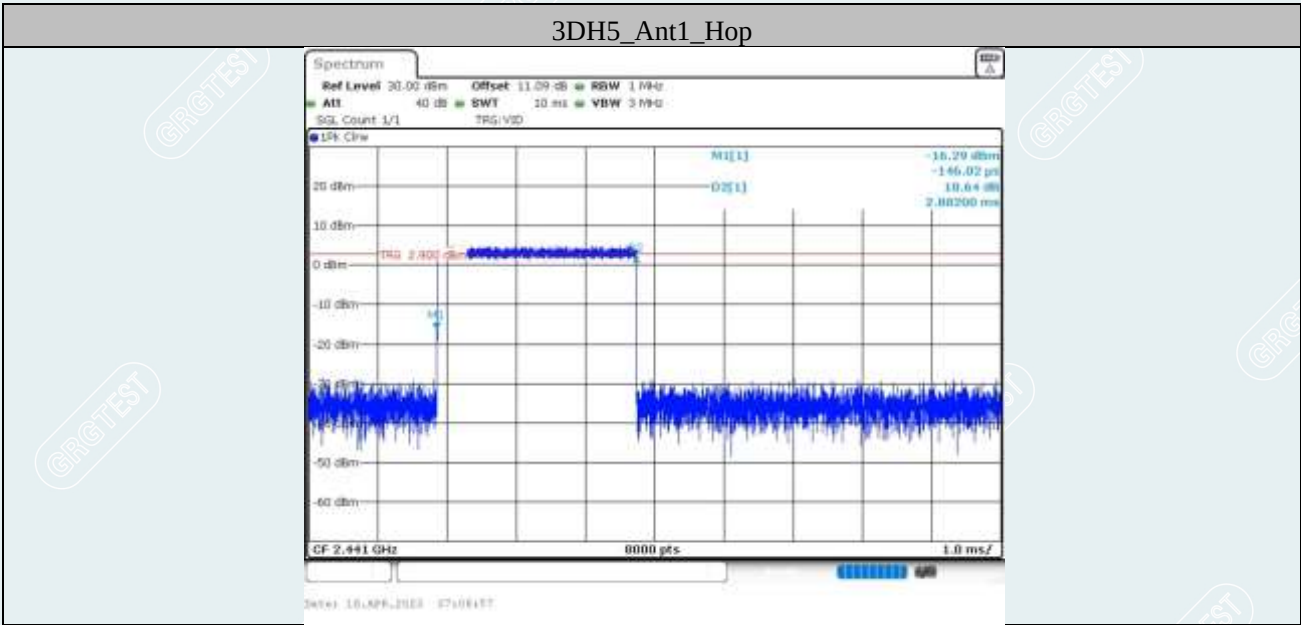
Test Graphs











11. MAXIMUM PEAK OUTPUT POWER

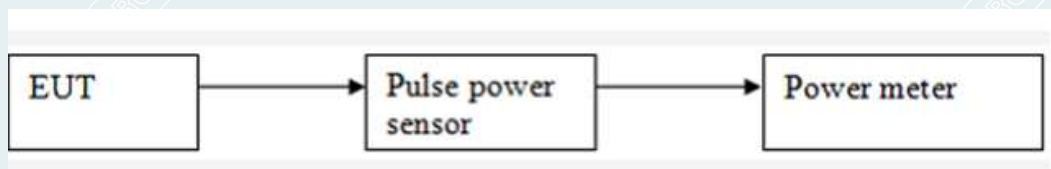
11.1 LIMITS

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



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

11.3 TEST RESULTS

Environment: 22.6°C/56%RH/101.0kPa
Tested By:Qin Tingting

Voltage:DC 13.5V
Date: 2023-04-12

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	1.61	20.97	Peak	Pass
Middle	2.441	2.04			Pass
Highest	2.480	1.91			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	4.22	20.97	Peak	Pass
Middle	2.441	5.25			Pass
Highest	2.480	5.62			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	4.01	20.97	Peak	Pass
Middle	2.441	5.57			Pass
Highest	2.480	5.46			Pass

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12. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

12.1 LIMITS

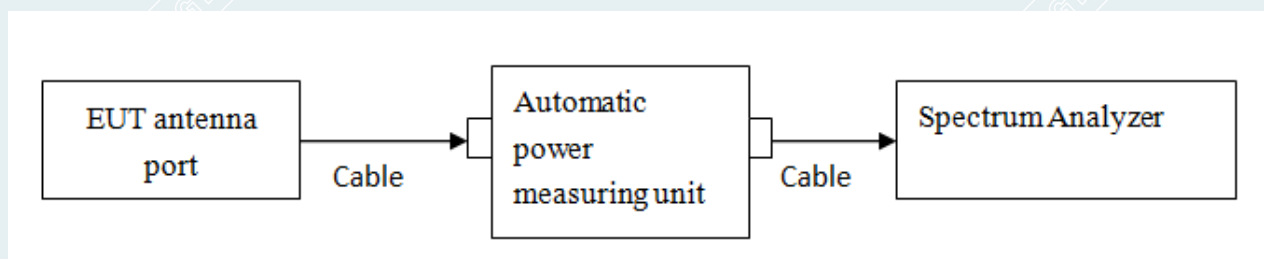
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, 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 30dB instead of 20dB.

12.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS 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: 22.6°C/56%RH/101.0kPa
Tested By:Qin Tingting

Voltage:DC 13.5V
Date: 2023-04-17 ~ 2023-04-18

Band Edge

Test Mode	Antenna	Ch Name	Freq[MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	1.63	-44.18	≤-18.37	PASS
		High	2480	1.26	-45.17	≤-18.74	PASS
		Low	Hop_2402	0.06	-45.45	≤-19.94	PASS
		High	Hop_2480	0.26	-45.51	≤-19.74	PASS
2DH5	Ant1	Low	2402	1.93	-45.66	≤-18.07	PASS
		High	2480	3.05	-45.18	≤-16.95	PASS
		Low	Hop_2402	1.62	-45.62	≤-18.38	PASS
		High	Hop_2480	3.29	-45.30	≤-16.71	PASS
3DH5	Ant1	Low	2402	2.18	-45.24	≤-17.82	PASS
		High	2480	3.15	-44.46	≤-16.85	PASS
		Low	Hop_2402	2.25	-46.02	≤-17.75	PASS
		High	Hop_2480	3.29	-43.92	≤-16.71	PASS

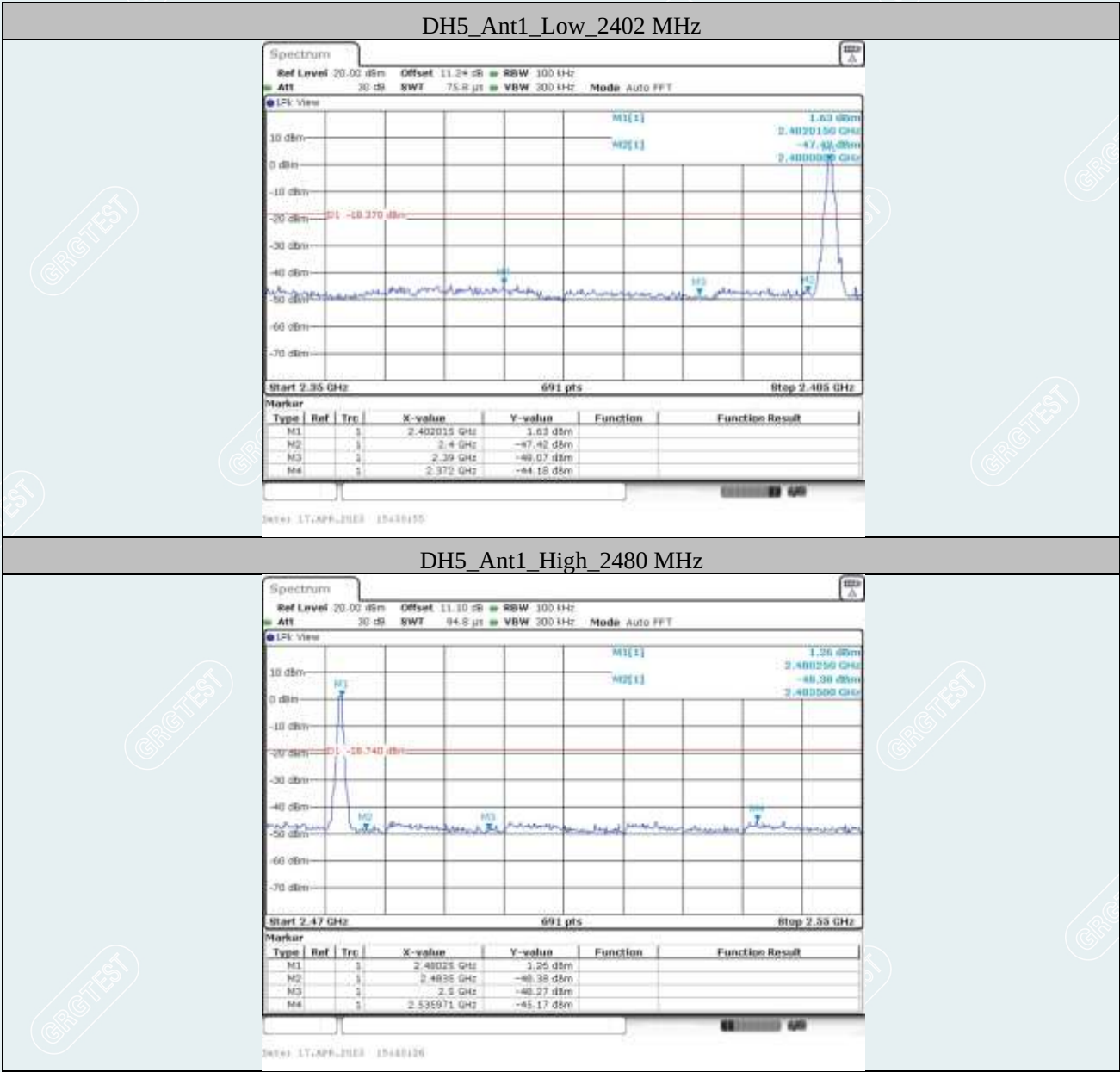
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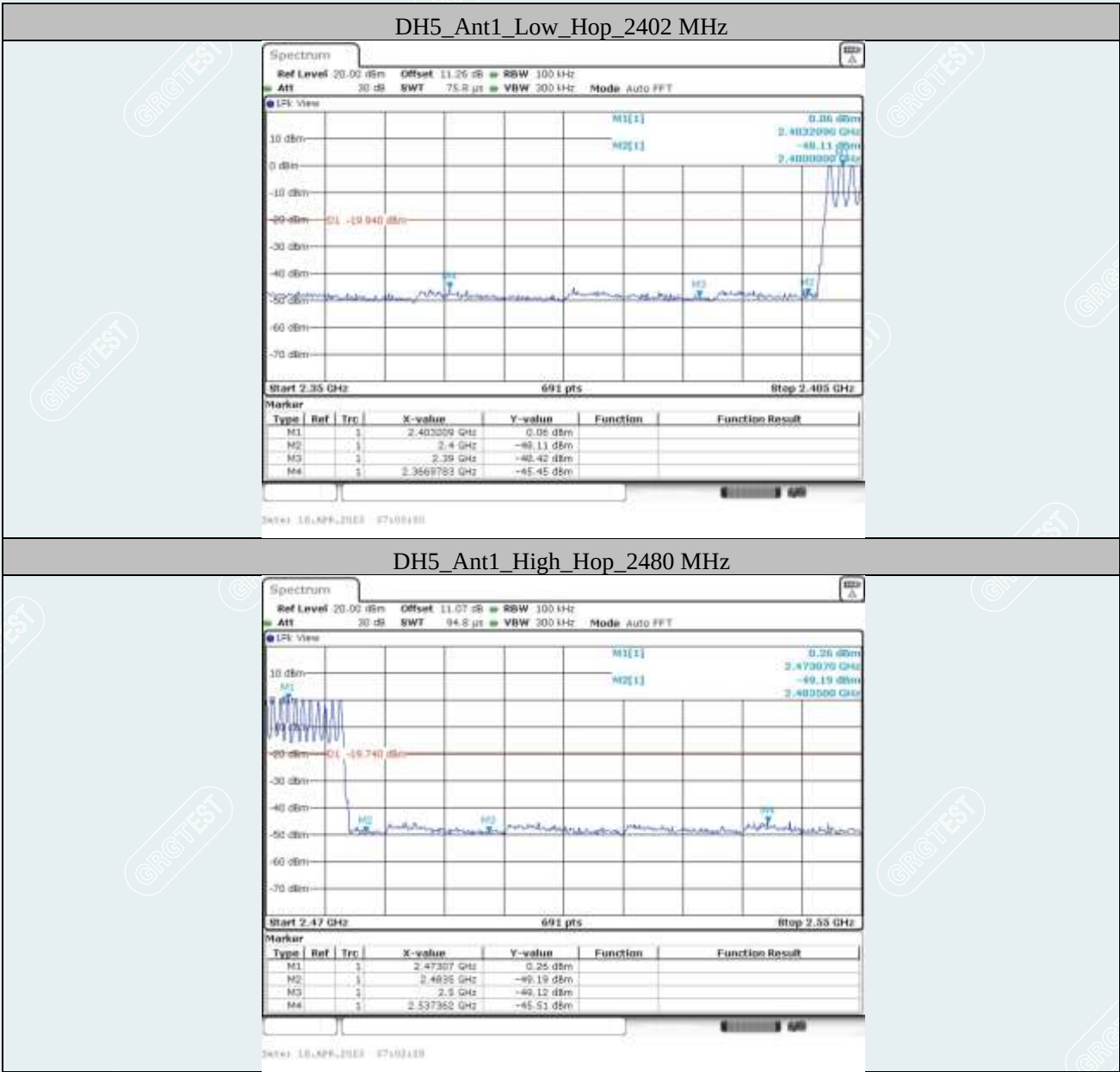
Conducted Spurious Emission

Test Mode	Antenna	Freq[MHz]	Freq Range [MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	1.84	1.84	---	PASS
			30~1000	1.84	-55.22	≤-18.16	PASS
			1000~26500	1.84	-41.32	≤-18.16	PASS
		2441	Reference	1.58	1.58	---	PASS
			30~1000	1.58	-55.42	≤-18.42	PASS
			1000~26500	1.58	-41.05	≤-18.42	PASS
		2480	Reference	1.22	1.22	---	PASS
			30~1000	1.22	-55.24	≤-18.78	PASS
			1000~26500	1.22	-41.00	≤-18.78	PASS
2DH5	Ant1	2402	Reference	2.07	2.07	---	PASS
			30~1000	2.07	-55.54	≤-17.93	PASS
			1000~26500	2.07	-40.76	≤-17.93	PASS
		2441	Reference	2.78	2.78	---	PASS
			30~1000	2.78	-56.19	≤-17.22	PASS
			1000~26500	2.78	-40.38	≤-17.22	PASS
		2480	Reference	3.01	3.01	---	PASS
			30~1000	3.01	-55.70	≤-16.99	PASS
			1000~26500	3.01	-41.91	≤-16.99	PASS
3DH5	Ant1	2402	Reference	2.31	2.31	---	PASS
			30~1000	2.31	-52.94	≤-17.69	PASS
			1000~26500	2.31	-41.36	≤-17.69	PASS
		2441	Reference	2.93	2.93	---	PASS
			30~1000	2.93	-55.11	≤-17.07	PASS
			1000~26500	2.93	-42.24	≤-17.07	PASS
		2480	Reference	3.16	3.16	---	PASS
			30~1000	3.16	-55.80	≤-16.84	PASS
			1000~26500	3.16	-41.71	≤-16.84	PASS

Test Graphs

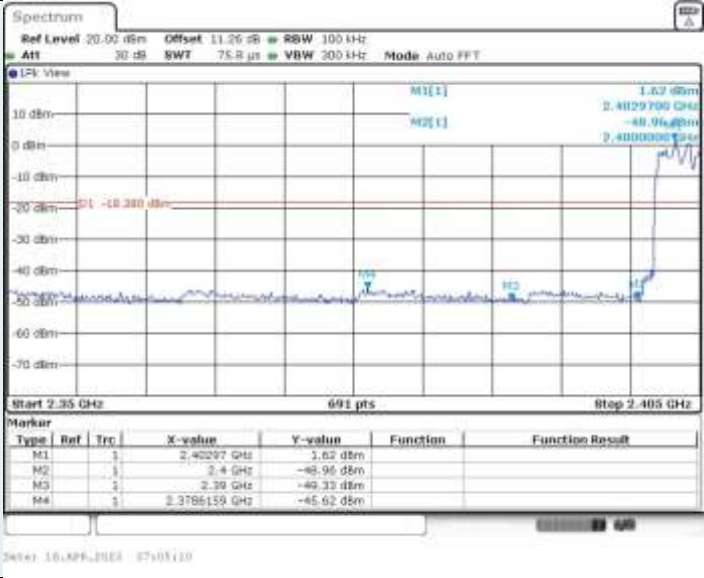
Band Edge



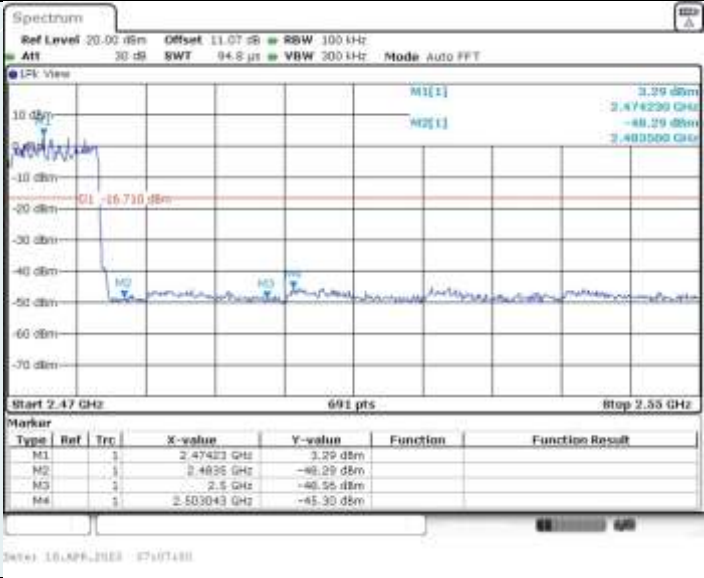




2DH5_Ant1_Low_Hop_2402 MHz

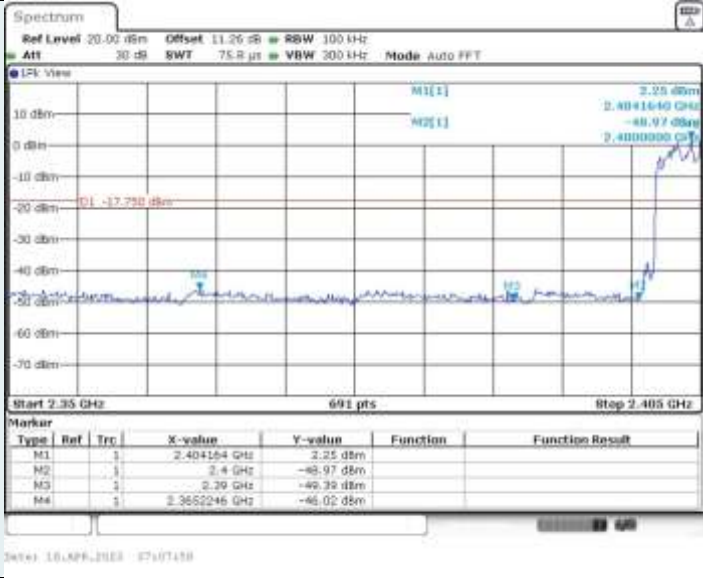


2DH5_Ant1_High_Hop_2480 MHz

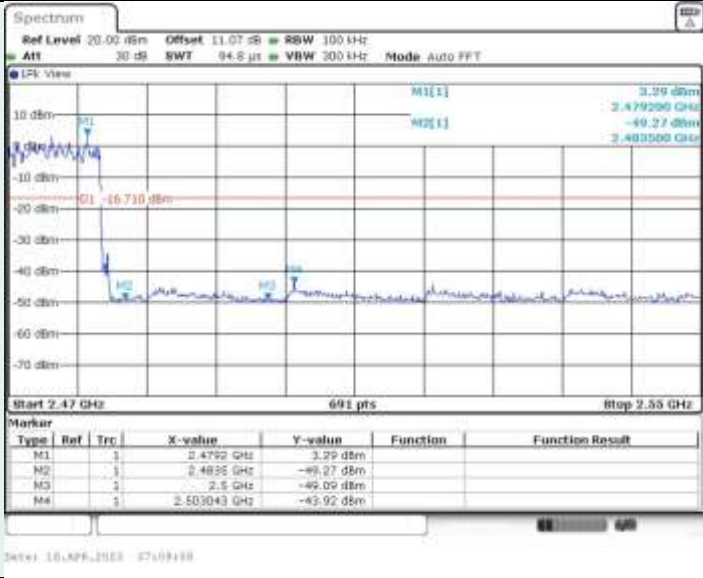




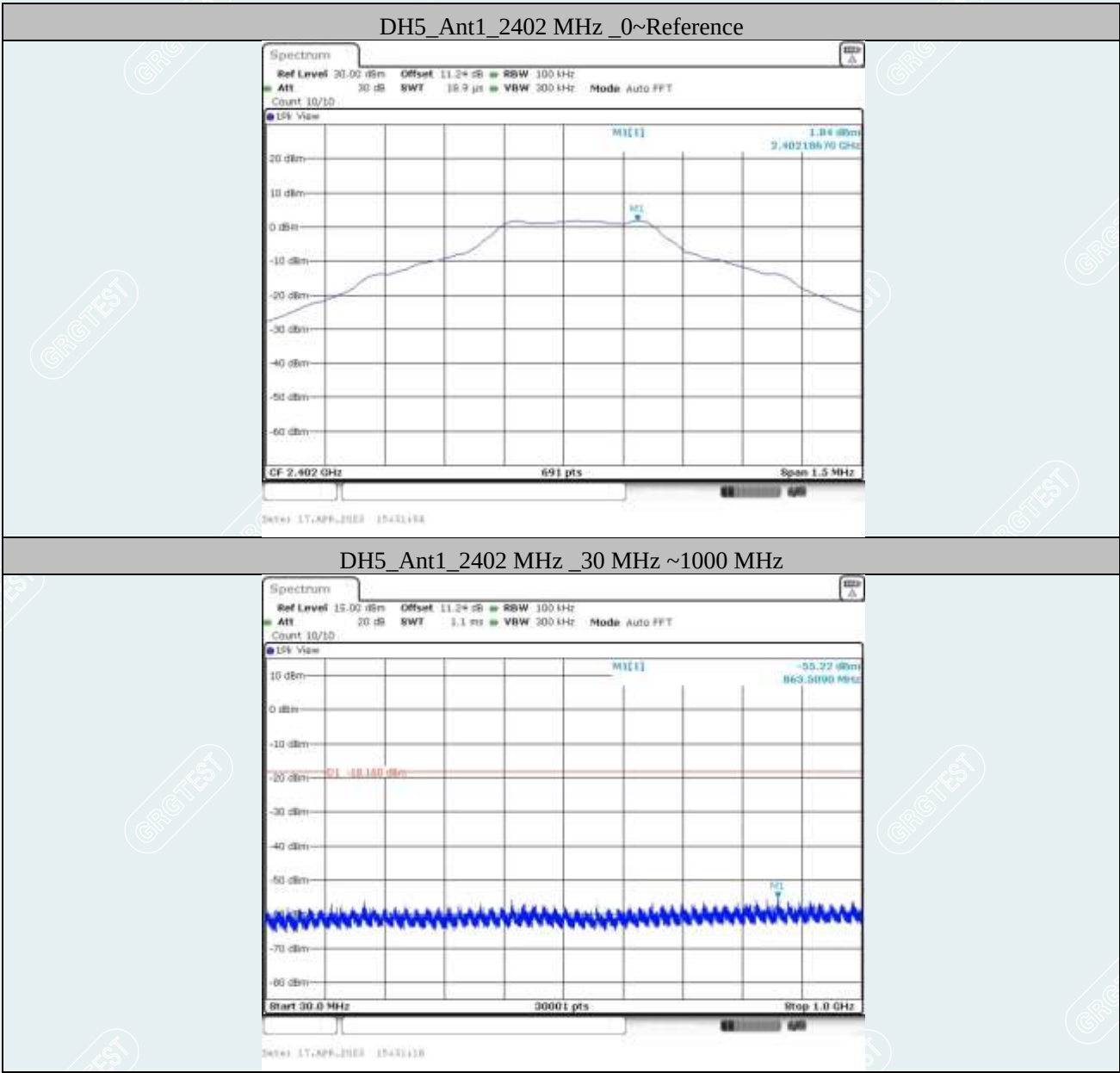
3DH5_Ant1_Low_Hop_2402 MHz

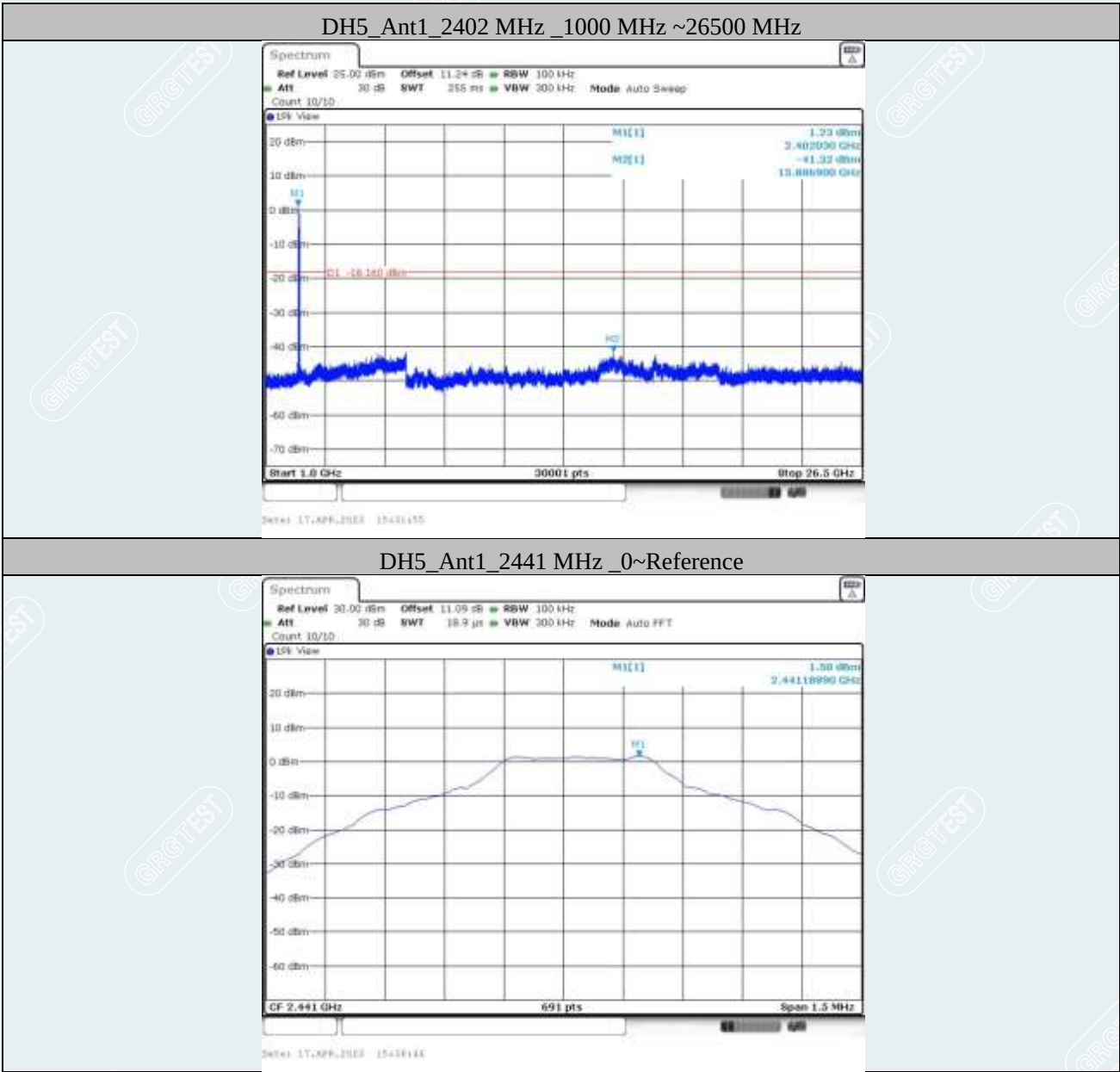


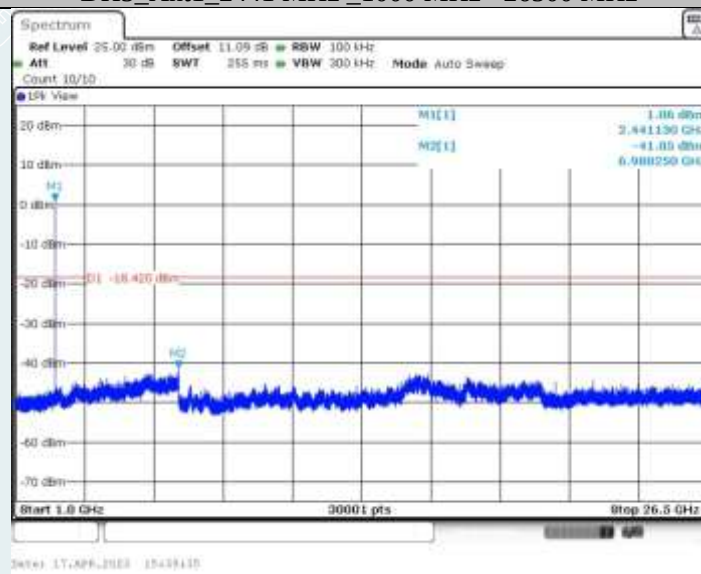
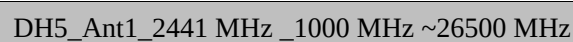
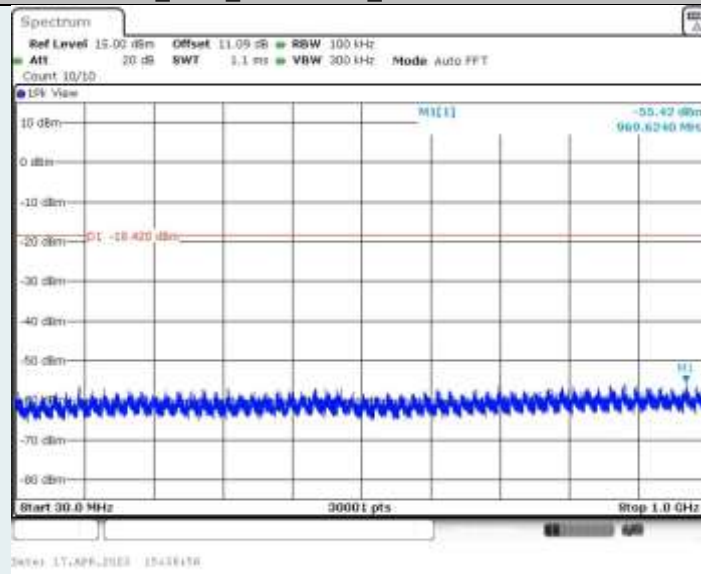
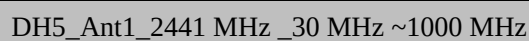
3DH5_Ant1_High_Hop_2480 MHz

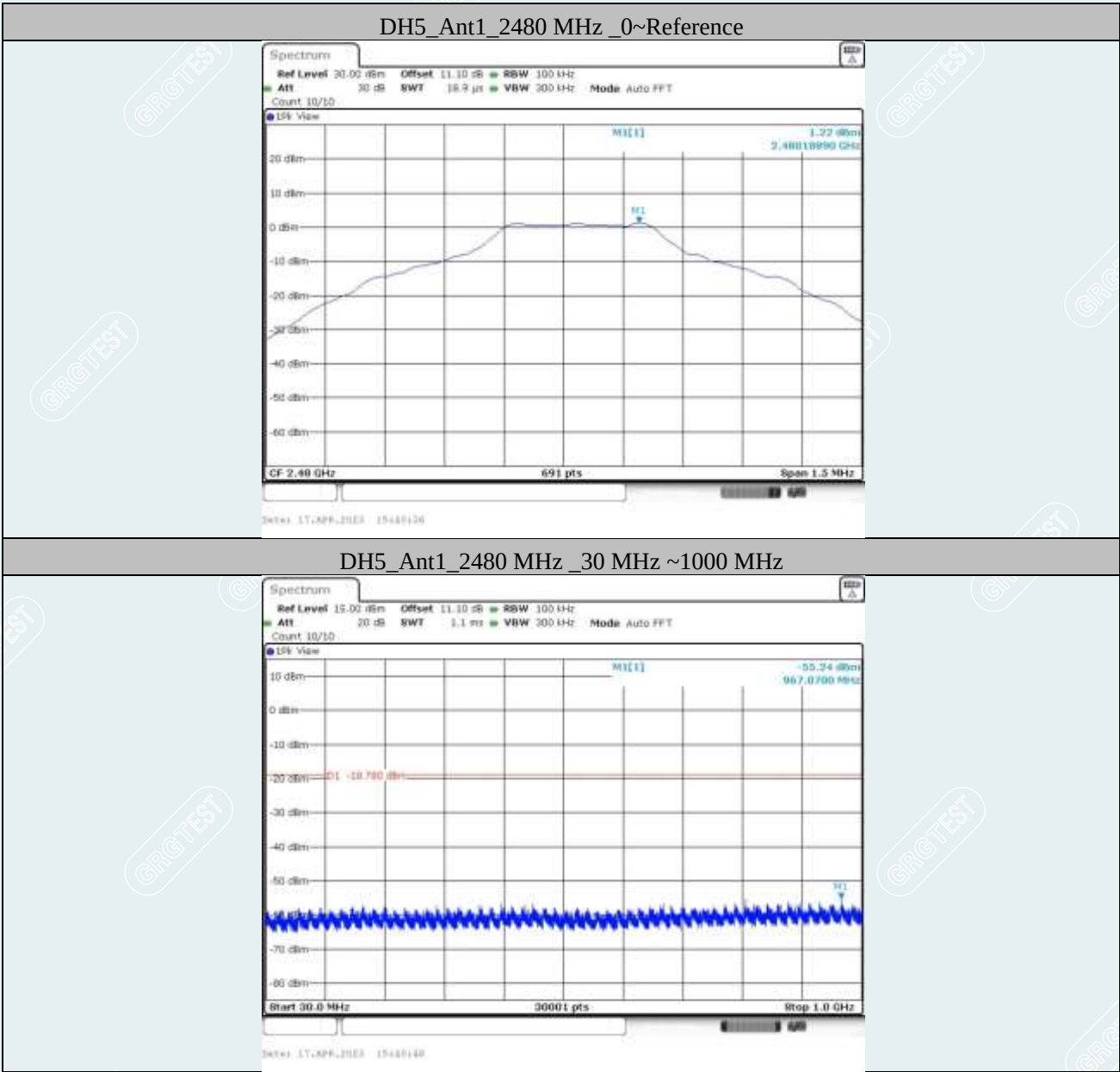


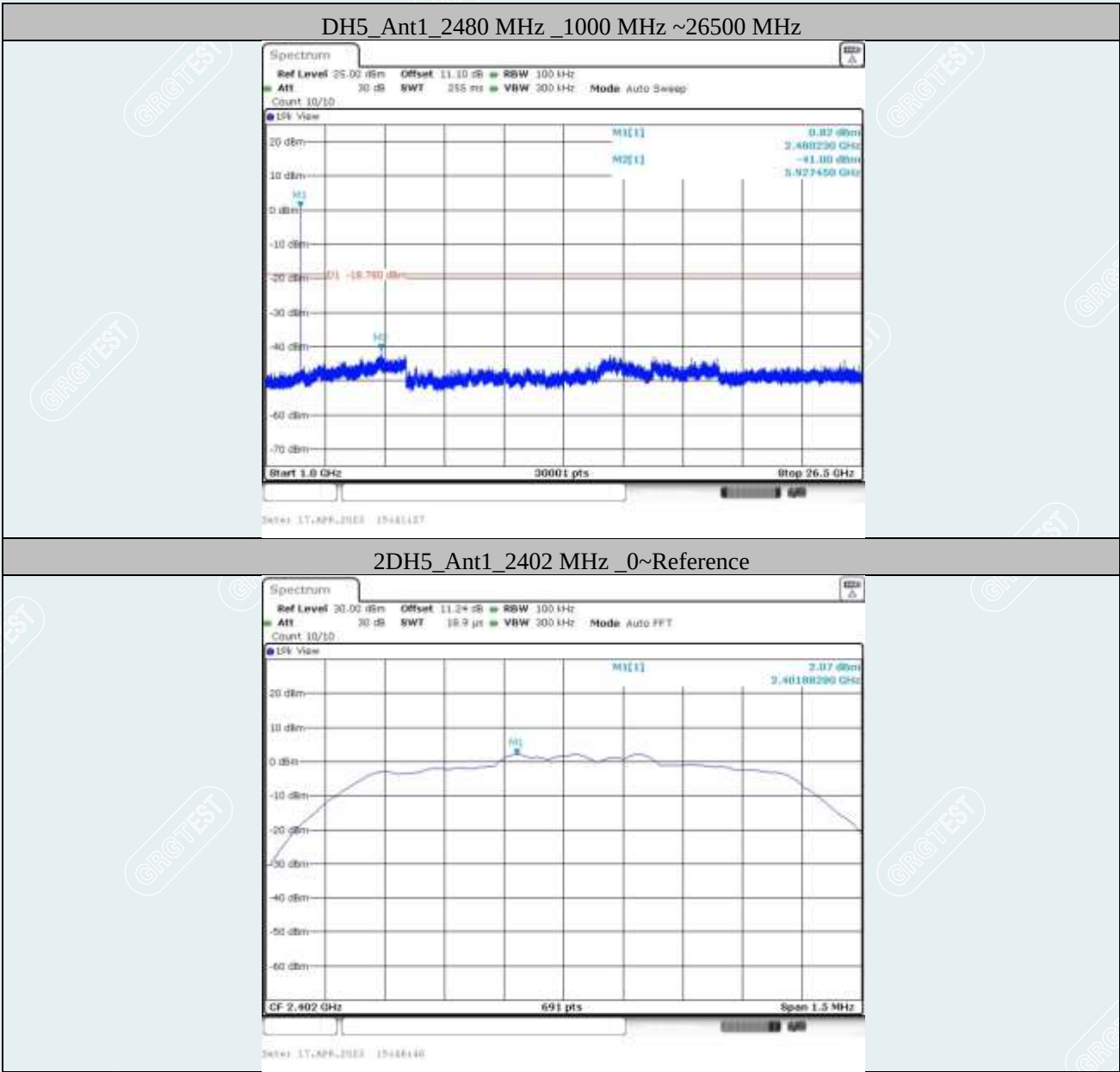
Conducted Spurious Emission

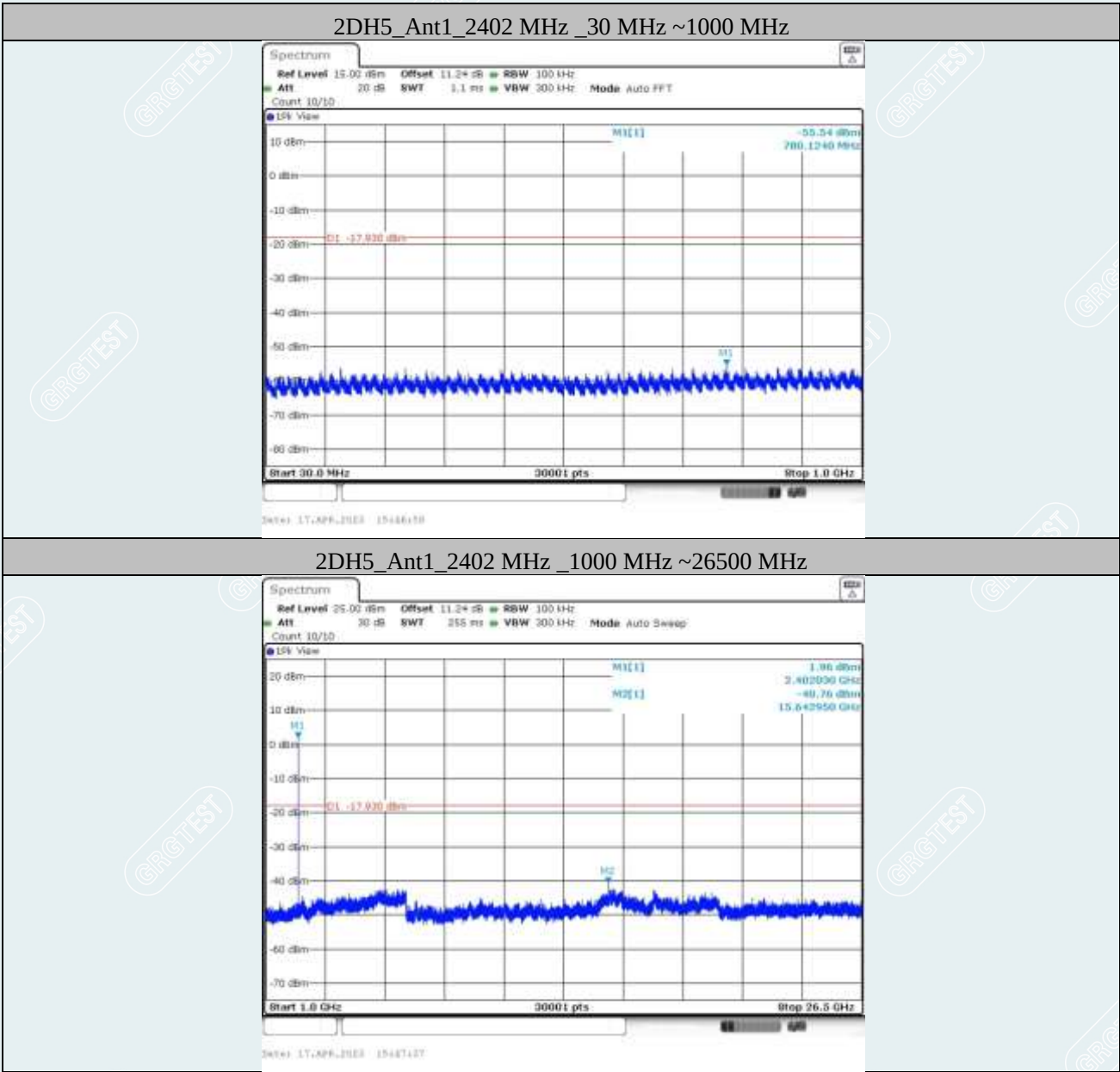


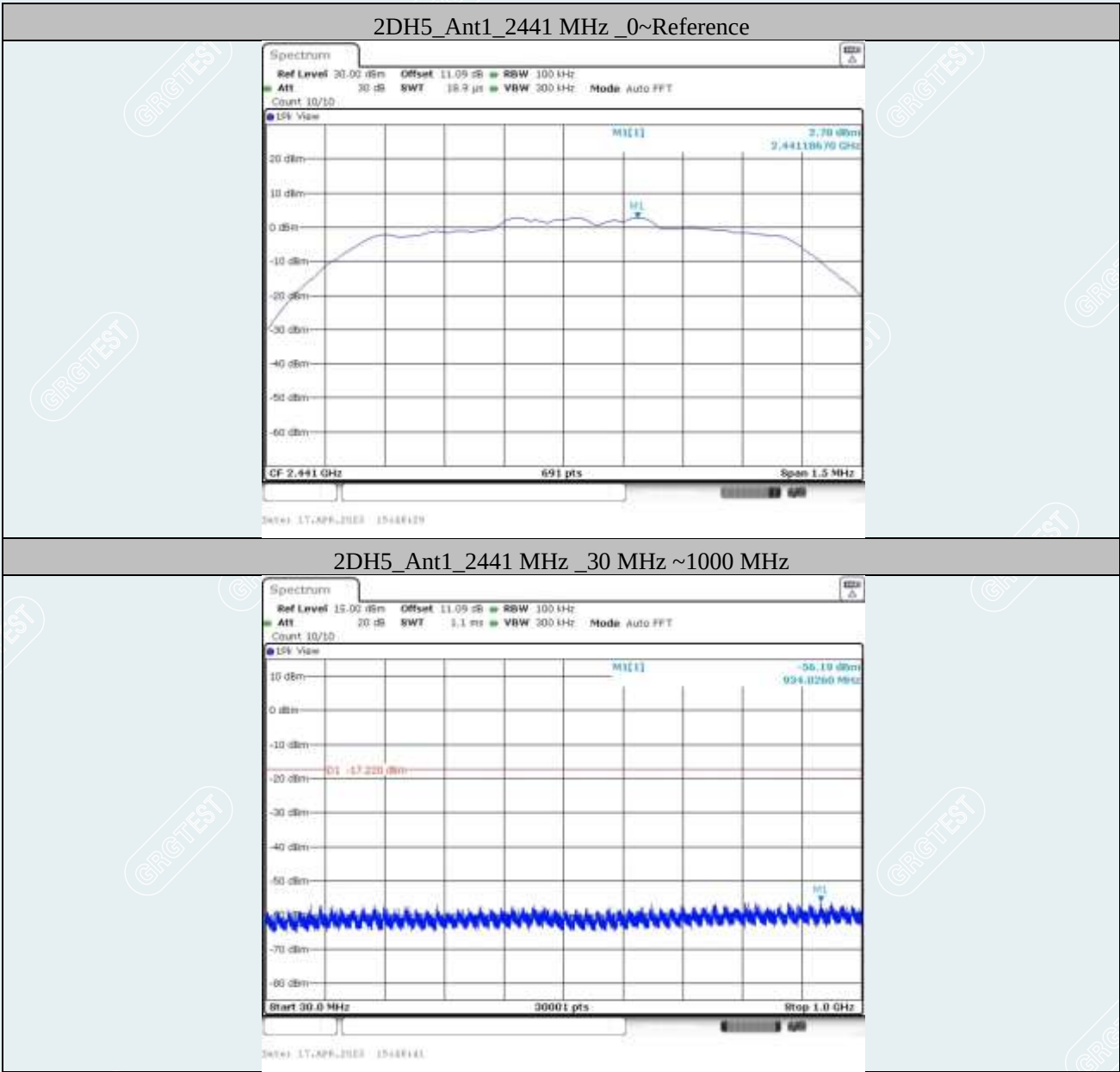


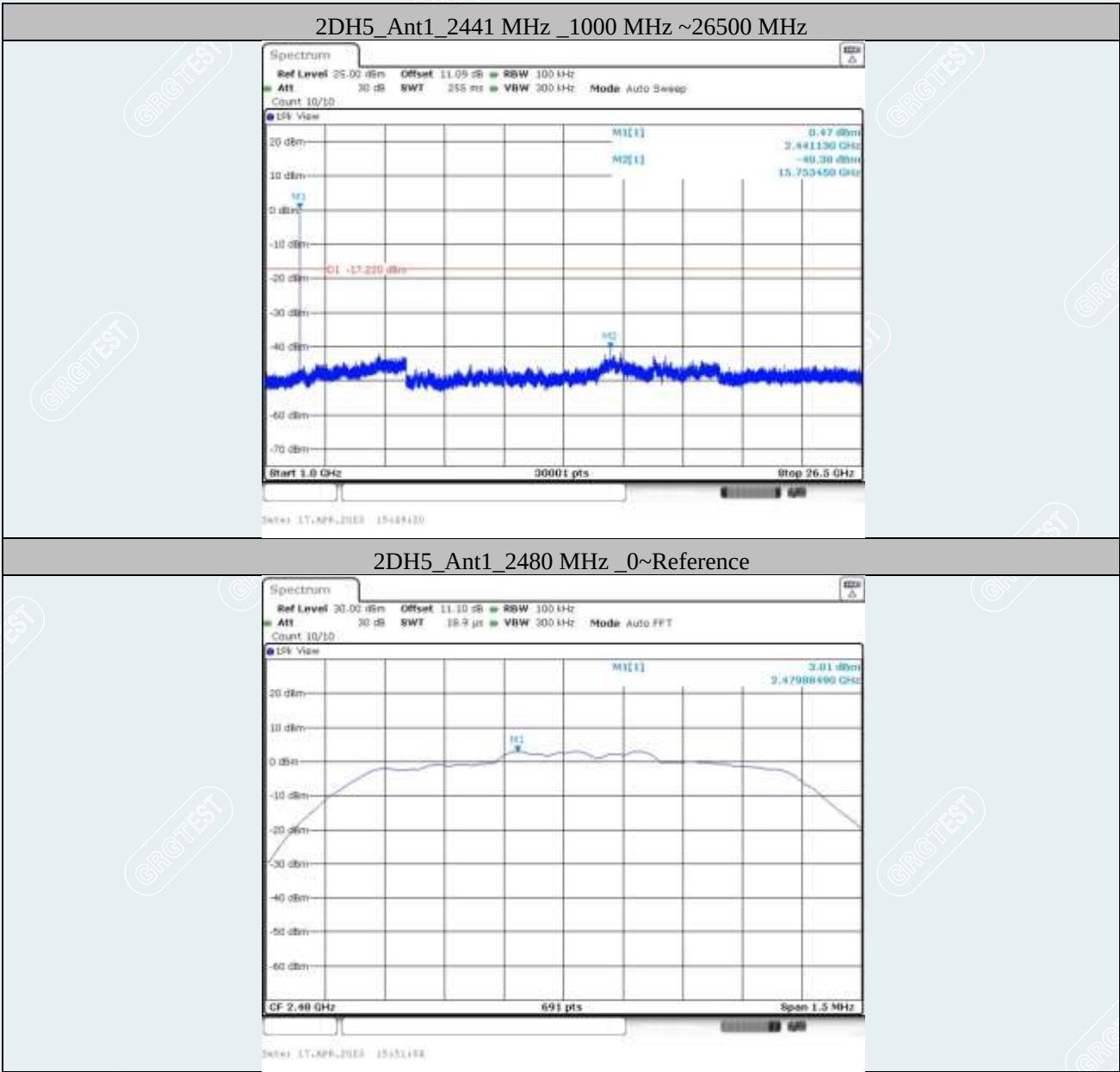


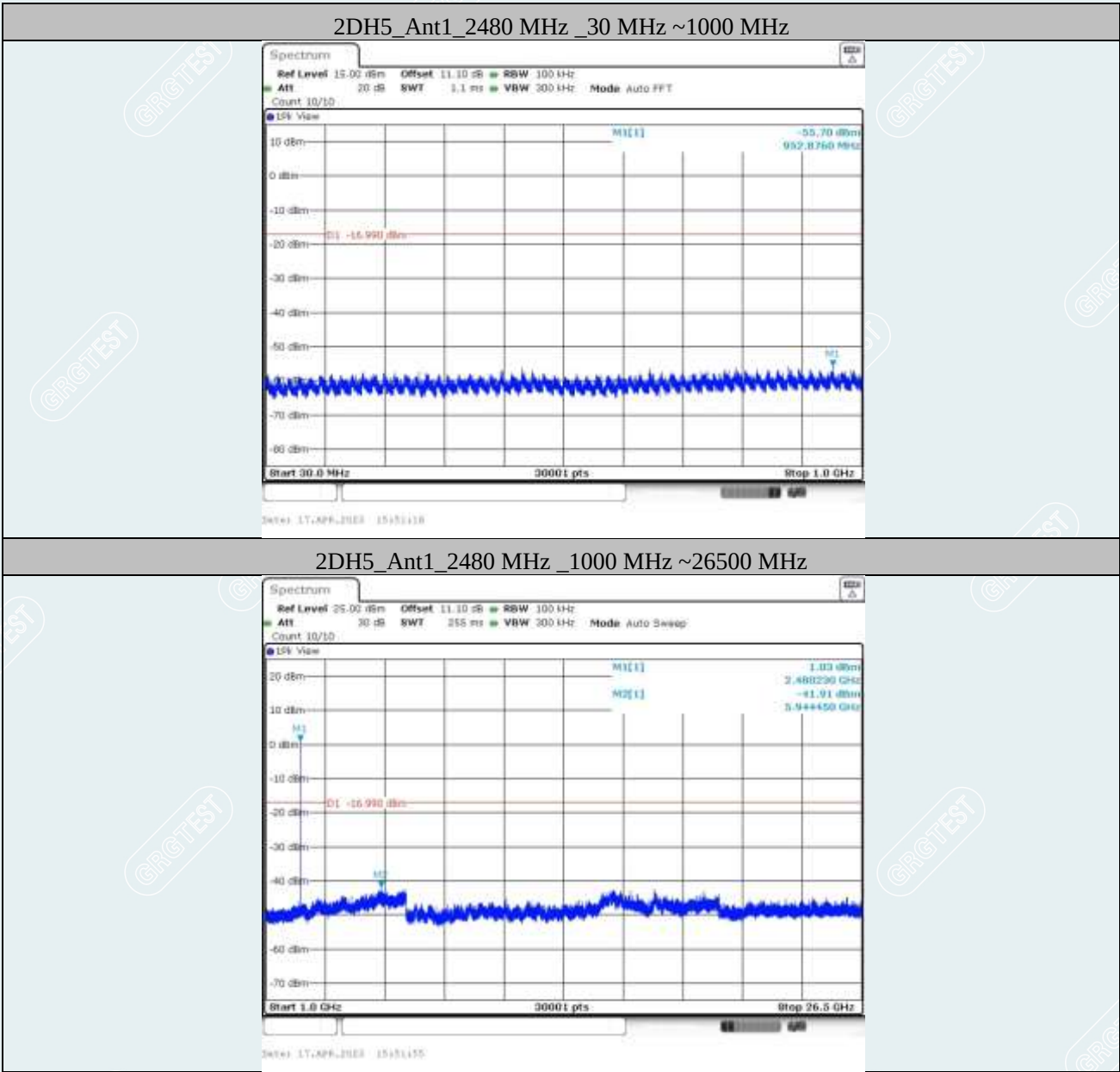


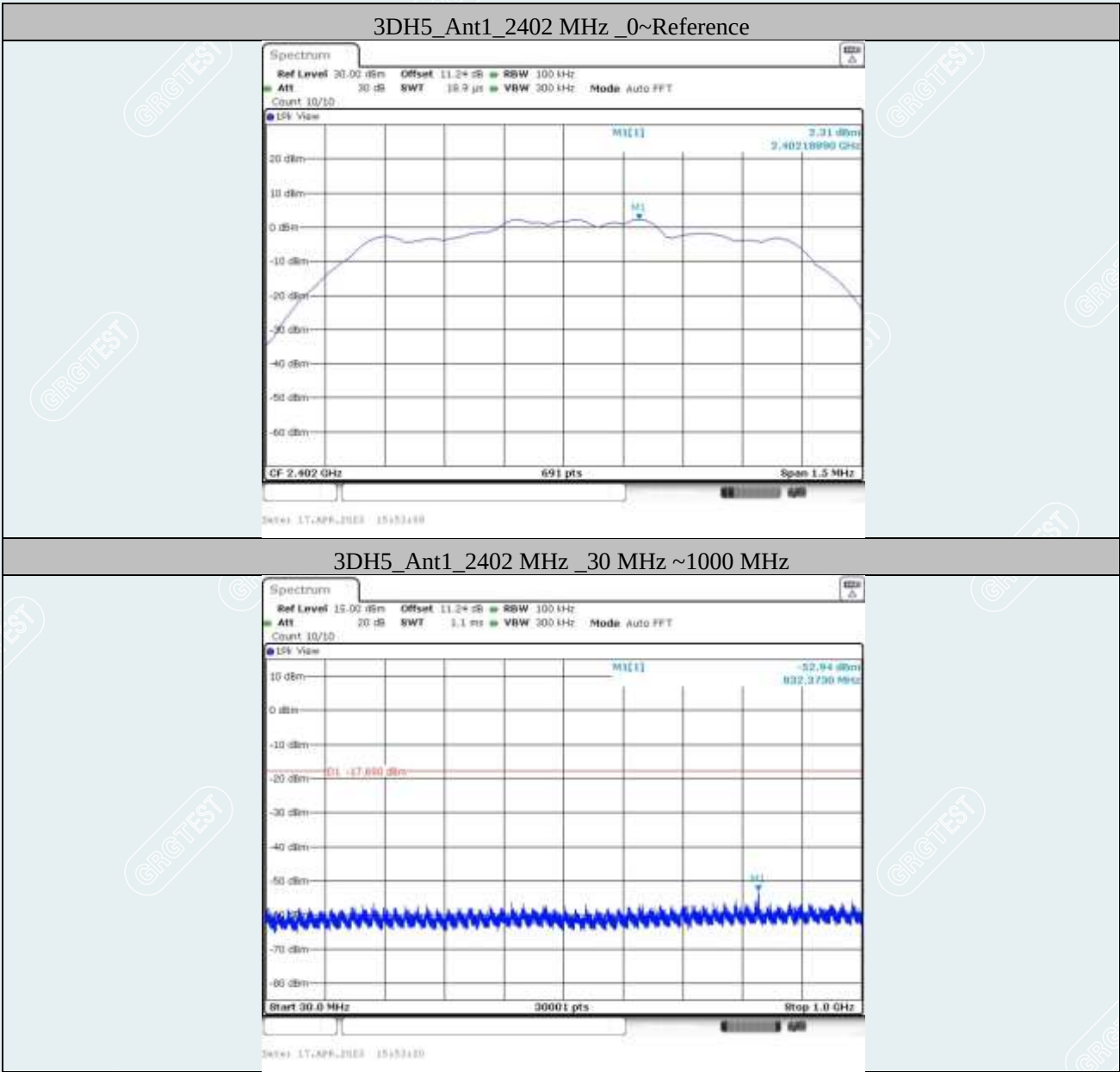


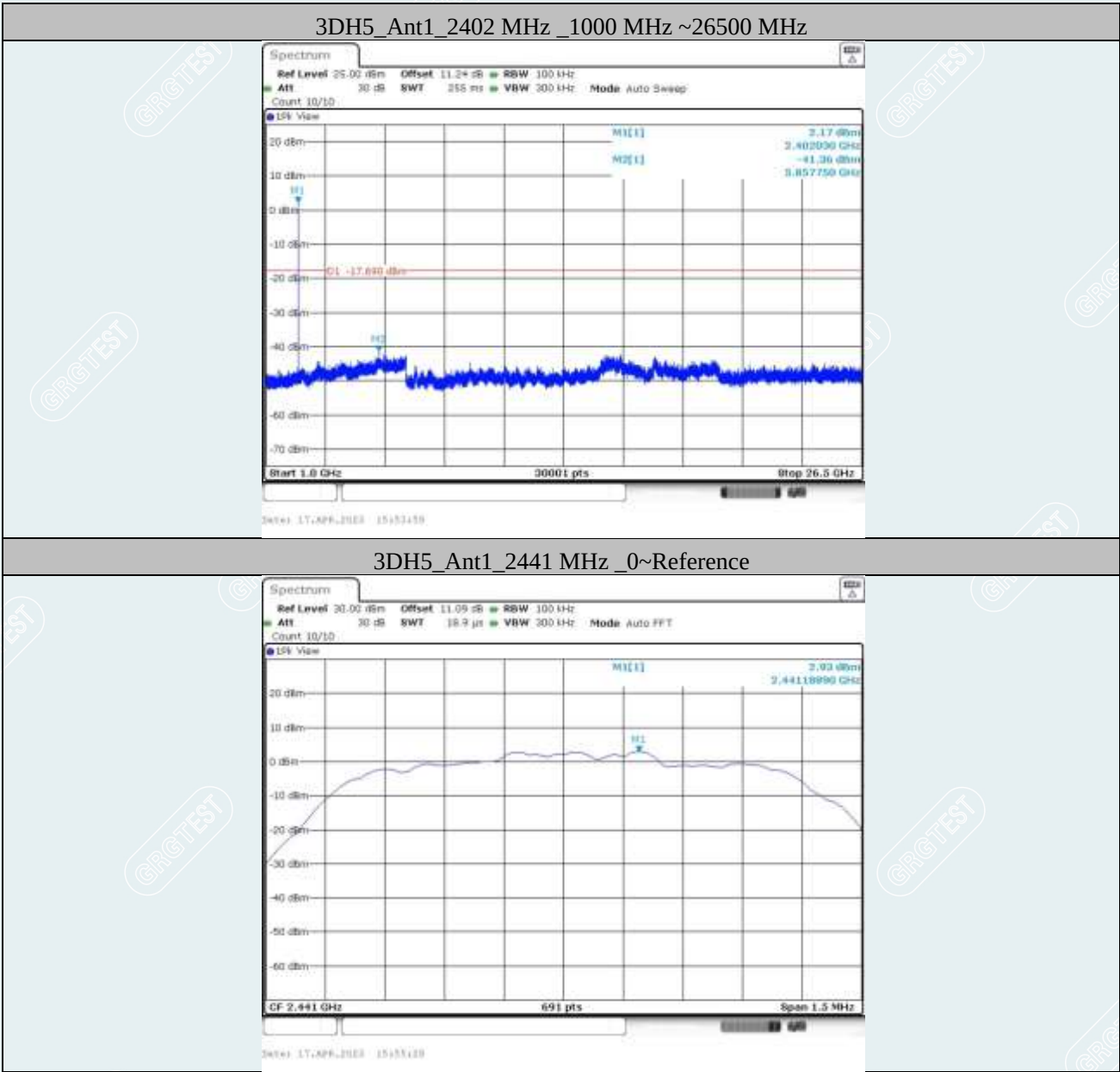


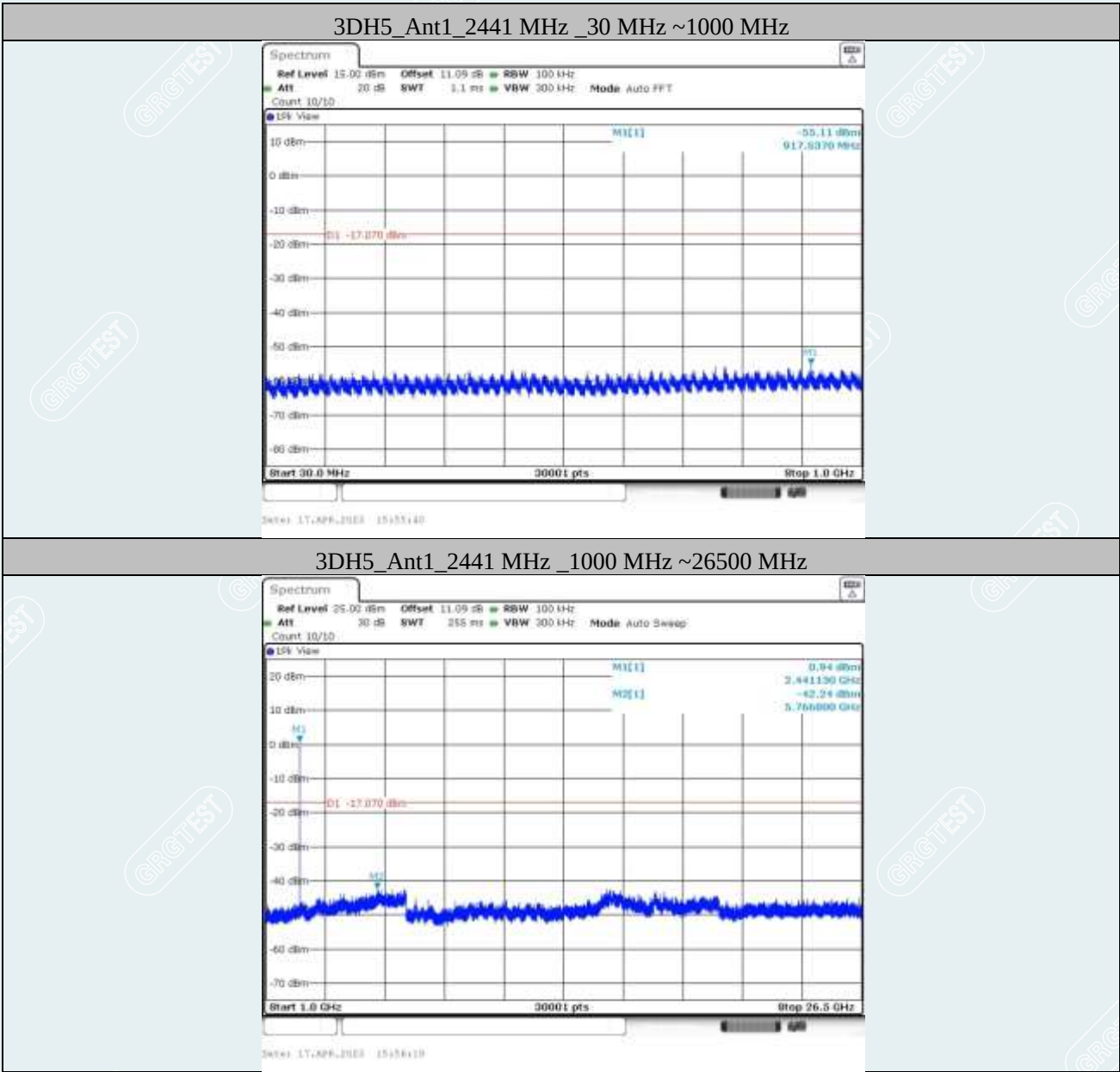


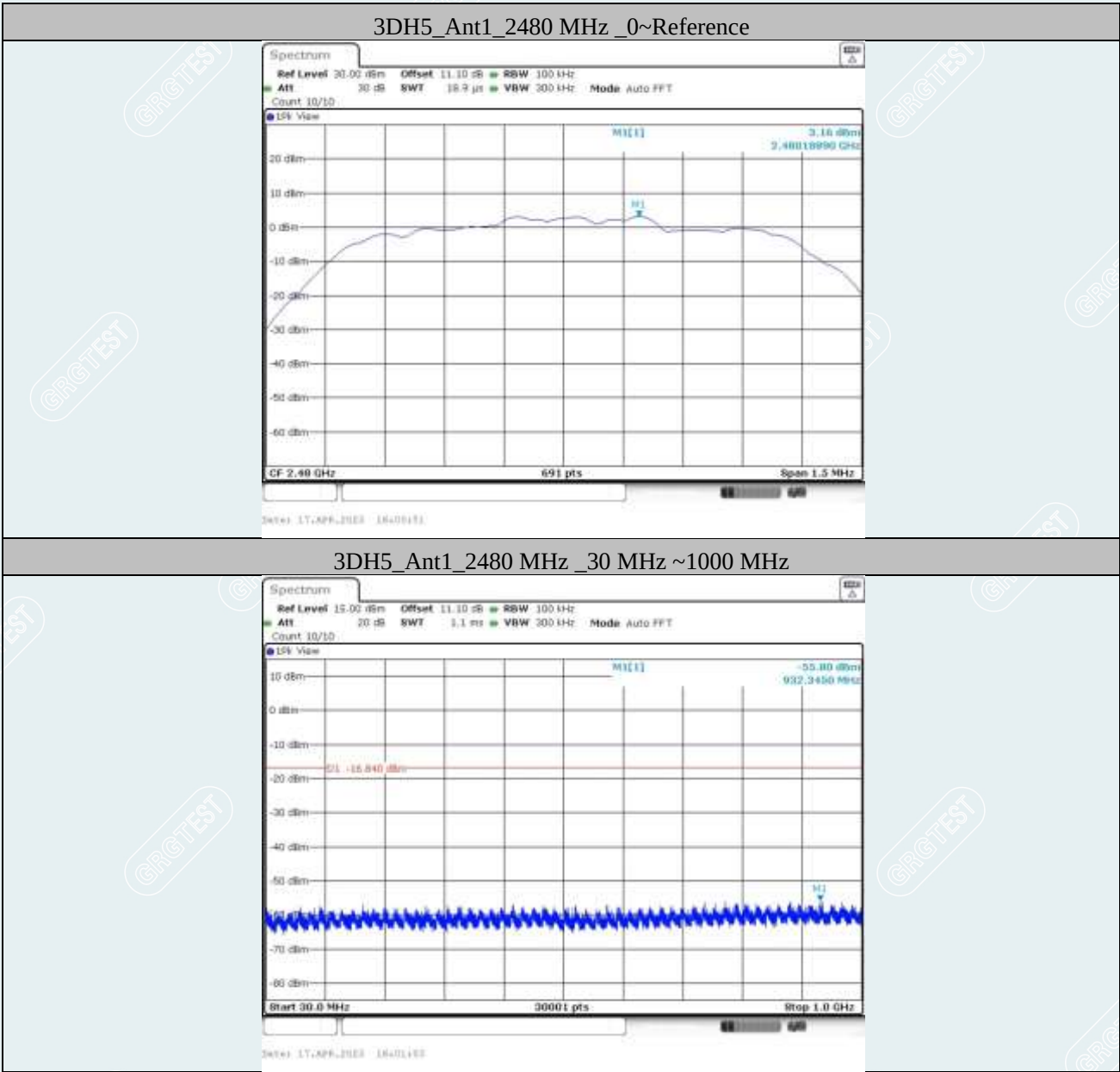


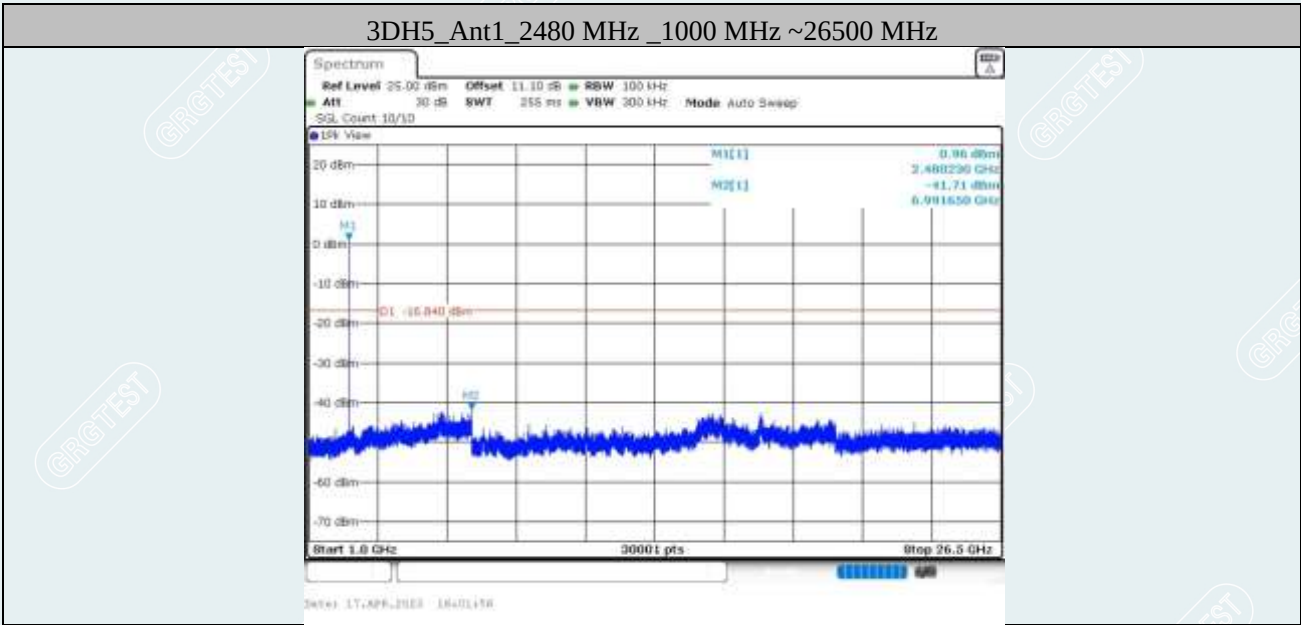












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13. RADIATED SPURIOUS EMISSIONS

13.1 LIMITS

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, 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 30dB instead of 20dB. 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 9-90kHz and 110-490kHz 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 9kHz to 30MHz

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.
- Set the EUT transmit continuously with maximum output power.
- 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 30MHz to 1GHz

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.

--- Set the EUT transmit continuously with maximum output power.

--- 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 1GHz to 18GHz

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.

--- Set the EUT transmit continuously with maximum output power.

--- 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 18GHz**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.
- Set the EUT transmit continuously with maximum output power.
- 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), RBW=300Hz(for Peak&AVG). the frequency from 150kHz to 30MHz, Set RBW=9kHz, RBW=9kHz, (for QP Detector).

- (b).The frequency from 30MHz to 1GHz, Set RBW=120kHz, RBW=300kHz, (for QP Detector).
- (c).The frequency above 1GHz, for Peak detector: Set RBW=1MHz, RBW=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 10 Hz. if the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$, Where T is defined in section 2.8.

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13.3 TEST SETUP

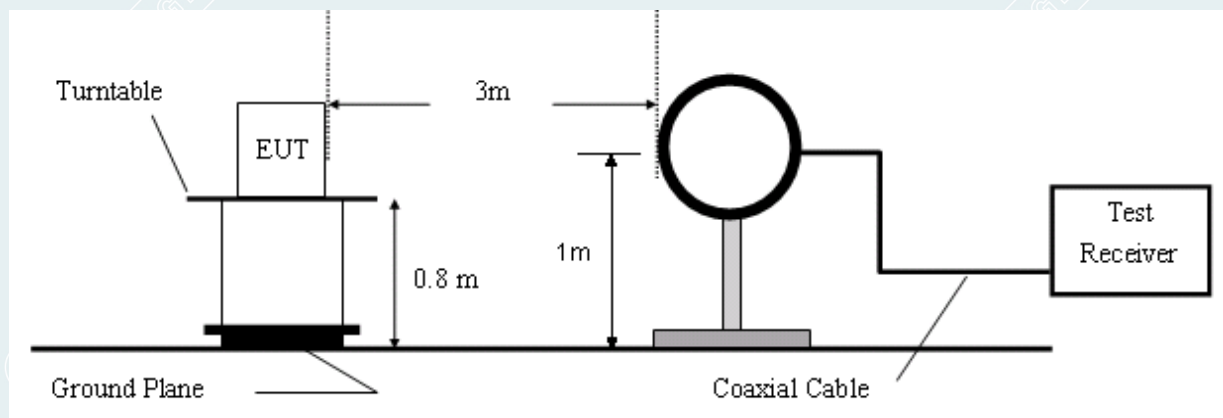


Figure 1. 9kHz to 30MHz radiated emissions test configuration

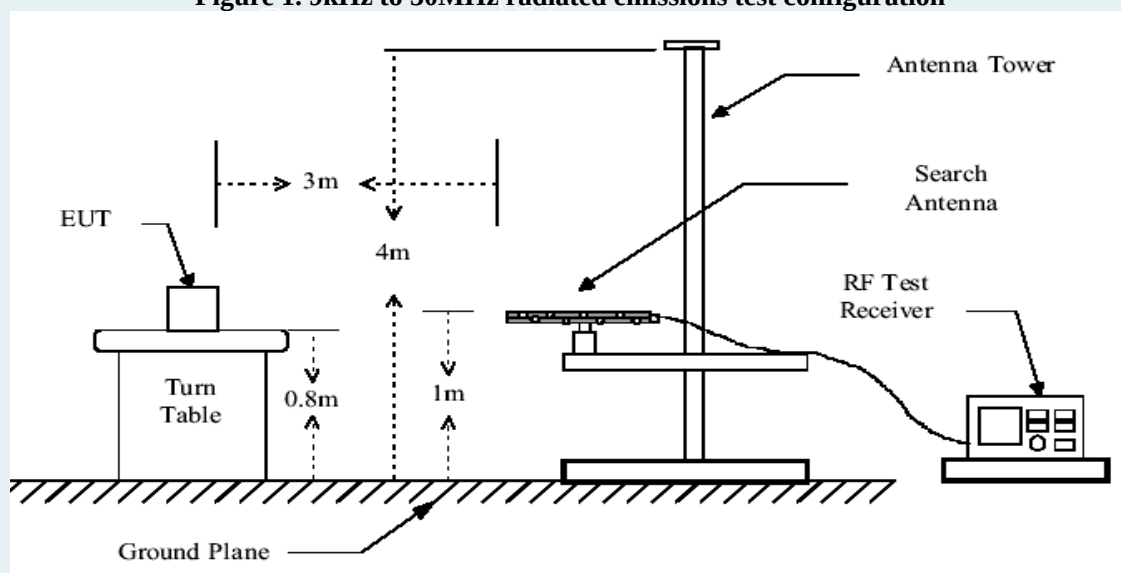


Figure 2. 30MHz to 1GHz radiated emissions test configuration

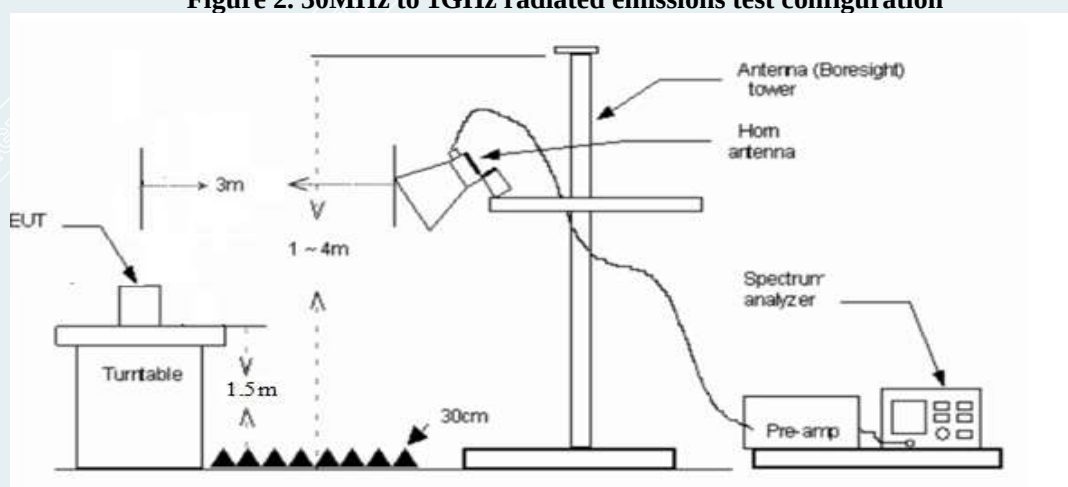


Figure 3. 1GHz to 18GHz radiated emissions test configuration

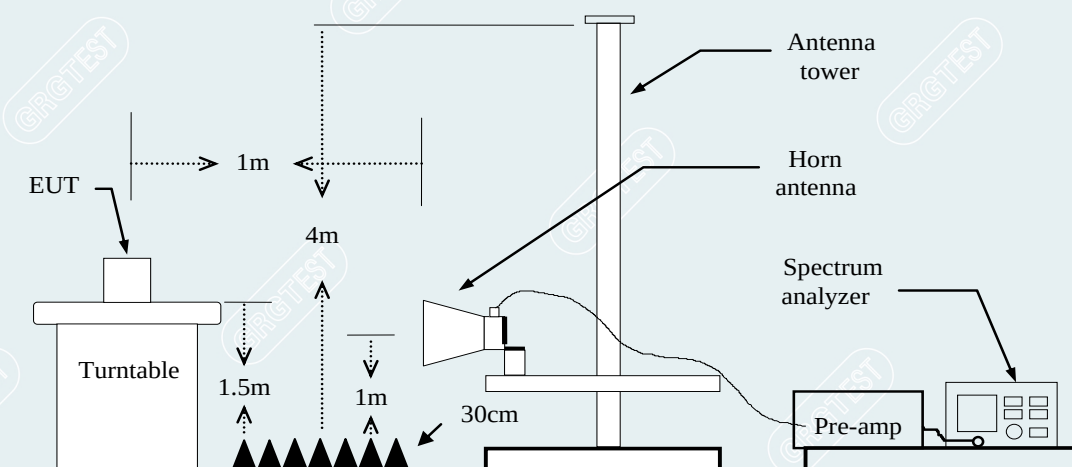


Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

13.4 DATA SAMPLE

30MHz to 1GHz

Suspected Data List										
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	66.85	31.09	-35.76	40.00	8.91	PK	200	351	Horizontal

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB μ V/m]	Level [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	-31.57	71.28	39.71	46.00	6.29	100	196	Horizontal

Frequency (MHz)	= Emission frequency in MHz
Reading (dB μ V/m)	= Uncorrected Analyzer / Receiver reading
Factor (dB)	= Antenna factor + Cable loss – Amplifier gain
Level (dB μ V/m)	= Reading (dB μ V/m) + Factor (dB)
Limit (dB μ V/m)	= Limit stated in standard
Margin (dB)	= Limit (dB μ V/m) – Level (dB μ V/m)
Polarity	= Antenna polarization
Peak	= Peak Reading
QP	= Quasi-peak Reading

1GHz-18GHz

No.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	78.01	55.30	-22.71	74.00	18.70	100	50	Horizontal	Peak
xxx	xxxx	66.37	43.66	-22.71	54.00	10.34	100	50	Horizontal	AVG

Above 18GHz

No.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	54.49	42.38	-12.11	83.54	41.16	100	211	Vertical	Peak
xxx	xxxx	43.99	31.88	-12.11	63.54	31.66	100	211	Vertical	AVG

Frequency (MHz)	= Emission frequency in MHz
Reading (dBμV/m)	= Uncorrected Analyzer / Receiver reading
Factor (dB)	= Antenna factor + Cable loss – Amplifier gain
Level (dBμV/m)	= Reading (dBμV/m) + Factor (dB)
Limit (dBμV/m)	= Limit stated in standard
Margin (dB)	= Limit (dBμV/m) – Level (dBμV/m)
Polarity	= Antenna polarization
Peak	= Peak Reading
AVG	= Average Reading

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13.5 TEST RESULTS

Below 1GHz

All models were pretested and only the worst modes and channels were recorded in this report (2DH5-2480MHz).

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

Mode: 2DH5

Highest Frequency (2480MHz)

Environment: 21.6°C/64%RH/101.0kPa

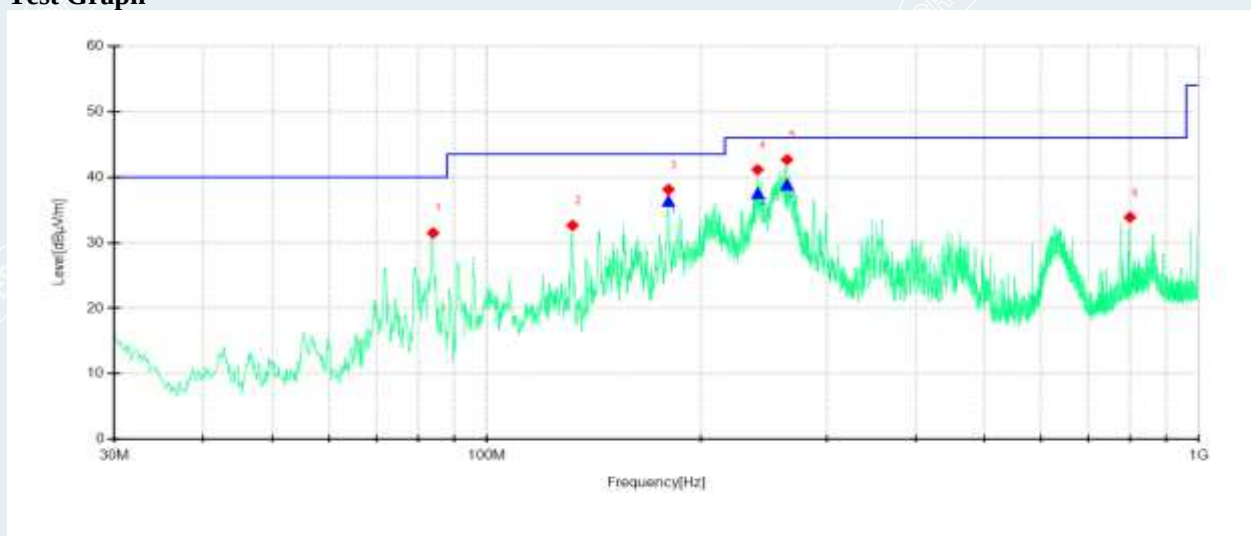
Test Engineer: Zhang Zishan

Date: 2023-05-19

Test Voltage: DC 13.5V

Probe : Horizontal

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	84.0843	67.26	31.50	-35.76	40.00	8.50	PK	200	16	Horizontal
2	131.984	64.10	32.65	-31.45	43.50	10.85	PK	200	279	Horizontal
3	180.005	70.53	38.14	-32.39	43.50	5.36	PK	100	1	Horizontal
4	240.0313	73.54	41.14	-32.40	46.00	4.86	PK	100	325	Horizontal
5	264.0418	74.28	42.66	-31.62	46.00	3.34	PK	100	208	Horizontal
6	800.0338	53.18	33.89	-19.29	46.00	12.11	PK	100	139	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBμV/m]	Level [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	180.0024	-32.39	68.75	36.36	43.50	7.14	135	143.1	Horizontal
2	240.2953	-32.40	69.94	37.54	46.00	8.46	114	319.7	Horizontal
3	263.9501	-31.62	70.49	38.87	46.00	7.13	100	187.4	Horizontal

Mode: 2DH5

Highest Frequency (2480MHz)

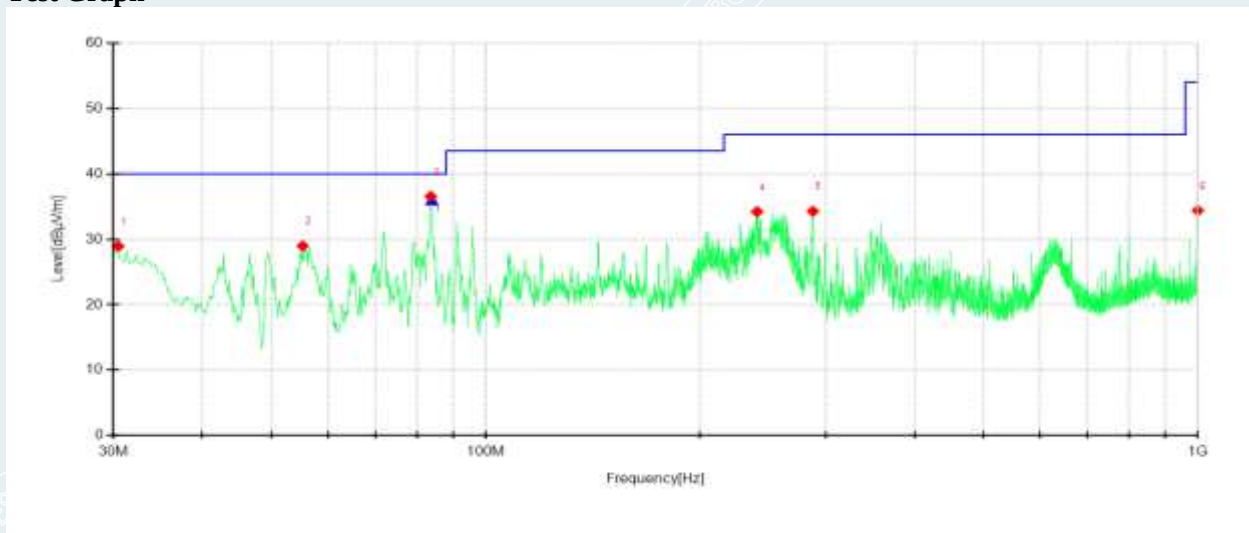
Environment: 21.6°C/64%RH/101.0kPa

Test Engineer: Zhang Zishan

Date: 2023-05-19

Test Voltage: DC 13.5V

Probe : Vertical

Test Graph

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	30.4851	59.93	28.94	-30.99	40.00	11.06	PK	100	26	Vertical
2	55.3444	60.08	28.98	-31.10	40.00	11.02	PK	100	117	Vertical
3	83.7205	72.32	36.56	-35.76	40.00	3.44	PK	100	324	Vertical
4	240.5163	66.60	34.22	-32.38	46.00	11.78	PK	200	71	Vertical
5	288.0523	65.02	34.29	-30.73	46.00	11.71	PK	100	176	Vertical
6	1000	52.15	34.40	-17.75	54.00	19.60	PK	100	166	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBμV/m]	Level [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	84.0064	-35.76	71.84	36.08	40.00	3.92	115	319.8	Vertical

Remark:

- No emission found between lowest internal used/generated frequency to 30MHz.
- Pre-scan all mode and recorded the worst case results in this report (TX-Highest Channel(2DH5))
- Measuring frequencies from 9kHz to the 1GHz.
- Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak/Quasi-peak detector mode.
- 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.
- The IF bandwidth of SPA between 30MHz to 1GHz was 120kHz.

1GHz to 18GHz

Mode: DH5

Lowest Frequency (2402MHz)

Environment: 20.5°C/63%RH 101.0kPa

Test Engineer: Zhang Zishan

Date: 2023-05-13

Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1301.2877	67.85	45.26	-22.59	74.00	28.74	200	95	Horizontal
2	1664.8331	67.23	45.55	-21.68	74.00	28.45	100	243	Horizontal
3	2534.1918	62.15	45.71	-16.44	74.00	28.29	100	16	Horizontal
4	9342.0428	50.34	51.40	1.06	74.00	22.60	100	295	Horizontal
5	16076.0095	45.37	51.64	6.27	74.00	22.36	100	70	Horizontal
6	17782.4728	45.63	51.42	5.79	74.00	22.58	100	100	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9338.4654	1.06	41.27	42.33	54.00	11.67	200	344	Horizontal
2	16081.0138	6.29	34.41	40.68	54.00	13.32	100	100	Horizontal
3	17780.4962	5.73	35.68	41.47	54.00	12.53	200	256	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	1329.7912	69.47	47.33	-22.14	74.00	26.67	100	181	Vertical
2	2533.9417	62.76	45.78	-16.98	74.00	28.22	100	349	Vertical
3	2660.4576	66.22	48.53	-17.69	74.00	25.47	100	223	Vertical
4	2844.7306	61.53	45.19	-16.34	74.00	28.81	200	133	Vertical
5	8993.2492	54.33	54.54	0.21	74.00	19.46	100	196	Vertical
6	17551.819	45.28	51.92	6.64	74.00	22.08	200	109	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2664.2847	-17.69	55.38	37.69	54.00	16.31	100	192	Vertical
2	8998.6452	0.21	39.67	39.88	54.00	14.12	200	78	Vertical
3	17547.1264	6.62	34.25	40.89	54.00	13.11	100	334	Vertical

Mode: DH5
 Middle Frequency (2441MHz)
 Environment: 20.5°C/63%RH 101.0kPa
 Test Engineer: Zhang Zishan

Date: 2023-05-13
 Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1164.2705	71.41	48.69	-22.72	74.00	25.31	100	134	Horizontal
2	1660.5826	66.43	44.74	-21.69	74.00	29.26	200	242	Horizontal
3	2529.9412	62.09	45.80	-16.29	74.00	28.20	100	124	Horizontal
4	7928.116	51.95	49.86	-2.09	74.00	24.14	100	238	Horizontal
5	9855.857	48.39	50.95	2.56	74.00	23.05	100	12	Horizontal
6	17549.9437	45.74	52.05	6.31	74.00	21.95	200	286	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1164.2705	-22.72	55.64	32.92	54.00	21.08	100	134	Horizontal
2	7936.2218	-2.02	40.27	38.18	54.00	15.82	100	238	Horizontal
3	9876.4296	2.36	38.16	40.72	54.00	13.28	200	147	Horizontal
4	17562.8524	6.01	32.51	38.82	54.00	15.18	200	137	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	1165.2707	69.88	46.33	-23.55	74.00	27.67	200	65	Vertical
2	1665.0831	69.85	47.38	-22.47	74.00	26.62	200	234	Vertical
3	2997.7497	67.56	51.20	-16.36	74.00	22.80	100	74	Vertical
4	9975.872	49.04	51.11	2.07	74.00	22.89	200	89	Vertical
5	10557.1946	48.66	51.01	2.35	74.00	22.99	100	29	Vertical
6	17598.6998	45.53	51.80	6.27	74.00	22.20	200	150	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2997.7497	-16.36	53.69	37.33	54.00	16.67	100	74	Vertical
2	9975.872	2.07	36.57	38.64	54.00	15.36	200	89	Vertical
3	10557.1946	2.35	38.21	40.56	54.00	13.44	100	29	Vertical
4	17598.6998	6.27	32.64	38.91	54.00	15.09	200	150	Vertical

Mode: DH5

Highest Frequency (2480MHz)

Environment: 20.5°C/63%RH 101.0kPa

Test Engineer: Zhang Zishan

Date: 2023-05-13

Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1160.5201	70.39	47.68	-22.71	74.00	26.32	100	138	Horizontal
2	1658.8324	68.89	47.20	-21.69	74.00	26.80	100	138	Horizontal
3	2480.185	61.86	46.02	-15.84	74.00	27.98	200	0	Horizontal
4	2848.231	60.27	44.15	-16.12	74.00	29.85	200	140	Horizontal
5	9285.7857	49.81	50.75	0.94	74.00	23.25	200	261	Horizontal
6	17497.4372	45.27	51.18	5.91	74.00	22.82	100	330	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9285.7857	0.94	38.52	39.46	54.00	14.54	200	261	Horizontal
2	17497.4372	5.91	34.67	40.58	54.00	13.42	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	1329.0411	68.29	46.16	-22.13	74.00	27.84	100	190	Vertical
2	1659.8325	71.99	49.54	-22.45	74.00	24.46	200	231	Vertical
3	2480.185	63.16	47.44	-15.72	74.00	26.56	100	347	Vertical
4	3986.3733	61.92	46.77	-15.15	74.00	27.23	100	188	Vertical
5	10549.6937	48.46	50.85	2.39	74.00	23.15	200	335	Vertical
6	17546.1933	44.93	51.50	6.57	74.00	22.50	200	61	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1660.8173	-22.45	53.42	30.97	54.00	23.03	200	225.5	Vertical
2	10549.6937	2.39	37.26	39.65	54.00	14.35	200	335	Vertical
3	17546.1933	6.57	31.58	38.15	54.00	15.85	200	61	Vertical

Mode: 2DH5
Lowest Frequency (2402MHz)
Environment: 20.5°C/63%RH 101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-13
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1297.5372	67.57	44.96	-22.61	74.00	29.04	100	219	Horizontal
2	1663.3329	68.55	46.87	-21.68	74.00	27.13	100	248	Horizontal
3	2597.1996	65.49	47.81	-17.68	74.00	26.19	100	108	Horizontal
4	9793.9742	49.02	51.66	2.64	74.00	22.34	100	258	Horizontal
5	16012.2515	45.84	52.20	6.36	74.00	21.80	100	248	Horizontal
6	17883.7355	48.25	53.17	4.92	74.00	20.83	200	343	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9792.4621	2.64	39.62	42.26	54.00	11.74	100	258	Horizontal
2	16010.1156	6.38	35.47	41.85	54.00	12.15	200	305	Horizontal
3	17881.8110	4.95	34.51	39.46	54.00	14.54	200	295	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	1332.5416	67.77	45.61	-22.16	74.00	28.39	100	156	Vertical
2	2513.4392	62.71	46.71	-16.00	74.00	27.29	100	256	Vertical
3	2997.9998	64.60	48.24	-16.36	74.00	25.76	200	103	Vertical
4	9831.4789	49.49	52.00	2.51	74.00	22.00	100	141	Vertical
5	14294.5368	46.87	51.40	4.53	74.00	22.60	200	306	Vertical
6	17814.3518	46.19	52.06	5.87	74.00	21.94	200	100	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2995.1225	-16.38	53.28	36.90	54.00	17.10	200	250	Vertical
2	9828.4235	2.52	38.47	40.99	54.00	13.01	100	209	Vertical
3	14231.5127	3.74	37.35	41.09	54.00	12.91	100	2	Vertical
4	17817.1238	5.91	32.19	38.10	54.00	15.90	200	41	Vertical

Mode: 2DH5
 Middle Frequency (2441MHz)
 Environment: 20.5°C/63%RH 101.0kPa
 Test Engineer: Zhang Zishan

Date: 2023-05-13
 Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1164.7706	67.56	44.84	-22.72	74.00	29.16	100	358	Horizontal
2	1662.5828	67.27	45.59	-21.68	74.00	28.41	100	241	Horizontal
3	2655.707	61.44	43.82	-17.62	74.00	30.18	100	251	Horizontal
4	7283.0354	51.91	48.38	-3.53	74.00	25.62	200	245	Horizontal
5	9876.4846	48.33	50.69	2.36	74.00	23.31	200	345	Horizontal
6	16079.76	45.12	51.40	6.28	74.00	22.60	200	108	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7283.0354	-3.53	44.37	40.84	54.00	13.16	200	245	Horizontal
2	9876.4846	2.36	39.62	41.98	54.00	12.02	200	345	Horizontal
3	16079.76	6.28	35.34	41.62	54.00	12.38	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	1661.3327	71.87	49.41	-22.46	74.00	24.59	200	230	Vertical
2	2655.957	62.53	44.84	-17.69	74.00	29.16	100	123	Vertical
3	7920.6151	51.31	49.42	-1.89	74.00	24.58	100	345	Vertical
4	9739.5924	48.59	51.29	2.70	74.00	22.71	200	198	Vertical
5	10540.3175	48.44	50.76	2.32	74.00	23.24	100	345	Vertical
6	17893.1116	45.67	52.13	6.46	74.00	21.87	200	296	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1666.4627	-22.48	54.04	31.58	54.00	22.42	200	122	Vertical
2	7924.8623	-1.80	40.37	38.48	54.00	15.52	100	149	Vertical
3	9746.2384	2.78	37.63	40.33	54.00	13.67	100	296	Vertical
4	10553.1527	2.37	36.28	38.60	54.00	15.40	200	246	Vertical
5	17893.1116	6.46	32.61	39.07	54.00	14.93	200	296	Vertical

Mode: 2DH5
Highest Frequency (2480MHz)
Environment: 20.5°C/63%RH 101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-13
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1164.7706	69.54	46.82	-22.72	74.00	27.18	100	148	Horizontal
2	1666.0833	67.31	45.63	-21.68	74.00	28.37	100	256	Horizontal
3	2480.185	62.36	46.52	-15.84	74.00	27.48	200	0	Horizontal
4	9289.5362	49.73	50.69	0.96	74.00	23.31	200	122	Horizontal
5	17101.7627	44.51	50.84	6.33	74.00	23.16	100	84	Horizontal
6	17549.9437	44.76	51.07	6.31	74.00	22.93	100	15	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9289.5362	0.96	38.24	39.20	54.00	14.80	200	122	Horizontal
2	17101.7627	6.33	34.65	40.98	54.00	13.02	100	84	Horizontal
3	17549.9437	6.31	36.79	43.10	54.00	10.90	100	15	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	1663.3329	68.96	46.50	-22.46	74.00	27.50	100	227	Vertical
2	1955.3694	65.93	45.00	-20.93	74.00	29.00	100	345	Vertical
3	2480.185	63.61	47.89	-15.72	74.00	26.11	100	345	Vertical
4	3988.2485	62.07	46.89	-15.18	74.00	27.11	100	35	Vertical
5	9732.0915	48.31	50.91	2.60	74.00	23.09	200	133	Vertical
6	17484.3105	45.82	51.30	5.48	74.00	22.70	100	74	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9732.0915	2.60	38.72	41.32	54.00	12.68	200	133	Vertical
2	17484.3105	5.48	34.18	39.66	54.00	14.34	100	74	Vertical

Mode: 3DH5
 Lowest Frequency (2402MHz)
 Environment: 20.5°C/63%RH 101.0kPa
 Test Engineer: Zhang Zishan

Date: 2023-05-13
 Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1165.5207	71.39	48.67	-22.72	74.00	25.33	100	134	Horizontal
2	1663.3329	67.49	45.81	-21.68	74.00	28.19	100	251	Horizontal
3	2533.9417	61.81	45.37	-16.44	74.00	28.63	100	17	Horizontal
4	9694.5868	48.35	50.24	1.89	74.00	23.76	100	306	Horizontal
5	11354.1693	48.79	49.34	0.55	74.00	24.66	100	117	Horizontal
6	16441.6802	44.99	51.18	6.19	74.00	22.82	100	277	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1165.5207	-22.72	57.28	34.56	54.00	19.44	100	134	Horizontal
2	9694.5868	1.89	36.84	38.73	54.00	15.27	100	306	Horizontal
3	11354.1693	0.55	38.26	38.81	54.00	15.19	100	117	Horizontal
4	16441.6802	6.19	32.19	38.38	54.00	15.62	100	277	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	1301.2877	68.79	46.87	-21.92	74.00	27.13	200	15	Vertical
2	2534.1918	61.22	44.23	-16.99	74.00	29.77	100	360	Vertical
3	5042.1303	55.47	44.71	-10.76	74.00	29.29	100	198	Vertical
4	9970.2463	48.60	50.63	2.03	74.00	23.37	200	360	Vertical
5	12100.5126	47.13	48.36	1.23	74.00	25.64	100	179	Vertical
6	17604.3255	45.17	51.40	6.23	74.00	22.60	100	80	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9966.1458	1.99	36.25	38.24	54.00	15.76	100	246	Vertical
2	12113.4513	1.29	35.81	37.10	54.00	16.90	100	80	Vertical
3	17609.3528	6.18	34.27	40.45	54.00	13.55	200	137	Vertical

Mode: 3DH5
Middle Frequency (2441MHz)
Environment: 20.5°C/63%RH 101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-13
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1166.0208	69.63	46.91	-22.72	74.00	27.09	200	346	Horizontal
2	1663.5829	68.84	47.16	-21.68	74.00	26.84	100	218	Horizontal
3	2654.7068	65.06	47.45	-17.61	74.00	26.55	100	101	Horizontal
4	3986.3733	58.97	44.21	-14.76	74.00	29.79	100	231	Horizontal
5	9793.9742	48.45	51.09	2.64	74.00	22.91	100	310	Horizontal
6	17540.5676	46.15	52.38	6.23	74.00	21.62	200	95	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9782.3427	2.56	37.26	39.90	54.00	14.10	200	95	Horizontal
2	17543.6521	6.26	34.38	40.61	54.00	13.39	100	261	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	1200.025	71.95	49.15	-22.80	74.00	24.85	200	348	Vertical
2	1666.0833	71.92	49.45	-22.47	74.00	24.55	200	231	Vertical
3	2523.4404	61.97	45.50	-16.47	74.00	28.50	100	163	Vertical
4	3146.2683	63.85	47.54	-16.31	74.00	26.46	200	158	Vertical
5	9750.8439	48.88	51.70	2.82	74.00	22.30	100	67	Vertical
6	17533.0666	45.56	51.84	6.28	74.00	22.16	100	18	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1202.1643	-22.72	61.27	38.47	54.00	15.53	200	122	Vertical
2	1668.1062	-22.48	62.16	39.69	54.00	14.31	200	308	Vertical
3	9752.3428	2.81	36.39	39.21	54.00	14.79	200	295	Vertical
4	17540.4527	6.44	32.62	38.90	54.00	15.10	100	343	Vertical

Mode: 3DH5
Highest Frequency (2480MHz)
Environment: 20.5°C/63%RH 101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-13
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1163.0204	68.67	45.95	-22.72	74.00	28.05	200	136	Horizontal
2	1663.833	67.74	46.06	-21.68	74.00	27.94	100	237	Horizontal
3	2480.185	63.00	47.16	-15.84	74.00	26.84	200	0	Horizontal
4	9197.6497	48.75	50.41	1.66	74.00	23.59	100	201	Horizontal
5	9868.9836	48.60	51.03	2.43	74.00	22.97	100	94	Horizontal
6	16550.4438	44.34	51.17	6.83	74.00	22.83	200	94	Horizontal

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9197.6497	1.66	40.39	42.05	54.00	11.95	100	201	Horizontal
2	9872.4284	2.39	38.62	41.05	54.00	12.95	200	84	Horizontal
3	16554.4438	6.63	35.24	42.07	54.00	11.93	100	231	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	1301.5377	68.27	46.35	-21.92	74.00	27.65	200	22	Vertical
2	1659.0824	71.25	48.80	-22.45	74.00	25.20	200	226	Vertical
3	2479.935	63.52	47.79	-15.73	74.00	26.21	100	345	Vertical
4	2662.2078	65.25	47.55	-17.70	74.00	26.45	100	228	Vertical
5	9932.7416	48.82	50.86	2.04	74.00	23.14	100	331	Vertical
6	17542.4428	45.09	51.57	6.48	74.00	22.43	100	75	Vertical

AV Final Data List									
NO.	Freq. [MHz]	Factor [dB]	AV Reading [dBμV/m]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1659.0824	-22.45	59.42	36.97	54.00	17.03	200	226	Vertical
2	9932.7416	2.04	36.57	38.61	54.00	15.39	100	331	Vertical
3	17542.4428	6.48	32.92	39.40	54.00	14.60	100	75	Vertical

Remark:

- 1 Measuring frequencies from 1 GHz to 18GHz harmonic of highest fundamental frequency.
- 2 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.
- 3 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.
- 4 Spectrum setting:
 - a. Peak Setting 1GHz–26.5GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz–26.5GHz, 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 10 Hz. if the EUT duty cycle is $< 98\%$, set $VBW \geq 1/T$, Where T is defined in section 2.8.

Test result: The unit does meet the requirements.

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

18GHz to 26.5GHz

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.

All models were pretested and only the worst modes were recorded in this report(2DH5).

Mode: 2DH5
Lowest Frequency (2402MHz)
Environment: 21.6°C/64%RH /101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-18
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18555.475	54.34	36.86	-17.48	83.54	46.68	100	283	Horizontal
2	19371.05	53.73	36.84	-16.89	83.54	46.70	200	345	Horizontal
3	20839.85	54.38	38.07	-16.31	83.54	45.47	100	143	Horizontal
4	22807.175	50.93	36.16	-14.77	83.54	47.38	200	189	Horizontal
5	24359.275	50.07	35.81	-14.26	83.54	47.73	100	298	Horizontal
6	25183.35	48.33	34.39	-13.94	83.54	49.15	100	205	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	18804.1	54.74	37.58	-17.16	83.54	45.96	100	280	Vertical
2	19290.3	54.81	37.55	-17.26	83.54	45.99	100	248	Vertical
3	20839.85	55.82	39.60	-16.22	83.54	43.94	200	343	Vertical
4	22624.85	51.46	36.30	-15.16	83.54	47.24	100	16	Vertical
5	23837.8	49.60	35.00	-14.60	83.54	48.54	100	32	Vertical
6	24733.7	48.48	34.48	-14.00	83.54	49.06	100	280	Vertical

Mode: 2DH5
Middle Frequency (2441MHz)
Environment: 21.6°C /64%RH /101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-18
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	19219.325	54.56	37.65	-16.91	83.54	45.89	100	282	Horizontal
2	19676.625	54.22	37.46	-16.76	83.54	46.08	100	346	Horizontal
3	20839.85	52.84	36.53	-16.31	83.54	47.01	100	205	Horizontal
4	21540.25	52.26	36.38	-15.88	83.54	47.16	200	282	Horizontal
5	22665.225	51.18	36.28	-14.90	83.54	47.26	100	346	Horizontal
6	24487.625	50.59	36.36	-14.23	83.54	47.18	200	174	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	19094.8	53.54	36.39	-17.15	83.54	47.15	200	18	Vertical
2	20031.075	53.11	36.34	-16.77	83.54	47.20	100	158	Vertical
3	20839.85	54.98	38.76	-16.22	83.54	44.78	100	189	Vertical
4	21794.825	51.50	35.58	-15.92	83.54	47.96	100	220	Vertical
5	22797.4	50.64	35.55	-15.09	83.54	47.99	100	250	Vertical
6	24589.625	49.29	35.15	-14.14	83.54	48.39	100	80	Vertical

Mode: 2DH5
Highest Frequency (2480MHz)
Environment: 21.6°C/64%RH /101.0kPa
Test Engineer: Zhang Zishan

Date: 2023-05-18
Test Voltage: DC 13.5V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	19161.525	54.13	37.21	-16.92	83.54	46.33	100	189	Horizontal
2	20839.85	53.69	37.38	-16.31	83.54	46.16	100	0	Horizontal
3	22820.775	51.46	36.69	-14.77	83.54	46.85	200	204	Horizontal
4	23208.8	51.57	36.63	-14.94	83.54	46.91	100	236	Horizontal
5	25174.85	48.81	34.87	-13.94	83.54	48.67	100	221	Horizontal
6	25373.325	48.98	34.87	-14.11	83.54	48.67	200	344	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	18806.225	53.94	36.78	-17.16	83.54	46.76	100	78	Vertical
2	19467.1	53.66	36.57	-17.09	83.54	46.97	100	78	Vertical
3	20839.85	56.78	40.56	-16.22	83.54	42.98	200	16	Vertical
4	22662.25	51.00	35.84	-15.16	83.54	47.70	100	219	Vertical
5	24486.35	49.00	34.76	-14.24	83.54	48.78	200	109	Vertical
6	25033.325	48.35	34.38	-13.97	83.54	49.16	100	297	Vertical

Note:

Above 18G test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dBμV/m).

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)).

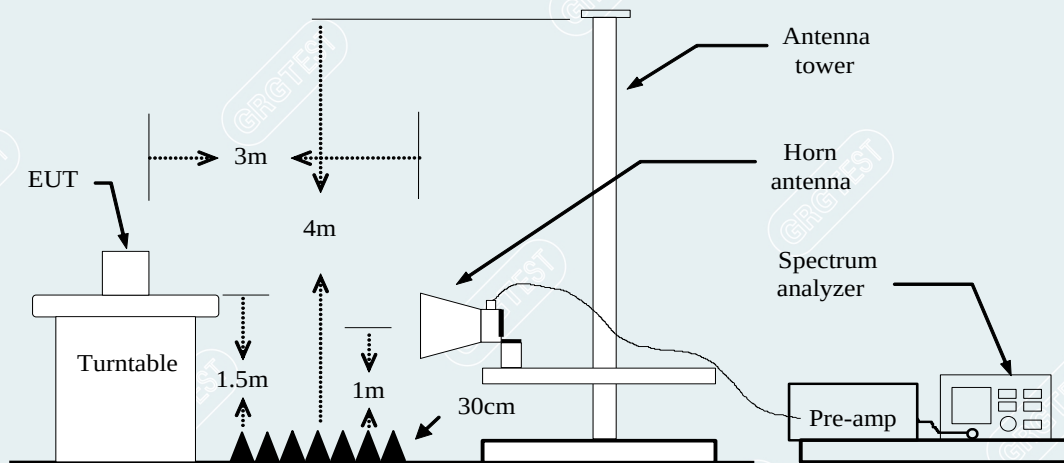
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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

- 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. Where T 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

DH5

Lowest Channel

Frequency 2402MHz

Environment: 21.7°C/64%RH/101.0kPa

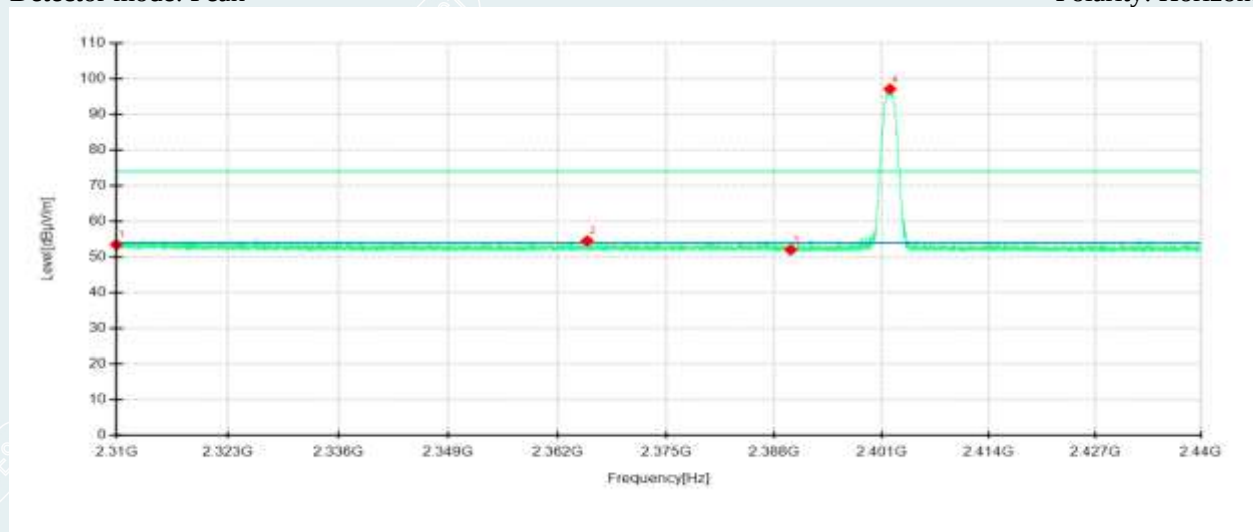
Tested By: Chen Xiacong

Detector mode: Peak

Test Voltage: DC 13.5V

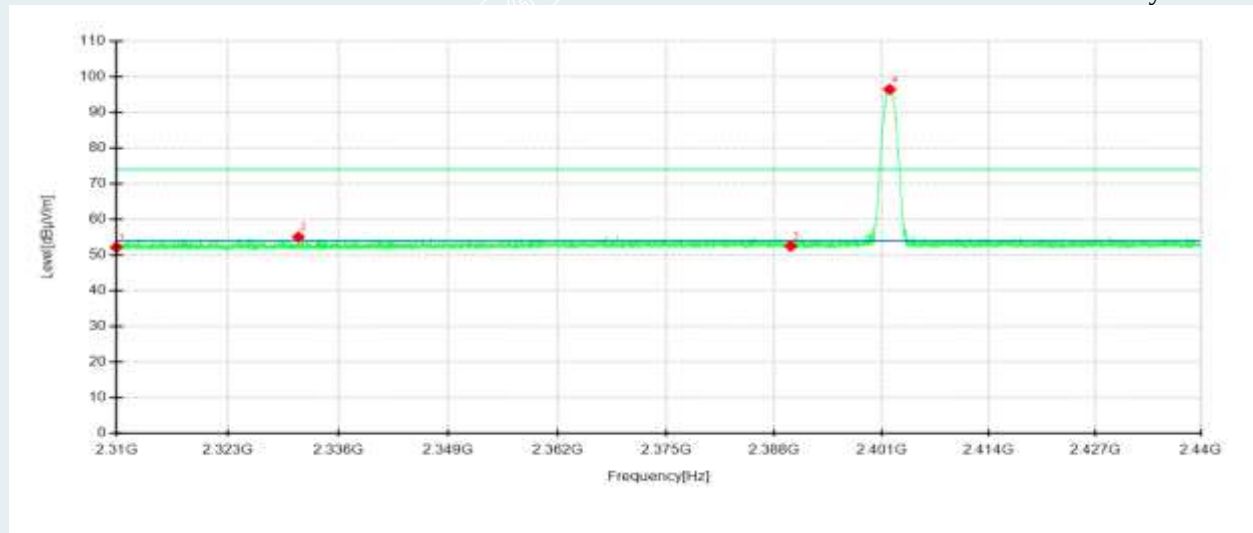
Date: 2023-05-11

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	Remark
1	2310	43.75	53.52	9.77	74.00	20.48	100	103	Horizontal	/
2	2365.5588	45.48	54.54	9.06	74.00	19.46	200	80	Horizontal	/
3	2390	42.91	52.02	9.11	74.00	21.98	200	149	Horizontal	/
4	2401.9912	87.99	97.11	9.12	74.00	-23.11	100	44	Horizontal	No limit
1	2310	43.13	52.20	9.07	74.00	21.80	100	237	Vertical	/
2	2331.3362	45.96	55.06	9.10	74.00	18.94	200	161	Vertical	/
3	2390	42.99	52.52	9.53	74.00	21.48	100	247	Vertical	/
4	2401.9587	86.80	96.42	9.62	74.00	-22.42	100	345	Vertical	No limit

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

Lowest Channel

Frequency 2402MHz

Environment: 21.7°C/64%RH/101.0kPa

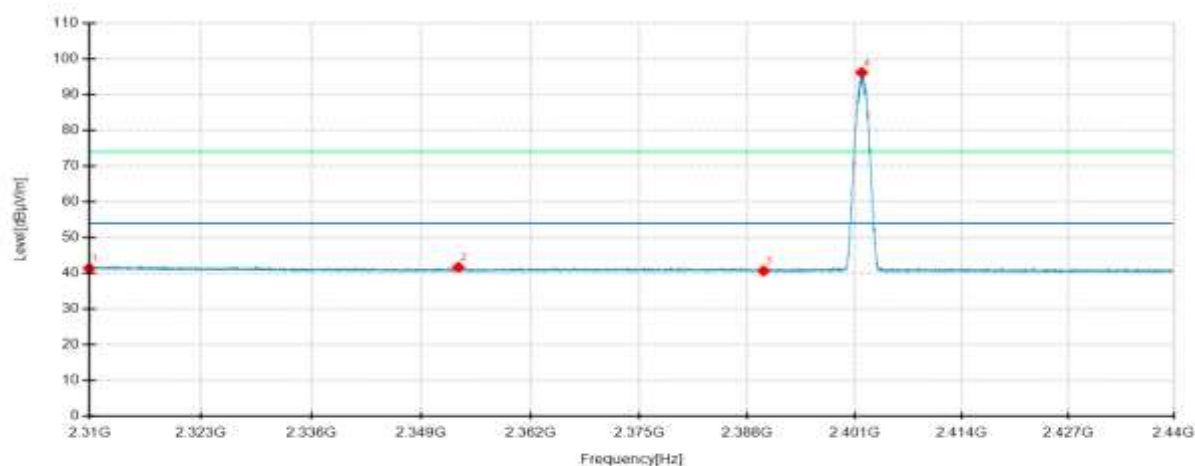
Tested By: Chen Xiacong

Detector mode: Average

Test Voltage: DC 13.5V

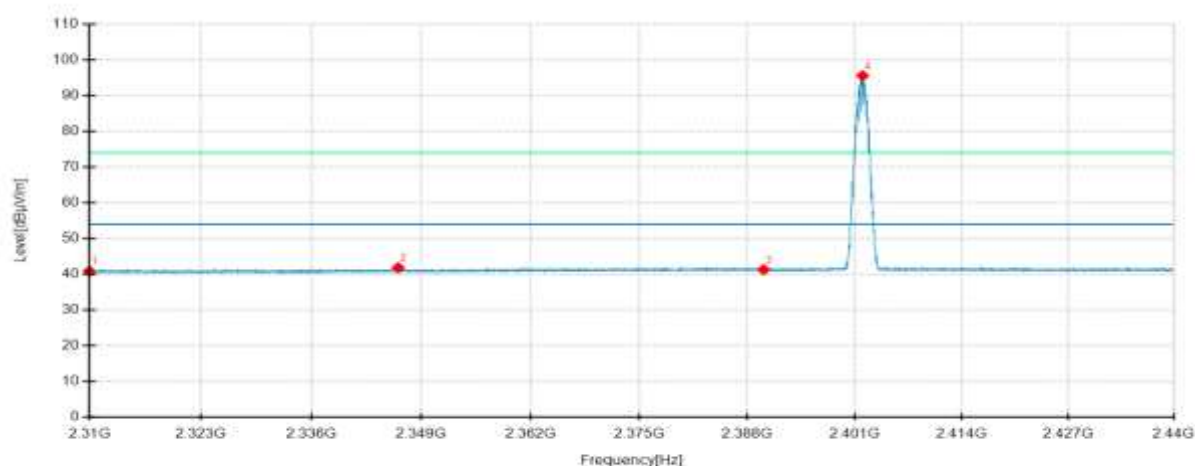
Date: 2023-05-11

Polarity: Horizontal



Detector mode: Average

Polarity: Vertical

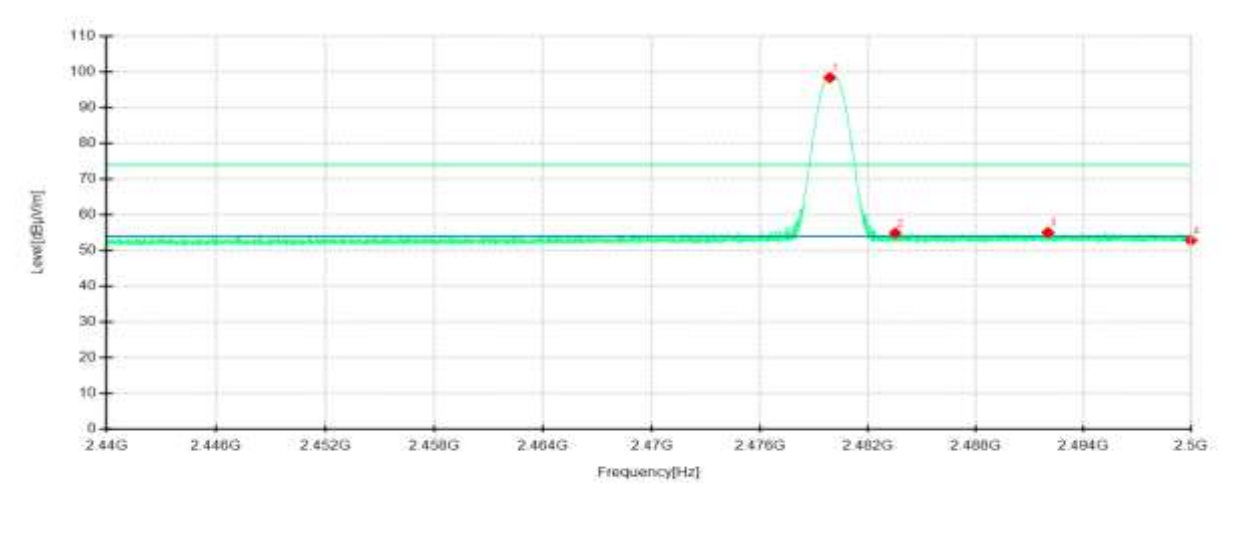


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310	31.64	41.41	9.77	54.00	12.59	200	247	Horizontal	/
2	2353.4363	32.67	41.70	9.03	54.00	12.30	200	316	Horizontal	/
3	2390	31.60	40.71	9.11	54.00	13.29	200	168	Horizontal	/
4	2401.8612	87.03	96.15	9.12	54.00	-42.15	100	45	Horizontal	No limit
1	2310	31.82	40.89	9.07	54.00	13.11	100	198	Vertical	/
2	2346.3025	32.74	41.86	9.12	54.00	12.14	100	129	Vertical	/
3	2390	31.78	41.31	9.53	54.00	12.69	100	32	Vertical	/
4	2401.9587	85.93	95.55	9.62	54.00	-41.55	100	344	Vertical	No limit

Highest Channel

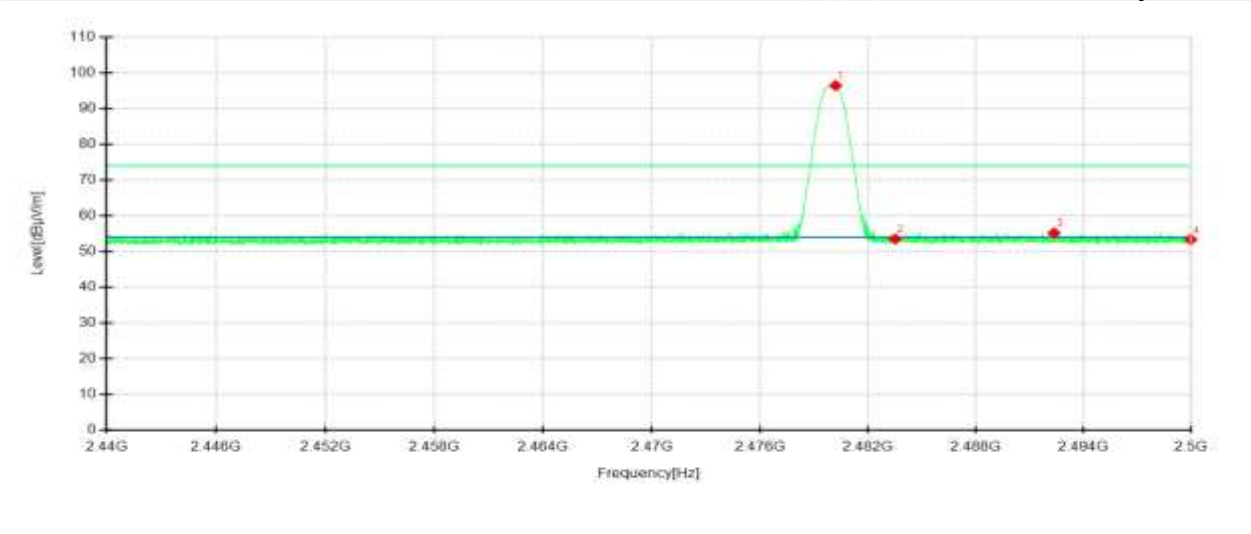
Frequency 2480MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Peak

Test Voltage: DC 13.5V
Date: 2023-05-11
Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical

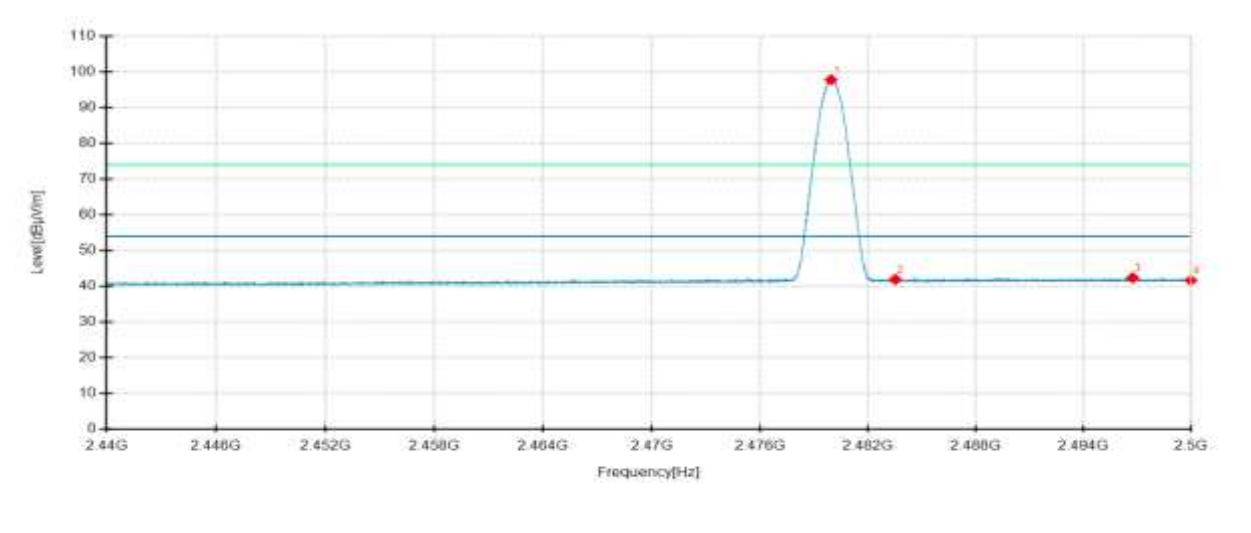


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.8625	88.77	98.38	9.61	74.00	-24.38	100	16	Horizontal	No limit
2	2483.5	45.23	54.91	9.68	74.00	19.09	100	16	Horizontal	/
3	2492.005	45.21	55.09	9.88	74.00	18.91	200	78	Horizontal	/
4	2500	42.79	52.84	10.05	74.00	21.16	100	183	Horizontal	/
1	2480.185	86.69	96.42	9.73	74.00	-22.42	100	344	Vertical	No limit
2	2483.5	43.77	53.52	9.75	74.00	20.48	200	37	Vertical	/
3	2492.35	45.41	55.21	9.80	74.00	18.79	100	187	Vertical	/
4	2500	43.50	53.35	9.85	74.00	20.65	200	37	Vertical	/

Highest Channel

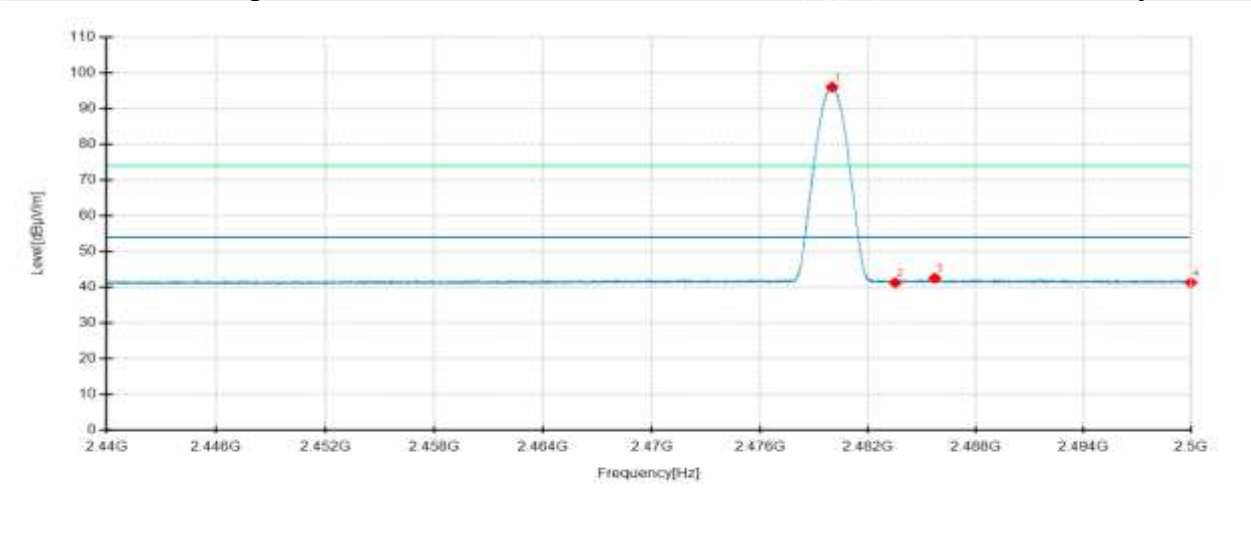
Frequency 2480MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Average

Test Voltage: DC 13.5V
Date: 2023-05-11
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	Remark
1	2479.93	88.16	97.77	9.61	54.00	-43.77	100	15	Horizontal	No limit
2	2483.5	32.26	41.94	9.68	54.00	12.06	200	346	Horizontal	/
3	2496.7375	32.42	42.40	9.98	54.00	11.60	200	102	Horizontal	/
4	2500	31.63	41.68	10.05	54.00	12.32	100	200	Horizontal	/
1	2479.99	86.25	95.98	9.73	54.00	-41.98	100	344	Vertical	No limit
2	2483.5	31.56	41.31	9.75	54.00	12.69	200	337	Vertical	/
3	2485.6975	32.81	42.57	9.76	54.00	11.43	200	15	Vertical	/
4	2500	31.48	41.33	9.85	54.00	12.67	100	344	Vertical	/

2DH5**Lowest Channel**

Frequency 2402MHz

Environment: 21.7°C/64%RH/101.0kPa

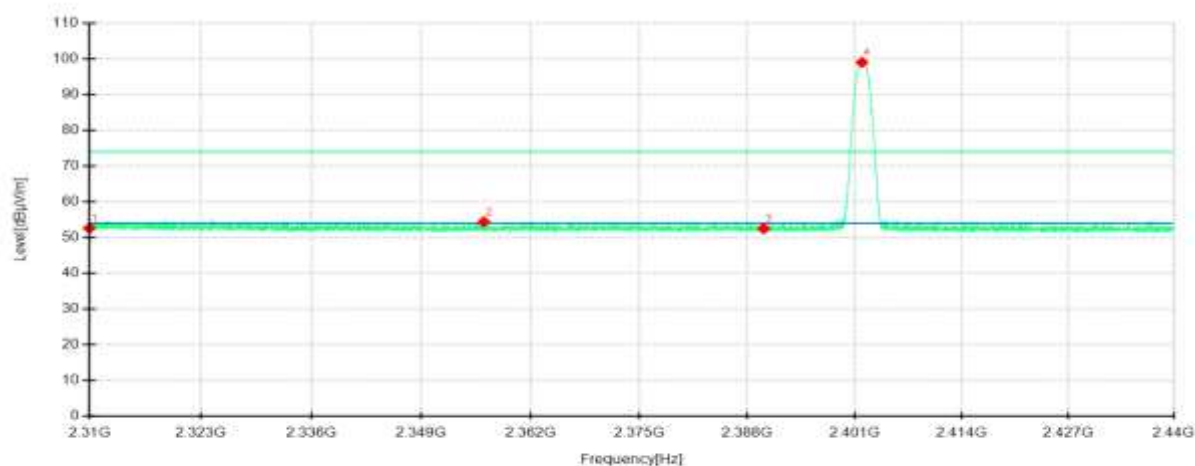
Tested By: Chen Xiacong

Detector mode: Peak

Test Voltage: DC 13.5V

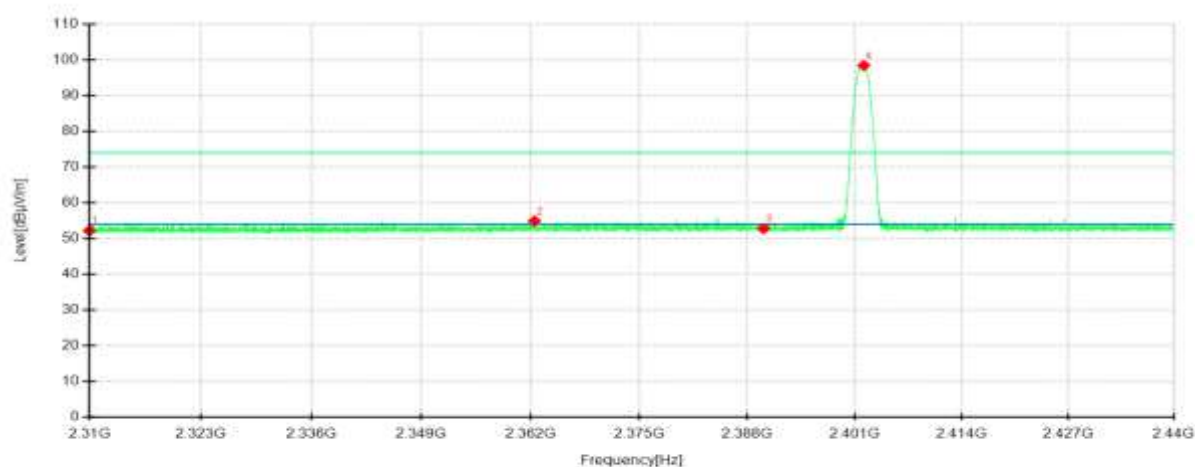
Date: 2023-05-11

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical

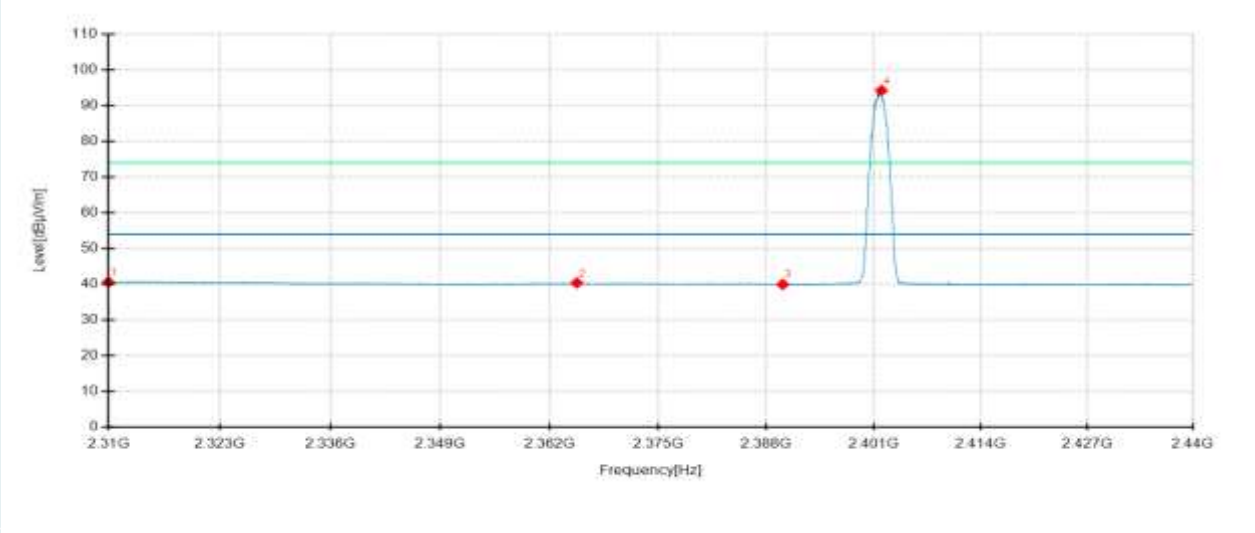


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310	42.87	52.64	9.77	74.00	21.36	100	347	Horizontal	/
2	2356.475	45.37	54.40	9.03	74.00	19.60	100	221	Horizontal	/
3	2390	43.39	52.50	9.11	74.00	21.50	100	84	Horizontal	/
4	2401.8775	89.87	98.99	9.12	74.00	-24.99	100	44	Horizontal	No limit
1	2310	43.16	52.23	9.07	74.00	21.77	100	236	Vertical	/
2	2362.5038	45.69	54.94	9.25	74.00	19.06	200	171	Vertical	/
3	2390	43.28	52.81	9.53	74.00	21.19	100	216	Vertical	/
4	2402.105	88.77	98.39	9.62	74.00	-24.39	100	345	Vertical	No limit

Lowest Channel

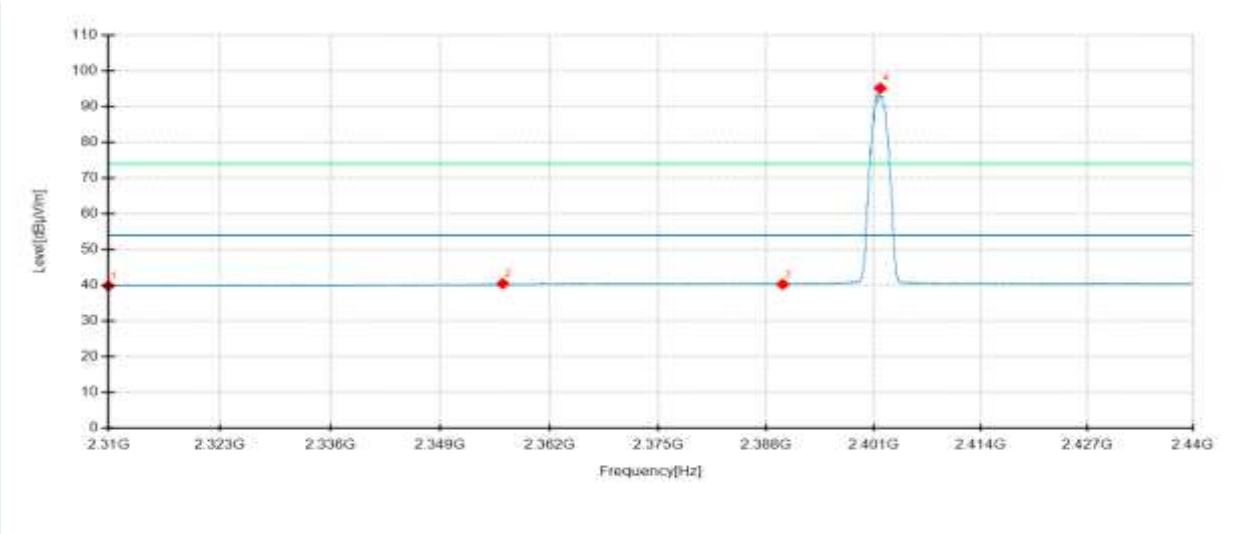
Frequency 2402MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Average

Test Voltage: DC 13.5V
Date: 2023-05-11
Polarity: Horizontal



Detector mode: Average

Polarity: Vertical

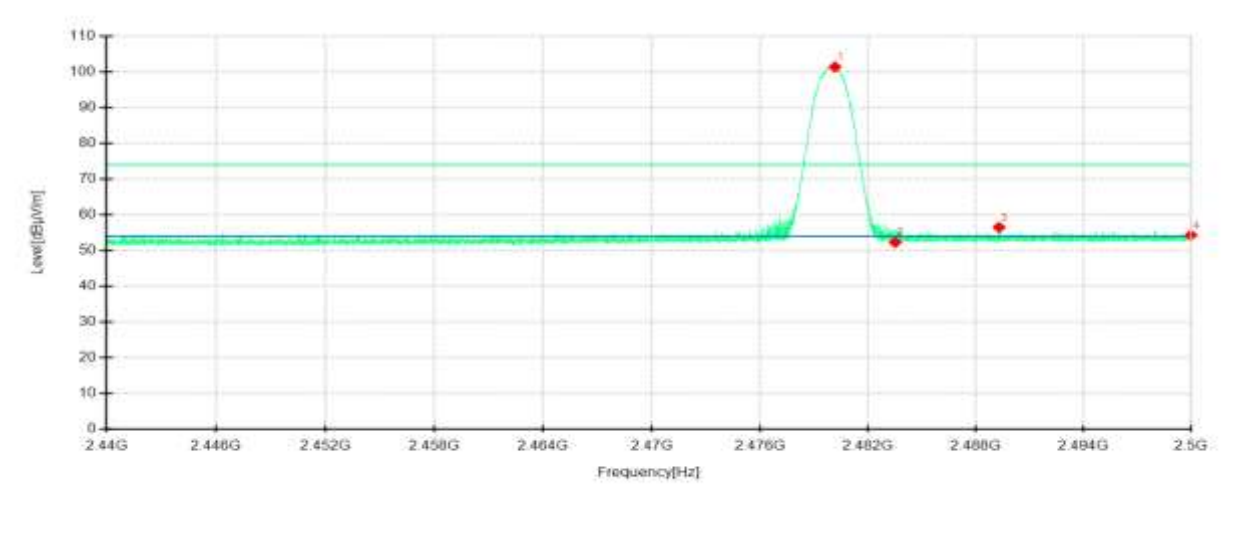


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310	30.88	40.65	9.77	54.00	13.35	100	229	Horizontal	/
2	2365.2825	31.36	40.41	9.05	54.00	13.59	100	200	Horizontal	/
3	2390	30.89	40.00	9.11	54.00	14.00	100	327	Horizontal	/
4	2401.9425	85.09	94.21	9.12	54.00	-40.21	100	45	Horizontal	No limit
1	2310	30.78	39.85	9.07	54.00	14.15	100	128	Vertical	/
2	2356.4587	31.29	40.48	9.19	54.00	13.52	200	159	Vertical	/
3	2390	30.77	40.30	9.53	54.00	13.70	100	59	Vertical	/
4	2401.8125	85.52	95.14	9.62	54.00	-41.14	100	50	Vertical	No limit

Highest Channel

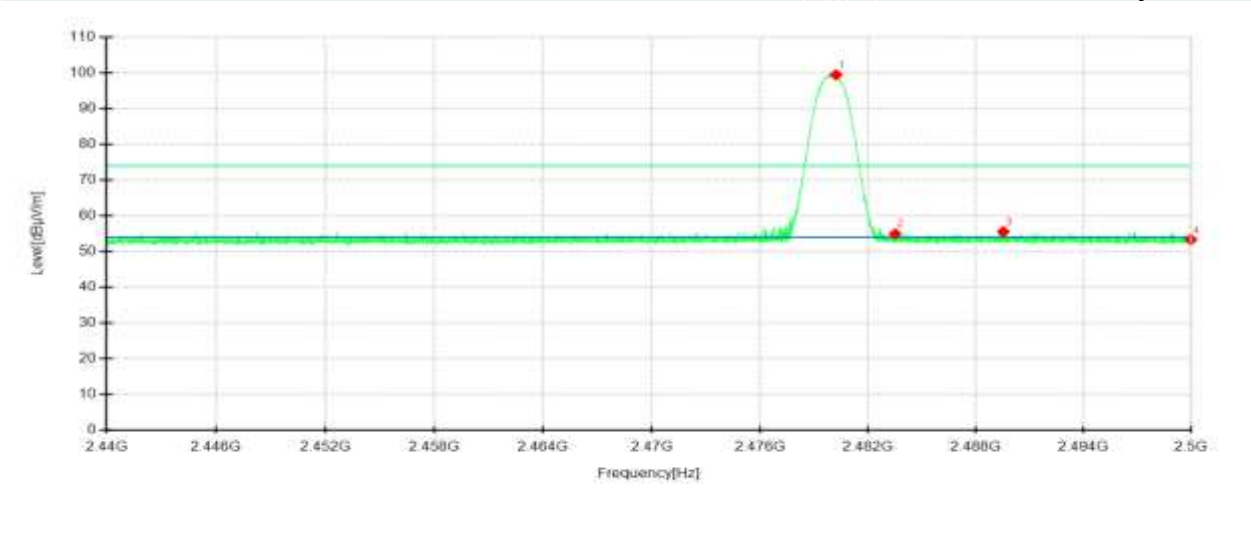
Frequency 2480MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Peak

Test Voltage: DC 13.5V
Date: 2023-05-11
Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical

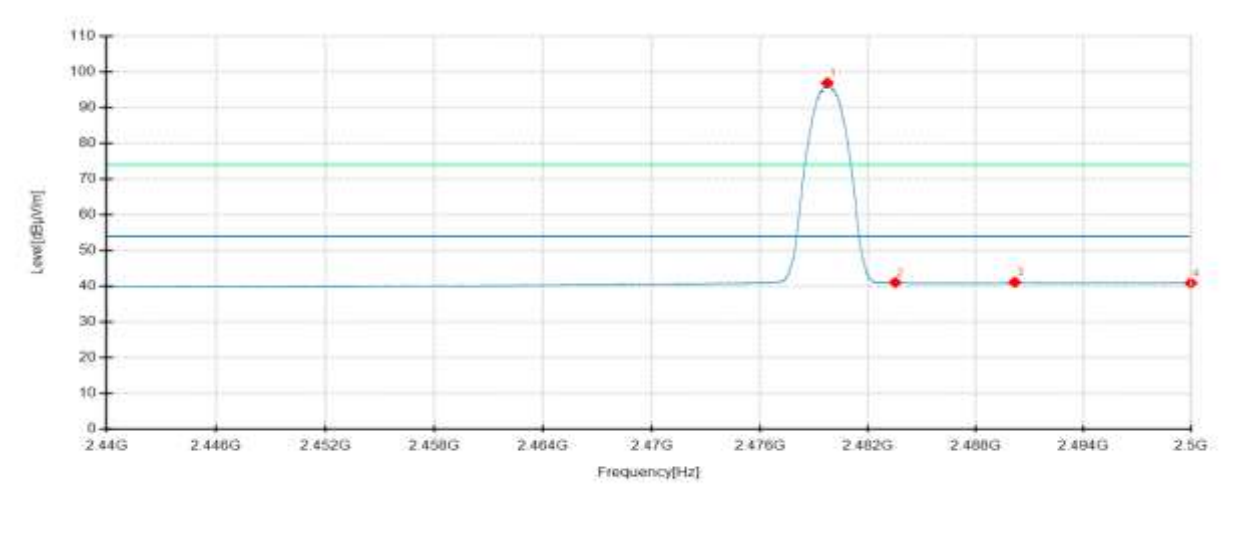


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2480.1475	91.75	101.36	9.61	74.00	-27.36	100	15	Horizontal	No limit
2	2483.5	42.62	52.30	9.68	74.00	21.70	100	288	Horizontal	/
3	2489.2825	46.70	56.51	9.81	74.00	17.49	200	11	Horizontal	/
4	2500	44.27	54.32	10.05	74.00	19.68	100	45	Horizontal	/
1	2480.2075	89.70	99.43	9.73	74.00	-25.43	100	344	Vertical	No limit
2	2483.5	45.21	54.96	9.75	74.00	19.04	100	235	Vertical	/
3	2489.515	45.78	55.57	9.79	74.00	18.43	200	52	Vertical	/
4	2500	43.47	53.32	9.85	74.00	20.68	200	249	Vertical	/

Highest Channel

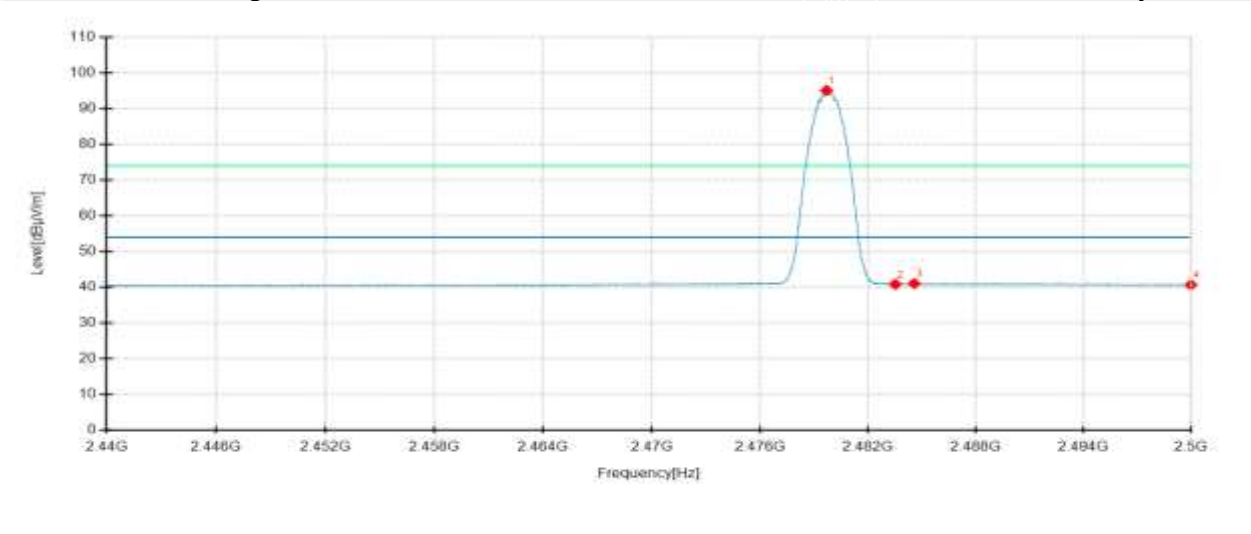
Frequency 2480MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Average

Test Voltage: DC 13.5V
Date: 2023-05-11
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	2479.7275	87.27	96.87	9.60	54.00	-42.87	100	15	Horizontal	No limit
2	2483.5	31.41	41.09	9.68	54.00	12.91	200	345	Horizontal	/
3	2490.1525	31.33	41.16	9.83	54.00	12.84	200	325	Horizontal	/
4	2500	30.90	40.95	10.05	54.00	13.05	100	15	Horizontal	/
1	2479.6825	85.34	95.06	9.72	54.00	-41.06	100	344	Vertical	No limit
2	2483.5	31.12	40.87	9.75	54.00	13.13	100	0	Vertical	/
3	2484.5575	31.34	41.10	9.76	54.00	12.90	100	1	Vertical	/
4	2500	30.87	40.72	9.85	54.00	13.28	100	246	Vertical	/

3DH5**Lowest Channel**

Frequency 2402MHz

Environment: 21.7°C/64%RH/101.0kPa

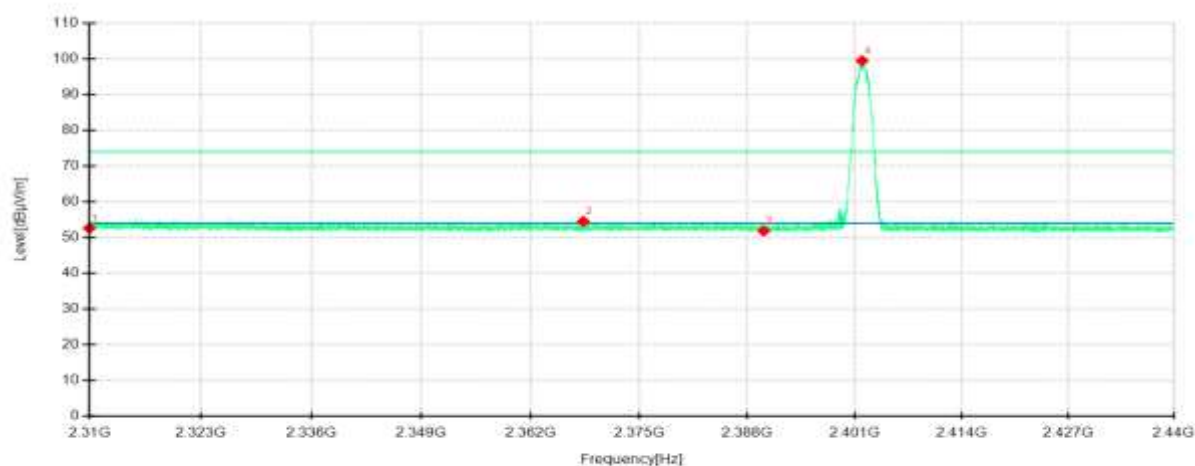
Tested By: Chen Xiacong

Detector mode: Peak

Test Voltage: DC 13.5V

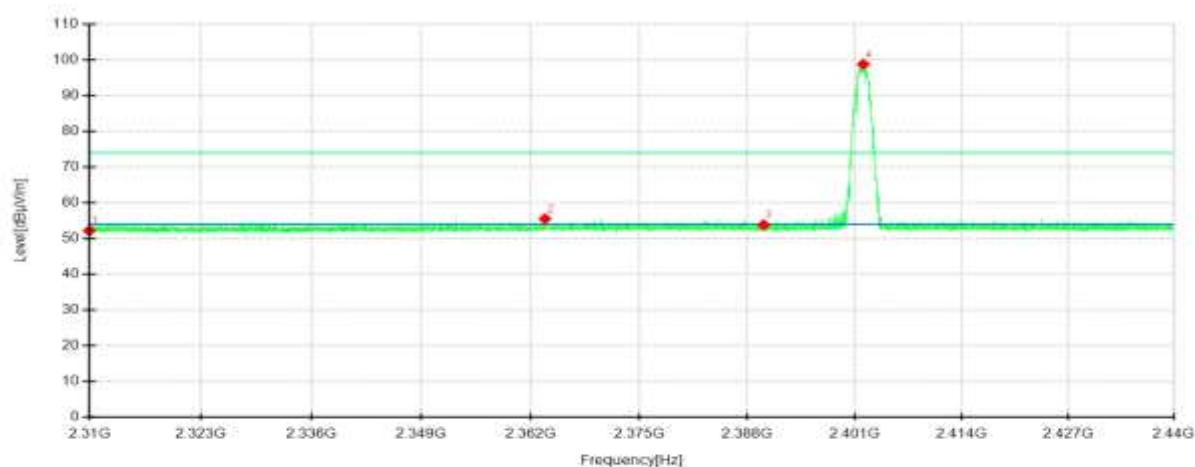
Date: 2023-05-11

Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical

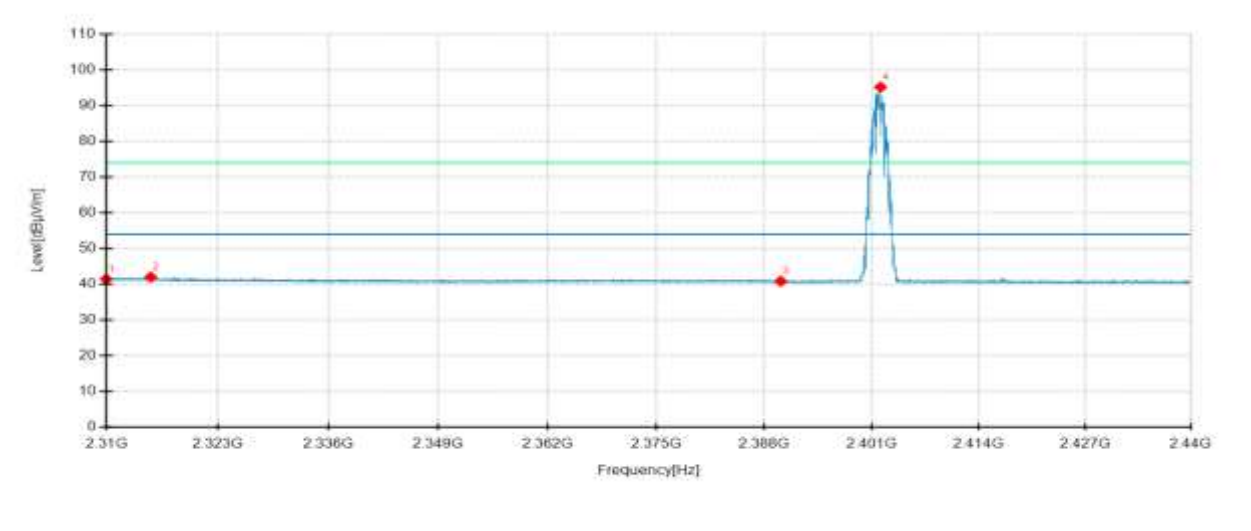


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBμV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310	42.87	52.64	9.77	74.00	21.36	100	143	Horizontal	/
2	2368.3212	45.47	54.53	9.06	74.00	19.47	200	226	Horizontal	/
3	2390	42.79	51.90	9.11	74.00	22.10	200	79	Horizontal	/
4	2401.8938	90.33	99.45	9.12	74.00	-25.45	100	44	Horizontal	No limit
1	2310	43.17	52.24	9.07	74.00	21.76	200	16	Vertical	/
2	2363.755	46.26	55.53	9.27	74.00	18.47	100	102	Vertical	/
3	2390	44.30	53.83	9.53	74.00	20.17	100	53	Vertical	/
4	2402.0562	89.11	98.73	9.62	74.00	-24.73	100	345	Vertical	No limit

Lowest Channel

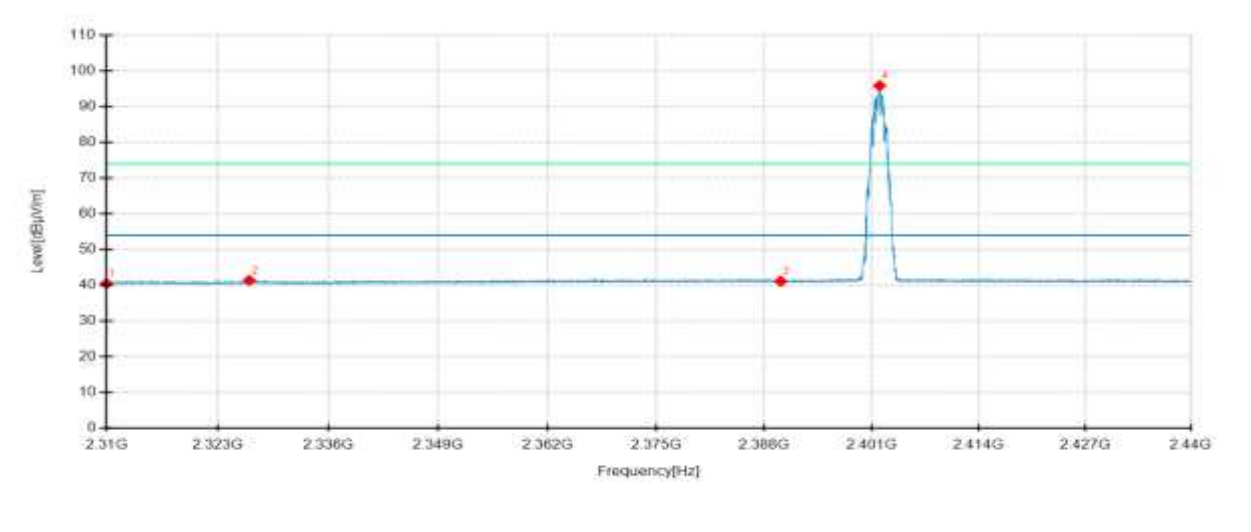
Frequency 2402MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Average

Test Voltage: DC 13.5V
Date: 2023-05-11
Polarity: Horizontal



Detector mode: Average

Polarity: Vertical

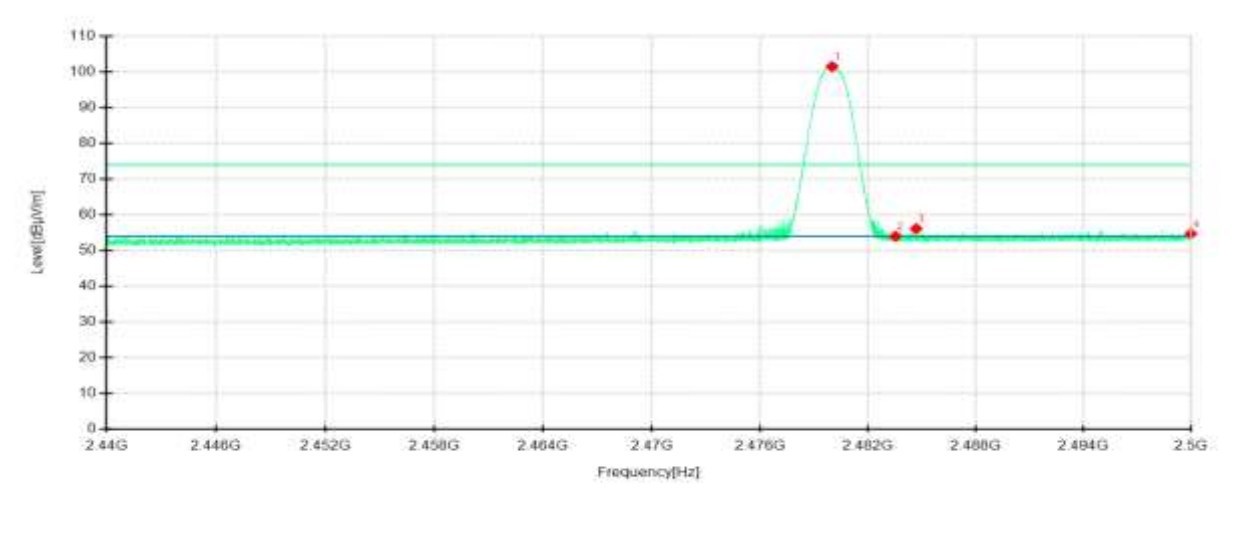


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310	31.70	41.47	9.77	54.00	12.53	100	142	Horizontal	/
2	2315.1838	32.36	42.04	9.68	54.00	11.96	200	12	Horizontal	/
3	2390	31.79	40.90	9.11	54.00	13.10	200	22	Horizontal	/
4	2402.0725	86.04	95.16	9.12	54.00	-41.16	100	55	Horizontal	No limit
1	2310	31.42	40.49	9.07	54.00	13.51	100	3	Vertical	/
2	2326.7212	32.32	41.41	9.09	54.00	12.59	200	360	Vertical	/
3	2390	31.62	41.15	9.53	54.00	12.85	100	62	Vertical	/
4	2401.9587	86.21	95.83	9.62	54.00	-41.83	100	52	Vertical	No limit

Highest Channel

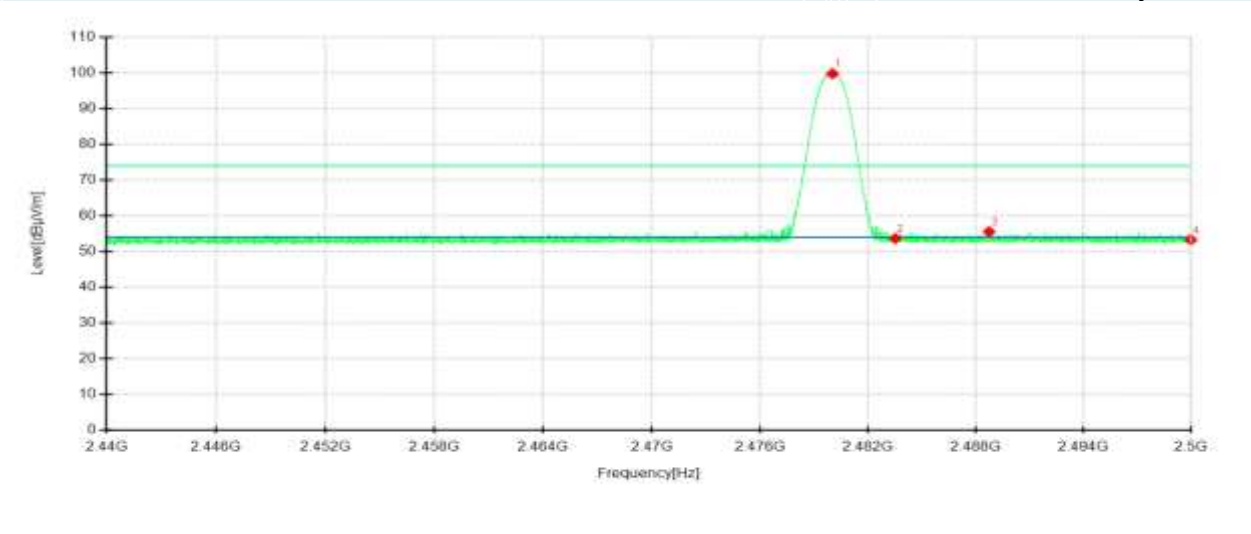
Frequency 2480MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Peak

Test Voltage: DC 13.5V
Date: 2023-05-11
Polarity: Horizontal



Detector mode: Peak

Polarity: Vertical

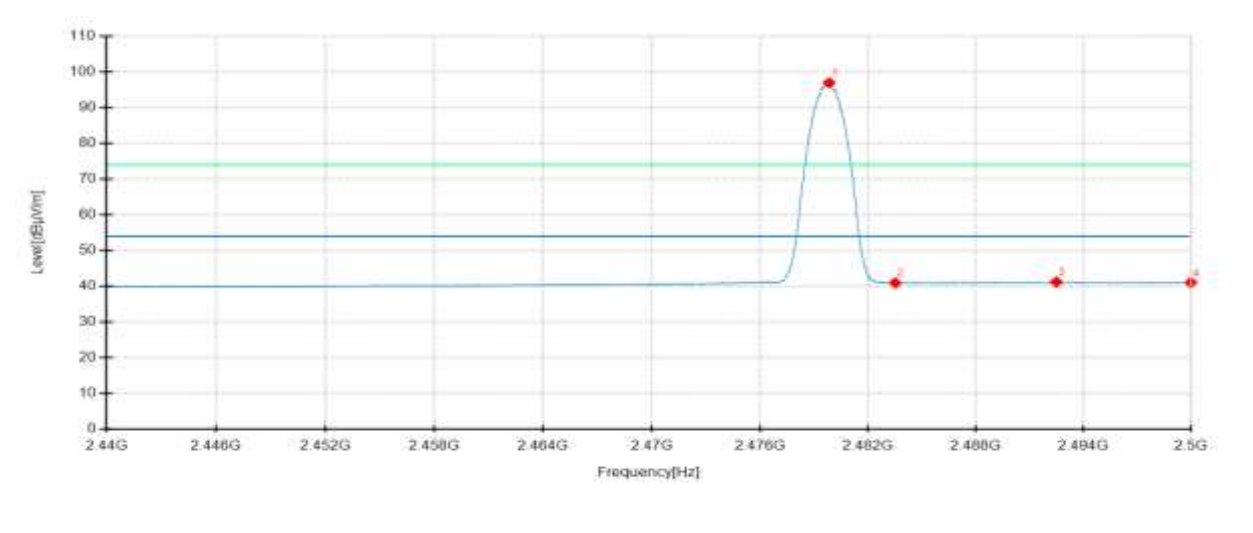


No.	Frequency MHz	Reading dBμV/m	Level dBμV/m	Factor dB	Limit dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2479.99	91.87	101.48	9.61	74.00	-27.48	100	14	Horizontal	No limit
2	2483.5	44.32	54.00	9.68	74.00	20.00	200	335	Horizontal	/
3	2484.6625	46.41	56.12	9.71	74.00	17.88	100	53	Horizontal	/
4	2500	44.67	54.72	10.05	74.00	19.28	200	325	Horizontal	/
1	2480.0125	90.01	99.74	9.73	74.00	-25.74	100	344	Vertical	No limit
2	2483.5	43.91	53.66	9.75	74.00	20.34	100	32	Vertical	/
3	2488.7275	45.75	55.53	9.78	74.00	18.47	200	46	Vertical	/
4	2500	43.41	53.26	9.85	74.00	20.74	200	328	Vertical	/

Highest Channel

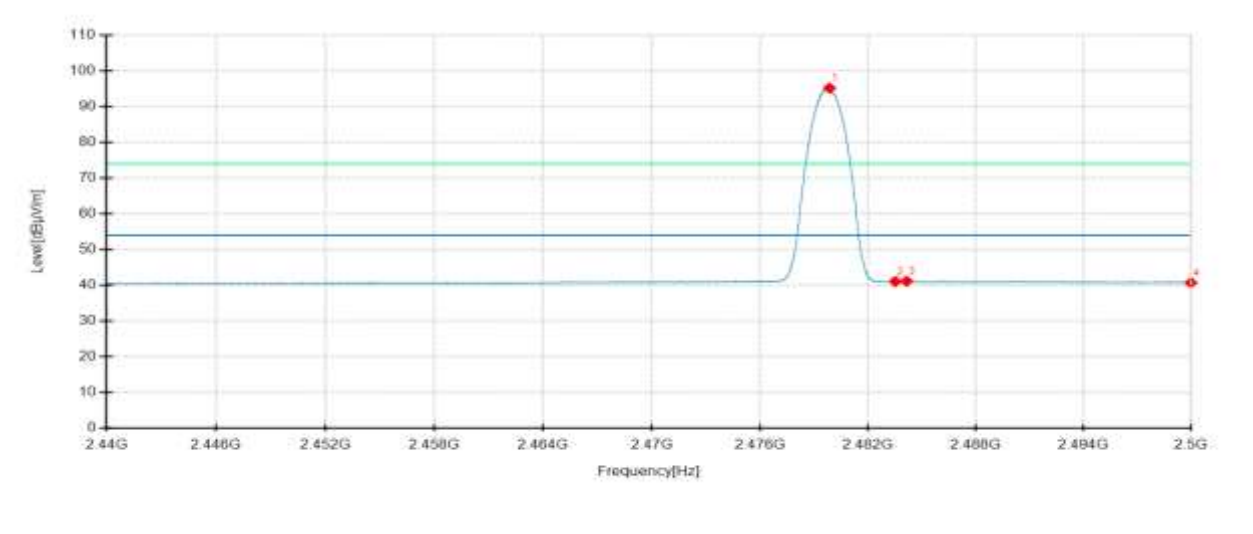
Frequency 2480MHz
Environment: 21.7°C/64%RH/101.0kPa
Tested By: Chen Xiacong
Detector mode: Average

Test Voltage: DC 13.5V
Date: 2023-05-11
Polarity: Horizontal



Detector mode: Average

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	2479.8325	87.29	96.90	9.61	54.00	-42.90	100	16	Horizontal	No limit
2	2483.5	31.28	40.96	9.68	54.00	13.04	100	63	Horizontal	/
3	2492.4775	31.36	41.24	9.88	54.00	12.76	200	345	Horizontal	/
4	2500	31.02	41.07	10.05	54.00	12.93	100	240	Horizontal	/
1	2479.8475	85.43	95.16	9.73	54.00	-41.16	100	344	Vertical	No limit
2	2483.5	31.33	41.08	9.75	54.00	12.92	200	341	Vertical	/
3	2484.13	31.43	41.18	9.75	54.00	12.82	100	334	Vertical	/
4	2500	30.89	40.74	9.85	54.00	13.26	200	75	Vertical	/

Remark:

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

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

APPENDIX A. PHOTOGRAPH OF THE TEST CONNECTION DIAGRAM

Please refer to the attached document E20230328398101-16-Test photo.

APPENDIX B. PHOTOGRAPH OF THE EUT

Please refer to the attached document E20230328398101-17-EUT photo.

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