Test Report

Verified code: 246561

Report No.: E20220126055701-2

Customer:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China
Sample Name:	Wireless earphones
Sample Model:	E505A
Receive Sample Date:	Feb.14,2022
Test Date:	Feb.15,2022 ~ Mar.03,2022
Reference Document:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators
Test Result:	Pass

Prepared by: Yang Zhaoyun Reviewed by: Jiang Tao Approved by: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-03-24

GUANGZHOU GRG METROLOGY & TEST CO., LTD.
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Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.

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.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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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)(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	Not Applicable
	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

The EUT antenna is FPC antenna. Max Antenna gain is -0.5dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section

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

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China

2.2 MANUFACTURER

Name:	OnePlus Technology (Shenzhen) Co., Ltd.
Address:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China

2.3 FACTORY

Name:	Jiangxi Risound Electronics Co., Ltd.
Address:	No.271, Innovation Avenue, Jinggangshan Economic and Technological Development Zone, Ji'an City, Jiangxi Province

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Wireless earphones
Model No.:	E505A
Adding Model:	/
Models discrepancy:	/
Trade Name:	ONEPLUS
FCC ID:	2ABZ2-E505AL
Power supply:	DC 3.8V power supplied by earphones battery DC 5V power supplied by E505A charging case or DC 3.7V power supplied by charging case battery
Charging Case:	E505A Input: 5.0V ⎓ 0.9A Output: 5.0V⎓ 0.3A Rated Capacity:480mAh 1.77Wh
Charging Case Battery Specification:	Rechargeable Li-ion Battery, Model:751443-1 Rated Voltage:3.7Vdc Rated Capacity:480mAh 1.77Wh Limited Charge voltage:4.35Vdc
Earphones Battery Specification:	Rechargeable Li-ion Cell , Model:1058PF3 Rated Voltage:3.8Vdc Rated Capacity:41mAh 0.155Wh

Frequency Band:	2402MHz~2480MHz
Transmit Power:	GFSK:13.01dBm π/4-DQPSK:12.96dBm 8DPSK: 12.97dBm
Type of Modulation:	FHSS (GFSK for 1Mbps, π/4-DQPSK for 2Mbps,8DPSK for 3Mbps)
Antenna Specification:	FPC antenna with - 0.5dBi gain (Max)
Temperature Range:	0℃~35℃
Hardware Version:	AA460_0
Software Version:	V1.0.0
Sample No:	E20220126055701-0005 E20220126055701-0007
Note:	Earphone is E505A,Charging Case is E505A

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	/

2.7 CONFIGURATION OF SYSTEM UNDER TEST

EUT

Test software:

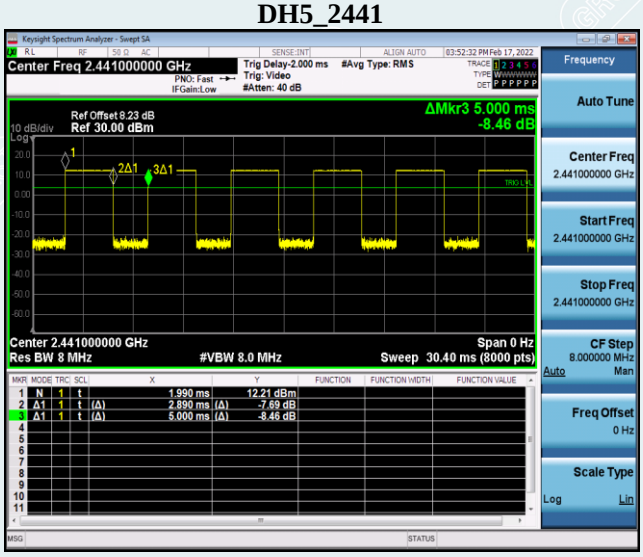
Software version	Test level
BQB.exe	3

2.8 DUTY CYCLE

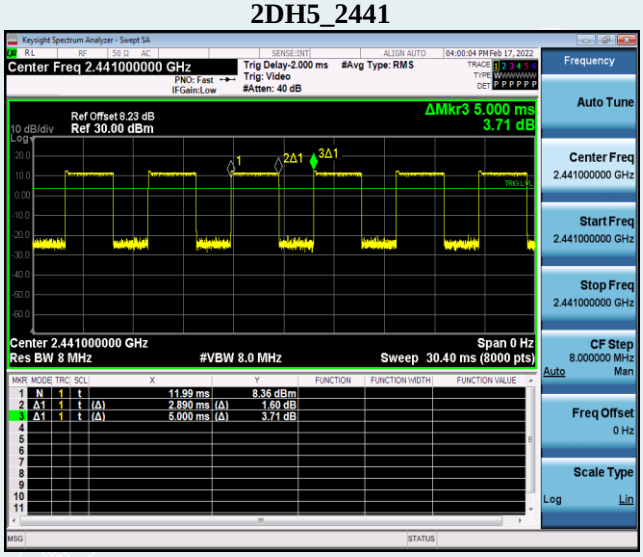
Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

Test Mode	Antenna	Frequency (MHz)	ON Time [ms]	Period [ms]	DC [%]	T [s]
DH5	Ant1	2441	2.89	5.00	57.80	0.00289
2DH5	Ant1	2441	2.89	5.00	57.80	0.00289
3DH5	Ant1	2441	2.90	5.00	58.00	0.00290

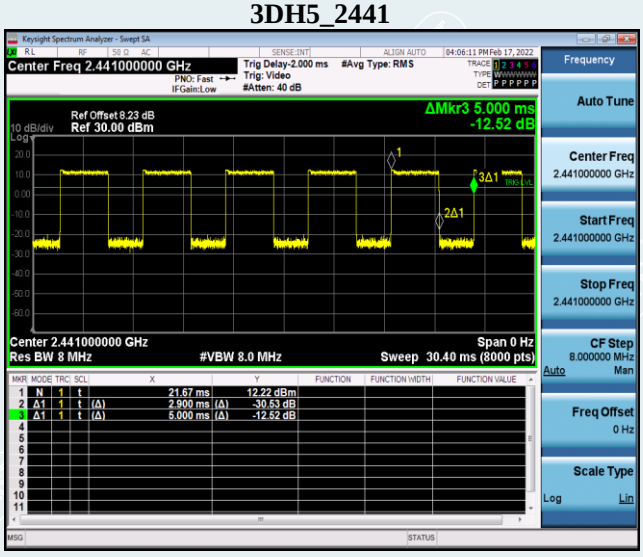
DH5_2441



2DH5_2441



3DH5_2441



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 Shenzhen, 518110, People's Republic of China
P.C.	:	518000
Tel	:	0755-61180008
Fax	:	0755-61180008

3.2 ACCREDITATIONS

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

USA	A2LA(Certificate #2861.01)
China	CNAS(L0446)

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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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℃

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	MY52221469	2022-04-16
Dwell Time				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Radiated Spurious Emission&Restricted bands of operation				
Test S/W	EZ	CCS-2ANT	/	/
Test Receiver	R&S	ESCI	100088	2022-10-31
Preamplifier	EMEC	EM330	/	2022-03-21
Bi-log Antenna	TESEQ	CBL6143A	32399	2022-11-25
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Loop Antenna	TESEQ	HLA6121	52599	2022-04-21
Horn Antenna	Schwarzbeck	BBHA9120D (1201)	02143	2022-10-22
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170-497	2022-10-16
Amplifier	Tonscend	TAP01018048	AP20E8060075	2022-05-09
Amplifier	Tonscend	TAP184050	AP20E806071	2022-05-17
Test S/W	Tonscend	JS36-RSE/2.5.1.5		
20 dB Bandwidth				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Maximum Peak Output Power				
Pulse power sensor	Agilent	MA2411B	1126150	2022-03-21
Power meter	Anritsu	ML2495A	1204003	2022-03-21
Conducted band edges and Spurious Emission				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16
Carrier Frequencies Separated				
Spectrum Analyzer	Agilent	N9010A	MY52221469	2022-04-16

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

5. EUT TEST CONDITIONS

Type of antenna: FPC 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. 20dB BANDWIDTH

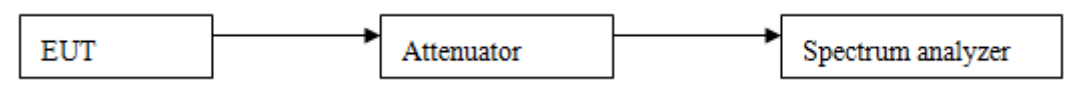
6.1 LIMITS

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.

6.2 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.

6.3 TEST SETUP



6.4 TEST RESULTS

Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

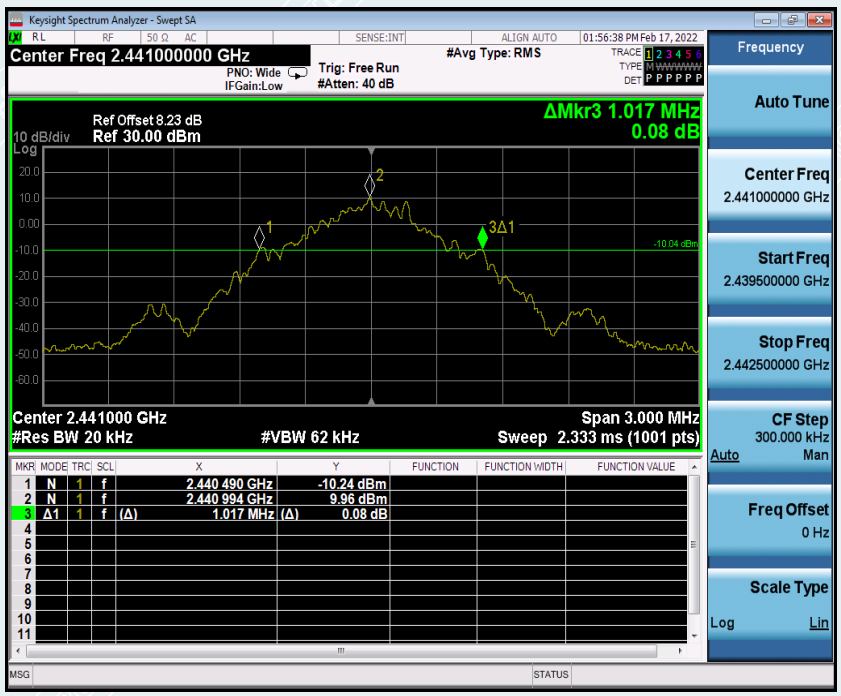
Test mode	Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
DH5	Lowest	2402	1011
	Middle	2441	1017
	Highest	2480	1008
Test mode	**Channel**	**Frequency (MHz)**	**20 dB Bandwidth (kHz)**
2DH5	Lowest	2402	1179
	Middle	2441	1203
	Highest	2480	1179
Test mode	**Channel**	**Frequency (MHz)**	**20 dB Bandwidth (kHz)**
3DH5	Lowest	2402	1179
	Middle	2441	1179
	Highest	2480	1236

Result plot as follows:

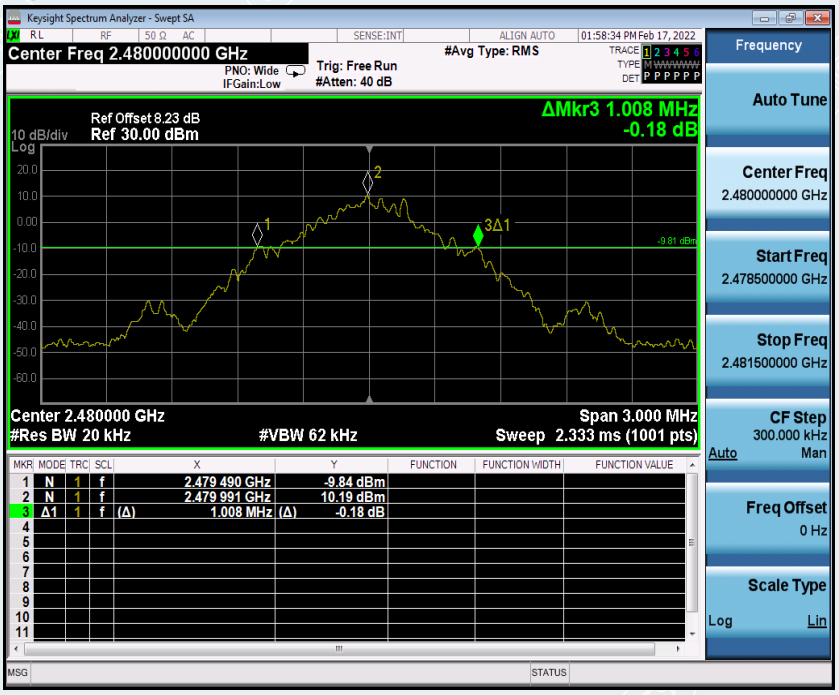
DH5

Lowest Channel

Middle Channel

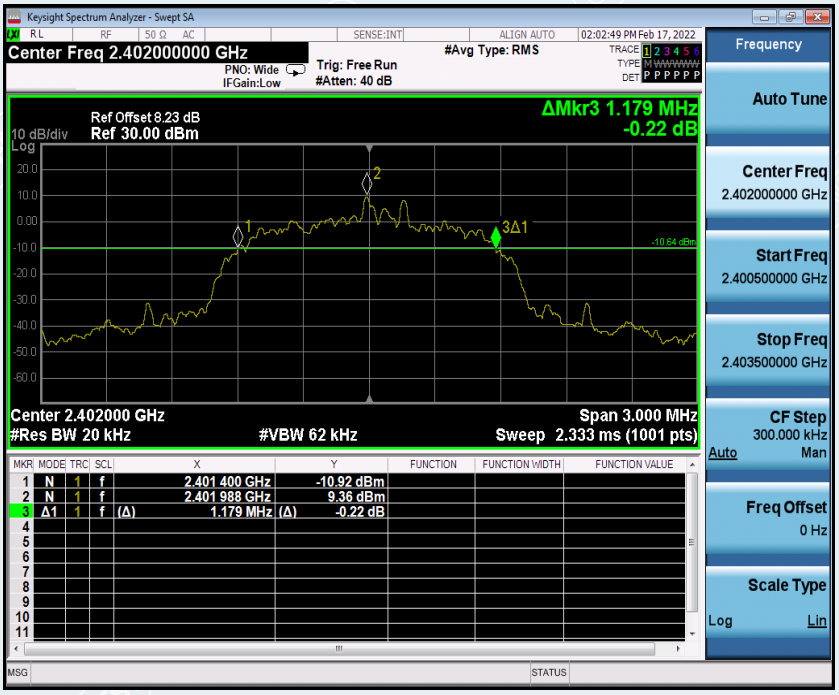


Highest Channel

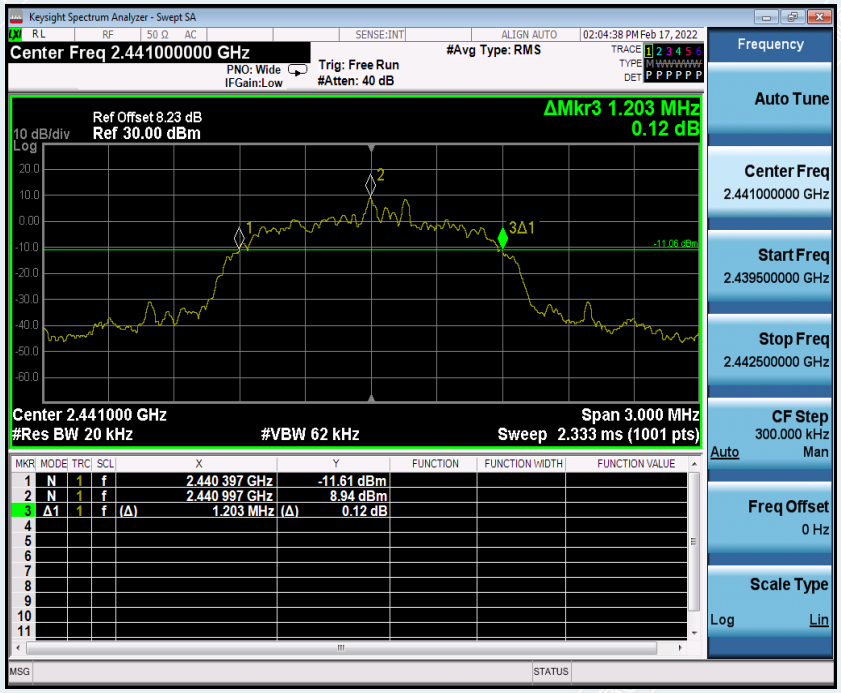


2DH5

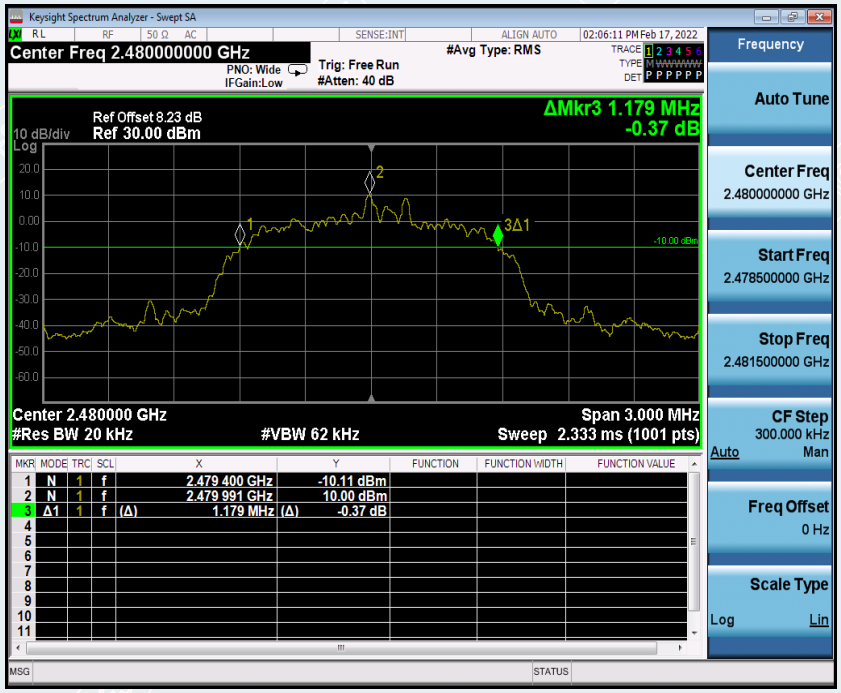
Lowest Channel



Middle Channel

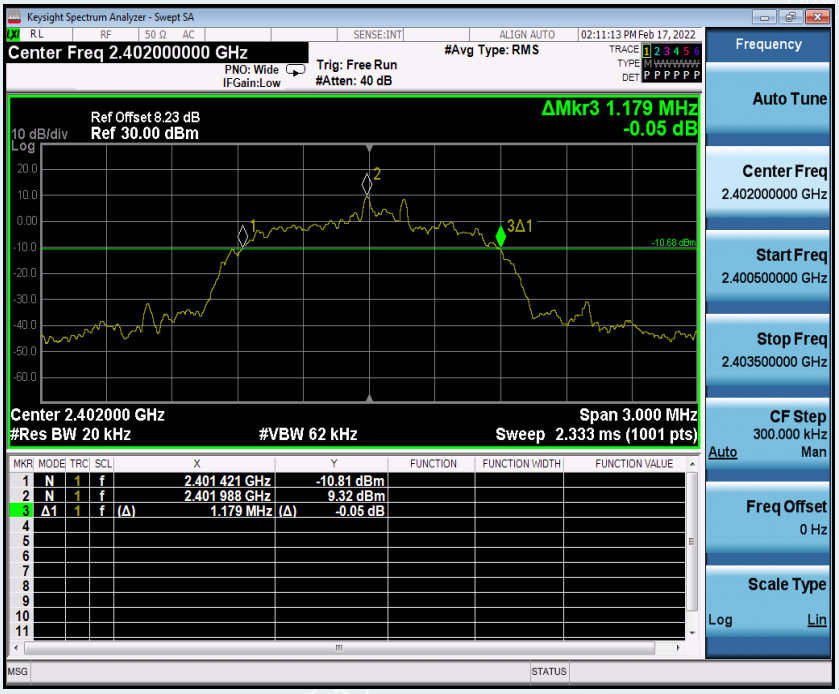


Highest Channel

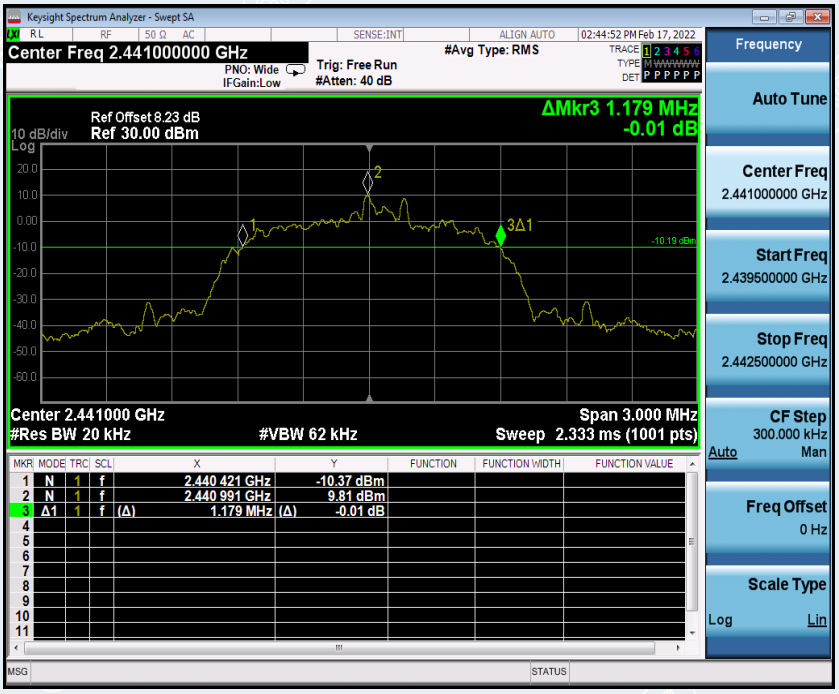


3DH5

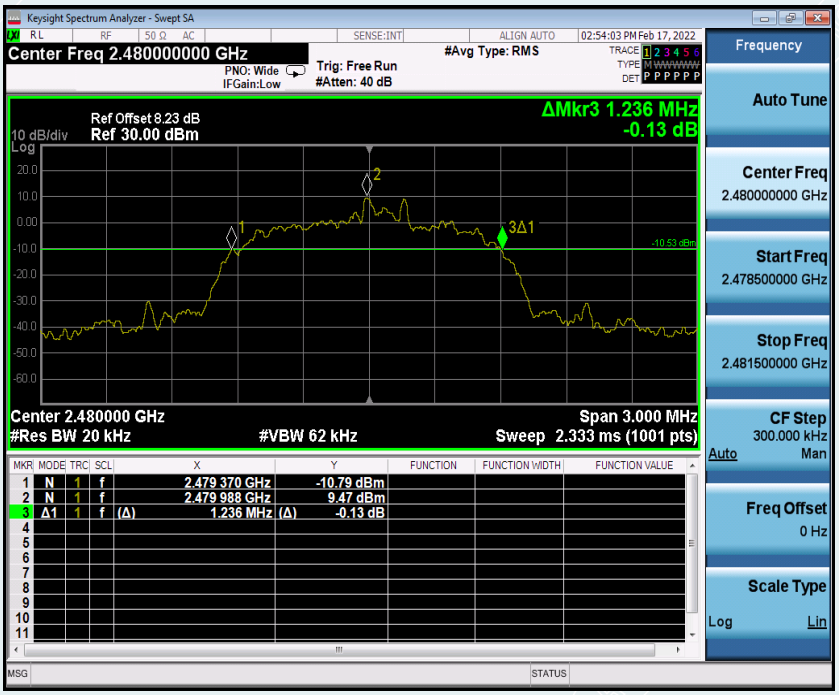
Lowest Channel



Middle Channel



Highest Channel



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7. CARRIER FREQUENCIES SEPARATED

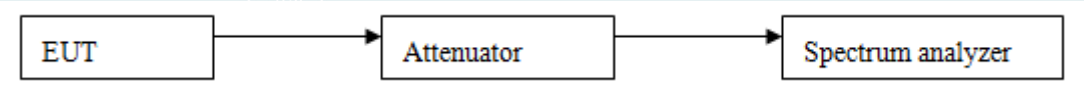
7.1 LIMITS

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.

7.2 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.

7.3 TEST SETUP



7.4 TEST RESULTS

Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
0.996	678	> Two-thirds of the 20 dB Bandwidth	Pass

2DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.002	802	> Two-thirds of the 20 dB Bandwidth	Pass

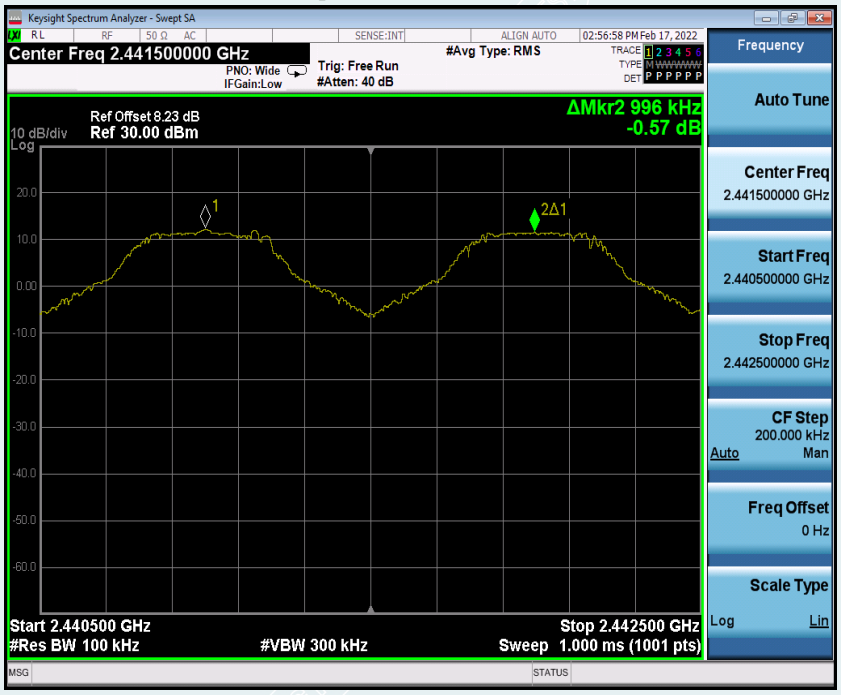
3DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.000	786	> 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

Test result: The unit does meet the FCC requirements.

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

8. HOPPING CHANNEL NUMBER

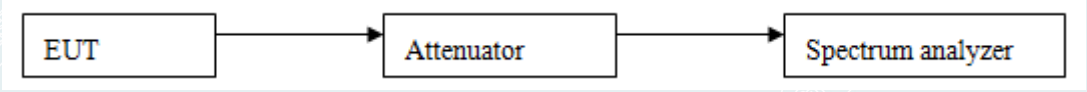
8.1 LIMITS

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

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 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.

8.3 TEST SETUP



8.4 TEST RESULTS

Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

GFSK

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

π/4-DQPSK

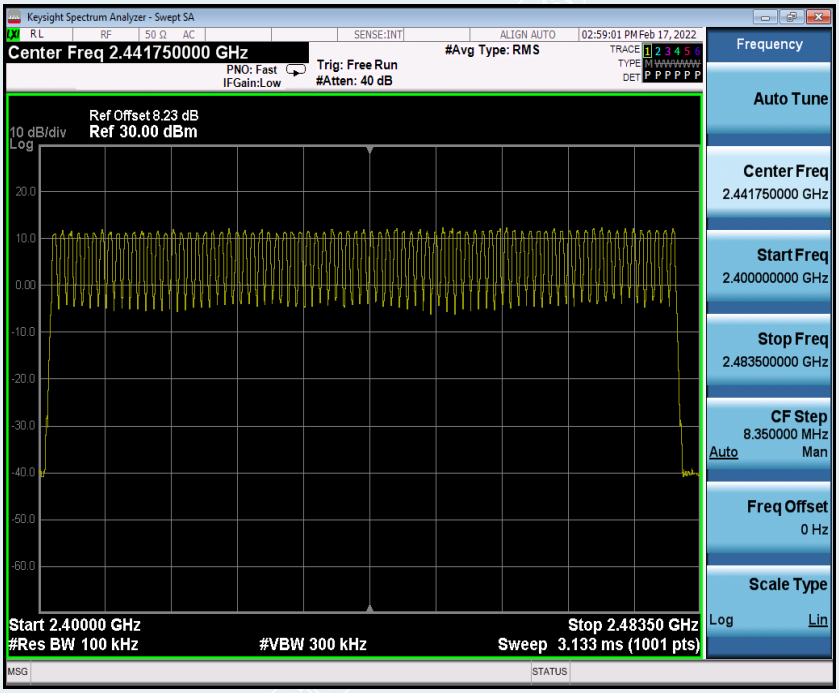
Result (No. of CH)	Limit (No. of CH)	Result
79	≥15	PASS

8DPSK

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

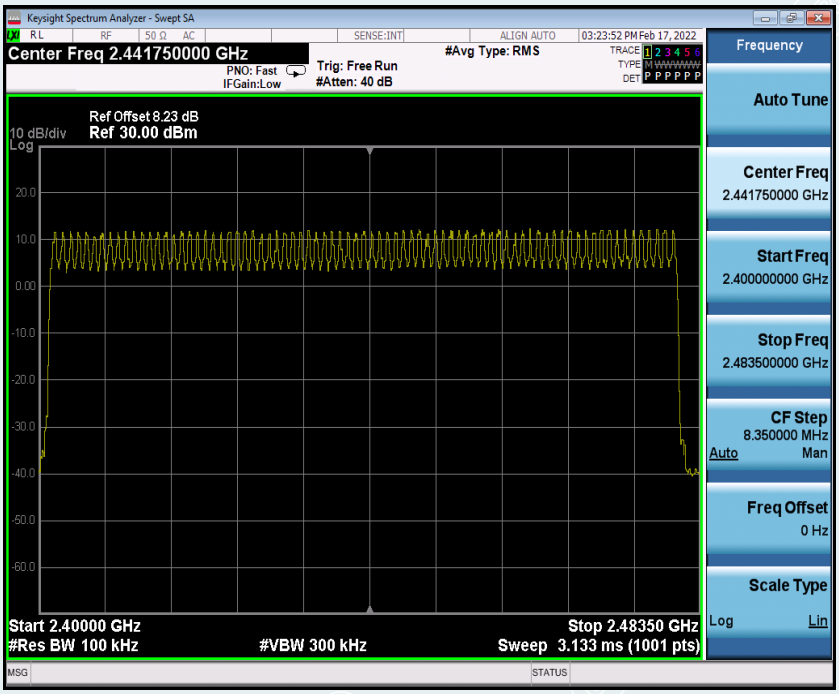
GFSK

2.400 GHz – 2.4835 GHz



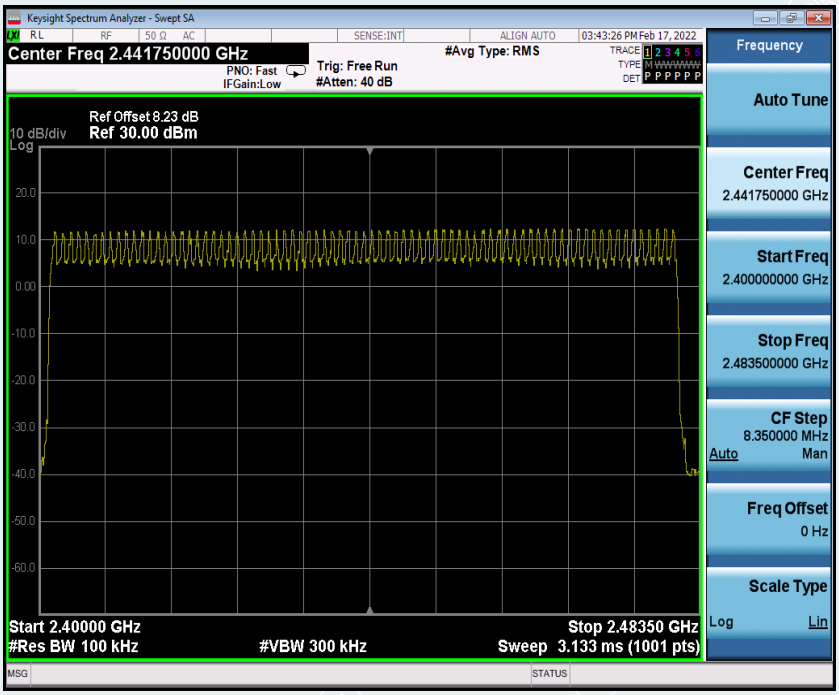
π/4-DQPSK

2.400 GHz – 2.4835 GHz



8DPSK

2.400 GHz – 2.4835 GHz



Test result: The unit does meet the FCC requirements.

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

9. DWELL TIME

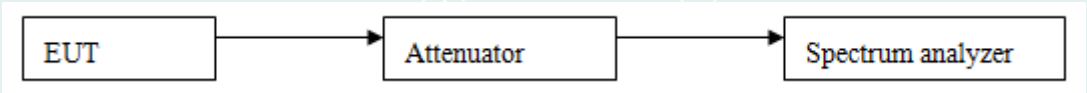
9.1 LIMITS

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

9.2 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 x 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 slotsTX, 1 time slot RX).So, the dwell time is the time duration of the pulse times 5.06 x 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 slotsTX, 1 time slot RX).So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds.

9.3 TEST SETUP



9.4 TEST RESULTS

Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

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

GFSK: Middle Channel (2.441GHz)

DH1	time slot=	0.39	(ms)*	(1600/(2*79))	*	31.6	=	124.8	ms
DH3	time slot=	1.64	(ms)*	(1600/(4*79))	*	31.6	=	262.4	ms
DH5	time slot=	2.89	(ms)*	(1600/(6*79))	*	31.6	=	308.3	ms

π/4-DQPSK: Middle Channel (2.441GHz)

2DH1	time slot=	0.40	(ms)*	(1600/(2*79))	*	31.6	=	128	ms
2DH3	time slot=	1.65	(ms)*	(1600/(4*79))	*	31.6	=	264	ms
2DH5	time slot=	2.90	(ms)*	(1600/(6*79))	*	31.6	=	309.3	ms

8DPSK: Middle Channel (2.441GHz)

3DH1	time slot=	0.40	(ms)*	(1600/(2*79))	*	31.6	=	128	ms
3DH3	time slot=	1.65	(ms)*	(1600/(4*79))	*	31.6	=	264	ms
3DH5	time slot=	2.90	(ms)*	(1600/(6*79))	*	31.6	=	309.3	ms

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

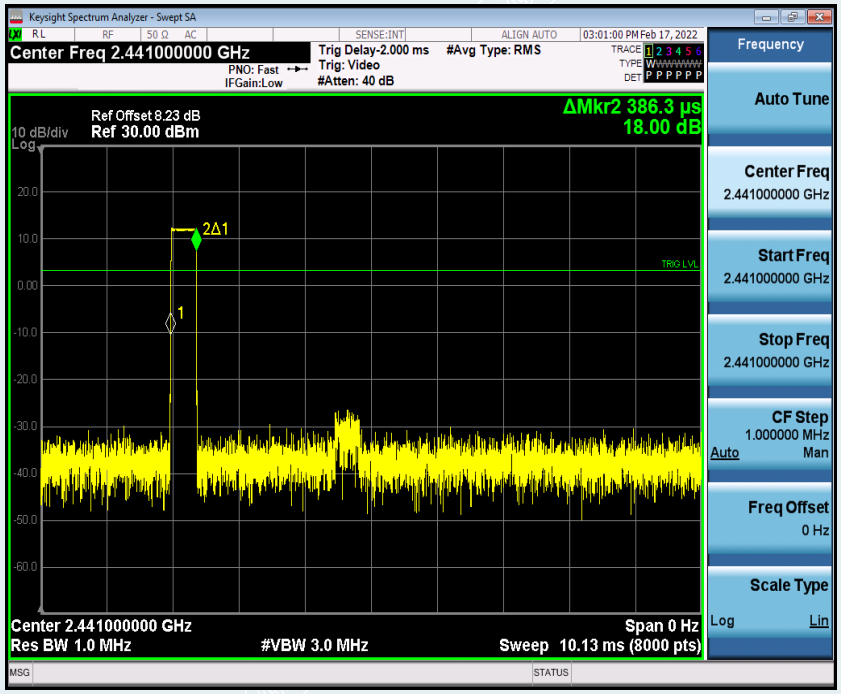
---------- The following blanks ----------

Please refer the graph as below:

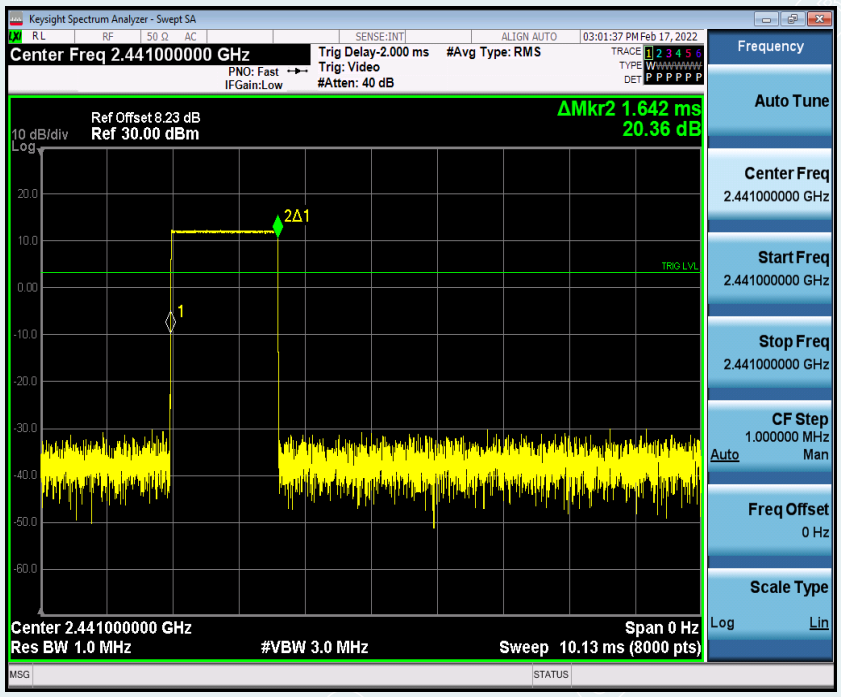
GFSK

Middle Frequency (2.441GHz)

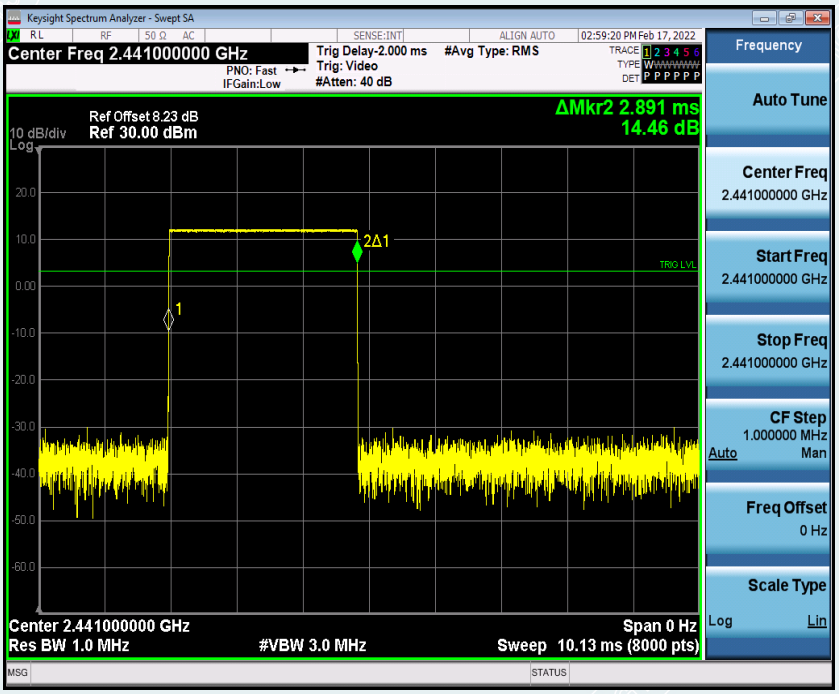
DH1



DH3

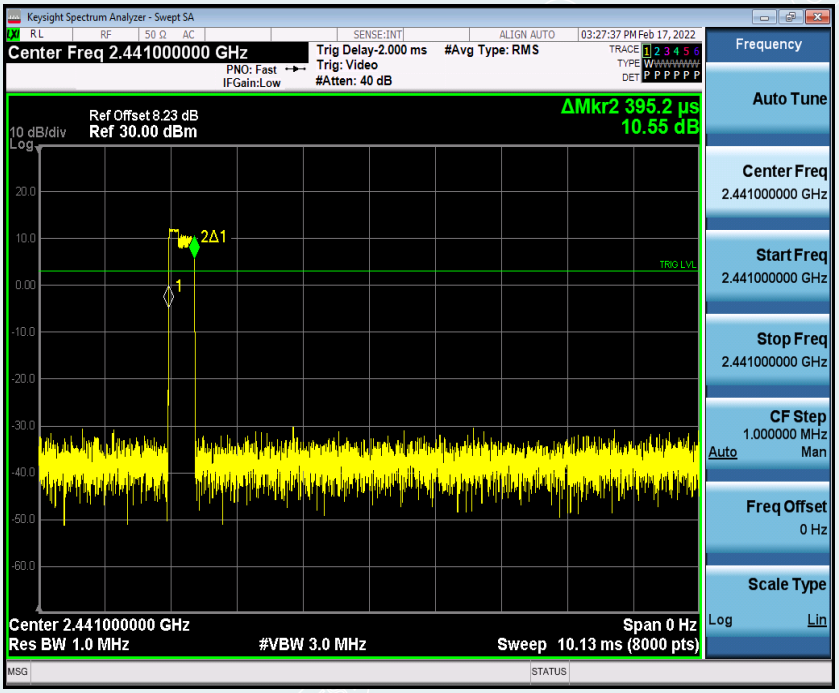


DH5

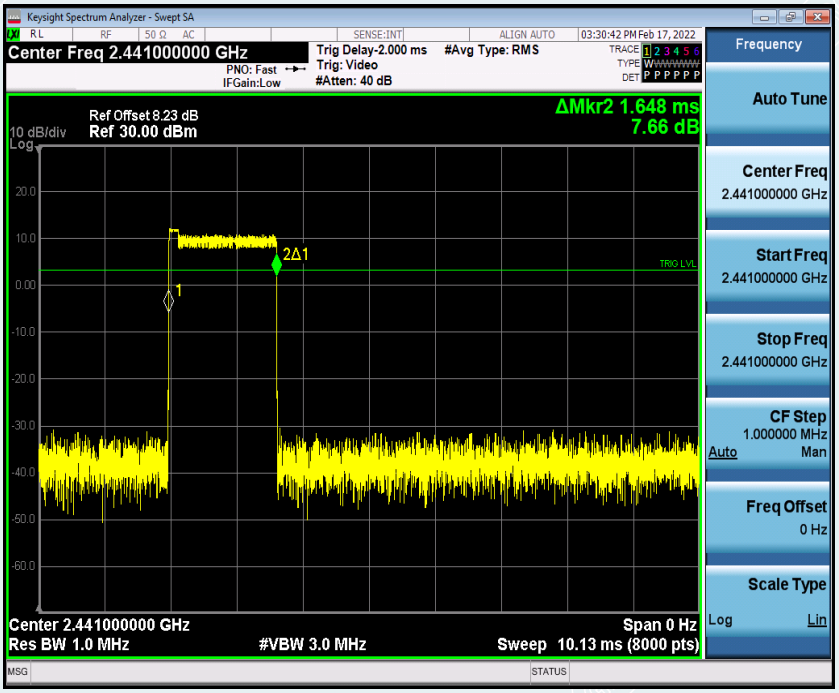


---------- **The following blanks** ----------

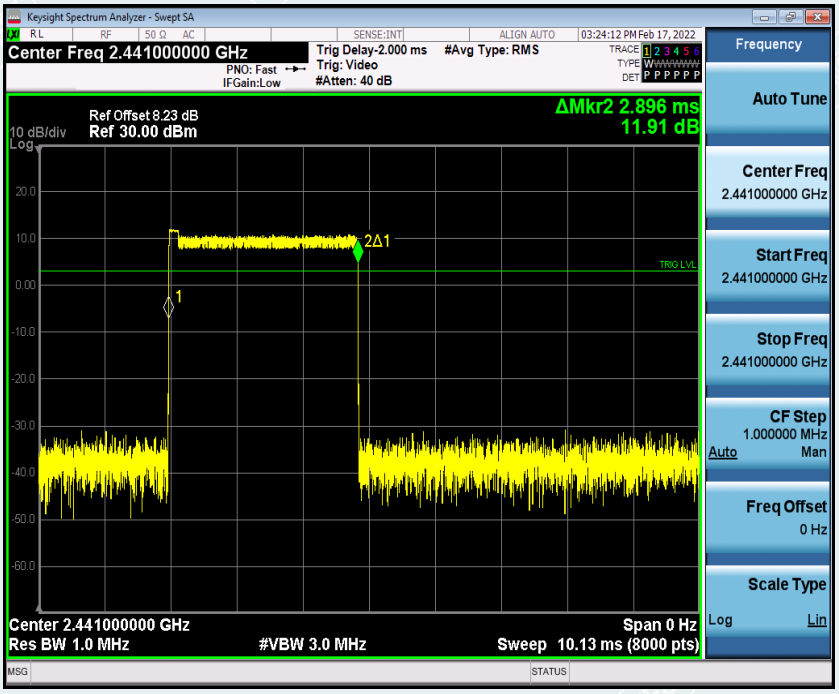
π/4-DQPSK
Middle Frequency (2.441GHz)
2DH1



Mid Frequency (2.441GHz)
2DH3



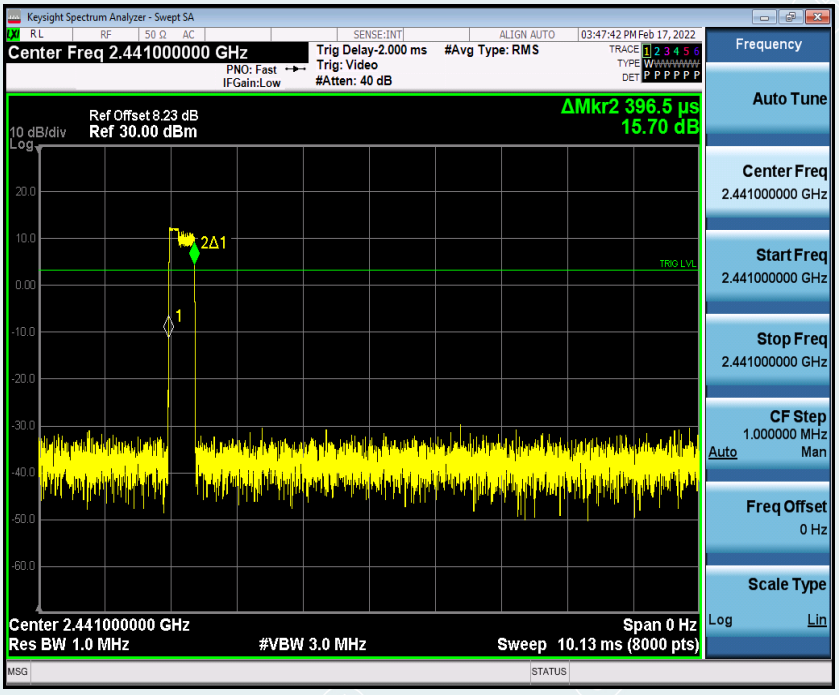
2DH5



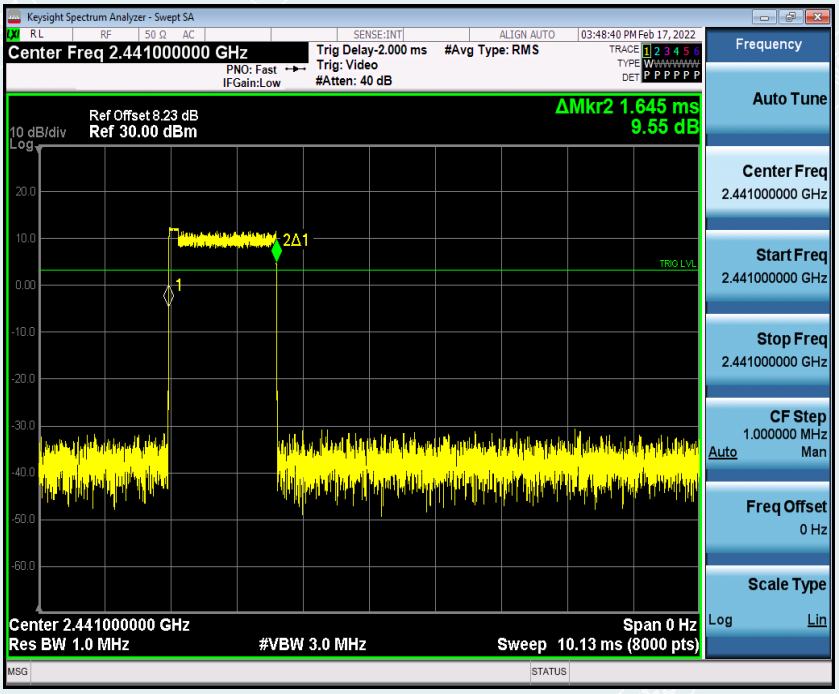
8DPSK

Middle Frequency (2.441GHz)

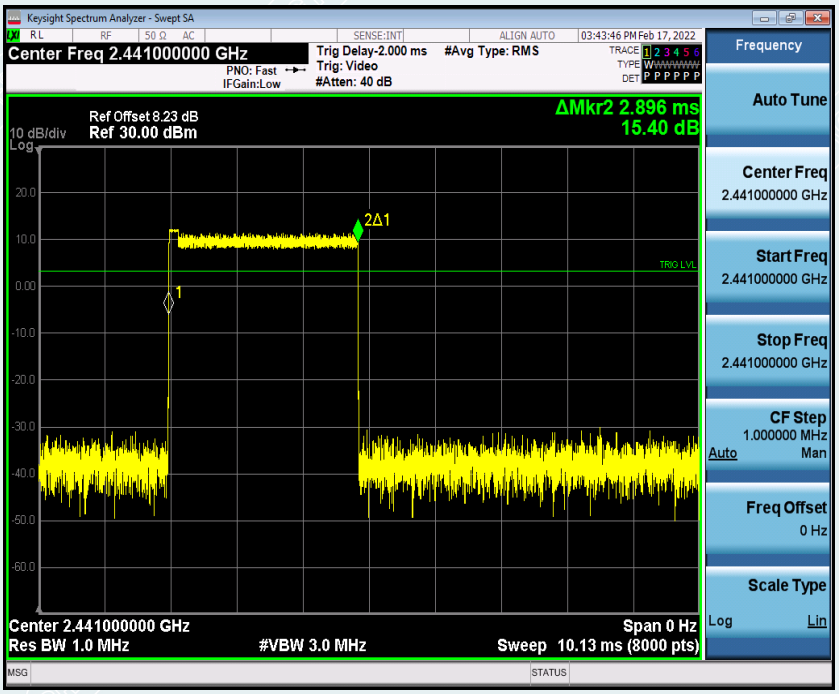
3DH1



3DH3


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
03:48:40 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.645 ms
9.55 dB
2Δ1
1
TRIG LVL
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

3DH5


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
03:43:46 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.896 ms
15.40 dB
2Δ1
1
TRIG LVL
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

10. MAXIMUM PEAK OUTPUT POWER

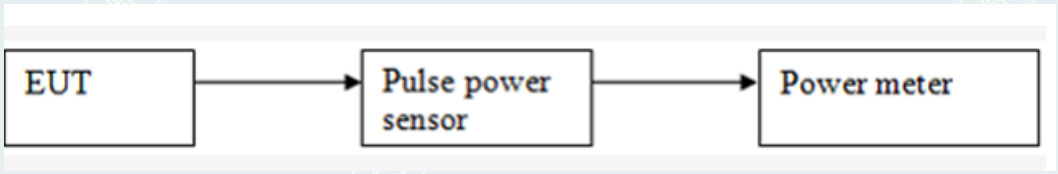
10.1 LIMITS

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.

10.2 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.

10.3 TEST SETUP



10.4 TEST RESULTS

Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	12.54	20.97	Peak	Pass
Middle	2.441	13.01			Pass
Highest	2.480	12.92			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	12.31	20.97	Peak	Pass
Middle	2.441	12.72			Pass
Highest	2.480	12.96			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	12.35	20.97	Peak	Pass
Middle	2.441	12.74			Pass
Highest	2.480	12.97			Pass

Test result: The unit does meet the FCC requirements.

11. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

11.1 LIMITS

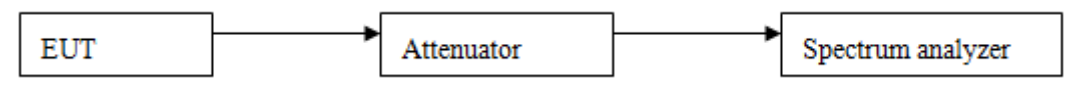
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

11.2 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.

11.3 TEST SETUP



11.4 TEST RESULTS

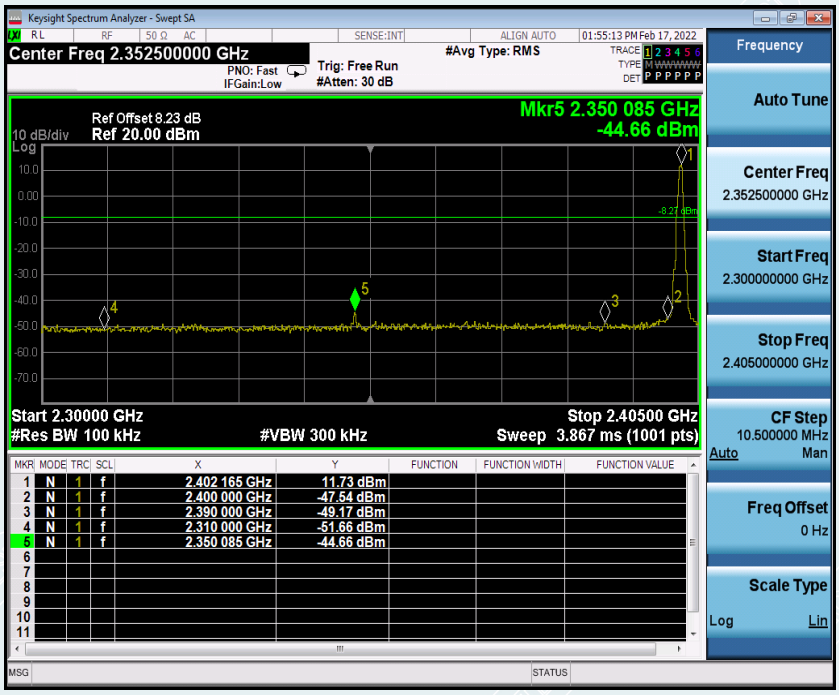
Environment: 23.1℃/53%RH Voltage: DC 3.8V
Tested By: Lu Wei Date: 2022/02/17

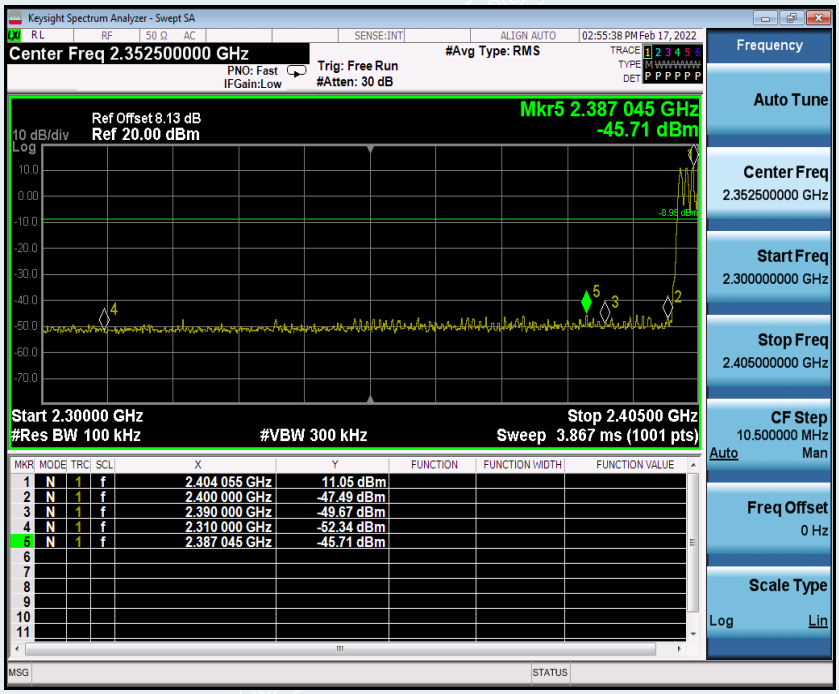
Test result plot as follows:

Band Edges

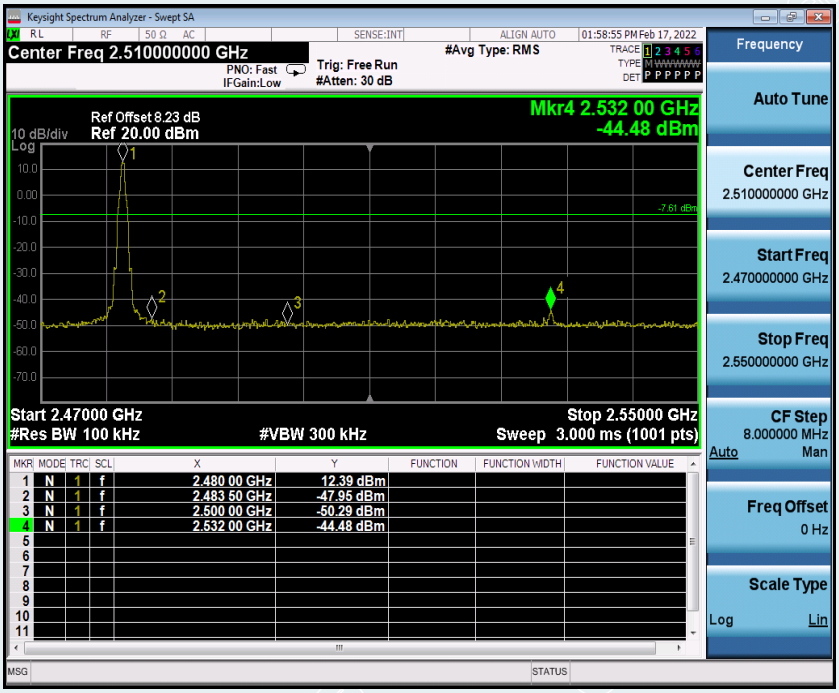
DH5

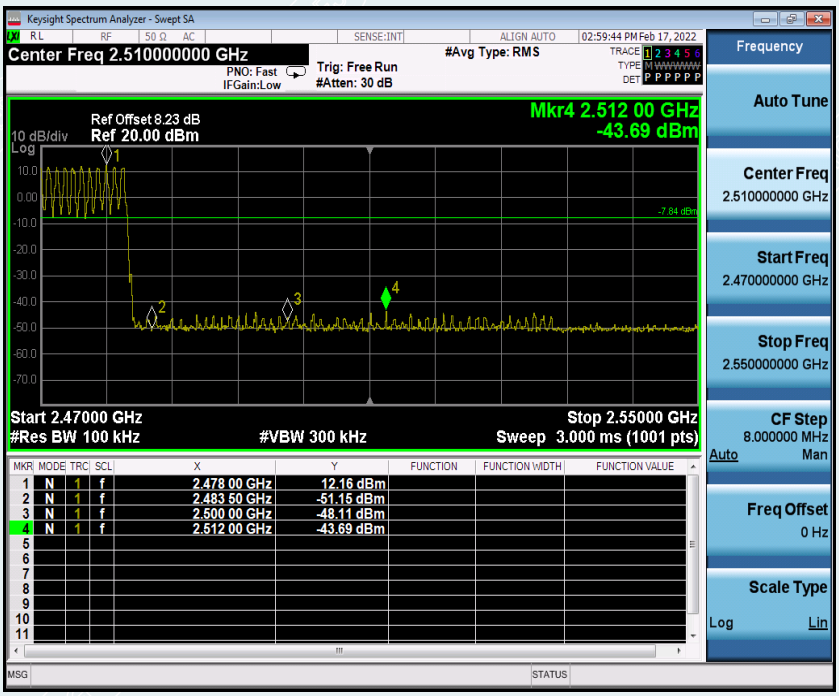
CH Low (2.30GHz ~2.405GHz)



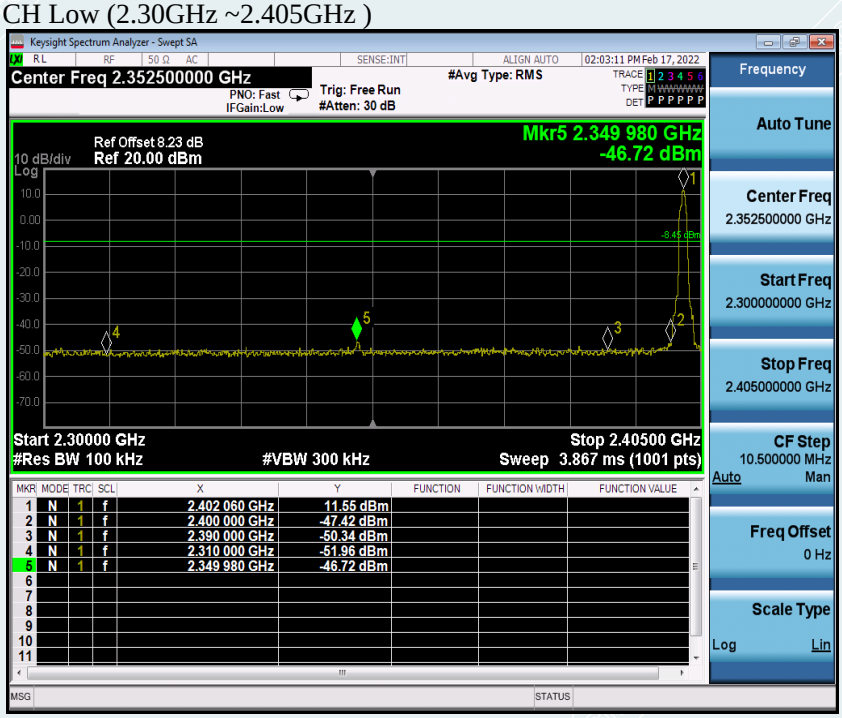


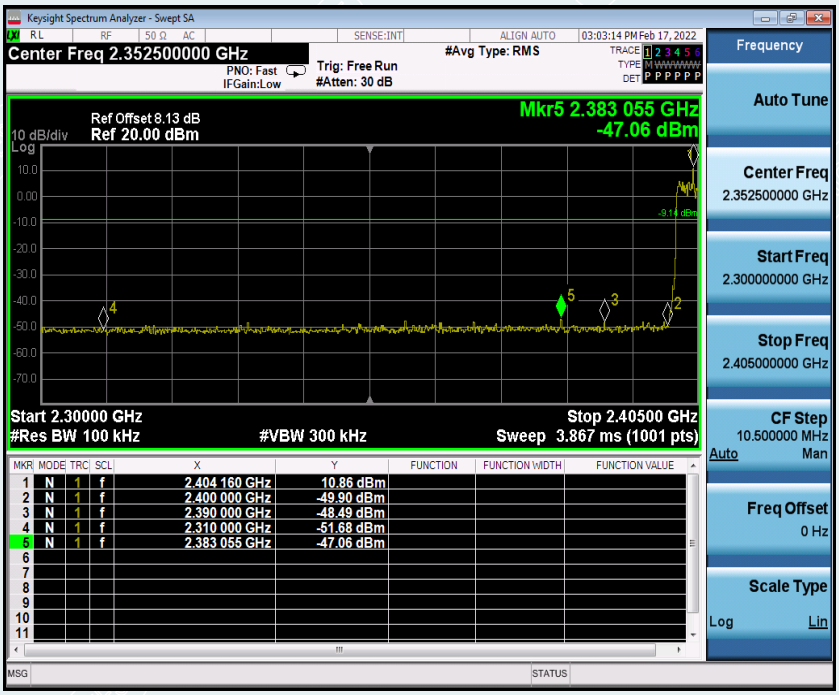
CH High (2.47GHz ~ 2.55GHz)



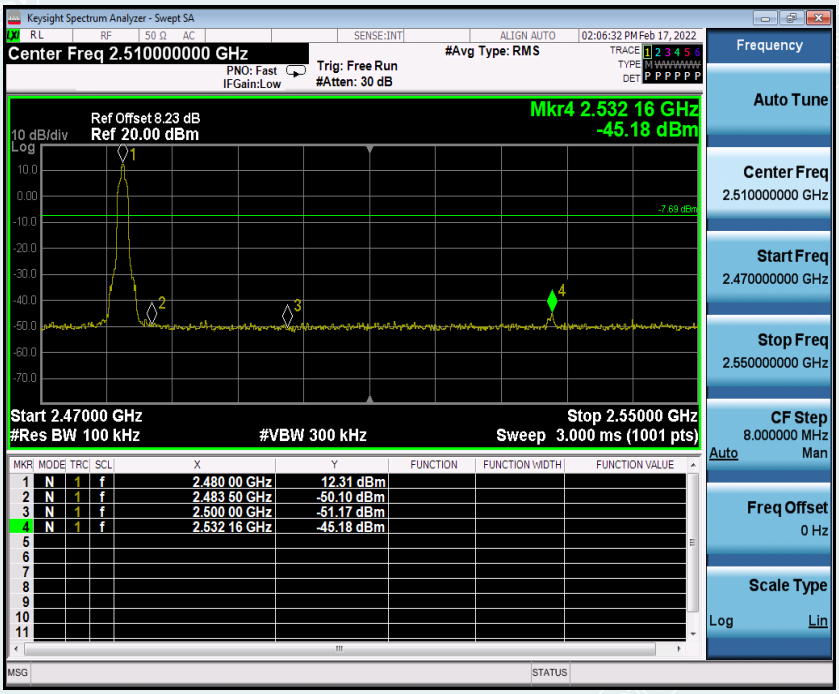


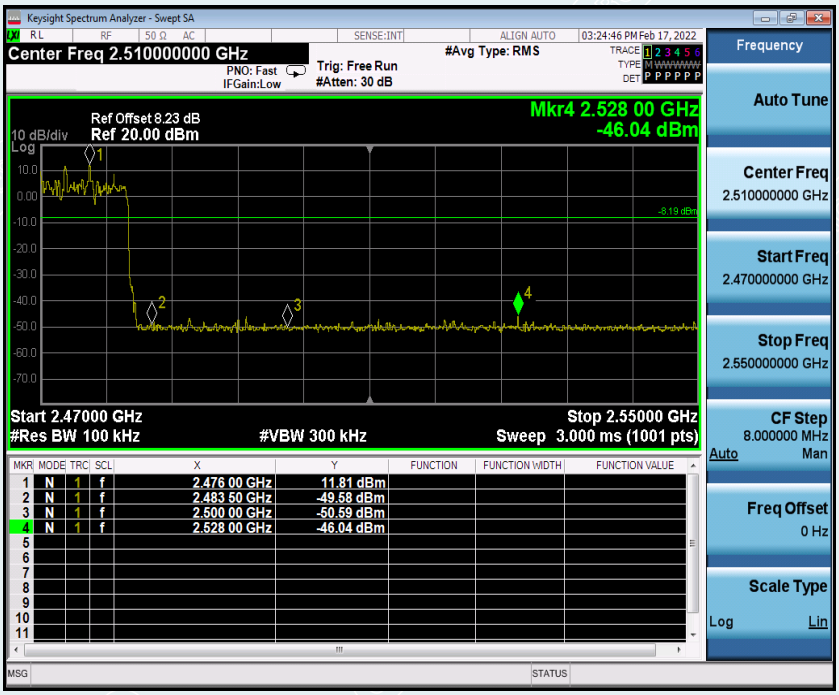
2DH5
CH Low (2.30GHz ~2.405GHz)



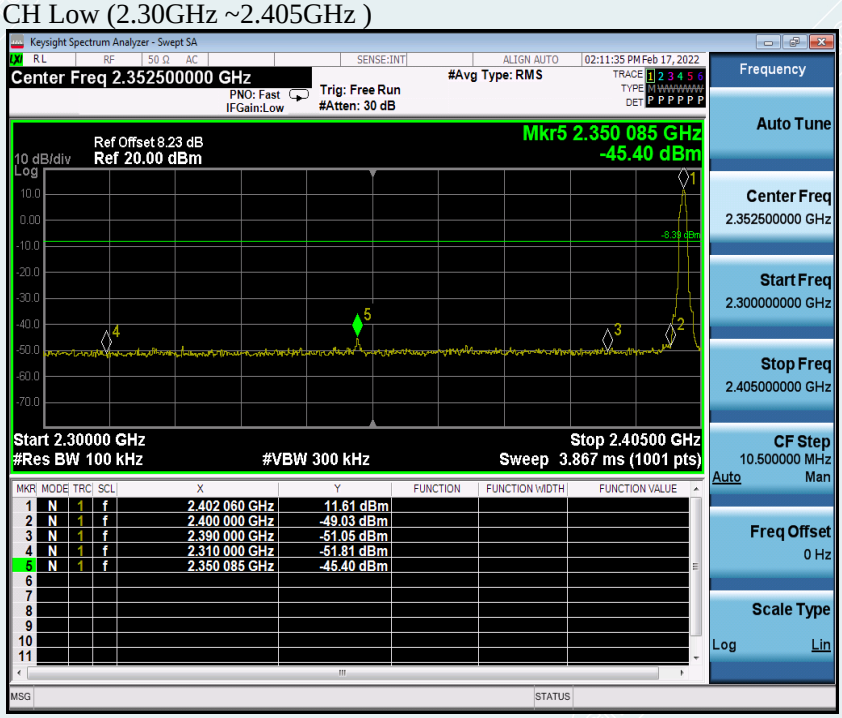


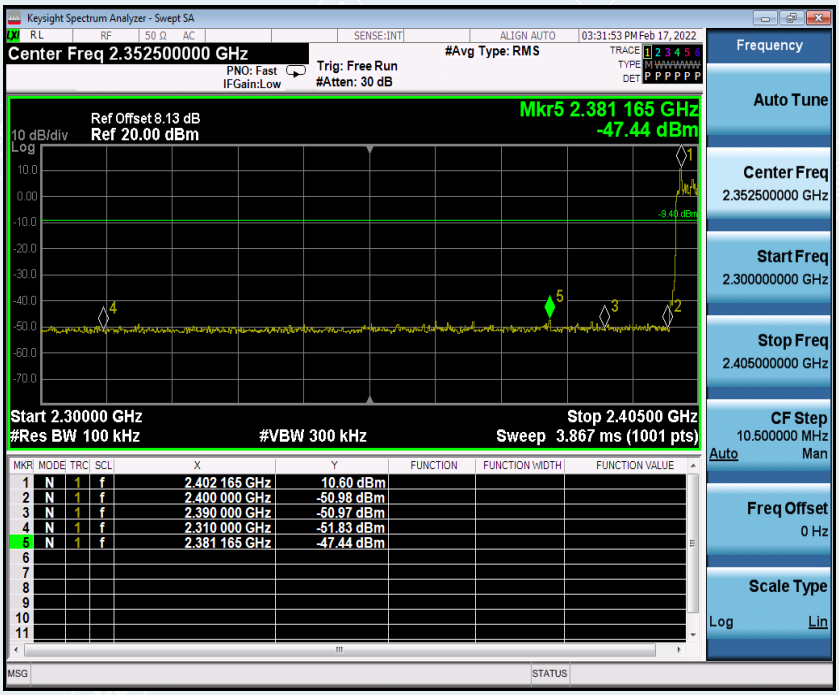
CH High (2.47GHz ~ 2.55GHz)



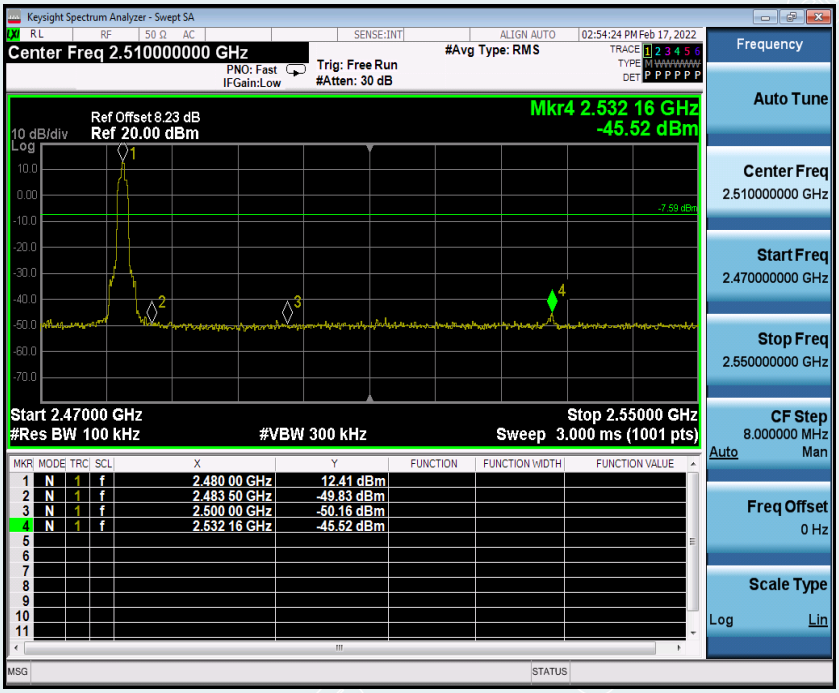


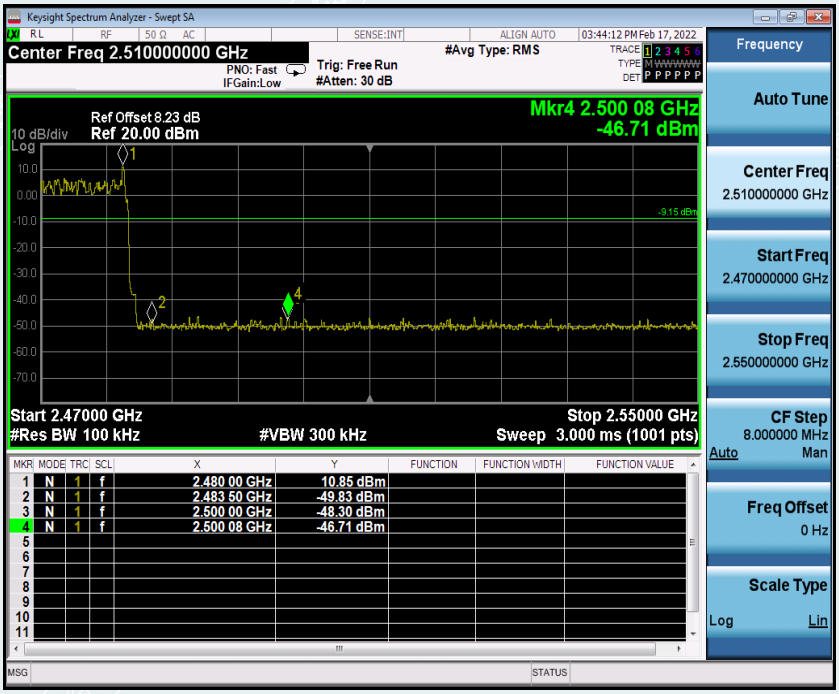
3DH5
CH Low (2.30GHz ~2.405GHz)



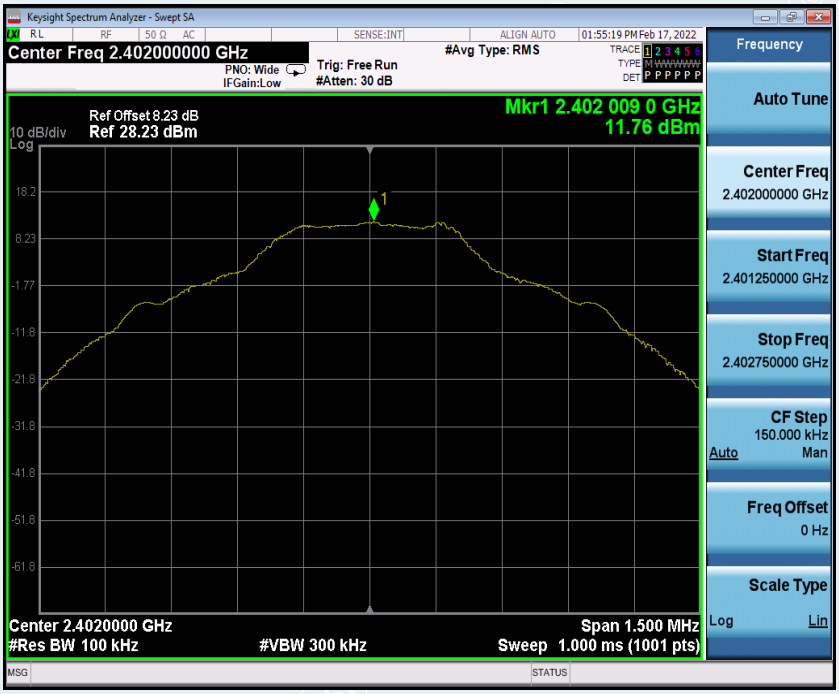


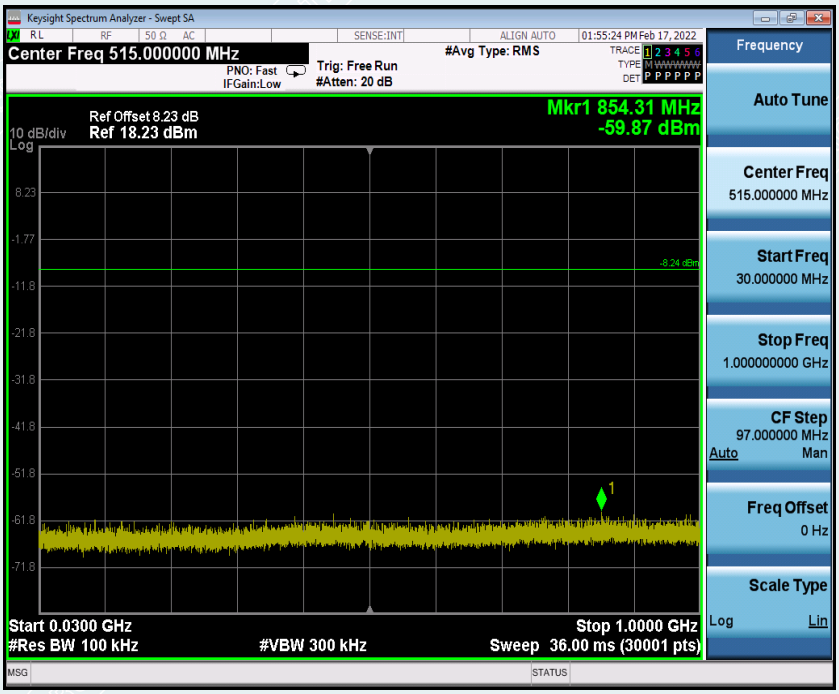
CH High (2.47GHz ~ 2.55GHz)

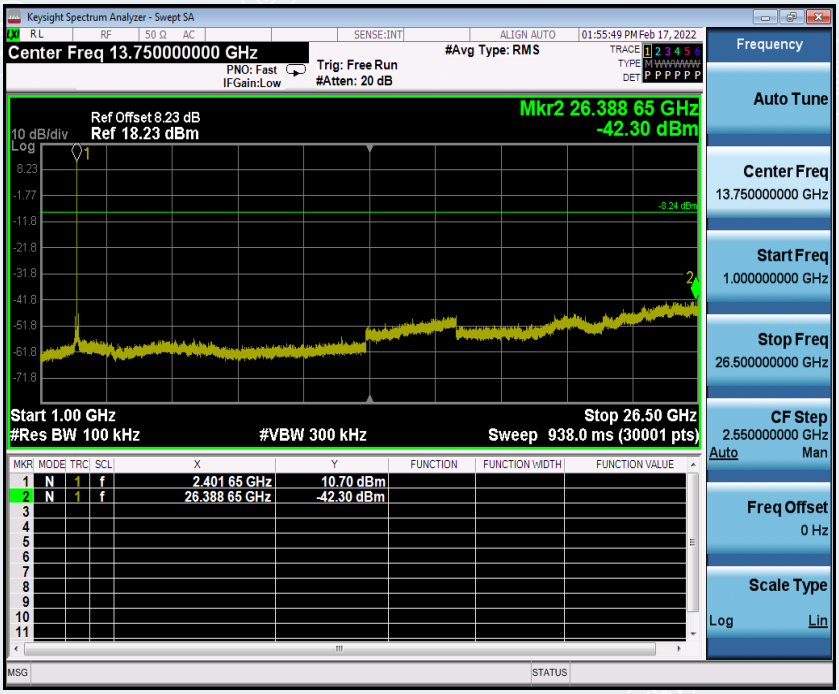




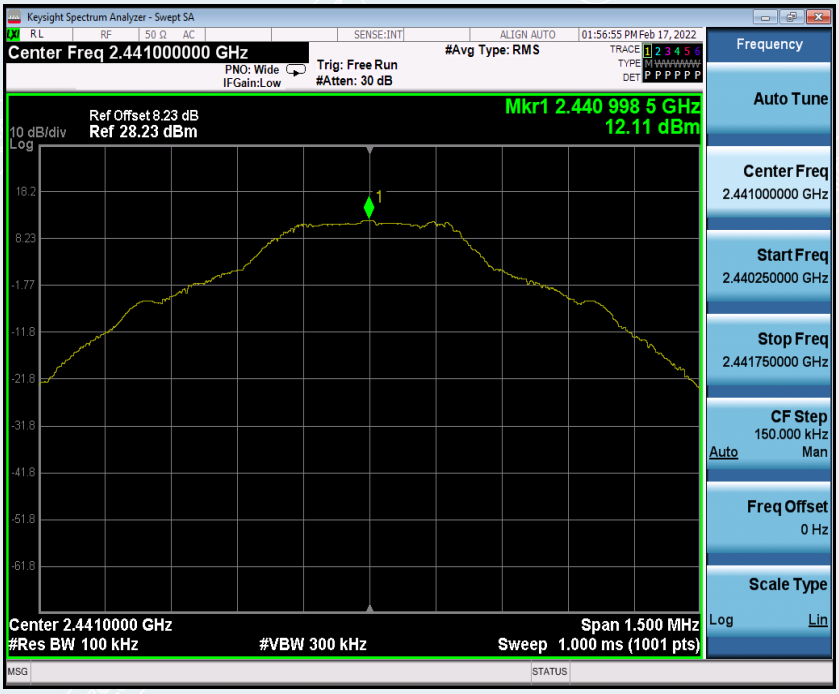
Spurious Emissions
DH5
CH Low

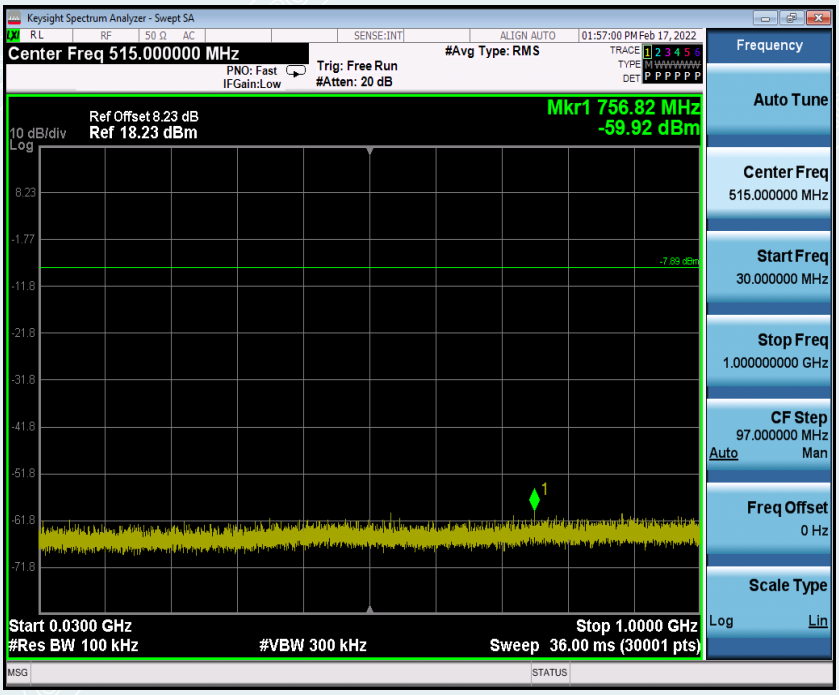


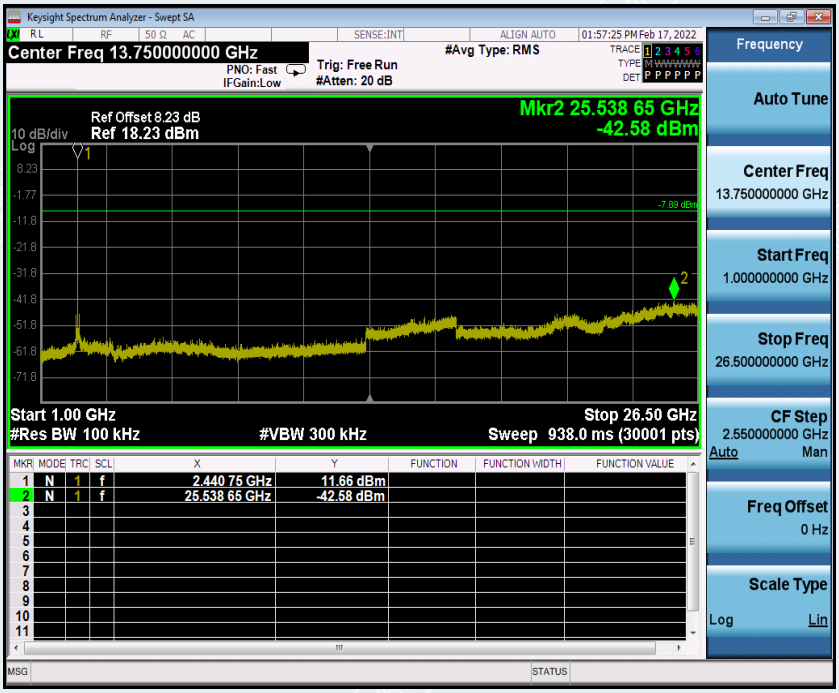



Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
01:55:49 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr2 26.388 65 GHz
-42.30 dBm
-8.24 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
1 N 1 f 2.401 65 GHz 10.70 dBm
2 N 1 f 26.388 65 GHz -42.30 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

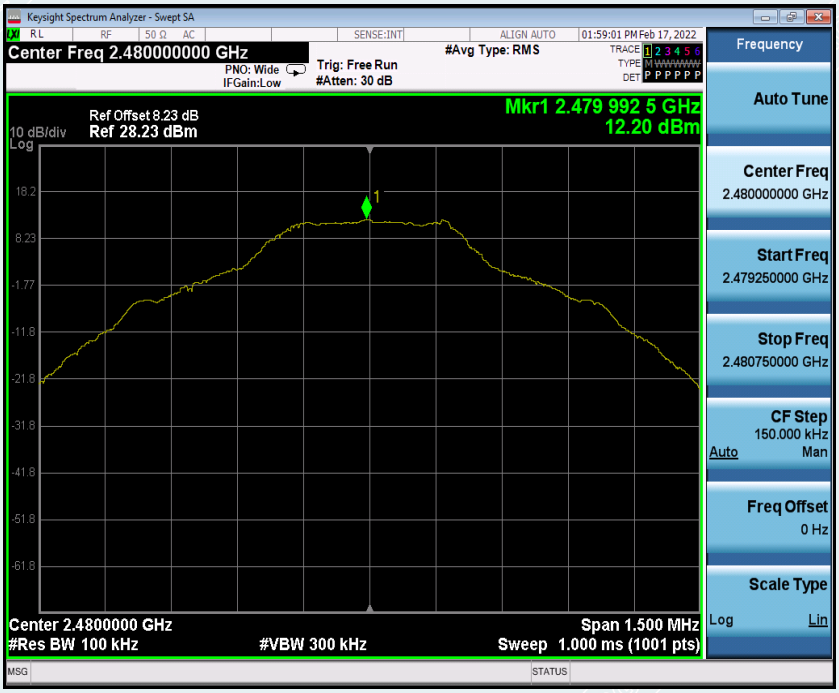
CH Mid

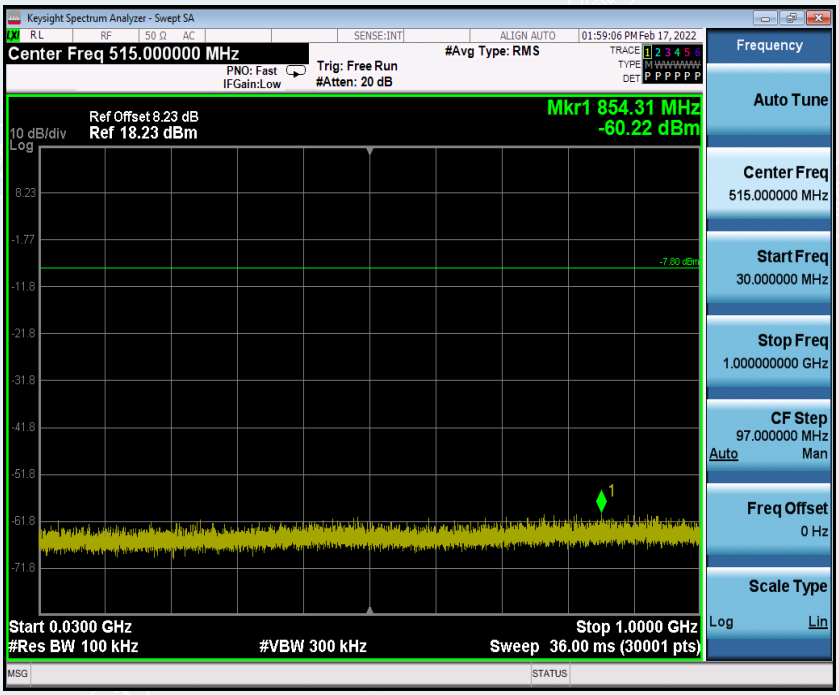

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
01:56:55 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Log
Mkr1 2.440 998 5 GHz
12.11 dBm
Center 2.4410000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.440250000 GHz
Stop Freq
2.441750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

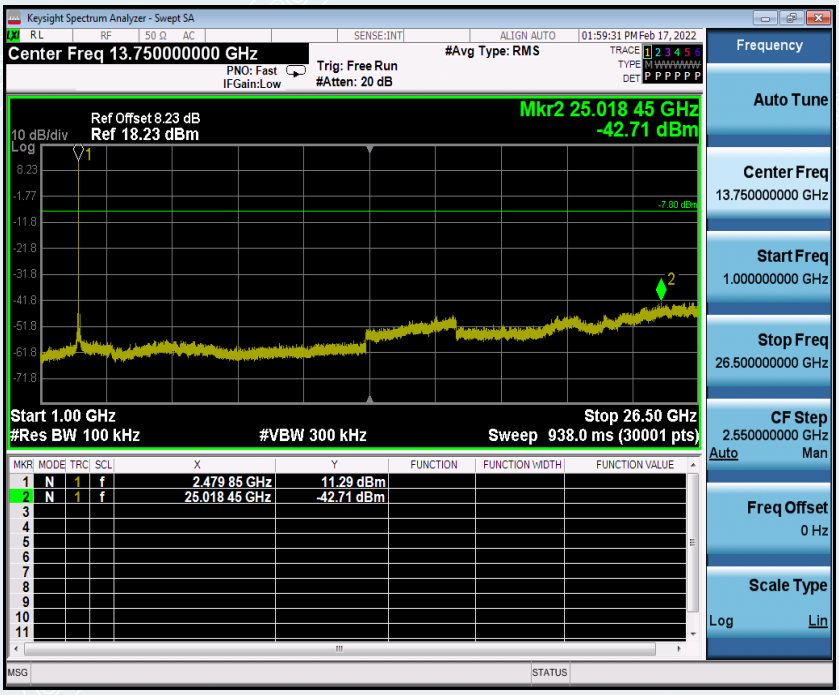

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
01:57:00 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr1 756.82 MHz
-59.92 dBm
-7.89 dBm
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
Frequency
Auto Tune
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
01:57:25 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr2 25.538 65 GHz
-42.58 dBm
-7.89 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
1 N 1 f 2.440 75 GHz 11.66 dBm
2 N 1 f 25.538 65 GHz -42.58 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

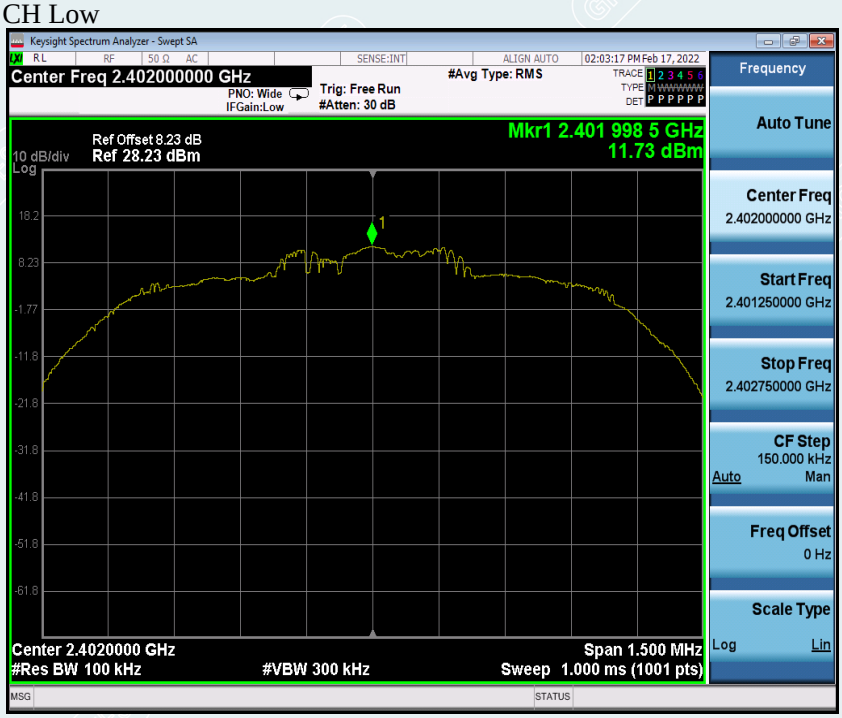
CH High

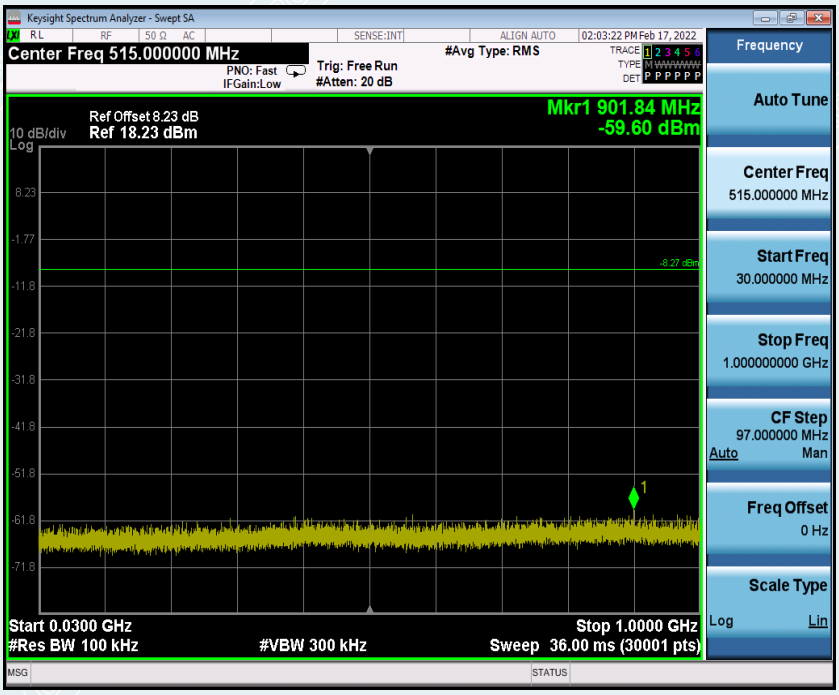

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
01:59:01 PM Feb 17, 2022
Frequency
Auto Tune
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Log
Mkr1 2.479 992 5 GHz
12.20 dBm
18.2
8.23
-1.77
-11.8
-21.8
-31.8
-41.8
-51.8
-61.8
Center Freq
2.480000000 GHz
Start Freq
2.479250000 GHz
Stop Freq
2.480750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Center 2.4800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
MSG
STATUS

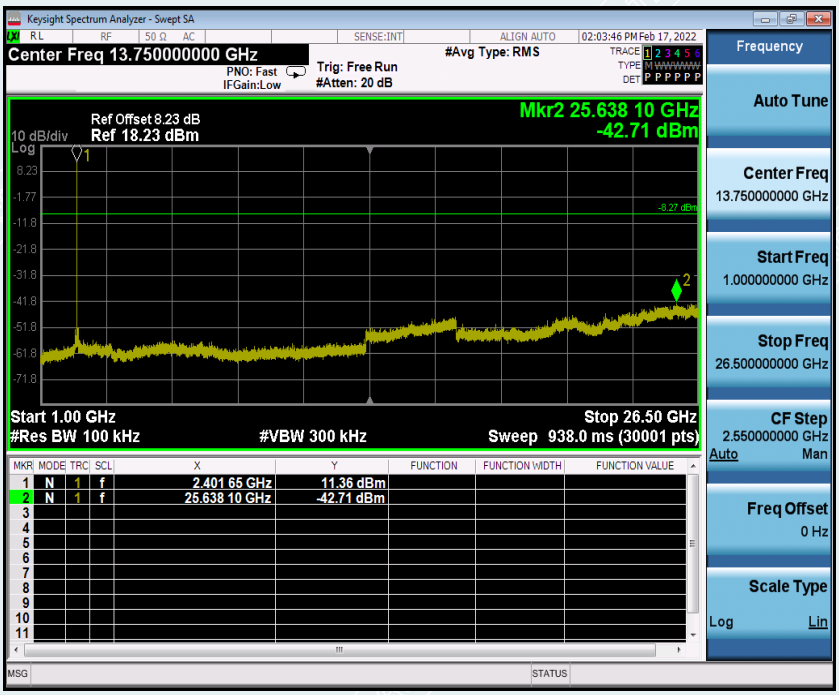

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
01:59:06 PM Feb 17, 2022
Frequency
Auto Tune
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr1 854.31 MHz
-60.22 dBm
8.23
-1.77
-11.8
-21.8
-31.8
-41.8
-51.8
-61.8
-71.8
-7.80 dBm
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
01:59:31 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr2 25.018 45 GHz
-42.71 dBm
-7.80 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
1 N 1 f 2.479 85 GHz 11.29 dBm
2 N 1 f 25.018 45 GHz -42.71 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

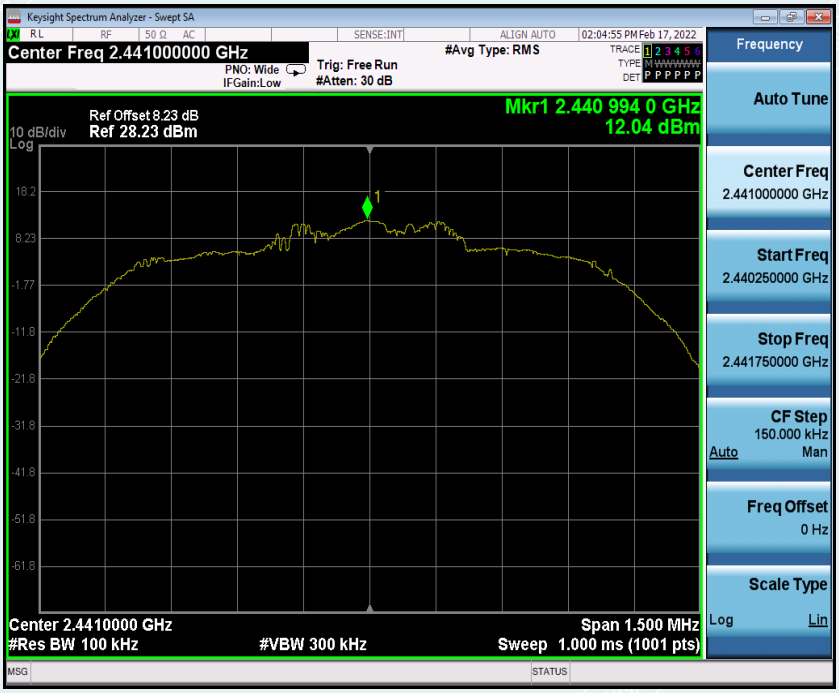
2DH5
CH Low

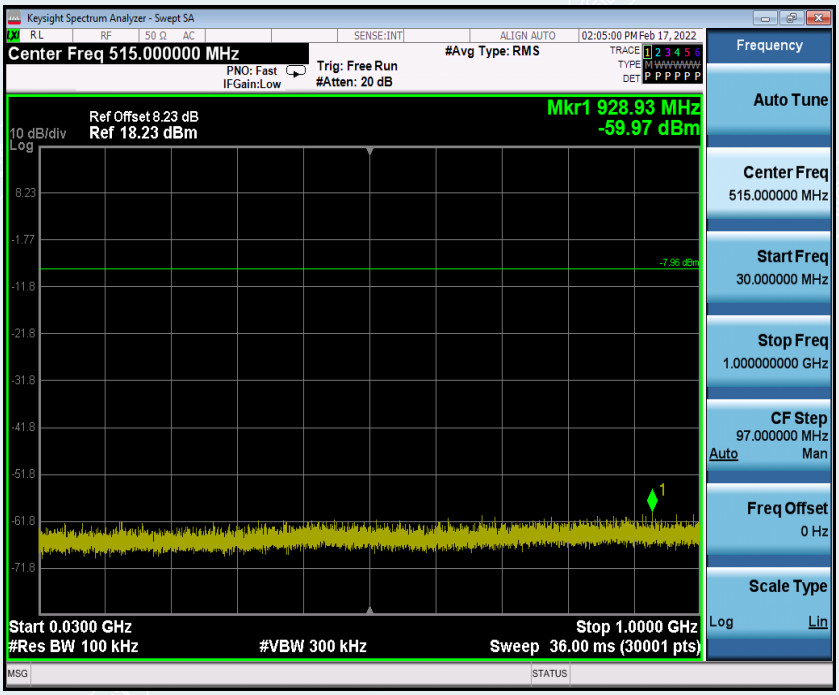

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.402000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
02:03:17 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Mkr1 2.401 998 5 GHz
11.73 dBm
Center 2.4020000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.402000000 GHz
Start Freq
2.401250000 GHz
Stop Freq
2.402750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

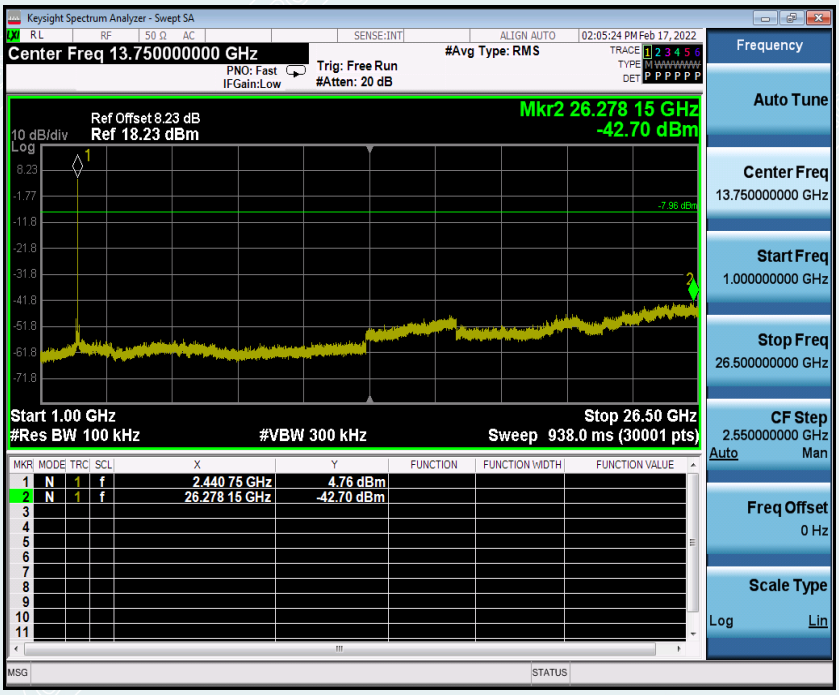

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:03:22 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr1 901.84 MHz
-59.60 dBm
-8.27 dBm
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
Frequency
Auto Tune
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:03:46 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr2 25.638 10 GHz
-42.71 dBm
-8.27 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.401 65 GHz 11.36 dBm
2 N 1 f 25.638 10 GHz -42.71 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

CH Mid

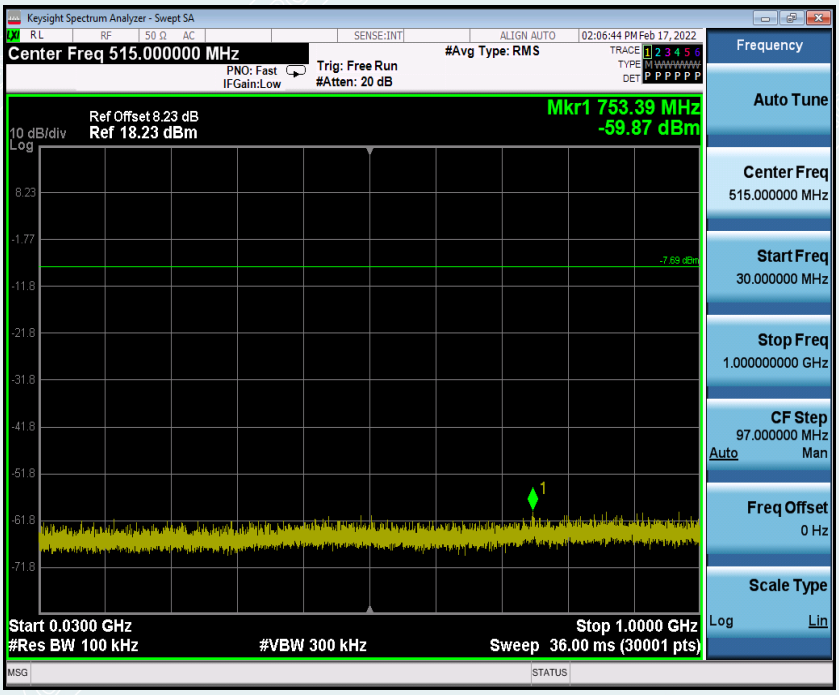

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
02:04:55 PM Feb 17, 2022
Frequency
Auto Tune
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Mkr1 2.440 994 0 GHz
12.04 dBm
Center Freq
2.441000000 GHz
Start Freq
2.440250000 GHz
Stop Freq
2.441750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Center 2.4410000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
MSG
STATUS

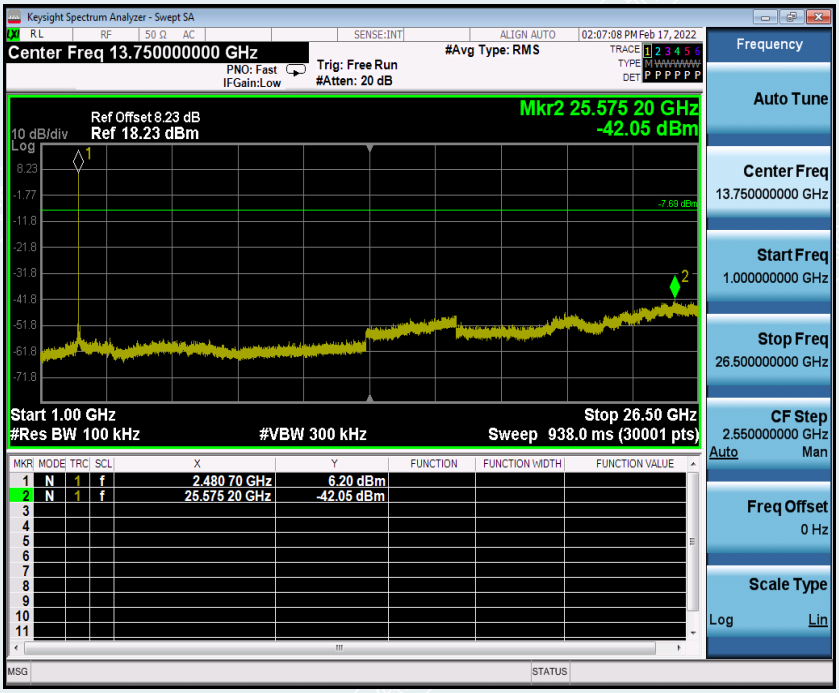

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:05:00 PM Feb 17, 2022
Frequency
Auto Tune
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr1 928.93 MHz
-59.97 dBm
-7.96 dBm
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:05:24 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr2 26.278 15 GHz
-42.70 dBm
-7.96 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
1 N 1 f 2.440 75 GHz 4.76 dBm
2 N 1 f 26.278 15 GHz -42.70 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

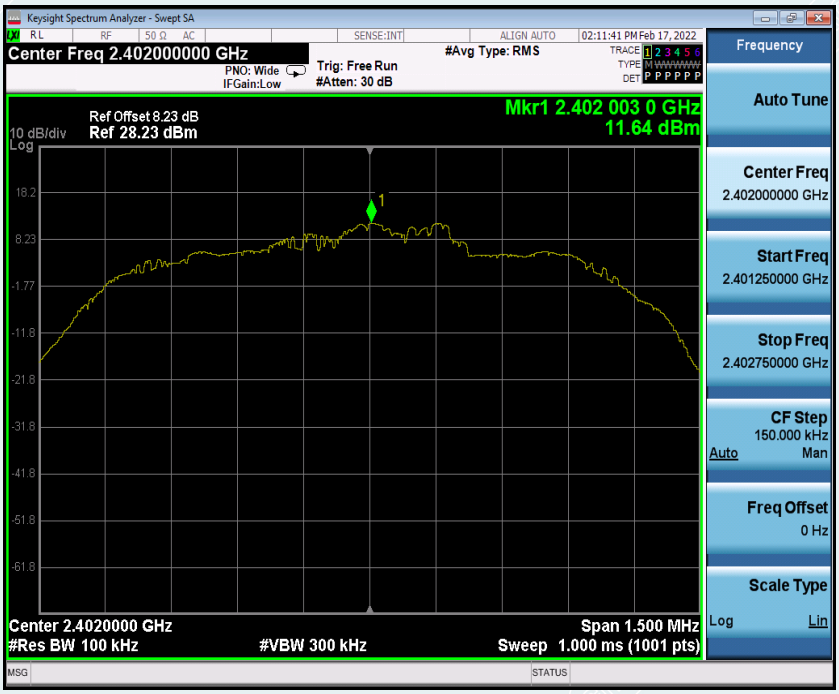
CH High

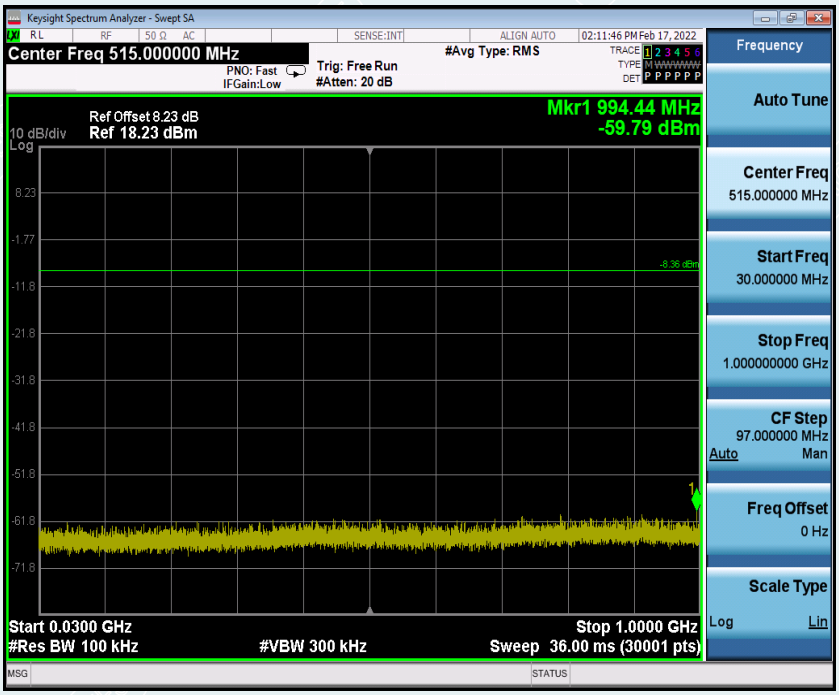

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
02:06:38 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Log
Mkr1 2.479 995 5 GHz
12.31 dBm
Center 2.4800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479250000 GHz
Stop Freq
2.480750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

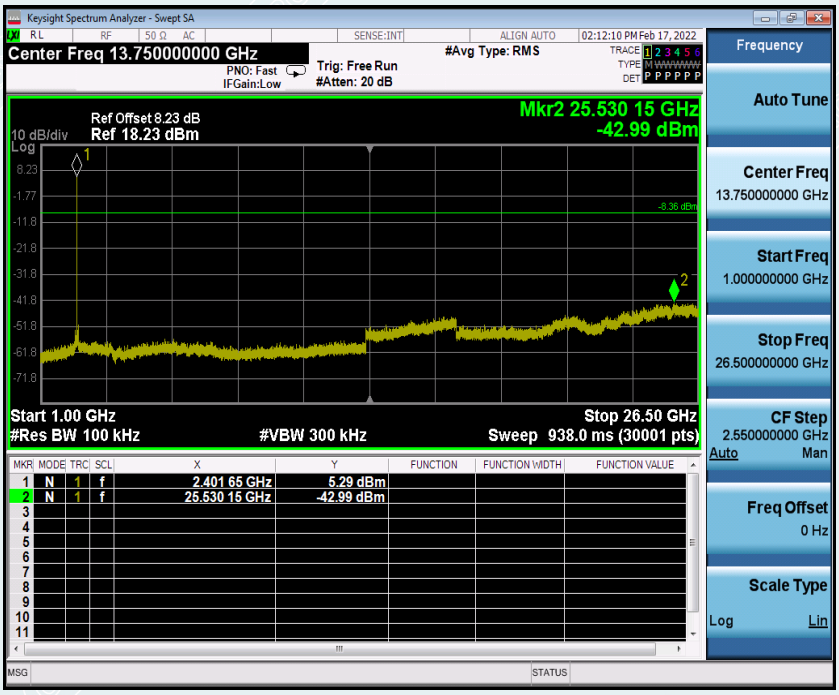

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:06:44 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr1 753.39 MHz
-59.87 dBm
-7.69 dBm
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
Frequency
Auto Tune
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:07:08 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr2 25.575 20 GHz
-42.05 dBm
-7.69 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.480 70 GHz 6.20 dBm
2 N 1 f 25.575 20 GHz -42.05 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

3DH5
CH Low

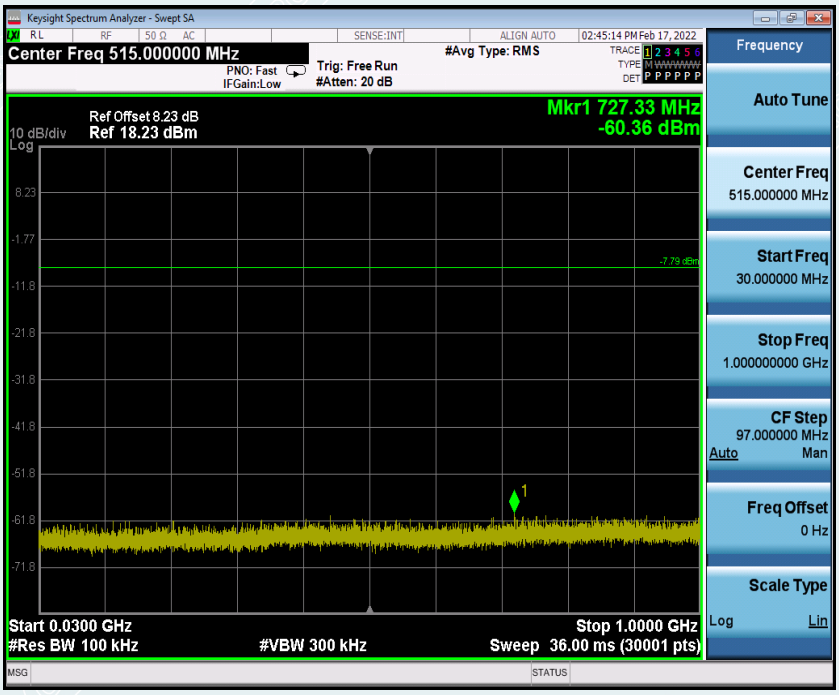

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.402000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
02:11:41 PM Feb 17, 2022
Frequency
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Mkr1 2.402 003 0 GHz
11.64 dBm
Auto Tune
Center Freq
2.402000000 GHz
Start Freq
2.401250000 GHz
Stop Freq
2.402750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Center 2.4020000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
MSG
STATUS

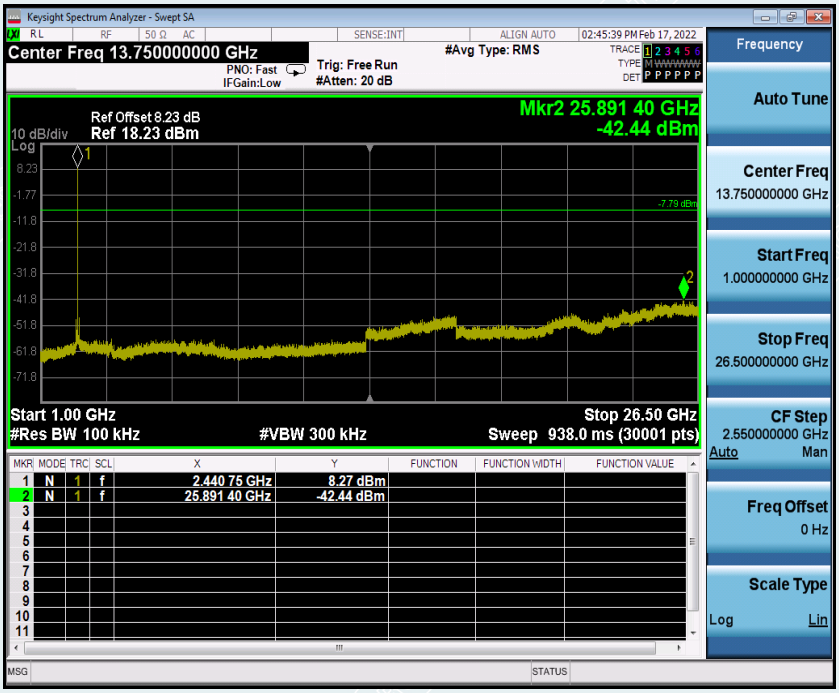

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:11:46 PM Feb 17, 2022
Frequency
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr1 994.44 MHz
-59.79 dBm
-8.36 dBm
Auto Tune
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:12:10 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr2 25.530 15 GHz
-42.99 dBm
-8.36 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
1 N 1 f 2.401 65 GHz 5.29 dBm
2 N 1 f 25.530 15 GHz -42.99 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

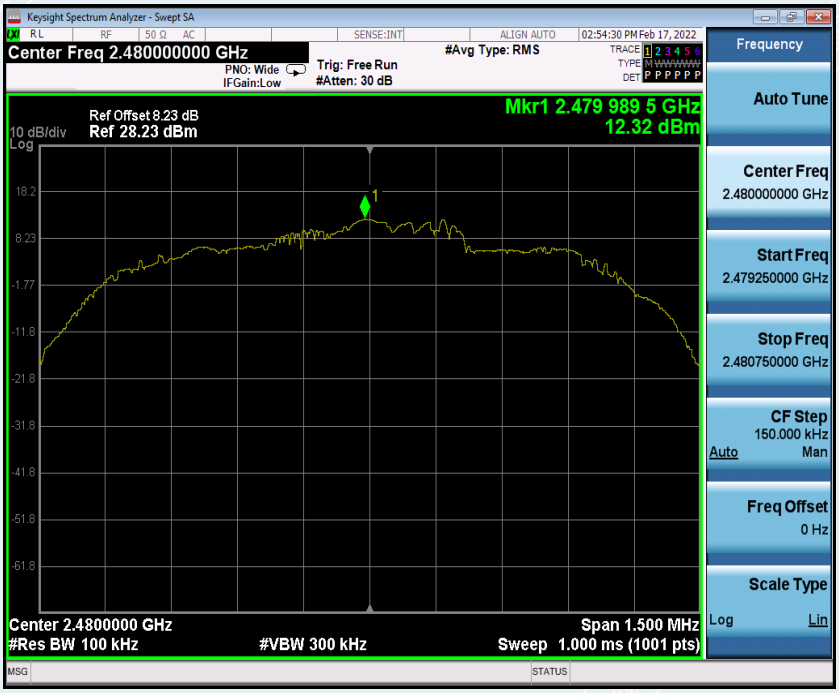
CH Mid

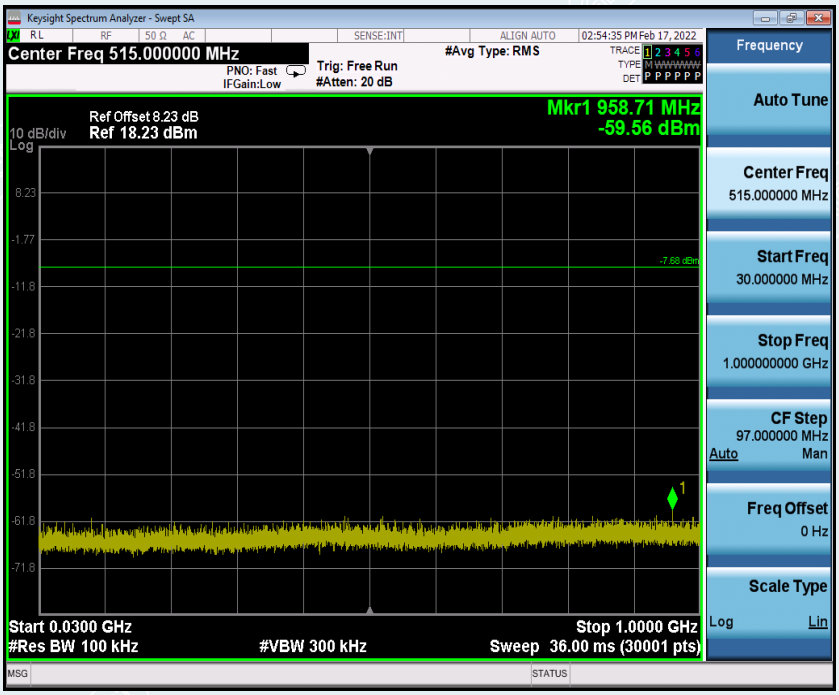

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
02:45:09 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Log
Mkr1 2.441 001 5 GHz
12.21 dBm
Center 2.44100000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.440250000 GHz
Stop Freq
2.441750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

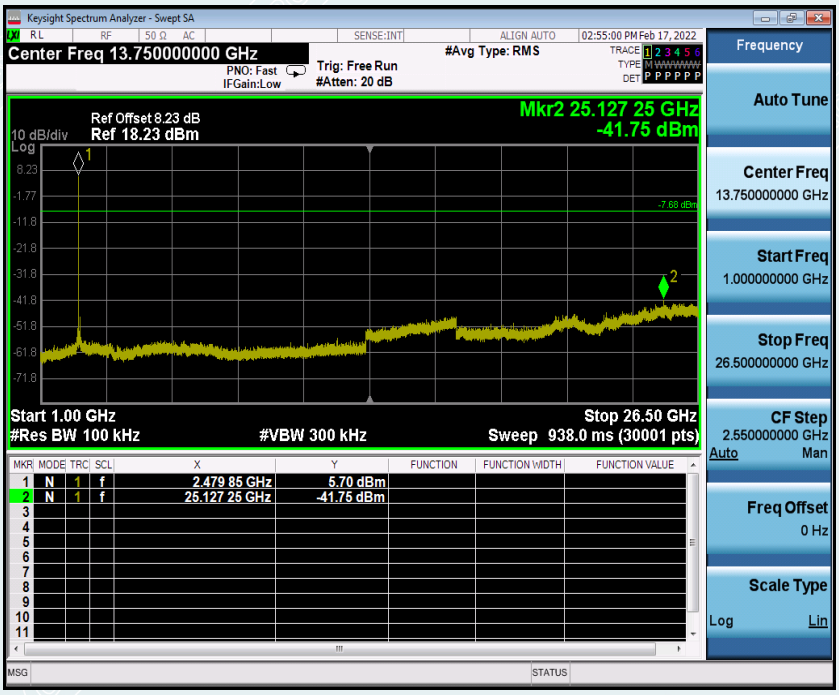

Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:45:14 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr1 727.33 MHz
-60.36 dBm
-7.79 dBm
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
Frequency
Auto Tune
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:45:39 PM Feb 17, 2022
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Log
Mkr2 25.891 40 GHz
-42.44 dBm
-7.79 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 938.0 ms (30001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.440 75 GHz 8.27 dBm
2 N 1 f 25.891 40 GHz -42.44 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
MSG
STATUS

CH High


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
02:54:30 PM Feb 17, 2022
Frequency
Auto Tune
Ref Offset 8.23 dB
10 dB/div
Ref 28.23 dBm
Mkr1 2.479 989 5 GHz
12.32 dBm
Center Freq
2.480000000 GHz
Start Freq
2.479250000 GHz
Stop Freq
2.480750000 GHz
CF Step
150.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Center 2.4800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.500 MHz
Sweep 1.000 ms (1001 pts)
MSG
STATUS


Keysight Spectrum Analyzer - Swept SA
Center Freq 515.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
02:54:35 PM Feb 17, 2022
Frequency
Auto Tune
Ref Offset 8.23 dB
10 dB/div
Ref 18.23 dBm
Mkr1 958.71 MHz
-59.56 dBm
-7.88 dBm
Center Freq
515.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
97.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin
Start 0.0300 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 36.00 ms (30001 pts)
MSG
STATUS



The unit does meet the FCC requirements.

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

12. RADIATED 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. Attenuation below the general limits specified in §15.209(a) is not required.

Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	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.

12.2 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.

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

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 ≥98%，set VBW≤RBW/100 (i.e.,10kHz) but not less than 10 Hz. If the EUT duty cycle is ＜98%，set VBW≥1/T, Where T is defined in section 2.8.
(e). For radiated measurement,pre-scanned in three orthogonal panels,X,Y,Z.The worst cases(X plane) were recorded in this report.

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

12.3 TEST SETUP

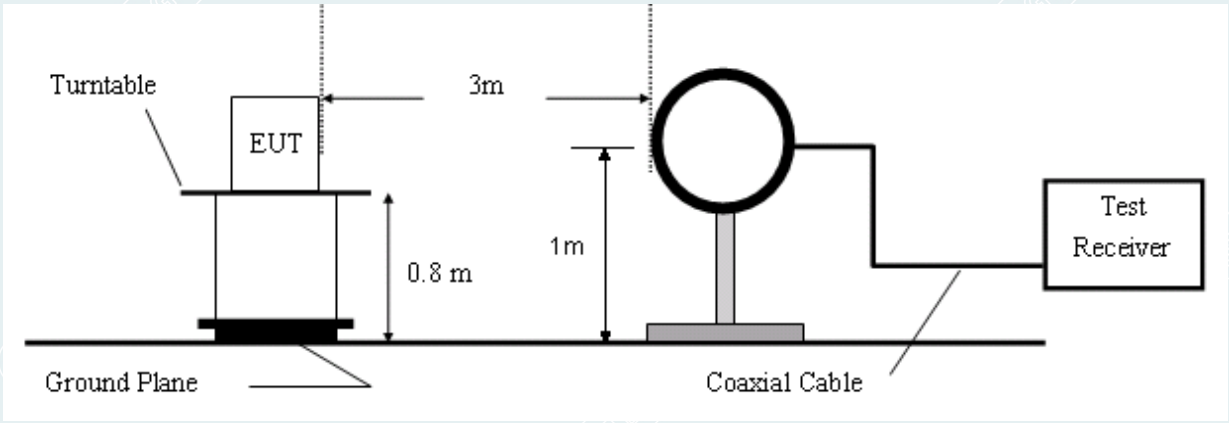


Figure 1. 9 kHz to 30MHz radiated emissions test configuration

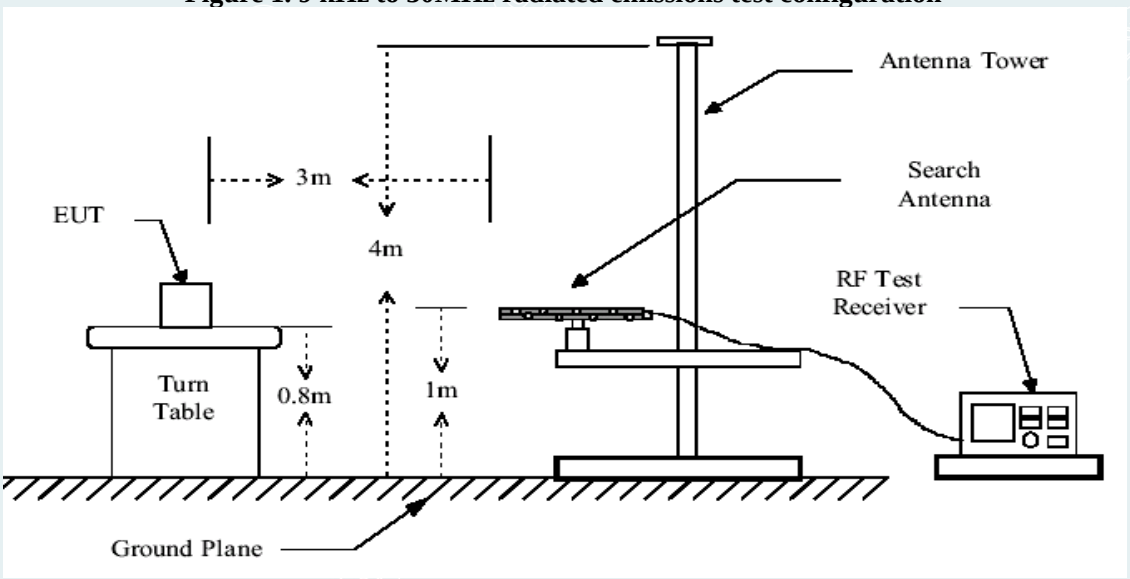


Figure 2. 30MHz to 1GHz radiated emissions test configuration

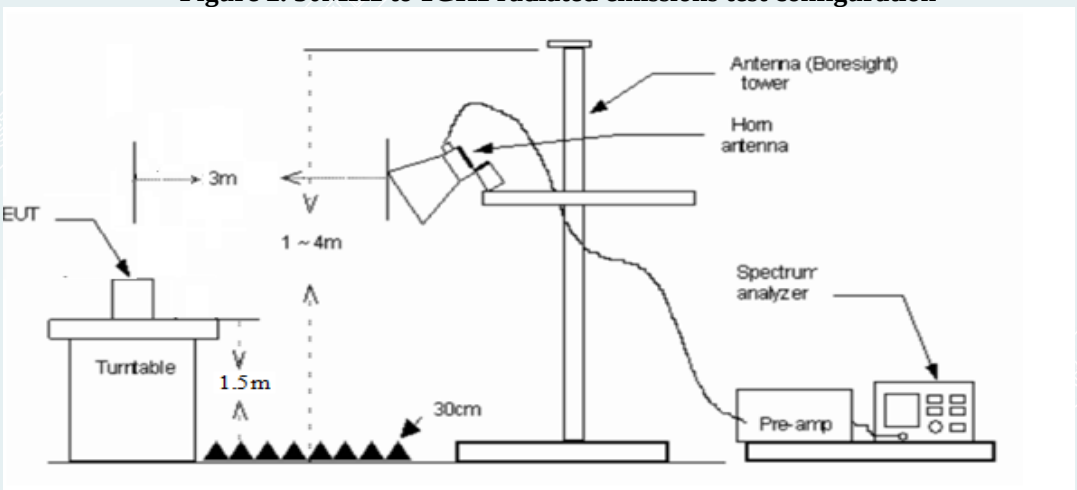


Figure 3. 1GH to 18GHz radiated emissions test configuration

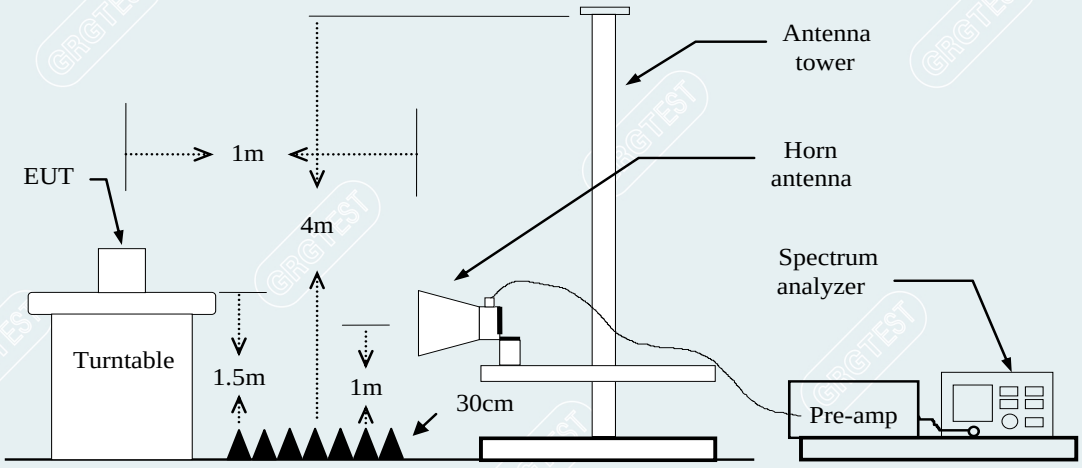


Figure 4. 18GHz to 26.5GHz radiated emissions test configuration

12.4 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

12.5 TEST RESULTS

30MHz to 1GHz:

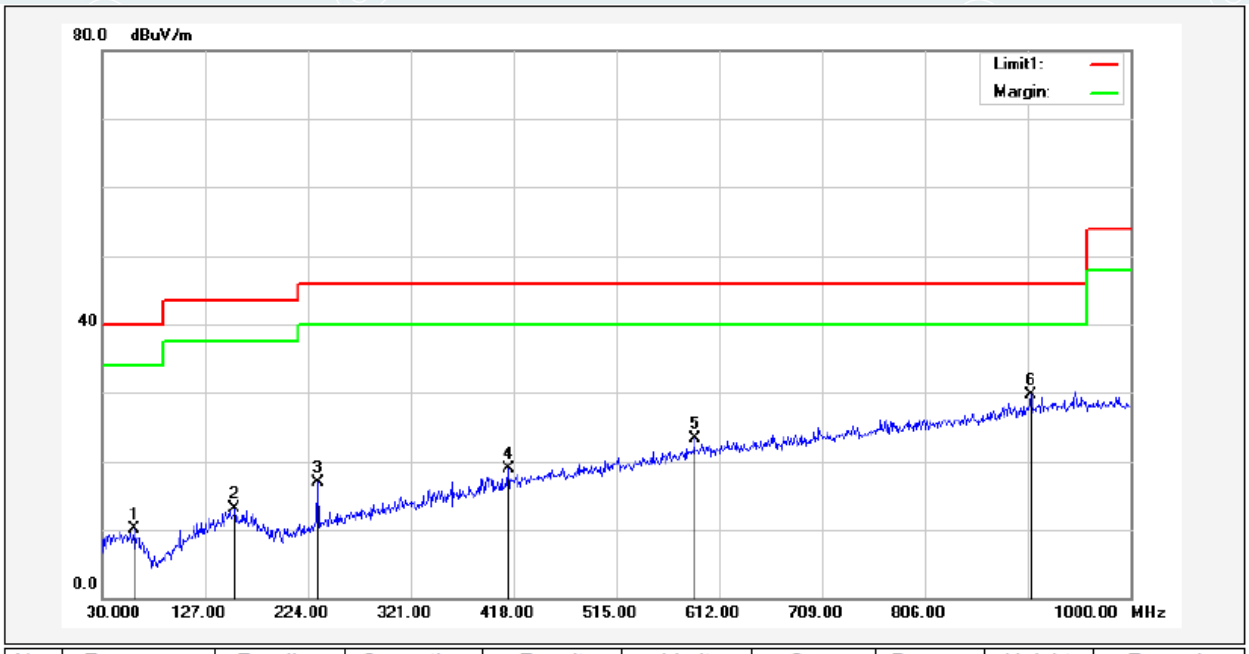
Mode: DH5

Low Frequency (2402MHz) Date: 2022/02/22

Test Engineer: Tang Shenghui

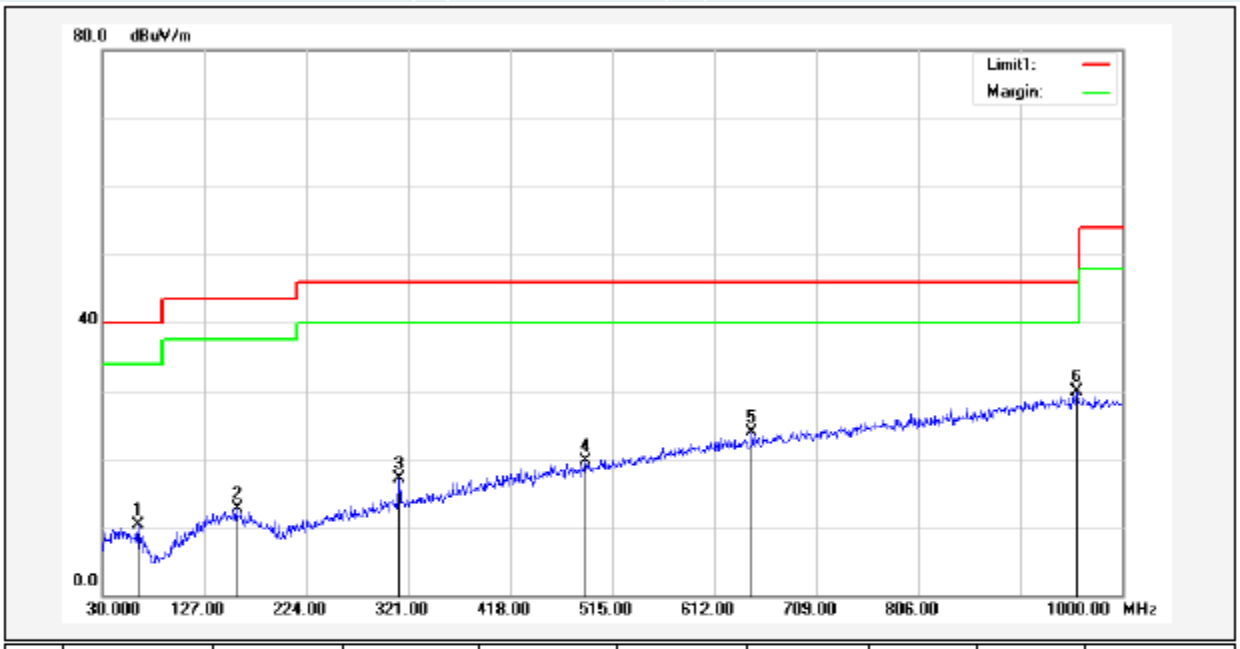
Test Voltage: DC 3.8V

Polarity: Horizontal



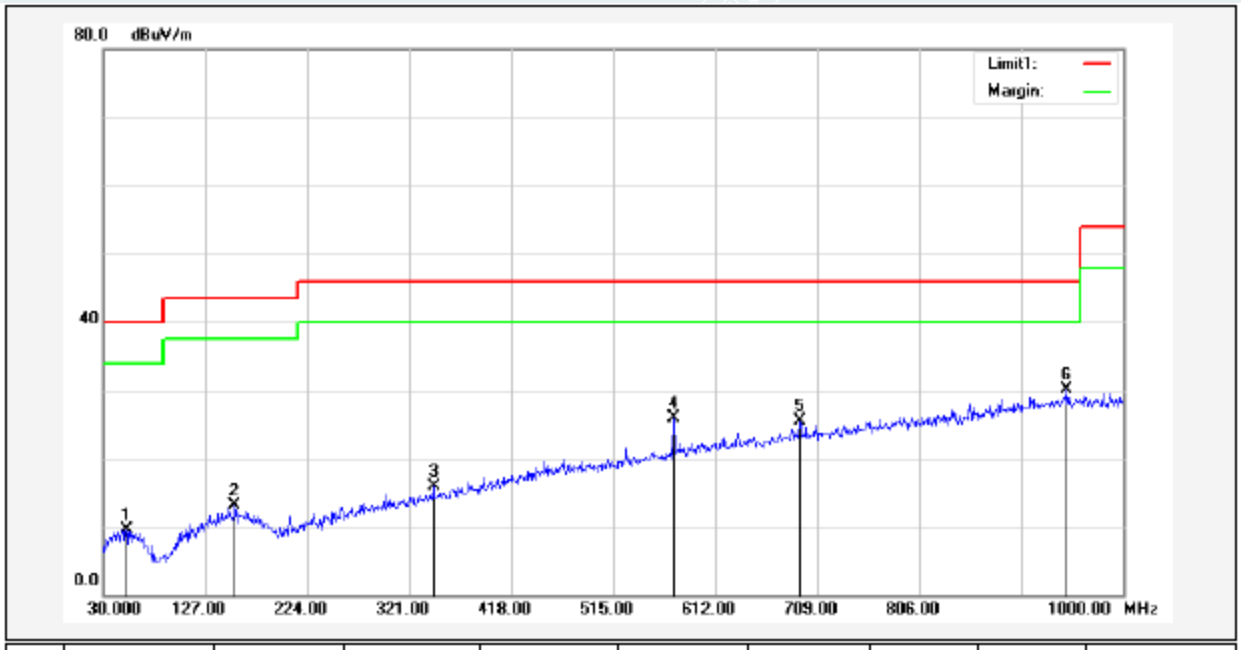
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	60.0700	37.31	-27.30	10.01	40.00	-29.99	14	200	QP
2	155.1300	37.56	-24.45	13.11	43.50	-30.39	135	100	QP
3	233.7000	42.71	-25.72	16.99	46.00	-29.01	201	100	QP
4	413.1500	38.42	-19.50	18.92	46.00	-27.08	205	100	QP
5	588.7200	38.08	-14.80	23.28	46.00	-22.72	356	100	QP
6*	905.9100	39.06	-9.36	29.70	46.00	-16.30	137	300	QP

Mode: DH5
Low Frequency (2402MHz) Date: 2022/02/22
Test Engineer: Tang Shenghui
Test Voltage: DC 3.8V
Polarity: Vertical



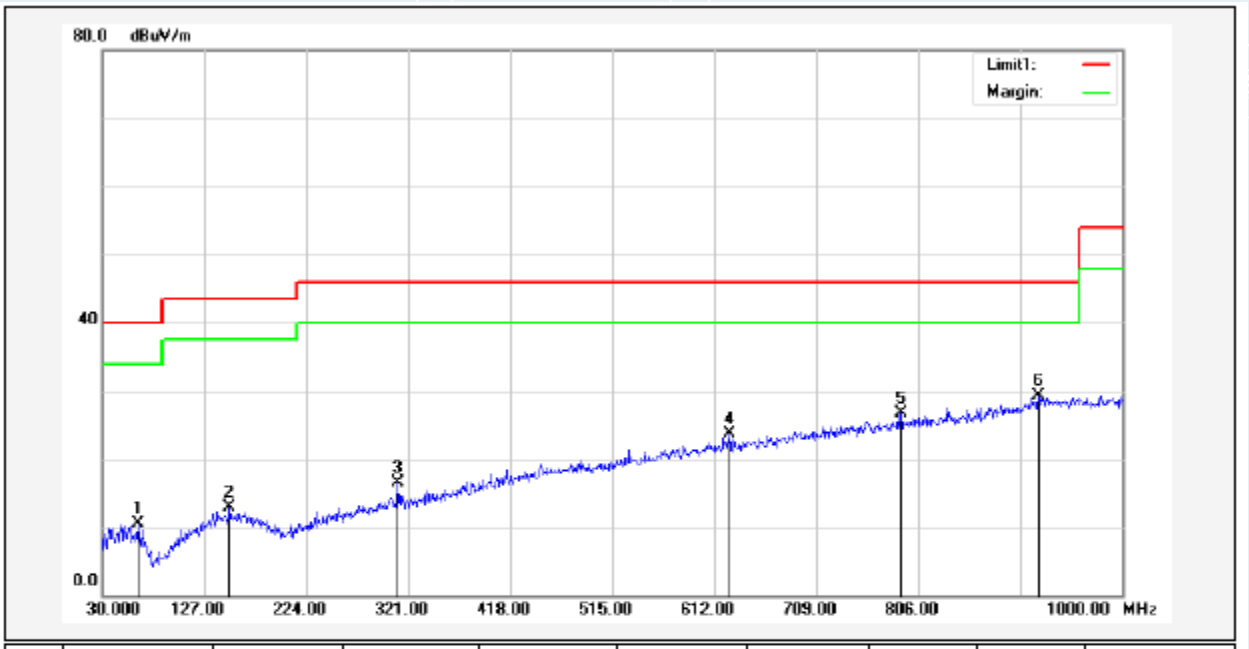
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	63.9500	38.02	-27.81	10.21	40.00	-29.79	124	100	QP
2	158.0400	37.15	-24.51	12.64	43.50	-30.86	341	100	QP
3	312.2700	39.81	-22.78	17.03	46.00	-28.97	273	400	QP
4	489.7800	37.12	-17.48	19.64	46.00	-26.36	334	300	QP
5	647.8900	37.67	-13.71	23.96	46.00	-22.04	4	200	QP
6*	956.3500	38.48	-8.65	29.83	46.00	-16.17	160	300	QP

Mode: DH5
Low Frequency (2441MHz) Date: 2022/02/22
Test Engineer: Tang Shenghui
Test Voltage: DC 3.8V
Polarity: Horizontal



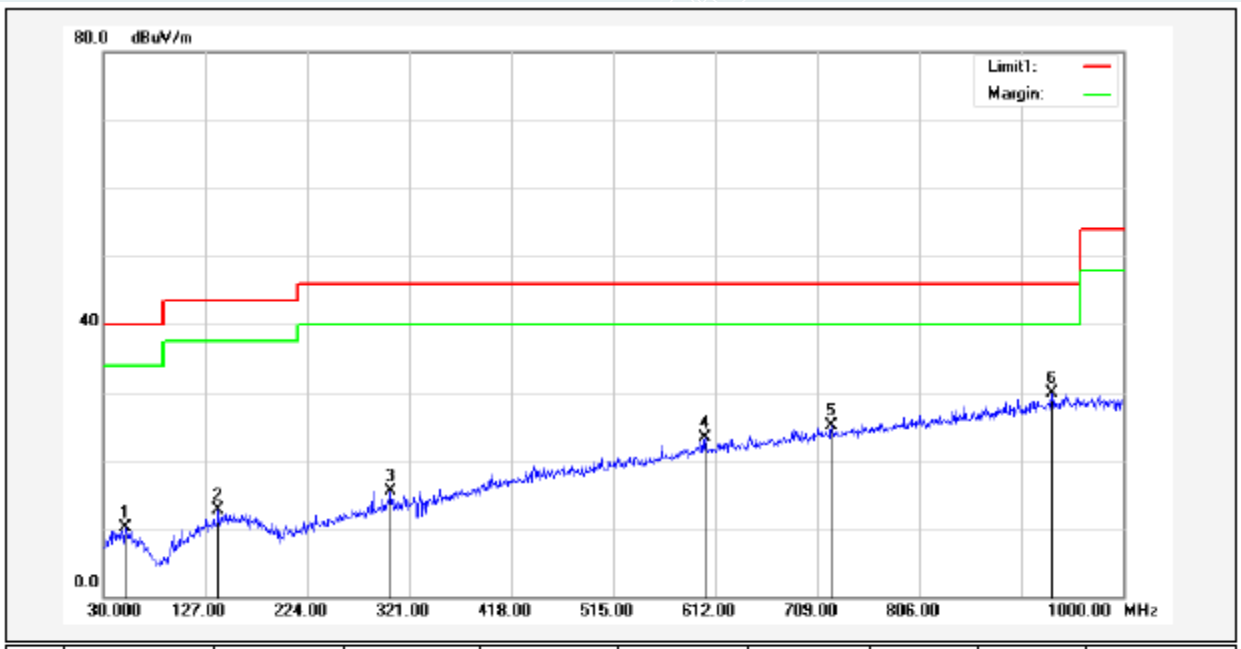
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	52.3100	36.21	-26.67	9.54	40.00	-30.46	20	400	QP
2	155.1300	37.58	-24.45	13.13	43.50	-30.37	205	200	QP
3	344.2800	37.87	-21.99	15.88	46.00	-30.12	232	300	QP
4	572.2300	41.13	-15.32	25.81	46.00	-20.19	84	200	QP
5	692.5100	38.39	-12.86	25.53	46.00	-20.47	50	200	QP
6*	946.6500	38.80	-8.77	30.03	46.00	-15.97	216	100	QP

Mode: DH5
Low Frequency (2441MHz) Date: 2022/02/22
Test Engineer: Tang Shenghui
Test Voltage: DC 3.8V
Polarity: Vertical



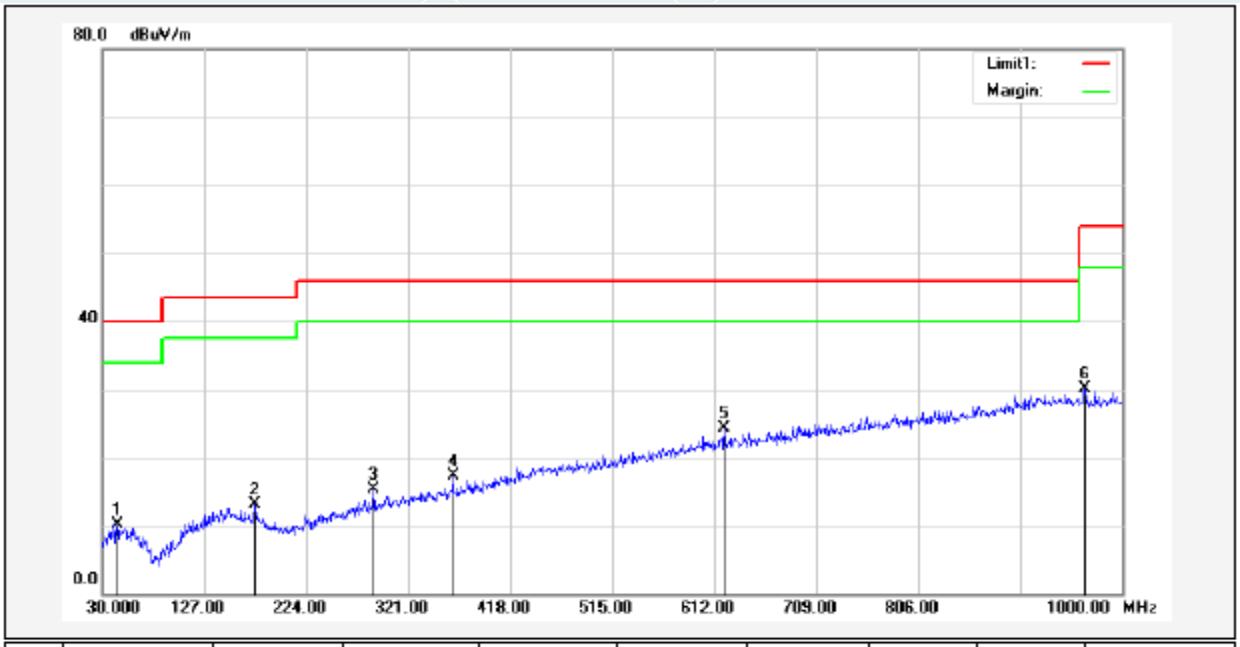
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	63.9500	38.37	-27.81	10.56	40.00	-29.44	162	100	QP
2	151.2500	37.32	-24.39	12.93	43.50	-30.57	66	100	QP
3	311.3000	39.30	-22.81	16.49	46.00	-29.51	351	100	QP
4	626.5500	37.71	-14.04	23.67	46.00	-22.33	60	100	QP
5	789.5100	37.73	-11.07	26.66	46.00	-19.34	105	300	QP
6*	920.4600	38.52	-9.16	29.36	46.00	-16.64	7	400	QP

Mode: DH5
Low Frequency (2480MHz) Date: 2022/02/22
Test Engineer: Tang Shenghui
Test Voltage: DC 3.8V
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	51.3400	36.63	-26.59	10.04	40.00	-29.96	246	300	QP
2	139.6100	37.62	-24.91	12.71	43.50	-30.79	73	200	QP
3	303.5400	38.54	-23.00	15.54	46.00	-30.46	221	100	QP
4	602.3000	37.66	-14.42	23.24	46.00	-22.76	0	399	QP
5	722.5800	37.40	-12.24	25.16	46.00	-20.84	0	399	QP
6*	932.1000	38.82	-8.99	29.83	46.00	-16.17	120	200	QP

Mode: DH5
Low Frequency (2480MHz) Date: 2022/02/22
Test Engineer: Tang Shenghui
Test Voltage: DC 3.8V
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	44.5500	36.82	-26.71	10.11	40.00	-29.89	331	400	QP
2	175.5000	38.36	-25.27	13.09	43.50	-30.41	25	100	QP
3	288.0200	38.79	-23.54	15.25	46.00	-30.75	0	134	QP
4	363.6800	38.61	-21.33	17.28	46.00	-28.72	301	300	QP
5*	621.7000	38.40	-14.11	24.29	46.00	-21.71	330	100	QP
6	964.1100	38.74	-8.56	30.18	54.00	-23.82	0	398	QP

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:

Mode: DH5
Lowest Frequency (2402MHz) Date: 2022/03/01
Test Engineer: Lu Qiang
Test Voltage: DC 3.8V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1077.0096	56.93	31.96	-24.97	74.00	42.04	200	122	Horizontal
2	1506.0633	56.50	33.61	-22.89	74.00	40.39	200	182	Horizontal
3	3230.6538	54.29	37.98	-16.31	74.00	36.02	100	201	Horizontal
4	3620.7026	54.59	40.14	-14.45	74.00	33.86	100	138	Horizontal
5	4803.9755	57.05	47.27	-9.78	74.00	26.73	100	89	Horizontal
6	7204.2755	48.11	44.94	-3.17	74.00	29.06	200	95	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	1165.0206	57.20	32.63	-24.57	74.00	41.37	100	224	Vertical
2	1850.1063	58.40	36.53	-21.87	74.00	37.47	100	217	Vertical
3	3573.8217	52.90	37.70	-15.20	74.00	36.30	200	298	Vertical
4	4803.9755	55.32	45.54	-9.78	74.00	28.46	200	141	Vertical
5	7189.2737	48.62	45.47	-3.15	74.00	28.53	200	39	Vertical
6	9949.6187	45.03	46.79	1.76	74.00	27.21	200	6	Vertical

Mode: DH5
Middle Frequency (2441MHz) Date: 2022/03/01
Test Engineer: Lu Qiang
Test Voltage: DC 3.8V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1166.7708	57.37	32.80	-24.57	74.00	41.20	100	132	Horizontal
2	1779.0974	58.57	36.35	-22.22	74.00	37.65	200	96	Horizontal
3	4128.8911	52.58	38.95	-13.63	74.00	35.05	100	61	Horizontal
4	4880.8601	58.16	48.27	-9.89	74.00	25.73	200	101	Horizontal
5	7716.2145	47.72	45.17	-2.55	74.00	28.83	200	156	Horizontal
6	8951.9940	46.45	46.47	0.02	74.00	27.53	200	312	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	4879.8351	-9.90	52.31	42.41	54.00	11.59	138	101	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	1114.0143	57.37	32.57	-24.80	74.00	41.43	200	48	Vertical
2	1950.1188	58.39	36.45	-21.94	74.00	37.55	100	48	Vertical
3	3498.8124	53.78	38.41	-15.37	74.00	35.59	100	272	Vertical
4	3804.4756	53.63	39.33	-14.30	74.00	34.67	200	54	Vertical
5	4878.9849	55.32	45.44	-9.88	74.00	28.56	200	115	Vertical
6	7969.3712	47.43	45.71	-1.72	74.00	28.29	100	156	Vertical

Mode: DH5
Highest Frequency (2480MHz) Date: 2022/03/01
Test Engineer: Lu Qiang
Test Voltage: DC 3.8V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1000.0000	66.45	41.29	-25.16	74.00	32.71	200	163	Horizontal
2	1659.5824	56.29	33.79	-22.50	74.00	40.21	100	356	Horizontal
3	3721.9652	53.65	38.92	-14.73	74.00	35.08	200	176	Horizontal
4	4959.6200	58.87	48.86	-10.01	74.00	25.14	100	121	Horizontal
5	7718.0898	48.28	45.76	-2.52	74.00	28.24	200	102	Horizontal
6	11502.3128	44.18	48.50	4.32	74.00	25.50	200	1	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	4959.9176	-10.01	52.80	42.79	54.00	11.21	145	114	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	1081.0101	57.35	32.40	-24.95	74.00	41.60	100	327	Vertical
2	1416.3020	57.00	33.62	-23.38	74.00	40.38	200	210	Vertical
3	1849.8562	57.94	36.07	-21.87	74.00	37.93	100	32	Vertical
4	3720.0900	54.34	39.60	-14.74	74.00	34.40	100	357	Vertical
5	4959.6200	56.23	46.22	-10.01	74.00	27.78	100	48	Vertical
6	8575.0719	46.45	45.78	-0.67	74.00	28.22	100	75	Vertical

Mode: 3DH5
Lowest Frequency (2402MHz) Date: 2022/03/02
Test Engineer: Zhang Qiang
Test Voltage: DC 3.8V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1543.5679	56.53	33.67	-22.86	74.00	40.33	200	33	Horizontal
2	3210.0263	53.65	37.66	-15.99	74.00	36.34	100	142	Horizontal
3	4803.9755	57.14	47.36	-9.78	74.00	26.64	100	169	Horizontal
4	7206.1508	47.35	44.16	-3.19	74.00	29.84	100	156	Horizontal
5	9375.7970	44.86	46.27	1.41	74.00	27.73	200	177	Horizontal
6	13460.0575	40.44	48.17	7.73	74.00	25.83	200	177	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	1541.3177	56.91	34.05	-22.86	74.00	39.95	200	34	Vertical
2	2401.9252	59.28	39.38	-19.90	74.00	34.62	200	359	Vertical
3	4350.1688	52.20	39.89	-12.31	74.00	34.11	100	14	Vertical
4	4803.9755	52.13	42.35	-9.78	74.00	31.65	200	96	Vertical
5	9235.1544	46.61	47.31	0.70	74.00	26.69	200	211	Vertical
6	14093.8867	39.74	49.25	9.51	74.00	24.75	200	217	Vertical

Mode: 3DH5
Middle Frequency (2441MHz) Date: 2022/03/02
Test Engineer: Zhang Qiang
Test Voltage: DC 3.8V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1768.0960	60.30	38.00	-22.30	74.00	36.00	200	292	Horizontal
2	2440.9301	63.95	44.27	-19.68	74.00	29.73	100	217	Horizontal
3	4880.8601	56.06	46.17	-9.89	74.00	27.83	200	116	Horizontal
4	7738.7173	46.25	44.10	-2.15	74.00	29.90	100	359	Horizontal
5	10776.5971	43.99	47.67	3.68	74.00	26.33	100	360	Horizontal
6	13343.7930	40.40	48.38	7.98	74.00	25.62	200	75	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	1736.8421	56.71	34.29	-22.42	74.00	39.71	200	292	Vertical
2	3196.8996	52.89	36.99	-15.90	74.00	37.01	100	285	Vertical
3	4880.8601	51.85	41.96	-9.89	74.00	32.04	200	347	Vertical
4	7196.7746	47.49	44.36	-3.13	74.00	29.64	100	34	Vertical
5	8741.9677	46.10	45.30	-0.80	74.00	28.70	100	48	Vertical
6	12531.8165	42.21	47.21	5.00	74.00	26.79	200	68	Vertical

Mode: 3DH5
Highest Frequency (2480MHz) Date: 2022/03/02
Test Engineer: Zhang Qiang
Test Voltage: DC 3.8V

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1508.8136	56.16	33.28	-22.88	74.00	40.72	100	88	Horizontal
2	1900.8626	56.93	35.05	-21.88	74.00	38.95	100	1	Horizontal
3	4353.9192	52.93	40.58	-12.35	74.00	33.42	200	101	Horizontal
4	4959.6200	58.34	48.33	-10.01	74.00	25.67	100	88	Horizontal
5	6802.9754	47.17	42.96	-4.21	74.00	31.04	100	299	Horizontal
6	9135.7670	45.05	45.49	0.44	74.00	28.51	100	258	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	1778.5973	58.27	36.05	-22.22	74.00	37.95	200	360	Vertical
2	3706.9634	53.47	38.66	-14.81	74.00	35.34	200	40	Vertical
3	4959.6200	55.00	44.99	-10.01	74.00	29.01	100	326	Vertical
4	6405.4257	48.71	42.49	-6.22	74.00	31.51	100	210	Vertical
5	7748.0935	46.65	44.67	-1.98	74.00	29.33	200	80	Vertical
6	11149.7687	42.42	46.89	4.47	74.00	27.11	100	0	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.

5 Spectrum setting:
a. Peak Setting 1GHz – 26.5GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
b. AV Setting 1GH z- 26.5GHz, RBW = 1MHz, VBW = 10Hz (if the EUT duty cycle is＜98% , set VBW≥1/T),Sweep time = auto.

6 As the Transmit Power of GFSK and 8DPSK is larger than π/4-DQPSK, Therefore, radiated spurious emissions recorded the worst case results in this report.

Test result: The unit does meet the requirements.

13. RESTRICTED BANDS OF OPERATION

13.1 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			

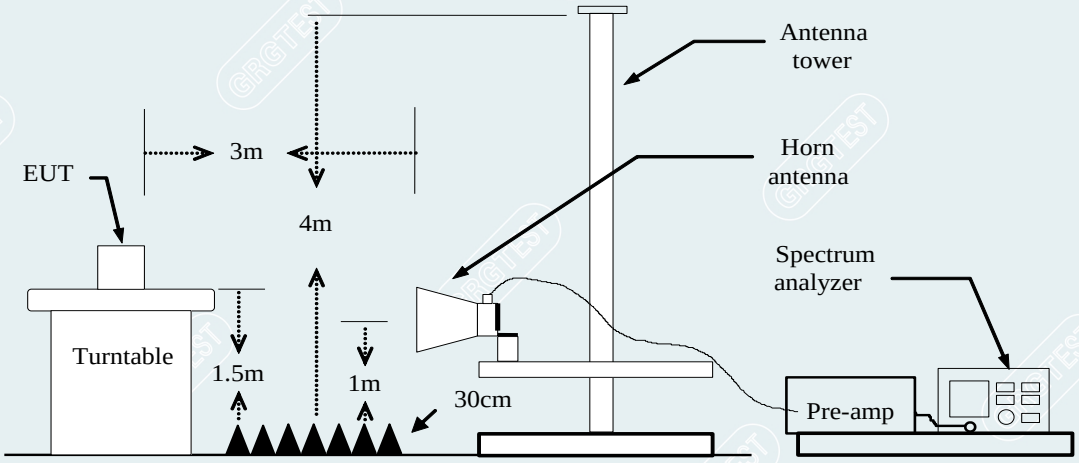
Frequency (MHz)	Quasi-peak(μV/m)	Measurement distance(m)	Quasi-peak(dBμV/m)@distance 3m
0.009-0.490	2400/F(kHz)	300	128.5-93.8
0.490-1.705	24000/F(kHz)	30	73.8-63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

13.2 TEST PROCEDURES

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

Note: For radiated measurement,pre-scanned in three orthogonal panels,X,Y,Z.The worst cases(X plane) were recorded in this report

13.3 TEST SETUP

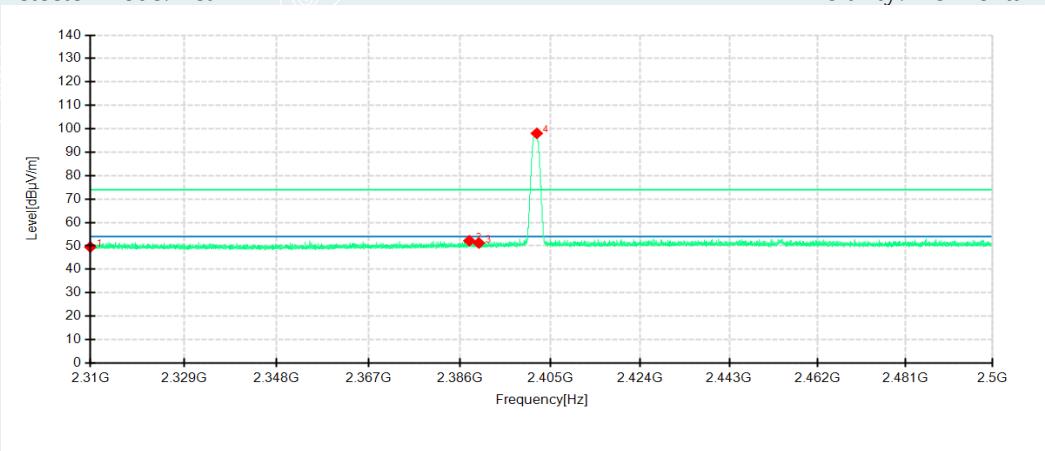


---------- **The following blanks** ----------

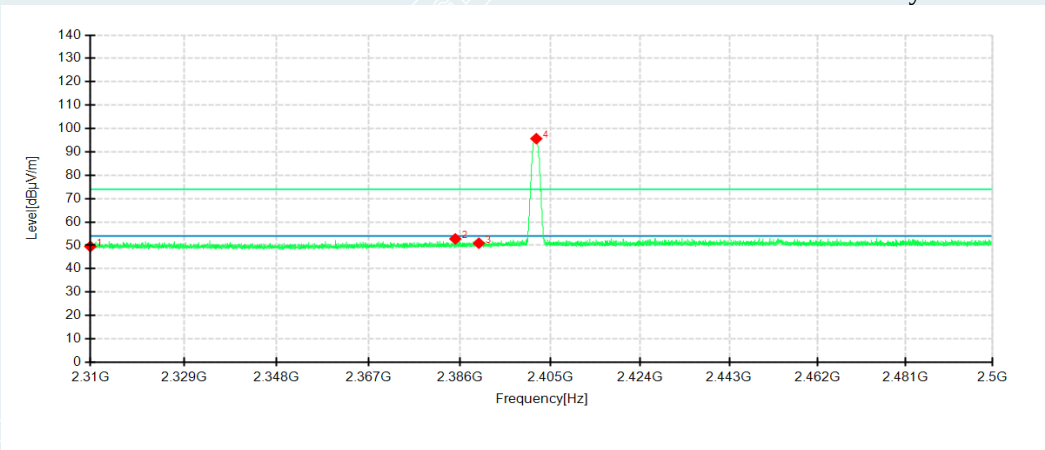
13.4 TEST RESULTS

Equipment:	Wireless earphones	Test Date	2022/03/03
Model No.:	E505A	Test Engineer:	Zhang Zishan
Test Voltage:	DC 3.8V	/	/

DH5
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 dBuV/m	Margin dB	Height cm	Angle °	Pole	Remark
1	2310.0000	46.05	49.53	3.48	74.00	24.47	200	149	Horizontal	/
2	2387.9950	48.42	52.20	3.78	74.00	21.80	200	142	Horizontal	/
3	2390.0000	47.44	51.25	3.81	74.00	22.75	100	218	Horizontal	/
4	2402.1500	94.06	98.05	3.99	74.00	-24.05	200	142	Horizontal	No limit
1	2310.0000	46.03	49.51	3.48	74.00	24.49	200	121	Vertical	/
2	2385.0690	49.04	52.77	3.73	74.00	21.23	100	142	Vertical	/
3	2390.0000	47.11	50.92	3.81	74.00	23.08	100	246	Vertical	/
4	2402.0550	91.68	95.67	3.99	74.00	-21.67	100	204	Vertical	No limit