Test Report

Verified code: 270835

Report No.: E202112276794-1

Customer:	NunoErin, LLC
Address:	533 Commerce Street, Jackson MS 39201 USA
Sample Name:	Table top touch screen
Sample Model:	UCTTA-42
Receive Sample Date:	Dec.29,2021
Test Date:	Dec.31,2021 ~ Apr.21,2022
Reference Document:	CFR 47, FCC Part 15 Subpart C RADIO FREQUENCY DEVICES:Subpart C—Intentional Radiators
Test Result:	Pass

Prepared by: Reviewed by: Approved by:

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-06-01

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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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202112276794-1	Original Issue	2022-04-27

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
FCC 47 CFR Part 15 Subpart C (15.247) ANSI C63.10-2013 KDB 558074 D01 15.247 measurement guidance v05r02	Antenna Requirement	Section 15.203	PASS
	20dB Bandwidth	Section 15.247(a)(1)	PASS
	Carrier Frequencies Separated	Section 15.247(a)(1)	PASS
	Hopping Channel Number	Section 15.247(a)(1)(ii)	PASS
	Dwell Time	Section 15.247(a)(1)(iii)	PASS
	Maximum Peak Output Power	Section 15.247(b)(1)	PASS
	Conducted Emission	Section 15.207	PASS
	Conducted band edges and Spurious Emission	Section 15.209 &15.247(d)	PASS
	Radiated Spurious Emission	Section 15.247(d) &15.205 &15.209	PASS
	Restricted bands of operation	Section 15.247(d) &15.205 &15.209	PASS

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

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

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

2.2 MANUFACTURER

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

2.3 FACTORY

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

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Table top touch screen
Model No.:	UCTTA-42
Adding Model:	/
Trade Name:	NunoErin
FCC ID:	2A5VA-UCTTA42
Rating:	Input: 100-240V~ 50/60Hz 2A
Frequency Band:	2402MHz~2480MHz
Transmit Power:	GFSK: 7.48dBm π/4-DQPSK: 7.49dBm 8DPSK: 6.11dBm
Type of Modulation:	FHSS (GFSK for 1Mbps, π/4-DQPSK for 2Mbps,8DPSK for 3Mbps)
Antenna Specification:	Internal antenna with 3dBi gain (Max)
Temperature Range:	0℃~ 50℃
Hardware Version:	V 2.0
Software Version:	Android 10
Sample No:	E202112276794-0003

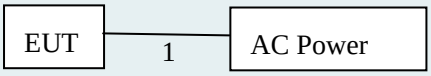
2.5 TEST OPERATION MODE

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

2.6 LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
/	/	/	/	/
Cable				
AC cable(No.1)	/	/	/	Unshield 1.2m

2.7 CONFIGURATION OF SYSTEM UNDER TEST



Test software:

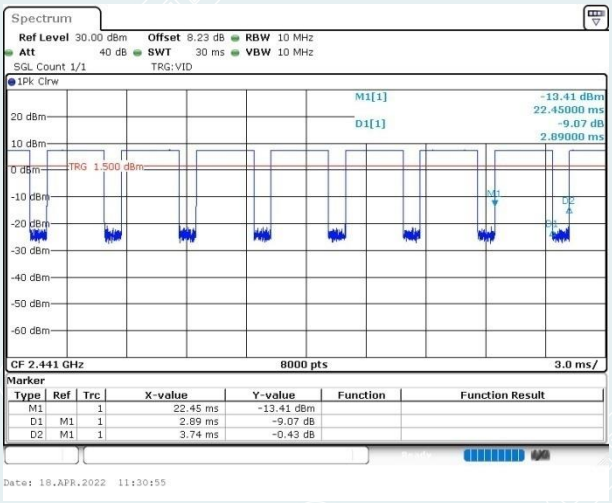
Software version	Test level
Ampak RF testTool	0

2.8 DUTY CYCLE

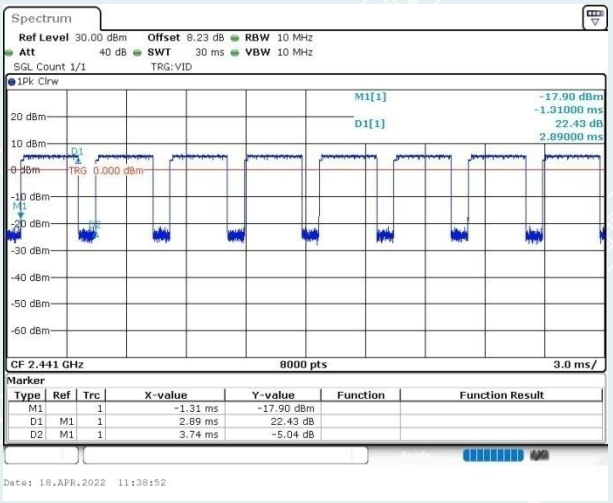
Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-04-18

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

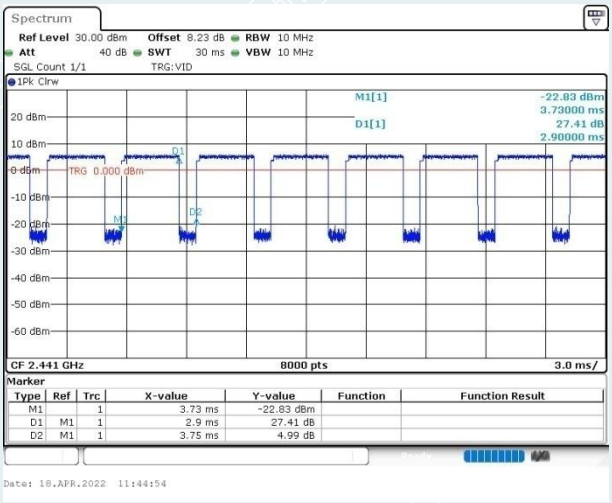
DH5_2441 MHz



2DH5_2441 MHz



3DH5_2441 MHz



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3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

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

Add	:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District 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 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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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
Conduction Emission		9 kHz～150kHz	2.80dB
		150kHz～10MHz	2.80dB
		10MHz～30MHz	2.20dB

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

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

5. EUT TEST CONDITIONS

Type of antenna: Internal antenna

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

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

EUT channels and frequencies list:

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

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

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

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6. CONDUCTED EMISSION MEASUREMENT

6.1 LIMITS

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

6.2 TEST PROCEDURES

Procedure of Preliminary Test

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

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

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

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

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

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

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

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

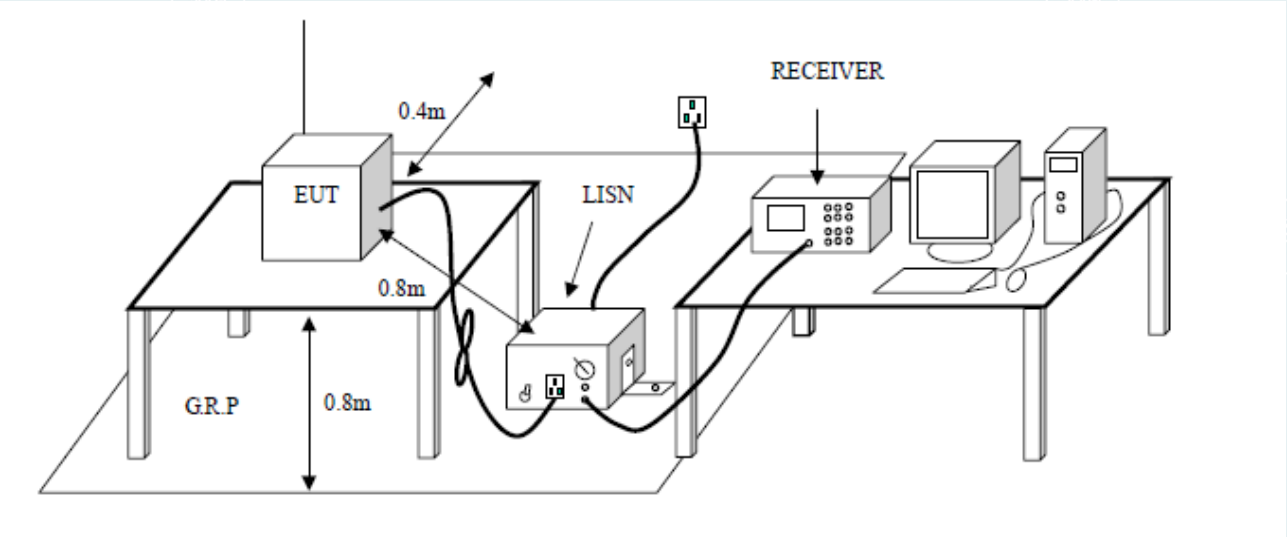
The test mode(s) described in Item 2.5 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.5 producing the highest emission level.The EUT configuration and cable configuration of the above highest emission levels were recorded for reference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

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

6.3 TEST SETUP



6.4 DATA SAMPLE

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

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

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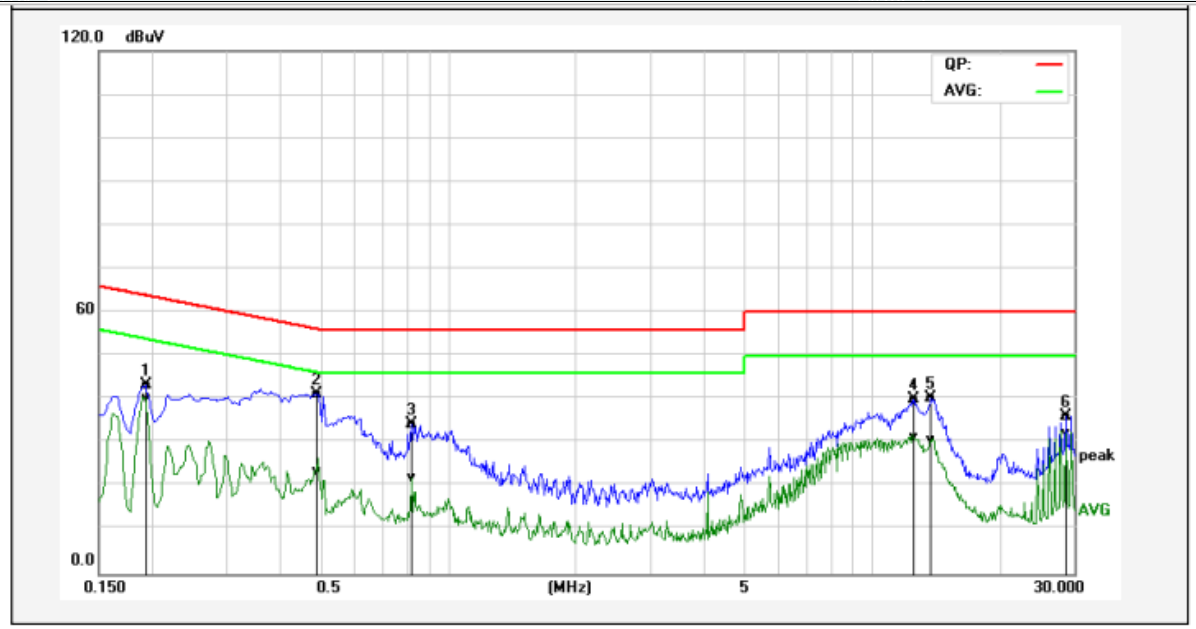
6.5 TEST RESULTS

EUT Name	Table top touch screen	Model	UCTTA-42
Environmental Conditions	22.5℃/45%RH	Test Mode	DH5 2402MHz
Tested By	Zeng Xianglong	Line	L
Tested Date	2022-02-15	Test Voltage	AC 120V/60Hz

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



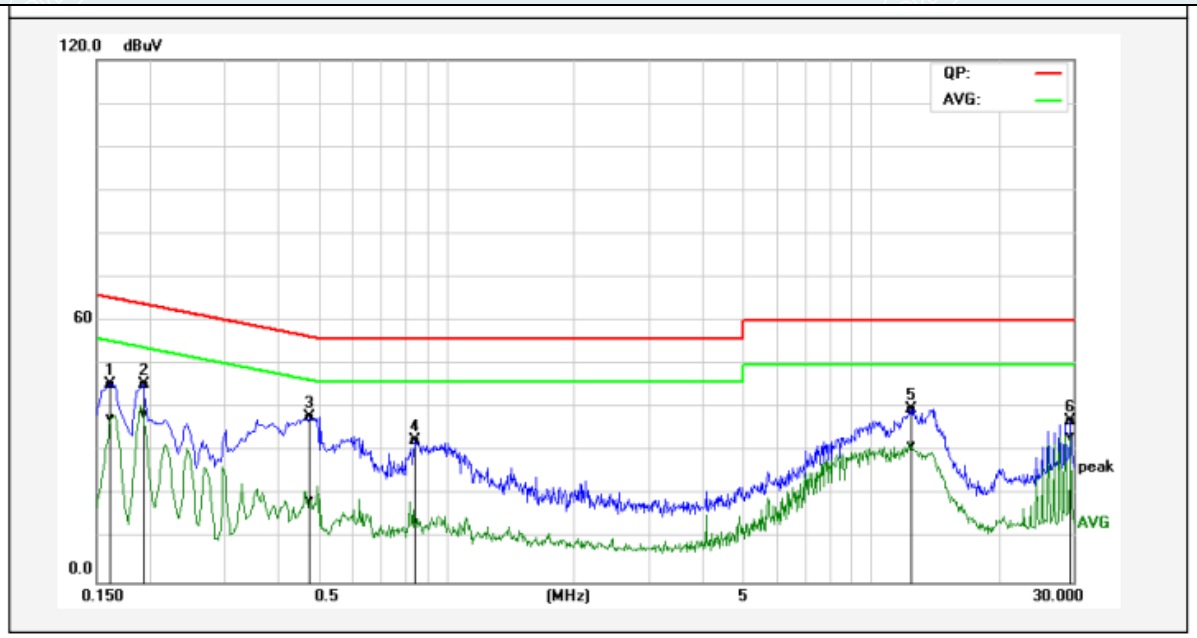
No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1924	33.66	30.66	9.54	43.20	40.20	63.93	53.93	-20.73	-13.73	Pass
2	0.4900	31.68	14.07	9.57	41.25	23.64	56.17	46.17	-14.92	-22.53	Pass
3	0.8220	24.85	12.38	9.57	34.42	21.95	56.00	46.00	-21.58	-24.05	Pass
4	12.5460	30.29	21.46	9.82	40.11	31.28	60.00	50.00	-19.89	-18.72	Pass
5	13.7740	30.57	20.80	9.83	40.40	30.63	60.00	50.00	-19.60	-19.37	Pass
6	28.7100	26.22	22.34	9.89	36.11	32.23	60.00	50.00	-23.89	-17.77	Pass

REMARKS: *L = Live Line*

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

EUT Name	Table top touch screen	Model	UCTTA-42
Environmental Conditions	22.5℃/45%RH	Test Mode	DH5 2402MHz
Tested By	Zeng Xianglong	Line	N
Tested Date	2022-02-15	Test Voltage	AC 120V/60Hz

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



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1620	36.04	28.16	9.52	45.56	37.68	65.36	55.36	-19.80	-17.68	Pass
2*	0.1940	35.95	29.09	9.56	45.51	38.65	63.86	53.86	-18.35	-15.21	Pass
3	0.4780	28.29	9.19	9.69	37.98	18.88	56.37	46.37	-18.39	-27.49	Pass
4	0.8460	22.90	4.09	9.64	32.54	13.73	56.00	46.00	-23.46	-32.27	Pass
5	12.5060	30.03	21.61	9.85	39.88	31.46	60.00	50.00	-20.12	-18.54	Pass
6	29.5300	27.14	23.27	10.04	37.18	33.31	60.00	50.00	-22.82	-16.69	Pass

REMARKS: *N = Neutral Line.*

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

7. 20dB BANDWIDTH

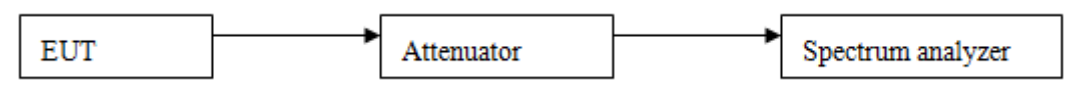
7.1 LIMITS

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

7.2 TEST PROCEDURES

1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
2) Set the spectrum analyzer as RBW=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



7.4 TEST RESULTS

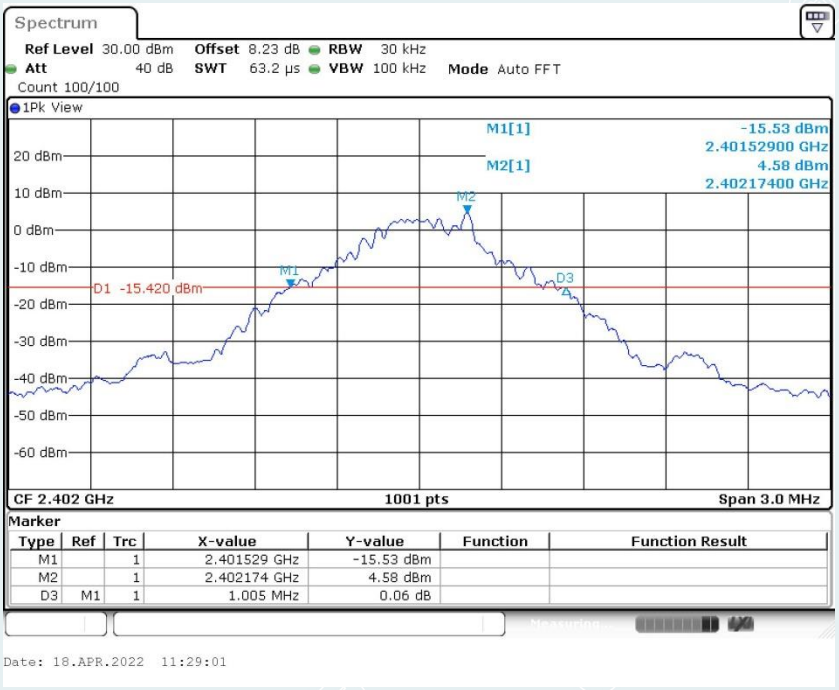
Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-04-18

Test mode	Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
DH5	Lowest	2402	1005
	Middle	2441	1008
	Highest	2480	1014
2DH5	Lowest	2402	1362
	Middle	2441	1362
	Highest	2480	1362
3DH5	Lowest	2402	1314
	Middle	2441	1314
	Highest	2480	1314

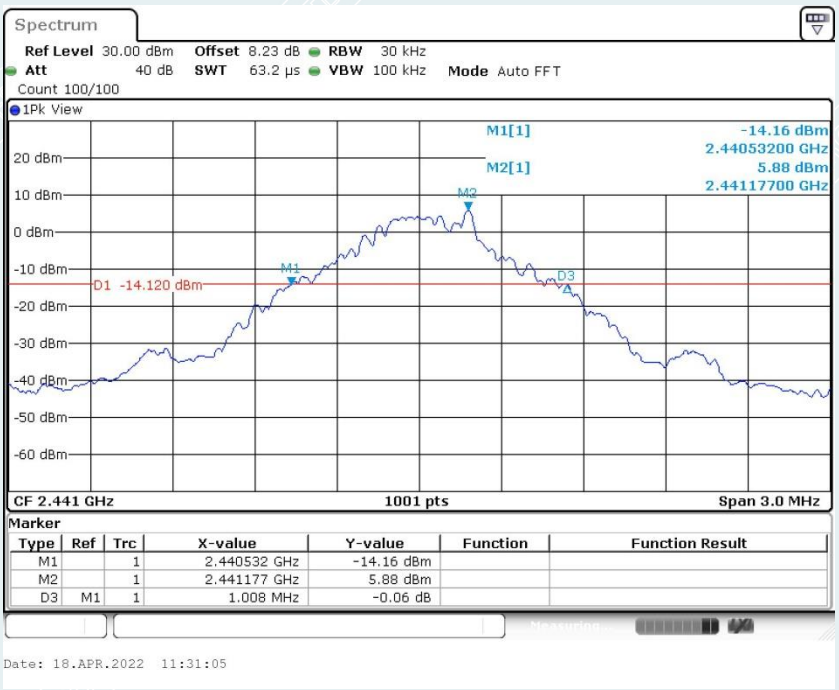
Result plot as follows:

DH5

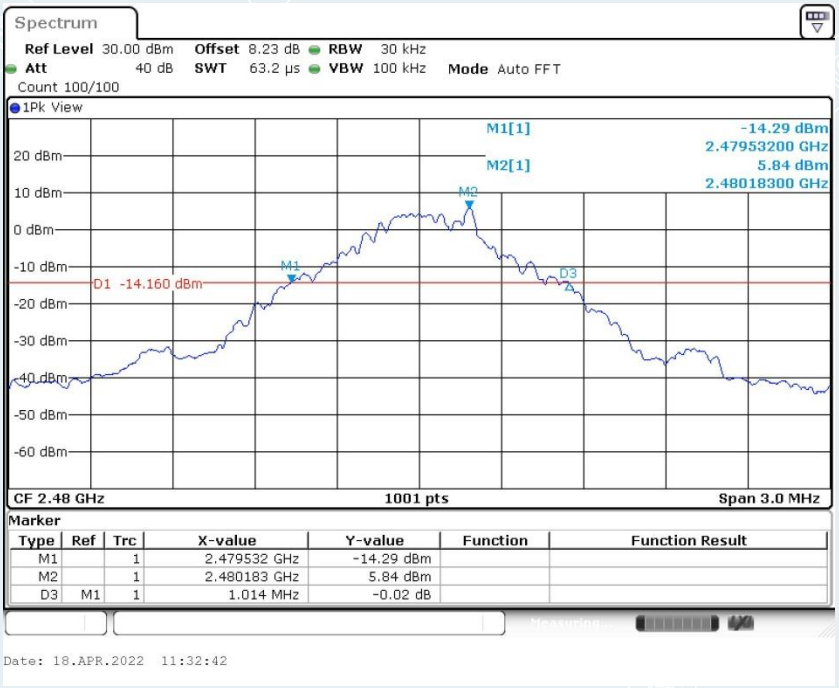
Lowest Channel



Middle Channel

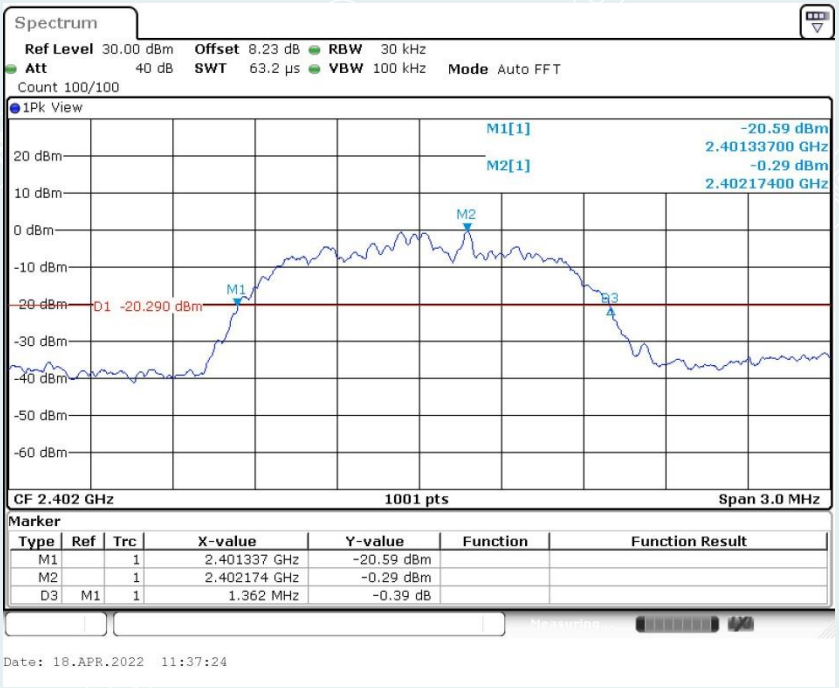


Highest Channel

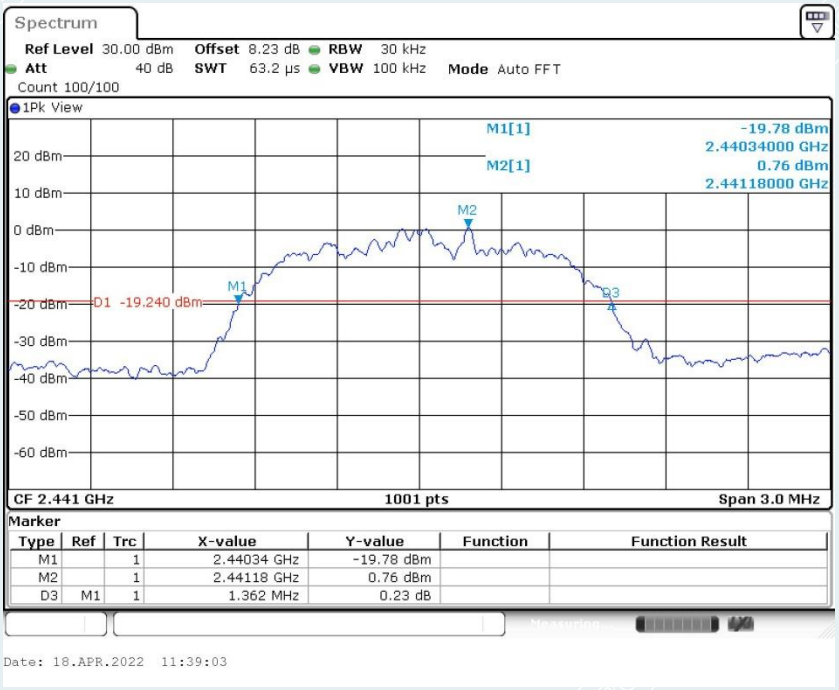


2DH5

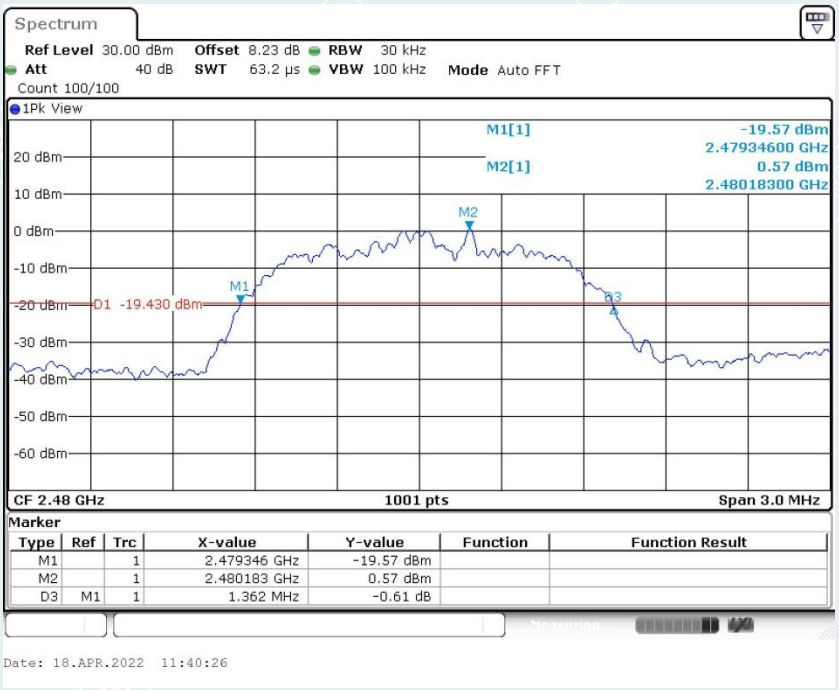
Lowest Channel



Middle Channel

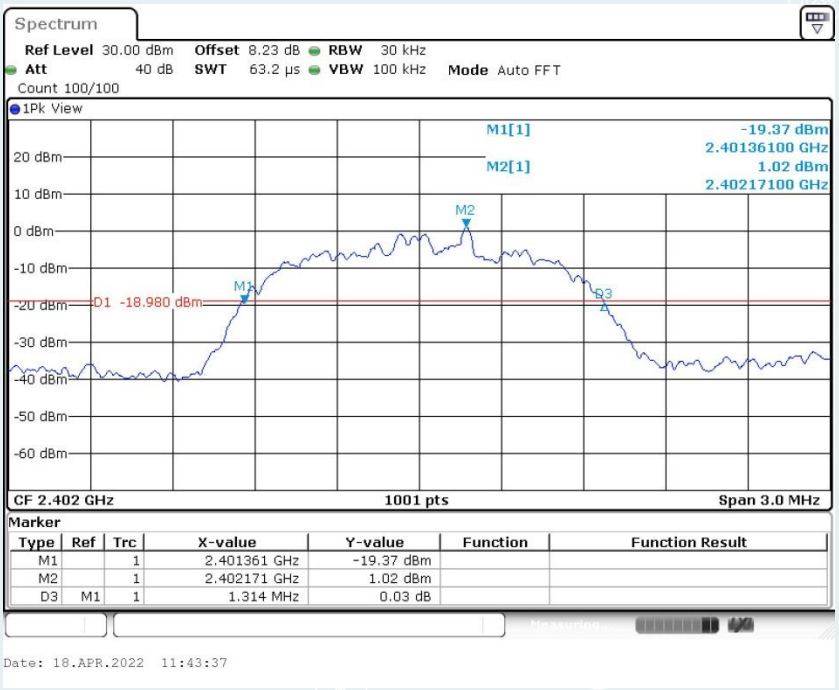


Highest Channel

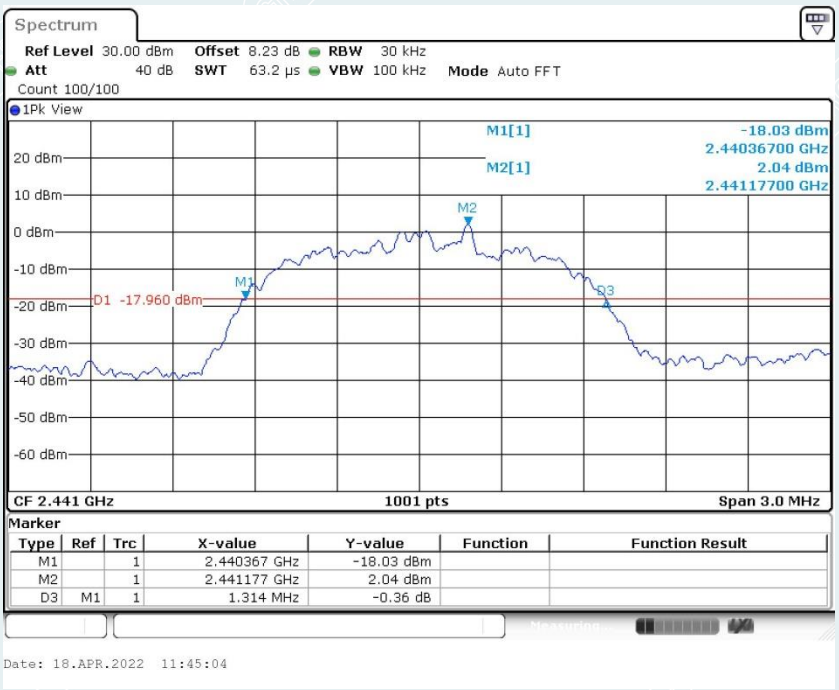


3DH5

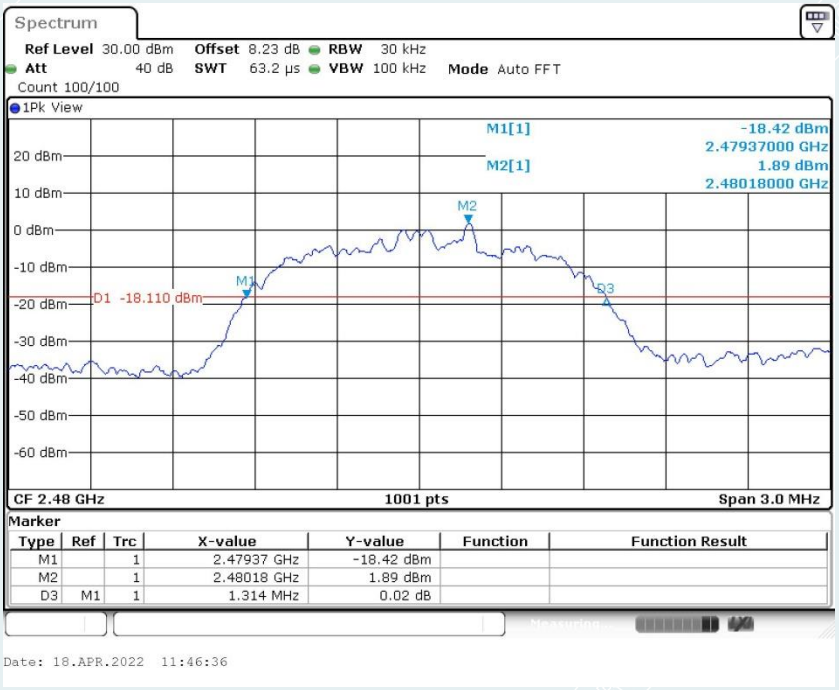
Lowest Channel



Middle Channel



Highest Channel



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8. CARRIER FREQUENCIES SEPARATED

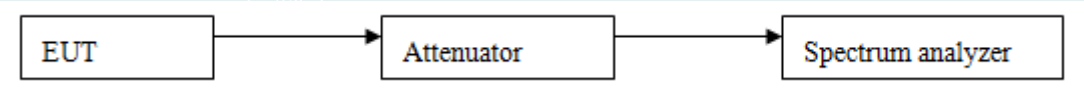
8.1 LIMITS

1) Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

8.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2) Set center frequency of spectrum analyzer = middle of hopping channel.
3) Set the spectrum analyzer as RBW=100kHz, VBW=300kHz, Adjust Span to 2 MHz, Sweep = auto.
4) Use the marker-delta function to mark hopping channel carrier frequencies and record the channel separation.

8.3 TEST SETUP



8.4 TEST RESULTS

Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-04-18

DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.000	676	> Two-thirds of the 20 dB Bandwidth	Pass

2DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.003	908	> Two-thirds of the 20 dB Bandwidth	Pass

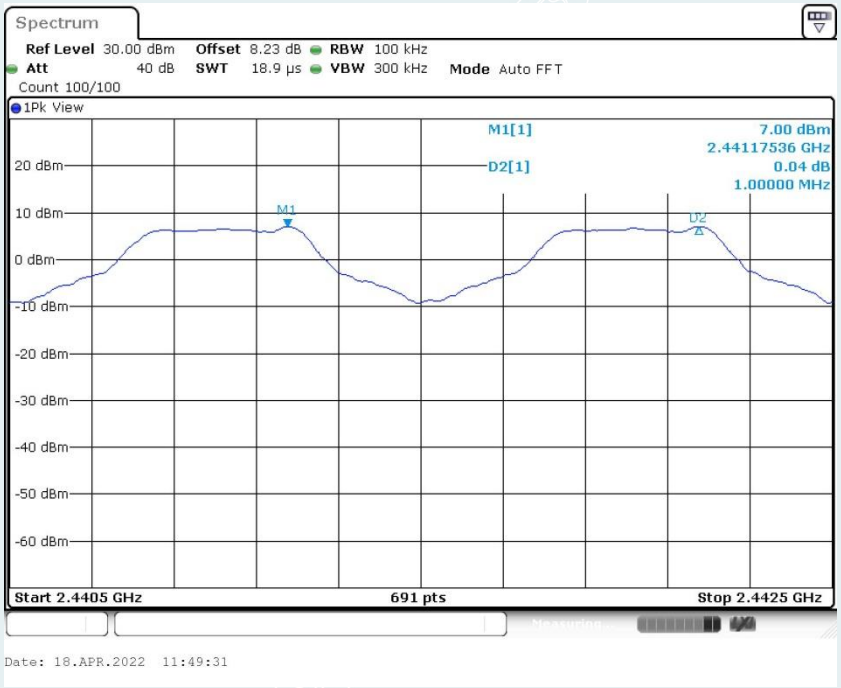
3DH5

Channel Separation (MHz)	Two-thirds of the 20 dB Bandwidth (kHz)	Channel Separation Limit	Result
1.003	876	> Two-thirds of the 20 dB Bandwidth	Pass

Result plot as follows:

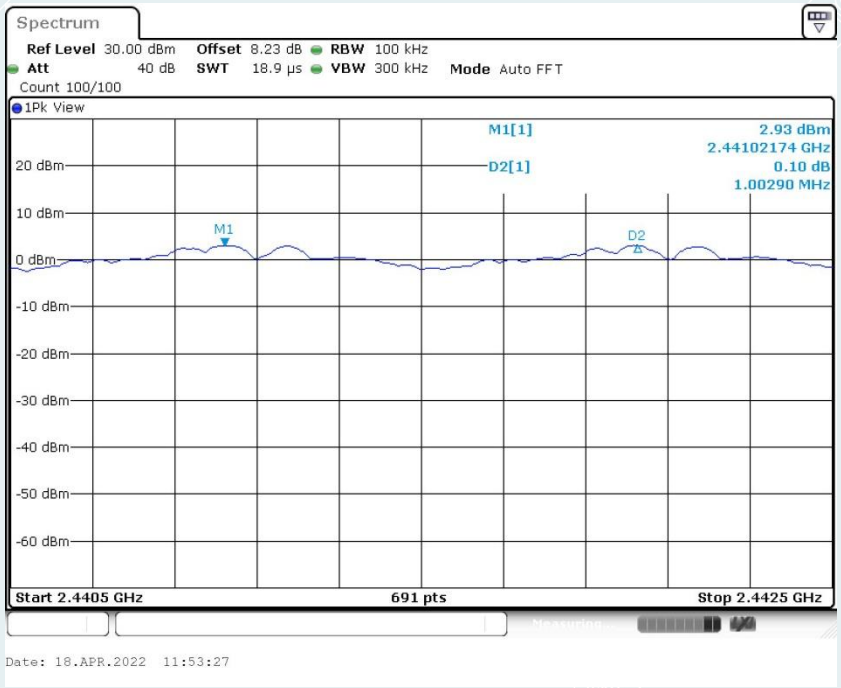
DH5

Measurement of Channel Separation



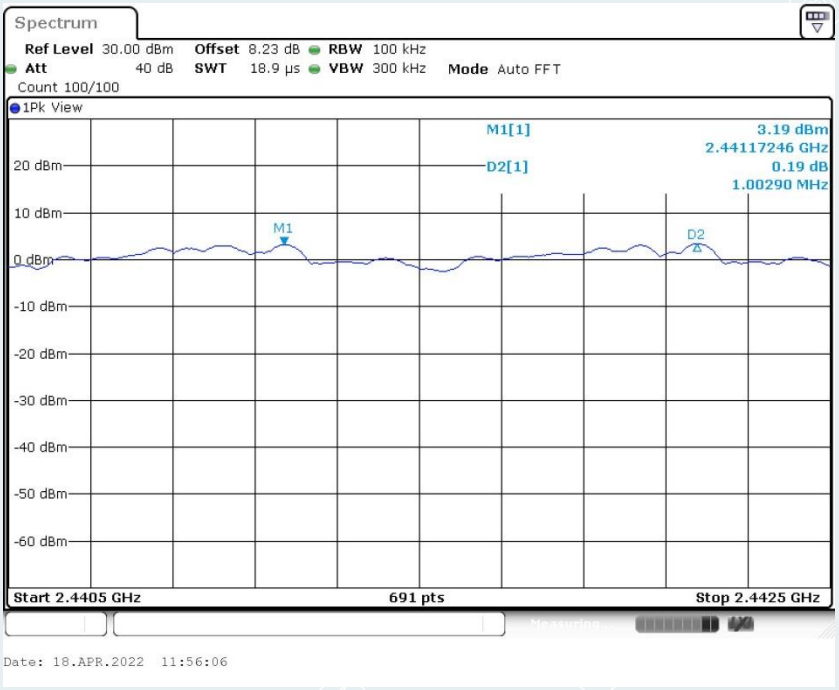
2DH5

Measurement of Channel Separation



3DH5

Measurement of Channel Separation



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9. HOPPING CHANNEL NUMBER

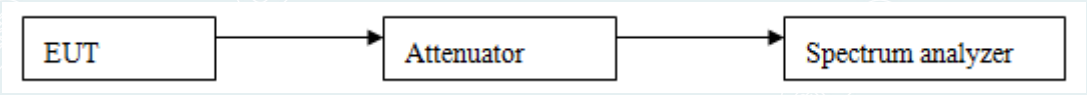
9.1 LIMITS

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

9.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2) Set the spectrum analyzer as RBW=100kHz, VBW=300kHz.
3) Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

9.3 TEST SETUP



9.4 TEST RESULTS

Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-04-18

GFSK

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

π/4-DQPSK

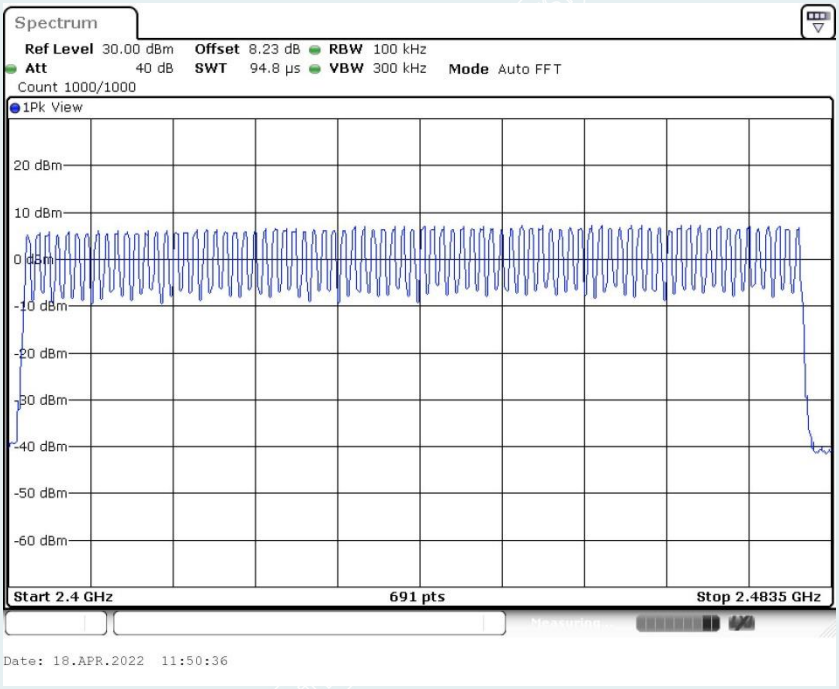
Result (No. of CH)	Limit (No. of CH)	Result
79	≥15	PASS

8DPSK

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

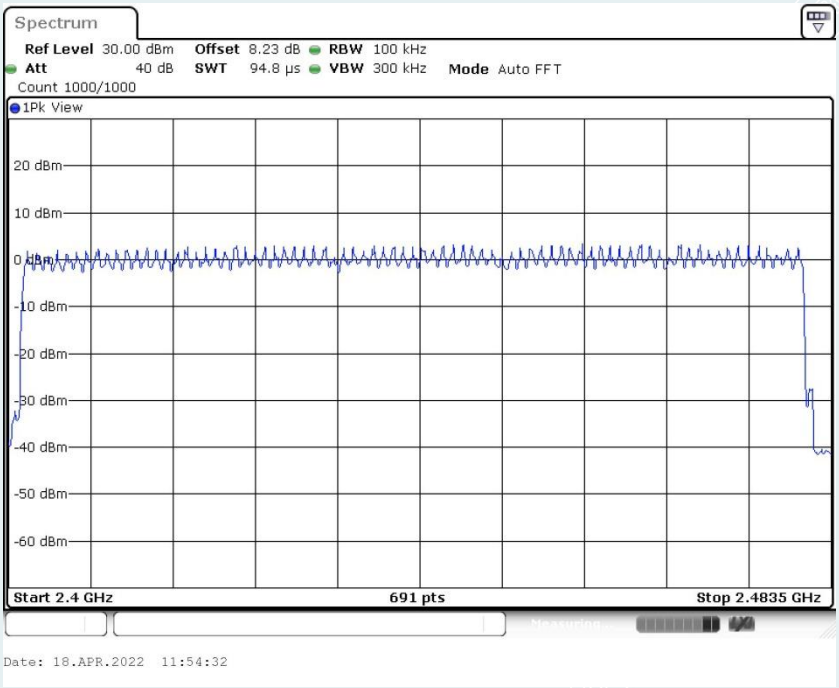
GFSK

2.400 GHz – 2.4835 GHz



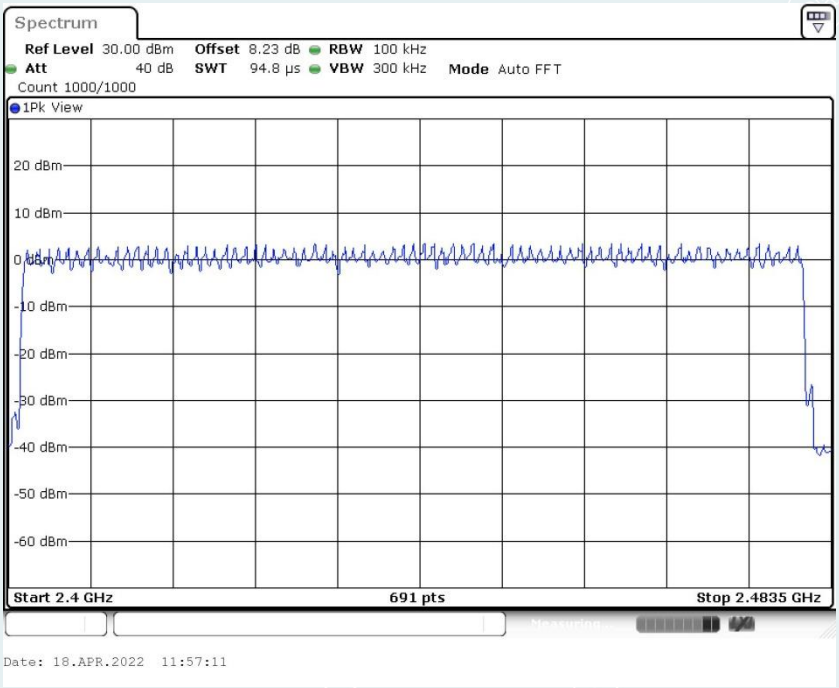
π/4-DQPSK

2.400 GHz – 2.4835 GHz



8DPSK

2.400 GHz – 2.4835 GHz



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10. DWELL TIME

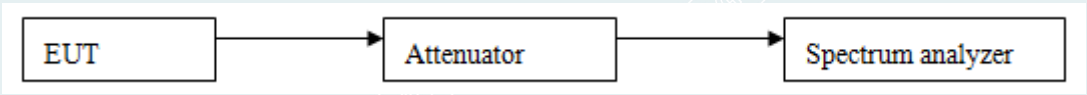
10.1 LIMITS

Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

10.2 TEST PROCEDURES

1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2) Set spectrum analyzer span = 0. centered on a hopping channel.
3) Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold.
4) Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). Repeat this test for each variation.
5) DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot TX, 1 time slot RX).So, the dwell time is the time duration of the pulse times 10.12 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.

10.3 TEST SETUP



10.4 TEST RESULTS

Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-01-14 to 2022-04-18

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

GFSK: Middle Channel (2.441GHz)

DH1	time slot=	0.38	(ms)*	(1600/(2*79))	*	31.6	=	122	ms
DH3	time slot=	1.64	(ms)*	(1600/(4*79))	*	31.6	=	262	ms
DH5	time slot=	2.88	(ms)*	(1600/(6*79))	*	31.6	=	307	ms

π/4-DQPSK: Middle Channel (2.441GHz)

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

8DPSK: Middle Channel (2.441GHz)

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

The results are not greater than 0.4 seconds.

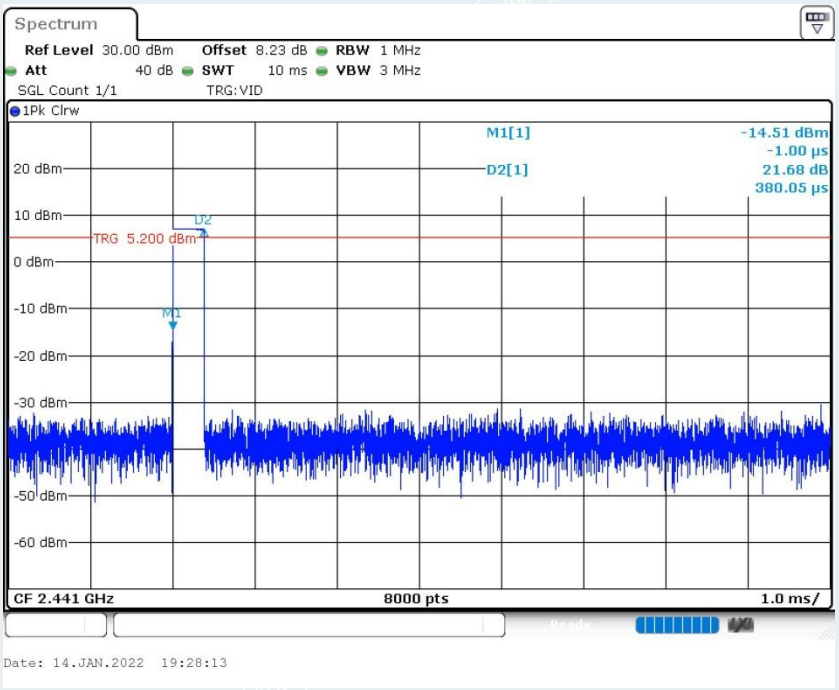
---------- The following blanks ----------

Please refer the graph as below:

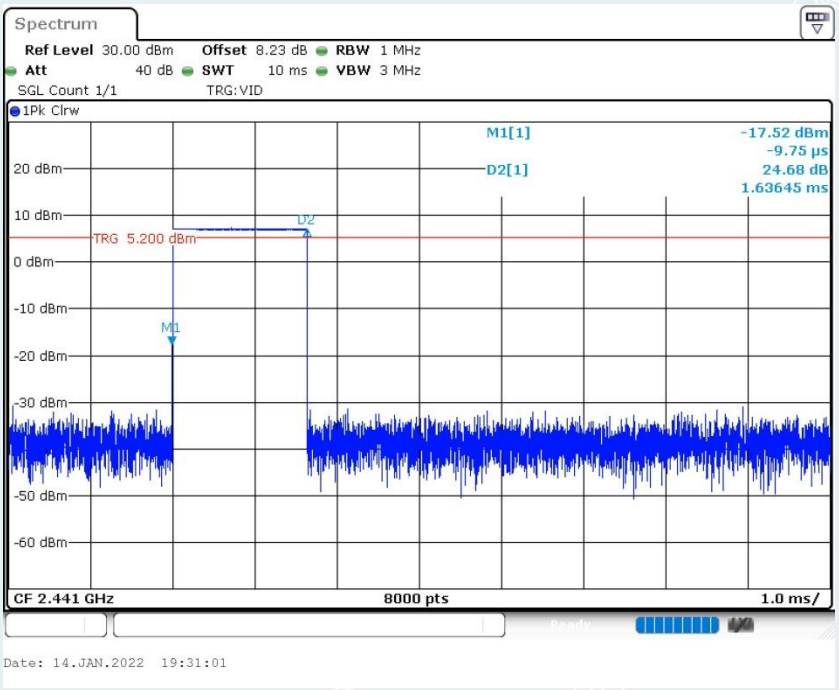
GFSK

Middle Frequency (2.441GHz)

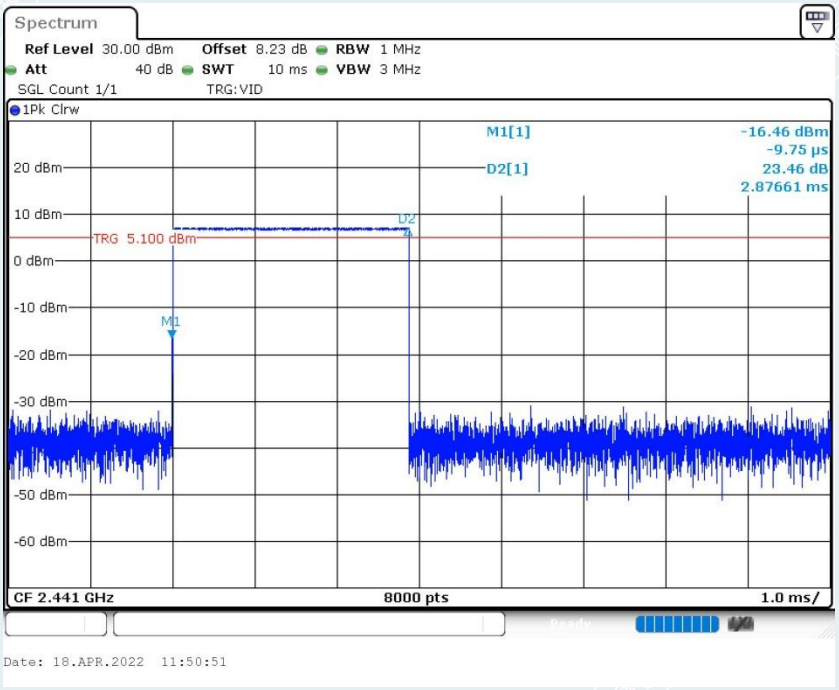
DH1



DH3

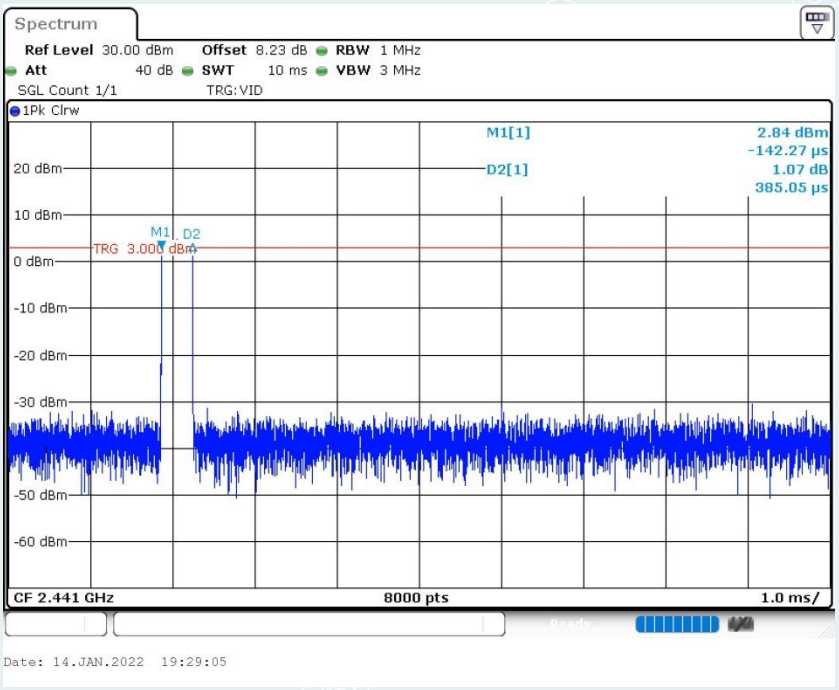


DH5

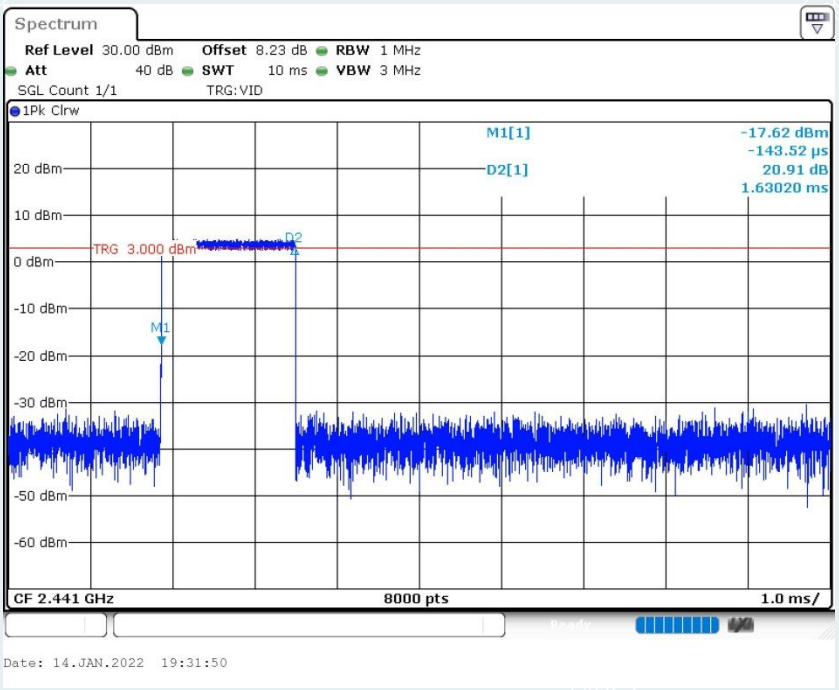


---------- The following blanks ----------

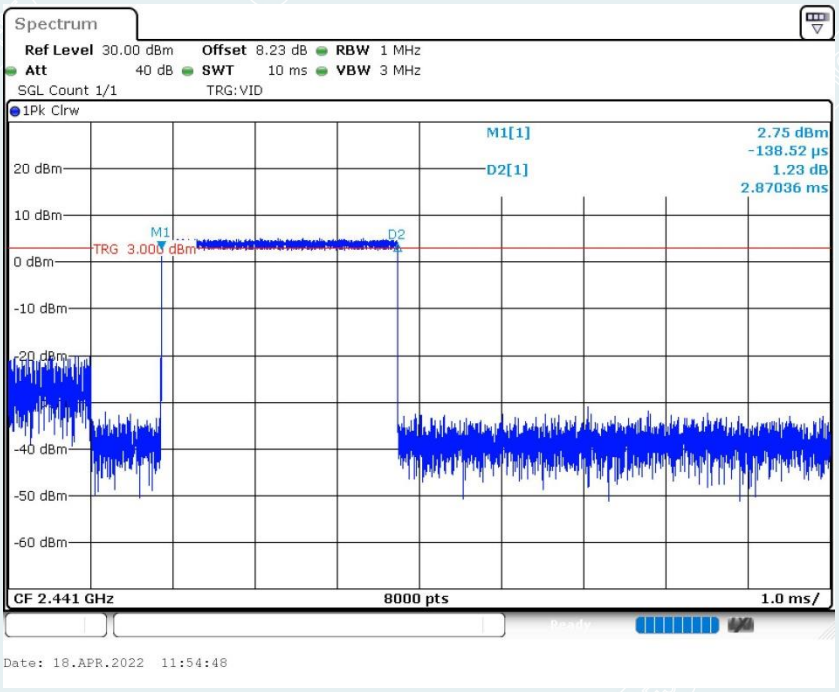
π/4-DQPSK
Middle Frequency (2.441GHz)
2DH1



Mid Frequency (2.441GHz)
2DH3



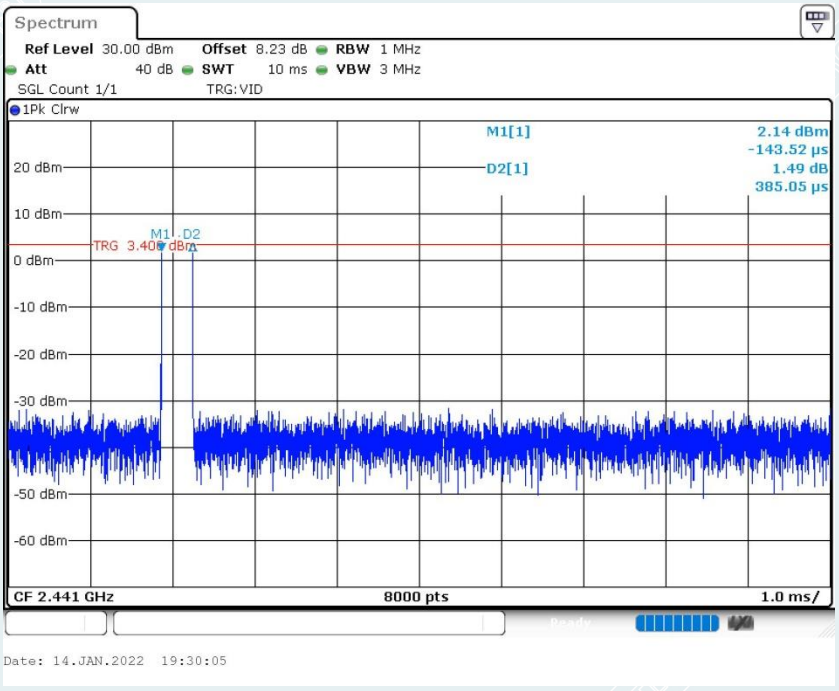
2DH5



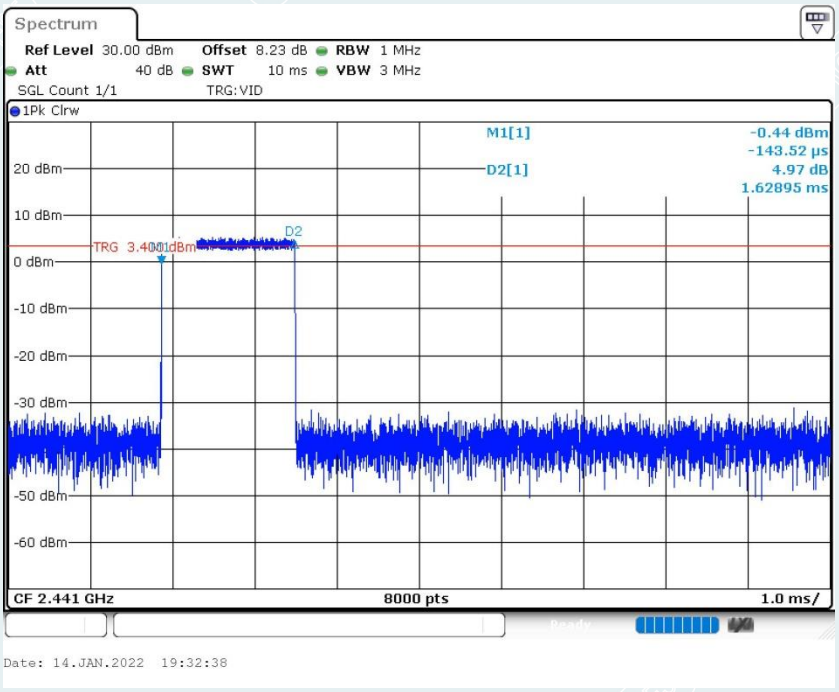
8DPSK

Middle Frequency (2.441GHz)

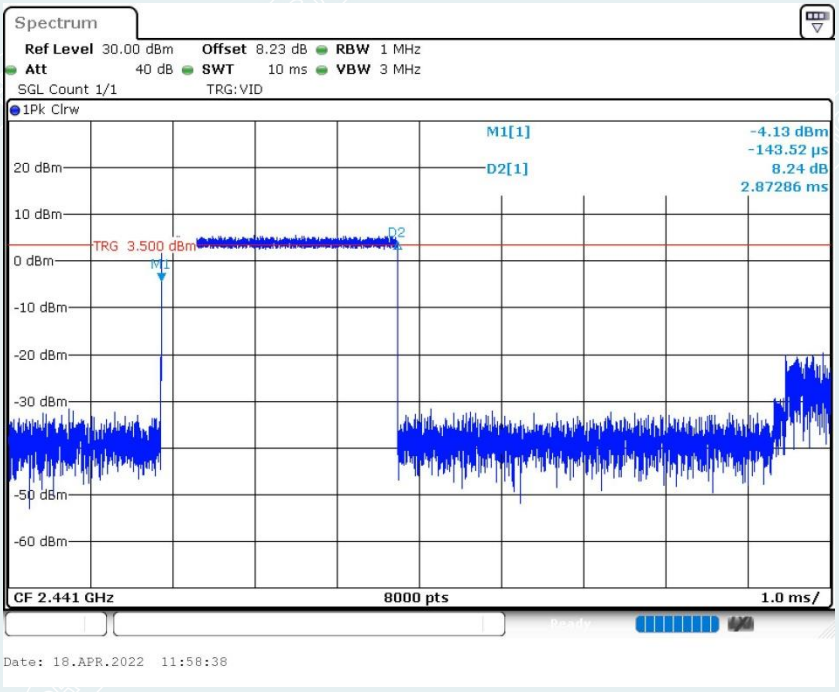
3DH1



3DH3


Spectrum
Ref Level 30.00 dBm Offset 8.23 dB RBW 1 MHz
Att 40 dB SWT 10 ms VBW 3 MHz
SGL Count 1/1 TRG:VID
1Pk Clrw
M1[1] -0.44 dBm
-143.52 µs
D2[1] 4.97 dB
1.62895 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
TRG 3.400 dBm
D2
CF 2.441 GHz
8000 pts
1.0 ms/
Date: 14.JAN.2022 19:32:38

3DH5


Spectrum
Ref Level 30.00 dBm Offset 8.23 dB RBW 1 MHz
Att 40 dB SWT 10 ms VBW 3 MHz
SGL Count 1/1 TRG:VID
1Pk Clrw
M1[1] -4.13 dBm
-143.52 µs
D2[1] 8.24 dB
2.87286 ms
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
TRG 3.500 dBm
D2
M1
CF 2.441 GHz
8000 pts
1.0 ms/
Date: 18.APR.2022 11:58:38

11. MAXIMUM PEAK OUTPUT POWER

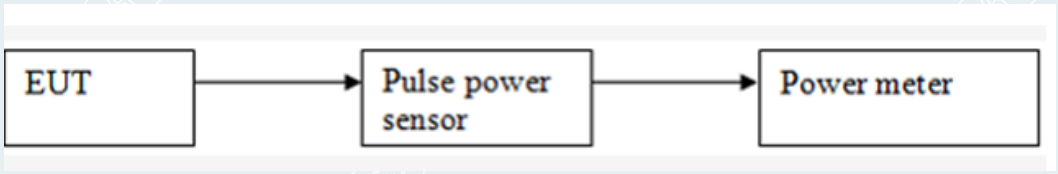
11.1 LIMITS

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



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11.4 TEST RESULTS

Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-04-18

DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	6.33	20.97	Peak	Pass
Middle	2.441	7.48			Pass
Highest	2.480	7.38			Pass

2DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	6.35	20.97	Peak	Pass
Middle	2.441	7.49			Pass
Highest	2.480	7.39			Pass

3DH5

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Peak/ Average	Pass/Fail
Lowest	2.402	5.37	20.97	Peak	Pass
Middle	2.441	6.11			Pass
Highest	2.480	5.96			Pass

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12. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

12.1 LIMITS

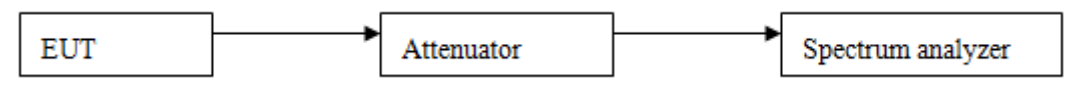
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

12.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 15.247 measurement guidance v05r02.

1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
3) Measure and record the results in the test report.
4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

12.3 TEST SETUP



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

12.4 TEST RESULTS

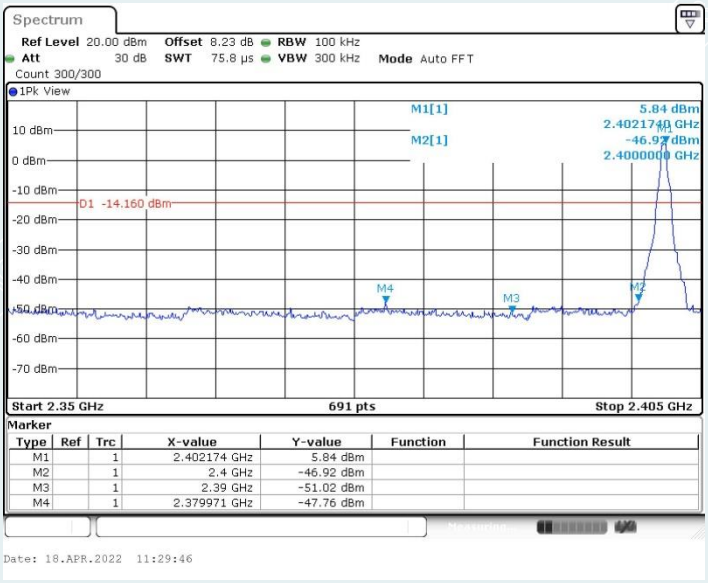
Environment: 22.6℃/48%RH Voltage: AC 120V/60Hz
Tested By: Deng Weihao Date: 2022-04-18

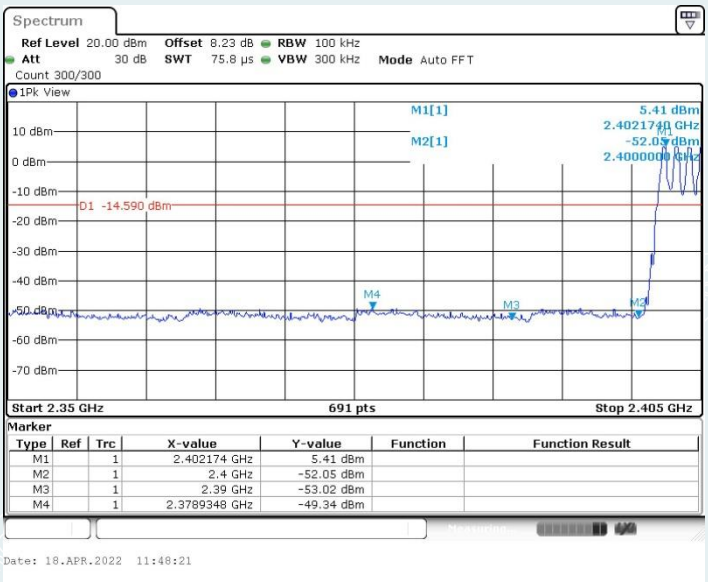
Test result plot as follows:

Band Edges

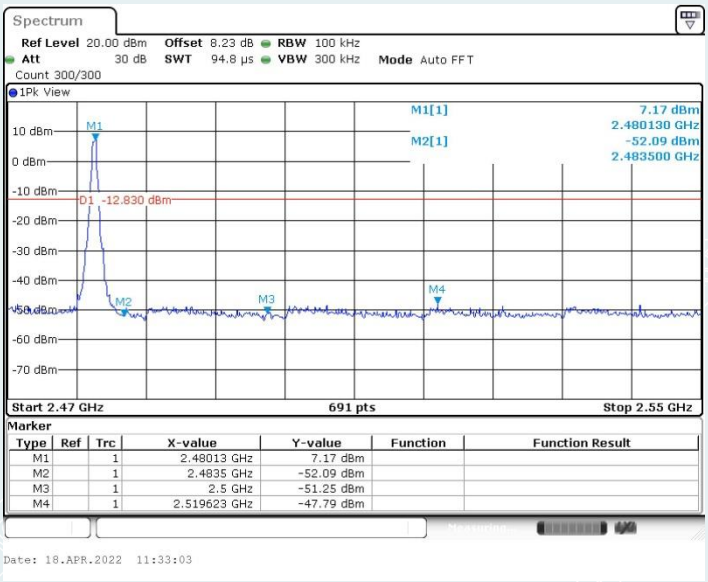
DH5

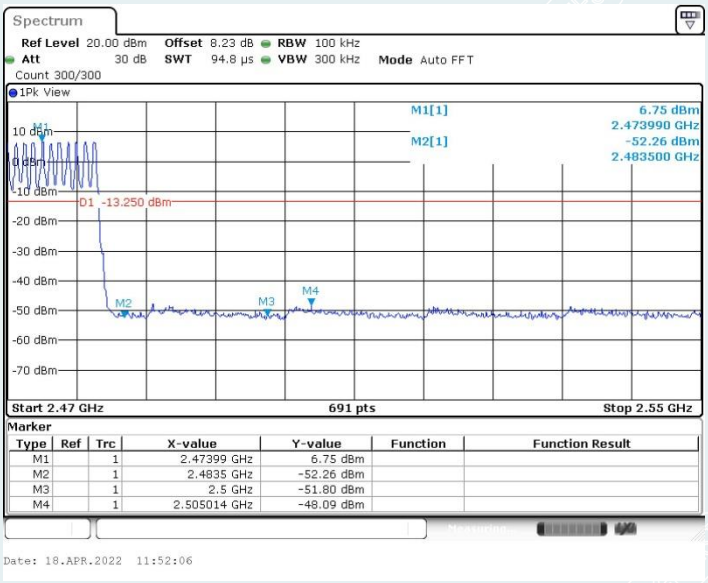
CH Low (2.35GHz ~2.405GHz)



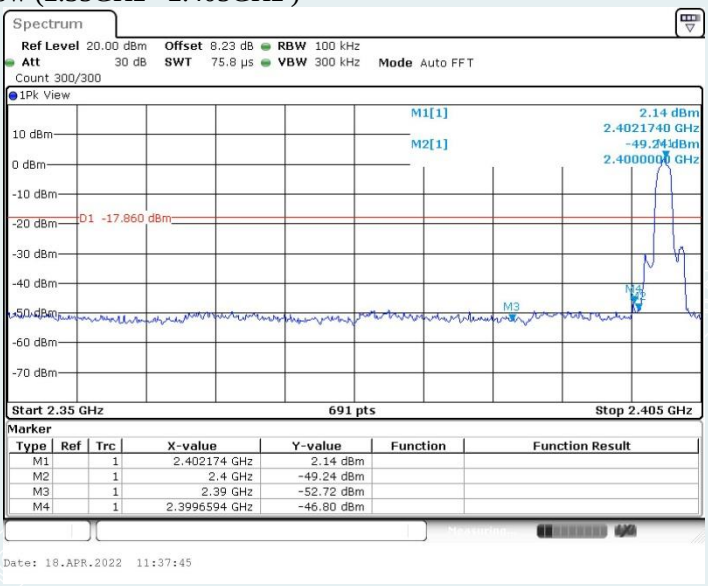


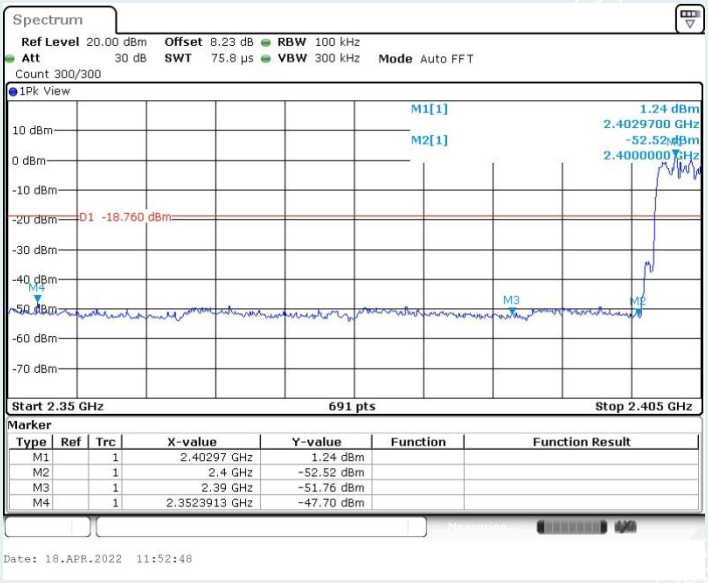
CH High (2.47GHz ~ 2.55GHz)



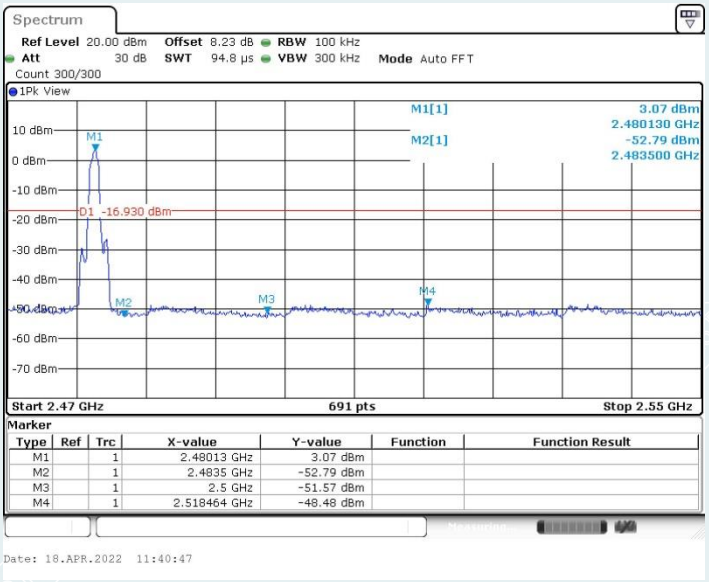


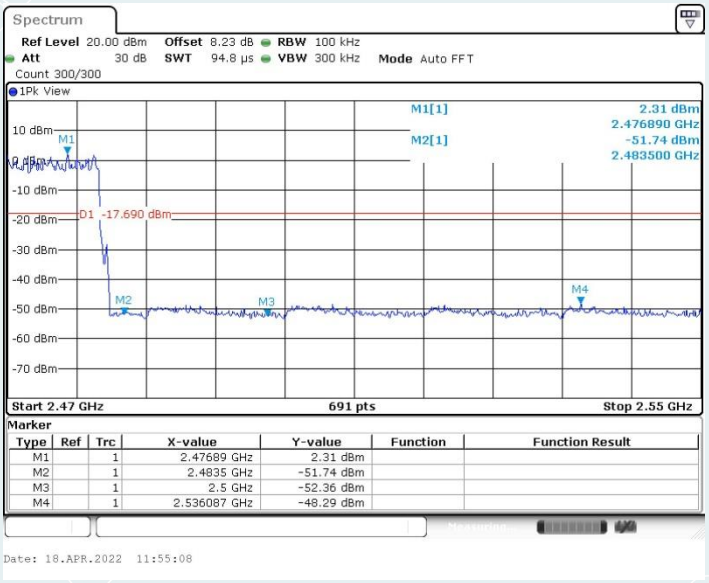
2DH5
CH Low (2.35GHz ~2.405GHz)



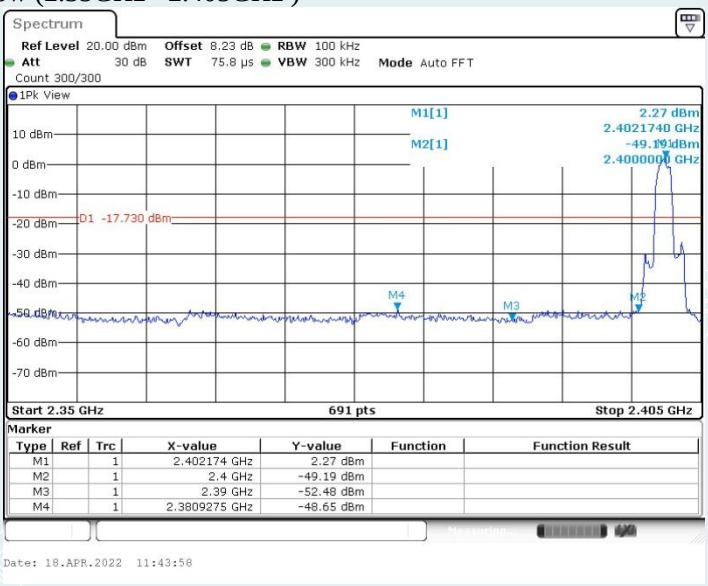


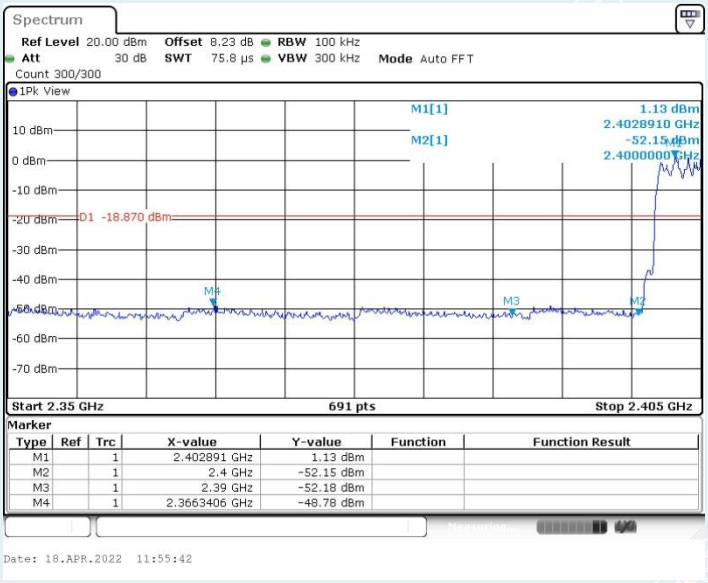
CH High (2.47GHz ~ 2.55GHz)



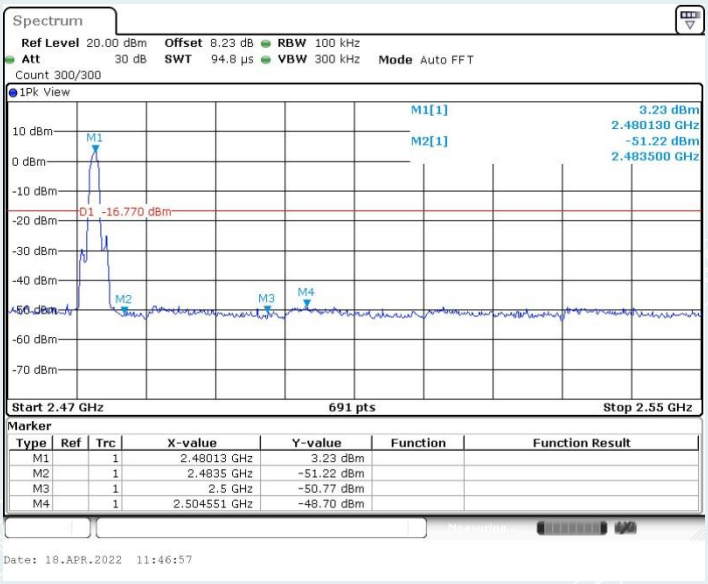


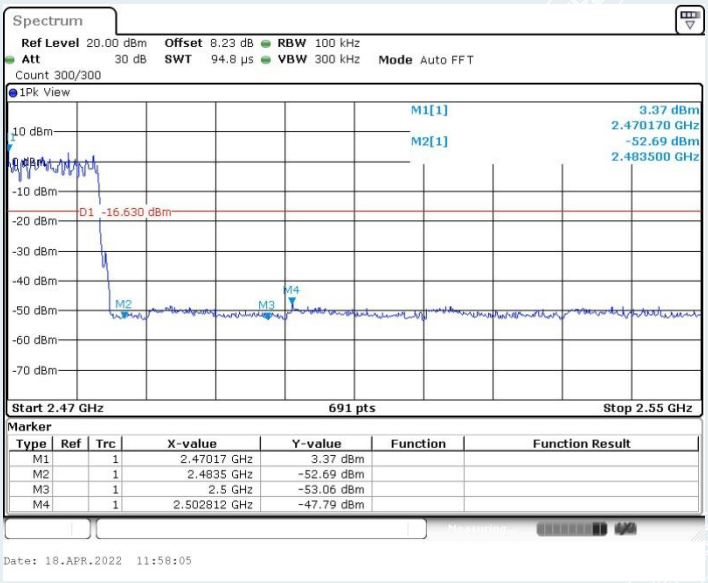
3DH5
CH Low (2.35GHz ~2.405GHz)



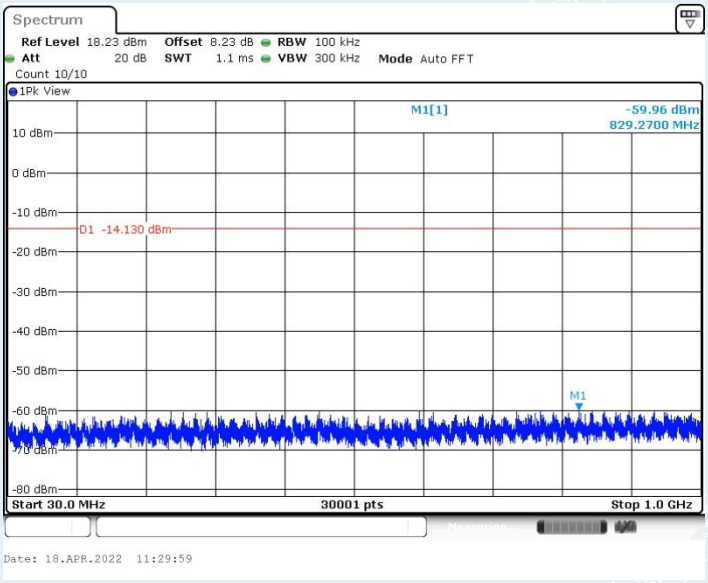


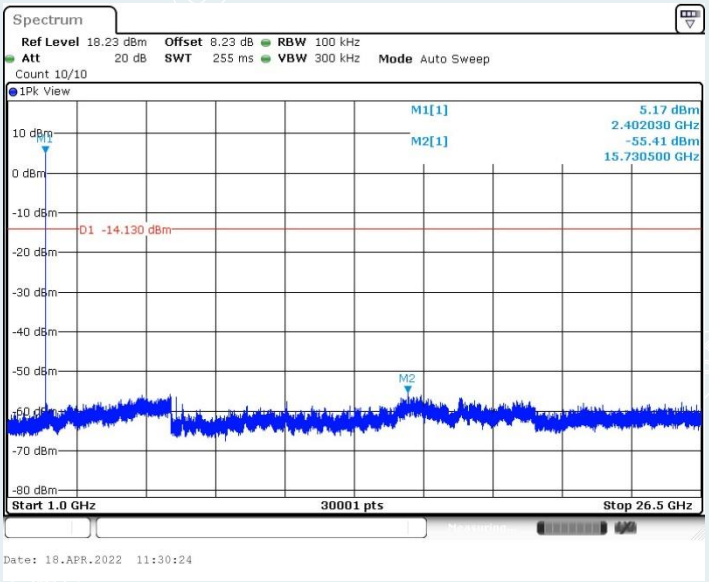
CH High (2.47GHz ~ 2.55GHz)





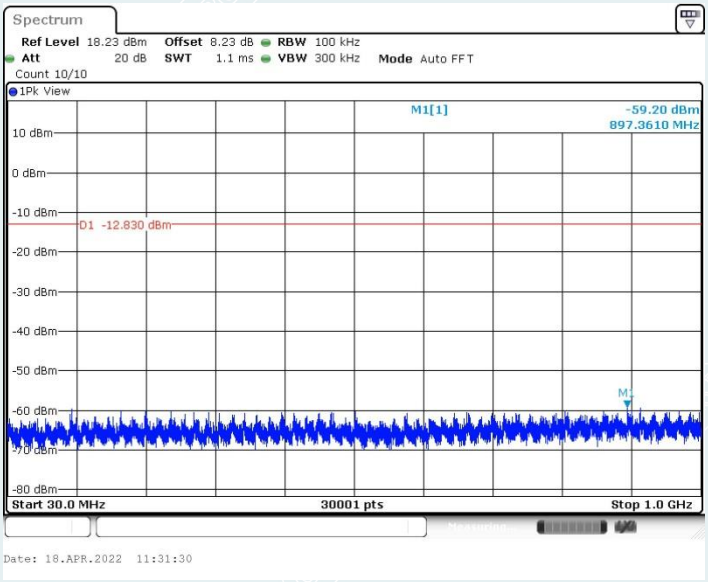
Spurious Emissions
DH5
CH Low

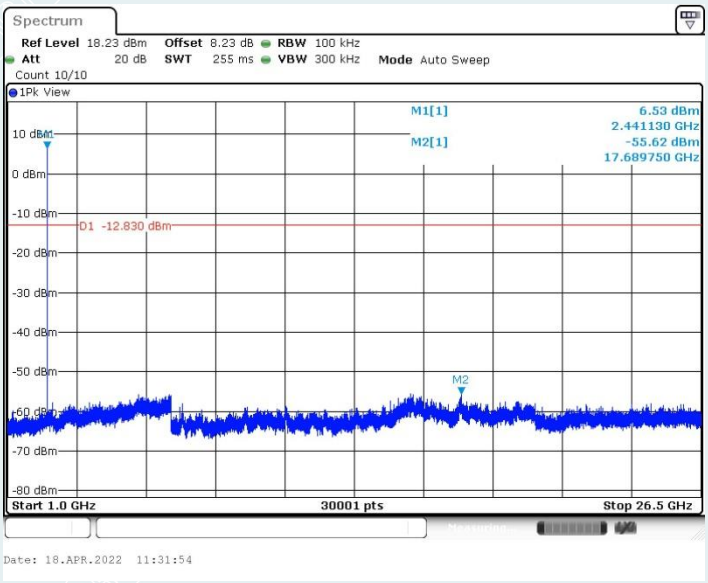



Spectrum
Ref Level 18.23 dBm Offset 8.23 dB RBW 100 kHz
Att 20 dB SWT 255 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk View
M1[1] 5.17 dBm
2.402030 GHz
M2[1] -55.41 dBm
15.730500 GHz
D1 -14.130 dBm
Start 1.0 GHz 30001 pts Stop 26.5 GHz
Date: 18.APR.2022 11:30:24

CH Mid

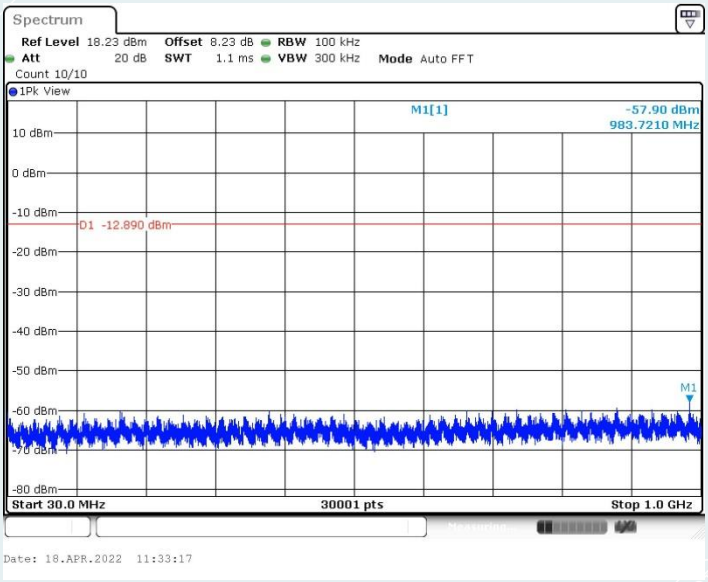

Spectrum
Ref Level 28.23 dBm Offset 8.23 dB RBW 100 kHz
Att 30 dB SWT 18.9 µs VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View
M1[1] 7.17 dBm
2.44117800 GHz
CF 2.441 GHz 691 pts Span 1.5 MHz
Date: 18.APR.2022 11:31:25


Spectrum
Ref Level 18.23 dBm Offset 8.23 dB RBW 100 kHz
Att 20 dB SWT 1.1 ms VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View
M1[1] -59.20 dBm
897.3610 MHz
D1 -12.830 dBm
Start 30.0 MHz 30001 pts Stop 1.0 GHz
Date: 18.APR.2022 11:31:30


Spectrum
Ref Level 18.23 dBm Offset 8.23 dB RBW 100 kHz
Att 20 dB SWT 255 ms VBW 300 kHz Mode Auto Sweep
Count 10/10
1Pk View
M1[1] 6.53 dBm
2.441130 GHz
M2[1] -55.62 dBm
17.689750 GHz
D1 -12.830 dBm
Start 1.0 GHz 30001 pts Stop 26.5 GHz
Date: 18.APR.2022 11:31:54

CH High


Spectrum
Ref Level 28.23 dBm Offset 8.23 dB RBW 100 kHz
Att 30 dB SWT 18.9 µs VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View
M1[1] 7.11 dBm
2.48018230 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.48 GHz
691 pts
Span 1.5 MHz
Date: 18.APR.2022 11:33:12


Spectrum
Ref Level 18.23 dBm Offset 8.23 dB RBW 100 kHz
Att 20 dB SWT 1.1 ms VBW 300 kHz Mode Auto FFT
Count 10/10
1Pk View
M1[1] -57.90 dBm
983.7210 MHz
10 dBm
0 dBm
-10 dBm
D1 -12.890 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 30.0 MHz
30001 pts
Stop 1.0 GHz
Date: 18.APR.2022 11:33:17