FCC Test Report

Report no.:	HQ200409EL03-FI
Applicant name:	ANKANG COMATE TECH CO.,LTD
Applicant address:	North end of Gaoxin No.7 Road, The High-Tech Industrial Zone, Ankang Shaanxi, China
FCC ID:	2ASKIMM444BT
Product name	3-PIECE CD SHELF SYSTEM with Digital PLL FM Stereo Radio and Bluetooth® Wireless Technology
Product name:	MAGNAVOX
Test model:	MM444BT
Series model:	CM444BT; CM0300BT; CM-444;
Received date:	Apr. 18, 2020
Test date:	Apr. 19, 2020~May 24, 2020
Issued date:	Jun. 12, 2020
Issued By:	Hwa-Hsing (Dongguan) Testing Co., Ltd.
Lab Address:	No.101, Bld N1,Yuyuan 2Rd, Yuyuan Industrial Park, HuangJiang Town, Dongguan, China
Test Location:	No.101, Bld N1,Yuyuan 2Rd, Yuyuan Industrial Park, HuangJiang Town, Dongguan, China
FCC Designation Number:	CN1255
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

The above equipmenthas been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jun. 12, 2020

Tank Tan//Engineer

Approved by : _____ , **Date:** Jun. 12, 2020

Harry Li/ Supervisor

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Table of Contents

Release Control Record **4**

1 Summary of Test Results **5**

1.1 Measurement Uncertainty 5
1.2 Modification Record 5

2 General Information **6**

2.1 General Description of EUT 6
2.2 Description of Test Modes 7
2.2.1 Test Mode Applicability and Tested Channel Detail 8
2.3 Description of Support Units 10
2.3.1 Configuration of System under Test 10
2.4 General Description of Applied Standards 11

3 Test Types and Results **12**

3.1 Radiated Emission and Bandedge Measurement 12
3.1.1 Limits of Radiated Emission and Bandedge Measurement 12
3.1.2 Test Instruments 13
3.1.3 Test Procedures 14
3.1.4 Deviation from Test Standard 14
3.1.5 Test Set Up 15
3.1.6 EUT Operating Conditions 16
3.1.7 Test Results 17
3.2 Conducted Emission Measurement 25
3.2.1 Limits of Conducted Emission Measurement 25
3.2.2 Test Instruments 25
3.2.3 Test Procedures 25
3.2.4 Deviation from Test Standard 25
3.2.5 Test Setup 26
3.2.6 EUT Operating Condition 26
3.2.7 Test Results 27
3.3 Number of Hopping Frequency Used 29
3.3.1 Limits of Hopping Frequency Used Measurement 29
3.3.2 Test Setup 29
3.3.3 Test Instruments 29
3.3.4 Test Procedure 29
3.3.5 Deviation fromTest Standard 29
3.3.6 Test Results 30
3.4 Dwell Time on Each Channel 31
3.4.1 LimitsofDwell Time on Each Channel Measurement 31
3.4.2 Test Setup 31
3.4.3 TestInstruments 31
3.4.4 Test Procedures 31
3.4.5 Deviationfrom Test Standard 31
3.4.6 Test Results 32
3.5 Channel Bandwidth 34
3.5.1 Limits of Channel Bandwidth Measurement 34
3.5.2 Test Setup 34
3.5.3 Test Instruments 34
3.5.4 Test Procedure 34
3.5.5 Deviation from Test Standard 34
3.5.6 EUT Operating Condition 34
3.5.7 Test Results 35
3.6 Occupied Bandwidth Measurement 36
3.6.1 Test Setup 36
3.6.2 Test Instruments 36

3.6.3 Test Procedure.....36
3.6.4 Deviation from Test Standard.....36
3.6.5 EUT Operating Conditions.....36
3.6.6 Test Results.....37
3.7 Hopping Channel Separation.....38
3.7.1 Limitsof Hopping Channel Separation Measurement.....38
3.7.2 Test Setup.....38
3.7.3 Test Instruments.....38
3.7.4 Test Procedure.....38
3.7.5 Deviationfrom Test Standard.....38
3.7.6 Test Results.....39
3.8 Maximum Output Power.....40
3.8.1 Limitsof Maximum Output Power Measurement.....40
3.8.2 Test Setup.....40
3.8.3 Test Instruments.....40
3.8.4 Test Procedure.....40
3.8.5 Deviation fromTest Standard.....40
3.8.6 EUT Operating Condition.....40
3.8.7 Test Results.....41
3.9 Conducted Out of Band Emission Measurement.....42
3.9.1 Limits Of Conducted Out Of Band Emission Measurement.....42
3.9.2 Test Instruments.....42
3.9.3 Test Procedure.....42
3.9.4 Deviation from Test Standard.....42
3.9.5 EUT Operating Condition.....42
3.9.6 Test Results.....43

4 Pictures of Test Arrangements.....47

4.1.2 Test Instruments.....47

Appendix – Information on the Testing Laboratories.....48

Release Control Record

Issue No.	Description	Date Issued
HQ200409EL03-FI	Original Release	Jun. 12, 2020

1 Summary of Test Results

47 CFR FCC Part 15, Subpart C(Section 15.247) ANSI C63.10:2013;			
FCCClause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit.
15.247(a)(1)(iii)	Number of Hopping Frequency Used	Pass	Meet the requirement of limit.
15.247(a)(1)(iii)	Dwell Time on Each Channel	Pass	Meet the requirement of limit.
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	Pass	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note:

If The Frequency Hopping System operating in 2400-2483.5MHz band and the outputpower less than 125mW.The hopping channel carrier frequencies separated by a minimumof 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.

1.1 Measurement Uncertainty

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

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.66 dB
Radiated Emissions up to 1 GHz	9KHz ~ 30MHz	2.90dB
	30MHz ~ 1000MHz	3.47 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	4.84 dB
	18GHz ~ 40GHz	4.62 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.2 Modification Record

There were no modifications required for compliance.

2 General Information

2.1 General Description of EUT

Product Name	3-PIECE CD SHELF SYSTEM with Digital PLL FM Stereo Radio and Bluetooth® Wireless Technology
Brand Name	MAGNAVOX
Test Model Name	MM444BT
Series Model Name	CM444BT; CM0300BT; CM-444;
Model Difference	Only difference of model name for trade purpose
Status of EUT	Engineeringprototype
Power Supply Rating	AC100-240V~50/60Hz (0.4A Max.), or, DC 1.5V*2(AAA) Battery
Modulation Type	GFSK, π/4 DQPSK, 8DPSK
Transfer Rate	1Mbps/2Mbps/3Mbps
Operating Frequency	2402 ~ 2480 MHz
Number of Channel	79
Output Power	1.45dBm
Antenna Type	PCB antenna with-0.58dBi gain
Antenna Connector	N/A
Raido software	FCC Assist 2.4
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. Please refer to the EUT photo document (Reference No.: HQ200409EL03) for detailed product photo.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

2.2 Description of Test Modes

79 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

2.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	**RE<1G**	**PLC**	**APCM**	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** AntennaPort Conducted Measurement

Note:
1.For Radiated emission test, pre-tested GFSK,π/4-DQPSKmodulation type and found GFSK was the worse, therefore chosen for the final test and presented in the test report.
2. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
3. "-"means no effect.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
-	0 to 78	78	FHSS	GFSK	DH5

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data ratesand antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
-	0 to 78	78	FHSS	GFSK	DH5

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Packet Type
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Tank Tan
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Tank Tan
PLC	25deg. C, 65%RH	120Vac, 60Hz	Tank Tan
APCM	25deg. C, 65%RH	120Vac, 60Hz	Harry Li

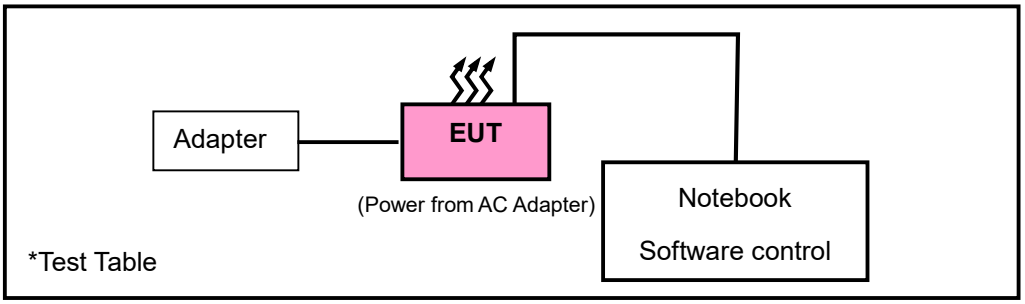
2.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

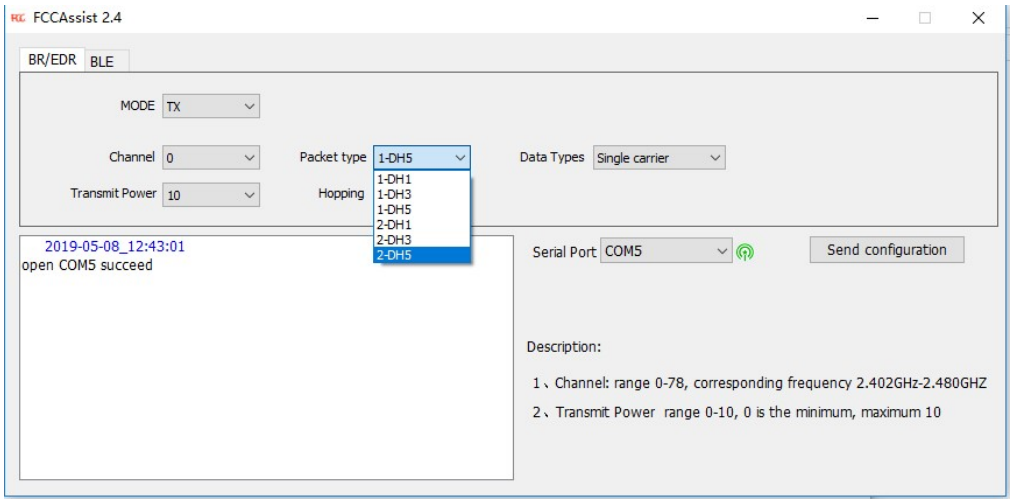
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook	Lenovo	E430	MP-0DN27	N/A

No.	Signal Cable Description Of The Above Support Units
1.	AC Line: Un-shieldin 1.5m
2.	/
3.	/

2.3.1 Configuration of System under Test



Radio Software:



2.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013
All test items have been performed and recorded as per the above standards.

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (sDoC). The test report has been issued separately.

3 Test Types and Results

3.1 Radiated Emission and Bandedge Measurement

3.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bandsmust comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.1.2 Test Instruments

For radiated emission test (9kHz-1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver (10kHz~7GHz)	Rohde&Schwarz	ESCI 7	100962	2021/05/14	2021/05/13
Loop Antenna 9kHz~30MHz	TESEQ	HLA 6121	56735	2020/04/15	2021/04/15
Broadband antenna (25MHz~2500MHz)	Schwarzbeck	VULB 9168	00937	2019/10/20	2021/10/19
Signal Amplifier (30MHz~1000MHz)	Com-power	PAM-103	18020051	2019/10/18	2020/10/17
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	NSEMC003	2020/04/15	2021/04/15
Attenuator	R&S	TS2GA-6dB	18101101	2019/10/18	2020/10/17
Test software	EZ	EZ_EMC V1.1.4.2	N/A	N/A	N/A
Digital Multimeter	FLUKE	15B+	43512617WS	2019/10/22	2020/10/21

For radiated emission test (1GHz-40GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA 9170	01959	2019/10/18	2020/10/17
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2019/10/18	2020/10/17
Broadband Coaxial Preamplifier (1GHz-18GHz)	Schwarzbeck	BBV 9718	00025	2019/10/18	2020/10/17
Horn Antenna (18GHz-40GHz)	Schwarzbeck	BBHA 9170	BBHA9170242	2019/10/18	2020/10/17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	2019/10/18	2020/10/17
High pass filter	Micro-Tronics	HPM50107	G050	2019/10/18	2020/10/17
High pass filter	Micro-Tronics	HPM50117	G007	2019/10/18	2020/10/17
Test software	EZ	EZ_EMC V1.1.4.2	N/A	N/A	N/A
Spectrum （10kHz~26.5GHz）	Keysight	N9020A	MY51240612	2019/10/18	2020/10/17
EMI Test Receiver (10kHz~7GHz)	Rohde&Schwarz	ESCI 7	100962	2019/10/18	2020/10/17

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA.

2. The test was performed in Chamber 1

3.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

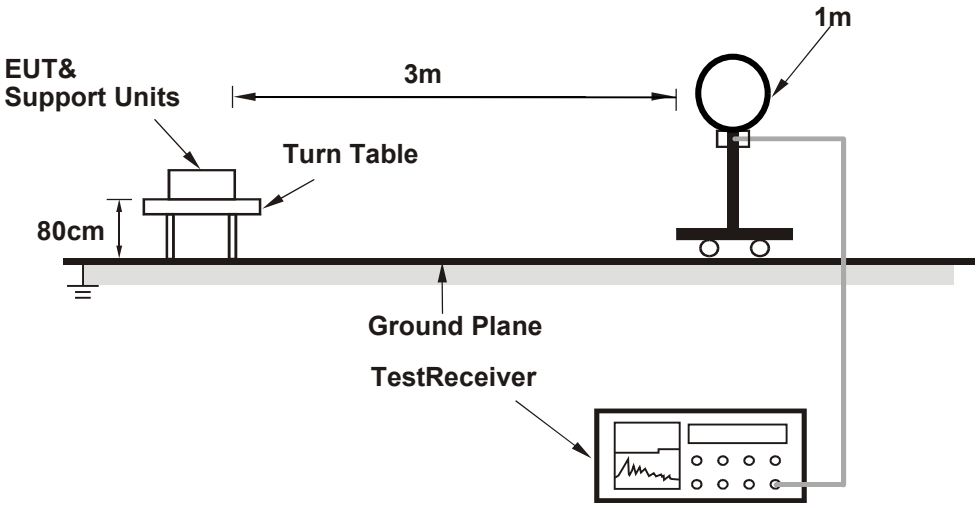
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. Test procedures for measuring FHSS device: The use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the unwanted emission limit is subject to an average field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector. Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period. Subclause 7.5 of ANSI C63.10 provides additional measurement guidance applicable to determination of the DCCF.
6. All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 Deviation from Test Standard

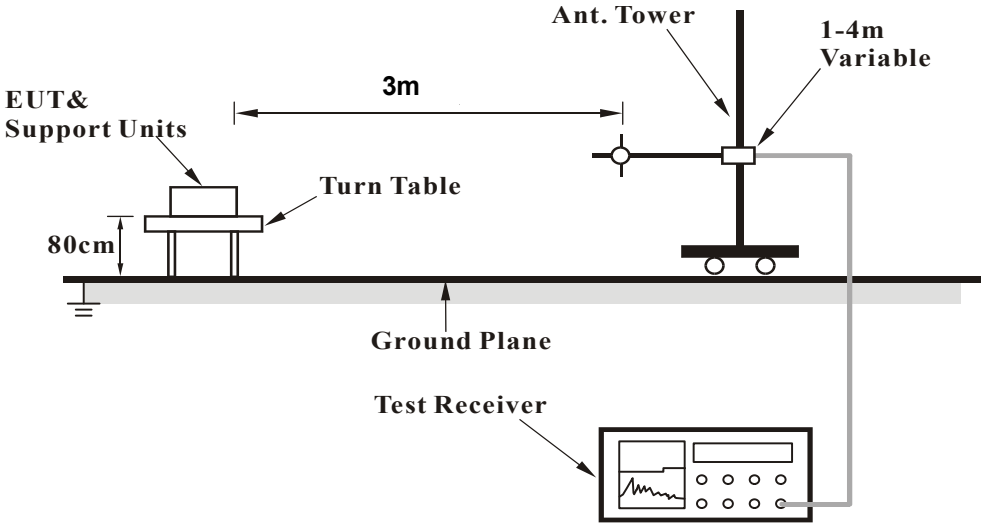
No deviation.

3.1.5 Test Set Up

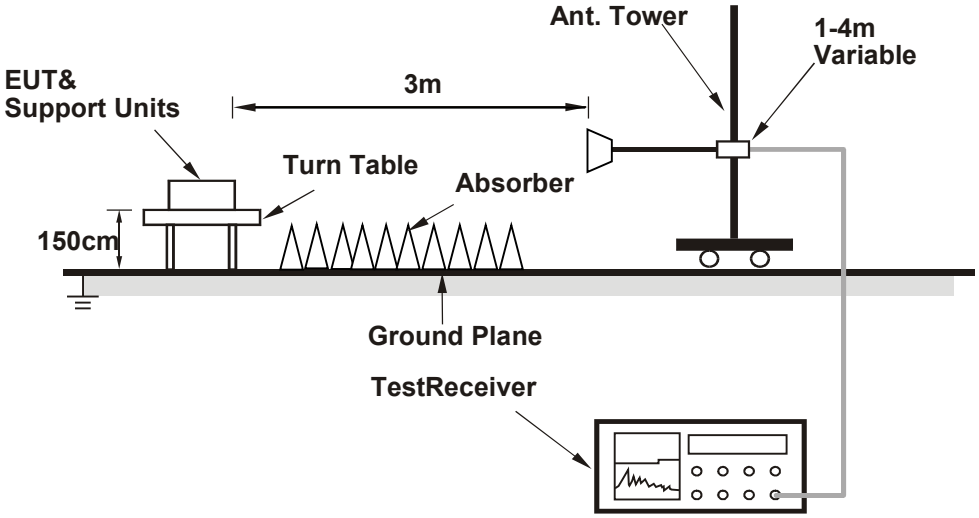
Radiated emission below 30MHz:



Frequency Range below 1GHz:



Frequency Range above 1GHz:



Directional antenna.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

3.1.7 Test Results

Above 1GHz Data:

GFSK

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1GHz ~ 25GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank Tan

Antenna Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	43.23	-0.77	42.46	74.00	-31.54	peak	100	272	
2	2390.000	9.97	-0.77	9.20	54.00	-44.80	AVG	100	272	
3	2402.000	94.42	-0.75	93.67			peak	100	272	C.F.
4	2402.000	61.16	-0.75	60.41			AVG	100	272	C.F.
5	4804.000	49.19	5.36	54.55	74.00	-19.45	peak	100	312	
6	4804.000	15.93	5.36	21.29	54.00	-32.71	AVG	100	312	
7	7206.000	44.12	11.75	55.87	74.00	-18.13	peak	100	140	
8	7206.000	10.86	11.75	22.61	54.00	-31.39	AVG	100	140	
Antenna Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	43.06	-0.77	42.29	74.00	-31.71	peak	100	229	
2	2390.000	9.80	-0.77	9.03	54.00	-44.97	AVG	100	229	
3	2402.000	93.02	-0.75	92.27			peak	100	229	C.F.
4	2402.000	59.76	-0.75	59.01			AVG	100	229	C.F.
5	4804.000	49.29	5.36	54.65	74.00	-19.35	peak	100	360	
6	4804.000	16.03	5.36	21.39	54.00	-32.61	AVG	100	360	
7	7206.000	44.60	11.75	56.35	74.00	-17.65	peak	100	82	
8	7206.000	11.34	11.75	23.09	54.00	-30.91	AVG	100	82	

Remarks:

1. Emission Level = Read Level +Factor (Antenna Factor + Cable Loss - Preamp Factor)
   Margin value = Emission level – Limit value
2. 2402MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1GHz ~ 25GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) CISPR Average (AV)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank Tan

Antenna Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2441.000	94.75	-0.64	94.11			peak	100	200	C.F.
2	2441.000	61.49	-0.64	60.85			AVG	100	200	C.F.
3	4882.000	52.03	6.27	58.30	74.00	-15.70	peak	100	360	
4	4882.000	18.77	6.27	25.04	54.00	-28.96	AVG	100	360	
5	7323.000	44.90	12.14	57.04	74.00	-16.96	peak	100	290	
6	7323.000	11.64	12.14	23.78	54.00	-30.22	AVG	100	290	
Antenna Polarity&TestDistance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2441.000	94.84	-0.64	94.20			peak	100	218	C.F.
2	2441.000	61.58	-0.64	60.94			AVG	100	218	C.F.
3	4882.000	47.78	6.27	54.05	74.00	-19.95	peak	100	275	
4	4882.000	14.52	6.27	20.79	54.00	-33.21	AVG	100	275	
5	7323.000	45.02	12.14	57.16	74.00	-16.84	peak	100	60	
6	7323.000	11.76	12.14	23.90	54.00	-30.10	AVG	100	60	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
   Margin value = Emission level – Limit value
2. 2441MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1GHz ~ 25GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank Tan

Antenna Polarity&TestDistance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2480.000	94.36	-0.52	93.84			peak	154	200	C.F.
2	2480.000	61.10	-0.52	60.58			AVG	154	200	C.F.
3	2483.500	52.68	-0.51	52.17	74.00	-21.83	peak	154	200	
4	2483.500	19.42	-0.51	18.91	54.00	-35.09	AVG	154	200	
5	4960.000	49.84	6.09	55.93	74.00	-18.07	peak	100	316	
6	4960.000	16.58	6.09	22.67	54.00	-31.33	AVG	100	316	
7	7440.000	44.48	12.53	57.01	74.00	-16.99	peak	100	172	
8	7440.000	11.22	12.53	23.75	54.00	-30.25	AVG	100	172	
Antenna Polarity&TestDistance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2480.000	94.71	-0.52	94.19			peak	100	218	C.F.
2	2480.000	61.45	-0.52	60.93			AVG	100	218	C.F.
3	2483.500	52.31	-0.51	51.80	74.00	-22.20	peak	100	218	
4	2483.500	19.05	-0.51	18.54	54.00	-35.46	AVG	100	218	
5	4960.000	49.29	6.09	55.38	74.00	-18.62	peak	100	240	
6	4960.000	16.03	6.09	22.12	54.00	-31.88	AVG	100	240	
7	7440.000	45.59	12.53	58.12	74.00	-15.88	peak	100	308	
8	7440.000	12.33	12.53	24.86	54.00	-29.14	AVG	100	308	

Remarks:

1. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
   Margin value = Emission level – Limit value
2. 2480MHz: Fundamental frequency.

8DPSK

EUT Test Condition		Measurement Detail	
Channel	Channel 0	Frequency Range	1GHz ~ 25GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank Tan

Antenna Polarity&TestDistance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	41.07	-0.77	40.30	74.00	-33.70	peak	100	257	
2	2390.000	7.81	-0.77	7.04	54.00	-46.96	AVG	100	257	
3	2402.000	94.87	-0.75	94.12			peak	100	257	C.F.
4	2402.000	61.61	-0.75	60.86			AVG	100	257	C.F.
5	4804.000	51.57	5.36	56.93	74.00	-17.07	peak	100	200	
6	4804.000	18.31	5.36	23.67	54.00	-30.33	AVG	100	200	
7	7206.000	44.89	11.75	56.64	74.00	-17.36	peak	100	290	
8	7206.000	11.63	11.75	23.38	54.00	-30.62	AVG	100	290	
Antenna Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2390.000	40.44	-0.77	39.67	74.00	-34.33	peak	100	170	
2	2390.000	7.18	-0.77	6.41	54.00	-47.59	AVG	100	170	
3	2402.000	93.31	-0.75	92.56			peak	100	170	C.F.
4	2402.000	60.05	-0.75	59.30			AVG	100	170	C.F.
5	4804.000	47.98	5.36	53.34	74.00	-20.66	peak	100	331	
6	4804.000	14.72	5.36	20.08	54.00	-33.92	AVG	100	331	
7	7206.000	44.95	11.75	56.70	74.00	-17.30	peak	100	204	
8	7206.000	11.69	11.75	23.44	54.00	-30.56	AVG	100	204	

Remarks:

3. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
   Margin value = Emission level – Limit value
4. C.F.: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 39	Frequency Range	1GHz ~ 25GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank Tan

Antenna Polarity&TestDistance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2441.000	94.78	-0.64	94.14			peak	174	199	C.F.
2	2441.000	61.52	-0.64	60.88			AVG	174	199	C.F.
3	4882.000	51.81	6.27	58.08	74.00	-15.92	peak	100	195	
4	4882.000	18.55	6.27	24.82	54.00	-29.18	AVG	100	195	
5	7323.000	45.88	12.14	58.02	74.00	-15.98	peak	100	300	
6	7323.000	12.62	12.14	24.76	54.00	-29.24	AVG	100	300	
Antenna Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2441.000	94.51	-0.64	93.87			peak	100	216	C.F.
2	2441.000	61.25	-0.64	60.61			AVG	100	216	C.F.
3	4882.000	47.28	6.27	53.55	74.00	-20.45	peak	100	267	
4	4882.000	14.02	6.27	20.29	54.00	-33.71	AVG	100	267	
5	7323.000	44.51	12.14	56.65	74.00	-17.35	peak	100	324	
6	7323.000	11.25	12.14	23.39	54.00	-30.61	AVG	100	324	

Remarks:

3. Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)
   Margin value = Emission level – Limit value
4. 2441MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	1GHz ~ 25GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank Tan

Antenna Polarity&Test Distance: Horizontal at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2480.000	93.80	-0.52	93.28			peak	100	218	C.F.
2	2480.000	60.54	-0.52	60.02			AVG	100	218	C.F.
3	2483.500	51.56	-0.51	51.05	74.00	-22.95	peak	100	218	
4	2483.500	18.30	-0.51	17.79	54.00	-36.21	AVG	100	218	
5	4960.000	51.82	6.09	57.91	74.00	-16.09	peak	100	244	
6	4960.000	18.56	6.09	24.65	54.00	-29.35	AVG	100	244	
7	7440.000	44.05	12.53	56.58	74.00	-17.42	peak	100	298	
8	7440.000	10.79	12.53	23.32	54.00	-30.68	AVG	100	298	
Antenna Polarity&Test Distance: Vertical at 3 m										
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	2480.000	94.94	-0.52	94.42			peak	100	218	C.F.
2	2480.000	61.68	-0.52	61.16			AVG	100	218	C.F.
3	2483.500	52.86	-0.51	52.35	74.00	-21.65	peak	100	218	
4	2483.500	19.60	-0.51	19.09	54.00	-34.91	AVG	100	218	
5	4960.000	48.27	6.09	54.36	74.00	-19.64	peak	100	330	
6	4960.000	15.01	6.09	21.10	54.00	-32.90	AVG	100	330	
7	7440.000	44.75	12.53	57.28	74.00	-16.72	peak	100	304	
8	7440.000	11.49	12.53	24.02	54.00	-29.98	AVG	100	304	

Remarks:

3. Emission Level = Read Level +Factor (Antenna Factor + Cable Loss - Preamp Factor)
   Margin value = Emission level – Limit value
4. 2480MHz: Fundamental frequency.

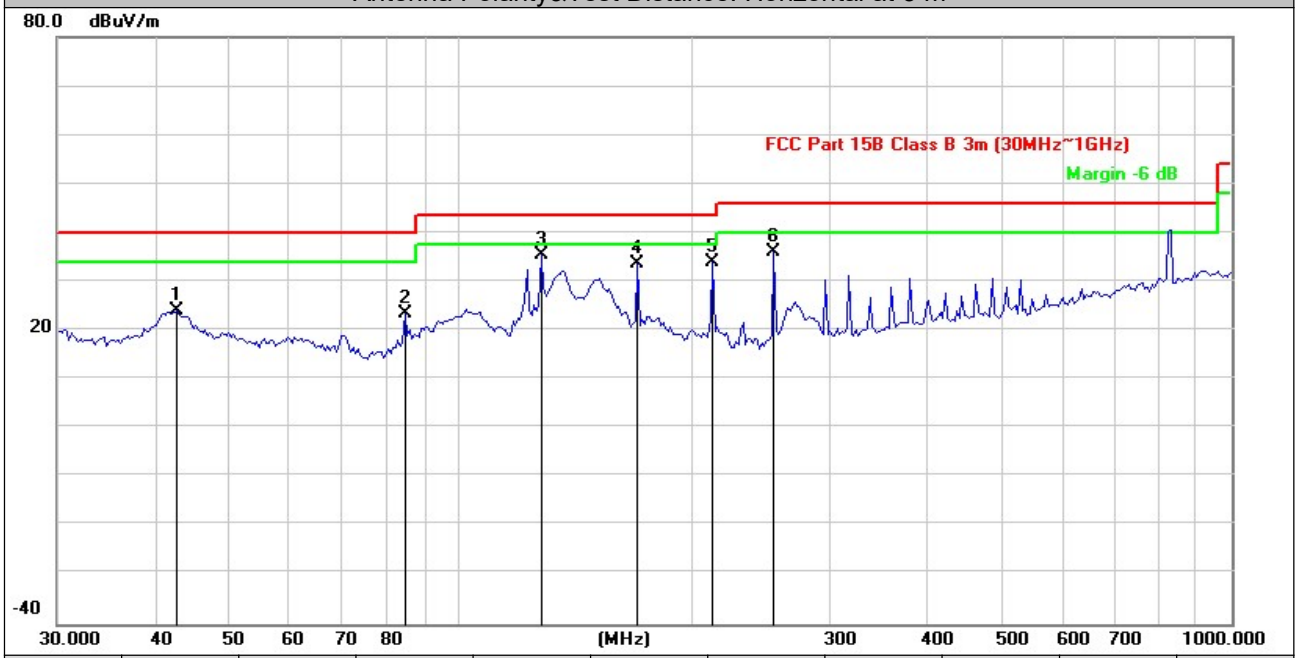
9kHz ~ 30MHz Data:

The amplitude of spurious emissions attenuated more than 20dB below the permissible value is not required to be report.

30MHz ~ 1GHz Worst-Case Data:

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	30MHz ~ 1GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank tan

Antenna Polarity&Test Distance: Horizontal at 3 m



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	42.8998	38.77	-14.77	24.00	40.00	-16.00	QP	200	250	
2	84.7019	42.51	-19.06	23.45	40.00	-16.55	QP	200	120	
3	127.2176	50.22	-14.67	35.55	43.50	-7.95	QP	200	134	
4	169.5990	47.02	-13.23	33.79	43.50	-9.71	QP	200	255	
5	212.2695	50.59	-16.73	33.86	43.50	-9.64	QP	200	30	
6	254.7284	51.10	-15.19	35.91	46.00	-10.09	QP	200	270	

Remarks:

Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)

Margin value = Emission level – Limit value

EUT Test Condition		Measurement Detail	
Channel	Channel 78	Frequency Range	30MHz ~ 1GHz
Input Power	120Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25deg. C, 65%RH	Tested By	Tank tan

Antenna Polarity&Test Distance: Vertical at 3 m

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecter	Antenna Height (cm)	Table Angle (Degree)	Remark
1	30.0000	52.84	-17.12	35.72	40.00	-4.28	QP	100	125	
2	41.7129	50.87	-15.07	35.80	40.00	-4.20	QP	100	187	
3	84.7018	43.85	-19.06	24.79	40.00	-15.21	QP	100	54	
4	136.4598	54.40	-14.40	40.00	43.50	-3.50	QP	100	240	
5	169.5990	45.89	-13.23	32.66	43.50	-10.84	QP	100	130	
6	254.7284	49.35	-15.19	34.16	46.00	-11.84	QP	100	264	

Remarks:

Emission Level = Read Level + Factor (Antenna Factor + Cable Loss - Preamp Factor)

Margin value = Emission level – Limit value

3.2 Conducted Emission Measurement

3.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to0.50MHz.

3.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
EMI Test Receiver Rohde&Schwarz	ESCI3	101418	2019/10/18	2020/10/17
Artificial Mains Network Rohde&Schwarz	ENV216	3560.6550.15	2019/10/18	2020/10/17
Test software FARAD	EZ_EMC V1.1.4.2	N/A	N/A	N/A
Hygrothermograph Yuhuaze	HTC-1	NA	2019/10/20	2020/10/19
Digital Multimeter FLUKE	15B+	43512617WS	2019/10/18	2020/10/17

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA.
2. The test was performed in Shielded Room 1.

3.2.3 Test Procedures

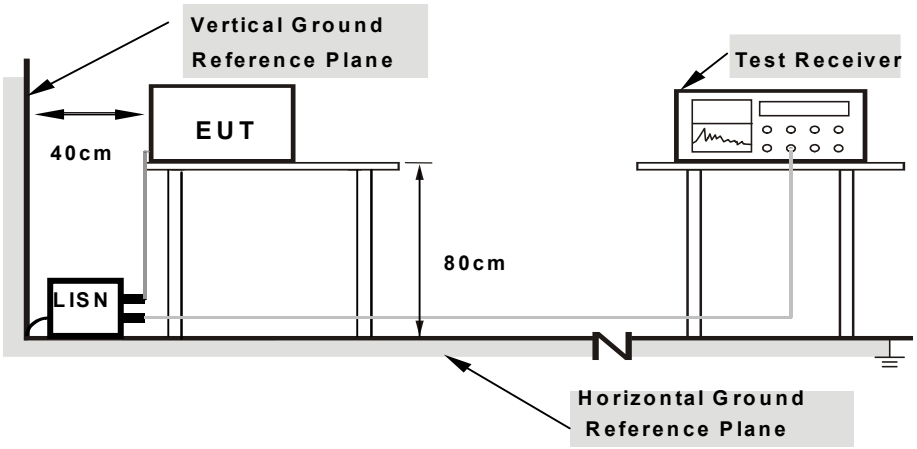
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB)was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 Deviation from Test Standard

No deviation.

3.2.5 Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.6 EUT Operating Condition

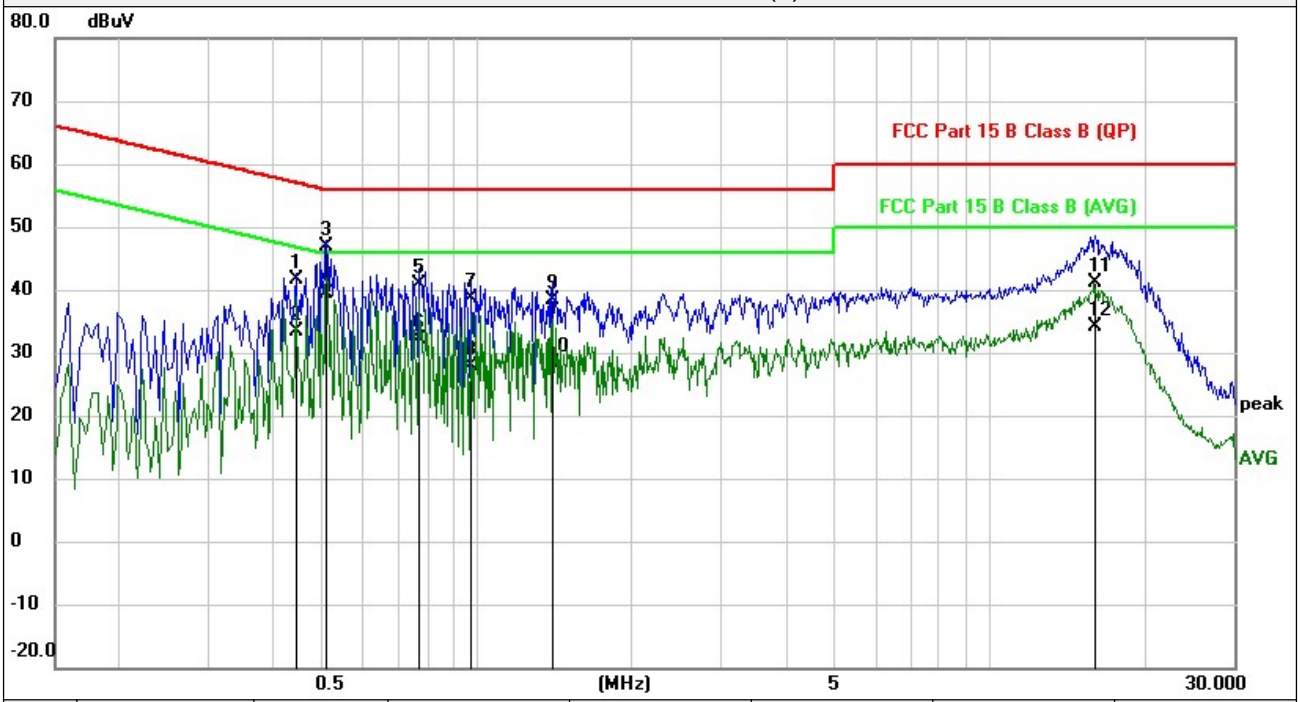
Set the EUT under transmission condition continuously at specific channel frequency.

3.2.7 Test Results

Conducted worst-case data：GFSK

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution andwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 60%RH
Tested by	Tank Tan	Test Date	2020/5/15

Phase Of Power: Line (L)



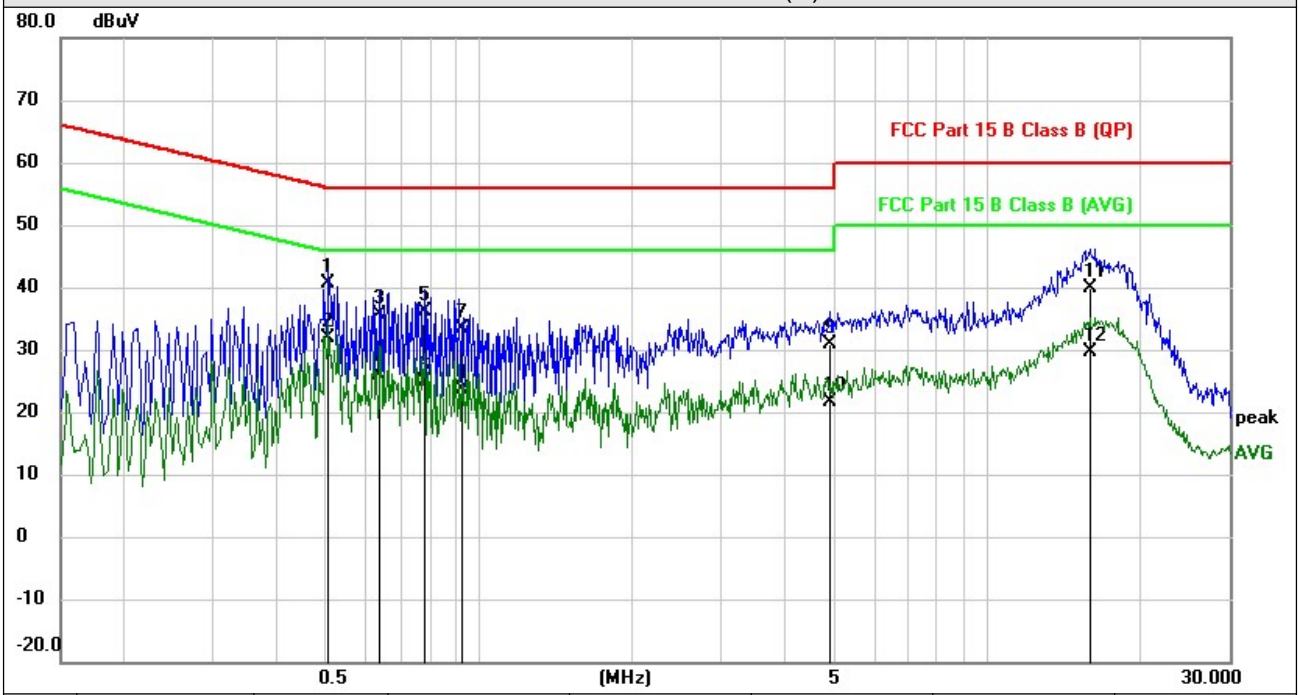
No	Frequency (MHz)	Reading (dBuV)	Correct Factor dB	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Remark Detecter
1	0.4425	31.83	9.76	41.59	57.01	-15.42	QP
2	0.4425	23.60	9.76	33.36	47.01	-13.65	AVG
3	0.5100	37.21	9.78	46.99	56.00	-9.01	QP
4	**0.5100**	**29.59**	**9.78**	**39.37**	**46.00**	**-6.63**	**AVG**
5	0.7710	31.15	9.73	40.88	56.00	-15.12	QP
6	0.7710	22.34	9.73	32.07	46.00	-13.93	AVG
7	0.9690	29.08	9.65	38.73	56.00	-17.27	QP
8	0.9690	18.26	9.65	27.91	46.00	-18.09	AVG
9	1.4100	28.86	9.63	38.49	56.00	-17.51	QP
10	1.4100	18.66	9.63	28.29	46.00	-17.71	AVG
11	16.1205	30.87	10.34	41.21	60.00	-18.79	QP
12	16.1205	23.71	10.34	34.05	50.00	-15.95	AVG

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution andwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 60%RH
Tested by	Tank Tan	Test Date	2020/5/15

Phase Of Power: Neutral (N)



No	Frequency (MHz)	Reading (dBuV)	Correct Factor dB	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Remark Detecter
1	0.5045	30.80	9.78	40.58	56.00	-15.42	QP
2	0.5045	22.10	9.78	31.88	46.00	-14.12	AVG
3	0.6387	25.99	9.76	35.75	56.00	-20.25	QP
4	0.6387	16.04	9.76	25.80	46.00	-20.20	AVG
5	0.7816	26.30	9.73	36.03	56.00	-19.97	QP
6	0.7816	15.13	9.73	24.86	46.00	-21.14	AVG
7	0.9205	23.67	9.66	33.33	56.00	-22.67	QP
8	0.9205	13.99	9.66	23.65	46.00	-22.35	AVG
9	4.9164	21.24	9.52	30.76	56.00	-25.24	QP
10	4.9164	12.17	9.52	21.69	46.00	-24.31	AVG
11	15.8811	29.53	10.32	39.85	60.00	-20.15	QP
12	15.8811	19.37	10.32	29.69	50.00	-20.31	AVG

REMARKS:

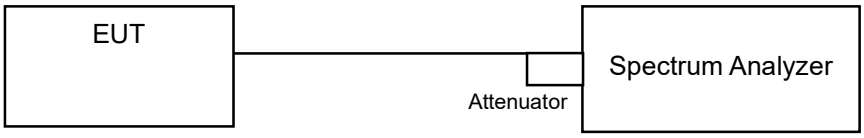
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

3.3 Number of Hopping Frequency Used

3.3.1 Limits of Hopping Frequency Used Measurement

At least 15 channels frequencies, and should be equally spaced.

3.3.2 Test Setup



3.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

3.3.4 Test Procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
d. Set the SA on View mode and then plot the result on SA screen.
e. Repeat above procedures until all frequencies measured were complete.

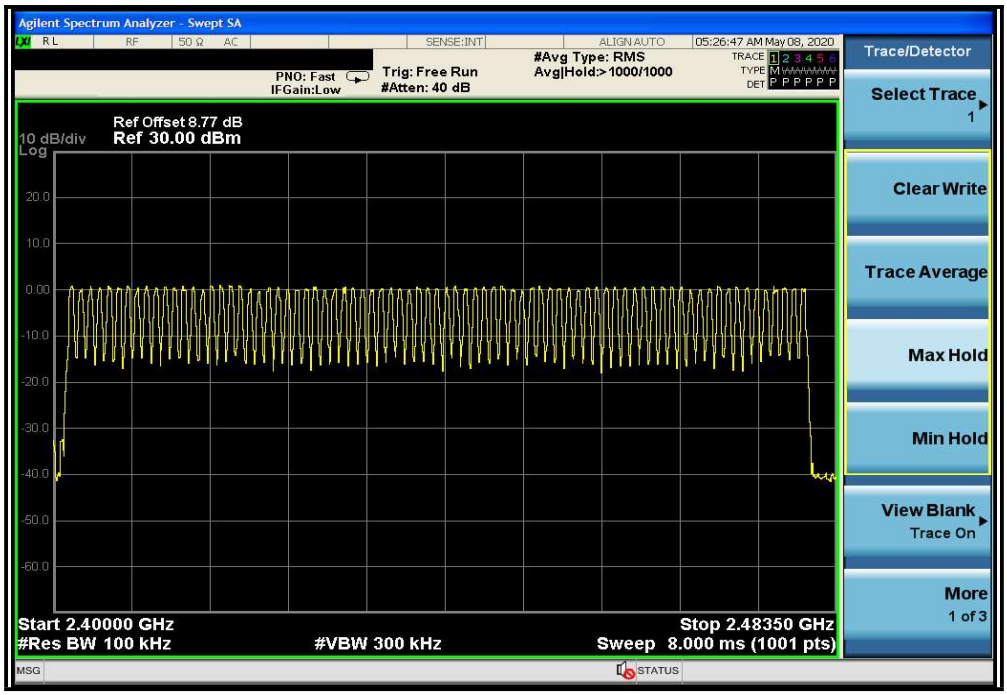
3.3.5 Deviation fromTest Standard

No deviation.

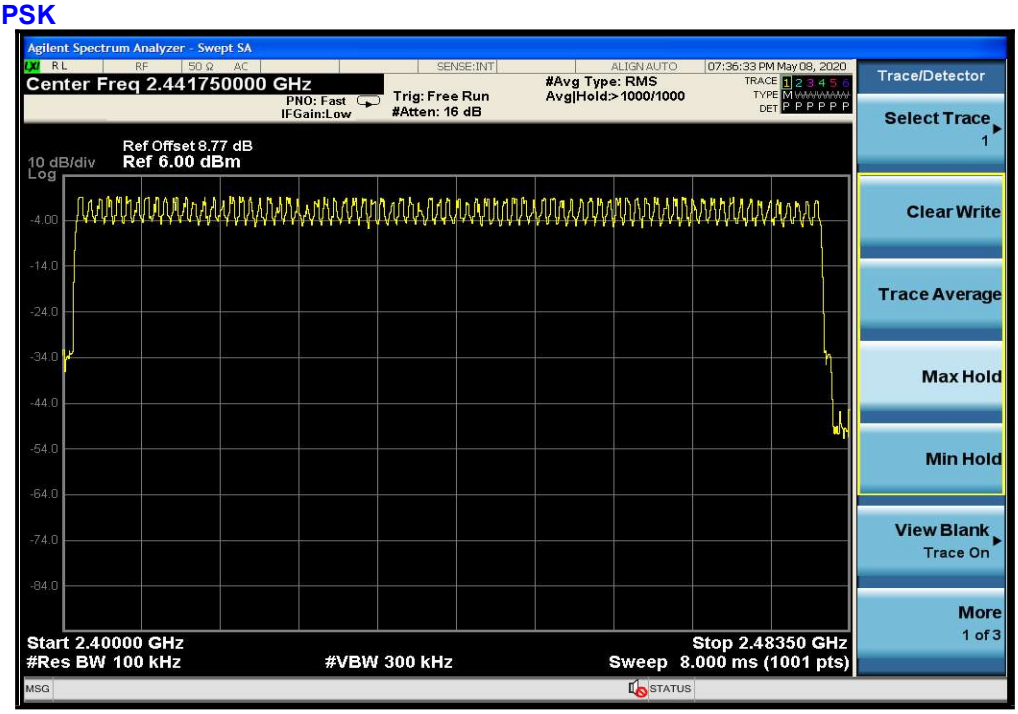
3.3.6 Test Results

There are 79 hopping frequencies in the hopping mode. Please refer to next page for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

GFSK



8DPSK

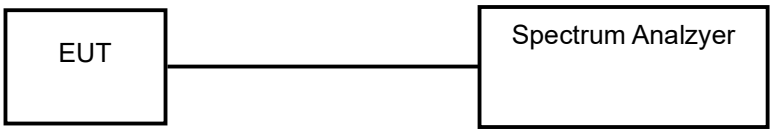


3.4 Dwell Time on Each Channel

3.4.1 LimitsofDwell Time on Each Channel Measurement

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.

3.4.2 Test Setup



3.4.3 TestInstruments

Refer to section 4.1.2 to get information of above instrument.

3.4.4 Test Procedures

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
e. Repeat above procedures until all different time-slot modes have been completed.

.

3.4.5 Deviationfrom Test Standard

No deviation.

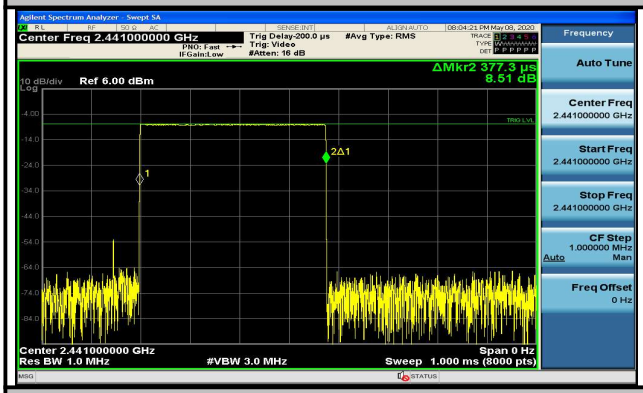
3.4.6 Test Results

GFSK

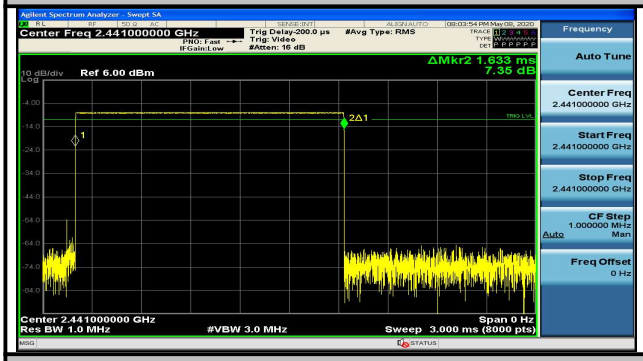
Mode	Number of Hopping Channel	Number of transmission in a period(channel number*0.4 sec)				Length of transmission time (msec)	Result (msec)	Limit (msec)	pass / fail
		period (sec)	sweep time (sec)	times in a sweep	times in a period				
DH1	79	31.6	3.16	32	320	0.377	120.640	400	pass
DH3	79	31.6	3.16	10	100	1.633	163.30	400	pass
DH5	79	31.6	3.16	8	80	2.880	230.40	400	pass

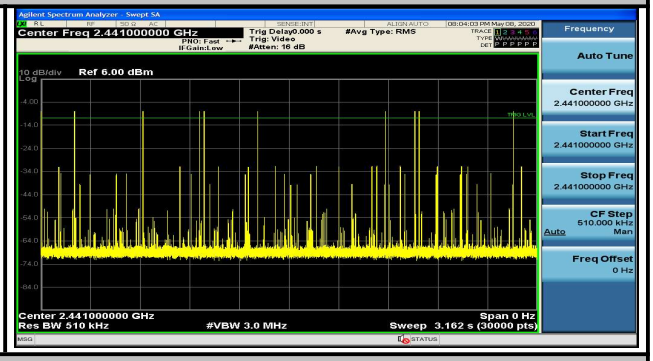
Note: Test plots of the transmitting time slot are shown as below.

DH1

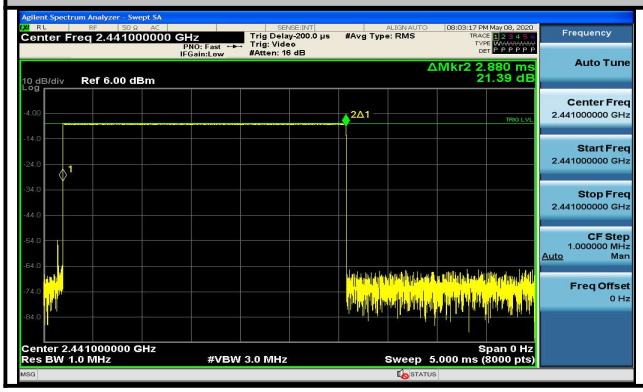


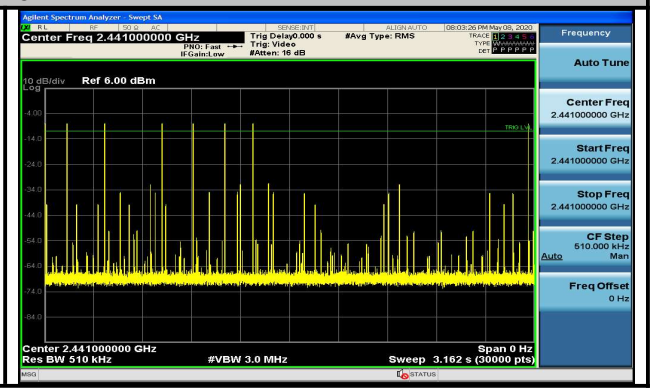
DH3





DH5





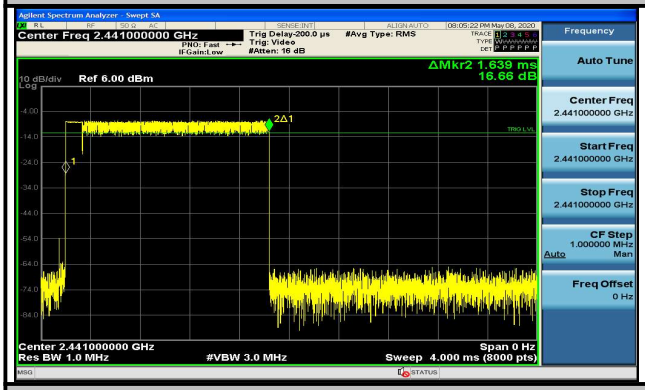
8DPSK

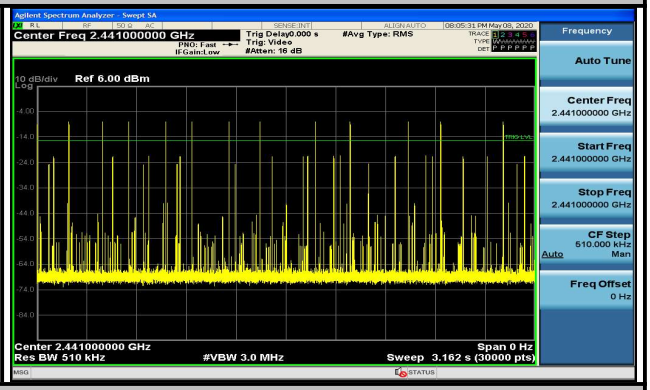
Mode	Number of Hopping Channel	Number of transmission in a period(channel number*0.4 sec)				Length of transmission time (msec)	Result (msec)	Limit (msec)	pass / fail
		period (sec)	sweep time (sec)	times in a sweep	times in a period				
DH1	79	31.6	3.16	32	320	0.387	123.840	400	pass
DH3	79	31.6	3.16	13	130	1.639	213.07	400	pass
DH5	79	31.6	3.16	9	90	2.887	259.83	400	pass

Note: Test plots of the transmitting time slot are shown as below.

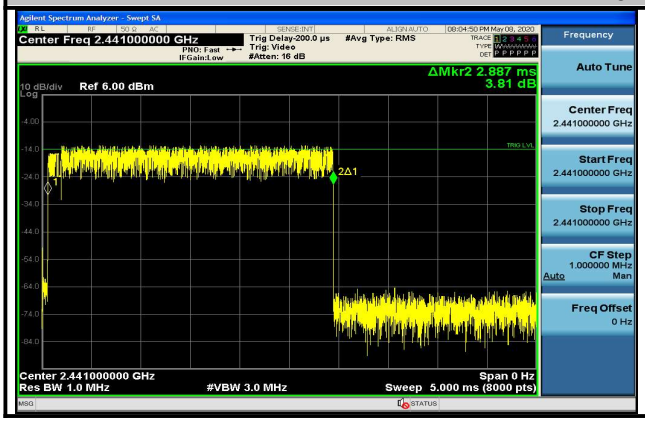
3DH1

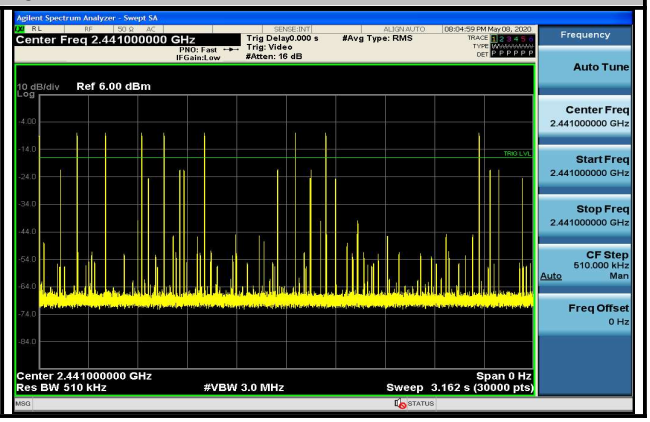
3DH3





3DH5



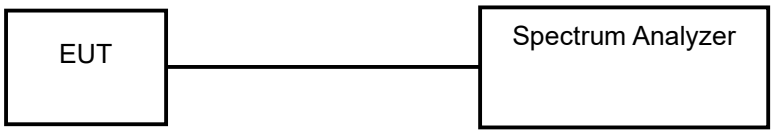


3.5 Channel Bandwidth

3.5.1 Limits of Channel Bandwidth Measurement

For frequency hopping system operating in the 2400-2483.5MHz, if the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dB bandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

3.5.2 Test Setup



3.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

3.5.4 Test Procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
d. Repeat above procedures until all frequencies measured were complete.

3.5.5 Deviation from Test Standard

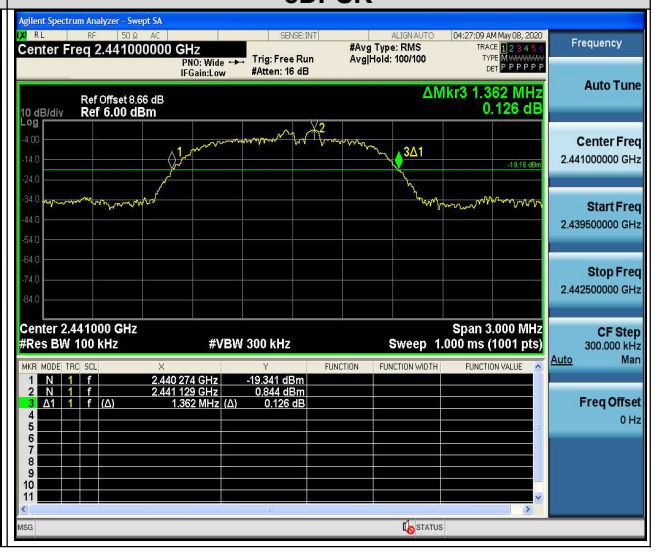
No deviation.

3.5.6 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

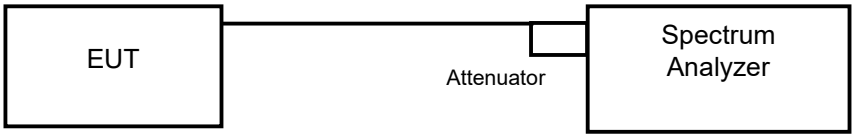
3.5.7 Test Results

Channel	Frequency (MHz)	20dB Bandwidth(MHz)	
		GFSK	8 DPSK
0	2402	1.074	1.341
39	2441	1.095	1.362
78	2480	1.098	1.362

Spectrum Plot of Worst Value	
GFSK	**8DPSK**
	

3.6 Occupied Bandwidth Measurement

3.6.1 Test Setup



3.6.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument

3.6.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5%of the total mean power of a given emission.

3.6.4 Deviation from Test Standard

No deviation.

3.6.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

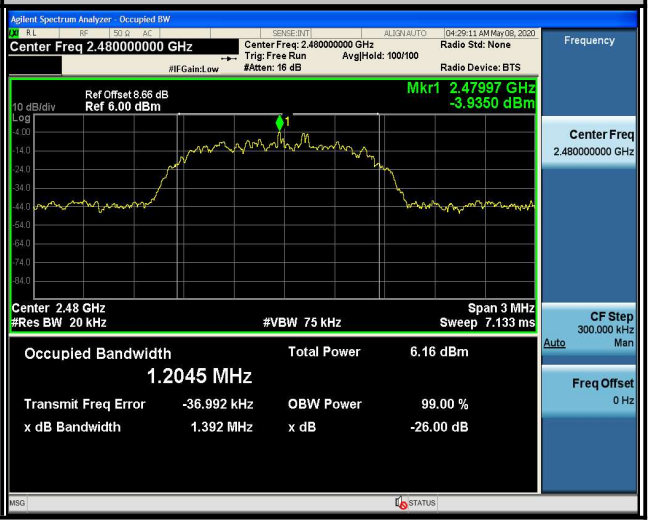
3.6.6 Test Results

Channel	Frequency (MHz)	OccupiedBandwidth(MHz)	
		GFSK	8 DPSK
0	2402	0.84761	1.1937
39	2441	0.84395	1.1985
78	2480	0.83107	1.2045

Spectrum Plot of Worst Value

GFSK

8DPSK

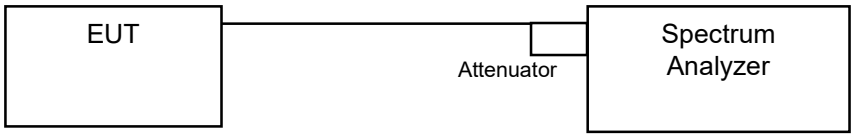


3.7 Hopping Channel Separation

3.7.1 Limitsof Hopping Channel Separation Measurement

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

3.7.2 Test Setup



3.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

3.7.4 Test Procedure

Measurement Procedure REF

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
c. By using the MaxHold function record the separation of two adjacent channels.
d. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
e. Repeat above procedures until all frequencies measured were complete.

3.7.5 Deviationfrom Test Standard

No deviation.

3.7.6 Test Results

Channel No.	Frequency (MHz)	Adjacent Channel Separation (MHz)		20dB channel bandwidth (MHz)		Minimum Limit (MHz)		Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK	GFSK	8DPSK	
0	2402	1.002	1.002	1.074	1.341	0.72	0.90	Pass
39	2441	1.000	0.996	1.095	1.362	0.74	0.91	Pass
78	2480	0.996	0.993	1.098	1.362	0.74	0.91	Pass

Note:

1. The minimum limit is two-third 20 dB bandwidth.

Spectrum Plot of Worst Value

GFSK

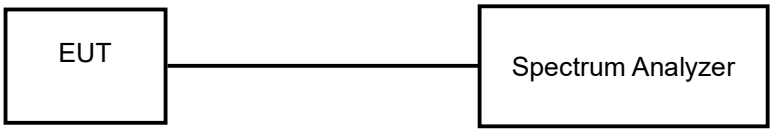
8DPSK

3.8 Maximum Output Power

3.8.1 Limitsof Maximum Output Power Measurement

The Maximum Output Power Measurement is 125mW.

3.8.2 Test Setup



3.8.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

3.8.4 Test Procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any oneconvenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3MHz RBW and 10 MHz VBW.
d. Measure the captured power within the band and recording the plot.
e. Repeat above procedures until all frequencies required were complete.

3.8.5 Deviation fromTest Standard

No deviation.

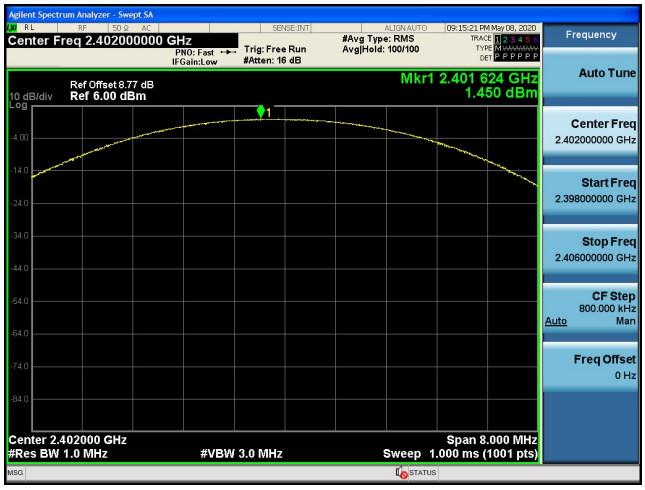
3.8.6 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

3.8.7 Test Results

Average Power:

Channel No.	Freq. (MHz)	Output Power (mW)		Output Power (dBm)		Power Limit (mW)	Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK		
0	2402	1.159	1.396	0.64	**1.45**	125	Pass
39	2441	1.089	1.265	0.37	1.02	125	Pass
78	2480	1.069	1.199	0.29	0.79	125	Pass



Peak Power:

Channel No.	Freq. (MHz)	Output Power (mW)		Output Power (dBm)		Power Limit (mW)	Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK		
0	2402	1.268	1.521	1.03	1.82	125	Pass
39	2441	1.186	1.384	0.74	1.41	125	Pass
78	2480	1.161	1.343	0.65	1.28	125	Pass

3.9 Conducted Out of Band Emission Measurement

3.9.1 Limits Of Conducted Out Of Band Emission Measurement

For average power：
Below –30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
For peak power:
Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth)

3.9.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

3.9.3 Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

3.9.4 Deviation from Test Standard

No deviation.

3.9.5 EUT Operating Condition

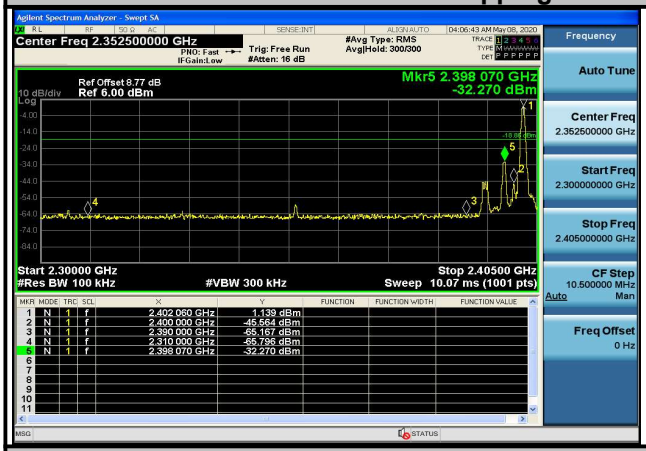
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

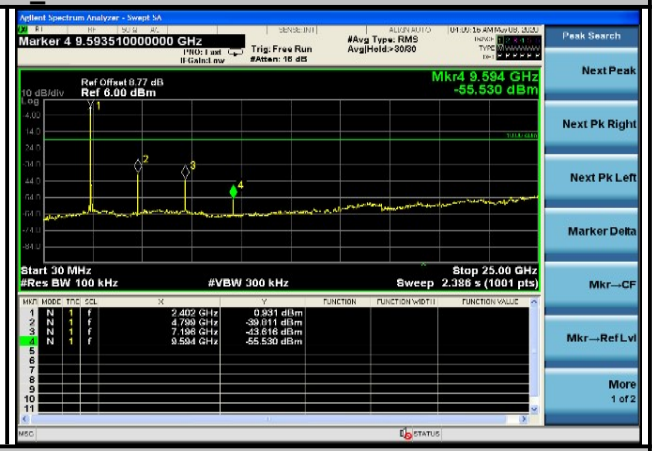
3.9.6 Test Results

The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

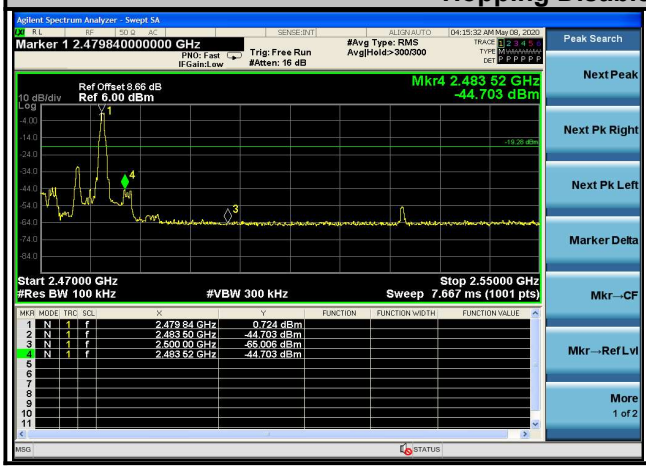
GFSK

Hopping Disabled_Low Channel

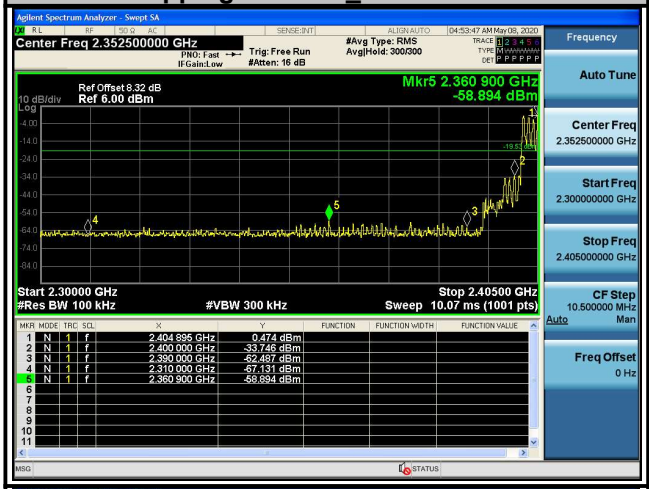
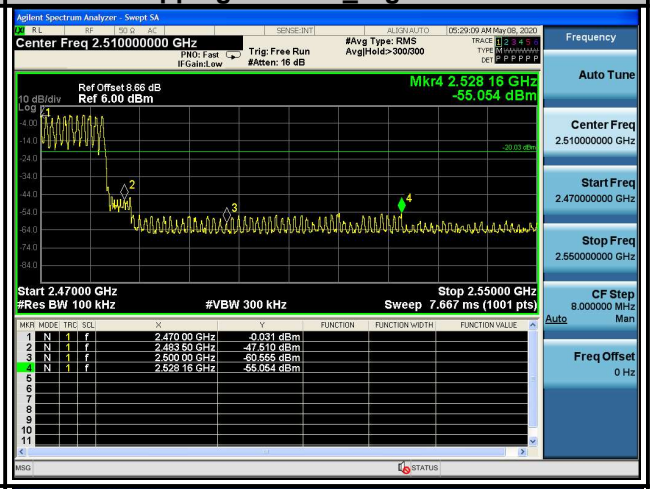
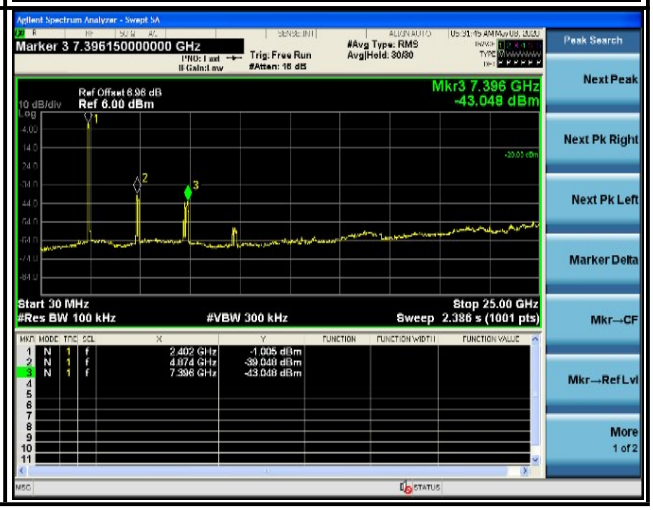




Hopping Disabled_High Channel

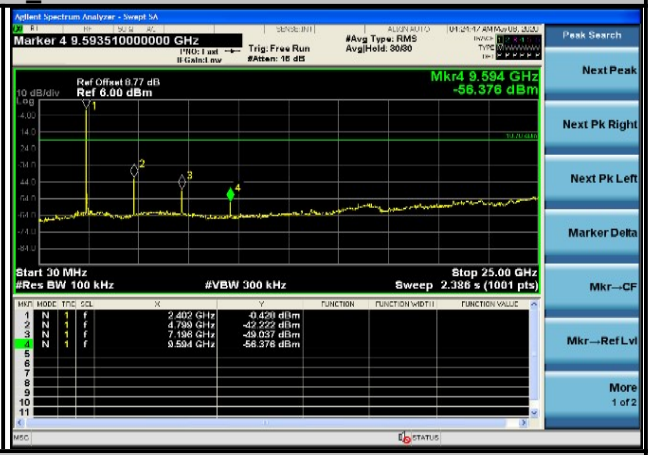


GFSK

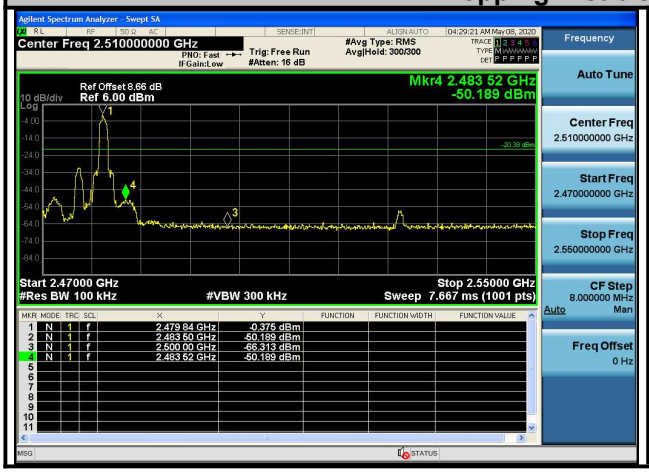
Hopping Enabled_Low Channel	Hopping Enabled_High Channel
	
	

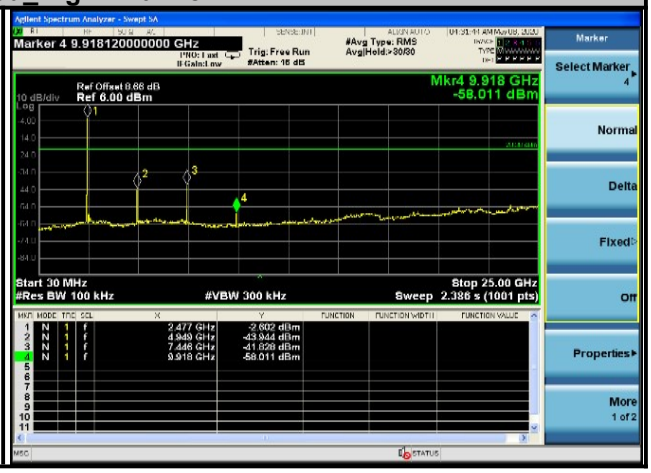
8-DPSK

Hopping Disabled_Low Channel

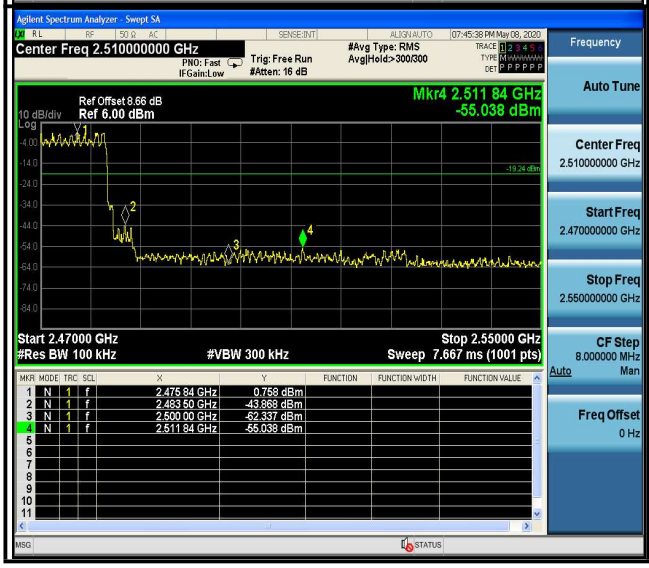
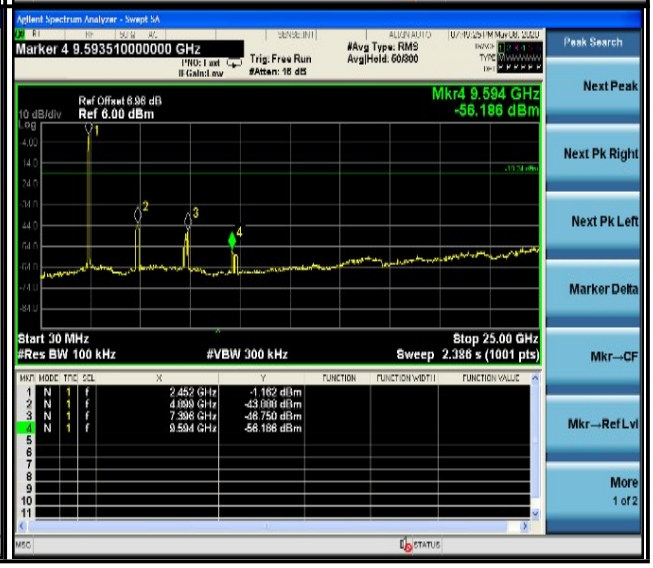


Hopping Disabled_High Channel





8-DPSK

Hopping Enabled_Low Channel	Hopping Enabled_Low Channel
	

4 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Spectrum Keysight	N9020A	MY51240612	2019/10/18	2020/10/17
Spectrum Analyzer Rohde&Schwarz	FSV-40N	101783	2019/10/18	2020/10/17
Power Meter10Hz~18GHz Tonscend	JS0806-2	188060126	2019/10/18	2020/10/17
Signal generator Keysight	N5182A	GB40051020	2019/10/18	2020/10/17
Signal generator Keysight	N5182A	MY47420944	2019/10/18	2020/10/17
Test Software Tonscend	JS0806-2	NA	NA	NA
Hygrothermograph Yuhuaze	HTC-1	NA	2019/10/18	2020/10/17

Note: 3. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA.

4. The test was performed in Chamber 1.

Appendix – Information on the Testing Laboratories

We,Hwa-Hsing (Dongguan) Co., Ltd.,A global provider of TESTING and CERTIFICATION services for consumer products, electronic products and wireless information technology products. Adhering to the core values “HONEST and TRUSTWORTHY, OBJECTIVE and IMPARTIALITY, RIGOROUS and AFFICIENT”, commitment to provide professional, perfect and efficient comprehensive ONE-STOP solution of TESTING and CERTIFICATION services for Manufacturers, Buyers, Traders, Brands, Retailers. Assist client to better manage risk, protect their brands, reduce costs and cut time to over 150 markets in global. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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