TEST REPORT

FCC ID: 2AGJ5DCS-3021C

Applicant	:	Gonsin Conference Equipment Co., Ltd
Address	:	No.401-406,Block C, Idea Industry Park, No.41 Fengxiang Road, Shunde, Foshan, Guangdong, China

Equipment Under Test (EUT):

Name	:	Chairman Terminal
Model	:	DCS-3021C-W, DCS-1021D-W, DCS-1021C-W, BJ-W5I, DCS-3022C, D-W, DCS-1022CF-W, DCS-1023CF-W, DCS-1022DF-W, DCS-1023DF-W, DCS-1022DV-W, DCS-1023DV-W, DCS-1022DI-W, DCS-1023DI-W

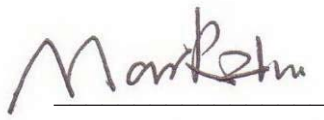
In Accordance with: FCC PART 15, SUBPART C : 2015 (Section 15.247)

Report No	:	T1851662 01
Date of Test	:	November 10-13, 2015
Date of Issue	:	November 13, 2015

Test Result: **PASS**

In the configuration tested, the EUT complied with the standards specified above

Authorized Signature



(Mark Zhu)
General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Alpha Product Testing Co., Ltd Or test done by Shenzhen Alpha Product Testing Co., Ltd Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Alpha Product Testing Co., Ltd Approvals in writing.

Contents

1. General Information 4
1.1. Description of Device (EUT) 4
1.2. Accessories of device (EUT) 5
1.3. Test Lab information 5
2. Summary of test 6
2.1. Summary of test result 6
2.2. Assistant equipment used for test 6
2.3. Block Diagram 7
2.4. Test mode 8
2.5. Test Conditions 9
2.6. Measurement Uncertainty (95% confidence levels, k=2) 9
2.7. Test Equipment 10
3. Maximum Peak Output power 11
3.1. Limit 11
3.2. Test Procedure 11
3.3. Test Setup 11
3.4. Test Result 11
4. Bandwidth 12
4.1. Limit 12
4.2. Test Procedure 12
4.3. Test Result 12
5. Carrier Frequency Separation 15
5.1. Limit 15
5.2. Test Procedure 15
5.3. Test Result 15
6. Number Of Hopping Channel 17
6.1. Limit 17
6.2. Test Procedure 17
6.3. Test Result 17
7. Dwell Time 19
7.1. Test limit 19
7.2. Test Procedure 19
7.3. Test Results 19
8. Radiated emissions 22
8.1. Limit 22
8.2. Block Diagram of Test setup 23
8.3. Test Procedure 23
8.4. Test Result 24
9. Band Edge Compliance 30
9.1. Block Diagram of Test Setup 30
9.2. Limit 30
9.3. Test Procedure 30

9.4. Test Result 30
10. Power Line Conducted Emissions 37
10.1. Block Diagram of Test Setup 37
10.2. Limit 37
10.3. Test Procedure 37
10.4. Test Result 38
11. Antenna Requirements 40
11.1. Limit 40
11.2. Result 40
12. Test setup photo 41
13. Photos of EUT 43

1. General Information

1.1. Description of Device (EUT)

EUT	:	Chairman Terminal
Model No.	:	DCS-3021C-W, DCS-1021D-W, DCS-1021C-W, BJ-W5I, DCS-3022C, D-W, DCS-1022CF-W, DCS-1023CF-W, DCS-1022DF-W, DCS-1023DF-W, DCS-1022DV-W, DCS-1023DV-W, DCS-1022DI-W, DCS-1023DI-W
DIFF.	:	All model's the function, software and electric circuit are the same, only different in Model Name.
Trade mark	:	GONSIN
Power supply	:	DC 3.7V from lithium battery or DC 5V From USB port
Radio Technology	:	2.4G ISM Band
Operation frequency	:	2402-2480MHz
Modulation	:	FHSS(FSK)
Antenna Type	:	Internal antenna, max gain 2.5dBi.
Applicant	:	Gonsin Conference Equipment Co., Ltd
Address	:	No.401-406, Block C, Idea Industry Park,No.41 Fengxiang Road, Shunde, Foshan, Guangdong, China
Manufacturer		Gonsin Conference Equipment Co., Ltd
Address		No.401-406, Block C, Idea Industry Park,No.41 Fengxiang Road, Shunde, Foshan, Guangdong, China

1.2. Accessories of device (EUT)

Accessories	:	N/A
Model		N/A
Input		N/A
Output		N/A
Accessories2	:	N/A
Model		N/A

1.3. Test Lab information

Shenzhen Alpha Product Testing Co., Ltd
Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road,
Bao'an, Shenzhen, China

August 11, 2014 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2. Summary of test

2.1. Summary of test result

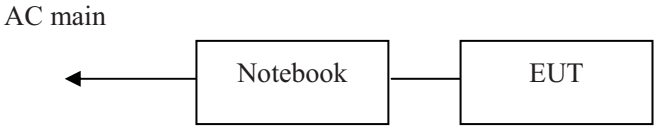
Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.4 :2014	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.4 :2014	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.4 :2014	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2014	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2014	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4 :2014	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.4 :2014	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.4 :2014	PASS
Antenna requirement	FCC Part 15: 15.203	PASS

2.2. Assistant equipment used for test

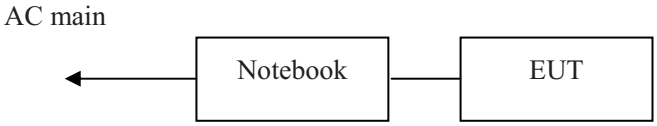
Description	:	Notebook
Manufacturer	:	ACER
Model No.	:	ZQT
Remark: FCC DOC approved		

2.3. Block Diagram

1. For radiated emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground. EUT was set into test mode before test. New battery is used during all test



2. For Power Line Conducted Emissions Test: EUT was connected to notebook by 0.6m USB line



2.4. Test mode

EUT work in Continuous TX mode, and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
FHSS(FSK)	Low :CH1	2402
	Middle: CH40	2441.089
	High: CH79	2480

Channel List

Chanel No.	Frequency (MHz)	Chanel No.	Frequency (MHz)	Chanel No.	Frequency (MHz)	Chanel No.	Frequency (MHz)
1	2402 MHz	21	2422.094MHz	41	2442.089MHz	61	2462.084MHz
2	2403.098MHz	22	2423.093MHz	42	2443.088MHz	62	2463.083MHz
3	2404.098MHz	23	2424.093MHz	43	2444.088MHz	63	2464.083MHz
4	2405.098MHz	24	2425.093MHz	44	2445.088MHz	64	2465.083MHz
5	2406.098MHz	25	2426.093MHz	45	2446.088MHz	65	2466.083MHz
6	2407.097MHz	26	2427.092MHz	46	2447.087MHz	66	2467.082MHz
7	2408.097MHz	27	2428.092MHz	47	2448.087MHz	67	2468.082MHz
8	2409.097MHz	28	2429.092MHz	48	2449.087MHz	68	2469.082MHz
9	2410.097MHz	29	2430.092MHz	49	2450.087MHz	69	2470.082MHz
10	2411.096MHz	30	2431.091MHz	50	2451.086MHz	70	2471.081MHz
11	2412.096MHz	31	2432.091MHz	51	2452.086MHz	71	2472.081MHz
12	2413.096MHz	32	2433.091MHz	52	2453.086MHz	72	2473.081MHz
13	2414.096MHz	33	2434.091MHz	53	2454.086MHz	73	2474.081MHz
14	2415.095MHz	34	2435.090MHz	54	2455.085MHz	74	2475.080MHz
15	2416.095MHz	35	2436.090MHz	55	2456.085MHz	75	2476.080MHz
16	2417.095MHz	36	2437.090MHz	56	2457.085MHz	76	2477.080MHz
17	2418.095MHz	37	2438.090MHz	57	2458.085MHz	77	2478.080MHz
18	2419.094MHz	38	2439.089MHz	58	2459.084MHz	78	2479.079MHz
19	2420.094MHz	39	2440.089MHz	59	2460.084MHz	79	2480 MHz
20	2421.094MHz	40	2441.089MHz	60	2461.084MHz	80	/

2.5. Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.6. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

2.7. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last Cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2015.01.19	1Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2015.01.19	1Year
Receiver	R&S	ESCI	101165	2015.01.19	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2014.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2014.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2014.01.21	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2015.01.19	1Year
Power Meter	Anritsu	ML2487A	6K00001491	2015.01.19	1Year
Power sensor	Anritsu	ML2491A	32516	2015.01.19	1Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	2015.01.19	1Year
Pre-amplifier	Quietek	AP-180C	CHM-0602012	2015.01.19	1Year

3. Maximum Peak Output power

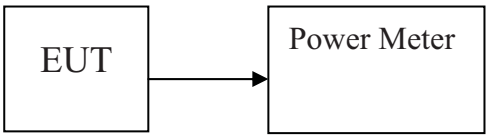
3.1. Limit

Please refer section15.247.
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, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.

3.3. Test Setup



3.4. Test Result

EUT: Chairman Terminal M/N: DCS-3021C-W					
Test date: 2015-11-11		Test site: RF site		Tested by: Eric	
Mode	Freq (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)	Margin (dB)
FHSS(FSK)	2402	20.62	115.345	30	9.380
	2441.089	21.01	126.183	30	8.990
	2480	21.74	149.279	30	8.260
Conclusion: PASS					

4. Bandwidth

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2. Test Procedure

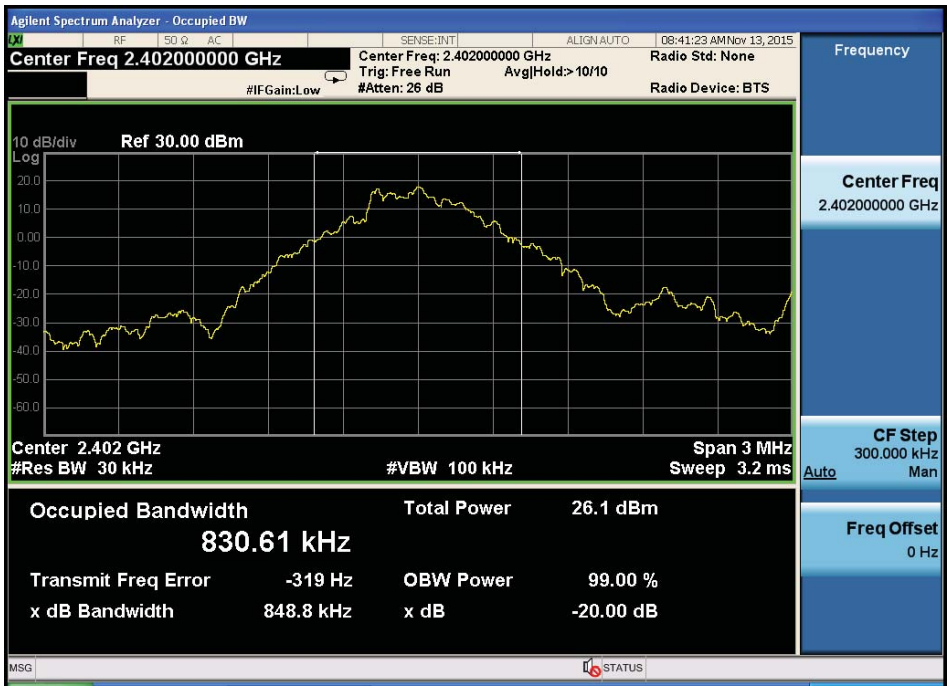
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 30kHz VBW, Peak Detector. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

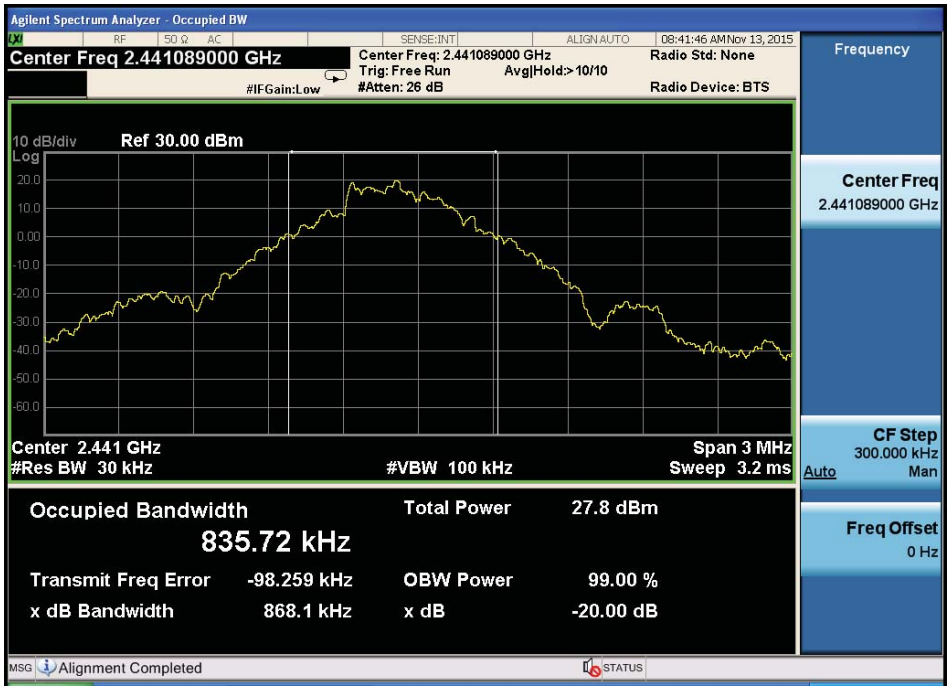
4.3. Test Result

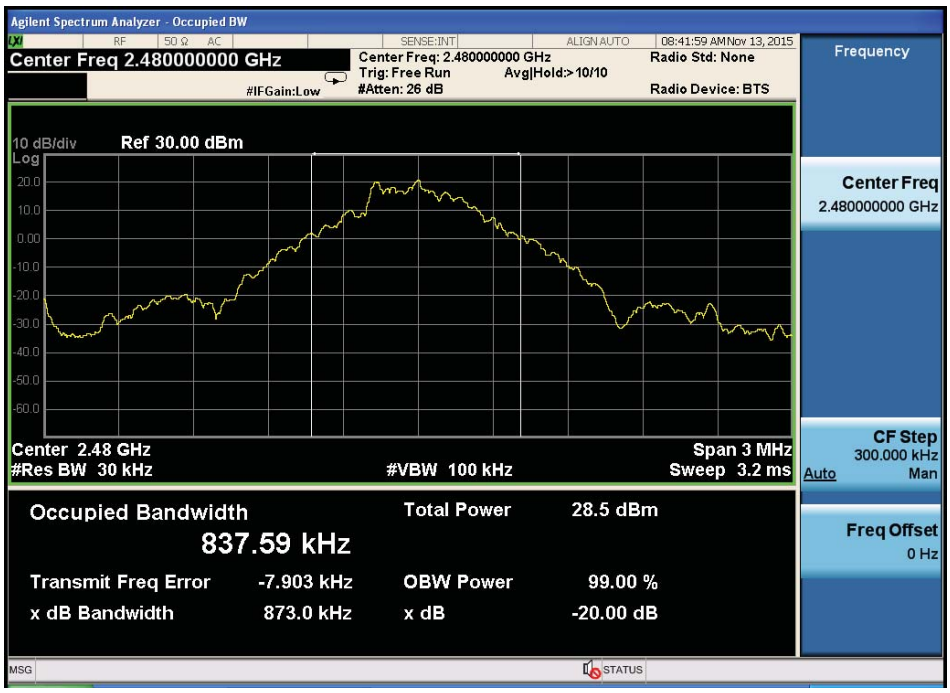
EUT: Chairman Terminal				
M/N: DCS-3021C-W				
Test Mode: Keeping TX mode				
Test date: 2015-11-12		Test site: RF site	Tested by: Eric	
Mode	Freq (MHz)	20dB Bandwidth (KHz)	Limit (kHz)	Conclusion
FHSS(FSK)	2402	848.8	/	PASS
	2441.089	868.1	/	PASS
	2480	873.0	/	PASS

Orginal Test data For 20dB bandwidth

FHSS(FSK):






Agilent Spectrum Analyzer - Occupied BW
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
08:41:59 AM Nov 13, 2015
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 26 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
837.59 kHz
Total Power
28.5 dBm
Freq Offset
0 Hz
Transmit Freq Error
-7.903 kHz
OBW Power
99.00 %
x dB Bandwidth
873.0 kHz
x dB
-20.00 dB
MSG
STATUS

5. Carrier Frequency Separation

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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

5.2. Test Procedure

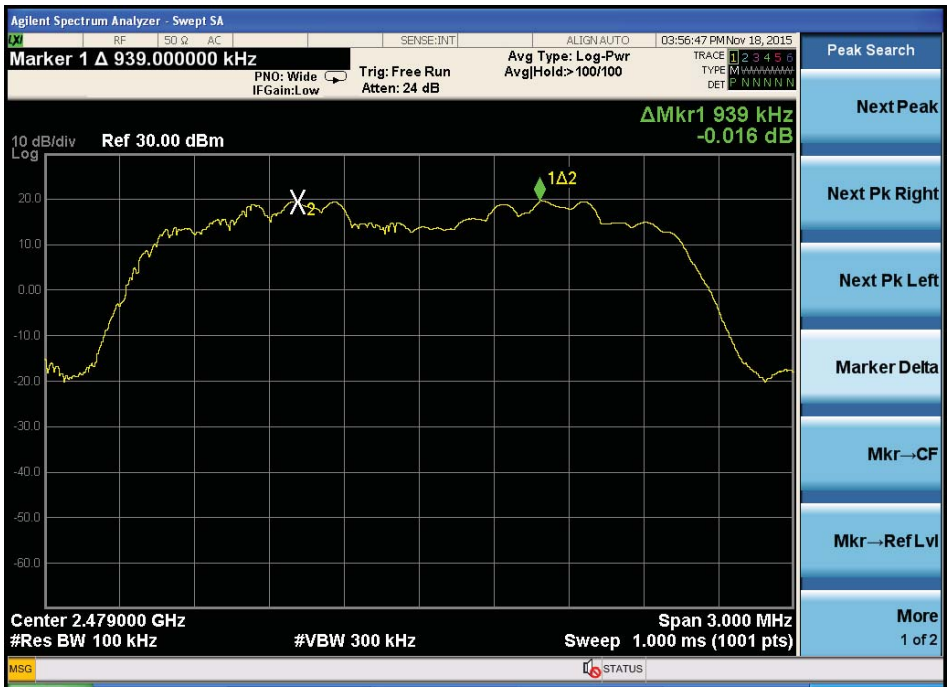
The transmitter output was coupled to a spectrum analyzer via a antenna. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 30kHz VBW, Peak Detector.

5.3. Test Result

EUT: Chairman Terminal				
M/N: DCS-3021C-W				
Test Mode: Keeping TX mode				
Test date: 2015-11-11		Test site: RF site	Tested by: Eric	
Mode/Channel	Channel separation (KHz)	20dB Bandwidth (KHz)	Limit (KHz) 20dB bandwidth	Conclusion
FHSS(FSK)	939	873	873	PASS

Orginal test data for channel separation

FHSS(FSK)



6. Number Of Hopping Channel

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

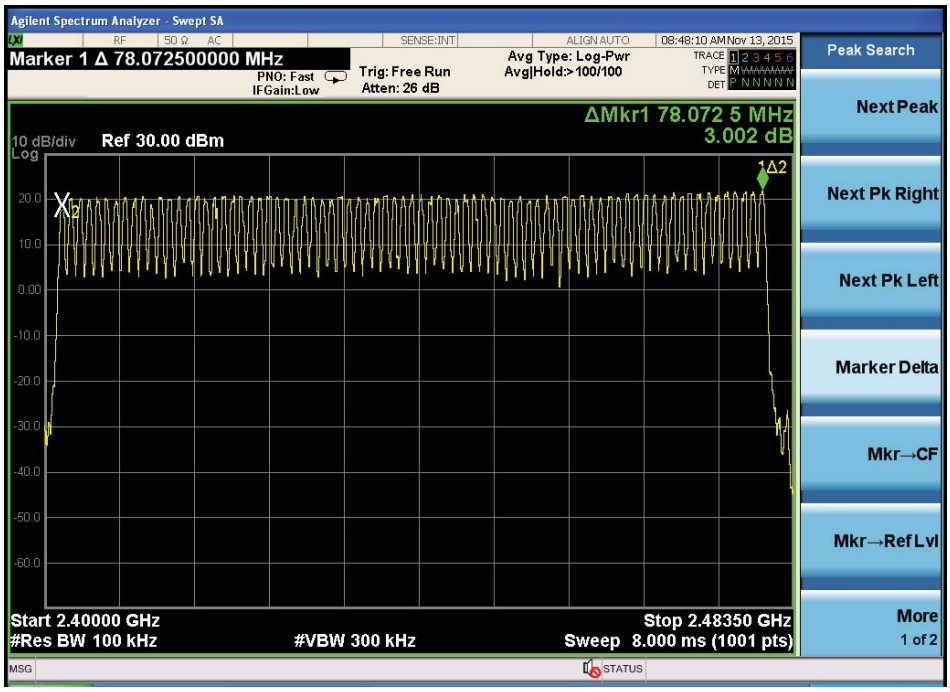
6.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW.

6.3. Test Result

EUT: Chairman Terminal			
M/N: DCS-3021C-W			
Test Mode: Keeping TX mode			
Test date: 2015-11-11	Test site: RF site	Tested by: Eric	
Mode	Number of hopping channel	Limit	Conclusion
FHSS(FSK)	79	>15	PASS

Original test data for hopping channel number
FHSS(FSK)



7. Dwell Time

7.1. Test limit

Please refer section15.247

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 sec- onds multiplied by the number of hopping channel employed.

7.2. Test Procedure

7.2.1. Place the EUT on the table and set it in transmitting mode.

7.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3. Set center frequency of spectrum analyzer = operating frequency.

7.2.4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.

7.2.5. Repeat above procedures until all frequency measured were complete.

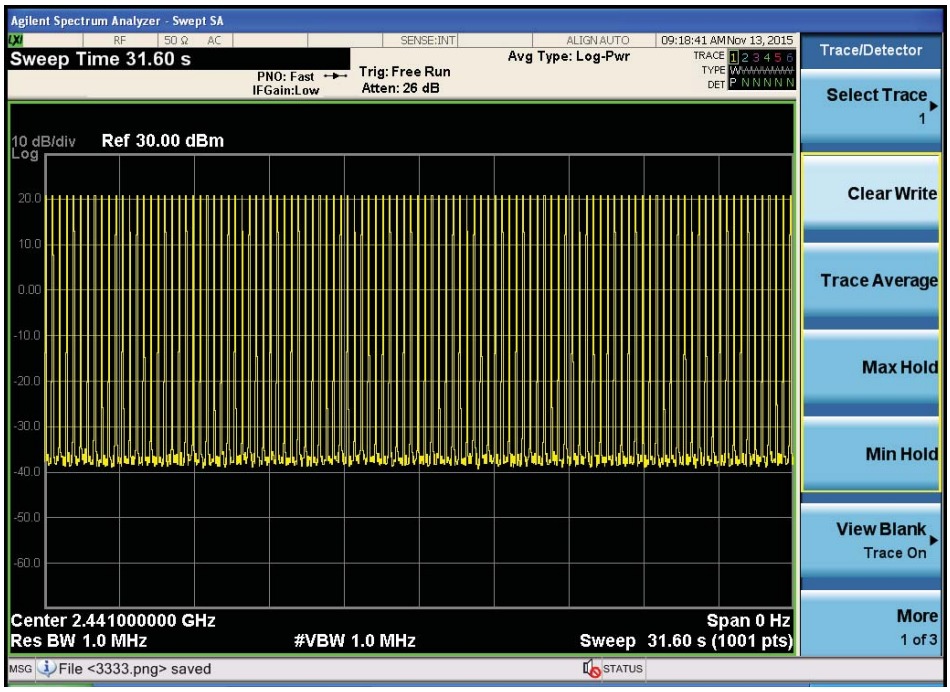
7.3. Test Results

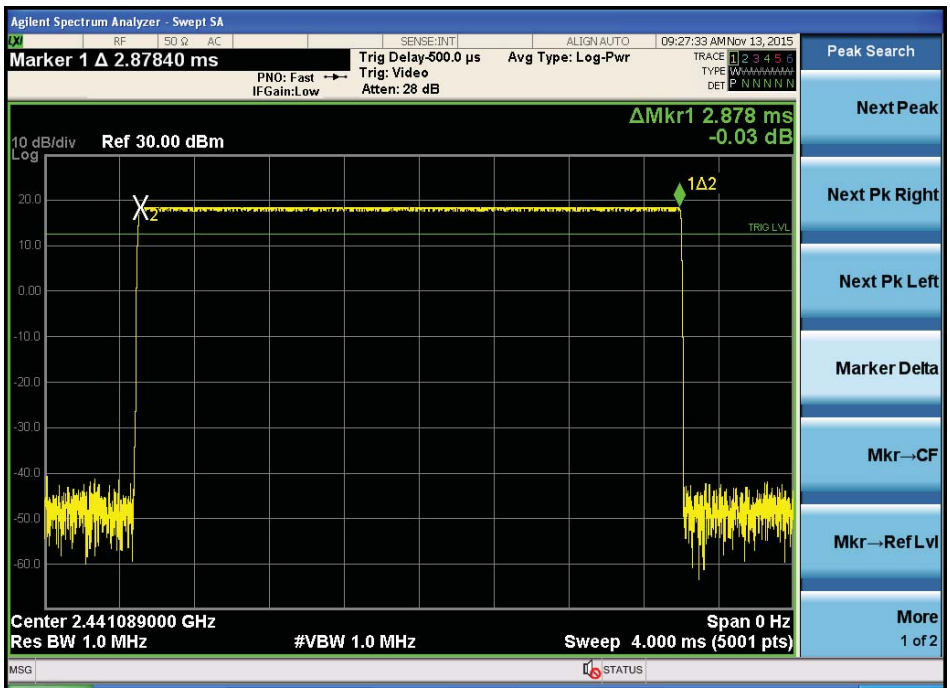
PASS.

Detailed information please see the following page.

EUT: Chairman Terminal					
M/N: DCS-3021C-W					
Test Mode: Keeping TX mode					
Test date: 2015-11-11	Test site: RF site Tested by: Eric				
Mode	Frequency (MHz)	Total Pulse Duration (ms)	Total Dwell Time (s)	Limit (s)	Conclusion
FHSS(FSK)	2441.089	110*2.878=316.58	0.317	<0.4	PASS
Note1: A period time = 0.4 (s) * 79 = 31.6(s)					

FHSS(FSK)




Agilent Spectrum Analyzer - Swept SA
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
09:27:33 AM Nov 13, 2015
Marker 1 Δ 2.87840 ms
PNO: Fast
IFGain:Low
Trig Delay-500.0 µs
Trig: Video
Atten: 28 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE
DET P N N N N N
ΔMkr1 2.878 ms
-0.03 dB
10 dB/div
Log
Ref 30.00 dBm
1Δ2
TRIG LVL
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 2.441089000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 4.000 ms (5001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

8. Radiated emissions

8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

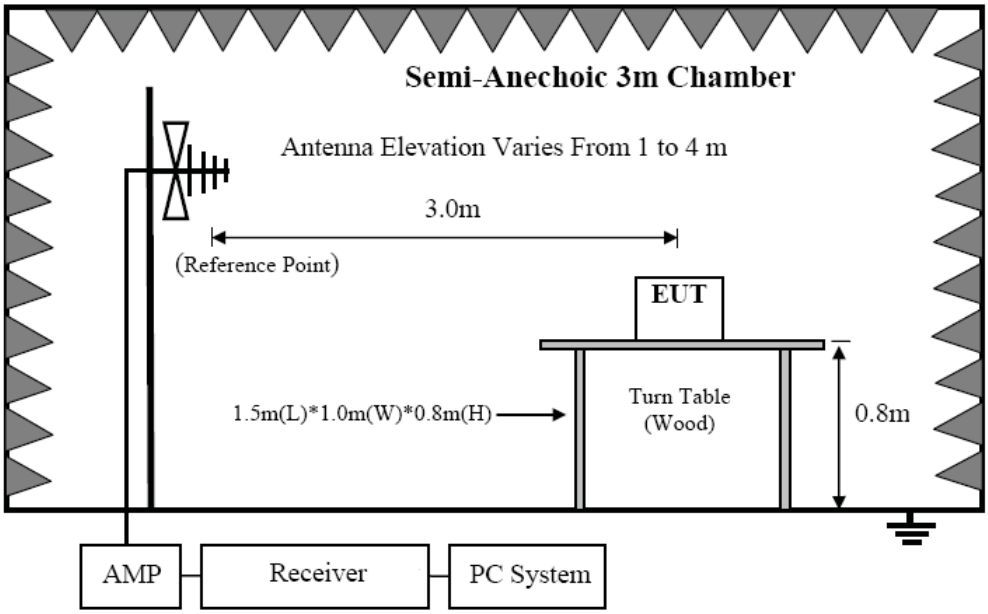
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

15.209 Limit

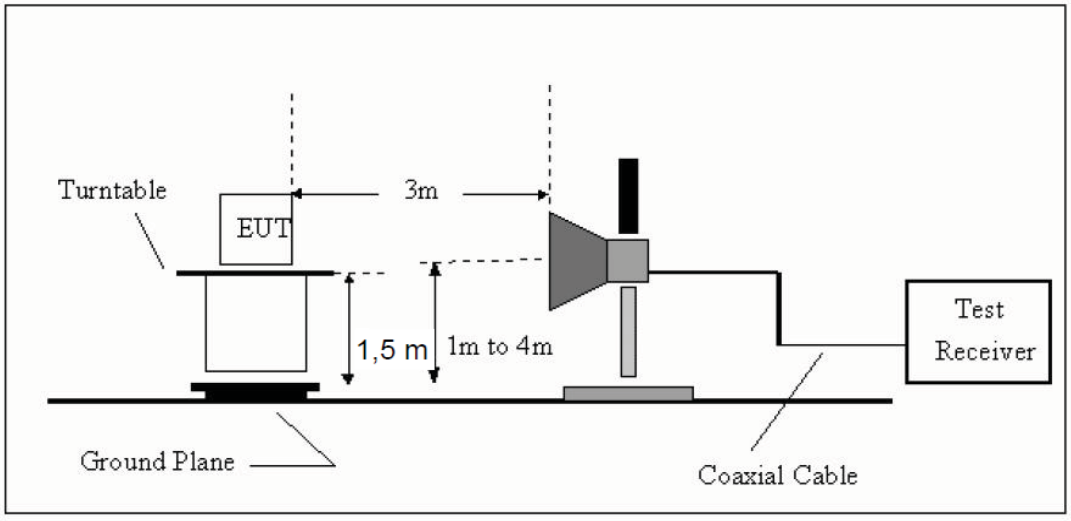
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

8.2. Block Diagram of Test setup

8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2 In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

8.3. Test Procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1GHz test, and150 cm above the ground plane for above 1GHz test.
(2) Setup EUT and simulator as shown in section 1.4 and 6.1
(3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan

procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

(4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated

(5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2014 on Radiated Emission test.

(6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

8.4. Test Result

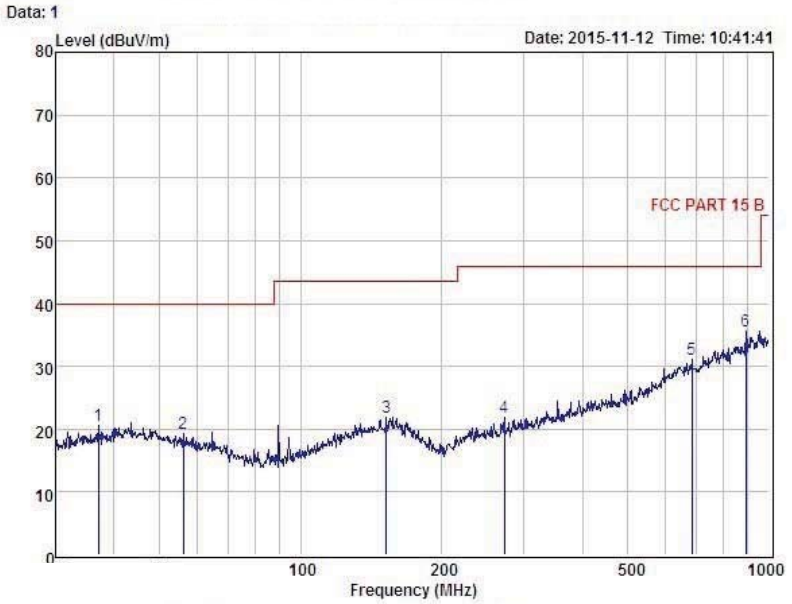
We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

From 30MHz to 1000MHz: Conclusion: PASS

Shenzhen Alpha Product Testing Co., Ltd.
Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: +86-755-29766001 FAX: +86-755-86375565
Website: http://www.a-lab.cn Email: service@a-lab.cn

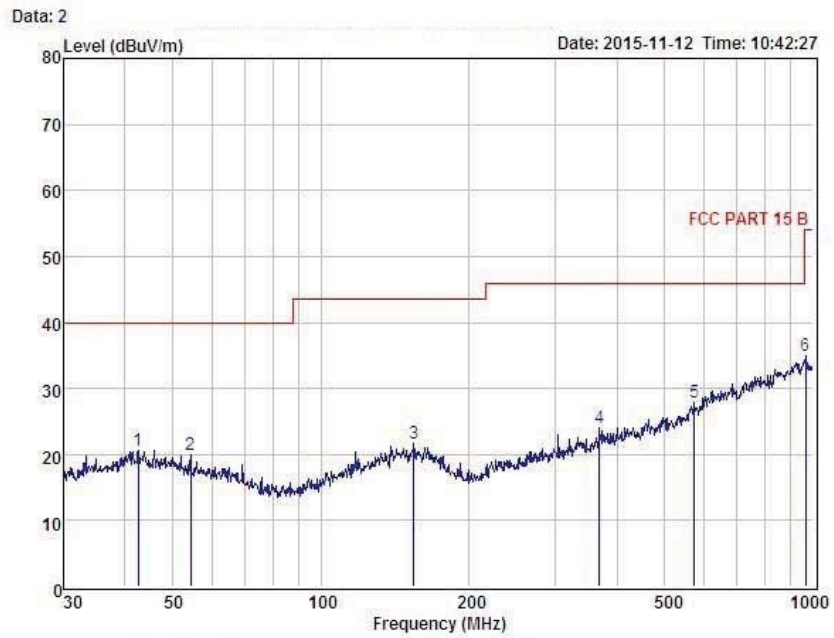


Condition : FCC PART 15 B 3m POL: HORIZONTAL
EUT : Chairman Terminal
Model No : DCS-3021C-W
Test Mode : TX mode
Power : AC 120V/60Hz
Test Engineer : Eric
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	37.02	37.48	13.73	30.83	0.10	20.48	40.00	-19.52	Peak
2	56.20	36.99	13.07	30.88	0.16	19.34	40.00	-20.66	Peak
3	152.66	36.70	14.16	29.36	0.41	21.91	43.50	-21.59	Peak
4	272.28	37.11	12.15	28.12	0.66	21.80	46.00	-24.20	Peak
5	684.75	36.11	19.50	25.83	1.42	31.20	46.00	-14.80	Peak
6	890.73	37.97	21.53	25.07	1.28	35.71	46.00	-10.29	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Shenzhen Alpha Product Testing Co., Ltd.
Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: +86-755-29766001 FAX: +86-755-86375565
Website: http://www.a-lab.cn Email: service@a-lab.cn



Condition : FCC PART 15 B 3m POL: VERTICAL
EUT : Chairman Terminal
Model No : DCS-3021C-W
Test Mode : TX mode
Power : AC 120V/60Hz
Test Engineer : Eric
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	42.60	37.00	13.93	30.40	0.14	20.67	40.00	-19.33	Peak
2	54.45	37.29	13.22	30.87	0.21	19.85	40.00	-20.15	Peak
3	154.28	36.40	14.15	29.36	0.40	21.59	43.50	-21.91	Peak
4	368.11	36.43	14.20	27.51	0.86	23.98	46.00	-22.02	Peak
5	574.63	35.54	17.81	26.71	1.27	27.91	46.00	-18.09	Peak
6	965.54	35.88	22.19	25.04	1.97	35.00	54.00	-19.00	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Remark: All modes have been tested, and only worst data of FHSS(FSK) mode, Channel 2441.085MHz was listed in this report.

1GHz—25GHz Radiated emissison Test result									
EUT: Chairman Terminal M/N: DCS-3021C-W									
Power: DC 3.7V From battery									
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric									
Test mode: FHSS(FSK) Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	49.39	31.29	5.79	34.08	52.39	74	21.61	PK
2	4804	40.74	31.29	5.79	34.08	43.74	54	10.26	AV
3	/	/							
4	/	/							
5	/	/							
Antenna Polarity: Horizontal									
1	4804	56.01	31.29	5.79	34.08	59.01	74	14.99	PK
2	4804	42.55	31.29	5.79	34.08	45.55	54	8.45	AV
3	/	/							
4	/	/							
5	/	/							

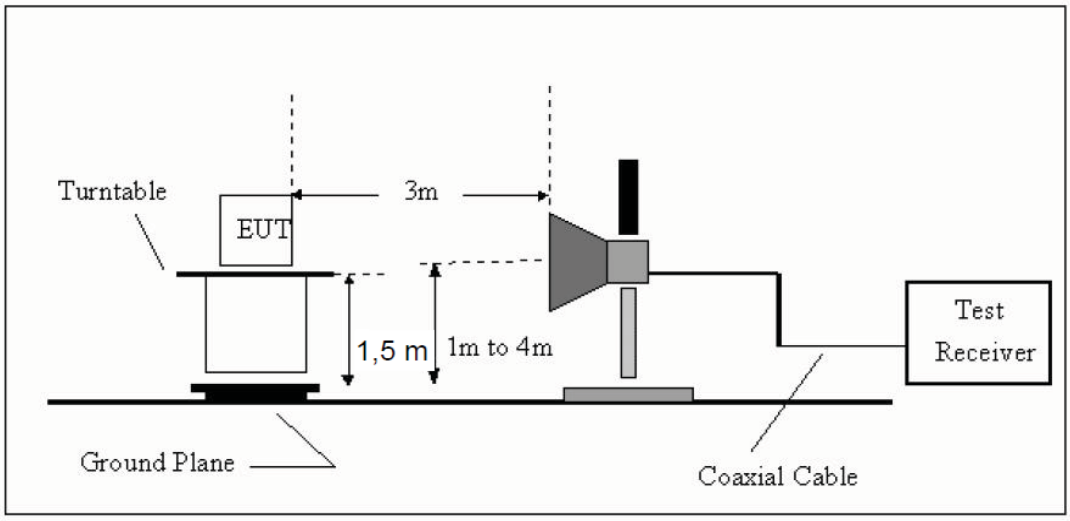
Note:
1, Measuring frequency from 1GHz to 25GHz
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

1GHz—25GHz Radiated emission Test result									
EUT: Chairman Terminal M/N: DCS-3021C-W									
Power: DC 3.7V From battery									
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric									
Test mode: FHSS(FSK) Tx CH40 2441.089MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882.178	50.61	31.41	5.75	34.12	54.26	74	19.74	PK
2	4882.178	41.12	31.41	5.75	34.12	45.02	54	8.98	AV
3	/	/							
4	/	/							
5	/	/							
Antenna Polarity: Horizontal									
1	4882.178	60.47	31.41	5.75	34.12	63.47	74	10.53	PK
2	4882.178	41.34	31.41	5.75	34.12	44.34	54	9.66	AV
3	/	/							
4	/	/							
5	/	/							
Note: 1, Measuring frequency from 1GHz to 25GHz 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emissison Test result									
EUT: Chairman Terminal M/N: DCS-3021C-W									
Power: DC 3.7V From battery									
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric									
Test mode: FHSS(FSK) Tx CH79 2480MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	49.76	31.48	5.79	34.08	52.76	74	21.24	PK
2	4960	40.51	31.48	5.79	34.08	43.51	54	10.49	AV
3	/	/							
4	/	/							
5	/	/							
Antenna Polarity: Horizontal									
1	4960	54.92	31.48	5.79	34.08	57.92	74	16.08	PK
2	4960	43.05	31.48	5.79	34.08	46.05	54	7.95	AV
3	/	/							
4	/	/							
5	/	/							
Note: 1, Measuring frequency from 1GHz to 25GHz 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

9. Band Edge Compliance

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

All restriction band and non- restriction band have been tested ， only worse case is reported.

9.4. Test Result

PASS. (See below detailed test data)

Radiated Method

FHSS(FSK)

CH LOW :

Band Edge Test result								
EUT: Chairman Terminal M/N: DCS-3021C-W								
Power: DC 3.7V From battery								
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric								
Test mode: Tx CH1 2402MHz								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	64.68	27.62	3.92	34.97	61.25	74	12.75	PK
2390	46.66	27.62	3.92	34.97	43.23	54	10.77	AV
/	/	/	/	/	/	/	/	/
Antenna Polarity: Horizontal								
2390	64.06	27.62	3.92	34.97	60.63	74	13.37	PK
2390	45.63	27.62	3.92	34.97	42.2	54	11.8	AV
/	/	/	/	/	/	/	/	/
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Band Edge Test result								
EUT: Chairman Terminal M/N: DCS-3021C-W								
Power: DC 3.7V From battery								
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric								
Test mode: Tx CH79 2480MHz								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	63.74	27.59	4	34.97	60.36	74	13.64	PK
2483.5	45.8	27.59	4	34.97	42.42	54	11.58	AV
Antenna Polarity: Horizontal								
2483.5	63.02	27.59	4	34.97	59.64	74	14.36	PK
2483.5	44.46	27.59	4	34.97	41.08	54	12.92	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

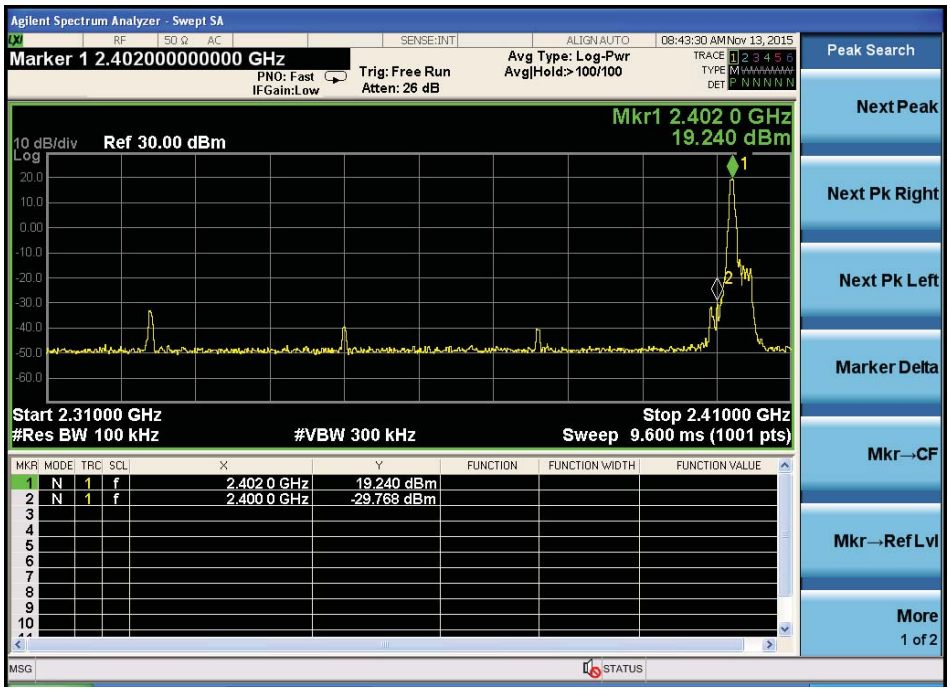
Band Edge Test result								
EUT: Chairman Terminal M/N: DCS-3021C-W								
Power: DC 3.7V From battery								
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric								
Test mode: Hopping								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	63.24	27.62	3.92	34.97	59.81	74	14.19	PK
2390	45.16	27.62	3.92	34.97	41.73	54	12.27	AV
/	/	/	/	/	/	/	/	/
Antenna Polarity: Horizontal								
2390	61.97	27.62	3.92	34.97	58.54	74	15.46	PK
2390	43.82	27.62	3.92	34.97	40.39	54	13.61	AV
/	/	/	/	/	/	/	/	/
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Band Edge Test result								
EUT: Chairman Terminal M/N: DCS-3021C-W								
Power: DC 3.7V From battery								
Test date: 2015-11-11 Test site: 3m Chamber Tested by: Eric								
Test mode: Hopping								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	62.36	27.59	4	34.97	58.98	74	15.02	PK
2483.5	43.81	27.59	4	34.97	40.43	54	13.57	AV
Antenna Polarity: Horizontal								
2483.5	63.13	27.59	4	34.97	59.75	74	14.25	PK
2483.5	42.02	27.59	4	34.97	38.64	54	15.36	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

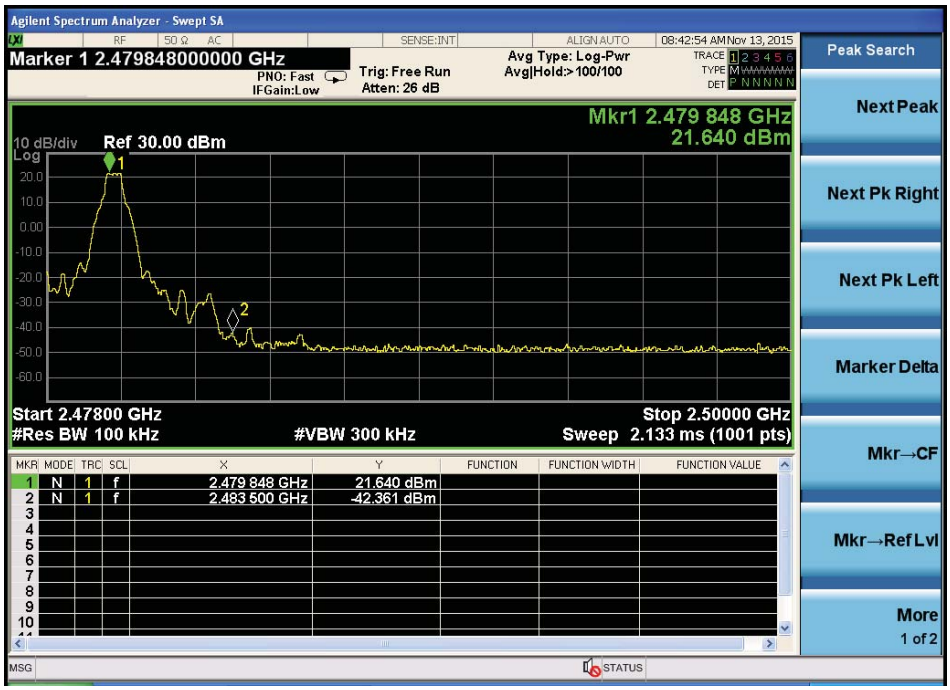
Conducted Method

FHSS(FSK)

CH LOW :

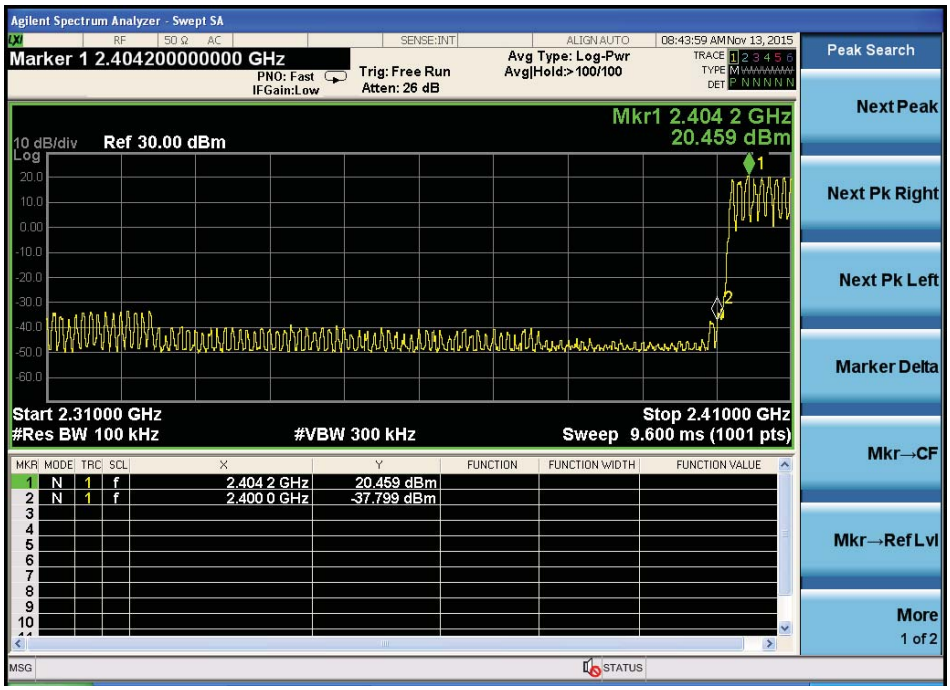


CH High :

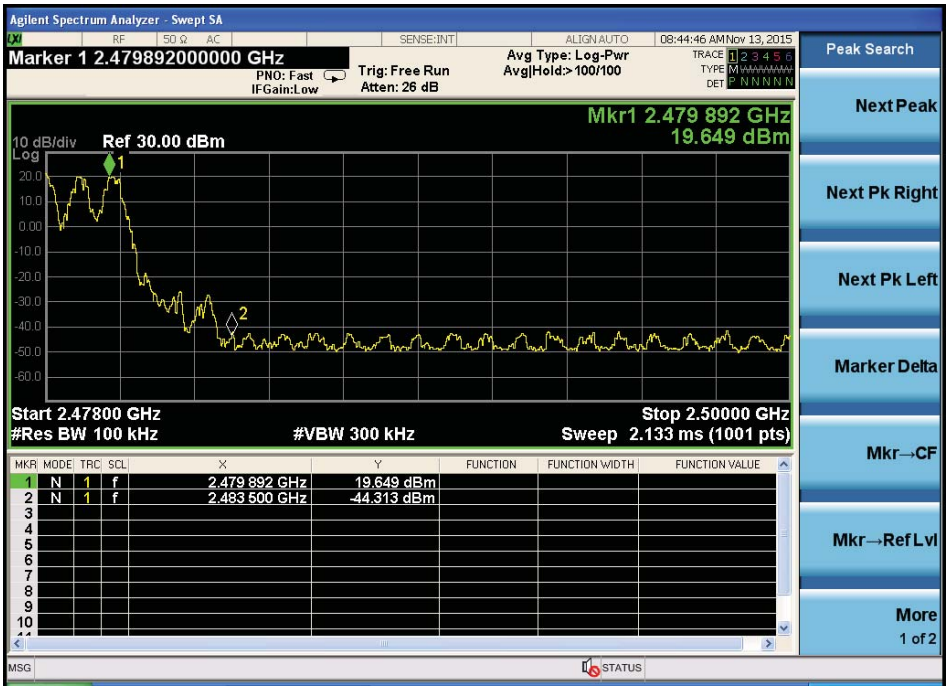


Hopping

Low

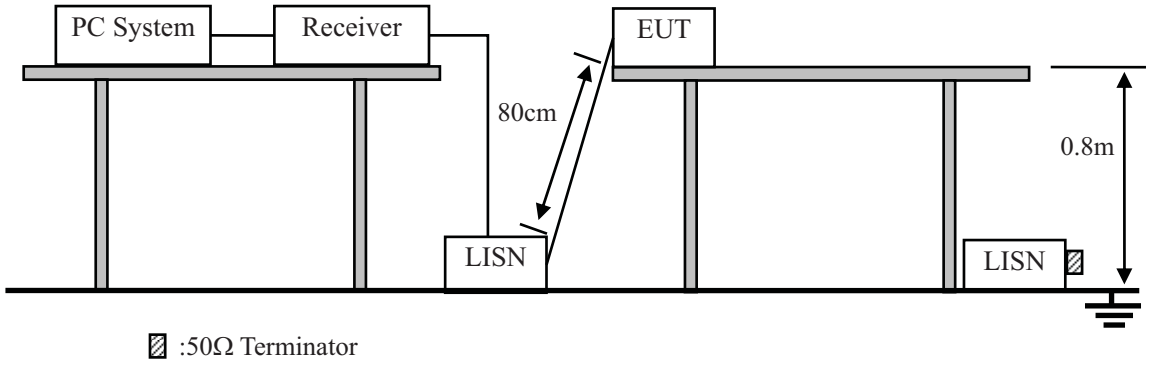


High



10. Power Line Conducted Emissions

10.1. Block Diagram of Test Setup



10.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

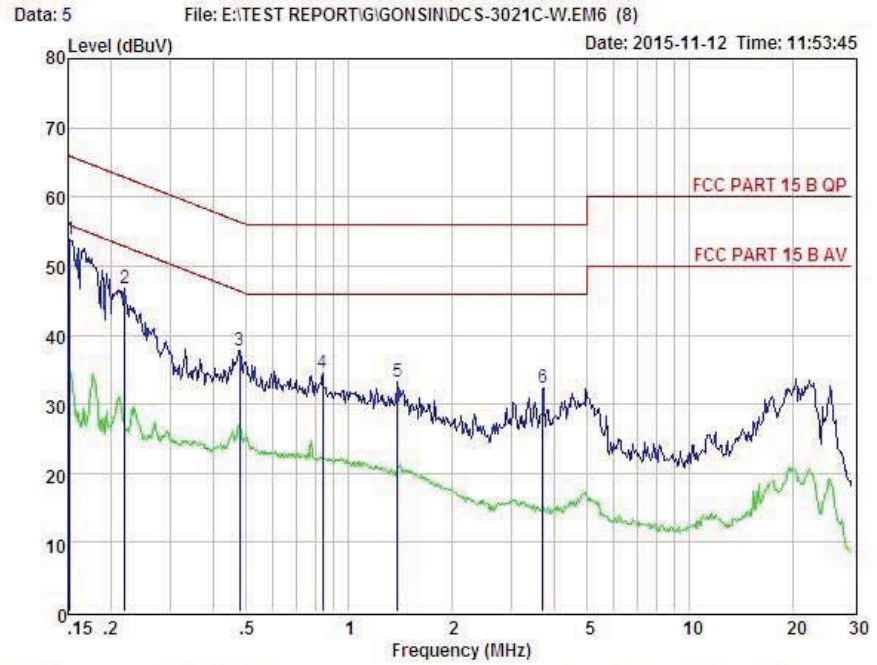
10.3. Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
(2) Setup the EUT and simulator as shown in 10.1
(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2014 on conducted Emission test.
(4) The bandwidth of test receiver is set at 10KHz.
(5) The frequency range from 150 KHz to 30MHz is checked.

10.4.Test Result

PASS. (See below detailed test data)

Shenzhen Alpha Product Testing Co., Ltd.
Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: +86-755-29766001 FAX: +86-755-86375565
Website: http://www.a-lab.cn Email: service@a-lab.cn

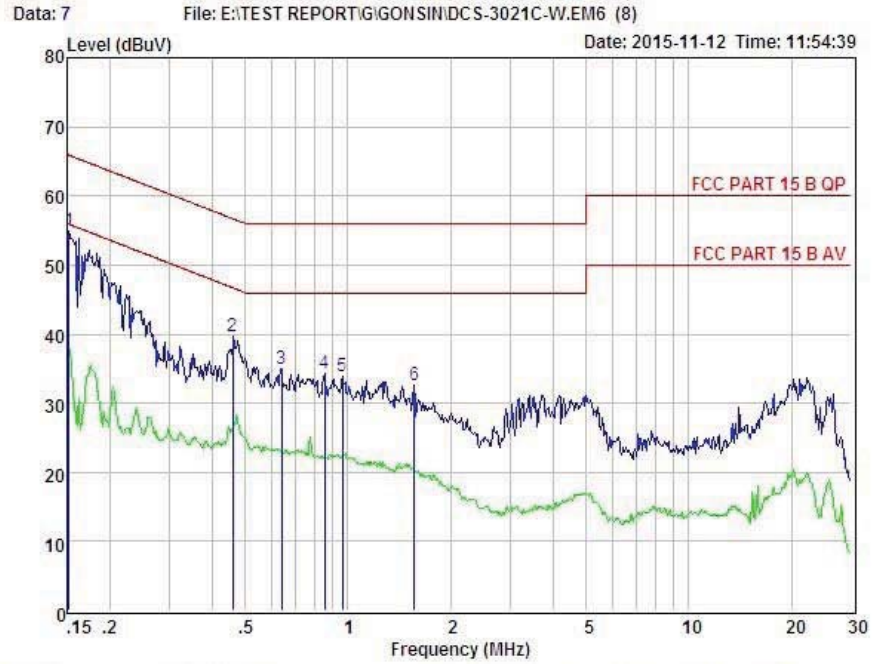


Condition : FCC PART 15 B QP POL: LINE Temp:24 ℃ Hum:56 %
EUT : Chairman Terminal
Model No : DCS-3021C-W
Test Mode : TX mode
Power : AC 120V/60Hz
Test Engineer: Eric
Remark :

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.152	44.08	0.03	-9.52	0.10	53.73	65.91	-12.18	Peak
2	0.219	37.06	0.03	-9.52	0.10	46.71	62.84	-16.13	Peak
3	0.477	28.13	0.03	-9.58	0.10	37.84	56.39	-18.55	Peak
4	0.840	24.88	0.04	-9.60	0.10	34.62	56.00	-21.38	Peak
5	1.389	23.54	0.05	-9.66	0.10	33.35	56.00	-22.65	Peak
6	3.709	22.32	0.08	-9.86	0.12	32.38	56.00	-23.62	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

Shenzhen Alpha Product Testing Co., Ltd.
Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: +86-755-29766001 FAX: +86-755-86375565
Website: http://www.a-lab.cn Email: service@a-lab.cn



Condition : FCC PART 15 B QP POL: NEUTRAL Temp:24 ℃ Hum:56 %
EUT : Chairman Terminal
Model No : DCS-3021C-W
Test Mode : TX mode
Power : AC 120V/60Hz
Test Engineer: Eric
Remark :

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.152	45.28	0.03	-9.52	0.10	54.93	65.91	-10.98	Peak
2	0.460	29.94	0.03	-9.58	0.10	39.65	56.69	-17.04	Peak
3	0.641	25.25	0.03	-9.59	0.10	34.97	56.00	-21.03	Peak
4	0.856	24.60	0.04	-9.62	0.10	34.36	56.00	-21.64	Peak
5	0.964	24.08	0.04	-9.63	0.10	33.85	56.00	-22.15	Peak
6	1.566	22.75	0.05	-9.69	0.10	32.59	56.00	-23.41	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

11. Antenna Requirements

11.1. Limit

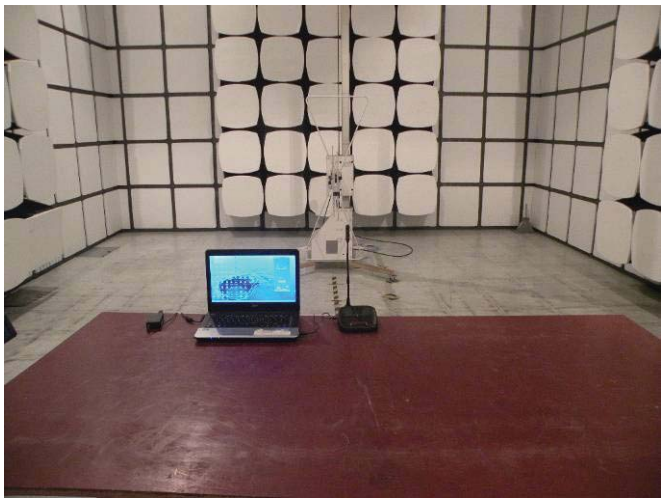
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

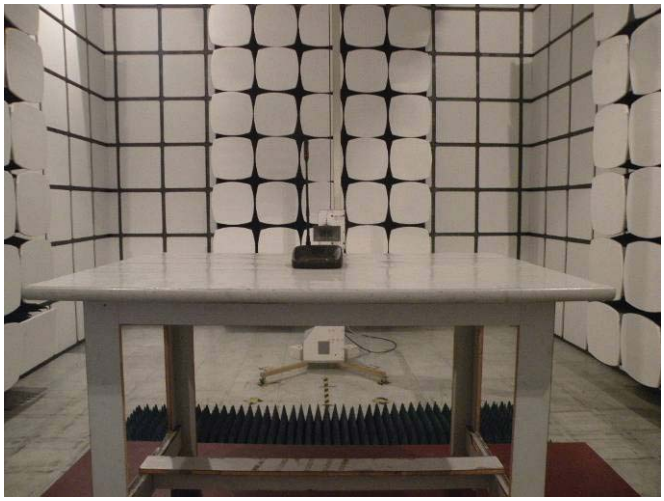
11.2. Result

The antenna used for this product is Antenna soldered on PCB, no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 2.5dBi .

12. Test setup photo

Photos of Radiated emission

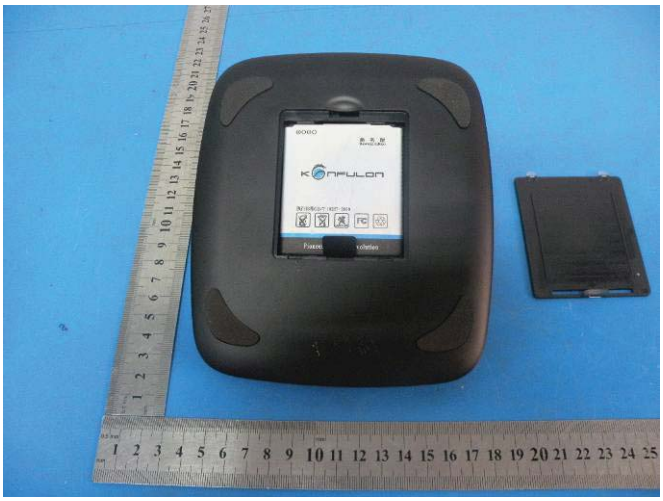


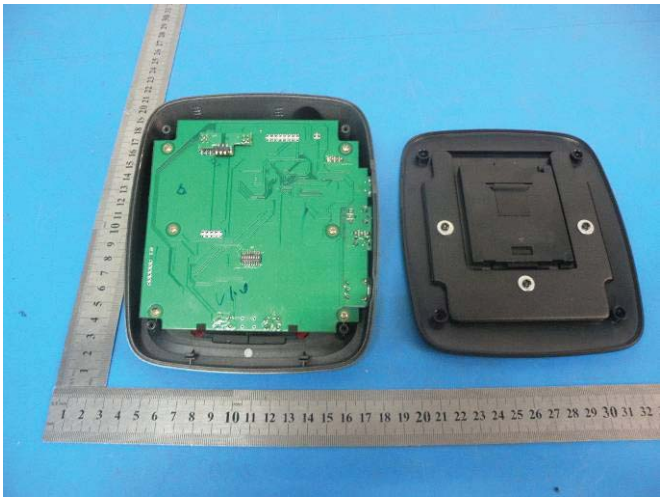


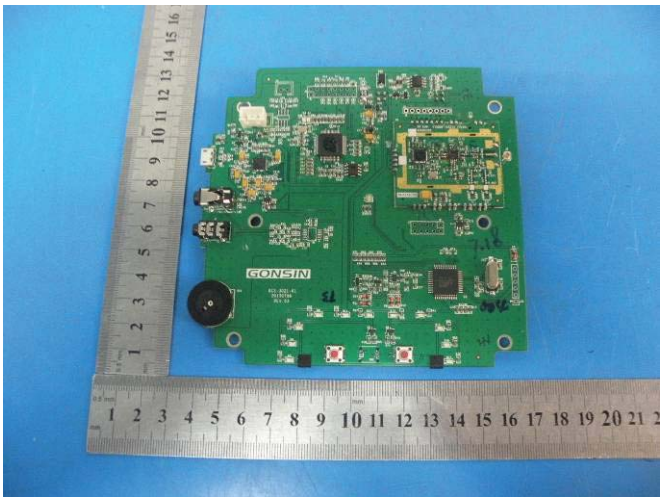
Photos of Conducted Emission test

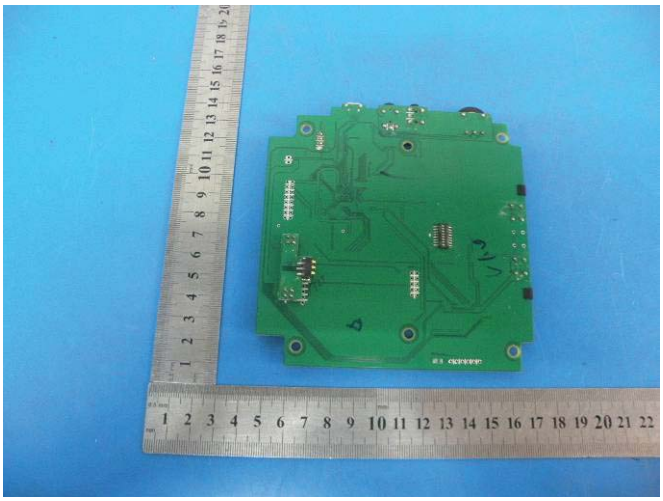
13. Photos of EUT

GONSIN









---------END OF THE REPORT-------