RF TEST REPORT

Report No.: 16070917-FCC-R

Supersede Report No.: N/A

Applicant	SHENZHEN NEW SUN DIGITAL CO.,LTD
Product Name	Extreme Party Mixer
Model No.	AIL-899
Serial No.	AIL-887，AIL-989，AIL-999，GA-10，GA-12，GA-15，GA-16，GA-18，GA-19，GA-20，GA-30，H-10，H-11，H-12，H-13，H-15，H-16，H-17,H-18，H-19,H-20，H-30
Test Standard	FCC Part 15.247: 2015, ANSI C63.10: 2013
Test Date	July 29 to August 09, 2016
Issue Date	August 10, 2016
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Loren Luo	David Huang	
Loren Luo Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
16070917-FCC-R	NONE	Original	August 10, 2016

2. Customer information

Applicant Name	SHENZHEN NEW SUN DIGITAL CO.,LTD
Applicant Add	BUILDING 3,4TH SHUITIAN INDUSTRIAL ZONE, SHIYAN TOWN BAOAN DISTRICT, SHENZHEN
Manufacturer	SHENZHEN NEW SUN DIGITAL CO.,LTD
Manufacturer Add	BUILDING 3,4TH SHUITIAN INDUSTRIAL ZONE, SHIYAN TOWN BAOAN DISTRICT, SHENZHEN

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Extreme Party Mixer
Main Model:	AIL-899
Serial Model:	AIL-887，AIL-989，AIL-999，GA-10，GA-12，GA-15，GA-16，GA-18，GA-19，GA-20，GA-30，H-10，H-11，H-12，H-13，H-15，H-16，H-17,H-18，H-19,H-20，H-30
Date EUT received:	July 28, 2016
Test Date(s):	July 29 to August 09, 2016
Equipment Category：	DSS
Antenna Gain:	0dBi
Antenna Type:	PCB antenna
Type of Modulation:	GFSK,π /4DQPSK,8DPSK
RF Operating Frequency (ies):	2402-2480 MHz
Max. Output Power:	-0.227dBm
Number of Channels:	79CH
Port:	USB Port, Power Port, Microphone Phone, Aux In Port, Guitar Port
Input Power:	Adapter: 100-240V~50/60Hz,50W; Battery: Model: GS12V7AH; Standby Use: 13.5-13.8V; Cycle Use: 14.4-15.0V; Initial Current : Less Than 2.1 A

Trade Name : Spectrum

FCC ID : 2AEWJBOOMS

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.247(a)(1)	Channel Separation	Compliance
§15.247(a)(1)	20 dB Bandwidth	Compliance
§15.247(b)(1)	Peak Output Power	Compliance
§15.247(a)(1)(iii)	Number of Hopping Channel	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(d)	Band Edge	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions	Compliance

Measurement Uncertainty

Emissions		
Test Item	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. Measurements, Examination And Derived Results

6.1 Antenna Requirement

Applicable Standard

According to § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.
The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the 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 6 dBi.

Antenna Connector Construction

The EUT has 1 antenna:
A permanently attached PCB antenna for Bluetooth, the gain is 0dBi for Bluetooth.

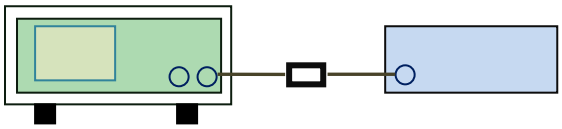
The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 Channel Separation

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	August 01, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(a)(1)	a)	Channel Separation < 20dB BW and 20dB BW < 25KHz ; Channel Separation Limit=25KHz Chanel Separation < 20dB BW and 20dB BW > 25kHz ; Channel Separation Limit=2/3 20dB BW	☑
Test Setup			
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer settings: - The EUT must have its hopping function enabled - Span = wide enough to capture the peaks of two adjacent channels - Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span - Video (or Average) Bandwidth (VBW) ≥ RBW - Sweep = auto - Detector function = peak - Trace = max hold - Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.		

Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Channel Separation measurement result

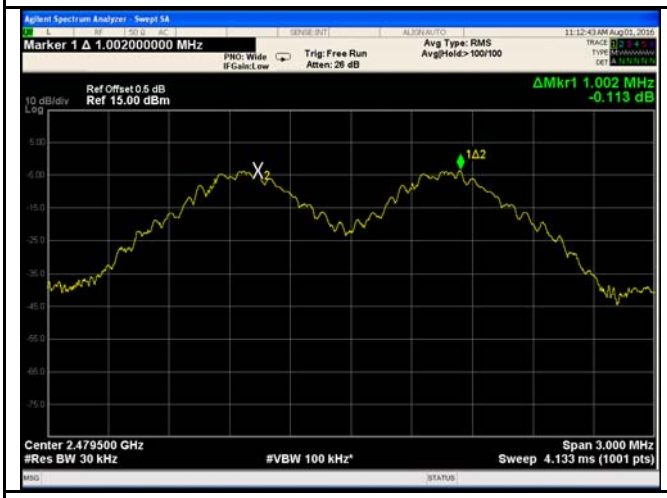
Type/ Modulation	CH	CH Freq (MHz)	CH Separation (MHz)	Limit (MHz)	Result
CH Separation GFSK	Low Channel	2402	1.002	0.697	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.002	0.690	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.002	0.693	Pass
	Adjacency Channel	2479			
CH Separation π /4 DQPSK	Low Channel	2402	1.002	0.910	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.002	0.897	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.891	Pass
	Adjacency Channel	2479			
	Adjacency Channel	2479			
CH Separation 8DPSK	Low Channel	2402	1.002	0.909	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.913	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.002	0.910	Pass
	Adjacency Channel	2479			

Test Plots

Channel Separation measurement result

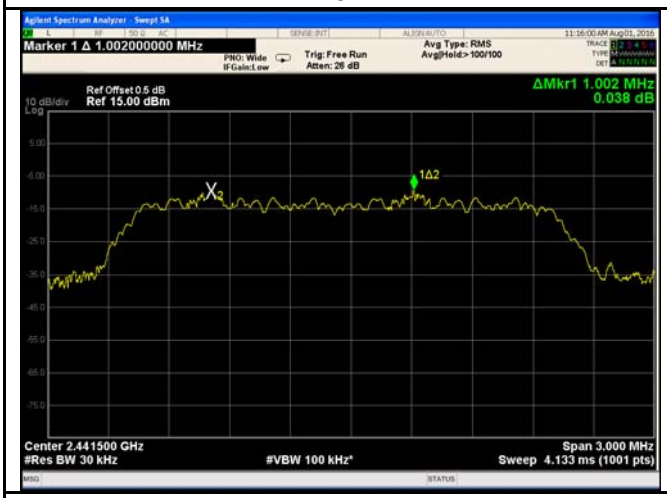
GFSK - Low Channel

GFSK - Middle Channel

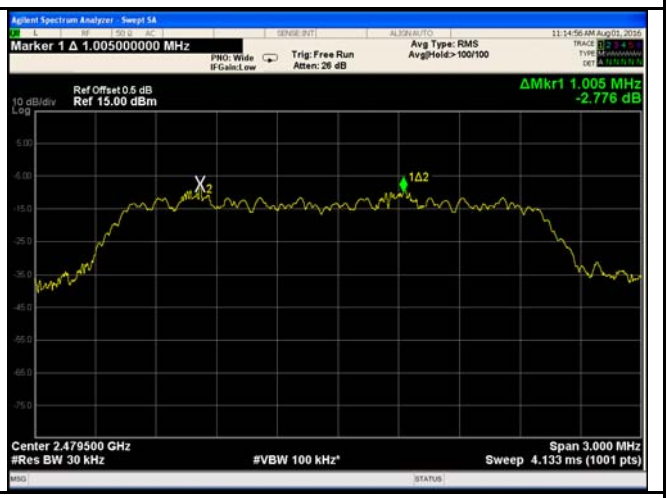


GFSK - High Channel

π /4 DPSK - Low Channel

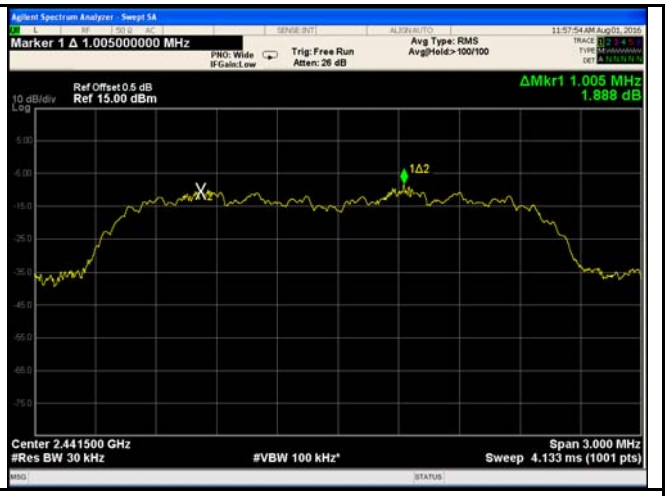


π /4 DQPSK - Middle Channel



π /4 DQPSK - High Channel

8DPSK - Low Channel



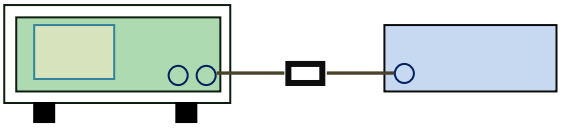
8DPSK - Middle Channel

8DPSK - High Channel

6.3 20dB Bandwidth

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	August 01, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a) (1)	a)	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.	☑
Test Setup			
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer settings: - Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel - RBW ≥ 1% of the 20 dB bandwidth - VBW ≥ RBW - Sweep = auto - Detector function = peak - Trace = max hold. - The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference		

	marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Measurement result

Modulation	CH	CH Freq (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GFSK	Low	2402	1.045	0.9472
	Mid	2441	1.035	0.9328
	High	2480	1.040	0.9400
π /4 DQPSK	Low	2402	1.365	1.2400
	Mid	2441	1.346	1.2381
	High	2480	1.336	1.2348
8DPSK	Low	2402	1.364	1.2469
	Mid	2441	1.369	1.2471
	High	2480	1.365	1.2444

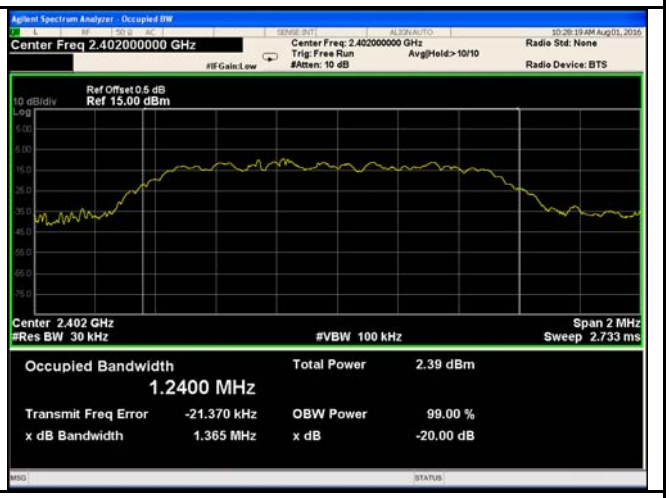
Test Plots

20dB Bandwidth measurement result

GFSK - Low Channel

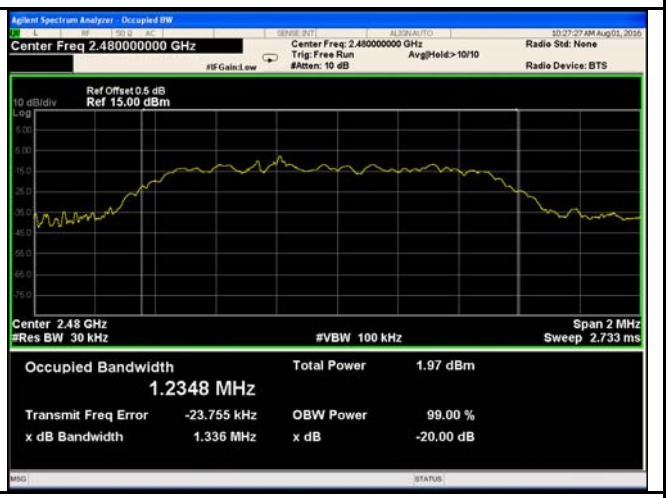
GFSK - Middle Channel

GFSK - High Channel

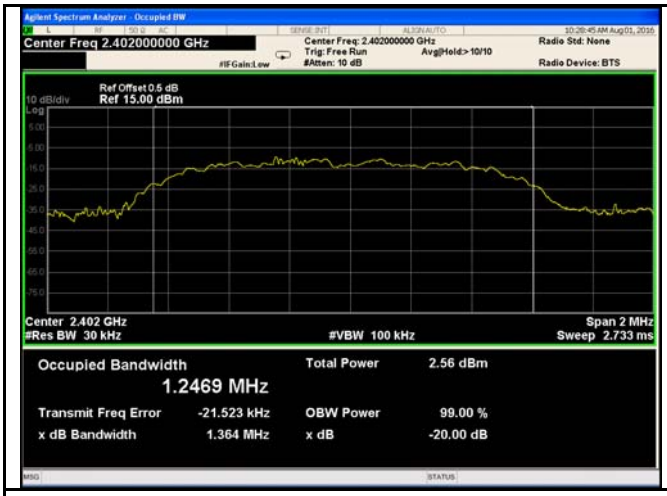


π /4 DPSK - Low Channel

π /4 DQPSK - Middle Channel

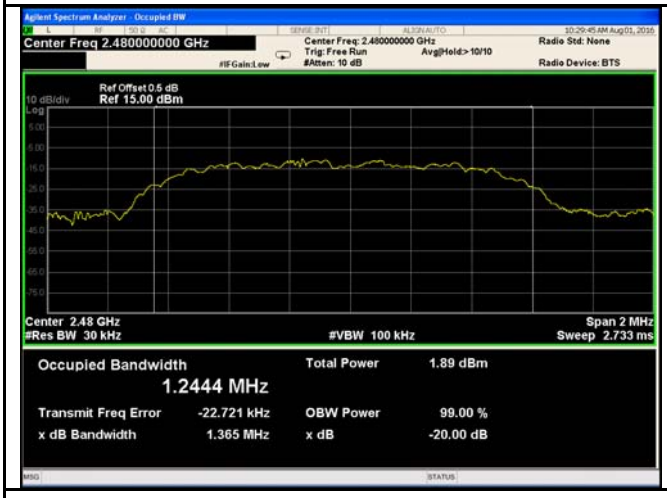


π /4 DQPSK - High Channel



8DPSK - Low Channel

8DPSK - Middle Channel

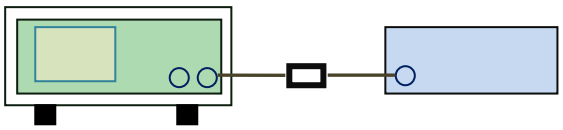


8DPSK - High Channel

6.4 Peak Output Power

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	August 01, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b) (3)	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	☑
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt	☐
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	☑
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt	☐
	e)	FHSS in 902-928MHz with ≥ 25 & <50 channels: ≤ 0.25 Watt	☐
	f)	DTS in 902-928MHz, 2400-2483.5MHz: ≤ 1 Watt	☐
Test Setup			
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer settings: - Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel - RBW > the 20 dB bandwidth of the emission being measured - VBW ≥ RBW - Sweep = auto - Detector function = peak - Trace = max hold - Allow the trace to stabilize.		

	- Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (see the note above regarding external attenuation and cable loss). The limit is specified in one of the subparagraphs of this Section. Submit this plot. A peak responding power meter may be used instead of a spectrum analyzer.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

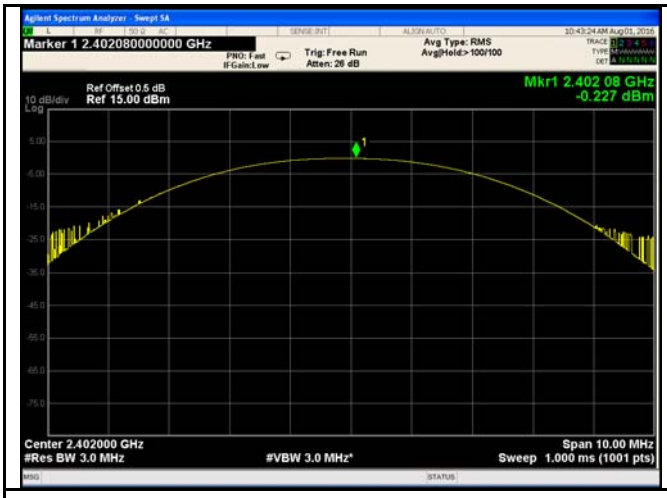
Test Plot ☑ Yes (See below) ☐ N/A

Peak Output Power measurement result

Type	Modulation	CH	Freq (MHz)	Conducted Power (dBm)	Limit (mW)	Result
Output power	GFSK	Low	2402	**-0.227**	125	Pass
		Mid	2441	-0.689	125	Pass
		High	2480	-0.556	125	Pass
	π /4 DQPSK	Low	2402	-0.254	125	Pass
		Mid	2441	-0.713	125	Pass
		High	2480	-0.551	125	Pass
	8DPSK	Low	2402	-0.249	125	Pass
		Mid	2441	-0.713	125	Pass
		High	2480	-0.565	125	Pass

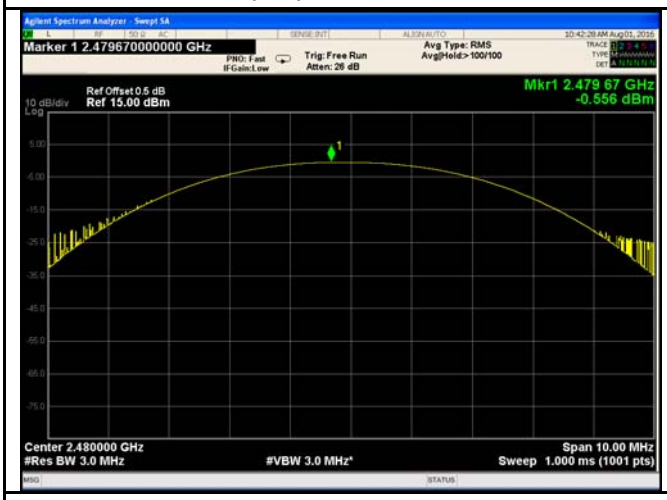
Test Plots

Output Power measurement result

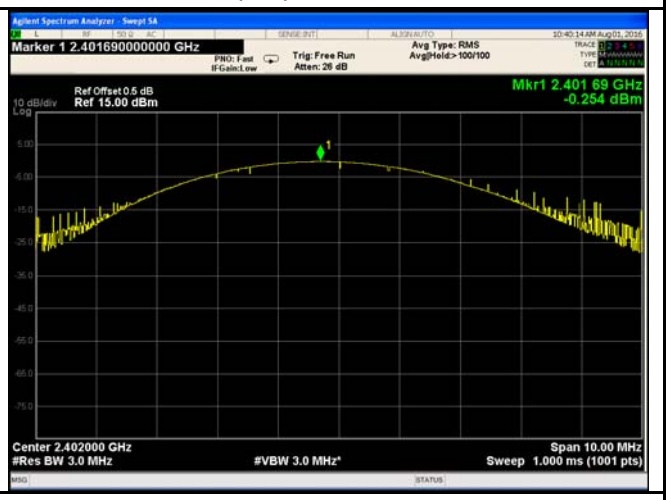


GFSK Output power - Low CH 2402

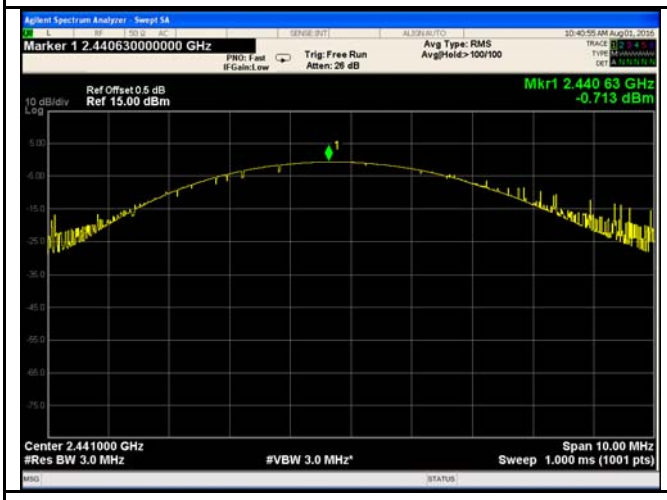
GFSK Output power - Mid CH 2441



GFSK Output power - High CH 2480

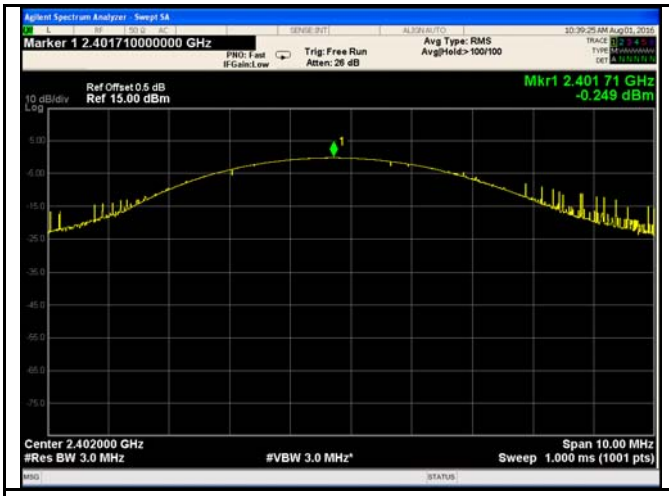


π /4 DQPSK Output power - Low CH 2402



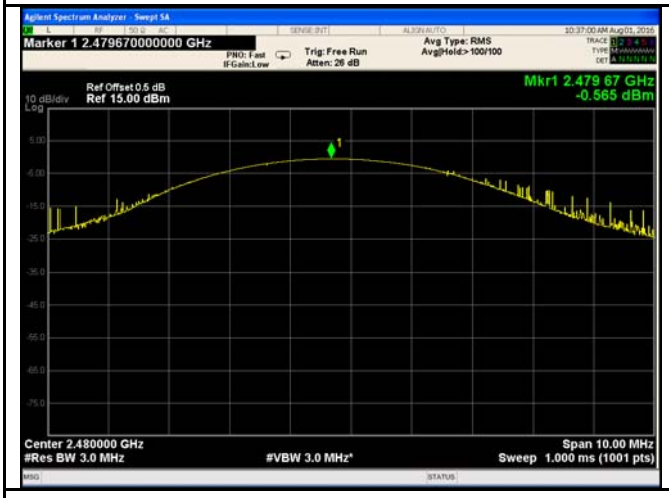
π /4 DQPSK Output power - Mid CH 2441

π /4 DQPSK Output power - High CH 2480



8DPSK Output power - Low CH 2402

8DPSK Output power - Mid CH 2441

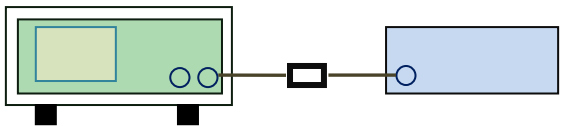


8DPSK Output power - High CH 2480

6.5 Number of Hopping Channel

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	August 01, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a)(1)(iii)	a)	FHSS in 2400-2483.5MHz ≥ 15 channels	☑
Test Setup			
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer settings: The EUT must have its hopping function enabled. - Span = the frequency band of operation - RBW ≥ 1% of the span - VBW ≥ RBW - Sweep = auto - Detector function = peak - Trace = max hold - Allow trace to fully stabilize. - It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).		
Remark			
Result	☑ Pass	☐ Fail	

Test Data ☑ Yes ☐ N/A

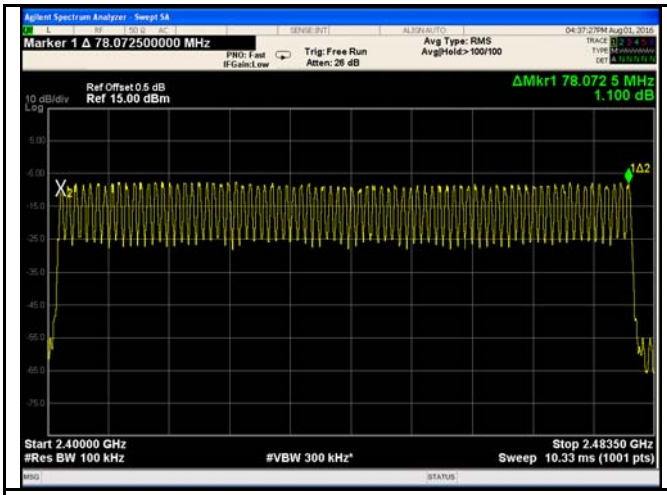
Test Plot ☑ Yes (See below) ☐ N/A

Number of Hopping Channel measurement result

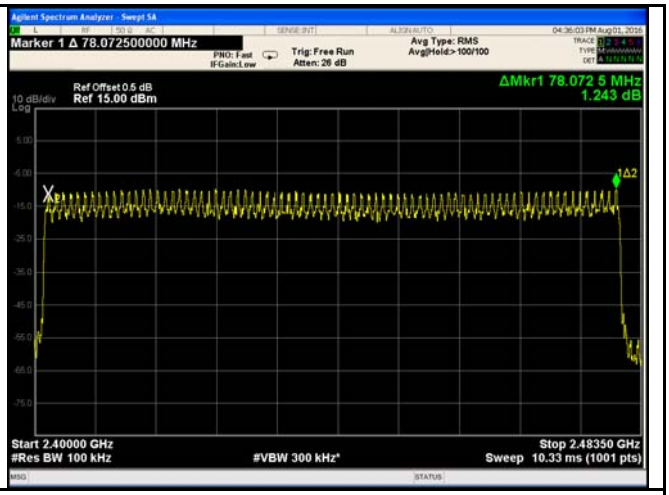
Type	Modulation	Frequency Range	Number of Hopping Channel	Limit
Number of Hopping Channel	GFSK	2400-2483.5	79	15
	π /4 DQPSK	2400-2483.5	79	15
	8-DPSK	2400-2483.5	79	15

Test Plots

Number of Hopping Channels measurement result



GFSK



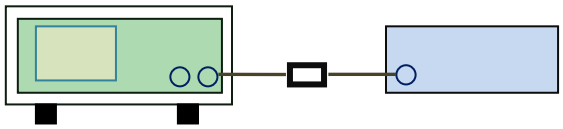
π /4DQPSK

8DPSK

6.6 Time of Occupancy (Dwell Time)

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	August 01, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a)(1)(iii)	a)	Dwell Time < 0.4s	☑
Test Setup			
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer - Span = zero span, centered on a hopping channel - RBW = 1 MHz - VBW ≥ RBW - Sweep = as necessary to capture the entire dwell time per hopping channel - Detector function = peak - Trace = max hold - use the marker-delta function to determine the dwell time		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

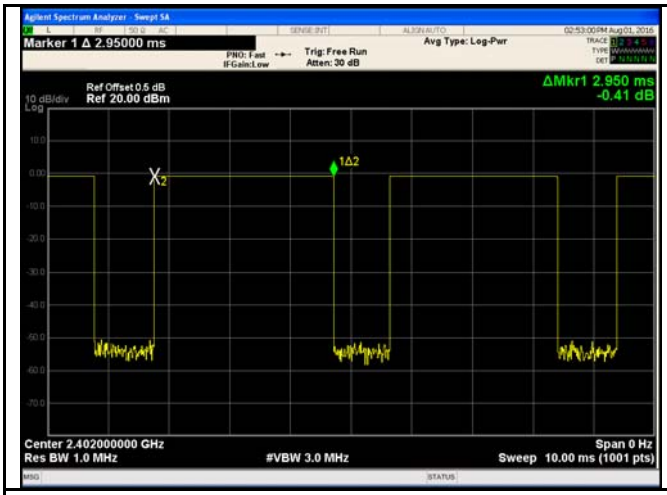
Test Plot ☑ Yes (See below) ☐ N/A

Dwell Time measurement result

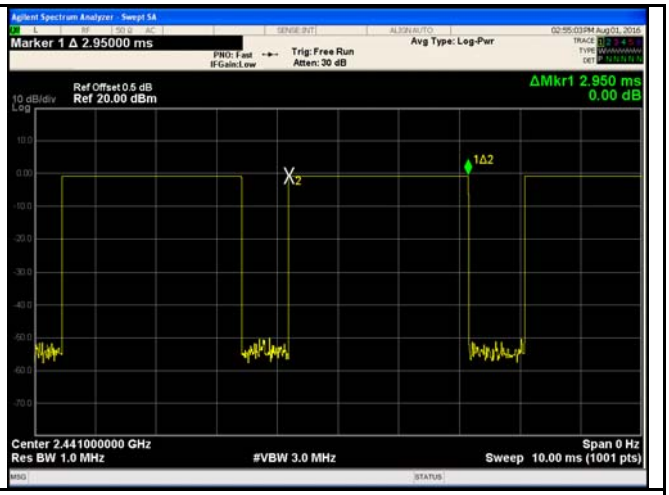
Type	Modulation	CH	Pulse Width (ms)	Dwell Time (ms)	Limit (ms)	Result
Dwell Time	GFSK	Low	2.950	314.667	400	Pass
		Mid	2.950	314.667	400	Pass
		High	2.760	294.400	400	Pass
	π /4 DQPSK	Low	2.800	298.667	400	Pass
		Mid	2.780	296.533	400	Pass
		High	2.760	294.400	400	Pass
	8DPSK	Low	2.780	296.533	400	Pass
		Mid	2.950	314.667	400	Pass
		High	2.770	295.467	400	Pass
Note: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6						

Test Plots

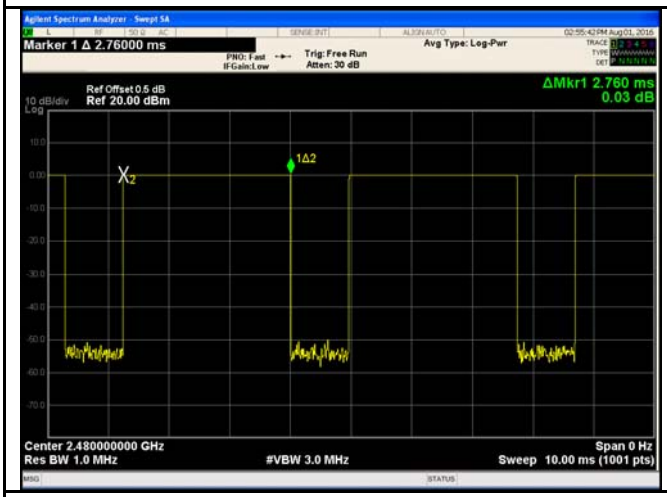
Dwell Time measurement result



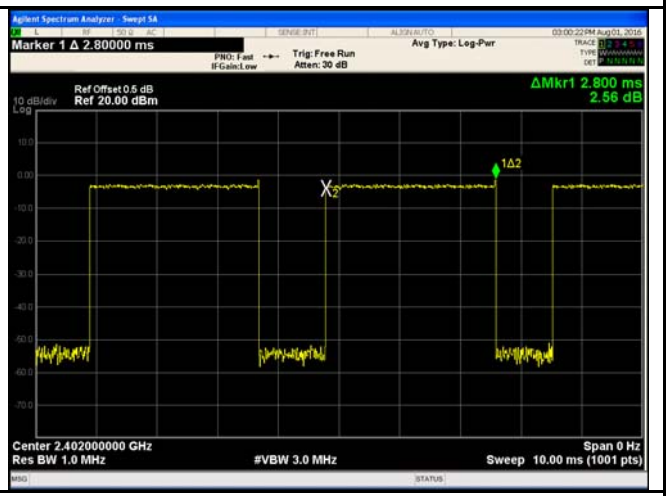
GFSK - Low CH 2402



GFSK - Mid CH 2441

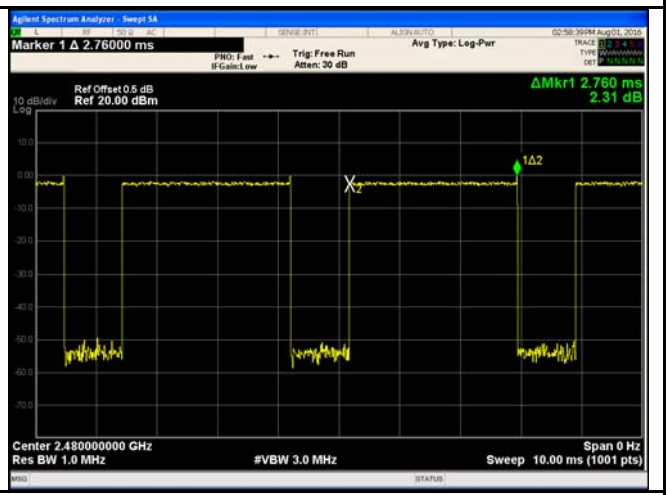


GFDK - High CH 2480

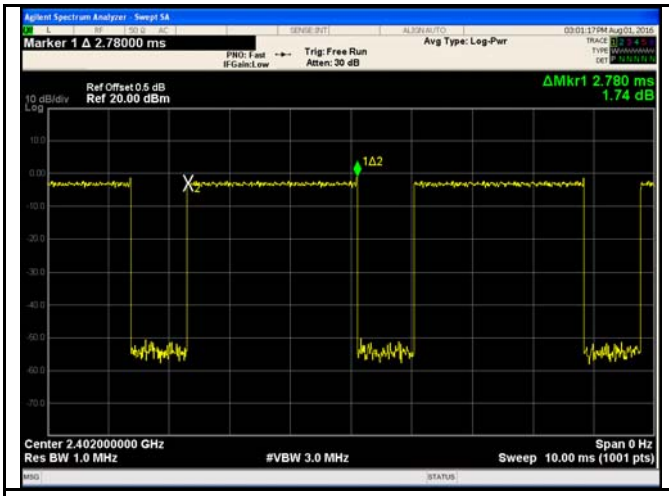


π /4 DQPSK - Low CH 2402

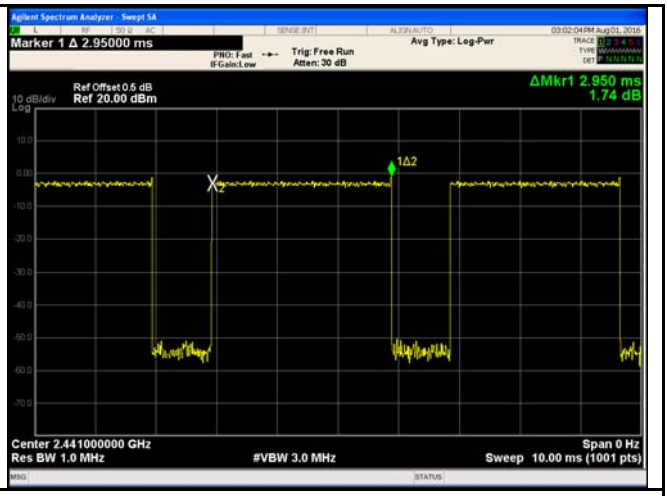
π /4 DQPSK - Mid CH 2441



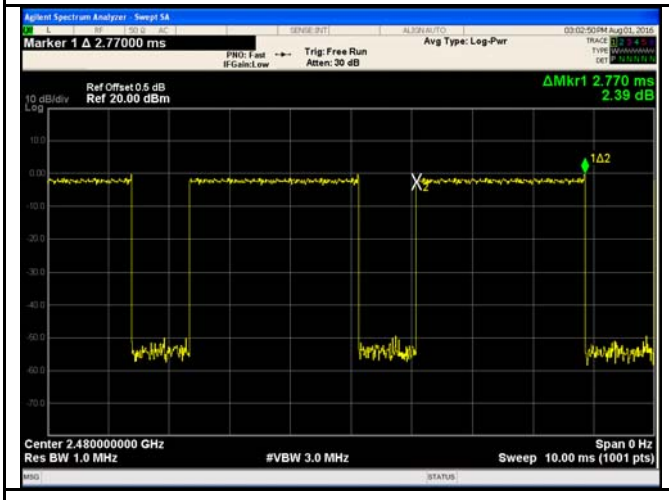
π /4 DQPSK - High CH 2480



8DPSK - Low CH 2402



8DPSK - Mid CH 2441

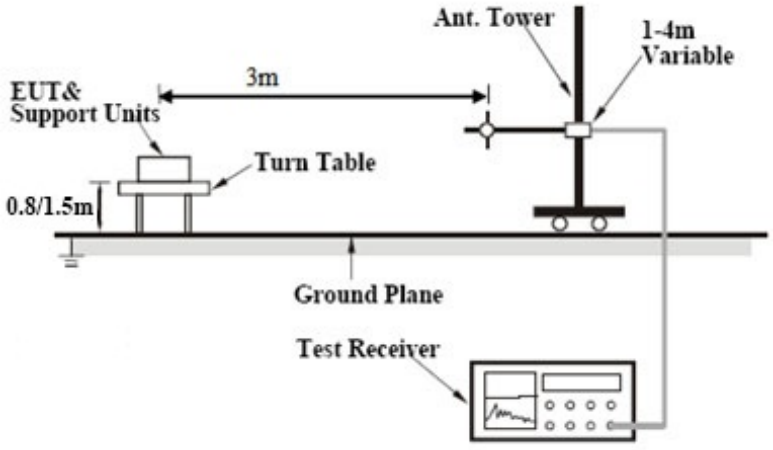


8DPSK - High CH 2480

6.7 Band Edge

Temperature	22℃
Relative Humidity	51%
Atmospheric Pressure	1009mbar
Test date :	August 09, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a)(1)(iii)	a)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.	☑
Test Setup			
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Radiated Method Only - 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. - 2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range,		

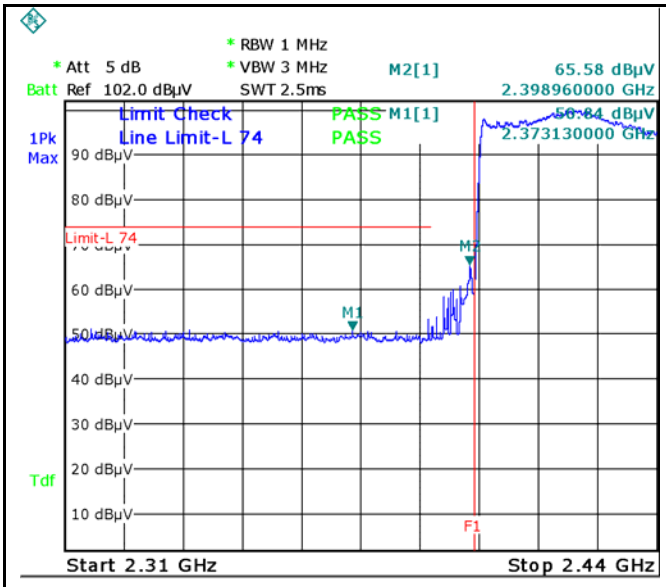
	and make sure the instrument is operated in its linear range. - 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. b. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. - 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. - 5. Repeat above procedures until all measured frequencies were complete.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☐ Yes ☑ N/A

Test Plot ☑ Yes (See below) ☐ N/A

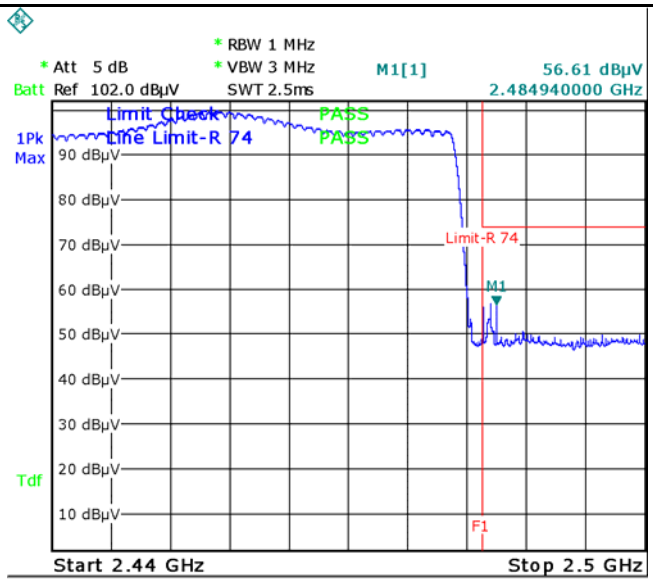
Test Plots

GFSK Mode:



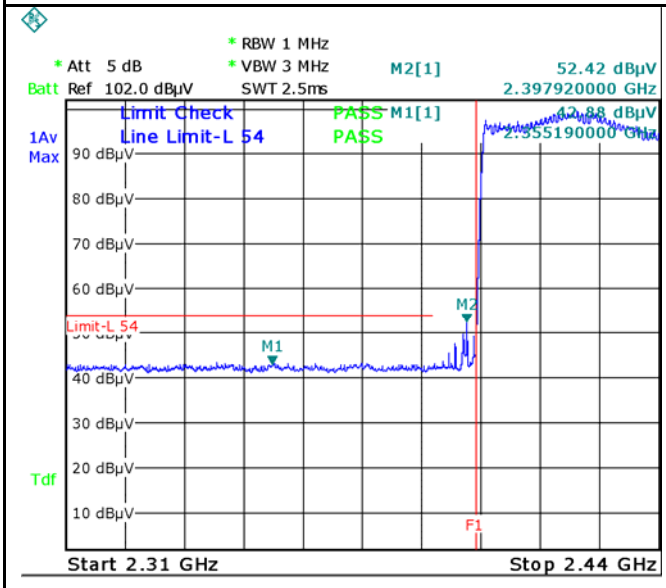
GFSK-Hopping Left Side-PK

Note: F1 is frequency 2400MHz

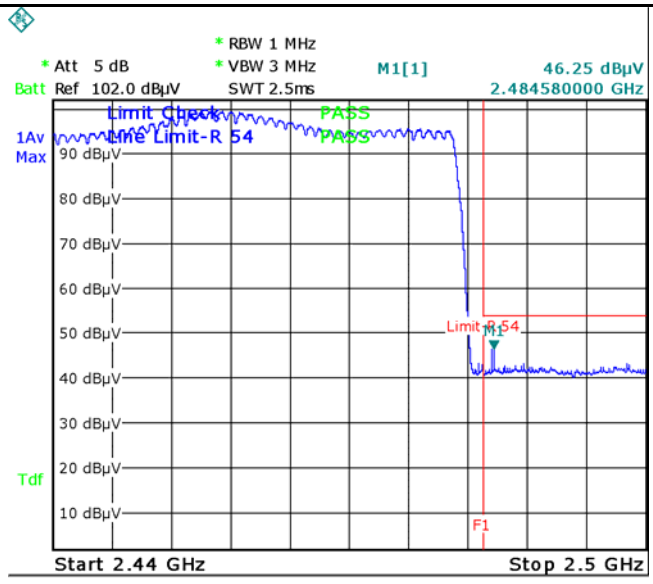


GFSK-Hopping Right Side-PK

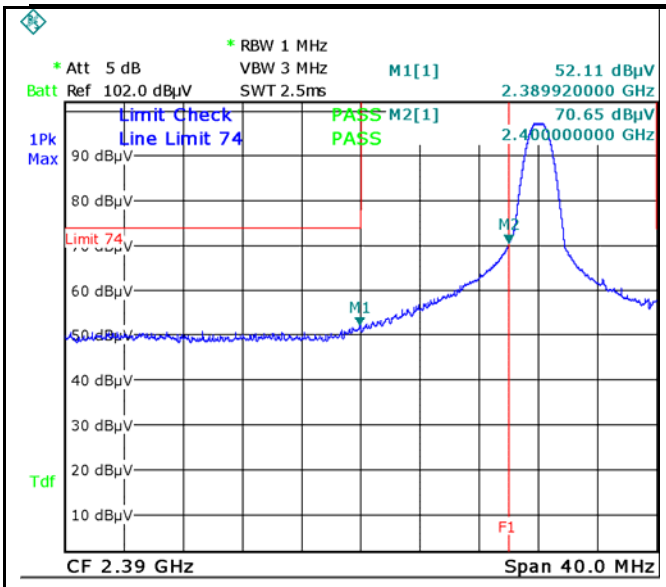
Note: F1 is frequency 2483.5MHz



GFSK-Hopping Left Side-AV

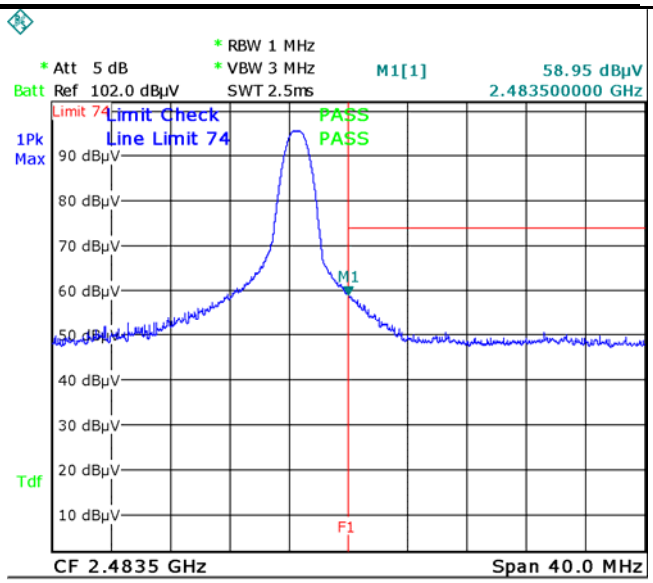


GFSK-Hopping Right Side-AV



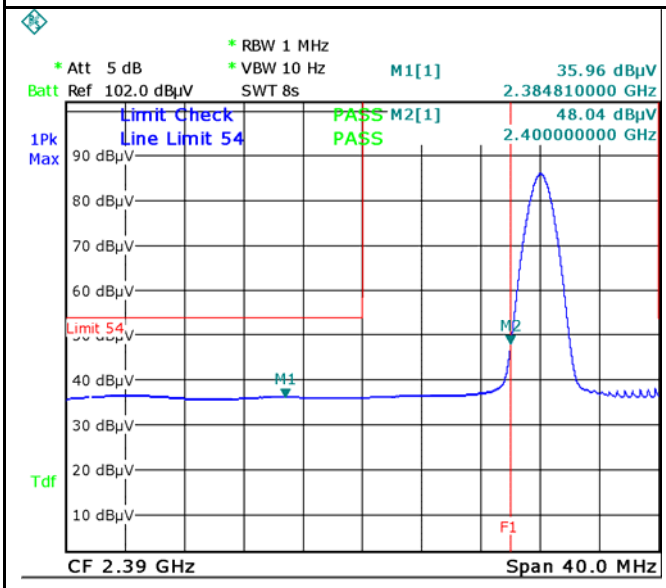
GFSK-Left Side-PK

Note: F1 is frequency 2400MHz

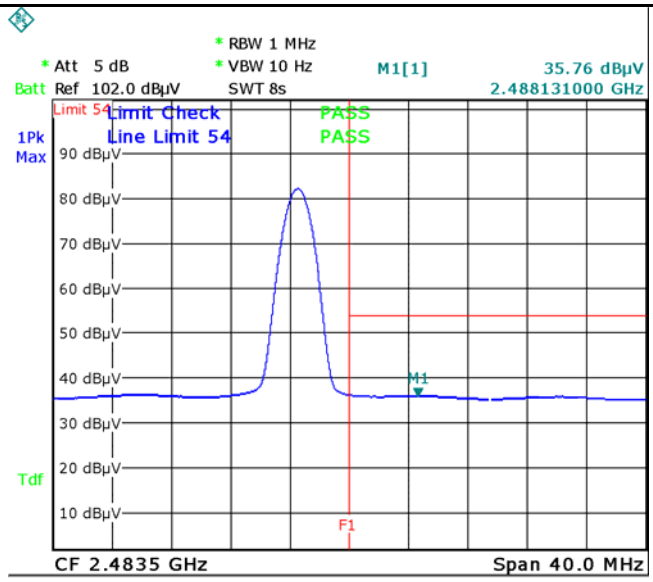


GFSK-Right Side-PK

Note: F1 is frequency 2483.5MHz

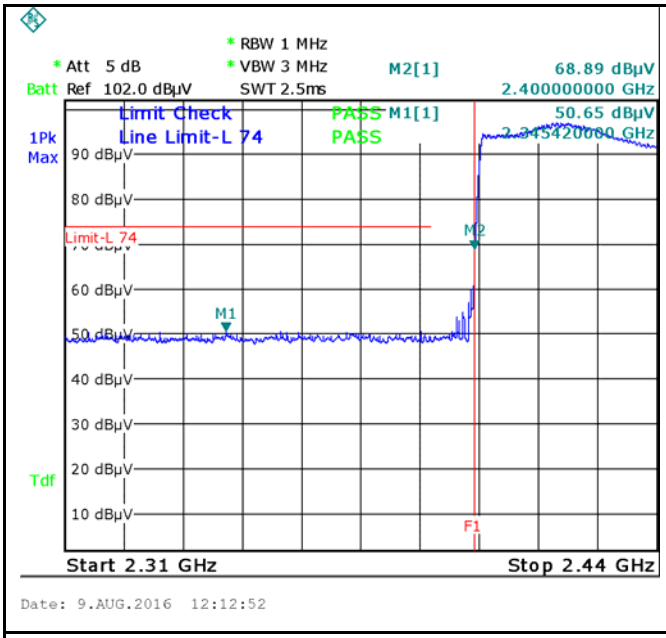


GFSK-Left Side-AV



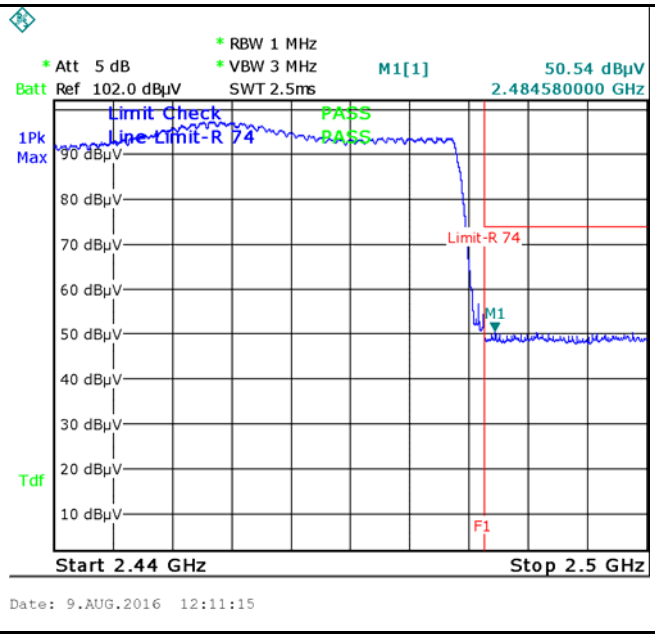
GFSK-Right Side-AV

π /4 DQPSK Mode:



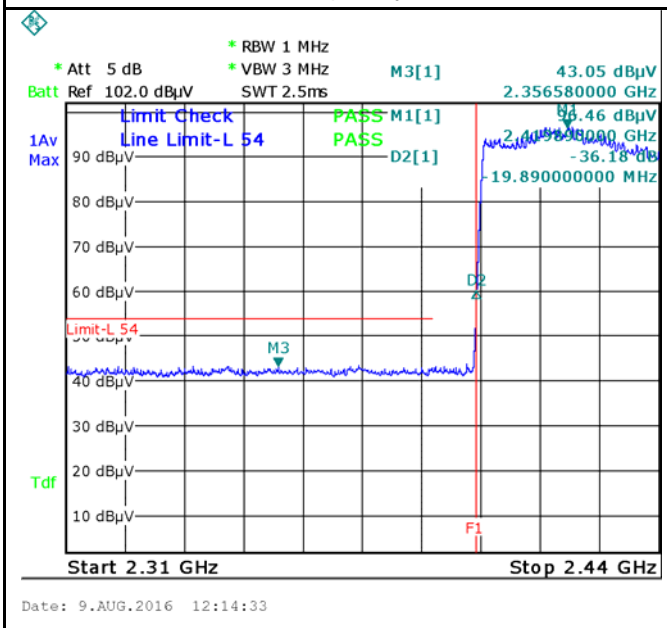
π /4 DQPSK-Hopping Left Side-PK

Note: F1 is frequency 2400MHz



π /4 DQPSK-Hopping Right Side-PK

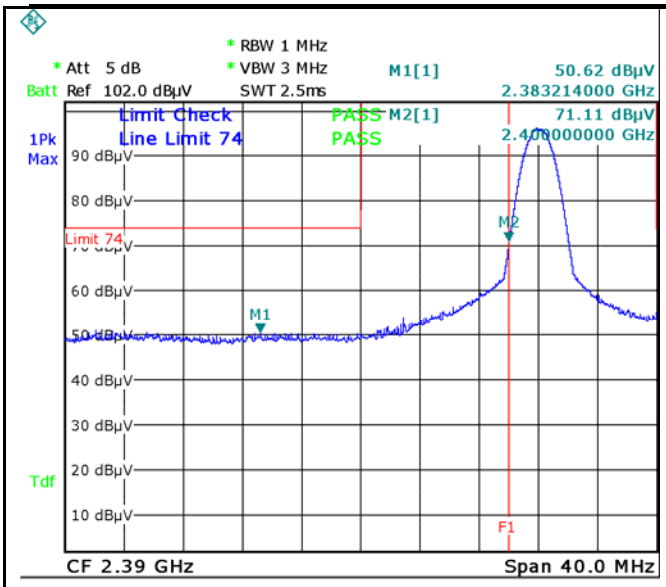
Note: F1 is frequency 2483.5MHz



π /4 DQPSK-Hopping Left-AV

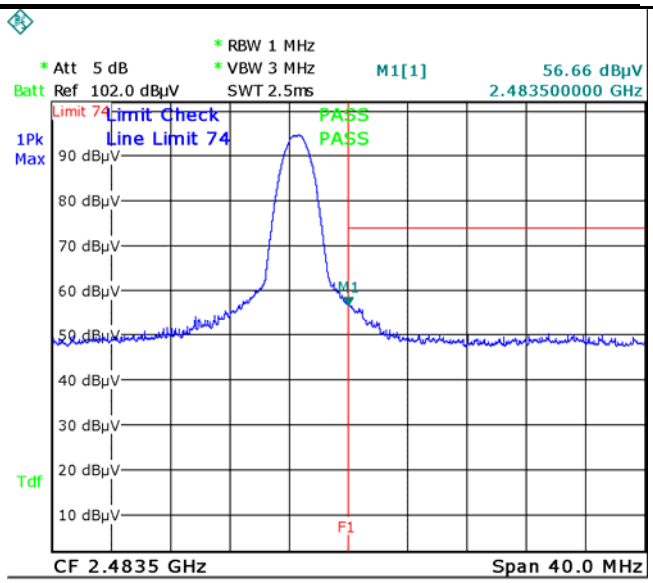
Note: (no need if PK value less than the AV limit)

π /4 DQPSK-Hopping Right-AV



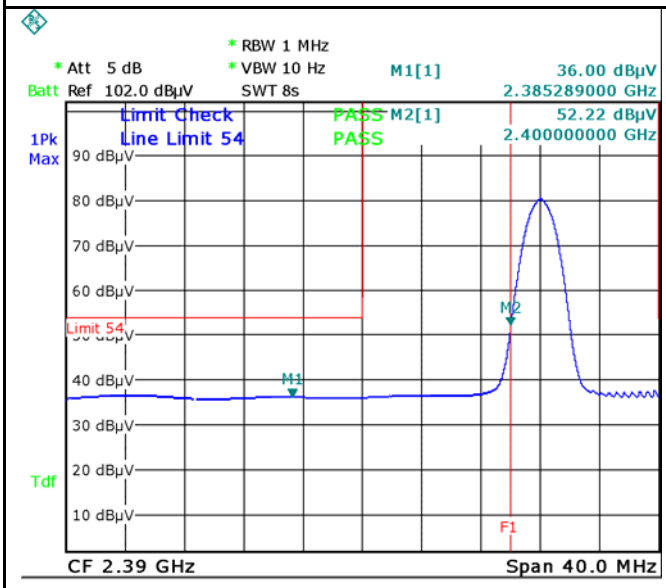
π /4 DQPSK-Left Side-PK

Note: F1 is frequency 2400MHz

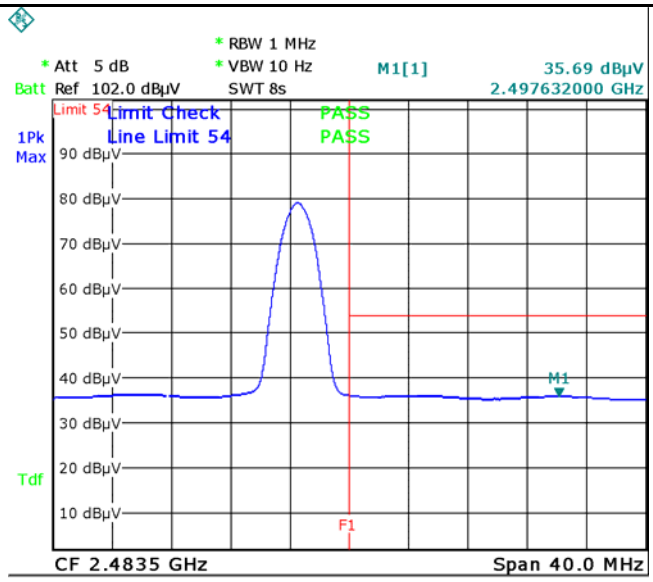


π /4 DQPSK-Right Side-PK

Note: F1 is frequency 2483.5MHz

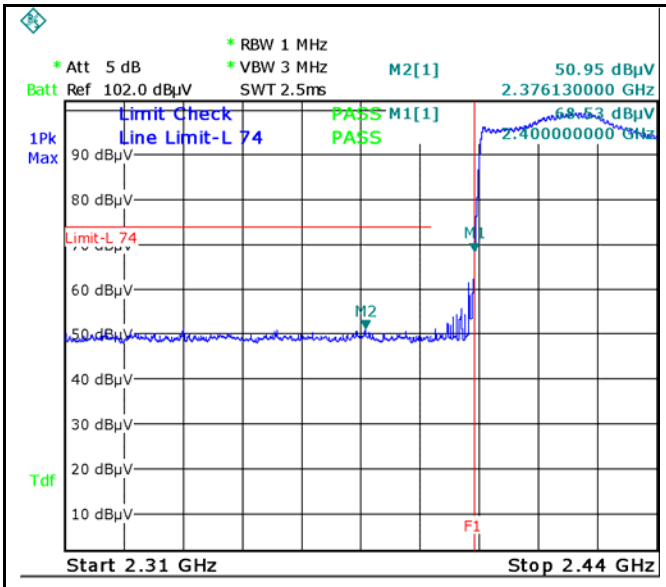


π /4 DQPSK-Left Side-AV



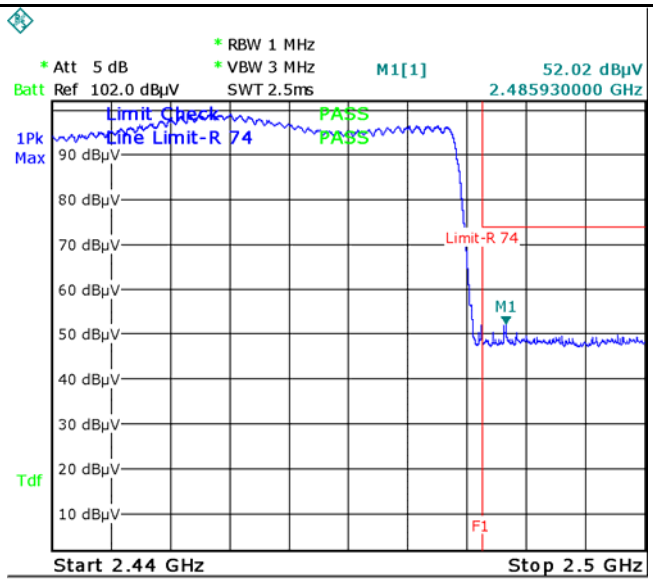
π /4 DQPSK-Right Side-AV

8DPSK Mode:



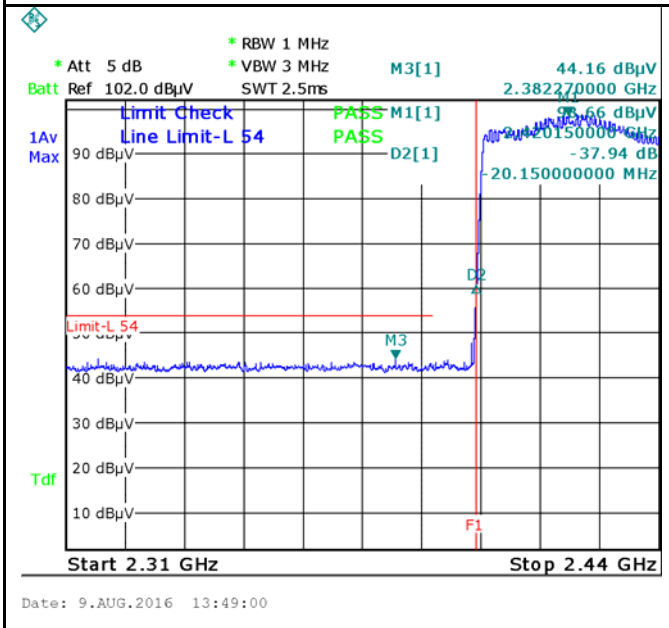
8DPSK-Hopping Left Side-PK

Note: F1 is frequency 2400MHz



8DPSK--Hopping Right Side-PK

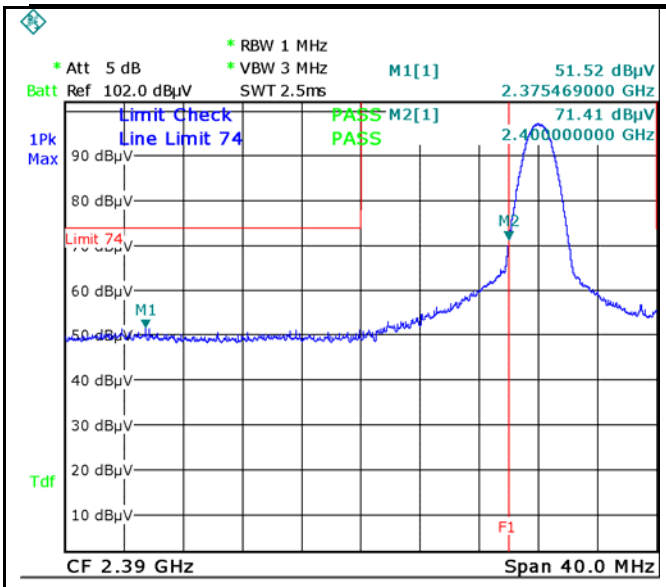
Note: F1 is frequency 2483.5MHz



8DPSK--Hopping Left-AV

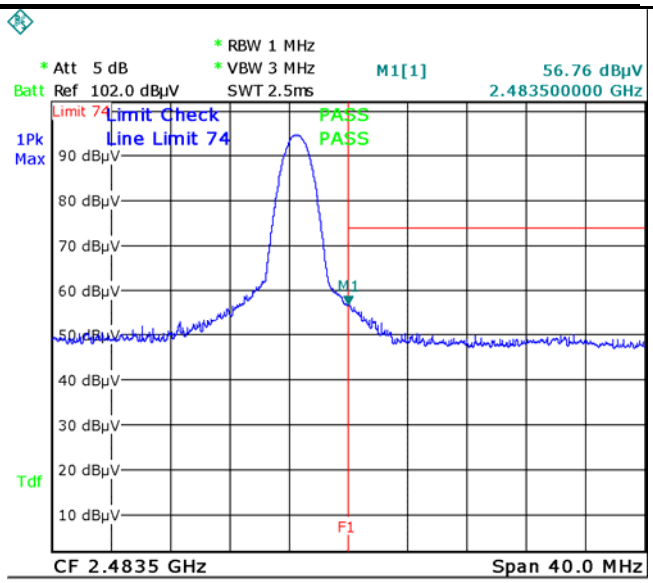
Note: (no need if PK value less than the AV limit)

8DPSK--Hopping Right-AV



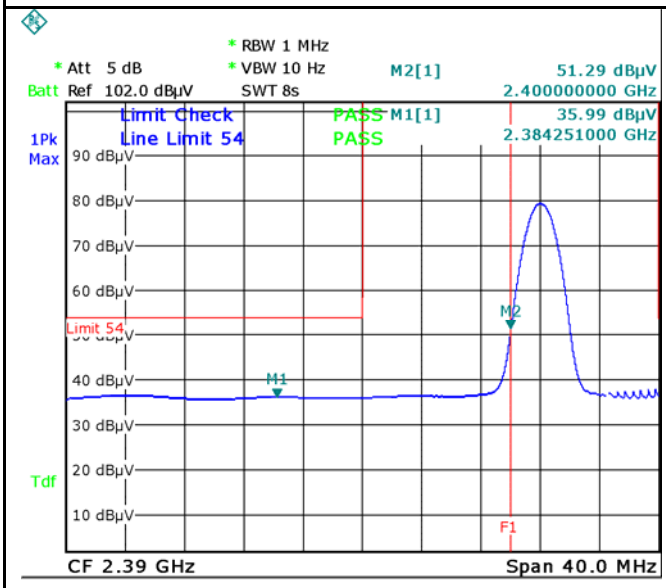
8DPSK--Left Side-PK

Note: F1 is frequency 2400MHz

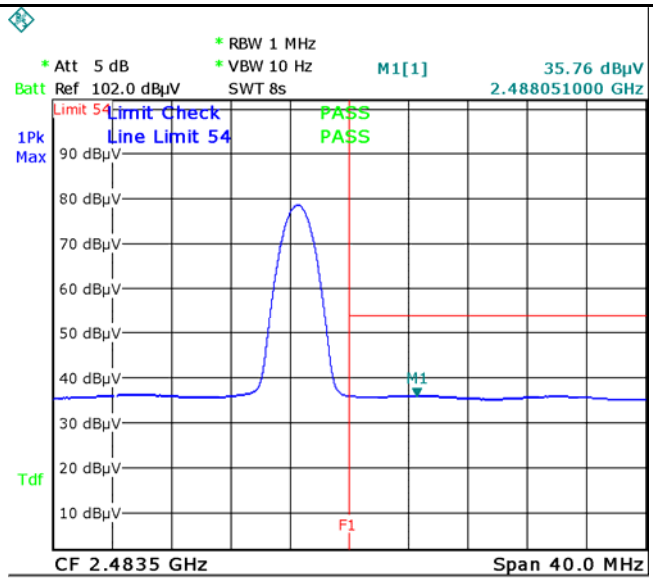


8DPSK--Right Side-PK

Note: F1 is frequency 2483.5MHz



8DPSK--Left Side-AV



8DPSK--Right Side-AV

6.8 AC Power Line Conducted Emissions

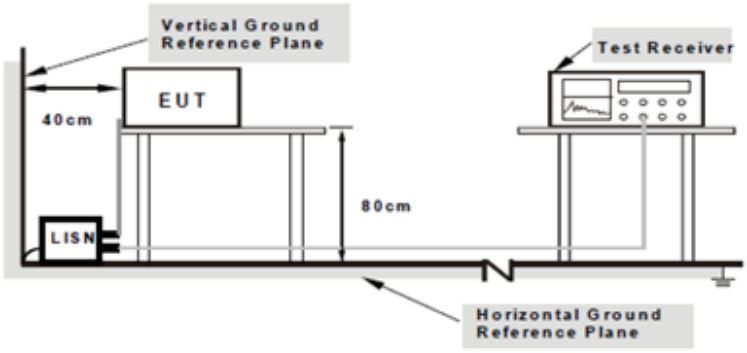
Temperature	22℃
Relative Humidity	57%
Atmospheric Pressure	1005mbar
Test date :	August 05, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.207, RSS210 (A8.1)	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.	☑

Frequency ranges (MHz)	Limit (dBμV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Test Setup



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

Procedure

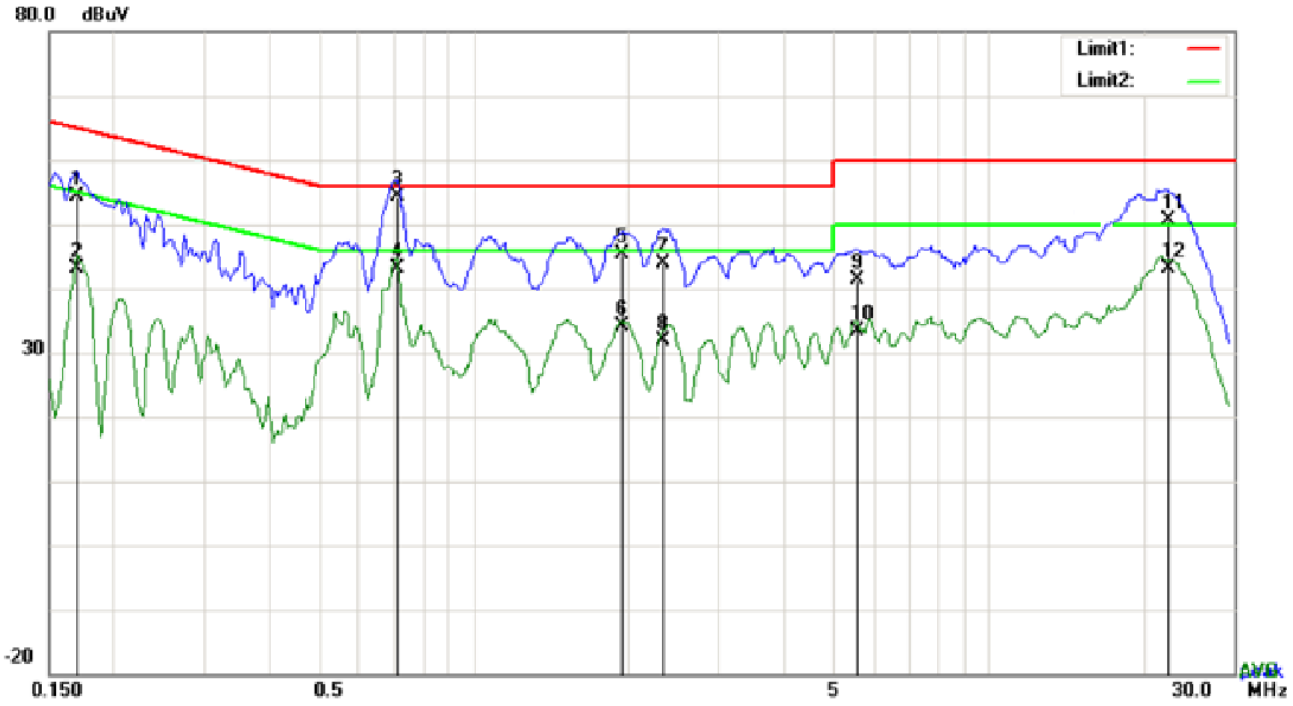
1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss

	coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode :	Bluetooth Mode

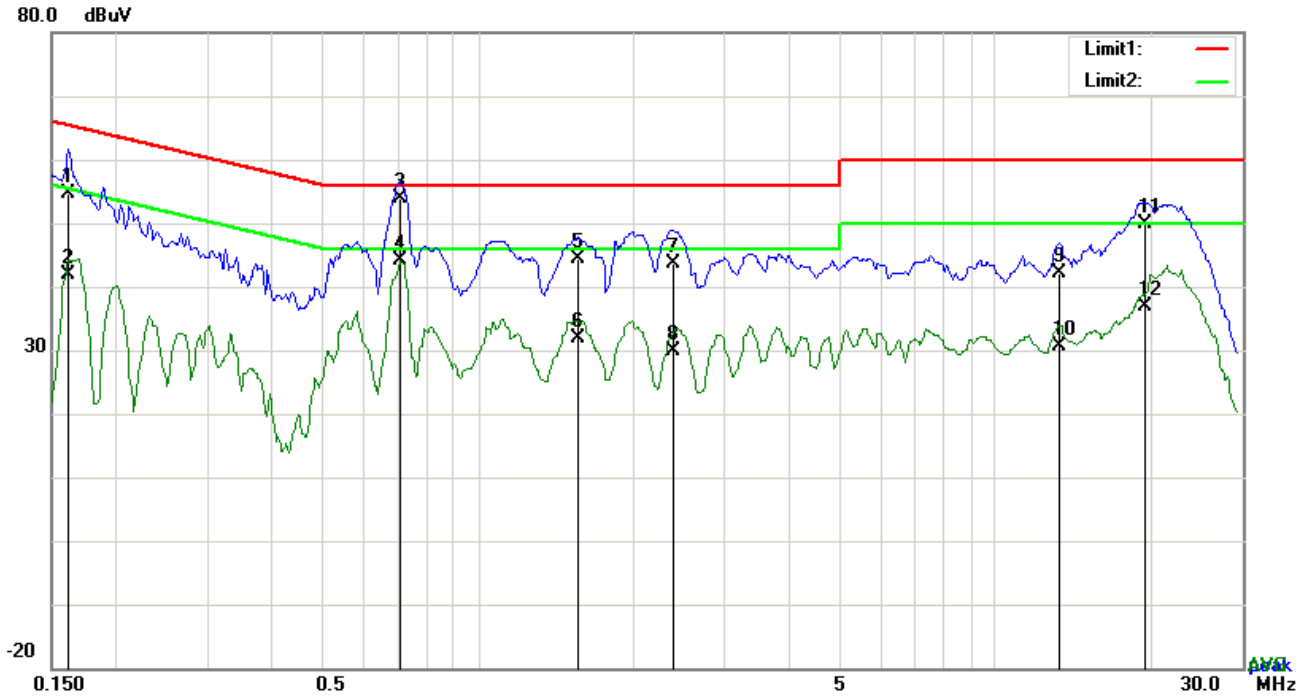


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1695	44.27	QP	10.03	54.30	64.98	-10.68
2	L1	0.1695	33.18	AVG	10.03	43.21	54.98	-11.77
3	L1	0.7155	44.37	QP	10.03	54.40	56.00	-1.60
4	L1	0.7155	33.04	AVG	10.03	43.07	46.00	-2.93
5	L1	1.9440	35.30	QP	10.04	45.34	56.00	-10.66
6	L1	1.9440	24.13	AVG	10.04	34.17	46.00	-11.83
7	L1	2.3379	33.84	QP	10.05	43.89	56.00	-12.11
8	L1	2.3379	21.71	AVG	10.05	31.76	46.00	-14.24
9	L1	5.5701	31.37	QP	10.09	41.46	60.00	-18.54
10	L1	5.5701	23.27	AVG	10.09	33.36	50.00	-16.64
11	L1	22.3011	40.22	QP	10.34	50.56	60.00	-9.44
12	L1	22.3011	32.69	AVG	10.34	43.03	50.00	-6.97

Test Mode :	Bluetooth Mode

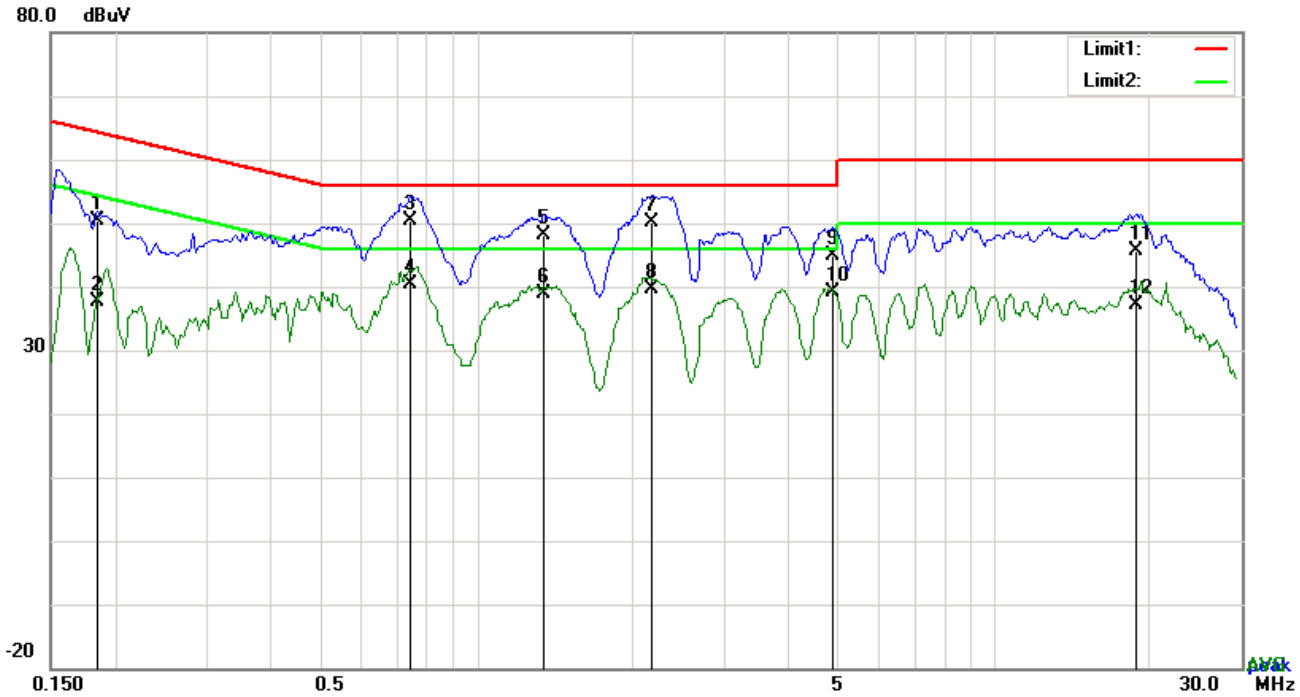


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1617	44.62	QP	10.02	54.64	65.38	-10.74
2	N	0.1617	31.85	AVG	10.02	41.87	55.38	-13.51
3	N	0.7077	43.84	QP	10.02	53.86	56.00	-2.14
4	N	0.7077	34.07	AVG	10.02	44.09	46.00	-1.91
5	N	1.5618	34.28	QP	10.04	44.32	56.00	-11.68
6	N	1.5618	21.77	AVG	10.04	31.81	46.00	-14.19
7	N	2.3886	33.70	QP	10.04	43.74	56.00	-12.26
8	N	2.3886	19.87	AVG	10.04	29.91	46.00	-16.09
9	N	13.3077	32.02	QP	10.18	42.20	60.00	-17.80
10	N	13.3077	20.46	AVG	10.18	30.64	50.00	-19.36
11	N	19.4775	39.68	QP	10.25	49.93	60.00	-10.07
12	N	19.4775	26.59	AVG	10.25	36.84	50.00	-13.16

Test Mode :	Bluetooth Mode

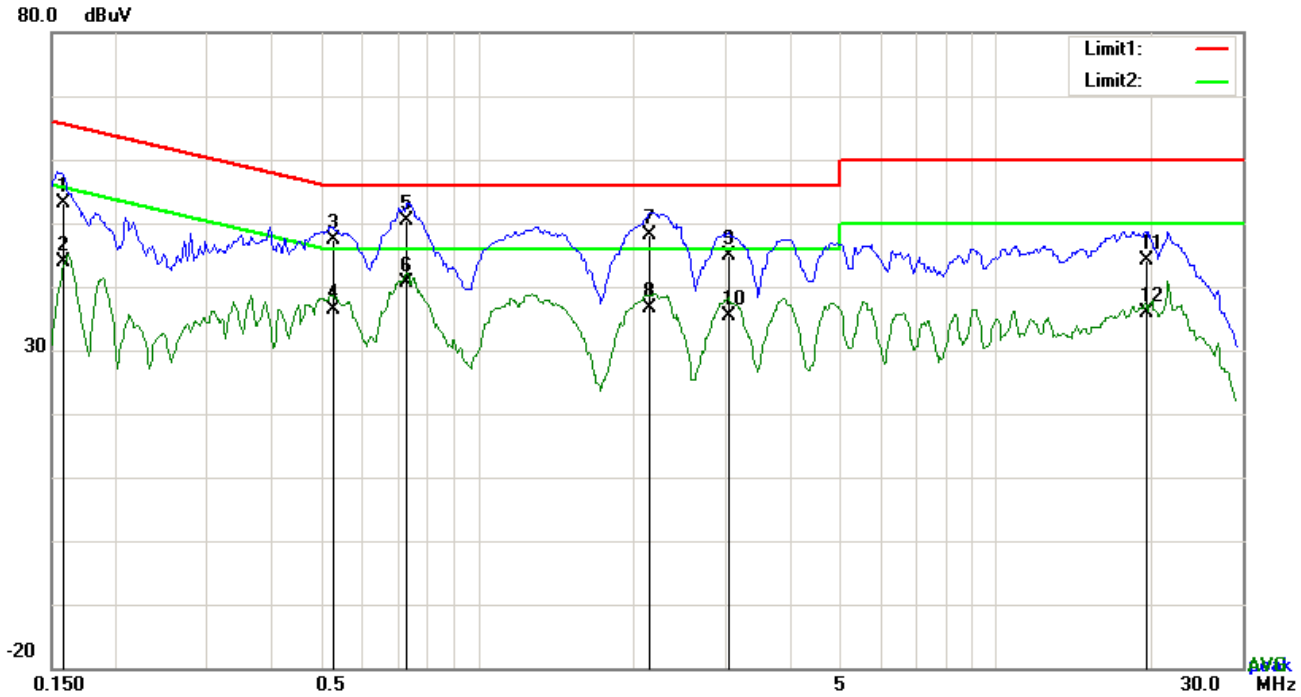


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.1851	40.25	QP	10.03	50.28	64.25	-13.97
2	L1	0.1851	27.54	AVG	10.03	37.57	54.25	-16.68
3	L1	0.7467	40.42	QP	10.03	50.45	56.00	-5.55
4	L1	0.7467	30.45	AVG	10.03	40.48	46.00	-5.52
5	L1	1.3473	38.07	QP	10.03	48.10	56.00	-7.90
6	L1	1.3473	28.80	AVG	10.03	38.83	46.00	-7.17
7	L1	2.1897	40.08	QP	10.04	50.12	56.00	-5.88
8	L1	2.1897	29.69	AVG	10.04	39.73	46.00	-6.27
9	L1	4.8642	34.83	QP	10.08	44.91	56.00	-11.09
10	L1	4.8642	28.99	AVG	10.08	39.07	46.00	-6.93
11	L1	18.8028	35.23	QP	10.28	45.51	60.00	-14.49
12	L1	18.8028	26.84	AVG	10.28	37.12	50.00	-12.88

Test Mode :	Bluetooth Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.1582	43.16	QP	10.02	53.18	65.56	-12.38
2	N	0.1582	33.75	AVG	10.02	43.77	55.56	-11.79
3	N	0.5244	37.33	QP	10.02	47.35	56.00	-8.65
4	N	0.5244	26.32	AVG	10.02	36.34	46.00	-9.66
5	N	0.7311	40.45	QP	10.02	50.47	56.00	-5.53
6	N	0.7311	30.73	AVG	10.02	40.75	46.00	-5.25
7	N	2.1546	38.21	QP	10.04	48.25	56.00	-7.75
8	N	2.1546	26.62	AVG	10.04	36.66	46.00	-9.34
9	N	3.0576	34.73	QP	10.05	44.78	56.00	-11.22
10	N	3.0576	25.40	AVG	10.05	35.45	46.00	-10.55
11	N	19.5316	33.83	QP	10.25	44.08	60.00	-15.92
12	N	19.5316	25.57	AVG	10.25	35.82	50.00	-14.18

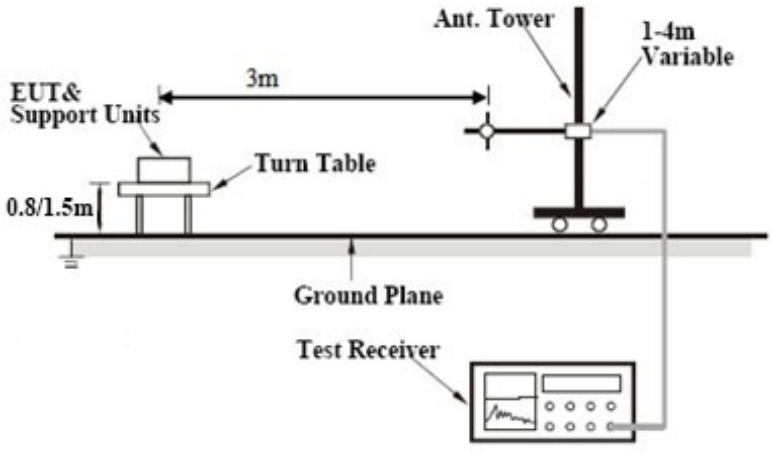
6.9 Radiated Spurious Emissions

Temperature	23℃
Relative Humidity	58%
Atmospheric Pressure	1006mbar
Test date :	August 06, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.205, §15.209, §15.247(d)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges	☑

Frequency range (MHz)	Field Strength (μV/m)
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:

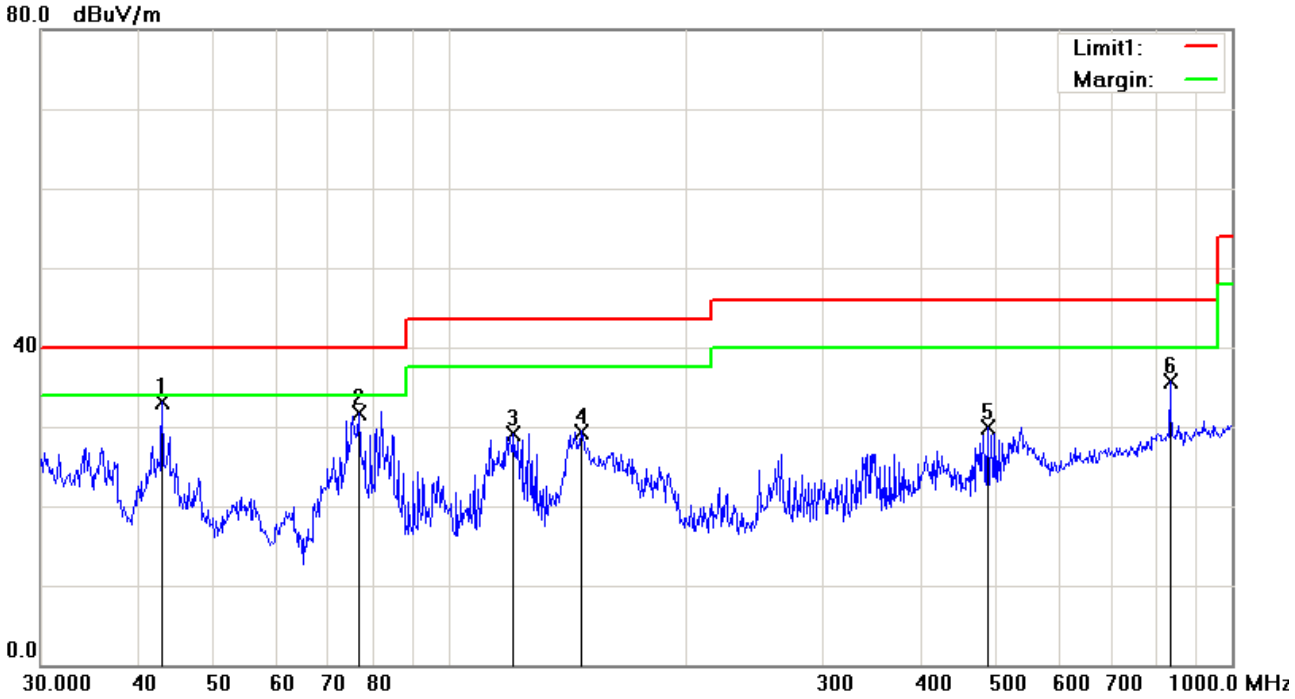
	a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. 4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. 5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Test Mode:	Bluetooth Mode

Below 1GHz

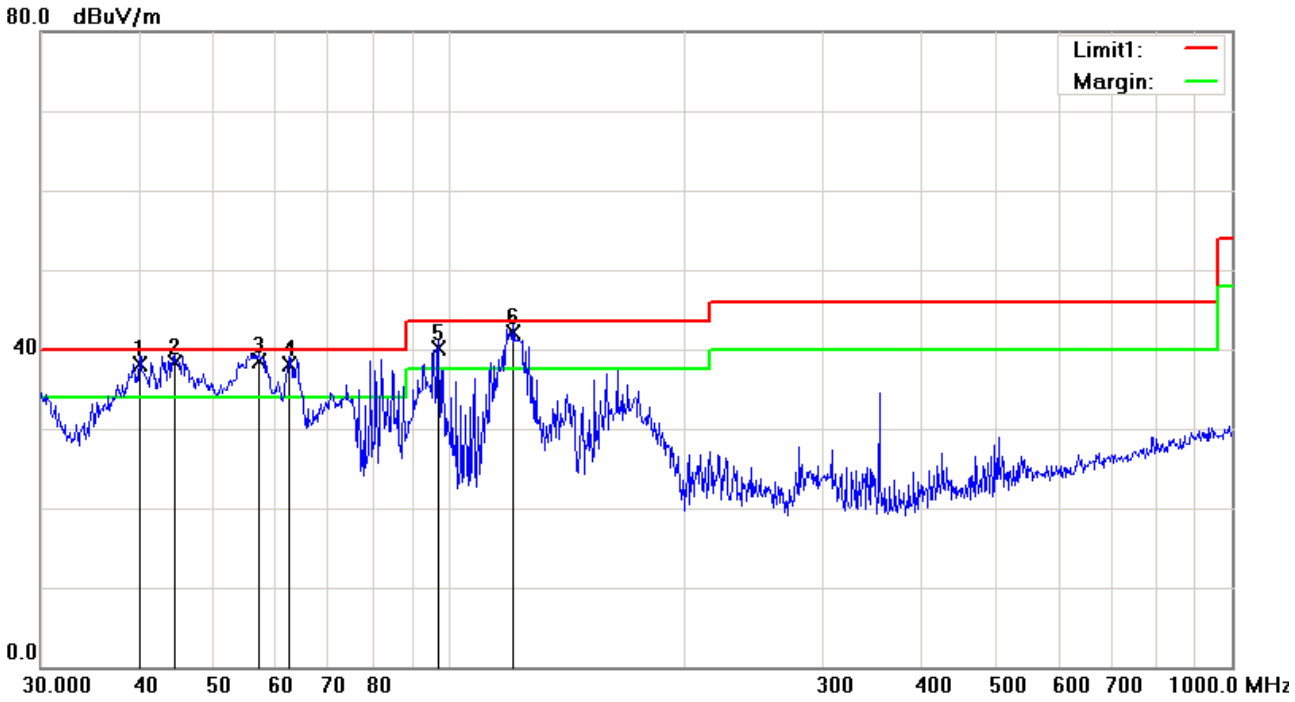


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	42.8998	42.55	peak	-9.53	33.02	40.00	-6.98	100	256
2	H	76.5121	45.45	peak	-13.75	31.70	40.00	-8.30	100	180
3	H	120.6991	36.49	peak	-7.35	29.14	43.50	-14.36	100	172
4	H	147.4036	37.84	peak	-8.44	29.40	43.50	-14.10	100	41
5	H	487.3151	31.93	peak	-2.04	29.89	46.00	-16.11	100	327
6	H	833.3171	32.03	peak	3.61	35.64	46.00	-10.36	100	55

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	40.1347	45.82	QP	-7.68	38.14	40.00	-1.86	100	289
2	V	44.4308	48.86	QP	-10.56	38.30	40.00	-1.70	100	107
3	V	56.9912	52.50	QP	-14.00	38.50	40.00	-1.50	100	156
4	V	62.4314	52.19	QP	-14.17	38.02	40.00	-1.98	100	52
5	V	96.7749	51.70	QP	-11.65	40.05	43.50	-3.45	100	95
6	V	120.6991	49.36	QP	-7.35	42.01	43.50	-1.49	100	124

Test Mode:	Transmitting Mode

Low Channel: GFSK Mode (Worst Case) (2402 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4804	38.66	AV	V	33.67	6.86	32.66	46.53	54	-7.47
4804	38.51	AV	H	33.67	6.86	32.66	46.38	54	-7.62
4804	47.95	PK	V	33.67	6.86	32.66	55.82	74	-18.18
4804	47.38	PK	H	33.67	6.86	32.66	55.25	74	-18.75
17831	24.53	AV	V	45.03	11.21	32.38	48.39	54	-5.61
17831	24.29	AV	H	45.03	11.21	32.38	48.15	54	-5.85
17831	40.91	PK	V	45.03	11.21	32.38	64.77	74	-9.23
17831	40.65	PK	H	45.03	11.21	32.38	64.51	74	-9.49

Middle Channel: GFSK Mode (Worst Case) (2441 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4882	38.75	AV	V	33.71	6.95	32.74	46.67	54	-7.33
4882	38.63	AV	H	33.71	6.95	32.74	46.55	54	-7.45
4882	48.01	PK	V	33.71	6.95	32.74	55.93	74	-18.07
4882	47.67	PK	H	33.71	6.95	32.74	55.59	74	-18.41
17859	24.16	AV	V	45.15	11.18	32.41	48.08	54	-5.92
17859	24.02	AV	H	45.15	11.18	32.41	47.94	54	-6.06
17859	41.25	PK	V	45.15	11.18	32.41	65.17	74	-8.83
17859	40.79	PK	H	45.15	11.18	32.41	64.71	74	-9.29

High Channel: π /4 DQPSK Mode (Worst Case) (2480 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4960	38.59	AV	V	33.9	6.76	32.74	46.51	54	-7.49
4960	38.46	AV	H	33.9	6.76	32.74	46.38	54	-7.62
4960	48.12	PK	V	33.9	6.76	32.74	56.04	74	-17.96
4960	47.95	PK	H	33.9	6.76	32.74	55.87	74	-18.13
17827	24.72	AV	V	45.22	11.35	32.38	48.91	54	-5.09
17827	24.48	AV	H	45.22	11.35	32.38	48.67	54	-5.33
17827	41.35	PK	V	45.22	11.35	32.38	65.54	74	-8.46
17827	41.09	PK	H	45.22	11.35	32.38	65.28	74	-8.72

Note:

*1, The testing has been conformed to 10*2480MHz=24,800MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

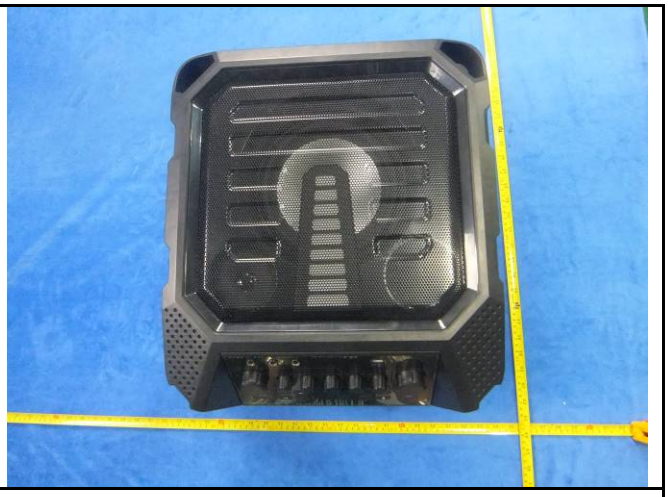
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/17/2015	09/16/2016	☑
Line Impedance	LI-125A	191106	09/25/2015	09/24/2016	☑
Line Impedance	LI-125A	191107	09/25/2015	09/24/2016	☑
LISN	ISN T800	34373	09/25/2015	09/24/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Transient Limiter	LIT-153	531118	09/01/2015	08/31/2016	☑
RF conducted test					
Agilent ESA-E SERIES	E4407B	MY45108319	09/17/2015	09/16/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
Positioning Controller	UC3000	MF780208282	11/19/2015	11/18/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/24/2016	03/23/2017	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	☑

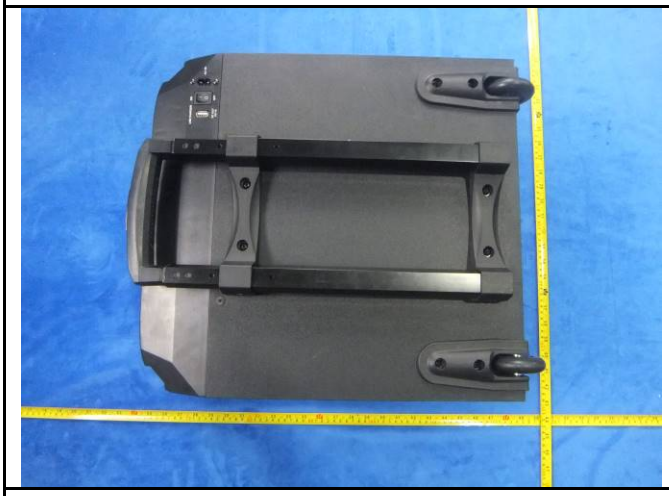
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

Whole Package View



EUT - Front View



EUT - Rear View

EUT – Top View

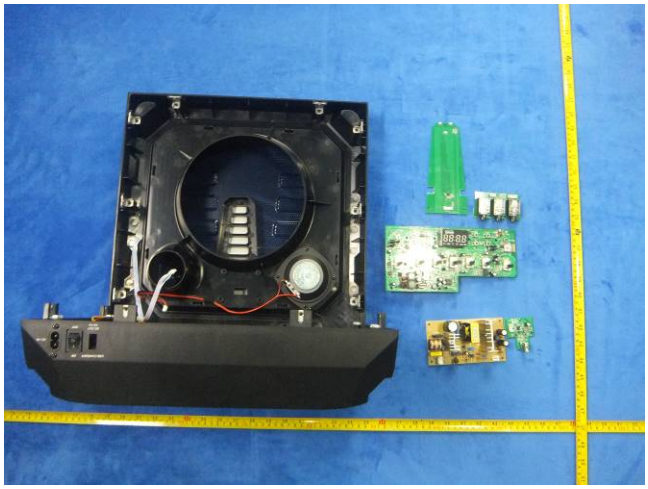
EUT - Bottom View

EUT - Left View

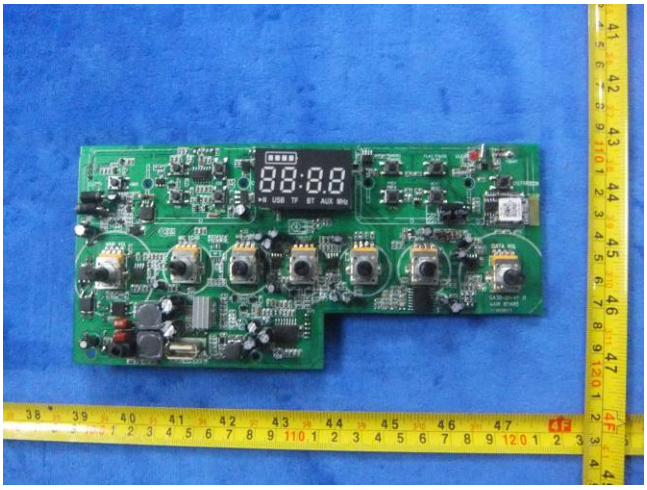
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

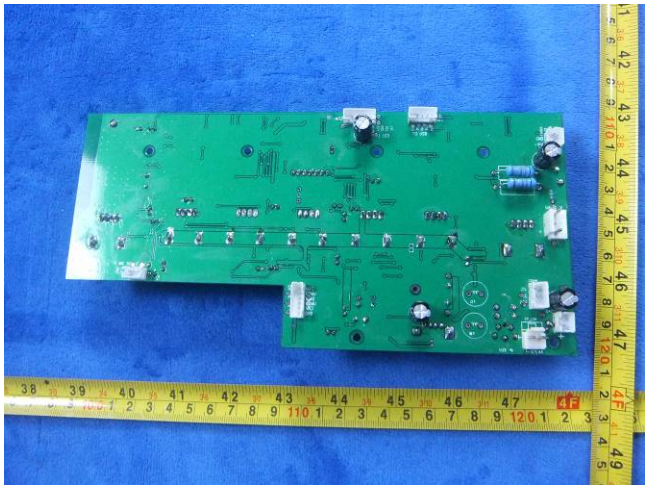
Cover Off - Top View 1



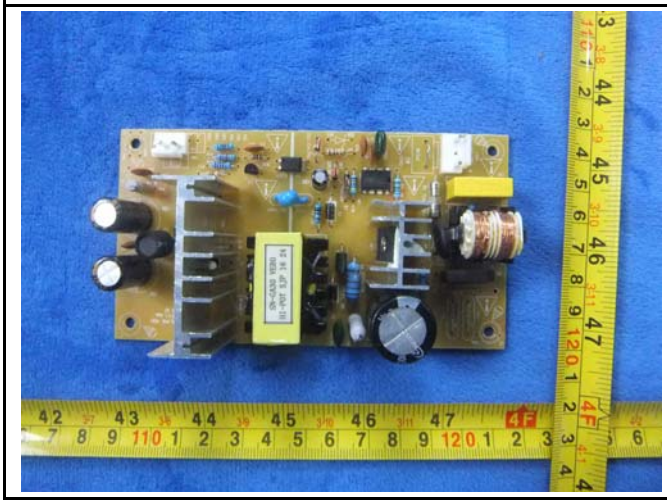
Cover Off - Top View 2



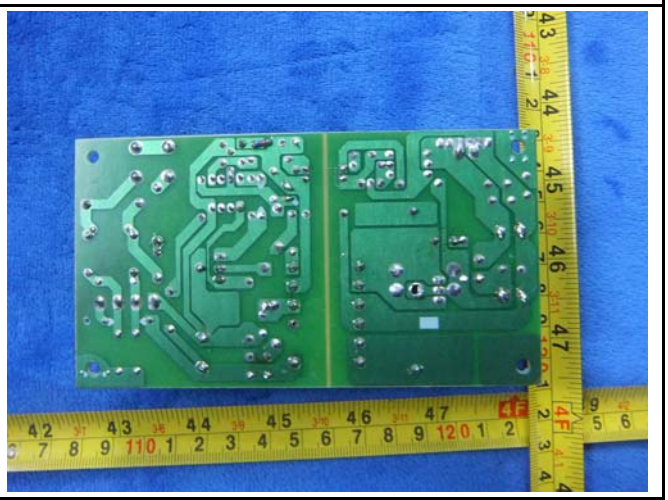
Main Board - Front View



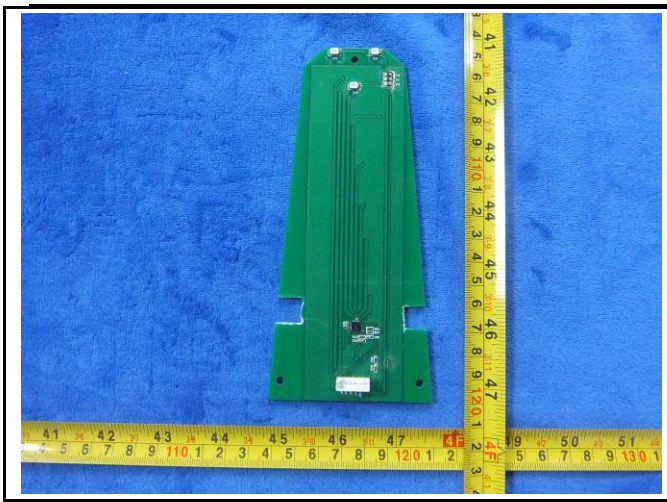
Main Board - Rear View



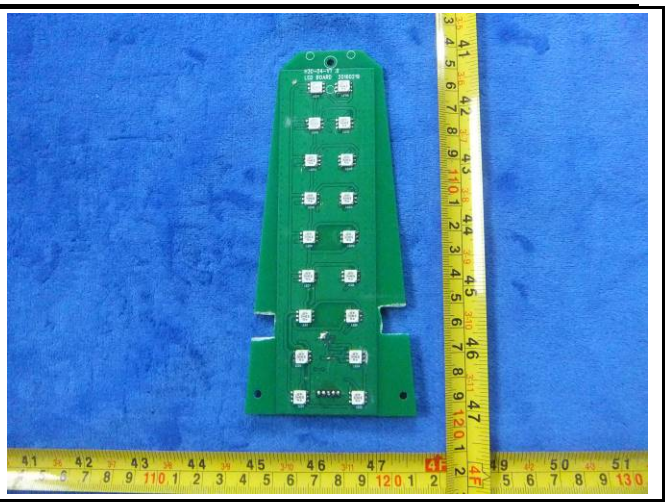
Power Board - Front View



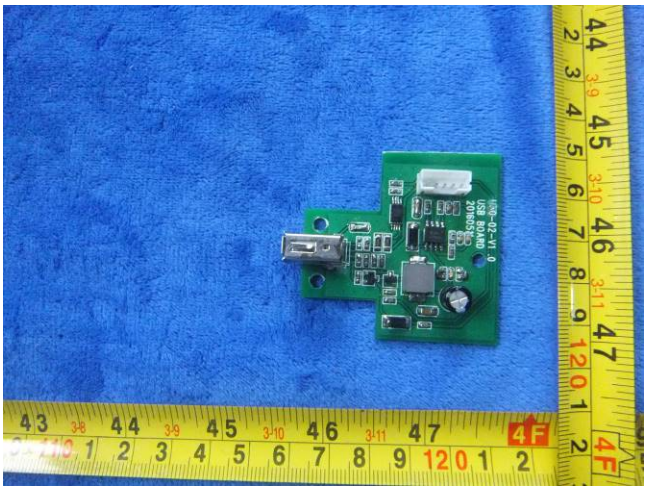
Power Board - Rear View



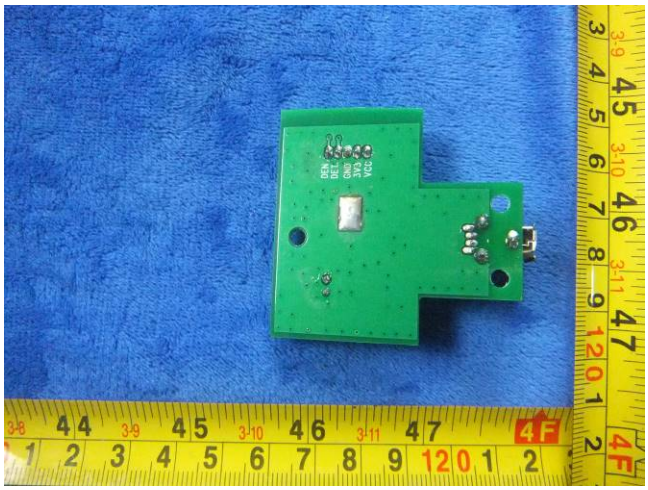
LED Board - Front View



LED Board - Rear View

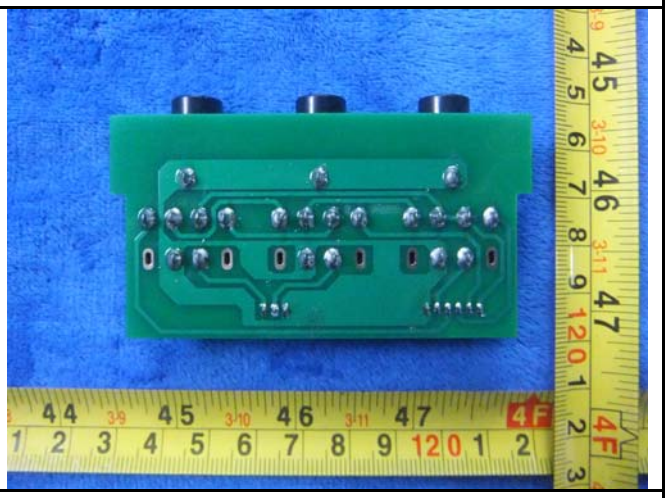


Connector Board- Front View

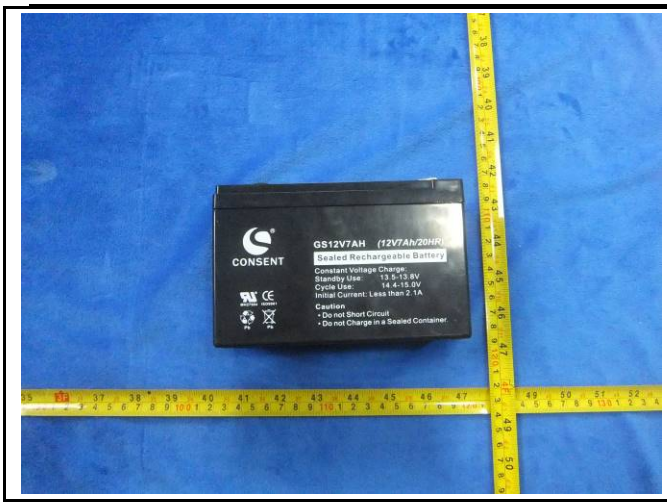


Connector Board- Rear View

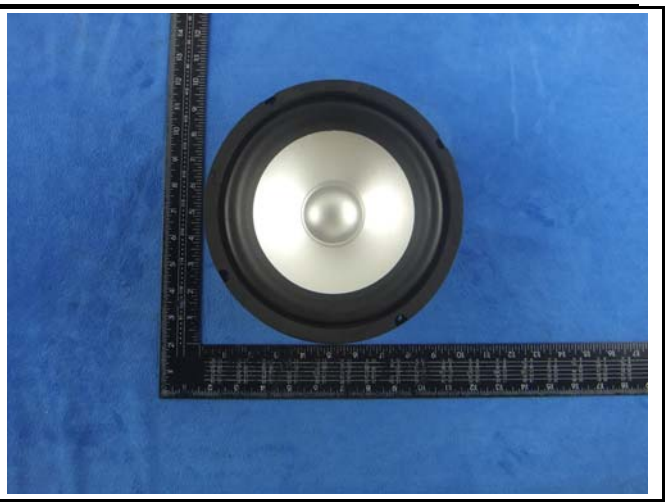
knob Board- Front View



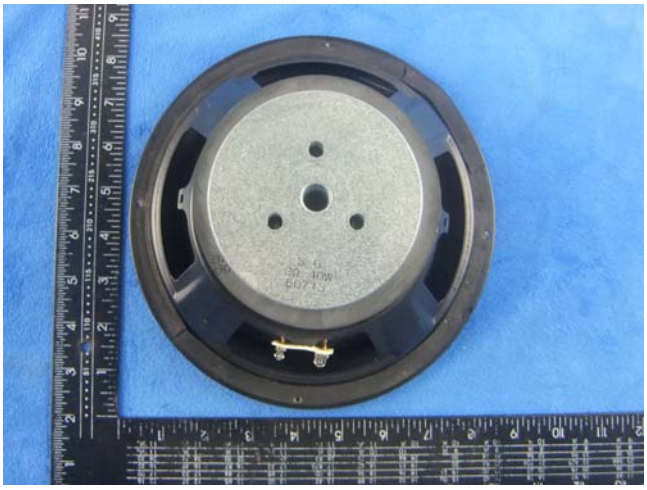
knob Board- rear View



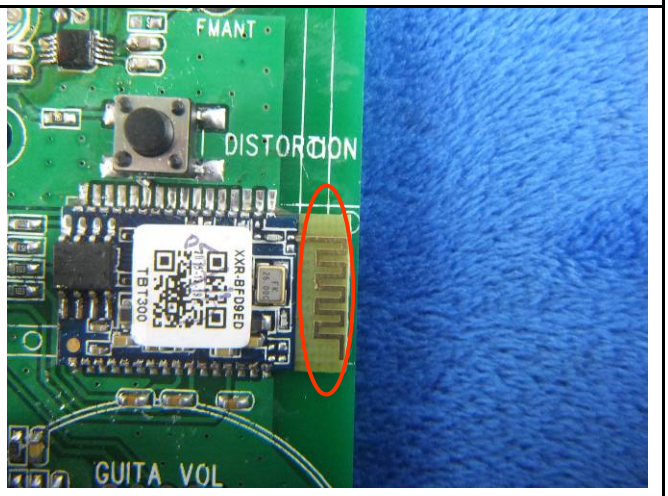
Batter View



Sperker-Top View



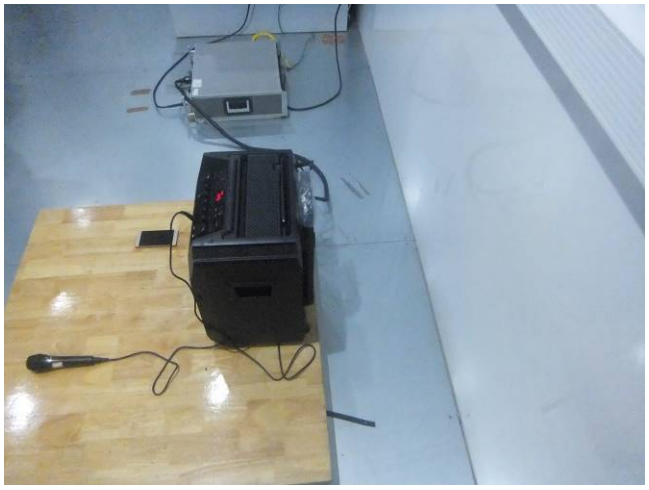
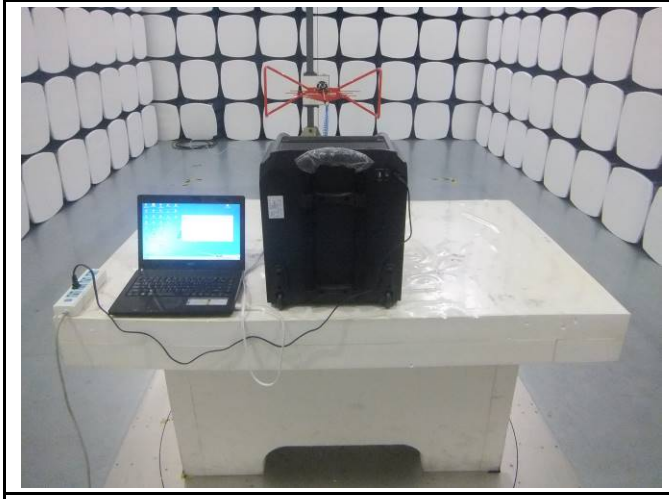
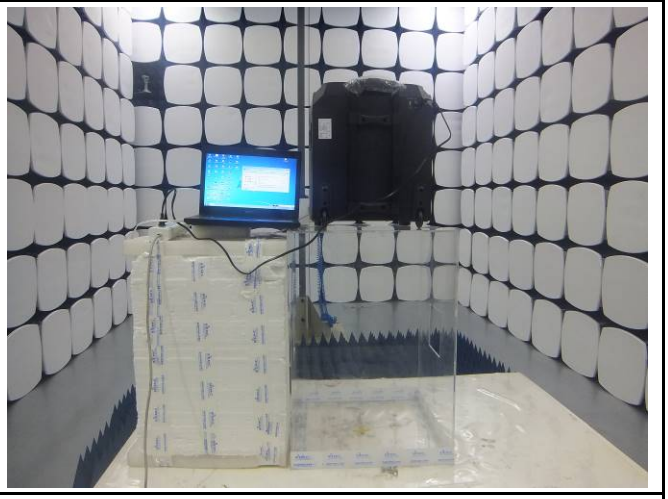
Sperker-Bottom View



BT – Antenna View

FM-Antenna

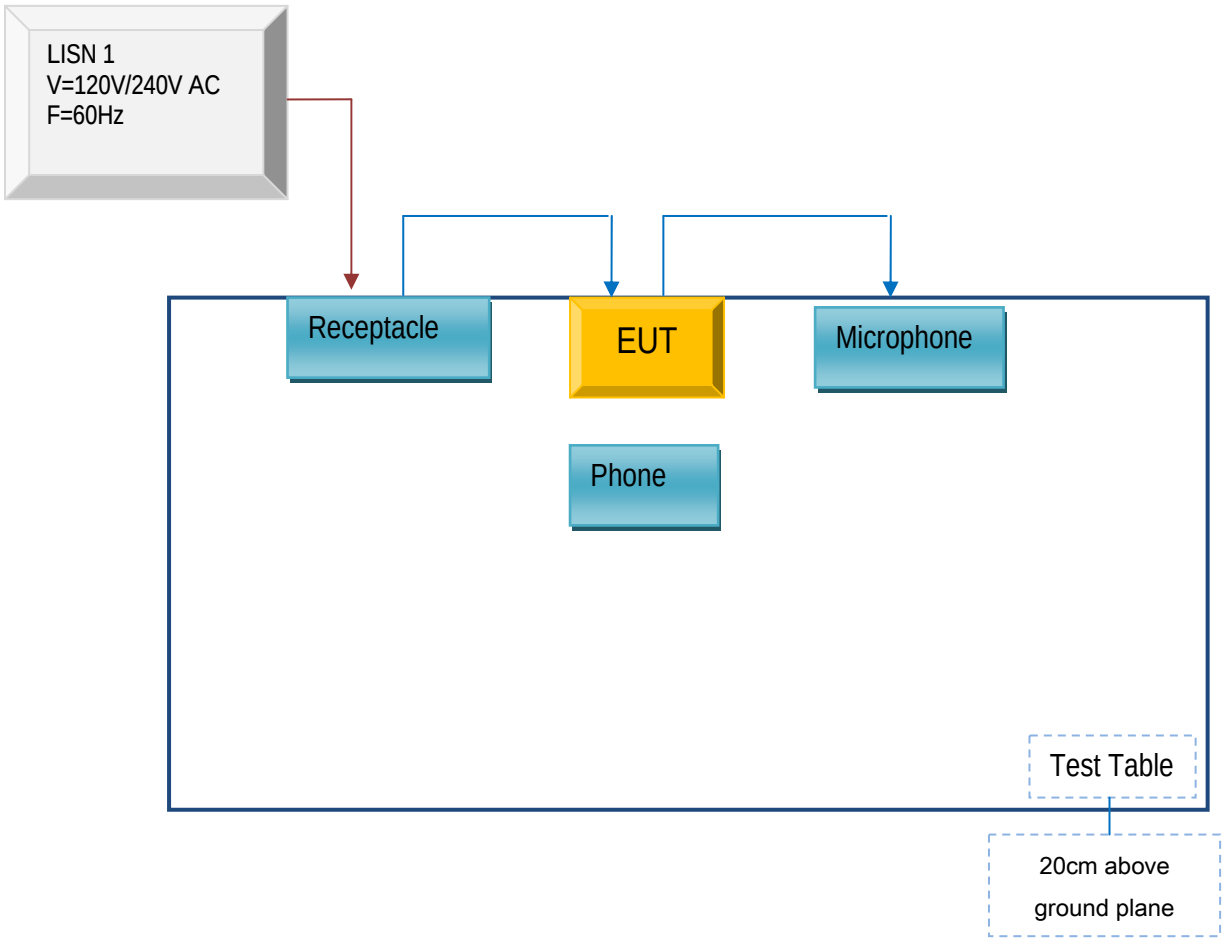
Annex B.iii. Photograph: Test Setup Photo

	
Conducted Emissions Test Setup – Front View	Conducted Emissions Test Setup – Side View
	
Radiated Spurious Emissions Test Setup Below 1GHz	Radiated Spurious Emissions Test Above 1GHz

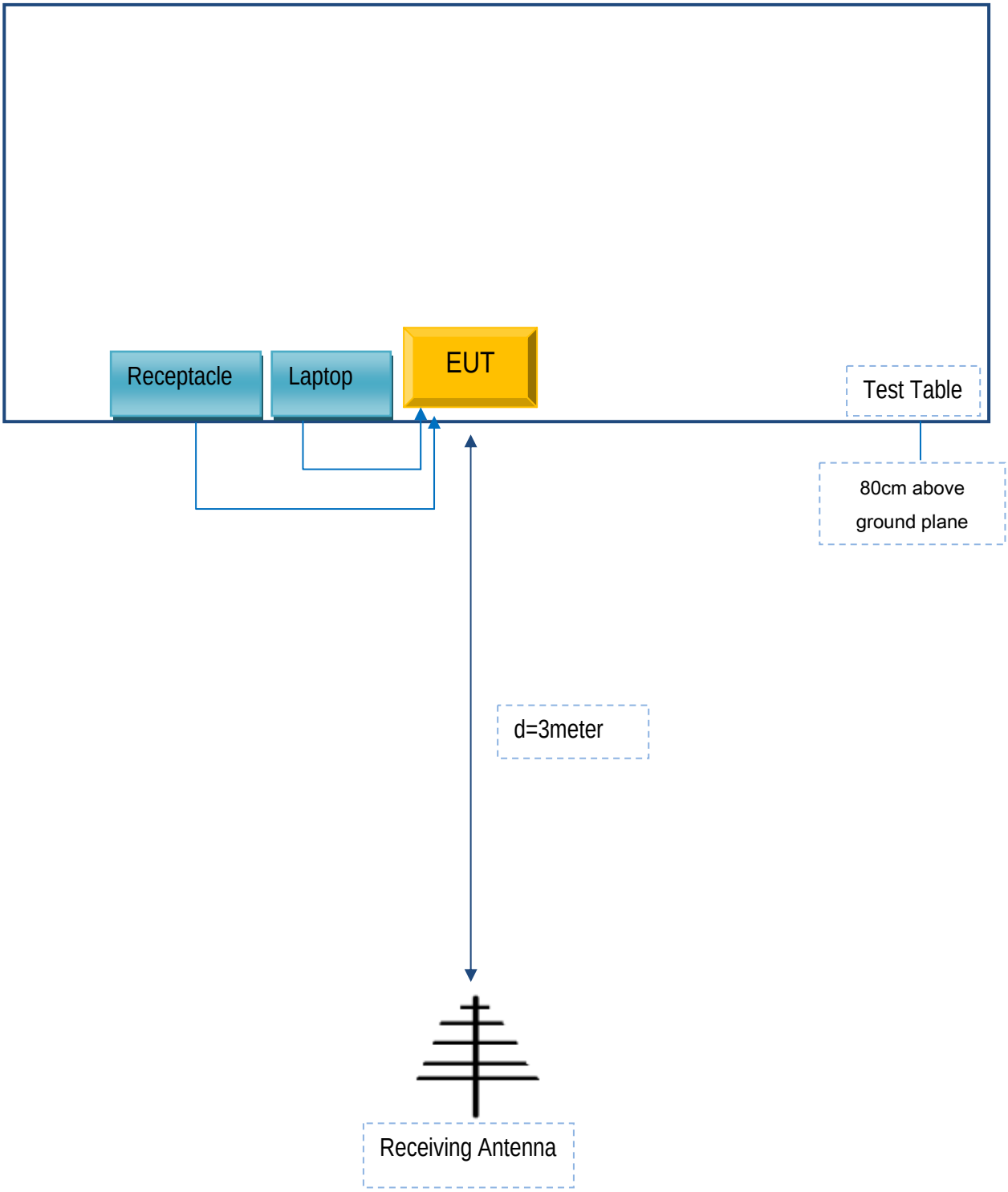
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

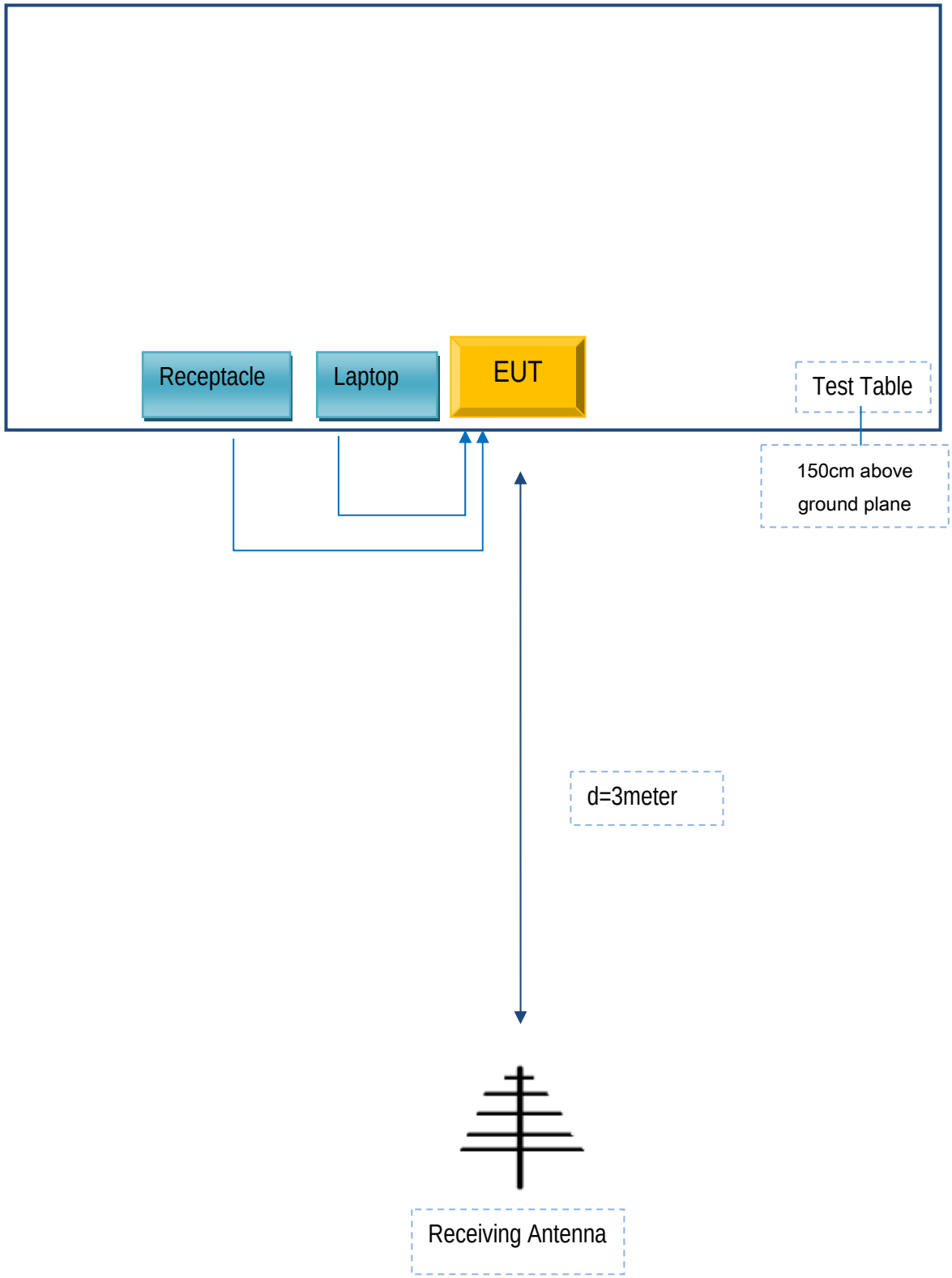
Block Configuration Diagram for AC Line Conducted Emissions



Block Configuration Diagram for Radiated Emission (Below 1GHz) .



Block Configuration Diagram for Radiated Emission (Above 1GHz) .



Annex C. iI. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Lenovo Laptop	E40	N3-F5022
Lenovo	AC Adapter	42T4416	21D9JU
Mi	Phone	MI 4W	W01400

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
Power Cable	Un-shielding	No	50cm	Y201301
MIC Cable	Un-shielding	No	2m	TX021131
USB Cable	Un-shielding	No	0.5m	S11021

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

Annex E. DECLARATION OF SIMILARITY

SHENZHEN NEW SUN DIGITAL CO.,LTD

To: SIEMIC ,775 Montague Expressway, Milpitas, CA 95035,USA

Declaration Letter

Dear Sir,

For our business issue and marketing requirement, we would like to list 23 model numbers on
the **FCCID** certificates and reports, as following:

Model No: AIL-899
We declare that the difference of these is listed as below:

Main Model No	Serial Model No	Difference
AIL-899	AIL-887, AIL-989, AIL-999, GA-10, GA-12, GA-15, GA-16, GA-18, GA-19, GA-20, GA-30, H-10, H-11, H-12, H-13, H-15, H-16, H-17,H-18, H-19,H-20, H-30	The color and model are different, the internal pcb layout、 schematics, structure and key components are the same

Thank you!

Signature: 

Printed name/title: Jiang hongfeng
Tel: 0755-29839301
Fax: 0755-29839301
Address: BUILDING 3,4TH SHUITIAN INDUSTRIAL ZONE, SHIYAN TOWN BAOAN DISTRICT, SHENZHEN