

RF TEST REPORT



Report No.: 16070659-FCC-R2

Supersede Report No.: N/A

Applicant	SMT TELECOMM HK LIMITED	
Product Name	Mobile Phone	
Model No.	X401	
Serial No.	N/A	
Test Standard	FCC Part 15.247: 2014, ANSI C63.10: 2013	
Test Date	May 12 to May 23, 2015	
Issue Date	June 07, 2016	
Test Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Winnie.Zhang	Chris You	
Lucifer He Test Engineer	Chris You Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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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
16070659-FCC-R2	NONE	Original	June 07,2016

2. Customer information

Applicant Name	SMT TELECOMM HK LIMITED
Applicant Add	Unit C 8/F, CHARMHILL CTR 50 HILLWOOD RD TST KL
Manufacturer	SMT TELECOMM HK LIMITED
Manufacturer Add	Unit C 8/F, CHARMHILL CTR 50 HILLWOOD RD TST KL

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:	Mobile Phone
Main Model:	X401
Serial Model:	N/A
Date EUT received:	May 11, 2015
Test Date(s):	May 12 to May 23, 2015
Equipment Category :	DSS
Antenna Gain:	GSM850: -0.4 dBi PCS1900: 0.5 dBi UMTS-FDD Band V: -0.4dBi UMTS-FDD Band II: 0.5dBi Bluetooth/BLE: 0.4dBi WIFI: 0.4 dBi
Type of Modulation:	GSM / GPRS: GMSK UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK
RF Operating Frequency (ies):	GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz UMTS-FDD Band II TX: 1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz WIFI: 802.11b/g/n(20M): 2412-2462 MHz WIFI: 802.11n(40M): 2422-2452 MHz Bluetooth& BLE: 2402-2480 MHz
Max. Output Power:	GFSK: 3.102 dBm

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GSM 850: 124CH
PCS1900: 299CH
UMTS-FDD Band V : 102CH
UMTS-FDD Band II : 277CH
WIFI :802.11b/g/n(20M): 11CH
WIFI :802.11n(40M): 7CH
Bluetooth: 79CH
BLE: 40CH

Number of Channels: Power Port, Earphone Port, USB Port

Adapter:

Model: PC X401
Input: AC 100-240V; 50/60Hz 0.15A Max

Input Power: Output: DC 5.0V; 0.5A

Battery:

Model: BP-X401
Spec: 3.7V 1200mAh
Charging Limit Voltage:4.2V

Trade Name : N/A

GPRS Multi-slot class 8/10/12

FCC ID: 2AIMEX401

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 2 antennas:

A permanently attached PIFA antenna for Bluetooth/BLE/WIFI, the gain is 0.4dBi for Bluetooth/BLE/WIFI.

A permanently attached PIFA antenna for GSM and UMTS, the gain is -0.4dBi for GSM850, -0.4dBi for UMTS-FDD Band V, 0.5dBi for PCS1900, the gain is 0.5dBi for UMTS-FDD Band II

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 Channel Separation

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	May 13, 2015
Tested By :	Lucifer He

Requirement(s):

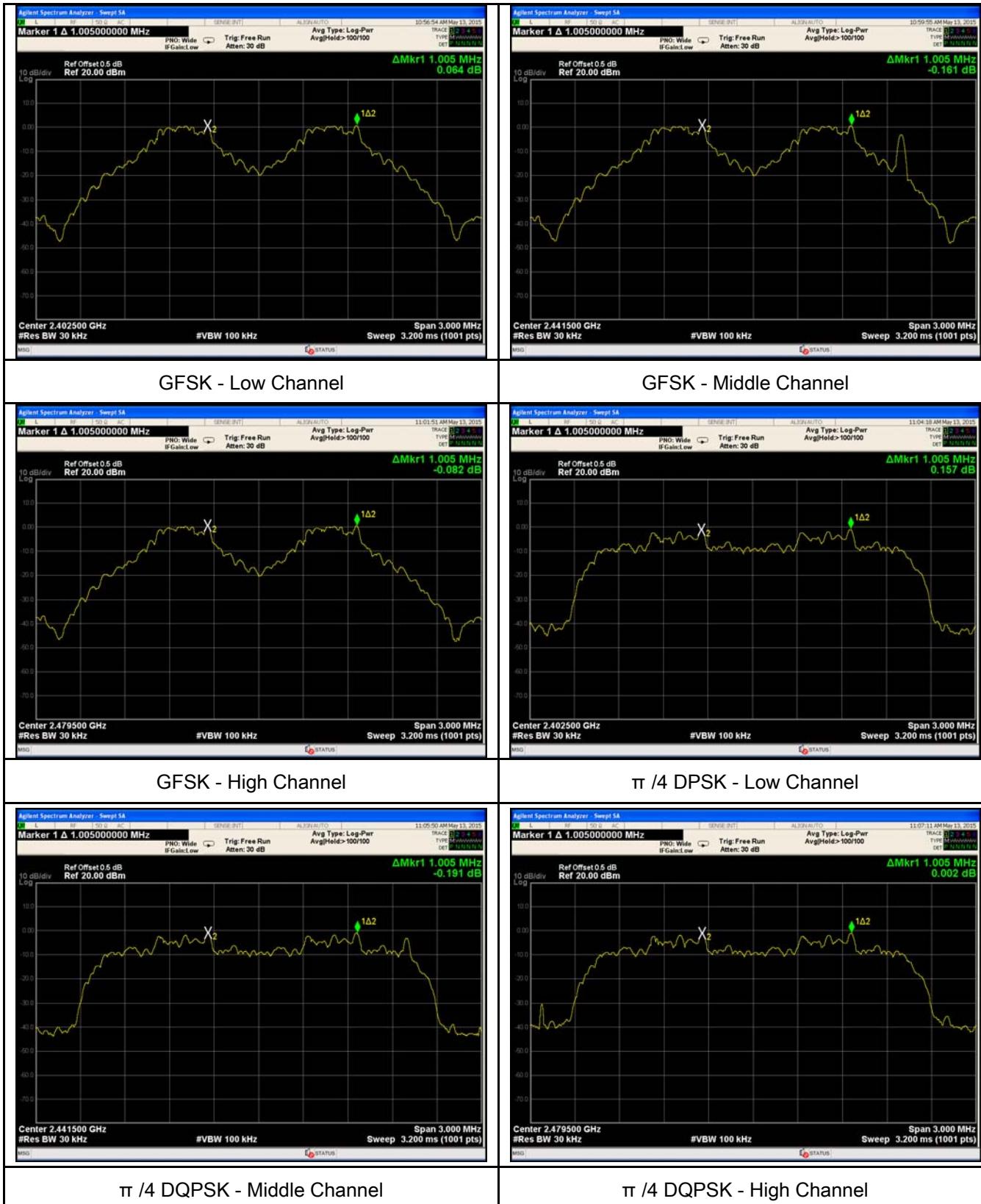
Remark		
Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Test Data	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> N/A
Test Plot	<input checked="" type="checkbox"/> Yes (See below)	<input type="checkbox"/> N/A

Channel Separation measurement result

Type/ Modulation	CH	CH Freq (MHz)	CH Separation (MHz)	Limit (MHz)	Result
CH Separation GFSK	Low Channel	2402	1.005	0.681	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.684	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.966	Pass
	Adjacency Channel	2479			
CH Separation $\pi/4$ DQPSK	Low Channel	2402	1.005	0.859	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.875	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.855	Pass
	Adjacency Channel	2479			
CH Separation 8DPSK	Low Channel	2402	1.005	0.865	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.861	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.861	Pass
	Adjacency Channel	2479			

Test Plots

Channel Separation measurement result





8DPSK - Low Channel



8DPSK - Middle Channel

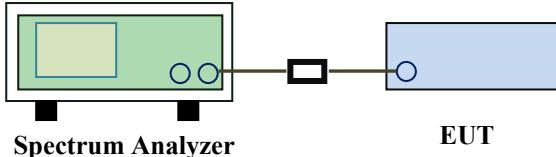


8DPSK - High Channel

6.3 20dB Bandwidth

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	May 13, 2015
Tested By :	Lucifer He

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.	<input checked="" type="checkbox"/>
Test Setup			
Test Procedure	<p>The test follows FCC Public Notice DA 00-705 Measurement Guidelines.</p> <p><u>Use the following spectrum analyzer settings:</u></p> <ul style="list-style-type: none"> - Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel - RBW \geq 1% of the 20 dB bandwidth - VBW \geq 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

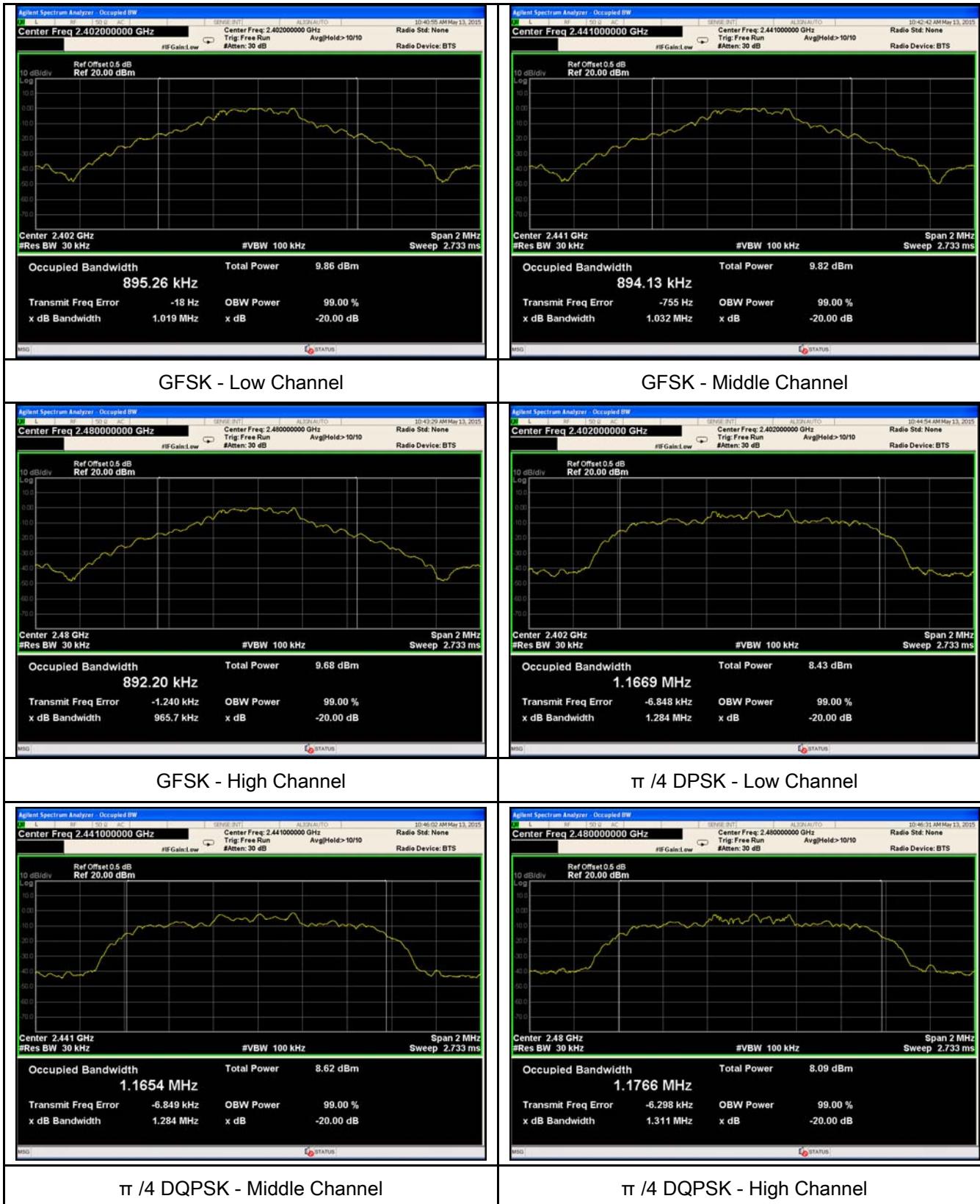
Test Plot Yes (See below) N/A

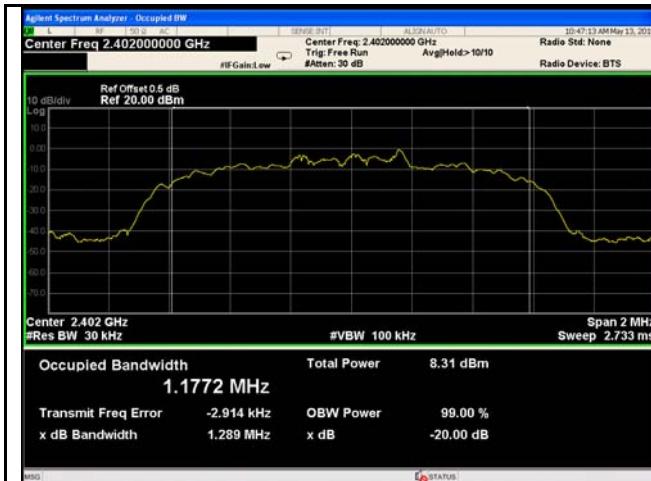
Measurement result

Modulation	CH	CH Freq (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GFSK	Low	2402	1.019	0.895
	Mid	2441	1.032	0.894
	High	2480	0.966	0.892
$\pi/4$ DQPSK	Low	2402	1.284	1.167
	Mid	2441	1.284	1.165
	High	2480	1.311	1.177
8-DPSK	Low	2402	1.289	1.177
	Mid	2441	1.288	1.176
	High	2480	1.289	1.179

Test Plots

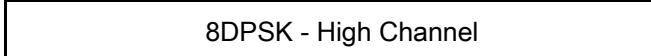
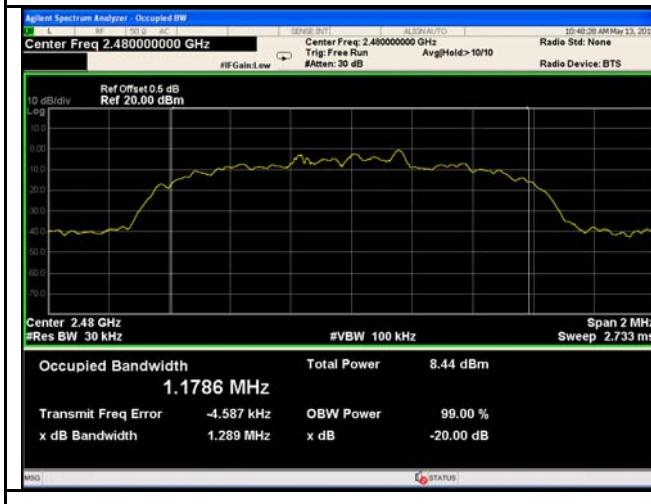
20dB Bandwidth measurement result





8DPSK - Low Channel

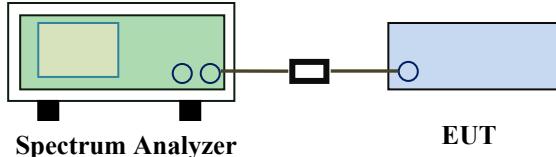
8DPSK - Middle Channel



6.4 Peak Output Power

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	May 13, 2015
Tested By :	Lucifer He

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b) (2)	a)	FHSS in 2400-2483.5MHz with \geq 75 channels: \leq 1 Watt	<input checked="" type="checkbox"/>
	b)	FHSS in 5725-5850MHz: \leq 1 Watt	<input type="checkbox"/>
	c)	For all other FHSS in the 2400-2483.5MHz band: \leq 0.125 Watt.	<input checked="" type="checkbox"/>
	d)	FHSS in 902-928MHz with \geq 50 channels: \leq 1 Watt	<input type="checkbox"/>
	e)	FHSS in 902-928MHz with \geq 25 & $<$ 50 channels: \leq 0.25 Watt	<input type="checkbox"/>
	f)	DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: \leq 1 Watt	<input type="checkbox"/>
Test Setup		 Spectrum Analyzer EUT	
Test Procedure		<p>The test follows FCC Public Notice DA 00-705 Measurement Guidelines.</p> <p><u>Use the following spectrum analyzer settings:</u></p> <ul style="list-style-type: none"> - Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel - RBW > the 20 dB bandwidth of the emission being measured - VBW \geq RBW - Sweep = auto - Detector function = peak - Trace = max hold 	

	<ul style="list-style-type: none"> - 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

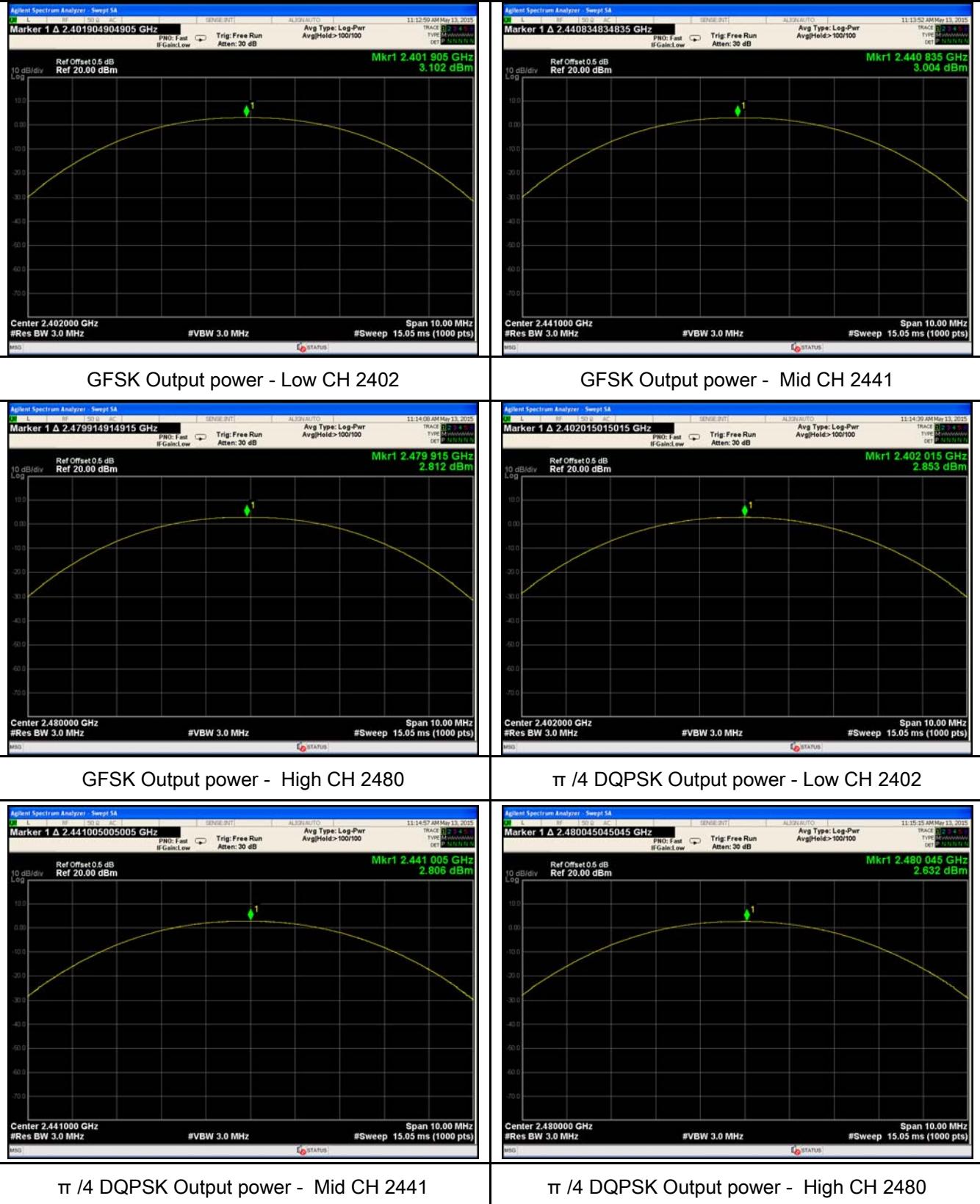
Test Plot Yes (See below) N/A

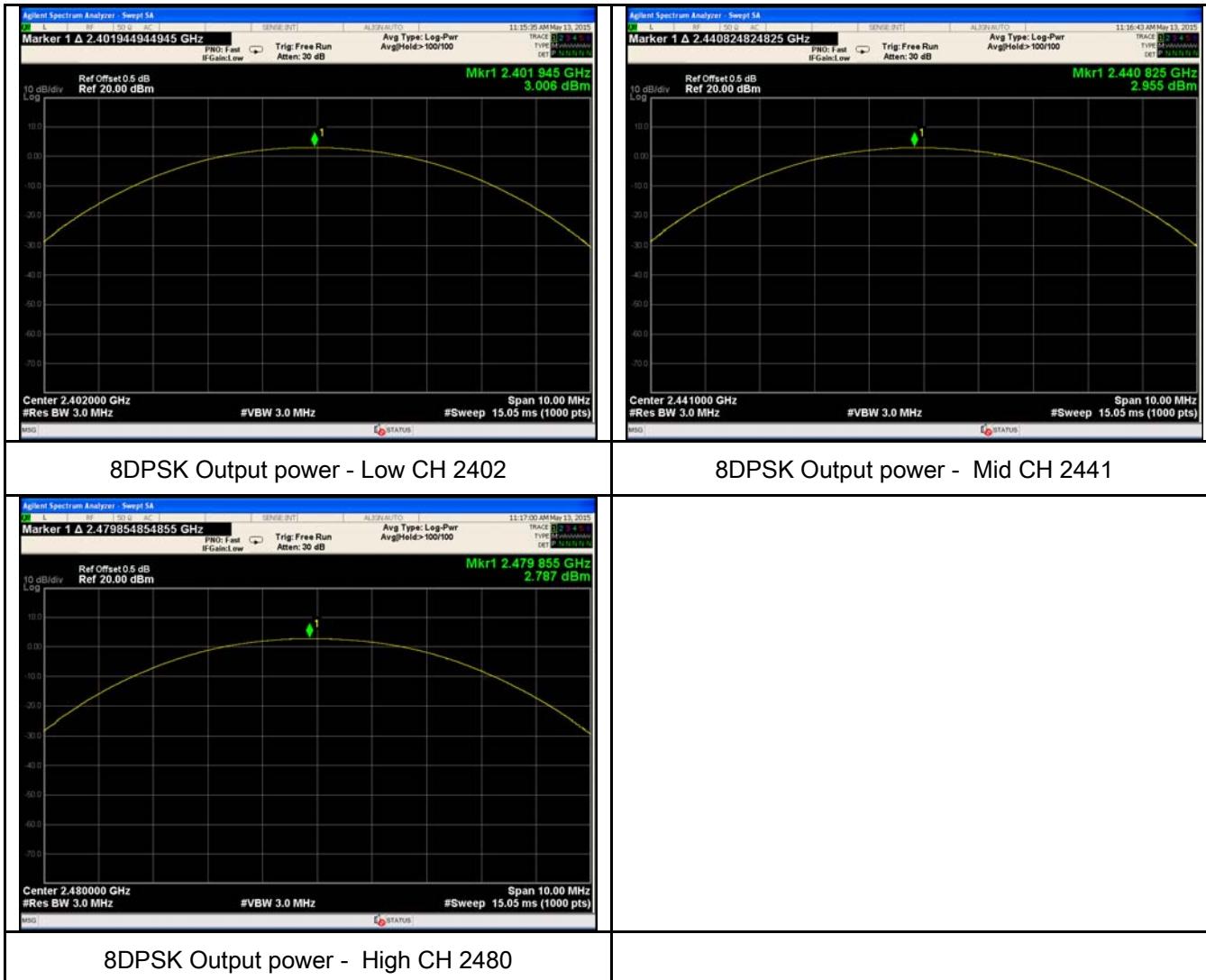
Peak Output Power measurement result

Type	Modulation	CH	Freq (MHz)	Conducted Power (dBm)	Limit (mW)	Result
Output power	GFSK	Low	2402	3.102	125	Pass
		Mid	2441	3.004	125	Pass
		High	2480	2.812	1000	Pass
	$\pi/4$ DQPSK	Low	2402	2.853	125	Pass
		Mid	2441	2.806	125	Pass
		High	2480	2.632	125	Pass
	8-DPSK	Low	2402	3.006	125	Pass
		Mid	2441	2.955	125	Pass
		High	2480	2.787	125	Pass

Test Plots

Output Power measurement result

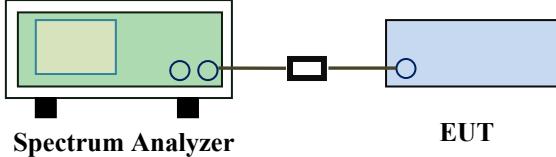




6.5 Number of Hopping Channel

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	May 13 2015
Tested By :	Lucifer He

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a) (1)(iii)	a)	FHSS in 2400-2483.5MHz \geq 15 channels	<input checked="" type="checkbox"/>
Test Setup			
Test Procedure	<p>The test follows FCC Public Notice DA 00-705 Measurement Guidelines.</p> <p><u>Use the following spectrum analyzer settings:</u></p> <p>The EUT must have its hopping function enabled.</p> <ul style="list-style-type: none"> - Span = the frequency band of operation - RBW \geq 1% of the span - VBW \geq 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

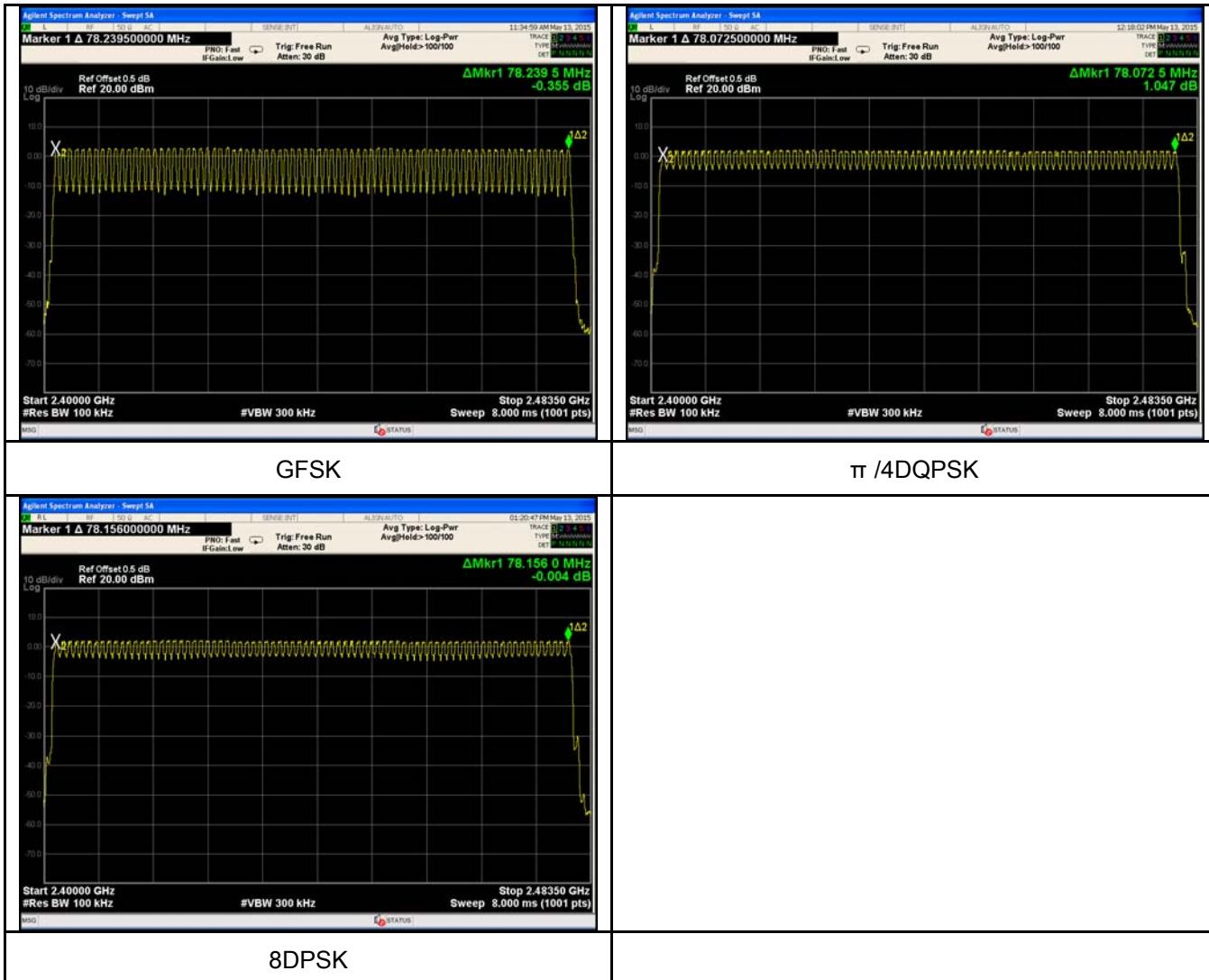
Test Plot Yes (See below) N/A

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
	$\pi/4$ DQPSK	2400-2483.5	79	15
	8-DPSK	2400-2483.5	79	15

Test Plots

Number of Hopping Channels measurement result



6.6 Time of Occupancy (Dwell Time)

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	May 13, 2015
Tested By :	Lucifer He

Requirement(s):

Test Data Yes N/A

Yes (See below) N/A

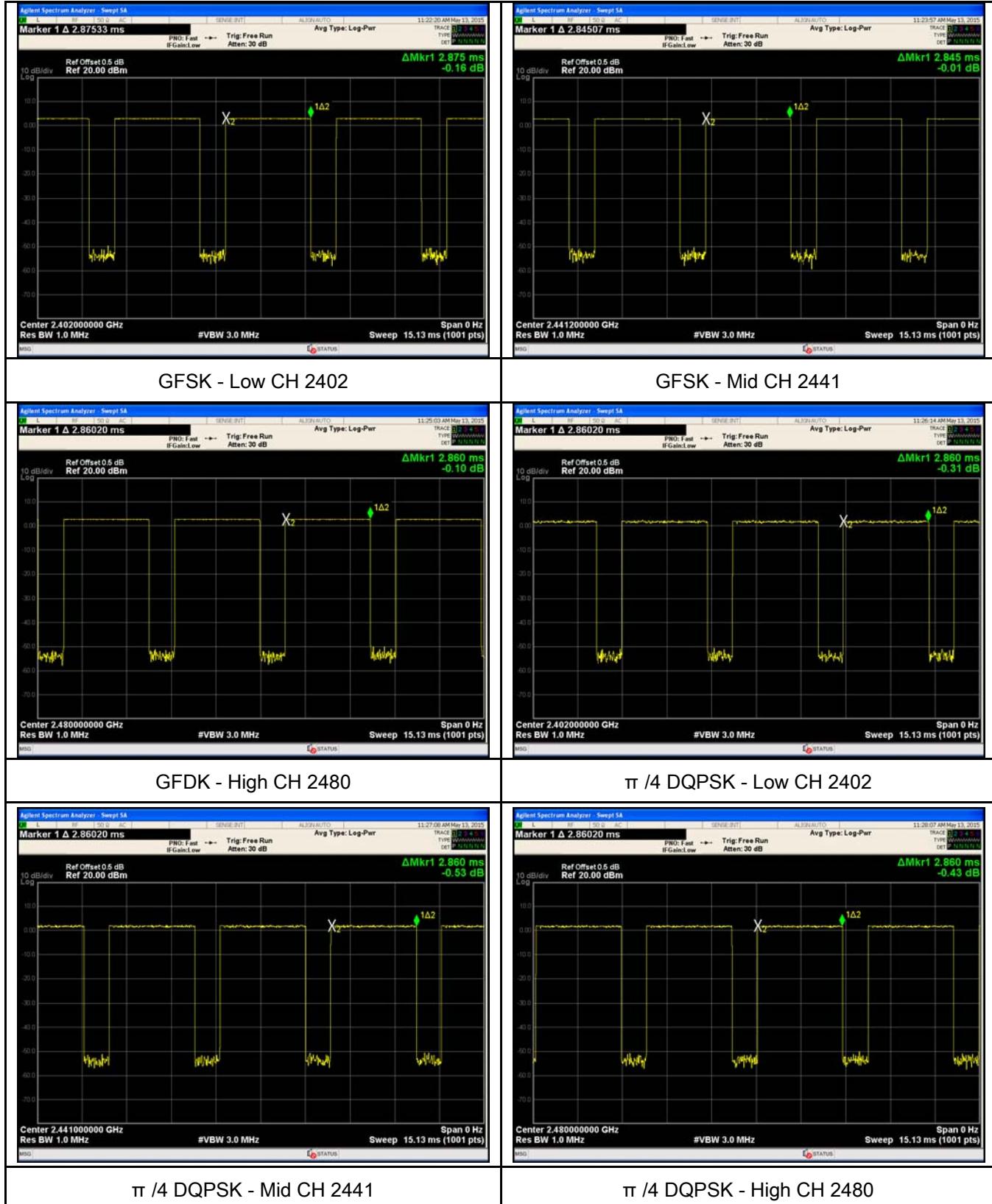
Dwell Time measurement result

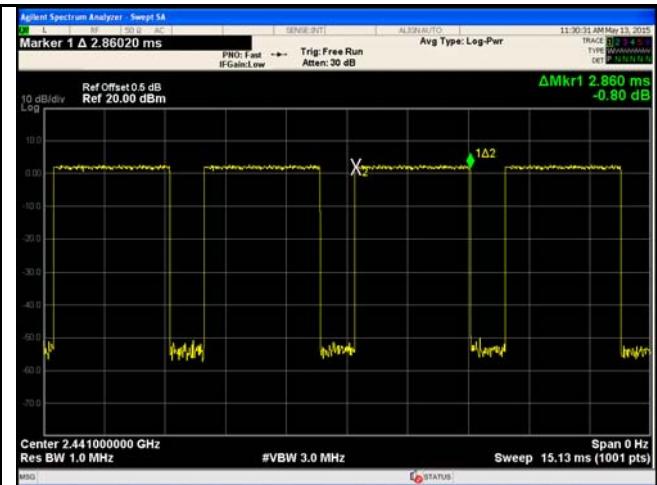
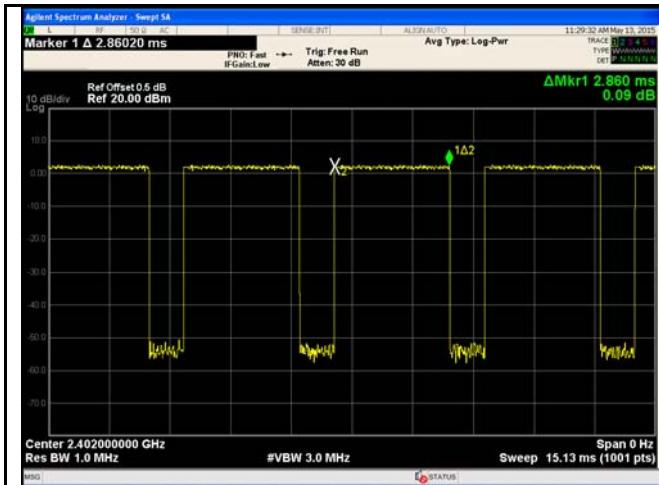
Type	Modulation	CH	Pulse Width (ms)	Dwell Time (ms)	Limit (ms)	Result
Dwell Time	GFSK	Low	2.875	306.667	400	Pass
		Mid	2.846	303.573	400	Pass
		High	2.860	305.067	400	Pass
	$\pi/4$ DQPSK	Low	2.860	305.067	400	Pass
		Mid	2.860	305.067	400	Pass
		High	2.860	305.067	400	Pass
	8-DPSK	Low	2.860	305.067	400	Pass
		Mid	2.860	305.067	400	Pass
		High	2.860	305.067	400	Pass

Note: Dwell time=Pulse Time (ms) \times (1600 \div 6 \div 79) \times 31.6

Test Plots

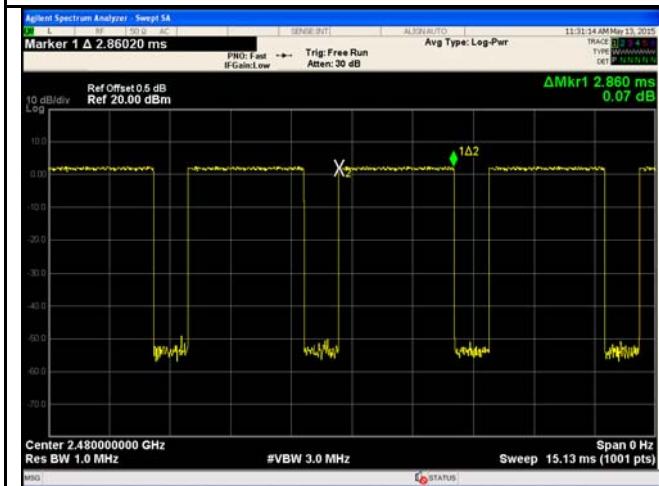
Dwell Time measurement result





8DPSK - Low CH 2402

8DPSK - Mid CH 2441

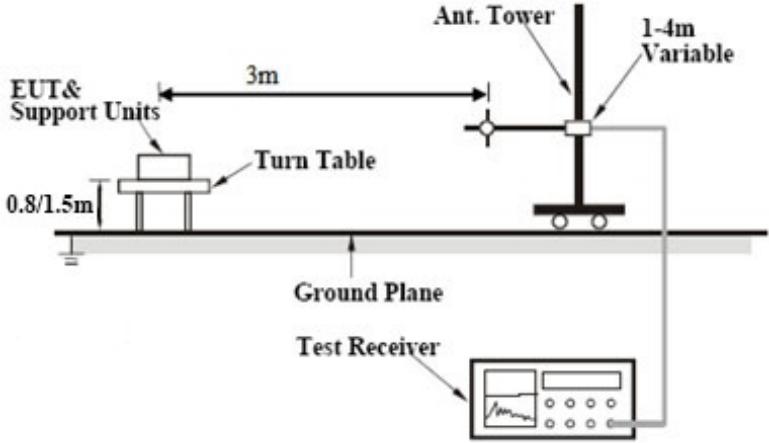


8DPSK - High CH 2480

6.7 Band Edge

Temperature	20°C
Relative Humidity	52%
Atmospheric Pressure	1022mbar
Test date :	April 22 2015
Tested By :	Lucifer He

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.	<input checked="" type="checkbox"/>
Test Setup	 <p>The diagram illustrates the test setup. An EUT & Support Units is positioned on a Turn Table, which is placed on a Ground Plane. The distance between the EUT and the Turn Table is 0.8/1.5m. The Turn Table is 3m away from an Ant. Tower. The Ant. Tower is connected to a Test Receiver. The height of the Ant. Tower is 1-4m Variable.</p>		
Test Procedure	<p>The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Radiated Method Only</p> <ul style="list-style-type: none"> - 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, 		

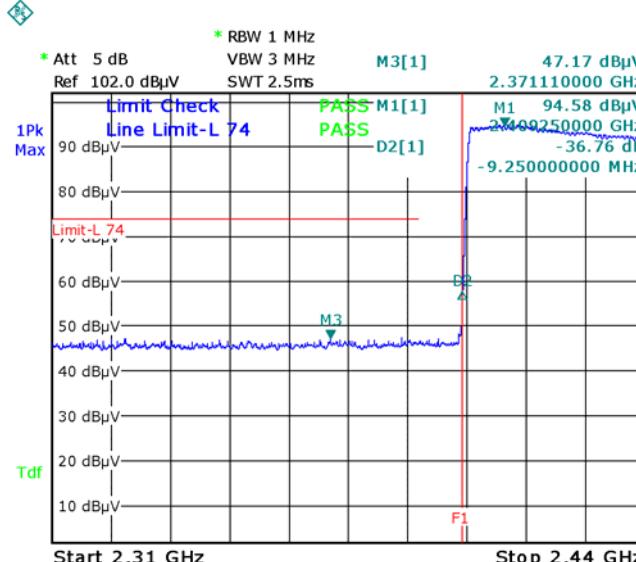
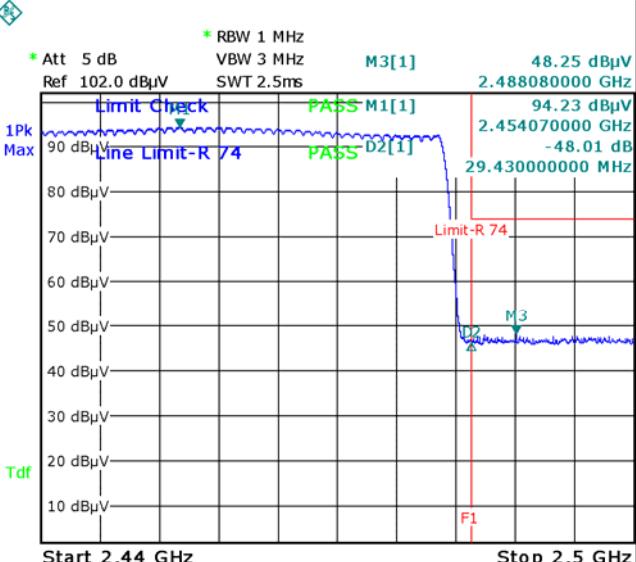
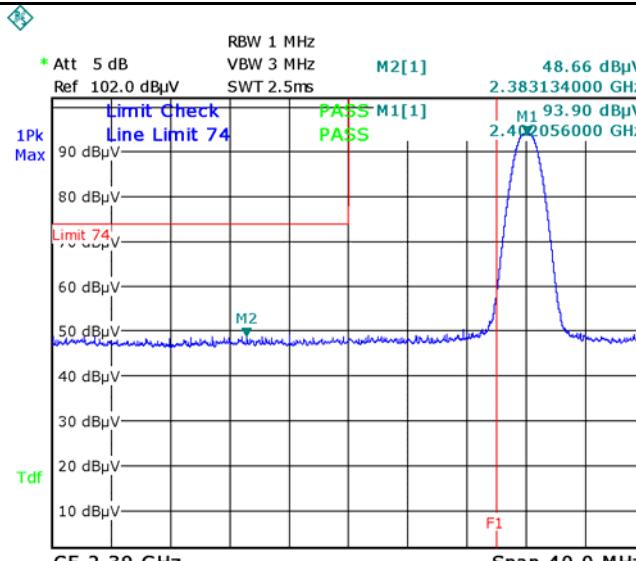
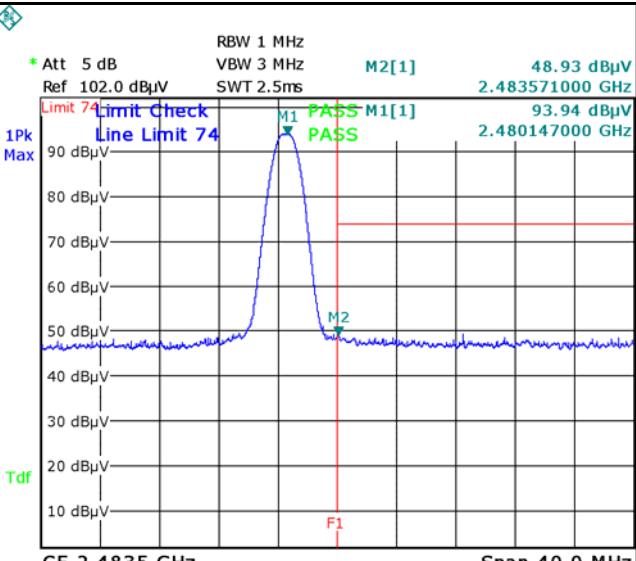
	<p>and make sure the instrument is operated in its linear range.</p> <ul style="list-style-type: none"> - 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: <ul style="list-style-type: none"> 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

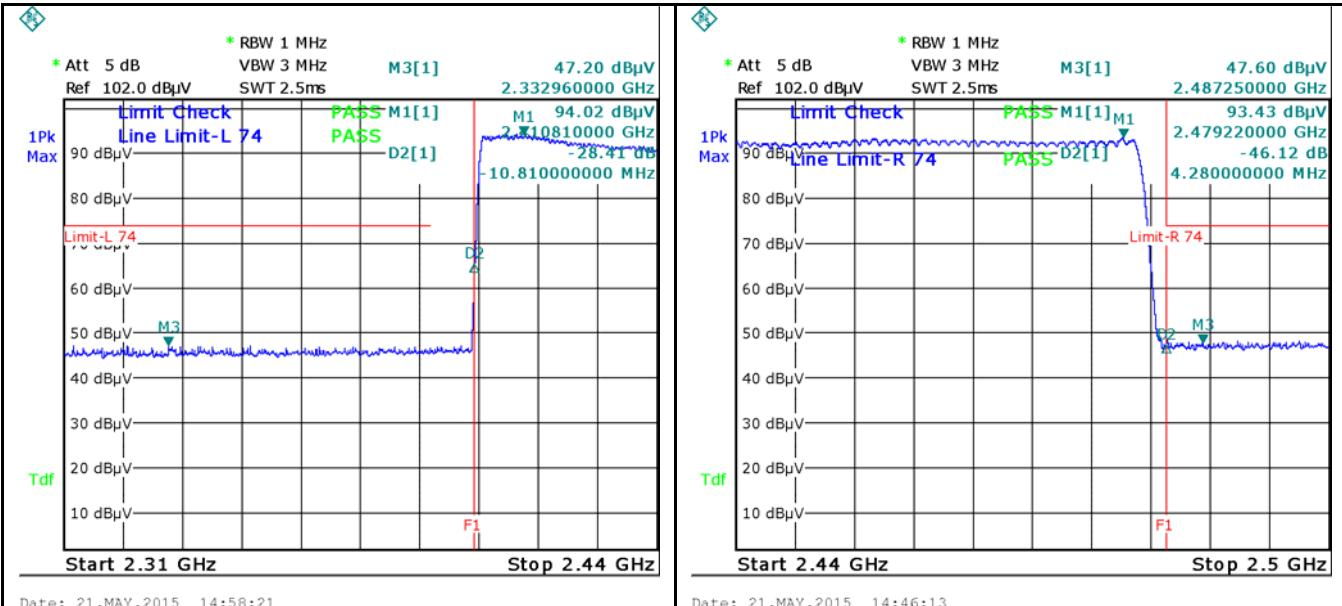
Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Plots

GFSK Mode:

 <p>RBW 1 MHz Att 5 dB Ref 102.0 dBμV VBW 3 MHz SWT 2.5ms M3[1] 47.17 dBμV 2.371110000 GHz 1Pk Max 90 dBμV Limit Check Line Limit-L 74 PASS M1[1] 94.58 dBμV 2.449250000 GHz -36.76 dB -9.250000000 MHz D2[1] 48.25 dBμV 2.488080000 GHz 1Pk Max 90 dBμV Limit Check Line Limit-R 74 PASS M1[1] 94.23 dBμV 2.454070000 GHz -48.01 dB 29.430000000 MHz D2[1] 48.25 dBμV 2.488080000 GHz Tdf Start 2.31 GHz Stop 2.44 GHz Date: 21.MAY.2015 15:01:33</p>	 <p>RBW 1 MHz Att 5 dB Ref 102.0 dBμV VBW 3 MHz SWT 2.5ms M3[1] 48.25 dBμV 2.488080000 GHz 1Pk Max 90 dBμV Limit Check Line Limit-R 74 PASS M1[1] 94.23 dBμV 2.454070000 GHz -48.01 dB 29.430000000 MHz D2[1] 48.25 dBμV 2.488080000 GHz 1Pk Max 90 dBμV Limit Check Line Limit-L 74 PASS M1[1] 94.23 dBμV 2.454070000 GHz -48.01 dB 29.430000000 MHz D2[1] 48.25 dBμV 2.488080000 GHz Tdf Start 2.44 GHz Stop 2.5 GHz Date: 21.MAY.2015 14:38:40</p>
<p>GFSK-Hopping Left Side-PK</p> <p>Note: F1 is frequency 2400MHz</p>	<p>GFSK-Hopping Right Side-PK</p> <p>Note: F1 is frequency 2483.5MHz</p>
<p>Note: (no need if PK value less than the AV limit)</p>	<p>Note: (no need if PK value less than the AV limit)</p>
<p>GFSK-Hopping Left Side-AV</p>	<p>GFSK-Hopping Right Side-AV</p>
 <p>RBW 1 MHz Att 5 dB Ref 102.0 dBμV VBW 3 MHz SWT 2.5ms M2[1] 48.66 dBμV 2.383134000 GHz 1Pk Max 90 dBμV Limit Check Line Limit 74 PASS M1[1] 93.90 dBμV 2.402056000 GHz D2[1] 48.66 dBμV 2.483170000 GHz 1Pk Max 90 dBμV Limit 74 PASS M1[1] 93.90 dBμV 2.402056000 GHz D2[1] 48.66 dBμV 2.483170000 GHz Tdf CF 2.39 GHz Span 40.0 MHz Date: 21.MAY.2015 14:09:38</p>	 <p>RBW 1 MHz Att 5 dB Ref 102.0 dBμV VBW 3 MHz SWT 2.5ms M2[1] 48.93 dBμV 2.483170000 GHz 1Pk Max 90 dBμV Limit 74 PASS M1[1] 93.94 dBμV 2.480147000 GHz D2[1] 48.93 dBμV 2.483170000 GHz 1Pk Max 90 dBμV Limit 74 PASS M1[1] 93.94 dBμV 2.480147000 GHz D2[1] 48.93 dBμV 2.483170000 GHz Tdf CF 2.4835 GHz Span 40.0 MHz Date: 21.MAY.2015 14:30:26</p>
<p>GFSK-Left Side-PK</p>	<p>GFSK-Right Side-PK</p>
<p>Note: F1 is frequency 2400MHz</p>	<p>Note: F1 is frequency 2483.5MHz</p>
<p>Note: (no need if PK value less than the AV limit)</p>	<p>Note: (no need if PK value less than the AV limit)</p>
<p>GFSK-Left Side-AV</p>	<p>GFSK-Right Side-AV</p>

$\pi/4$ DQPSK Mode:


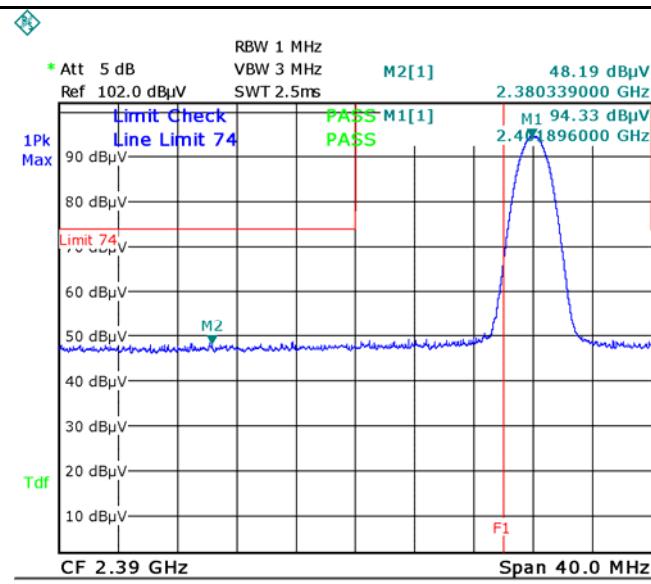
Date: 21.MAY.2015 14:58:21

Date: 21.MAY.2015 14:46:13

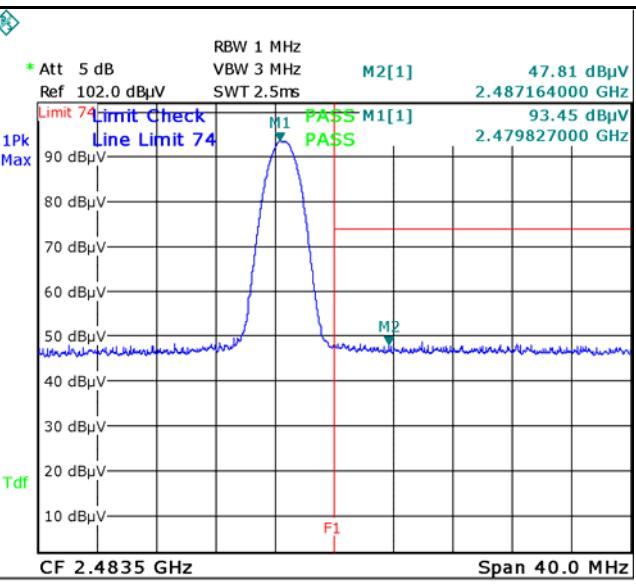
 $\pi/4$ DQPSK-Hopping Left Side-PK
Note: F1 is frequency 2400MHz
 $\pi/4$ DQPSK-Hopping Right Side-PK
Note: F1 is frequency 2483.5MHz

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

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

 $\pi/4$ DQPSK-Hopping Left-AV
 $\pi/4$ DQPSK-Hopping Right-AV


Date: 21.MAY.2015 14:15:53



Date: 21.MAY.2015 14:27:41

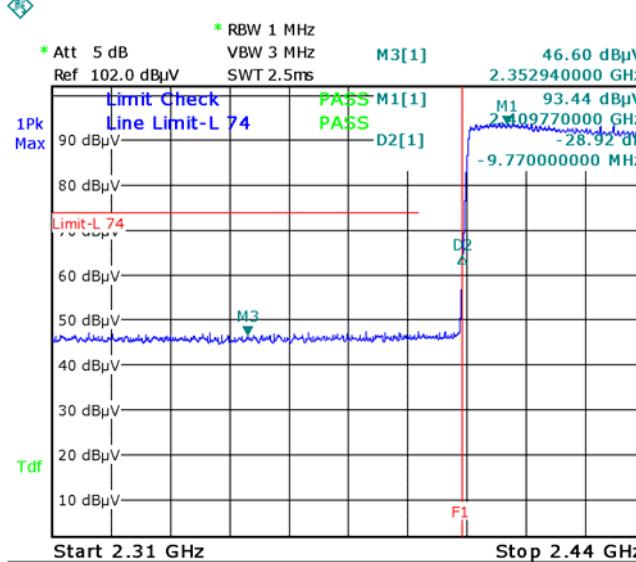
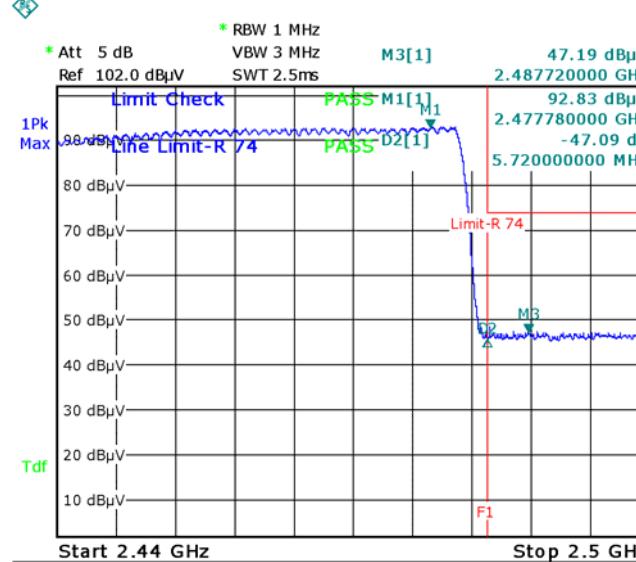
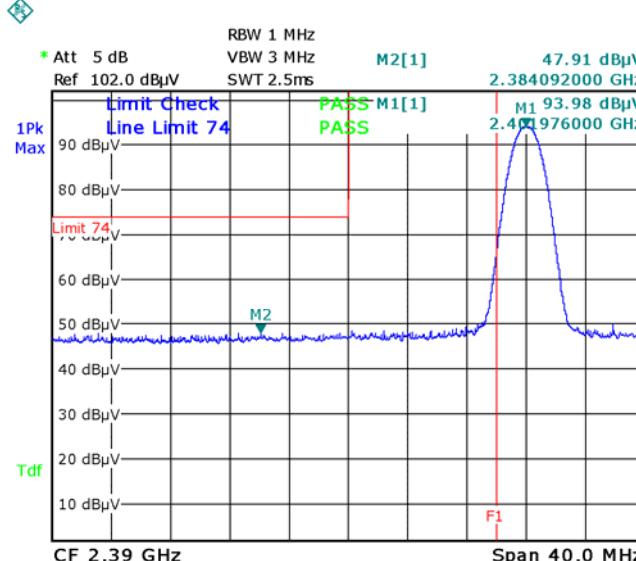
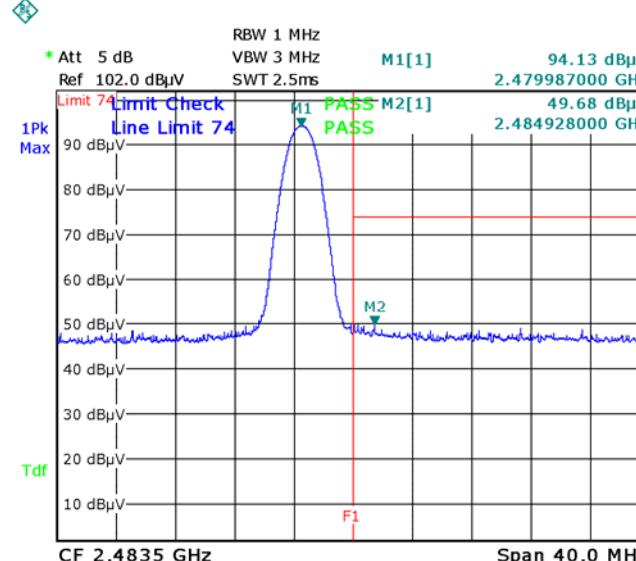
 $\pi/4$ DQPSK-Left Side-PK
Note: F1 is frequency 2400MHz
 $\pi/4$ DQPSK-Right Side-PK
Note: F1 is frequency 2483.5MHz

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

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

 $\pi/4$ DQPSK-Left Side-AV
 $\pi/4$ DQPSK-Right Side-AV

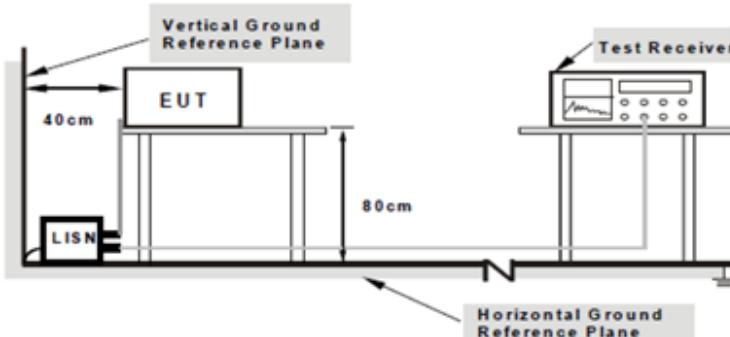
8-DPSK Mode:

 <p>RBW 1 MHz VBW 3 MHz SWT 2.5ms * Att 5 dB Ref 102.0 dBμV M3[1] 46.60 dBμV 2.352940000 GHz 1Pk Max Limit Check Line Limit-L 74 90 dBμV 80 dBμV 70 dBμV 60 dBμV 50 dBμV 40 dBμV 30 dBμV 20 dBμV 10 dBμV Tdf Start 2.31 GHz Stop 2.44 GHz Date: 21.MAY.2015 14:55:03</p>	 <p>RBW 1 MHz VBW 3 MHz SWT 2.5ms * Att 5 dB Ref 102.0 dBμV M3[1] 47.19 dBμV 2.487720000 GHz 1Pk Max Limit Check Line Limit-R 74 98 dBμV 90 dBμV 80 dBμV 70 dBμV 60 dBμV 50 dBμV 40 dBμV 30 dBμV 20 dBμV 10 dBμV Tdf Start 2.44 GHz Stop 2.5 GHz Date: 21.MAY.2015 14:50:41</p>
<p>8DPSK-Hopping Left Side-PK Note: F1 is frequency 2400MHz</p>	<p>8DPSK-Hopping Right Side-PK Note: F1 is frequency 2483.5MHz</p>
<p>Note: (no need if PK value less than the AV limit)</p>	<p>Note: (no need if PK value less than the AV limit)</p>
<p>8DPSK-Hopping Left-AV</p>	<p>8DPSK-Hopping Right-AV</p>
 <p>RBW 1 MHz VBW 3 MHz SWT 2.5ms * Att 5 dB Ref 102.0 dBμV M2[1] 47.91 dBμV 2.384092000 GHz 1Pk Max Limit Check Line Limit 74 90 dBμV 80 dBμV 70 dBμV 60 dBμV 50 dBμV 40 dBμV 30 dBμV 20 dBμV 10 dBμV Tdf CF 2.39 GHz Span 40.0 MHz Date: 21.MAY.2015 14:20:09</p>	 <p>RBW 1 MHz VBW 3 MHz SWT 2.5ms * Att 5 dB Ref 102.0 dBμV M1[1] 94.13 dBμV 2.479987000 GHz 1Pk Max Limit 74 Limit Check Line Limit 74 90 dBμV 80 dBμV 70 dBμV 60 dBμV 50 dBμV 40 dBμV 30 dBμV 20 dBμV 10 dBμV Tdf CF 2.4835 GHz Span 40.0 MHz Date: 21.MAY.2015 14:24:38</p>
<p>8DPSK-Left Side-PK Note: F1 is frequency 2400MHz</p>	<p>8DPSK-Right Side-PK Note: F1 is frequency 2483.5MHz</p>
<p>Note: (no need if PK value less than the AV limit)</p>	<p>Note: (no need if PK value less than the AV limit)</p>
<p>8DPSK-Left Side-AV</p>	<p>8DPSK-Right Side-AV</p>

6.8 AC Power Line Conducted Emissions

Temperature	20°C
Relative Humidity	52%
Atmospheric Pressure	1022bar
Test date :	April 22, 2015
Tested By :	Lucifer He

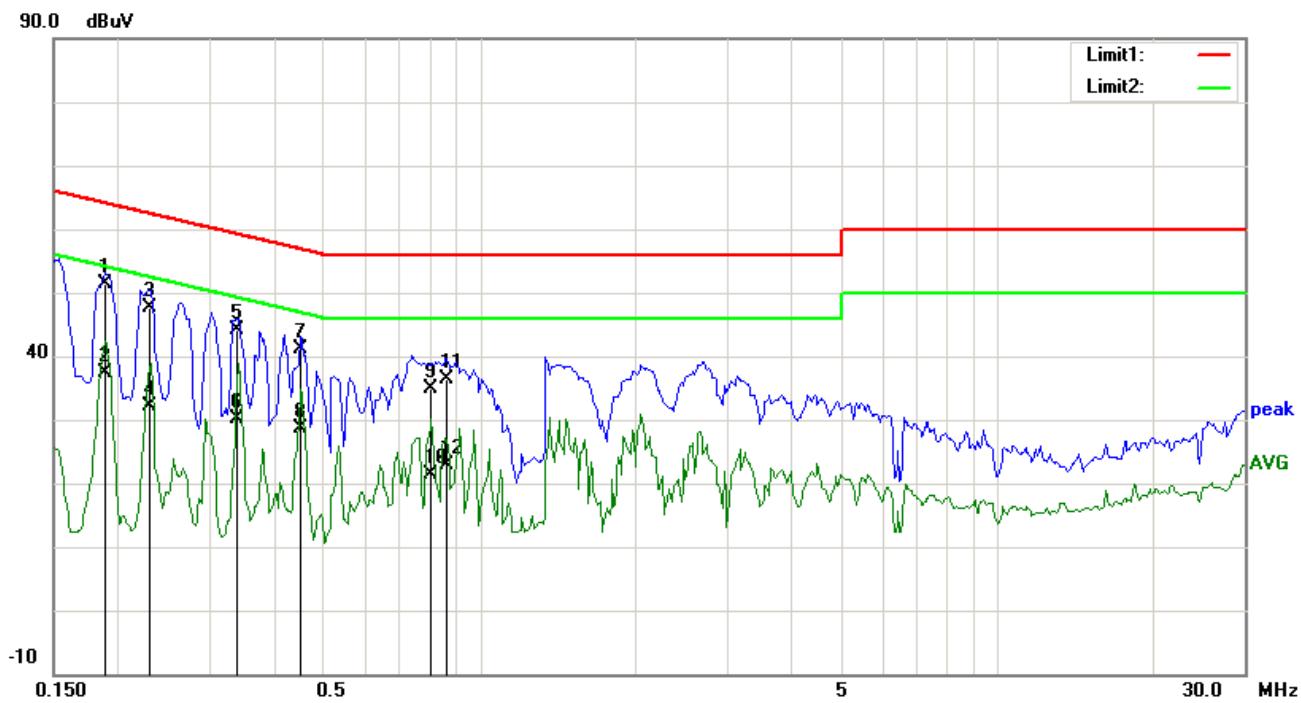
Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.207,	a)	<p>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.</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency ranges (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>QP</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15 ~ 0.5</td> <td>66 – 56</td> <td>56 – 46</td> </tr> <tr> <td>0.5 ~ 5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5 ~ 30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency ranges (MHz)	Limit (dB μ V)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	<input checked="" type="checkbox"/>
Frequency ranges (MHz)	Limit (dB μ V)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															
Test Setup			 <p>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.</p>														
Procedure	<ol style="list-style-type: none"> 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. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains. 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

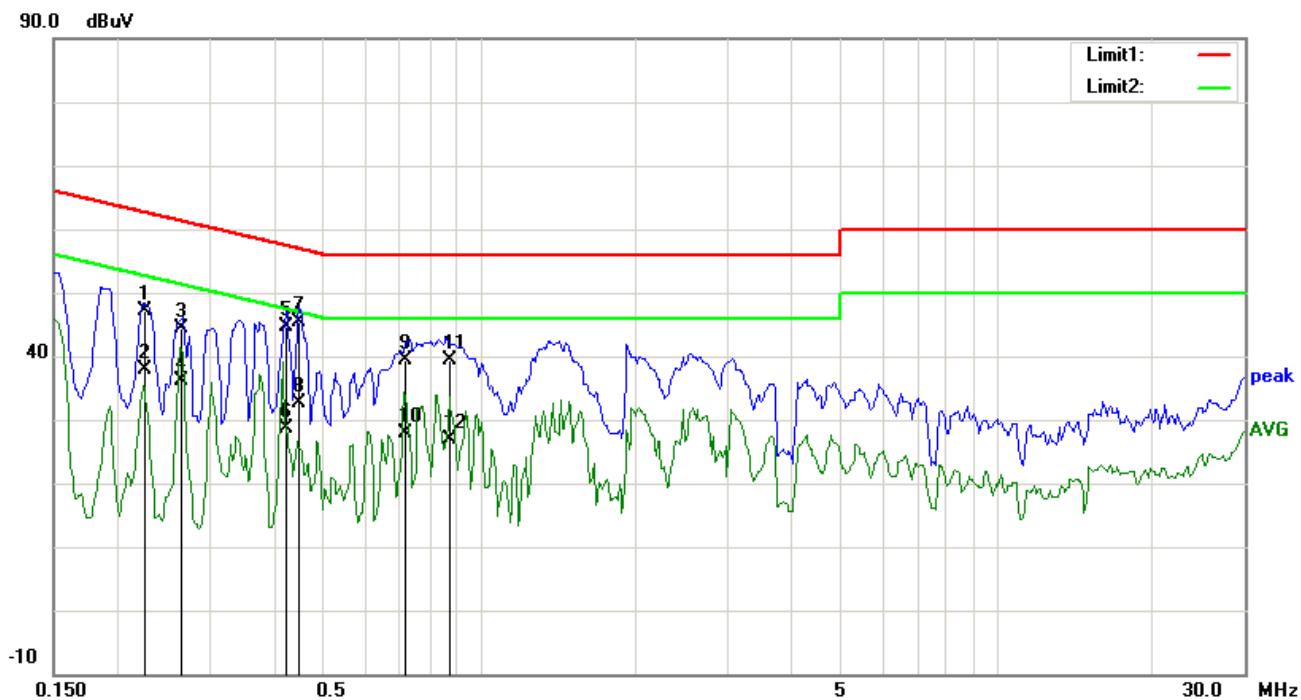
Test Plot Yes (See below) N/A

Test Mode: Bluetooth Mode

Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	L1	0.1891	38.23	QP	13.05	51.28	64.08	-12.80	
2	L1	0.1891	24.39	AVG	13.05	37.44	54.08	-16.64	
3	L1	0.2304	34.82	QP	12.90	47.72	62.44	-14.72	
4	L1	0.2304	19.19	AVG	12.90	32.09	52.44	-20.35	
5	L1	0.3392	31.60	QP	12.50	44.10	59.22	-15.12	
6	L1	0.3392	17.60	AVG	12.50	30.10	49.22	-19.12	
7	L1	0.4508	28.94	QP	12.08	41.02	56.86	-15.84	
8	L1	0.4508	16.51	AVG	12.08	28.59	46.86	-18.27	
9	L1	0.8063	23.32	QP	11.59	34.91	56.00	-21.09	
10	L1	0.8063	9.91	AVG	11.59	21.50	46.00	-24.50	
11	L1	0.8618	24.85	QP	11.54	36.39	56.00	-19.61	
12	L1	0.8618	11.37	AVG	11.54	22.91	46.00	-23.09	

Test Mode: Bluetooth Mode



Test Data

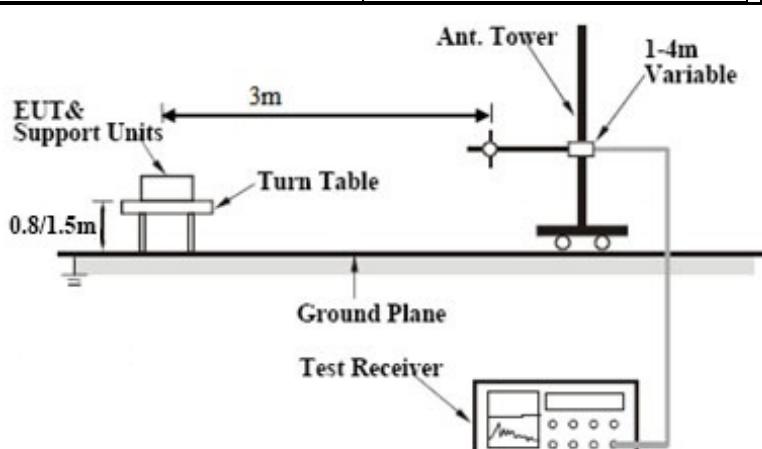
Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
1	N	0.2256	34.18	QP	12.92	47.10	62.61	-15.51	
2	N	0.2256	24.99	AVG	12.92	37.91	52.61	-14.70	
3	N	0.2644	31.49	QP	12.78	44.27	61.29	-17.02	
4	N	0.2644	23.40	AVG	12.78	36.18	51.29	-15.11	
5	N	0.4234	32.57	QP	12.18	44.75	57.38	-12.63	
6	N	0.4234	16.36	AVG	12.18	28.54	47.38	-18.84	
7	N	0.4469	33.34	QP	12.10	45.44	56.93	-11.49	
8	N	0.4469	20.62	AVG	12.10	32.72	46.93	-14.21	
9	N	0.7164	27.75	QP	11.68	39.43	56.00	-16.57	
10	N	0.7164	16.25	AVG	11.68	27.93	46.00	-18.07	
11	N	0.8766	27.93	QP	11.52	39.45	56.00	-16.55	
12	N	0.8766	15.48	AVG	11.52	27.00	46.00	-19.00	

6.9 Radiated Spurious Emissions

Temperature	20°C
Relative Humidity	52%
Atmospheric Pressure	1022mbar
Test date :	May 22, 2015
Tested By :	Lucifer He

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15. 205, §15.209, §15.247(d)	a)	<p>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</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (μV/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table>	Frequency range (MHz)	Field Strength (μ V/m)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength (μ V/m)												
30 – 88	100												
88 – 216	150												
216 960	200												
Above 960	500												
Test Setup	 <p>The diagram illustrates the test setup for radiated spurious emissions. A 'Turn Table' is positioned on a 'Ground Plane'. A 'EUT & Support Units' assembly is mounted on the turn table. A vertical 'Ant. Tower' is connected to the turn table, with a '1-4m Variable' height adjustment mechanism. A 'Test Receiver' is connected to the turn table and the 'Ant. Tower'. A horizontal distance of 3m is indicated between the EUT and the Ant. Tower. The height of the EUT is marked as 0.8/1.5m.</p>												
Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. 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: 												

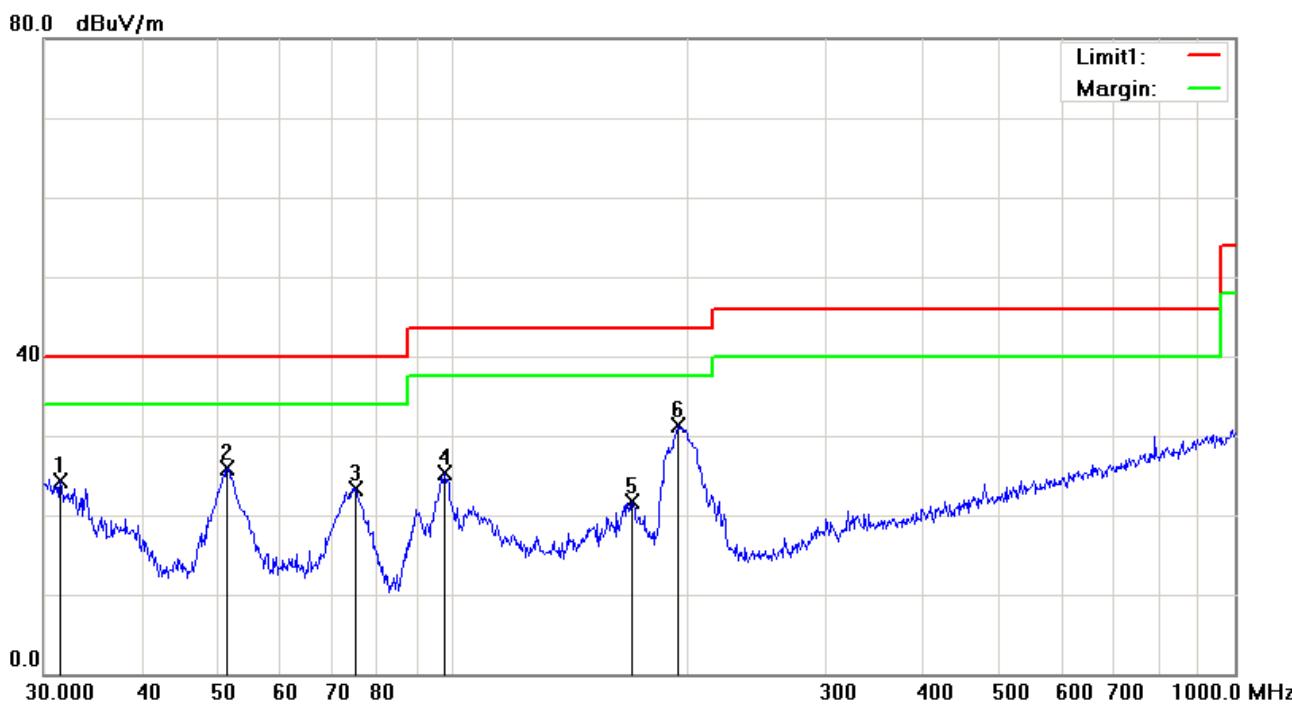
	<p>a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.</p> <p>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.</p> <p>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.</p> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Mode: Bluetooth Mode

Below 1GHz

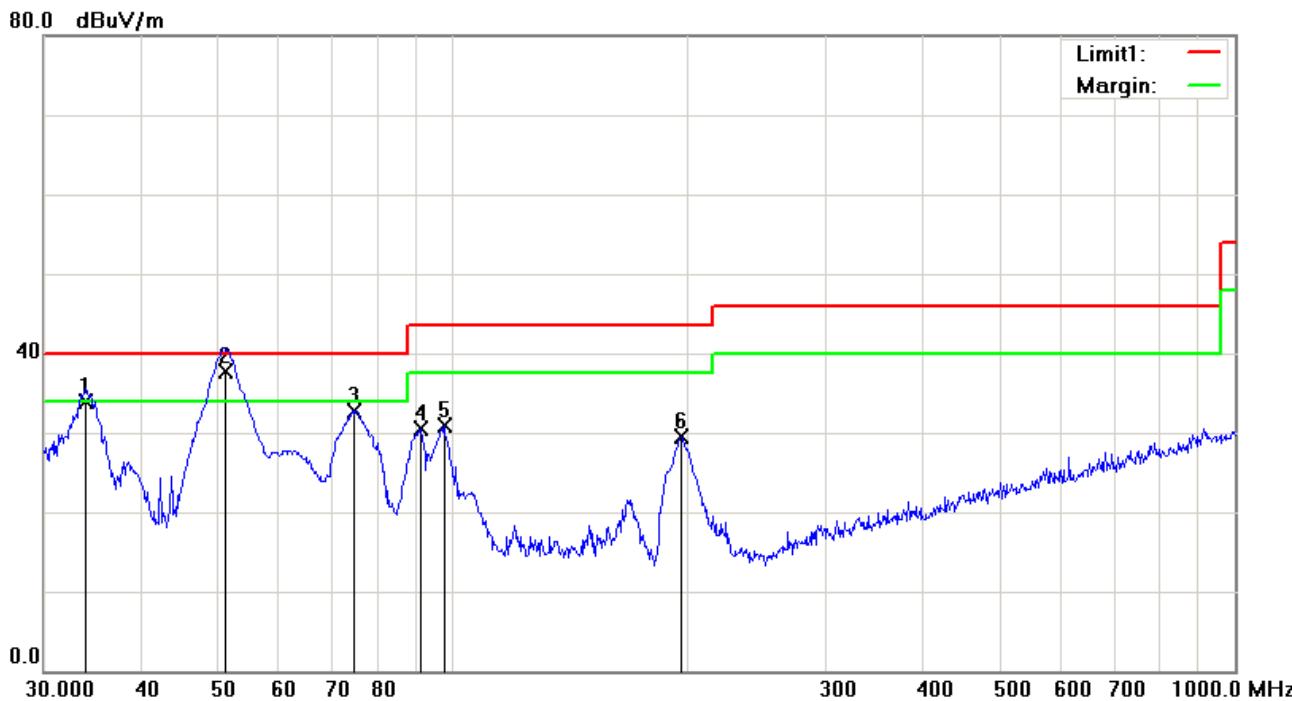


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree	Comment
		(MHz)	(dBuV/m)		(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()	
1	H	31.5095	25.64	peak	-1.37	24.27	40.00	-15.73	100	34	
2	H	51.4807	39.25	peak	-13.35	25.90	40.00	-14.10	100	233	
3	H	75.1823	37.08	peak	-13.74	23.34	40.00	-16.66	100	207	
4	H	97.7983	36.64	peak	-11.39	25.25	43.50	-18.25	100	165	
5	H	169.5990	30.69	peak	-9.07	21.62	43.50	-21.88	100	162	
6	H	194.4534	40.27	peak	-9.01	31.26	43.50	-12.24	100	211	

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBuV/ m)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree ()	Comment
1	V	33.9174	37.09	QP	-3.15	33.94	40.00	-6.06	100	205	
2	V	51.2217	51.07	QP	-13.31	37.76	40.00	-2.24	100	291	
3	V	74.9191	46.48	peak	-13.74	32.74	40.00	-7.26	100	1	
4	V	91.1746	43.51	peak	-13.08	30.43	43.50	-13.07	100	100	
5	V	97.4560	42.29	peak	-11.48	30.81	43.50	-12.69	100	96	
6	V	195.8220	38.42	peak	-8.94	29.48	43.50	-14.02	100	186	

Test Mode:	Transmitting Mode
------------	-------------------

Mode: GFSK (Worst Case)

Low Channel (2402 MHz)

Frequency (MHz)	S.A. Reading (dB μ V)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
4804	34.56	AV	V	33.83	6.86	31.72	43.53	54	-10.47
4804	34.88	AV	H	33.83	6.86	31.72	43.85	54	-10.15
4804	47.61	PK	V	33.83	6.86	31.72	56.58	74	-17.42
4804	47.95	PK	H	33.83	6.86	31.72	56.92	74	-17.08

Middle Channel (2441 MHz)

Frequency (MHz)	S.A. Reading (dB μ V)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
4882	35.16	AV	V	33.86	6.82	31.82	44.02	54	-9.98
4882	34.83	AV	H	33.86	6.82	31.82	43.69	54	-10.31
4882	48.21	PK	V	33.86	6.82	31.82	57.07	74	-16.93
4882	47.86	PK	H	33.86	6.82	31.82	56.72	74	-17.28

High Channel (2480 MHz)

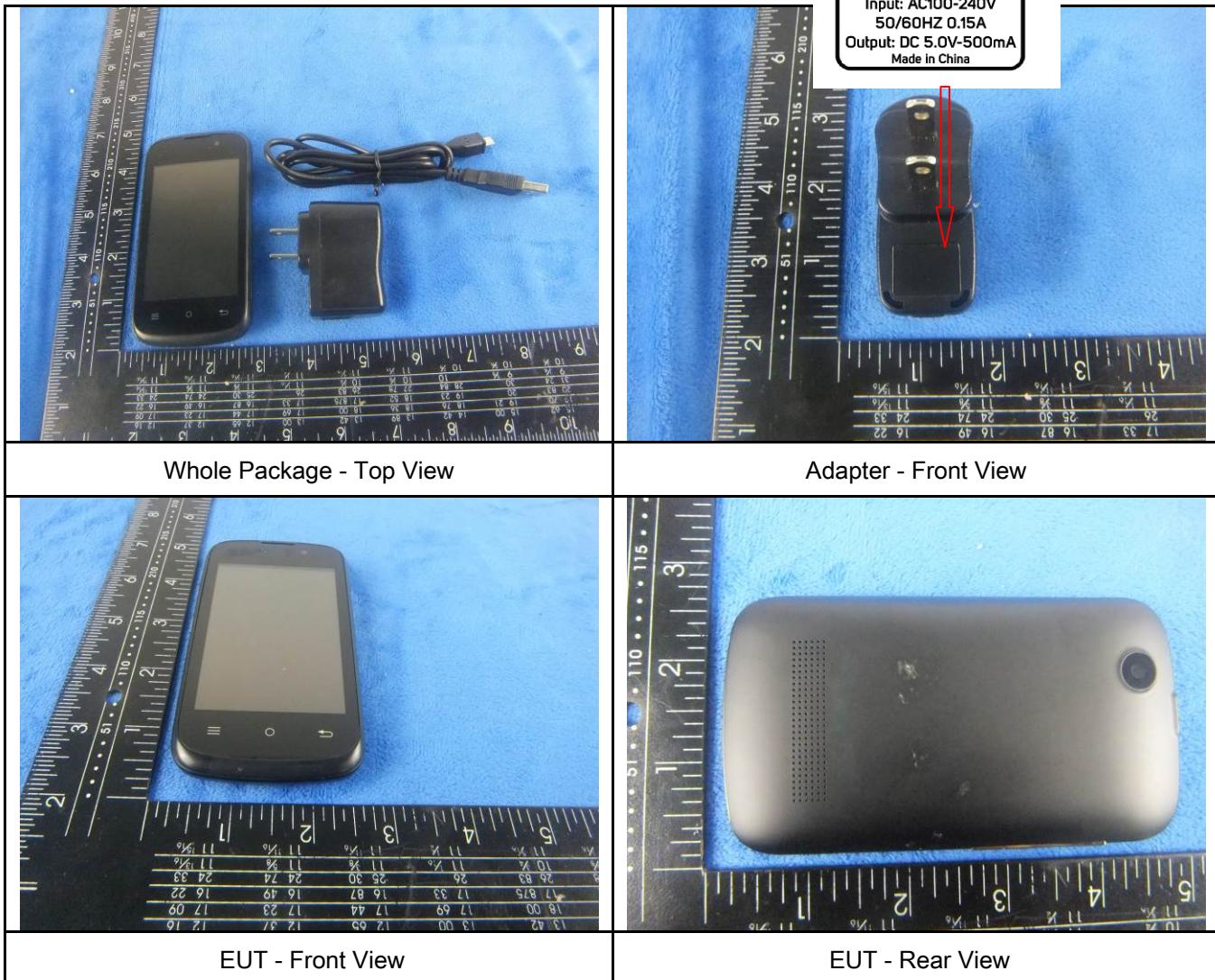
Frequency (MHz)	S.A. Reading (dB μ V)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
4960	34.87	AV	V	33.9	6.76	31.92	43.61	54	-10.39
4960	34.73	AV	H	33.9	6.76	31.92	43.47	54	-10.53
4960	48.19	PK	V	33.9	6.76	31.92	56.93	74	-17.07
4960	47.92	PK	H	33.9	6.76	31.92	56.66	74	-17.34

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Line Impedance	LI-125A	191106	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Line Impedance	LI-125A	191107	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/25/2014	09/24/2015	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
RF conducted test					
Agilent ESA-E SERIES	E4407B	MY45108319	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Positioning Controller	UC3000	MF780208282	11/20/2014	11/19/2015	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/25/2014	09/24/2015	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

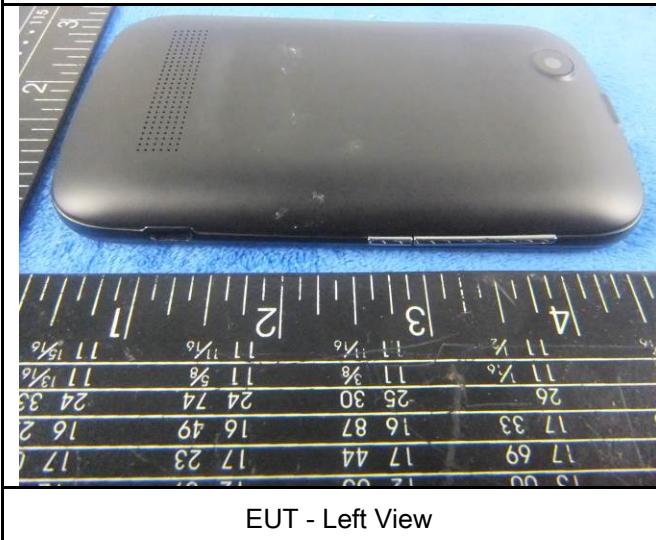




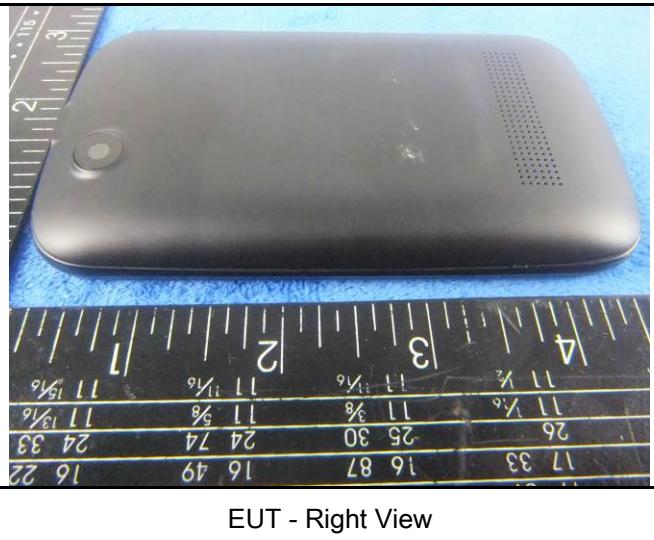
EUT - Top View



EUT - Bottom View

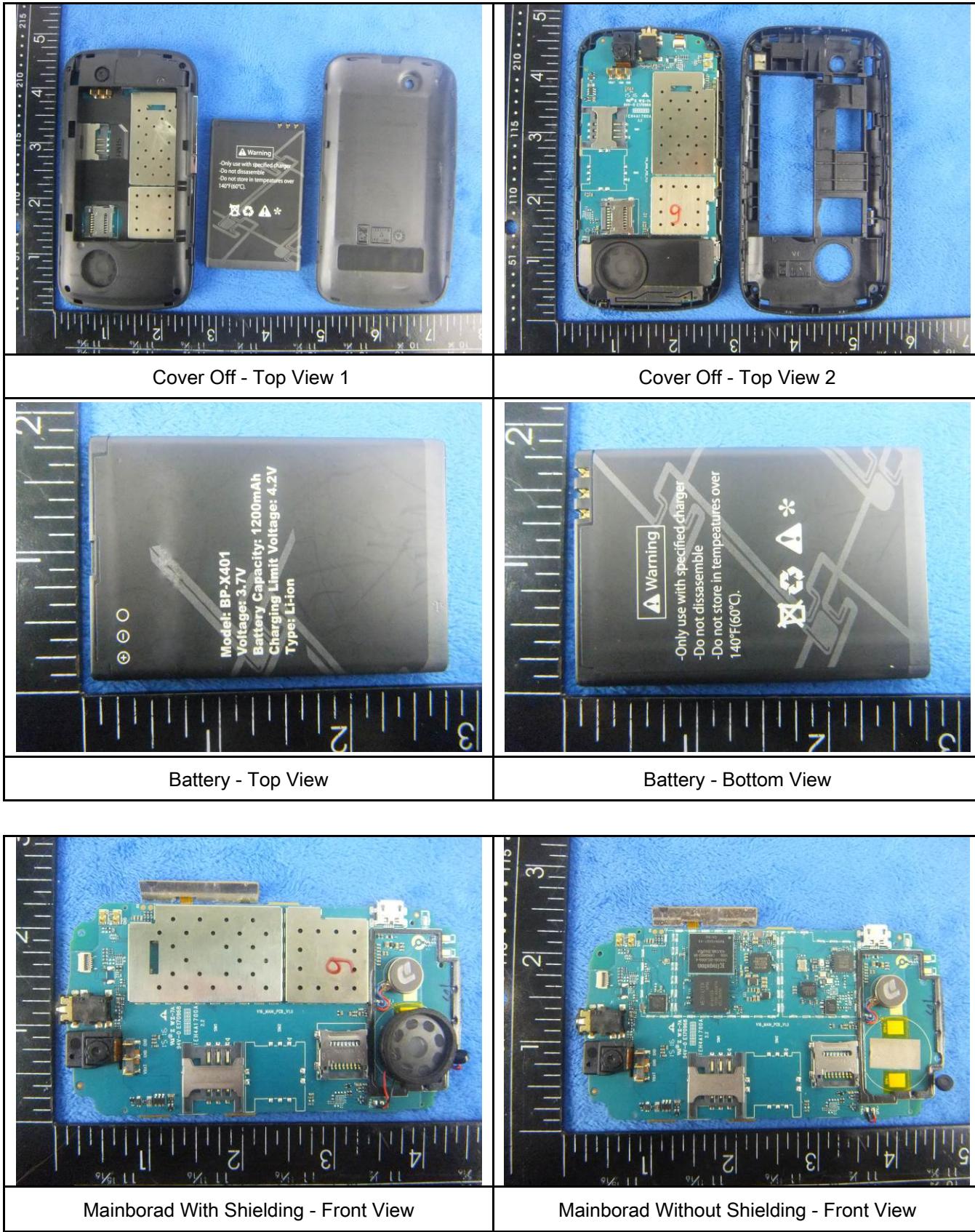


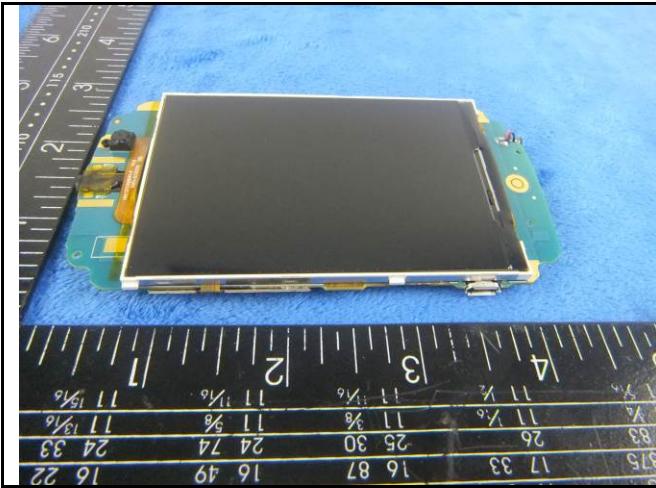
EUT - Left View



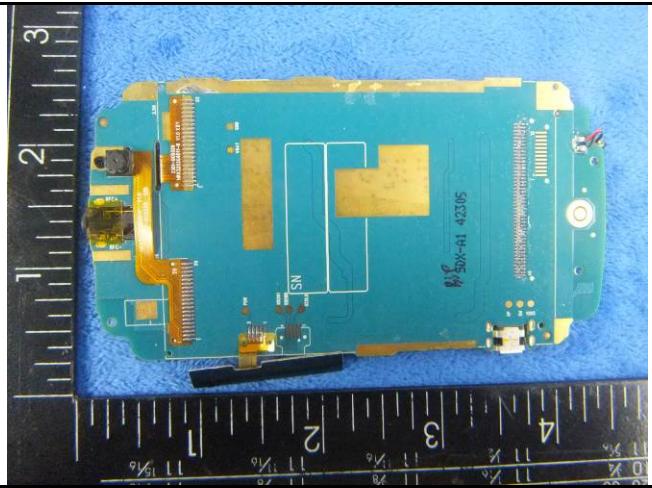
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

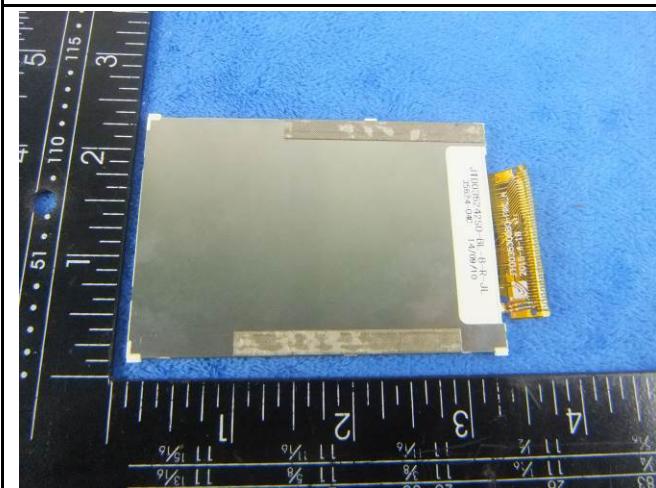




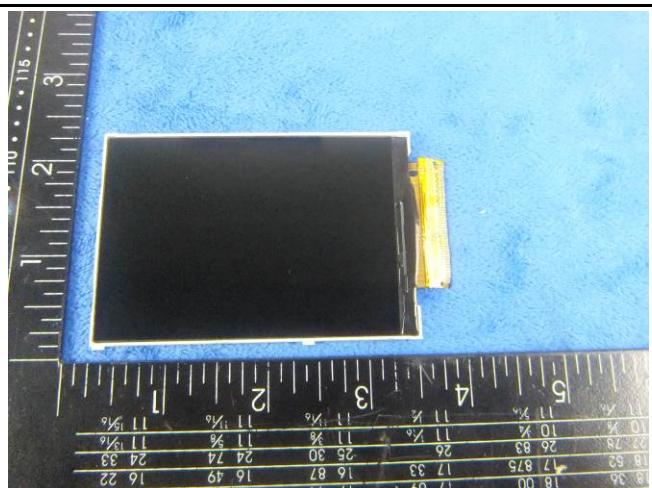
Mainborad Without Shielding - rear View



Mainborad Without Shielding - rear View



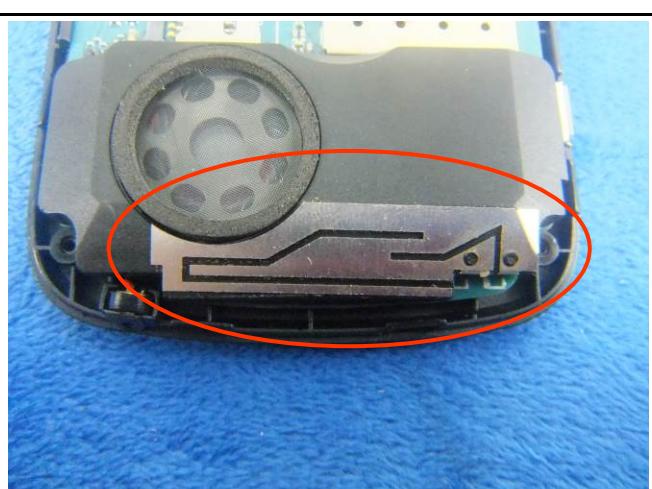
LCD – Rear View



LCD - Front View

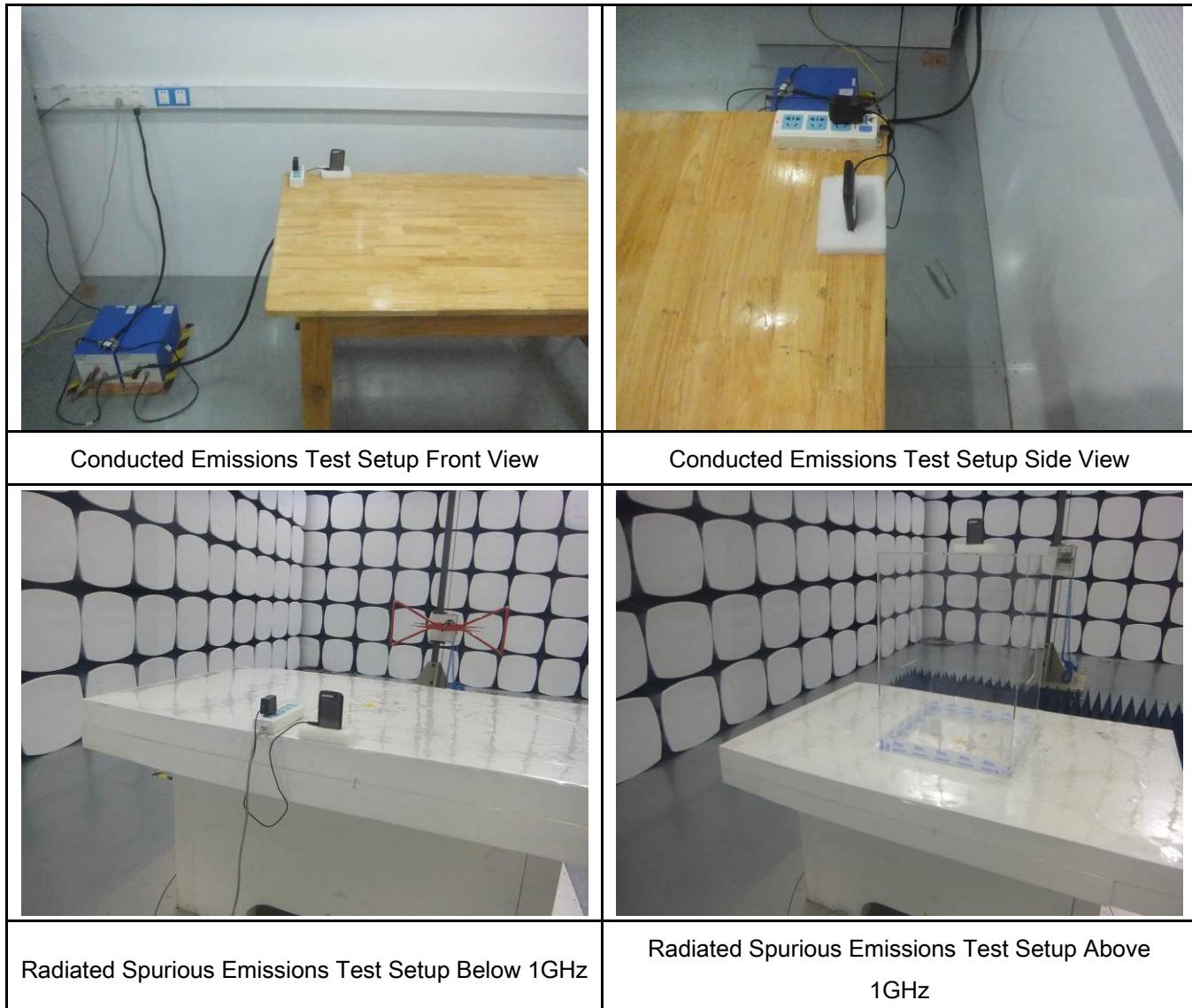


WIFI/BT/BLE - Antenna View



GSM/PCS/UMTS-FDD Antenna View

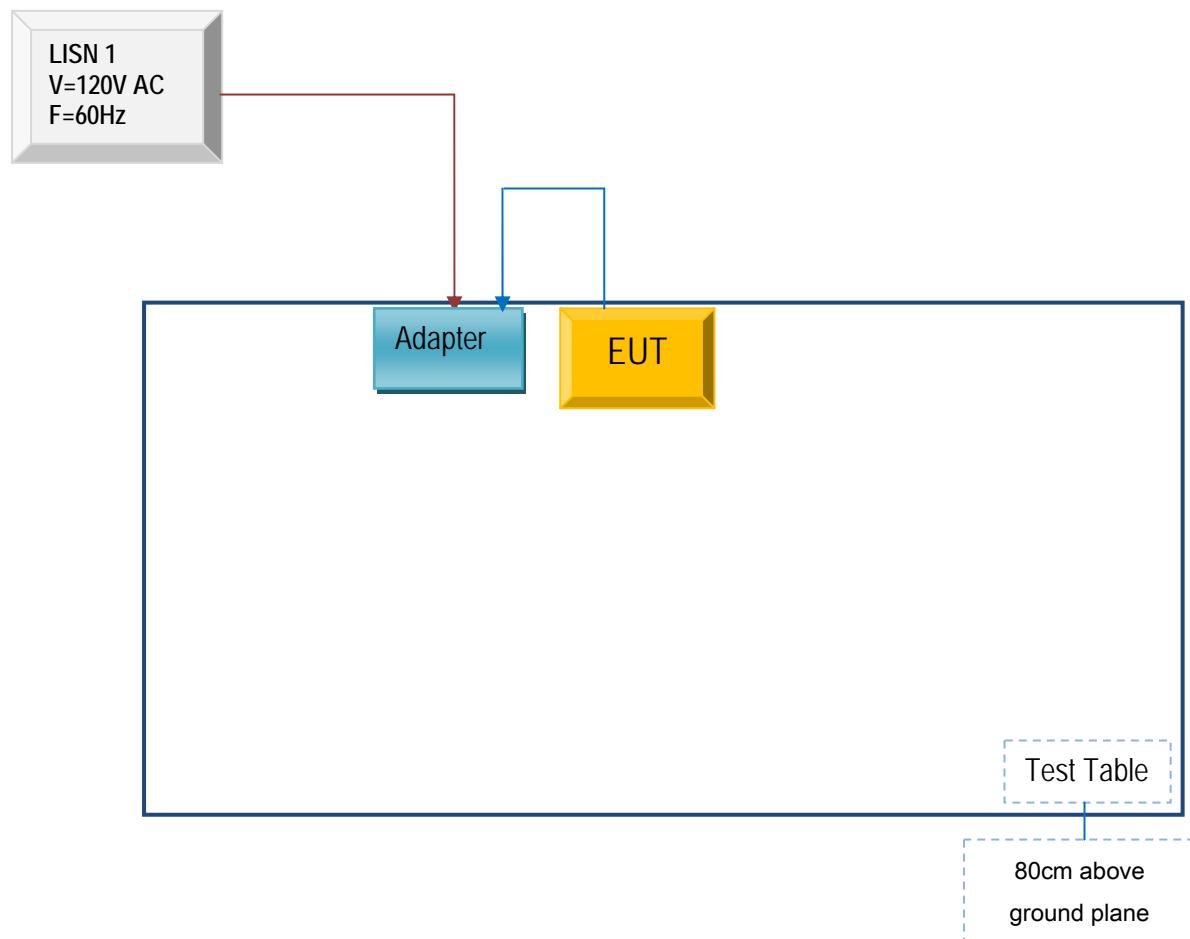
Annex B.iii. Photograph: Test Setup Photo



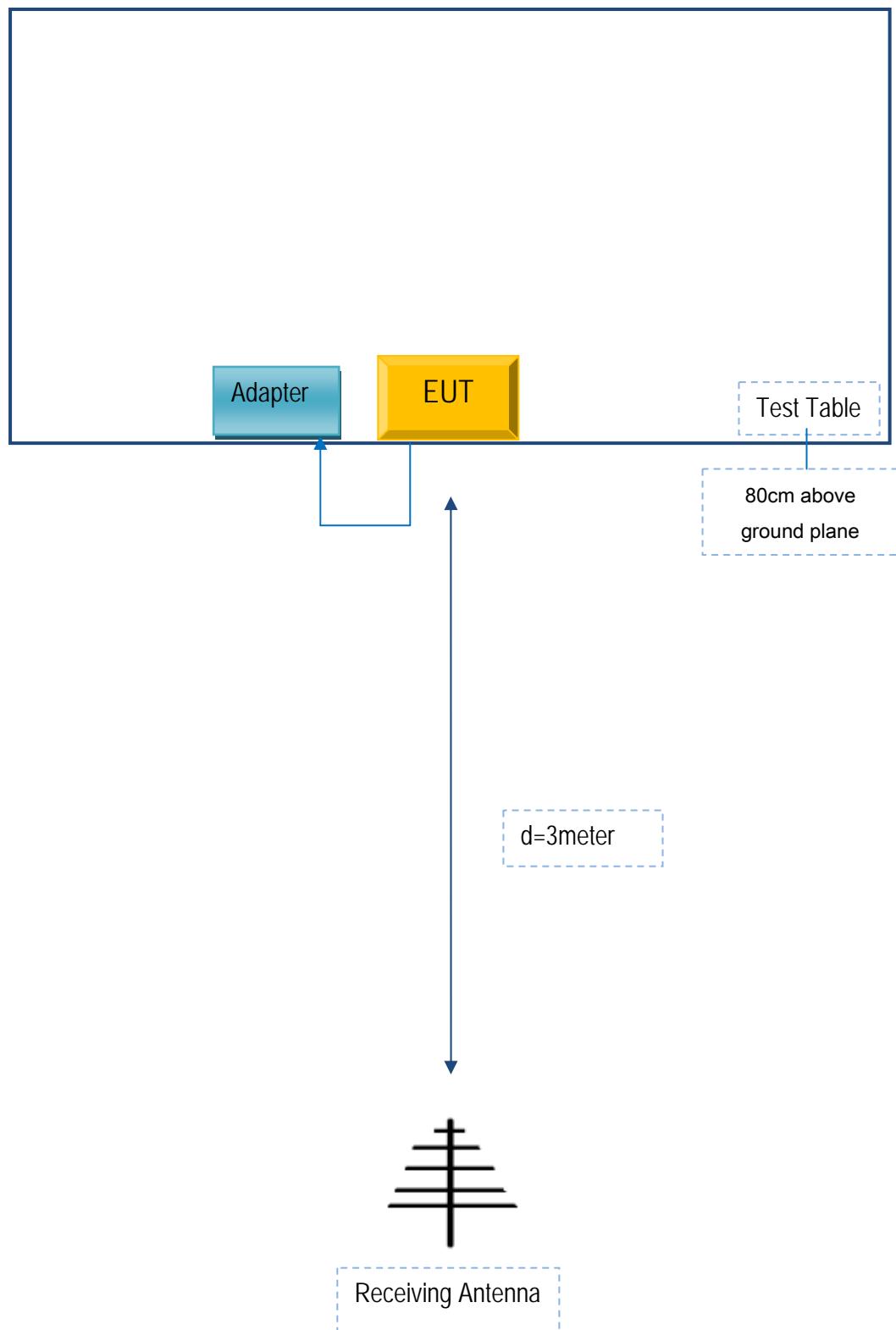
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

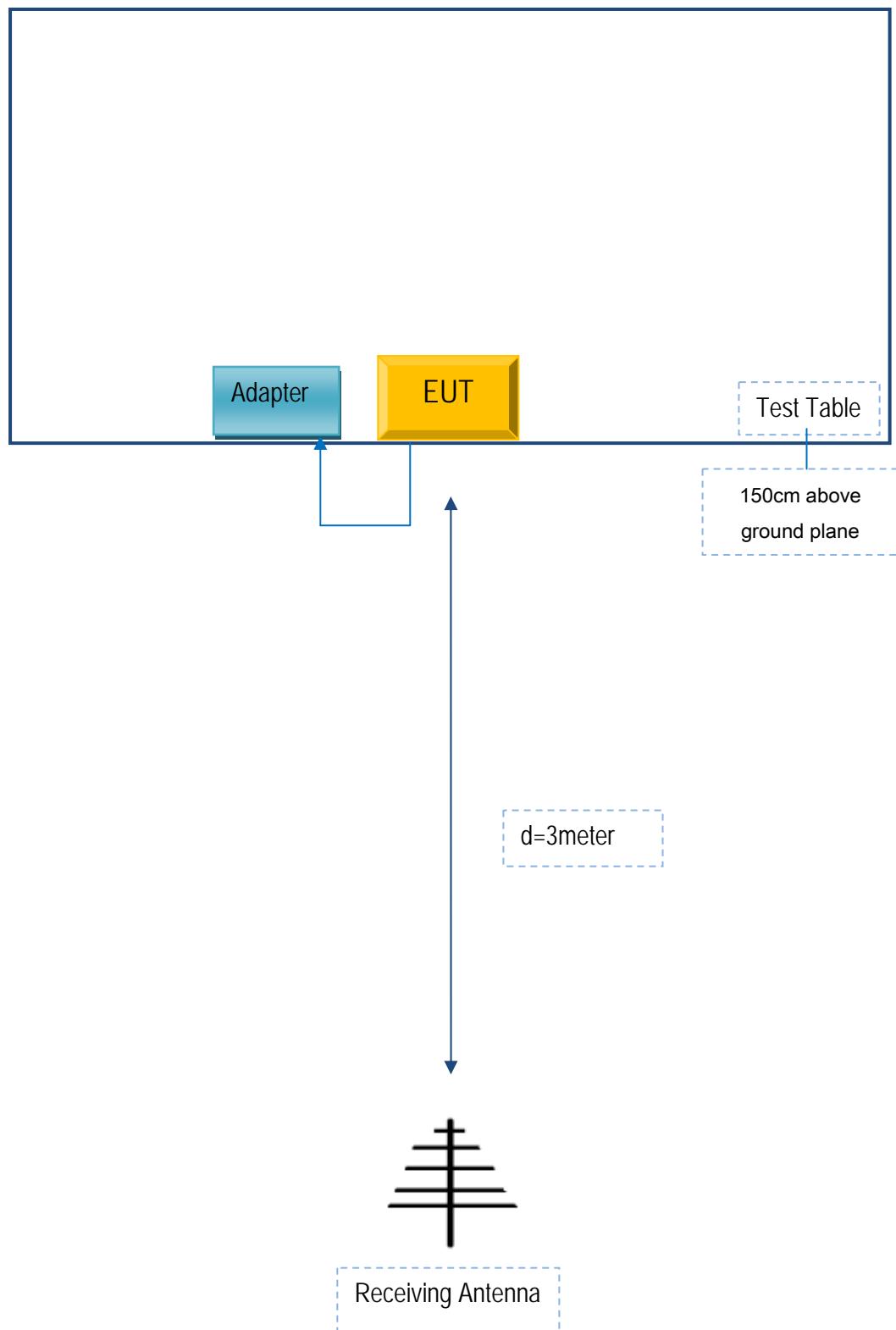
Block Configuration Diagram for AC Line Conducted Emissions



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



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



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

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

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
N/A	N/A	N/A	N/A	N/A

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

Please see attachment

Annex E. DECLARATION OF SIMILARITY

N/A