RF TEST REPORT



Report No.: 17071442-FCC-R3
Supersede Report No.: N/A

Applicant	MFOURTEL MEXICO S.A. DE C.V.			
Product Name	Smart Pho	Smart Phone		
Model No.	M4 B2			
Serial No.	N/A			
Test Standard	FCC Part 1	5.247: 2016,	ANSI C63.10: 2	013
Test Date	December	22, 2017 to c	lanuary 24, 2018	
Issue Date	January 25	, 2018		
Test Result	Pass Fail			
Equipment compli	Equipment complied with the specification			
Equipment did no	Equipment did not comply with the specification			
Jaron Li	Javan Lione David Huang			
Aaron Liang Test Engineer			d Huang cked 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

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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
17071442-FCC-R3	NONE	Original	January 25, 2018

2. Customer information

Applicant Name	MFOURTEL MEXICO S.A. DE C.V.
Applicant Add	Av. Ejército Nacional 436 Piso 3 Chapultepec Morales Miguel Hidalgo Distrito
	Federal 11570.
Manufacturer	CK Telecom Limited
Manufacturer Add	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.

3. Test site information

Test Lab A:

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES	
	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park	
Lab Address	South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China	
	518108	
FCC Test Site No.	535293	
IC Test Site No.	4842E-1	
Test Software	Radiated Emission Program-To Shenzhen v2.0	

Test Lab B:

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
I als Asistas as	2-1 Longcang Avenue Yuhua Economic and
Lab Address	Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC(ver.lcp-03A1)

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.



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4. Equipment under Test (EUT) Information

Description of EUT: Smart Phone

Main Model: M4 B2

Serial Model: N/A

Date EUT received: December 21, 2017

Test Date(s): December 22, 2017 to January 24, 2018

Equipment Category: DSS

GSM850: -3dBi PCS1900: -1dBi

UMTS-FDD Band V: -3dBi UMTS-FDD Band II: -1dBi

LTE Band II: -1dBi

Antenna Gain: LTE Band IV: -3dBi

LTE Band VII: 0 dBi LTE Band XII: -4dBi Bluetooth/BLE: 1dBi

WIFI: 1dBi GPS: -1dBi

Antenna Type: PIFA Antenna

GSM / GPRS: GMSK EGPRS: GMSK,8PSK UMTS-FDD: QPSK

Type of Modulation: LTE Band: QPSK, 16QAM

802.11b/g/n: DSSS, OFDM

Bluetooth: GFSK, π /4DQPSK, 8DPSK

BLE: GFSK GPS:BPSK



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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

LTE Band II TX: 1850.7 ~ 1909.3MHz; RX : 1930.7 ~ 1989.3 MHz

RF Operating Frequency (ies): LTE Band IV TX: 1710.7 ~ 1754.3 MHz; RX : 2110.7~ 2154.3 MHz

LTE Band VII TX: $2502.5 \sim 2567.5 \text{ MHz}$; RX: $2622.5 \sim 2687.5 \text{ MHz}$

LTE Band XII TX:699.7 ~ 715.3 MHz; RX: 729.7~ 745.3MHz

WIFI: 802.11b/g/n(20M): 2412-2462 MHz WIFI: 802.11n(40M): 2422-2452 MHz Bluetooth& BLE: 2402-2480 MHz

GPS: 1575.42 MHz

Max. Output Power: 5.955dBm

GSM 850: 124CH PCS1900: 299CH

UMTS-FDD Band V: 102CH UMTS-FDD Band II: 277CH

Number of Channels: WIFI:802.11b/g/n(20M): 11CH

WIFI:802.11n(40M): 7CH

Bluetooth: 79CH

BLE: 40CH GPS:1CH

Port: USB Port, Earphone Port

Adapter: Model: M4

Input: AC100-240V~50/60Hz,150mA

Input Power: Output: DC 5V, 1000mA

Battery:

Model: M2400A

Spec: 3.7V, 2400mAh, 8.88Wh

Trade Name: M4

GPRS/EGPRS Multi-slot class 8/10/11/12



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FCC ID:	CLNM4B2	



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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& Restricted Band	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions& Restricted Band	Compliance

Measurement Uncertainty

Emissions			
Test Item	Uncertainty		
Band Edge& Restricted Band and Radiated Emissions& Restricted Band	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	
-	-	-	



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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/WIF/GPS, the gain is 1dBi for Bluetooth/BLE/WIFI, the gain is -1dBi for GPS.

A permanently attached PIFA antenna for GSM/PCS/UMTS/LTE Band II/IV/VII/XII, the gain is -3dBi for GSM850/UMTS-FDD Band V/LTE Band IV, the gain is -1dBi for PCS1900/UMTS-FDD Band II/ LTE Band II, the gain is 0dBi for UMTS-FDD Band VII, the gain is -4dBi for LTE Band XII.

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.



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6.2 Channel Separation

Temperature	27 °C		
Relative Humidity	55%		
Atmospheric Pressure	1023mbar		
Test date :	January 22, 2018		
Tested By :	Aaron Liang		

Requirement(s):

Requirement(s):						
Spec	Item	em Requirement Application				
0.45.047(.)(4)		Channel Separation < 20dB BW and 20dB BW <				
	۵)	25KHz;Channel Separation Limit=25KHz	V			
§ 15.247(a)(1)	(a)	Chanel Separation < 20dB BW and 20dB BW >				
		25kHz; Channel Separation Limit=2/3 20dB BW				
Test Setup	Spectrum Analyzer EUT					
	The t	est 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					
Test Procedure	- Video (or Average) Bandwidth (VBW) ≥ RBW					
Tool Toolaaro	- 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.				



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Rema	rk				
Resu	lt	Pass	Fail		
Test Data	Yes	;	□ _{N/A}		
Test Plot	Ye	s (See below)	N/A		

Channel Separation measurement result

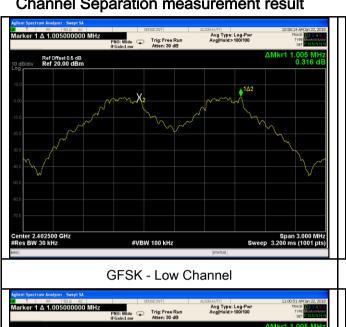
Type/ Modulation	СН	CH Frequency (MHz)	CH Separation (MHz)	Limit (MHz)	Result
	Low Channel	2402	1.005	0.965	Pass
	Adjacency Channel	2403	1.005	0.903	F d 5 5
CH Separation	Mid Channel	2440	1.002	0.961	Pass
GFSK	Adjacency Channel	2441	1.002	0.901	P d 5 5
	High Channel	2480	1.005	0.681	Door
	Adjacency Channel	2479	1.005	0.001	Pass
	Low Channel	2402	1.002	0.877	Pass
	Adjacency Channel	2403	1.002	0.677	Pass
CH Separation	Mid Channel	2440	1.002	0.878	Pass
π /4 DQPSK	Adjacency Channel	2441	1.002	0.076	Pass
	High Channel	2480	1.002	0.057	Dees
	Adjacency Channel	2479	1.002	0.857	Pass
	Low Channel	2402	4.000	0.007	Desa
	Adjacency Channel	2403	1.002	0.867	Pass
CH Separation	Mid Channel	2440	4.000	0.070	Dana
8DPSK	Adjacency Channel	2441	1.002	0.873	Pass
	High Channel	2480	1.005	0.004	Dess
	Adjacency Channel	2479	1.005	0.861	Pass



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Test Plots

Channel Separation measurement result











GFSK - High Channel

 π /4 DPSK - Low Channel





 π /4 DQPSK - Middle Channel

 π /4 DQPSK - High Channel



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8DPSK - Low Channel

8DPSK - Middle Channel



8DPSK - High Channel



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6.3 20dB Bandwidth

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	January 22, 2018
Tested By :	Aaron Liang

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.	V	
Test Setup	Spectrum Analyzer EUT			
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			



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		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 va	each variation. The limit is specified in one of the subparagraphs of		
		this Sec	ction. Submit this plot(s).		
Remark					
Result		Pass	☐ Fail		
Test Data	Y	es	N/A		
Test Plot	Y	es (See below)	□ _{N/A}		

Measurement result

Modulation	СН	CH Frequency	20dB Bandwidth	99% Occupied
Modulation	G	(MHz)	(MHz)	Bandwidth (MHz)
	Low	2402	0.9646	0.8897
GFSK	Mid	2441	0.9605	0.8921
	High	2480	1.022	0.8982
π /4 DQPSK	Low	2402	1.315	1.1876
	Mid	2441	1.317	1.1836
	High	2480	1.286	1.1803
	Low	2402	1.300	1.1918
8-DPSK	Mid	2441	1.309	1.2026
	High	2480	1.292	1.1968



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Test Plots

20dB Bandwidth measurement result







GFSK - Middle Channel

Center Freq: 2.402000000 GHz
Trig: Free Run Avg|Hold>10/10

10:36:32 AM Jan Radio Std: None

Radio Device: BTS

10:35:32 AM Jan Radio Std: None



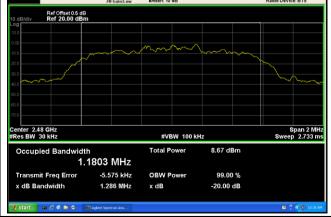


π /4 DPSK - Low Channel

GFSK - High Channel







π /4 DQPSK - Middle Channel

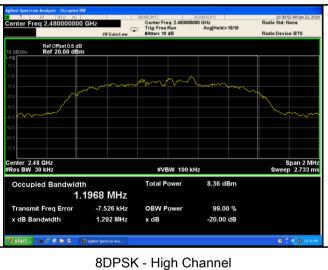
π /4 DQPSK - High Channel



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8DPSK - Middle Channel



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6.4 Peak Output Power

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	January 22, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable	
	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	>	
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt		
§15.247(b)	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	V	
(3)	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt		
	e)	e) FHSS in 902-928MHz with ≥ 25 & <50 channels: ≤ 0.25 Watt		
	f)	DTS in 902-928MHz, 2400-2483.5MHz: ≤ 1 Watt		
Test Setup	Spectrum Analyzer EUT			
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			



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		- 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 re	garding external attenuation and cable loss). The limit is		
		specified	in one of the subparagraphs of this Section. Submit this		
		plot. A pe	eak responding power meter may be used instead of a		
		spectrum	n analyzer.		
Remark					
Result		Pass	Fail		
Test Data	V	´es	□ _{N/A}		
Test Plot	Y	es (See below)	□ _{N/A}		

Peak Output Power measurement result

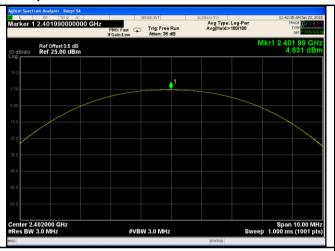
Туре	Modulation	СН	Frequenc y (MHz)	Conducted Power (dBm)	Limit (mW)	Result
		Low	2402	4.631	1000	Pass
	GFSK	Mid	2441	5.955	125	Pass
		High	2480	5.217	125	Pass
Outtout	π /4 DQPSK 8-DPSK	Low	2402	5.550	125	Pass
Output power		Mid	2441	5.156	125	Pass
		High	2480	5.395	125	Pass
		Low	2402	5.559	125	Pass
		Mid	2441	5.126	125	Pass
		High	2480	5.371	125	Pass

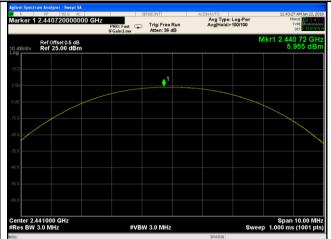


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Test Plots

Output Power measurement result

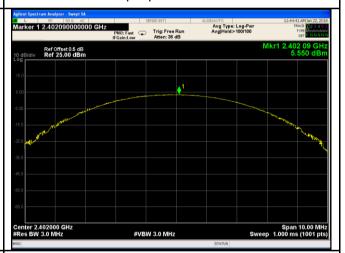




GFSK Output power - Low CH 2402



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

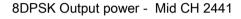


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8DPSK Output power - Low CH 2402





8DPSK Output power - High CH 2480



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6.5 Number of Hopping Channel

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	January 22, 2018
Tested By :	Aaron Liang

Requirement(s):					
Spec	Item	Requirement	Applicable		
§15.247(a) (1)(iii)	a)	a) FHSS in 2400-2483.5MHz ≥ 15 channels			
Test Setup	Spectrum Analyzer EUT				
	The tes	st follows FCC Public Notice DA 00-705 Measurement Gu	idelines.		
		e following spectrum analyzer settings:			
		JT must have its hopping function enabled.			
	- Span = the frequency band of operation				
	- RBW ≥ 1% of the span				
	- VBW ≥ RBW				
Test	- Sweep = auto				
Procedure	-	- Detector function = peak			
	- Trace = max hold				
	-	Allow trace to fully stabilize.			
	- It may prove necessary to break the span up to sections, in orde				
	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	Pas	s Fail			
Test Data	Yes	N/A			
Test Plot	Yes (See	below) N/A			



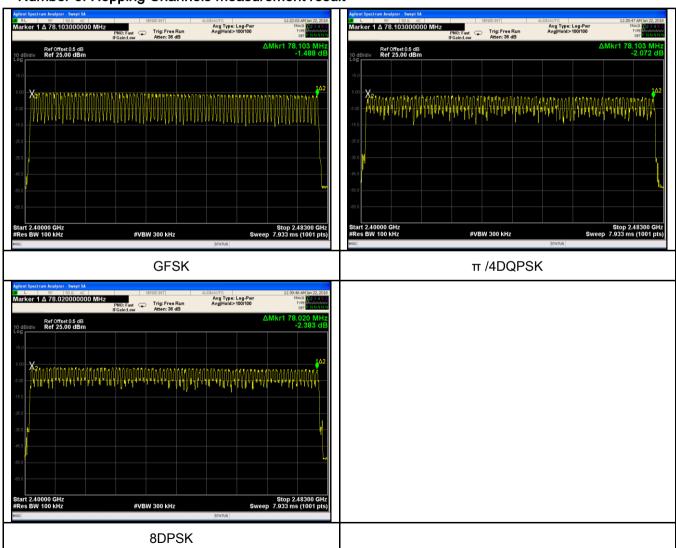
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Number of Hopping Channel measurement result

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

Test Plots

Number of Hopping Channels measurement result





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6.6 Time of Occupancy (Dwell Time)

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	January 22, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
	ILEIII	Nequilement	Applicable
§15.247(a)	a)	Dwell Time < 0.4s	
(1)(iii)	۵,	2 Well Tillie Citie	
Test Setup		Spectrum Analyzer EUT	
	The te	st follows FCC Public Notice DA 00-705 Measurement G	Guidelines.
	Use the	e following spectrum analyzer	
	-	Span = zero span, centered on a hopping channel	
	- RBW = 1 MHz		
Test	-	VBW ≥ RBW	
Procedure	-	Sweep = as necessary to capture the entire dwell time p	er hopping
		channel	
	-	Detector function = peak	
	-	Trace = max hold	
	-	- use the marker-delta function to determine the dwell time	
Remark			
Result	Pas	s Fail	

Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	□ _{N/A}



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Dwell Time measurement result

Туре	Modulation	СН	Pulse Width (ms)	Dwell Time (ms)	Limit (ms)	Result
		Low	2.990	318.933	400	Pass
	GFSK	Mid	2.990	318.933	400	Pass
		High	2.920	311.467	400	Pass
		Low	2.970	316.800	400	Pass
Dwell Time	π /4 DQPSK	Mid	2.970	316.800	400	Pass
		High	2.930	312.533	400	Pass
		Low	2.990	318.933	400	Pass
	8-DPSK	Mid	2.960	315.733	400	Pass
		High	2.970	316.800	400	Pass
Note: Dwell time-Dulce Time (me) x (1600 ÷ 6 ÷ 70) x21 6						

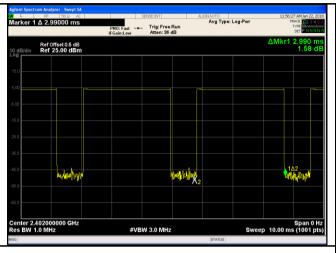
Note: Dwell time=Pulse Time (ms) \times (1600 ÷ 6 ÷ 79) \times 31.6

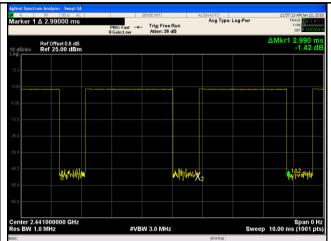


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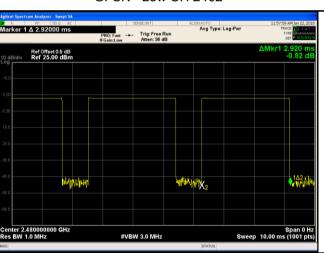
Test Plots

Dwell Time measurement result

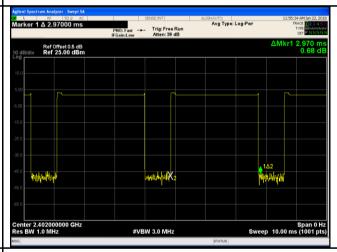




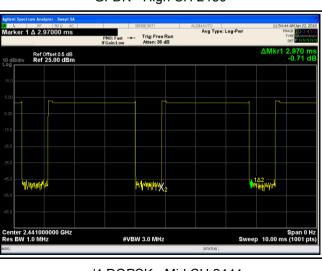
GFSK - Low CH 2402



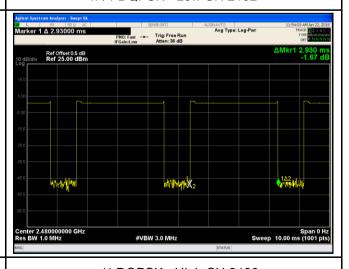
GFSK - Mid CH 2441



GFDK - High CH 2480



 π /4 DQPSK - Low CH 2402

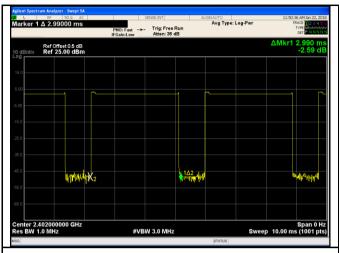


 π /4 DQPSK - Mid CH 2441

 π /4 DQPSK - High CH 2480 $\,$



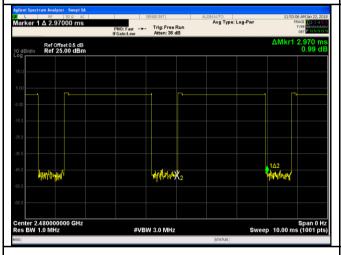
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8DPSK - Low CH 2402

8DPSK - Mid CH 2441



8DPSK - High CH 2480



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6.7 Band Edge & Restricted Band

Temperature	26 °C
Relative Humidity	57%
Atmospheric Pressure	1025mbar
Test date :	December 25, 2017
Tested By :	Aaron Liang

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	Ant. Tower Support Units Turn Table Ground Plane Test Receiver		
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,		



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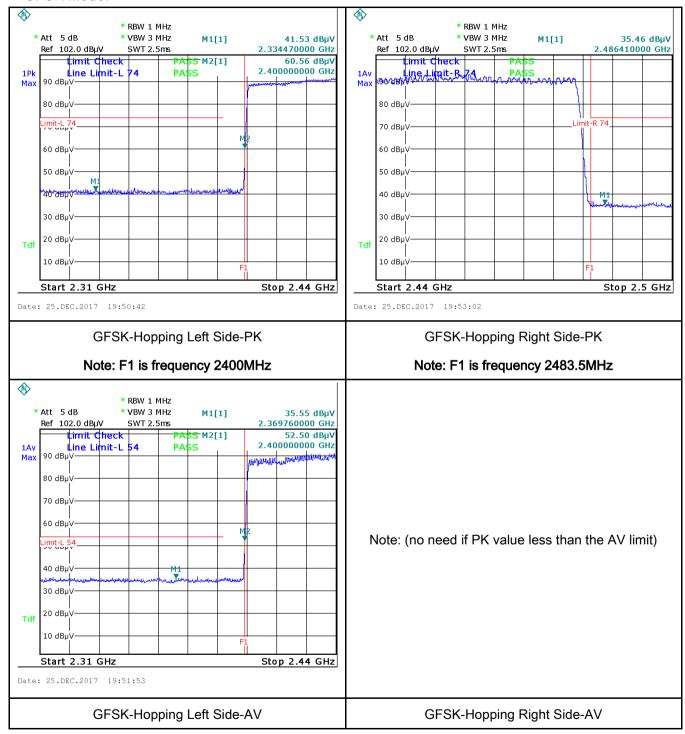
	and make sure the instrument is operated in its linear range.
	- 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a
	convenient frequency span including 100kHz bandwidth from band edge, check
	the emission of EUT, if pass then set Spectrum Analyzer as below:
	a. The resolution bandwidth 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	∕es N/A
. 55: 24:4	
Test Plot	'es (See below) N/A



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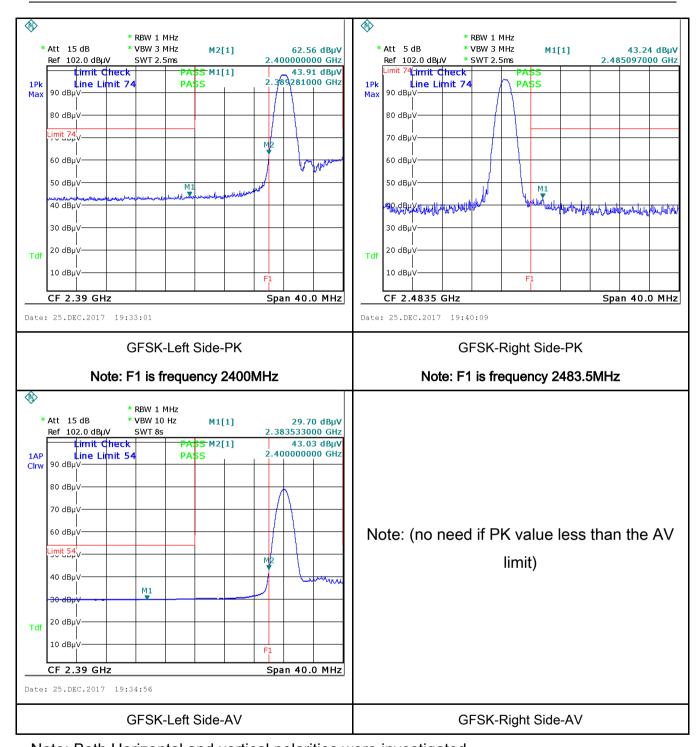
Test Plots

GFSK Mode:





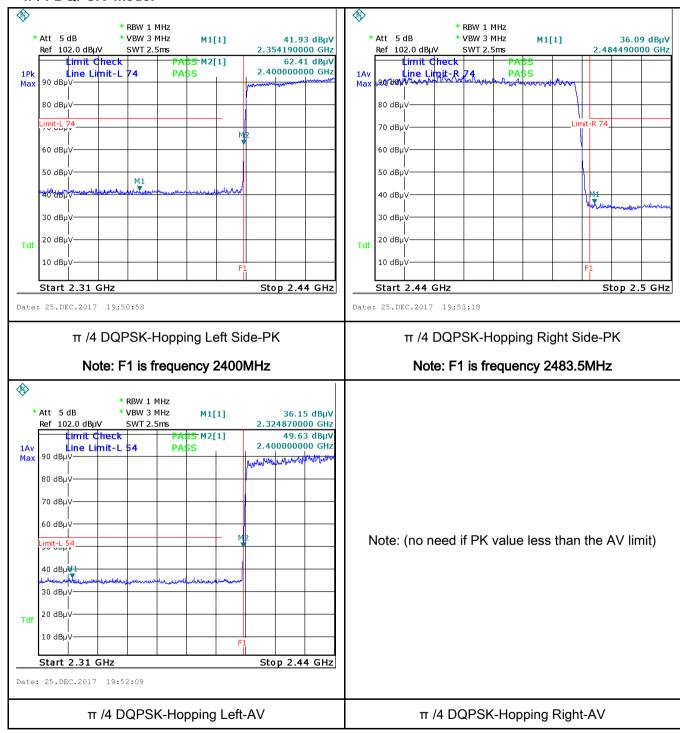
Test Report	17071442-FCC-R3
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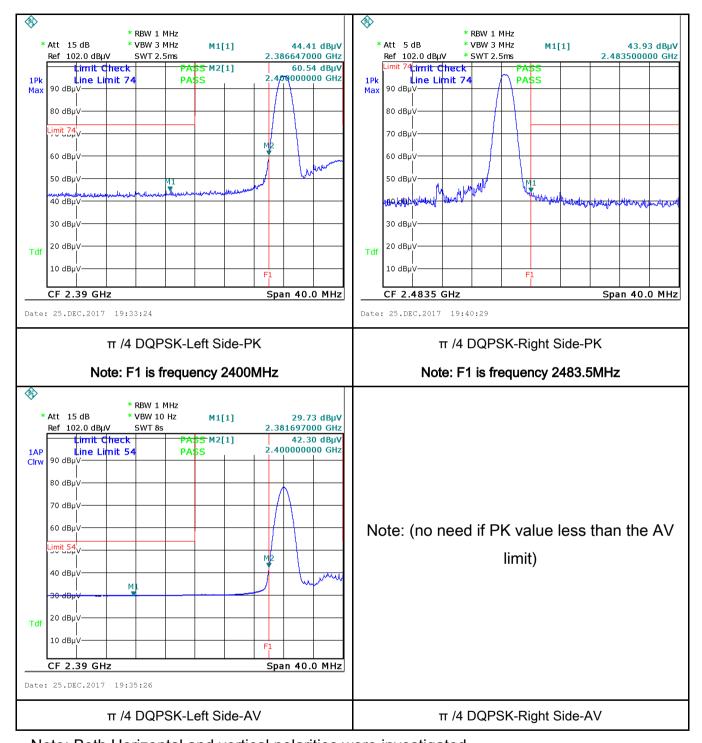
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π /4 DQPSK Mode:





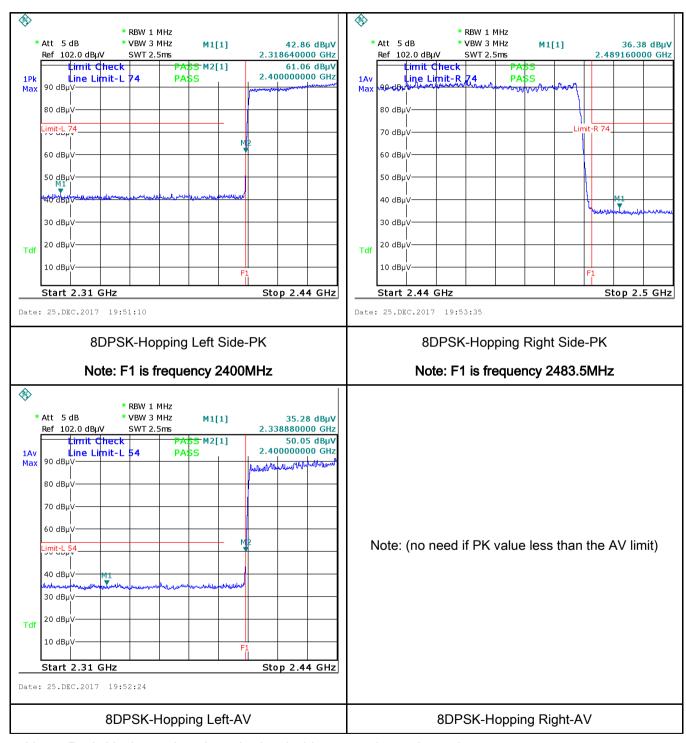
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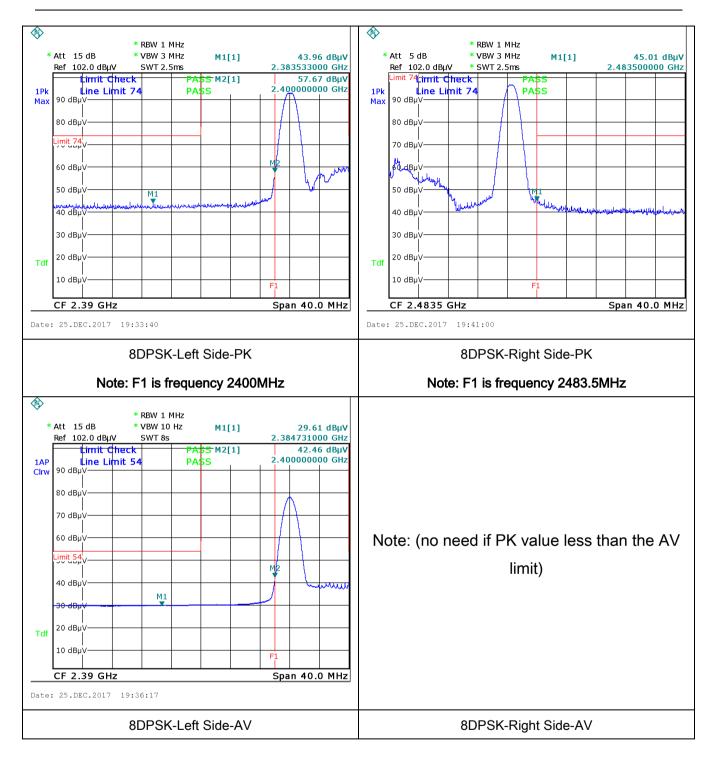
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8-DPSK Mode:





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6.8 AC Power Line Conducted Emissions

Temperature	25 °C
Relative Humidity	55%
Atmospheric Pressure	1017mbar
Test date :	December 23, 2017
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement Applicable				
47CFR§15. 207, RSS210	a)	For Low-power radio-fr connected to the public voltage that is conducted frequency or frequencies not exceed the limits in [mu]H/50 ohms line implower limit applies at the Frequency ranges				
(A8.1)		(MHz)	Limit (Average		
		0.15 ~ 0.5	66 – 56	56 – 46		
		0.5 ~ 5	56	46		
		5 ~ 30	60	50		
Test Setup	Vertical Ground Reference Plane EUT Horizontal Ground Reference Plane 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	 The EUT and supporting equipment were set up in accordance with the requirement 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 filtered mains. 					
	3. The	RF OUT of the EUT LIS	SN was connected to the	ne EMI test receiver via	a low-loss	



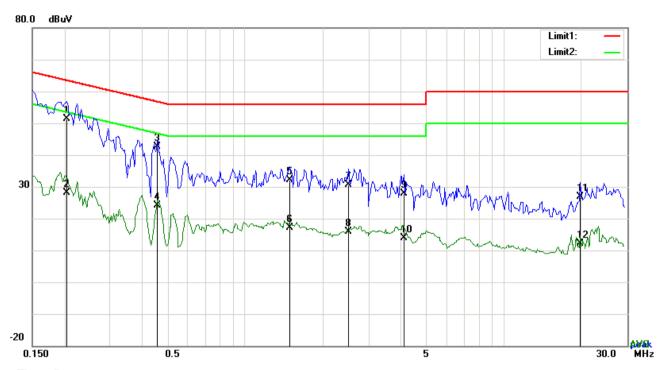
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	coaxial cable.
	4. All other supporting equipment were powered separately from another main supply.
	5. The EUT was switched on and allowed to warm up to its normal operating condition.
	6. A scan was made on the NEUTRAL line (for AC mains) or Earth 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)



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Test Mode:	Bluetooth Mode
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Test Data

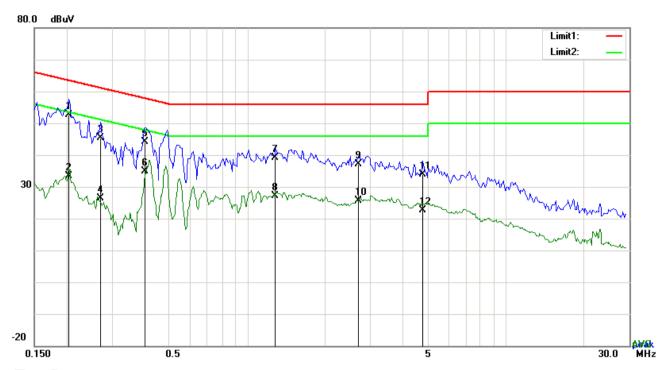
Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2046	41.37	QP	10.03	51.40	63.42	-12.02
2	L1	0.2046	18.19	AVG	10.03	28.22	53.42	-25.20
3	L1	0.4581	32.49	QP	10.03	42.52	56.73	-14.21
4	L1	0.4581	14.09	AVG	10.03	24.12	46.73	-22.61
5	L1	1.4838	22.07	QP	10.04	32.11	56.00	-23.89
6	L1	1.4838	7.21	AVG	10.04	17.25	46.00	-28.75
7	L1	2.5056	20.65	QP	10.05	30.70	56.00	-25.30
8	L1	2.5056	5.91	AVG	10.05	15.96	46.00	-30.04
9	L1	4.1037	17.74	QP	10.07	27.81	56.00	-28.19
10	L1	4.1037	3.73	AVG	10.07	13.80	46.00	-32.20
11	L1	19.7076	16.69	QP	10.30	26.99	60.00	-33.01
12	L1	19.7076	1.87	AVG	10.30	12.17	50.00	-37.83



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Test Mode:	Bluetooth Mode



Test Data

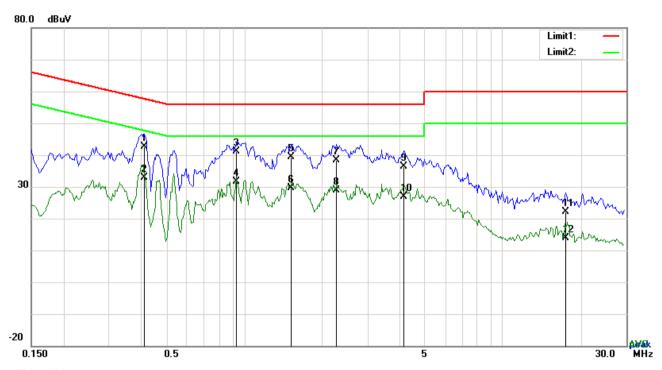
Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2046	42.72	QP	10.02	52.74	63.42	-10.68
2	N	0.2046	23.41	AVG	10.02	33.43	53.42	-19.99
3	N	0.2709	35.44	QP	10.02	45.46	61.09	-15.63
4	N	0.2709	16.44	AVG	10.02	26.46	51.09	-24.63
5	N	0.4035	34.03	QP	10.02	44.05	57.78	-13.73
6	N	0.4035	24.85	AVG	10.02	34.87	47.78	-12.91
7	N	1.2888	29.12	QP	10.03	39.15	56.00	-16.85
8	N	1.2888	17.01	AVG	10.03	27.04	46.00	-18.96
9	N	2.6925	27.20	QP	10.05	37.25	56.00	-18.75
10	N	2.6925	15.60	AVG	10.05	25.65	46.00	-20.35
11	N	4.7667	23.82	QP	10.07	33.89	56.00	-22.11
12	N	4.7667	12.59	AVG	10.07	22.66	46.00	-23.34



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Test Mode: Bluetooth Mode



Test Data

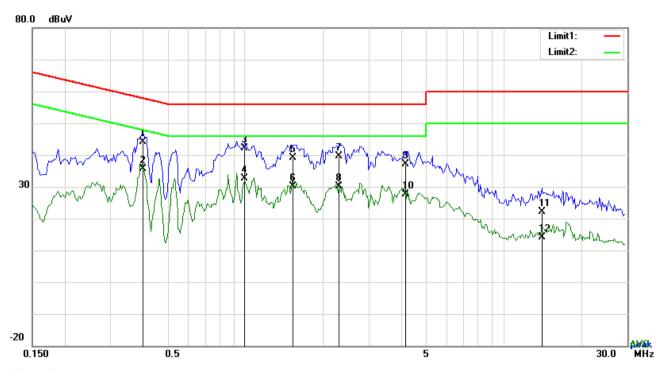
Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.4113	32.48	QP	10.03	42.51	57.62	-15.11
2	L1	0.4113	22.74	AVG	10.03	32.77	47.62	-14.85
3	L1	0.9339	31.22	QP	10.03	41.25	56.00	-14.75
4	L1	0.9339	21.50	AVG	10.03	31.53	46.00	-14.47
5	L1	1.5228	29.23	QP	10.04	39.27	56.00	-16.73
6	L1	1.5228	19.71	AVG	10.04	29.75	46.00	-16.25
7	L1	2.2677	28.43	QP	10.05	38.48	56.00	-17.52
8	L1	2.2677	18.73	AVG	10.05	28.78	46.00	-17.22
9	L1	4.1466	26.25	QP	10.07	36.32	56.00	-19.68
10	L1	4.1466	16.81	AVG	10.07	26.88	46.00	-19.12
11	L1	17.4768	11.94	QP	10.26	22.20	60.00	-37.80
12	L1	17.4768	3.66	AVG	10.26	13.92	50.00	-36.08



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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	0.4035	34.07	QP	10.02	44.09	57.78	-13.69
2	N	0.4035	25.50	AVG	10.02	35.52	47.78	-12.26
3	N	0.9924	32.07	QP	10.03	42.10	56.00	-13.90
4	N	0.9924	22.56	AVG	10.03	32.59	46.00	-13.41
5	N	1.5345	28.98	QP	10.04	39.02	56.00	-16.98
6	N	1.5345	20.01	AVG	10.04	30.05	46.00	-15.95
7	N	2.2989	29.50	QP	10.04	39.54	56.00	-16.46
8	N	2.2989	20.02	AVG	10.04	30.06	46.00	-15.94
9	N	4.1661	27.11	QP	10.06	37.17	56.00	-18.83
10	N	4.1661	17.55	AVG	10.06	27.61	46.00	-18.39
11	N	14.0409	11.86	QP	10.19	22.05	60.00	-37.95
12	N	14.0409	4.01	AVG	10.19	14.20	50.00	-35.80



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6.9 Radiated Emissions & Restricted Band

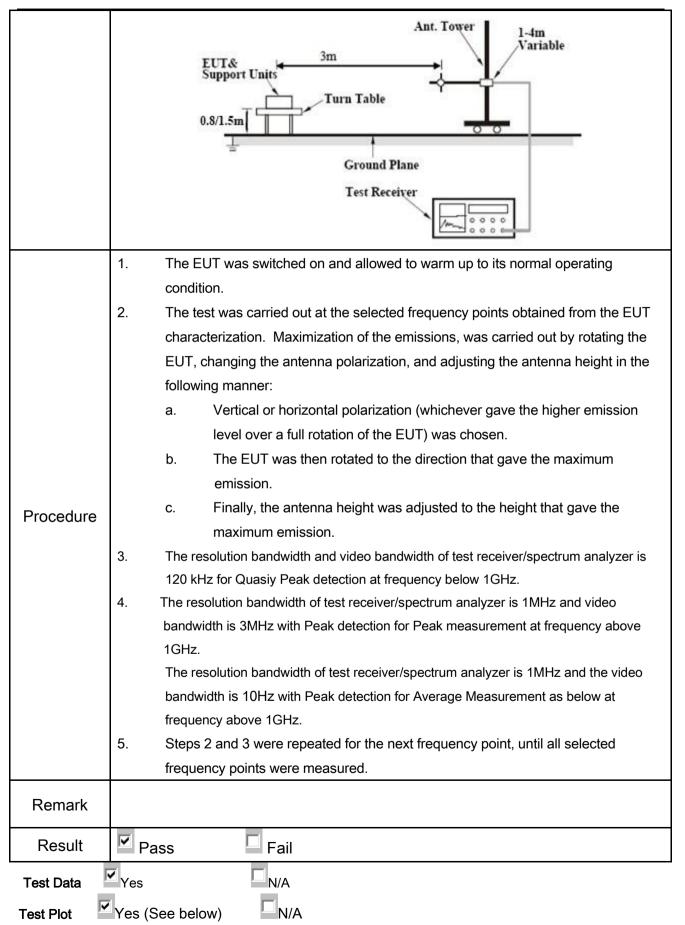
Temperature	26 °C
Relative Humidity	57%
Atmospheric Pressure	1025mbar
Test date :	December 25, 2017
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement Applicable				
47CFR§15.		Except higher limit as specified else emissions from the low-power radio exceed the field strength levels specified the level of any unwanted emissions the fundamental emission. The tight edges				
205, §15.209,	a)	Frequency range (MHz) 0.009~0.490	Field Strength (μV/m) 2400/F(KHz)	V		
§15.247(d)		0.490~1.705	24000/F(KHz)			
310.247 (d)		1.705~30.0	30			
		30 – 88	100			
		88 – 216	150			
		216 960	200			
		Above 960	500			
Test Setup		EUT 0.8m	p ma			



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Test Result:

Test Mode: Transmitting Mode

Frequency range: 9KHz - 30MHz

Freq.	Detection	Factor	Reading	Result	Limit@3m	Margin
(MHz)	value	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
						>20
						>20

Note:

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

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

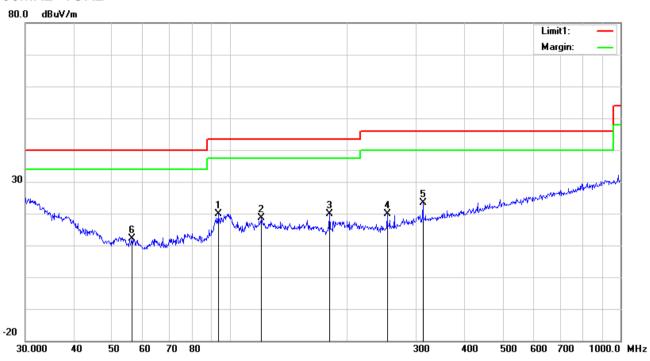
Limit line = specific limits(dBuv) + distance extrapolation factor.



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Test Mode: Bluetooth Mode

30MHz -1GHz



Test Data

Horizontal Polarity Plot @3m

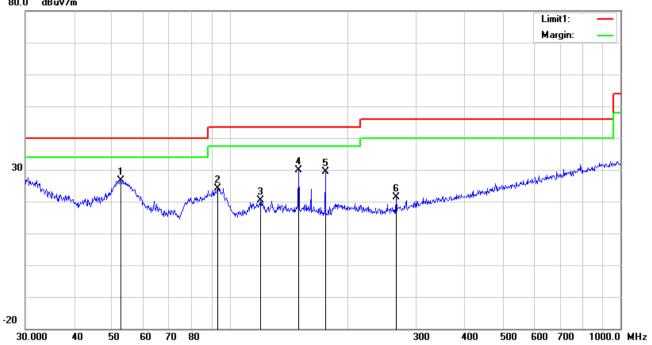
No.	P/L	Frequency	Reading	Detect	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr
	.,_			or								ee
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	Н	93.4402	32.43	peak	8.83	22.32	0.98	19.92	43.50	-23.58	100	38
2	Н	120.6991	25.95	peak	13.85	22.36	1.16	18.60	43.50	-24.90	100	216
3	Н	180.0165	29.82	peak	11.00	22.25	1.36	19.93	43.50	-23.57	100	273
4	Η	252.9482	28.92	peak	11.53	22.29	1.71	19.87	46.00	-26.13	100	82
5	Н	312.1794	29.93	peak	13.86	22.26	1.85	23.38	46.00	-22.62	100	27
6	Н	56.1974	26.02	peak	7.72	22.40	0.77	12.11	40.00	-27.89	200	291



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30MHz -1GHz





Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detect	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr
		(MHz)	(dBuV/m)	or	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	ee ()
		(**** 12)	(abat/iii)		(42/)	(42)	(42)	(abav,iii)	(abav,iii)	(42)	(GIII)	()
1	V	52.5753	40.23	peak	8.12	22.39	0.79	26.75	40.00	-13.25	200	44
2	V	93.1132	36.76	peak	8.75	22.32	0.97	24.16	43.50	-19.34	100	246
3	٧	119.8556	27.68	peak	13.87	22.36	1.16	20.35	43.50	-23.15	100	191
4	٧	150.0108	38.28	peak	12.60	22.34	1.34	29.88	43.50	-13.62	100	167
5	V	175.6516	38.82	peak	11.35	22.25	1.36	29.28	43.50	-14.22	100	326
6	٧	266.6089	29.74	peak	12.13	22.29	1.73	21.31	46.00	-24.69	100	343



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Above 1GHz

nsmitting 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	48.49	AV	V	33.39	7.22	48.46	40.64	54	-13.36
4804	44.26	AV	Н	33.39	7.22	48.46	36.41	54	-17.59
4804	70.14	PK	V	33.39	7.22	48.46	62.29	74	-11.71
4804	64.84	PK	Н	33.39	7.22	48.46	56.99	74	-17.01
8785	30.29	AV	V	37.64	7.86	47.45	28.34	54	-25.66
8785	29.48	AV	Н	37.64	7.86	47.45	27.53	54	-26.47
8785	50.29	PK	V	37.64	7.86	47.45	48.34	74	-25.66
8785	49.87	PK	Н	37.64	7.86	47.45	47.92	74	-26.08

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	47.15	AV	V	33.62	7.53	48.36	39.94	54	-14.06
4882	43.35	AV	Н	33.62	7.53	48.36	36.14	54	-17.86
4882	70.33	PK	V	33.62	7.53	48.36	63.12	74	-10.88
4882	64.49	PK	Н	33.62	7.53	48.36	57.28	74	-16.72
10231	30.28	AV	V	40.13	10.52	47.18	33.75	54	-20.25
10231	29.56	AV	Н	40.13	10.52	47.18	33.03	54	-20.97
10231	46.35	PK	V	40.13	10.52	47.18	49.82	74	-24.18
10231	45.87	PK	Н	40.13	10.52	47.18	49.34	74	-24.66



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High Channel: GFSK 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	42.26	AV	V	33.89	7.86	48.31	35.7	54	-18.3
4960	44.75	AV	Н	33.89	7.86	48.31	38.19	54	-15.81
4960	66.13	PK	V	33.89	7.86	48.31	59.57	74	-14.43
4960	66	PK	Н	33.89	7.86	48.31	59.44	74	-14.56
17767	46.56	AV	V	42.55	19.4	43.72	64.79	54	10.79
17767	47.13	AV	Н	42.55	19.4	43.72	65.36	54	11.36
17767	41.37	PK	V	42.55	19.4	43.72	59.6	74	-14.4
17767	41.45	PK	Н	42.55	19.4	43.72	59.68	74	-14.32

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.
- 4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.



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Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/15/2017	09/14/2018	<u><</u>
Line Impedance	LI-125A	191106	09/23/2017	09/22/2018	~
Line Impedance	LI-125A	191107	09/23/2017	09/22/2018	>
ISN	ISN T800	34373	09/23/2017	09/22/2018	
Transient Limiter	LIT-153	531118	08/30/2017	08/29/2018	
RF conducted test					
Agilent ESA-E SERIES	E4407B	MY45108319	09/15/2017	09/14/2018	>
Power Splitter	1#	1#	08/30/2017	08/29/2018	>
DC Power Supply	E3640A	MY40004013	09/15/2017	09/14/2018	>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	>
Positioning Controller	UC3000	MF780208282	11/17/2017	11/16/2018	>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	<u><</u>
Horn Antenna	BBHA9170	3145226D1	09/27/2017	09/26/2018	<u>\</u>
Active Antenna (9kHz-30MHz)	AL-130	121031	10/12/2017	10/11/2018	>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/22/2017	09/21/2018	(
Universal Radio Communication Tester	CMU200	121393	09/23/2017	09/22/2018	Y



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Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo





Adapter - Lable View





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EUT - Front View



EUT - Rear View



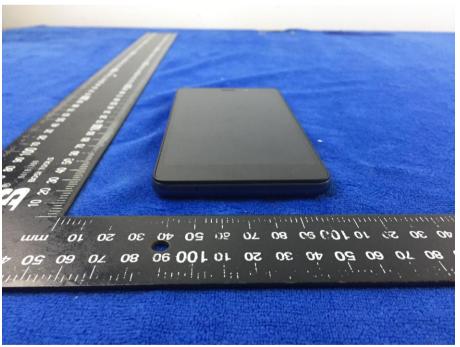


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EUT - Top View



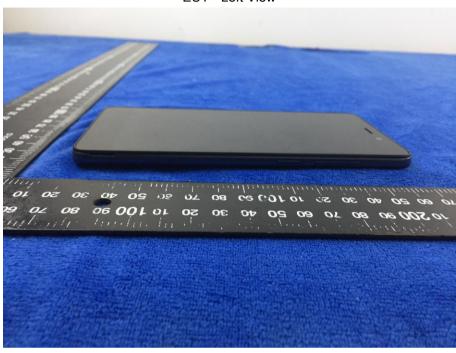
EUT - Bottom View





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EUT - Left View



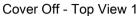
EUT - Right View





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Annex B.ii. Photograph: EUT Internal Photo





Cover Off - Top View 2





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Battery - Front View



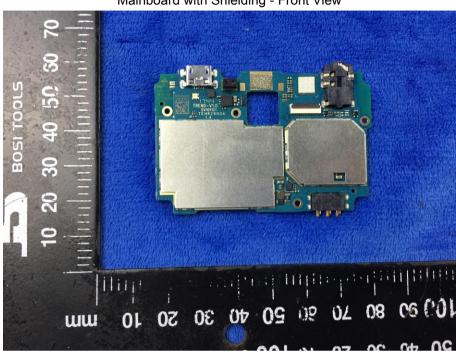
Battery - Rear View



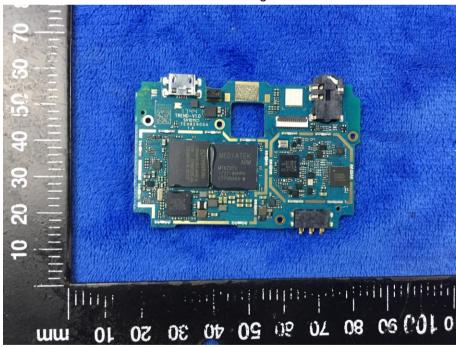


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Mainboard with Shielding - Front View



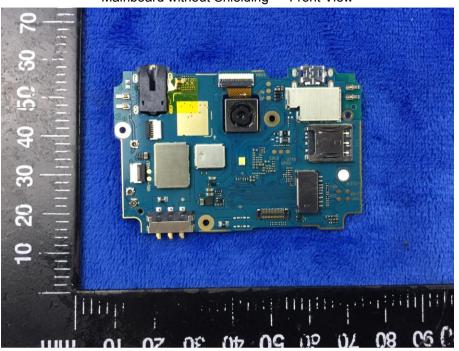
Mainboard with Shielding - Rear View



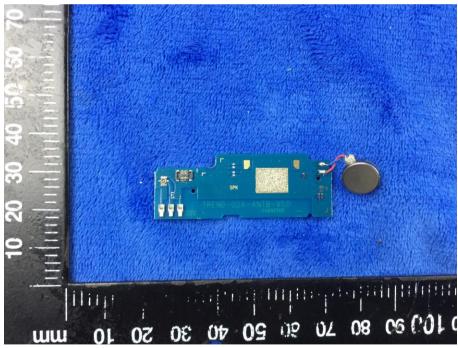


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Mainboard without Shielding - Front View



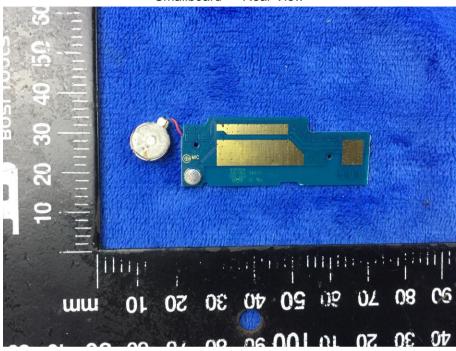
Smallboard - Front View





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Smallboard - Rear View



LCD - Front View





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LCD - Rear View



GSM/PCS/UMTS-FDD/LTE Antenna View





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WIFI/BT/BLE/GPS - Antenna View



RXD- Antenna View





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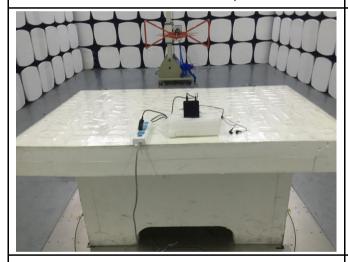
Annex B.iii. Photograph: Test Setup Photo



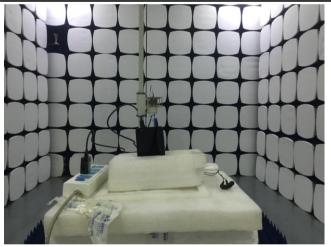
Conducted Emissions Test Setup Front View



Conducted Emissions Test Setup Side View



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Above 1GHz

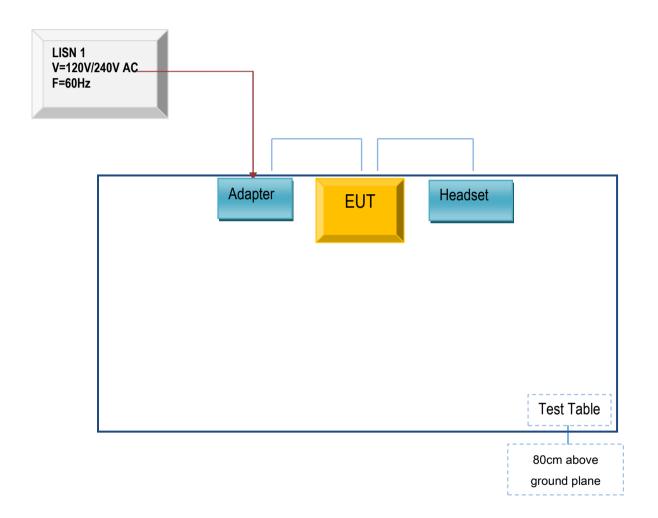


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Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

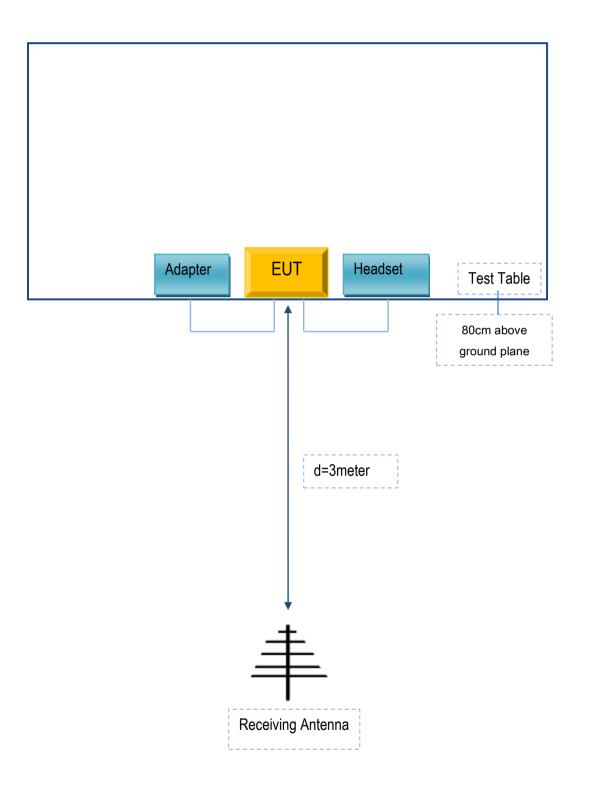
Block Configuration Diagram for AC Line Conducted Emissions





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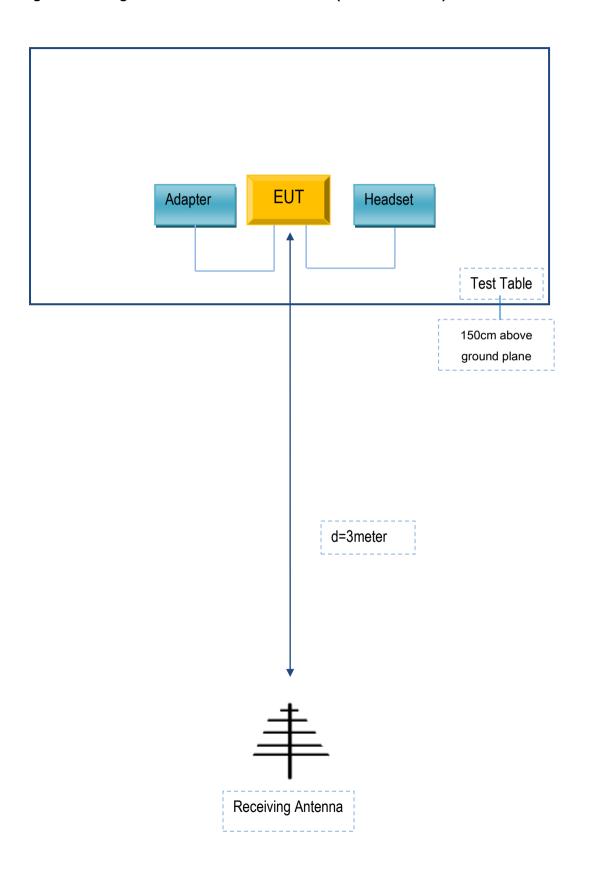
Block Configuration Diagram for Radiated Emissions (Below 1GHz).





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





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Annex C. il. 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
MFOURTEL MEXICO S.A. DE C.V.	Adapter	M4	N/A
MFOURTEL MEXICO S.A. DE C.V.	headset	M4 B2	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	N/A



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

Please see the attachment



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Annex E. DECLARATION OF SIMILARITY

N/A