# RF TEST REPORT



Report No.: 17071152-FCC-R4
Supersede Report No.: N/A

Applicant	BLU Produ	cts, Inc.		
Product Name	Mobile Pho	ne		
Model No.	STUDIO VI	IEW		
Serial No.	N/A			
Test Standard	FCC Part 1	5.247: 2016,	ANSI C63.10: 2	013
Test Date	October 31	to Novembe	r 19, 2017	
Issue Date	November	20, 2017		
Test Result	Pass	Fail		
Equipment compl	ied with the	specification	V	
Equipment did no	t comply with	h the specific	ation 🔲	
Loven	Luo	David	Huang	
Loren Luo 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.



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### **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
17071152-FCC-R4	NONE	Original	November 20, 2017

# 2. Customer information

Applicant Name	BLU Products, Inc.
Applicant Add	10814 NW 33rd St # 100 Doral, FL 33172
Manufacturer	BLU Products, Inc.
Manufacturer Add	10814 NW 33rd St # 100 Doral, FL 33172

# 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
Lab Address	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: Mobile Phone

Main Model: STUDIO VIEW

Serial Model: N/A

Date EUT received: October 30, 2017

Test Date(s): October 31 to November 19, 2017

Equipment Category : DTS

GSM850: -3.8dBi PCS1900: -2.5dBi

UMTS-FDD Band V: -3.8dBi

UMTS-FDD Band IV: -2.3dBi Antenna Gain:

UMTS-FDD Band II: -2.7dBi

WIFI: -3.6dBi

Bluetooth/BLE: -3.3dBi

GPS: -3.3dBi

Antenna Type: PIFA antenna

GSM / GPRS: GMSK

EGPRS: GMSK

UMTS-FDD: QPSK

Type of Modulation: 802.11b/g/n: DSSS, OFDM

Bluetooth: GFSK, π /4DQPSK, 8DPSK

BLE: GFSK GPS:BPSK

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

RF Operating Frequency (ies): UMTS-FDD Band IV TX:1712.4 ~ 1752.6 MHz;

RX: 2112.4 ~ 2152.6 MHz

UMTS-FDD Band II TX:1852.4 ~ 1907.6 MHz;

RX: 1932.4 ~ 1987.6 MHz



Number of Channels:

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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

802.11b: 12.76 dBm

Max. Output Power: 802.11g: 11.66 dBm

802.11n(20M): 11.64 dBm 802.11n(40M): 10.37 dBm

GSM 850: 124CH PCS1900: 299CH

UMTS-FDD Band V: 102CH UMTS-FDD Band IV: 202CH UMTS-FDD Band II: 277CH

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: TPA-46050150UU

Input: AC100-240V~50/60Hz,0.3A

Input Power: Output: DC 5.0V,1.5A

Battery:

Model: C765640280P

Spec: 3.8V, 2850mAh, 10.83Wh

Trade Name: BLU

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

FCC ID: YHLBLUSTUDIOVIEW



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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)(2)	DTS (6 dB&20 dB) CHANNEL BANDWIDTH	Compliance
§15.247(b)(3)	Conducted Maximum Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247(d)	Band-Edge & Unwanted Emissions into Restricted Frequency Bands	Compliance
§15.207 (a),	AC Power Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	Compliance

#### **Measurement Uncertainty**

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



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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 GSM/PCS/ UMTS-FDD Band V/ IV /II, the gain is -3.8dBi for GSM850/UMTS-FDD Band V, the gain is -2.5dBi for PCS1900, the gain is -2.3dBi for UMTS-FDD Band IV, the gain is -2.7dBi for UMTS-FDD Band II.

A permanently attached PIFA antenna for Bluetooth/BLE/WIFI/GPS, the gain is -3.6dBi for WIFI, the gain is -3.3dBi for Bluetooth/BLE/GPS.

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.



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# 6.2 DTS (6 dB&20 dB) Channel Bandwidth

Temperature	24 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	November 15, 2017
Tested By :	Loren Luo

Γ_	l	<u></u>	<u> </u>				
Spec	Item	<u> </u>					
§ 15.247(a)(2)	a)	6dB BW≥ 500kHz;					
RSS Gen(4.6.1)	b)	99% BW: For FCC reference only; required by IC.					
Test Setup	Spectrum Analyzer EUT						
	55807	4 D01 DTS MEAS Guidance v03r03, 8.1 DTS bandwidth					
	6dB b	andwidth_					
	a) Se	t RBW = 100 kHz.					
	b) Set the video bandwidth (VBW) ≥ 3 × RBW.						
	c) Detector = Peak.						
	d) Trace mode = max hold.						
	e) Sweep = auto couple.						
	f) Allow the trace to stabilize.						
	g) Measure the maximum width of the emission that is constrained by the freq						
Test Procedure	uencies associated with the two outermost amplitude points (upper and lower fr						
restriocedule	equencies) that are attenuated by 6 dB relative to the maximum level measure						
	d in the fundamental emission.						
	20dB bandwidth						
	C63.10 Occupied Bandwidth (OBW=20dB bandwidth)						
	1. Set RBW = 1%-5% OBW.						
	2. S	2. Set the video bandwidth (VBW) ≥ 3 x RBW.					
	3. Set the span range between 2 times and 5 times of the OBW.						
	4. Sweep time=Auto, Detector=PK, Trace=Max hold.						
	5. Once the reference level is established, the equipment is conditioned with t						
	ypical modulating signals to produce the worst-						



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	-
	case (i.e., the widest) bandwidth. Unless otherwise specified for an unlicensed
	wireless device, measure the bandwidth at the 20 dB levels with respect to the
	reference level.
Remark	
Result	Pass

Test Data	Yes	□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>

### Measurement result

Test mode	СН	Freq (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
	Low	2412	10.085	≥ 0.5
802.11b	Mid	2437	10.111	≥ 0.5
	High	2462	10.090	≥ 0.5
	Low	2412	16.467	≥ 0.5
802.11g	Mid	2437	16.461	≥ 0.5
	High	2462	16.479	≥ 0.5
000 44-	Low	2412	17.703	≥ 0.5
802.11n	Mid	2437	17.737	≥ 0.5
(20M)	High	2462	17.712	≥ 0.5
000.44	Low	2422	36.379	≥ 0.5
802.11n	Mid	2437	36.337	≥ 0.5
(40M)	High	2452	36.356	≥ 0.5



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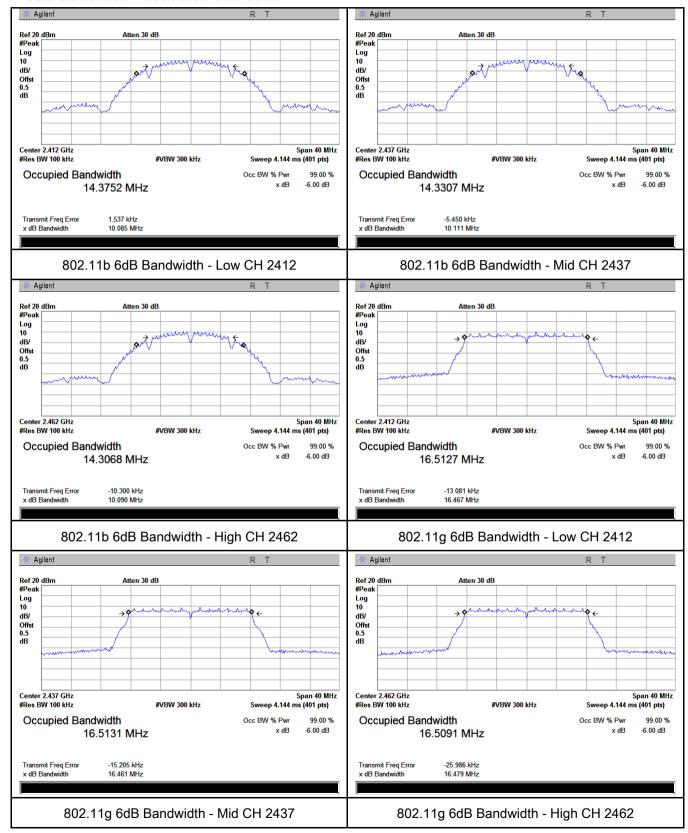
Test mode	СН	Freq (MHz)	20dB Bandwidth (MHz)
	Low	2412	16.748
802.11b	Mid	2437	16.749
	High	2462	16.474
	Low	2412	19.348
802.11g	Mid	2437	19.404
	High	2462	19.444
000 44.5	Low	2412	19.632
802.11n	Mid	2437	19.607
(20M)	High	2462	19.577
000 445	Low	2422	40.314
802.11n	Mid	2437	40.418
(40M)	High	2452	40.046



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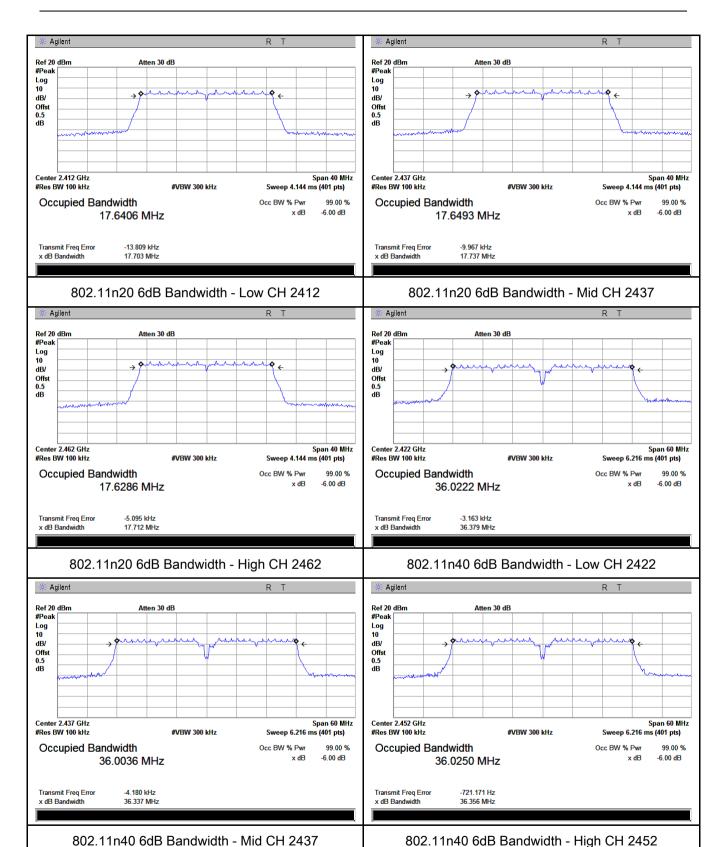
#### **Test Plots**

#### 6dB Bandwidth measurement result





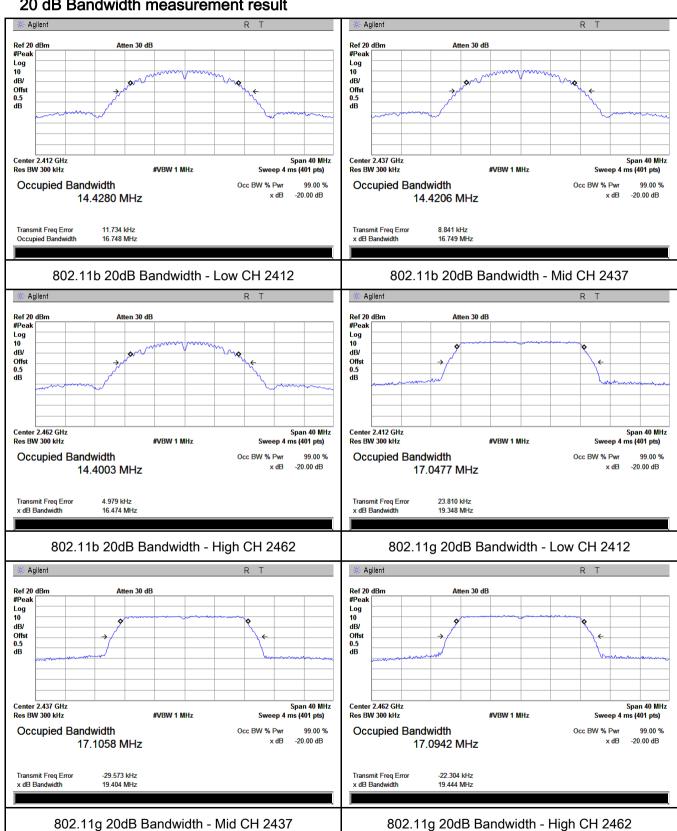
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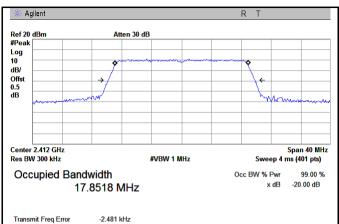
#### 20 dB Bandwidth measurement result

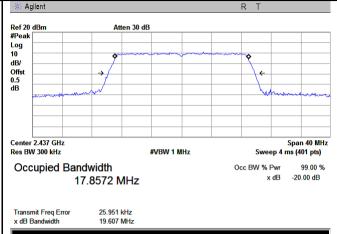




x dB Bandwidth

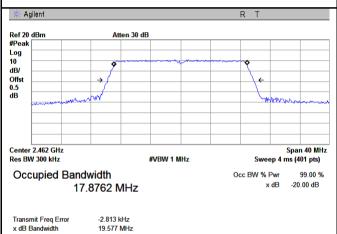
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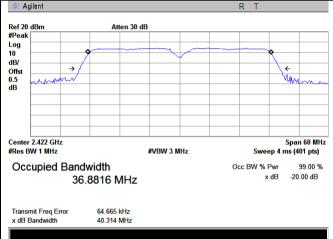


#### 802.11n20 20dB Bandwidth - Low CH 2412

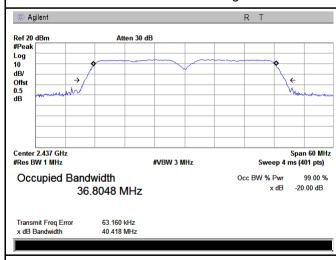
19.632 MHz



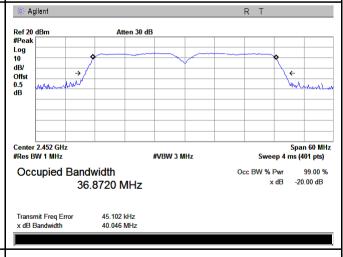
#### 802.11n20 20dB Bandwidth - Mid CH 2437



#### 802.11n20 20dB Bandwidth - High CH 2462



#### 802.11n40 20dB Bandwidth - Low CH 2422



802.11n40 20dB Bandwidth - Mid CH 2437

802.11n40 20dB Bandwidth - High CH 2452



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# 6.3 Maximum Output Power

Temperature	24 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	November 15, 2017
Tested By :	Loren Luo

#### Requirement(s):

Requirement(s):	Ito	Paguiroment	Applicable
Spec	Ite	Requirement	Applicable
	m		
	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.	
(3),RSS210	-1\		
(A8.4)	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	<b>~</b>
Test Setup		Spectrum Analyzer EUT	
	558074 D01 DTS MEAS Guidance v03r03, 9.1.2 Integrated band power method		
	Maximum output power measurement procedure		
	-	a) Set span to at least 1.5 times the OBW.	
	-	b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.	
	- c) Set VBW ≥ 3 x RBW.		
Test	-	d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to	b-bin spacing
Procedure	≤ RBW/2, so that narrowband signals are not lost between frequency bins.)		
	-	e) Sweep time = auto.	
	-	f) Detector = RMS (i.e., power averaging), if available. Otherwise, u	se sample
	detector mode.		
	-	g) If transmit duty cycle < 98 %, use a sweep trigger with the level s	set to enable
		triggering only on full power pulses. The transmitter shall operate a	t maximum



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	power control level for the entire duration of every sweep. If the EUT transmits
	continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each
	transmission is entirely at the maximum power control level, then the trigger shall
	be set to "free run".
	- h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
	- i) Compute power by integrating the spectrum across the OBW of the signal
	using the instrument's band power measurement function, with band limits set
	equal to the OBW band edges. If the instrument does not have a band power
	function, sum the spectrum levels (in power units) at intervals equal to the RBW
	extending across the entire OBW of the spectrum.
Remark	
Result	Pass Fail

Test Data	Yes	□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>

### Output Power measurement result

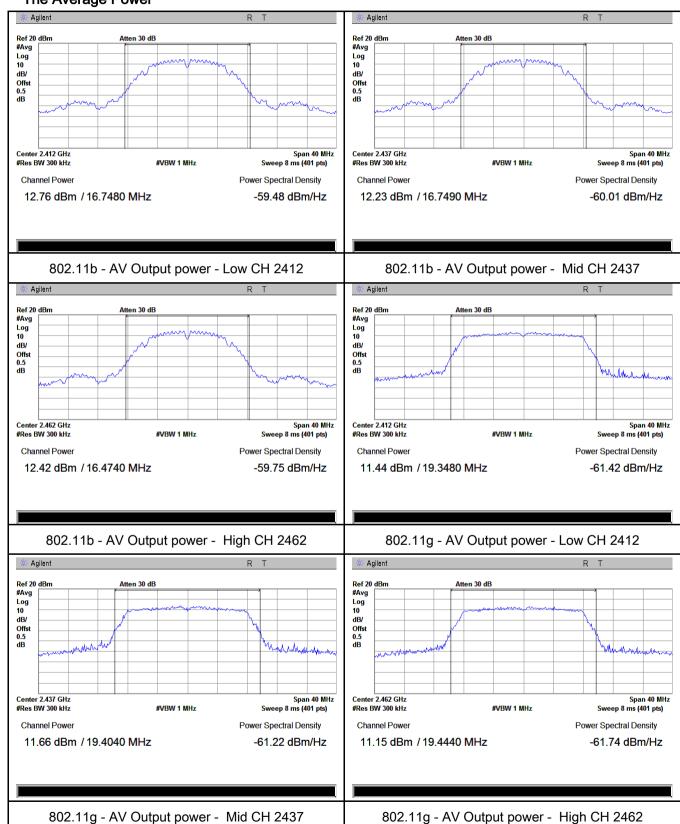
Tymo	Test mode	СН	Frequency	Conducted	Limit	Result
Туре	rest mode	СП	(MHz)	Power (dBm)	(dBm)	Nesult
		Low	2412	12.76	30	Pass
	802.11b	Mid	2437	12.23	30	Pass
		High	2462	12.42	30	Pass
		Low	2412	11.44	30	Pass
	802.11g 802.11n	Mid	2437	11.66	30	Pass
Output		High	2462	11.15	30	Pass
power		Low	2412	11.15	30	Pass
		Mid	2437	11.64	30	Pass
	(20M)	High	2462	11.62	30	Pass
	802.11n (40M)	Low	2422	10.37	30	Pass
		Mid	2437	10.22	30	Pass
		High	2452	10.15	30	Pass



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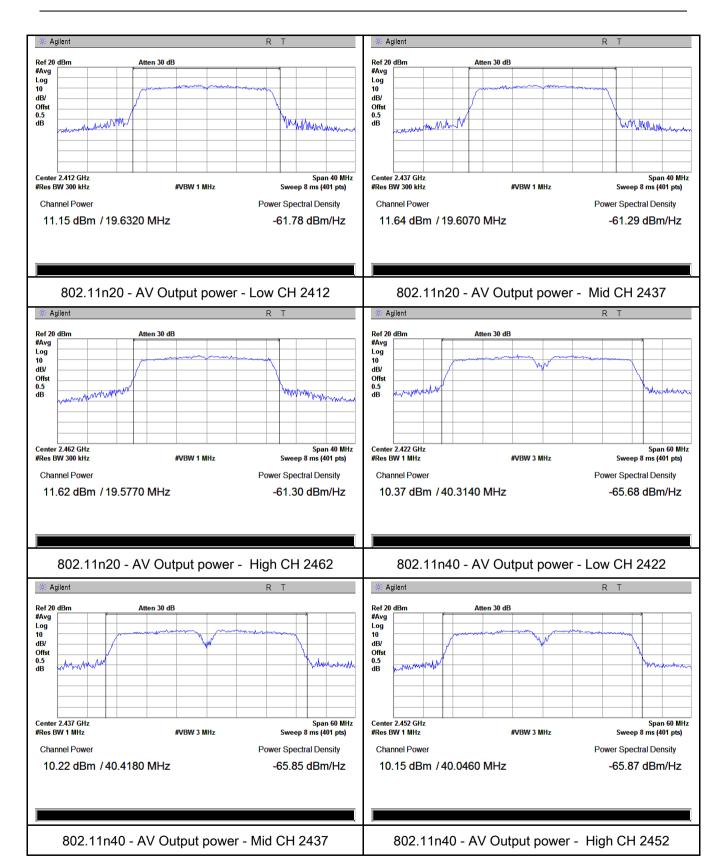
#### **Test Plots**

#### The Average Power





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# 6.4 Power Spectral Density

Temperature	25 °C
Relative Humidity	58%
Atmospheric Pressure	1016mbar
Test date :	November 16, 2017
Tested By:	Loren Luo

Spec	Item	Requirement	Applicable	
§15.247(e)	a)	The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.		
Test Setup		Spectrum Analyzer EUT		
Test Procedure		a) Done DTS MEAS Guidance v03r03, 10.2 power spectral density measurement procedure  a) Set analyzer center frequency to DTS channel center frequency b) Set the span to 1.5 times the DTS bandwidth.  c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.  d) Set the VBW ≥ 3 × RBW.  e) Detector = peak.  f) Sweep time = auto couple.  g) Trace mode = max hold.  h) Allow trace to fully stabilize.  i) Use the peak marker function to determine the maximum and level within the RBW.  j) If measured value exceeds limit, reduce RBW (no less than repeat.	uency.	
Remark				
Result	Pas	ss Fail		



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Test Data	Yes	$\square_{N/A}$
Test Plot	Yes (See below)	□ <sub>N/A</sub>

### Power Spectral Density measurement result

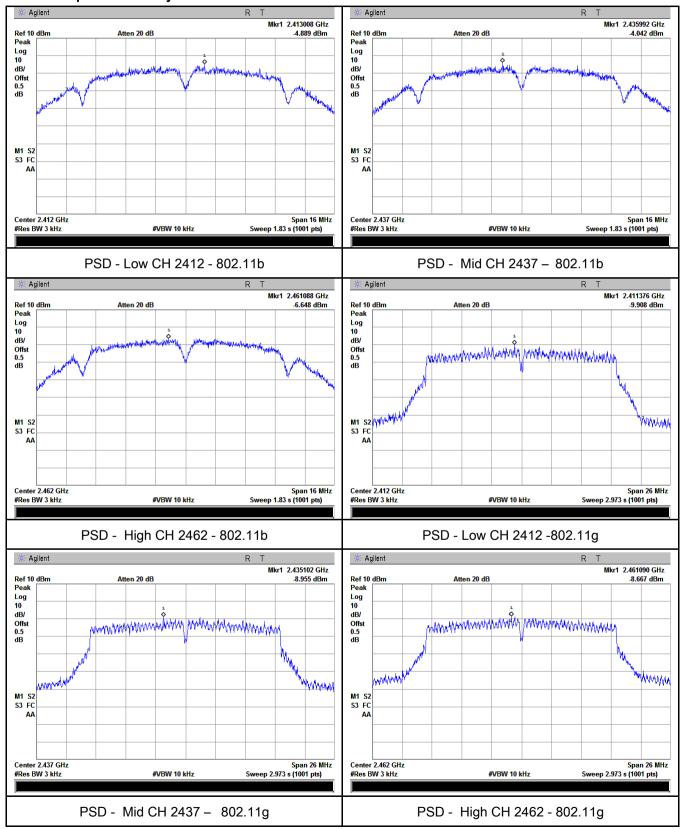
Туре	Test mode	СН	Freq	PSD	Limit	Result
			(MHz)	(dBm)	(dBm)	
		Low	2412	-4.889	8	Pass
	802.11b	Mid	2437	-4.042	8	Pass
		High	2462	-6.648	8	Pass
	802.11g	Low	2412	-9.908	8	Pass
		Mid	2437	-8.955	8	Pass
PSD		High	2462	-8.667	8	Pass
P2D	000 445	Low	2412	-12.00	8	Pass
	802.11n	Mid	2437	-9.402	8	Pass
	(20M) 802.11n (40M)	High	2462	-8.875	8	Pass
		Low	2422	-13.01	8	Pass
		Mid	2437	-12.71	8	Pass
		High	2452	-13.02	8	Pass



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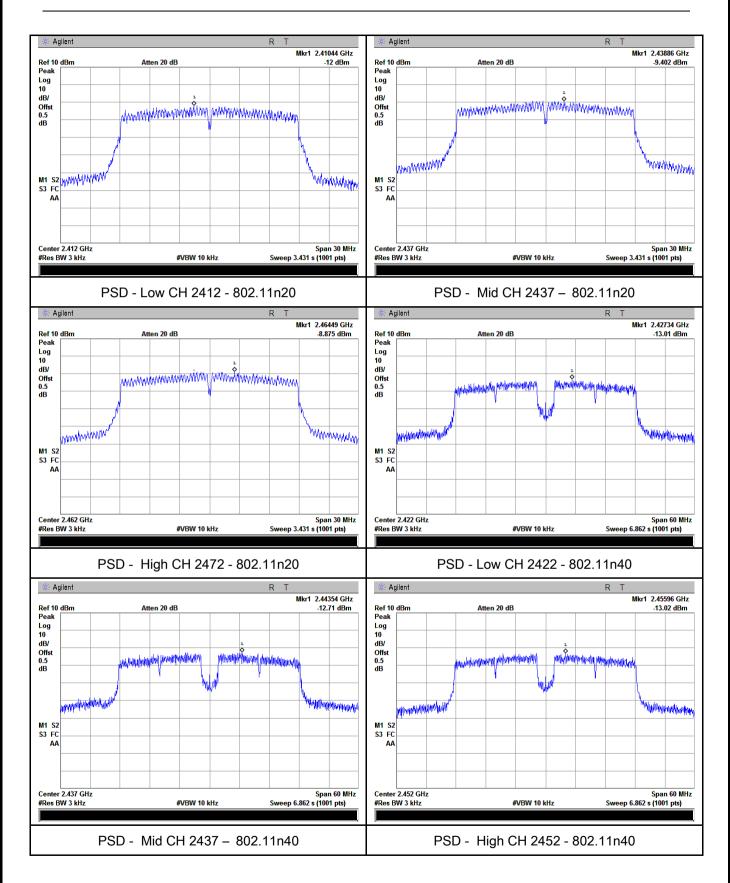
#### **Test Plots**

#### Power Spectral Density measurement result





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# 6.5 Band-Edge & Unwanted Emissions into Restricted Frequency Bands

Temperature	22 °C	
Relative Humidity	53%	
Atmospheric Pressure	1008mbar	
Test date :	November 02, 2017	
Tested By:	Loren Luo	

### Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(d)	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	FUT& 3m Support Units  Ground Plane Test Receiver		
Test Procedure	<ul> <li>Radiated Method Only</li> <li>1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.</li> <li>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.</li> </ul>		



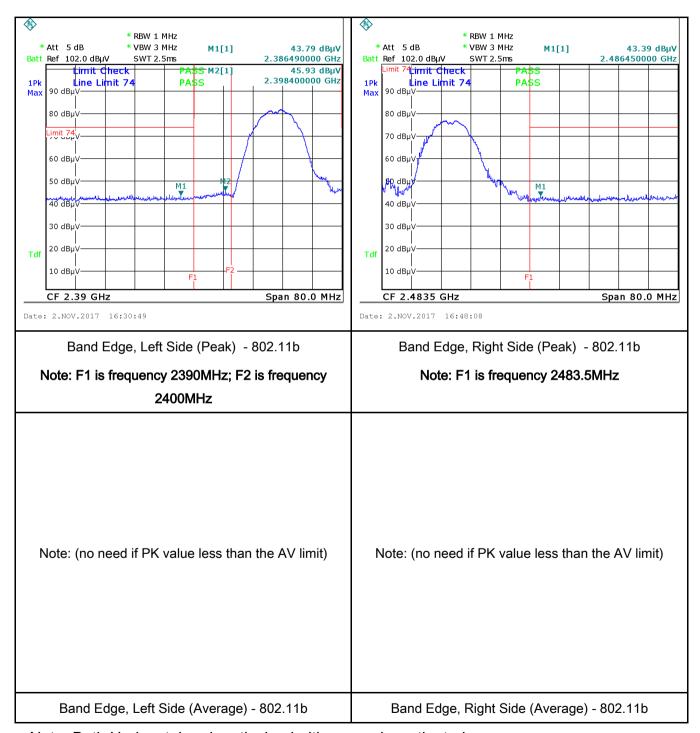
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	- 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a
	convenient frequency span including 100kHz bandwidth from band edge,
	check the emission of EUT, if pass then set Spectrum Analyzer as below:
	a. The resolution bandwidth and 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



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# Test Plots Band Edge measurement result



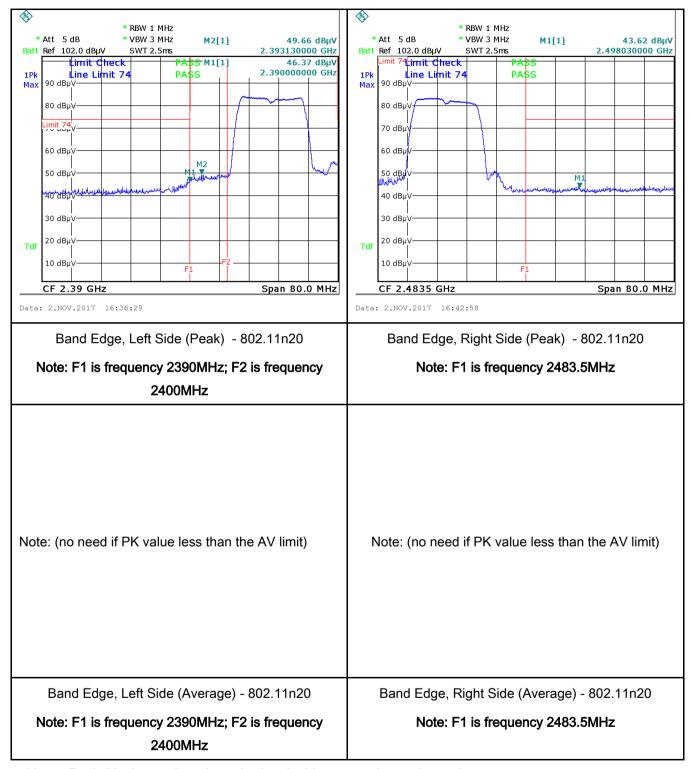


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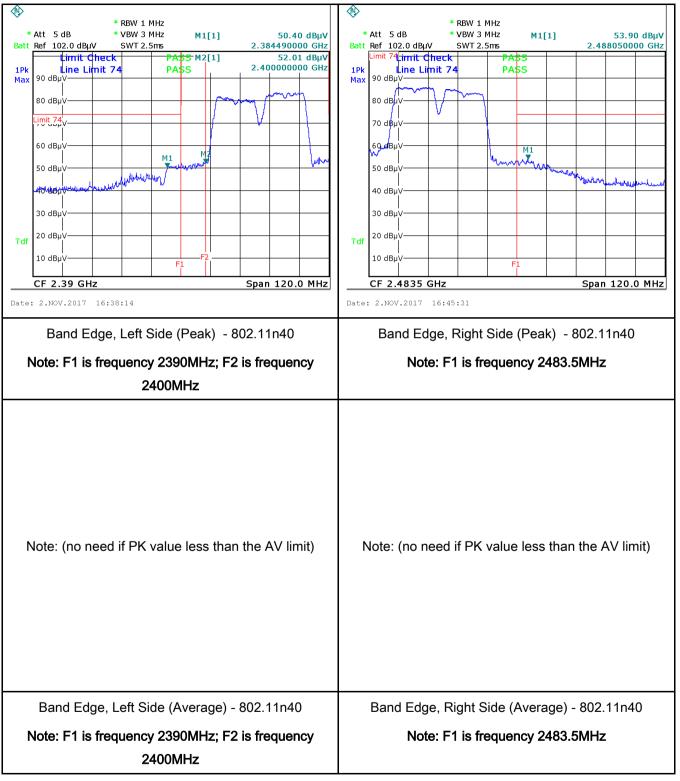


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# 6.6 AC Power Line Conducted Emissions

Temperature	22 °C		
Relative Humidity	53%		
Atmospheric Pressure	1008mbar		
Test date :	November 02, 2017		
Tested By :	Loren Luo		

### Requirement(s):

Spec	Item	Requirement			Applicable
47CFR§15. 207, RSS210 (A8.1)	a)	For Low-power radio-freconnected to the public voltage that is conducted frequency or frequencies not exceed the limits in [mu] H/50 ohms line im lower limit applies at the Frequency ranges (MHz)  0.15 ~ 0.5  0.5 ~ 5  5 ~ 30	e utility (AC) power line ed back onto the AC po es, within the band 150 the following table, as pedance stabilization r	the radio frequency ower line on any kHz to 30 MHz, shall measured using a 50 network (LISN). The ne frequencies ranges.	
Test Setup  Note: 1. Support units were connected to second LISN.  2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm					
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				

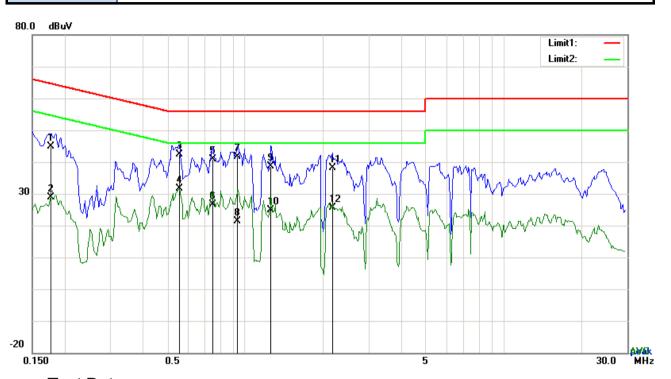


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_		
		coaxial cable.
	4.	All other supporting equipment were powered separately from another main supply.
	5.	The EUT was switched on and allowed to warm up to its normal operating condition.
	6.	A scan was made on the NEUTRAL line (for AC mains) or 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	V	Pass Fail
Test Data	Ye	s N/A
Test Plot	Ye	s (See below)



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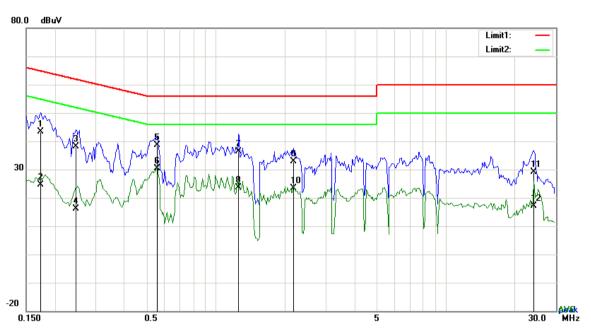
Test Data

## Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.1773	34.74	QP	10.03	44.77	64.61	-19.84
2	L1	0.1773	18.77	AVG	10.03	28.80	54.61	-25.81
3	L1	0.5556	32.31	QP	10.03	42.34	56.00	-13.66
4	L1	0.5556	21.68	AVG	10.03	31.71	46.00	-14.29
5	L1	0.7506	30.79	QP	10.03	40.82	56.00	-15.18
6	L1	0.7506	16.62	AVG	10.03	26.65	46.00	-19.35
7	L1	0.9378	31.50	QP	10.03	41.53	56.00	-14.47
8	L1	0.9378	11.40	AVG	10.03	21.43	46.00	-24.57
9	L1	1.2615	28.55	QP	10.03	38.58	56.00	-17.42
10	L1	1.2615	14.83	AVG	10.03	24.86	46.00	-21.14
11	L1	2.1702	27.97	QP	10.04	38.01	56.00	-17.99
12	L1	2.1702	15.49	AVG	10.04	25.53	46.00	-20.47



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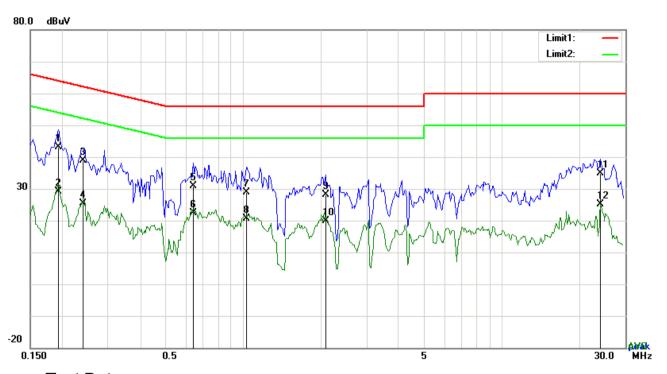
Test Data

### Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	N	0.1734	33.45	QP	10.02	43.47	64.80	-21.33
2	N	0.1734	14.53	AVG	10.02	24.55	54.80	-30.25
3	N	0.2475	28.00	QP	10.02	38.02	61.84	-23.82
4	N	0.2475	6.19	AVG	10.02	16.21	51.84	-35.63
5	N	0.5556	28.57	QP	10.02	38.59	56.00	-17.41
6	N	0.5556	20.25	AVG	10.02	30.27	46.00	-15.73
7	N	1.2615	26.34	QP	10.03	36.37	56.00	-19.63
8	N	1.2615	13.62	AVG	10.03	23.65	46.00	-22.35
9	N	2.1741	22.88	QP	10.04	32.92	56.00	-23.08
10	N	2.1741	13.32	AVG	10.04	23.36	46.00	-22.64
11	N	24.0483	18.87	QP	10.32	29.19	60.00	-30.81
12	N	24.0483	6.76	AVG	10.32	17.08	50.00	-32.92



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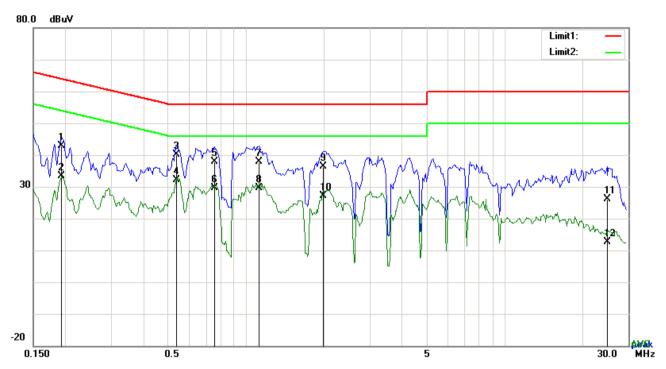
### Test Data

## Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	L1	0.1929	33.13	QP	10.03	43.16	63.91	-20.75
2	L1	0.1929	19.10	AVG	10.03	29.13	53.91	-24.78
3	L1	0.2397	28.78	QP	10.03	38.81	62.11	-23.30
4	L1	0.2397	15.34	AVG	10.03	25.37	52.11	-26.74
5	L1	0.6414	20.90	QP	10.03	30.93	56.00	-25.07
6	L1	0.6414	12.47	AVG	10.03	22.50	46.00	-23.50
7	L1	1.0275	18.90	QP	10.03	28.93	56.00	-27.07
8	L1	1.0275	10.70	AVG	10.03	20.73	46.00	-25.27
9	L1	2.0805	18.16	QP	10.04	28.20	56.00	-27.80
10	L1	2.0805	9.82	AVG	10.04	19.86	46.00	-26.14
11	L1	24.0249	24.54	QP	10.38	34.92	60.00	-25.08
12	L1	24.0249	14.66	AVG	10.38	25.04	50.00	-24.96



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### Test Data

## Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)
1	N	0.1929	32.82	QP	10.02	42.84	63.91	-21.07
2	Ν	0.1929	23.39	AVG	10.02	33.41	53.91	-20.50
3	N	0.5361	30.15	QP	10.02	40.17	56.00	-15.83
4	N	0.5361	22.02	AVG	10.02	32.04	46.00	-13.96
5	Ν	0.7545	27.74	QP	10.03	37.77	56.00	-18.23
6	Ν	0.7545	19.48	AVG	10.03	29.51	46.00	-16.49
7	Ν	1.1211	27.80	QP	10.03	37.83	56.00	-18.17
8	N	1.1211	19.51	AVG	10.03	29.54	46.00	-16.46
9	N	1.9869	26.39	QP	10.04	36.43	56.00	-19.57
10	Ν	1.9869	17.07	AVG	10.04	27.11	46.00	-18.89
11	N	24.8283	15.89	QP	10.34	26.23	60.00	-33.77
12	N	24.8283	2.22	AVG	10.34	12.56	50.00	-37.44



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# 6.7 Radiated Spurious Emissions & Restricted Band

Temperature	22 °C
Relative Humidity	53%
Atmospheric Pressure	1008mbar
Test date :	November 02, 2017
Tested By:	Loren Luo

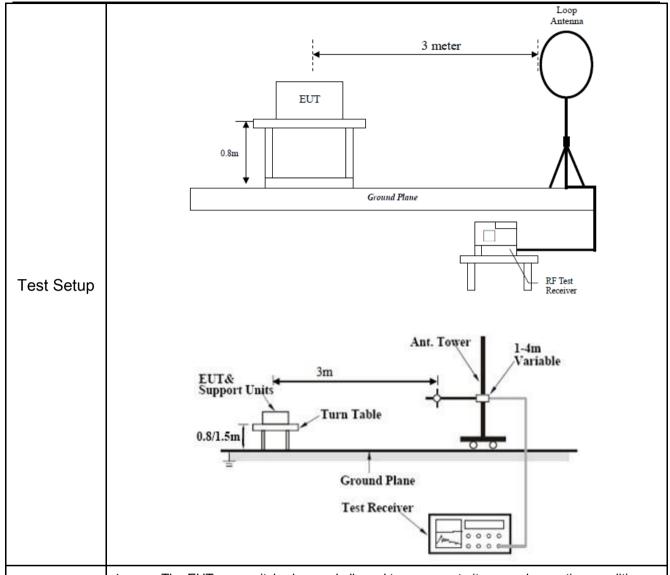
#### Requirement(s):

Spec	Item	Requirement	Applicable				
		Except higher limit as specified else emissions from the low-power radio exceed the field strength levels spet the level of any unwanted emission the fundamental emission. The tight edges					
	-\	Frequency range (MHz)	Field Strength (μV/m)				
	(a)	0.009~0.490	2400/F(KHz)	>			
		0.490~1.705	24000/F(KHz)				
		1.705~30.0	30				
		30 - 88	100				
47CFR§15.		88 – 216	150				
247(d),		216 960	200				
RSS210		Above 960	500				
(A8.5)	b)	For non-restricted band, In any 100 frequency band in which the spread modulated intentional radiator is oppower that is produced by the inter 20 dB or 30dB below that in the 10 band that contains the highest lever determined by the measurement mused. Attenuation below the general is not required	d spectrum or digitally perating, the radio frequency ational radiator shall be at least 0 kHz bandwidth within the 1 of the desired power, sethod on output power to be	>			
			dB down				
	c) or restricted band, emission must also comply with the radiated emission limits specified in 15.209						



Procedure

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- 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.
- 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.



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	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.
Domonik	Different RF configuration has been evaluated but not much difference was found. The data
Remark	presented here is the worst case data with EUT under 802.11n – HT20-2437MHz mode.
Result	Pass Fail

Test Data	Yes	□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>



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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);

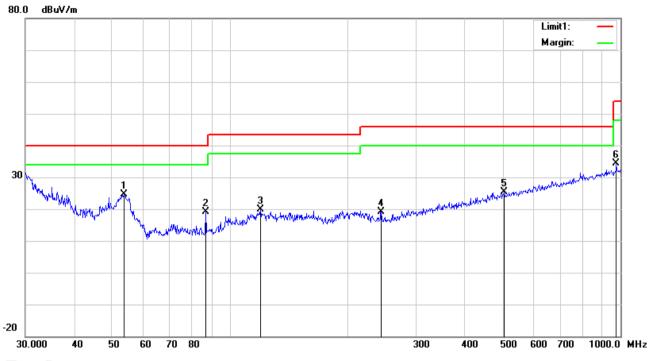
Limit line = specific limits(dBuv) + distance extrapolation factor.



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Test Mode: Transmitting Mode

#### 30MHz -1GHz



### Test Data

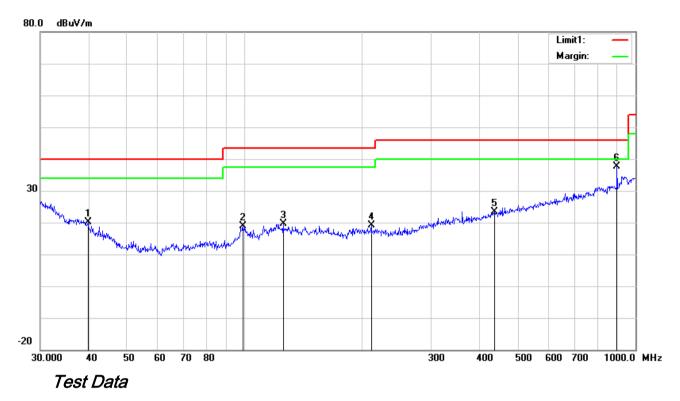
## Vertical Polarity Plot @3m

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)	( °)
1	V	53.6932	38.17	peak	7.99	22.39	0.79	24.56	40.00	-15.44	100	75
2	٧	86.8068	32.49	peak	7.87	22.35	1.03	19.04	40.00	-20.96	100	291
3	V	119.8556	27.10	peak	13.87	22.36	1.16	19.77	43.50	-23.73	100	322
4	V	244.2321	28.28	peak	11.48	22.30	1.68	19.14	46.00	-26.86	100	320
5	٧	504.7062	26.89	peak	17.77	21.80	2.43	25.29	46.00	-20.71	100	112
6	V	975.7529	28.84	peak	22.88	20.74	3.32	34.30	54.00	-19.70	100	91



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### 30MHz -1GHz



## Horizontal Polarity Plot @3m

N	P/	Frequency	Reading	Detect	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr
О.	L			or								ее
		(MHz)	(dBuV/m )		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	( )
1	Н	39.7147	27.60	peak	14.11	22.28	0.79	20.22	40.00	-19.78	100	241
2	Н	98.8326	30.11	peak	10.12	22.32	1.09	19.00	43.50	-24.50	100	101
3	Н	125.4457	27.26	peak	13.55	22.37	1.18	19.62	43.50	-23.88	100	23
4	Н	210.7860	28.06	peak	11.95	22.36	1.57	19.22	43.50	-24.28	200	199
5	Н	435.5898	26.74	peak	16.41	21.94	2.10	23.31	46.00	-22.69	100	164
6	Н	896.9965	33.02	peak	22.47	20.89	3.06	37.66	46.00	-8.34	100	337



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#### Above 1GHz

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

## Low Channel (2412 MHz) (b mode worst case)

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)
4824	42.36	AV	V	33.39	7.22	48.46	34.51	54	-19.49
4824	47.62	AV	Η	33.39	7.22	48.46	39.77	54	-14.23
4824	66.89	PK	٧	33.39	7.22	48.46	59.04	74	-14.96
4824	63.4	PK	Н	33.39	7.22	48.46	55.55	74	-18.45
12374	19.49	AV	٧	40.9	13.62	46.76	27.25	54	-26.75
12374	20.19	AV	Ι	40.9	13.62	46.76	27.95	54	-26.05
12374	40.87	PK	V	40.9	13.62	46.76	48.63	74	-25.37
12374	40.19	PK	Н	40.9	13.62	46.76	47.95	74	-26.05

#### Middle Channel (2437 MHz) (b mode worst case)

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)
4874	46.83	AV	V	33.62	7.53	48.36	39.62	54	-14.38
4874	46.17	AV	Н	33.62	7.53	48.36	38.96	54	-15.04
4874	66.7	PK	<b>V</b>	33.62	7.53	48.36	59.49	74	-14.51
4874	63.66	PK	Ι	33.62	7.53	48.36	56.45	74	-17.55
10669	19.86	AV	<b>V</b>	40.07	11.04	46.33	24.64	54	-29.36
10669	20.47	AV	Ι	40.07	11.04	46.33	25.25	54	-28.75
10669	38.92	PK	V	40.07	11.04	46.33	43.7	74	-30.3
10669	38.79	PK	Н	40.07	11.04	46.33	43.57	74	-30.43



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#### High Channel (2462 MHz) (b mode worst case)

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)
4924	43.96	AV	<b>V</b>	33.74	7.78	48.34	37.14	54	-16.86
4924	43.26	AV	Н	33.74	7.78	48.34	36.44	54	-17.56
4924	65.67	PK	V	33.74	7.78	48.34	58.85	74	-15.15
4924	68.13	PK	Н	33.74	7.78	48.34	61.31	74	-12.69
17828	19.74	AV	V	42.53	18.8	44.46	36.61	54	-17.39
17828	20.61	AV	Н	42.53	18.8	44.46	37.48	54	-16.52
17828	38.52	PK	V	42.53	18.8	44.46	55.39	74	-18.61
17828	41.94	PK	Н	42.53	18.8	44.46	58.81	74	-15.19

#### Note:

- 1, The testing has been conformed to 10\*2462MHz=24,620MHz
- 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
mstument	Model	Serial #	Cai Date	Cai Due	III use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/15/2017	09/14/2018	~
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	<b>V</b>
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	0.1.1==		00/00/00/7	00/00/00/0	1
(0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	>
Horn Antenna	BBHA9170	3145226D1	09/27/2017	09/26/2018	>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	<b>\</b>
Active Antenna (9kHz-30MHz)	AL-130	121031	10/12/2017	10/11/2018	<u>&lt;</u>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	<u>\</u>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/22/2017	09/21/2018	<b>\</b>
Universal Radio Communication Tester	CMU200	121393	09/23/2017	09/22/2018	V



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# Annex B. EUT and Test Setup Photographs

## Annex B.i. Photograph: EUT External Photo





Adapter View





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**EUT - Front View** 



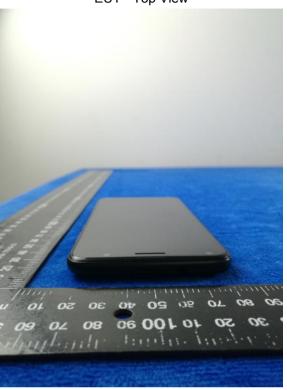
**EUT - Rear View** 



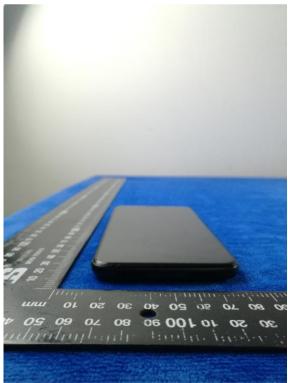


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EUT - Top View



EUT - Bottom View



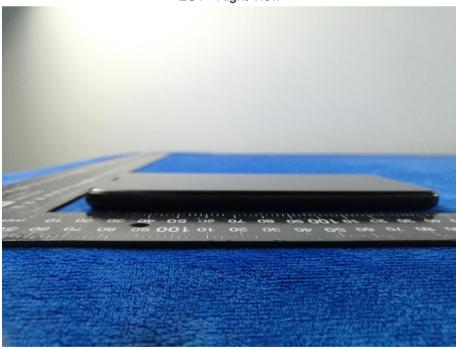


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EUT - Left View



EUT - Right View





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#### Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1



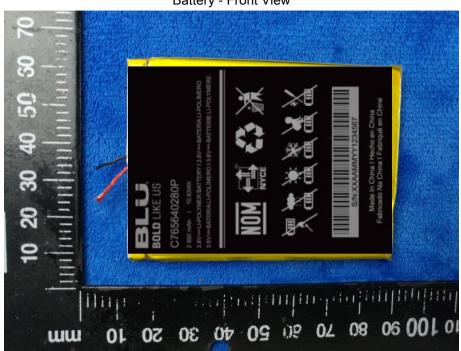
Cover Off - Top View 2



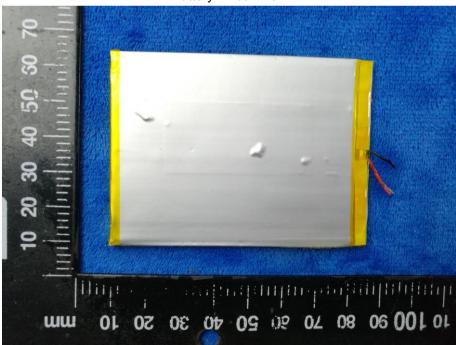


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Battery - Front View



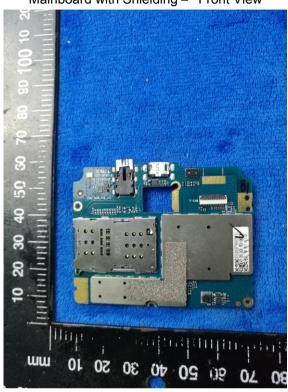
Battery - Rear View





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Mainboard with Shielding - Front View



Mainboard with Shielding - Rear View



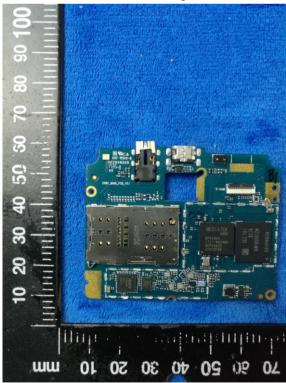


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Mainboard without Shielding - Rear View



Mainboard without Shielding - Rear View



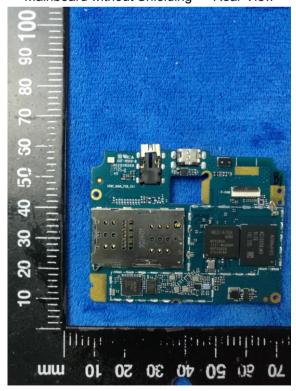


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Mainboard without Shielding - Front View



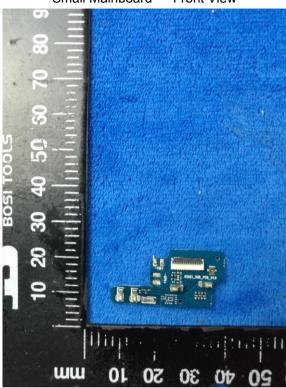
Mainboard without Shielding - Rear View



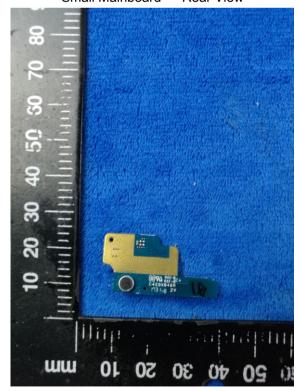


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Small Mainboard - Front View



Small Mainboard - Rear View





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LCD - Front View



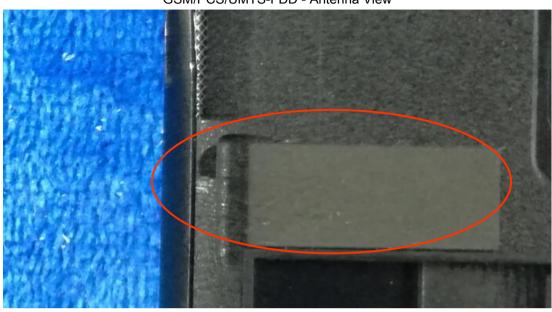
LCD - Rear View





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#### GSM/PCS/UMTS-FDD - Antenna View



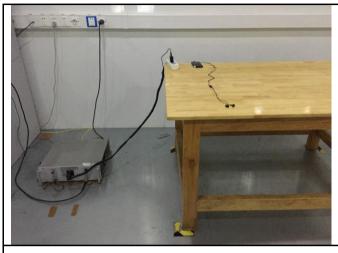
WIFI/BT/BLE/GPS - Antenna View





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### Annex B.iii. Photograph: Test Setup Photo



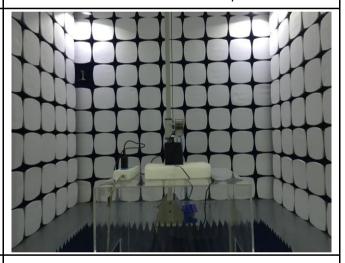
Conducted Emissions Test Setup Front View



Conducted Emissions Test Setup Side View



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Above 1GHz

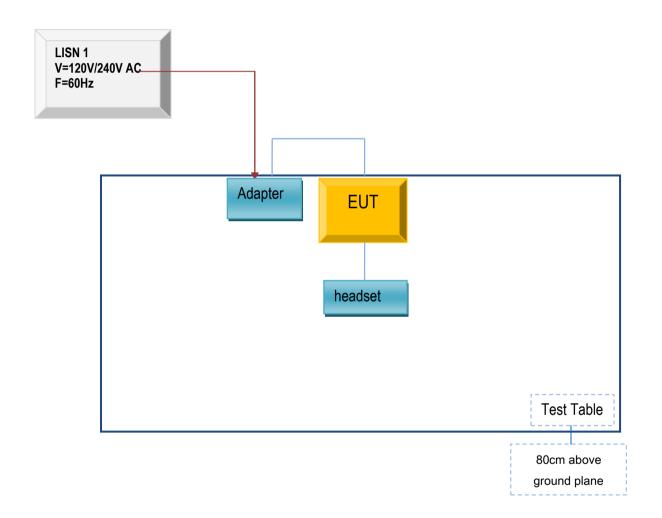


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# Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

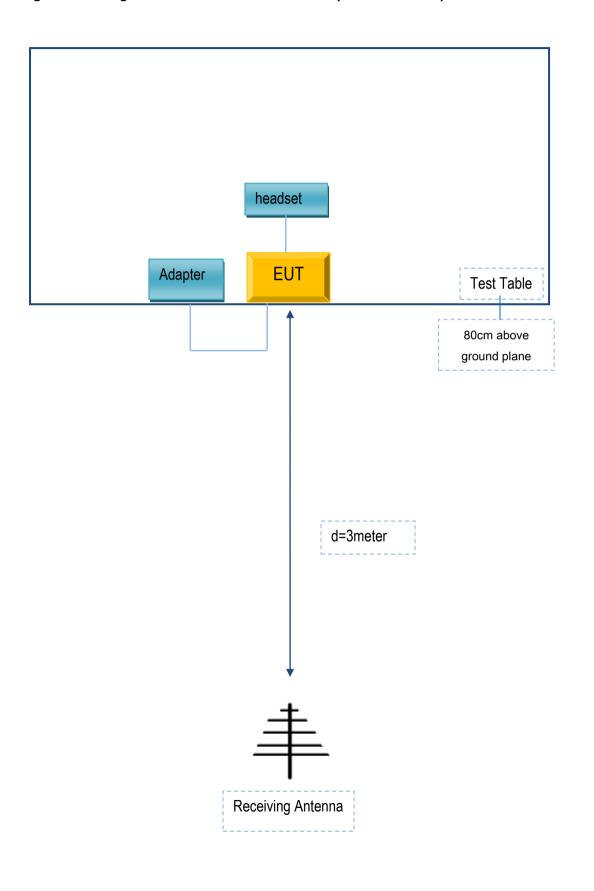
Block Configuration Diagram for AC Line Conducted Emissions





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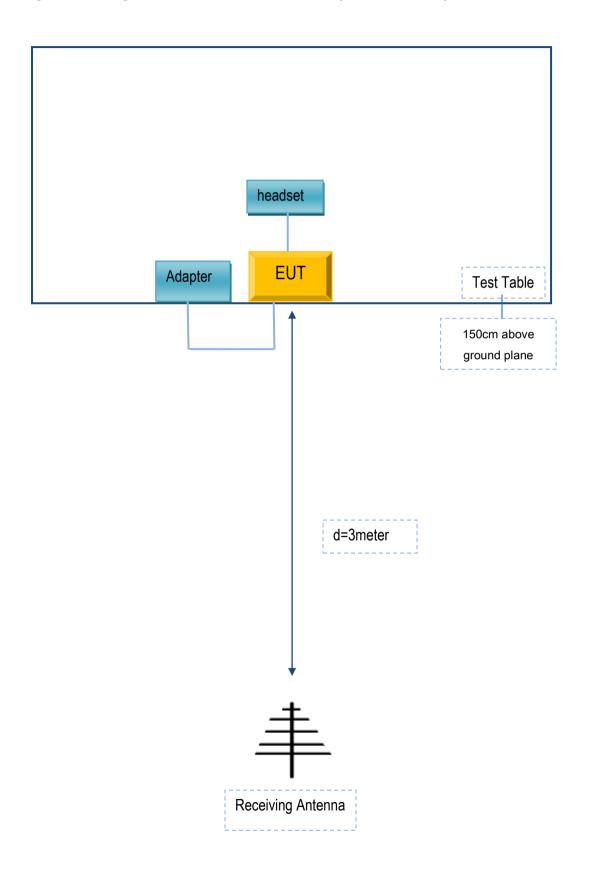
## Block Configuration Diagram for Radiated Emissions (Below 1GHz).





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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
BLU Products, Inc.	Adapter	TPA-46050150UU	N/A
SAMSUNG	headset	HS330	N/A

### Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
Power 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