

EMC TEST REPORT



Report No.: 17070343-FCC-E

Supersede Report No: N/A

Applicant	SMT TELECOMM HK LIMITED	
Product Name	Mobile Phone	
Model No.	X422	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2016, ANSI C63.4: 2014	
Test Date	May 06 to May 22, 2017	
Issue Date	May 23, 2017	
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"/>
Evans He	David Huang	
Evans He Test Engineer	David Huang 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
17070343-FCC-E	NONE	Original	May 23, 2017

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 of Radiated Emission	Radiated Emission Program-To Shenzhen v2.0
Test Software of Conducted Emission	EZ-EMC(ver.lcp-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	Mobile Phone
Main Model:	X422
Serial Model:	N/A
Antenna Gain:	GSM850: -1.5dBi PCS1900: -0.6dBi UMTS-FDD Band V: -1.5dBi UMTS-FDD Band II: -0.6dBi Bluetooth/BLE: -0.5dBi WIFI: -0.5dBi
Antenna Type:	PIFA antenna
Input Power:	Adapter: Model: PCX422 Input: AC100-240V~50/60Hz,0.15A Output: DC 5.0V,500mA Battery: Model: BPX422 Spec : 3.7V,1300mAh Maximum chargeable voltage: 4.2V
Equipment Category :	JBP
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK UMTS-FDD: QPSK 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

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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

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

Port: USB Port, Earphone Port

Trade Name : N/A

GRPS/ EGPRS Multi-slot class 8/10/12

FCC ID: 2AIMEX422

Date EUT received: May 05, 2017

Test Date(s): May 06 to May 22, 2017

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
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

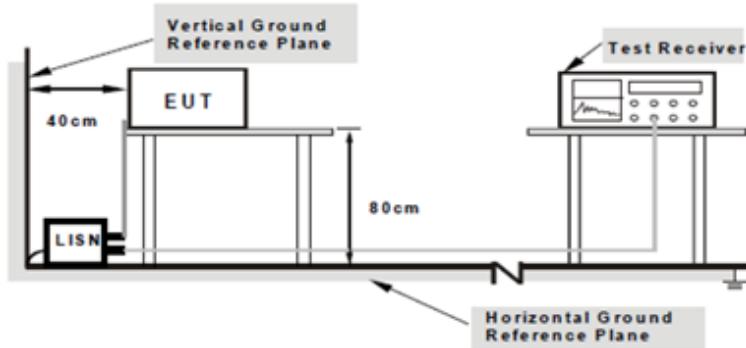
Parameter	Uncertainty
AC Power Line Conducted Emissions (150kHz~30MHz)	±3.11dB
Radiated Emission(30MHz~1GHz)	±5.12dB
Radiated Emission(1GHz~6GHz)	±5.34dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	23 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	May 12, 2017
Tested By :	Evans He

Requirement(s):

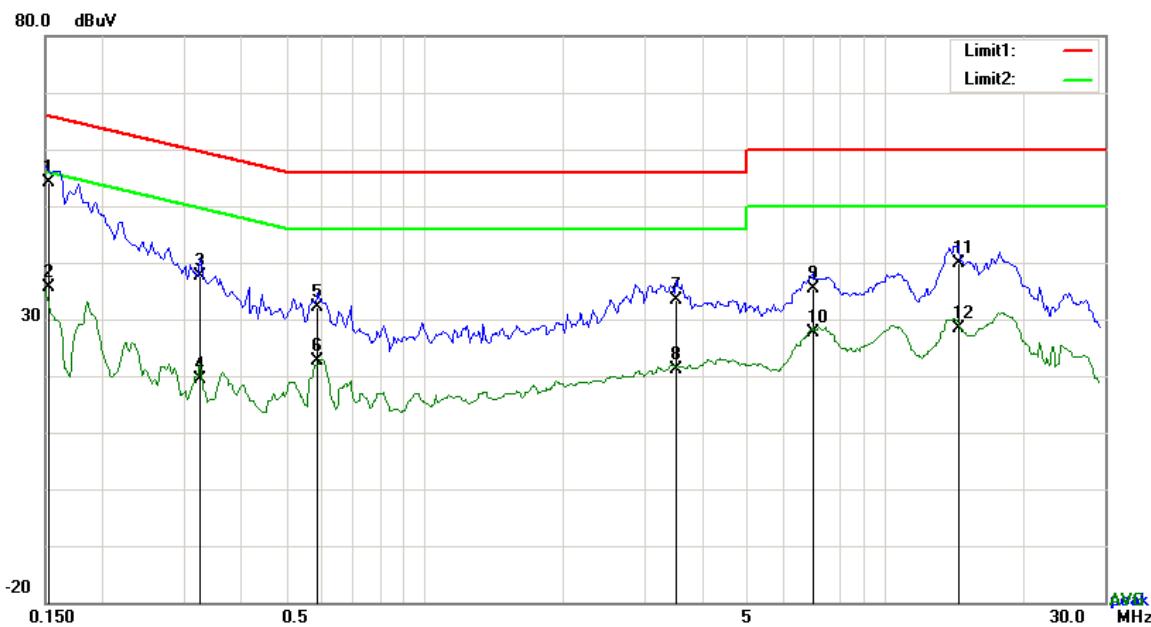
Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	<p>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 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>The diagram illustrates the test setup for conducted emissions. An EUT (Equipment Under Test) is placed on a table. A LISN (Line Impedance Stabilization Network) is connected between the EUT and the power source. A test receiver is connected to the LISN. The setup is positioned on a horizontal ground reference plane. The distance between the LISN and the EUT is 40 cm, and the distance between the LISN and the test receiver is 80 cm. A vertical ground reference plane is also indicated.</p> <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 50Ω /50mH EUT LISN, connected to filtered mains. 																

	<ol style="list-style-type: none"> 3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

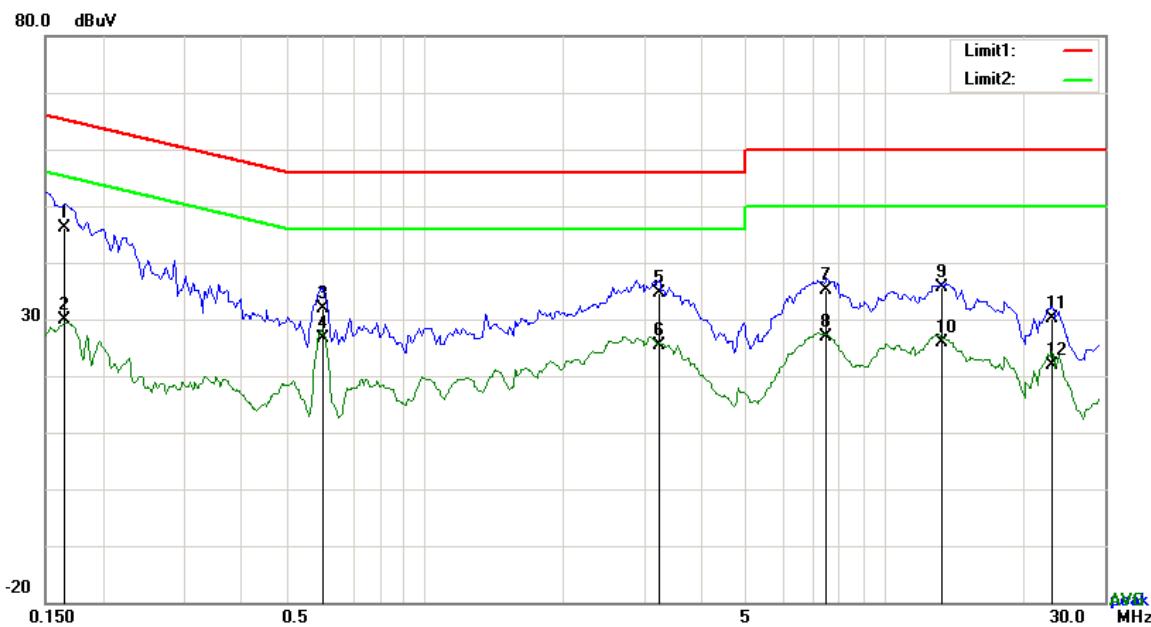
Test Mode : USB Mode



Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1524	44.12	QP	10.03	54.15	65.87	-11.72
2	L1	0.1524	25.52	AVG	10.03	35.55	55.87	-20.32
3	L1	0.3255	27.48	QP	10.03	37.51	59.57	-22.06
4	L1	0.3255	9.23	AVG	10.03	19.26	49.57	-30.31
5	L1	0.5868	22.21	QP	10.03	32.24	56.00	-23.76
6	L1	0.5868	12.60	AVG	10.03	22.63	46.00	-23.37
7	L1	3.5109	23.40	QP	10.06	33.46	56.00	-22.54
8	L1	3.5109	11.15	AVG	10.06	21.21	46.00	-24.79
9	L1	6.9858	25.18	QP	10.11	35.29	60.00	-24.71
10	L1	6.9858	17.46	AVG	10.11	27.57	50.00	-22.43
11	L1	14.4426	29.64	QP	10.22	39.86	60.00	-20.14
12	L1	14.4426	18.25	AVG	10.22	28.47	50.00	-21.53

Test Mode : **USB Mode**

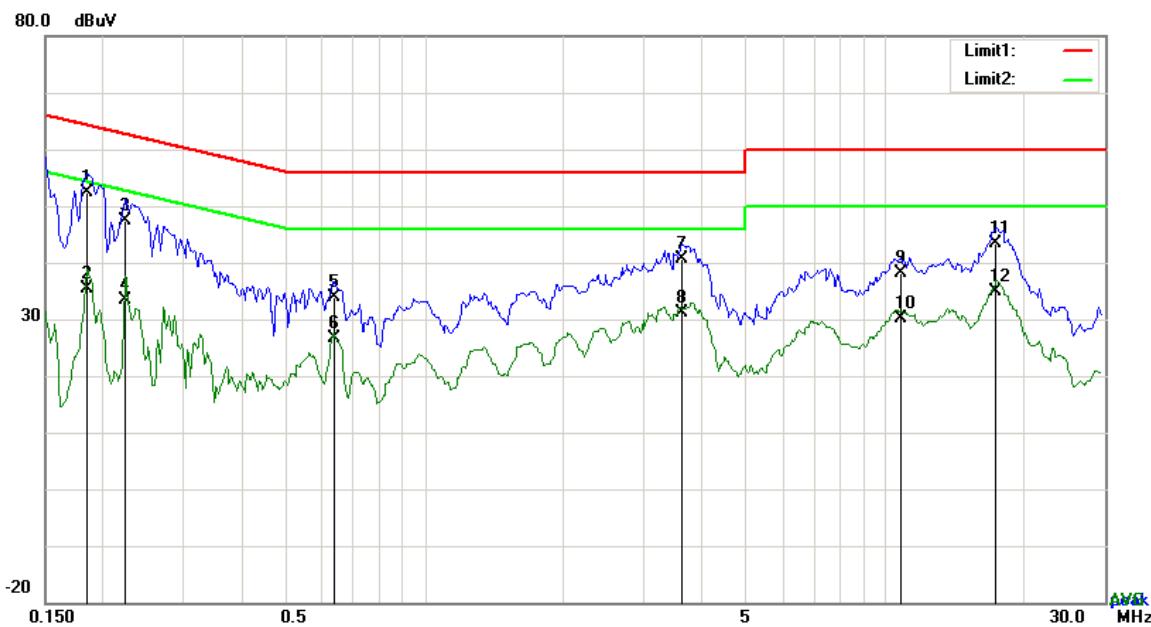


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.1656	36.15	QP	10.02	46.17	65.18	-19.01
2	N	0.1656	19.86	AVG	10.02	29.88	55.18	-25.30
3	N	0.6024	21.90	QP	10.02	31.92	56.00	-24.08
4	N	0.6024	16.64	AVG	10.02	26.66	46.00	-19.34
5	N	3.2262	24.62	QP	10.05	34.67	56.00	-21.33
6	N	3.2262	15.22	AVG	10.05	25.27	46.00	-20.73
7	N	7.4694	24.94	QP	10.10	35.04	60.00	-24.96
8	N	7.4694	16.80	AVG	10.10	26.90	50.00	-23.10
9	N	13.2960	25.52	QP	10.18	35.70	60.00	-24.30
10	N	13.2960	15.75	AVG	10.18	25.93	50.00	-24.07
11	N	23.0655	19.80	QP	10.31	30.11	60.00	-29.89
12	N	23.0655	11.59	AVG	10.31	21.90	50.00	-28.10

Test Mode : **USB Mode**

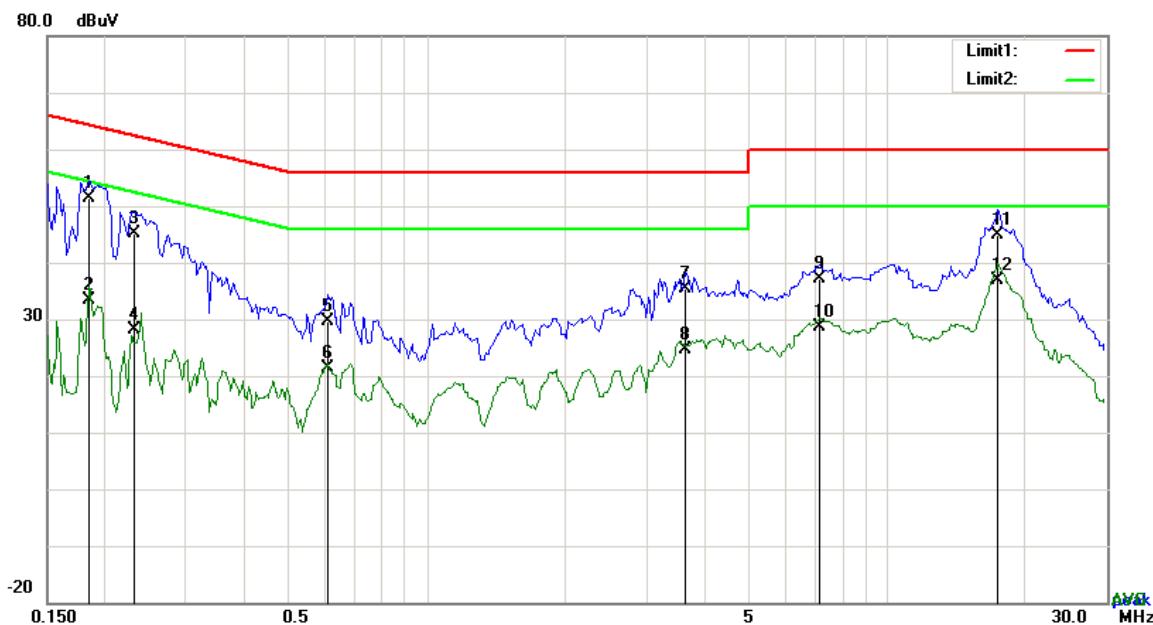


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	L1	0.1851	42.35	QP	10.03	52.38	64.25	-11.87
2	L1	0.1851	25.32	AVG	10.03	35.35	54.25	-18.90
3	L1	0.2241	37.35	QP	10.03	47.38	62.67	-15.29
4	L1	0.2241	23.28	AVG	10.03	33.31	52.67	-19.36
5	L1	0.6375	23.81	QP	10.03	33.84	56.00	-22.16
6	L1	0.6375	16.52	AVG	10.03	26.55	46.00	-19.45
7	L1	3.6045	30.63	QP	10.06	40.69	56.00	-15.31
8	L1	3.6045	21.19	AVG	10.06	31.25	46.00	-14.75
9	L1	10.7961	27.90	QP	10.16	38.06	60.00	-21.94
10	L1	10.7961	19.92	AVG	10.16	30.08	50.00	-19.92
11	L1	17.4573	33.24	QP	10.26	43.50	60.00	-16.50
12	L1	17.4573	24.71	AVG	10.26	34.97	50.00	-15.03

Test Mode : **USB Mode**



Test Data

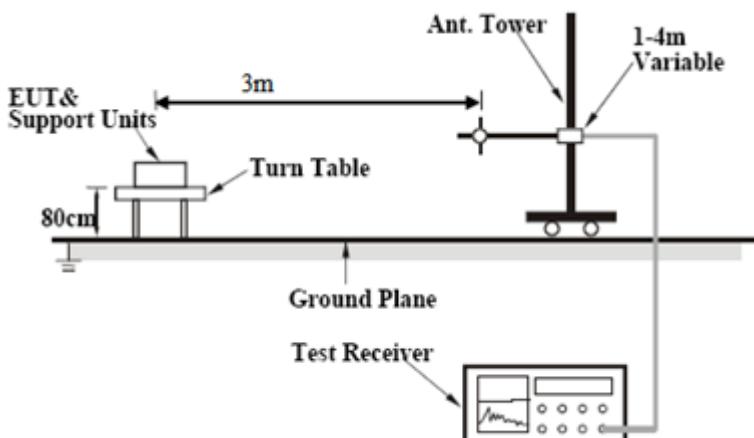
Phase Neutral Plot at 240Vac, 60Hz

No.	P/L	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	N	0.1851	41.39	QP	10.02	51.41	64.25	-12.84
2	N	0.1851	23.28	AVG	10.02	33.30	54.25	-20.95
3	N	0.2319	35.18	QP	10.02	45.20	62.38	-17.18
4	N	0.2319	18.21	AVG	10.02	28.23	52.38	-24.15
5	N	0.6102	19.61	QP	10.02	29.63	56.00	-26.37
6	N	0.6102	11.43	AVG	10.02	21.45	46.00	-24.55
7	N	3.6591	25.36	QP	10.06	35.42	56.00	-20.58
8	N	3.6591	14.45	AVG	10.06	24.51	46.00	-21.49
9	N	7.1340	26.93	QP	10.10	37.03	60.00	-22.97
10	N	7.1340	18.65	AVG	10.10	28.75	50.00	-21.25
11	N	17.3988	34.66	QP	10.23	44.89	60.00	-15.11
12	N	17.3988	26.57	AVG	10.23	36.80	50.00	-13.20

6.2 Radiated Emissions

Temperature	23 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	May 12, 2017
Tested By :	Evans He

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.109(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. A 'Turn Table' is positioned on a 'Ground Plane'. An 'EUT & Support Units' is mounted on the turn table at a height of 80cm. A vertical 'Ant. Tower' is connected to the turn table. The distance between the EUT and the Ant. Tower is 3m. The antenna height is adjustable, indicated as '1-4m Variable'. A 'Test Receiver' is connected to the turn table to measure the emissions.</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: <ol style="list-style-type: none"> Vertical or horizontal polarization (whichever gave the higher emission level) 												

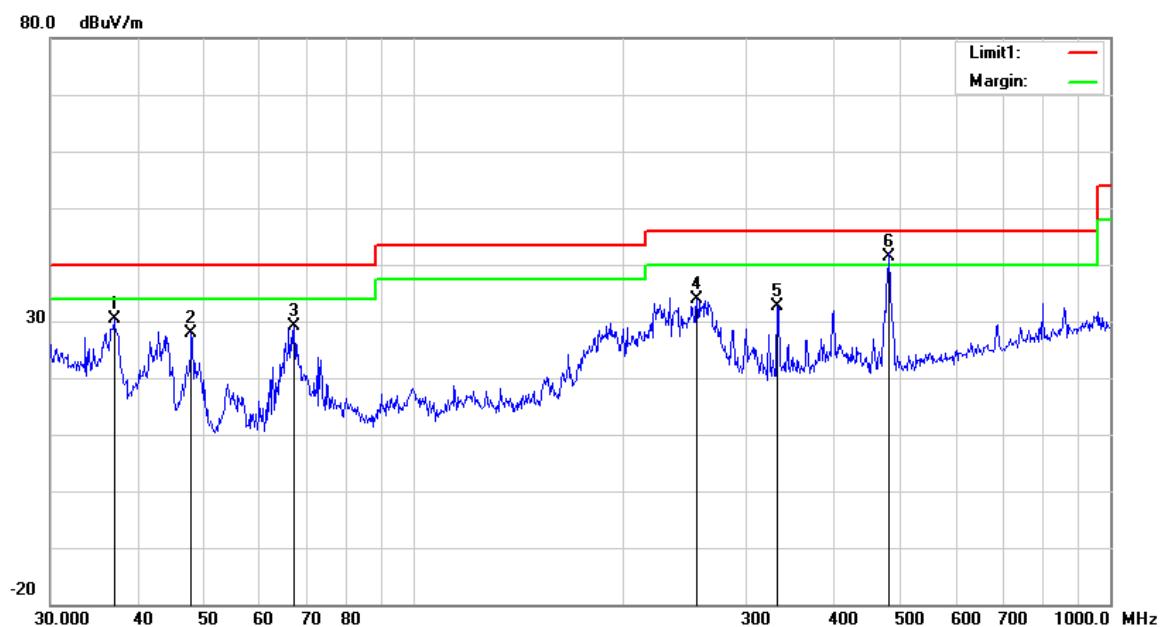
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum 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 with Peak detection for Average Measurement as below at frequency above 1GHz.</p> <ul style="list-style-type: none"> ■ 1 kHz (Duty cycle < 98%) <input type="checkbox"/> 10 Hz (Duty cycle > 98%) <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 : **USB Mode**

Below 1GHz

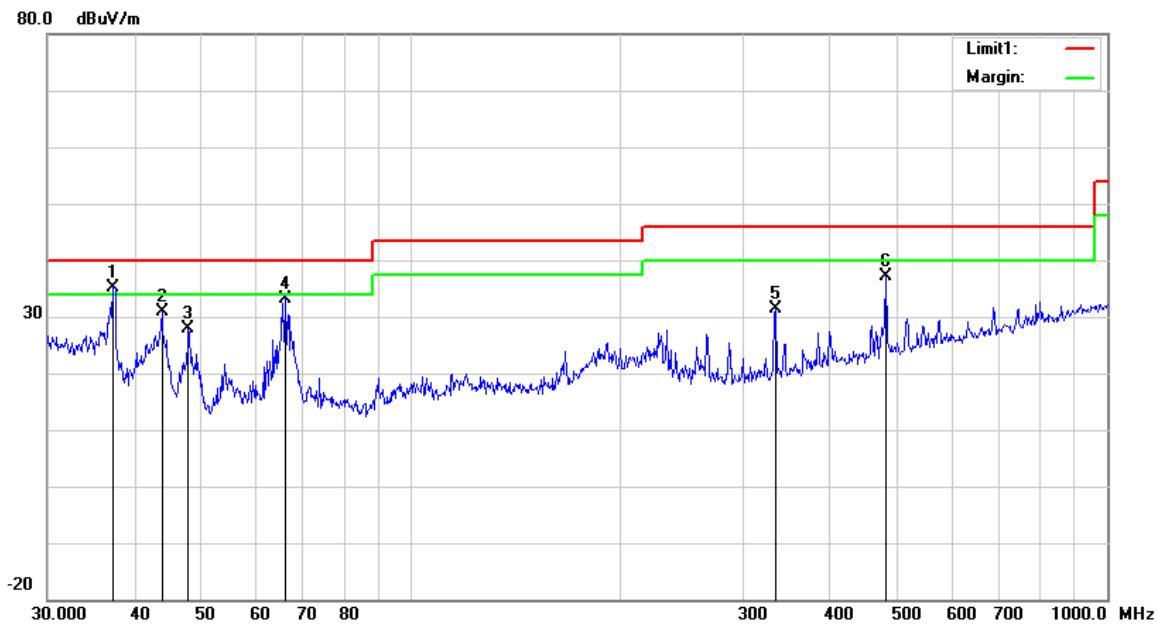


Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	H	37.0249	35.86	peak	16.07	22.26	0.77	30.44	40.00	-9.56	100	209
2	H	47.8260	40.01	peak	9.36	22.34	0.78	27.81	40.00	-12.19	100	117
3	H	67.2022	42.88	peak	7.66	22.39	0.92	29.07	40.00	-10.93	100	53
4	H	254.7284	42.86	peak	11.61	22.29	1.71	33.89	46.00	-12.11	100	238
5	H	332.5187	38.49	peak	14.28	22.20	1.95	32.52	46.00	-13.48	100	133
6	H	480.5276	43.53	QP	17.31	21.85	2.31	41.30	46.00	-4.70	100	331

Below 1GHz



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	37.2855	40.71	QP	15.88	22.26	0.77	35.10	40.00	-4.90	100	291
2	V	43.8119	41.05	peak	11.38	22.29	0.76	30.90	40.00	-9.10	100	118
3	V	47.8260	40.19	peak	9.36	22.34	0.78	27.99	40.00	-12.01	100	81
4	V	66.0342	47.09	QP	7.60	22.39	0.90	33.20	40.00	-6.80	100	216
5	V	333.6867	37.27	peak	14.31	22.20	1.96	31.34	46.00	-14.66	200	343
6	V	480.5276	39.26	peak	17.31	21.85	2.31	37.03	46.00	-8.97	100	69

Above 1GHz

Frequency (MHz)	Read_level (dB μ V/m)	Azimuth	Height (cm)	Polarity (H/V)	Level (dB μ V/m)	Factors (dB)	Limit (dB μ V/m)	Margin (dB)	Detector (PK/AV)
1320.121	69.63	35	100	V	51.12	-18.51	74	-22.88	PK
1812.785	73.54	118	200	V	58.06	-15.48	74	-15.94	PK
2431.997	73.02	249	100	V	59.27	-13.75	74	-14.73	PK
1121.506	69.58	67	100	H	51.43	-18.15	74	-22.57	PK
1996.946	72.58	102	100	H	58.15	-14.43	74	-15.85	PK
2436.358	72.61	331	100	H	58.86	-13.75	74	-15.14	PK

*Note1: The highest frequency of the EUT is 2480 MHz, so the testing has been conformed to 5*2480MHz=12,400MHz.*

Note2: The frequency that above 3GHz is mainly from the environment noise.

Note3: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

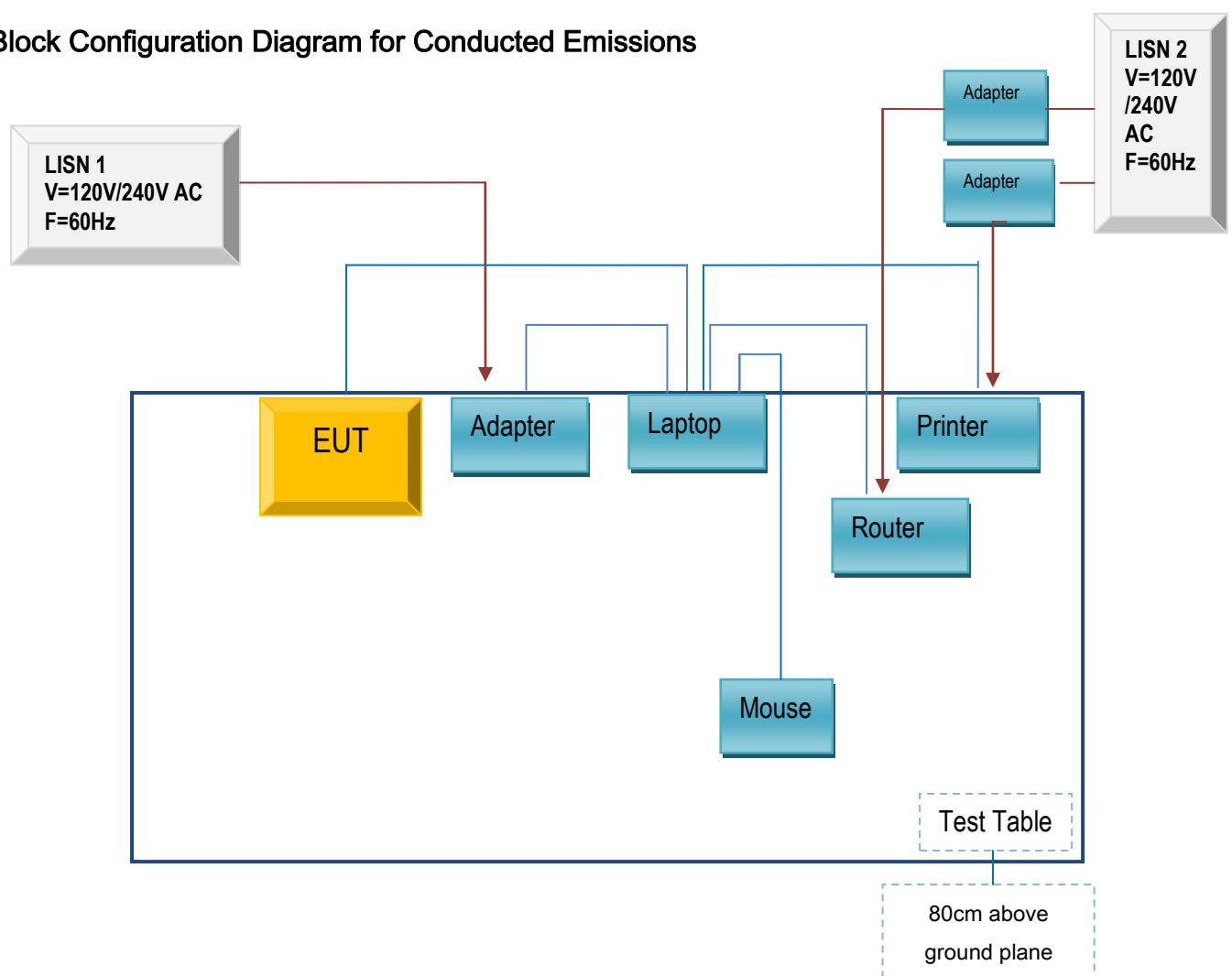
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>

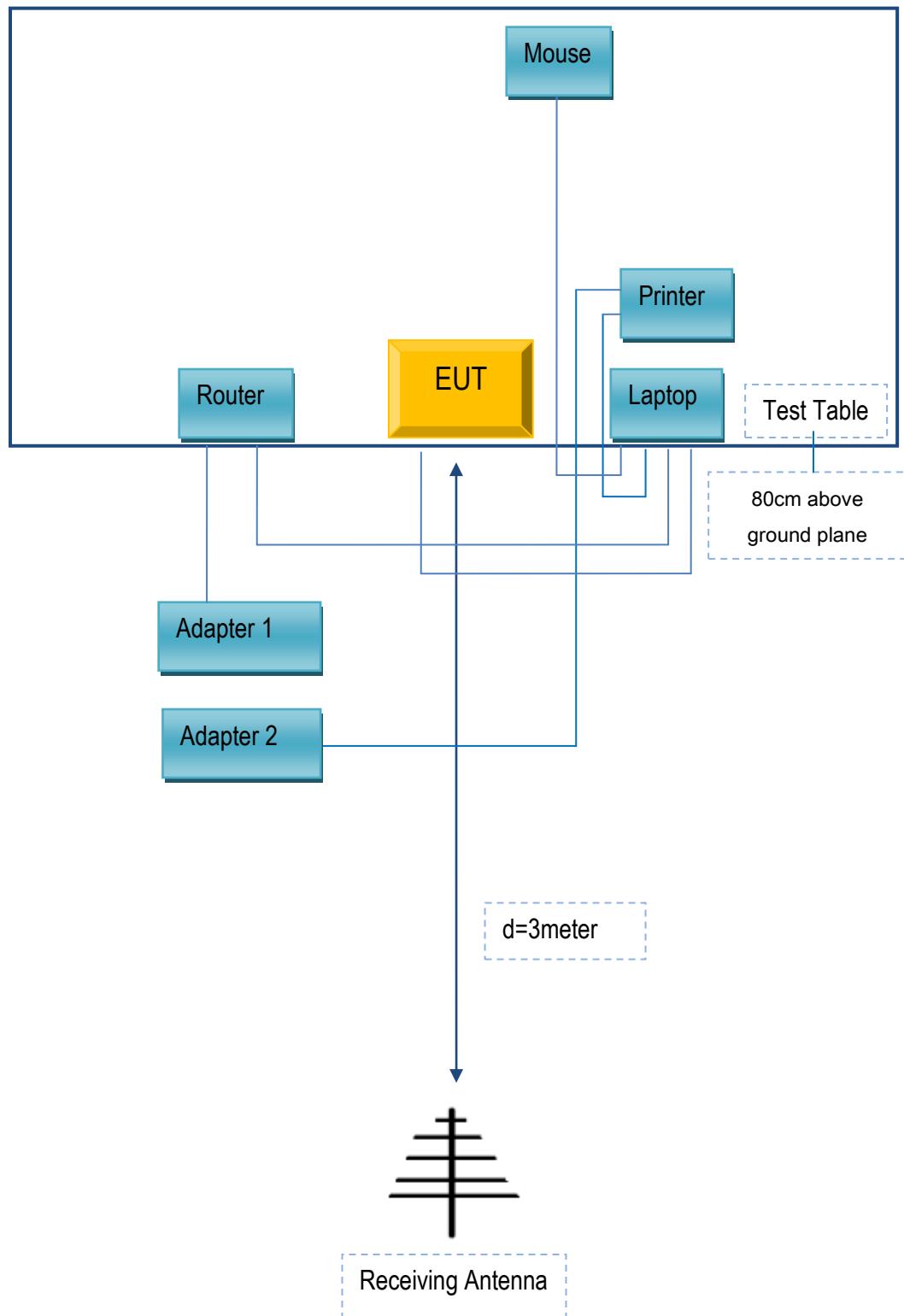
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

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

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	LR-1EHRX
GOLDWEB	Router	R102	1202032094
Lenovo	AC Adapter	42T4416	21D9JU
HP	Printer	VCVRA-1003	CN36M19JWX
DELL	Mouse	E100	912NMTUT41481
BULL	Socket	GN-403	GN201203

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274
USB Cable	Un-shielding	No	2m	CBA3000AH0C1
RJ45 Cable	Un-shielding	No	2m	KX156327541
Router Power cable	Un-shielding	No	2m	13274630Z
Printer Power cable	Un-shielding	No	2m	127581031
Power Cable	Un-shielding	No	0.8m	GT211032

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

Please see the attachment

Annex E. DECLARATION OF SIMILARITY

N/A