

EMC TEST REPORT



Report No.: 18070040-FCC-E

Supersede Report No: N/A

Applicant	ZTE Corporation	
Product Name	LTE/WCDMA/GSM(EDGE、GPRS) USB modem	
Model No.	MF833V	
Serial No.	N/A	
Test Standard	FCC Part 15 Subpart B Class B:2016, ANSI C63.4: 2014	
Test Date	January 12 to February 01, 2018	
Issue Date	February 2, 2018	
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"/>	
<i>Evans He</i>	<i>David Huang</i>	
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
18070040-FCC-E	NONE	Original	February 2, 2018

2. Customer information

Applicant Name	ZTE Corporation
Applicant Add	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer Add	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

3. Test site information

Test Lab A:

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.	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 Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMG(ver.lcp-03A1)

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

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LTE Band II TX: 1850.7 ~ 1909.3MHz; RX : 1930.7 ~ 1989.3 MHz
 LTE Band IV TX: 1710.7 ~ 1754.3 MHz; RX : 2110.7~ 2154.3 MHz
 LTE Band V TX: 824.7~ 848.3 MHz; RX : 869.7 ~ 893.3MHz
 LTE Band VII TX: 2502.5 ~ 2567.5 MHz; RX : 2622.5 ~ 2687.5 MHz
 LTE Band XII TX:699.7 ~ 715.3 MHz; RX : 729.7~ 745.3MHz
 LTE Band XVII TX: 706.5 ~ 713.5 MHz; RX : 736.5 ~ 743.5 MHz

Number of Channels: GSM 850: 124CH
 PCS1900: 299CH
 UMTS-FDD Band V: 102CH
 UMTS-FDD Band IV: 202CH
 UMTS-FDD Band II: 277CH

Port: USB Port

Trade Name : ZTE

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

FCC ID: SRQ-MF833V

Date EUT received: January11, 2018

Test Date(s): January 12 to February 01, 2018

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

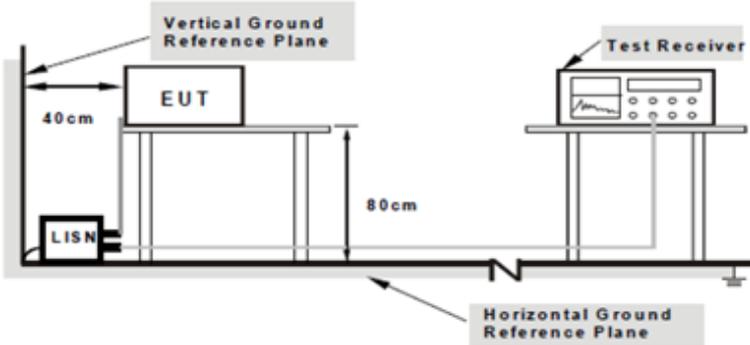
6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	January 22, 2018
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 [μ] 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 (dBμV)		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 (dBμV)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	 <p>Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</p>
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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.
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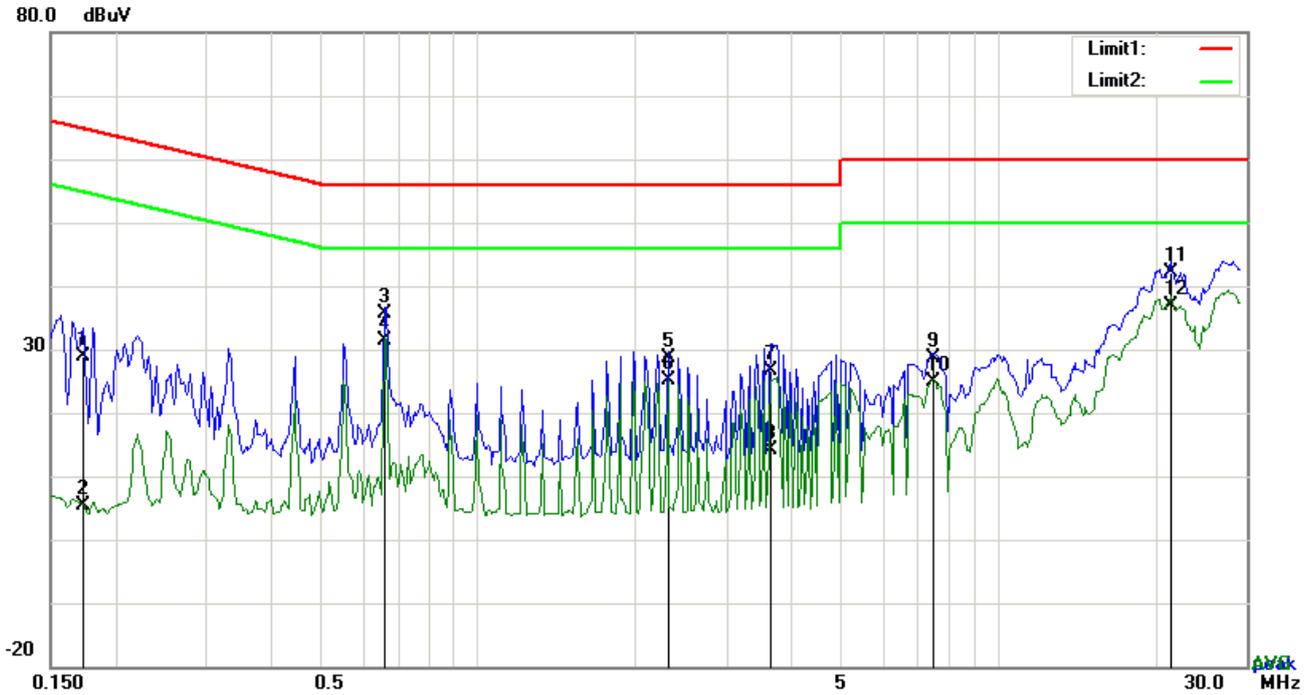
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	<ol style="list-style-type: none"> 3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and 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 : Working Mode

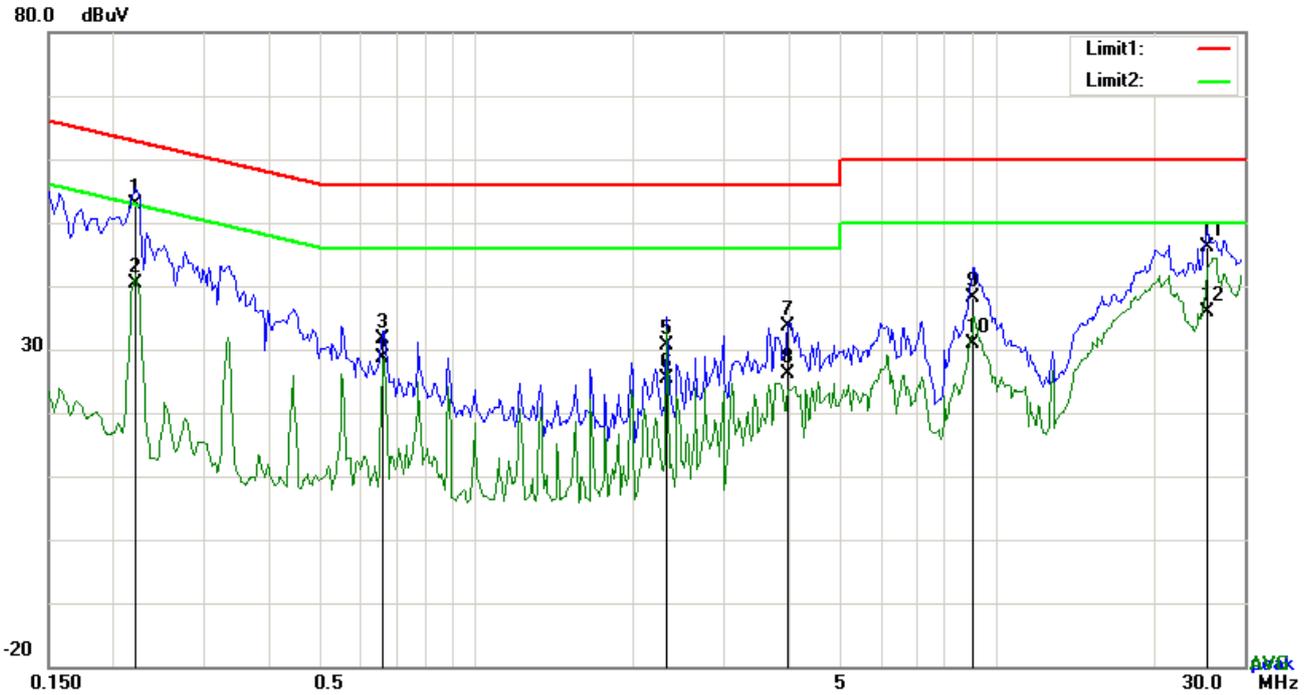


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1734	18.82	QP	10.03	28.85	64.80	-35.95
2	L1	0.1734	-4.55	AVG	10.03	5.48	54.80	-49.32
3	L1	0.6609	25.65	QP	10.03	35.68	56.00	-20.32
4	L1	0.6609	21.28	AVG	10.03	31.31	46.00	-14.69
5	L1	2.3184	18.67	QP	10.05	28.72	56.00	-27.28
6	L1	2.3184	15.16	AVG	10.05	25.21	46.00	-20.79
7	L1	3.6552	16.66	QP	10.06	26.72	56.00	-29.28
8	L1	3.6552	4.01	AVG	10.06	14.07	46.00	-31.93
9	L1	7.5045	18.46	QP	10.12	28.58	60.00	-31.42
10	L1	7.5045	14.79	AVG	10.12	24.91	50.00	-25.09
11	L1	21.4119	31.89	QP	10.33	42.22	60.00	-17.78
12	L1	21.4119	26.47	AVG	10.33	36.80	50.00	-13.20

Test Mode:	USB Mode
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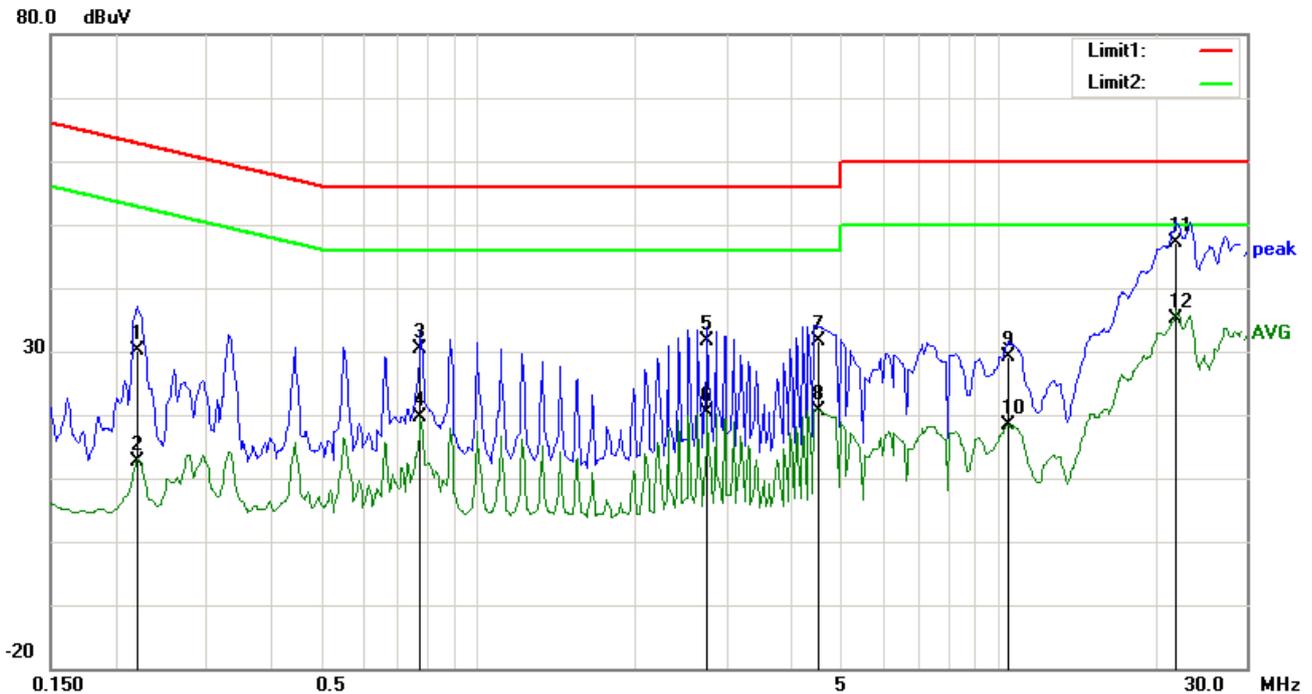


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.2202	42.95	QP	10.02	52.97	62.81	-9.84
2	N	0.2202	30.38	AVG	10.02	40.40	52.81	-12.41
3	N	0.6609	21.62	QP	10.02	31.64	56.00	-24.36
4	N	0.6609	18.69	AVG	10.02	28.71	46.00	-17.29
5	N	2.3184	20.71	QP	10.04	30.75	56.00	-25.25
6	N	2.3184	15.23	AVG	10.04	25.27	46.00	-20.73
7	N	3.9750	23.53	QP	10.06	33.59	56.00	-22.41
8	N	3.9750	15.98	AVG	10.06	26.04	46.00	-19.96
9	N	9.0528	27.93	QP	10.13	38.06	60.00	-21.94
10	N	9.0528	20.83	AVG	10.13	30.96	50.00	-19.04
11	N	25.4094	35.84	QP	10.35	46.19	60.00	-13.81
12	N	25.4094	25.62	AVG	10.35	35.97	50.00	-14.03

Test Mode :	USB Mode
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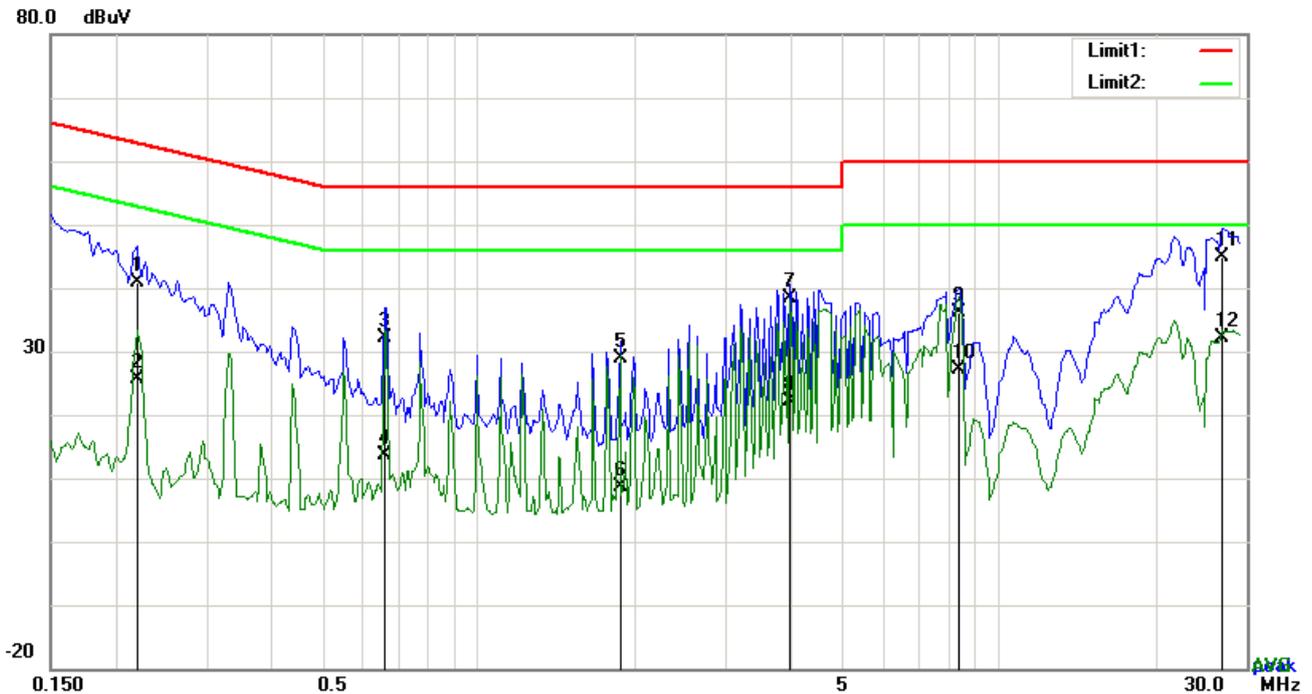


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.2202	20.08	QP	10.03	30.11	62.81	-32.70
2	L1	0.2202	2.59	AVG	10.03	12.62	52.81	-40.19
3	L1	0.7740	20.41	QP	10.03	30.44	56.00	-25.56
4	L1	0.7740	9.52	AVG	10.03	19.55	46.00	-26.45
5	L1	2.7591	21.64	QP	10.05	31.69	56.00	-24.31
6	L1	2.7591	10.38	AVG	10.05	20.43	46.00	-25.57
7	L1	4.5249	21.61	QP	10.07	31.68	56.00	-24.32
8	L1	4.5249	10.44	AVG	10.07	20.51	46.00	-25.49
9	L1	10.4841	19.07	QP	10.16	29.23	60.00	-30.77
10	L1	10.4841	8.23	AVG	10.16	18.39	50.00	-31.61
11	L1	21.8526	36.69	QP	10.34	47.03	60.00	-12.97
12	L1	21.8526	24.89	AVG	10.34	35.23	50.00	-14.77

Test Mode :	USB Mode
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Test Data

Phase Neutral Plot at 240Vac, 60Hz

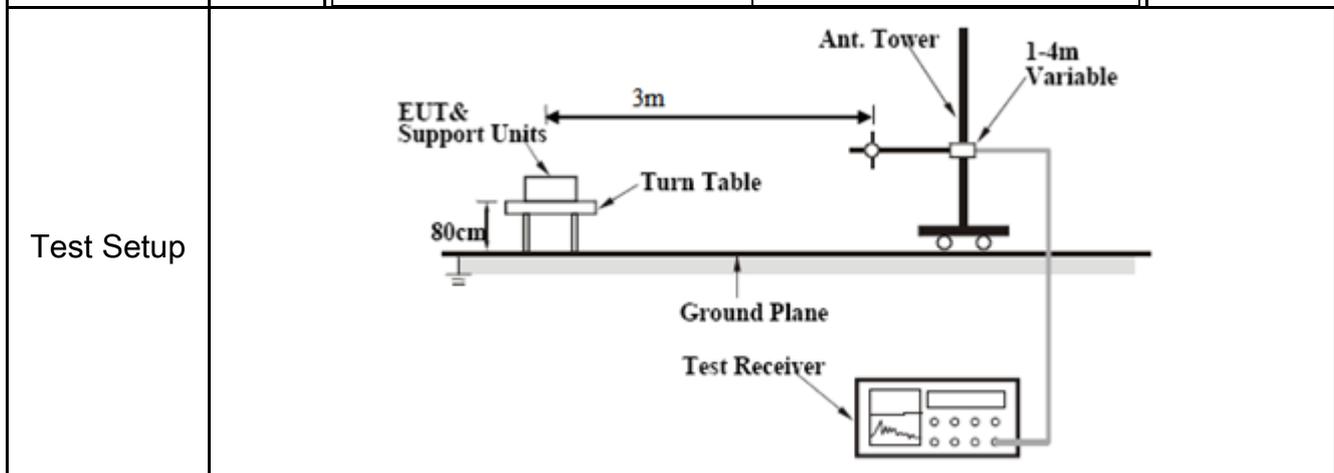
No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	N	0.2202	30.85	QP	10.02	40.87	62.81	-21.94
2	N	0.2202	15.60	AVG	10.02	25.62	52.81	-27.19
3	N	0.6609	22.00	QP	10.02	32.02	56.00	-23.98
4	N	0.6609	3.71	AVG	10.02	13.73	46.00	-32.27
5	N	1.8777	18.80	QP	10.04	28.84	56.00	-27.16
6	N	1.8777	-1.50	AVG	10.04	8.54	46.00	-37.46
7	N	3.9750	28.36	QP	10.06	38.42	56.00	-17.58
8	N	3.9750	12.05	AVG	10.06	22.11	46.00	-23.89
9	N	8.3898	26.08	QP	10.12	36.20	60.00	-23.80
10	N	8.3898	17.12	AVG	10.12	27.24	50.00	-22.76
11	N	26.9265	34.40	QP	10.37	44.77	60.00	-15.23
12	N	26.9265	21.66	AVG	10.37	32.03	50.00	-17.97

6.2 Radiated Emissions

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

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.109(d)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges	<input checked="" type="checkbox"/>										
		<table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength ($\mu\text{V/m}$)</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 ($\mu\text{V/m}$)	30 – 88	100	88 – 216	150	216 - 960	200	Above 960	500
		Frequency range (MHz)		Field Strength ($\mu\text{V/m}$)									
		30 – 88		100									
		88 – 216		150									
216 - 960	200												
Above 960	500												



Procedure	<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> a. Vertical or horizontal polarization (whichever gave the higher emission level
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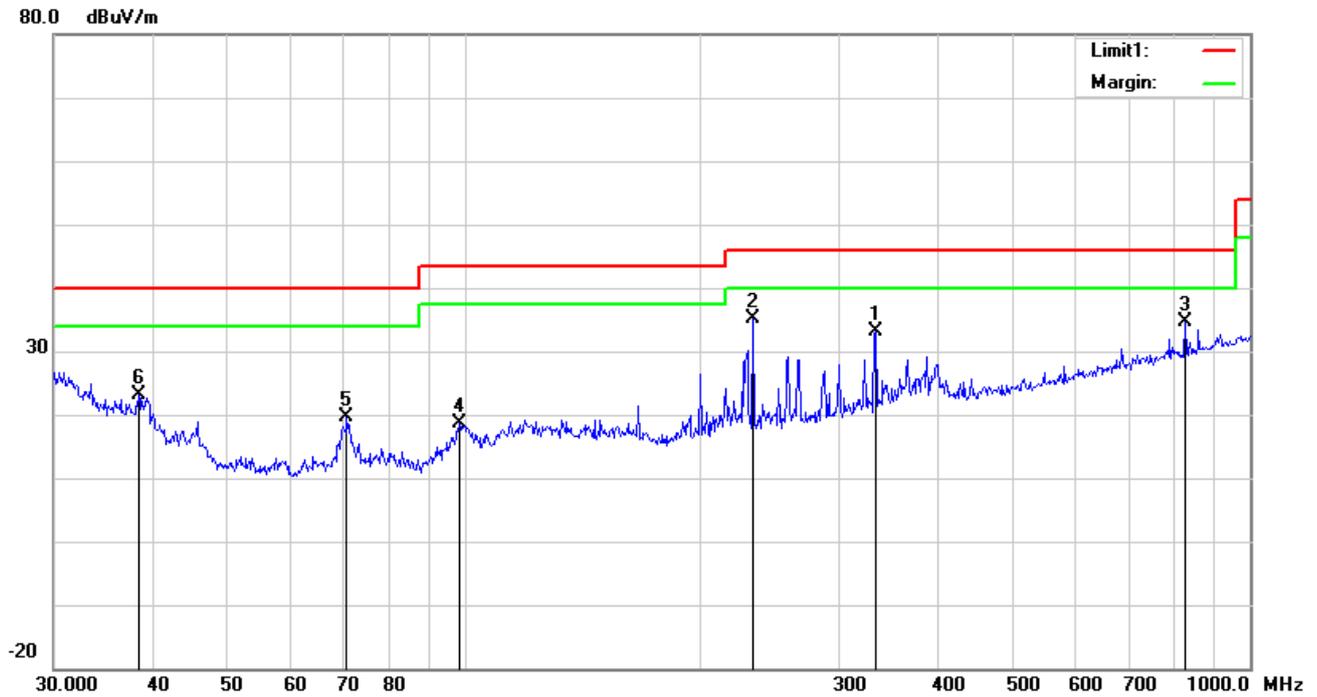
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum 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. 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. ■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%)</p> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Mode :	USB Mode
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Below 1GHz

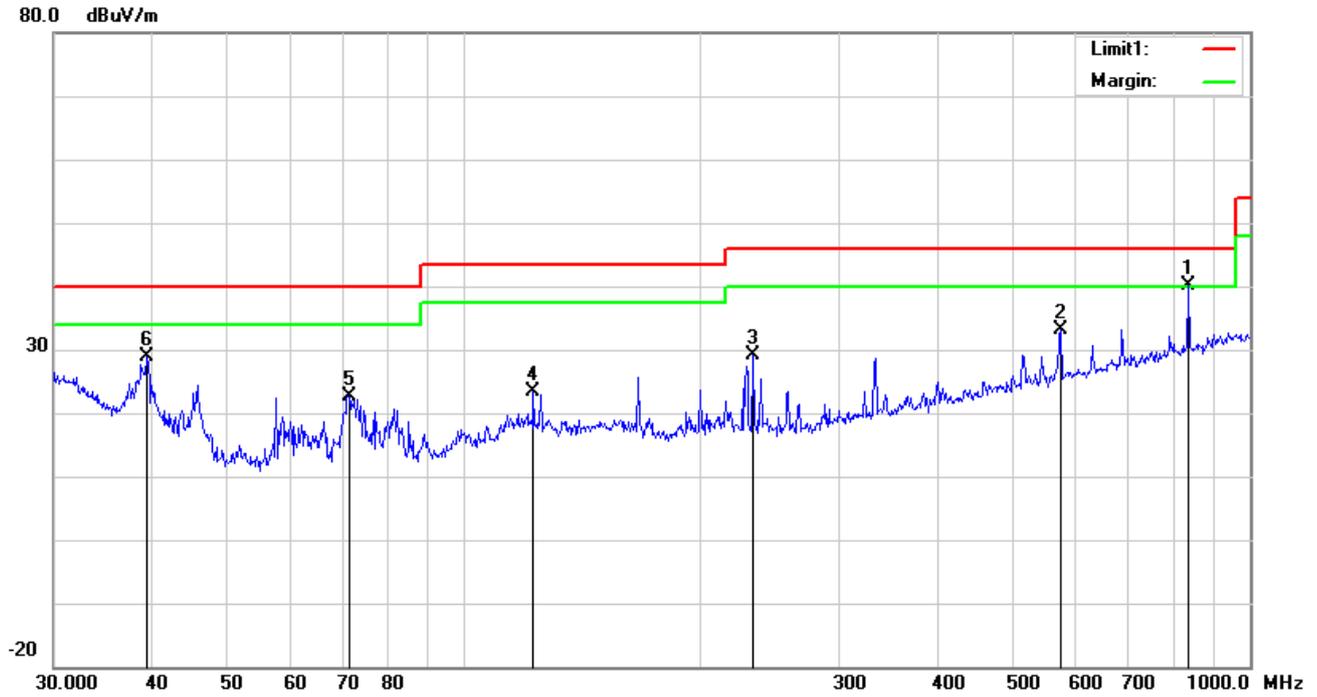


Test Data

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	333.6867	38.97	peak	14.31	22.20	1.96	33.04	46.00	-12.96	100	23
2	H	232.5318	44.23	peak	11.64	22.32	1.64	35.19	46.00	-10.81	100	359
3	H	827.4934	31.05	peak	21.70	21.08	2.91	34.58	46.00	-11.42	100	277
4	H	98.4866	29.91	peak	10.04	22.32	1.08	18.71	43.50	-24.79	200	213
5	H	70.8315	33.21	peak	7.78	22.38	0.98	19.59	40.00	-20.41	100	185
6	H	38.4809	29.72	peak	15.01	22.27	0.78	23.24	40.00	-16.76	100	285

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	836.2443	36.45	QP	21.80	21.05	2.89	40.09	46.00	-5.91	100	141
2	V	574.6258	33.54	peak	18.74	21.64	2.48	33.12	46.00	-12.88	100	94
3	V	233.3487	38.12	peak	11.63	22.32	1.65	29.08	46.00	-16.92	100	247
4	V	122.4040	30.86	peak	13.74	22.37	1.17	23.40	43.50	-20.10	100	287
5	V	71.3300	36.38	peak	7.77	22.39	0.97	22.73	40.00	-17.27	100	224
6	V	39.4372	36.03	peak	14.31	22.28	0.79	28.85	40.00	-11.15	100	217

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)
1622.32	66.2	89	100	V	-17.25	48.95	74	-25.05	PK
2233.95	61.31	323	100	V	-13.95	47.36	74	-26.64	PK
3314.6	62.05	265	100	V	-12.54	49.51	74	-24.49	PK
1420.36	65.86	204	100	H	-19.24	46.62	74	-27.38	PK
2383.64	64.43	216	100	H	-14.58	49.85	74	-24.15	PK
3874.7	58.69	245	100	H	-10.27	48.42	74	-25.58	PK

*Note1: The highest frequency of the EUT is 2567.5 MHz, so the testing has been conformed to 5*2567.5MHz=12,838MHz.*

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.

Note4: The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
ISN	ISN T800	34373	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	<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	09/19/2017	09/18/2018	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/22/2017	09/21/2018	<input checked="" type="checkbox"/>
Horn Antenna	BBHA9170	3145226D1	09/27/2017	09/26/2018	<input checked="" type="checkbox"/>

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

EUT - Front View



EUT - Rear View



EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View



Annex B.ii. Photograph: EUT Internal Photo

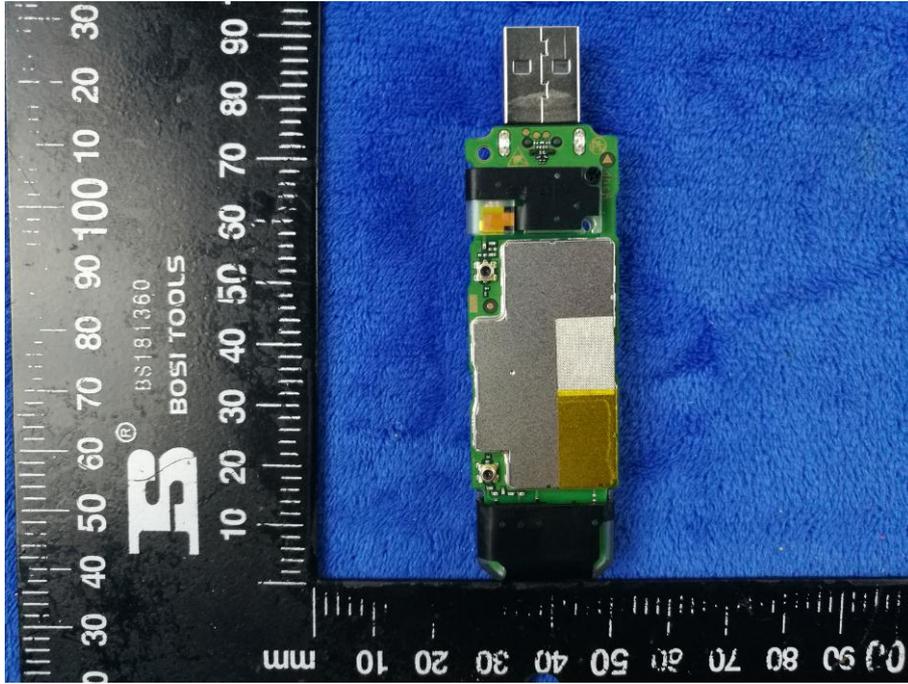
Cover Off - Top View 1



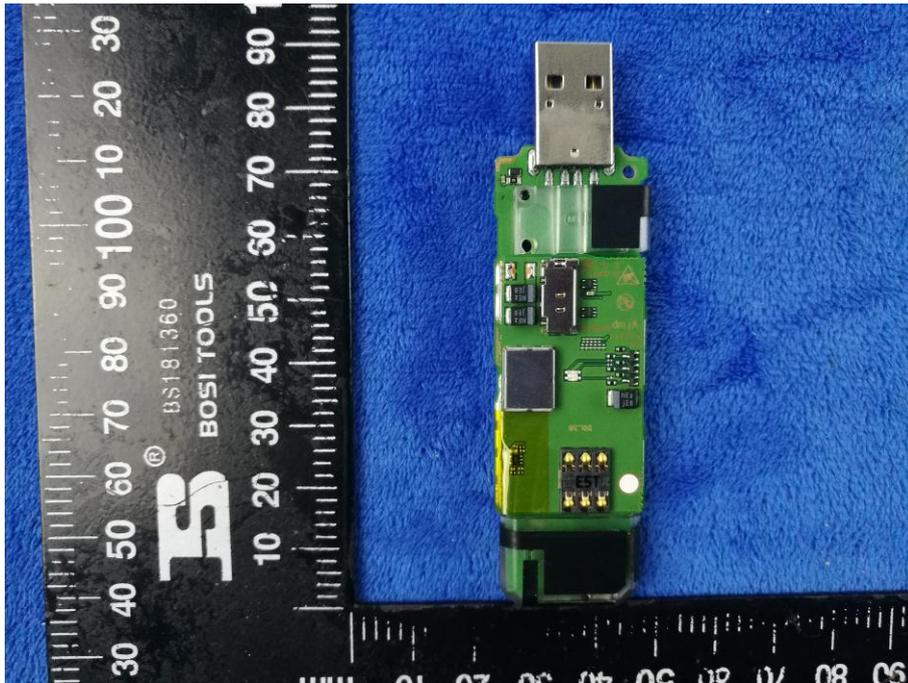
Cover Off - Top View 2



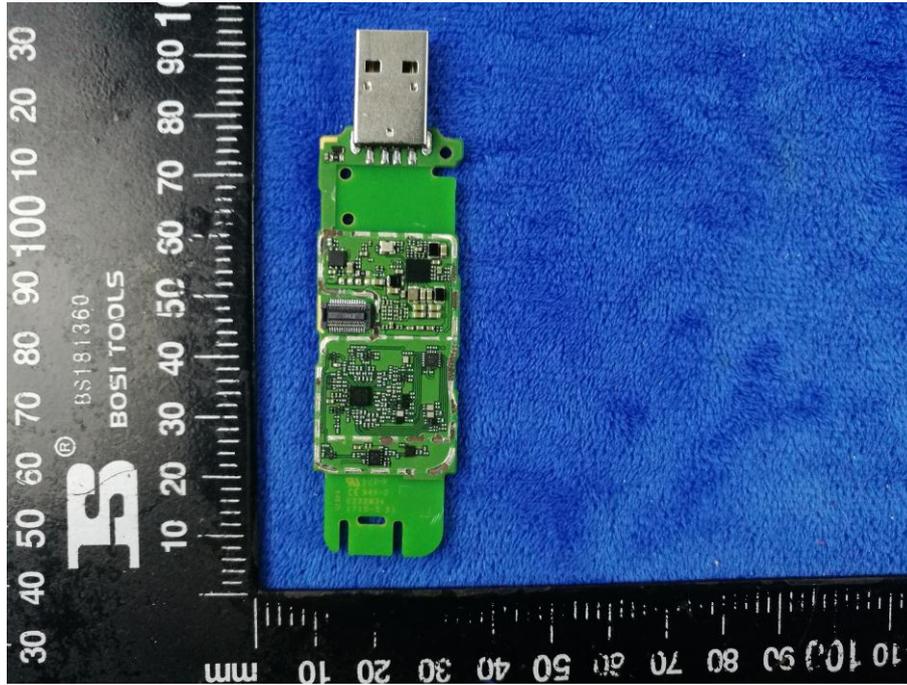
Mainboard with Shielding - Front View



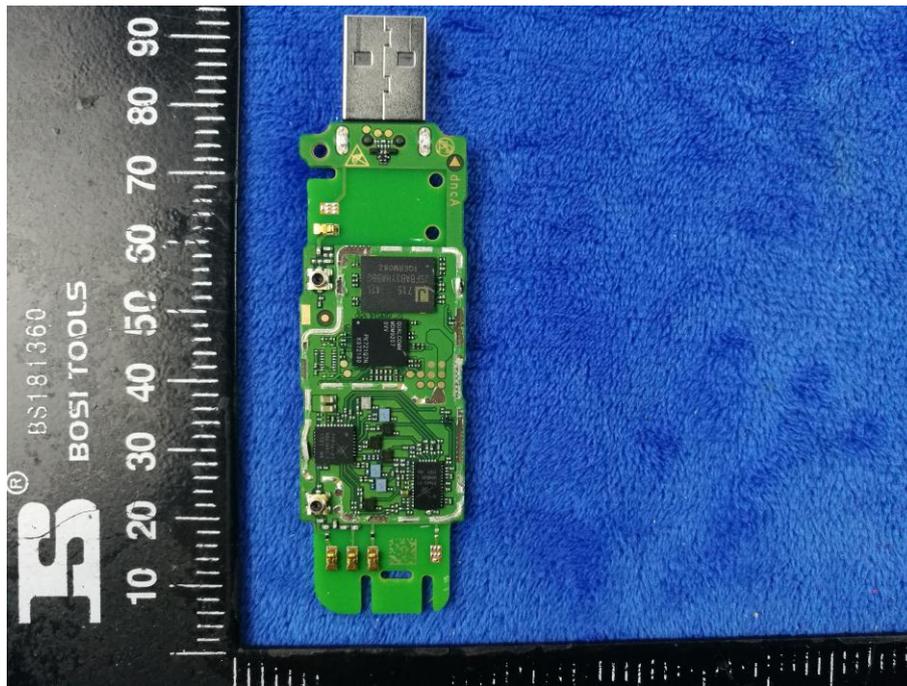
Mainboard with Shielding - Rear View



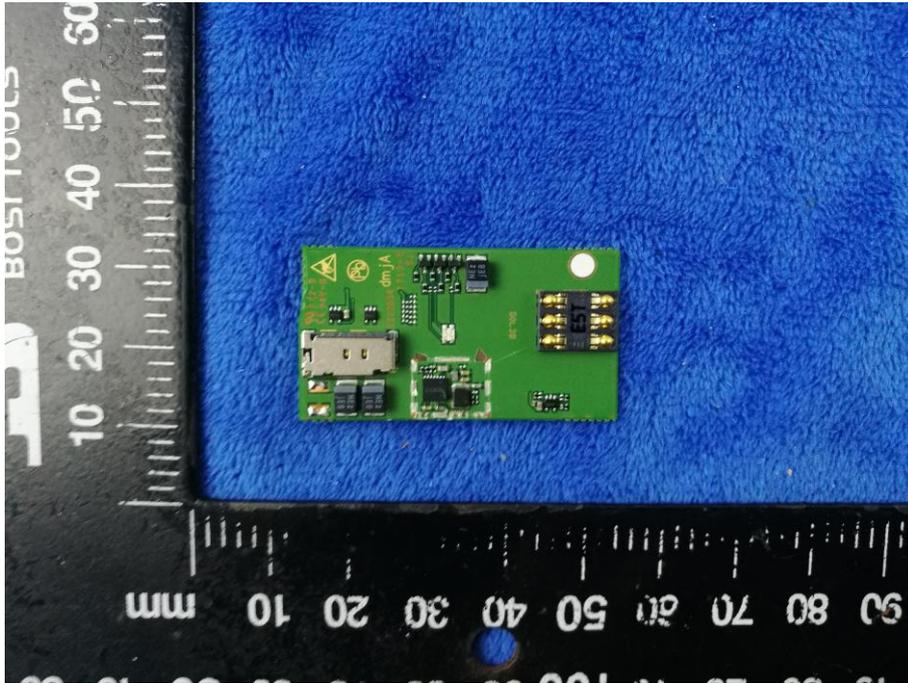
Mainboard without Shielding - Front View



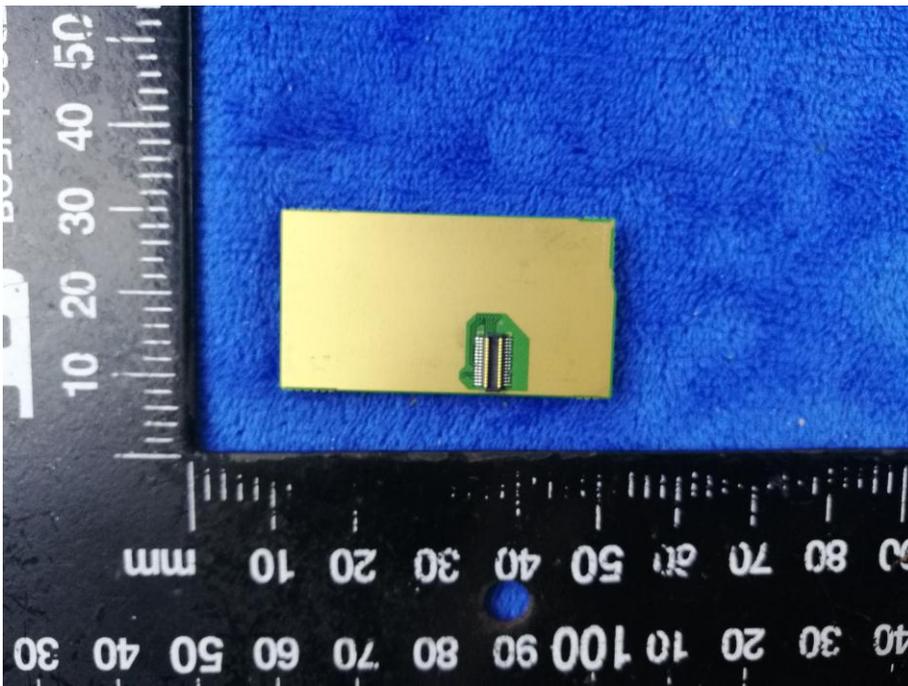
Mainboard without Shielding - Rear View



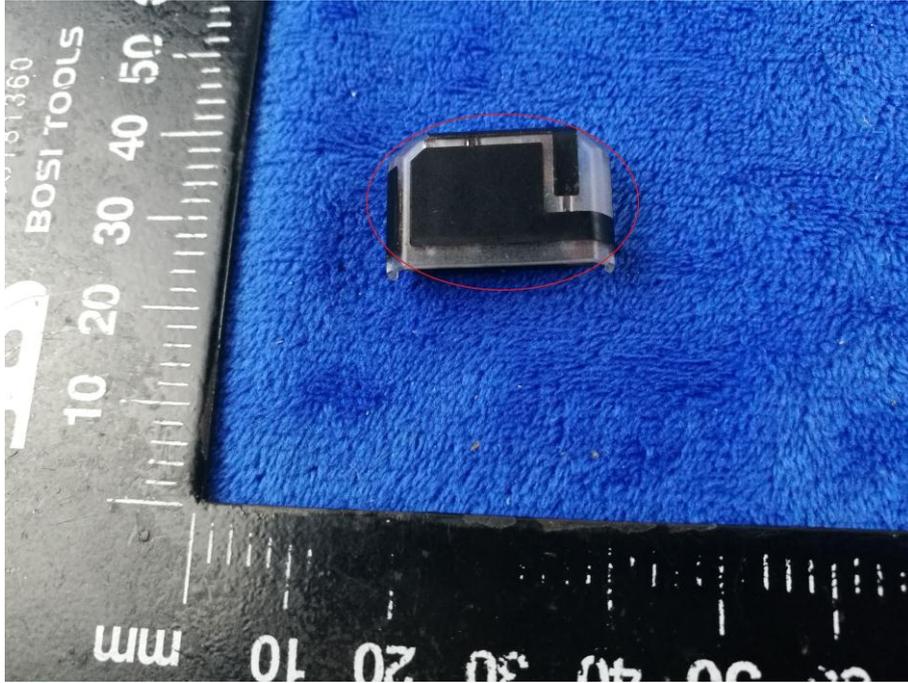
Small board - Front View



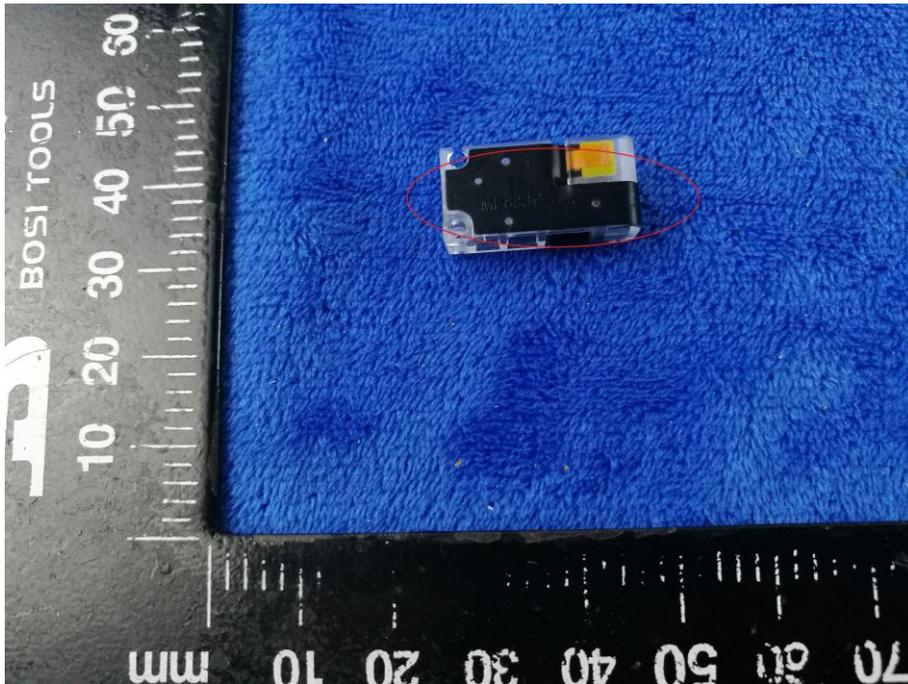
Small board - Rear View



GSM/PCS/UMTS-FDD/LTE Antenna View



Receive Diversity Antenna



Annex B.iii. Photograph: Test Setup Photo



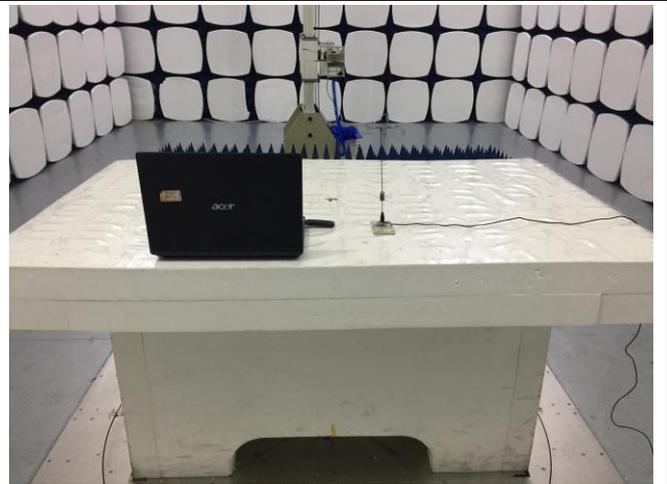
Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



Radiated Emissions Test Setup Below 1GHz

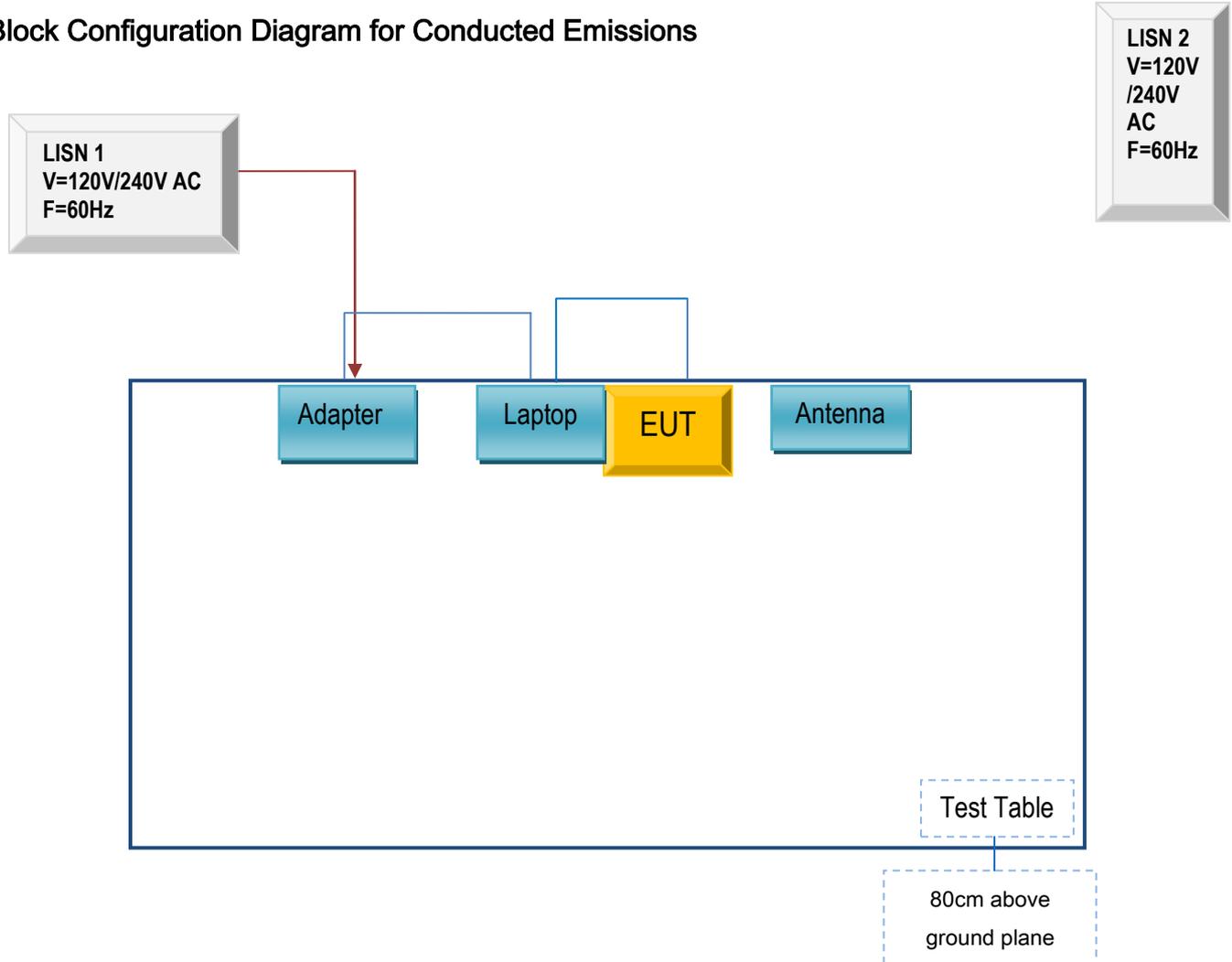


Radiated Emissions Test Setup Above 1GHz

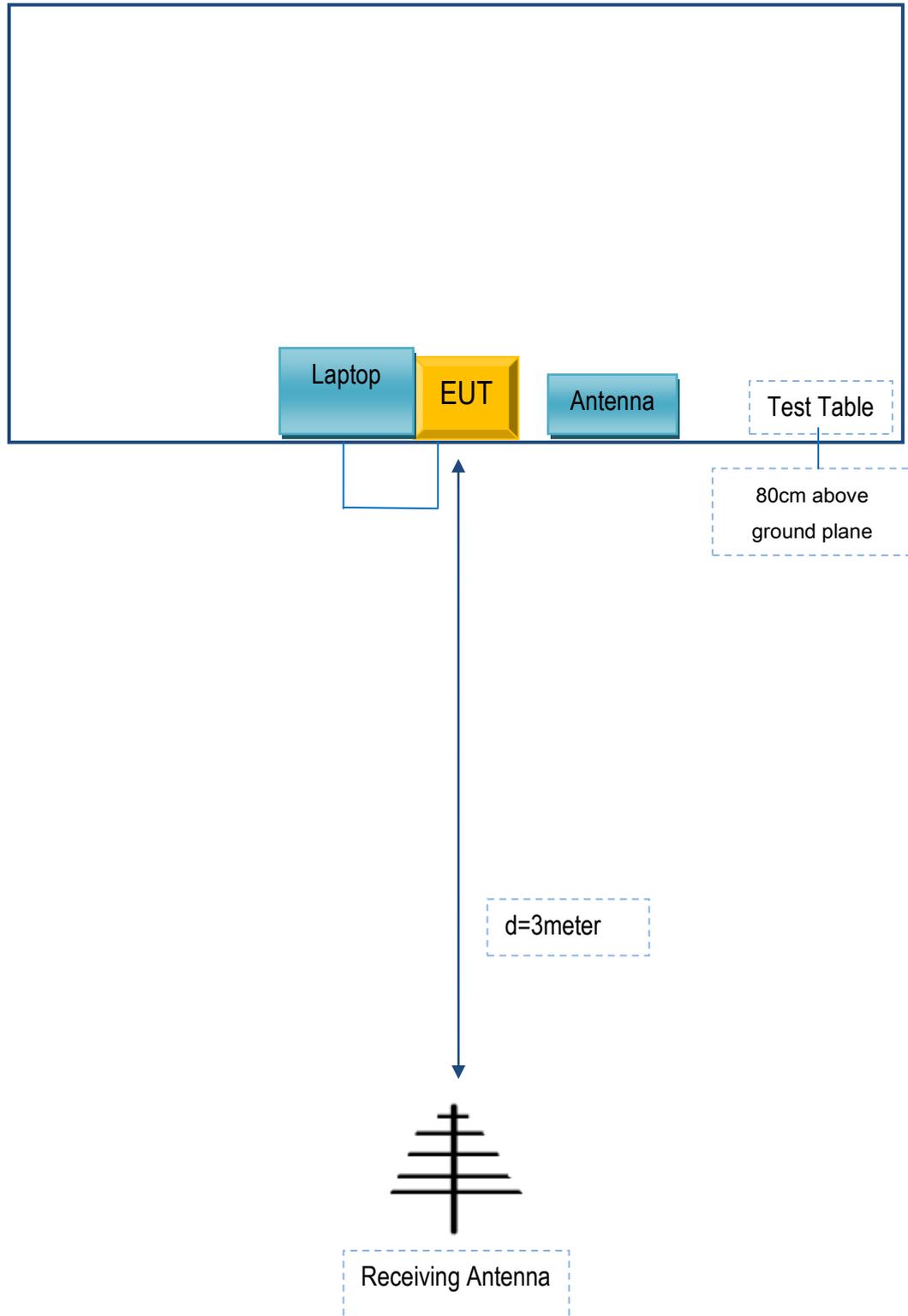
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

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
Lenovo	AC Adapter	42T4416	21D9JU

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	2m	JX120051274

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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