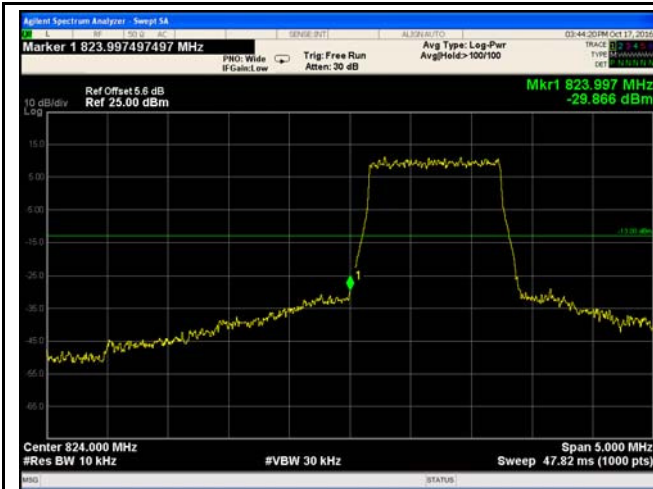
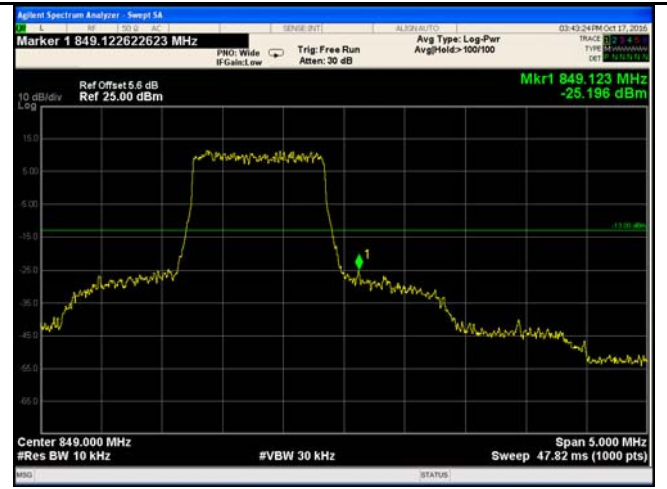


LTE Band V (Part 22H)



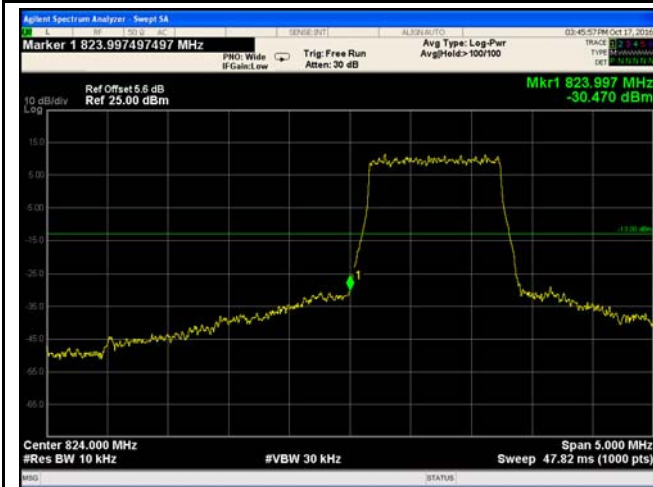
LTE Band V - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.77/10)=4.5+1.1=5.6 dB



LTE Band V - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.83/10)=4.5+1.1=5.6 dB



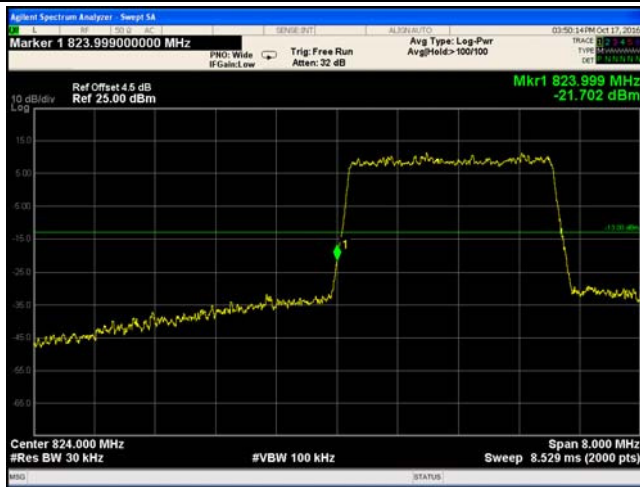
LTE Band V - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.90/10)=4.5+1.1=5.6 dB



LTE Band V - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.77/10)=4.5+1.1=5.6 dB



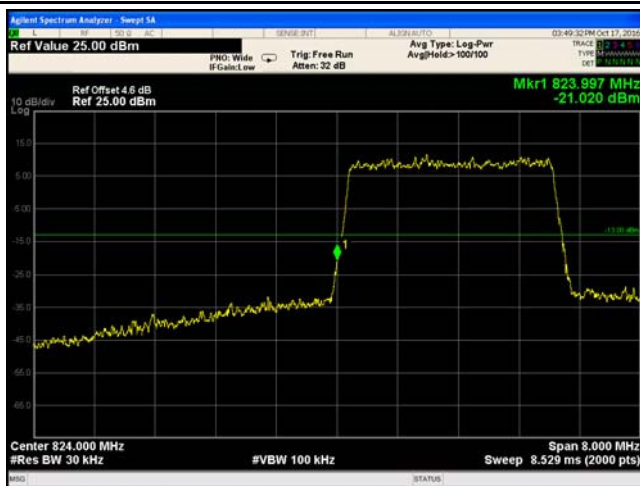
LTE Band V - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
(30.24/30)=4.5+0.0=4.5 dB



LTE Band V - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
(30.38/30)=4.5+0.1=4.6 dB



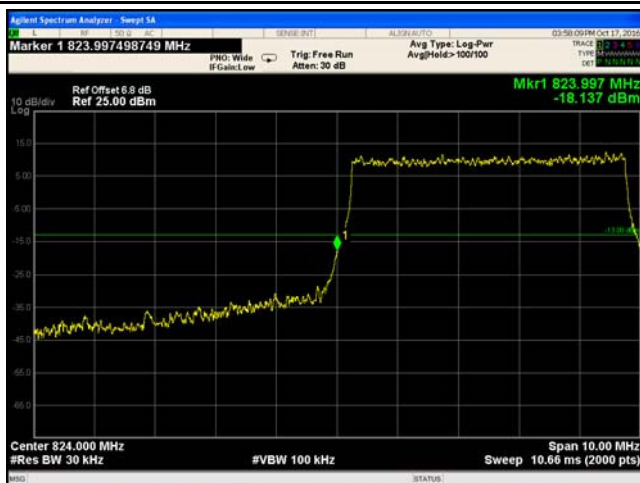
LTE Band V - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
(30.43/30)=4.5+0.1=4.6 dB



LTE Band V - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
(30.56/30)=4.5+0.1=4.6 dB

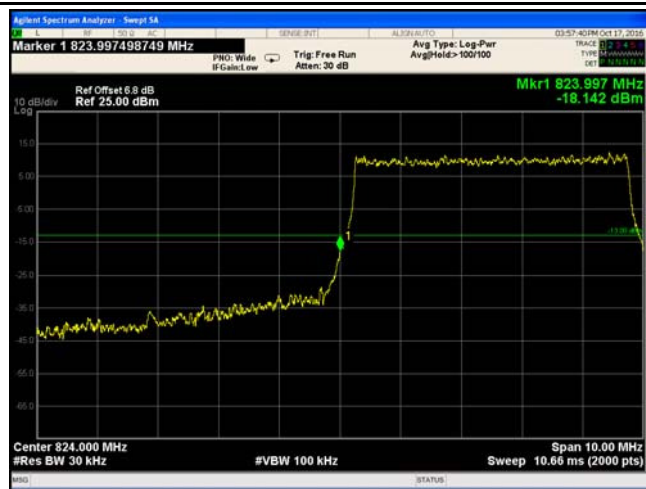


LTE Band V - Low Channel QPSK-5



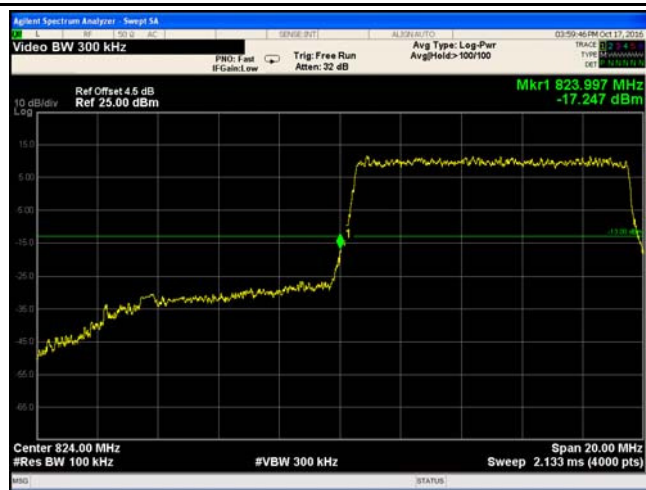
LTE Band V - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log
(50.45/30)=4.5+2.3=6.8 dB

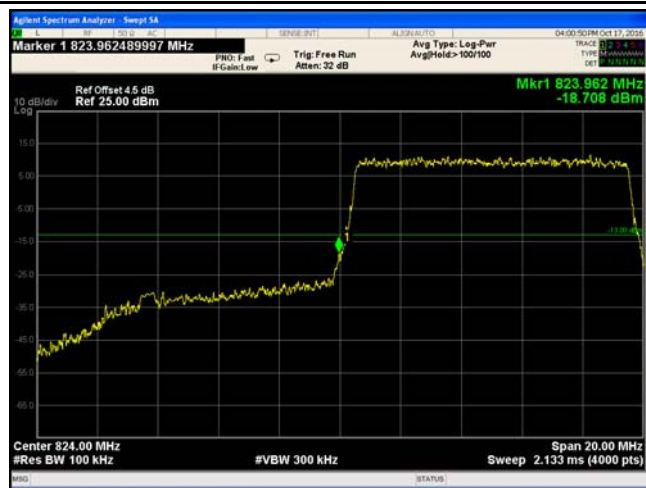


LTE Band V - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log
(50.47/30)=4.5+2.3=6.8 dB



LTE Band V - Low Channel QPSK-10



LTE Band V - Low Channel 16QAM-10

Note: Offset=Cable loss (4.5) + 10log
(50.33/30)=4.5+2.2=6.7 dB

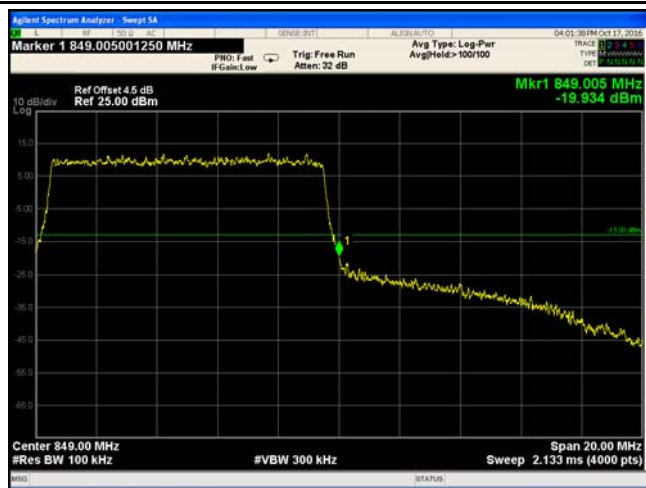


LTE Band V - High Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log
(50.44/30)=4.5+2.3=6.8 dB



LTE Band V - High Channel QPSK-10



LTE Band V - High Channel 16QAM-10

LTE Band XVII (Part 27)



LTE Band XVII - Low Channel QPSK-5

Note: Offset=Cable loss (4.0) + 10log
(50.71/30)=4.5+2.3=6.7 dB



LTE Band XVII - High Channel QPSK-5

Note: Offset=Cable loss (4.0) + 10log
(50.38/30)=4.5+2.3=6.8 dB



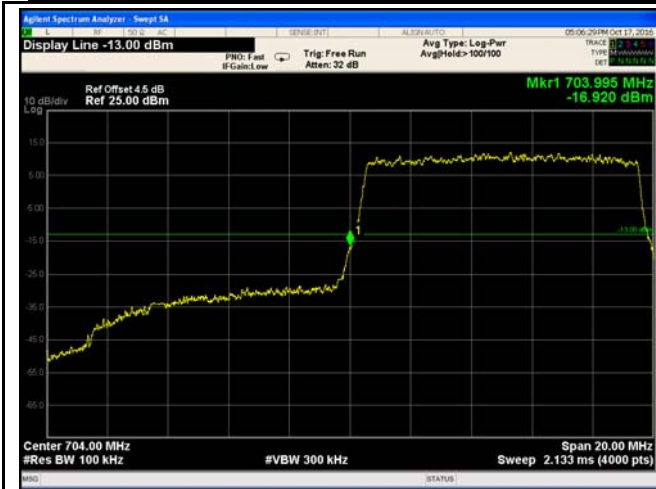
LTE Band XVII - Low Channel 16QAM-5

Note: Offset=Cable loss (4.0) + 10log
(50.71/30)=4.5+2.3=6.8 dB



LTE Band XVII - High Channel 16QAM-5

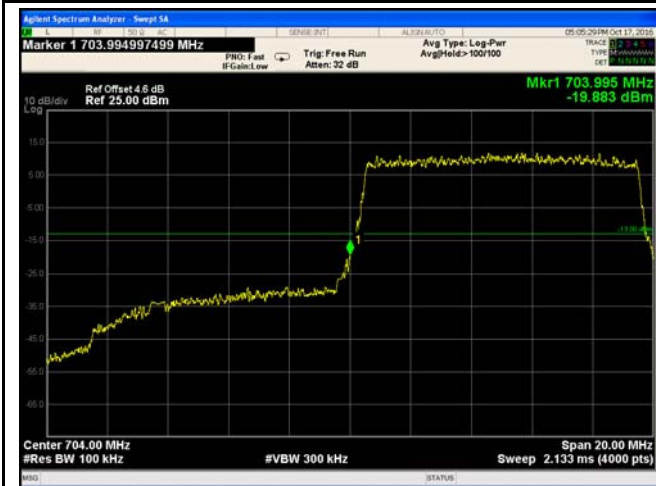
Note: Offset=Cable loss (4.0) + 10log
(50.25/30)=4.5+2.2=6.7 dB



LTE Band XVII - Low Channel QPSK-10



LTE Band XVII - High Channel QPSK-10



LTE Band XVII - Low Channel 16QAM-10

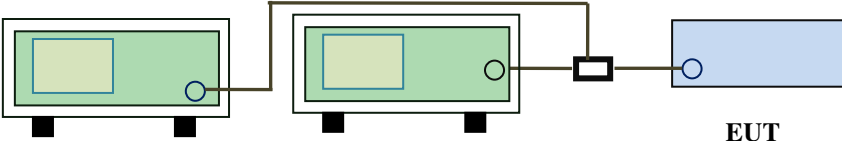


LTE Band XVII - High Channel 16QAM-10

6.8 Band Edge 27.53(m)

Temperature	22°C
Relative Humidity	59%
Atmospheric Pressure	1017mbar
Test date :	October 17, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than $43+10\log(P)$ dB at the channel edge, the limit of emission equal to -13dBm. And $55+10\log(P)$ dB at 5.5MHz from the channel edges, the limit of emission equal to -25dBm. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;">Base Station Spectrum Analyzer EUT</p>	
Test Procedure	<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers. 	
Remark		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

LTE Band VII (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	20775	2499.9	QPSK	-23.445	-13
			16QAM	-24.630	-13
5	21425	2570	QPSK	-25.666	-13
			16QAM	-25.760	-13
10	20800	2499.9	QPSK	-23.970	-13
			16QAM	-24.159	-13
10	21400	2570	QPSK	-26.380	-13
			16QAM	-26.050	-13
15	20825	2499.9	QPSK	-24.411	-13
			16QAM	-24.056	-13
15	21400	2570	QPSK	-27.218	-13
			16QAM	-27.297	-13
20	20850	2499.9	QPSK	-24.255	-13
			16QAM	-25.653	-13
20	21350	2570	QPSK	-32.184	-13
			16QAM	-33.279	-13

LTE Band VII (Part 27)



LTE Band VII - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log
(50.26/30)=4.5+2.2=6.7 dB



LTE Band VII - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log
(50.57/30)=4.5+2.3=6.8 dB



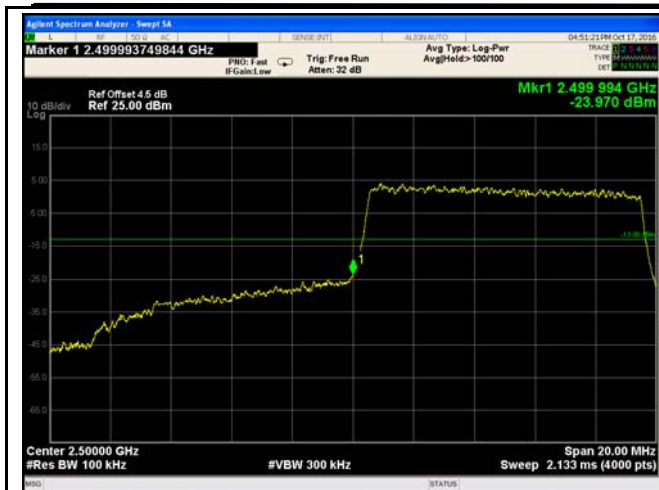
LTE Band VII - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log
(50.67/30)=4.5+2.3=6.8 dB

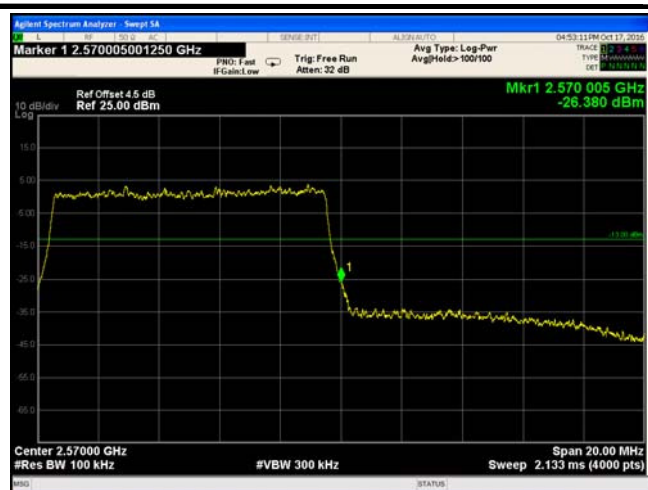


LTE Band VII - High Channel 16QAM-5

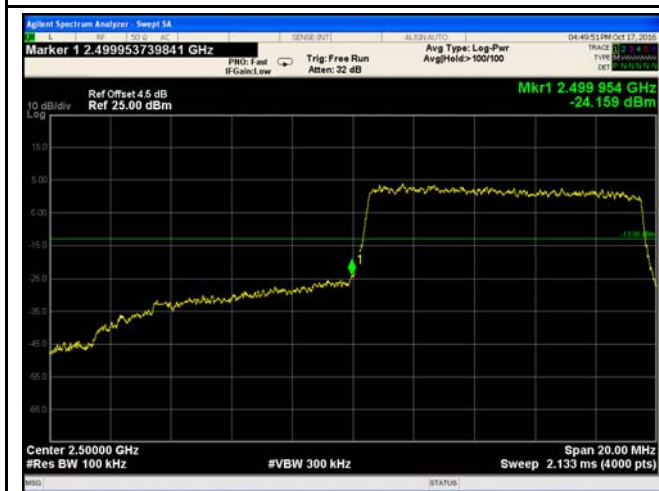
Note: Offset=Cable loss (4.5) + 10log
(50.98/30)=4.5+2.3=6.8 dB



LTE Band VII - Low Channel QPSK-10



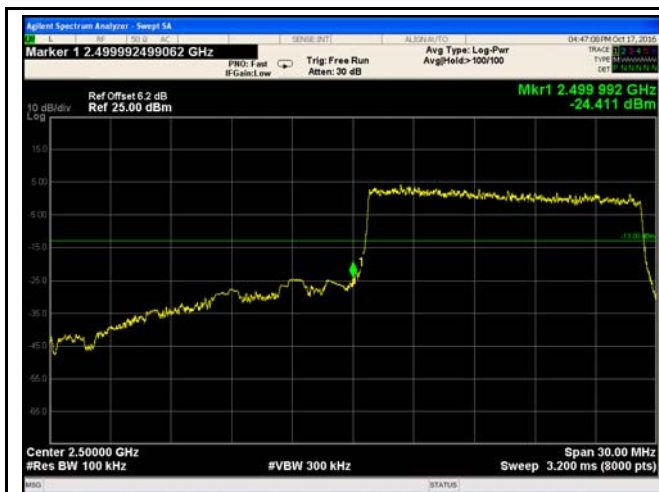
LTE Band VII - High Channel QPSK-10



LTE Band VII - Low Channel 16QAM-10



LTE Band VII - High Channel 16QAM-10



LTE Band VII - Low Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log
(148.7/100)=4.5+1.7=6.2 dB



LTE Band VII - High Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log
(148.6/100)=4.5+1.7=6.2 dB



LTE Band VII - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log
(149.3/100)=4.5+1.7=6.2dB



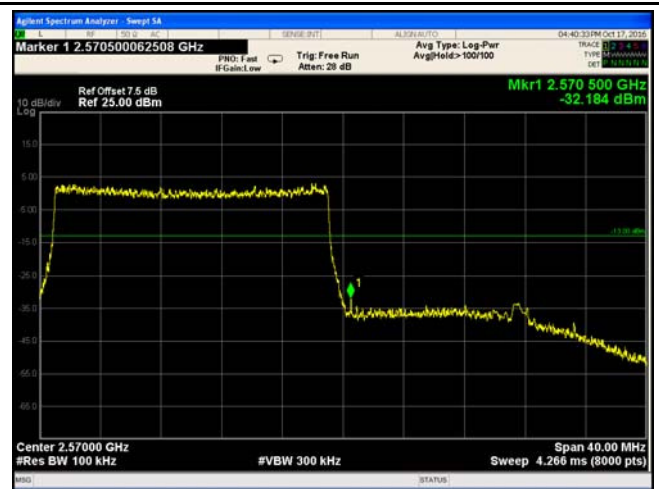
LTE Band VII - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log
(148.9/100)=4.5+1.7=6.2 dB



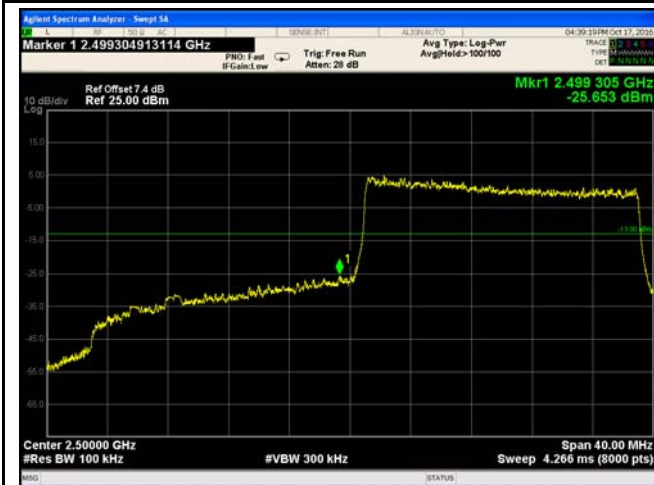
LTE Band VII - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log
(193.3/100)=4.5+2.9=7.4 dB



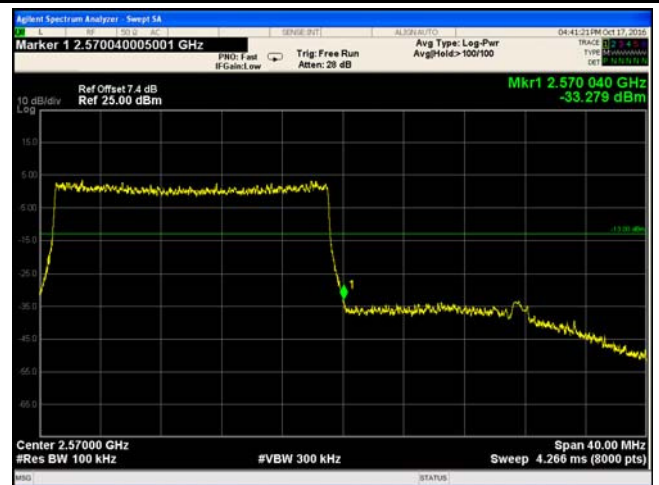
LTE Band VII - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log
(198/100)=4.5+3.0=7.5dB



LTE Band VII - Low Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log
(193.2/100)=4.5+2.9=7.4 dB



LTE Band VII - High Channel 16QAM-20

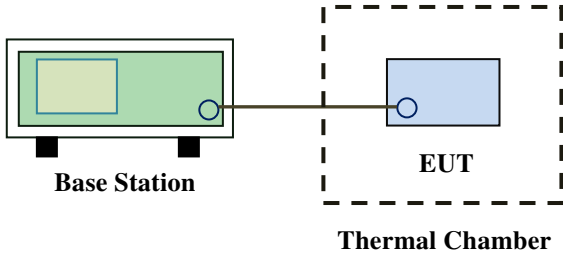
Note: Offset=Cable loss (4.5) + 10log
(196.3/100)=4.5+2.9=7.4 dB

6.9 Frequency Stability

Temperature	22°C
Relative Humidity	59%
Atmospheric Pressure	1017mbar
Test date :	October 17, 2016
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable																																
§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54	a)	<p>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr> </thead> <tbody> <tr> <td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr> <tr> <td>to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr> <tr> <td>450 to 512</td><td>2.5</td><td>5.0</td><td>5 0</td></tr> <tr> <td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>928 to 929.</td><td>5.0</td><td>N/A</td><td>N/A</td></tr> <tr> <td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr> <tr> <td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p> <p>According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</p>	Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)	25 to 50	20.0	20.0	50.0	to 450	5.0	5.0	50.0	450 to 512	2.5	5.0	5 0	821 to 896	1.5	2.5	2.5	928 to 929.	5.0	N/A	N/A	929 to 960.	1.5	N/A	N/A	2110 to 2220	10.0	N/A	N/A	<input checked="" type="checkbox"/>
Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)																																
25 to 50	20.0	20.0	50.0																																
to 450	5.0	5.0	50.0																																
450 to 512	2.5	5.0	5 0																																
821 to 896	1.5	2.5	2.5																																
928 to 929.	5.0	N/A	N/A																																
929 to 960.	1.5	N/A	N/A																																
2110 to 2220	10.0	N/A	N/A																																

Test setup	 <p>Base Station</p> <p>EUT</p> <p>Thermal Chamber</p>
Procedure	<p>A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.</p> <p>Limit: The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.</p>
Remark	<p>Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of -10°C to +55°C at normal supply voltage.</p>
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

LTE Band IV (Part 27) result

Middle Channel, $f_0 = 1732.5$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-13	0.0075	2.5
0		-15	0.0087	2.5
10		-14	0.0081	2.5
20		-11	0.0063	2.5
30		-8	0.0046	2.5
40		-10	0.0058	2.5
50		-12	0.0069	2.5
55		-12	0.0069	2.5
25	4.2	-14	0.0081	2.5
	3.5	-15	0.0087	2.5

LTE Band V (Part 22H) result

Middle Channel, $f_0 = 836.5$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-5	0.0060	2.5
0		-4	0.0048	2.5
10		-6	0.0072	2.5
20		-8	0.0096	2.5
30		-14	0.0167	2.5
40		-5	0.0060	2.5
50		-10	0.0120	2.5
55		-5	0.0060	2.5
25	4.2	-11	0.0132	2.5
	3.5	-13	0.0155	2.5

LTE Band VII (Part 27) result

Middle Channel, $f_0 = 2535$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-12	0.0047	2.5
0		-10	0.0039	2.5
10		-8	0.0032	2.5
20		-6	0.0024	2.5
30		-12	0.0047	2.5
40		-10	0.0039	2.5
50		-9	0.0036	2.5
55		-4	0.0016	2.5
25	4.2	-9	0.0036	2.5
	3.5	-11	0.0043	2.5

LTE Band XVII (Part 27) result

Middle Channel, $f_0 = 710$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	8	0.0113	2.5
0		6	0.0085	2.5
10		6	0.0085	2.5
20		5	0.0070	2.5
30		4	0.0056	2.5
40		6	0.0085	2.5
50		12	0.0169	2.5
55		7	0.0099	2.5
25	4.2	10	0.0141	2.5
	3.5	9	0.0127	2.5

Annex A. TEST INSTRUMENT

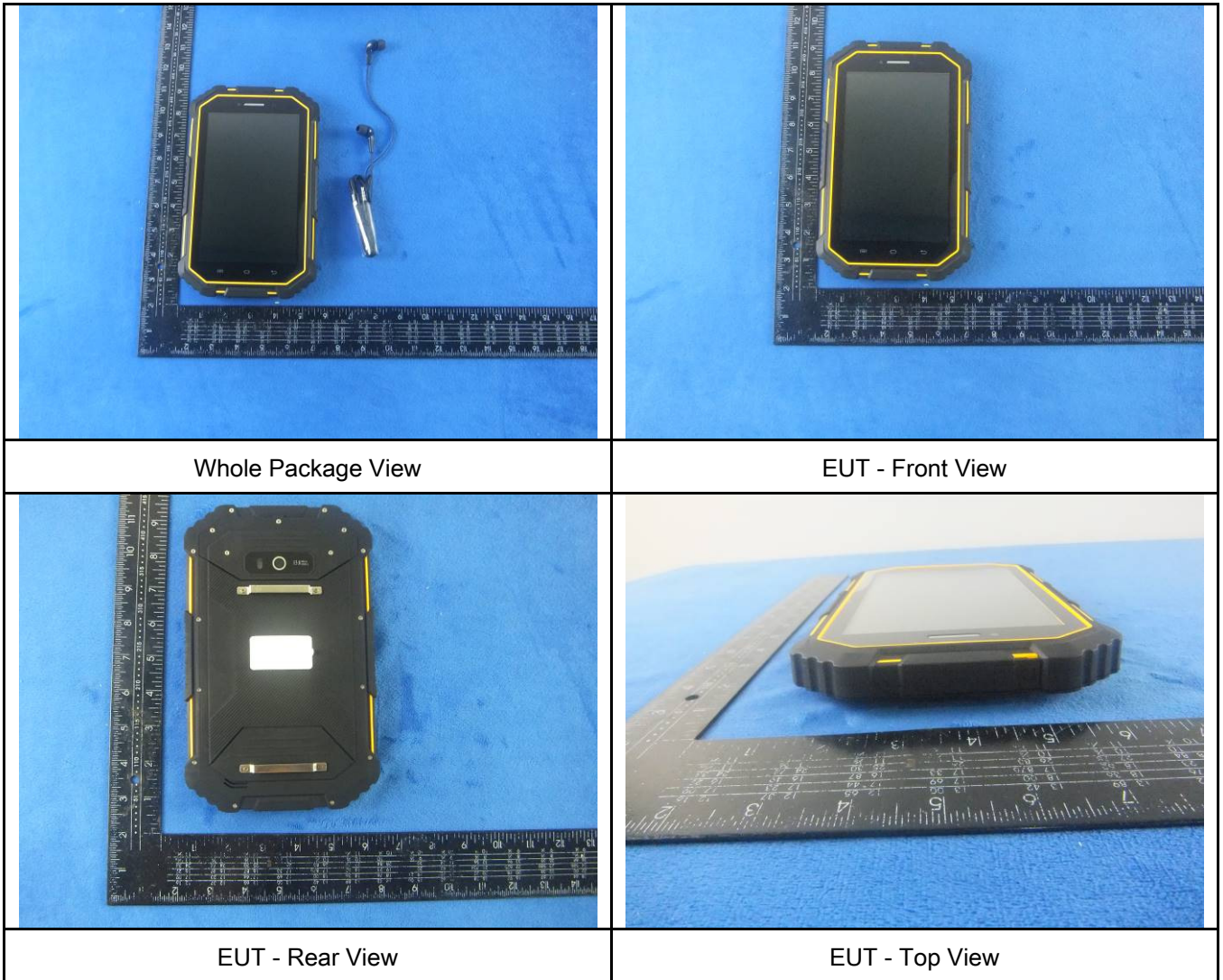
Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/15/2016	09/14/2017	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Wideband Radio Communication Tester	CMW500	120906	03/27/2016	03/26/2017	<input checked="" type="checkbox"/>
Temperature/Humidity Chamber	UHL-270	001	10/08/2016	10/07/2017	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/16/2016	09/15/2017	<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 (0.5 ~ 18GHz)	PAM-118	443008	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Tunable Notch Filter	3NF-800/1000-S	AA4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>

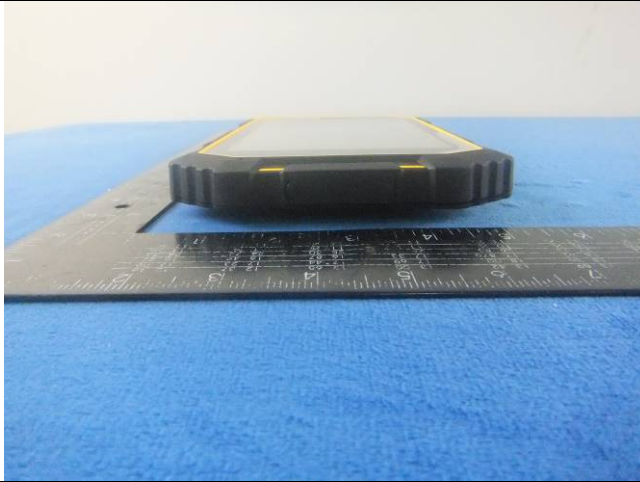
Test Report	16071169-FCC-R5
Page	98 of 109

Tunable Notch Filter	3NF- 1000/2000-S	AM 4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
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Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo





EUT - Bottom View



EUT - Left View



EUT - Right View

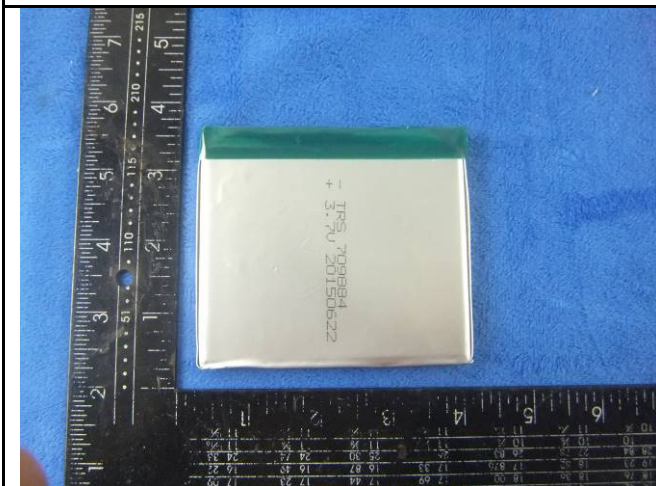
Annex B.ii. Photograph: EUT Internal Photo



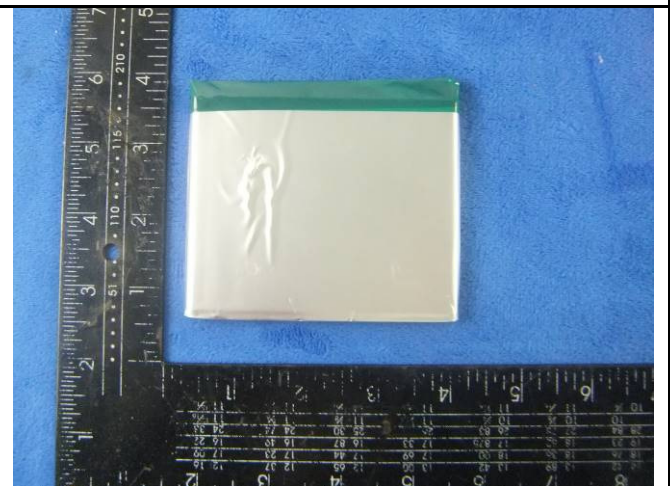
Cover Off - Top View 1



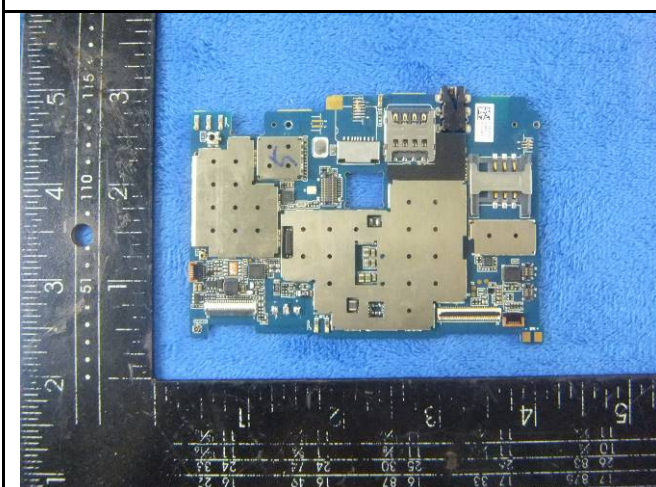
Cover Off - Top View 2



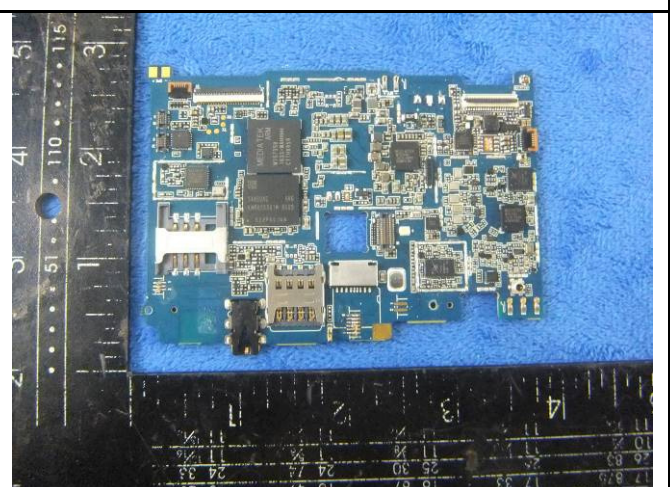
Battery - Front View



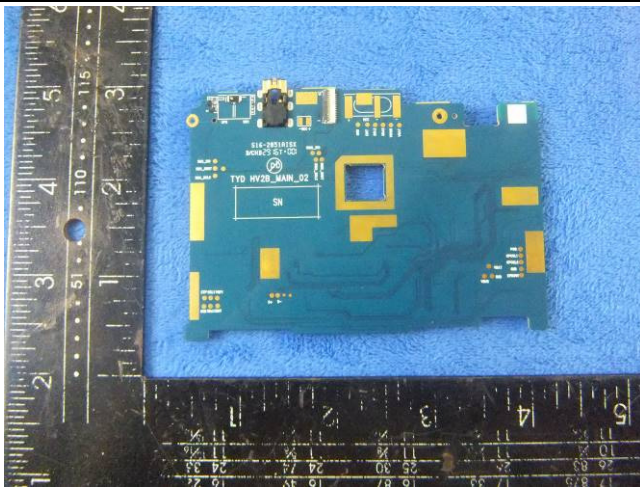
Battery - Rear View



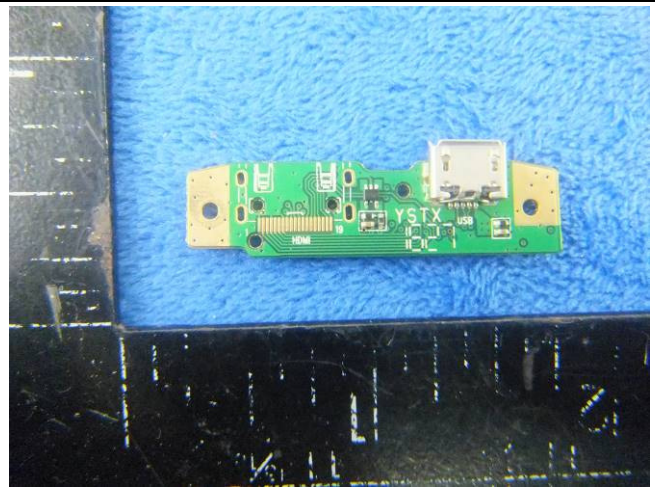
Mainboard with sheilding - Front View



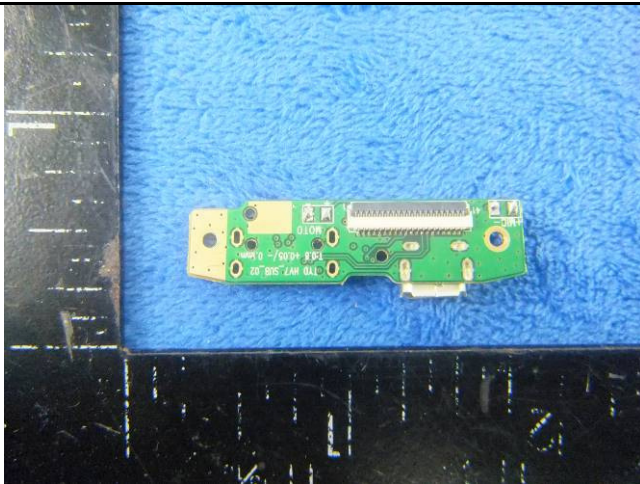
Mainboard without sheilding - Front View



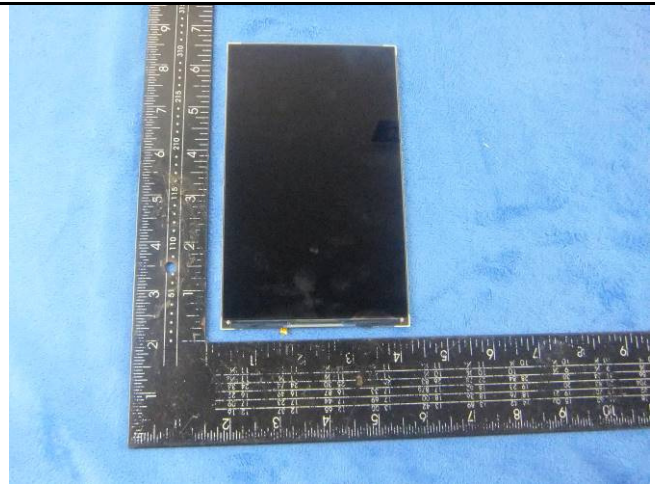
Mainboard – Rear View



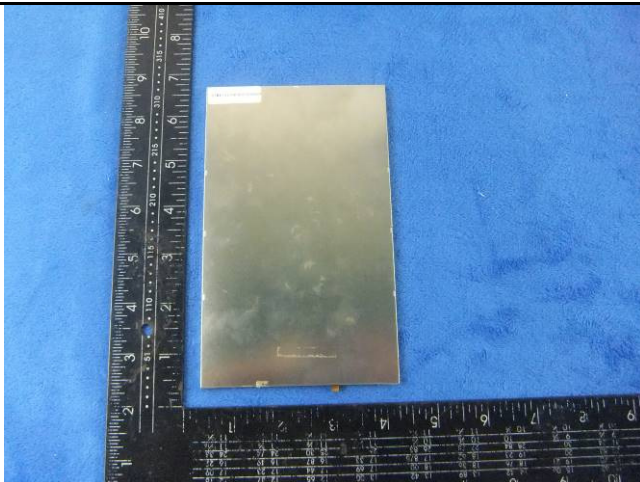
USB board – Front View



USB board - Rear View



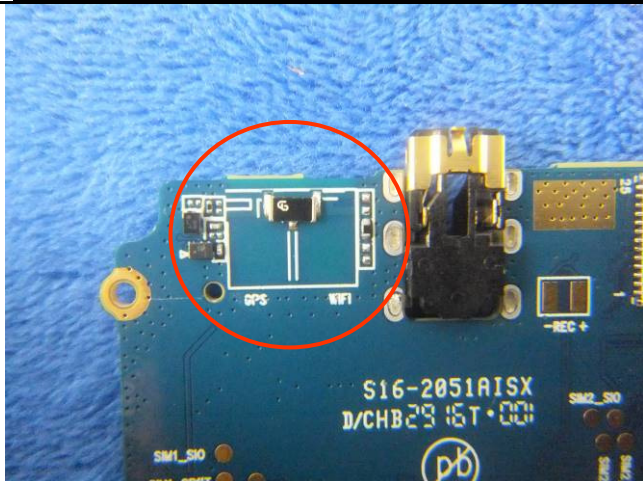
LCD – Front View



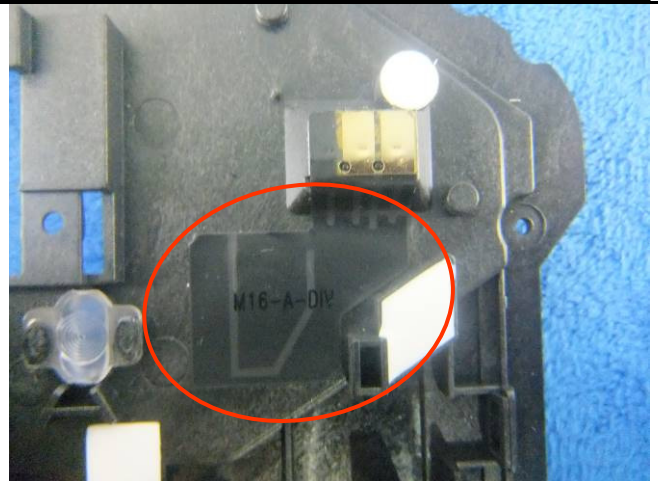
LCD – Rear View



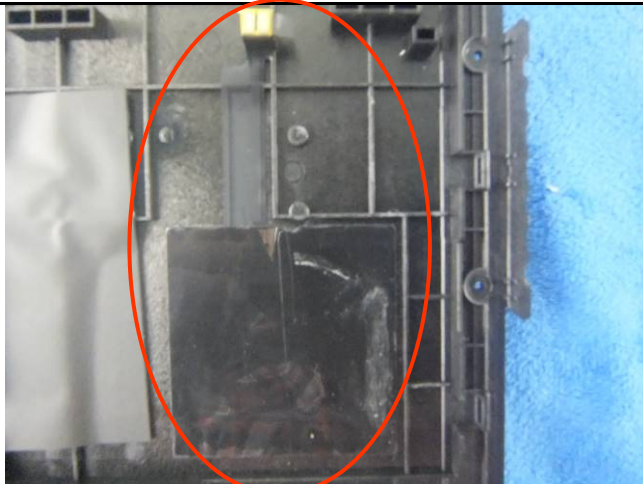
GSM/PCS/UMTS-FDD Antenna View



WIFI/BT/BLE/GPS - Antenna View

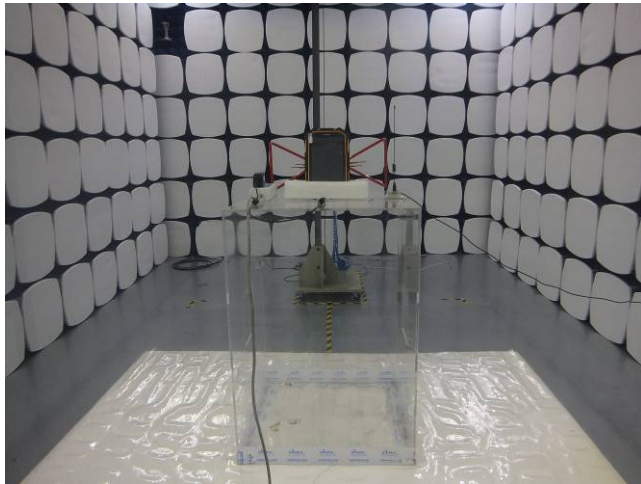


LTE Antenna View

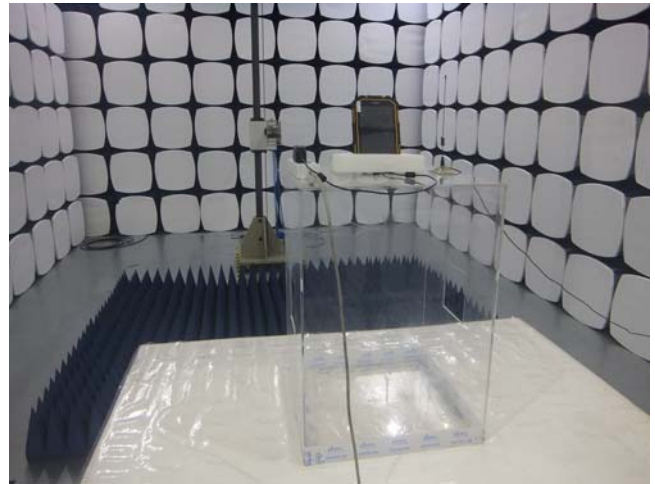


NFC - Antenna View

Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz

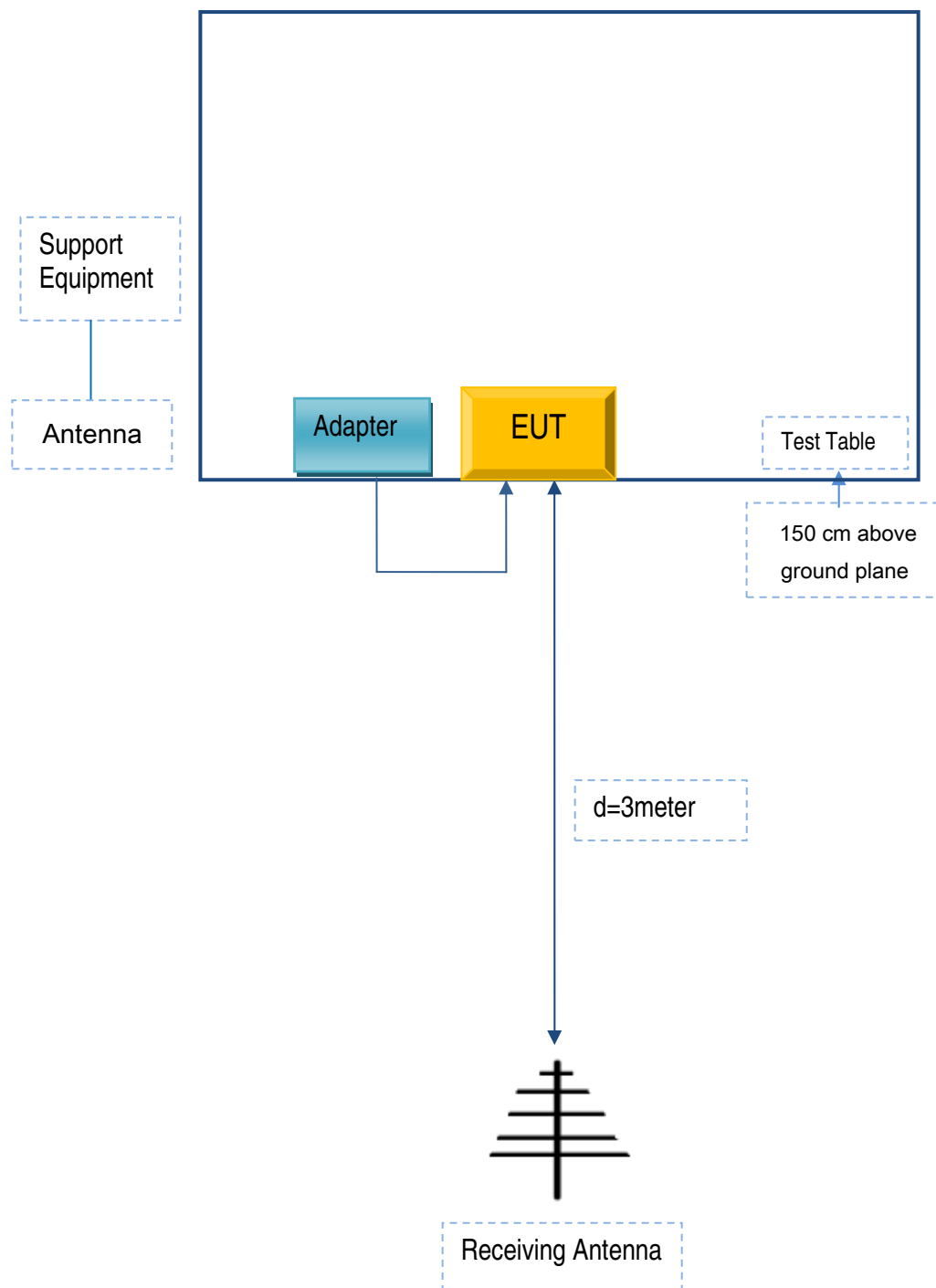


Radiated Spurious Emissions Test Setup Above
1GHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

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	AC Adapter	42T4416	21D9JU

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	GT211032

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Annex C.ii. EUT OPERATING CONKITIONS

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