RF TEST REPORT

Report No.: 17070388-FCC-R5

Supersede Report No.: N/A

Applicant	BLU Products, Inc.
Product Name	Mobile Phone
Model No.	R2
Serial No.	N/A
Test Standard	FCC Part 27: 2016; ANSI/TIA-603-D: 2010
Test Date	May 27 to June 19, 2017
Issue Date	June 20, 2017
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Loren Luo	David Huang	
Loren Luo Test Engineer	David Huang Checked 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

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

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
17070388-FCC-R5	NONE	Original	June 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

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	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Mobile Phone
Main Model:	R2
Serial Model:	N/A
Date EUT received:	May 26, 2017
Test Date(s):	May 27 to June 19, 2017
Equipment Category：	PCE
Antenna Gain:	GSM850: -2.8dBi PCS1900: -2.3dBi UMTS-FDD Band V: -2.5dBi UMTS-FDD Band IV: -2.5dBi UMTS-FDD Band II: -2.5dBi LTE Band VII: -3.0dBi WIFI: -2.7dBi Bluetooth/BLE: -2.7dBi GPS: -2.9dBi
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK,8PSK UMTS-FDD: QPSK LTE Band: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK GPS:BPSK
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 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

	LTE Band VII TX: 2502.5 ~ 2567.5 MHz; RX : 2622.5 ~ 2687.5 MHz 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
Number of Channels:	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
Maximum Conducted AV Power to Antenna:	LTE Band 7: 22.82 dBm
ERP/EIRP:	LTE Band 7: 17.67 dBm / EIRP
Port:	USB Port, Earphone Port
Input Power:	Adapter: Model: US-WT-1500 Input: AC100-240V~50/60Hz,0.3A Output: DC 5V,1.5A Battery: Model: C716041300P Spec : 3.8V,3000mAh,11.4Wh Input : 5.0V,1.5A
Trade Name :	BLU
GPRS/EGPRS Multi-slot class	8/10/12
FCC ID:	YHLBLUR2

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
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§2.1046; § 27.50(c.10); §27.50(d.4)	RF Output Power	Compliance
§ 27.50(d)	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 27.53(h)	Field Strength of Spurious Radiation	Compliance
§ 27.53(h)	Out of band emission, Band Edge	Compliance
§ 27.53(m)	Band Edge 27.53(m)	Compliance
§ 2.1055; § 27.5(h); § 27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

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

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

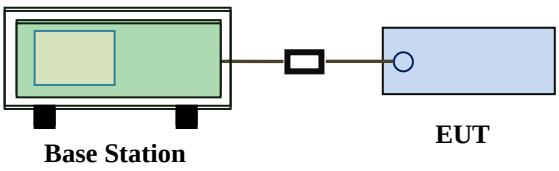
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 17070388-FCC-H.

6.2 RF Output Power

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§27.50 (c)	c)	EIRP: 30dBm	☑
Test Setup			
Test Procedure	For Conducted Power: - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. For ERP/EIRP: - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental frequency was investigated. - Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-		

	radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Conducted Power

LTE Band 7:

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
20MHz	20850	2510	QPSK	1	0	0	22.26	22±1
				1	49	0	22.25	22±1
				1	99	0	22.22	22±1
				50	0	1	21.51	22±1
				50	24	1	21.54	22±1
				50	49	1	21.55	22±1
				100	0	1	21.58	22±1
			16QAM	1	0	1	21.49	21.3±1
				1	49	1	21.48	21.3±1
				1	99	1	21.47	21.3±1
				50	0	2	21.45	21.3±1
				50	24	2	21.42	21.3±1
				50	49	2	21.43	21.3±1
				100	0	2	20.44	21.3±1
	21100	2535	QPSK	1	0	0	21.86	21.3±1
				1	49	0	21.85	21.3±1
				1	99	0	21.82	21.3±1
				50	0	1	21.16	21.3±1
				50	24	1	21.13	21.3±1
				50	49	1	21.13	21.3±1
				100	0	1	21.26	21.3±1
			16QAM	1	0	1	21.29	21.3±1
				1	49	1	21.3	21.3±1
				1	99	1	21.32	21.3±1
				50	0	2	21.15	21.3±1
				50	24	2	21.18	21.3±1
				50	49	2	21.2	21.3±1
				100	0	2	20.5	21.3±1
	21350	2560	QPSK	1	0	0	21.95	21.3±1
				1	49	0	21.93	21.3±1
				1	99	0	21.93	21.3±1
				50	0	1	21.16	21.3±1
				50	24	1	21.15	21.3±1
				50	49	1	21.12	21.3±1
				100	0	1	20.96	21.3±1
			16QAM	1	0	1	21.51	21.3±1
				1	49	1	21.52	21.3±1
				1	99	1	21.53	21.3±1
				50	0	2	21.26	21.3±1
				50	24	2	21.23	21.3±1
				50	49	2	21.26	21.3±1
				100	0	2	20.42	21.3±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
15MHz	20825	1717.5	QPSK	1	0	0	22.36	22±1
				1	37	0	22.38	22±1
				1	74	0	22.39	22±1
				36	0	1	21.52	22±1
				36	16	1	21.54	22±1
				36	35	1	21.54	22±1
				75	0	1	21.39	22±1
			16QAM	1	0	1	21.26	21.3±1
				1	37	1	21.25	21.3±1
				1	74	1	21.27	21.3±1
				36	0	2	21.36	21.3±1
				36	16	2	21.35	21.3±1
				36	35	2	21.36	21.3±1
				75	0	2	20.52	21.3±1
	21100	1732.5	QPSK	1	0	0	21.81	21.3±1
				1	37	0	21.81	21.3±1
				1	74	0	21.84	21.3±1
				36	0	1	21.24	21.3±1
				36	16	1	21.26	21.3±1
				36	35	1	21.26	21.3±1
				75	0	1	21.2	21.3±1
			16QAM	1	0	1	21.23	21.3±1
				1	37	1	21.24	21.3±1
				1	74	1	21.22	21.3±1
				36	0	2	21.25	21.3±1
				36	16	2	21.23	21.3±1
				36	35	2	21.2	21.3±1
				75	0	2	20.42	21.3±1
	21375	1747.5	QPSK	1	0	0	21.86	21.3±1
				1	37	0	21.89	21.3±1
				1	74	0	21.92	21.3±1
				36	0	1	20.84	21.3±1
				36	16	1	20.85	21.3±1
				36	35	1	20.85	21.3±1
				75	0	1	20.41	21.3±1
			16QAM	1	0	1	21.46	21.3±1
				1	37	1	21.49	21.3±1
				1	74	1	21.46	21.3±1
				36	0	2	20.82	21.3±1
				36	16	2	20.8	21.3±1
				36	35	2	20.8	21.3±1
				75	0	2	20.45	21.3±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
10MHz	20800	2502	QPSK	1	0	0	22.37	22±1
				1	24	0	22.4	22±1
				1	49	0	22.42	22±1
				25	0	1	21.38	22±1
				25	12	1	21.4	22±1
				25	24	1	21.38	22±1
				50	0	1	21.4	22±1
			16QAM	1	0	1	21.23	21.3±1
				1	24	1	21.25	21.3±1
				1	49	1	21.28	21.3±1
				25	0	2	21.38	21.3±1
				25	12	2	21.39	21.3±1
				25	24	2	21.42	21.3±1
				50	0	2	20.45	21.3±1
	21100	2535	QPSK	1	0	0	22.32	22±1
				1	24	0	22.29	22±1
				1	49	0	22.28	22±1
				25	0	1	21.48	22±1
				25	12	1	21.46	22±1
				25	24	1	21.48	22±1
				50	0	1	21.48	22±1
			16QAM	1	0	1	22.03	21.3±1
				1	24	1	22.01	21.3±1
				1	49	1	21.98	21.3±1
				25	0	2	21.47	21.3±1
				25	12	2	21.47	21.3±1
				25	24	2	21.5	21.3±1
				50	0	2	20.55	21.3±1
	21400	2565	QPSK	1	0	0	22.69	22±1
				1	24	0	22.7	22±1
				1	49	0	22.68	22±1
				25	0	1	21.74	22±1
				25	12	1	21.73	22±1
				25	24	1	21.74	22±1
				50	0	1	21.78	22±1
			16QAM	1	0	1	21.68	21.3±1
				1	24	1	21.71	21.3±1
				1	49	1	21.71	21.3±1
				25	0	2	21.75	21.3±1
				25	12	2	21.75	21.3±1
				25	24	2	21.78	21.3±1
				50	0	2	20.83	21.3±1

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	Tune up Power tolerant
5MHz	19975	1712.5	QPSK	1	0	0	22.48	22±1
				1	12	0	22.45	22±1
				1	24	0	22.47	22±1
				12	0	1	21.44	22±1
				12	6	1	21.41	22±1
				12	11	1	21.43	22±1
				25	0	1	21.38	22±1
			16QAM	1	0	1	21.5	21.3±1
				1	12	1	21.5	21.3±1
				1	24	1	21.47	21.3±1
				12	0	2	21.45	21.3±1
				12	6	2	21.45	21.3±1
				12	11	2	21.43	21.3±1
				25	0	2	20.42	21.3±1
	20175	1732.5	QPSK	1	0	0	22.49	22±1
				1	12	0	22.49	22±1
				1	24	0	22.46	22±1
				12	0	1	21.54	22±1
				12	6	1	21.54	22±1
				12	11	1	21.57	22±1
				25	0	1	21.51	22±1
			16QAM	1	0	1	21.87	21.3±1
				1	12	1	21.9	21.3±1
				1	24	1	21.88	21.3±1
				12	0	2	21.54	21.3±1
				12	6	2	21.57	21.3±1
				12	11	2	21.59	21.3±1
				25	0	2	20.53	21.3±1
	20375	1752.5	QPSK	1	0	0	22.8	22±1
				1	12	0	22.81	22±1
				1	24	0	22.82	22±1
				12	0	1	21.83	22±1
				12	6	1	21.82	22±1
				12	11	1	21.83	22±1
				25	0	1	21.78	22±1
			16QAM	1	0	1	21.75	21.3±1
				1	12	1	21.72	21.3±1
				1	24	1	21.71	21.3±1
				12	0	2	21.82	21.3±1
				12	6	2	21.8	21.3±1
				12	11	2	21.77	21.3±1
				25	0	2	20.93	21.3±1

ERP & EIRP

ERP for LTE Band 7 (Part 27)

Frequency (MHz)	BW (MHz)	Modulation	RB Size/Offset	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
2502.5	5	QPSK	1/0	9.28	V	8.93	0.83	17.38	33
2535	5	QPSK	1/0	9.27	V	8.93	0.83	17.37	33
2567.5	5	QPSK	1/24	9.57	V	8.93	0.83	17.67	33
2502.5	5	QPSK	1/0	8.12	H	8.93	0.83	16.22	33
2535	5	QPSK	1/0	8.05	H	8.93	0.83	16.15	33
2567.5	5	QPSK	1/24	8.38	H	8.93	0.83	16.48	33
2502.5	5	16-QAM	1/0	8.25	V	8.93	0.83	16.35	33
2535	5	16-QAM	1/0	8.62	V	8.93	0.83	16.72	33
2567.5	5	16-QAM	1/24	8.57	V	8.93	0.83	16.67	33
2502.5	5	16-QAM	1/0	7.16	H	8.93	0.83	15.26	33
2535	5	16-QAM	1/0	7.43	H	8.93	0.83	15.53	33
2567.5	5	16-QAM	1/24	7.39	H	8.93	0.83	15.49	33
2505	10	QPSK	1/0	9.15	V	8.93	0.83	17.25	33
2535	10	QPSK	1/49	9.08	V	8.93	0.83	17.18	33
2565	10	QPSK	1/0	9.44	V	8.93	0.83	17.54	33
2505	10	QPSK	1/0	8.01	H	8.93	0.83	16.11	33
2535	10	QPSK	1/49	7.95	H	8.93	0.83	16.05	33
2565	10	QPSK	1/0	8.27	H	8.93	0.83	16.37	33
2505	10	16-QAM	1/0	8.18	V	8.93	0.83	16.28	33
2535	10	16-QAM	1/49	8.8	V	8.93	0.83	16.9	33
2565	10	16-QAM	1/0	8.5	V	8.93	0.83	16.6	33
2505	10	16-QAM	1/0	7.03	H	8.93	0.83	15.13	33
2535	10	16-QAM	1/49	7.34	H	8.93	0.83	15.44	33
2565	10	16-QAM	1/0	7.28	H	8.93	0.83	15.38	33
2507.5	15	QPSK	1/0	9.13	V	8.93	0.83	17.23	33
2535	15	QPSK	1/74	8.58	V	8.93	0.83	16.68	33
2562.5	15	QPSK	1/0	8.63	V	8.93	0.83	16.73	33
2507.5	15	QPSK	1/0	7.99	H	8.93	0.83	16.09	33
2535	15	QPSK	1/74	7.41	H	8.93	0.83	15.51	33
2562.5	15	QPSK	1/0	7.53	H	8.93	0.83	15.63	33

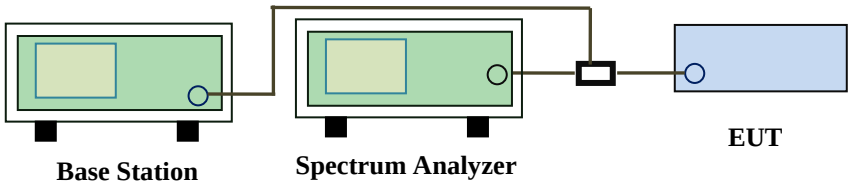
2507.5	15	16-QAM	1/0	8.14	V	8.93	0.83	16.24	33
2535	15	16-QAM	1/74	8.01	V	8.93	0.83	16.11	33
2562.5	15	16-QAM	1/0	8.21	V	8.93	0.83	16.31	33
2507.5	15	16-QAM	1/0	6.97	H	8.93	0.83	15.07	33
2535	15	16-QAM	1/74	6.91	H	8.93	0.83	15.01	33
2562.5	15	16-QAM	1/0	7.06	H	8.93	0.83	15.16	33
2510	20	QPSK	1/99	9.02	V	8.93	0.83	17.12	33
2535	20	QPSK	1/99	8.61	V	8.93	0.83	16.71	33
2560	20	QPSK	1/0	8.7	V	8.93	0.83	16.8	33
2510	20	QPSK	1/99	7.86	H	8.93	0.83	15.96	33
2535	20	QPSK	1/99	7.54	H	8.93	0.83	15.64	33
2560	20	QPSK	1/0	7.58	H	8.93	0.83	15.68	33
2510	20	16-QAM	1/99	8.24	V	8.93	0.83	16.34	33
2535	20	16-QAM	1/99	8.04	V	8.93	0.83	16.14	33
2560	20	16-QAM	1/0	8.29	V	8.93	0.83	16.39	33
2510	20	16-QAM	1/99	7.12	H	8.93	0.83	15.22	33
2535	20	16-QAM	1/99	7.05	H	8.93	0.83	15.15	33
2560	20	16-QAM	1/0	7.17	H	8.93	0.83	15.27	33

6.3 Peak-Average Ratio

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§ 27.50(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	☑

Test Setup	
Test Procedure	According with KDB 971168 v02r02 5.7.2 Alternate procedure for PAPR 5.1.2 Peak power measurements with a peak power meter The total peak output power may be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector. 5.2.3 Average power measurement with average power meter As an alternative to the use of a spectrum/signal analyzer or EMI receiver to perform a measurement of the total in-band average output power, a wideband RF average power meter with a thermocouple detector or equivalent can be used under certain conditions If the EUT can be configured to transmit continuously (i.e., the burst duty cycle ≥ 98%) and at all times the EUT is transmitting at is maximum output power level, then a conventional wide-band RF power meter can be used. If the EUT cannot be configured to transmit continuously (i.e., the burst duty cycle < 98%), then there are two options for the use of an average power meter. First, a gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only over active transmission bursts at maximum

	output power levels. A conventional average power meter can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to 10log(1/duty cycle)
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

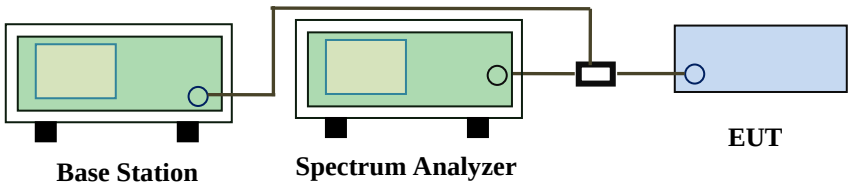
LTE Band 7 (part 27)

BW(MHz)	Frequency (MHz)	Mode	Modulation	Conducted Power (dBm)		Peak-Average Ratio (PAR)
				Peak	Average	
5	2535	RB 1/0	QPSK	25.36	22.49	2.87
			16QAM	24.26	21.87	2.39
10	2535	RB 1/0	QPSK	25.39	22.32	3.07
			16QAM	25.29	22.03	3.26
15	2535	RB 1/0	QPSK	24.41	21.81	2.6
			16QAM	24.71	21.23	3.48
20	2535	RB 1/0	QPSK	24.32	21.86	2.46
			16QAM	24.33	21.29	3.04

6.4 Occupied Bandwidth

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15 & 20, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §27.53(a)	a)	99% Occupied Bandwidth(kHz)	☑
	b)	26 dB Bandwidth(kHz)	☑
Test Setup			
Test Procedure	- 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	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

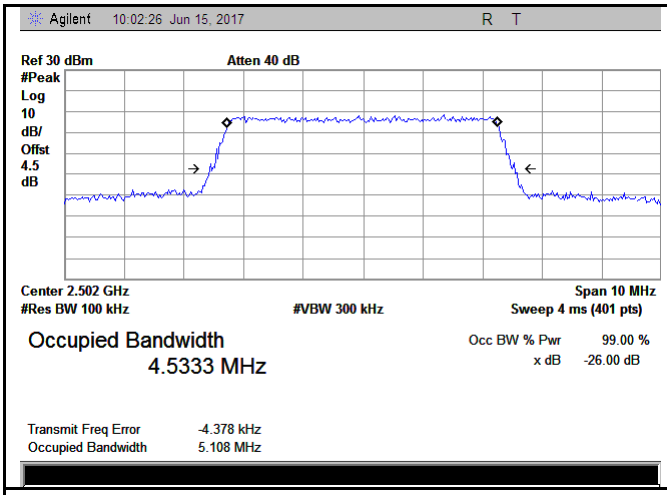
Test Plot ☑ Yes (See below) ☐ N/A

LTE Band 7 (Part 27) result

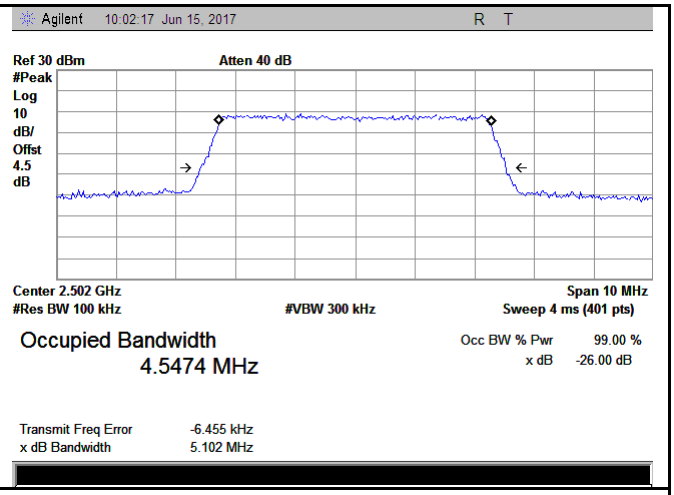
BW(MHz)	Channel	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
5	20775	2502.5	16QAM	4.5474	5.102
			QPSK	4.5333	5.108
5	21100	2535	16QAM	4.5328	5.099
			QPSK	4.5252	5.096
5	21425	2567.5	16QAM	4.5467	5.080
			QPSK	4.5399	5.075
10	20800	2505	16QAM	9.0898	10.259
			QPSK	9.0591	10.235
10	21100	2535	16QAM	9.0788	10.243
			QPSK	9.0711	10.276
10	21400	2562.5	16QAM	9.0847	10.268
			QPSK	9.1132	10.279
15	20825	2507.5	16QAM	13.5030	14.979
			QPSK	13.5095	14.964
15	21100	2535	16QAM	13.4964	14.969
			QPSK	13.5047	15.015
15	21400	2562.5	16QAM	13.5147	15.076
			QPSK	13.5235	15.020
20	20850	2510	16QAM	17.8676	19.618
			QPSK	17.8781	19.595
20	21100	2535	16QAM	17.9237	19.620
			QPSK	17.9260	19.531
20	21350	2560	16QAM	17.9380	19.554
			QPSK	17.9430	19.460

Test Plots

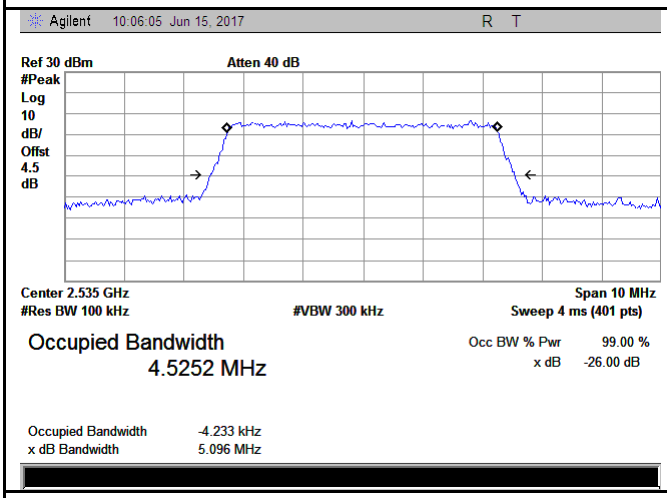
LTE Band 7 (Part 27)



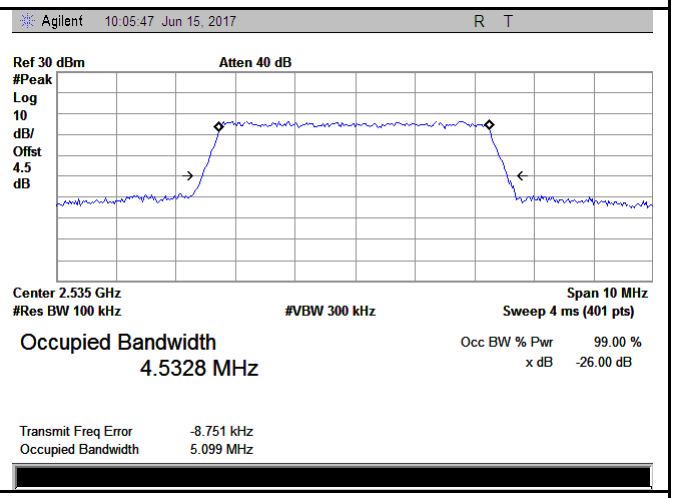
LTE band 7 - Low CH QPSK-5



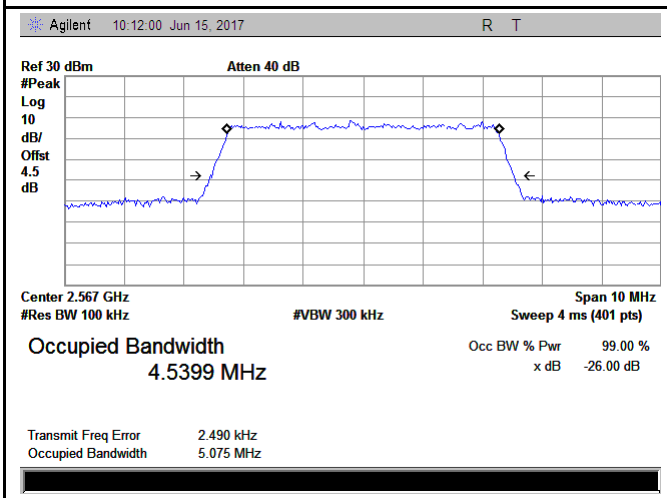
LTE band 7 - Low CH 16QAM-5



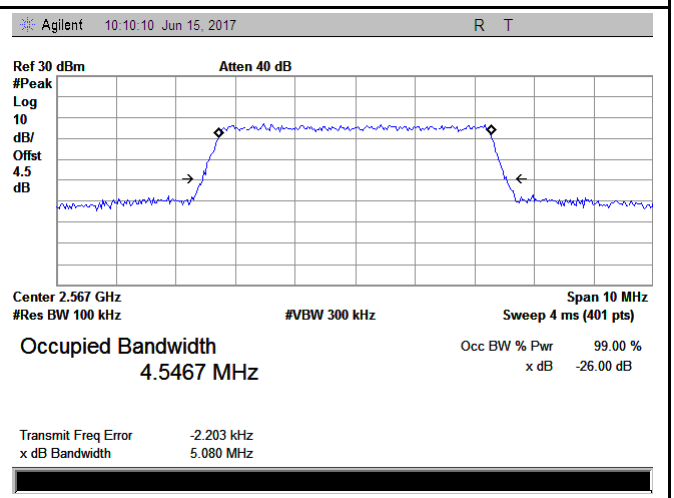
LTE band 7 - Middle CH QPSK-5



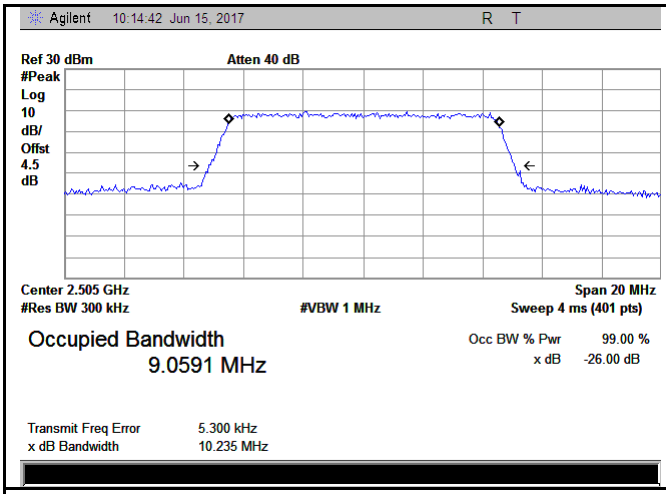
LTE band 7 - Middle CH 16QAM-5



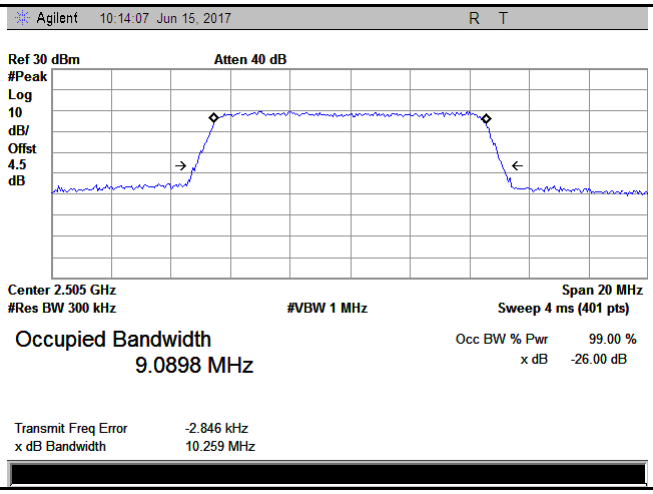
LTE band 7 - High CH QPSK-5



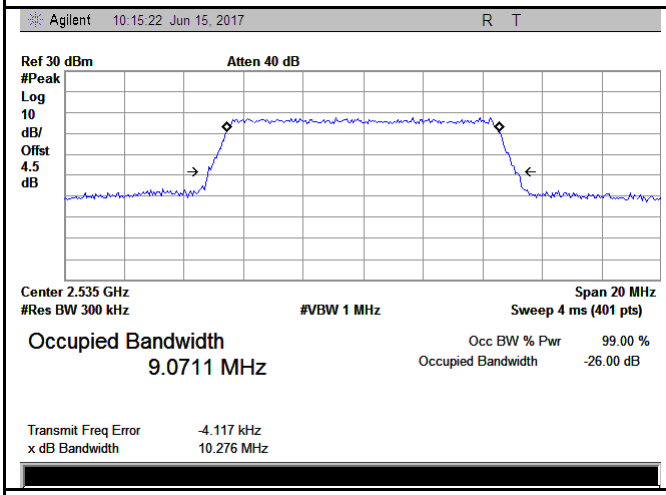
LTE band 7 - High CH 16QAM-5



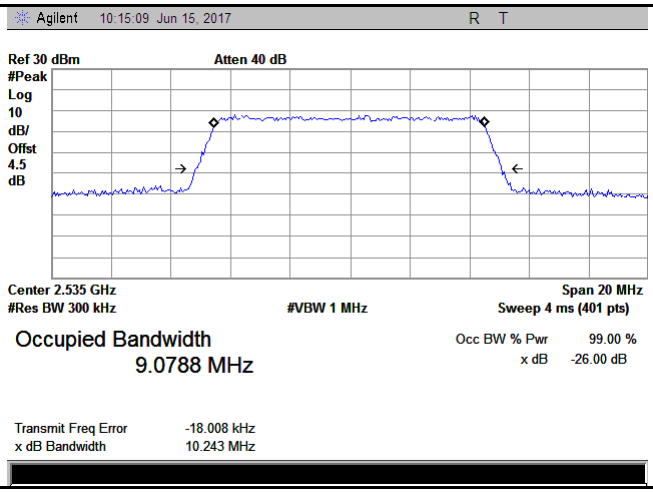
LTE band 7 - Low CH QPSK-10



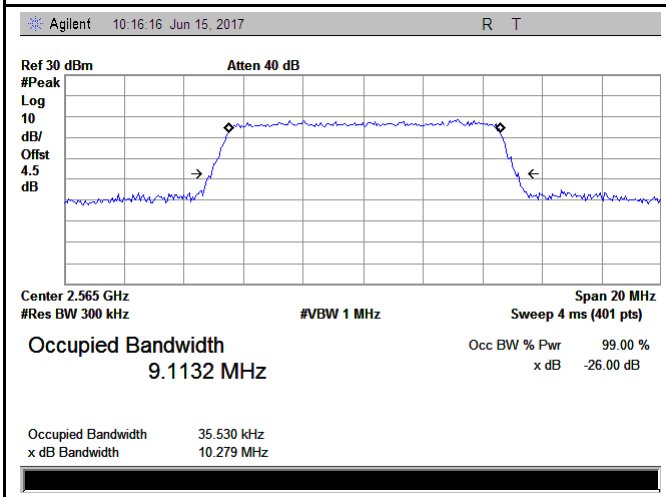
LTE band 7 - Low CH 16QAM-10



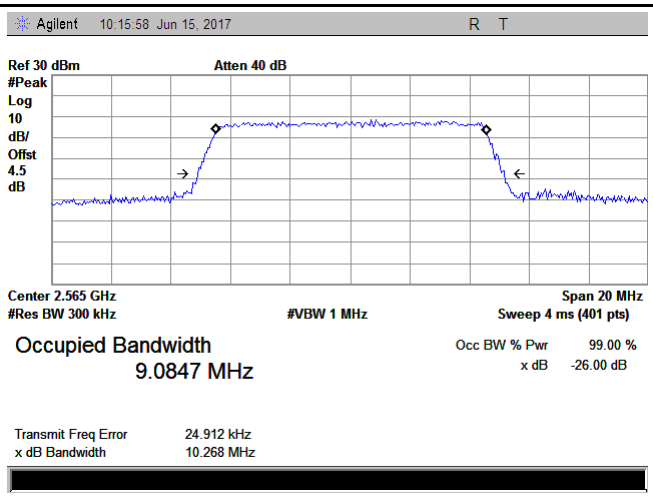
LTE band 7 - Middle CH QPSK-10



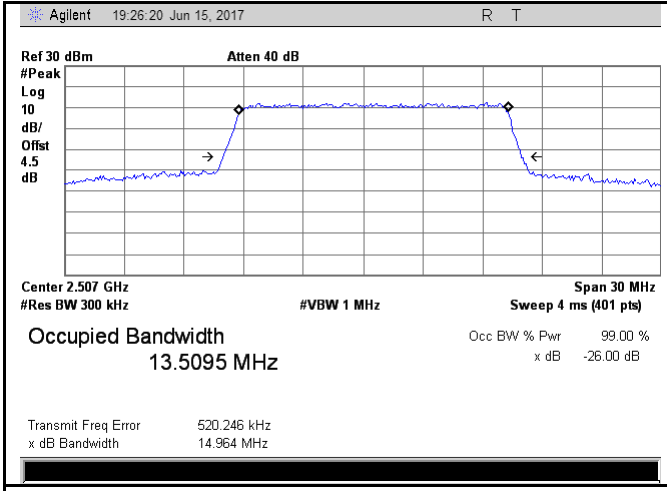
LTE band 7 - Middle CH 16QAM-10



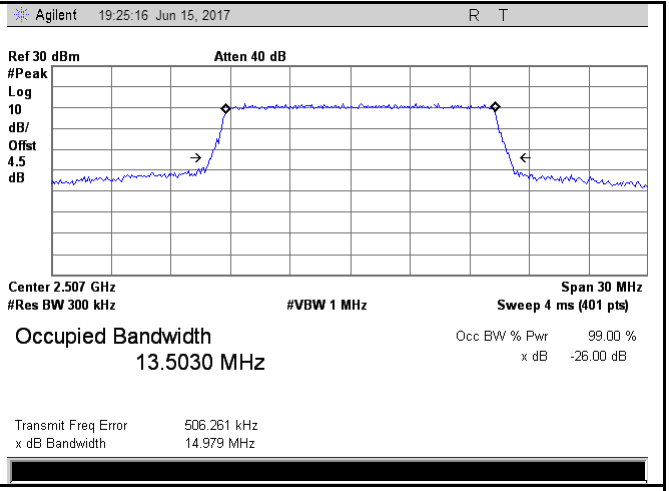
LTE band 7 - High CH QPSK-10



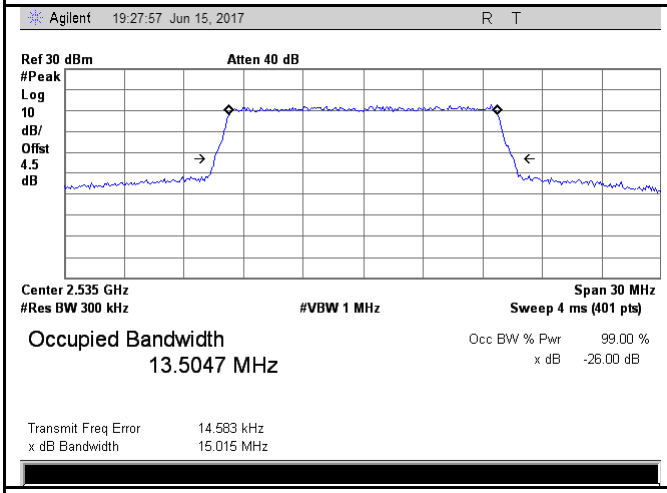
LTE band 7 - High CH 16QAM-10



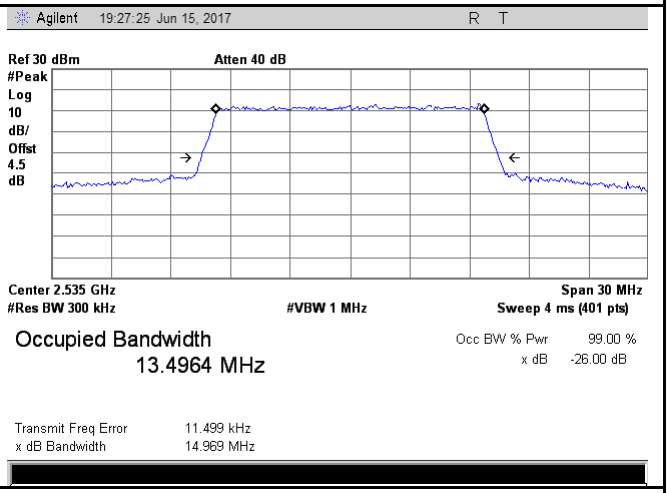
LTE band 7 - Low CH QPSK-15



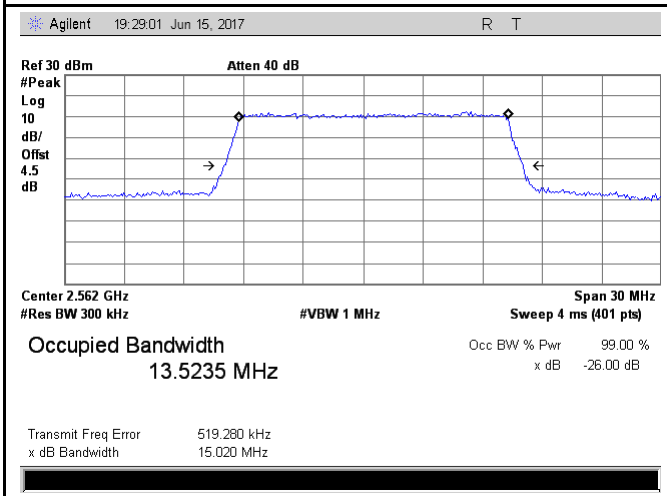
LTE band 7 - Low CH 16QAM-15



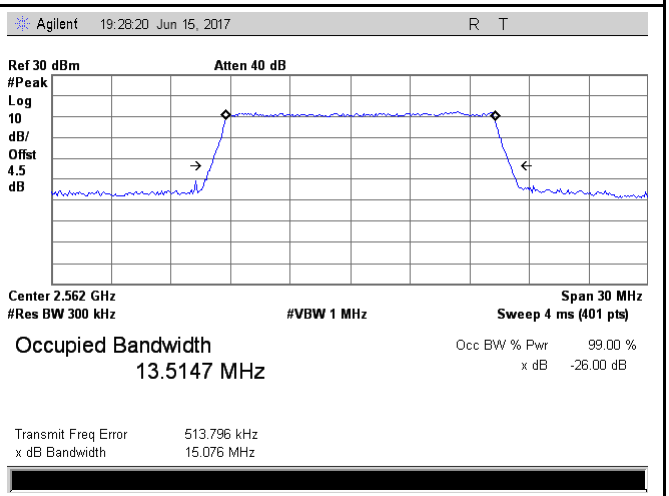
LTE band 7 - Middle CH QPSK-15



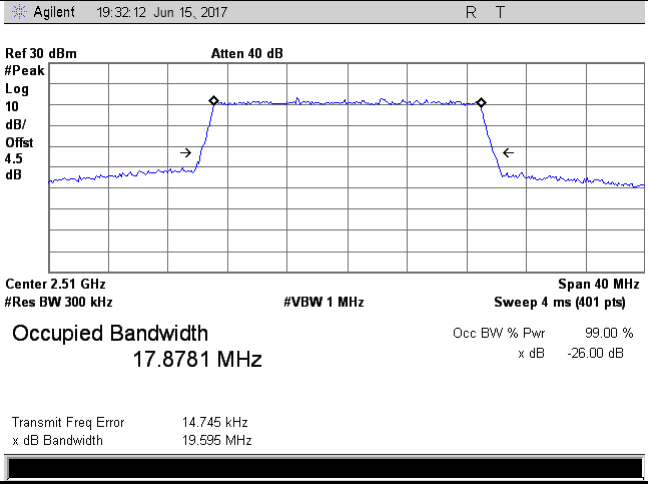
LTE band 7 - Middle CH 16QAM-15



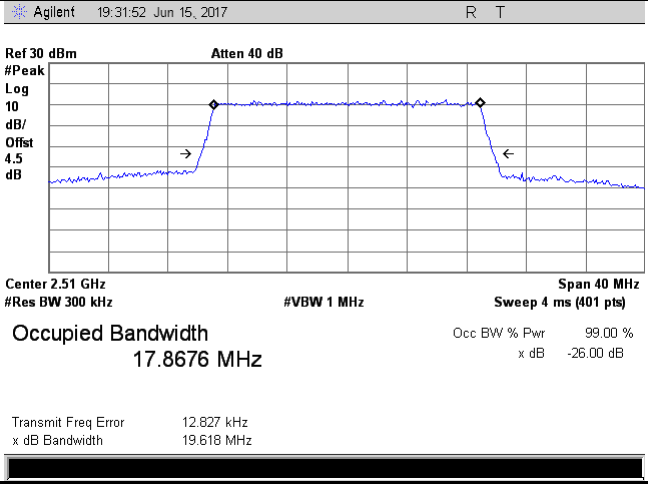
LTE band 7 - High CH QPSK-15



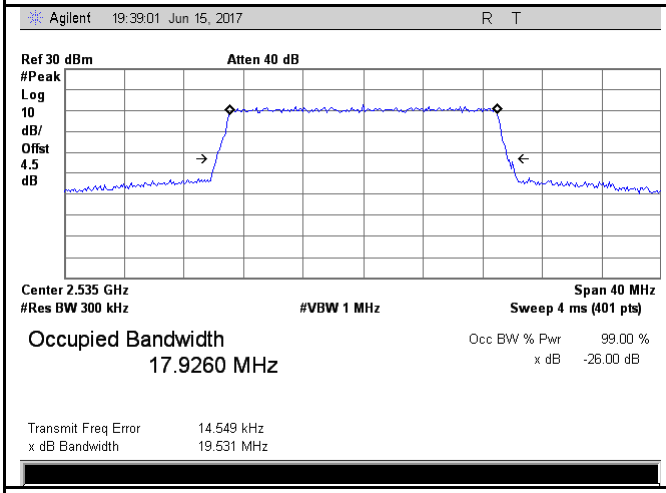
LTE band 7 - High CH 16QAM-15



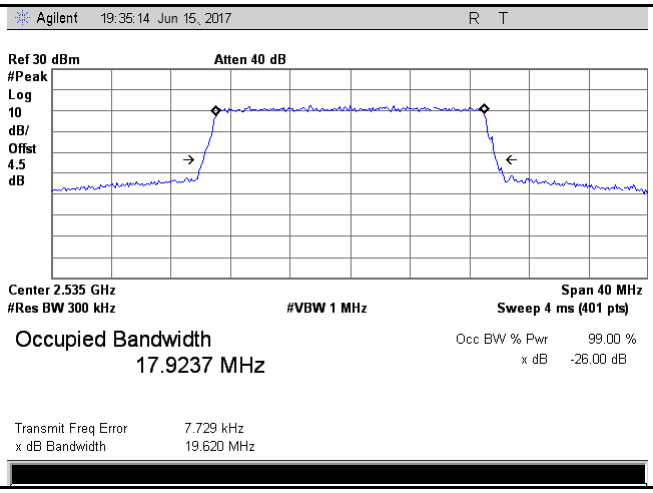
LTE band 7 - Low CH QPSK-20



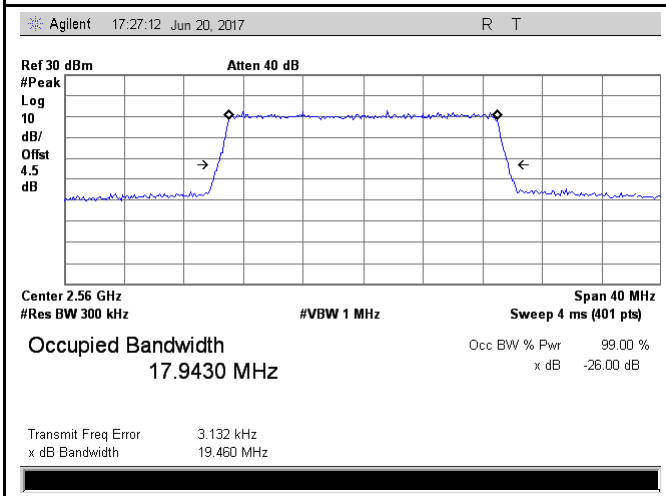
LTE band 7 - Low CH 16QAM-20



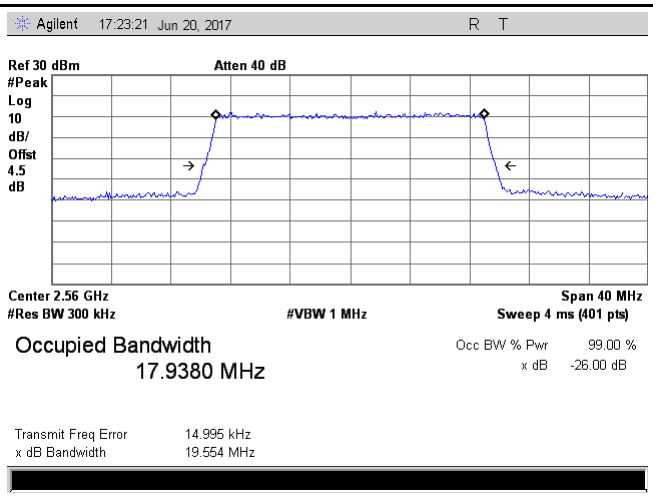
LTE band 7 - Middle CH QPSK-20



LTE band 7 - Middle CH 16QAM-20



LTE band 7 - High CH QPSK-20

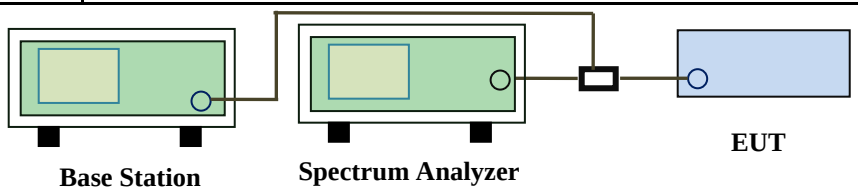


LTE band 7 - High CH 16QAM-20

6.5 Spurious Emissions at Antenna Terminals

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2017
Tested By :	Loren Luo

Requirement(s):

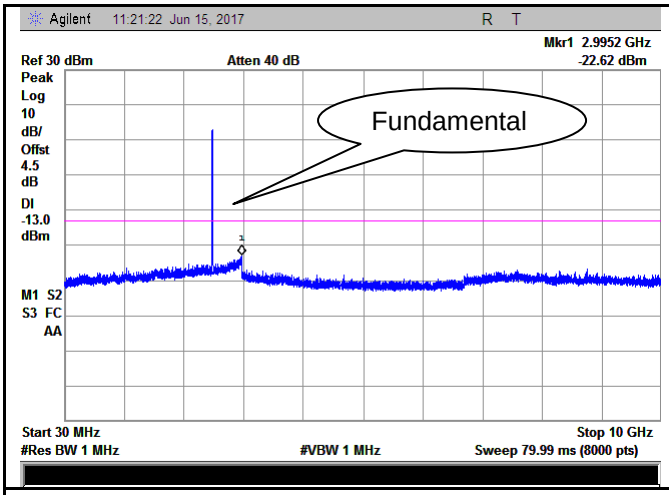
Spec	Item	Requirement	Applicable
§2.1051, § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

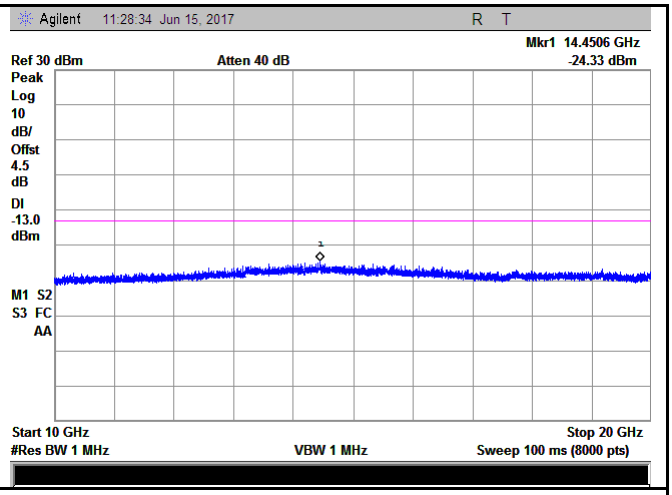
Test Plot ☑ Yes (See below) ☐ N/A

Test Plots 30MHz-5GHz

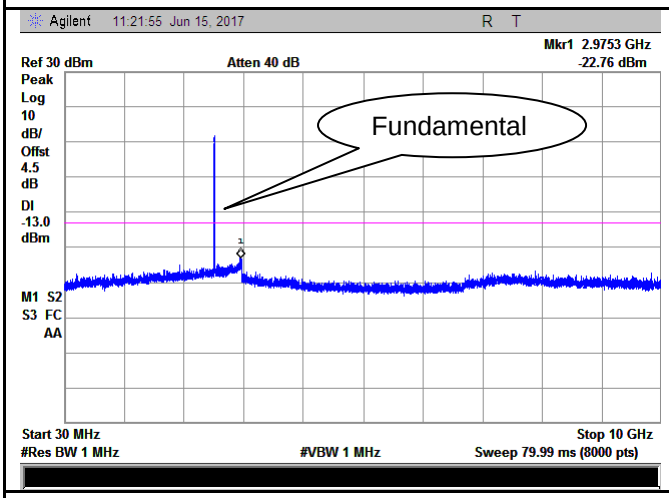
LTE Band 7 (Part 27)



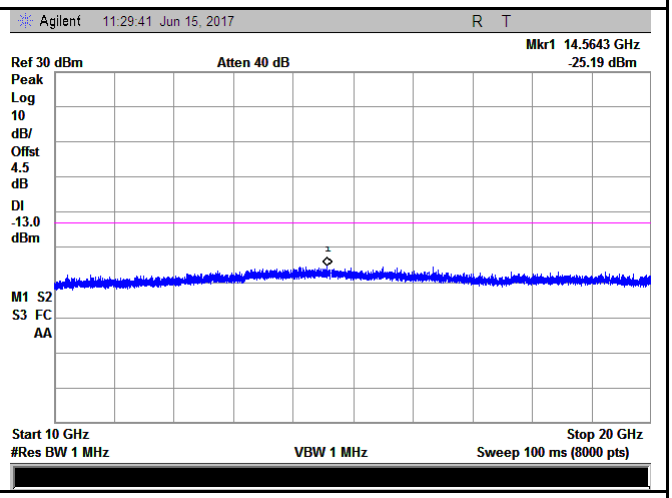
LTE Band 7 - Low Channel-1



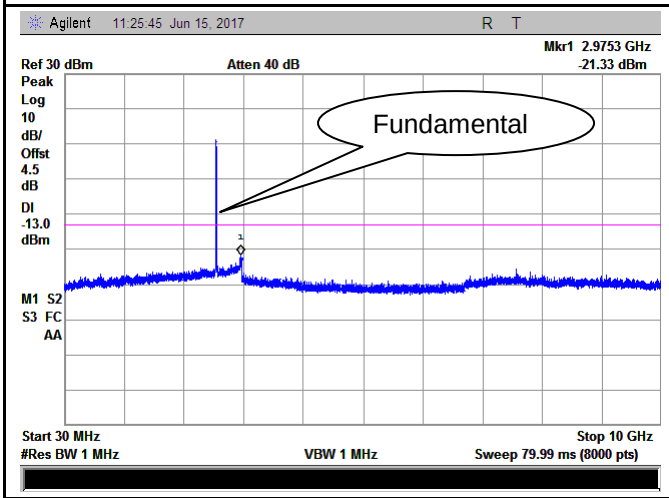
LTE Band 7 - Low Channel-2



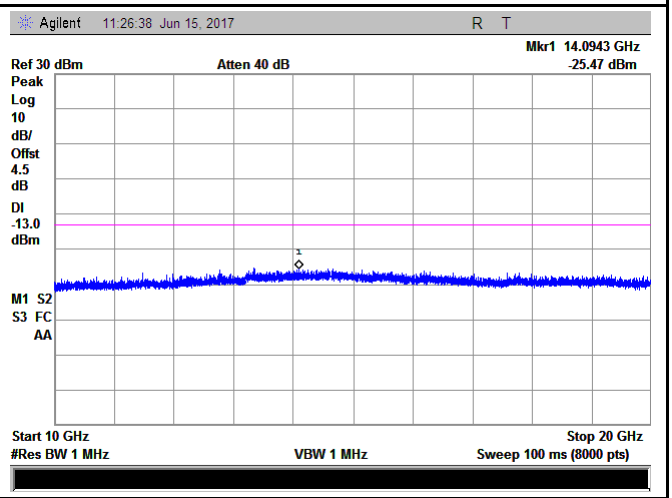
LTE Band 7- Middle Channel-1



LTE Band 7 - Middle Channel-2



LTE Band 7 - High Channel-1

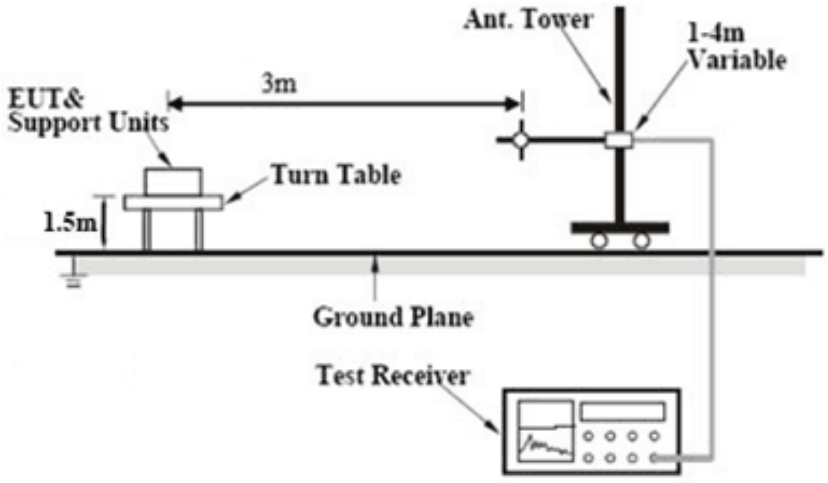


LTE Band 7 - High Channel-2

6.6 Spurious Radiated Emissions

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

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	☑
Test setup			
Test Procedure	1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna		

	Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band 7(Part27) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5020	-47.65	V	10.29	0.98	-38.34	-13	-25.34
5020	-47.23	H	10.29	0.98	-37.92	-13	-24.92
52.3	-46.18	V	-4.2	0.11	-50.49	-13	-37.49
211.5	-47.93	H	4.6	0.18	-43.51	-13	-30.51

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5070	-47.57	V	10.3	0.99	-38.26	-13	-25.26
5070	-47.26	H	10.3	0.99	-37.95	-13	-24.95
52.6	-45.89	V	-4.2	0.11	-50.2	-13	-37.2
211.7	-47.81	H	4.6	0.18	-43.39	-13	-30.39

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5120	-47.69	V	10.32	1	-38.37	-13	-25.37
5120	-47.33	H	10.32	1	-38.01	-13	-25.01
52.1	-46.41	V	-4.2	0.11	-50.72	-13	-37.72
211.3	-47.53	H	4.6	0.18	-43.11	-13	-30.11

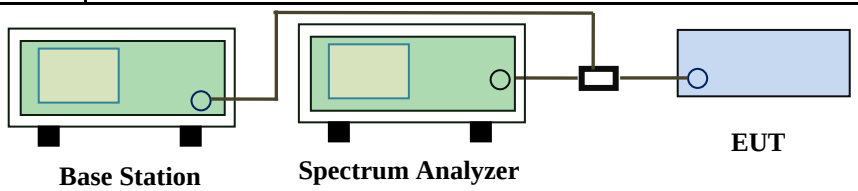
Note:

*1, The testing has been conformed to 10*2567.5MHz=25,675MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and –Axis were investigated. The results above show only the worst case.

6.7 Band Edge

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	------
Tested By :	------

Requirement(s):

Spec	Item	Requirement	Applicable
§ 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.	☐
Test setup			
Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.		
Remark			
Result	☐ Pass ☐ Fail ☑ N/A		

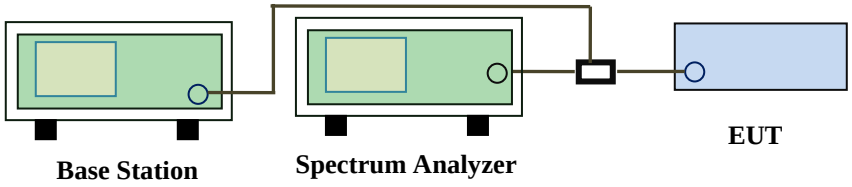
Test Data ☐ Yes ☑ N/A

Test Plot ☐ Yes (See below) ☑ N/A

6.8 Band Edge 27.53(m)

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	According to FCC 27.53(m)(4) specified that power of any emmission ouutside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than 43+10log (P)dB at the channel edge, the limit of emission equal to -13dBm. And 55+10log (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 frenqency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.	☑
Test Setup		
Test Procedure	- 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	☑ Pass ☐ Fail	

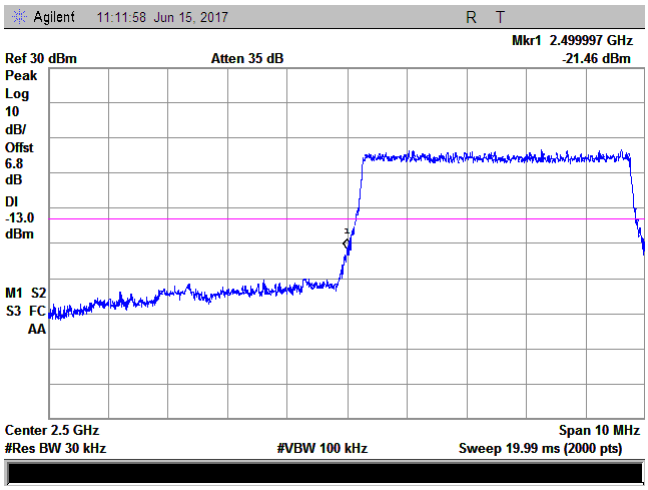
Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

LTE Band 7 (Part 27) result

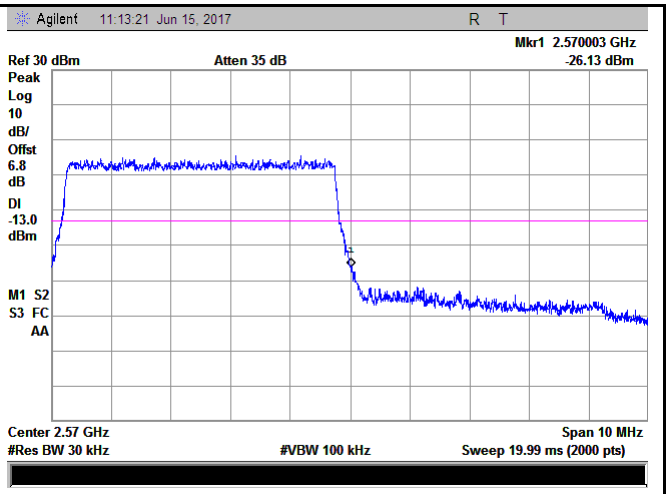
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	20775	2502.5	QPSK	-21.46	-13
			16QAM	-20.71	-13
5	21425	2567.5	QPSK	-26.13	-13
			16QAM	-24.76	-13
10	20800	2505	QPSK	-24.95	-13
			16QAM	-22.86	-13
10	21400	2562.5	QPSK	-26.60	-13
			16QAM	-28.34	-13
15	20825	2507.5	QPSK	-22.55	-13
			16QAM	-22.79	-13
15	21400	2562.5	QPSK	-26.36	-13
			16QAM	-22.85	-13
20	20850	2510	QPSK	-21.68	-13
			16QAM	-22.29	-13
20	21350	2560	QPSK	-30.70	-13
			16QAM	-30.88	-13

LTE Band 7 (Part 27)



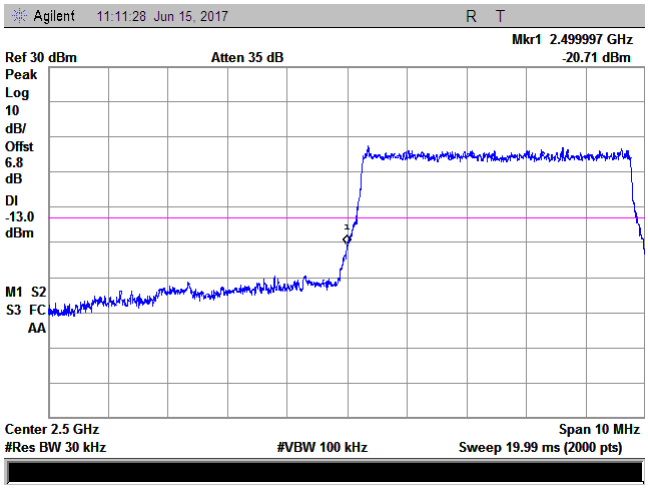
LTE Band 7 - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (51.08/30)=4.5+2.3=6.8 dB



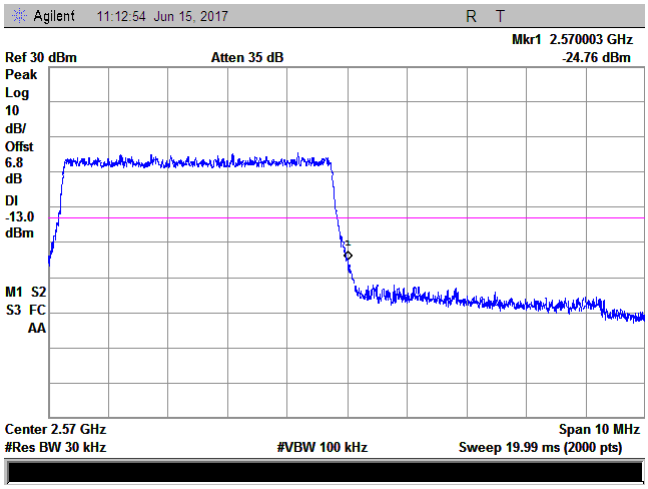
LTE Band 7 - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log (50.75/30)=4.5+2.3=6.8 dB



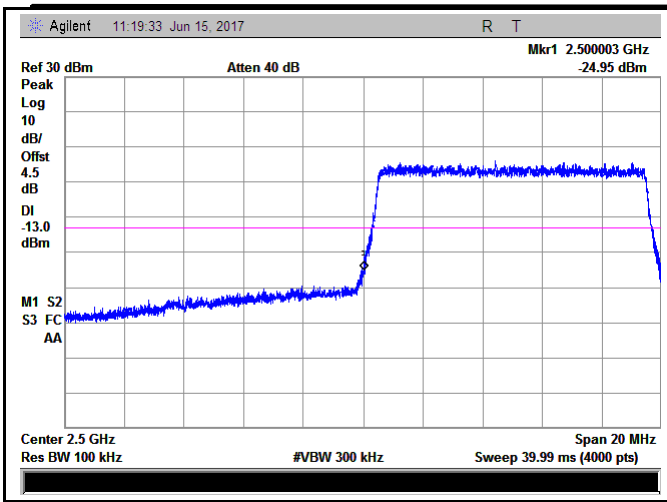
LTE Band 7 - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log (51.02/30)=4.5+2.3=6.8 dB

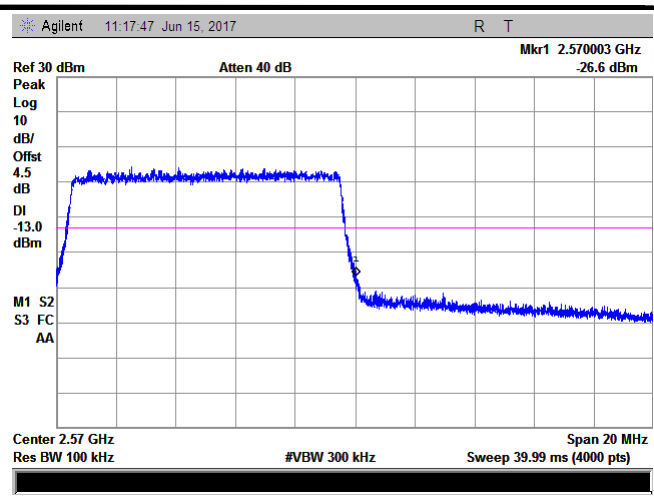


LTE Band 7 - High Channel 16QAM-5

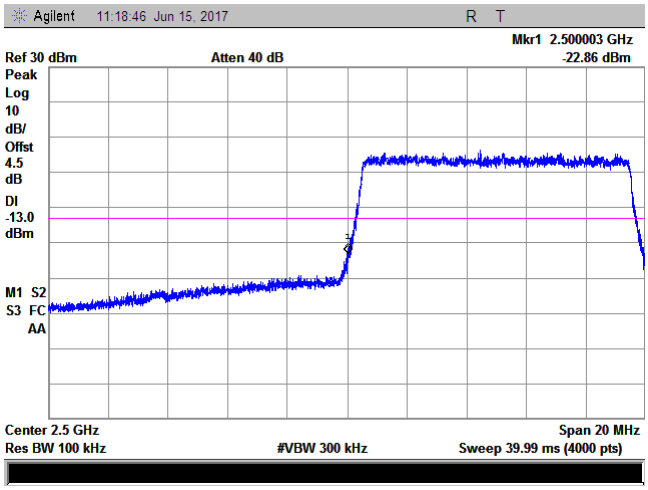
Note: Offset=Cable loss (4.5) + 10log (50.80/30)=4.5+2.3=6.8 dB



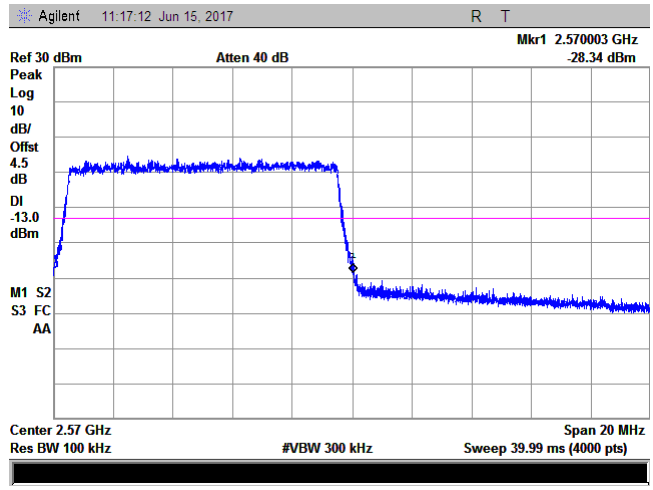
LTE Band 7 - Low Channel QPSK-10



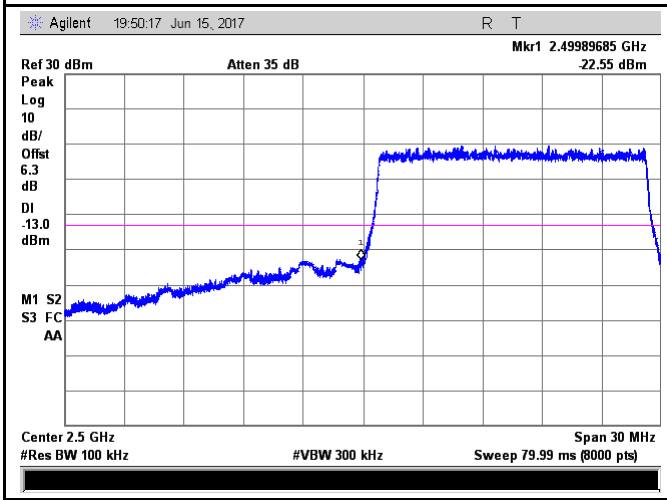
LTE Band 7 - High Channel QPSK-10



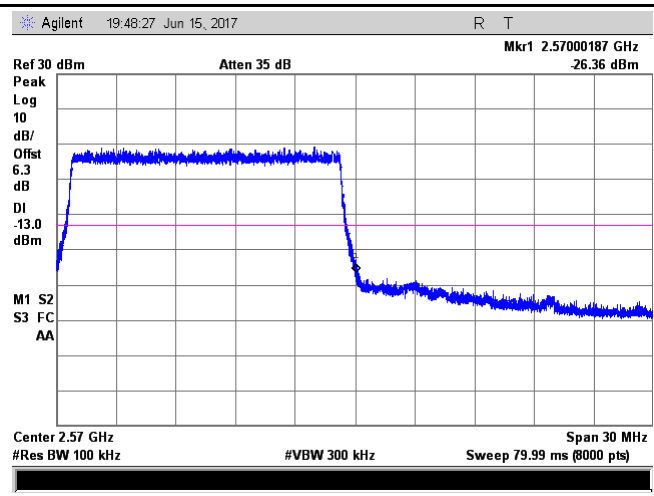
LTE Band 7 - Low Channel 16QAM-10



LTE Band 7 - High Channel 16QAM-10



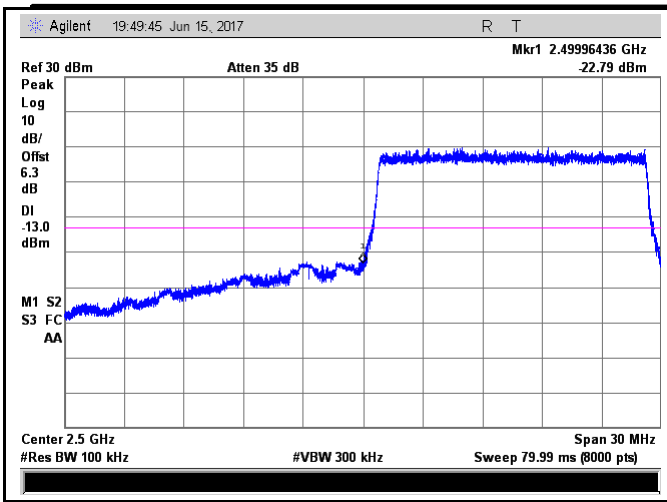
LTE Band 7 - Low Channel QPSK-15



LTE Band 7 - High Channel QPSK-15

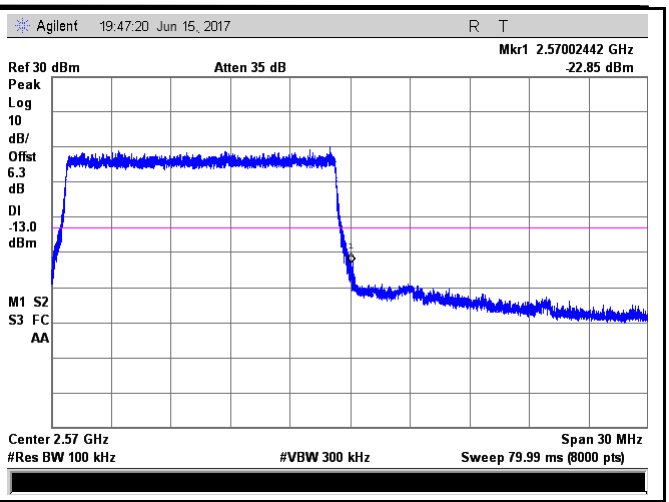
Note: Offset=Cable loss (4.5) + 10log (149.64/100)=4.5+1.8=6.3 dB

Note: Offset=Cable loss (4.5) + 10log (150.2/100)=4.5+1.8=6.3 dB



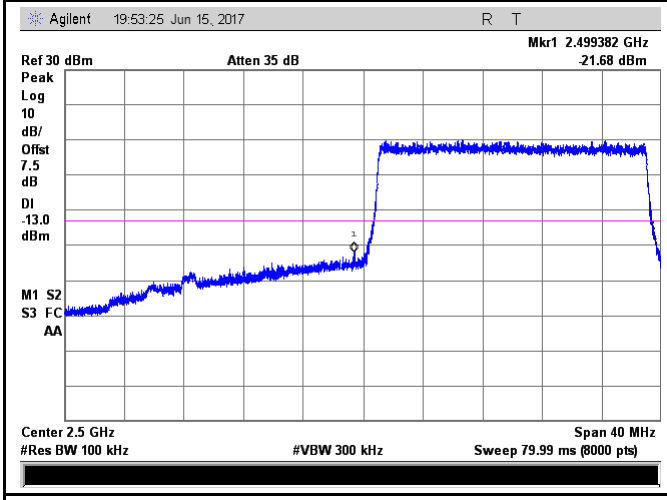
LTE Band 7 - Low Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (149.79/100)=4.5+1.8=6.3 dB



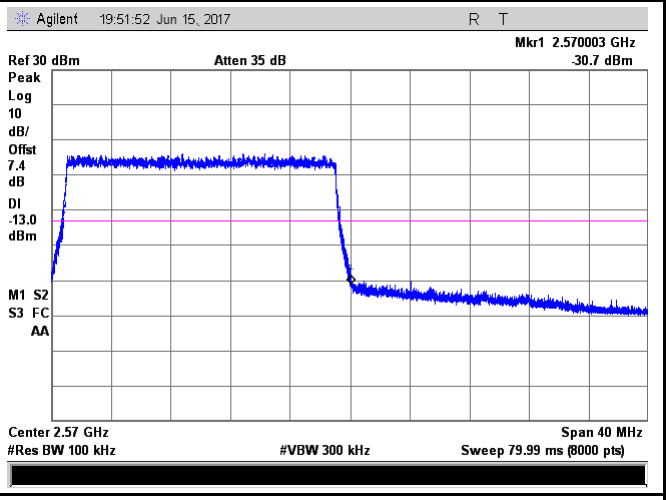
LTE Band 7 - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (150.76/100)=4.5+1.8=6.3 dB



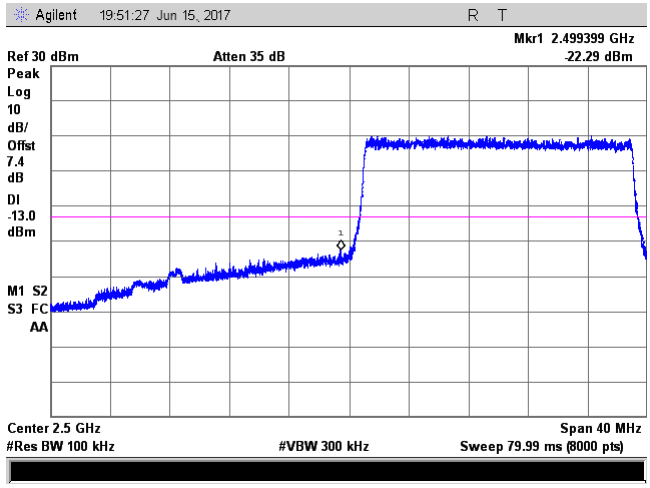
LTE Band 7 - Low Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (195.95/100)=4.5+3.0=7.5 dB



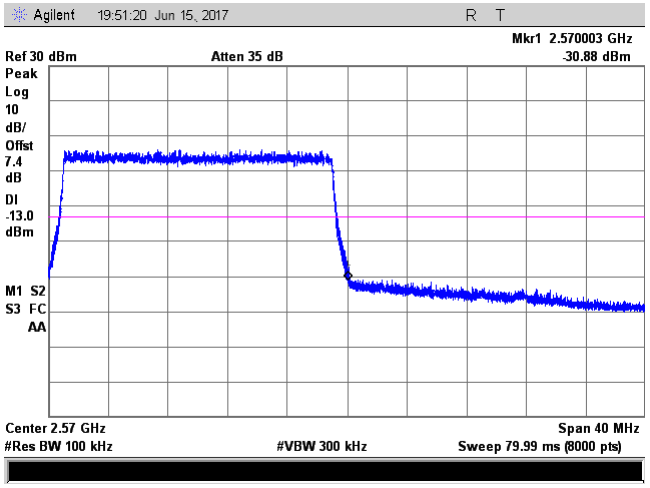
LTE Band 7 - High Channel QPSK-20

Note: Offset=Cable loss (4.5) + 10log (194.6/100)=4.5+2.9=7.4 dB



LTE Band 7 - Low Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log (196.18/100)=4.5+2.9=7.4 dB



LTE Band 7 - High Channel 16QAM-20

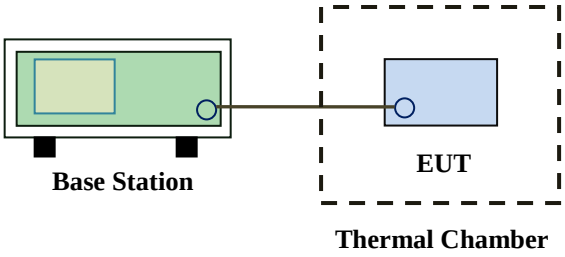
Note: Offset=Cable loss (4.5) + 10log (195.54/100)=4.5+2.9=7.4 dB

6.9 Frequency Stability

Temperature	24 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	June 15, 2017
Tested By :	Loren Luo

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§2.1055 ;
§ 27.5(h);
§ 27.54</td><td>a)</td><td>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:
Frequency Tolerance for Transmitters in the Public Mobile Services
<table>
<tr><th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (pp□)</th><th>Mobile ≤ 3 watts (ppm)</th></tr>
<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/□</td><td>N/A</td></tr>
</table>
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.
According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</td><td>☑</td></tr>
</table>

Test setup	
Procedure	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. Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.
Remark	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 -10ºC to +55ºC at normal supply voltage.
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

LTE Band 7 (Part 27) result

Middle Channel, f_o = 2535 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-15	0.0059	2.5
0		-14	0.0055	2.5
10		-19	0.0075	2.5
20		-12	0.0047	2.5
30		-17	0.0067	2.5
40		-15	0.0059	2.5
50		-10	0.0039	2.5
55		-14	0.0055	2.5
25	4.2	-13	0.0051	2.5
	3.5	-12	0.0047	2.5

Annex A. TEST INSTRUMENT

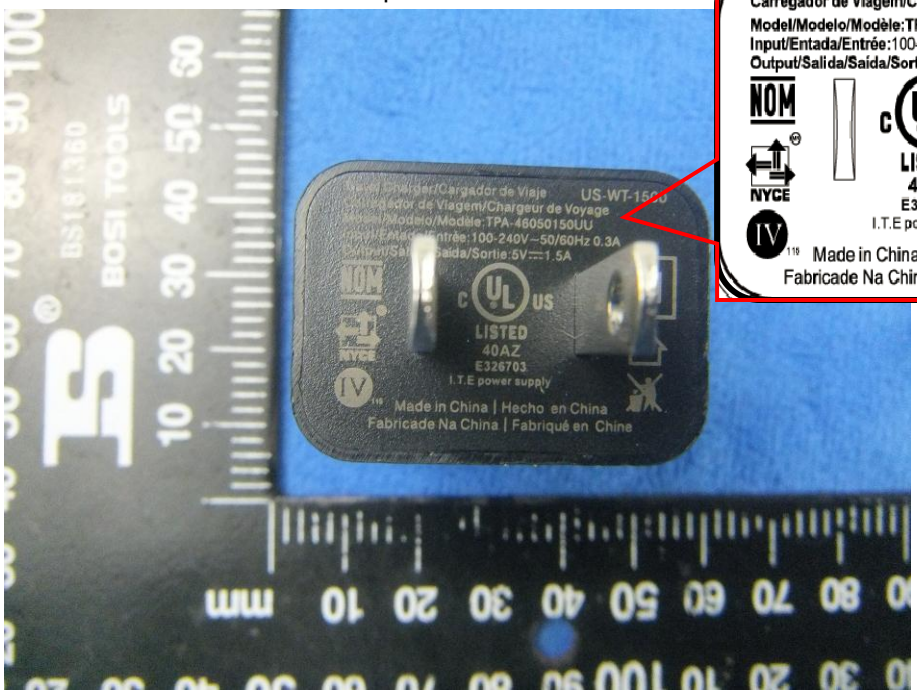
Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/15/2016	09/17/2017	☑
Power Splitter	1#	1#	08/31/2016	08/30/2017	☑
Universal Radio Communication Tester	CMU200	121393	09/24/2016	09/23/2017	☑
Wideband Radio Communication Tester	CMW500	120906	03/26/2017	03/25/2018	☑
Temperature/Humidity Chamber	UHL-270	001	10/08/2016	10/07/2017	☑
DC Power Supply	E3640A	MY40004013	09/16/2016	09/15/2017	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	☑
Microwave Preamplifier (0.5 ~ 18GHz)	PAM-118	443008	08/31/2016	08/30/2017	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	☑
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/20/2016	09/19/2017	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/23/2016	09/22/2017	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/23/2016	09/22/2017	☑
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/16/2016	09/15/2017	☑
Tunable Notch Filter	3NF-800/1000-S	AA4	08/31/2016	08/30/2017	☑
Tunable Notch Filter	3NF-1000/2000-S	AM 4	08/31/2016	08/30/2017	☑

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

Whole Package View

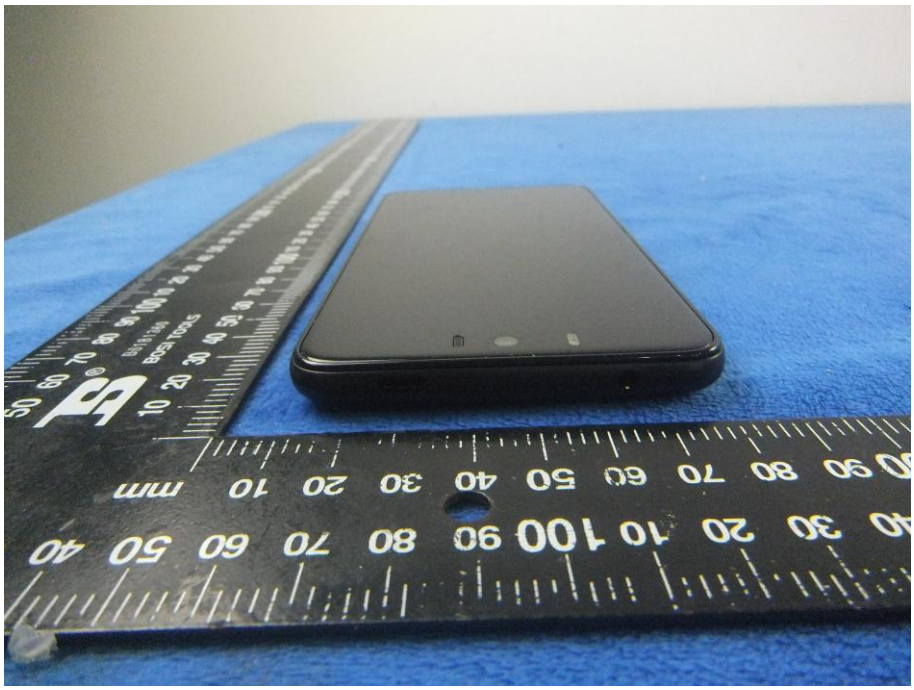
Adapter - Front View



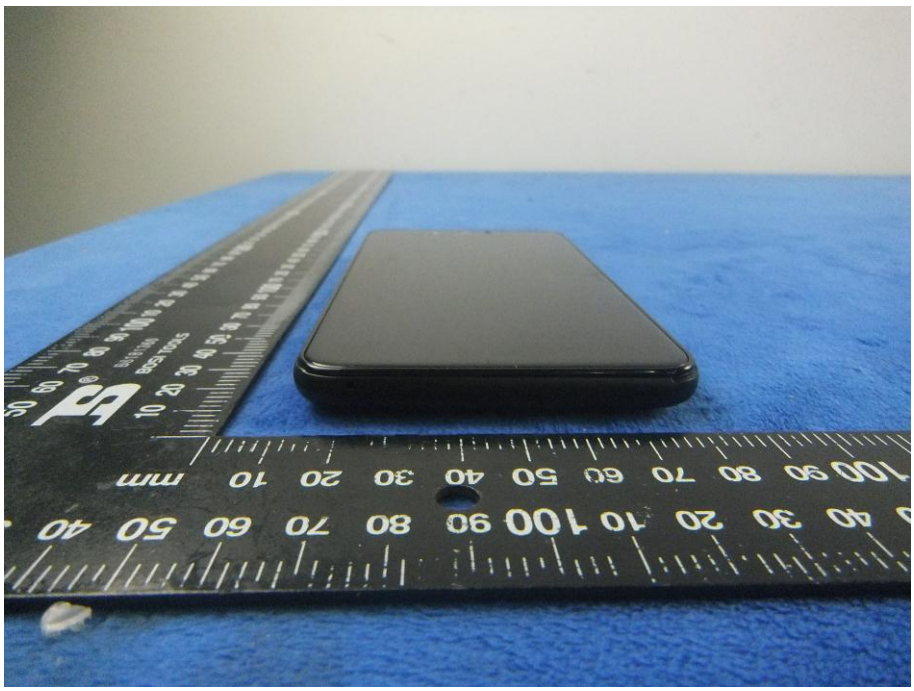
EUT - Front View

EUT - Rear View

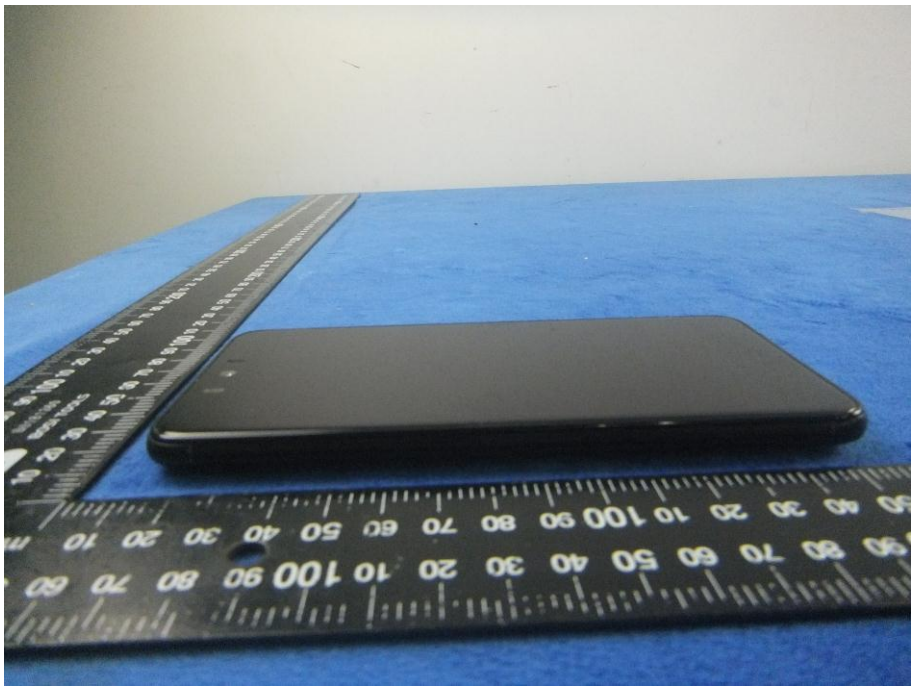
EUT - Top View



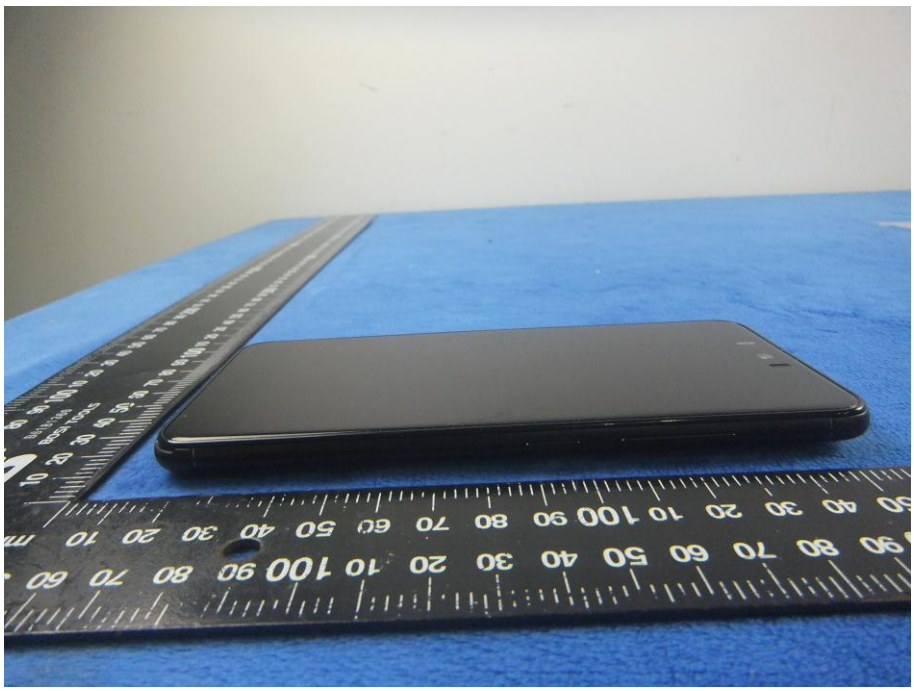
EUT - Bottom View



EUT - Left View



EUT - Right View

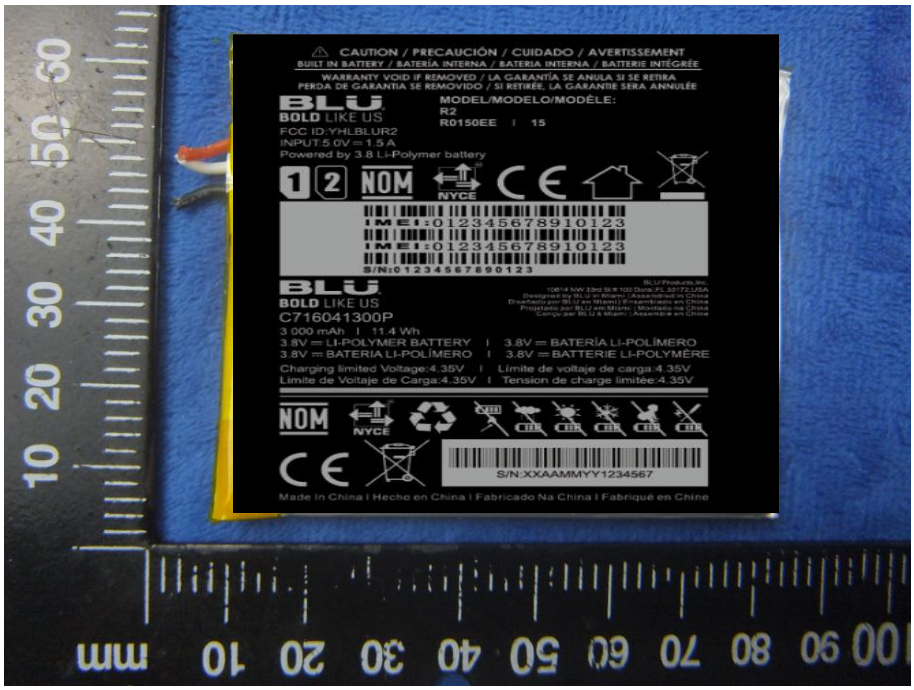


Annex B.ii. Photograph: EUT Internal Photo

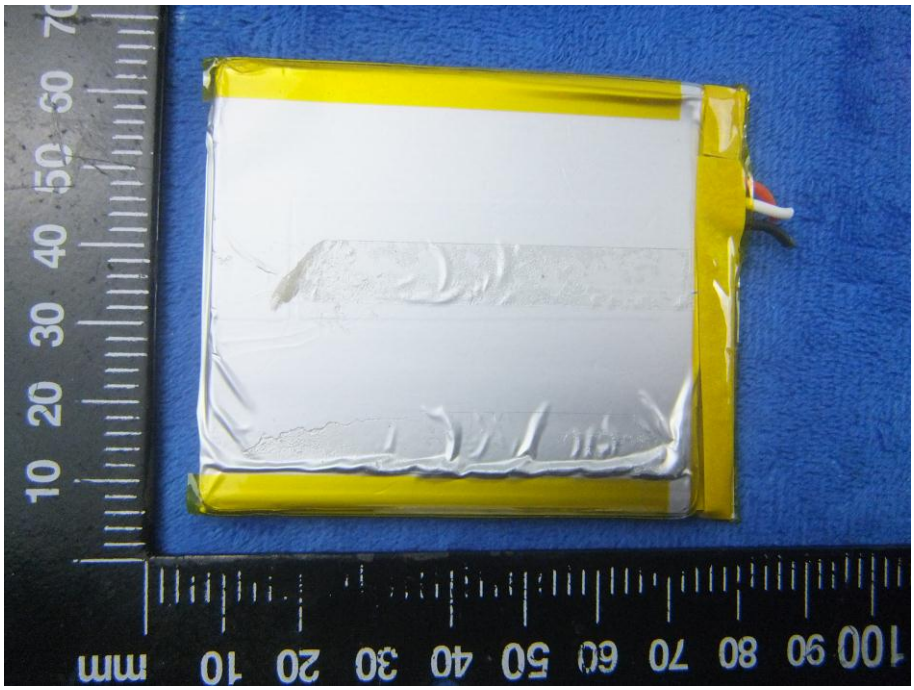
Cover Off - Top View 1

Cover Off - Top View 2

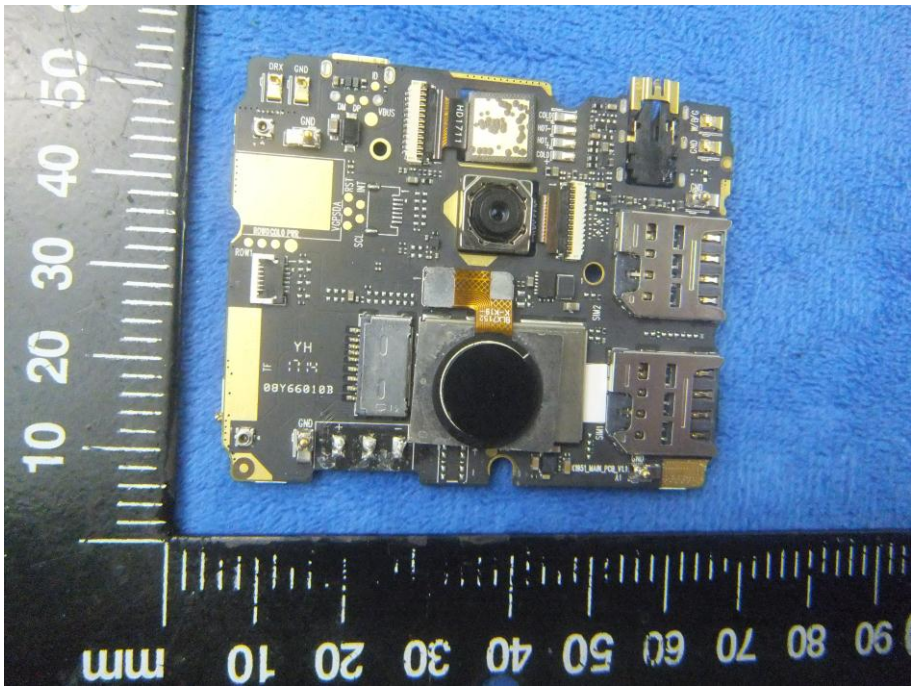
Battery - Front View



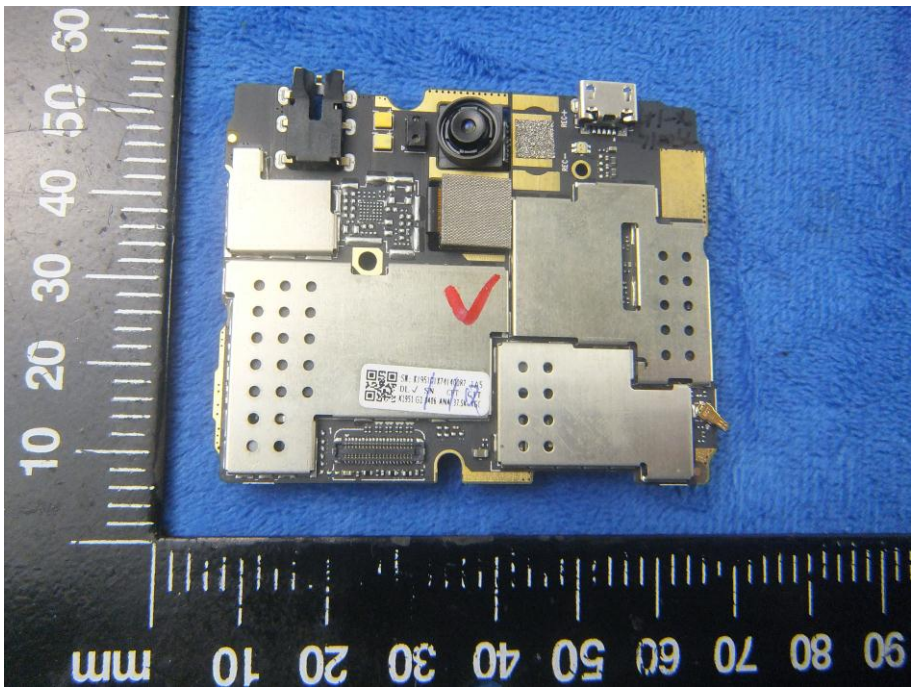
Battery - Rear View



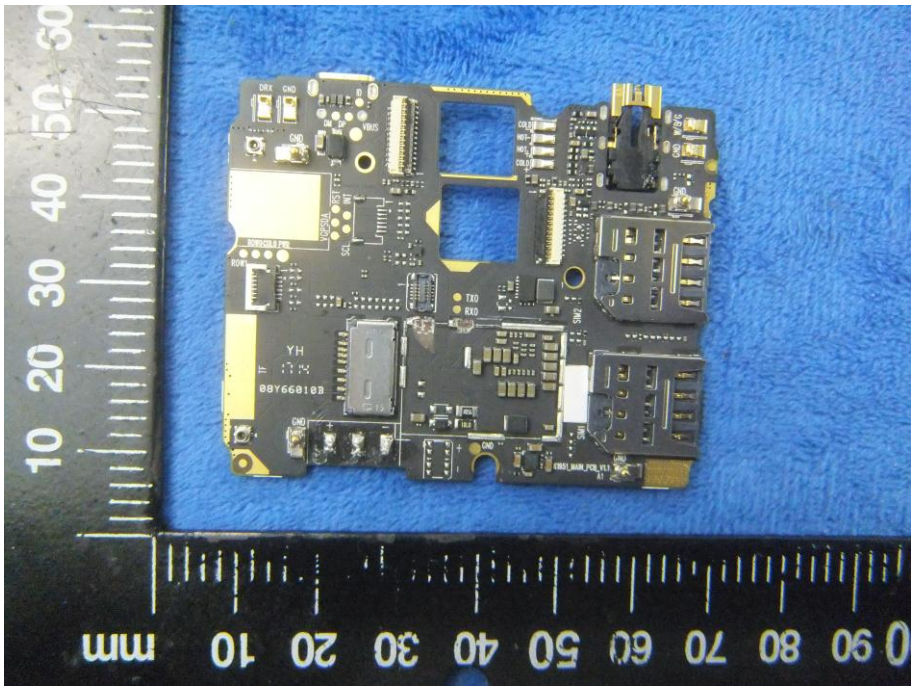
Mainboard with Shielding - Front View



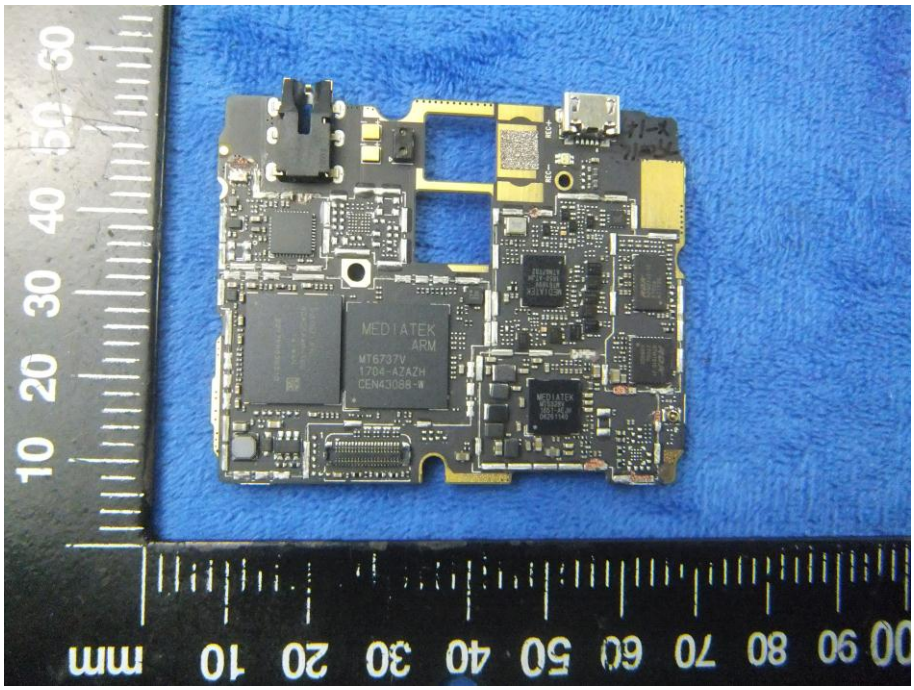
Mainboard with Shielding - Rear View



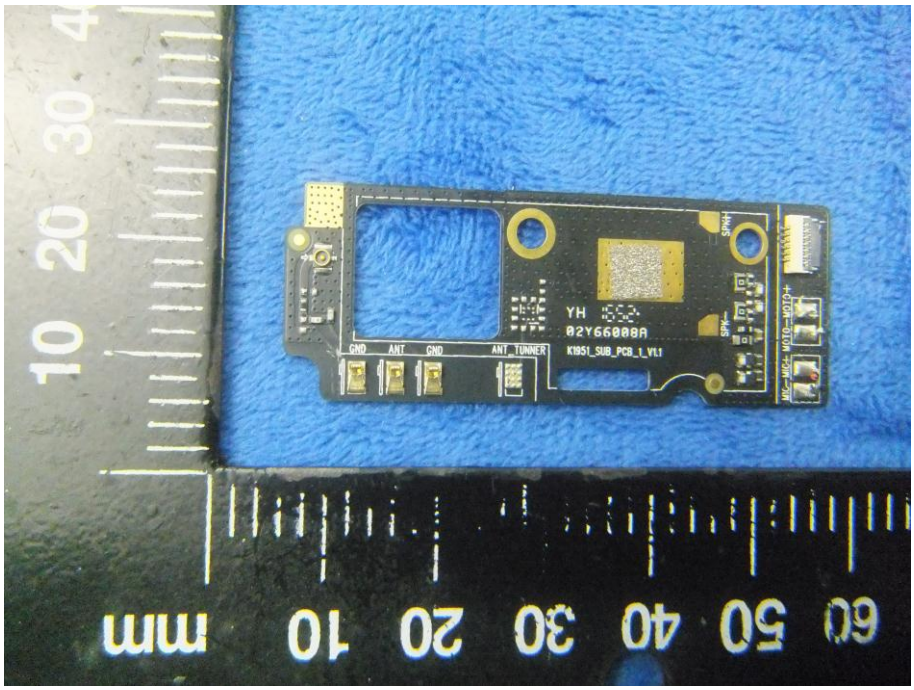
Mainboard without Shielding - Front View



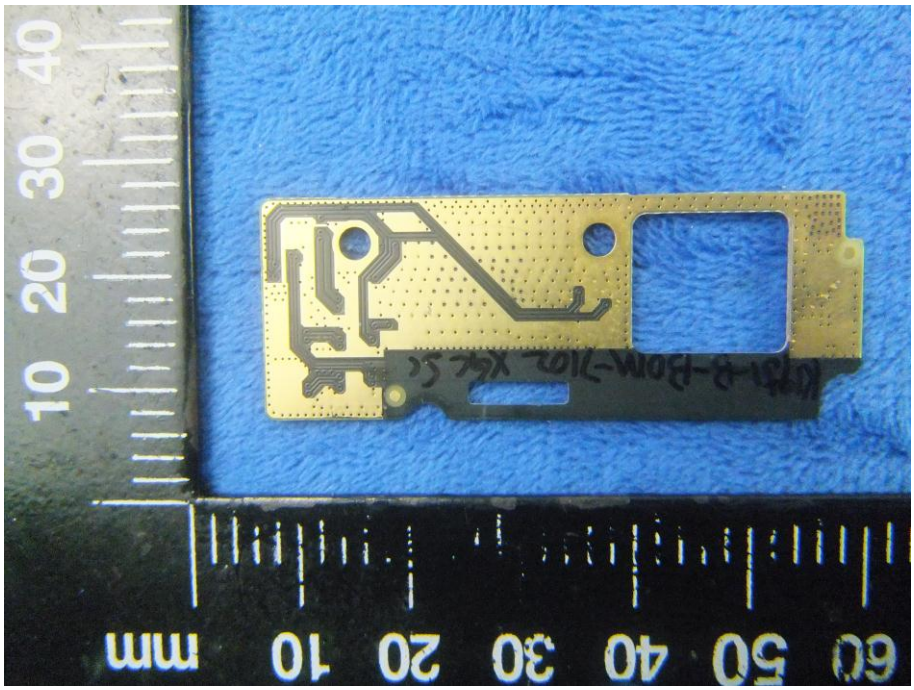
Mainboard without Shielding - Rear View



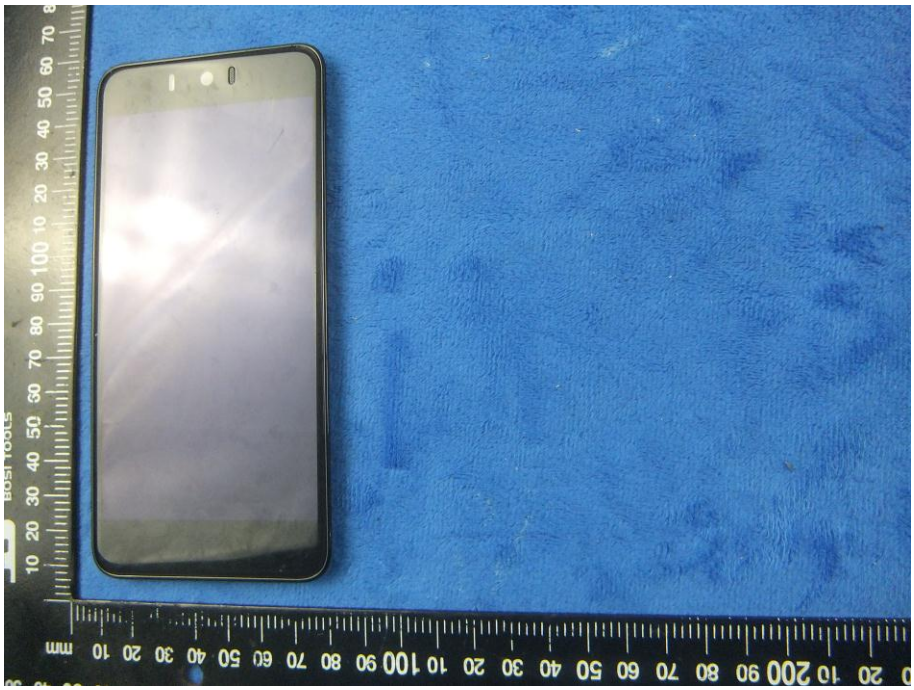
Small Mainboard - Front View



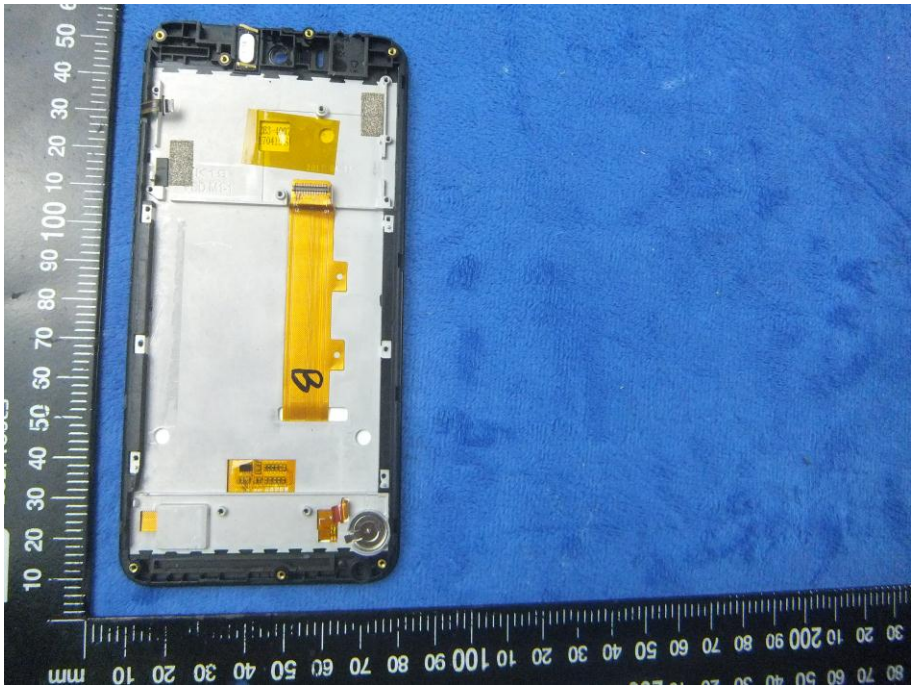
Small Mainboard - Rear View



LCD – Front View

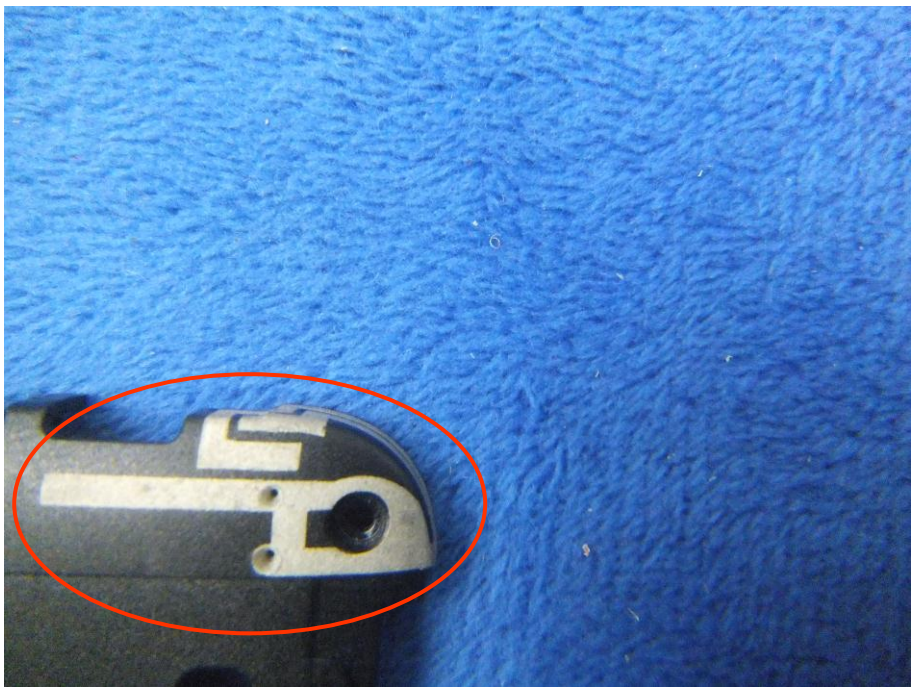


LCD – Rear View



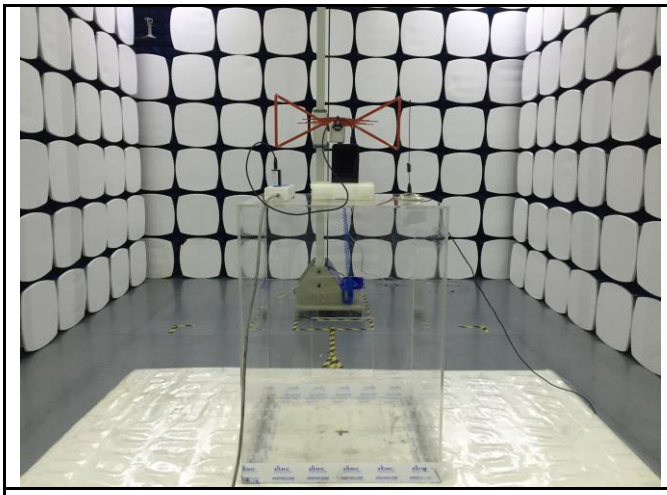
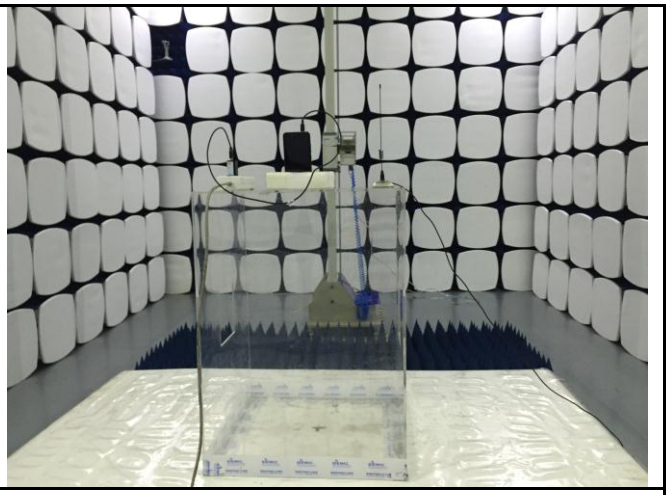
GSM/PCS/UMTS - Antenna View

BT/WIFI - Antenna View



LTE - Antenna View

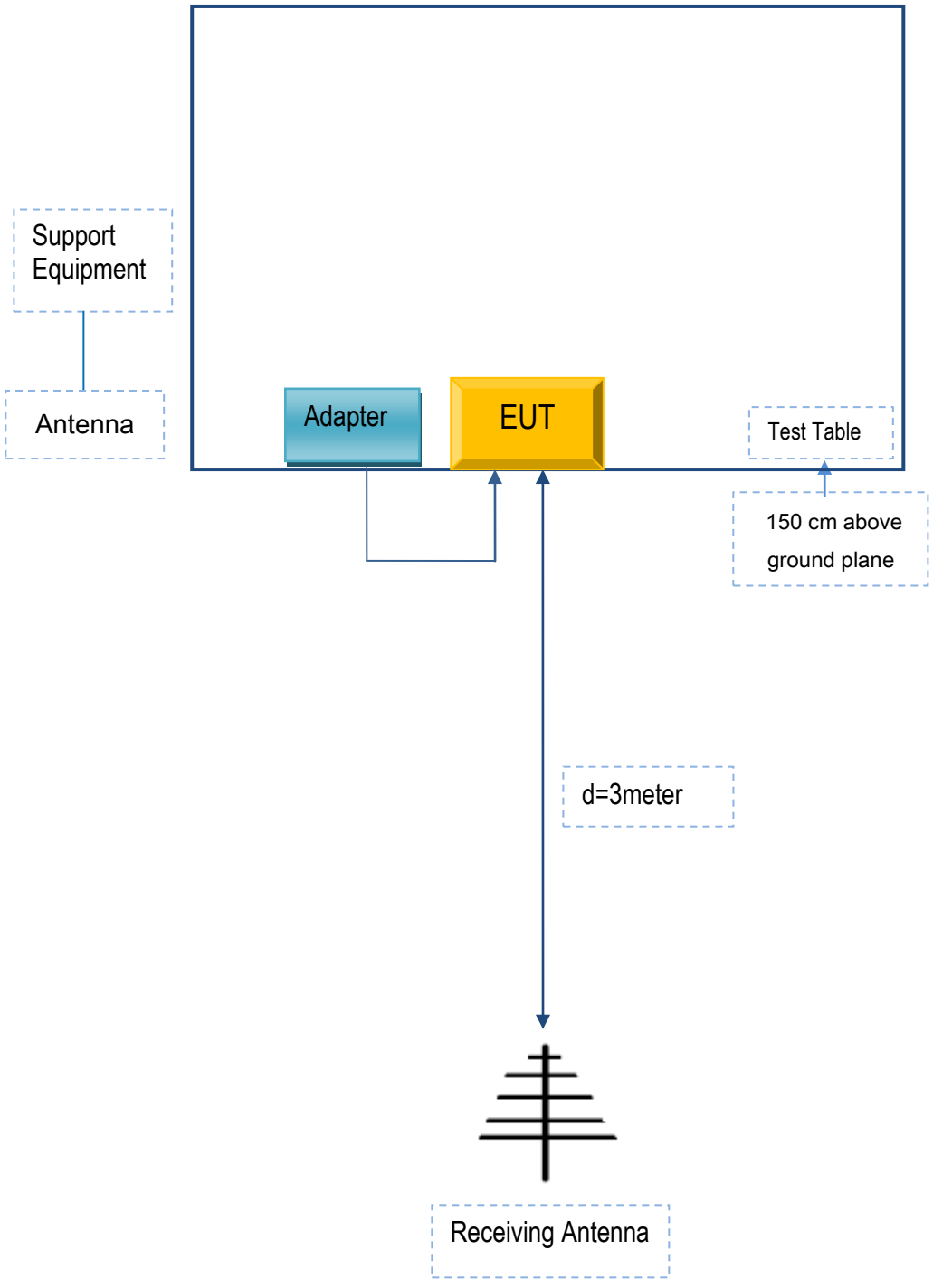
Annex B.iii. Photograph: Test Setup Photo

	
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. 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	US-WT-1500	ST560

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	ST560

Annex C.ii. EUT OPERATING CONKITIONS

N/A

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

N/A

Annex E. DECLARATION OF SIMILARITY

N/A