

FCC Test Report (PART 27)

Report No.: RF160517W001-5

FCC ID: ZC4L610

Test Model: Ilium L610

Received Date: May 17, 2016

Test Date: May 18, 2016 ~ Jun. 11, 2016

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RELEASE CONTROL RECORD

Issue No.	Description	Date Issued
RF160517W001-5	Original release	Jun. 12, 2016



1 Certificate of Conformity

Product: Smartphone

Brand: LANIX

Test Model: Ilium L610

Sample Status: Production unit

Applicant: Corporativo Lanix S.A. de C.V.

Test Date: May 18, 2016 ~ Jun. 11, 2016

Standards: FCC Part 27, Subpart C, L

FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :	pmy	, Date:	Jun. 12, 2016	
	Amyee Qian / Engineer			
Approved by :	William	, Date:	Jun. 12, 2016	
Approved by .		, Date	Juli. 12, 2010	
	William Chung / Manager			



2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2				
FCC Clause	Test Item	Result	Remarks	
2.1046 27.50(d)(4)	Maximum Peak Output Power	PASS	Meet the requirement of limit.	
2.1055 27.54	Frequency Stability	PASS	Meet the requirement of limit.	
2.1049 27.53(h)	Occupied Bandwidth	PASS	Meet the requirement of limit.	
27.50(d)(5)	Peak to average ratio	PASS	Meet the requirement of limit.	
27.53(h)	Band Edge Measurements	PASS	Meet the requirement of limit.	
2.1051 27.53(h)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.	
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -7.06dB at 31.94MHz.	

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.93 dB
Radiated Emissions up to 1 GHz	200MHz ~1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
Radiated Effissions above 1 GHZ	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



2.2 Test Site And Instruments

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Apr. 05,16	Apr. 04,17
Bilog Antenna 1	Teseq	CBL 6111D	30643	Jun. 25,15	Jun. 24,16
Bilog Antenna 2	Teseq	CBL 6111D	27089	Jun. 25,15	Jun. 24,16
Horn Antenna	ETS-Lindgren	3117	00062558	May 30,14	May 29,17
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Jan. 21,14	Jan. 20,17
Amplifier	Burgeon	BPA-530	100220	Apr. 05,16	Apr. 04,17
Pre-Amplifier	HP	8449B	3008A00409	Apr. 24,16	Apr. 23,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 11,15	Nov. 10,16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 14	Aug. 07, 16
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
Power Meter	Anritsu	ML2495A	1139001	Feb.19,16	Feb. 18,17
Power Sensor	Anritsu	MA2411B	1126068	Feb.19,16	Feb. 18,17
Power Sensor	Keysight	U2021XA	MY55060016	May 27,15	May 26,17
Power Sensor	Keysight	U2021XA	MY55060018	May 27,15	May 26,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct. 11, 16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 09,15	Nov. 08,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Apr. 21, 16	Apr. 20, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Sep. 01,15	Aug. 31,16
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Oct. 12, 15	Oct. 11, 16

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

- 2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 3. The test was performed in HwaYa Chamber 4.
- 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 5. The FCC Site Registration No. is 460141.
- 6. The IC Site Registration No. is IC7450F-4.



3 General Information

3.1 General Description of EUT

PRODUCT	Smartphone		
BRAND	LANIX		
MODEL NAME	Ilium L610		
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (battery)		
MODULATION TECHNOLOGY	LTE Band 4	QPSK, 16QAM	
	LTE Band 4 Channel Bandwidth: 1.4MHz	1710.7MHz ~ 1754.3MHz	
	LTE Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.5MHz	
	LTE Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~ 1752.5MHz	
FREQUENCY RANGE	LTE Band 4 Channel Bandwidth: 10MHz	1715.0MHz ~ 1750.0MHz	
	LTE Band 4 Channel Bandwidth: 15MHz LTE Band 4	1717.5MHz ~ 1747.5MHz	
	Channel Bandwidth: 20MHz LTE Band 17	1720.0MHz ~ 1745.0MHz	
	Channel Bandwidth: 5MHz LTE Band 17	706.5MHz ~ 713.5MHz	
	Channel Bandwidth: 10MHz	709.0MHz ~ 711.0MHz	
	LTE Band 4 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D	
		16QAM: 1M09W7D	
	LTE Band 4 Channel Bandwidth: 3MHz	QPSK: 2M69G7D	
		16QAM: 2M69W7D	
	LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 4M49G7D	
		16QAM: 4M47W7D	
	LTE Band 4	QPSK: 8M94G7D	
EMISSION DESIGNATOR	Channel Bandwidth: 10MHz	16QAM: 8M95W7D	
	LTE Band 4	QPSK: 13M5G7D	
	Channel Bandwidth: 15MHz	16QAM: 13M4W7D	
	LTE Band 4 Channel Bandwidth: 20MHz	QPSK: 17M9G7D	
		16QAM: 17M9W7D	
	LTE Band 17	QPSK: 4M49G7D	
	Channel Bandwidth: 5MHz	16QAM: 4M47W7D	
	LTE Band 17	QPSK: 8M95G7D	
	Channel Bandwidth: 10MHz	16QAM: 8M93W7D	
	LTE Band 4 Channel Bandwidth: 1.4MHz	340mW	
MAX. ERP/EIRP POWER	LTE Band 4 Channel Bandwidth: 3MHz	346mW	
	LTE Band 4 Channel Bandwidth: 5MHz	340mW	



	LTE Band 4 Channel Bandwidth: 10MHz	323mW	
	LTE Band 4 Channel Bandwidth: 15MHz	304mW	
	LTE Band 4 Channel Bandwidth: 20MHz	258mW	
	LTE Band 17 Channel Bandwidth: 5MHz	198mW	
	LTE Band 17 Channel Bandwidth: 10MHz	177mW	
ANTENNA TYPE	Fixed Internal antenna; 0dBi for LTE	Band 4, -1dBi for LTE Band 17	
HW VERSION V0.10			
SW VERSION	Ilium L610_TELCEL_SW_01_01		
ACCESSORY DEVICE	Refer to note as below USB cable: shielded, detachable, 0.8 m Earphone cable: Unshielded, detachable, 1.5 m		
DATA CABLE			

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

2. The EUT was powered by the following adapters:

ADAPTER 1		
BRAND:	LANIX	
MODEL:	Ilium L610-C	
INPUT:	AC 100-240V, 150mA	
OUTPUT:	DC 5V, 1000mA	

ADAPTER 2		
BRAND:	LANIX	
MODEL:	Ilium L610-C	
NPUT:	AC 100-240V, 150mA	
OUTPUT:	DC 5V, 1000mA	

4. The EUT matched the following USB Cable and Earphone.

USB CABLE		
BRAND:	LANIX	
MODEL:	Ilium L610	
SIGNAL LINE:	0.8 METER	

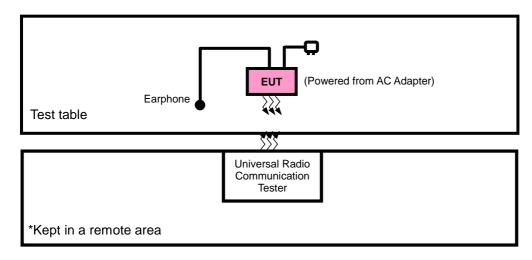
EARPHONE		
BRAND:	LANIX	
MODEL:	Ilium L610	
SIGNAL LINE:	1.5 METER	

5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

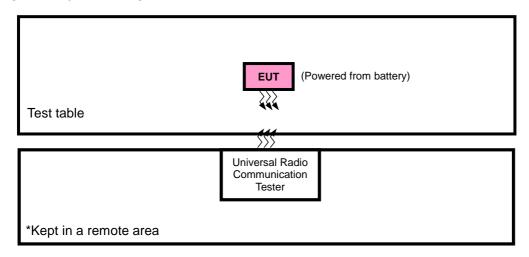


3.2 Configuration of System Under Test

FOR RADIATION EMISSION TEST



FOR E.R.P./E.I.R.P TEST



3.2.1 Description Of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS								
1	DC Line: Unshielded, Detachable 1.0m								
2	AC Line: Unshielded, Detachable 1.5m								

NOTE:

1. All power cords of the above support units are non shielded (1.8m).



3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
Α	EUT + Adapter + USB Cable + Earphone with LTE link
В	EUT + Battery + USB Cable + Earphone with LTE link

LTE BAND 4

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE	
		19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
В	EIRP	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
Ь	LIKE	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		19957 to 20393	20175	1.4MHz	QPSK	1 RB / 0 RB Offset	
		19965 to 20385	20175	3MHz	QPSK	1 RB / 0 RB Offset	
В	FREQUENCY	19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset	
Ь	STABILITY	20000 to 20350	20175	10MHz	QPSK	1 RB / 0 RB Offset	
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset	
		20050 to 20300	20175	20MHz	QPSK	1 RB / 0 RB Offset	
	OCCUPIED BANDWIDTH		19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset	
В		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset	
В		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset	
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset	
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100 RB / 0 RB Offset	
		19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
В	PEAK TO	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
	AVERAGE RATIO	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
			19957	1.4MHz	QPSK	1 RB / 0 RB Offset	
		19957 to 20393	10001	1.4101⊓2	હા અ	6 RB / 0 RB Offset	
		1990/ 10 20393	20393	1.4MHz	QPSK	1 RB / 5 RB Offset	
В	BAND EDGE		20393	1.4101⊓2	QPSK	6 RB / 0 RB Offset	
D	DAIND EDGE		19965	3MHz	QPSK	1 RB / 0 RB Offset	
		10065 to 20295	10000	JIVII IZ	QP3N	15 RB / 0 RB Offset	
		19965 to 20385	20385	3MHz	OBSK	1 RB / 14 RB Offset	
			20000	OIVII IZ	QPSK	15 RB / 0 RB Offset	



			19975	5MHz	QPSK	1 RB / 0 RB Offset
		40075 +- 00075	19975	SIVII 12	QPSK	25 RB / 0 RB Offset
		19975 to 20375	20375	5MHz	ODCK	1 RB / 24 RB Offset
			20010	SIVII 12	QPSK	25 RB / 0 RB Offset
			20000	10MHz	ODCK	1 RB / 0 RB Offset
		20000 to 20350	20000	TOWNIZ	QPSK	50 RB / 0 RB Offset
		20000 10 20350	20350	10MHz	ODSK	1 RB / 49 RB Offset
			20330	TOWNIZ	QPSK	50 RB / 0 RB Offset
			20025	15MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20225	20020	13WI IZ		75 RB / 0 RB Offset
		20025 to 20325	20325	45141	ODCK	1 RB / 74 RB Offset
В	BAND EDGE		20323	15MHz	QPSK	75 RB / 0 RB Offset
Ь		20050 to 20300	20050	20MHz	QPSK	1 RB / 0 RB Offset
				ZOWITIZ	QPSK	100 RB / 0 RB Offset
			20300	20MHz	QPSK	1 RB / 99 RB Offset
			20300	ZUIVITZ	QPSK	100 RB / 0 RB Offset
		19957 to 20393	20175	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	20175	3MHz	QPSK	1 RB / 0 RB Offset
В	CONDCUDETED	19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset
	EMISSION	20000 to 20350	20175	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20175	20MHz	QPSK	1 RB / 0 RB Offset
		19957 to 20393	20175	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	20175	3MHz	QPSK	1 RB / 0 RB Offset
Α	RADIATED	19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset
	EMISSION	20000 to 20350	20175	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20175	20MHz	QPSK	1 RB / 0 RB Offset



LTE BAND 17

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
В	ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
	210	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
В	FREQUENCY	23755 to 23825	23790	5MHz	QPSK	1 RB / 0 RB Offset
В	STABILITY	23780 to 23800	23790	10MHz	QPSK	1 RB / 0 RB Offset
В	OCCUPIED	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
В	BANDWIDTH	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
В	PEAK TO AVERAGE RATIO	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
Ь		23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
			22755	ENU I	ODCK	1 RB / 0 RB Offset
		00755 / 00005	23755	5MHz	QPSK	25 RB / 0 RB Offset
		23755 to 23825	00005 FMI	ODCK	1 RB / 24 RB Offset	
			23825	5MHz	QPSK	25 RB / 0 RB Offset
В	BAND EDGE	BAND EDGE	00700	401411	00014	1 RB / 0 RB Offset
		00700 / 00000	23780	10MHz	QPSK	50 RB / 0 RB Offset
		23780 to 23800	23800	10MHz	0.0014	1 RB / 49 RB Offset
			23000	TOIVIE	QPSK	50 RB / 0 RB Offset
В	CONDCUDETED	23755 to 23825	23790	5MHz	QPSK	1 RB / 0 RB Offset
В	EMISSION	23780 to 23800	23790	10MHz	QPSK	1 RB / 0 RB Offset
А	RADIATED	23755 to 23825	23790	5MHz	QPSK	1 RB / 0 RB Offset
A	EMISSION	23780 to 23800	23790	10MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	21deg. C, 71%RH 22deg. C, 71%RH	DC 3.8V from battery	Yuqiang Yin
Frequency Stability	24deg. C, 64%RH	DC 3.8V from battery	Yuqiang Yin
Occupied Bandwidth	24deg. C, 64%RH	DC 3.8V from battery	Yuqiang Yin
Band Edge	24deg. C, 64%RH	DC 3.8V from battery	Yuqiang Yin
Condcudeted Emission	24deg. C, 64%RH	DC 3.8V from battery	Yuqiang Yin
Radiated Emission	21deg. C, 71%RH	5Vdc from adapter	Alex Chen

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency



3.5 General Description of Applied Standards The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2
FCC 47 CFR Part 27
KDB Publication 971168 D02
ANSI/TIA/EIA-603-D

NOTE: All test items have been performed and recorded as per the above standards.



4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stat ions operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 699-716 MHz band are limited to 3 watts ERP.

4.1.2 Test Procedures

EIRP / ERP Measurement:

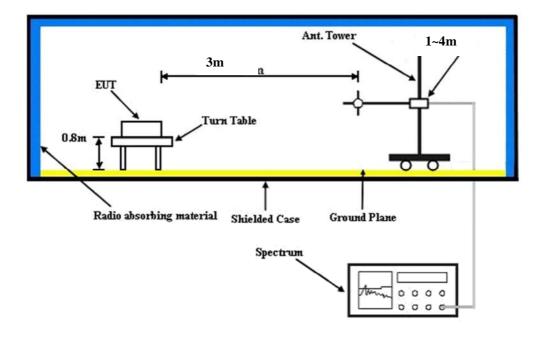
- a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RBW and VBW is 10MHz for LTE.
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- d. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn
- e. E.R.P = E.I.R.P- 2.15 dB

Conducted Power Measurement:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



4.1.3 Test Setup EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).



4.1.4 Test Results

AVERAGE CONDUCTED OUTPUT POWER (dBm)

				LTE Band 4			
DW.	Madulation	RB	RB	Low CH 19957	Mid CH 20175	High CH 20393	мор
BW	Modulation	Size	Offset	Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz	MPR
		1	0	23.41	23.51	23.53	0
		1	2	23.26	23.38	23.40	0
		1	5	23.26	23.20	23.42	0
	QPSK	3	0	23.39	23.49	23.51	0
		3	1	23.24	23.36	23.38	0
		3	3	23.24	23.18	23.40	0
4 48411-		6	0	22.33	22.24	22.39	1
1.4MHz		1	0	22.51	22.62	22.63	1
		1	2	22.40	22.35	22.56	1
		1	5	22.33	22.24	22.41	1
	16QAM	3	0	22.50	22.61	22.62	1
		3	1	22.39	22.34	22.55	1
		3	3	22.32	22.23	22.40	1
		6	0	21.42	21.47	21.19	2
				LTE Band 4			•
		RB	RB	Low CH 19965	Mid CH 20175	High CH 20385	
BW	Modulation	Size	Offset	Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz	MPR
		1	0	23.42	23.52	23.54	0
		1	7	23.27	23.39	23.41	0
		1	14	23.27	23.21	23.43	0
	QPSK	8	0	22.30	22.29	22.41	1
		8	3	22.32	22.15	22.40	1
		8	7	22.20	22.19	22.39	1
		15	0	22.34	22.25	22.40	1
3 MHz		1	0	22.52	22.63	22.64	1
		1	7	22.41	22.36	22.57	1
		1	14	22.34	22.25	22.42	1
	16QAM	8	0	21.59	21.42	21.38	2
		8	3	21.52	21.39	21.27	2
		I	1	1	1		_
		8	7	21.40	21.38	21.41	2



BW	Modulation	RB	RB	Low CH 19975	Mid CH 20175	High CH 20375	мрр
BVV	Modulation	Size	Offset	Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz	MPR
		1	0	23.45	23.55	23.57	0
		1	12	23.30	23.42	23.44	0
		1	24	23.30	23.24	23.46	0
	QPSK	12	0	22.33	22.32	22.44	1
		12	6	22.35	22.18	22.43	1
		12	13	22.23	22.22	22.42	1
5 MHz		25	0	22.37	22.28	22.43	1
3 IVITZ		1	0	22.55	22.66	22.67	1
		1	12	22.44	22.39	22.60	1
		1	24	22.37	22.28	22.45	1
	16QAM	12	0	21.62	21.45	21.41	2
		12	6	21.55	21.42	21.30	2
		12	13	21.43	21.41	21.44	2
		25	0	21.46	21.51	21.23	2

	LTE Band 4											
BW	Modulation	RB	RB	Low CH 20000	Mid CH 20175	High CH 20350	MPR					
BW	Modulation	Size	Offset	Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz	WIPK					
		1	0	23.49	23.59	23.61	0					
		1	24	23.34	23.46	23.48	0					
		1	49	23.34	23.28	23.50	0					
	QPSK	25	0	22.37	22.36	22.48	1					
		25	12	22.39	22.22	22.47	1					
		25	25	22.27	22.26	22.46	1					
10 MHz		50	0	22.41	22.32	22.47	1					
10 MHZ		1	0	22.59	22.70	22.71	1					
		1	24	22.48	22.43	22.64	1					
		1	49	22.41	22.32	22.49	1					
	16QAM	25	0	21.66	21.49	21.45	2					
		25	12	21.59	21.46	21.34	2					
		25	25	21.47	21.45	21.48	2					
		50	0	21.50	21.55	21.27	2					



BW	Modulation	RB	RB	Low CH 20025	Mid CH 20175	High CH 20325	MPR
DVV	Modulation	Size	Offset	Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz	IVIPK
		1	0	23.55	23.65	23.67	0
		1	37	23.40	23.52	23.54	0
		1	74	23.40	23.34	23.56	0
	QPSK	36	0	22.43	22.42	22.54	1
		36	19	22.45	22.28	22.53	1
		36	39	22.33	22.32	22.52	1
15 MHz		75	0	22.47	22.38	22.53	1
15 WITZ		1	0	22.65	22.76	22.77	1
		1	37	22.54	22.49	22.70	1
		1	74	22.47	22.38	22.55	1
	16QAM	36	0	21.72	21.55	21.51	2
		36	19	21.65	21.52	21.40	2
		36	39	21.53	21.51	21.54	2
		75	0	21.56	21.61	21.33	2

LTE Band 4

BW	Modulation	RB	RB	Low CH 20050	Mid CH 20175	High CH 20300	МОО
DVV	Modulation	Size	Offset	Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz	MPR
		1	0	23.58	23.68	23.70	0
		1	50	23.43	23.55	23.57	0
		1	99	23.43	23.37	23.59	0
	QPSK	50	0	22.46	22.45	22.57	1
		50	25	22.48	22.31	22.56	1
		50	50	22.36	22.35	22.55	1
20MHz		100	0	22.50	22.41	22.56	1
ZUIVITZ		1	0	22.68	22.79	22.80	1
		1	50	22.57	22.52	22.73	1
		1	99	22.50	22.41	22.58	1
	16QAM	50	0	21.75	21.58	21.54	2
		50	25	21.68	21.55	21.43	2
		50	50	21.56	21.54	21.57	2
		100	0	21.59	21.64	21.36	2



				LTE Band 17			
вw	Modulation	RB	RB	Low CH 23755	Mid CH 23790	High CH 23825	MPR
BW	Modulation	Size	Offset	Frequency 706.5 MHz	Frequency 710 MHz	Frequency 713.5 MHz	IVIPK
		1	0	23.31	23.41	23.37	0
		1	12	23.18	23.17	23.27	0
		1	24	23.16	23.36	23.32	0
	QPSK	12	0	22.37	22.39	22.26	1
		12	6	22.18	22.20	22.24	1
		12	13	22.19	22.16	22.23	1
5 MHz		25	0	22.27	22.33	22.32	1
S IVITZ		1	0	22.43	22.51	22.46	1
		1	12	22.32	22.44	22.40	1
16QA		1	24	22.38	22.36	22.30	1
	16QAM	12	0	21.39	21.21	21.29	2
		12	6	21.25	21.17	21.42	2
		12	13	21.23	21.22	21.43	2
		25	0	21.28	21.32	21.36	2
	Modulation	RB	RB	Low CH 23780	Mid CH 23790	High CH 23800	
BW		Size	Offset	Frequency 709 MHz	Frequency 710 MHz	Frequency 711 MHz	MPR
		1	0	23.35	23.45	23.41	0
		1	24	23.22	23.21	23.31	0
		1	49	23.20	23.40	23.36	0
	QPSK	25	0	22.41	22.43	22.30	1
		25	12	22.22	22.24	22.28	1
		25	25	22.23	22.20	22.27	1
40.000		50	0	22.31	22.37	22.36	1
10 MHz		1	0	22.47	22.55	22.50	1
		1	24	22.36	22.48	22.44	1
		1	49	22.42	22.40	22.34	1
	16QAM	25	0	21.43	21.25	21.33	2
		25	12	21.29	21.21	21.46	2
		25	25	21.27	21.26	21.47	2
			_				



EIRP

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
19957	1710.7	-17.50	41.29	23.79	239.55	Н	1
20175	1732.5	-17.11	41.36	24.25	266.07	Н	1
20393	1754.3	-17.42	42.74	25.32	340.25	Н	1
19957	1710.7	-23.03	44.25	21.22	132.28	V	1
20175	1732.5	-23.98	44.20	20.22	105.20	V	1
20393	1754.3	-23.76	44.09	20.33	107.77	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
19957	1710.7	-18.37	41.29	22.92	196.06	Н	1
20175	1732.5	-18.04	41.36	23.32	214.78	Н	1
20393	1754.3	-18.38	42.74	24.36	272.77	Н	1
19957	1710.7	-23.90	44.25	20.35	108.27	V	1
20175	1732.5	-24.91	44.20	19.29	84.92	V	1
20393	1754.3	-24.72	44.09	19.37	86.40	V	1



LTE BAND 4
CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
19965	1711.5	-17.48	41.27	23.79	239.17	Н	1
20175	1732.5	-17.17	41.36	24.19	262.42	Н	1
20385	1753.5	-17.37	42.76	25.39	345.70	Н	1
19965	1711.5	-23.01	44.26	21.25	133.41	V	1
20175	1732.5	-24.04	44.20	20.16	103.75	V	1
20385	1753.5	-23.71	44.23	20.52	112.77	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
19965	1711.5	-18.55	41.27	22.72	186.94	Н	1
20175	1732.5	-18.06	41.36	23.30	213.80	Н	1
20385	1753.5	-18.36	42.76	24.40	275.23	Н	1
19965	1711.5	-24.08	44.26	20.18	104.28	V	1
20175	1732.5	-24.93	44.20	19.27	84.53	V	1
20385	1753.5	-24.70	44.23	19.53	89.78	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

LTE BAND 4

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
19975	1712.5	-17.54	41.39	23.85	242.61	Н	1
20175	1732.5	-17.12	41.36	24.24	265.46	Н	1
20375	1752.5	-17.32	42.63	25.31	339.55	Н	1
19975	1712.5	-23.07	44.17	21.10	128.71	V	1
20175	1732.5	-23.99	44.20	20.21	104.95	V	1
20375	1752.5	-23.66	44.35	20.69	117.08	V	1



CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
19975	1712.5	-18.37	41.39	23.02	200.40	Н	1
20175	1732.5	-18.14	41.36	23.22	209.89	Н	1
20375	1752.5	-18.42	42.63	24.21	263.57	Н	1
19975	1712.5	-23.90	44.17	20.27	106.32	V	1
20175	1732.5	-25.01	44.20	19.19	82.99	V	1
20375	1752.5	-24.76	44.35	19.59	90.89	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

LTE BAND 4

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
20000	1715.0	-17.35	41.49	24.14	259.18	Н	1
20175	1732.5	-17.06	41.36	24.30	269.15	Н	1
20350	1750.0	-17.19	42.28	25.09	323.07	Н	1
20000	1715.0	-22.88	44.06	21.18	131.31	V	1
20175	1732.5	-23.93	44.20	20.27	106.41	V	1
20350	1750.0	-23.53	44.43	20.90	123.03	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
20000	1715.0	-18.50	41.49	22.99	198.88	Н	1
20175	1732.5	-18.16	41.36	23.20	208.93	Н	1
20350	1750.0	-18.35	42.28	23.93	247.34	Н	1
20000	1715.0	-24.03	44.06	20.03	100.76	V	1
20175	1732.5	-25.03	44.20	19.17	82.60	V	1
20350	1750.0	-24.69	44.43	19.74	94.19	V	1



LTE BAND 4
CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
20025	1717.5	-17.36	41.34	23.98	249.92	Н	1
20175	1732.5	-17.13	41.36	24.23	264.85	Н	1
20325	1747.5	-17.26	42.09	24.83	303.81	Н	1
20025	1717.5	-22.89	44.04	21.15	130.44	V	1
20175	1732.5	-24.00	44.20	20.20	104.71	V	1
20325	1747.5	-23.60	44.22	20.62	115.21	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
20025	1717.5	-18.22	41.34	23.12	205.02	Н	1
20175	1732.5	-18.00	41.36	23.36	216.77	Н	1
20325	1747.5	-18.11	42.09	23.98	249.80	Н	1
20025	1717.5	-23.75	44.04	20.29	107.00	V	1
20175	1732.5	-24.87	44.20	19.33	85.70	V	1
20325	1747.5	-24.45	44.22	19.77	94.73	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

LTE BAND 4

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
20050	1720.0	-17.94	41.28	23.34	215.82	Н	1
20175	1732.5	-17.58	41.36	23.78	238.84	Н	1
20300	1745.0	-17.84	41.96	24.12	258.05	Н	1
20050	1720.0	-23.47	44.14	20.67	116.55	V	1
20175	1732.5	-24.45	44.20	19.75	94.32	V	1
20300	1745.0	-24.18	43.88	19.70	93.37	V	1



CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
20050	1720.0	-18.87	41.28	22.41	174.22	Н	1
20175	1732.5	-18.65	41.36	22.71	186.68	Н	1
20300	1745.0	-18.67	41.96	23.29	213.16	Н	1
20050	1720.0	-24.40	44.14	19.74	94.08	V	1
20175	1732.5	-25.52	44.20	18.68	73.72	V	1
20300	1745.0	-25.01	43.88	18.87	77.13	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

LTE BAND 17

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
23755	706.5	-8.25	32.64	22.24	167.30	Н	3
23790	710.0	-8.26	32.92	22.51	178.24	Н	3
23825	713.5	-7.70	32.83	22.98	198.43	Н	3
23755	706.5	-17.25	32.14	12.74	18.78	V	3
23790	710.0	-16.03	32.18	14.00	25.12	V	3
23825	713.5	-16.23	31.95	13.57	22.77	V	3

NOTE: ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
23755	706.5	-9.11	32.64	21.38	137.25	Н	3
23790	710.0	-9.13	32.92	21.64	145.88	Н	3
23825	713.5	-8.55	32.83	22.13	163.15	Н	3
23755	706.5	-17.53	32.14	12.46	17.60	V	3
23790	710.0	-16.90	32.18	13.13	20.56	V	3
23825	713.5	-17.08	31.95	12.72	18.72	V	3



LTE BAND 17

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
23780	709.0	-8.83	32.90	21.92	155.42	Н	3
23790	710.0	-8.71	32.92	22.06	160.62	Н	3
23800	711.0	-8.28	32.92	22.49	177.46	Н	3
23780	709.0	-17.25	32.20	12.80	19.03	V	3
23790	710.0	-16.48	32.18	13.55	22.66	V	3
23800	711.0	-16.81	32.13	13.17	20.75	V	3

NOTE: ERP (dBm) = LVL (dBm) + Correction Factor (dB)-2.15dB.

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
23780	709.0	-9.76	32.90	20.99	125.46	Н	3
23790	710.0	-9.78	32.92	20.99	125.55	Н	3
23800	711.0	-9.11	32.92	21.66	146.59	Н	3
23780	709.0	-18.18	32.20	11.87	15.36	V	3
23790	710.0	-17.55	32.18	12.48	17.71	V	3
23800	711.0	-17.64	32.13	12.34	17.14	V	3



4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

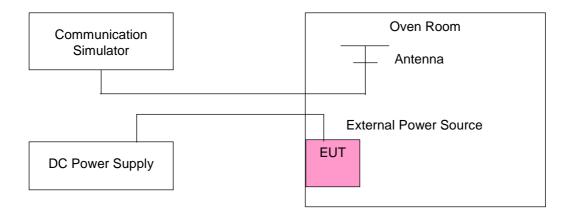
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 Test Procedure

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the \pm 0.5°C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup





4.2.4 Test Results

LTE BAND 4

AFC FREQUENCY ERROR vs. VOLTAGE									
VOLTACE (Volta)		FREQUENCY ERROR (ppm)							
VOLTAGE (Volts)	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz	LIMIT (ppm)		
3.8	-0.0015	-0.0014	0.0016	0.0016	0.0012	0.0015	2.5		
3.6	0.0017	0.0017	-0.0021	-0.0020	-0.0016	-0.0022	2.5		
4.2	0.0012	-0.0015	-0.0018	-0.0018	-0.0014	-0.0018	2.5		

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.2Vdc.

	AFC FREQUENCY ERROR vs. TEMPERATURE										
TEMP (%)		FRE	QUENCY	ERROR (p	opm)		LIMIT (nnm)				
TEMP. (℃)	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz	LIMIT (ppm)				
-30	-0.0063	-0.0057	-0.0060	-0.0067	-0.0064	-0.0062	2.5				
-20	-0.0056	-0.0051	-0.0053	-0.0056	-0.0057	-0.0054	2.5				
-10	-0.0048	-0.0044	-0.0046	-0.0047	-0.0049	-0.0047	2.5				
0	-0.0041	-0.0037	-0.0040	-0.0039	-0.0041	-0.0039	2.5				
10	-0.0034	-0.0030	-0.0031	-0.0033	-0.0034	-0.0032	2.5				
20	-0.0027	-0.0021	-0.0024	-0.0025	-0.0026	-0.0026	2.5				
30	-0.0020	-0.0014	-0.0017	-0.0018	-0.0020	-0.0018	2.5				
40	-0.0012	-0.0008	-0.0010	-0.0012	-0.0012	-0.0011	2.5				
50	-0.0006	-0.0001	-0.0003	-0.0004	-0.0005	-0.0004	2.5				
60	0.0002	0.0006	0.0004	0.0003	0.0002	0.0003	2.5				



LTE BAND 17

VOLTAGE (Volta)	FREQUENCY	LIMIT (nnm)	
VOLTAGE (Volts)	5MHz	10MHz	LIMIT (ppm)
3.8	0.0043	-0.0041	2.5
3.6	-0.0015	0.0044	2.5
4.2	-0.0013	0.0037	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.2Vdc.

TEMP. (°C)	FREQUENCY I	ERROR (ppm)	LIMIT (nnm)
TEMP. (C)	5MHz	10MHz	LIMIT (ppm)
-30	-0.0125	-0.0133	2.5
-20	-0.0108	-0.0116	2.5
-10	-0.0092	-0.0100	2.5
0	-0.0076	-0.0082	2.5
10	-0.0058	-0.0065	2.5
20	-0.0042	-0.0048	2.5
30	-0.0026	-0.0033	2.5
40	-0.0009	-0.0016	2.5
50	0.0005	-0.0003	2.5
60	0.0022	0.0012	2.5

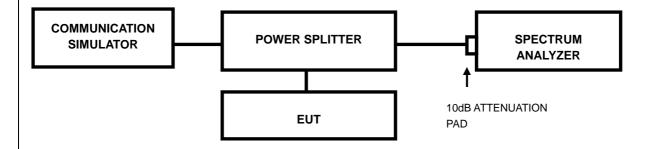


4.3 Occupied Bandwidth Measurement

4.3.1 Limits Of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.3.2 Test Setup



4.3.3 Test Procedures

- a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



4.3.4 Test Result

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	Frequency		CUPIED Ith (MHz)	CHANNEL	Frequency	99% OCCUPIED Bandwidth (MHz)	
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM
19957	1710.7	1.09	1.09	19965	1711.5	2.69	2.69
20175	1732.5	1.09	1.09	20175	1732.5	2.69	2.68
20393	1754.3	1.09	1.09	20385	1753.5	2.69	2.68





CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	Frequency		CUPIED Ith (MHz)	CHANNEL	Frequency	99% OCCUPIED Bandwidth (MHz)	
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM
19975	1712.5	4.49	4.47	20000	1715	8.94	8.92
20175	1732.5	4.49	4.47	20175	1732.5	8.94	8.95
20375	1752.5	4.49	4.47	20350	1750	8.94	8.94





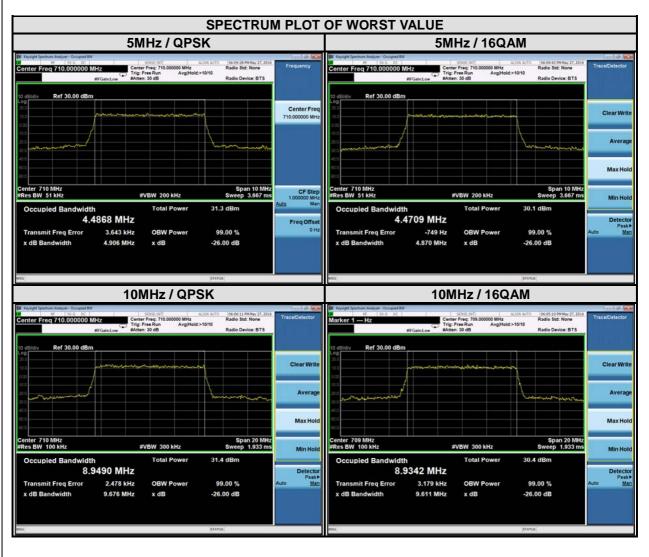
CHANNEL BANDWIDTH: 15MHz				CHANNEL BANDWIDTH: 20MHz			
CHANNEL	FREQUENC		99% OCCUPIED BANDWIDTH (MHz)		FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)	
	Y (MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM
20025	1717.5	13.43	13.42	20050	1720	17.89	17.83
20175	1732.5	13.46	13.43	20175	1732.5	17.94	17.86
20325	1747.5	13.43	13.42	20300	1745	17.94	17.85





LTE BAND 17

CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		CHANNEL	Frequency	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM		(MHz)	QPSK	16QAM
23755	706.5	4.47	4.46	23780	709	8.94	8.93
23790	710	4.49	4.47	23790	710	8.95	8.93
23825	713.5	4.48	4.47	23800	711	8.94	8.93



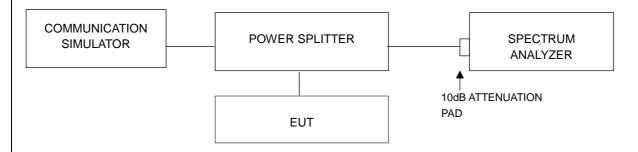


4.4 Peak To Average Ratio

4.4.1 Limits of Peak To Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.4.2 Test Setup



4.4.3 Test Procedures

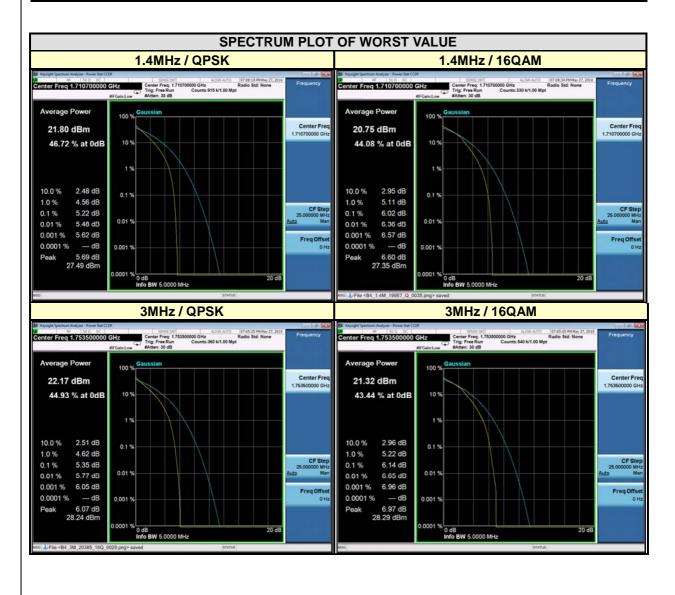
- 1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
- 2. Set the number of counts to a value that stabilizes the measured CCDF curve;
- 3. Record the maximum PAPR level associated with a probability of 0.1%.



4.4.4 Test Results

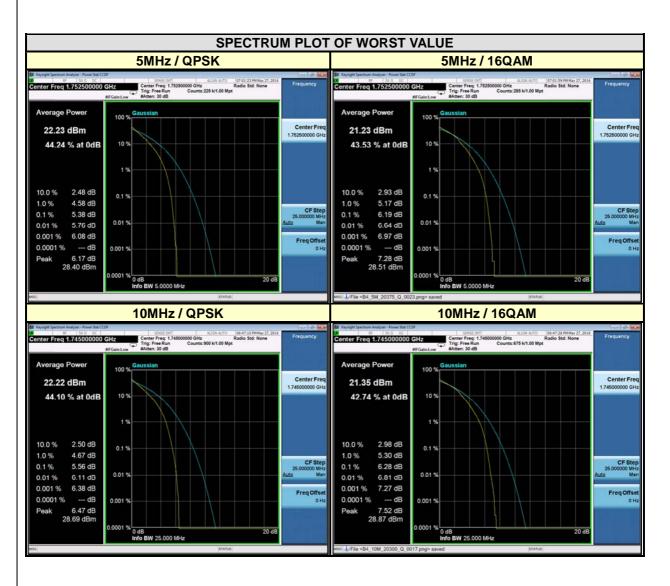
LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM		(MHz)	QPSK	16QAM
19957	1710.7	5.22	6.02	19965	1711.5	5.32	6.08
20175	1732.5	5.04	5.66	20175	1732.5	5.12	5.89
20393	1754.3	5.21	6.02	20385	1753.5	5.35	6.14



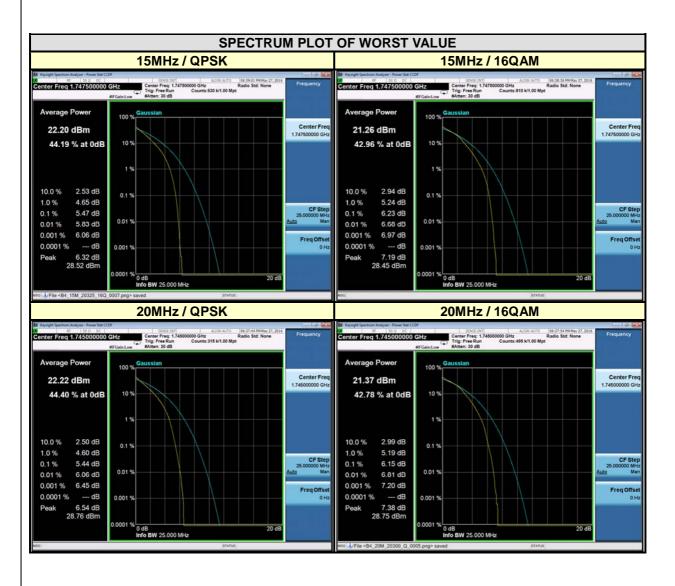


CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM		(MHz)	QPSK	16QAM
19975	1712.5	5.34	6.09	20000	1715	5.33	6.14
20175	1732.5	5.28	6.05	20175	1732.5	5.26	6.01
20375	1752.5	5.38	6.19	20350	1750	5.56	6.28





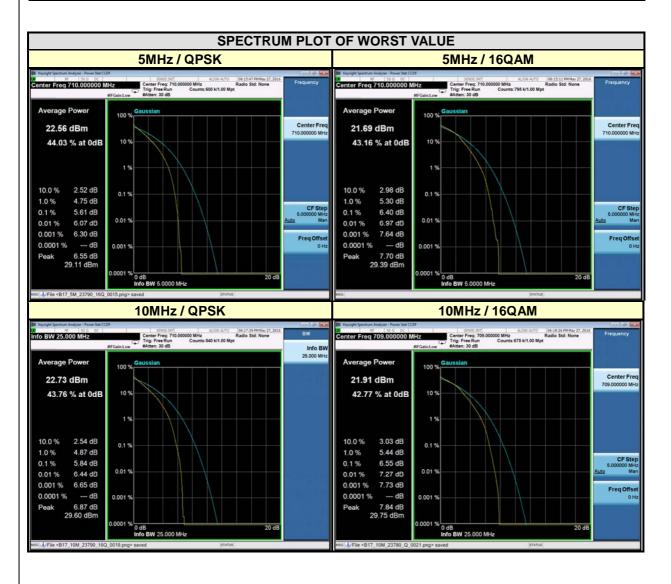
CHA	ANNEL BANDW	IDTH: 15M	Hz	CHANNEL BANDWIDTH: 20MHz					
CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)			
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM		
20025	1717.5	5.32	6.10	20050	1720	5.24	6.00		
20175	1732.5	5.30	6.00	20175	1732.5	5.32	6.03		
20325	1747.5	5.47	6.23	20300	1745	5.44	6.15		





LTE BAND 17

CH.	ANNEL BANDV	VIDTH: 5MI	Ηz	CHANNEL BANDWIDTH: 10MHz					
CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)			
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM		
23755	706.5	5.45	6.30	23780	709	5.77	6.55		
23790	710	5.61	6.40	23790	710	5.84	6.52		
23825	713.5	5.60	6.39	23800	711	5.78	6.53		





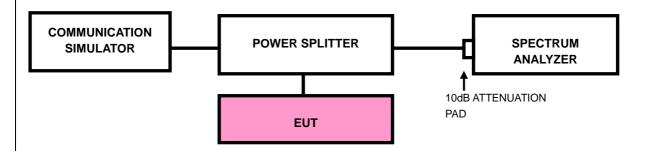
4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

4.5.2 Test Setup



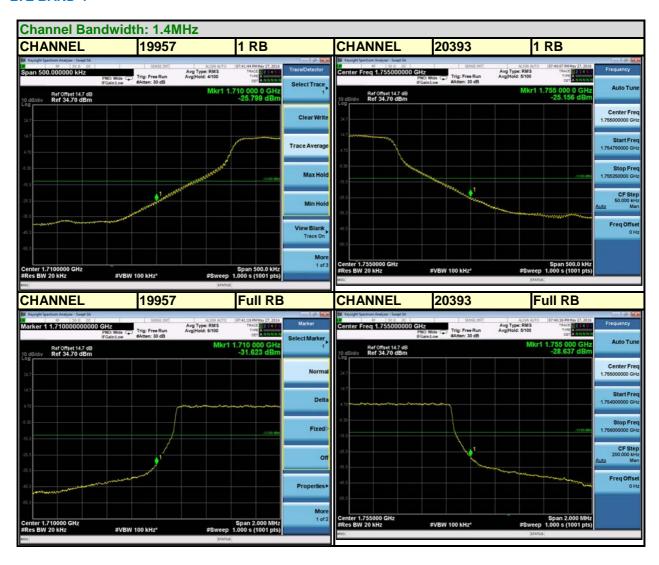
4.5.3 Test Procedures

- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 20kHz and VB of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)
- d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- h. he center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- i. Record the max trace plot into the test report.



4.5.4 Test Results

LTE BAND 4

















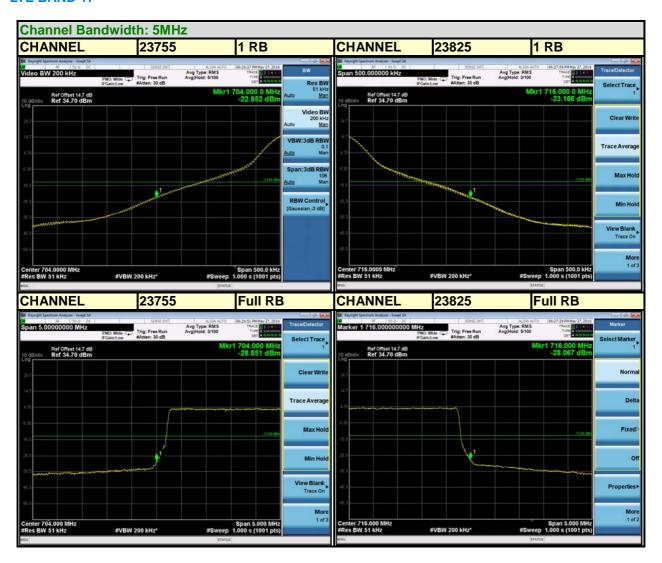




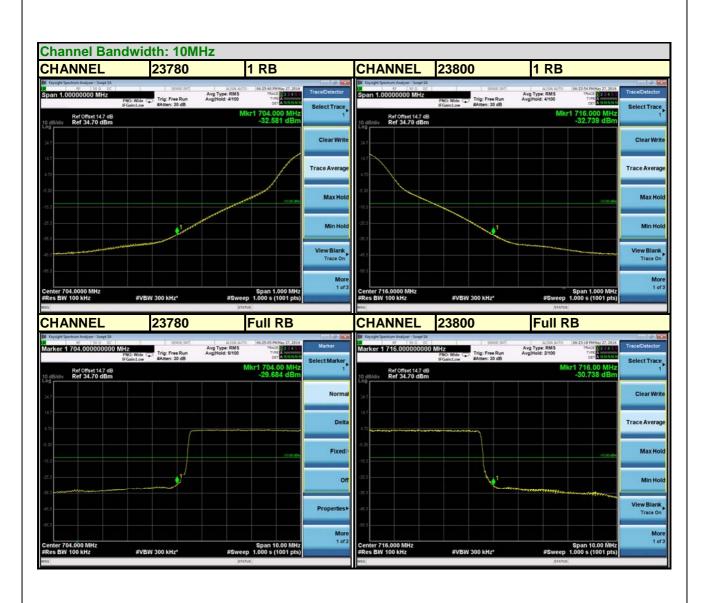




LTE BAND 17









4.6 Conducted Spurious Emissions

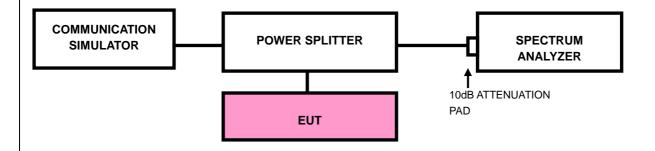
4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission is equal to -13dBm.

4.6.2 Test Procedure

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 30MHz to 19.1GHz for LTE Band 4 and 30 MHz to 9GHz for LTE Band 17. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

4.6.3 Test Setup



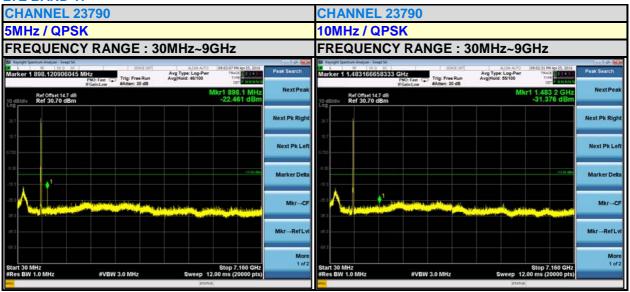


4.6.4 Test Results

LTE BAND 4 **CHANNEL 20175** CHANNEL 20175 1.4MHz / QPSK 3MHz / QPSK FREQUENCY RANGE: 30MHz~19.1GHz FREQUENCY RANGE: 30MHz~19.1GHz Avg Type: Log-Pwr AvgiHold: 84/100 Avg Type: Log-Pwr Avg|Hold:>100/100 Ref Offset 14.7 dB Ref 34.70 dBm Ref Offset 14.7 dB Ref 34.70 dBm Next Pk Let Marker Delt Mkr-Ref Lv 5MHz / QPSK 10MHz/QPSK FREQUENCY RANGE: 30MHz~19.1GHz FREQUENCY RANGE: 30MHz~19.1GHz Marker 1 3.272062103105 GHz PNO: Fast Agency Service Renewal Service Renewal Service Renewal R Marker 1 2.389076953848 GHz Avg Type: Log-Pwr Avg|Hold: 33/100 Ref Offset 14.7 dB Ref 34.70 dBm Ref Offset 14.7 dB Ref 34.70 dBm Next Pk Lei Mkr-C More 1 of 2 Stop 19.100 G Sweep 32.00 ms (20000 Start 30 MHz #Res BW 1.0 MHz Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz #VBW 3.0 MHz 15MHz / QPSK 20MHz / QPSK FREQUENCY RANGE: 30MHz~19.1GHz FREQUENCY RANGE: 30MHz~19.1GHz Marker 1 2.764774738737 GHz PNO: Fast C Avg Type: Log-Pwr AvgiHold: 42/100 Avg Type: Log-Pwr Avg/Hold: 45/100 Ref Offset 14.7 dB Ref 34.70 dBm Ref Offset 14.7 dB Ref 34.70 dBm Next Pk Righ Marker Delt Mkr-RefLy Mkr-RefL More 1 of 2 Start 30 MHz Res BW 1.0 MHz #VBW 3.0 MHz



LTE BAND 17





4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

In the FCC 27.53(m) (4), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The emission limit equal to -13dBm.

4.7.2 Test Procedure

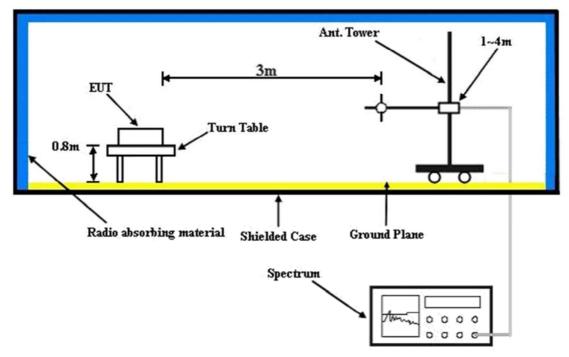
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- c. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power 2.15dBi.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard No deviation.



4.7.4 Test Setup



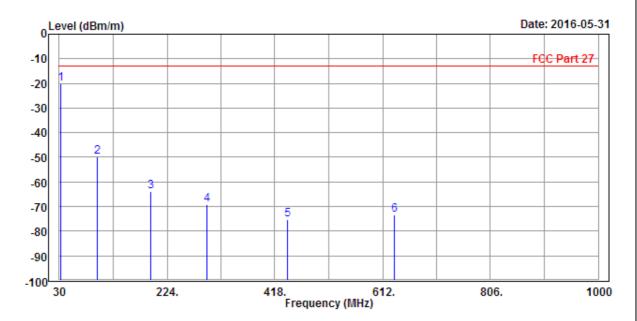
For the actual test configuration, please refer to the attached file (Test Setup Photo).



4.7.5 Test Results

BELOW 1GHz WORST-CASE DATA

LTE Band 4:

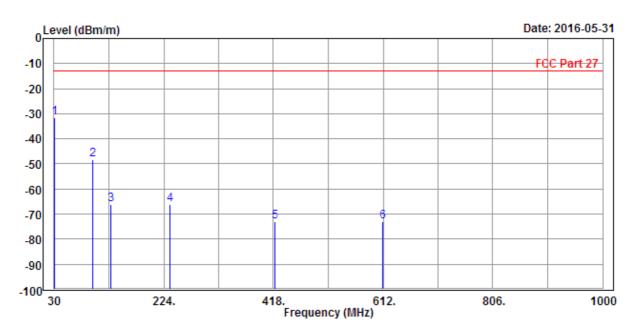


Condition: FCC Part 27 3m EIRP_26M-1GHz-20160505-EMC9135+3143B-FCC

EUT : Baifone P4905 Mode : LTE Band4 Test By : Alex Chen

	Freq	Level		Limit Line	Over Limit	Factor	Remark	Pol/Phase
_	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	31.940	-20.06	-36.73	-13.00	-7.06	16.67	Peak	Horizontal
2	97.900	-49.76	-39.05	-13.00	-36.76	-10.71	Peak	Horizontal
3	193.930	-63.84	-46.45	-13.00	-50.84	-17.39	Peak	Horizontal
4	295.780	-69.19	-55.17	-13.00	-56.19	-14.02	Peak	Horizontal
5	441.280	-75.35	-64.92	-13.00	-62.35	-10.43	Peak	Horizontal
6	633.340	-73.45	-65.87	-13.00	-60.45	-7.58	Peak	Horizontal





Condition: FCC Part 27 3m EIRP_26M-1GHz-20160505-EMC9135+3143B-FCC

EUT : Baifone P4905 Mode : LTE Band4 Test By : Alex Chen

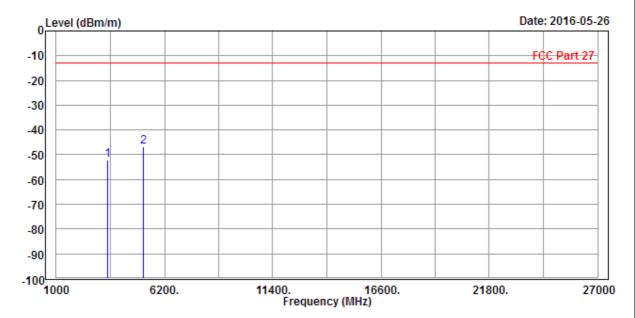
	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	30.970	-31.53	-35.57	-13.00	-18.53	4.04	Peak	Vertical
2	97.900	-48.43	-37.79	-13.00	-35.43	-10.64	Peak	Vertical
3	130.880	-66.07	-54.51	-13.00	-53.07	-11.56	Peak	Vertical
4	234.670	-66.30	-55.05	-13.00	-53.30	-11.25	Peak	Vertical
5	420.910	-72.99	-62.83	-13.00	-59.99	-10.16	Peak	Vertical
6	612.000	-72.85	-65.65	-13.00	-59.85	-7.20	Peak	Vertical



ABOVE 1GHz DATA

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz / QPSK



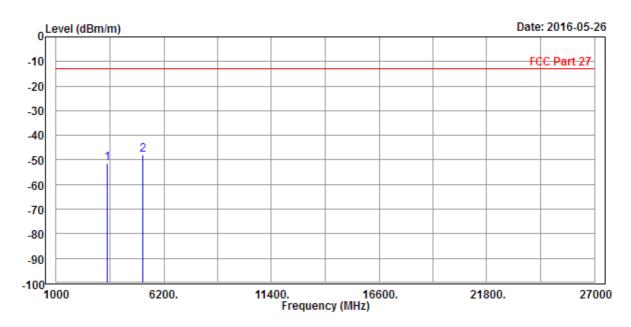
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band4(1.4M)

Plan : Y-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3444.000 5197.500							Horizontal Horizontal





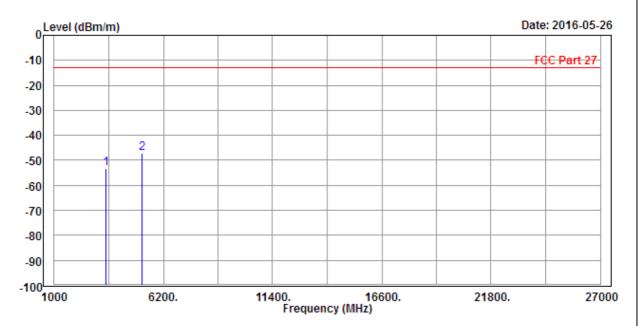
EUT : Baifone P4905 Mode : LTE Band4(1.4M)

Plan : Y-Plan Test By : Alex Chen

Freq	Level		Limit Line		Factor	Remark	Pol/Phase
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
3444.000 5197.500							Vertical Vertical



CHANNEL BANDWIDTH: 3MHz / QPSK



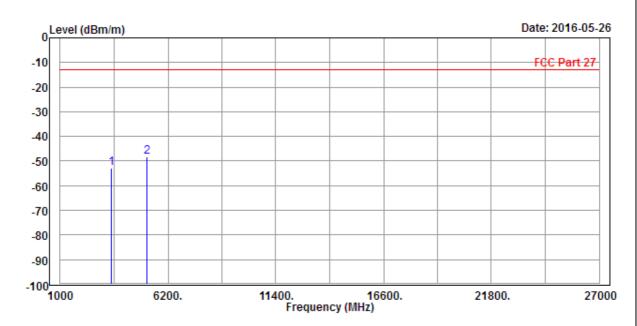
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band4(3M)

Mode : LTE Band4(
Plan : Y-Plan
Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3444.000 5197.500							Horizontal Horizontal





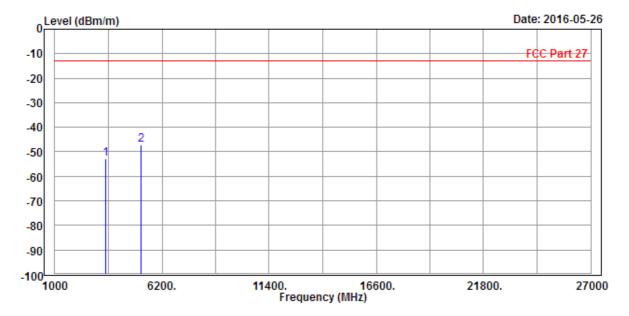
EUT : Baifone P4905 Mode : LTE Band4(3M)

Plan : Y-Plan Test By : Alex Chen

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
	3444.000 5197.500							Vertical Vertical



CHANNEL BANDWIDTH: 5MHz / QPSK



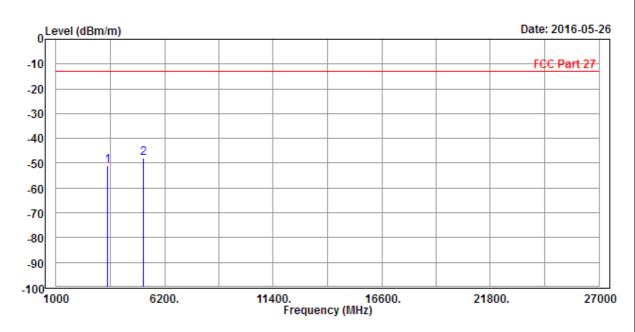
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band4(5M)

Plan : Y-Plan Test By : Alex Chen

		Freq	Level		Line		Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3444.000 5197.500							Horizontal Horizontal





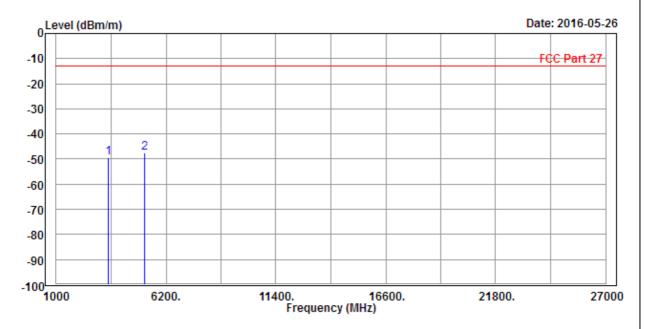
EUT : Baifone P4905 Mode : LTE Band4(5M)

Plan : Y-Plan Test By : Alex Chen

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
	3444.000 5197.500							Vertical Vertical



CHANNEL BANDWIDTH: 10MHz / QPSK



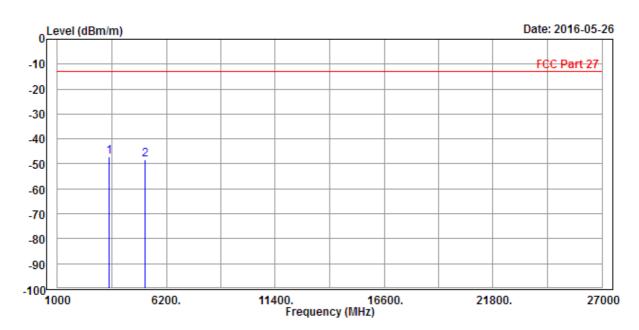
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band4(10M)

Plan : X-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3444.000 5197.500							Horizontal Horizontal





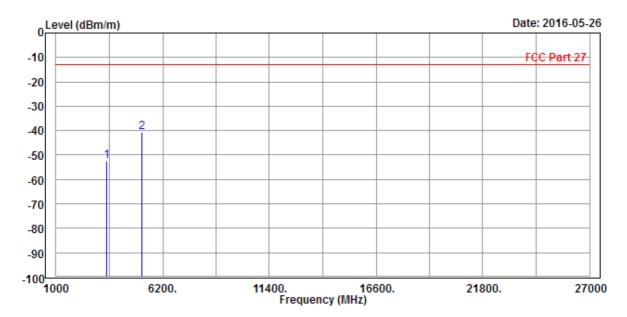
EUT : Baifone P4905 Mode : LTE Band4(10M) Plan : X-Plan

Plan : X-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
_		3444.000 5197.500							Vertical Vertical



CHANNEL BANDWIDTH: 15MHz / QPSK



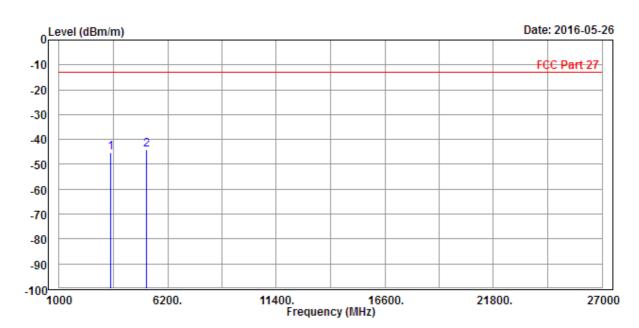
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band4(15M)

Plan : Y-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3444.000 5197.500							Horizontal Horizontal





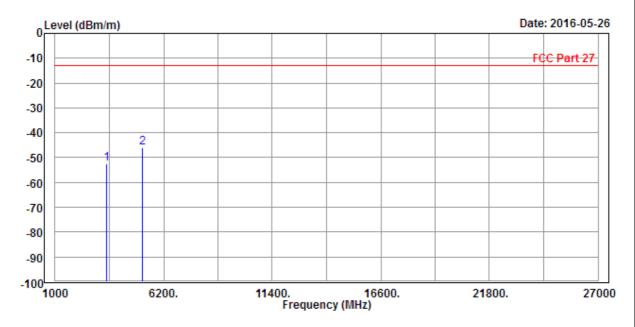
EUT : Baifone P4905 Mode : LTE Band4(15M) Plan : Y-Plan

Plan : Y-Plan Test By : Alex Chen

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase	
-	MHz	dBm/m	dBm	dBm/m	dB	dB/m			
	3444.000 5197.500							Vertical Vertical	



CHANNEL BANDWIDTH: 20MHz / QPSK



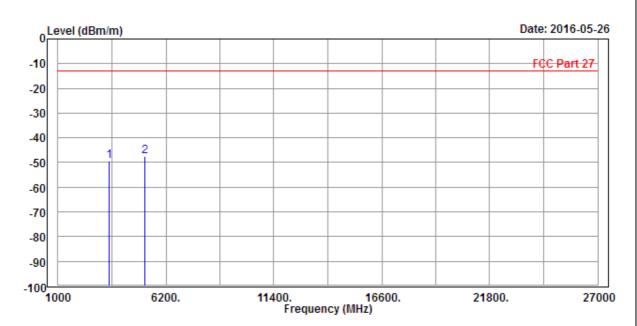
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band4(20M)

Plan : Y-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
_		3444.000 5197.500							Horizontal Horizontal





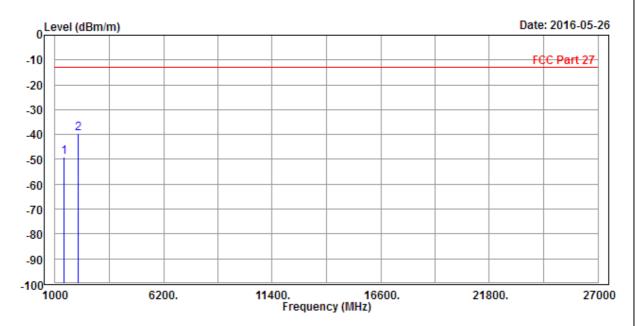
EUT : Baifone P4905 Mode : LTE Band4(20M)

Plan : Y-Plan Test By : Alex Chen

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
	3444.000 5197.500							Vertical Vertical



LTE Band 17
CHANNEL BANDWIDTH: 5MHz / QPSK

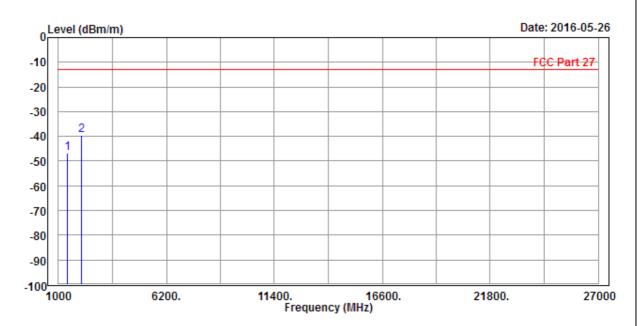


EUT : Baifone P4905 Mode : LTE Band17(5M)

Plan : X-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		1416.000 2130.000							Horizontal Horizontal





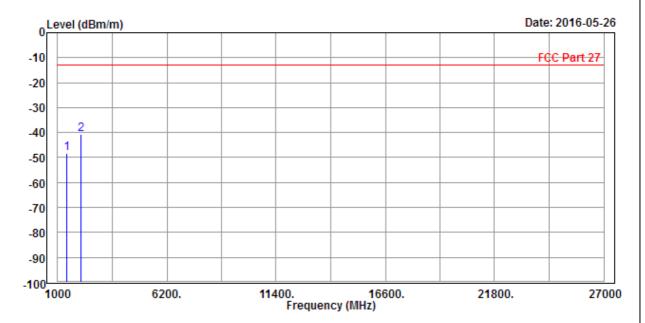
EUT : Baifone P4905 Mode : LTE Band17(5M)

Plan : X-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase	
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m			
1		1416.000 2130.000							Vertical Vertical	



CHANNEL BANDWIDTH: 10MHz / QPSK



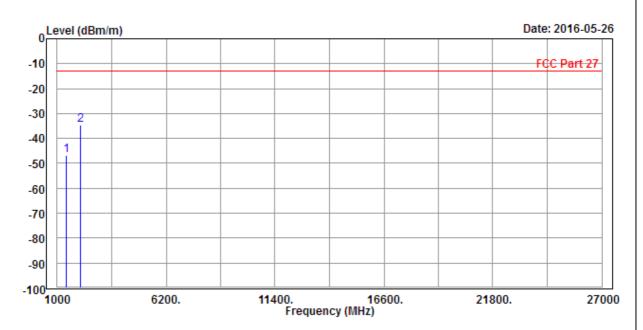
Condition: FCC Part 27 3m EIRP_1G-18G-_20160505-EMC012645B+3117-FCC

EUT : Baifone P4905 Mode : LTE Band17(10M)

Plan : X-Plan Test By : Alex Chen

					Limit				
		Freq	Level	Level	Line	Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		1416.000	-48.16	-41.44	-13.00	-35.16	-6.72	Peak	Horizontal
2	PP	2130.000	-40.73	-38.80	-13.00	-27.73	-1.93	Peak	Horizontal





EUT : Baifone P4905 Mode : LTE Band17(10M)

Plan : X-Plan Test By : Alex Chen

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		1416.000							Vertical Vertical



5	Pictures of Test Arrangements
PI	ease refer to the attached file (Test Setup Photo).



Appendix - Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Hsin Chu EMC/RF Lab/Telecom Lab

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The address and road map of all our labs can be found in our web site also.

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