

# FCC TEST REPORT (PART 24)

**REPORT NO.:** RF140225C37

**MODEL NO.:** E580P

FCC ID: UZI-580P

**RECEIVED:** Feb. 25, 2014

**TESTED:** Mar. 11 ~ Mar. 18, 2014

**ISSUED:** Mar. 24, 2014

APPLICANT: BandRich Inc.

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11493, Taiwan (R.O.C.)

**ISSUED BY:** Bureau Veritas Consumer Products Services

(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,

New Taipei City, Taiwan (R.O.C.)

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei

Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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Report No.: RF140225C37 1 of 70 Report Format Version 5.0.0



## **TABLE OF CONTENTS**

RELEAS	E CONTROL RECORD	
1	CERTIFICATION	
2	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY	
2.2	TEST INSTRUMENTS	
3	GENERAL INFORMATION	
3.1	GENERAL DESCRIPTION OF EUT	7
3.2	CONFIGURATION OF SYSTEM UNDER TEST	
3.3	DESCRIPTION OF SUPPORT UNITS	
3.4	DESCRIPTION OF TEST MODES	
3.5	EUT OPERATING CONDITIONS	
3.6	GENERAL DESCRIPTION OF APPLIED STANDARDS	12
4	TEST TYPES AND RESULTS	
4.1	OUTPUT POWER MEASUREMENT	13
4.1.1	LIMITS OF OUTPUT POWER MEASUREMENT	
4.1.2	TEST PROCEDURES	13
4.1.3	TEST SETUP	14
4.1.4	TEST RESULTS	15
4.2	FREQUENCY STABILITY MEASUREMENT	23
4.2.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	23
4.2.2	TEST PROCEDURE	23
4.2.3	TEST SETUP	23
4.2.4	TEST RESULTS	24
4.3	OCCUPIED BANDWIDTH MEASUREMENT	
4.3.1	TEST PROCEDURES	25
4.3.2	TEST SETUP	25
4.3.3	TEST RESULTS	26
4.4	PEAK TO AVERAGE RATIO	
4.4.1	LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT	29
4.4.2	TEST SETUP	29
4.4.3	TEST PROCEDURES	29
4.4.4	TEST RESULTS	30
4.5	BAND EDGE MEASUREMENT	33
4.5.1	LIMITS OF BAND EDGE MEASUREMENT	33
4.5.2	TEST SETUP	33
4.5.3	TEST PROCEDURES	33
4.5.4	TEST RESULTS	
4.6	CONDUCTED SPURIOUS EMISSIONS	38
4.6.1	LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT	38
4.6.2	TEST PROCEDURE	38
4.6.3	TEST SETUP	38
4.6.4	TEST RESULTS	
4.7	RADIATED EMISSION MEASUREMENT	
4.7.1	LIMITS OF RADIATED EMISSION MEASUREMENT	54
4.7.2	TEST PROCEDURES	
4.7.3	DEVIATION FROM TEST STANDARD	
4.7.4	TEST SETUP	55
4.7.5	TEST RESULTS	56
5	PHOTOGRAPHS OF THE TEST CONFIGURATION	68
6	INFORMATION ON THE TESTING LABORATORIES	
7	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO TH	
	EUT BY THE LAB	70



### **RELEASE CONTROL RECORD**

ISSUE NO. REASON FOR CHANGE		DATE ISSUED
RF140225C37	Original release	Mar. 24, 2014

Report No.: RF140225C37 3 of 70 Report Format Version 5.0.0



### 1 CERTIFICATION

PRODUCT: LTE Outdoor CPE

**MODEL NO.:** E580P

**BRAND:** BandLuxe

APPLICANT: BandRich Inc.

**TEST SAMPLE: ENGINEERING SAMPLE** 

**TESTED:** Mar. 11 ~ Mar. 18, 2014

TEST STANDARDS: FCC Part 24, Subpart E

FCC Part 2

The above equipment (model: E580P) 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: , DATE: Mar. 24, 2014

Pettie Chen / Senior Specialist

APPROVED BY: Year 15M , DATE: Mar. 24, 2014

Ivan Tsai / Project Engineer



### 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1046 24.232	Equivalent isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth		Meet the requirement of limit.
24.238(b)	24.238(b) Band Edge Measurements		Meet the requirement of limit.
2.1051 24.238 Conducted Spurious Emissions		PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions		Meet the requirement of limit. Minimum passing margin is –17.20dB at 3703.00MHz.

### 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
	30MHz ~ 200MHz	3.19 dB
Dadiated emissions	200MHz ~1000MHz	3.21 dB
Radiated emissions	1GHz ~ 18GHz	2.26 dB
	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.

Report No.: RF140225C37 5 of 70 Report Format Version 5.0.0



### 2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Dec. 18, 2013	Dec. 17, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 05, 2014	Jan. 04, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 28, 2013	Oct. 27, 2014
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH CO2000		019303	NA	NA
Turn Table BV ADT	I 11100		NA	NA
Turn Table Controller BV ADT			NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Sep. 09, 2013	Sep. 08, 2014
JFW 20dB attenuation	50HF-020-SMA	NA NA		NA

**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 test was performed in HwaYa Chamber 4.
- 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 4. The FCC Site Registration No. is 460141.
- 5. The IC Site Registration No. is IC7450F-4.



### **3 GENERAL INFORMATION**

### 3.1 GENERAL DESCRIPTION OF EUT

EUT	LTE Outdoor CPE				
MODEL NO.	E580P				
POWER SUPPLY	48Vdc (PoE)				
MODUL ATION TYPE	CDMA	QPSK, OQPSK, HPSK			
MODULATION TYPE	LTE	QPSK, 16QAM			
	CDMA	1851.25MHz ~ 1908.75MHz			
	LTE Band 25 (Channel Bandwidth: 3MHz)	1851.5MHz ~ 1913.5MHz			
FREQUENCY RANGE	LTE Band 25 (Channel Bandwidth: 5MHz)	1852.5MHz ~ 1912.5MHz			
	LTE Band 25 (Channel Bandwidth: 10MHz)	1855.0MHz ~ 1910.0MHz			
	CDMA	376.704mW (25.76dBm)			
	LTE Band 25 (Channel Bandwidth: 3MHz)	361.410mW (25.58dBm)			
MAX. EIRP POWER	LTE Band 25 (Channel Bandwidth: 5MHz)	299.226mW (24.76dBm)			
	LTE Band 25 (Channel Bandwidth: 10MHz)	308.319mW (24.89dBm)			
	CDMA	1M29F9W			
	LTE Band 25	QPSK: 2M73G7D			
EMISSION	(Channel Bandwidth: 3MHz)	16QAM: 2M73W7D			
EMISSION DESIGNATOR	LTE Band 25	QPSK: 4M50G7D			
	(Channel Bandwidth: 5MHz)	16QAM: 4M50W7D			
	LTE Band 25	QPSK: 9M00G7D			
	(Channel Bandwidth: 10MHz)	16QAM: 8M97W7D			
CATEGORY	LTE: 3				
ANTENNA TYPE	Embedded high gain directional antenna with 3dBi gain (TX) Embedded high gain directional antenna with 7dBi gain (RX)				
ANTENNA CONNECTOR	IPEX				
DATA CABLE	NA				
I/O PORTS	Refer to user's manual				
ACCESSORY DEVICES	NA				

Report No.: RF140225C37 7 of 70 Report Format Version 5.0.0



### NOTE:

1. The EUT uses following PoE.

Brand	ALFA
Model	APOE01(F)
Input Power	48Vdc

Adapter of PoE

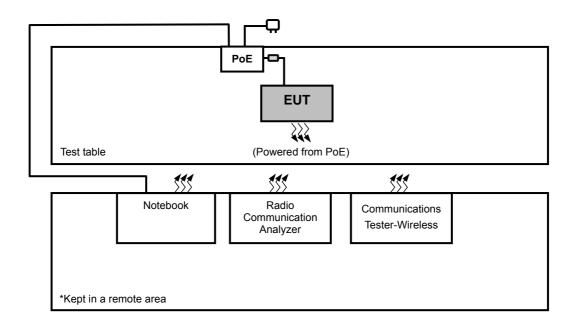
1445710. 0.1. 0.2				
Brand	DVE			
Model	DSA-42D-48 1 480100 1			
Input Power	100-240V~ 50/60Hz 1.2A			
Output Power	+48V / 1A			
Dower Line	AC: 0.6m non-shielded power cord without core			
Power Line	DC: 1.5m cable with one core attached on adapter			

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

Report No.: RF140225C37 8 of 70 Report Format Version 5.0.0



### 3.2 CONFIGURATION OF SYSTEM UNDER TEST



### 3.3 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	Notebook	DELL	E5430	FKKCYW1	FCC DoC Approved
2	Communications Tester-Wireless	Agilent	8960 Series 10	MY50260642	NA
3	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	NA

#### NOTE:

- 1. All power cords of the above support units are non-shielded (1.8m).
- 2. Items 2, 3 act as communication partners to transfer data.



### 3.4 DESCRIPTION OF TEST MODES

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 cases were found when positioned on **Y-plane**. Following channel(s) was (were) selected for the final test as listed below:

#### **CDMA**

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	EIRP	25 to 1175	25, 600, 1175	CDMA
-	FREQUENCY STABILITY	25 to 1175	600	CDMA
-	OCCUPIED BANDWIDTH	25 to 1175	25, 600, 1175	CDMA , EVDO
-	PEAK TO AVERAGE RATIO	25 to 1175	25, 600, 1175	CDMA , EVDO
-	BAND EDGE	25 to 1175	25, 1175	CDMA , EVDO
-	CONDCUDETED EMISSION	25 to 1175	600	CDMA , EVDO
-	RADIATED EMISSION Below 1GHz	25 to 1175	25	CDMA
-	RADIATED EMISSION Above 1GHz	25 to 1175	25, 600, 1175	CDMA

Report No.: RF140225C37 10 of 70 Report Format Version 5.0.0



### LTE Band 25

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
	26055 to 26675	26055, 26365, 26675	3MHz	QPSK	1 RB / 0 RB Offset
EIRP	26065 to 26665	26065, 26365, 26665	5MHz	QPSK	1 RB / 0 RB Offset
	26090 to 26640	26090, 26365, 26640	10MHz	QPSK	1 RB / 0 RB Offset
	26055 to 26675	26365	3MHz	QPSK	1 RB / 0 RB Offset
FREQUENCY STABILITY	26065 to 26665	26365	5MHz	QPSK	1 RB / 0 RB Offset
	26090 to 26640	26365	10MHz	QPSK	1 RB / 0 RB Offset
	26055 to 26675	26055, 26365, 26675	3MHz	QPSK/16QAM	15 RB / 0RB Offset
OCCUPIED BANDWIDTH	26065 to 26665	26065, 26365, 26665	5MHz	QPSK/16QAM	25 RB / 0RB Offset
	26090 to 26640	26090, 26365, 26640	10MHz	QPSK/16QAM	50 RB / 0RB Offset
	26055 to 26675	26055, 26365, 26675	3MHz	QPSK/16QAM	1 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	26065 to 26665	26065, 26365, 26665	5MHz	QPSK/16QAM	1 RB / 0 RB Offset
RATIO	26090 to 26640	26090, 26365, 26640	10MHz	QPSK/16QAM	1 RB / 0 RB Offset
			3MHz	QPSK	15 RB / 0RB Offset
	26055 to 26675	26055, 26675			1 RB / 0RB Offset
					1RB / 14RB Offset
				QPSK QPSK	25 RB / 0RB Offset
BAND EDGE	26065 to 26665	26065, 26665	5MHz 10MHz		1 RB / 0RB Offset
					1RB / 24RB Offset
					50 RB / 0RB Offset
	26090 to 26640	26090, 26640			1 RB / 0RB Offset
					1RB / 49RB Offset
CONDOUDETED	26055 to 26675	26055, 26365, 26675	3MHz	QPSK	1 RB / 0 RB Offset
CONDCUDETED EMISSION	26065 to 26665	26065, 26365, 26665	5MHz	QPSK	1 RB / 0 RB Offset
EIVIISSION	26090 to 26640	26090, 26365, 26640	10MHz	QPSK	1 RB / 0 RB Offset
DADIATED EMISSION	26055 to 26675	26055	3MHz	QPSK	1 RB / 0 RB Offset
RADIATED EMISSION Below 1GHz	26065 to 26665	26065	5MHz	QPSK	1 RB / 0 RB Offset
DEIOW TOTAL	26090 to 26640	26090	10MHz	QPSK	1 RB / 0 RB Offset
DADIATED EMIGGICAL	26055 to 26675	26055, 26365, 26675	3MHz	QPSK	1 RB / 0 RB Offset
RADIATED EMISSION Above 1GHz	26065 to 26665	26065, 26365, 26665	5MHz	QPSK	1 RB / 0 RB Offset
ADOVE IGHZ	26090 to 26640	26090, 26365, 26640	10MHz	QPSK	1 RB / 0 RB Offset

### **TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
EIRP	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
FREQUENCY STABILITY	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
OCCUPIED BANDWIDTH	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
PEAK TO AVERAGE RATIO	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
BAND EDGE	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
CONDCUDETED EMISSION	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz	Brad Tung



#### 3.5 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

### 3.6 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 24 ANSI/TIA/EIA-603-C 2004

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

Report No.: RF140225C37 12 of 70 Report Format Version 5.0.0



### 4 TEST TYPES AND RESULTS

### 4.1 OUTPUT POWER MEASUREMENT

### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP

#### 4.1.2 TEST PROCEDURES

#### **EIRP MEASUREMENT:**

- a. All measurements were done at low, middle and high operational frequency range. RWB and VBW is 5MHz for CDMA mode and 10MHz for LTE mode.
- b. 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.
- 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 c. Record the power level of S.G
- d. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.

### **CONDUCTED POWER MEASUREMENT:**

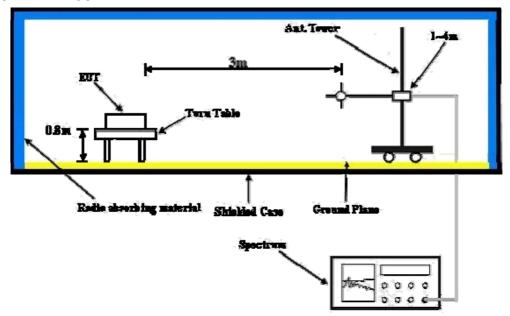
The EUT was set up for the maximum power with CDMA / LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Report No.: RF140225C37 13 of 70 Report Format Version 5.0.0



### 4.1.3 TEST SETUP

### **EIRP POWER 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

### **CONDUCTED OUTPUT POWER (dBm)**

Band		CDMA	
Channel	25	600	1175
Frequency	1851.25	1880	1908.75
RC1+SO55	25.29	25.28	24.75
RC3+SO55	25.23	25.26	24.72
RC3+SO32(+ F-SCH)	25.30	25.29	24.77
RC3+SO32(+SCH)	25.28	25.25	24.75
RTAP 153.6	24.91	25.03	24.92
RETAP 4096	24.95	24.06	24.97

Report No.: RF140225C37 15 of 70 Report Format Version 5.0.0



				LTE Band	25			
BW	Modulation	СН	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
		26055	1851.5	1	0	0	23.30	23.01
		26365	1882.5	1	0	0	23.30	23.05
		26675	1913.5	1	0	0	23.30	21.20
		26055	1851.5	1	7	0	23.30	23.03
		26365	1882.5	1	7	0	23.30	23.06
		26675	1913.5	1	7	0	23.30	21.36
		26055	1851.5	1	14	0	23.30	22.87
		26365	1882.5	1	14	0	23.30	22.91
		26675	1913.5	1	14	0	23.30	21.14
		26055	1851.5	8	0	1	23.30	21.90
	QPSK	26365	1882.5	8	0	1	23.30	21.94
		26675	1913.5	8	0	1	23.30	20.19
		26055	1851.5	8	3	1	23.30	21.99
		26365	1882.5	8	3	1	23.30	22.13
		26675	1913.5	8	3	1	23.30	20.96
		26055	1851.5	8	7	1	23.30	21.90
		26365	1882.5	8	7	1	23.30	21.95
		26675	1913.5	8	7	1	23.30	20.94
		26055	1851.5	15	0	1	23.30	21.98
		26365	1882.5	15	0	1	23.30	22.04
2 MII-		26675	1913.5	15	0	1	23.30	20.98
3 MHz		26055	1851.5	1	0	1	23.30	22.01
		26365	1882.5	1	0	1	23.30	22.06
		26675	1913.5	1	0	1	23.30	20.31
		26055	1851.5	1	7	1	23.30	22.07
		26365	1882.5	1	7	1	23.30	22.11
		26675	1913.5	1	7	1	23.30	20.35
		26055	1851.5	1	14	1	23.30	22.09
		26365	1882.5	1	14	1	23.30	22.10
		26675	1913.5	1	14	1	23.30	20.38
		26055	1851.5	8	0	2	23.30	20.87
	16QAM	26365	1882.5	8	0	2	23.30	20.90
		26675	1913.5	8	0	2	23.30	19.19
		26055	1851.5	8	3	2	23.30	20.96
		26365	1882.5	8	3	2	23.30	20.99
		26675	1913.5	8	3	2	23.30	19.23
		26055	1851.5	8	7	2	23.30	20.97
	Ī	26365	1882.5	8	7	2	23.30	20.10
		26675	1913.5	8	7	2	23.30	19.28
		26055	1851.5	15	0	2	23.30	21.08
		26365	1882.5	15	0	2	23.30	21.13
		26675	1913.5	15	0	2	23.30	19.30



				LTE Band 2	25			
BW	Modulation	СН	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
		26065	1852.5	1	0	0	23.30	22.90
		26365	1882.5	1	0	0	23.30	22.91
		26665	1912.5	1	0	0	23.30	21.53
		26065	1852.5	1	12	0	23.30	22.86
		26365	1882.5	1	12	0	23.30	22.94
		26665	1912.5	1	12	0	23.30	21.50
		26065	1852.5	1	24	0	23.30	22.39
		26365	1882.5	1	24	0	23.30	22.44
		26665	1912.5	1	24	0	23.30	21.00
		26065	1852.5	12	0	1	23.30	21.91
	QPSK	26365	1882.5	12	0	1	23.30	21.95
		26665	1912.5	12	0	1	23.30	20.54
		26065	1852.5	12	6	1	23.30	21.90
		26365	1882.5	12	6	1	23.30	21.91
		26665	1912.5	12	6	1	23.30	20.56
		26065	1852.5	12	13	1	23.30	21.88
		26365	1882.5	12	13	1	23.30	21.91
		26665	1912.5	12	13	1	23.30	20.52
		26065	1852.5	25	0	1	23.30	21.87
		26365	1882.5	25	0	1	23.30	21.90
5 NALL-		26665	1912.5	25	0	1	23.30	20.47
5 MHz		26065	1852.5	1	0	1	23.30	21.77
		26365	1882.5	1	0	1	23.30	21.81
		26665	1912.5	1	0	1	23.30	20.44
		26065	1852.5	1	12	1	23.30	21.80
		26365	1882.5	1	12	1	23.30	21.83
		26665	1912.5	1	12	1	23.30	20.47
		26065	1852.5	1	24	1	23.30	21.63
		26365	1882.5	1	24	1	23.30	21.65
		26665	1912.5	1	24	1	23.30	20.19
		26065	1852.5	12	0	2	23.30	20.99
	16QAM	26365	1882.5	12	0	2	23.30	21.11
		26665	1912.5	12	0	2	23.30	19.74
		26065	1852.5	12	6	2	23.30	20.89
		26365	1882.5	12	6	2	23.30	20.91
		26665	1912.5	12	6	2	23.30	19.57
		26065	1852.5	12	13	2	23.30	20.90
		26365	1882.5	12	13	2	23.30	20.93
		26665	1912.5	12	13	2	23.30	19.51
		26065	1852.5	25	0	2	23.30	20.91
		26365	1882.5	25	0	2	23.30	20.95
		26665	1912.5	25	0	2	23.30	19.61



				LTE Band	25			
BW	Modulation	СН	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
		26090	1855	1	0	0	23.30	22.59
		26365	1882.5	1	0	0	23.30	23.07
		26640	1910	1	0	0	23.30	22.94
		26090	1855	1	24	0	23.30	22.70
		26365	1882.5	1	24	0	23.30	23.19
		26640	1910	1	24	0	23.30	23.11
		26090	1855	1	49	0	23.30	22.17
		26365	1882.5	1	49	0	23.30	22.64
		26640	1910	1	49	0	23.30	22.51
		26090	1855	25	0	1	23.30	21.85
	QPSK	26365	1882.5	25	0	1	23.30	22.39
		26640	1910	25	0	1	23.30	22.24
		26090	1855	25	12	1	23.30	21.85
		26365	1882.5	25	12	1	23.30	22.41
		26640	1910	25	12	1	23.30	22.26
		26090	1855	25	25	1	23.30	21.86
		26365	1882.5	25	25	1	23.30	22.39
		26640	1910	25	25	1	23.30	22.24
		26090	1855	50	0	1	23.30	21.76
		26365	1882.5	50	0	1	23.30	22.29
40 MH-		26640	1910	50	0	1	23.30	22.19
10 MHz		26090	1855	1	0	1	23.30	21.97
		26365	1882.5	1	0	1	23.30	22.46
		26640	1910	1	0	1	23.30	22.34
		26090	1855	1	24	1	23.30	22.14
		26365	1882.5	1	24	1	23.30	22.69
		26640	1910	1	24	1	23.30	22.55
		26090	1855	1	49	1	23.30	21.54
		26365	1882.5	1	49	1	23.30	22.06
		26640	1910	1	49	1	23.30	21.95
		26090	1855	25	0	2	23.30	21.72
	16QAM	26365	1882.5	25	0	2	23.30	22.28
		26640	1910	25	0	2	23.30	22.15
		26090	1855	25	12	2	23.30	20.89
		26365	1882.5	25	12	2	23.30	20.47
		26640	1910	25	12	2	23.30	20.35
		26090	1855	25	25	2	23.30	20.88
		26365	1882.5	25	25	2	23.30	20.46
		26640	1910	25	25	2	23.30	20.35
		26090	1855	50	0	2	23.30	20.80
		26365	1882.5	50	0	2	23.30	20.41
		26640	1910	50	0	2	23.30	20.33



### **EIRP POWER**

### **CDMA**

MODE TX channel 25										
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1851.25	-13.85	24.69	1.07	25.76	33.00	-7.24			
	Α	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1851.25	-17.32	19.30	1.07	20.37	33.00	-12.63			

MODE TX channel 600											
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	1880.00	-15.23	23.49	1.12	24.61	33.00	-8.39				
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	1880.00	-18.12	18.14	1.12	19.26	33.00	-13.74				

MOD	ODE TX channel 1175									
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1908.75	-16.45	22.65	1.11	23.76	33.00	-9.24			
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1908.75	-17.95	17.95	1.11	19.06	33.00	-13.94			

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).



### LTE Band 25 (Channel Bandwidth 3MHz)

MODE TX channel 26055											
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	1851.50	-14.03	24.51	1.07	25.58	33.00	-7.42				
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	1851.50	-16.85	19.77	1.07	20.84	33.00	-12.16				

MODE TX channel 26365										
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1882.50	-14.33	24.42	1.12	25.54	33.00	-7.46			
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1882.50	-16.98	19.25	1.12	20.37	33.00	-12.63			

MODE TX channel 26675										
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1913.50	-15.75	22.85	0.77	23.62	33.00	-9.38			
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	1913.50	-17.75	19.91	0.77	20.68	33.00	-12.32			

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Report No.: RF140225C37 20 of 70 Report Format Version 5.0.0



### LTE Band 25 (Channel Bandwidth 5MHz)

MODE TX channel 26065											
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	1852.50	-14.86	23.69	1.07	24.76	33.00	-8.24				
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	1852.50	-17.18	19.43	1.07	20.50	33.00	-12.50				

MODE TX channel 26365								
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No. I Freq. (MHz)			Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	1882.50	-15.64	23.11	1.12	24.23	33.00	-8.77	
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M		
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1882.50	-17.96	18.27	1.12	19.39	33.00	-13.61	

MOD	MODE TX channel 26665						
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.   Freg. (MHz)		Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB) EIRP (dBm)		Limit (dBm)	Margin (dB)
1	1912.50	-16.56	22.04	0.77	22.81	33.00	-10.19
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M	
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1912.50	-18.26	19.39	0.77	20.16	33.00	-12.84

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Report No.: RF140225C37 21 of 70 Report Format Version 5.0.0



### LTE Band 25 (Channel Bandwidth 10MHz)

MOD	E	TX char	TX channel 26090					
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1855.00	-14.75	23.81	1.08	24.89	33.00	-8.11	
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M		
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1855.00	-17.15	19.42	1.08	20.50	33.00	-12.50	

MOD	MODE TX channel 26365							
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1882.50	-15.42	23.33	1.12	24.45	33.00	-8.55	
	Α	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M		
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1882.50	-17.75	18.48	1.12	19.60	33.00	-13.40	

MOD	E	TX channel 26640						
	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1910.00	-16.54	22.07	0.77	22.84	33.00	-10.16	
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M		
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	
1	1910.00	-17.96	19.68	0.77	20.45	33.00	-12.55	

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Report No.: RF140225C37 22 of 70 Report Format Version 5.0.0



#### 4.2 FREQUENCY STABILITY MEASUREMENT

#### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

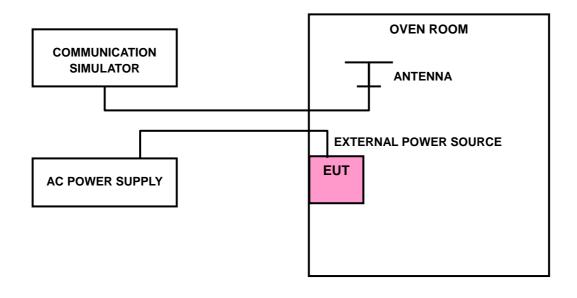
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### 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 AC 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  $\pm 0.5^{\circ}$ 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



Report No.: RF140225C37 23 of 70 Report Format Version 5.0.0



### 4.2.4 TEST RESULTS

### FREQUENCY ERROR VS. VOLTAGE

	FREQUENCY ERROR (ppm)						
VOLTAGE (Volts)	LTE Band 25						
( , , ,	CDMA	3MHz	5MHz	10MHz	(ppm)		
132	-0.007	-0.007	-0.007	-0.010	2.5		
120	-0.006	-0.007	-0.007	-0.008	2.5		
108	-0.006	-0.008	-0.007	-0.009	2.5		

**NOTE:** The applicant defined the normal working voltage of the battery is from 108Vac to 132Vac.

### FREQUENCY ERROR vs. TEMPERATURE

		FREQUENCY EF	RROR (ppm)				
<b>TEMP.</b> (℃)	CDMA	LTE Band 25					
	CDIMA	3MHz	5MHz	10MHz	(ppm)		
60	-0.013	-0.012	-0.013	-0.016	2.5		
50	-0.011	-0.013	-0.012	-0.015	2.5		
40	-0.011	-0.012	-0.010	-0.013	2.5		
30	-0.010	-0.010	-0.011	-0.009	2.5		
20	-0.006	-0.007	-0.007	-0.008	2.5		
10	-0.010	-0.008	-0.008	-0.011	2.5		
0	-0.012	-0.013	-0.010	-0.013	2.5		
-10	-0.014	-0.014	-0.014	-0.019	2.5		
-20	-0.016	-0.018	-0.018	-0.022	2.5		
-30	-0.016	-0.016	-0.012	-0.024	2.5		
-40	-0.019	-0.017	-0.016	-0.023	2.5		

Report No.: RF140225C37 24 of 70 Report Format Version 5.0.0

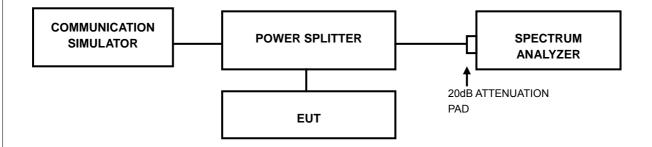


#### 4.3 OCCUPIED BANDWIDTH MEASUREMENT

### 4.3.1 TEST PROCEDURES

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

### 4.3.2 TEST SETUP



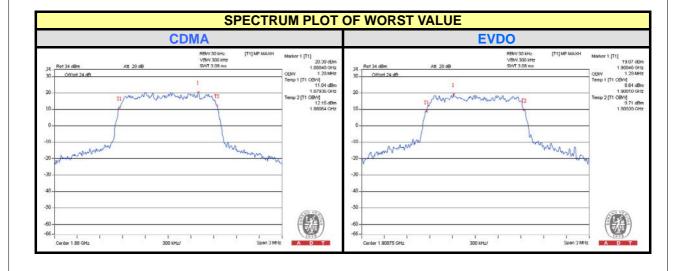
Report No.: RF140225C37 25 of 70 Report Format Version 5.0.0



### 4.3.3 TEST RESULTS

### **CDMA**

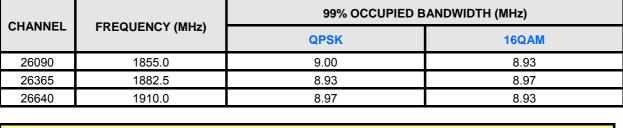
CHANNEL	EDECLIENCY (MIL-)	99% OCCUPIED BANDWIDTH (MHz)		
CHANNEL	FREQUENCY (MHz)	CDMA	EVDO	
25	1851.25	1.28	1.28	
600	1880.00	1.29	1.28	
1175	1908.75	1.28	1.29	

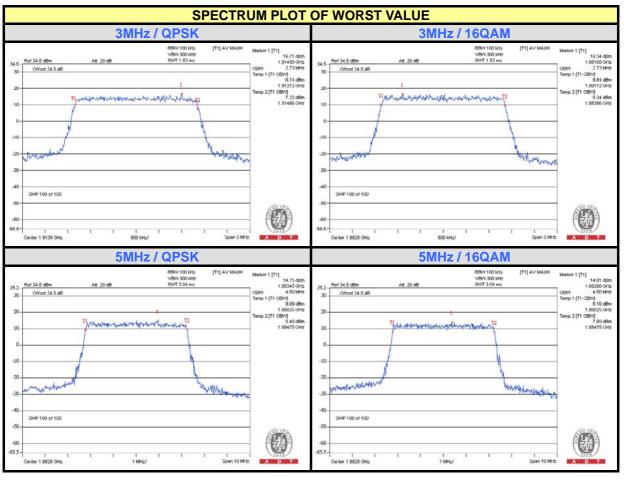




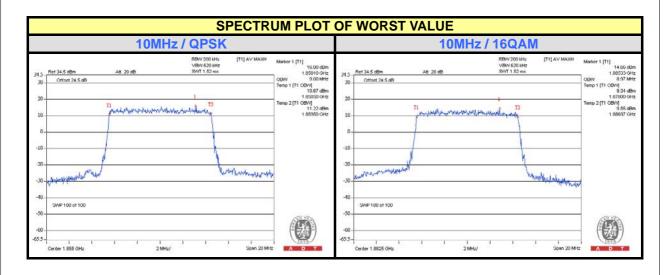
### LTE Band 25

C	CHANNEL BANDWIDTH 3MHz				CHANNEL BANDWIDTH 5MHz			
CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)		
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM	
26055	1851.5	2.72	2.72	26065	1852.5	4.48	4.48	
26365	1882.5	2.73	2.73	26365	1882.5	4.50	4.50	
26675	1913.5	2.73	2.72	26665	1912.5	4.48	4.48	
	CHANNEL BANDWIDTH 10MHz							
	IEL FREQUENCY (MHz)			99% OCCUPIED BANDWIDTH (MHz)				
CHANNEL								









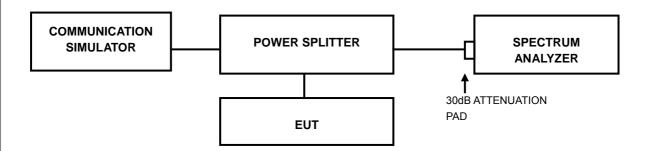


### 4.4 PEAK TO AVERAGE RATIO

### 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%.

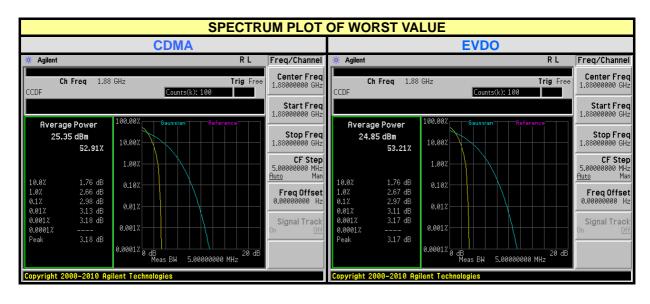
Report No.: RF140225C37 29 of 70 Report Format Version 5.0.0



### 4.4.4 TEST RESULTS

#### **CDMA**

CHANNEL	EDECUENCY (MLL)	PEAK TO AVERAGE RATIO (dB)		
	FREQUENCY (MHz)	CDMA	EVDO	
25	1851.25	2.76	2.73	
600	1880.00	2.98	2.97	
1175	1908.75	2.94	2.92	



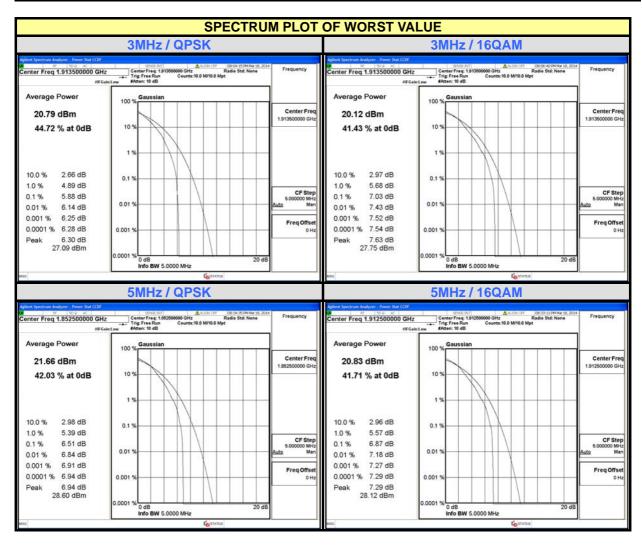


#### LTE Band 25

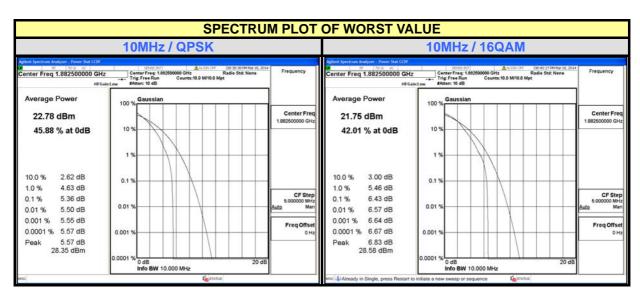
CHANNEL BANDWIDTH 3MHz				CHANNEL BANDWIDTH 5MHz				
CHANNEL	FREQUENCY		TO AVERAGE RATIO (dB) CHA		FREQUENCY	PEAK TO AVERAGE RATIO (dB)		
	(MHz)	QPSK	16QAM		(MHz)	QPSK 16QAM		
26055	1851.5	5.28	6.49	26065	1852.5	6.51	6.52	
26365	1882.5	5.49	6.67	26365	1882.5	5.48	6.68	
26675	1913.5	5.88	7.03	26665	1912.5	5.74	6.87	

#### **CHANNEL BANDWIDTH 10MHz**

		PEAK TO AVERAGE RATIO (dB)				
CHANNEL FREQUENCY (MHz		QPSK	16QAM			
26090	1855.0	5.30	6.23			
26365	1882.5	5.36	6.43			
26640	1910.0	5.16	6.00			







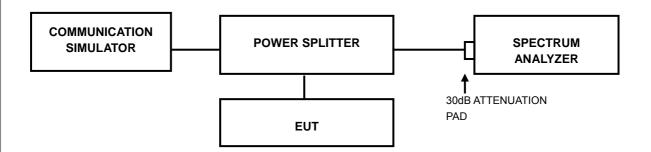


### 4.5 BAND EDGE MEASUREMENT

#### 4.5.1 LIMITS OF BAND EDGE MEASUREMENT

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

#### 4.5.2 TEST SETUP



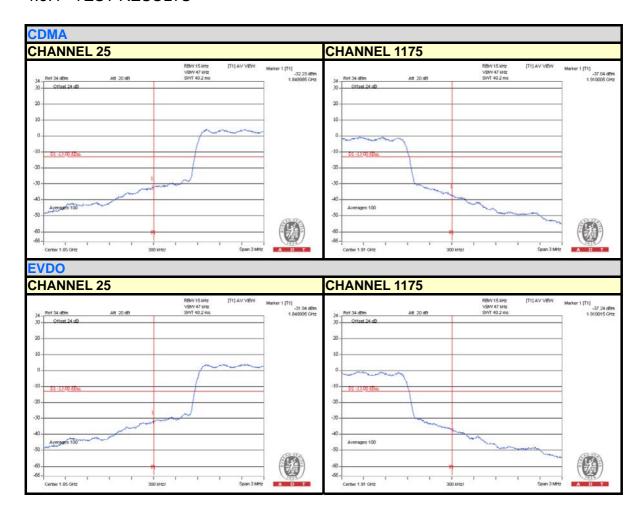
### 4.5.3 TEST PROCEDURES

- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 3MHz. RB of the spectrum at least 1% of emission bandwidth and VBW  $\geq$  3RBW (CDMA/EVDO).
- c. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum at least 1% of emission bandwidth and VBW  $\geq$  3RBW (LTE ).
- d. Record the max trace plot into the test report.

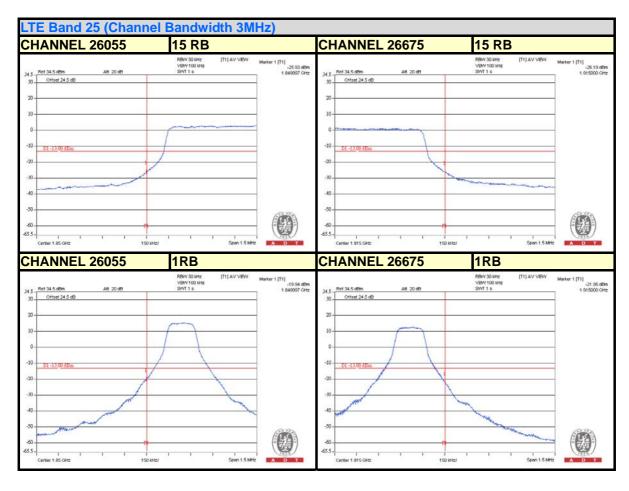
Report No.: RF140225C37 33 of 70 Report Format Version 5.0.0



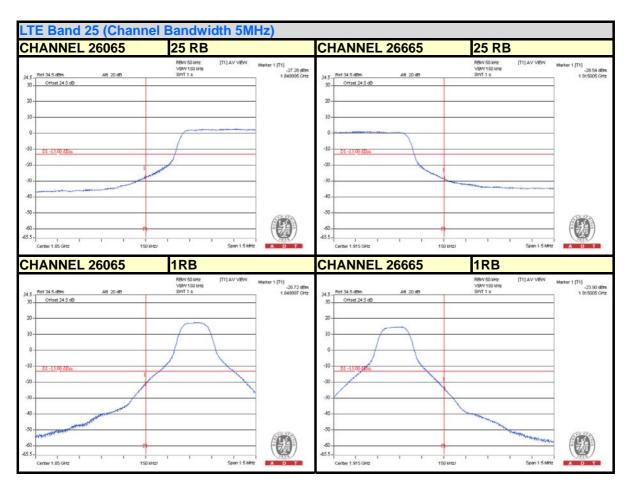
### 4.5.4 TEST RESULTS



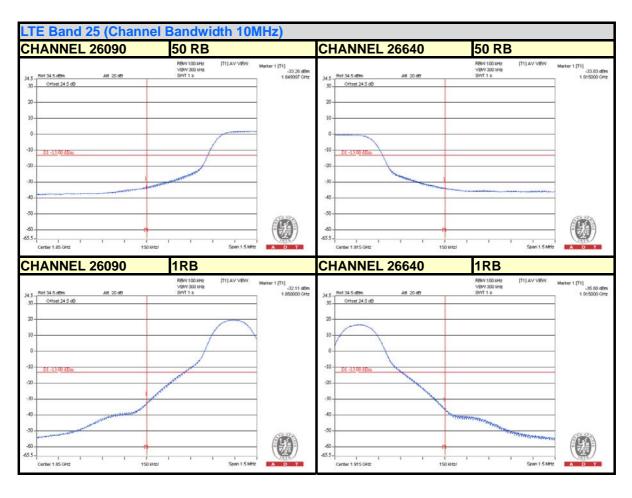














## 4.6 CONDUCTED SPURIOUS EMISSIONS

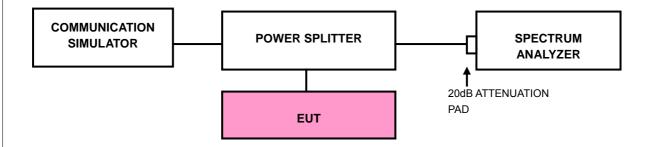
## 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P) dB$ . The emission limit 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 9kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

## 4.6.3 TEST SETUP



Report No.: RF140225C37 38 of 70 Report Format Version 5.0.0



## 4.6.4 TEST RESULTS



















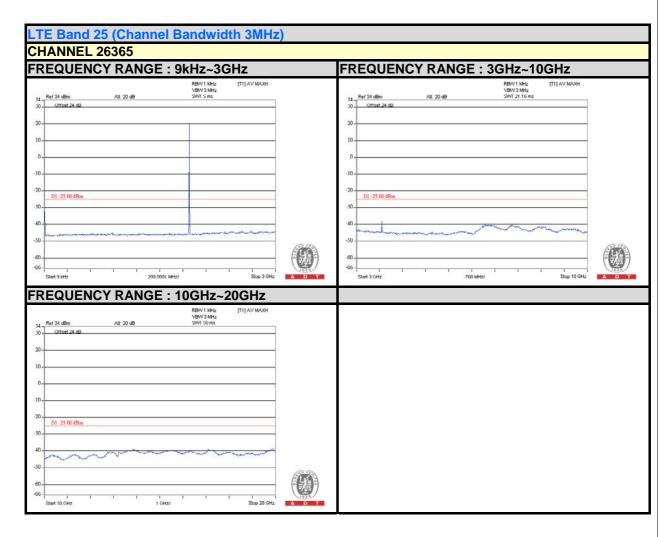








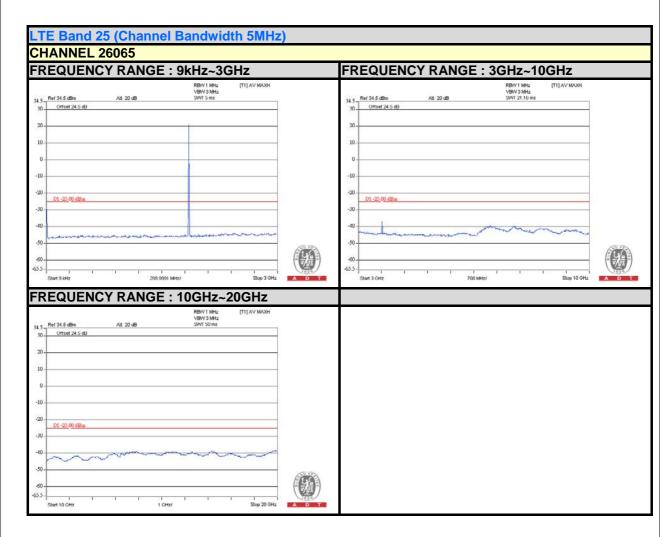








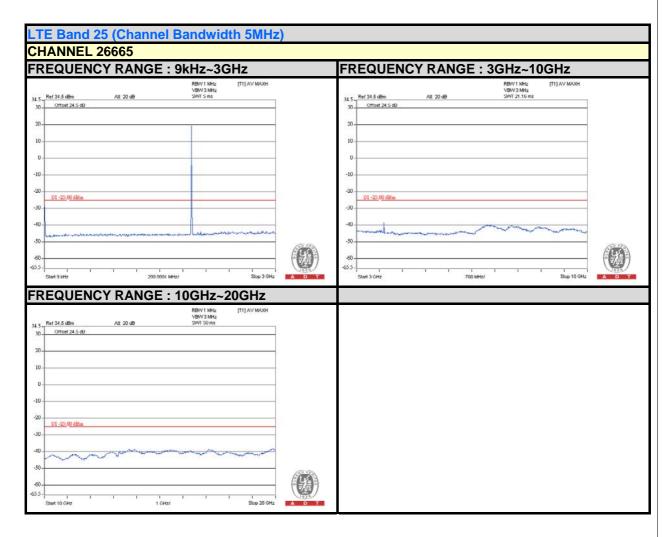




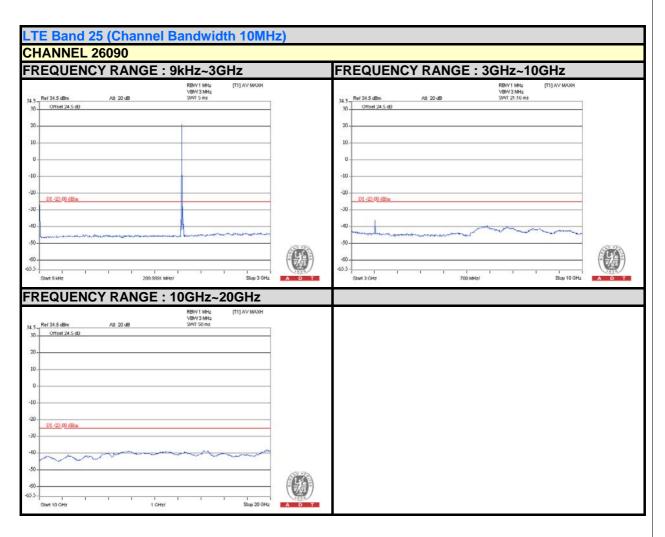








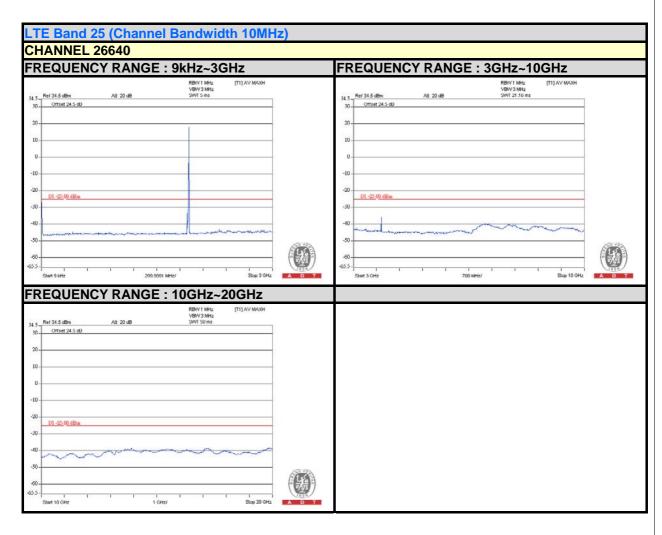














#### 4.7 RADIATED EMISSION MEASUREMENT

#### 4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P) dB$ . The emission limit equal to -13dBm.

#### 4.7.2 TEST PROCEDURES

- 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. 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.R.P power 2.15dBi.

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

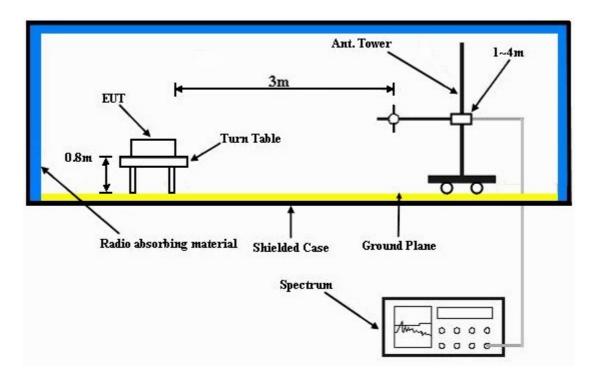
## 4.7.3 DEVIATION FROM TEST STANDARD

No deviation

Report No.: RF140225C37 54 of 70 Report Format Version 5.0.0



# 4.7.4 TEST SETUP



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



## 4.7.5 TEST RESULTS

## **CDMA**

MODE	TX channel 25	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	55.22	-53.96	-45.79	-8.63	-54.42	-13.00	-41.42				
2	78.50	-43.49	-48.24	-2.14	-50.38	-13.00	-37.38				
3	216.24	-31.88	-43.56	5.46	-38.10	-13.00	-25.10				
4	282.20	-48.94	-57.95	5.22	-52.73	-13.00	-39.73				
5	375.32	-54.66	-60.46	5.23	-55.23	-13.00	-42.23				
6	456.80	-60.54	-65.02	5.06	-59.96	-13.00	-46.96				
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	L AT 3 M					
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)				
1	43.58	-35.75	-30.18	-10.30	-40.48	-13.00	-27.48				
2	78.50	-37.22	-39.82	-2.14	-41.96	-13.00	-28.96				
3	210.42	-36.69	-44.64	5.46	-39.18	-13.00	-26.18				
4	235.64	-44.57	-51.77	5.42	-46.35	-13.00	-33.35				
5	336.52	-54.21	-59.45	5.19	-54.26	-13.00	-41.26				
6	561.56	-61.46	-62.09	4.61	-57.48	-13.00	-44.48				

## **REMARKS:**

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 56 of 70 Report Format Version 5.0.0



MODE	TX channel 25	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3702.50	-45.15	-39.23	7.16	-32.07	-13.00	-19.07			
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3702.50	-46.75	-41.02	7.16	-33.86	-13.00	-20.86			

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

MODE	TX channel 600	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3760.00	-45.75	-39.69	7.10	-32.59	-13.00	-19.59			
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3760.00	-47.34	-41.47	7.10	-34.37	-13.00	-21.37			

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



MODE	TX channel 1175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3817.50	-46.32	-40.13	7.05	-33.08	-13.00	-20.08			
	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
	Α	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	L AT 3 M				
No.	Al Freq. (MHz)	NTENNA PO Reading (dBm)	LARITY & TE S.G Power Value (dBm)	ST DISTANC Correction Factor (dB)	E: VERTICA	L AT 3 M Limit (dBm)	Margin (dB)			

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 58 of 70 Report Format Version 5.0.0



# LTE Band 25 (Channel Bandwidth 3MHz)

MODE TX channel 26055		FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	AN <sup>-</sup>	ΓENNA POL	ARITY & TES	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)						
1	49.40	-59.13	-47.62	-9.85	-57.47	-13.00	-44.47						
2	105.66	-52.54	-58.84	0.65	-58.19	-13.00	-45.19						
3	214.30	-39.10	-50.78	5.45	-45.33	-13.00	-32.33						
4	288.02	-49.67	-58.79	5.19	-53.60	-13.00	-40.60						
5	359.80	-54.26	-61.22	5.22	-56.00	-13.00	-43.00						
6	602.30	-54.99	-57.73	4.45	-53.28	-13.00	-40.28						
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)						
1	49.40	-41.53	-36.73	-9.85	-46.58	-13.00	-33.58						
2	119.24	-48.86	-52.50	0.10	-52.40	-13.00	-39.40						
3	212.36	-40.17	-48.10	5.46	-42.64	-13.00	-29.64						
4	344.28	-54.99	-60.37	5.20	-55.17	-13.00	-42.17						
5	532.46	-58.82	-60.23	4.73	-55.50	-13.00	-42.50						
6	604.24	-54.89	-54.09	4.46	-49.63	-13.00	-36.63						

# **REMARKS:**

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 59 of 70 Report Format Version 5.0.0



MODE	Channel 26055	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3703.00	-43.28	-37.36	7.16	-30.20	-13.00	-17.20			
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M				
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3703.00	-45.90	-40.17	7.16	-33.01	-13.00	-20.01			

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

MODE	Channel 26365	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Ted Chang		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)			
1	3765.00	-45.88	-39.80	7.09	-32.71	-13.00	-19.71			
	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	L AT 3 M				
No.	Al Freq. (MHz)	Reading (dBm)	LARITY & TE S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	L AT 3 M Limit (dBm)	Margin (dB)			

## **REMARKS:**

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 60 of 70 Report Format Version 5.0.0



MODE	Channel 26675	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3827.00	-44.57	-38.38	7.06	-31.32	-13.00	-18.32		
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M			
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3827.00	-47.73	-41.72	7.06	-34.66	-13.00	-21.66		

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



# LTE Band 25 (Channel Bandwidth 5MHz)

MODE	TX channel 26065	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	39.70	-53.22	-38.31	-10.93	-49.24	-13.00	-36.24		
2	214.30	-39.23	-50.91	5.45	-45.46	-13.00	-32.46		
3	243.40	-46.07	-56.45	5.40	-51.05	-13.00	-38.05		
4	369.50	-55.75	-62.03	5.21	-56.82	-13.00	-43.82		
5	532.46	-58.04	-62.15	4.73	-57.42	-13.00	-44.42		
6	600.36	-52.84	-55.63	4.44	-51.19	-13.00	-38.19		
	Α	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M			
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	41.64	-39.25	-33.26	-10.62	-43.88	-13.00	-30.88		
2	117.30	-49.67	-53.48	0.18	-53.30	-13.00	-40.30		
3	117.30 212.36	-49.67 -39.65	-53.48 -47.58	0.18 5.46	-53.30 -42.12	-13.00 -13.00	-40.30 -29.12		
<u> </u>									
3	212.36	-39.65	-47.58	5.46	-42.12	-13.00	-29.12		

## **REMARKS:**

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 62 of 70 Report Format Version 5.0.0



MODE	Channel 26065	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3705.00	-43.53	-37.60	7.15	-30.45	-13.00	-17.45		
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M			
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3705.00	-46.23	-40.48	7.15	-33.33	-13.00	-20.33		

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

MODE	Channel 26365	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3765.00	-45.24	-39.16	7.09	-32.07	-13.00	-19.07		
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M			
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3765.00	-47.95	-42.06	7.09	-34.97	-13.00	-21.97		

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



MODE	Channel 26665	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3825.00	-45.96	-39.77	7.06	-32.71	-13.00	-19.71		
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M			
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)		
1	3825.00	-48.46	-42.46	7.06	-35.40	-13.00	-22.40		

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 64 of 70 Report Format Version 5.0.0



# LTE Band 25 (Channel Bandwidth 10MHz)

MODE	TX channel 26090	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	41.64	-57.73	-43.53	-10.62	-54.15	-13.00	-41.15
2	212.36	-39.11	-50.81	5.46	-45.35	-13.00	-32.35
3	253.10	-41.15	-51.16	5.38	-45.78	-13.00	-32.78
4	303.54	-50.75	-59.64	5.13	-54.51	-13.00	-41.51
5	359.80	-55.38	-62.34	5.22	-57.12	-13.00	-44.12
6	600.36	-53.45	-56.24	4.44	-51.80	-13.00	-38.80
	A	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	LAT3M	
No.		Reading	S.G Power	Correction			
	Freq. (MHz)	(dBm)	Value (dBm)	Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	43.58	Ū	0.0 . 0 0		<b>EIRP (dBm)</b> -44.17	-13.00	Margin (dB) -31.17
1 2		(dBm)	Value (dBm)	Factor (dB)	. ,	, ,	<b>5</b> ( )
<del></del>	43.58	(dBm) -39.44	Value (dBm) -33.87	-10.30	-44.17	-13.00	-31.17
2	43.58 121.18	(dBm) -39.44 -48.48	Value (dBm) -33.87 -51.97	-10.30 0.05	-44.17 -51.92	-13.00 -13.00	-31.17 -38.92
2	43.58 121.18 214.30	(dBm) -39.44 -48.48 -39.91	-33.87 -51.97 -47.82	-10.30 0.05 5.45	-44.17 -51.92 -42.37	-13.00 -13.00 -13.00	-31.17 -38.92 -29.37

## **REMARKS:**

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Report No.: RF140225C37 65 of 70 Report Format Version 5.0.0



MODE	Channel 26090	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3710.00	-44.28	-38.34	7.15	-31.19	-13.00	-18.19
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
	Al	NTENNA PO	LARITY & TE	ST DISTANC	E: VERTICA	L AT 3 M	
No.	Al Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	L AT 3 M Limit (dBm)	Margin (dB)

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

MODE	Channel 26365	65 <b>FREQUENCY RANGE</b> Above 1000MF	
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3765.00	-44.98	-38.90	7.09	-31.81	-13.00	-18.81
	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3765.00	-48.26	-42.37	7.09	-35.28	-13.00	-22.28

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



MODE	Channel 26640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	INPUT POWER	120Vac, 60 Hz
TESTED BY	Brad Tung		

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3820.00	-45.75	-39.56	7.05	-32.51	-13.00	-19.51
	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3820.00	-49.03	-43.02	7.05	-35.97	-13.00	-22.97

- 1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- 2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



5 PHOTOGRAPHS OF THE TEST CONFIGURATION
Please refer to the attached file (Test Setup Photo).

Report No.: RF140225C37 68 of 70 Report Format Version 5.0.0



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

Report No.: RF140225C37 69 of 70 Report Format Version 5.0.0



# 7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---

Report No.: RF140225C37 70 of 70 Report Format Version 5.0.0