

# FCC TEST REPORT (PART 24)

 REPORT NO.:
 RF121012C09-1

 MODEL NO.:
 E6710

 FCC ID:
 V65E6710

 RECEIVED:
 Oct. 12, 2012

 TESTED:
 Oct. 23 ~ Nov. 01, 2012

 ISSUED:
 Dec. 06, 2012

APPLICANT: Kyocera Communications, Inc.

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- **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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# RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121012C09-1	Original release	Dec. 06, 2012



# **1 CERTIFICATION**

PRODUCT:PDA PhoneMODEL:E6710BRAND:KyoceraAPPLICANT:Kyocera Communications, Inc.TESTED:Oct. 23 ~ Nov. 01, 2012TEST SAMPLE:ENGINEERING SAMPLESTANDARDS:FCC Part 24, Subpart E

The above equipment (model: E6710) 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** : Dec. 06, 2012

Ivonne Wu / Senior Specialist

APPROVED BY

, DATE : Dec. 06, 2012

Anderson Chiu / Senior Engineer



# 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2						
STANDARD SECTION	TEST TYPE	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	PASS	Meet the requirement of limit.			
24.232(d)	PEAK TO AVERAGE RATIO	PASS	Meet the requirement of limit.			
24.238(b)	Band Edge Measurements	PASS	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 -23.81dB at 42.96MHz.			

# 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	150kHz~30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
Radiated emissions	200MHz ~1000MHz	2.95 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.



## 2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver Agilent	N9038A	MY51210203	Dec. 22, 2011	Dec. 21, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2011	Dec. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 20, 2011	Dec. 19, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 20, 2011	Dec. 19, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 20, 2011	Dec. 19, 2012
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 30, 2011	Dec. 29, 2012
Preamplifier EMCI	EMC 330H	980112	Dec. 30, 2011	Dec. 29, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Jan. 02, 2012	Jan. 01, 2013
RF signal cable Worken	RG-213	NA	Jan. 02, 2012	Jan. 01, 2013
Software	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Mar. 23, 2012	Mar. 22, 2013
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Communications Tester-Wireless	E5515C	MY52102544	Sep. 05, 2012	Sep. 04, 2013
Radio Communication Analyzer	MT8820C	6201127458	May 25, 2012	May 24, 2013

**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 9.
- 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 IC 7450F-4.



# **3 GENERAL INFORMATION**

3.1 GENERAL DESCRIPTION OF EUT				
EUT	PDA Phone			
MODEL NO.	E6710			
POWER SUPPLY	5.0Vdc (adapter or host equipme 3.8Vdc (battery)	ent)		
MODULATION TYPE	CDMA	QPSK, OQPSK, HPSK		
MODULATION THE	LTE Band 25	QPSK, 16QAM		
	CDMA	1851.3MHz ~ 1908.8MHz		
FREQUENCY RANGE	LTE Band 25 (Channel Bandwidth: 5MHz)	1852.5MHz ~ 1912.5MHz		
	LTE Band 25 (Channel Bandwidth: 10MHz)	1855MHz ~ 1910MHz		
	CDMA	169.43mW		
MAX. EIRP POWER	LTE Band 25 (Channel Bandwidth: 5MHz)	123.88mW		
	LTE Band 25 (Channel Bandwidth: 10MHz)	112.72mW		
	CDMA	1M26F9W		
	LTE Band 25	QPSK: 4M49G7D		
EMISSION DESIGNATOR	(Channel Bandwidth: 5MHz)	16QAM: 4M49W7D		
	LTE Band 25	QPSK: 8M93G7D		
	(Channel Bandwidth: 10MHz)	16QAM: 8M93W7D		
ANTENNA TYPE	Fixed Internal antenna with -0.9dBi gain			
I/O PORTS	Refer to users' manual			
DATA CABLE	Refer to NOTE as below			
ACCESSORY DEVICES	Refer to NOTE as below			

#### NOTE:

1. The EUT has following accessories.

No.	Product	Brand	MODEL	Description
1	Power Adapter	Kyocera SCP-37AI		I/P: 100-240Vac, 50/60Hz, 0.2A O/P: 5.0Vdc, 1.0A
2	Battery	Kyocera	SCP-51LBPS	Rating: 3.8 Vdc, 2500mAh Type: Li-ion
3	Earphone	GALIENELECTRON	HF-KYO-2D-01	1.4m non-shielded cable without ferrite core
4	USB Cable	TESCOM	SCP-11SDC	1.2m non-shielded cable without ferrite core

2. SW version is 0401NS.

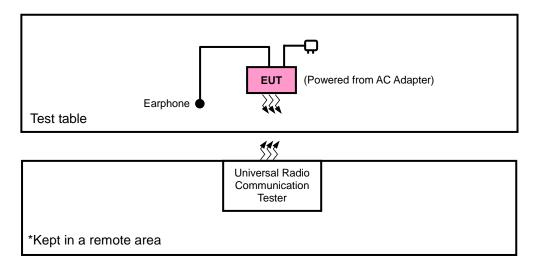
3. HW version is 0101.

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

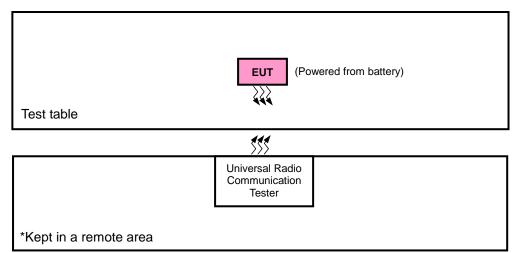


# 3.2 CONFIGURATION OF SYSTEM UNDER TEST

#### FOR RADIATION EMISSION TEST



#### FOR E.I.R.P. TEST



# 3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.



# 3.4 TEST ITEM AND TEST CONFIGURATION

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 for EIRP, Y-axis for CDMA and X-axis for LTE Band 25 for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

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

#### **CDMA MODE**



#### LTE BAND 25 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	26065 to 26665	26065, 26365, 26665	5MHz	QPSK	1 RB / 0 RB Offset
LIKP	26090 to 26640	26090, 26365, 26640	10MHz	QPSK	1 RB / 49 RB Offset
FREQUENCY STABILITY	26065 to 26665	26365	5MHz	QPSK	1 RB / 0 RB Offset
FREQUENCT STABILITY	26090 to 26640	26365	10MHz	QPSK	1 RB / 49 RB Offset
OCCUPIED BANDWIDTH	26065 to 26665	26065, 26365, 26665	5MHz	QPSK / 16QAM	25 RB / 0 RB Offset
OCCOPIED BAINDWIDTH	26090 to 26640	26090, 26365, 26640	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	26065 to 26665	26065, 26365, 26665	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	26090 to 26640	26090, 26365, 26640	10MHz	QPSK / 16QAM	1 RB / 49 RB Offset
		20005	5MHz	QPSK	1 RB / 0 RB Offset
	26065 to 26665	26065		QPSK	25 RB / 0 RB Offset
		00005	5MHz	QPSK	1 RB / 24 RB Offset
BAND EDGE		26665		QPSK	25 RB / 0 RB Offset
BAND EDGE	26090 to 26640	26090	10MHz	QPSK	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
		26640	10MHz	QPSK	1 RB / 49 RB Offset
		20040	TUMHZ	QPSK	50 RB / 0 RB Offset
CONDCUDETED EMISSION	26065 to 26665	26365	5MHz	QPSK	1 RB / 0 RB Offset
CONDCODETED EMISSION	26090 to 26640	26365	10MHz	QPSK	1 RB / 49 RB Offset
				QPSK	1 RB / 0 RB Offset
	26065 to 26665	26365	5MHz	QPSK	25 RB / 0 RB Offset
	20003 10 20003	20300		100.004	1 RB / 0 RB Offset
				16QAM	25 RB / 0 RB Offset
RADIATED EMISSION				ODEK	1 RB / 49 RB Offset
	26000 to 26640	26365	10MHz	QPSK	50 RB / 0 RB Offset
	26090 to 26640	20300	TUIVIHZ	160414	1 RB / 0 RB Offset
				16QAM	50 RB / 0 RB Offset

#### **TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	26deg. C, 58%RH	3.8Vdc	Howard Kao
FREQUENCY STABILITY	26deg. C, 58%RH	3.8Vdc	Howard Kao
OCCUPIED BANDWIDTH	26deg. C, 58%RH	3.8Vdc	Howard Kao
BAND EDGE	26deg. C, 58%RH	3.8Vdc	Howard Kao
CONDCUDETED EMISSION	26deg. C, 58%RH	3.8Vdc	Howard Kao
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu



# 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

**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

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. RBW and VBW is 1MHz for 5MHz for CDMA 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 b. Record the power level of S.G
- d. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.

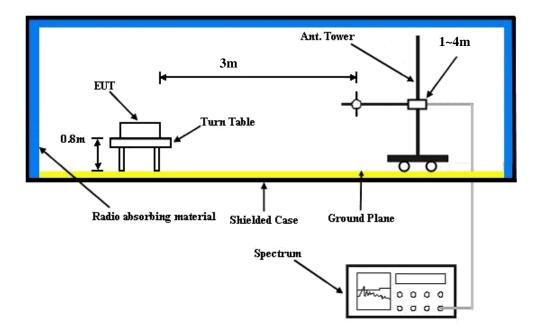
#### CONDUCTED POWER MEASUREMENT:

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.



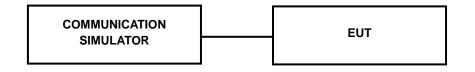
#### 4.1.3 TEST SETUP

#### EIRP 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 (MHz)	1851.25	1880	1908.75		
RC1+SO55	24.40	24.39	24.52		
RC3+SO55	24.48	24.48	24.58		
RC3+SO32(+ F-SCH)	24.35	24.42	24.51		
RC3+SO32(+SCH)	24.37	24.50	24.52		
RTAP 153.6	24.34	24.37	24.41		
<b>RETAP 4096</b>	24.30	24.33	24.39		

	LTE Band 25							
-			Frequency		<b>DD 0</b> %		Target	Measured
BW	Modulation	СН	(MHz)	RB	RB Offset	MPR	Power	Power
		26065	1852.5	1	0	0	23.9	23.57
		26365	1882.5	1	0	0	23.9	23.74
		26665	1912.5	1	0	0	23.9	23.23
		26065	1852.5	1	24	0	23.9	23.35
		26365	1882.5	1	24	0	23.9	23.62
	QPSK	26665	1912.5	1	24	0	23.9	23.20
	QPSK	26065	1852.5	12	6	1	22.9	22.35
		26365	1882.5	12	6	1	22.9	22.69
		26665	1912.5	12	6	1	22.9	22.18
		26065	1852.5	25	0	1	22.9	22.43
		26365	1882.5	25	0	1	22.9	22.58
5MHz		26665	1912.5	25	0	1	22.9	22.13
SIVITIZ		26065	1852.5	1	0	1	22.9	22.64
		26365	1882.5	1	0	1	22.9	22.76
		26665	1912.5	1	0	1	22.9	22.27
		26065	1852.5	1	24	1	22.9	22.43
		26365	1882.5	1	24	1	22.9	22.69
	16QAM	26665	1912.5	1	24	1	22.9	22.24
	IOQAIN	26065	1852.5	12	6	2	21.9	21.53
		26365	1882.5	12	6	2	21.9	21.71
		26665	1912.5	12	6	2	21.9	21.29
		26065	1852.5	25	0	2	21.9	21.48
		26365	1882.5	25	0	2	21.9	21.63
		26665	1912.5	25	0	2	21.9	21.22



				LTE Band	25			
			Frequency		<b>DD 0</b> %		Target	Measured
BW	Modulation	СН	(MHz)	RB	RB Offset	MPR	Power	Power
		20690	1855	1	0	0	23.9	23.55
		26365	1882.5	1	0	0	23.9	23.75
		26640	1910	1	0	0	23.9	23.46
		20690	1855	1	49	0	23.9	23.49
		26365	1882.5	1	49	0	23.9	23.72
	QPSK	26640	1910	1	49	0	23.9	23.30
	QPSK	20690	1855	25	12	1	22.9	22.35
		26365	1882.5	25	12	1	22.9	22.60
		26640	1910	25	12	1	22.9	22.32
		20690	1855	50	0	1	22.9	22.39
		26365	1882.5	50	0	1	22.9	22.54
40141-		26640	1910	50	0	1	22.9	22.18
10MHz		20690	1855	1	0	1	22.9	22.58
		26365	1882.5	1	0	1	22.9	22.80
		26640	1910	1	0	1	22.9	22.49
		20690	1855	1	49	1	22.9	22.75
		26365	1882.5	1	49	1	22.9	22.79
	100 111	26640	1910	1	49	1	22.9	22.27
	16QAM	20690	1855	25	12	2	21.9	21.53
		26365	1882.5	25	12	2	21.9	21.69
		26640	1910	25	12	2	21.9	21.34
		20690	1855	50	0	2	21.9	21.44
		26365	1882.5	50	0	2	21.9	21.63
		26640	1910	50	0	2	21.9	21.27



#### EIRP POWER (dBm)

#### **CDMA**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	25	1851.25	-15.96	38.19	22.23	167.11	Н
	600	1880.00	-16.41	38.70	22.29	169.43	Н
x	1175	1908.75	-16.34	38.43	22.09	161.81	Н
^	25	1851.25	-19.06	38.48	19.42	87.50	V
	600	1880.00	-19.53	38.59	19.06	80.54	V
	1175	1908.75	-19.31	38.87	19.56	90.36	V

#### LTE Band 25

#### Channel Bandwidth: 5MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	26065	1852.5	-17.40	38.19	20.79	119.95	Н
	26365	1882.5	-17.77	38.70	20.93	123.88	Н
x	26665	1912.5	-18.51	39.35	20.84	121.34	Н
^	26065	1852.5	-24.03	38.48	14.45	27.86	V
	26365	1882.5	-24.07	38.59	14.52	28.31	V
	26665	1912.5	-24.13	38.87	14.74	29.79	V

#### Channel Bandwidth: 10MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	26090	1855.0	-17.94	38.19	20.25	105.93	Н
	26365	1882.5	-18.18	38.70	20.52	112.72	Н
x	26640	1910.0	-19.02	39.35	20.33	107.89	Н
^	26090	1855.0	-22.85	38.48	15.63	36.56	V
	26365	1882.5	-23.47	38.59	15.12	32.51	V
	26640	1910.0	-23.85	38.87	15.02	31.77	V



# 4.2 FREQUENCY STABILITY MEASUREMENT

#### 4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

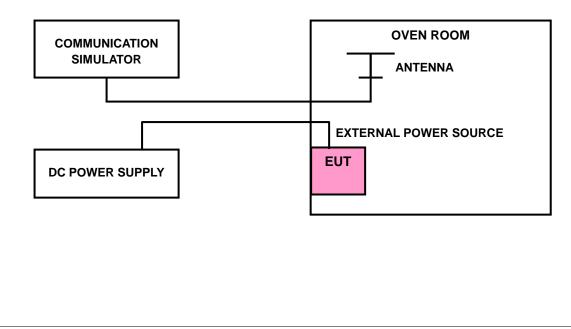
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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





# 4.2.4 TEST RESULTS

#### FREQUENCY ERROR VS. VOLTAGE

	FRE				
VOLTAGE (Volts)	ODMA	LTE B	LIMIT (ppm)		
	CDMA 5MHz		10MHz		
3.8	0.003	0.001	-0.003	2.5	
3.6	0.004	0.007	0.006	2.5	
4.2	0.004	0.003	-0.004	2.5	

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

#### FREQUENCY ERROR vs. TEMPERATURE

	FRE	QUENCY ERROR (p	opm)	
ТЕМР. (℃)	CDMA	LTE Ba	LIMIT (ppm)	
	CDWA	5MHz	10MHz	
-30	0.004	-0.006	-0.007	2.5
-20	0.003	-0.005	-0.006	2.5
-10	0.003	-0.007	-0.008	2.5
0	0.003	-0.001	-0.005	2.5
10	0.004	-0.003	-0.005	2.5
20	0.003	-0.001	0.004	2.5
30	0.003	-0.008	-0.007	2.5
40	0.003	-0.006	0.004	2.5
50	0.003	0.008	-0.006	2.5
55	0.003	-0.008	-0.004	2.5

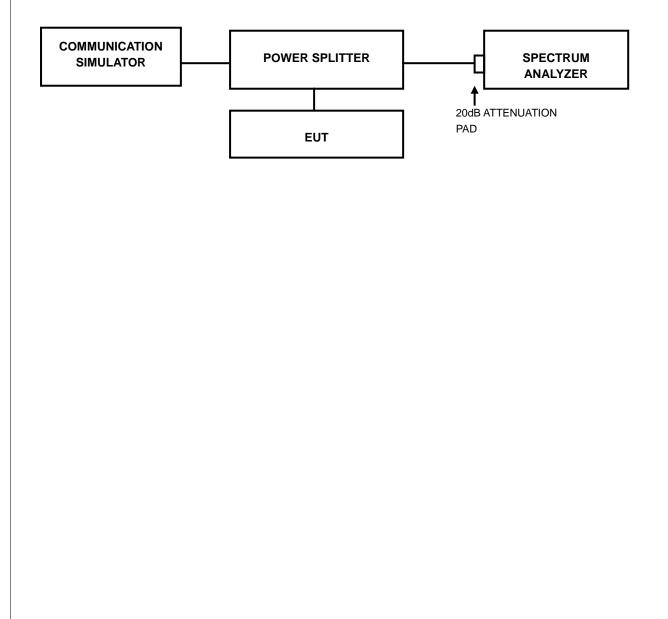


# 4.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 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





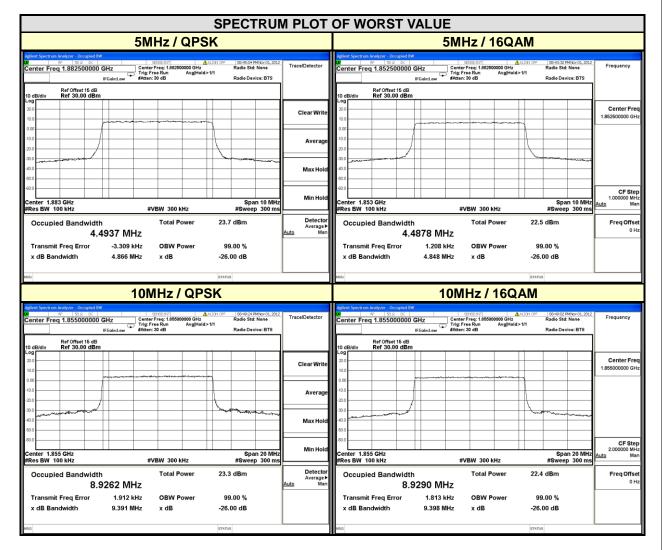
# 4.3.3 TEST RESULTS

CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)
• • • • • • • • • • • • • • • • • • • •	(MHz)	CDMA
25	1851.3	1.2612
600	1880.0	1.2638
1175	1908.8	1.2630

				WCDN	A		
0	n Analyzer - Occupi RF 50 ♀ 0 3q 1.8800000	c	Center		ALIGN OFF I GHz gjHold>1/1	07:43:38 PM Oct Radio Std: Non Radio Device: E	e Frequency
0 dB/div	Ref Offset 15 Ref 30.00 d						
.og 20.0 10.0							Center Free 1.880000000 GH
100							
80.0 10.0	and the second second	J			l le		dans.
0.0			_				_
enter 1.8 Res BW 3			#	VBW 100 kHz		Span 3 #Sweep 30	B MHz Auto Mar
Occupi	ied Bandwi	dth 1.2638	ИНz	Total Powe	ər 27	.3 dBm	Freq Offse 0 H
	it Freq Error ndwidth		'68 Hz 1 MHz	OBW Powe		99.00 % 5.00 dB	



	LTE BAND 25									
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz						
CHANNEL	FREQUENCY	99% OCCUPIED FREQUENCY BANDWIDTH (MHz) CI		CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)				
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM			
26065	1852.5	4.4923	4.4878	26090	1855	8.9262	8.9290			
26365	1882.5	4.4937	4.4861	26365	1882.5	8.9239	8.9239			
26665	1912.5	4.4904	4.4865	26640	1910	8.9213	8.9252			



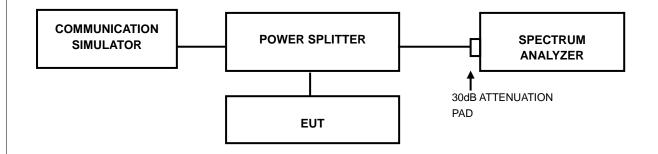


# 4.4 PEAK TO AVERAGE RATIO

# 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  $\geq$  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%.



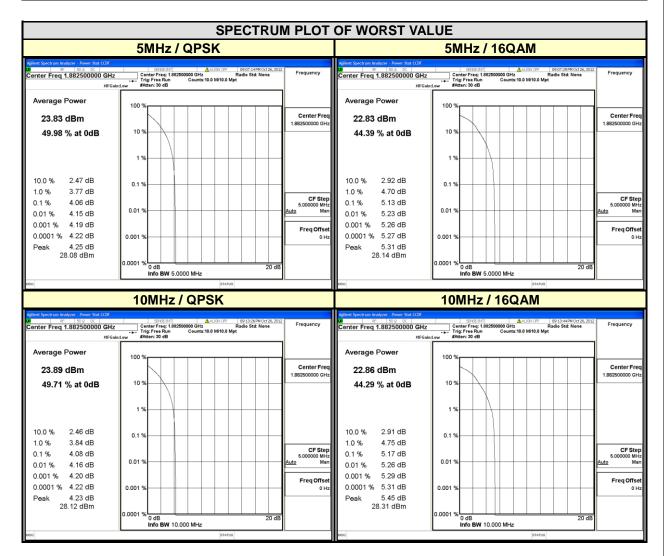
# 4.4.4 TEST RESULTS

CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)
CHANNEL	(MHz)	CDMA
25	1851.3	3.33
600	1880.0	3.45
1175	1908.8	3.00

SPECT	RUM PLOT OF WORST VALUE	
	WCDMA / CH 9262	
Agilent Spectrum Analyzer - Power Stat CCDF	SENSE:INT ALIGN OFF 07:48:00 PM Oct 26, 2	2012
Center Freq 1.880000000 GHz	Center Freq: 1.88000000 GHz Radio Std: None Trig: Free Run Counts:10.0 M/10.0 Mpt	Trace
#IFGain	Low #Atten: 30 dB	Store
Average Power		Ref Trace
24.88 dBm		Ref Trace
		On <u>Off</u>
51.50 % at 0dB	10 %	
		Gaussian Line On <u>Off</u>
	1 %	
10.0 % 1.79 dB 1.0 % 2.94 dB	0.1 %	-
0.1 % 2.94 dB		
0.01 % 3.74 dB	0.01 %	_
0.001 % 3.91 dB		
0.0001 % 4.00 dB	0.001 %	_
Peak 4.06 dB		
28.94 dBm	0.0001 %	
	0 dB 20 d Info BW 5.0000 MHz	dB
MSG	STATUS	



	LTE BAND 25									
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz						
CHANNEL	FREQUENCY		AVERAGE D (dB)	CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)				
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM			
26065	1852.5	3.52	4.58	26090	1855	3.82	4.88			
26365	1882.5	4.06	5.13	26365	1882.5	4.08	5.17			
26665	1912.5	4.06	5.10	26640	1910	4.04	5.10			



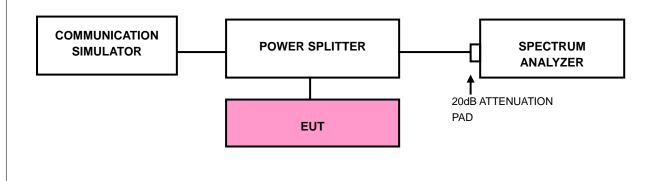


# 4.5 BAND EDGE MEASUREMENT

#### 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



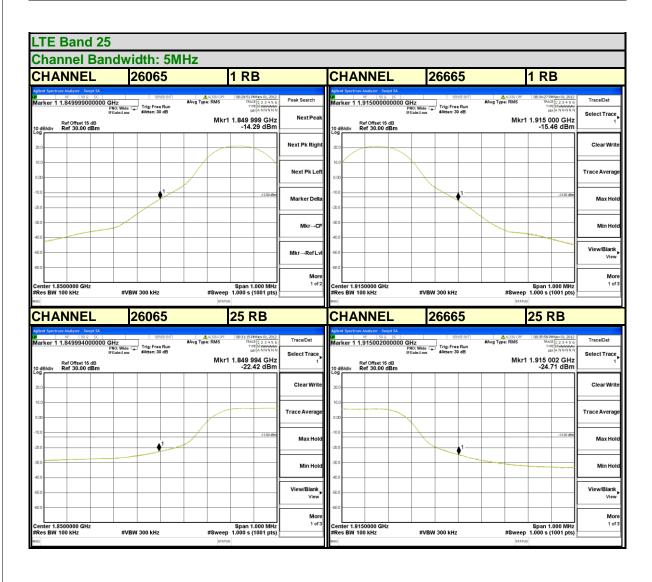
#### 4.5.3 TEST PROCEDURES

- 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 1MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (CDMA).
- c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE).
- d. Record the max trace plot into the test report.



# 4.5.4 TEST RESULTS

CDMA																		
СНА	NNEL			2	5				CH	IAI	NNEL	•		11	75			
()0	rum Analyzer - Swept SA ℝF 50 Ω DC 1.850000000000	0 GHz	SENSE		ALI #Avg Type: R	RMS	07:40:18PM Oct 26, 2 TRACE 1 2 3 4	D12 5.6 Peak Search	1,00		Analyzer - Swept №F 50 © 0 910000000	000 GHz	SENSE:	#Av	ALIGN OFF g Type: RMS	07:38:16	6PM Oct 26, 2012 ACE 1 2 3 4 5 6	Peak Search
10 dB/div	Ref Offset 15 dB Ref 30.00 dBm	PNO: Wide IFGain:Low	#Atten: 30 di	un /	Avg Hold: 100	0/100	1.850 000 GH -35.703 dB	z NextPeak	10 dB/	R	tef Offset 15 dE	PNO: Wide ↔ IFGain:Low	#Atten: 30 dE	in Avg	Hold: 100/100	r1 1.910	000 GHz 867 dBm	NextPeak
20.0								Next Pk Right	20.0									Next Pk Right
0.00								Next Pk Left	10.0 0.00									Next Pk Left
-10.0							-13.00	Marker Delta	-10.0		$\mathbb{N}$						-13.00 dBm	Marker Delta
-30.0		_!				$ \rightarrow$	/	Mkr→CF	-30.0		$  \cdot \rangle$							Mkr→CF
-40.0								Mkr→RefLvl	-40.0									Mkr→RefLvl
-60.0 Center 1.5	8502000 GHz						Span 1.000 M	More 1 of 2	-60.0	er 1.90	98000 GHz					Span	1.000 MHz	More 1 of 2
#Res BW		#VBW	/ 51 kHz*		#		1.00 s (1001 p			BW 13		#VBV	/ 51 kHz*		#Swe	ep 1.00 s	(1001 pts)	





LTE Band 2													
Channel Bandwidth: 10MHz													
CHANNEL	26090	1 RB		CHANNEL	26640	1 RB							
Aglent Spectrum Analyzer Swept SA Ref Dig 20 2 00 Marker 1 1.849997000000 Ref Offset 15 dB Ref 30.00 dBm	0 GHz PRO: Wide Trig: Free Run IFGein:Low #Atten: 30 dB	ALLON OFF 085402 FMM/W 08,2012     FAXE [1 2 3 4 5 6	Trace/Det Select Trace	Adlent Spectrum Analyzer - Swept SA D	SBEEINT SHZ PRO:Wide C→ FGain:Low #Atten:30 dB	▲ ۸.1940 OFF 08:57:21 PM/0/01,2012     ▲ ۸.1940 OFF 08:57:21 PM/0/01,2012     ▲ ۸.1940 OFF     ▲ ۸.19	Trace/Det Select Trace 1						
20.0			Clear Write	20.0			Clear Writ						
0.00			Trace Average	0.00			Trace Averag						
-10.0		-13.00 dBs	Max Hold	-10.0		-13.00 dBm	Max Hol						
-30.0			Min Hold	-30.0			Min Hol						
-50.0			View/Blank View	-50.0			View/Blank ∨iew						
-00.0				-60.0			Mor						
Center 1.8500000 GHz #Res BW 100 kHz	#VBW 300 kHz	Span 1.000 MHz #Sweep 1.000 s (1001 pts)	More 1 of 3	Center 1.9150000 GHz #Res BW 100 kHz	#VBW 300 kHz	Span 1.000 MHz #Sweep 1.000 s (1001 pts)	1 of						
#Res BW 100 kHz	#VBW 300 kHz				#VBW 300 kHz								
#Res BW 100 kHz           Moi           CHANNEL           Addref Spectrum Andyre Sweet M           Image: State S	26090	#Sweep 1.000 s (1001 pts)		Res BW 100 kHz	26640	#Sweep 1.000 s (1001 pts)							
#Res BW 100 kHz	26090	#Sweep 1.000 s (1001 pts) status 50 RB 4Avg Type: RMS TMAC 12.2 4 4 5 TMAC 12.2 4 5 5 TMAC 12.2 4 5 TMAC 12.2 4 TMAC 12.2 4 5 TMAC 12.2 4 TMAC 12.2	1 of 3	#Res BW 100 kHz	26640	#Sweep 1.000 s (1001 pts)	1 of						
#Res BW 100 kHz	26090	#Sweep 1.000 s (1001 pts) status 50 RB 4Avg Type: RMS TMAC 12.2 4 4 5 TMAC 12.2 4 5 5 TMAC 12.2 4 5 TMAC 12.2 4 TMAC 12.2 4 5 TMAC 12.2 4 TMAC 12.2	1 of 3 Peak Search Next Peak	Res BW 100 kHz           Marker           Advert spectrum Analyzer           Marker           1.9 150008000000000000000000000000000000000	26640	#Sweep 1.000 s (1001 pts)	1 of Trace/Det Select Trace 1						
#Res BW 100 kHz #80 CHANNEL Addm System Analyzer, Even (A) Sol (A) Marker 11.849996000000 10 ddl/div Ref 0ffset 15 dB Ceg 20 10 10	26090	#Sweep 1.000 s (1001 pts) status 50 RB 4Avg Type: RMS TMAC 12.2 4 4 5 TMAC 12.2 4 5 5 TMAC 12.2 4 5 TMAC 12.2 4 TMAC 12.2 4 5 TMAC 12.2 4 TMAC 12.2	1 of 3 Peak Search Next Peak Next Pk Right	Res BW 100 kHz     Hold     Hold	26640	#Sweep 1.000 s (1001 pts)	1 of Trace/Det Select Trace 1 Clear Writ						
RRes BW 100 kHz	26090	#Sweep 1.000 s (1001 pts) [stanu] 50 RB Action of the standard	1 of 3 Peak Search Next Peak Next Pk Right Next Pk Left	Res BW 100 kHz	26640	#Sweep 1.000 s (1001 pts)	1 of Trace/Det Select Trace Clear Writ						
Res BW 100 kHz	26090	#Sweep 1.000 s (1001 pts) [stanu] 50 RB Action of the standard	1 of 3 Peak Search Next Peak Next Pk Right Next Pk Left Marker Delta	Rese BW 100 kH2           Marker 1000 cc           Ref Offset 15 dB           Ref Offset 15 dB           100 dB           100 dB           0	26640	#Sweep 1.000 s (1001 pts)	1 or Trace/Det Select Trace Clear Wri Trace Avera Max Ho						



# 4.6 CONDUCTED SPURIOUS EMISSIONS

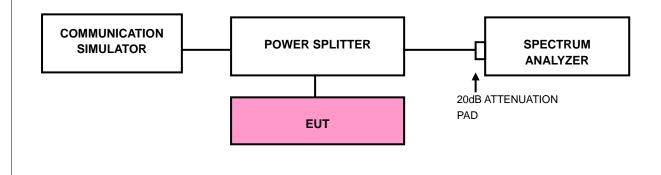
## 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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

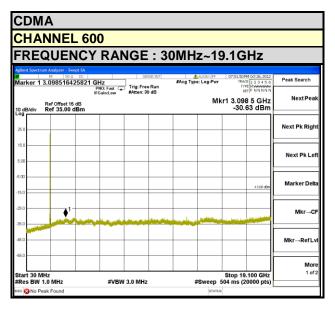
- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 30 MHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission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

# 4.6.3 TEST SETUP





## 4.6.4 TEST RESULTS



LTE Band 25 (Channel Bandwidth: 5MHz)										LTE Band 25 (Channel Bandwidth: 10MHz)												
CHANNEL 26365 FREQUENCY RANGE : 30MHz~19.1GHz										CHANNEL 26365 FREQUENCY RANGE : 30MHz~19.1GHz												
Agilent Spec	ctrum Analyzer - Sv										Agile		Analyzer - Sw									
Marker	NF 50 s 1 3.8041417	707085 GHz		1	Run		ALIGN OFF e: Log-Pwr	TRAC	CE 1 2 3 4 5 6 PE MWWWWW	Peak Search	Mar		RF 50 s 7764888	24441 G		1	Run		ALIGN OFF	TRAC	M Oct 26, 2012 2 1 2 3 4 5 6 2 M M M M M	Peak Search
10 dB/div	Ref Offset 1 Ref 35.00	IFGainLow #Atten: 30 dB DET P NNNN							NextPeak	HIG: Fast C Tig: Free Run         HIG: Fast C Tig: Free Run         HIG: Fast C Tig: Free Run           If Geinclow         #Atten: 30 dB         Mkr1 3.776 5 GI           10 dB/div         Ref 0ffset 15 dB         Mkr1 3.776 5 GI           10 dB/div         Ref 35.00 dB         -30.30 dB							65GHz	Next Peak				
25.0										Next Pk Right												Next Pk Right
5.00										Next Pk Left	15.0 5.00											Next Pk Left
-5.00									-13.00 dBm	Marker Delta	-5.00										-13.00 dBm	Marker Delta
-25.0		•1	a utili	, de la cita	un de alleur.		data da		and the first	Mkr→CF	-25.0			•1				en la sela com	(united by a second	. 12.000		Mkr→CF
-45.0										Mkr→RefLvi	-35.0 -45.0											Mkr→RefLvi
-55.0	MHz							Stop 19	.100 GHz	More 1 of 2	-55.0 Sta	rt 30 MH;	,							Stop 19	.100 GHz	More 1 of 2
	V 1.0 MHz		#VBW	3.0 MHz		#	Sweep	504 ms (2	20000 pts)			s BW 1.0			#VBW	3.0 MHz		#	Sweep	504 ms (2	0000 pts)	



# 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.
- 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.R.P power - 2.15dBi.

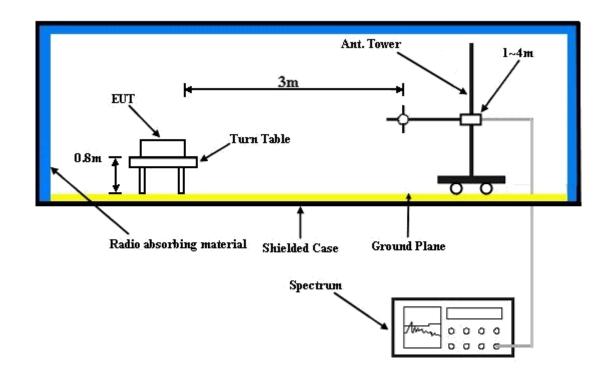
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

#### 4.7.3 DEVIATION FROM TEST STANDARD

No deviation



## 4.7.4 TEST SETUP

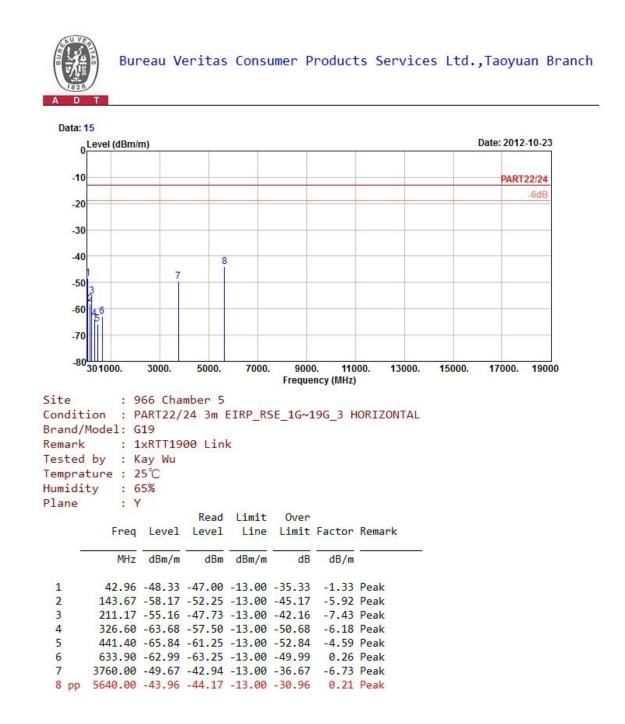


For the actual test configuration, please refer to the attached file (Test Setup Photo).



#### 4.7.5 TEST RESULTS

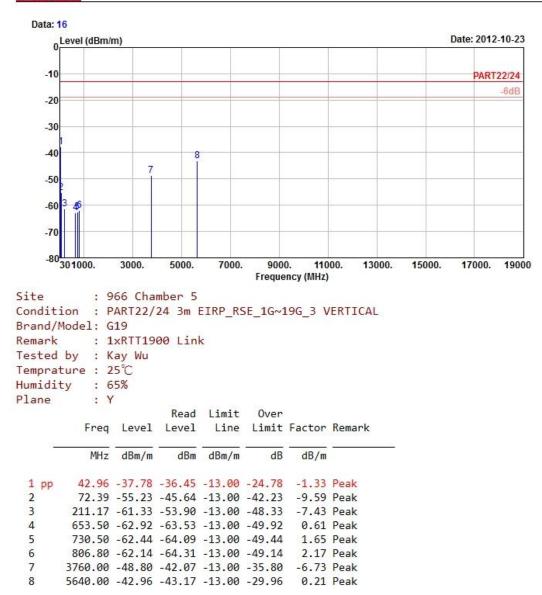
CDMA:







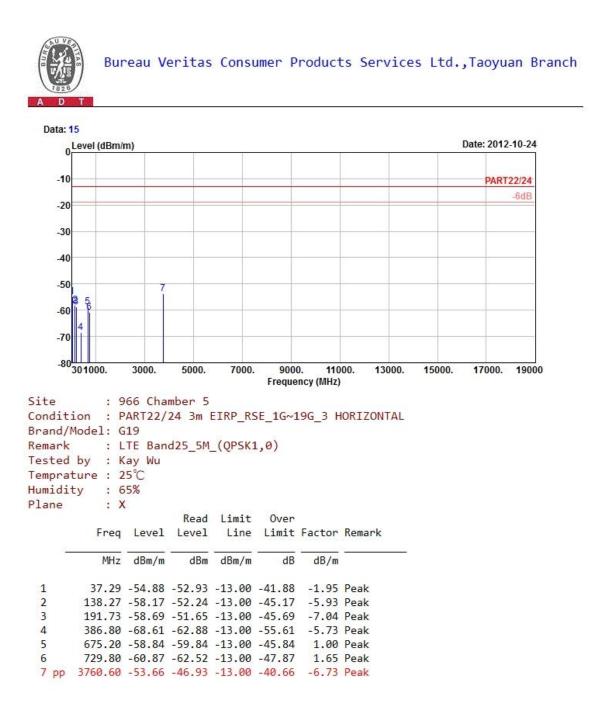
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch





#### LTE Band 25

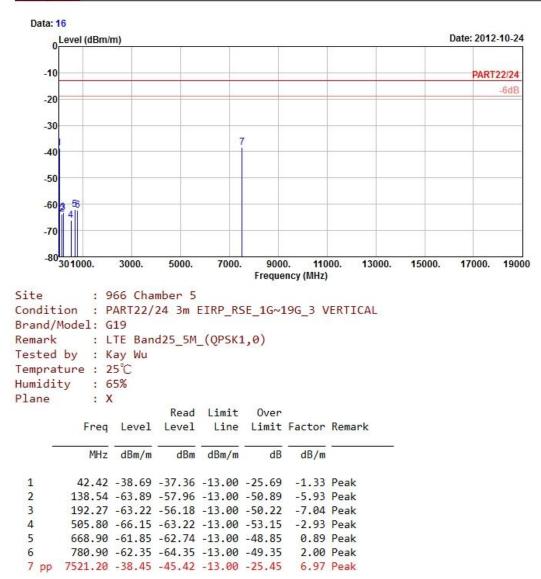
#### Channel Bandwidth: 5MHz / QPSK







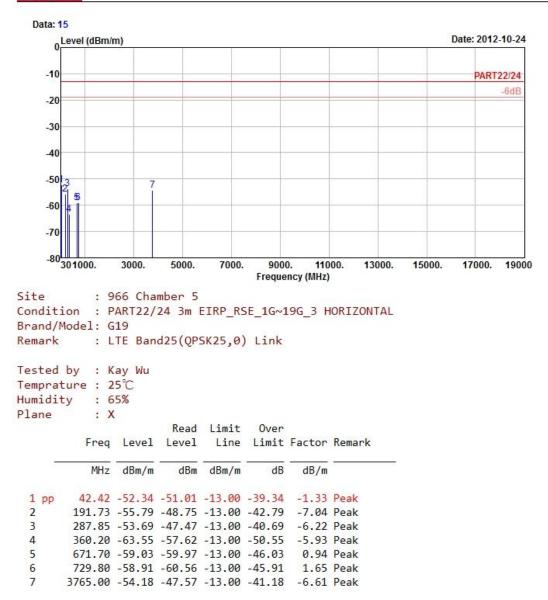
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch





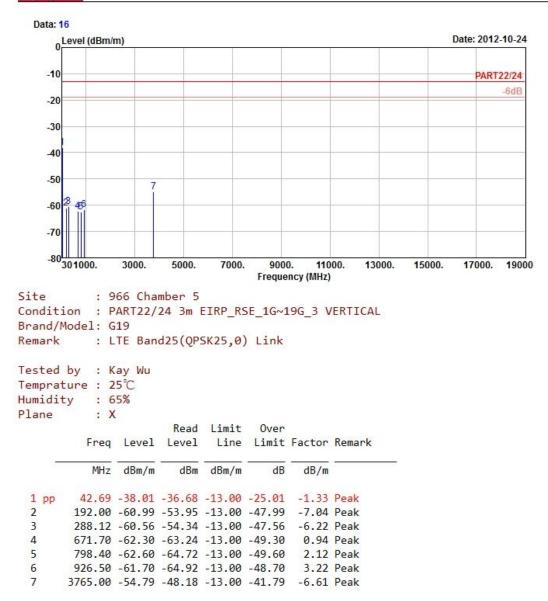


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



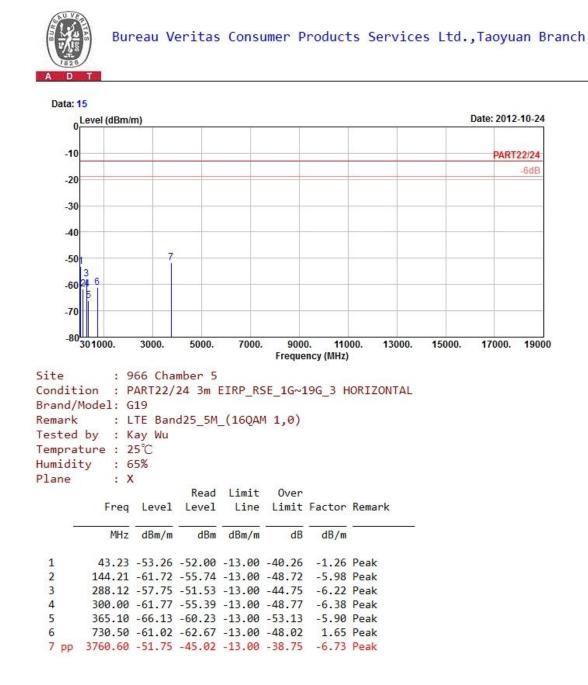






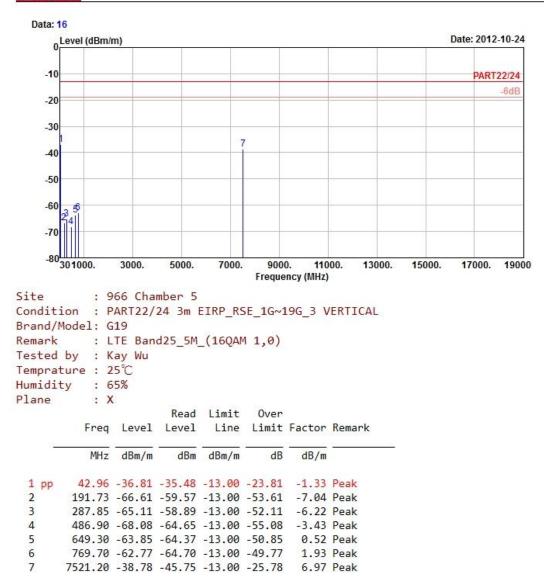


### Channel Bandwidth: 5MHz / 16QAM



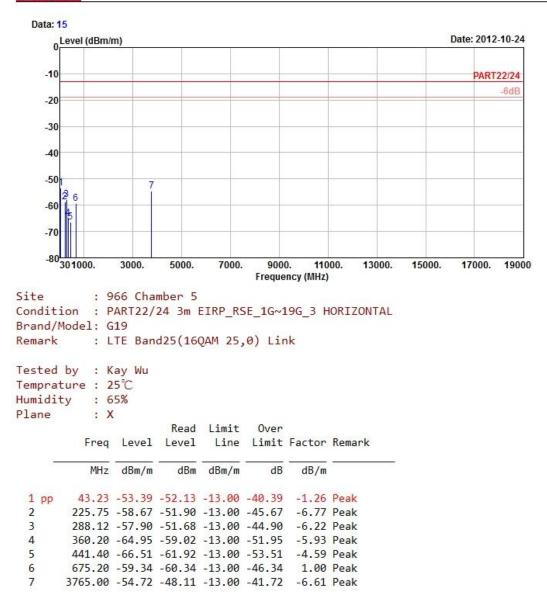






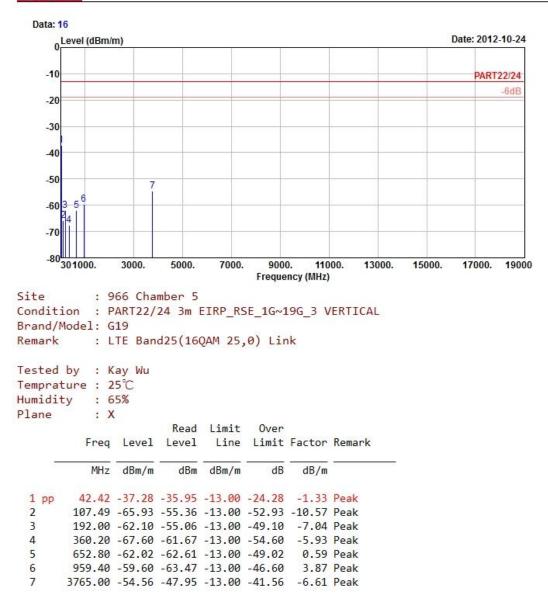






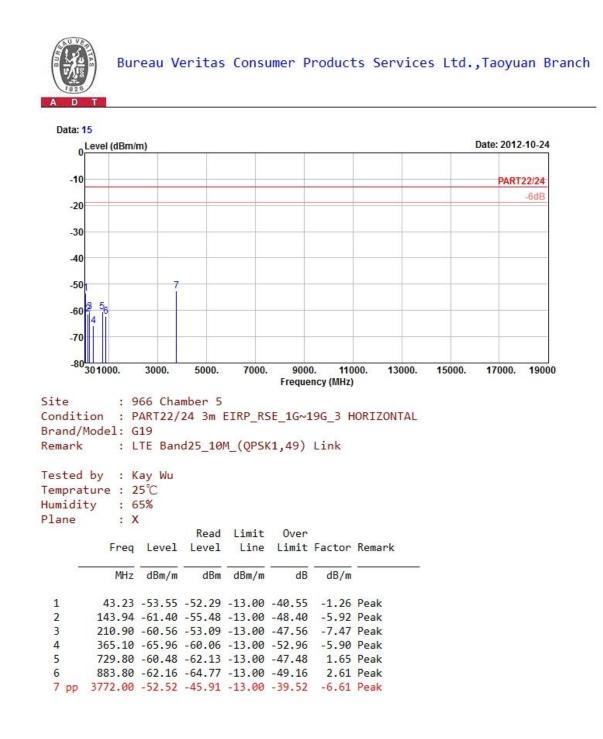






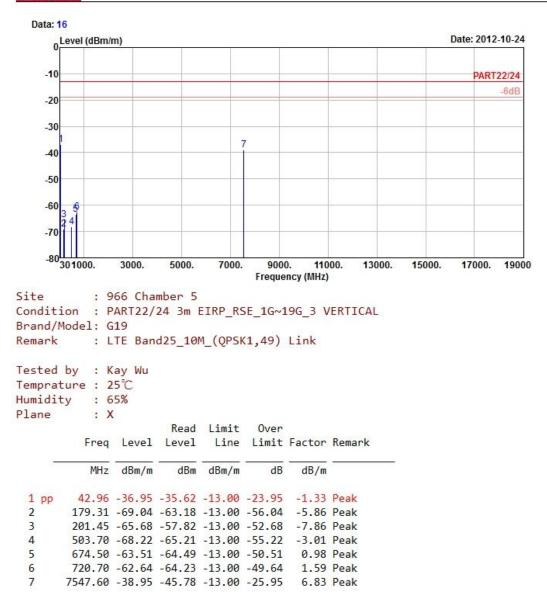


### Channel Bandwidth: 10MHz / QPSK



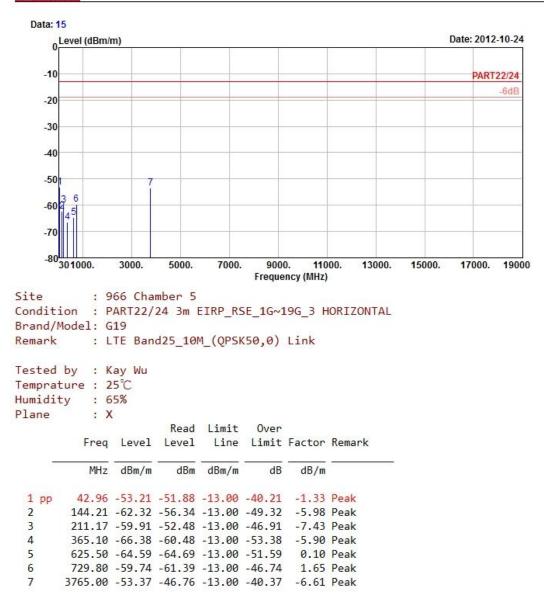






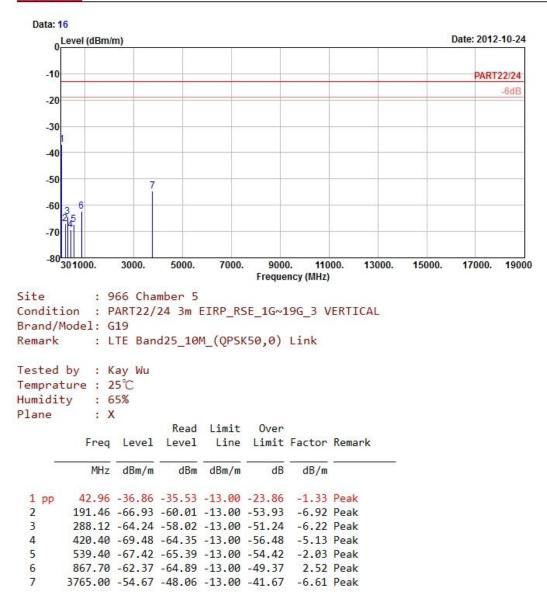






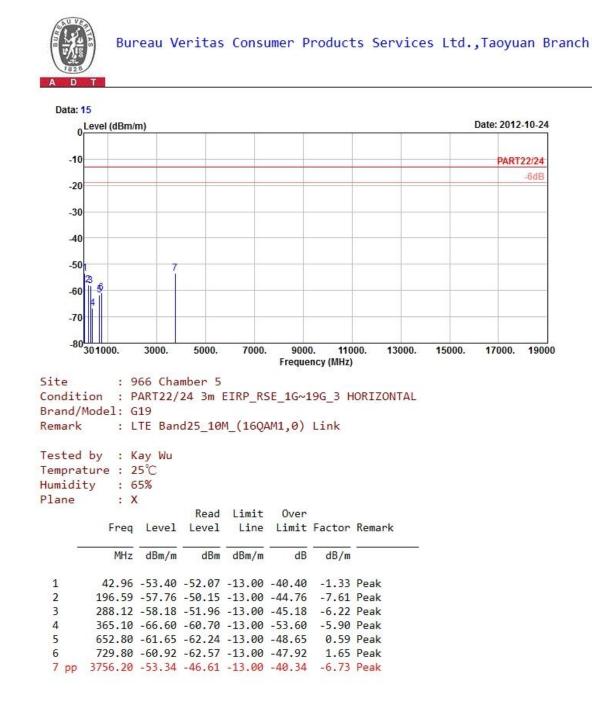






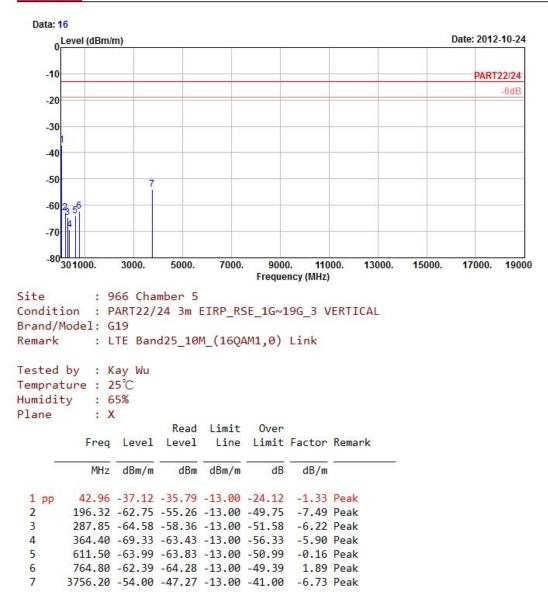


### Channel Bandwidth: 10MHz / 16QAM



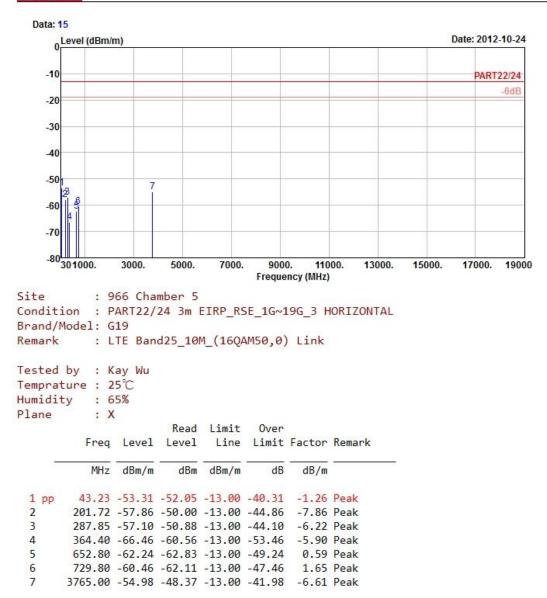






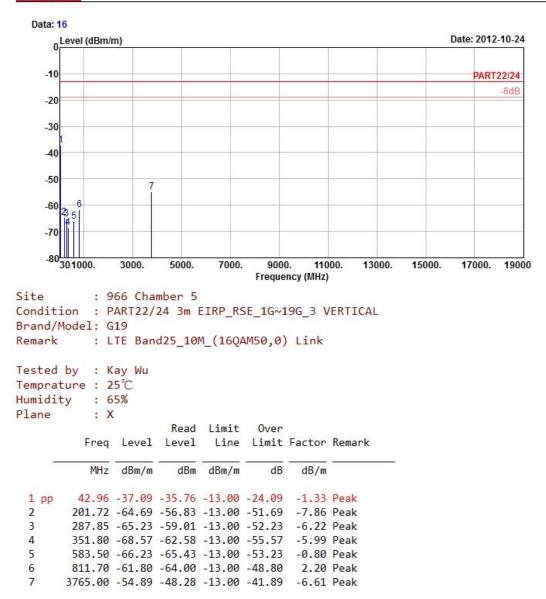














# 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



## 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:

Linko EMC/RF Lab: Tel: 886-2-26052180 Fax: 886-2-26051924 Hsin Chu EMC/RF Lab: Tel: 886-3-5935343 Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab: Tel: 886-3-3183232 Fax: 886-3-3270892

Email: <u>service.adt@tw.bureauveritas.com</u> Web Site: <u>www.bureauveritas-adt.com</u>

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



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

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

---END----