FCC TEST REPORT

(PART 24)

REPORT NO.: RF130716C14-1

MODEL NO.: 0P4E100

FCC ID: NM80P4E100

RECEIVED: Jul. 16, 2013

TESTED: Jul. 23, 2013 ~ Jul. 30, 2013

ISSUED: Aug. 08, 2013

APPLICANT: HTC Corporation

ADDRESS: No. 23, Xinghua Rd., Taoyuan City, Taiwan

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
RF130716C14-1	Original release	Aug. 08, 2013

1 CERTIFICATION

PRODUCT: Smartphone
MODEL: 0P4E100
BRAND: HTC
APPLICANT: HTC Corporation
TESTED: Jul. 23, 2013 ~ Jul. 30, 2013
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 24, Subpart E**

The above equipment (model: 0P4E100) 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 :** Aug. 08, 2013
Ivonne Wu / Senior Specialist

APPROVED BY : _____ **, DATE :** Aug. 08, 2013
Sam Chen / Assistant Manager

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	PASS	Meet the requirement of limit. Minimum passing margin is -27.90dB at 30.54MHz.

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
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	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 ROHDE & SCHWARZ	ESCI	100744	Apr. 15, 2013	Apr. 14, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2012	Dec. 16, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 07, 2013	Jan. 06, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 25, 2012	Dec. 24, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 184045	980116	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable Worken	RG-213	NA	Dec. 29, 2012	Dec. 28, 2013
Software BV ADT	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	Jul. 18, 2013	Jul. 17, 2014
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Communications Tester-Wireless	E5515C	MY52102544	Sep. 05, 2012	Sep. 04, 2013
Radio Communication Analyzer	MT8820C	6201300640	Aug. 01, 2013	Jul. 31, 2014

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 10.

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 690701.

5. The IC Site Registration No. is IC 7450F-10.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

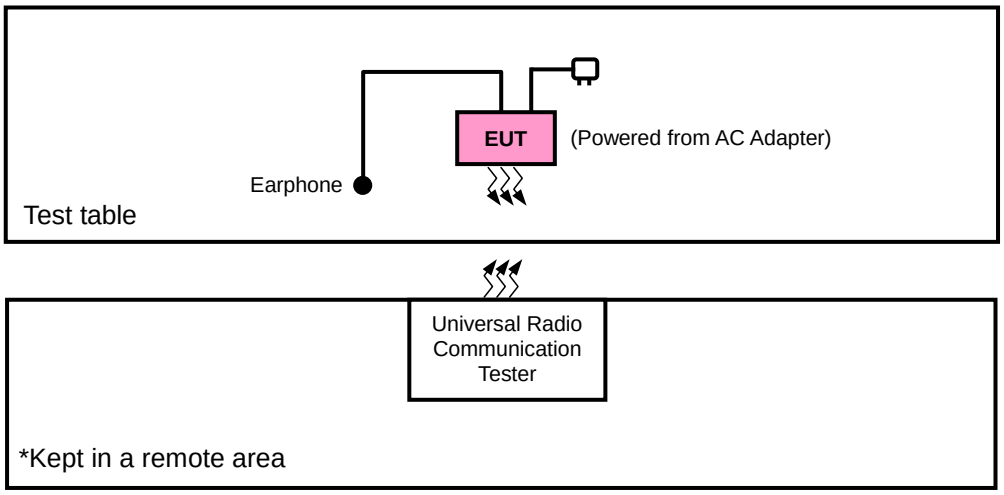
EUT	Smartphone	
MODEL NO.	0P4E100	
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (battery)	
MODULATION TYPE	**CDMA**	QPSK, OQPSK, HPSK
	LTE Band 25	QPSK, 16QAM
FREQUENCY RANGE	**CDMA**	1851.25MHz ~ 1908.75MHz
	LTE Band 25 (Channel Bandwidth: 5MHz)	1852.5MHz ~ 1912.5MHz
	LTE Band 25 (Channel Bandwidth: 10MHz)	1855MHz ~ 1910MHz
MAX. EIRP POWER	**CDMA**	119.40mW
	LTE Band 25 (Channel Bandwidth: 5MHz)	92.47mW
	LTE Band 25 (Channel Bandwidth: 10MHz)	90.78mW
EMISSION DESIGNATOR	**CDMA**	1M28F9W
	LTE Band 25 (Channel Bandwidth: 5MHz)	4M49G7D
	LTE Band 25 (Channel Bandwidth: 10MHz)	8M92W7D
ANTENNA TYPE	Fixed Internal Antenna	
I/O PORTS	Refer to users' manual	
DATA CABLE	Refer to NOTE as below	
ACCESSORY DEVICES	Refer to NOTE as below	

NOTE:

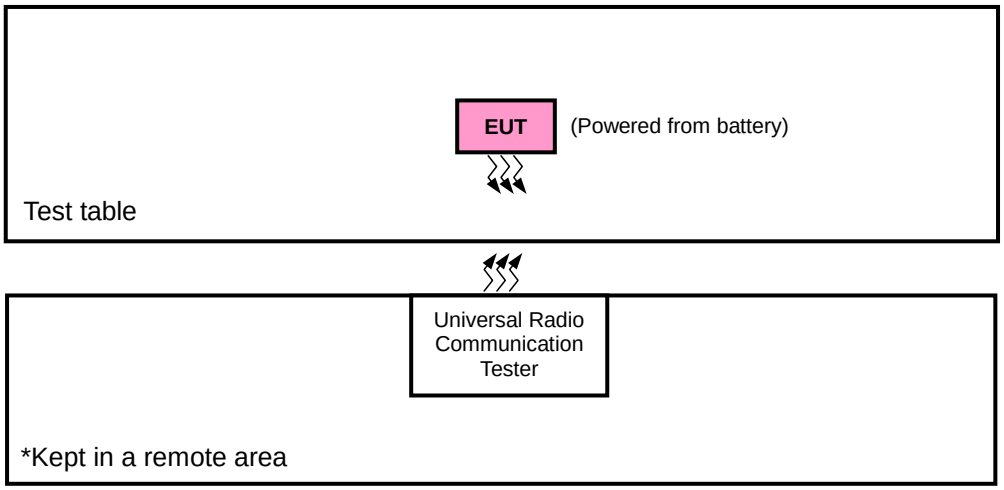
1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

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 together with other necessary accessories or support units.

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

CDMA MODE

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

LTE BAND 25 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
-	EIRP	26065 to 26665	26065, 26365, 26665	5MHz	QPSK	1 RB / 12 RB Offset
		26090 to 26640	26090, 26365, 26640	10MHz	QPSK	1 RB / 24 RB Offset
-	FREQUENCY STABILITY	26065 to 26665	26365	5MHz	QPSK	1 RB / 12 RB Offset
		26090 to 26640	26365	10MHz	QPSK	1 RB / 24 RB Offset
-	OCCUPIED BANDWIDTH	26065 to 26665	26065, 26365, 26665	5MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		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 / 12 RB Offset
		26090 to 26640	26090, 26365, 26640	10MHz	QPSK / 16QAM	1 RB / 24 RB Offset
-	BAND EDGE	26065 to 26665	26065	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			26665	5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		26090 to 26640	26090	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			26640	10MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	CONDCUDETED EMISSION	26065 to 26665	26365	5MHz	QPSK	1 RB / 12 RB Offset
		26090 to 26640	26365	10MHz	QPSK	1 RB / 24 RB Offset
-	RADIATED EMISSION	26065 to 26665	26365	5MHz	QPSK	1 RB / 12 RB Offset
		26090 to 26640	26365	10MHz	QPSK	1 RB / 24 RB Offset

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

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
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	Anson Lin

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 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

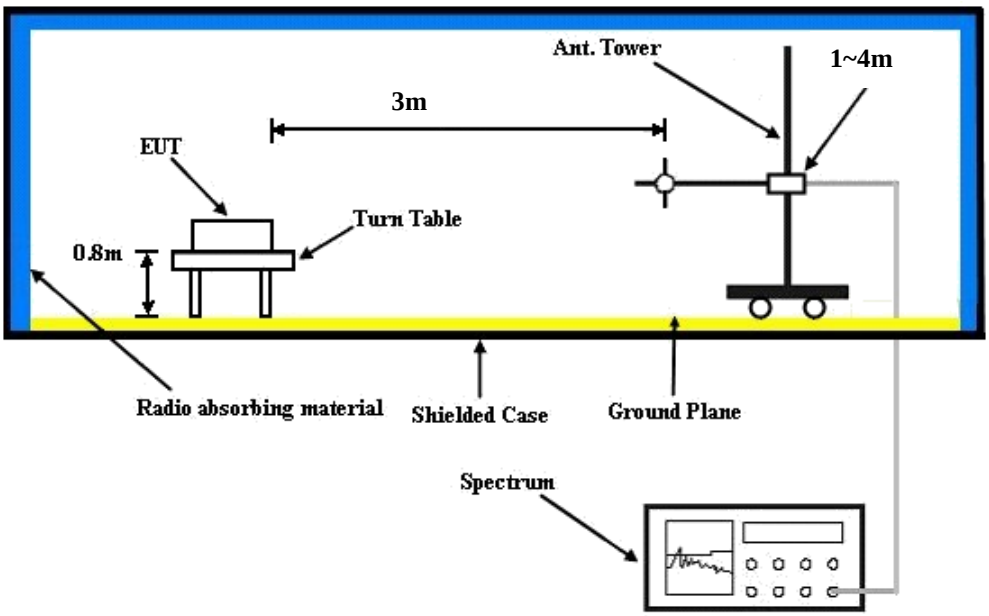
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

CONDUCTED POWER MEASUREMENT:

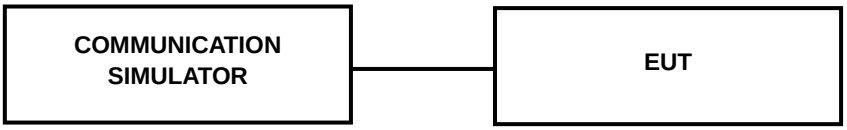
The EUT was set up for the maximum power with CDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 TEST SETUP

EIRP / ERP MEASUREMENT:



CONDUCTED POWER MEASUREMENT:



4.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	CDMA		
Channel	25	600	1175
Frequency (MHz)	1851.25	1880	1908.75
RC1+SO55	24.69	24.98	24.20
RC3+SO55	24.70	**24.99**	24.21
RC3+SO32(+ F-SCH)	24.66	24.95	24.17
RC3+SO32(+SCH)	24.62	24.91	24.13
RTAP 153.6	24.54	24.83	24.05
RETAP 4096	24.51	24.80	24.02

LTE							
Band / BW	Modulation	RB Size	RB Offset	Low CH 26065 Frequency 1852.5 MHz	Mid CH 26365 Frequency 1882.5 MHz	High CH 26665 Frequency 1912.5 MHz	3PGG MPR (dB)
25 / 5M	QPSK	1	0	23.18	23.51	23.58	0
		1	12	23.19	23.59	23.61	0
		1	24	23.09	23.11	23.49	0
		12	0	22.01	22.22	22.25	1
		12	6	22.03	22.21	22.30	1
		12	13	22.05	22.27	22.41	1
		25	0	22.01	22.10	22.22	1
	16QAM	1	0	22.18	22.51	22.58	1
		1	12	22.19	22.59	22.61	1
		1	24	22.09	22.11	22.49	1
		12	0	21.01	21.22	21.25	2
		12	6	21.03	21.21	21.30	2
		12	13	21.05	21.27	21.41	2
		25	0	21.01	21.10	21.22	2

LTE							
Band / BW	Modulation	RB Size	RB Offset	Low CH 26090 Frequency 1855.0 MHz	Mid CH 26365 Frequency 1882.5 MHz	High CH 26640 Frequency 1910.0 MHz	3PGG MPR (dB)
25 / 10M	QPSK	1	0	23.21	23.54	23.61	0
		1	24	23.22	23.62	23.64	0
		1	49	23.12	23.14	23.52	0
		25	0	22.04	22.25	22.28	1
		25	12	22.06	22.24	22.33	1
		25	25	22.08	22.30	22.44	1
		50	0	22.04	22.13	22.25	1
	16QAM	1	0	22.21	22.54	22.61	1
		1	24	22.22	22.62	22.64	1
		1	49	22.12	22.14	22.52	1
		25	0	21.04	21.25	21.28	2
		25	12	21.06	21.24	21.33	2
		25	25	21.08	21.30	21.44	2
		50	0	21.04	21.13	21.25	2

EIRP POWER (dBm)

CDMA

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	25	1851.25	-17.62	38.19	20.57	114.02	H
	600	1880.00	-17.93	38.70	20.77	119.40	H
	1175	1908.75	-17.68	38.43	20.75	118.85	H
	25	1851.25	-21.00	38.48	17.48	55.98	V
	600	1880.00	-21.33	38.59	17.26	53.21	V
	1175	1908.75	-21.75	38.87	17.12	51.52	V

LTE Band 25

CHANNEL BANDWIDTH: 5MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
Z	26065	1852.5	-18.53	38.19	19.66	92.47	H
	26365	1882.5	-19.57	38.70	19.13	81.85	H
	26665	1912.5	-20.21	39.35	19.14	82.04	H
	26065	1852.5	-20.79	38.48	17.69	58.75	V
	26365	1882.5	-21.45	38.59	17.14	51.76	V
	26665	1912.5	-21.44	38.87	17.43	55.34	V

CHANNEL BANDWIDTH: 5MHz 16QAM

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
Z	26065	1852.5	-20.03	38.19	18.16	65.46	H
	26365	1882.5	-20.04	38.70	18.66	73.45	H
	26665	1912.5	-20.76	39.35	18.59	72.28	H
	26065	1852.5	-21.32	38.48	17.16	52.00	V
	26365	1882.5	-21.16	38.59	17.43	55.34	V
	26665	1912.5	-21.14	38.87	17.73	59.29	V

CHANNEL BANDWIDTH: 10MHz QPSK

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
Z	20690	1855	-18.61	38.19	19.58	90.78	H
	26365	1882.5	-19.41	38.70	19.29	84.92	H
	26640	1910	-19.83	39.35	19.52	89.54	H
	20690	1855	-20.92	38.48	17.56	57.02	V
	26365	1882.5	-21.35	38.59	17.24	52.97	V
	26640	1910	-21.06	38.87	17.81	60.39	V

CHANNEL BANDWIDTH: 10MHz 16QAM

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
Z	20690	1855	-20.09	38.19	18.10	64.57	H
	26365	1882.5	-19.94	38.70	18.76	75.14	H
	26640	1910	-20.91	39.35	18.44	69.82	H
	20690	1855	-21.52	38.48	16.96	49.66	V
	26365	1882.5	-22.16	38.59	16.43	43.95	V
	26640	1910	-22.19	38.87	16.68	46.56	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

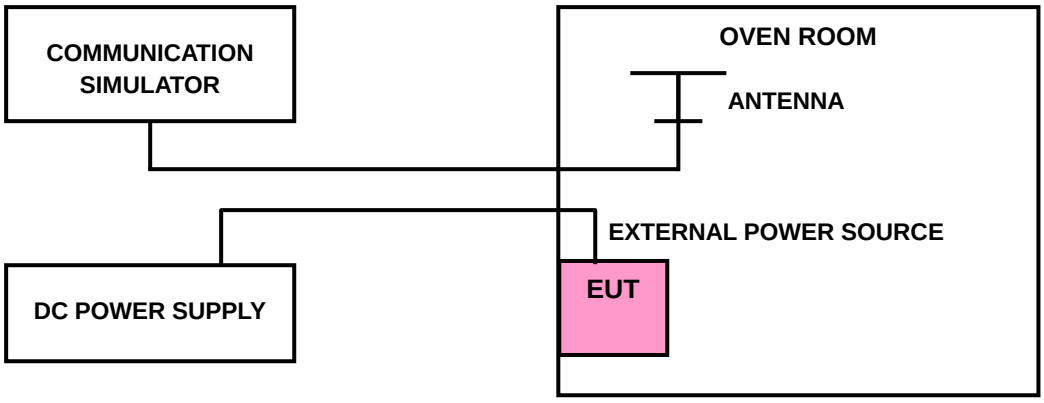
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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 ±0.5℃ 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

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)			LIMIT (ppm)
	CDMA	LTE Band 2		
		5MHz	10MHz	
3.8	0.004	-0.007	0.003	2.5
3.6	0.006	-0.004	-0.005	2.5
4.34	0.006	-0.003	-0.006	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.34Vdc.

FREQUENCY ERROR vs. TEMPERATURE

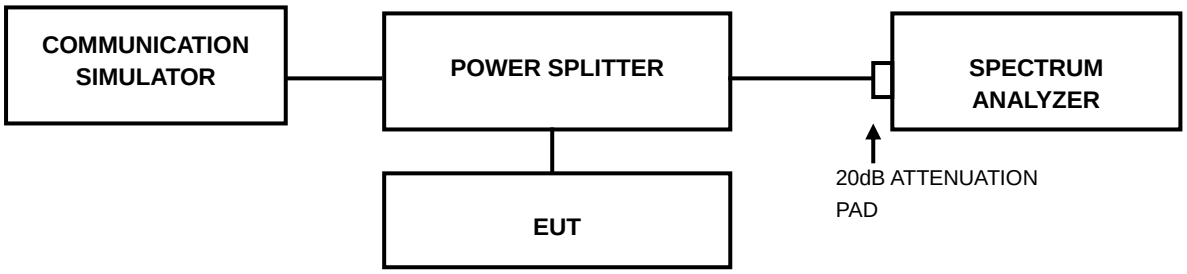
TEMP. (℃)	FREQUENCY ERROR (ppm)			LIMIT (ppm)
	CDMA	LTE Band 2		
		5MHz	10MHz	
-30	0.003	0.008	0.002	2.5
-20	0.003	0.004	0.002	2.5
-10	0.004	-0.004	-0.004	2.5
0	0.004	0.002	-0.002	2.5
10	0.005	0.002	-0.004	2.5
20	0.004	0.009	-0.005	2.5
30	0.003	-0.002	-0.006	2.5
40	0.003	-0.002	-0.006	2.5
50	0.004	0.001	0.004	2.5
60	0.004	0.004	0.003	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

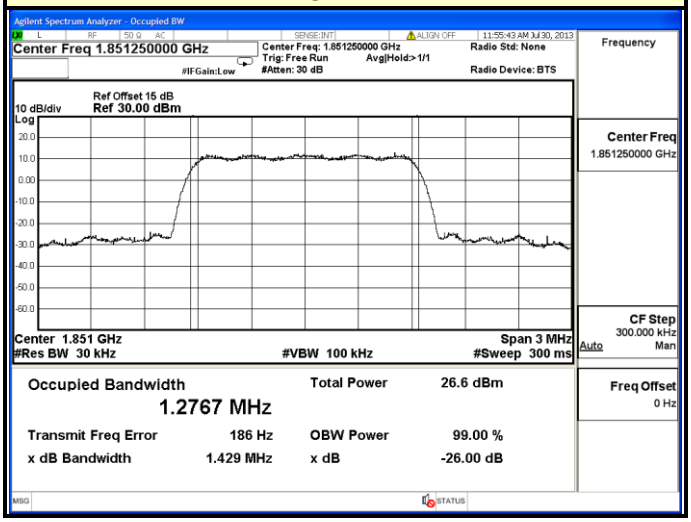


4.3.3 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)
		CDMA
25	1851.25	1.2767
600	1880.00	1.2749
1175	1908.75	1.2763

SPECTRUM PLOT OF WORST VALUE

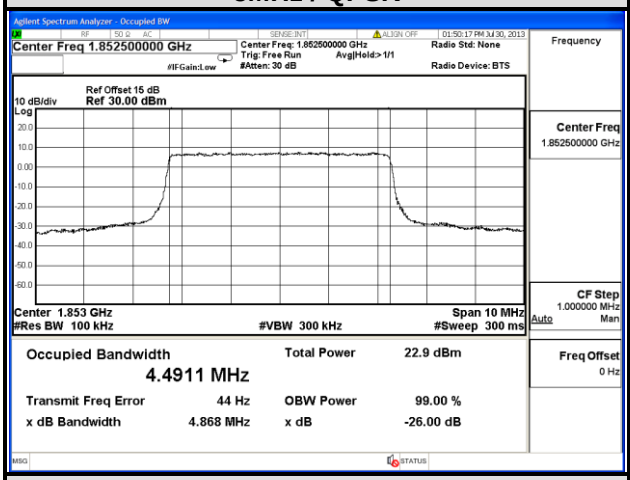
CDMA



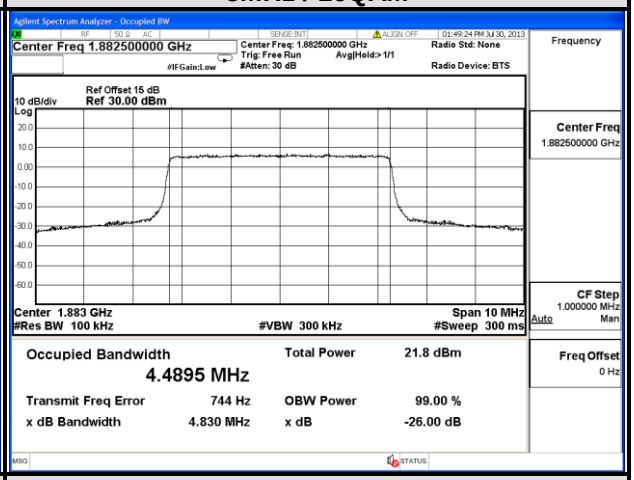
LTE BAND 25							
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
26065	1852.5	4.4911	4.4853	26090	1855.0	8.9127	8.9172
26365	1882.5	4.4873	4.4895	26365	1882.5	8.9164	8.9143
26665	1912.5	4.4879	4.4836	26640	1910.0	8.9143	8.9164

SPECTRUM PLOT OF WORST VALUE

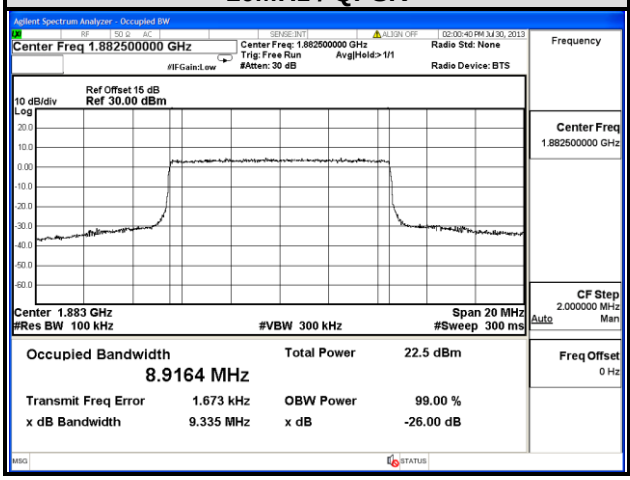
5MHz / QPSK



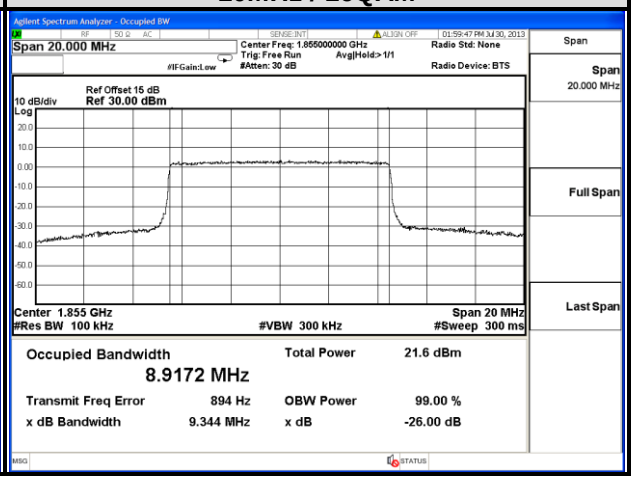
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

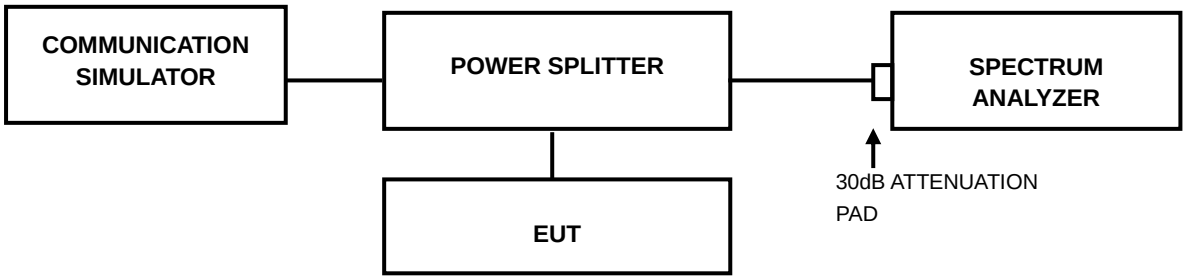


4.4 PEAK TO AVERAGE RATIO

4.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

4.4.2 TEST SETUP



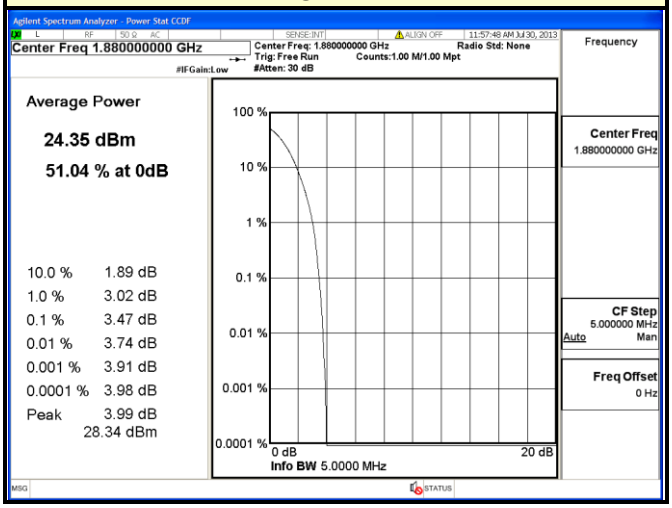
4.4.3 TEST PROCEDURES

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

4.4.4 TEST RESULTS

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
		CDMA
25	1851.25	3.20
600	1880.00	3.47
1175	1908.75	3.05

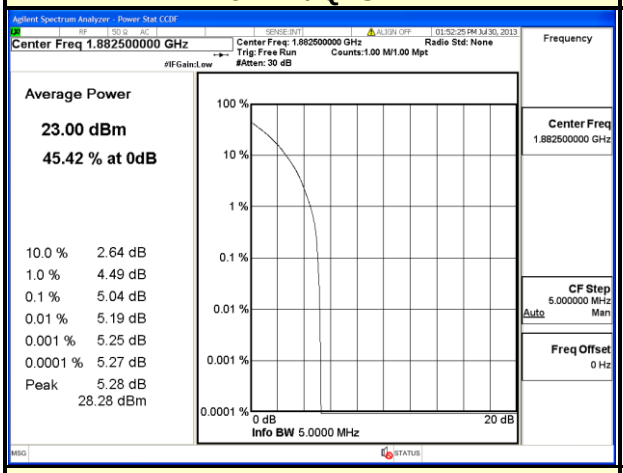
SPECTRUM PLOT OF WORST VALUE
CDMA



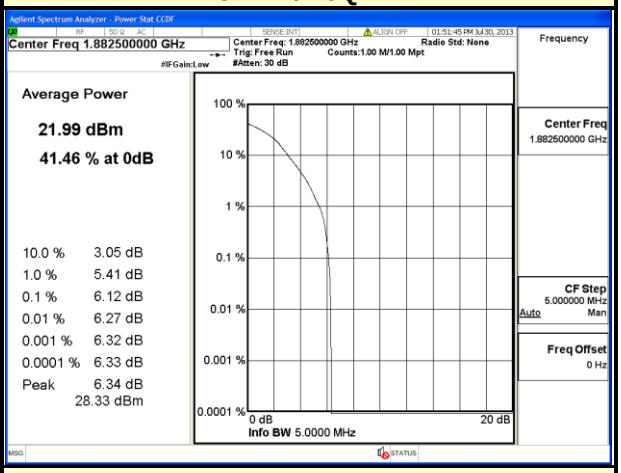
LTE BAND 25							
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
26065	1852.5	5.04	6.02	26090	1855.0	4.95	6.02
26365	1882.5	5.04	6.12	26365	1882.5	4.89	5.94
26665	1912.5	4.45	5.64	26640	1910.0	4.58	5.78

SPECTRUM PLOT OF WORST VALUE

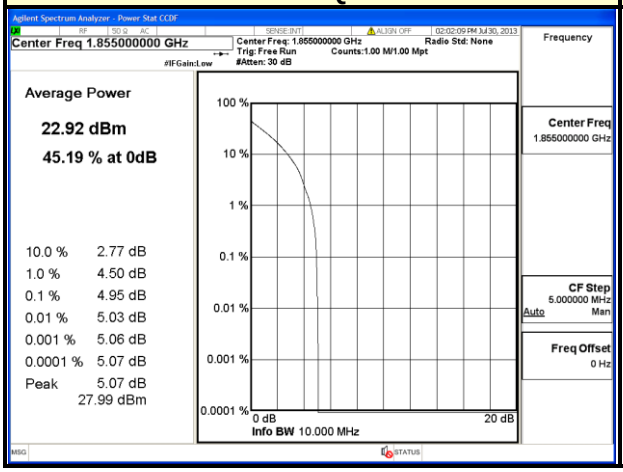
5MHz / QPSK



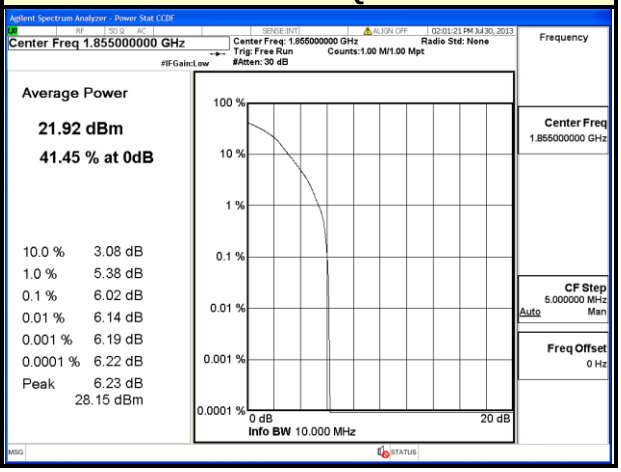
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

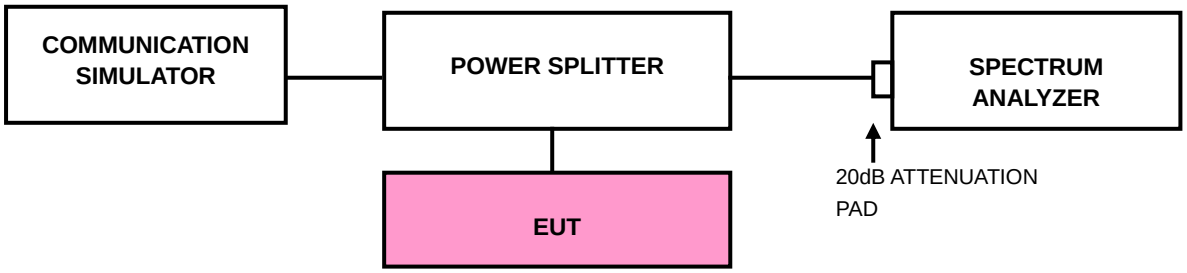


4.5 BAND EDGE MEASUREMENT

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 1 MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (CDMA).

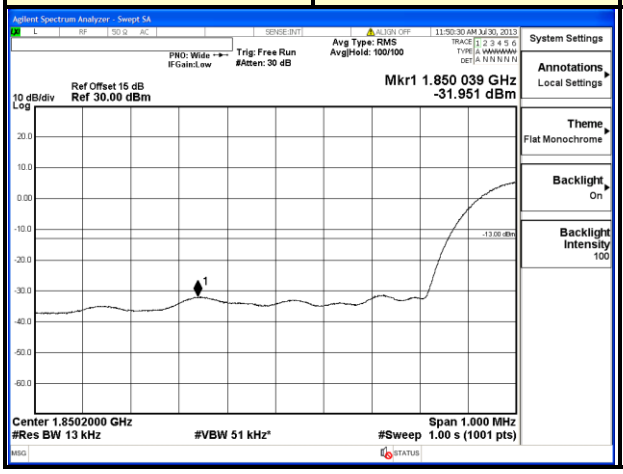
c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE).

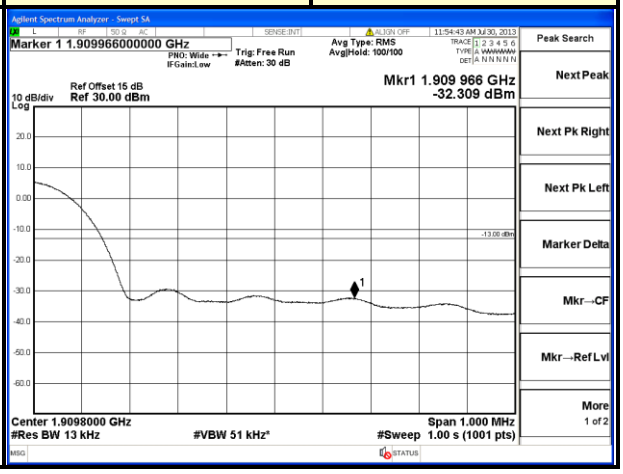
d. Record the max trace plot into the test report.

4.5.4 TEST RESULTS

CDMA

CHANNEL	25	CHANNEL	1175

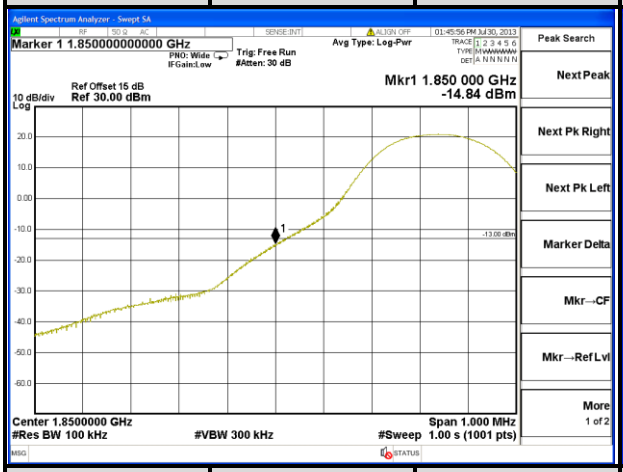


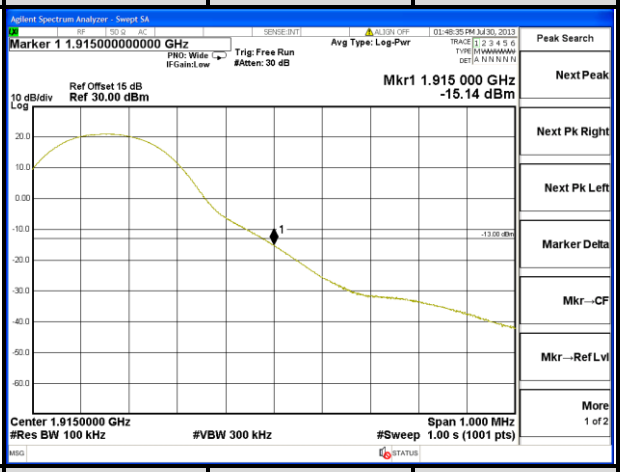


LTE Band 25

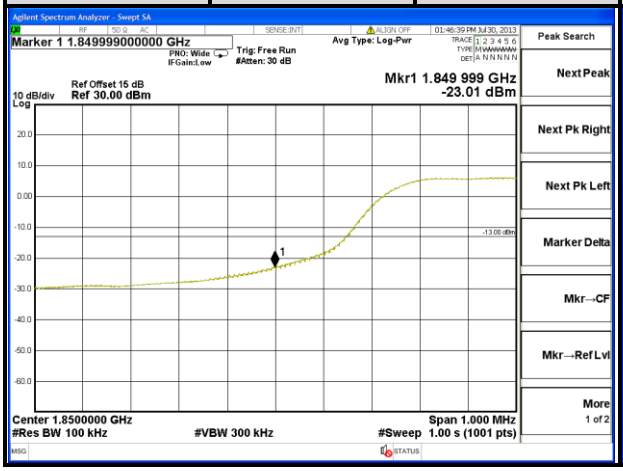
Channel Bandwidth: 5MHz

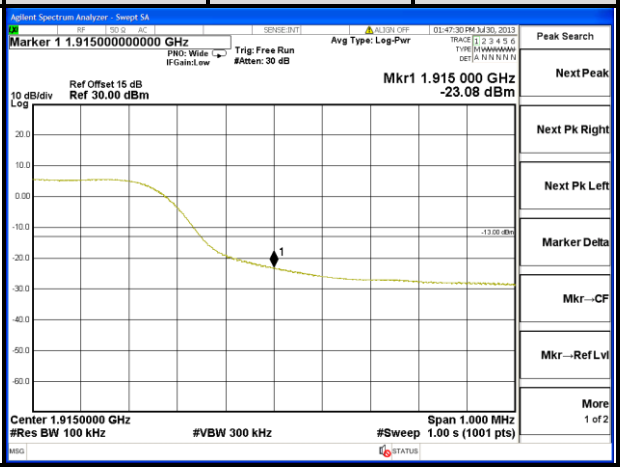
CHANNEL	26065	1 RB	CHANNEL	26665	1 RB





CHANNEL	26065	25 RB	CHANNEL	26665	25 RB

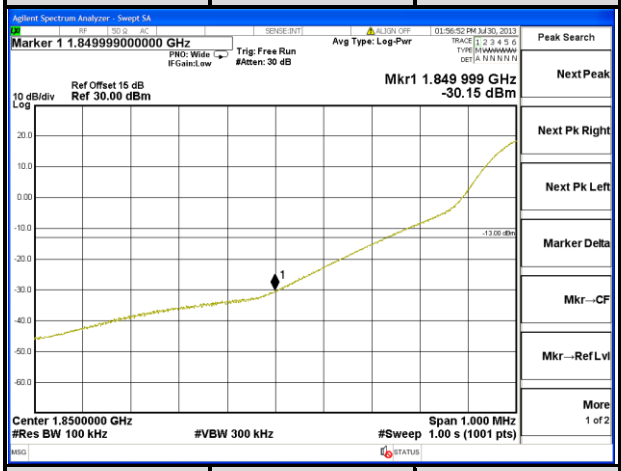


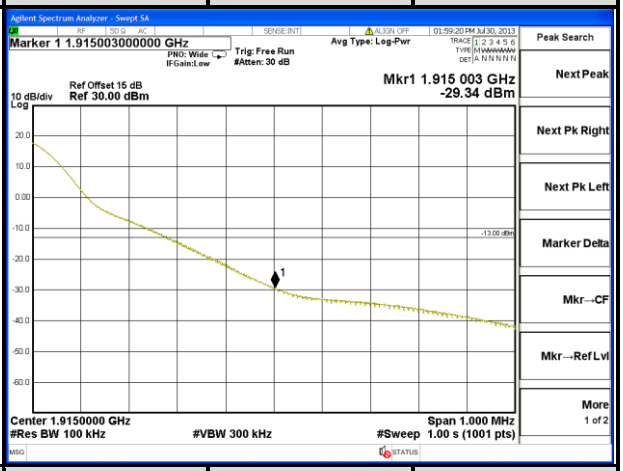


LTE Band 25

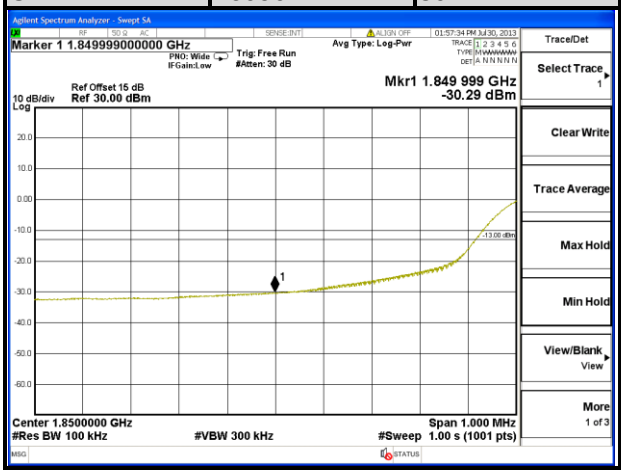
Channel Bandwidth: 10MHz

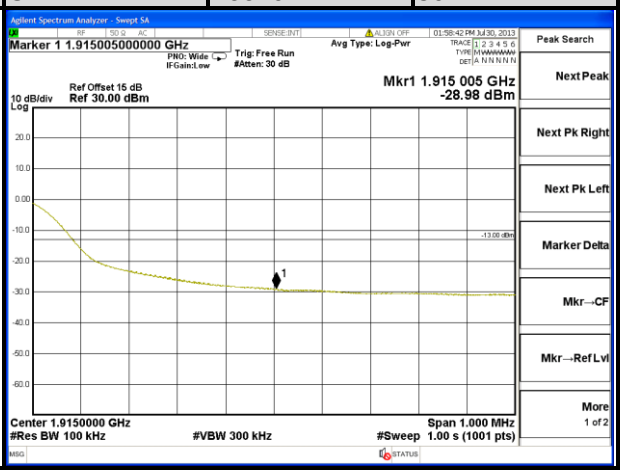
CHANNEL	26090	1 RB	CHANNEL	26640	1 RB





CHANNEL	26090	50 RB	CHANNEL	26640	50 RB





4.6 CONDUCTED SPURIOUS EMISSIONS

4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

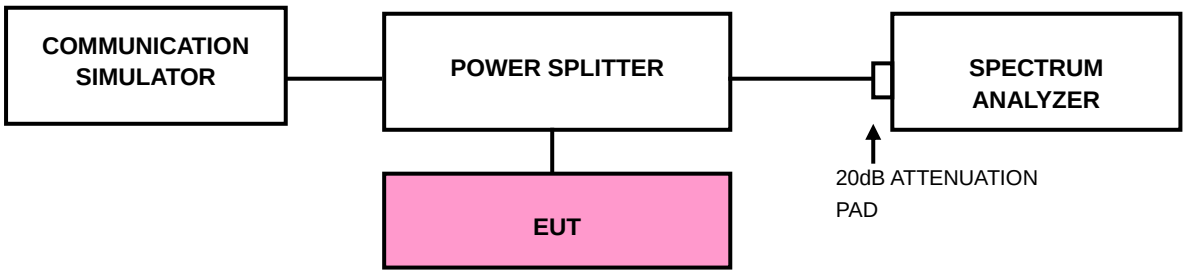
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

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.

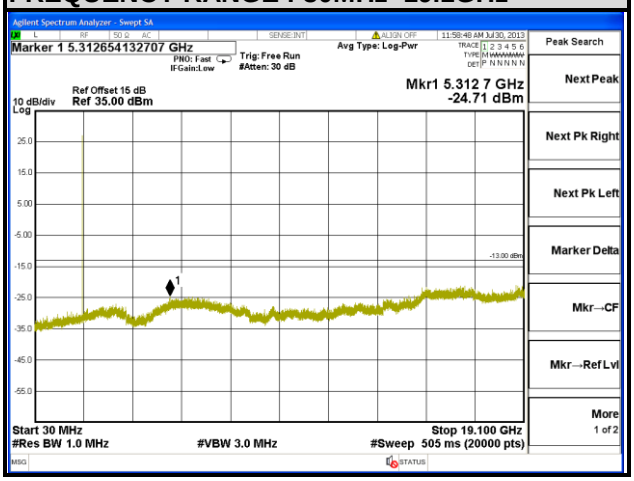
b. Measuring frequency range is from 30 MHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

4.6.3 TEST SETUP

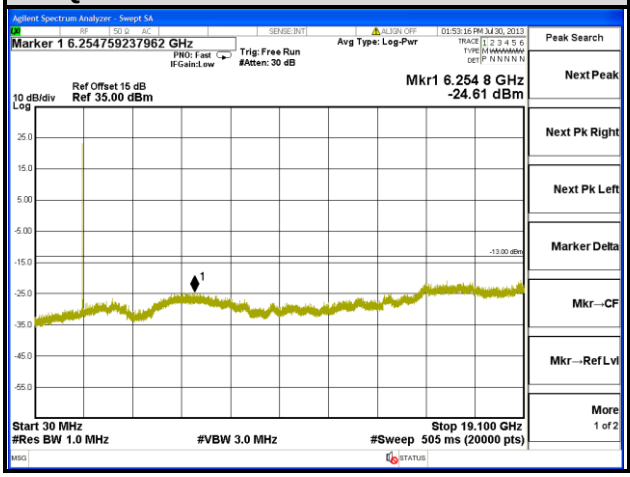


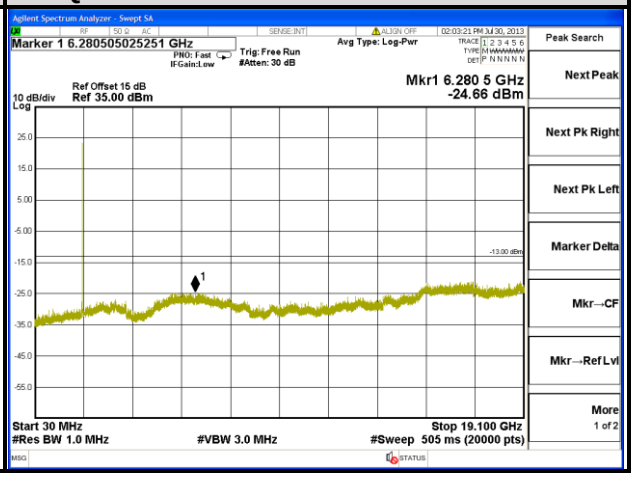
4.6.4 TEST RESULTS

CDMA
CHANNEL 600
FREQUENCY RANGE : 30MHz~19.1GHz



LTE Band 25 (Channel Bandwidth: 5MHz)	LTE Band 25 (Channel Bandwidth: 10MHz)
CHANNEL 26365	CHANNEL 26365
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz





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.

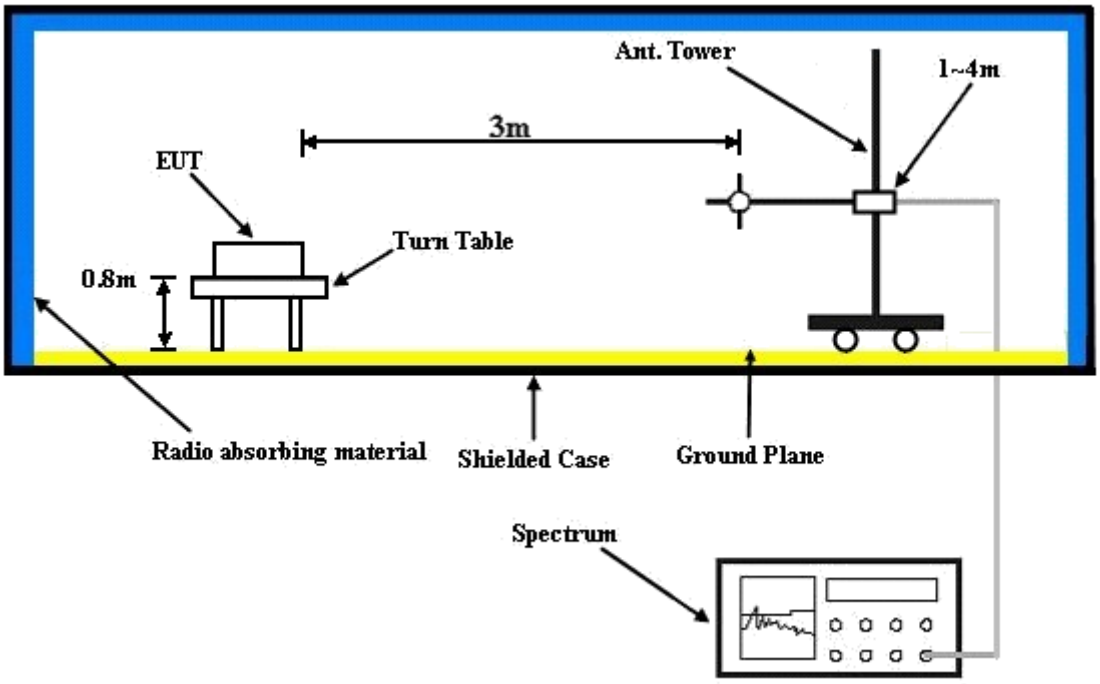
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

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:

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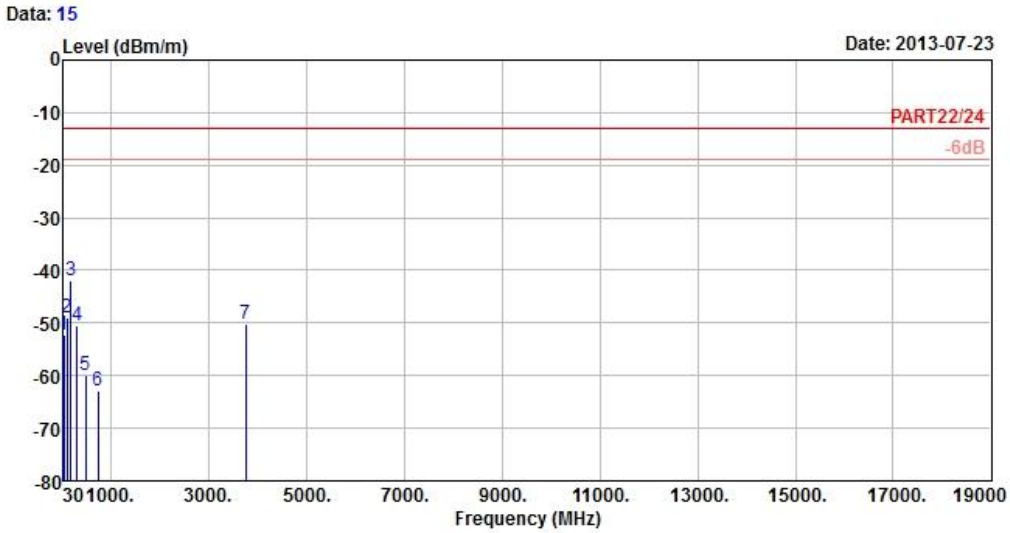

Site : 966 Chamber 5
Condition : PART22/24 3m HORIZONTAL
Brand/Model: 0P4E100
Remark : 1xRTT1900 Link
Tested by : AnsonLin
Temprature : 25℃
Humidity : 65%
Plane : Z

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	30.00	-52.15	-53.22	-13.00	-39.15	1.07	Peak
2	105.60	-48.97	-38.44	-13.00	-35.97	-10.53	Peak
3 pp	172.29	-41.95	-35.20	-13.00	-28.95	-6.75	Peak
4	300.70	-50.47	-44.10	-13.00	-37.47	-6.37	Peak
5	478.50	-59.84	-56.19	-13.00	-46.84	-3.65	Peak
6	729.80	-62.97	-64.62	-13.00	-49.97	1.65	Peak
7	3760.00	-50.13	-41.83	-13.00	-37.13	-8.30	Peak

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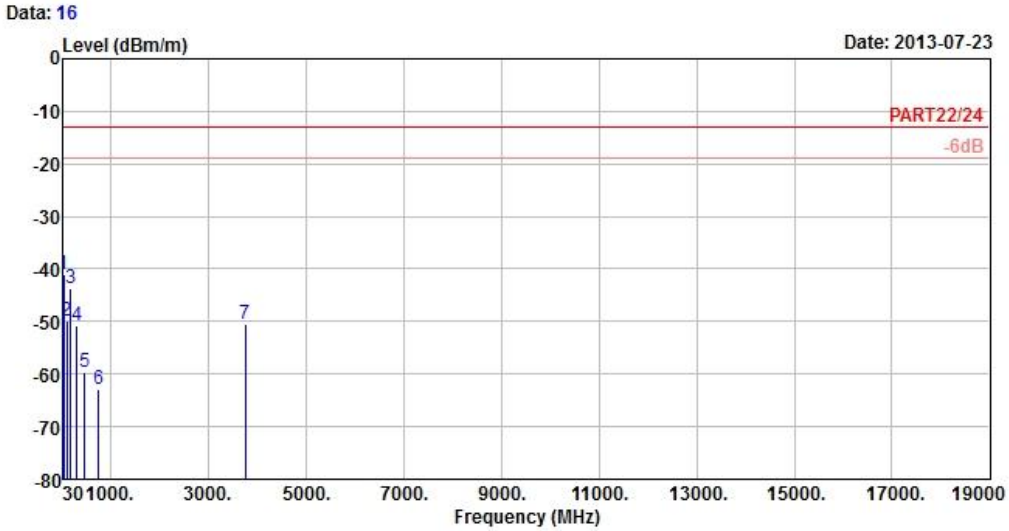

Site : 966 Chamber 5
Condition : PART22/24 3m VERTICAL
Brand/Model: 0P4E100
Remark : 1xRTT1900 Link
Tested by : AnsonLin
Temprature : 25℃
Humidity : 65%
Plane : Z

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	30.54	-40.90	-41.24	-13.00	-27.90	0.34	Peak
2	104.25	-50.02	-39.52	-13.00	-37.02	-10.50	Peak
3	177.42	-43.76	-37.53	-13.00	-30.76	-6.23	Peak
4	300.70	-50.66	-44.29	-13.00	-37.66	-6.37	Peak
5	464.50	-59.64	-55.64	-13.00	-46.64	-4.00	Peak
6	744.50	-63.02	-64.77	-13.00	-50.02	1.75	Peak
7	3760.00	-50.47	-42.17	-13.00	-37.47	-8.30	Peak

LTE BAND 25

CHANNEL BANDWIDTH: 5MHz / QPSK

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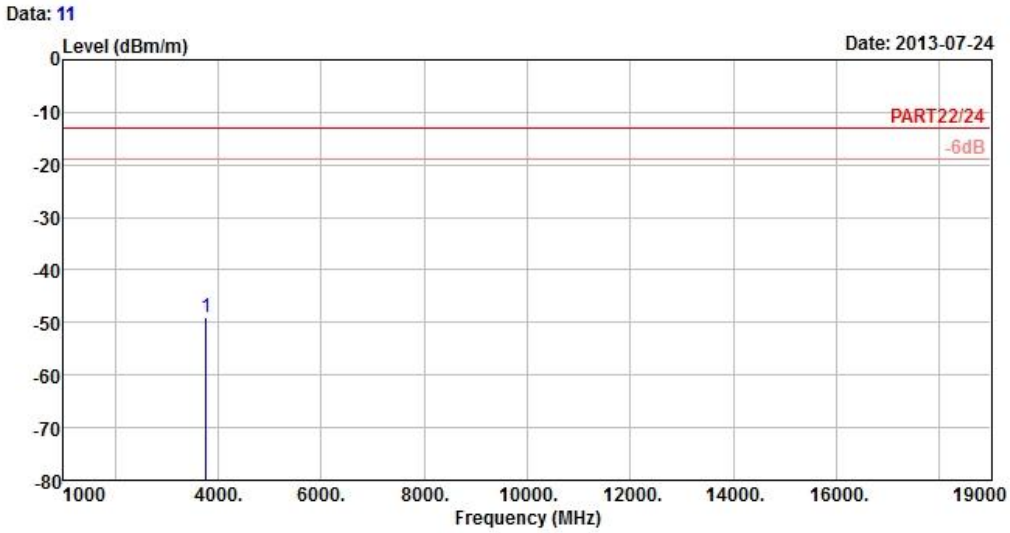
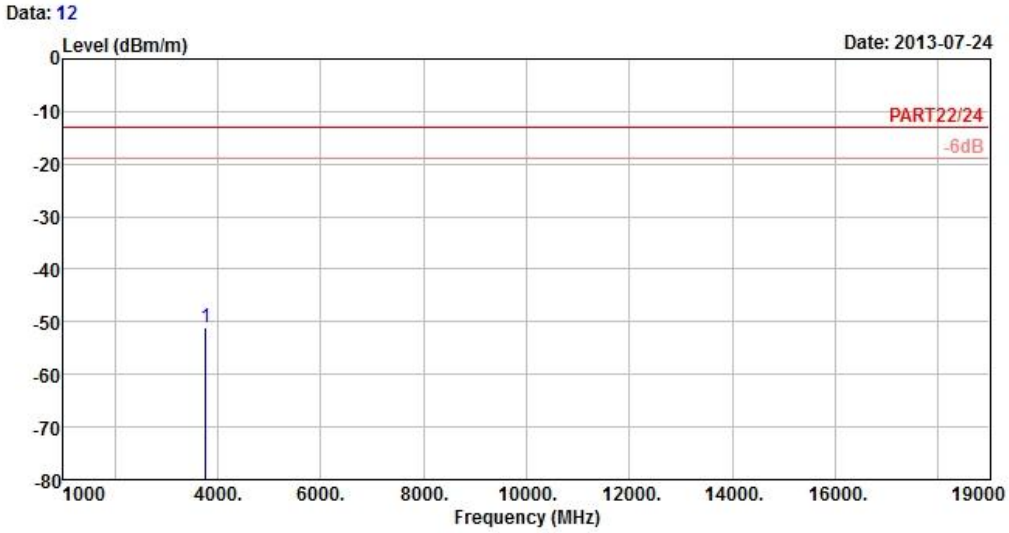


Site : 966 Chamber 5
Condition : PART22/24 3m HORIZONTAL
Brand/Model: 0P4E100
Remark : LTE Band 25_5M_QPSK(1,12) Link
Tested by : AnsonLin
Temprature : 25℃
Humidity : 65%
Plane : Y

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3765.00	-49.00	-40.76	-13.00	-36.00	-8.24	Peak

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



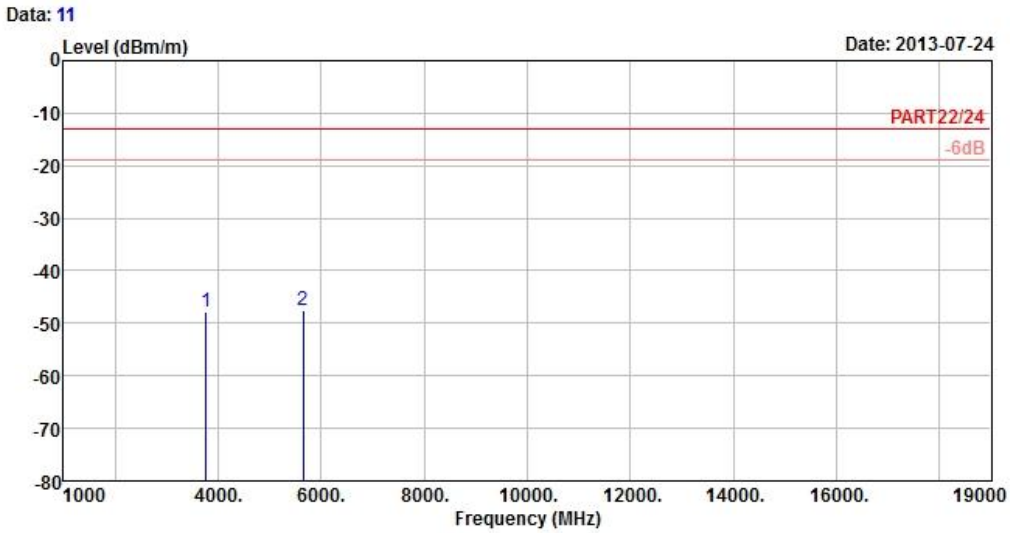
Site : 966 Chamber 5
Condition : PART22/24 3m VERTICAL
Brand/Model: 0P4E100
Remark : LTE Band 25_5M_QPSK(1,12) Link
Tested by : AnsonLin
Temprature : 25℃
Humidity : 65%
Plane : Y

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3765.00	-51.19	-42.95	-13.00	-38.19	-8.24	Peak

LTE BAND 25

CHANNEL BANDWIDTH: 10MHz / QPSK

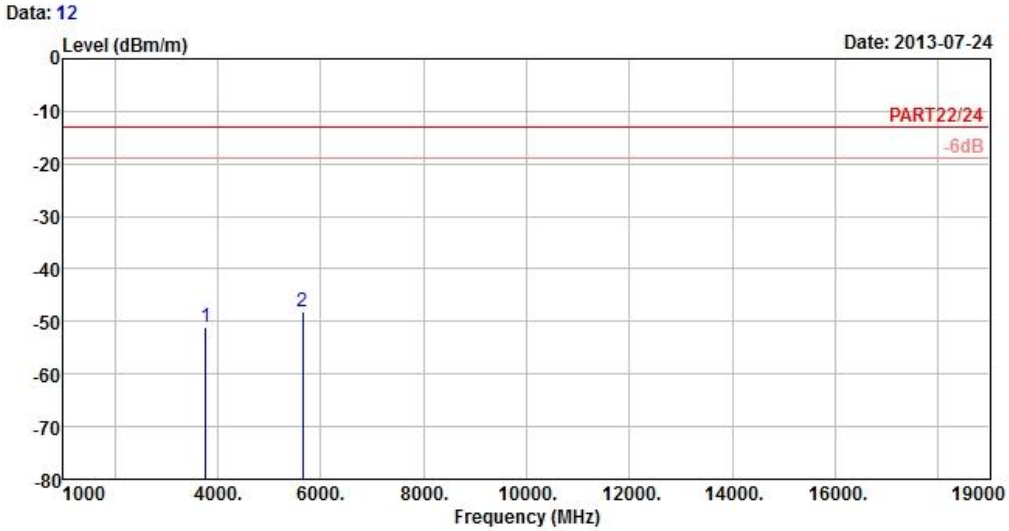
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition : PART22/24 3m HORIZONTAL
Brand/Model: 0P4E100
Remark : LTE Band 25_10M_QPSK(1,24) Link
Tested by : AnsonLin
Temprature : 25℃
Humidity : 65%
Plane : Y

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	3765.00	-47.82	-39.58	-13.00	-34.82	-8.24	Peak
2 pp	5647.50	-47.44	-45.54	-13.00	-34.44	-1.90	Peak

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition : PART22/24 3m VERTICAL
Brand/Model: 0P4E100
Remark : LTE Band 25_10M_QPSK(1,24) Link
Tested by : AnsonLin
Temprature : 25℃
Humidity : 65%
Plane : Y

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	3765.00	-51.08	-42.84	-13.00	-38.08	-8.24	Peak
2 pp	5647.50	-48.13	-46.23	-13.00	-35.13	-1.90	Peak

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: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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---