FCC TEST REPORT

(PART 27)

REPORT NO.:	RF140409C02A-7
MODEL NO.:	HTL23
FCC ID:	NM8HTL23
RECEIVED:	Apr. 09, 2014
TESTED:	May 01, 2014 ~ May 06, 2014
ISSUED:	May 15, 2014

APPLICANT: HTC Corporation

ADDRESS: 1F, 6-3 Baoqiang Road, Xindian District, New Taipei City, Taiwan 231

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.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140409C02A-7	Original release	May 15, 2014

1 CERTIFICATION

PRODUCT:	Smartphone
MODEL NO.:	HTL23
BRAND:	HTC
APPLICANT:	HTC Corporation
TESTED:	May 01, 2014 ~ May 06, 2014
TEST SAMPLE:	Production Unit
TEST STANDARDS:	**FCC Part 27, Subpart C, L** **FCC Part 2** ANSI C63.4-2003

The above equipment (model: HTL23) 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:** May 15, 2014

Ivonne Wu / Supervisor

APPROVED BY : _____ , **DATE:** May 15, 2014

Sam Chen / Senior Project Engineer

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

LTE Band 17			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
2.1046 27.50(C)(10)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	PASS	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -5.92dB at 1420.00MHz.

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	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 AGILENT	N9038A	MY51210203	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 27. 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 19, 2014	Feb. 18, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 184045	980116	Jan. 13, 2014	Jan. 12, 2015
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Worken	RG-213	NA	Nov. 07, 2013	Nov. 06, 2014
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, 2014
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

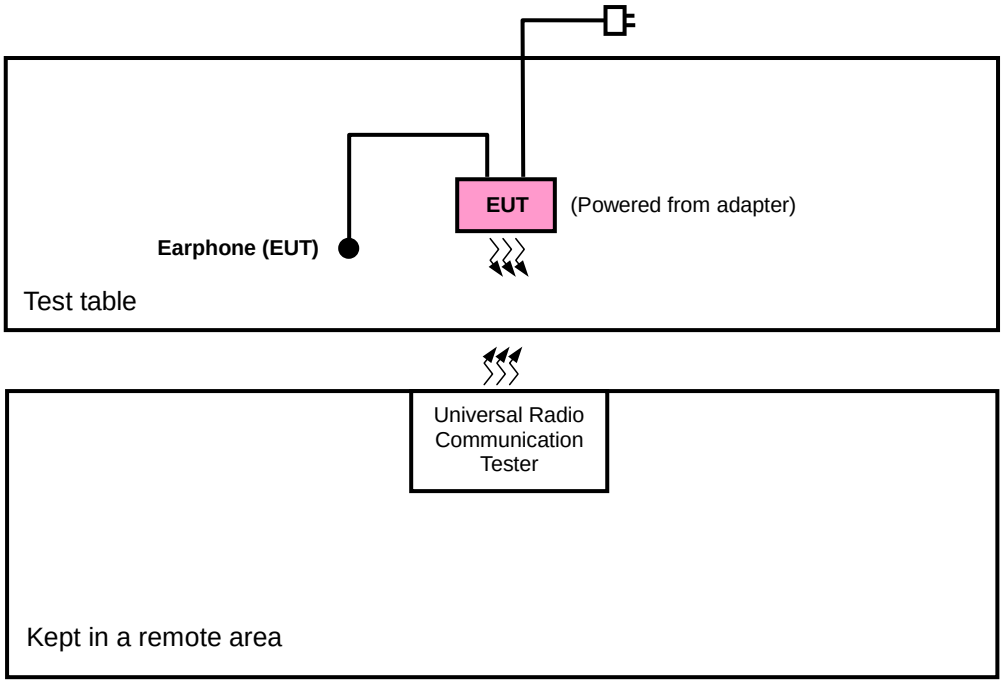
PRODUCT	Smartphone	
MODEL NO.	HTL23	
POWER SUPPLY	5Vdc (adapter or host equipment) 3.8Vdc (battery)	
MODULATION TECHNOLOGY	**LTE Band 17**	QPSK, 16QAM
FREQUENCY RANGE	**LTE Band 17** **Channel Bandwidth: 5MHz**	706.5MHz ~ 713.5MHz
	LTE Band 17 **Channel Bandwidth: 10MHz**	709MHz ~ 711MHz
EMISSION DESIGNATOR	**LTE Band 17** **Channel Bandwidth: 5MHz**	4M50G7D
	LTE Band 17 **Channel Bandwidth: 10MHz**	8M94W7D
MAX. ERP POWER	**LTE Band 17** **Channel Bandwidth: 5MHz**	34.99mW
	LTE Band 17 **Channel Bandwidth: 10MHz**	36.90mW
ANTENNA TYPE	Fixed Internal Antenna	
DATA CABLE	Refer to Note as below	
I/O PORTS	Refer to users' manual	
ACCESSORY DEVICES	Refer to Note as below	

NOTE:

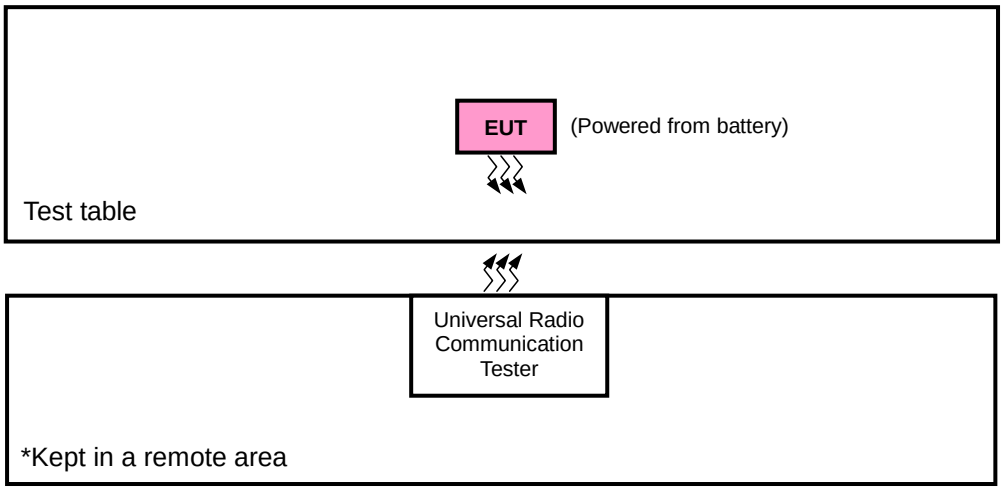
1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR E.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 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 case was found when positioned on Y-plane for ERP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

LTE Band 17

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
-	ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB / 12 RB Offset
		23780 to 23800	23780, 23790, 23800	10MHz	QPSK	1 RB / 24 RB Offset
-	FREQUENCY STABILITY	23755 to 23825	23790	5MHz	QPSK	1 RB / 12 RB Offset
		23780 to 23800	23790	10MHz	QPSK	1 RB / 24 RB Offset
-	OCCUPIED BANDWIDTH	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	PEAK TO AVERAGE RATIO	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	BAND EDGE	23755 to 23825	23755	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23825	5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23780 to 23800	23780	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23800	10MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	CONDCUDETED EMISSION	23755 to 23825	23790	5MHz	QPSK	1 RB / 12 RB Offset
		23780 to 23800	23790	10MHz	QPSK	1 RB / 24 RB Offset
-	RADIATED EMISSION	23755 to 23825	23790	5MHz	QPSK	1 RB / 12 RB Offset
		23780 to 23800	23790	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
ERP/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
PEAK TO AVERAGE RATIO	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	Johnson Liao

3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2
FCC 47 CFR Part 27
ANSI C63.4-2003
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

Portable stations (hand-held devices) operating in the 704-716 MHz band are limited to 3 watts ERP

4.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

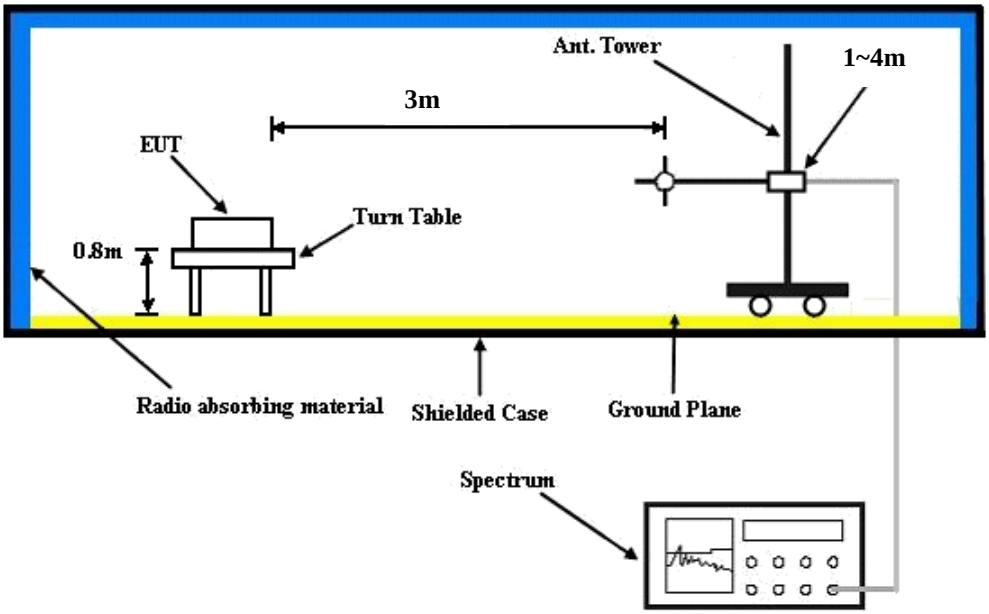
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum 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:

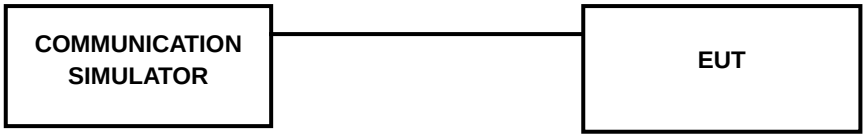
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 TEST SETUP

EIRP / ERP MEASUREMENT:



CONDUCTED POWER MEASUREMENT:



4.1.4 TEST RESULTS

Average Conducted Output Power (dBm)

Band / BW	Modulation	RB Size	RB Offset	Low CH 23755 Frequency 706.5 MHz	Mid CH 23790 Frequency 710.0 MHz	High CH 23825 Frequency 713.5 MHz	3PGG MPR (dB)
17 / 5M	QPSK	1	0	22.57	22.55	22.60	0
		1	12	22.67	22.63	22.70	0
		1	24	22.45	22.44	22.57	0
		12	0	21.67	21.64	21.70	1
		12	6	21.71	21.69	21.74	1
		12	13	21.66	21.65	21.75	1
		25	0	21.73	21.71	21.75	1
	16QAM	1	0	21.57	21.55	21.60	1
		1	12	21.67	21.63	21.70	1
		1	24	21.45	21.44	21.57	1
		12	0	20.67	20.64	20.70	2
		12	6	20.71	20.69	20.74	2
		12	13	20.66	20.65	20.75	2
		25	0	20.73	20.71	20.75	2

Band / BW	Modulation	RB Size	RB Offset	Low CH 23780 Frequency 709.0 MHz	Mid CH 23790 Frequency 710.0 MHz	High CH 23800 Frequency 711.0 MHz	3PGG MPR (dB)
17 / 10M	QPSK	1	0	22.68	22.66	22.71	0
		1	24	22.78	22.74	22.81	0
		1	49	22.56	22.55	22.68	0
		25	0	21.78	21.75	21.81	1
		25	12	21.82	21.80	21.85	1
		25	25	21.77	21.76	21.86	1
		50	0	21.84	21.82	21.86	1
	16QAM	1	0	21.68	21.66	21.71	1
		1	24	21.78	21.74	21.81	1
		1	49	21.56	21.55	21.68	1
		25	0	20.78	20.75	20.81	2
		25	12	20.82	20.80	20.85	2
		25	25	20.77	20.76	20.86	2
		50	0	20.84	20.82	20.86	2

AVERAGE ERP (dBm)

LTE Band 17							
Channel Bandwidth: 5MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor(dB)**	**ERP(dBm)**	**ERP(mW)**	**Polarization (H/V)**
Y	23755	706.5	-12.77	30.36	15.44	34.99	H
	23790	710.0	-12.79	30.17	15.23	33.34	
	23825	713.5	-12.96	30.17	15.06	32.06	
	23755	706.5	-18.00	32.03	11.88	15.42	V
	23790	710.0	-17.94	31.98	11.89	15.45	
	23825	713.5	-17.96	32.06	11.95	15.67	

LTE Band 17							
Channel Bandwidth: 5MHz / 16QAM							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor(dB)**	**ERP(dBm)**	**ERP(mW)**	**Polarization (H/V)**
Y	23755	706.5	-13.53	30.36	14.68	29.38	H
	23790	710.0	-13.59	30.17	14.43	27.73	
	23825	713.5	-13.79	30.17	14.23	26.49	
	23755	706.5	-18.89	32.03	10.99	12.56	V
	23790	710.0	-18.76	31.98	11.07	12.79	
	23825	713.5	-18.59	32.06	11.32	13.55	

LTE Band 17							
Channel Bandwidth: 10MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor(dB)**	**ERP(dBm)**	**ERP(mW)**	**Polarization (H/V)**
Y	23780	709.0	-12.35	30.17	15.67	36.90	H
	23790	710.0	-12.52	30.17	15.50	35.48	
	23800	711.0	-12.90	30.18	15.13	32.58	
	23780	709.0	-18.07	31.96	11.74	14.93	V
	23790	710.0	-18.05	31.98	11.78	15.07	
	23800	711.0	-18.06	32.03	11.82	15.21	

LTE Band 17							
Channel Bandwidth: 10MHz / 16QAM							
Plane	**Channel**	**Frequency (MHz)**	**LVL (dBm)**	**Correction Factor(dB)**	**ERP(dBm)**	**ERP(mW)**	**Polarization (H/V)**
Y	23780	709.0	-13.46	30.17	14.56	28.58	H
	23790	710.0	-13.50	30.17	14.52	28.31	
	23800	711.0	-13.75	30.18	14.28	26.79	
	23780	709.0	-18.51	31.96	11.30	13.49	V
	23790	710.0	-18.87	31.98	10.96	12.47	
	23800	711.0	-18.60	32.03	11.28	13.43	

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

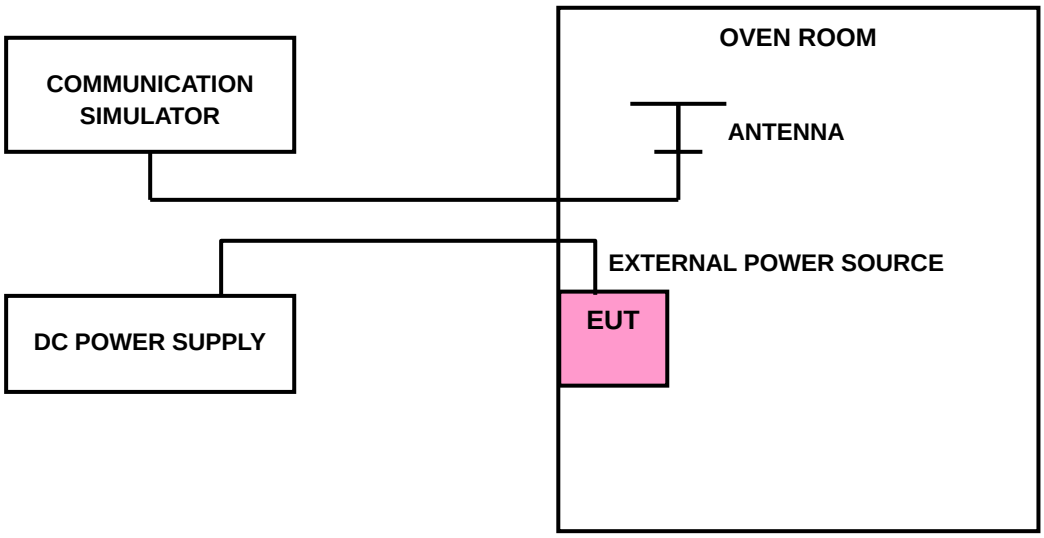
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 TEST PROCEDURE

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±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)
	LTE BAND 17		
	5MHz	10MHz	
3.8	0.002	0.007	2.5
3.6	0.007	0.006	2.5
4.35	0.008	0.005	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE

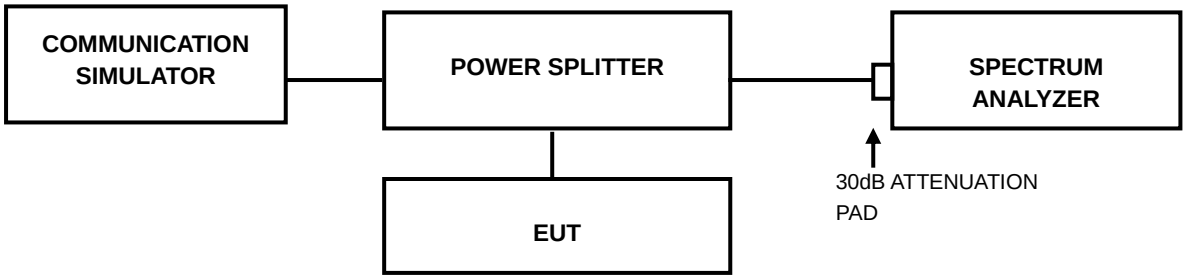
TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	LTE BAND 17		
	5MHz	5MHz	
-30	0.005	0.007	2.5
-20	0.003	0.006	2.5
-10	0.003	0.005	2.5
0	0.006	0.005	2.5
10	0.005	0.005	2.5
20	0.004	0.007	2.5
30	0.005	0.004	2.5
40	0.003	0.004	2.5
50	0.006	0.003	2.5
60	0.005	0.008	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

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

4.3.2 TEST SETUP



4.3.3 TEST PROCEDURES

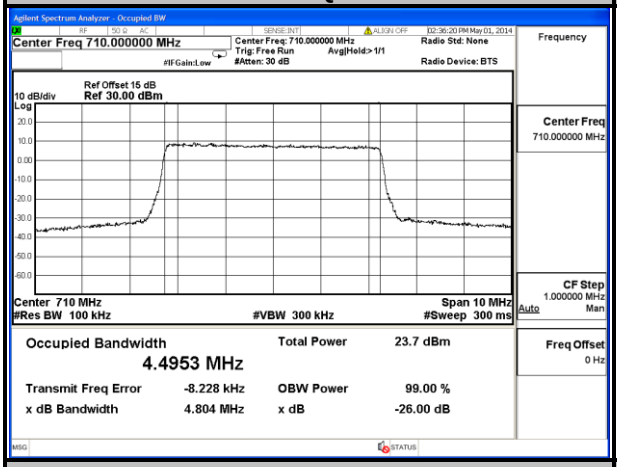
a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.4 TEST RESULTS

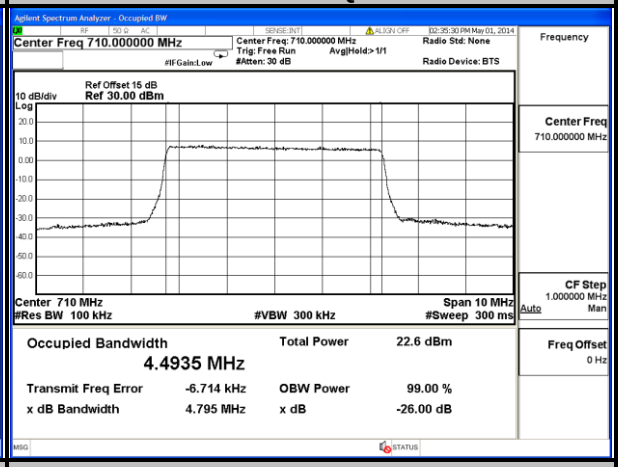
LTE BAND 17							
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	4.4892	4.4862	23780	709.0	8.9259	8.9284
23790	710.0	4.4953	4.4935	23790	710.0	8.9334	8.9353
23825	713.5	4.4946	4.4920	23800	711.0	8.9343	8.9402
CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (MHz)		CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (MHz)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	4.808	4.798	23780	709.0	9.334	9.334
23790	710.0	4.804	4.795	23790	710.0	9.326	9.333
23825	713.5	4.827	4.808	23800	711.0	9.385	9.364

SPECTRUM PLOT OF WORST VALUE

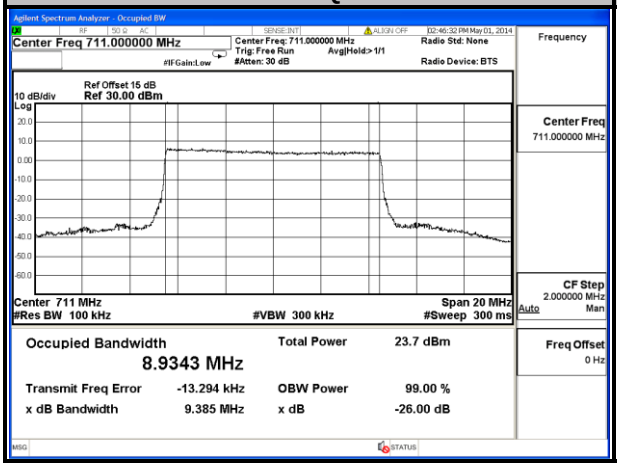
5MHz / QPSK



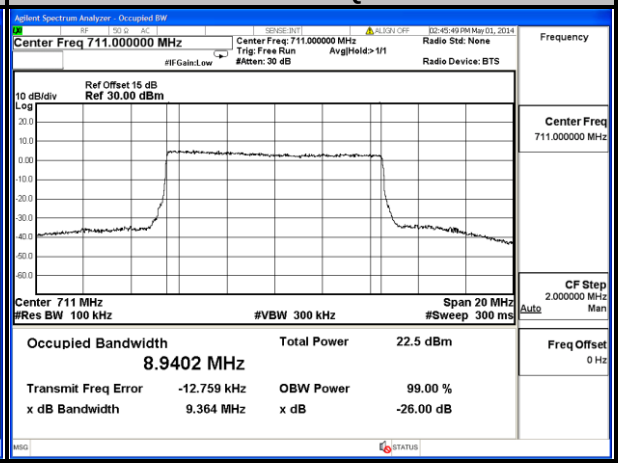
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

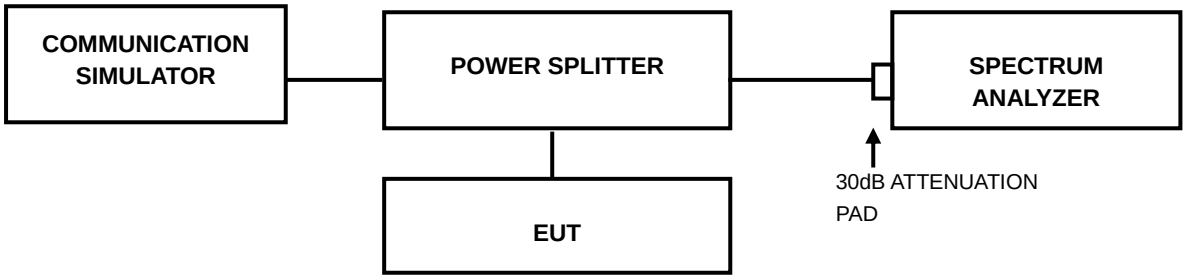


4.4 PEAK TO AVERAGE RATIO

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

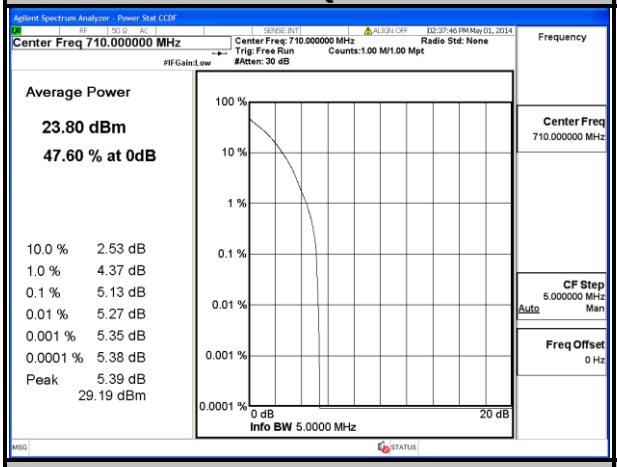
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.4.4 TEST RESULTS

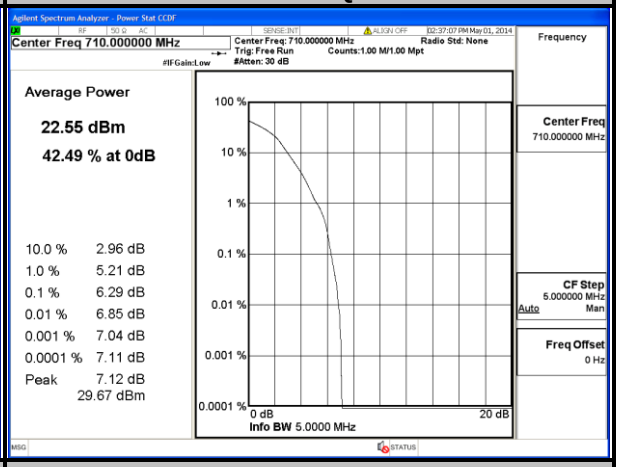
LTE BAND 17							
CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	4.97	6.10	23780	709.0	5.04	6.29
23790	710.0	5.13	6.29	23790	710.0	5.05	6.35
23825	713.5	4.80	6.08	23800	711.0	5.10	6.40

SPECTRUM PLOT OF WORST VALUE

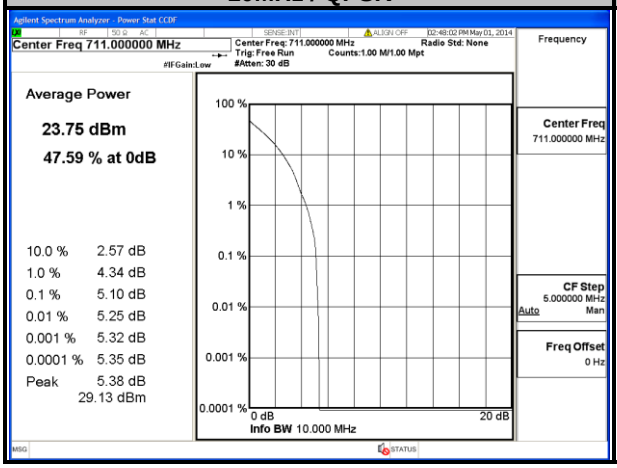
5MHz / QPSK



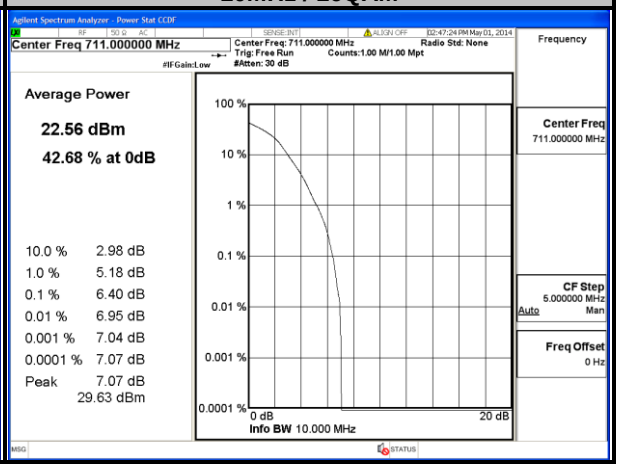
5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

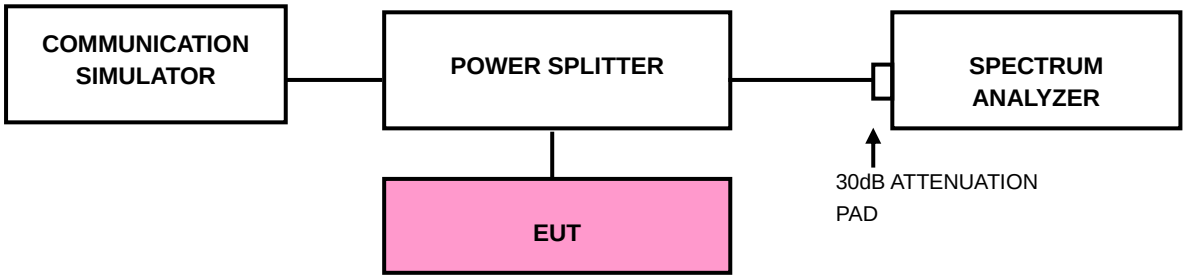


4.5 BAND EDGE MEASUREMENT

4.5.1 LIMITS OF BAND EDGE MEASUREMENT

For operations in the 704-716 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

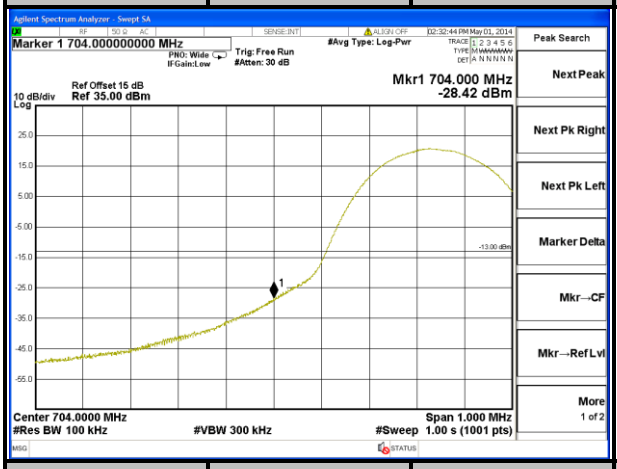
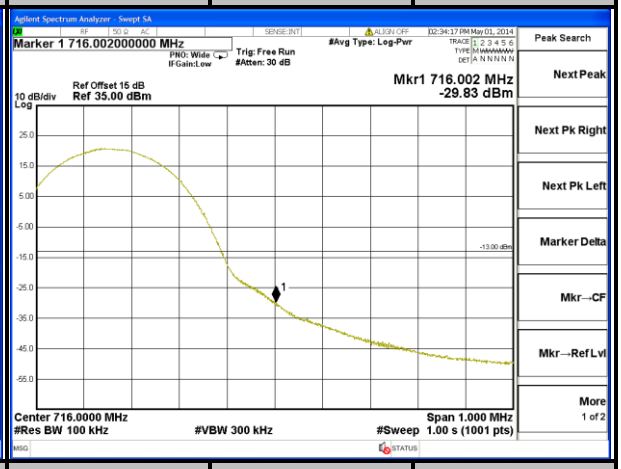
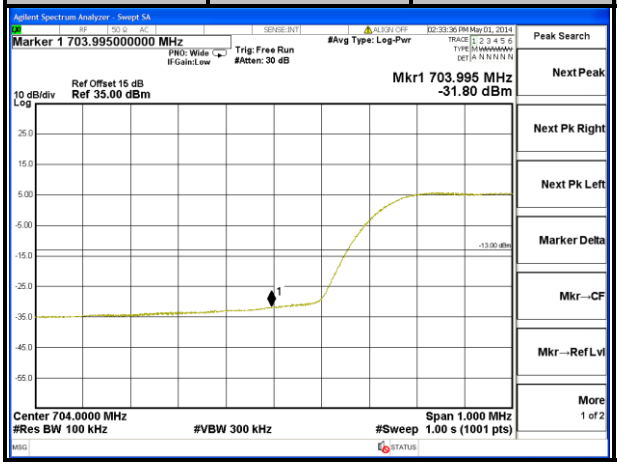
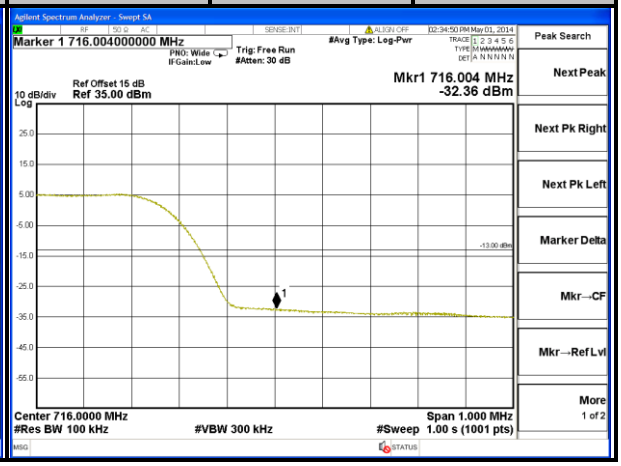
4.5.2 TEST SETUP

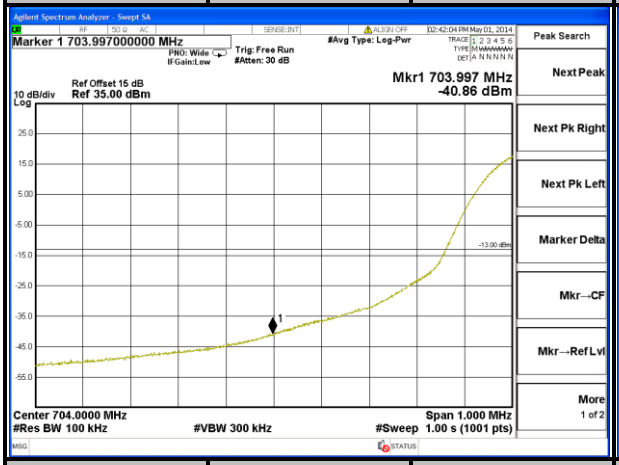
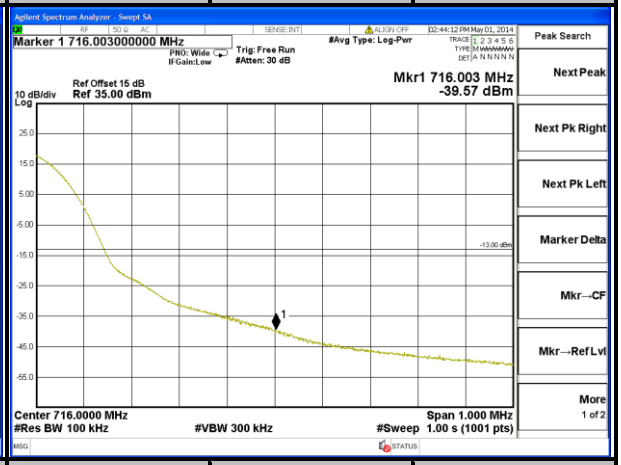
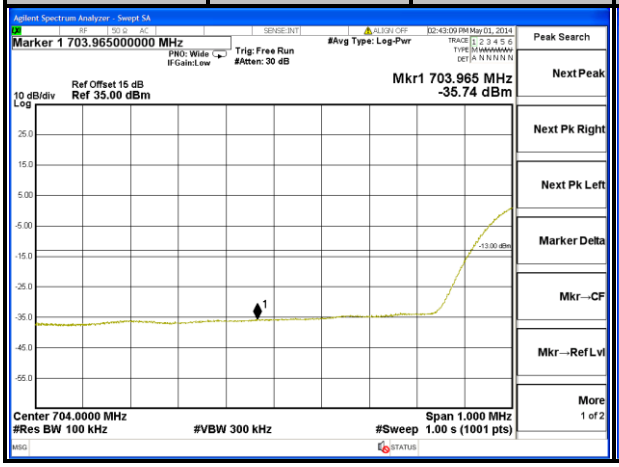
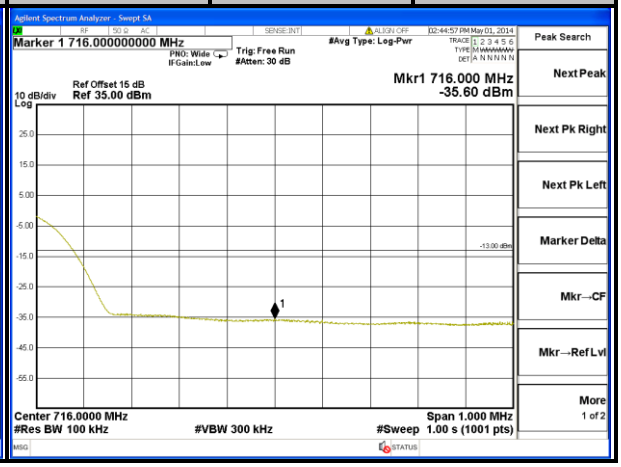


4.5.3 TEST PROCEDURES

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

4.5.4 TEST RESULTS

LTE BAND 17					
CHANNEL BANDWIDTH: 5MHz					
CHANNEL	23755	1 RB	CHANNEL	23825	1 RB
					
CHANNEL	23755	25 RB	CHANNEL	23825	25 RB
					

LTE BAND 17					
CHANNEL BANDWIDTH: 10MHz					
CHANNEL	23780	1 RB	CHANNEL	23800	1 RB
					
CHANNEL	23780	50 RB	CHANNEL	23800	50 RB
					

4.6 CONDUCTED SPURIOUS EMISSIONS

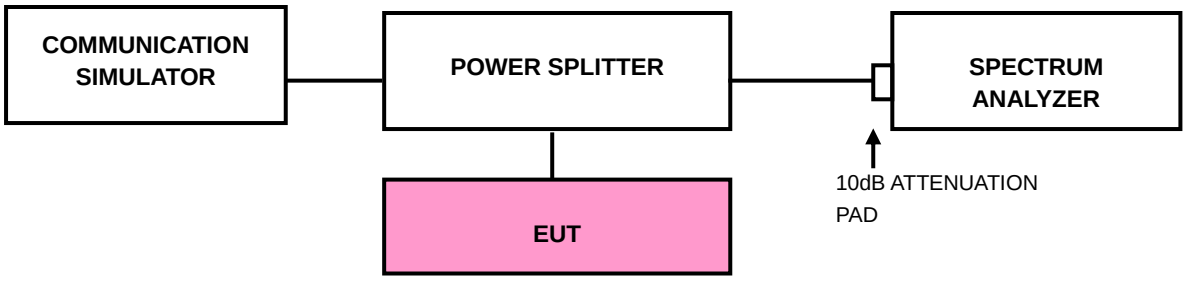
4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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

4.6.2 TEST PROCEDURE

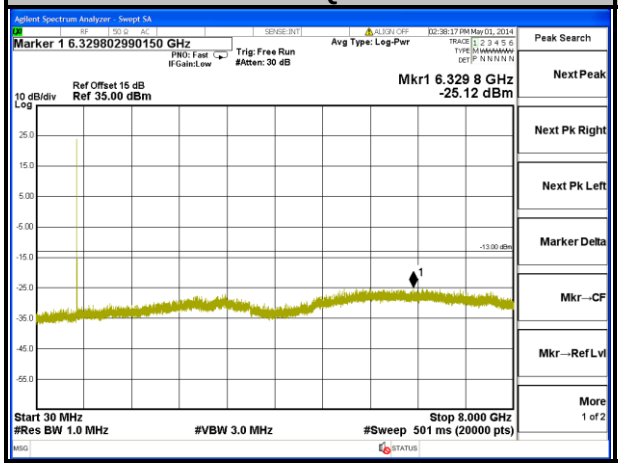
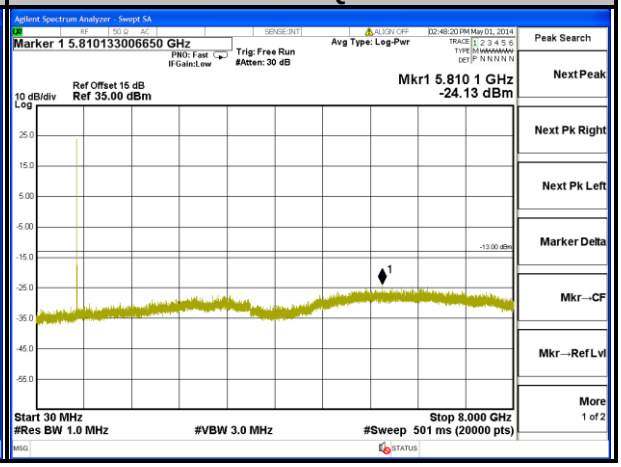
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 30 MHz to 8GHz for LTE Band 17 and from 30MHz to 18GHz for LTE Band 4. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

4.6.3 TEST SETUP



4.6.4 TEST RESULTS

FREQUENCY RANGE: 30MHz~8GHz

LTE BAND 17	
CHANNEL 23790	
5MHz / QPSK	10MHz / QPSK
	

4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

4.7.2 TEST PROCEDURES

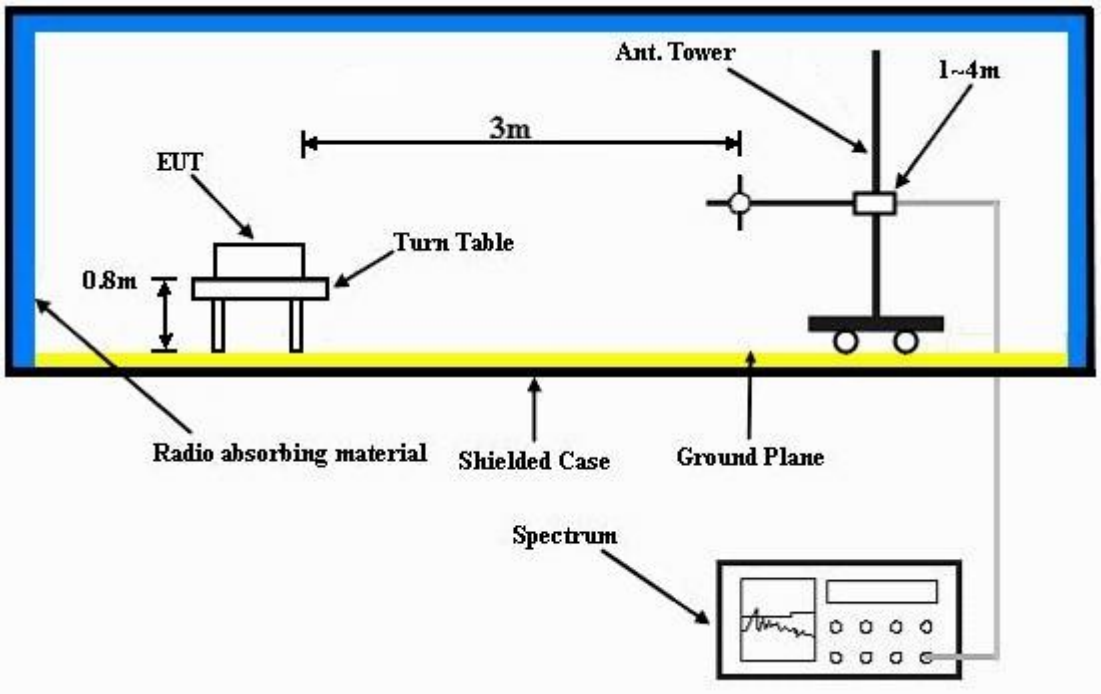
a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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.P.R power - 2.15dBi.

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

4.7.3 DEVIATION FROM TEST STANDARD

No deviation

4.7.4 TEST SETUP



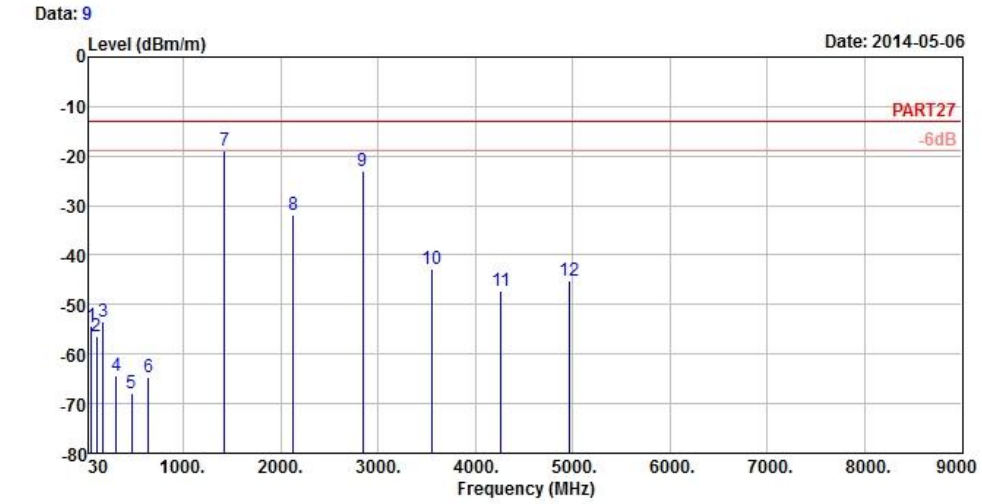
For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.7.5 TEST RESULTS

LTE BAND 17

CHANNEL BANDWIDTH: 5MHz / QPSK

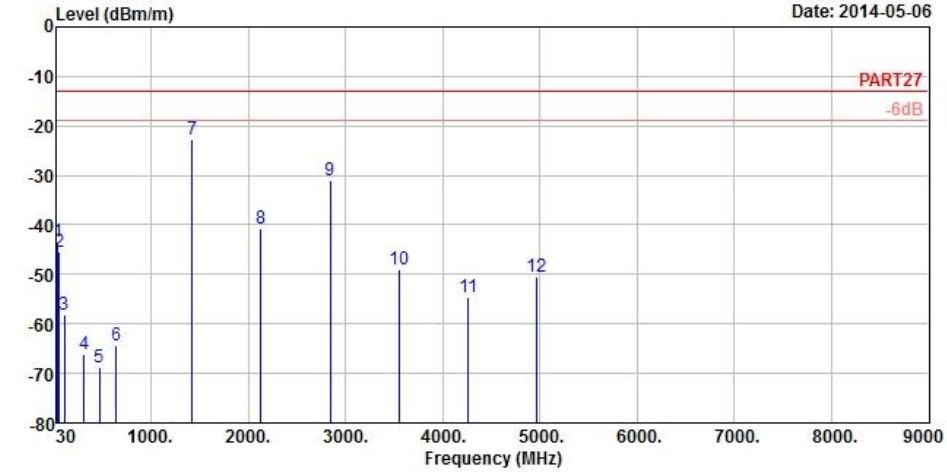
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 3m HORIZONTAL
Remark : LTE Band 17_5M_QPSK(1,12) Link
Tested by: Johnson Liao
Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	51.33	-54.33	-49.58	-13.00	-41.33	-4.75	Peak
2	107.49	-56.42	-45.85	-13.00	-43.42	-10.57	Peak
3	176.61	-53.33	-46.91	-13.00	-40.33	-6.42	Peak
4	313.30	-64.25	-57.97	-13.00	-51.25	-6.28	Peak
5	467.30	-67.95	-64.03	-13.00	-54.95	-3.92	Peak
6	644.40	-64.51	-64.95	-13.00	-51.51	0.44	Peak
7 pp	1420.00	-18.92	-5.33	-13.00	-5.92	-13.59	Peak
8	2130.00	-31.88	-20.16	-13.00	-18.88	-11.72	Peak
9	2840.00	-22.88	-13.14	-13.00	-9.88	-9.74	Peak
10	3550.00	-42.88	-34.04	-13.00	-29.88	-8.84	Peak
11	4260.00	-47.20	-40.29	-13.00	-34.20	-6.91	Peak
12	4970.00	-45.25	-42.15	-13.00	-32.25	-3.10	Peak

Data: 10



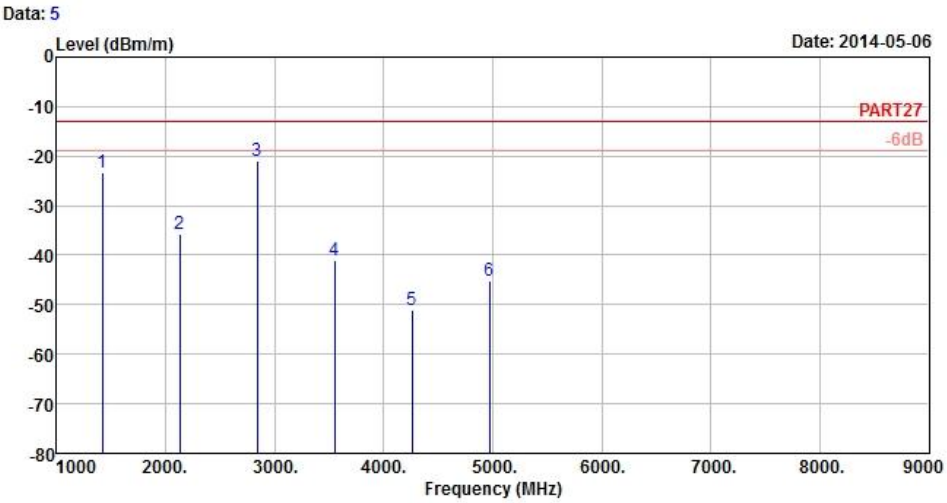
Site : 966 Chamber 5
Condition: PART27 3m VERTICAL
Remark : LTE Band 17_5M_QPSK(1,12) Link
Tested by: Johnson Liao
Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	39.45	-43.30	-41.77	-13.00	-30.30	-1.53	Peak
2	57.54	-45.51	-39.86	-13.00	-32.51	-5.65	Peak
3	107.49	-58.16	-47.59	-13.00	-45.16	-10.57	Peak
4	309.10	-66.22	-59.91	-13.00	-53.22	-6.31	Peak
5	464.50	-68.74	-64.74	-13.00	-55.74	-4.00	Peak
6	643.00	-64.24	-64.66	-13.00	-51.24	0.42	Peak
7 pp	1420.00	-22.83	-9.24	-13.00	-9.83	-13.59	Peak
8	2130.00	-40.64	-28.92	-13.00	-27.64	-11.72	Peak
9	2840.00	-31.13	-21.39	-13.00	-18.13	-9.74	Peak
10	3550.00	-48.97	-40.13	-13.00	-35.97	-8.84	Peak
11	4260.00	-54.57	-47.66	-13.00	-41.57	-6.91	Peak
12	4970.00	-50.55	-47.45	-13.00	-37.55	-3.10	Peak

LTE BAND 17

CHANNEL BANDWIDTH: 10MHz / QPSK

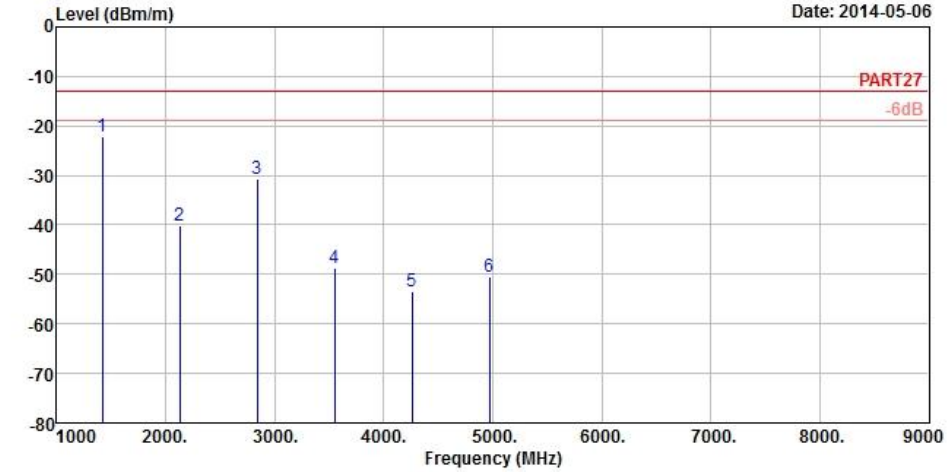
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 3m HORIZONTAL
Remark : LTE Band 17_10M_QPSK(1,24) Link
Tested by: Johnson Liao
Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	1420.00	-23.25	-9.66	-13.00	-10.25	-13.59	Peak
2	2130.00	-35.77	-24.05	-13.00	-22.77	-11.72	Peak
3 pp	2840.00	-20.96	-11.22	-13.00	-7.96	-9.74	Peak
4	3550.00	-41.13	-32.29	-13.00	-28.13	-8.84	Peak
5	4260.00	-50.98	-44.07	-13.00	-37.98	-6.91	Peak
6	4970.00	-45.16	-42.06	-13.00	-32.16	-3.10	Peak

Data: 6



Site : 966 Chamber 5
Condition: PART27 3m VERTICAL
Remark : LTE Band 17_10M_QPSK(1,24) Link
Tested by: Johnson Liao
Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	1420.00	-22.23	-8.64	-13.00	-9.23	-13.59	Peak
2	2130.00	-40.13	-28.41	-13.00	-27.13	-11.72	Peak
3	2840.00	-30.78	-21.04	-13.00	-17.78	-9.74	Peak
4	3550.00	-48.63	-39.79	-13.00	-35.63	-8.84	Peak
5	4260.00	-53.30	-46.39	-13.00	-40.30	-6.91	Peak
6	4970.00	-50.62	-47.52	-13.00	-37.62	-3.10	Peak

5 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.adt.com.tw

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

6 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---