

# FCC TEST REPORT (PART 27)

**REPORT NO.:** RF131114C03-2

**MODEL NO.:** C6730

**FCC ID:** V65C6730

**RECEIVED:** Nov. 14, 2013

**TESTED:** Nov. 29, 2013 ~ Feb. 14, 2014

**ISSUED:** Feb. 25, 2014

APPLICANT: Kyocera Communications, Inc. c/o Kyocera Corporation

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

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## **RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF131114C03-2	Original release	Feb. 25, 2014

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## 1 CERTIFICATION

**PRODUCT:** Kyocera phone

**MODEL NO.:** C6730

**BRAND**: Kyocera

APPLICANT: Kyocera Communications, Inc. c/o Kyocera Corporation

**TESTED:** Nov. 29, 2013 ~ Feb. 14, 2014

**TEST SAMPLE:** Identical Prototype

TEST STANDARDS: FCC Part 27, Subpart C, M

FCC Part 2

ANSI C63.4-2003

The above equipment (model: C6730) 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.

Vera Huang / Specialist

APPROVED BY: , DATE: Feb. 25, 2014

Sam Chen / Senior Project Engineer



## **2 SUMMARY OF TEST RESULTS**

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1046 27.50(h)	Equivalent isotropically radiated power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	PASS	Meet the requirement of limit.
2.1049	2.1049 Occupied Bandwidth		Meet the requirement of limit.
	Peak to average ratio	PASS	Meet the requirement of limit.
2.1051 27.53(I)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(I)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(l)	Radiated Spurious Emissions		Meet the requirement of limit. Minimum passing margin is -13.09dB at 5172.80MHz.

#### 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 ROHDE & SCHWARZ	ESCI	100744	Apr. 15, 2013	Apr. 14, 2014
Spectrum Analyzer Agilent	E4446A	MY51100039	Jul. 31, 2013	Jul. 30, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D- 209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 25, 2012	Dec. 24, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Loop Antenna	3127-836	00099258	Aug. 09, 2013	Aug. 08, 2014
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
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	Kyocera phone					
MODEL NO.	C6730	C6730				
POWER SUPPLY	5.0Vdc (adapter or host equipmed 3.8Vdc (battery)	5.0Vdc (adapter or host equipment) 3.8Vdc (battery)				
MODULATION TECHNOLOGY	LTE Band 41	QPSK, 16QAM				
	LTE Band 41 Channel Bandwidth: 10MHz	2501.0MHz ~ 2685.0MHz				
FREQUENCY RANGE	LTE Band 41 Channel Bandwidth: 15MHz	2503.5MHz ~ 2682.5MHz				
	LTE Band 41 Channel Bandwidth: 20MHz	2506.0MHz ~ 2680.0MHz				
	LTE Band 41 Channel Bandwidth: 10MHz	8M92W7D				
EMISSION DESIGNATOR	LTE Band 41 Channel Bandwidth: 15MHz	13M4G7D				
	LTE Band 41 Channel Bandwidth: 20MHz	17M8G7D				
	LTE Band 41 Channel Bandwidth: 10MHz	178.24mW				
MAX. EIRP POWER	LTE Band 41 Channel Bandwidth: 15MHz	174.98mW				
	LTE Band 41 Channel Bandwidth: 20MHz	187.50mW				
ANTENNA TYPE	Fixed Internal Antenna with -1.5	dBi gain				
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 has following accessories.

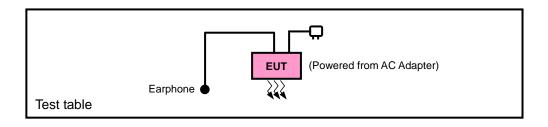
ITEM	ITEM BRAND		DESCRIPTION
AC Adapter	AC Adapter Kyocera		I/P: 100-240Vac, 50/60Hz, 200mA O/P: 5Vdc, 1000mA
Li-ion Battery Kyocera		SCP-59LBPS	Rating: 3.8Vdc, 2000mAh
USB cable	Kyocera	SCP-11SDC	1.2m non-shielded cable w/o ferrite core

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

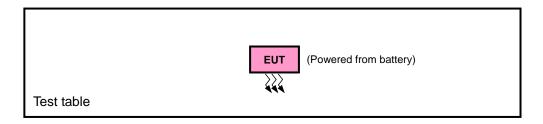


## 3.2 CONFIGURATION OF SYSTEM UNDER TEST

#### 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. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	EARPHONE	GALIEN	HF-HB04D	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

#### NOTE:

- 1. All power cords of the above support units are non-shielded (1.8m).
- 2. Item 1 was provided by client.



## 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 EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

#### LTE Band 41

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
		39700 to 41540	39700, 40620, 41540	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	EIRP	39725 to 41515	39725, 40620, 41515	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41515	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		39700 to 41540	40620	10MHz	QPSK	1 RB / 0 RB Offset
-	FREQUENCY STABILITY	39725 to 41515	40620	15MHz	QPSK	1 RB / 0 RB Offset
	017(3)2111	39750 to 41490	40620	20MHz	QPSK	1 RB / 0 RB Offset
		39700 to 41540	39700, 40620, 41540	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	OCCUPIED BANDWIDTH	39725 to 41515	39725, 40620, 41515	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41515	20MHz	QPSK, 16QAM	100 RB / 0 RB Offset
	PEAK TO AVERAGE RATIO	39700 to 41540	39700, 40620, 41540	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-		39725 to 41515	39725, 40620, 41515	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41515	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
	BAND EDGE	39700 to 41540	39700, 41540	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-		39725 to 41515	39725, 41515	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		39750 to 41490	39750, 41490	20MHz	QPSK, 16QAM	100 RB / 0 RB Offset
		39700 to 41540	40620	10MHz	QPSK	1 RB / 0 RB Offset
-	CONDCUDETED EMISSION	39725 to 41515	40620	15MHz	QPSK	1 RB / 0 RB Offset
		39750 to 41490	40620	20MHz	QPSK	1 RB / 0 RB Offset
		39700 to 41540	40620	10MHz	QPSK	1 RB / 0 RB Offset
		39700 to 41540	40020	TOWINZ	QPSK	50 RB / 0 RB Offset
	RADIATED 20725 to 445	39725 to 41515	40620	15MHz	QPSK	1 RB / 0 RB Offset
-	EMISSION	EMISSION 39725 to 41515 40620	40020	I DIVIDZ	. QPSK	75 RB / 0 RB Offset
	39750 to 41490	40620	20MHz	QPSK	1 RB / 0 RB Offset	
		39730 10 41490	9750 to 41490 40620	ZUIVIMZ	QP5K	100 RB / 0 RB Offset

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



## **TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP/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 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

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that "User stations are limited to 2 watts" and 27.50(i) specific that "Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage."

#### 4.1.2 TEST PROCEDURES

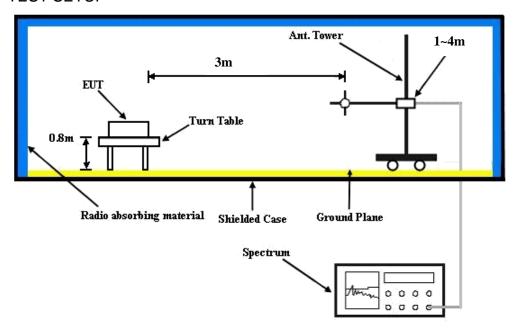
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the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

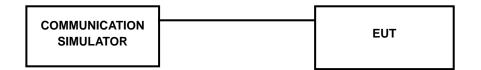
- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



## 4.1.3 TEST SETUP



## **CONDUCTED POWER MEASUREMENT:**





## 4.1.4 TEST RESULTS

## AVERAGE CONDUCTED OUTPUT POWER (dBm)

Band / BW	Modulation	RB Size	RB Offset	Low CH 39700 Frequency 2501.0 MHz	Mid CH 40160 Frequency 2547.0 MHz	Mid CH 40620 Frequency 2593.0 MHz	Mid CH 41080 Frequency 2639.0 MHz	High CH 41540 Frequency 2685.0 MHz	3PGG MPR (dB)
		1	0	23.27	23.09	23.19	23.39	23.54	0
		1	24	23.44	23.23	23.39	23.47	23.53	0
		1	49	23.11	22.88	22.97	23.13	23.17	0
	QPSK	25	0	22.43	22.06	22.09	22.37	22.45	1
		25	12	22.29	21.93	22.23	22.31	22.34	1
		25	25	22.16	21.84	22.13	22.15	22.14	1
41 /		50	0	22.19	21.88	22.15	22.31	22.37	1
10M		1	0	22.17	21.99	22.09	22.29	22.44	1
		1	24	22.34	22.13	22.29	22.37	22.43	1
		1	49	22.01	21.87	21.87	22.03	22.07	1
	16QAM	25	0	21.33	20.96	20.99	21.27	21.35	2
		25	12	21.19	20.83	21.13	21.21	21.24	2
		25	25	21.06	20.85	21.03	21.05	21.04	2
		50	0	21.09	20.88	21.05	21.21	21.27	2

Band / BW	Modulation	RB Size	RB Offset	Low CH 39725 Frequency 2503.5 MHz	Mid CH 40173 Frequency 2548.3 MHz	Mid CH 40620 Frequency 2593.0 MHz	Mid CH 41068 Frequency 2637.8 MHz	High CH 41515 Frequency 2682.5 MHz	3PGG MPR (dB)
		1	0	23.40	23.22	23.32	23.52	23.67	0
		1	37	23.57	23.36	23.52	23.60	23.66	0
		1	74	23.24	22.90	23.10	23.26	23.30	0
	QPSK	36	0	22.56	22.19	22.22	22.50	22.58	1
		36	19	22.42	22.06	22.36	22.44	22.47	1
		36	39	22.29	21.97	22.26	22.28	22.27	1
41 /		75	0	22.32	21.90	22.28	22.44	22.50	1
15M		1	0	22.30	22.12	22.22	22.42	22.57	1
		1	37	22.47	22.26	22.42	22.50	22.56	1
		1	74	22.14	21.89	22.00	22.16	22.20	1
	16QAM	36	0	21.46	21.09	21.12	21.40	21.48	2
		36	19	21.32	20.96	21.26	21.34	21.37	2
		36	39	21.19	20.87	21.16	21.18	21.17	2
		75	0	21.22	20.90	21.18	21.34	21.40	2



Band / BW	Modulation	RB Size	RB Offset	Low CH 39750 Frequency 2506.0 MHz	Mid CH 40185 Frequency 2549.5 MHz	Mid CH 40620 Frequency 2593.0 MHz	Mid CH 41055 Frequency 2636.5 MHz	High CH 41490 Frequency 2680.0 MHz	3PGG MPR (dB)
		1	0	23.51	23.33	23.43	23.63	23.78	0
		1	50	23.68	23.47	23.63	23.71	23.77	0
		1	99	23.35	23.01	23.21	23.37	23.41	0
	QPSK	50	0	22.67	22.30	22.33	22.61	22.69	1
		50	25	22.53	22.17	22.47	22.55	22.58	1
		50	50	22.40	22.08	22.37	22.39	22.38	1
41 /		100	0	22.43	22.01	22.39	22.55	22.61	1
20M		1	0	22.41	22.23	22.33	22.53	22.68	1
		1	50	22.58	22.37	22.53	22.61	22.67	1
		1	99	22.25	21.91	22.11	22.27	22.31	1
	16QAM	50	0	21.57	21.20	21.23	21.51	21.59	2
		50	25	21.43	21.07	21.37	21.45	21.48	2
		50	50	21.30	20.98	21.27	21.29	21.28	2
		100	0	21.33	20.91	21.29	21.45	21.51	2

## AVERAGE EIRP (dBm)

## LTE BAND 41

## **CHANNEL BANDWIDTH: 10MHZ QPSK**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	39700	2501.0	-16.47	38.98	22.51	178.24	Н
	40620	2593.0	-16.61	38.17	21.56	143.22	Н
v	41540	2685.0	-16.33	38.45	22.12	162.93	Н
'	39700	2501.0	-24.05	39.04	14.99	31.55	V
	40620	2593.0	-23.94	38.68	14.74	29.79	V
	41540	2685.0	-24.48	38.60	14.12	25.82	V

## **CHANNEL BANDWIDTH: 10MHZ 16QAM**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	39700	2501.0	-17.53	38.98	21.45	139.64	Н
	40620	2593.0	-17.76	38.17	20.41	109.90	Н
v	41540	2685.0	-17.30	38.45	21.15	130.32	Н
'	39700	2501.0	-25.96	39.04	13.08	20.32	V
	40620	2593.0	-25.82	38.68	12.86	19.32	V
	41540	2685.0	-26.24	38.60	12.36	17.22	V



## **CHANNEL BANDWIDTH: 15MHZ QPSK**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	39725	2503.5	-16.66	39.09	22.43	174.98	Н
	40620	2593.0	-16.49	38.17	21.68	147.23	Н
Y	41515	2682.5	-16.79	38.52	21.73	148.94	Н
'	39725	2503.5	-24.01	39.04	15.03	31.84	V
	40620	2593.0	-24.08	38.68	14.60	28.84	V
	41515	2682.5	-24.97	38.66	13.69	23.39	V

## **CHANNEL BANDWIDTH: 15MHZ 16QAM**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	39725	2503.5	-17.33	39.09	21.76	149.97	Н
	40620	2593.0	-17.32	38.17	20.85	121.62	Н
v	41515	2682.5	-17.47	38.52	21.05	127.35	Н
ľ	39725	2503.5	-25.83	39.04	13.21	20.94	V
	40620	2593.0	-25.75	38.68	12.93	19.63	V
	41515	2682.5	-25.75	38.66	12.91	19.54	V



## **CHANNEL BANDWIDTH: 20MHZ QPSK**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	39750	2506.0	-16.53	39.26	22.73	187.50	Н
	40620	2593.0	-16.49	38.17	21.68	147.23	Н
	41490	2680.0	-16.46	38.71	22.25	167.88	Н
ı	39750	2506.0	-23.98	39.33	15.35	34.28	V
	40620	2593.0	-24.07	38.68	14.61	28.91	V
	41490	2680.0	-25.02	38.76	13.74	23.66	V

## **CHANNEL BANDWIDTH: 20MHZ 16QAM**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	39750	2506.0	-17.29	39.26	21.97	157.40	Н
	40620	2593.0	-17.00	38.17	21.17	130.92	Н
V	41490	2680.0	-17.08	38.71	21.63	145.55	Н
ľ	39750	2506.0	-25.92	39.33	13.41	21.93	V
	40620	2593.0	-25.06	38.68	13.62	23.01	V
	41490	2680.0	-24.85	38.76	13.91	24.60	V



#### 4.2 FREQUENCY STABILITY MEASUREMENT

#### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

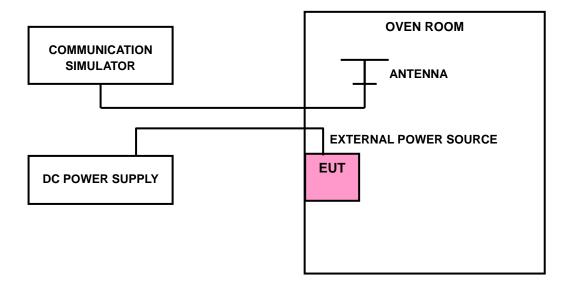
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

#### 4.2.2 TEST PROCEDURE

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}$ 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

	FREQUENCY ERROR (ppm)					
VOLTAGE (Volts)		LIMIT (ppm)				
(10110)	10MHz	15MHz	20MHz			
3.7	-0.0019	-0.002	-0.005	2.5		
3.3	-0.0041	0.002	0.005	2.5		
4.2	0.0023	0.002	-0.003	2.5		

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.3Vdc to 4.2Vdc.

## FREQUENCY ERROR vs. TEMPERATURE

	FR	EQUENCY ERROR (pp	om)	
TEMP. (°C)		LTE BAND 41		LIMIT (ppm)
	10MHz	15MHz	20MHz	
-30	0.0034	0.006	0.009	2.5
-20	-0.0028	-0.003	0.004	2.5
-10	0.0039	0.009	0.005	2.5
0	0.0019	0.009	0.002	2.5
10	0.0008	0.004	-0.001	2.5
20	0.0021	0.002	0.004	2.5
30	0.0023	0.009	0.004	2.5
40	0.0014	0.002	0.004	2.5
50	0.0008	0.010	0.005	2.5

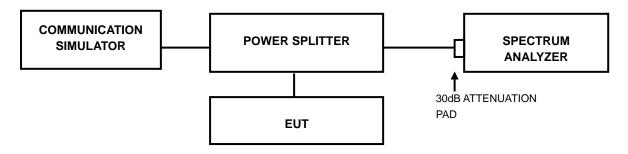


#### 4.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 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



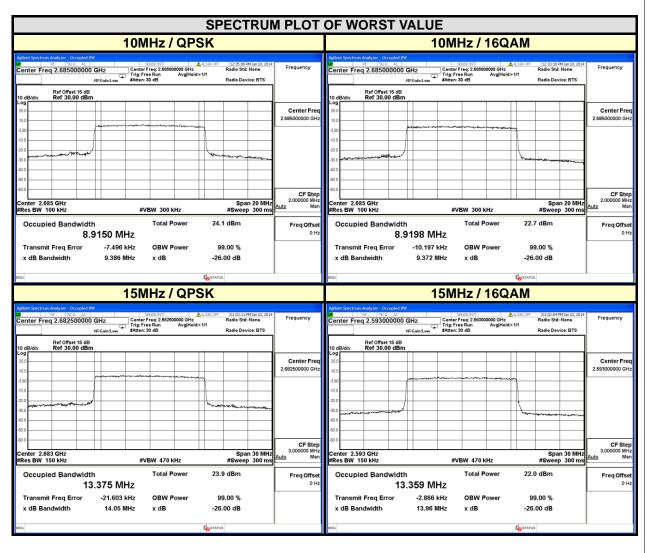
## 4.3.3 TEST PROCEDURES

- 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.



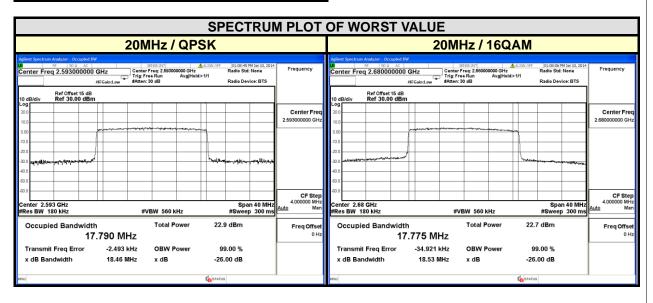
#### 4.3.4 TEST RESULTS

LTE BAND 41								
С	HANNEL BAND	WIDTH: 10MI	-lz		CHANNEL BANDWIDTH: 15MHz			
CHANNEL FREQUE	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)		CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)		
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM	
39700	2501.0	8.9131	8.9097	39725	2503.5	13.362	13.349	
40620	2593.0	8.9125	8.9152	40620	2593.0	13.368	13.359	
41540	2685.0	8.9150	8.9198	41515	2682.5	13.375	13.357	





	LTE BAND 41							
CHANNEL BANDWIDTH: 20MHz								
CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (MHz)						
	(MHz)	QPSK	16QAM					
39750	2506.0	17.777	17.773					
40620	2593.0	17.790	17.775					
41490	2680.0	17.785	17.775					



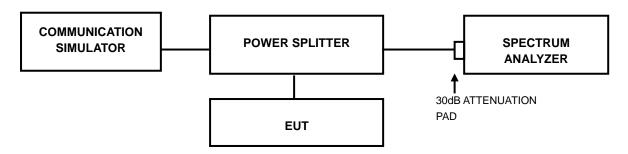


## 4.4 PEAK TO AVERAGE RATIO

#### 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



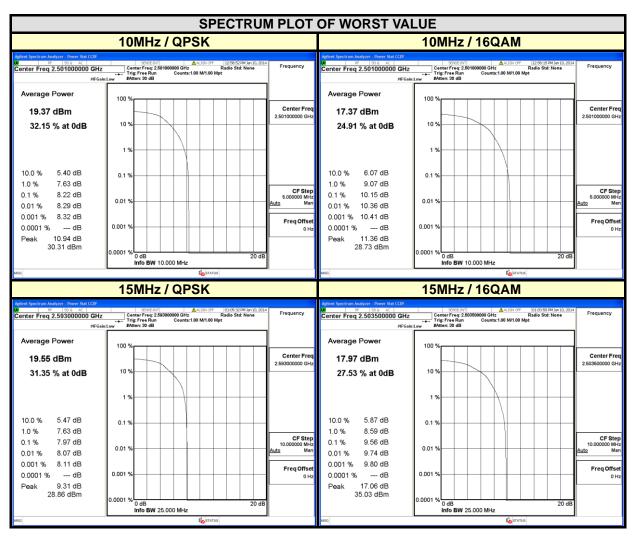
#### 4.4.3 TEST PROCEDURES

- 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%.



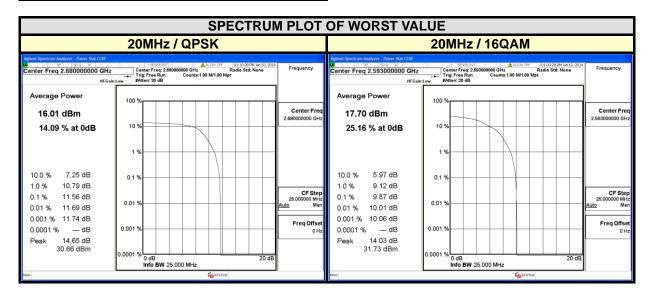
#### 4.4.4 TEST RESULTS

LTE BAND 41									
CHANNEL BANDWIDTH: 10MHz				CHANNEL BANDWIDTH: 15MHz					
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)			
		QPSK	16QAM		(MHz)	QPSK	16QAM		
39700	2501.0	8.22	10.15	39725	2503.5	6.64	9.56		
40620	2593.0	7.59	9.70	40620	2593.0	7.97	9.53		
41540	2685.0	7.17	8.75	41515	2682.5	7.28	8.32		





LTE BAND 41							
CHANNEL BANDWIDTH: 20MHz							
CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)					
	(MHz)	QPSK	16QAM				
39750	2506.0	7.25	7.58				
40620	2593.0	8.46	9.87				
41490	2680.0	11.56	9.16				



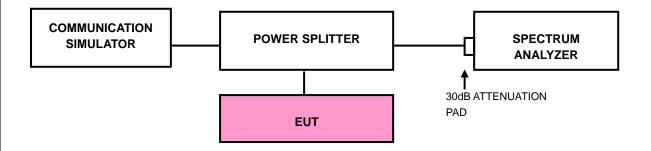


#### 4.5 BAND EDGE MEASUREMENT

#### 4.5.1 LIMITS OF BAND EDGE MEASUREMENT

According to FCC 27.53(I)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 43 + 10 log (P) dB at the channel edge, the limit of emission equal to –13dBm. And 55 + 10 log (P) dB at 5.5 MHz from the channel edges, the limit of emission equal to –25dBm.In the 1MHz 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



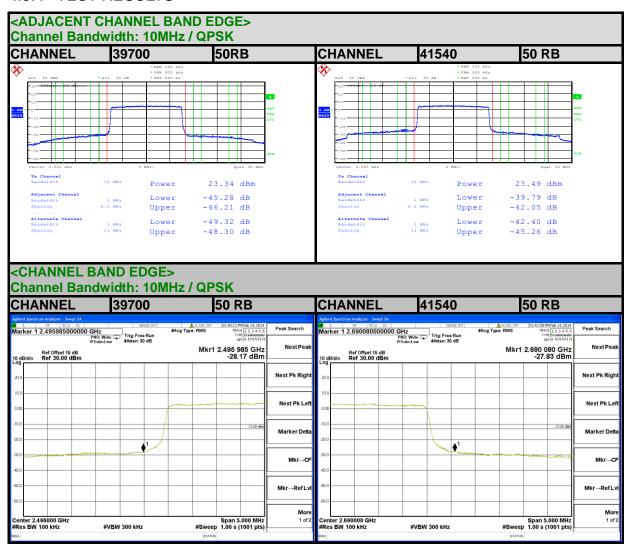


### 4.5.3 TEST PROCEDURES

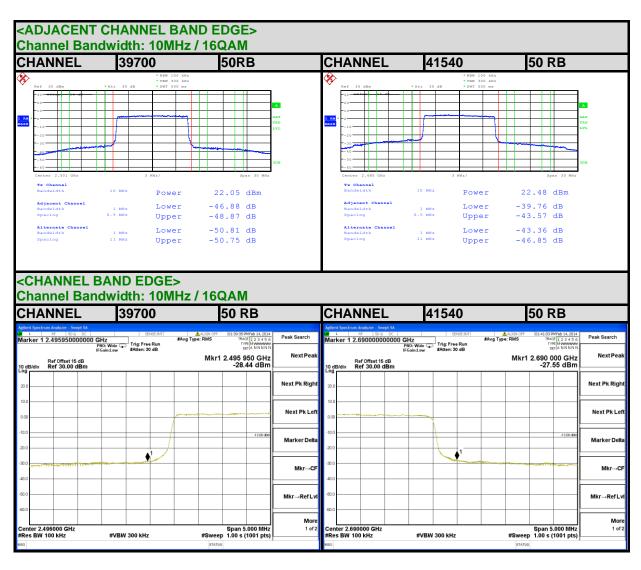
- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 20 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (Channel bandwidth 5MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 40 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (Channel bandwidth 10MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 60 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (Channel bandwidth 15MHz).
- f. The center frequency of spectrum is the band edge frequency and span is 80 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (Channel bandwidth 20MHz).
- g. Record the max trace plot into the test report.



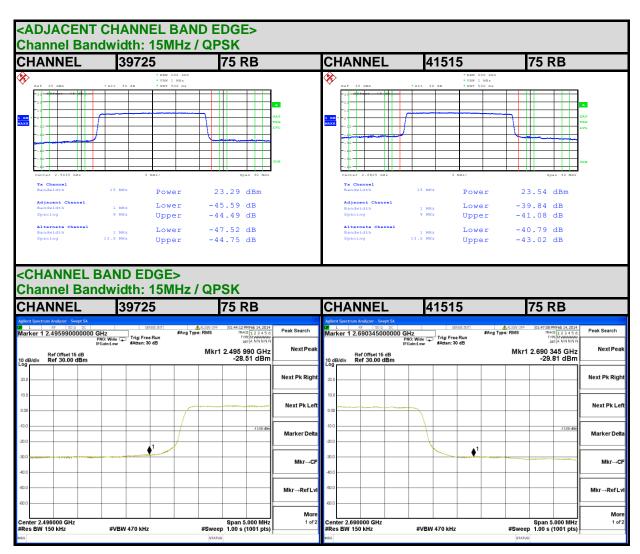
#### 4.5.4 TEST RESULTS



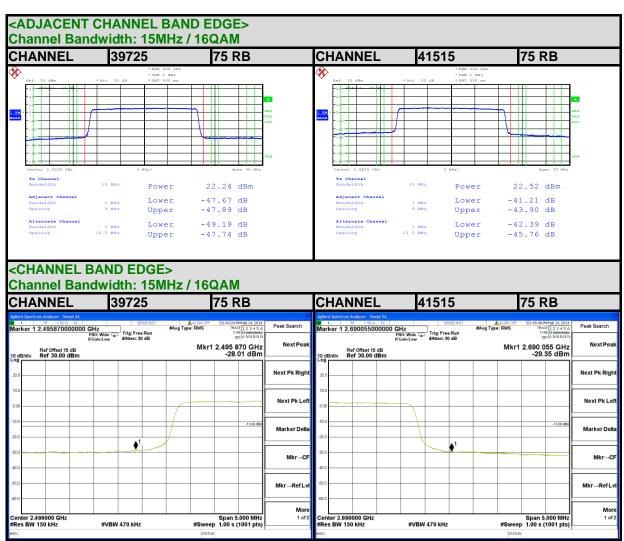




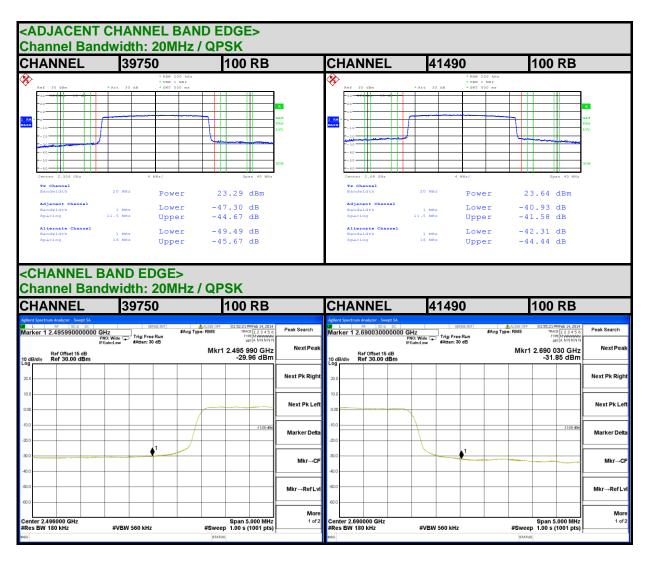




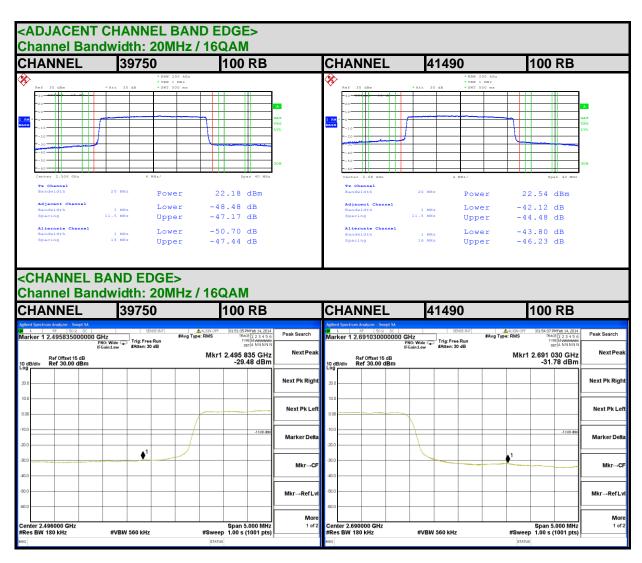














#### 4.6 CONDUCTED SPURIOUS EMISSIONS

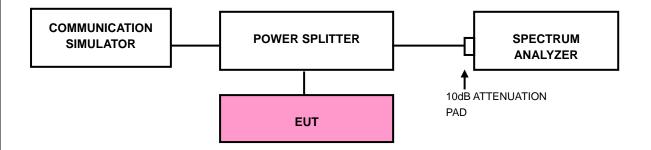
#### 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission equal to -25dBm

#### 4.6.2 TEST PROCEDURE

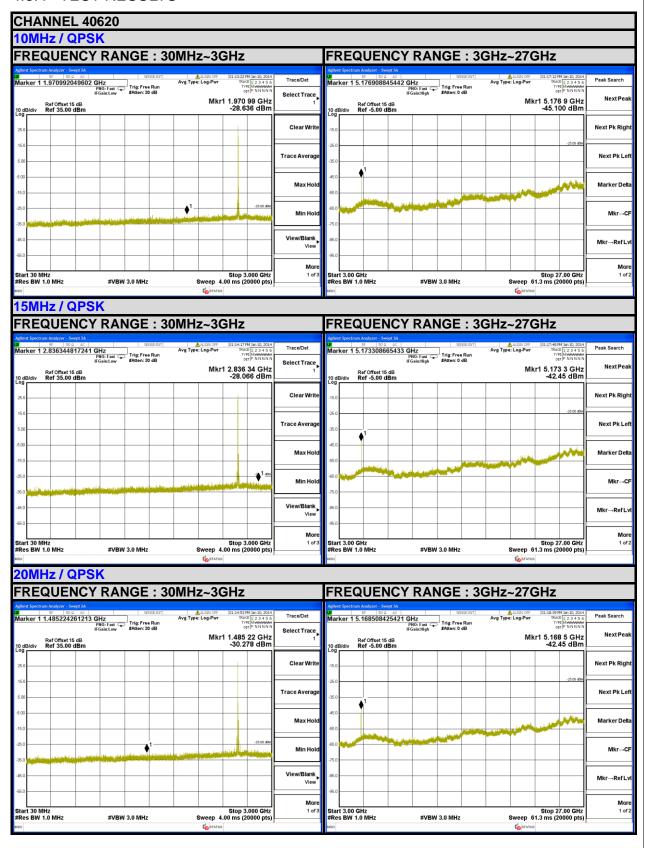
- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 30 MHz to 27GHz for LTE Band 41. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

#### 4.6.3 TEST SETUP





#### 4.6.4 TEST RESULTS





#### 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 55 +10 log10(P) dB. The limit of emission equal to -25dBm

#### 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.

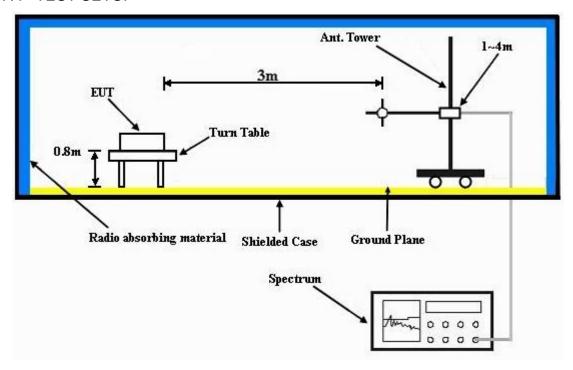
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

#### 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).



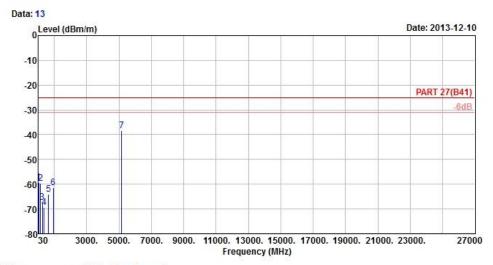
#### 4.7.5 TEST RESULTS

#### LTE BAND 41

## CHANNEL BANDWIDTH: 10MHz / QPSK (1 RB / 0 RB Offset)



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



Site : 966 Chamber 5

Condition : PART 27(B41) 3m HORIZONTAL

Brand/Model: G81-C6730

Remark : Band 41 10M QPSK(1,0) Link

Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

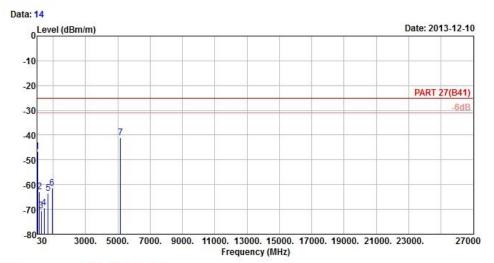
Read Limit Over Freq Level Level Line Limit Factor Remark

MHz dBm/m dBm dBm/m dB dB/m

1 39.45 -59.20 -57.67 -25.00 -34.20 -1.53 Peak
2 146.10 -59.58 -53.47 -25.00 -34.58 -6.11 Peak
3 258.96 -67.23 -61.43 -25.00 -42.23 -5.80 Peak
4 379.10 -69.23 -63.44 -25.00 -44.23 -5.79 Peak
5 653.50 -64.06 -64.67 -25.00 -39.06 0.61 Peak
6 948.20 -61.35 -65.01 -25.00 -36.35 3.66 Peak
7 pp 5177.20 -38.36 -35.21 -25.00 -13.36 -3.15 Peak







Site : 966 Chamber 5

Condition : PART 27(B41) 3m VERTICAL

Brand/Model: G81-C6730

Remark : Band 41 10M QPSK(1,0) Link Tested by : Anson Lin

Tested by : Anson Lin Temprature : 25℃ Humidity : 65%

Plane : X

Sample No : C131120-002-024-006

Read Limit Over Freq Level Level Line Limit Factor Remark

MHz dBm/m dBm dBm/m dB dB/m

1 40.80 -46.67 -45.21 -25.00 -21.67 -1.46 Peak
2 140.97 -62.81 -57.08 -25.00 -37.81 -5.73 Peak
3 261.66 -70.54 -64.70 -25.00 -45.54 -5.84 Peak
4 440.70 -69.52 -64.91 -25.00 -44.52 -4.61 Peak
5 685.70 -63.34 -64.53 -25.00 -38.34 1.19 Peak
6 932.80 -61.52 -64.87 -25.00 -36.52 3.35 Peak

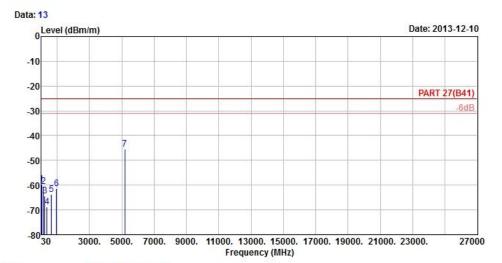
7 pp 5177.20 -40.92 -37.77 -25.00 -15.92 -3.15 Peak



## CHANNEL BANDWIDTH: 10MHz / QPSK (50 RB / 0 RB Offset)



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



Site : 966 Chamber 5 Condition : PART 27(B41) 3m HORIZONTAL

Brand/Model: G81-C6730

: Band 41 10M QPSK(50,0) Link

Tested by : Anson Lin Temprature : 25℃ Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

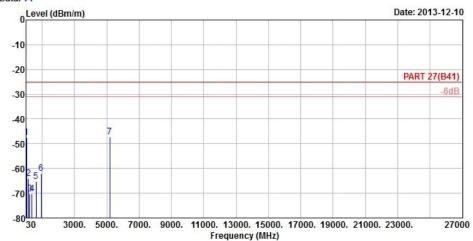
Freq Level Line Limit Factor Remark

	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	41.61	-59.58	-58.19	-25.00	-34.58	-1.39	Peak
2	146.10	-60.64	-54.53	-25.00	-35.64	-6.11	Peak
3	243.03	-64.21	-58.22	-25.00	-39.21	-5.99	Peak
4	374.90	-68.85	-63.03	-25.00	-43.85	-5.82	Peak
5	643.70	-63.62	-64.06	-25.00	-38.62	0.44	Peak
6	958.70	-61.43	-65.28	-25.00	-36.43	3.85	Peak
7 pp	5186.00	-45.54	-42.48	-25.00	-20.54	-3.06	Peak









: 966 Chamber 5

Condition : PART 27(B41) 3m VERTICAL

Brand/Model: G81-C6730

Remark : Band 41 10M QPSK(50,0) Link Tested by : Anson Lin Temprature : 25℃ Humidity : 65%

Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Freq Level Level Line Limit Factor Remark MHz dBm/m dBm dBm/m dB dB/m

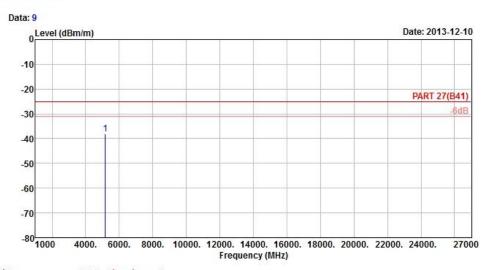
1	39.45	-47.57	-46.04	-25.00	-22.57	-1.53	Peak	
2	140.16	-64.11	-58.38	-25.00	-39.11	-5.73	Peak	
3	251.40	-70.25	-64.56	-25.00	-45.25	-5.69	Peak	
4	371.40	-70.29	-64.44	-25.00	-45.29	-5.85	Peak	
5	622.70	-65.22	-65.27	-25.00	-40.22	0.05	Peak	
6	930.00	-61.98	-65.27	-25.00	-36.98	3.29	Peak	
7 pp	5186.00	-47.11	-44.05	-25.00	-22.11	-3.06	Peak	



## CHANNEL BANDWIDTH: 15MHz / QPSK (1 RB / 0 RB Offset)



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



Site : 966 Chamber 5 Condition : PART 27(B41) 3m HORIZONTAL

Brand/Model: G81-C6730

: Band 41 15M QPSK(1,0) Link

Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Freq Level Line Limit Factor Remark

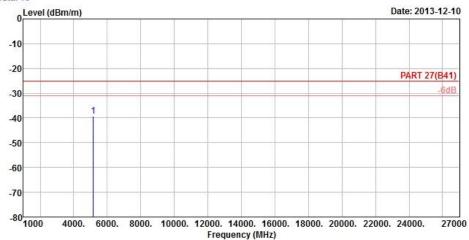
dBm dBm/m MHz dBm/m dB/m

1 pp 5172.80 -38.09 -34.94 -25.00 -13.09 -3.15 Peak









: 966 Chamber 5

Condition : PART 27(B41) 3m VERTICAL

Brand/Model: G81-C6730

Remark : Band 41 15M QPSK(1,0) Link Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Line Limit Factor Remark Freq Level Level

MHz dBm/m dBm dBm/m dB dB/m

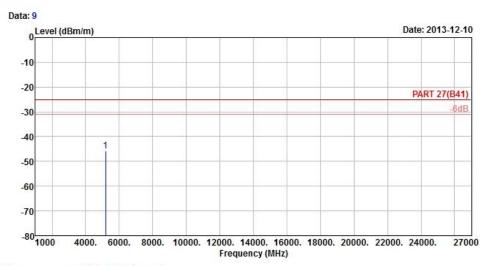
1 pp 5172.80 -39.17 -36.02 -25.00 -14.17 -3.15 Peak



## CHANNEL BANDWIDTH: 15MHz / QPSK (75 RB / 0 RB Offset)



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



Site : 966 Chamber 5 Condition : PART 27(B41) 3m HORIZONTAL

Brand/Model: G81-C6730

: Band 41 15M QPSK(75,0) Link

Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Freq Level Line Limit Factor Remark

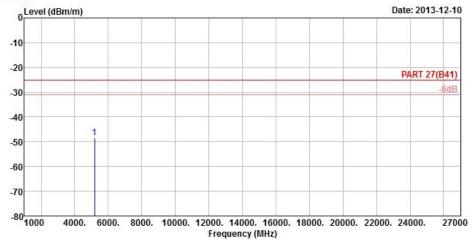
dBm dBm/m MHz dBm/m dB/m

1 pp 5186.00 -45.79 -42.73 -25.00 -20.79 -3.06 Peak









: 966 Chamber 5

Condition : PART 27(B41) 3m VERTICAL

Brand/Model: G81-C6730

Remark : Band 41 15M QPSK(75,0) Link Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Line Limit Factor Remark Freq Level Level

MHz dBm/m dBm dBm/m dB dB/m

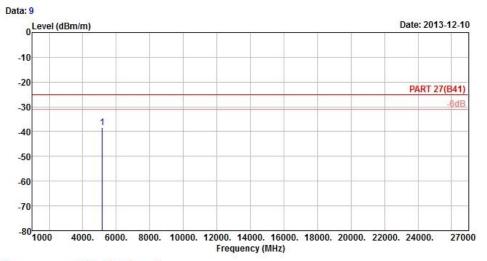
1 pp 5186.00 -48.32 -45.26 -25.00 -23.32 -3.06 Peak



## CHANNEL BANDWIDTH: 20MHz / QPSK (1 RB / 0 RB Offset)



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



Site : 966 Chamber 5 Condition : PART 27(B41) 3m HORIZONTAL

Brand/Model: G81-C6730

: Band 41 20M QPSK(1,0) Link

Tested by : Anson Lin Temprature : 25℃ Humidity : 65%

Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Freq Level Line Limit Factor Remark

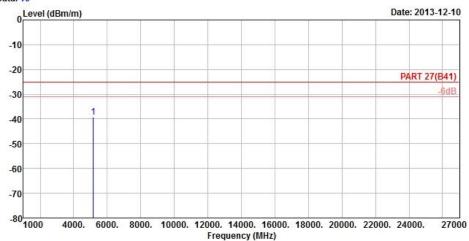
dBm dBm/m MHz dBm/m dB/m

1 pp 5168.40 -38.34 -35.19 -25.00 -13.34 -3.15 Peak









: 966 Chamber 5

Condition : PART 27(B41) 3m VERTICAL

Brand/Model: G81-C6730

Remark : Band 41 20M QPSK(1,0) Link Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Line Limit Factor Remark Freq Level Level

MHz dBm/m dBm dBm/m dB dB/m

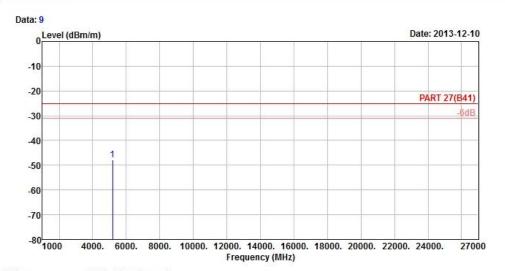
1 pp 5168.40 -39.24 -36.09 -25.00 -14.24 -3.15 Peak



## CHANNEL BANDWIDTH: 20MHz / QPSK (100 RB / 0 RB Offset)



#### Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



: 966 Chamber 5

Condition : PART 27(B41) 3m HORIZONTAL

Brand/Model: G81-C6730

Remark : Band 41 20M QPSK(100,0) Link Tested by : Anson Lin Temprature : 25℃ Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit 0ver

Freq Level Level Line Limit Factor Remark

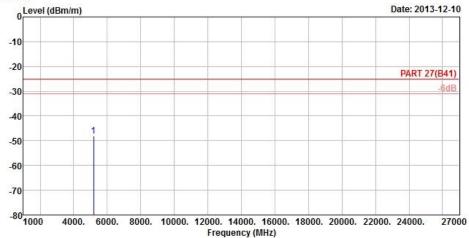
MHz dBm/m dBm dBm/m dB dB/m

1 pp 5186.00 -47.97 -44.91 -25.00 -22.97 -3.06 Peak









: 966 Chamber 5

Condition : PART 27(B41) 3m VERTICAL

Brand/Model: G81-C6730

Remark : Band 41 20M QPSK(100,0) Link Tested by : Anson Lin Temprature : 25℃

Humidity : 65% Plane : X

Sample No : C131120-002-024-006

Read Limit Over

Line Limit Factor Remark Freq Level Level

MHz dBm/m dBm dBm/m dB dB/m

1 pp 5186.00 -48.06 -45.00 -25.00 -23.06 -3.06 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: Hsin Chu EMC/RF Lab:

Tel: 886-2-26052180 Tel: 886-3-5935343 Fax: 886-2-26051924 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.

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