

# FCC Test Report

## (PART 27)

**Report No.:** RF160104C15-3

**FCC ID:** GKR-TP00078ASI

**Test Model:** TP00078A

**Received Date:** Jan. 04, 2016

**Test Date:** Jan. 16, 2016 ~ Feb. 03, 2016

**Issued Date:** Feb. 18, 2016

**Applicant:** Compal Electronics Inc.

**Address:** No.581, Ruiguang Rd., Neihu District, Taipei City, Taiwan 11492, R.O.C.

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 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 is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agency



## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 Summary of Test Results</b> .....	<b>5</b>
2.1 Measurement Uncertainty .....	5
2.2 Test Site and Instruments .....	6
<b>3 General Information</b> .....	<b>7</b>
3.1 General Description of EUT .....	7
3.2 Configuration of System under Test.....	8
3.2.1 Description of Support Units .....	8
3.3 Test Mode Applicability and Tested Channel Detail .....	9
3.4 EUT Operating Conditions .....	9
3.5 General Description of Applied Standards.....	9
<b>4 Test Types and Results</b> .....	<b>10</b>
4.1 Output Power Measurement .....	10
4.1.1 Limits of Output Power Measurement .....	10
4.1.2 Test Procedures.....	10
4.1.3 Test Results .....	11
4.2 Radiated Emission Measurement.....	15
4.2.1 Limits of Radiated Emission Measurement .....	15
4.2.2 Test Procedure .....	15
4.2.3 Deviation from Test Standard .....	15
4.2.4 Test Setup.....	15
4.2.5 Test Results .....	16
<b>5 Pictures of Test Arrangements</b> .....	<b>18</b>
<b>Appendix – Information on the Testing Laboratories</b> .....	<b>19</b>



A D T

### Release Control Record

Issue No.	Description	Date Issued
RF160104C15-3	Original Release	Feb. 18, 2016



**1 Certificate of Conformity**

**Product:** Tablet Computer  
**Brand:** Lenovo  
**Test Model:** TP00078A  
**Sample Status:** Production Unit  
**Applicant:** Compal Electronics Inc.  
**Test Date:** Jan. 16, 2016 ~ Feb. 03, 2016  
**Standards:** FCC Part 27, Subpart C, M

The above equipment 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 :** Evonne Liu , **Date:** Feb. 18, 2016  
Evonne Liu / Specialist

**Approved by :** Stanley Wu , **Date:** Feb. 18, 2016  
Stanley Wu / Assistant Manager

## 2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(h)	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1053 27.53(m)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -25.13 dB at 5070.00 MHz.

Note: Only test item of Conducted power, EIRP, and RSE tests were performed for this report. Other testing data is referring to China Telecommunication Technology Labs module report (Test Report No.: B15W50341-FCC-RF\_Rev1, Issue Date: Jul, 10, 2015).

### 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	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB



A D T

## 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. 21, 2015	Jan. 20, 2016
			Jan. 21, 2016	Jan. 20, 2017
Spectrum Analyzer Agilent	N9010A	MY52220314	Sep. 03, 2015	Sep. 02, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 05, 2015	Feb. 04, 2016
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 184045	980116	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2015	Dec. 27, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 12, 2015	Oct. 11, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 12, 2015	Oct. 11, 2016
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 12, 2015	Oct. 11, 2016
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
Radio Communication Analyzer	MT8820C	6201300640	Aug. 10, 2015	Aug. 09, 2017

- 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 preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
  4. The FCC Site Registration No. is 690701.
  5. The IC Site Registration No. is IC7450F-10.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	Tablet Computer	
<b>Brand</b>	Lenovo	
<b>Test Model</b>	TP00078A	
<b>Status of EUT</b>	Production Unit	
<b>Power Supply Rating</b>	20.0 Vdc (adapter) 15.2 Vdc (Li-ion battery)	
<b>Modulation Type</b>	QPSK, 16QAM	
<b>Frequency Range</b>	LTE Band 7 (Channel Bandwidth: 5 MHz)	2502.5 ~ 2567.5 MHz
	LTE Band 7 (Channel Bandwidth: 10 MHz)	2505 ~ 2565 MHz
	LTE Band 7 (Channel Bandwidth: 15 MHz)	2507.5 ~ 2562.5 MHz
	LTE Band 7 (Channel Bandwidth: 20 MHz)	2510 ~ 2560 MHz
	LTE Band 41 (Channel Bandwidth: 5 MHz)	2498.5 ~ 2687.5 MHz
	LTE Band 41 (Channel Bandwidth: 10 MHz)	2501.0 ~ 2685.0 MHz
	LTE Band 41 (Channel Bandwidth: 15 MHz)	2503.5 ~ 2682.5 MHz
	LTE Band 41 (Channel Bandwidth: 20 MHz)	2506.0 ~ 2680.0 MHz
<b>Max. EIRP Power</b>	LTE Band 7 (Channel Bandwidth: 5 MHz)	0.12 W
	LTE Band 7 (Channel Bandwidth: 10 MHz)	0.12 W
	LTE Band 7 (Channel Bandwidth: 15 MHz)	0.12 W
	LTE Band 7 (Channel Bandwidth: 20 MHz)	0.12 W
	LTE Band 41 (Channel Bandwidth: 5 MHz)	0.13 W
	LTE Band 41 (Channel Bandwidth: 10 MHz)	0.13 W
	LTE Band 41 (Channel Bandwidth: 15 MHz)	0.14 W
	LTE Band 41 (Channel Bandwidth: 20 MHz)	0.14 W
<b>Accessory Device</b>	Refer to Note as below	
<b>Data Cable Supplied</b>	Refer to Note as below	

Note:

1. The antenna information is listed as below.

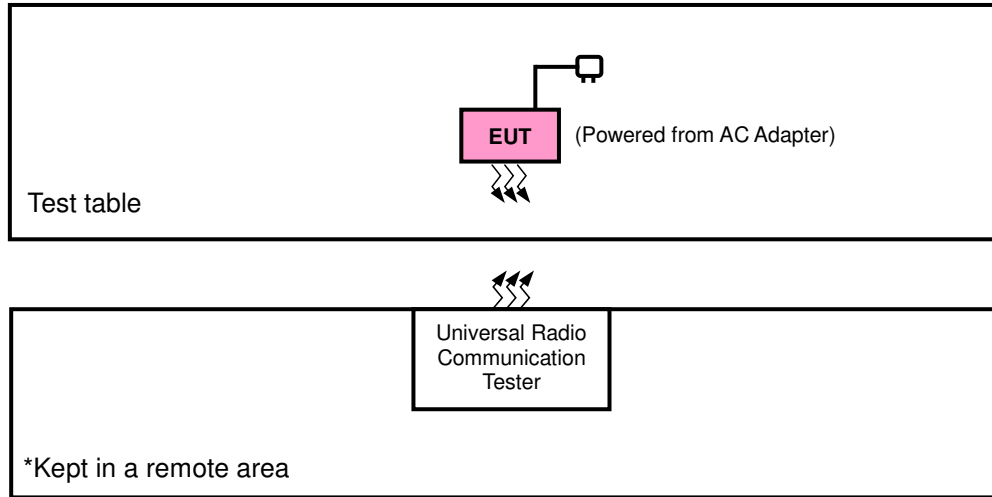
Antenna Type	Brand Name	Parts Number	Antenna Gain
PIFA	Ethertronics Inc.	WWAN Main Antenna: 5001997 WWAN Aux. Antenna: 5002014 (RX only)	LTE Band 7: -0.42 dBi LTE Band 41: -0.19 dBi

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	Lenovo	ADLX45NCC2A	I/P: 100-240Vac, 50-60Hz, 1.3A O/P: 20Vdc, 2.25A
Adapter 2	Lenovo	ADLX45NDC2A	I/P: 100-240Vac, 50-60Hz, 1.3A O/P: 20Vdc, 2.25A
Battery	Lenovo	SB10F46465	15.2Vdc, 2.895Ah
WLAN Module	Intel	8260NGW	--
WWAN Module	Sierra	EM7455	--

3. 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



#### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.



### 3.3 Test Mode Applicability and Tested Channel Detail

#### LTE Band 7

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Radiated Emission	20850 to 21350	21100	20 MHz	QPSK	1 RB / 50 RB Offset

#### LTE Band 41

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM	1 RB / 50 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	25 deg. C, 65 % RH	15.2 Vdc	Luke Chen
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Anson Lin

### 3.4 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

### 3.5 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**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

**KDB 412172 D01 Determining ERP and EIRP v01r01**

**KDB 996369 D01 Module Certification Guide v02**

**ANSI/TIA/EIA-603-D 2010**

**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

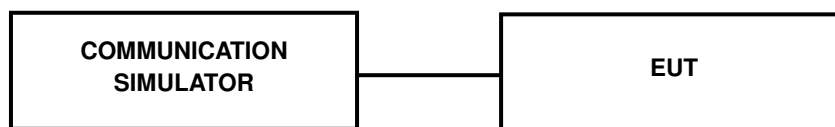
The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent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

#### 4.1.2 Test Procedures

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

#### Conducted Power Measurement:

- The EUT was set up for the maximum power with 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.



#### EIRP / ERP Measurement:

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$ ,  $ERP = EIRP - 2.15$ , where

$P_T$  = transmitter output power in dBm

$G_T$  = gain of the transmitting antenna in dBi

$L_C$  = signal attenuation in the connecting cable between the transmitter and antenna in dB

4.1.3 Test Results

Conducted Output Power (dBm)

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20775	Mid Ch 21100	High Ch 21425		Low Ch 20775	Mid Ch 21100	High Ch 21425	
			2502.5 MHz	2535.0 MHz	2567.5 MHz		2502.5 MHz	2535.0 MHz	2567.5 MHz	
7 / 5M	1	0	20.87	20.95	20.59	0	19.88	20.00	19.57	1
	1	12	21.00	21.07	20.74	0	20.03	20.10	19.72	1
	1	24	20.53	20.66	20.36	0	19.46	19.63	19.27	1
	12	0	19.89	19.97	19.56	1	18.78	18.93	18.51	2
	12	6	19.94	20.01	19.59	1	18.89	19.01	18.54	2
	12	13	19.63	19.74	19.35	1	18.56	18.70	18.29	2
	25	0	19.74	19.79	19.44	1	18.66	18.76	18.44	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20800	Mid Ch 21100	High Ch 21400		Low Ch 20800	Mid Ch 21100	High Ch 21400	
			2505.0 MHz	2535.0 MHz	2565.0 MHz		2505.0 MHz	2535.0 MHz	2565.0 MHz	
7 / 10M	1	0	20.97	21.05	20.70	0	19.98	20.07	19.70	1
	1	24	21.05	21.12	20.85	0	20.09	20.17	19.82	1
	1	49	20.57	20.74	20.39	0	19.59	19.77	19.32	1
	25	0	19.91	20.10	19.73	1	18.98	19.07	18.67	2
	25	12	20.06	20.15	19.83	1	19.03	19.13	18.79	2
	25	25	19.69	19.88	19.49	1	18.70	18.84	18.47	2
	50	0	19.83	19.93	19.62	1	18.80	18.88	18.51	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20825	Mid Ch 21100	High Ch 21375		Low Ch 20825	Mid Ch 21100	High Ch 21375	
			2507.5 MHz	2535.0 MHz	2562.5 MHz		2507.5 MHz	2535.0 MHz	2562.5 MHz	
7 / 15M	1	0	21.00	21.08	20.75	0	20.03	20.12	19.76	1
	1	37	21.12	21.17	20.79	0	20.08	20.21	19.94	1
	1	74	20.71	20.79	20.45	0	19.69	19.81	19.45	1
	36	0	20.08	20.17	19.85	1	19.02	19.18	18.80	2
	36	19	20.17	20.22	19.98	1	19.12	19.23	18.90	2
	36	39	19.85	19.99	19.64	1	18.85	18.95	18.60	2
	75	0	19.95	20.03	19.68	1	18.95	19.01	18.69	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20850	Mid Ch 21100	High Ch 21350		Low Ch 20850	Mid Ch 21100	High Ch 21350	
			2510.0 MHz	2535.0 MHz	2560.0 MHz		2510.0 MHz	2535.0 MHz	2560.0 MHz	
7 / 20M	1	0	21.08	21.15	20.84	0	20.12	20.20	19.87	1
	1	50	21.17	21.22	20.95	0	20.17	20.27	19.93	1
	1	99	20.79	20.88	20.63	0	19.84	19.92	19.55	1
	50	0	20.16	20.28	19.97	1	19.17	19.29	18.93	2
	50	25	20.25	20.32	20.03	1	19.27	19.33	19.00	2
	50	50	20.02	20.10	19.80	1	18.93	19.09	18.75	2
	100	0	20.10	20.14	19.84	1	19.04	19.13	18.88	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 39675	Mid Ch 40620	High Ch 41565		Low Ch 39675	Mid Ch 40620	High Ch 41565	
			2498.5 MHz	2593.0 MHz	2687.5 MHz		2498.5 MHz	2593.0 MHz	2687.5 MHz	
41 / 5M	1	0	20.74	20.63	21.00	0	19.78	19.66	20.04	1
	1	12	21.23	21.13	21.41	0	20.28	20.18	20.46	1
	1	24	20.39	20.32	20.72	0	19.41	19.34	19.75	1
	12	0	19.76	19.62	20.00	1	18.74	18.58	19.01	2
	12	6	19.88	19.81	20.13	1	18.88	18.80	19.15	2
	12	13	19.47	19.39	19.74	1	18.42	18.34	18.72	2
	25	0	19.87	19.70	20.09	1	18.87	18.67	19.10	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 39700	Mid Ch 40620	High Ch 41540		Low Ch 39700	Mid Ch 40620	High Ch 41540	
			2501.0 MHz	2593.0 MHz	2685.0 MHz		2501.0 MHz	2593.0 MHz	2685.0 MHz	
41 / 10M	1	0	20.80	20.71	21.06	0	19.84	19.74	20.10	1
	1	24	21.28	21.18	21.46	0	20.33	20.23	20.51	1
	1	49	20.48	20.41	20.79	0	19.51	19.44	19.83	1
	25	0	19.89	19.75	20.12	1	18.88	18.72	19.14	2
	25	12	20.00	19.93	20.24	1	19.00	18.93	19.26	2
	25	25	19.61	19.53	19.87	1	18.56	18.48	18.85	2
	50	0	19.99	19.83	20.20	1	18.99	18.81	19.22	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 39725	Mid Ch 40620	High Ch 41515		Low Ch 39725	Mid Ch 40620	High Ch 41515	
			2503.5 MHz	2593.0 MHz	2682.5 MHz		2503.5 MHz	2593.0 MHz	2682.5 MHz	
41 / 15M	1	0	20.86	20.78	21.12	0	19.90	19.81	20.16	1
	1	37	21.33	21.23	21.51	0	20.38	20.27	20.56	1
	1	74	20.56	20.49	20.85	0	19.57	19.50	19.88	1
	36	0	20.01	19.89	20.22	1	18.99	18.85	19.22	2
	36	19	20.11	20.04	20.34	1	19.10	19.02	19.35	2
	36	39	19.76	19.68	20.00	1	18.72	18.63	18.97	2
	75	0	20.10	19.96	20.30	1	19.09	18.93	19.31	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 39750	Mid Ch 40620	High Ch 41490		Low Ch 39750	Mid Ch 40620	High Ch 41490	
			2506.0 MHz	2593.0 MHz	2680.0 MHz		2506.0 MHz	2593.0 MHz	2680.0 MHz	
41 / 20M	1	0	20.92	20.85	21.18	0	19.95	19.87	20.22	1
	1	50	21.38	21.28	21.56	0	20.42	20.32	20.56	1
	1	99	20.65	20.59	20.92	0	19.65	19.58	19.95	1
	50	0	20.13	20.02	20.33	1	19.10	18.98	19.31	2
	50	25	20.23	20.16	20.44	1	19.21	19.13	19.43	2
	50	50	19.90	19.83	20.12	1	18.86	18.78	19.08	2
	100	0	20.22	20.08	20.41	1	19.19	19.04	19.39	2

**EIRP Power (dBm)**

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		20775	21100	21425	20775	21100	21425
	Frequency	2502.5	2535	2567.5	2502.5	2535	2567.5
MHz		MHz	MHz	MHz	MHz	MHz	
7 / 5M	Conducted power(dBm)	21	21.07	20.74	20.03	20.1	19.72
	Conducted power (Watts)	0.13	0.13	0.12	0.10	0.10	0.09
	E.I.R.P (dBm)	20.58	20.65	20.32	19.61	19.68	19.3
	E.I.R.P (Watts)	0.11	0.12	0.11	0.09	0.09	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		20800	21100	21400	20800	21100	21400
	Frequency	2505	2535	2565	2505	2535	2565
MHz		MHz	MHz	MHz	MHz	MHz	
7 / 10M	Conducted power(dBm)	21.05	21.12	20.85	20.09	20.17	19.82
	Conducted power (Watts)	0.13	0.13	0.12	0.10	0.10	0.10
	E.I.R.P (dBm)	20.63	20.7	20.43	19.67	19.75	19.4
	E.I.R.P (Watts)	0.12	0.12	0.11	0.09	0.09	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		20825	21100	21375	20825	21100	21375
	Frequency	2507.5	2535	2562.5	2507.5	2535	2562.5
MHz		MHz	MHz	MHz	MHz	MHz	
7 / 15M	Conducted power(dBm)	21.12	21.17	20.79	20.08	20.21	19.94
	Conducted power (Watts)	0.13	0.13	0.12	0.10	0.10	0.10
	E.I.R.P (dBm)	20.7	20.75	20.37	19.66	19.79	19.52
	E.I.R.P (Watts)	0.12	0.12	0.11	0.09	0.10	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		20850	21100	21350	20850	21100	21350
	Frequency	2510	2535	2560	2510	2535	2560
MHz		MHz	MHz	MHz	MHz	MHz	
7 / 20M	Conducted power(dBm)	21.17	21.22	20.95	20.17	20.27	19.93
	Conducted power (Watts)	0.13	0.13	0.12	0.10	0.11	0.10
	E.I.R.P (dBm)	20.75	20.8	20.53	19.75	19.85	19.51
	E.I.R.P (Watts)	0.12	0.12	0.11	0.09	0.10	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		39675	40620	41565	39675	40620	41565
	Frequency	2498.5	2593	2687.5	2498.5	2593	2687.5
MHz		MHz	MHz	MHz	MHz	MHz	
41 / 5M	Conducted power(dBm)	21.23	21.13	21.41	20.28	20.18	20.46
	Conducted power (Watts)	0.13	0.13	0.14	0.11	0.10	0.11
	E.I.R.P (dBm)	21.04	20.94	21.22	20.09	19.99	20.27
	E.I.R.P (Watts)	0.13	0.12	0.13	0.10	0.10	0.11

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		39700	40620	41540	39700	40620	41540
	Frequency	2501	2593	2685	2501	2593	2685
MHz		MHz	MHz	MHz	MHz	MHz	
41 / 10M	Conducted power(dBm)	21.28	21.18	21.46	20.33	20.23	20.51
	Conducted power (Watts)	0.13	0.13	0.14	0.11	0.11	0.11
	E.I.R.P (dBm)	21.09	20.99	21.27	20.14	20.04	20.32
	E.I.R.P (Watts)	0.13	0.13	0.13	0.10	0.10	0.11

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		39725	40620	41515	39725	40620	41515
	Frequency	2503.5	2593	2682.5	2503.5	2593	2682.5
MHz		MHz	MHz	MHz	MHz	MHz	
41 / 15M	Conducted power(dBm)	21.33	21.23	21.51	20.38	20.27	20.56
	Conducted power (Watts)	0.14	0.13	0.14	0.11	0.11	0.11
	E.I.R.P (dBm)	21.14	21.04	21.32	20.19	20.08	20.37
	E.I.R.P (Watts)	0.13	0.13	0.14	0.10	0.10	0.11

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH	Mid CH	High CH	Low CH	Mid CH	High CH
		39750	40620	41490	39750	40620	41490
	Frequency	2506	2593	2680	2506	2593	2680
MHz		MHz	MHz	MHz	MHz	MHz	
41 / 20M	Conducted power(dBm)	21.38	21.28	21.56	20.42	20.32	20.56
	Conducted power (Watts)	0.14	0.13	0.14	0.11	0.11	0.11
	E.I.R.P (dBm)	21.19	21.09	21.37	20.23	20.13	20.37
	E.I.R.P (Watts)	0.13	0.13	0.14	0.11	0.10	0.11

## 4.2 Radiated Emission Measurement

### 4.2.1 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  $55 + 10 \log_{10}(P)$  dB. The limit of emission is equal to -25 dBm.

### 4.2.2 Test Procedure

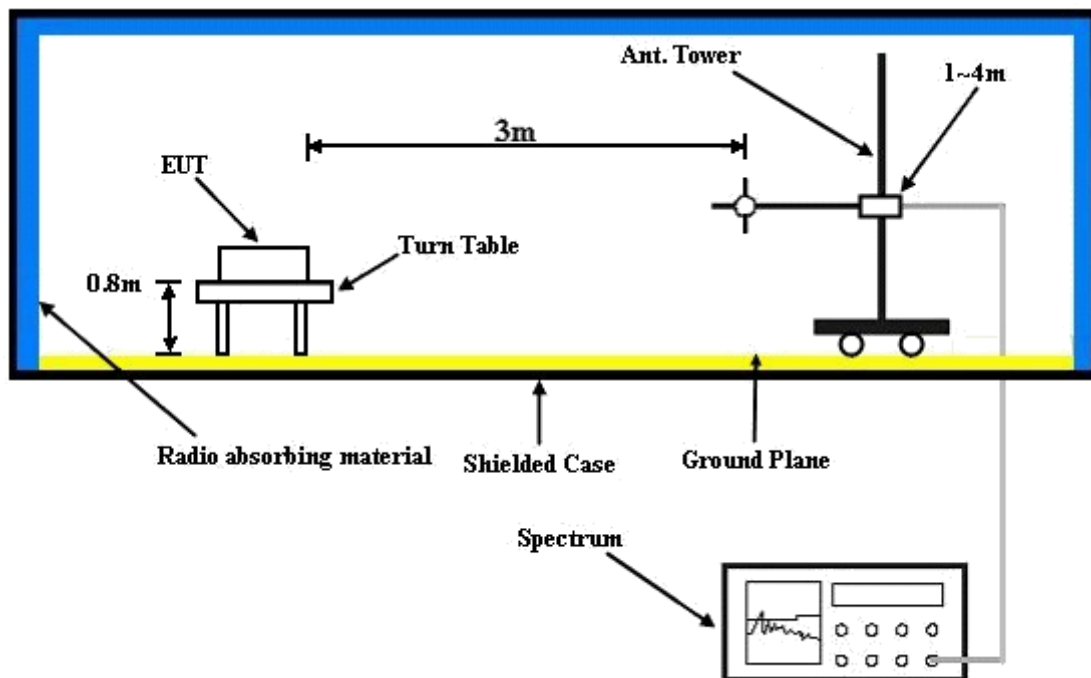
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 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.
- $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$ .

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

### 4.2.3 Deviation from Test Standard

No deviation.

### 4.2.4 Test Setup



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

4.2.5 Test Results

LTE Band 7

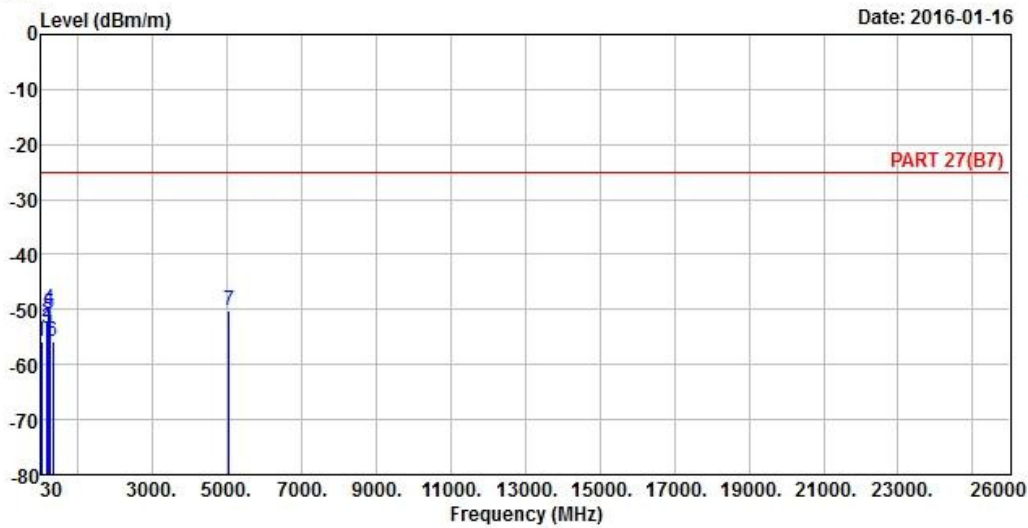
Channel Bandwidth: 20 MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5  
 Condition: PART 27(B7) 3m HORIZONTAL  
 Remak : LTE Band 7 QPSK\_20M(1,50) Link  
 Tested by: Anson Lin  
 Plane : NB

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	30.00	-55.81	-56.19	-13.00	-42.81	0.38	Peak
2	191.02	-52.16	-44.98	-13.00	-39.16	-7.18	Peak
3	218.18	-53.34	-46.06	-13.00	-40.34	-7.28	Peak
4	238.55	-49.90	-43.44	-13.00	-36.90	-6.46	Peak
5	253.10	-50.85	-44.80	-13.00	-37.85	-6.05	Peak
6	336.52	-55.87	-49.42	-13.00	-42.87	-6.45	Peak
7 pp	5070.00	-50.13	-47.01	-25.00	-25.13	-3.12	Peak



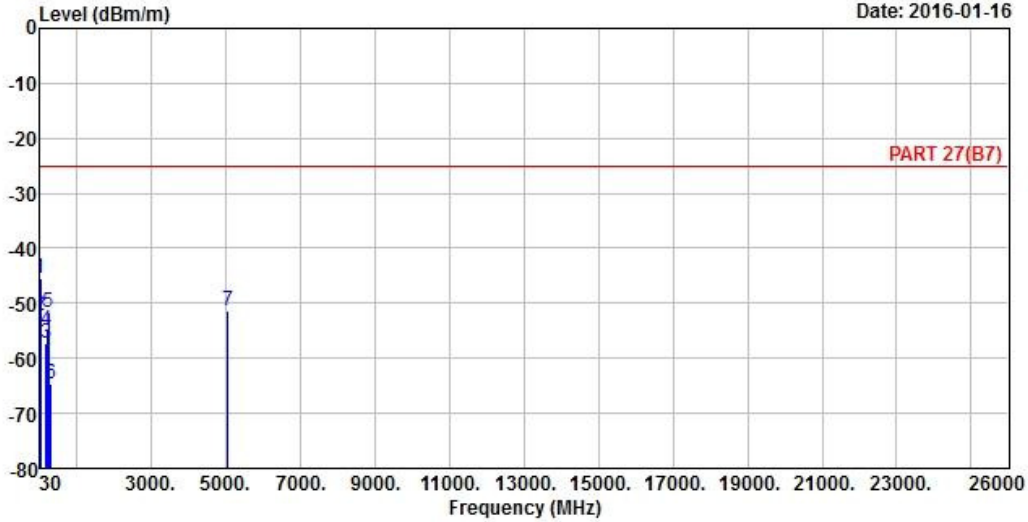


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 2016-01-16



Site : 966 Chamber 5  
 Condition: PART 27(B7) 3m VERTICAL  
 Remak : LTE Band 7 QPSK\_20M(1,50) Link  
 Tested by: Anson Lin  
 Plane : NB

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	30.97	-45.35	-45.24	-13.00	-32.35	-0.11	Peak
2	41.64	-52.18	-51.77	-13.00	-39.18	-0.41	Peak
3	187.14	-57.26	-50.08	-13.00	-44.26	-7.18	Peak
4	218.18	-54.95	-47.67	-13.00	-41.95	-7.28	Peak
5	247.28	-51.65	-45.54	-13.00	-38.65	-6.11	Peak
6	320.03	-64.72	-58.02	-13.00	-51.72	-6.70	Peak
7 pp	5070.00	-51.23	-48.11	-25.00	-26.23	-3.12	Peak

## 5 Pictures of Test Arrangements

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



A D T

## Appendix – 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/Telecom Lab**

Tel: 886-3-6668565

Fax: 886-3-6668323

### **Hwa Ya EMC/RF/Safety**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---