

FCC Test Report

(PART 24)

Report No.: RF160104C14-5

FCC ID: GKR-TP00078ASB

Test Model: TP00078A

Received Date: Jan. 04, 2016

Test Date: Jan. 16, 2016

Issued Date: Feb. 18, 2016

Applicant: Compal Electronics Inc

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

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Test Location: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.



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Release Control Record

Issue No.	Description	Date Issued
RF160104C14-5	Original Release	Feb. 18, 2016



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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

Standards: FCC Part 24, Subpart E

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 : Gina Liu , **Date:** Feb. 18, 2016
Gina Liu / Specialist

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

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -20.59 dB at 5647.50 MHz.

Note: Only test item of Conducted power, EIRP, and Radiated Emissions tests were performed for this report.
Other test data please refer to China Telecommunication Technolgy Labs module report no.: B15W50341-FCC-RF_Rev1 (Brand: Sierra Wireless Inc., Model: EM7455) 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



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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. 21, 2016
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. 04, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 09, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 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	Jan. 09, 2015	Jan. 08, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2014	Dec. 26, 2015
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.



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3 General Information

3.1 General Description of EUT

Product	Tablet Computer	
Brand	Lenovo	
Test Model	TP00078A	
Status of EUT	Production Unit	
Power Supply Rating	20Vdc (Adapter) 15.2Vdc (Li-ion battery)	
Modulation Type	WCDMA	BPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA	1852.4 ~ 1907.6 MHz
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1909.3 MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1908.5 MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1907.5 MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1905.0 MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1902.5 MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1900.0 MHz
	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1914.3 MHz
	LTE Band 25 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1913.5 MHz
	LTE Band 25 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1912.5 MHz
	LTE Band 25 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1910.0 MHz
	LTE Band 25 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1907.5 MHz
	LTE Band 25 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1905.0 MHz
Max. EIRP Power	WCDMA	0.21 W
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	0.21 W
	LTE Band 2 (Channel Bandwidth: 3 MHz)	0.21 W
	LTE Band 2 (Channel Bandwidth: 5 MHz)	0.22 W
	LTE Band 2 (Channel Bandwidth: 10 MHz)	0.23 W
	LTE Band 2 (Channel Bandwidth: 15 MHz)	0.19 W
	LTE Band 2 (Channel Bandwidth: 20 MHz)	0.25 W
	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	0.20 W
	LTE Band 25 (Channel Bandwidth: 3 MHz)	0.21 W
	LTE Band 25 (Channel Bandwidth: 5 MHz)	0.21 W
	LTE Band 25 (Channel Bandwidth: 10 MHz)	0.21 W
	LTE Band 25 (Channel Bandwidth: 15 MHz)	0.21 W
	LTE Band 25 (Channel Bandwidth: 20 MHz)	0.21 W
Antenna Type	PIFA Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	



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Note:

1. 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	Broadcom	BCM94356Z	--
WWAN Module	Sierra	EM7455	--

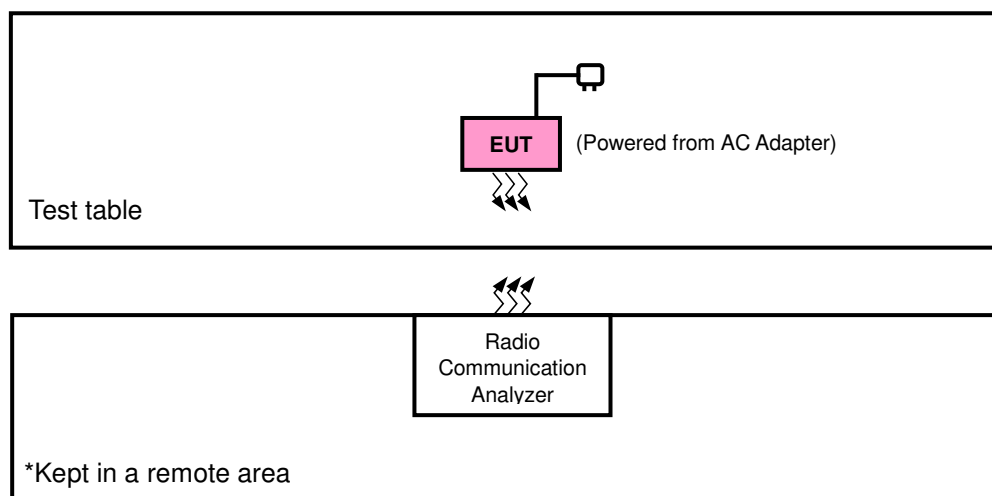
2. The antenna information is listed as below.

Antenna Type	Brand Name	Parts Number	Antenna Gain		
			WCDMA II	LTE 2	LTE 25
PIFA	Ethertronics Inc.	WWAN Main Antenna: 5001997 WWAN Aux. Antenna: 5002014 (RX only)	0.06	0.06	0.06

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

<Radiated Emission 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. 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.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	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 acted as communication partners to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

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 as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	Radiated Emission
LTE Band 25	Z-axis

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA

LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

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

LTE Band 25

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	26140 to 26590	26365	20 MHz	QPSK	1 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
EIRP	26 deg. C, 58 % RH	15.2 Vdc	Anson Lin
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 24

KDB 971168 D01 Power Meas License Digital Systems v02r02

KDB 412172 D0 Determining ERP and EIRP v01

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

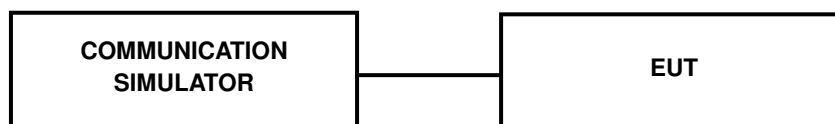
Mobile / Portable station are limited to 2 watts e.i.r.p.

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	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	23.01	23.09	22.99
HSDPA Subtest-1	21.86	21.88	21.91
HSDPA Subtest-2	21.88	21.90	21.96
HSDPA Subtest-3	21.36	21.39	21.45
HSDPA Subtest-4	21.32	21.02	21.44
HSUPA Subtest-1	21.54	21.60	21.65
HSUPA Subtest-2	20.00	20.52	19.97
HSUPA Subtest-3	20.53	20.51	20.48
HSUPA Subtest-4	19.79	19.83	19.88
HSUPA Subtest-5	22.00	21.90	22.00

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 18607	Mid Ch 18900	High Ch 19193		Low Ch 18607	Mid Ch 18900	High Ch 19193	
			1850.7 MHz	1880.0 MHz	1909.3 MHz		1850.7 MHz	1880.0 MHz	1909.3 MHz	
2 / 1.4M	1	0	23.08	23.09	22.97	0	22.53	22.54	22.42	1
	1	2	22.10	22.05	22.37	0	21.55	21.50	21.82	1
	1	5	22.04	22.10	22.20	0	21.49	21.55	21.65	1
	3	0	22.42	22.55	22.37	0	21.87	22.00	21.82	1
	3	1	22.12	22.19	22.16	0	21.57	21.64	21.61	1
	3	3	22.14	22.06	22.08	0	21.59	21.51	21.53	1
	6	0	21.36	21.20	21.34	1	20.81	20.65	20.79	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 18615	Mid Ch 18900	High Ch 19185		Low Ch 18615	Mid Ch 18900	High Ch 19185	
			1851.5 MHz	1880.0 MHz	1908.5 MHz		1851.5 MHz	1880.0 MHz	1908.5 MHz	
2 / 3M	1	0	23.22	23.23	23.11	0	22.59	22.60	22.48	1
	1	7	22.24	22.19	22.51	0	21.61	21.56	21.88	1
	1	14	22.18	22.24	22.34	0	21.55	21.61	21.71	1
	8	0	21.56	21.69	21.51	1	20.93	21.06	20.88	2
	8	3	21.26	21.33	21.30	1	20.63	20.70	20.67	2
	8	7	21.28	21.20	21.22	1	20.65	20.57	20.59	2
	15	0	21.50	21.34	21.48	1	20.87	20.71	20.85	2



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Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 18625	Mid Ch 18900	High Ch 19175		Low Ch 18625	Mid Ch 18900	High Ch 19175	
			1852.5 MHz	1880.0 MHz	1907.5 MHz		1852.5 MHz	1880.0 MHz	1907.5 MHz	
2 / 5M	1	0	23.38	23.39	23.27	0	22.66	22.67	22.55	1
	1	12	22.40	22.35	22.67	0	21.68	21.63	21.95	1
	1	24	22.34	22.40	22.50	0	21.62	21.68	21.78	1
	12	0	21.72	21.85	21.67	1	21.00	21.13	20.95	2
	12	6	21.42	21.49	21.46	1	20.70	20.77	20.74	2
	12	13	21.44	21.36	21.38	1	20.72	20.64	20.66	2
	25	0	21.66	21.50	21.64	1	20.94	20.78	20.92	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 18650	Mid Ch 18900	High Ch 19150		Low Ch 18650	Mid Ch 18900	High Ch 19150	
			1855.0 MHz	1880.0 MHz	1905.0 MHz		1855.0 MHz	1880.0 MHz	1905.0 MHz	
2 / 10M	1	0	23.57	23.58	23.46	0	22.71	22.72	22.60	1
	1	24	22.59	22.54	22.86	0	21.73	21.68	22.00	1
	1	49	22.53	22.59	22.69	0	21.67	21.73	21.83	1
	25	0	21.91	22.04	21.86	1	21.05	21.18	21.00	2
	25	12	21.61	21.68	21.65	1	20.75	20.82	20.79	2
	25	25	21.63	21.55	21.57	1	20.77	20.69	20.71	2
	50	0	21.85	21.69	21.83	1	20.99	20.83	20.97	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 18675	Mid Ch 18900	High Ch 19125		Low Ch 18675	Mid Ch 18900	High Ch 19125	
			1857.5 MHz	1880.0 MHz	1902.5 MHz		1857.5 MHz	1880.0 MHz	1902.5 MHz	
2 / 15M	1	0	23.69	23.70	23.58	0	22.74	22.75	22.63	1
	1	37	22.71	22.66	22.98	0	21.76	21.71	22.03	1
	1	74	22.65	22.71	22.81	0	21.70	21.76	21.86	1
	36	0	22.03	22.16	21.98	1	21.08	21.21	21.03	2
	36	19	21.73	21.80	21.77	1	20.78	20.85	20.82	2
	36	39	21.75	21.67	21.69	1	20.80	20.72	20.74	2
	75	0	21.97	21.81	21.95	1	21.02	20.86	21.00	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 18700	Mid Ch 18900	High Ch 19100		Low Ch 18700	Mid Ch 18900	High Ch 19100	
			1860.0 MHz	1880.0 MHz	1900.0 MHz		1860.0 MHz	1880.0 MHz	1900.0 MHz	
2 / 20M	1	0	23.85	23.86	23.74	0	22.77	22.78	22.66	1
	1	50	22.87	22.82	23.14	0	21.79	21.74	22.06	1
	1	99	22.81	22.87	22.97	0	21.73	21.79	21.89	1
	50	0	22.19	22.32	22.14	1	21.11	21.24	21.06	2
	50	25	21.89	21.96	21.93	1	20.81	20.88	20.85	2
	50	50	21.91	21.83	21.85	1	20.83	20.75	20.77	2
	100	0	22.13	21.97	22.11	1	21.05	20.89	21.03	2



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Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26047	Mid Ch 26365	High Ch 26683		Low Ch 26047	Mid Ch 26365	High Ch 26683	
			1850.7 MHz	1882.5 MHz	1914.3 MHz		1850.7 MHz	1882.5 MHz	1914.3 MHz	
25 / 1.4M	1	0	22.98	22.84	22.95	0	22.06	21.95	22.04	1
	1	2	22.31	22.15	22.25	0	21.45	21.21	21.31	1
	1	5	22.49	22.34	22.44	0	21.57	21.40	21.54	1
	3	0	22.23	22.11	22.19	0	21.36	21.18	21.26	1
	3	1	21.80	21.70	21.75	0	20.96	20.73	20.80	1
	3	3	21.64	21.51	21.58	0	20.69	20.51	20.57	1
	6	0	21.17	21.05	21.13	1	20.19	20.00	20.14	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26055	Mid Ch 26365	High Ch 26675		Low Ch 26055	Mid Ch 26365	High Ch 26675	
			1851.5 MHz	1882.5 MHz	1913.5 MHz		1851.5 MHz	1882.5 MHz	1913.5 MHz	
25 / 3M	1	0	23.06	22.97	23.04	0	22.09	21.95	22.04	1
	1	7	22.44	22.32	22.39	0	21.42	21.28	21.34	1
	1	14	22.61	22.50	22.55	0	21.58	21.46	21.53	1
	8	0	21.58	21.46	21.52	1	20.56	20.47	20.54	2
	8	3	21.23	21.06	21.14	1	20.17	20.02	20.11	2
	8	7	21.01	20.85	20.91	1	19.95	19.81	19.90	2
	15	0	21.35	21.20	21.29	1	20.34	20.19	20.30	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26065	Mid Ch 26365	High Ch 26665		Low Ch 26065	Mid Ch 26365	High Ch 26665	
			1852.5 MHz	1882.5 MHz	1912.5 MHz		1852.5 MHz	1882.5 MHz	1912.5 MHz	
25 / 5M	1	0	23.11	23.02	23.09	0	22.16	22.04	22.12	1
	1	12	22.53	22.42	22.49	0	21.54	21.39	21.45	1
	1	24	22.68	22.58	22.64	0	21.65	21.57	21.61	1
	12	0	21.73	21.56	21.65	1	20.68	20.58	20.63	2
	12	6	21.38	21.20	21.26	1	20.28	20.16	20.21	2
	12	13	21.15	21.00	21.05	1	20.09	19.96	20.03	2
	25	0	21.44	21.35	21.40	1	20.44	20.32	20.41	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26090	Mid Ch 26365	High Ch 26640		Low Ch 26090	Mid Ch 26365	High Ch 26640	
			1855.0 MHz	1882.5 MHz	1910.0 MHz		1855.0 MHz	1882.5 MHz	1910.0 MHz	
25 / 10M	1	0	23.16	23.05	23.14	0	22.20	22.11	22.17	1
	1	24	22.62	22.48	22.53	0	21.63	21.50	21.59	1
	1	49	22.70	22.62	22.66	0	21.75	21.67	21.74	1
	25	0	21.74	21.66	21.73	1	20.82	20.66	20.72	2
	25	12	21.53	21.35	21.40	1	20.45	20.29	20.34	2
	25	25	21.26	21.15	21.22	1	20.24	20.10	20.17	2
	50	0	21.54	21.45	21.49	1	20.54	20.40	20.48	2



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Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26115	Mid Ch 26365	High Ch 26615		Low Ch 26115	Mid Ch 26365	High Ch 26615	
			1857.5 MHz	1882.5 MHz	1907.5 MHz		1857.5 MHz	1882.5 MHz	1907.5 MHz	
25 / 15M	1	0	23.21	23.14	23.20	0	22.26	22.16	22.23	1
	1	37	22.69	22.57	22.63	0	21.68	21.59	21.65	1
	1	74	22.79	22.70	22.74	0	21.81	21.72	21.78	1
	36	0	21.86	21.77	21.81	1	20.91	20.76	20.83	2
	36	19	21.55	21.47	21.54	1	20.60	20.46	20.52	2
	36	39	21.40	21.30	21.37	1	20.41	20.26	20.32	2
	75	0	21.67	21.59	21.65	1	20.65	20.57	20.63	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26140	Mid Ch 26365	High Ch 26590		Low Ch 26140	Mid Ch 26365	High Ch 26590	
			1860.0 MHz	1882.5 MHz	1905.0 MHz		1860.0 MHz	1882.5 MHz	1905.0 MHz	
25 / 20M	1	0	23.26	23.19	23.25	0	22.31	22.23	22.30	1
	1	50	22.79	22.66	22.72	0	21.81	21.67	21.72	1
	1	99	22.85	22.78	22.83	0	21.89	21.81	21.86	1
	50	0	21.97	21.87	21.93	1	20.99	20.86	20.90	2
	50	25	21.67	21.60	21.66	1	20.64	20.56	20.60	2
	50	50	21.57	21.45	21.51	1	20.55	20.40	20.46	2
	100	0	21.77	21.70	21.76	1	20.76	20.68	20.72	2



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EIRP Power (dBm)

Band	WCDMA II		
Channel	9262	9400	9538
Rx Channel	9662	9800	9938
Frequency	1852.4	1880	1907.6
Conducted power(dBm)	23.01	23.09	22.99
Conducted power (Watts)	0.20	0.20	0.20
EIRP (dBm)	23.07	23.15	23.05
EIRP (Watts)	0.20	0.21	0.20

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 18607	Mid CH 18900	High CH 19193	Low CH 18607	Mid CH 18900	High CH 19193
	Frequency	1850.7 MHz	1880 MHz	1909.3 MHz	1850.7 MHz	1880 MHz	1909.3 MHz
2 / 1.4M	Conducted power(dBm)	23.08	23.09	22.97	22.53	22.54	22.42
	Conducted power (Watts)	0.20	0.20	0.20	0.18	0.18	0.17
	EIRP (dBm)	23.14	23.15	23.03	22.59	22.6	22.48
	EIRP (Watts)	0.21	0.21	0.20	0.18	0.18	0.18

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 18615	Mid CH 18900	High CH 19185	Low CH 18615	Mid CH 18900	High CH 19185
	Frequency	1851.5 MHz	1880 MHz	1908.5 MHz	1851.5 MHz	1880 MHz	1908.5 MHz
2 / 3M	Conducted power(dBm)	23.22	23.23	23.11	22.59	22.6	22.48
	Conducted power (Watts)	0.21	0.21	0.20	0.18	0.18	0.18
	EIRP (dBm)	23.28	23.29	23.17	22.65	22.66	22.54
	EIRP (Watts)	0.21	0.21	0.21	0.18	0.18	0.18

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 18625	Mid CH 18900	High CH 19175	Low CH 18625	Mid CH 18900	High CH 19175
	Frequency	1852.5 MHz	1880 MHz	1907.5 MHz	1852.5 MHz	1880 MHz	1907.5 MHz
2 / 5M	Conducted power(dBm)	23.38	23.39	23.27	22.66	22.67	22.55
	Conducted power (Watts)	0.22	0.22	0.21	0.18	0.18	0.18
	EIRP (dBm)	23.44	23.45	23.33	22.72	22.73	22.61
	EIRP (Watts)	0.22	0.22	0.22	0.19	0.19	0.18

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 18650	Mid CH 18900	High CH 19150	Low CH 18650	Mid CH 18900	High CH 19150
	Frequency	1855 MHz	1880 MHz	1905 MHz	1855 MHz	1880 MHz	1905 MHz
2 / 10M	Conducted power(dBm)	23.57	23.58	23.46	22.71	22.72	22.6
	Conducted power (Watts)	0.23	0.23	0.22	0.19	0.19	0.18
	EIRP (dBm)	23.63	23.64	23.52	22.77	22.78	22.66
	EIRP (Watts)	0.23	0.23	0.22	0.19	0.19	0.18

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 18675	Mid CH 18900	High CH 19125	Low CH 18675	Mid CH 18900	High CH 19125
	Frequency	1857.5 MHz	1880 MHz	1902.5 MHz	1857.5 MHz	1880 MHz	1902.5 MHz
2 / 15M	Conducted power(dBm)	21.97	21.81	21.95	22.74	22.75	22.63
	Conducted power (Watts)	0.16	0.15	0.16	0.19	0.19	0.18
	EIRP (dBm)	22.03	21.87	22.01	22.8	22.81	22.69
	EIRP (Watts)	0.16	0.15	0.16	0.19	0.19	0.19

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 18700	Mid CH 18900	High CH 19100	Low CH 18700	Mid CH 18900	High CH 19100
	Frequency	1860 MHz	1880 MHz	1900 MHz	1860 MHz	1880 MHz	1900 MHz
2 / 20M	Conducted power(dBm)	23.85	23.86	23.74	22.77	22.78	22.66
	Conducted power (Watts)	0.24	0.24	0.24	0.19	0.19	0.18
	EIRP (dBm)	23.91	23.92	23.8	22.83	22.84	22.72
	EIRP (Watts)	0.25	0.25	0.24	0.19	0.19	0.19

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26047	Mid CH 26365	High CH 26683	Low CH 26047	Mid CH 26365	High CH 26683
	Frequency	1850.7 MHz	1882.5 MHz	1914.3 MHz	1850.7 MHz	1882.5 MHz	1914.3 MHz
25 / 1.4M	Conducted power(dBm)	22.98	22.84	22.95	22.06	21.95	22.04
	Conducted power (Watts)	0.20	0.19	0.20	0.16	0.16	0.16
	EIRP (dBm)	23.04	22.9	23.01	22.12	22.01	22.1
	EIRP (Watts)	0.20	0.19	0.20	0.16	0.16	0.16

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26055	Mid CH 26365	High CH 26675	Low CH 26055	Mid CH 26365	High CH 26675
	Frequency	1851.5 MHz	1882.5 MHz	1913.5 MHz	1851.5 MHz	1882.5 MHz	1913.5 MHz
25 / 3M	Conducted power(dBm)	23.06	22.97	23.04	22.09	21.95	22.04
	Conducted power (Watts)	0.20	0.20	0.20	0.16	0.16	0.16
	EIRP (dBm)	23.12	23.03	23.1	22.15	22.01	22.1
	EIRP (Watts)	0.21	0.20	0.20	0.16	0.16	0.16

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26065	Mid CH 26365	High CH 26665	Low CH 26065	Mid CH 26365	High CH 26665
	Frequency	1852.5 MHz	1882.5 MHz	1912.5 MHz	1852.5 MHz	1882.5 MHz	1912.5 MHz
25 / 5M	Conducted power(dBm)	23.11	23.02	23.09	22.16	22.04	22.12
	Conducted power (Watts)	0.20	0.20	0.20	0.16	0.16	0.16
	EIRP (dBm)	23.17	23.08	23.15	22.22	22.1	22.18
	EIRP (Watts)	0.21	0.20	0.21	0.17	0.16	0.17

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26090	Mid CH 26365	High CH 26640	Low CH 26090	Mid CH 26365	High CH 26640
	Frequency	1855 MHz	1882.5 MHz	1910 MHz	1855 MHz	1882.5 MHz	1910 MHz
25 / 10M	Conducted power(dBm)	23.16	23.05	23.14	22.2	22.11	22.17
	Conducted power (Watts)	0.21	0.20	0.21	0.17	0.16	0.16
	EIRP (dBm)	23.22	23.11	23.2	22.26	22.17	22.23
	EIRP (Watts)	0.21	0.20	0.21	0.17	0.16	0.17

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26115	Mid CH 26365	High CH 26615	Low CH 26115	Mid CH 26365	High CH 26615
	Frequency	1857.5 MHz	1882.5 MHz	1907.5 MHz	1857.5 MHz	1882.5 MHz	1907.5 MHz
25 / 15M	Conducted power(dBm)	23.21	23.14	23.2	22.26	22.16	22.23
	Conducted power (Watts)	0.21	0.21	0.21	0.17	0.16	0.17
	EIRP (dBm)	23.27	23.2	23.26	22.32	22.22	22.29
	EIRP (Watts)	0.21	0.21	0.21	0.17	0.17	0.17



Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26140	Mid CH 26365	High CH 26590	Low CH 26140	Mid CH 26365	High CH 26590
	Frequency	1860 MHz	1882.5 MHz	1905 MHz	1860 MHz	1882.5 MHz	1905 MHz
25 / 20M	Conducted power(dBm)	23.26	23.19	23.25	22.31	22.23	22.3
	Conducted power (Watts)	0.21	0.21	0.21	0.17	0.17	0.17
	EIRP (dBm)	23.32	23.25	23.31	22.37	22.29	22.36
	EIRP (Watts)	0.21	0.21	0.21	0.17	0.17	0.17

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

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

4.2.2 Test Procedure

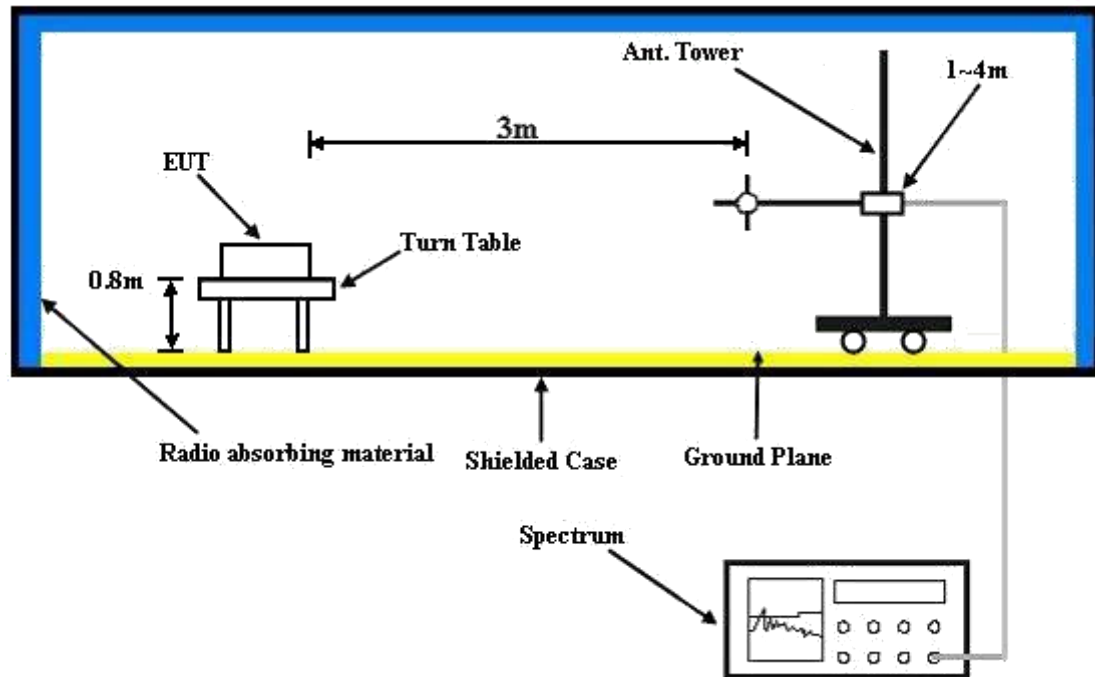
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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 and video bandwidth of test receiver/spectrum analyzer is 1 MHz/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 25

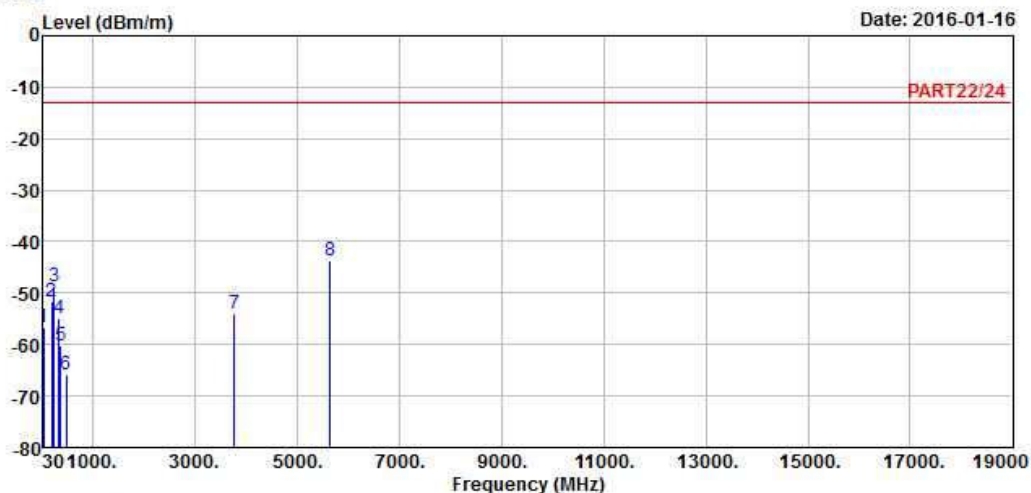
Channel Bandwidth: 20 MHz / QPSK



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Data: 7



Site : 966 Chamber 5
Condition: PART22/24 3m HORIZONTAL
Remak : LTE Band 25 QPSK_20M(1,0) Link
Tested by: Anson Lin
Plane : NB

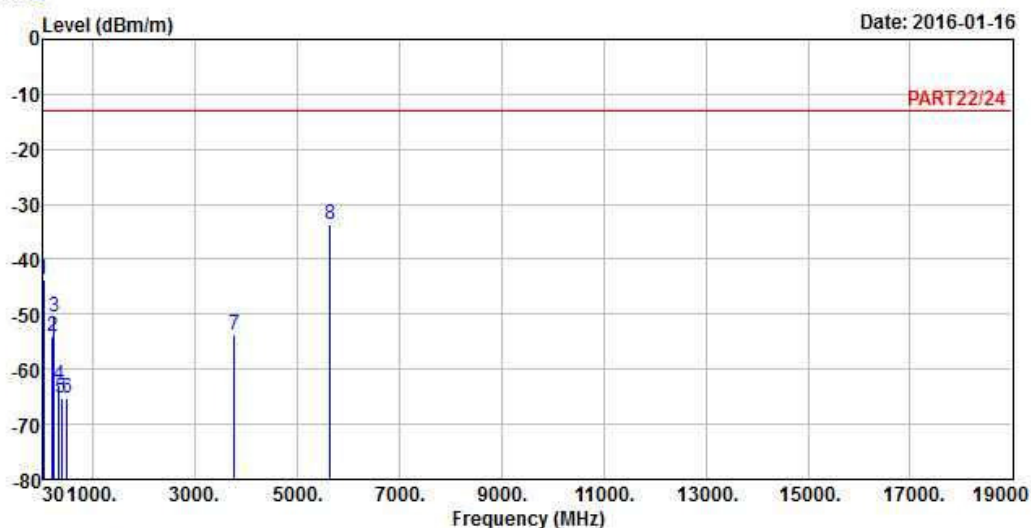
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	30.00	-56.69	-57.07	-13.00	-43.69	0.38	Peak
2	191.99	-51.71	-44.43	-13.00	-38.71	-7.28	Peak
3	246.31	-48.57	-42.42	-13.00	-35.57	-6.15	Peak
4	332.64	-54.91	-48.40	-13.00	-41.91	-6.51	Peak
5	369.50	-60.11	-53.99	-13.00	-47.11	-6.12	Peak
6	483.96	-65.70	-60.78	-13.00	-52.70	-4.92	Peak
7	3765.00	-54.03	-46.06	-13.00	-41.03	-7.97	Peak
8 pp	5647.50	-43.72	-41.78	-13.00	-30.72	-1.94	Peak



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Data: 8



Site : 966 Chamber 5
Condition: PART22/24 3m VERTICAL
Remak : LTE Band 25 QPSK_20M(1,0) 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	-43.69	-44.07	-13.00	-30.69	0.38	Peak
2	216.24	-54.02	-46.66	-13.00	-41.02	-7.36	Peak
3	243.40	-50.55	-44.28	-13.00	-37.55	-6.27	Peak
4	331.67	-62.80	-56.28	-13.00	-49.80	-6.52	Peak
5	390.84	-65.18	-59.18	-13.00	-52.18	-6.00	Peak
6	490.75	-65.32	-60.53	-13.00	-52.32	-4.79	Peak
7	3765.00	-53.77	-45.80	-13.00	-40.77	-7.97	Peak
8 pp	5647.50	-33.59	-31.65	-13.00	-20.59	-1.94	Peak



5 Pictures of Test Arrangements

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



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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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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