

FCC Test Report

(PART 22)

Report No.: RF160104C14-4

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
RF160104C14-4	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 22, Subpart H

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 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -15.35 dB at 2509.20 MHz.

Note: Only test item of Conducted power, ERP, and Radiated Emissions tests were performed for this report. Other test data please refer to China Telecommunication Technology 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) ($\pm$)
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	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

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	826.4 ~ 846.6 MHz
	LTE 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 26 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 26 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 26 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 15 MHz)	831.5 ~ 841.5 MHz
Max. ERP Power	WCDMA	0.12 W
	LTE 5 (Channel Bandwidth: 1.4 MHz)	0.12 W
	LTE 5 (Channel Bandwidth: 3 MHz)	0.12 W
	LTE 5 (Channel Bandwidth: 5 MHz)	0.12 W
	LTE 5 (Channel Bandwidth: 10 MHz)	0.12 W
	LTE 26 (Channel Bandwidth: 1.4 MHz)	0.11 W
	LTE 26 (Channel Bandwidth: 3 MHz)	0.11 W
	LTE 26 (Channel Bandwidth: 5 MHz)	0.11 W
	LTE 26 (Channel Bandwidth: 10 MHz)	0.12 W
	LTE 26 (Channel Bandwidth: 15 MHz)	0.12 W
Antenna Type	PIFA Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

- 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	--

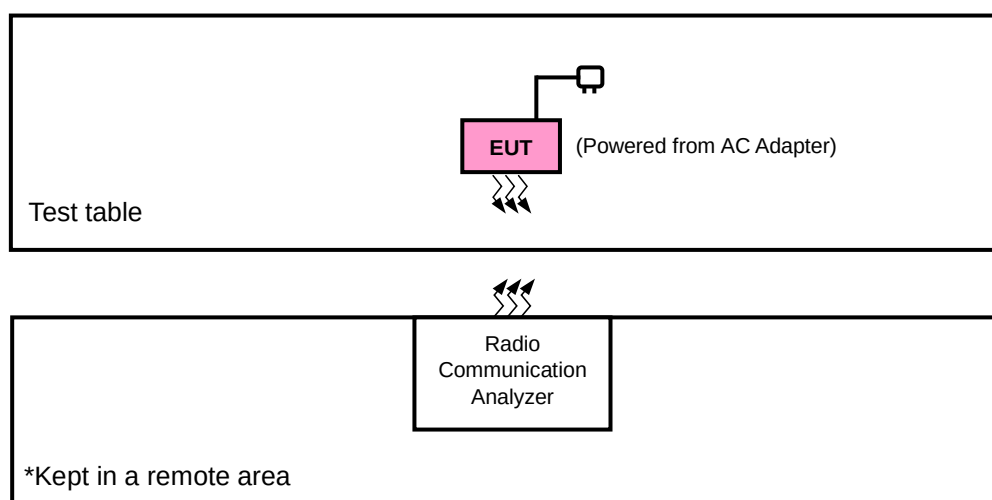
2. The antenna information is listed as below.

Antenna Type	Brand Name	Parts Number	Antenna Gain		
			WCDMA V	LTE 5	LTE 26
PIFA	Ethertronics Inc.	WWAN Main Antenna: 5001997 WWAN Aux. Antenna: 5002014 (RX only)	0.02	0.02	-0.89

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 5	Z-axis

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA

LTE Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 2 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Radiated Emission	20450 to 20600	20525	10 MHz	QPSK	1 RB / 24 RB Offset

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

LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	1 RB / 5 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	1 RB / 14 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	1 RB / 49 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	25 deg. C, 65 % 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 22

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

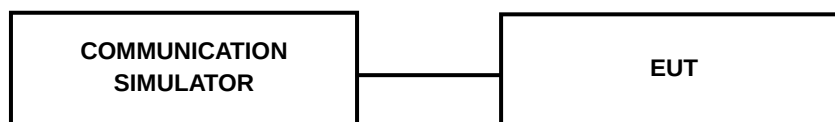
Mobile / Portable station are limited to 7 watts e.r.p.

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 V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	22.73	22.69	22.76
HSDPA Subtest-1	21.50	21.45	21.51
HSDPA Subtest-2	21.52	21.48	21.54
HSDPA Subtest-3	21.04	21.02	21.13
HSDPA Subtest-4	21.02	20.98	21.05
HSUPA Subtest-1	21.25	21.20	21.27
HSUPA Subtest-2	19.53	19.50	19.61
HSUPA Subtest-3	20.13	20.09	20.16
HSUPA Subtest-4	19.45	19.40	19.54
HSUPA Subtest-5	21.53	21.50	21.56

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20407	Mid Ch 20525	High Ch 20643		Low Ch 20407	Mid Ch 20525	High Ch 20643	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
5 / 1.4M	1	0	22.84	22.82	22.41	0	21.89	21.87	21.47	1
	1	2	22.76	22.73	22.36	0	21.82	21.77	21.42	1
	1	5	22.76	22.73	22.36	0	21.82	21.77	21.42	1
	3	0	21.49	21.48	21.08	0	20.57	20.52	20.07	1
	3	1	21.43	21.42	21.04	0	20.49	20.46	20.99	1
	3	3	21.38	21.35	21.02	0	20.39	20.34	20.94	1
	6	0	21.38	21.35	20.99	1	20.39	20.34	19.94	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20415	Mid Ch 20525	High Ch 20635		Low Ch 20415	Mid Ch 20525	High Ch 20635	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
5 / 3M	1	0	22.89	22.88	22.53	0	21.95	21.92	21.49	1
	1	7	22.84	22.82	22.45	0	21.87	21.81	21.44	1
	1	14	22.84	22.82	22.45	0	21.87	21.81	21.44	1
	8	0	21.69	21.60	21.31	1	20.68	20.58	20.20	2
	8	3	21.58	21.56	21.17	1	20.56	20.54	20.13	2
	8	7	21.54	21.51	21.13	1	20.50	20.46	20.07	2
	15	0	21.54	21.51	21.20	1	20.50	20.46	20.09	2



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Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20425	Mid Ch 20525	High Ch 20625		Low Ch 20425	Mid Ch 20525	High Ch 20625	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
5 / 5M	1	0	22.95	22.93	22.60	0	21.99	21.98	21.61	1
	1	12	22.90	22.88	22.55	0	21.94	21.90	21.56	1
	1	24	22.90	22.88	22.55	0	21.94	21.90	21.56	1
	12	0	21.77	21.71	21.43	1	20.71	20.69	20.34	2
	12	6	21.69	21.67	21.32	1	20.67	20.63	20.26	2
	12	13	21.64	21.62	21.27	1	20.61	20.58	20.22	2
	25	0	21.64	21.62	21.29	1	20.61	20.58	20.23	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20450	Mid Ch 20525	High Ch 20600		Low Ch 20450	Mid Ch 20525	High Ch 20600	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
5 / 10M	1	0	23.00	22.99	22.67	0	22.00	21.99	21.70	1
	1	24	22.96	22.95	22.63	0	21.98	21.99	21.65	1
	1	49	22.96	22.95	22.63	0	21.97	21.99	21.65	1
	25	0	21.86	21.80	21.51	1	20.89	20.80	20.42	2
	25	12	21.78	21.77	21.46	1	20.76	20.74	20.41	2
	25	25	21.75	21.74	21.42	1	20.72	20.70	20.37	2
	50	0	21.75	21.74	21.42	1	20.72	20.70	20.43	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26797	Mid Ch 26915	High Ch 27033		Low Ch 26797	Mid Ch 26915	High Ch 27033	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
26 / 1.4M	1	0	22.50	21.96	22.57	0	21.53	20.97	21.63	1
	1	2	22.27	21.78	22.18	0	21.28	20.78	21.42	1
	1	5	22.34	21.84	22.44	0	21.36	20.84	21.47	1
	3	0	21.10	20.63	21.51	1	20.07	19.58	20.53	1
	3	1	21.01	20.51	21.40	1	19.96	19.46	20.36	1
	3	3	21.07	20.59	21.44	1	20.03	19.54	20.48	1
	6	0	21.24	20.67	21.27	1	20.22	19.62	20.35	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26805	Mid Ch 26915	High Ch 27025		Low Ch 26805	Mid Ch 26915	High Ch 27025	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
26 / 3M	1	0	22.59	22.05	22.64	0	21.63	21.07	21.69	1
	1	7	22.34	21.89	22.26	0	21.37	20.91	21.23	1
	1	14	22.44	21.94	22.48	0	21.47	20.96	21.52	1
	8	0	21.25	20.76	21.34	1	20.23	19.71	20.33	2
	8	3	21.13	20.65	21.11	1	20.10	19.60	20.18	2
	8	7	21.23	20.72	21.26	1	20.20	19.67	20.30	2
	15	0	21.34	20.87	21.40	1	20.34	19.83	20.35	2



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Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26815	Mid Ch 26915	High Ch 27015		Low Ch 26815	Mid Ch 26915	High Ch 27015	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
26 / 5M	1	0	22.65	22.13	22.68	0	21.68	21.15	21.74	1
	1	12	22.43	21.97	22.51	0	21.46	20.99	21.36	1
	1	24	22.53	22.09	22.55	0	21.56	21.11	21.61	1
	12	0	21.38	20.93	21.43	0	20.35	19.89	20.45	2
	12	6	21.22	20.81	21.34	0	20.19	19.76	20.34	2
	12	13	21.37	20.88	21.40	0	20.34	19.84	20.45	2
	25	0	21.45	20.94	21.51	1	20.44	19.91	20.51	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26840	Mid Ch 26915	High Ch 26990		Low Ch 26840	Mid Ch 26915	High Ch 26990	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
26 / 10M	1	0	22.62	22.49	22.74	0	21.67	21.53	21.79	1
	1	24	22.34	22.23	22.44	0	21.37	21.25	21.46	1
	1	49	22.45	22.41	22.62	0	21.48	21.44	21.67	1
	25	0	21.46	21.32	21.57	1	20.44	20.29	20.51	2
	25	12	21.31	21.22	21.47	1	20.28	20.17	20.40	2
	25	25	21.44	21.27	21.56	1	20.42	20.24	20.49	2
	50	0	21.5	21.41	21.61	1	20.49	20.38	20.57	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26865	Mid Ch 26915	High Ch 26965		Low Ch 26865	Mid Ch 26915	High Ch 26965	
			831.5 MHz	836.5 MHz	841.5 MHz		831.5 MHz	836.5 MHz	841.5 MHz	
26 / 15M	1	0	22.61	22.63	22.79	0	21.58	21.65	21.84	1
	1	37	22.38	22.56	22.56	0	21.33	21.57	21.67	1
	1	74	22.53	22.59	22.71	0	21.46	21.61	21.74	1
	36	0	21.48	21.66	21.63	1	20.40	20.64	20.66	2
	36	19	21.39	21.58	21.56	1	20.28	20.53	20.56	2
	36	39	21.42	21.62	21.60	1	20.32	20.58	20.61	2
	75	0	21.52	21.64	21.69	1	20.43	20.62	20.71	2

ERP Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Rx Channel	4357	4407	4458
Frequency	826.4	836.4	846.6
Conducted power(dBm)	22.73	22.69	22.76
Conducted power (Watts)	0.19	0.19	0.19
ERP (dBm)	20.64	20.6	20.67
ERP (Watts)	0.12	0.11	0.12

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 20407	Mid CH 20525	High CH 20643	Low CH 20407	Mid CH 20525	High CH 20643
	Frequency	824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz
5 / 1.4M	Conducted power(dBm)	22.84	22.82	22.41	21.89	21.87	21.47
	Conducted power (Watts)	0.19	0.19	0.17	0.15	0.15	0.14
	ERP (dBm)	20.75	20.73	20.32	19.8	19.78	19.38
	ERP (Watts)	0.12	0.12	0.11	0.10	0.10	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 20415	Mid CH 20525	High CH 20635	Low CH 20415	Mid CH 20525	High CH 20635
	Frequency	825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz
5 / 3M	Conducted power(dBm)	22.89	22.88	22.53	21.95	21.92	21.49
	Conducted power (Watts)	0.19	0.19	0.18	0.16	0.16	0.14
	ERP (dBm)	20.8	20.79	20.44	19.86	19.83	19.4
	ERP (Watts)	0.12	0.12	0.11	0.10	0.10	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 20425	Mid CH 20525	High CH 20625	Low CH 20425	Mid CH 20525	High CH 20625
	Frequency	826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz
5 / 5M	Conducted power(dBm)	22.95	22.93	22.6	21.99	21.98	21.61
	Conducted power (Watts)	0.20	0.20	0.18	0.16	0.16	0.14
	ERP (dBm)	20.86	20.84	20.51	19.9	19.89	19.52
	ERP (Watts)	0.12	0.12	0.11	0.10	0.10	0.09



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Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 20450	Mid CH 20525	High CH 20600	Low CH 20450	Mid CH 20525	High CH 20600
	Frequency	829 MHz	836.5 MHz	844 MHz	829 MHz	836.5 MHz	844 MHz
5 / 10M	Conducted power(dBm)	23	22.99	22.67	22	21.99	21.7
	Conducted power (Watts)	0.20	0.20	0.18	0.16	0.16	0.15
	ERP (dBm)	20.91	20.9	20.58	19.91	19.9	19.61
	ERP (Watts)	0.12	0.12	0.11	0.10	0.10	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26797	Mid CH 26915	High CH 27033	Low CH 26797	Mid CH 26915	High CH 27033
	Frequency	824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz
26 / 1.4M	Conducted power(dBm)	22.5	21.96	22.57	21.53	20.97	21.63
	Conducted power (Watts)	0.18	0.16	0.18	0.14	0.13	0.15
	ERP (dBm)	20.41	19.87	20.48	19.44	18.88	19.54
	ERP (Watts)	0.11	0.10	0.11	0.09	0.08	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26805	Mid CH 26915	High CH 27025	Low CH 26805	Mid CH 26915	High CH 27025
	Frequency	825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz
26 / 3M	Conducted power(dBm)	22.59	22.05	22.64	21.63	21.07	21.69
	Conducted power (Watts)	0.18	0.16	0.18	0.15	0.13	0.15
	ERP (dBm)	20.5	19.96	20.55	19.54	18.98	19.6
	ERP (Watts)	0.11	0.10	0.11	0.09	0.08	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26815	Mid CH 26915	High CH 27015	Low CH 26815	Mid CH 26915	High CH 27015
	Frequency	826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz
26 / 5M	Conducted power(dBm)	22.65	22.13	22.68	21.68	21.15	21.74
	Conducted power (Watts)	0.18	0.16	0.19	0.15	0.13	0.15
	ERP (dBm)	20.56	20.04	20.59	19.59	19.06	19.65
	ERP (Watts)	0.11	0.10	0.11	0.09	0.08	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26840	Mid CH 26915	High CH 26990	Low CH 26840	Mid CH 26915	High CH 26990
	Frequency	829 MHz	836.5 MHz	844 MHz	829 MHz	836.5 MHz	844 MHz
26 / 10M	Conducted power(dBm)	22.62	22.49	22.74	21.67	21.53	21.79
	Conducted power (Watts)	0.18	0.18	0.19	0.15	0.14	0.15
	ERP (dBm)	20.53	20.4	20.65	19.58	19.44	19.7
	ERP (Watts)	0.11	0.11	0.12	0.09	0.09	0.09

Band / BW	Mode	QPSK			16QAM		
	Channel	Low CH 26865	Mid CH 26915	High CH 26965	Low CH 18675	Mid CH 18900	High CH 19125
	Frequency	831.5 MHz	836.5 MHz	841.5 MHz	1857.5 MHz	1880 MHz	1902.5 MHz
26 / 15M	Conducted power(dBm)	22.61	22.63	22.79	21.58	21.65	21.84
	Conducted power (Watts)	0.18	0.18	0.19	0.14	0.15	0.15
	ERP (dBm)	20.52	20.54	20.7	19.49	19.56	19.75
	ERP (Watts)	0.11	0.11	0.12	0.09	0.09	0.09

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

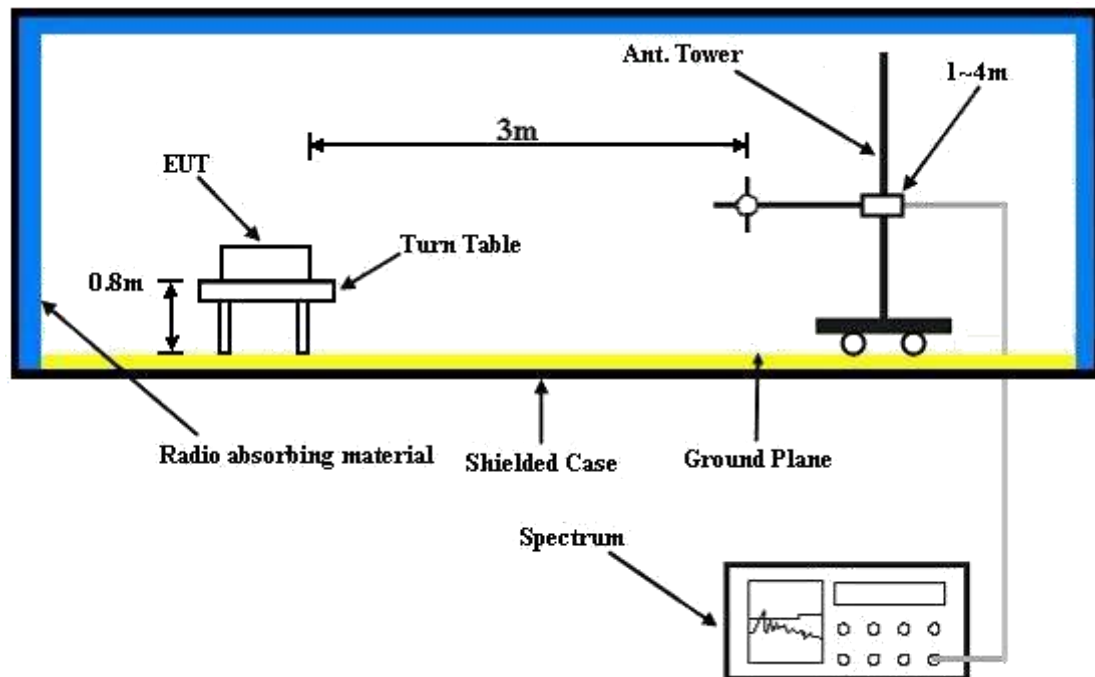
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m 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, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dBi}.$

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 5

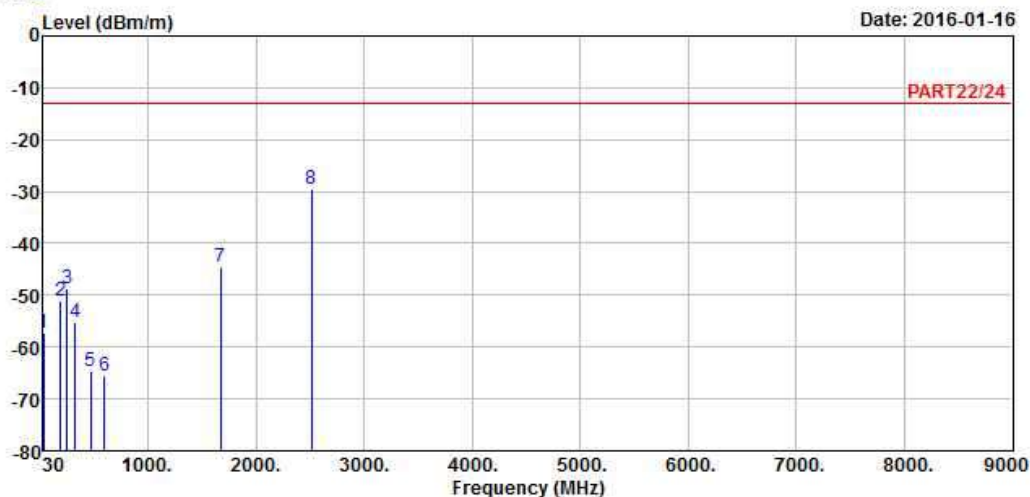
Channel Bandwidth: 10 MHz / QPSK



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Data: 5



Site : 966 Chamber 5
Condition: PART22/24 3m HORIZONTAL
Remak : LTE Band V QPSK_10M(1,0) Link
Tested by: Anson Lin
Plane : NB

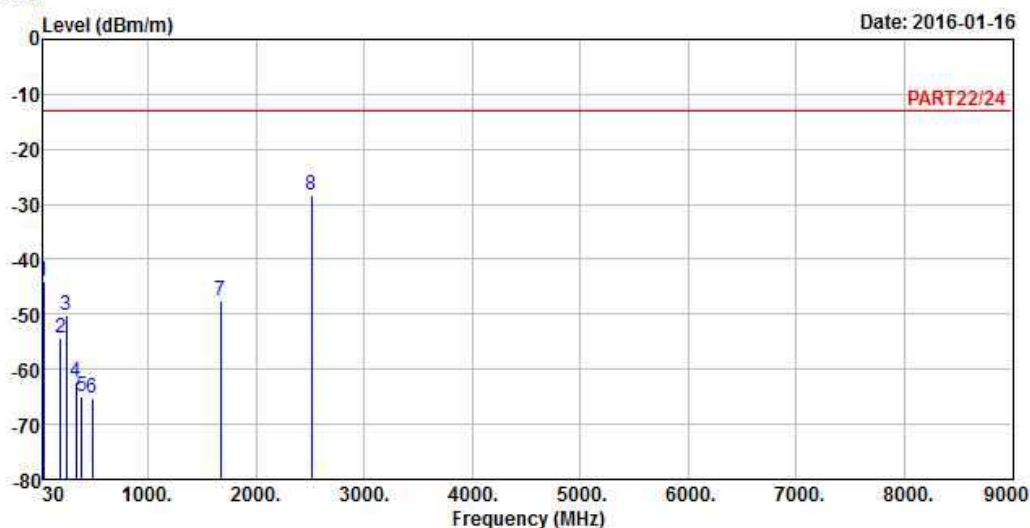
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	32.91	-57.13	-56.04	-13.00	-44.13	-1.09	Peak
2	191.99	-51.20	-43.92	-13.00	-38.20	-7.28	Peak
3	249.22	-48.73	-42.70	-13.00	-35.73	-6.03	Peak
4	326.82	-55.33	-48.73	-13.00	-42.33	-6.60	Peak
5	465.53	-64.75	-59.49	-13.00	-51.75	-5.26	Peak
6	598.42	-65.44	-64.61	-13.00	-52.44	-0.83	Peak
7	1672.80	-44.45	-29.77	-13.00	-31.45	-14.68	Peak
8 pp	2509.20	-29.50	-18.59	-13.00	-16.50	-10.91	Peak



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Data: 6



Site : 966 Chamber 5

Condition: PART22/24 3m VERTICAL

Remak : LTE Band V QPSK_10M(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	-44.09	-44.47	-13.00	-31.09	0.38	Peak
2	192.96	-54.39	-47.02	-13.00	-41.39	-7.37	Peak
3	246.31	-50.14	-43.99	-13.00	-37.14	-6.15	Peak
4	331.67	-62.30	-55.78	-13.00	-49.30	-6.52	Peak
5	386.96	-64.90	-58.88	-13.00	-51.90	-6.02	Peak
6	485.90	-65.09	-60.21	-13.00	-52.09	-4.88	Peak
7	1672.80	-47.41	-32.73	-13.00	-34.41	-14.68	Peak
8 pp	2509.20	-28.35	-17.44	-13.00	-15.35	-10.91	Peak



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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:

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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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