Partial FCC Test Report

(PART 22)

Report No.:	RFBEDW-WTW-P21040353
FCC ID:	GKR-LN100EG3L
Test Model:	Lenovo 100e Chromebook Gen 3**********(*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)
Received Date:	Apr. 21, 2021
Test Date:	May 14 ~ Jun. 24, 2021
Issued Date:	Jun. 28, 2021
Applicant:	Compal Electronics Inc
Address:	No. 581 & 581-1, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan, R.O.C
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBEDW-WTW-P21040353	Original Release	Jun. 28, 2021

1 Certificate of Conformity

Product:	Notebook Computer
Brand:	Lenovo
Test Model:	Lenovo 100e Chromebook Gen 3**********(*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)
Sample Status:	Engineering Sample
Applicant:	Compal Electronics Inc
Test Date:	May 14 ~ Jun. 24, 2021
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 RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jun. 28, 2021
Polly Chien / Specialist

Approved by : _____ , **Date:** Jun. 28, 2021
Bruce Chen / Senior Project Engineer

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.
2.1047	Modulation Characteristics	N/A	Refer to Note 1
22.913 (d)	Peak to Average Ratio	N/A	Refer to Note 1
2.1055 22.355	Frequency Stability	N/A	Refer to Note 1
2.1049	Occupied Bandwidth	N/A	Refer to Note 1
22.917	Band Edge Measurements	N/A	Refer to Note 1
2.1051 22.917	Conducted Spurious Emissions	N/A	Refer to Note 1
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -31.10 dB at 31.41 MHz.

Note:

1. This report is a partial report. Therefore, only test item of Effective Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to SPORTON report no.: FG091101A_R01 & FG091101B_R01 for module (Brand: Fibocom, Model: NL668-AM-00)
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	3.86 dB
	200 MHz ~ 1000 MHz	3.87 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna EMCI	EM-6879	269	Sep. 17, 2020	Sep. 16, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 22, 2021	Mar. 21, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 01, 2020	May 31, 2021
			Jun. 01, 2021	May 31, 2022
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 06, 2020	Jun. 05, 2021
			Jun. 02, 2021	Jun. 01, 2022

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 3.

3 General Information

3.1 General Description of EUT

Product	Notebook Computer		
Brand	Lenovo		
Test Model	Lenovo 100e Chromebook Gen 3**********(*=0~9, A~Z, a~z, "-" or blank, for marketing use only, with no impact on RF compliance of the product)		
Status of EUT	Engineering Sample		
Power Supply Rating	20Vdc from adapter		
Modulation Type	WCDMA	QPSK	
	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	
Max. ERP Power	WCDMA	85.114mW (19.30dBm)	
		QPSK	16QAM
	LTE 5 (Channel Bandwidth: 1.4 MHz)	84.918mW (19.29dBm)	64.269mW (18.08dBm)
	LTE 5 (Channel Bandwidth: 3 MHz)	86.696mW (19.38dBm)	64.121mW (18.07dBm)
	LTE 5 (Channel Bandwidth: 5 MHz)	85.114mW (19.30dBm)	65.163mW (18.14dBm)
	LTE 5 (Channel Bandwidth: 10 MHz)	88.716mW (19.48dBm)	65.313mW (18.15dBm)
Antenna Type	Refer to Note as below		
Accessory Device	Refer to Note as below		
Data Cable Supplied	Refer to Note as below		

Note:

1. The EUT contains following accessory devices.

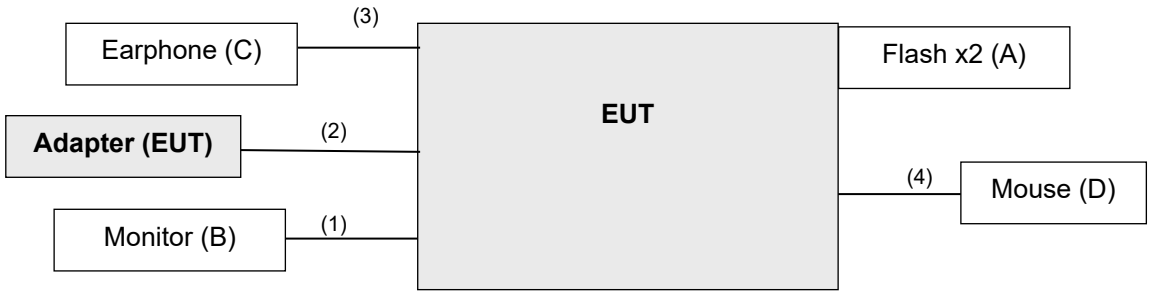
Product	Brand	Model	Description
Adapter	Lenovo	ADLX65YAC2D	I/P: 100-240Vac, 50-60Hz, 1.8A O/P: 20.0V ===3.25A, 65.0W 1.55M / 1core
Battery	Lenovo	L20D3PG0	11.52 Vdc, 3994 mAh, 46Wh
PCS Licensed Transmitter LTE module	Fibocom	NL668-AM-00	--

2. The antenna information is listed as below.

Ant. Type	Brand	Ant.	Model	Antenna Peak Gain (dBi)		Connector
				WCDMA V	LTE 5	
PIFA	MAGLAYERS	Main	DC33002K410 (FPA-8011-4G0C7-A1)	-2.04	-2.04	-
		Aux.	DC33002K410 (FPA-8011-4G0C7-A1)			
	South Star	Main	DC33002IZ10 (N19-0848-R0A)	-2.65	-2.65	MHF-B13-N-01
		Aux.	DC33002IZ10 (N19-0848-R0A)			
* The Max antenna gain was chosen for final test.						

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
4. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Flash	HP	v250W	05	NA	-
	Flash	HP	v250W	09	NA	-
B.	Monitor	DELL	SE2416Hc	CN-OWJKMC-641 80-66D-013B-A00	FCC DoC Approved	-
C.	Earphone	NA	NA	NA	NA	-
D.	Mouse	Microsoft	ITE78CJ	NA	FCC DoC Approved	-

Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	HDMI cable	1	1.0	N	0	Provided by Lab (Brand: Amber, Model: HDMI-AA120)
2.	Power cable	1	1.75	N	0	Provided by Client
3.	Audio cable	1	1.2	N	0	-
4.	USB cable	1	1.8	N	0	-

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 & NB Mode, and antenna ports.
The worst case was found when positioned on NB mode for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Radiated Emission	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 / 0 RB Offset 1 RB / 2 RB Offset 1 RB / 5 RB Offset 3 RB / 0 RB Offset 3 RB / 1 RB Offset 3 RB / 3 RB Offset 6 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 7 RB Offset 1 RB / 14 RB Offset 8 RB / 0 RB Offset 8 RB / 3 RB Offset 8 RB / 7 RB Offset 15 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 12 RB Offset 1 RB / 24 RB Offset 12 RB / 0 RB Offset 12 RB / 6 RB Offset 12 RB / 13 RB Offset 25 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 1 RB / 49 RB Offset 25 RB / 0 RB Offset 25 RB / 12 RB Offset 25 RB / 25 RB Offset 50 RB / 0 RB Offset
-	Radiated Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 60%RH	120Vac, 60Hz	Jones Chang
Radiated Emission	23 deg. C, 67 % RH	120 Vac, 60 Hz	Adair Peng

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 and references

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

Test Standard:
FCC 47 CFR Part 2
FCC 47 CFR Part 22
ANSI 63.26-2015

Note: All test items have been performed and recorded as per the above standards.

References Test Guidance:
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016

Note: All test items have been performed as a reference to the above KDB test guidance.

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

Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA, 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.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$EIRP = P_{Meas} + G_T$

$ERP = P_{Meas} + G_T - 2.15$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA V		
TX Channel	4132	4182	4233
Rx Channel	4357	4407	4458
Frequency	826.4	836.4	846.6
RMC 12.2K	23.33	23.42	23.49
HSDPA Subtest-1	22.53	22.61	22.56
HSDPA Subtest-2	22.56	22.68	22.60
HSDPA Subtest-3	22.06	22.20	22.10
HSDPA Subtest-4	22.05	22.19	22.10
HSUPA Subtest-1	22.59	21.99	22.63
HSUPA Subtest-2	21.42	21.50	21.23
HSUPA Subtest-3	21.32	21.33	21.35
HSUPA Subtest-4	21.42	21.31	21.44
HSUPA Subtest-5	22.60	22.70	22.70

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	23.42	23.27	23.31
		1	24	23.46	23.37	23.40
		1	49	23.42	23.19	23.67
		25	0	22.43	22.42	22.44
		25	12	22.38	22.40	22.51
		25	25	22.43	22.41	22.54
		50	0	22.42	22.33	22.44
10M	16QAM	1	0	22.29	22.34	22.10
		1	24	22.28	22.06	22.12
		1	49	21.91	21.79	21.92
		25	0	21.45	21.41	21.53
		25	12	21.55	21.43	21.75
		25	25	21.63	21.74	21.72
		50	0	21.36	21.25	21.51

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	23.31	23.20	23.20
		1	12	23.32	23.21	23.37
		1	24	23.23	23.02	23.49
		12	0	22.28	22.30	22.42
		12	6	22.37	22.30	22.48
		12	13	22.27	22.40	22.47
		25	0	22.26	22.19	22.40
5M	16QAM	1	0	22.21	22.33	22.03
		1	12	22.11	22.01	21.92
		1	24	21.89	21.62	21.83
		12	0	21.27	21.40	21.34
		12	6	21.36	21.32	21.55
		12	13	21.63	21.64	21.55
		25	0	21.18	21.22	21.32

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	23.38	23.25	23.23
		1	7	23.38	23.17	23.39
		1	14	23.40	23.10	23.57
		8	0	22.23	22.26	22.29
		8	3	22.31	22.27	22.45
		8	7	22.33	22.21	22.53
		15	0	22.23	22.23	22.40
3M	16QAM	1	0	22.13	22.18	21.99
		1	7	22.26	21.96	22.09
		1	14	21.79	21.74	21.92
		8	0	21.31	21.31	21.42
		8	3	21.38	21.32	21.60
		8	7	21.57	21.68	21.66
		15	0	21.31	21.05	21.37

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	23.32	23.21	23.30
		1	2	23.33	23.27	23.34
		1	5	23.31	23.13	23.48
		3	0	22.41	22.28	22.28
		3	1	22.27	22.39	22.50
		3	3	22.36	22.35	22.41
		6	0	22.39	22.22	22.39
1.4M	16QAM	1	0	22.16	22.27	22.02
		1	2	22.27	21.86	22.09
		1	5	21.71	21.78	21.91
		3	0	21.44	21.35	21.48
		3	1	21.47	21.25	21.70
		3	3	21.48	21.61	21.72
		6	0	21.35	21.23	21.47

ERP Power (dBm)

Band	WCDMA V		
TX Channel	4132	4182	4233
Rx Channel	4357	4407	4458
Frequency	826.4	836.4	846.6
RMC 12.2K	19.14	19.23	**19.30**
HSDPA Subtest-1	18.34	18.42	18.37
HSDPA Subtest-2	18.37	18.49	18.41
HSDPA Subtest-3	17.87	18.01	17.91
HSDPA Subtest-4	17.86	18.00	17.91
HSUPA Subtest-1	18.40	17.80	18.44
HSUPA Subtest-2	17.23	17.31	17.04
HSUPA Subtest-3	17.13	17.14	17.16
HSUPA Subtest-4	17.23	17.12	17.25
HSUPA Subtest-5	18.41	18.51	18.51

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	19.23	19.08	19.12
		1	24	19.27	19.18	19.21
		1	49	19.23	19.00	**19.48**
		25	0	18.24	18.23	18.25
		25	12	18.19	18.21	18.32
		25	25	18.24	18.22	18.35
		50	0	18.23	18.14	18.25
10M	16QAM	1	0	18.10	**18.15**	17.91
		1	24	18.09	17.87	17.93
		1	49	17.72	17.60	17.73
		25	0	17.26	17.22	17.34
		25	12	17.36	17.24	17.56
		25	25	17.44	17.55	17.53
		50	0	17.17	17.06	17.32

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	19.12	19.01	19.01
		1	12	19.13	19.02	19.18
		1	24	19.04	18.83	**19.30**
		12	0	18.09	18.11	18.23
		12	6	18.18	18.11	18.29
		12	13	18.08	18.21	18.28
		25	0	18.07	18.00	18.21
5M	16QAM	1	0	18.02	**18.14**	17.84
		1	12	17.92	17.82	17.73
		1	24	17.70	17.43	17.64
		12	0	17.08	17.21	17.15
		12	6	17.17	17.13	17.36
		12	13	17.44	17.45	17.36
		25	0	16.99	17.03	17.13

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	19.19	19.06	19.04
		1	7	19.19	18.98	19.20
		1	14	19.21	18.91	**19.38**
		8	0	18.04	18.07	18.10
		8	3	18.12	18.08	18.26
		8	7	18.14	18.02	18.34
		15	0	18.04	18.04	18.21
3M	16QAM	1	0	17.94	17.99	17.80
		1	7	**18.07**	17.77	17.90
		1	14	17.60	17.55	17.73
		8	0	17.12	17.12	17.23
		8	3	17.19	17.13	17.41
		8	7	17.38	17.49	17.47
		15	0	17.12	16.86	17.18

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	19.13	19.02	19.11
		1	2	19.14	19.08	19.15
		1	5	19.12	18.94	**19.29**
		3	0	18.22	18.09	18.09
		3	1	18.08	18.20	18.31
		3	3	18.17	18.16	18.22
		6	0	18.20	18.03	18.20
1.4M	16QAM	1	0	17.97	**18.08**	17.83
		1	2	**18.08**	17.67	17.90
		1	5	17.52	17.59	17.72
		3	0	17.25	17.16	17.29
		3	1	17.28	17.06	17.51
		3	3	17.29	17.42	17.53
		6	0	17.16	17.04	17.28

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

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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.
b. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
c. 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.R.P power - 2.15 dB.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:

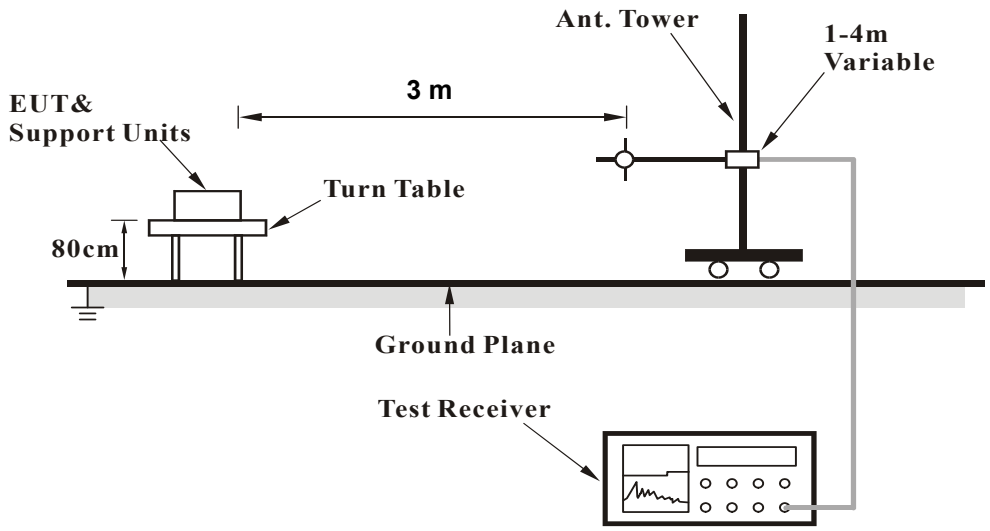
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.3 Deviation from Test Standard

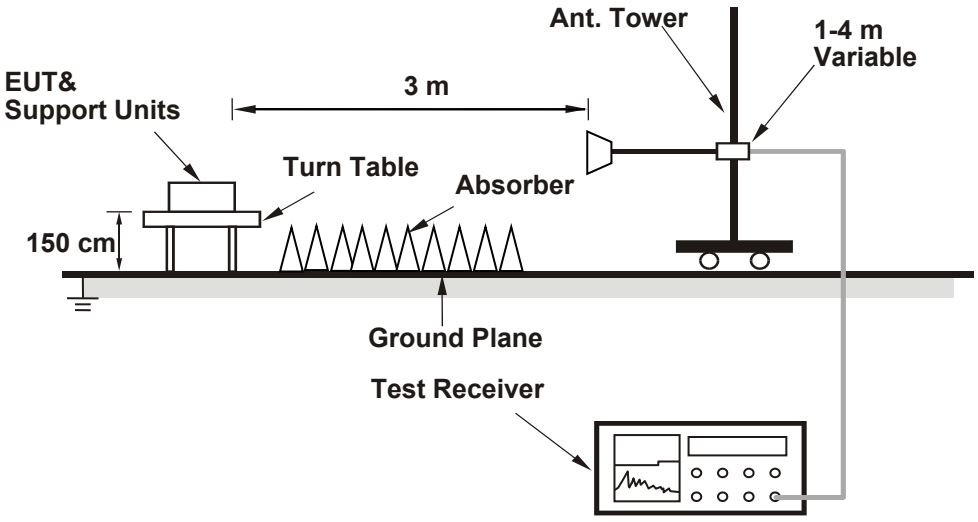
No deviation.

4.2.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.2.5 Test Results

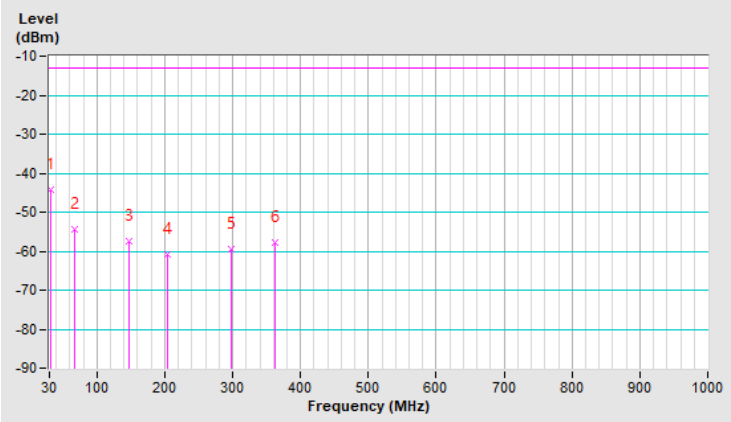
BELOW 1GHz

RF Mode	TX WCDMA Band V	Channel	CH 4132：826.4 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**31.41**	**-44.10**	**-13.00**	**-31.10**	**1.00 H**	**247**	**64.34**	**-108.44**
2	66.55	-54.51	-13.00	-41.51	1.00 H	80	53.16	-107.67
3	148.09	-57.61	-13.00	-44.61	2.00 H	165	48.46	-106.07
4	204.32	-60.90	-13.00	-47.90	1.00 H	256	47.70	-108.60
5	297.10	-59.41	-13.00	-46.41	1.50 H	115	44.62	-104.03
6	363.17	-57.72	-13.00	-44.72	1.00 H	253	44.98	-102.70

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

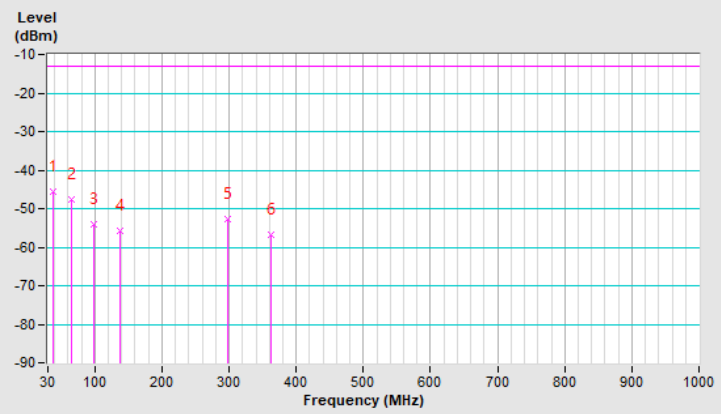


RF Mode	TX WCDMA Band V	Channel	CH 4132：826.4 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	37.03	-45.66	-13.00	-32.66	1.50 V	315	61.79	-107.45
2	65.14	-47.77	-13.00	-34.77	1.00 V	17	59.78	-107.55
3	98.88	-53.99	-13.00	-40.99	1.00 V	113	56.86	-110.85
4	136.84	-55.92	-13.00	-42.92	2.00 V	112	50.78	-106.70
5	297.10	-52.71	-13.00	-39.71	1.00 V	108	51.32	-104.03
6	363.17	-56.66	-13.00	-43.66	1.50 V	266	46.04	-102.70

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

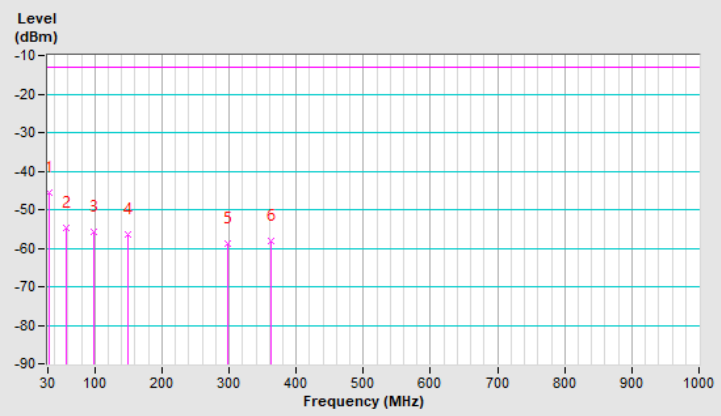


RF Mode	TX LTE Band V-10MHz	Channel	CH 20525：836.5 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	32.81	-45.44	-13.00	-32.44	1.50 H	351	62.85	-108.29
2	58.12	-54.80	-13.00	-41.80	1.99 H	336	51.97	-106.77
3	98.88	-55.61	-13.00	-42.61	1.99 H	118	55.24	-110.85
4	149.49	-56.33	-13.00	-43.33	1.00 H	159	49.58	-105.91
5	297.10	-58.87	-13.00	-45.87	1.00 H	116	45.16	-104.03
6	363.17	-57.99	-13.00	-44.99	1.00 H	251	44.71	-102.70

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

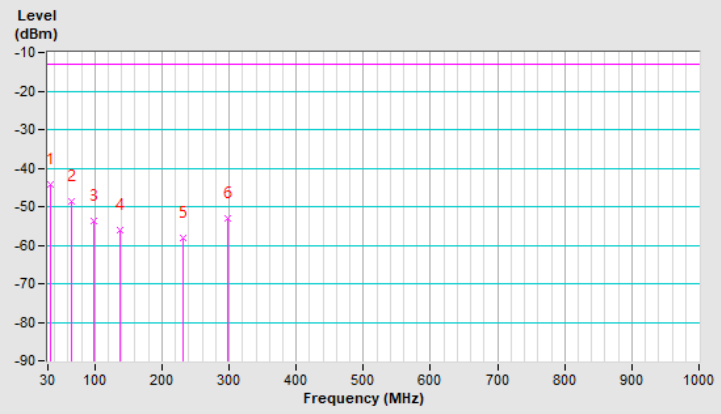


RF Mode	TX LTE Band V-10MHz	Channel	CH 20525：836.5 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	34.22	-44.22	-13.00	-31.22	1.51 V	241	63.68	-107.90
2	65.14	-48.80	-13.00	-35.80	1.01 V	7	58.75	-107.55
3	98.88	-53.81	-13.00	-40.81	1.01 V	78	57.04	-110.85
4	136.84	-56.22	-13.00	-43.22	1.01 V	118	50.48	-106.70
5	231.03	-58.26	-13.00	-45.26	1.01 V	148	49.44	-107.70
6	297.10	-52.89	-13.00	-39.89	1.01 V	50	51.14	-104.03

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.



ABOVE 1GHz

RF Mode	TX WCDMA Band V	Channel	CH 4132：826.4 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1652.80	-55.70	-13.00	-42.70	1.69 H	290	46.88	-102.58
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1652.80	-51.46	-13.00	-38.46	1.93 V	198	51.12	-102.58

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX WCDMA Band V	Channel	CH 4183：836.6 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-56.04	-13.00	-43.04	1.72 H	294	46.47	-102.51
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-51.68	-13.00	-38.68	1.93 V	199	50.83	-102.51

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX WCDMA Band V	Channel	CH 4233：846.6 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.20	-51.92	-13.00	-38.92	1.96 H	204	50.51	-102.43
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.20	-51.92	-13.00	-38.92	1.96 V	204	50.51	-102.43

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-1.4MHz	Channel	CH 20407：824.7 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-59.52	-13.00	-46.52	1.62 H	228	43.08	-102.60
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-59.69	-13.00	-46.69	1.84 V	241	42.91	-102.60

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-1.4MHz	Channel	CH 20525：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-60.42	-13.00	-47.42	1.61 H	229	42.09	-102.51
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-60.23	-13.00	-47.23	1.81 V	245	42.28	-102.51

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-1.4MHz	Channel	CH 20643：848.3 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-59.71	-13.00	-46.71	1.62 H	228	42.71	-102.42
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-60.45	-13.00	-47.45	1.86 V	243	41.97	-102.42

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-5MHz	Channel	CH 20425：826.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-60.06	-13.00	-47.06	1.60 H	233	42.52	-102.58
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-59.89	-13.00	-46.89	1.85 V	239	42.69	-102.58

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-5MHz	Channel	CH 20525：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-59.99	-13.00	-46.99	1.66 H	225	42.52	-102.51
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-60.29	-13.00	-47.29	1.79 V	242	42.22	-102.51

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-5MHz	Channel	CH 20625：846.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-59.87	-13.00	-46.87	1.64 H	228	42.56	-102.43
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-60.41	-13.00	-47.41	1.84 V	239	42.02	-102.43

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-10MHz	Channel	CH 20450：829 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-60.33	-13.00	-47.33	1.65 H	230	42.23	-102.56
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-59.78	-13.00	-46.78	1.86 V	242	42.78	-102.56

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-10MHz	Channel	CH 20525：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-59.43	-13.00	-46.43	1.62 H	227	43.08	-102.51
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-59.60	-13.00	-46.60	1.82 V	243	42.91	-102.51

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

RF Mode	TX LTE Band V-10MHz	Channel	CH 20600：844 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-59.54	-13.00	-46.54	1.67 H	231	42.92	-102.46
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-60.51	-13.00	-47.51	1.82 V	245	41.95	-102.46

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

5 Pictures of Test Arrangements

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

Appendix – Information of 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou 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 Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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.

--- END ---