Partial FCC Test Report
(Part 22 – GSM850, WCDMA B5, LTE B5/B26)

Report No.:	RFBBGM-WTW-P22110832
FCC ID:	WIYSLM500QA
Test Model:	SLM500
Received Date:	Nov. 30, 2022
Test Date:	Dec. 28, 2022 ~ Jan. 11, 2023
Issued Date:	Mar. 14, 2023
Applicant:	CASTLES TECHNOLOGY CO., LTD.
Address:	6F, NO. 207-5, SEC. 3, BEIXIN RD., XINDIAN DISTRICT, NEW TAIPEI CITY 23143, 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

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Release Control Record

Issue No.	Description	Date Issued
RFBBGM-WTW-P22110832	Original release	Mar. 14, 2023

1 Certificate of Conformity

Product:	Smart module
Brand:	CASTLES TECHNOLOGY
Test Model:	SLM500
Sample Status:	Identical Prototype
Applicant:	CASTLES TECHNOLOGY CO., LTD.
Test Date:	Dec. 28, 2022 ~ Jan. 11, 2023
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 : Celine Chou , **Date:** Mar. 14, 2023

Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Mar. 14, 2023

Jeremy Lin / 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
22.913 (d)	Peak To Average Ratio	N/A	Refer to Note
2.1055 22.355	Frequency Stability	N/A	Refer to Note
2.1049	Occupied Bandwidth	N/A	Refer to Note
22.917	Band Edge Measurements	N/A	Refer to Note
2.1051 22.917	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -26.11dB at 1672.80MHz.

Note:

1. This report is a Class II change partial report. Therefore, only test item of Radiated Spurious Emissions tests and Effective Radiated Power were performed for this report. Other testing data please refer to SGS report no.: SZCR210300003005 & SZCR210300003006 & SZCR210300003007 (Smart module, Brand: Meig Link, Model: SLM500, FCC ID: 2APJ4-SLM500).
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	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 27, 2022	Apr. 26, 2023
Signal Analyzer Agilent	N9010A	MY52220207	Jan. 06, 2022	Jan. 05, 2023
			Jan. 03, 2023	Jan. 02, 2024
Loop Antenna TESEQ	HLA 6121	45745	Jul. 27, 2022	Jul. 26, 2023
Pre-amplifier EMCI	EMC001340	980201	Sep. 23, 2022	Sep. 22, 2023
RF Coaxial Cable EMCI	5D-NM-BM	140903+140902	Jan. 15, 2022	Jan. 14, 2023
Preamplifier EMCI	EMC 330H	980112	Oct. 01, 2022	Sep. 30, 2023
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 21, 2022	Oct. 20, 2023
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 01, 2022	Sep. 30, 2023
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 13, 2022	Nov. 12, 2023
Preamplifier EMCI	EMC 012645	980115	Oct. 01, 2022	Sep. 30, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-8000	171005	Oct. 01, 2022	Sep. 30, 2023
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 01, 2022	Sep. 30, 2023
RF FLITER MICRO-TRONICS	BRM50716	060	Jan. 10, 2022	Jan. 09, 2023
			Jan. 11, 2023	Jan. 10, 2024
RF FLITER MICRO-TRONICS	BRM17690	004	Jan. 10, 2022	Jan. 09, 2023
			Jan. 11, 2023	Jan. 10, 2024
Pre-Amplifier EMCI	EMC 184045	980116	Oct. 01, 2022	Sep. 30, 2023
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 13, 2022	Nov. 12, 2023
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Jul. 09, 2022	Jul. 08, 2023
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Jul. 09, 2022	Jul. 08, 2023
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-440H	AT93021705	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller Max-Full	MF-7802	NA	NA	NA
Boresight antenna tower fixture BV	BAF-02	7	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 26, 2021	Aug. 22, 2023

Note: 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HY - 966 chamber 5.

3 General Information

3.1 General Description of EUT

Product	Smart module	
Brand	CASTLES TECHNOLOGY	
Test Model	SLM500	
Sample Status	Identical Prototype	
Power Supply Rating	3.55-4.40Vdc	
Modulation Type	GSM, GPRS: GMSK EDGE: 8PSK WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM	
Operating Frequency	GSM, GPRS, EDGE	824.2MHz ~ 848.8MHz
	WCDMA Band 5	826.4MHz ~ 846.6MHz
	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 5 (Channel Bandwidth 10MHz)	829.0MHz ~ 844.0MHz
	LTE Band 26 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 26 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 26 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 26 (Channel Bandwidth 10MHz)	829.0MHz ~ 844.0MHz
	LTE Band 26 (Channel Bandwidth 15MHz)	821.5MHz ~ 841.5MHz

Max. ERP Power	GSM, GPRS	394.457mW (25.96dBm)	
	EDGE	92.257mW (19.65dBm)	
	WCDMA Band 5	46.238mW (16.65dBm)	
		QPSK	16QAM
	LTE Band 5 (Channel Bandwidth 1.4MHz)	52.000mW (17.16dBm)	43.053mW (16.34dBm)
	LTE Band 5 (Channel Bandwidth 3MHz)	52.240mW (17.18dBm)	43.053mW (16.34dBm)
	LTE Band 5 (Channel Bandwidth 5MHz)	52.602mW (17.21dBm)	43.053mW (16.34dBm)
	LTE Band 5 (Channel Bandwidth 10MHz)	52.845mW (17.23dBm)	43.551mW (16.39dBm)
	LTE Band 26 (Channel Bandwidth 1.4MHz)	43.853mW (16.42dBm)	34.435mW (15.37dBm)
	LTE Band 26 (Channel Bandwidth 3MHz)	43.954mW (16.43dBm)	31.117mW (14.93dBm)
	LTE Band 26 (Channel Bandwidth 5MHz)	44.875mW (16.52dBm)	32.211mW (15.08dBm)
	LTE Band 26 (Channel Bandwidth 10MHz)	45.604mW (16.59dBm)	32.584mW (15.13dBm)
	LTE Band 26 (Channel Bandwidth 15MHz)	45.394mW (16.57dBm)	32.063mW (15.06dBm)
Antenna Type	Refer to Note as below		
Antenna Connector	Refer to Note as below		
Accessory Device	NA		
Cable Supplied	NA		

Note:

1. The EUT is authorized for use in specific End-product.

Product	Brand	Model
POS Terminal	CASTLES TECHNOLOGY	SATURN1000MINI

2. The End-product contains following accessory devices.

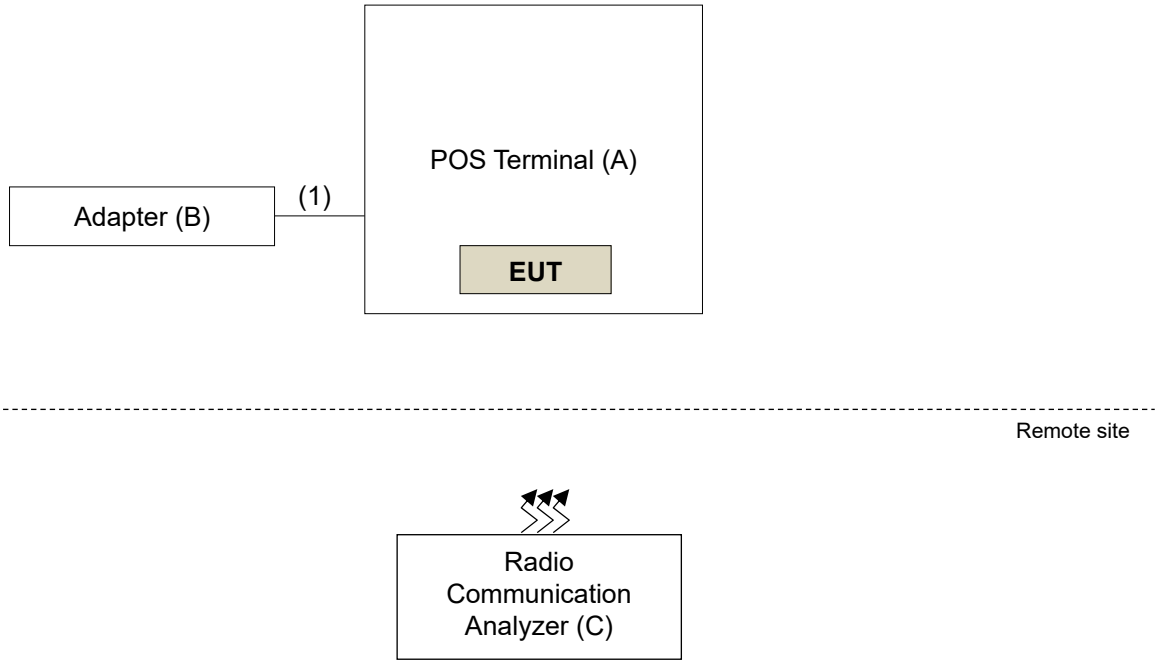
Part	Brand	Model	Specification
Adapter	CASTLES TECHNOLOGY	1A52-UB52A	I/P: 100-240Vac, 50-60Hz, 0.3A O/P: 5Vdc, 2A, 10W
Battery	CASTLES TECHNOLOGY	S1Mini	Rating: 3.7Vdc, 1600mAh, 5.92Wh
USB Cable	CHANG YANG ELECTRON CO.,LTD	CY-AS-HK0059	0.95m shielded cable without core

3. The following antennas were provided to the End-product.

Type	Connector	Gain (dBi)							
		GSM 850	GSM 1900	WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5
PIFA	ipex(MHF)	-3.62	-0.95	-0.95	0.56	-3.62	-0.95	0.56	-3.62
		LTE B7	LTE B12	LTE B13	LTE B17	LTE B25	LTE B26 (814-824 MHz)	LTE B26 (824-849 MHz)	LTE B66
		-2.99	-12.50	-5.21	-12.50	-0.95	-4.21	-3.62	0.56

* 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.

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.	POS Terminal	CASTLES TECHNOLOGY	SATURN1000MINI	NA	NA	Provided by manufacturer
B.	Adapter	CASTLES TECHNOLOGY	1A52-UB52A	NA	NA	Provided by manufacturer
C.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item C acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	0.95	Y	0	Provided by manufacturer

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 and XYZ axis. 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
GSM, EDGE	Y-Plane
WCDMA Band 5	Y-Plane
LTE Band 5	Y-Plane
LTE Band 26	Y-Plane

GSM

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GSM, GPRS, EDGE
-	Radiated Emission Below 1GHz	128 to 251	189 (836.4MHz)	GSM, EDGE
-	Radiated Emission Above 1GHz	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GSM, EDGE

Note: For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

WCDMA Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	WCDMA, HSDPA, HSUPA
-	Radiated Emission Below 1GHz	4132 to 4233	4132 (826.4MHz)	WCDMA
-	Radiated Emission Above 1GHz	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	WCDMA

Note: For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

LTE Band 5

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		20415 to 20635	20415 (825.5MHz), 20525 (836.5MHz), 20635 (847.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
-	Radiated Emission Below 1GHz	20425 to 20625	20425 (826.5MHz)	5MHz	QPSK	1
-	Radiated Emission Above 1GHz	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK	1
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK	1
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK	1

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 below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
3. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.

LTE Band 26

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		26805 to 27025	26805 (825.5MHz), 26915 (836.5MHz), 27025 (847.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		26840 to 26990	26840 (829.0MHz), 26915 (836.5MHz), 26990 (844.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		26765 to 26965	26765 (821.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
-	Radiated Emission Below 1GHz	26765 to 26965	26765 (821.5MHz)	15MHz	QPSK	1
-	Radiated Emission Above 1GHz	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK	1
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK	1
		26765 to 26965	26765 (821.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK	1

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 below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
3. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 60%RH	120Vac, 60Hz (System)	Willy Cheng
Radiated Emission	24deg. C, 78%RH, 19deg. C, 67%RH	120Vac, 60Hz (System)	Vincent Chen, Thomas Cheng

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:

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, WCDMA, LTE link data modulation and link up with simulator. The power measurement was performed on emulator and power value was measured from power function on emulator. 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	GSM, GPRS, EDGE 850		
Channel	128	189	251
Frequency	824.2	836.4	848.8
GSM	31.32	31.53	31.73
GPRS 1Tx Slot	31.53	31.70	31.72
GPRS 2Tx Slot	28.67	29.17	29.37
GPRS 3Tx Slot	25.86	26.41	26.57
GPRS 4Tx Slot	25.11	25.66	25.88
EDGE 1Tx Slot (MCS9)	24.87	25.06	25.42
EDGE 2Tx Slot (MCS9)	24.11	24.46	24.72
EDGE 3Tx Slot (MCS9)	21.43	21.65	22.06
EDGE 4Tx Slot (MCS9)	20.25	20.72	20.86

Band	WCDMA V		
TX Channel	4132	4182	4233
Frequency	826.4	836.4	846.6
RMC 12.2K	**22.42**	22.32	22.41
HSDPA Subtest-1	21.39	21.22	21.30
HSDPA Subtest-2	21.31	21.16	21.24
HSDPA Subtest-3	20.76	20.58	20.71
HSDPA Subtest-4	20.64	20.44	20.50
DC-HSDPA Subtest-1	21.23	21.08	21.16
DC-HSDPA Subtest-2	21.18	20.96	21.11
DC-HSDPA Subtest-3	20.54	20.31	20.45
DC-HSDPA Subtest-4	20.51	20.34	20.40
HSUPA Subtest-1	21.11	20.89	20.96
HSUPA Subtest-2	19.39	19.20	19.32
HSUPA Subtest-3	20.62	20.45	20.51
HSUPA Subtest-4	19.31	19.10	19.23
HSUPA Subtest-5	21.19	21.04	21.12

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	22.95	22.86	23.00
		1	24	22.93	22.83	22.96
		1	49	22.57	22.46	22.61
		25	0	22.23	22.05	22.27
		25	12	22.14	22.02	22.24
		25	25	22.11	21.97	22.14
		50	0	22.16	21.97	22.18
10M	16QAM	1	0	21.80	21.68	21.85
		1	24	21.72	21.56	21.78
		1	49	21.66	21.54	21.67
		25	0	21.08	20.97	21.18
		25	12	22.14	22.03	22.16
		25	25	22.08	21.95	22.13
		50	0	21.08	20.95	21.14
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	22.92	22.78	22.98
		1	12	22.86	22.77	22.86
		1	24	22.55	22.36	22.52
		12	0	22.22	22.01	22.17
		12	6	22.12	22.00	22.23
		12	13	22.10	21.92	22.13
		25	0	22.08	21.97	22.18
5M	16QAM	1	0	21.76	21.59	21.79
		1	12	21.72	21.47	21.74
		1	24	21.58	21.53	21.63
		12	0	21.00	20.90	21.14
		12	6	22.11	21.94	22.08
		12	13	22.00	21.95	22.03
		25	0	21.03	20.85	21.07

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	22.88	22.84	22.95
		1	7	22.87	22.82	22.90
		1	14	22.56	22.42	22.54
		8	0	22.15	22.01	22.21
		8	3	22.09	22.01	22.19
		8	7	22.09	21.88	22.12
		15	0	22.14	21.96	22.11
3M	16QAM	1	0	21.74	21.63	21.80
		1	7	21.72	21.52	21.72
		1	14	21.64	21.50	21.64
		8	0	21.06	20.96	21.08
		8	3	22.11	22.03	22.06
		8	7	22.06	21.87	22.10
		15	0	21.04	20.94	21.11
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	22.93	22.78	22.92
		1	2	22.90	22.73	22.90
		1	5	22.49	22.37	22.51
		3	0	22.20	22.05	22.17
		3	1	22.07	22.02	22.14
		3	3	22.07	21.91	22.11
		6	0	22.09	21.93	22.18
1.4M	16QAM	1	0	21.76	21.60	21.78
		1	2	21.67	21.54	21.74
		1	5	21.56	21.49	21.63
		3	0	20.98	20.96	21.11
		3	1	22.06	21.99	22.09
		3	3	22.06	21.87	22.11
		6	0	21.06	20.87	21.12

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26765	26915	26965
		Frequency (MHz)		821.5	836.5	841.5
15M	QPSK	1	0	22.21	22.34	22.28
		1	37	22.17	22.28	22.21
		1	74	22.07	22.28	22.12
		36	0	21.23	21.35	21.23
		36	19	21.17	21.25	21.16
		36	39	20.97	21.14	20.97
		75	0	21.02	21.19	21.09
15M	16QAM	1	0	20.76	20.83	20.68
		1	37	20.52	20.82	20.56
		1	74	20.63	20.69	20.67
		36	0	20.09	20.29	20.08
		36	19	20.13	20.23	20.12
		36	39	19.77	19.96	19.76
		75	0	19.88	20.11	19.94
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26840	26915	26990
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	22.36	22.22	22.20
		1	24	22.34	22.16	22.15
		1	49	22.29	22.24	22.05
		25	0	21.27	21.20	21.16
		25	12	21.26	21.11	21.16
		25	25	21.11	21.13	20.97
		50	0	21.16	21.17	21.00
10M	16QAM	1	0	20.90	20.70	20.66
		1	24	20.69	20.75	20.47
		1	49	20.66	20.56	20.61
		25	0	20.36	20.28	20.03
		25	12	20.18	20.13	20.10
		25	25	20.01	19.94	19.72
		50	0	20.01	20.03	19.92

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26815	26915	27015
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	22.24	22.10	22.23
		1	12	22.22	22.06	22.21
		1	24	22.29	22.22	22.10
		12	0	21.20	21.05	21.17
		12	6	21.16	20.99	21.06
		12	13	21.10	21.05	20.89
		25	0	21.12	21.02	21.05
5M	16QAM	1	0	20.85	20.59	20.65
		1	12	20.66	20.61	20.46
		1	24	20.62	20.42	20.63
		12	0	20.30	20.28	20.01
		12	6	20.14	20.03	20.03
		12	13	19.86	19.79	19.73
		25	0	19.86	19.95	19.87
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26805	26915	27025
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	22.20	22.10	22.17
		1	7	22.08	22.05	22.12
		1	14	22.09	21.94	22.02
		8	0	21.09	21.01	21.18
		8	3	21.02	21.06	21.10
		8	7	21.07	20.92	20.83
		15	0	21.10	20.85	21.04
3M	16QAM	1	0	20.70	20.63	20.53
		1	7	20.70	20.33	20.43
		1	14	20.46	20.59	20.59
		8	0	20.23	19.91	19.96
		8	3	20.05	20.08	19.99
		8	7	19.79	19.65	19.66
		15	0	19.92	19.86	19.86

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26797	26915	27033
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	22.19	22.18	22.06
		1	2	22.03	22.04	22.12
		1	5	22.12	21.99	21.97
		3	0	22.11	22.08	22.11
		3	1	22.01	22.16	22.10
		3	3	21.99	21.93	21.74
		6	0	21.15	20.86	20.90
1.4M	16QAM	1	0	20.57	20.56	20.39
		1	2	20.69	20.47	20.29
		1	5	20.53	20.47	20.46
		3	0	21.14	20.95	20.81
		3	1	20.98	21.05	20.90
		3	3	20.92	20.70	20.52
		6	0	20.01	19.90	19.75

ERP Power (dBm)

Band	GSM, GPRS, EDGE 850		
Channel	128	189	251
Frequency	824.2	836.4	848.8
GSM	25.55	25.76	25.96
GPRS 1Tx Slot	25.76	25.93	25.95
GPRS 2Tx Slot	22.90	23.40	23.60
GPRS 3Tx Slot	20.09	20.64	20.80
GPRS 4Tx Slot	19.34	19.89	20.11
EDGE 1Tx Slot (MCS9)	19.10	19.29	19.65
EDGE 2Tx Slot (MCS9)	18.34	18.69	18.95
EDGE 3Tx Slot (MCS9)	15.66	15.88	16.29
EDGE 4Tx Slot (MCS9)	14.48	14.95	15.09

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

Band	WCDMA V		
TX Channel	4132	4182	4233
Frequency	826.4	836.4	846.6
RMC 12.2K	16.65	16.55	16.64
HSDPA Subtest-1	15.62	15.45	15.53
HSDPA Subtest-2	15.54	15.39	15.47
HSDPA Subtest-3	14.99	14.81	14.94
HSDPA Subtest-4	14.87	14.67	14.73
DC-HSDPA Subtest-1	15.46	15.31	15.39
DC-HSDPA Subtest-2	15.41	15.19	15.34
DC-HSDPA Subtest-3	14.77	14.54	14.68
DC-HSDPA Subtest-4	14.74	14.57	14.63
HSUPA Subtest-1	15.34	15.12	15.19
HSUPA Subtest-2	13.62	13.43	13.55
HSUPA Subtest-3	14.85	14.68	14.74
HSUPA Subtest-4	13.54	13.33	13.46
HSUPA Subtest-5	15.42	15.27	15.35

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

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	17.18	17.09	17.23
		1	24	17.16	17.06	17.19
		1	49	16.80	16.69	16.84
		25	0	16.46	16.28	16.50
		25	12	16.37	16.25	16.47
		25	25	16.34	16.20	16.37
		50	0	16.39	16.20	16.41
10M	16QAM	1	0	16.03	15.91	16.08
		1	24	15.95	15.79	16.01
		1	49	15.89	15.77	15.90
		25	0	15.31	15.20	15.41
		25	12	16.37	16.26	16.39
		25	25	16.31	16.18	16.36
		50	0	15.31	15.18	15.37
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	17.15	17.01	17.21
		1	12	17.09	17.00	17.09
		1	24	16.78	16.59	16.75
		12	0	16.45	16.24	16.40
		12	6	16.35	16.23	16.46
		12	13	16.33	16.15	16.36
		25	0	16.31	16.20	16.41
5M	16QAM	1	0	15.99	15.82	16.02
		1	12	15.95	15.70	15.97
		1	24	15.81	15.76	15.86
		12	0	15.23	15.13	15.37
		12	6	16.34	16.17	16.31
		12	13	16.23	16.18	16.26
		25	0	15.26	15.08	15.30

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

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	17.11	17.07	17.18
		1	7	17.10	17.05	17.13
		1	14	16.79	16.65	16.77
		8	0	16.38	16.24	16.44
		8	3	16.32	16.24	16.42
		8	7	16.32	16.11	16.35
		15	0	16.37	16.19	16.34
3M	16QAM	1	0	15.97	15.86	16.03
		1	7	15.95	15.75	15.95
		1	14	15.87	15.73	15.87
		8	0	15.29	15.19	15.31
		8	3	16.34	16.26	16.29
		8	7	16.29	16.10	16.33
		15	0	15.27	15.17	15.34
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	17.16	17.01	17.15
		1	2	17.13	16.96	17.13
		1	5	16.72	16.60	16.74
		3	0	16.43	16.28	16.40
		3	1	16.30	16.25	16.37
		3	3	16.30	16.14	16.34
		6	0	16.32	16.16	16.41
1.4M	16QAM	1	0	15.99	15.83	16.01
		1	2	15.90	15.77	15.97
		1	5	15.79	15.72	15.86
		3	0	15.21	15.19	15.34
		3	1	16.29	16.22	16.32
		3	3	16.29	16.10	16.34
		6	0	15.29	15.10	15.35

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26765	26915	26965
		Frequency (MHz)		821.5	836.5	841.5
15M	QPSK	1	0	16.44	16.57	16.51
		1	37	16.40	16.51	16.44
		1	74	16.30	16.51	16.35
		36	0	15.46	15.58	15.46
		36	19	15.40	15.48	15.39
		36	39	15.20	15.37	15.20
		75	0	15.25	15.42	15.32
15M	16QAM	1	0	14.99	15.06	14.91
		1	37	14.75	15.05	14.79
		1	74	14.86	14.92	14.90
		36	0	14.32	14.52	14.31
		36	19	14.36	14.46	14.35
		36	39	14.00	14.19	13.99
		75	0	14.11	14.34	14.17
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26840	26915	26990
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	16.59	16.45	16.43
		1	24	16.57	16.39	16.38
		1	49	16.52	16.47	16.28
		25	0	15.50	15.43	15.39
		25	12	15.49	15.34	15.39
		25	25	15.34	15.36	15.20
		50	0	15.39	15.40	15.23
10M	16QAM	1	0	15.13	14.93	14.89
		1	24	14.92	14.98	14.70
		1	49	14.89	14.79	14.84
		25	0	14.59	14.51	14.26
		25	12	14.41	14.36	14.33
		25	25	14.24	14.17	13.95
		50	0	14.24	14.26	14.15

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26815	26915	27015
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	16.47	16.33	16.46
		1	12	16.45	16.29	16.44
		1	24	16.52	16.45	16.33
		12	0	15.43	15.28	15.40
		12	6	15.39	15.22	15.29
		12	13	15.33	15.28	15.12
		25	0	15.35	15.25	15.28
5M	16QAM	1	0	15.08	14.82	14.88
		1	12	14.89	14.84	14.69
		1	24	14.85	14.65	14.86
		12	0	14.53	14.51	14.24
		12	6	14.37	14.26	14.26
		12	13	14.09	14.02	13.96
		25	0	14.09	14.18	14.10
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26805	26915	27025
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	16.43	16.33	16.40
		1	7	16.31	16.28	16.35
		1	14	16.32	16.17	16.25
		8	0	15.32	15.24	15.41
		8	3	15.25	15.29	15.33
		8	7	15.30	15.15	15.06
		15	0	15.33	15.08	15.27
3M	16QAM	1	0	14.93	14.86	14.76
		1	7	14.93	14.56	14.66
		1	14	14.69	14.82	14.82
		8	0	14.46	14.14	14.19
		8	3	14.28	14.31	14.22
		8	7	14.02	13.88	13.89
		15	0	14.15	14.09	14.09

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26797	26915	27033
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	16.42	16.41	16.29
		1	2	16.26	16.27	16.35
		1	5	16.35	16.22	16.20
		3	0	16.34	16.31	16.34
		3	1	16.24	16.39	16.33
		3	3	16.22	16.16	15.97
		6	0	15.38	15.09	15.13
1.4M	16QAM	1	0	14.80	14.79	14.62
		1	2	14.92	14.70	14.52
		1	5	14.76	14.70	14.69
		3	0	15.37	15.18	15.04
		3	1	15.21	15.28	15.13
		3	3	15.15	14.93	14.75
		6	0	14.24	14.13	13.98

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

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 equal to –13dBm.

4.2.2 Test Procedure

a. 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. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.

d. Following C63.26 section 5.5 and 5.2.7.
EIRP (dBm) = E (dBμV/m) + 20log (D) - 104.8; where D is the measurement distance (in the far field region) in m.
ERP (dBm) = E (dBμV/m) + 20log (D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

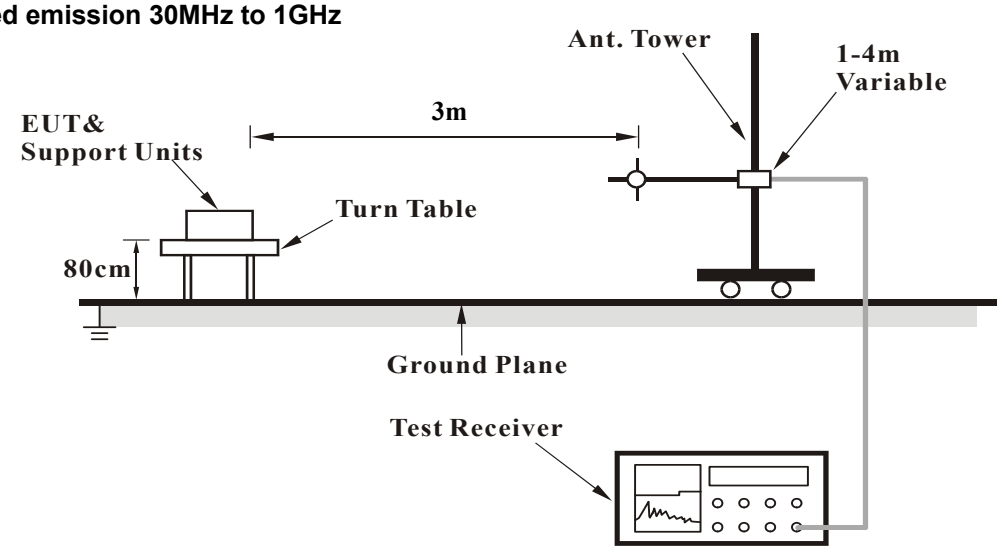
Note:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.3 Deviation from Test Standard

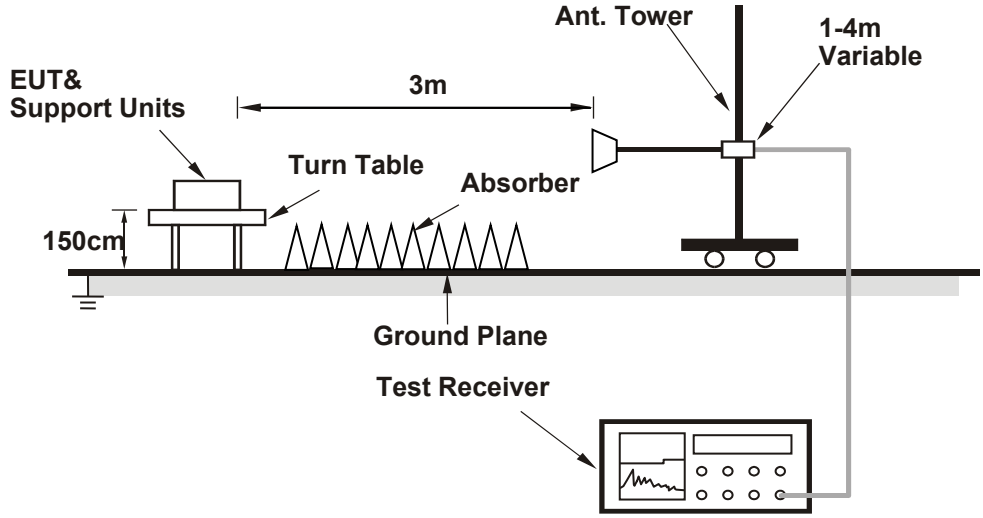
No deviation.

4.2.4 Test Setup

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



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

4.2.5 Test Results

Below 1GHz

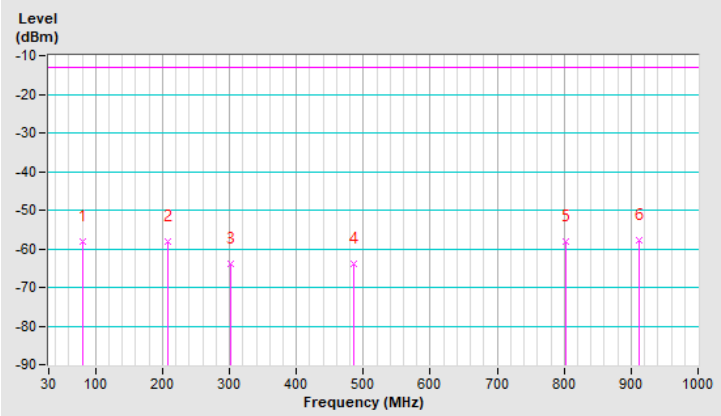
GSM 850

Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

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	81.41	-58.10	-13.00	-45.10	1.00 H	203	56.48	-114.58
2	208.48	-57.97	-13.00	-44.97	1.50 H	233	55.10	-113.07
3	301.60	-64.02	-13.00	-51.02	2.00 H	194	45.12	-109.14
4	484.93	-63.87	-13.00	-50.87	1.50 H	189	40.82	-104.69
5	802.12	-58.24	-13.00	-45.24	1.00 H	34	40.62	-98.86
6	911.73	-57.78	-13.00	-44.78	2.00 H	315	40.50	-98.28

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.

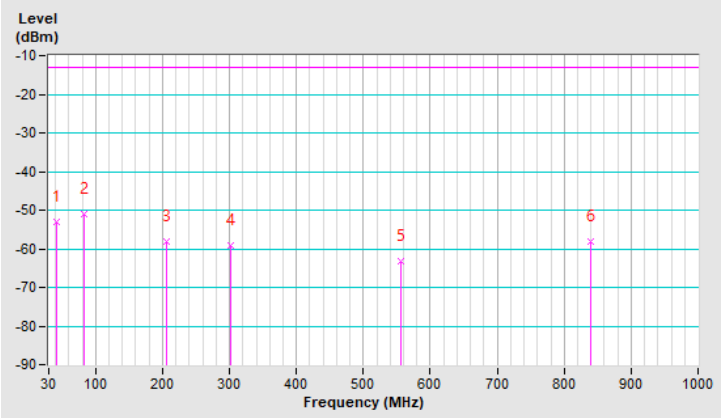


Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Vertical 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	41.64	-53.20	-13.00	-40.20	2.00 V	135	56.54	-109.74
2	83.35	-50.99	-13.00	-37.99	1.50 V	184	63.92	-114.91
3	206.54	-58.05	-13.00	-45.05	1.00 V	303	55.03	-113.08
4	302.57	-59.17	-13.00	-46.17	1.50 V	149	49.93	-109.10
5	555.74	-63.13	-13.00	-50.13	2.00 V	5	40.51	-103.64
6	839.95	-58.07	-13.00	-45.07	1.00 V	2	40.83	-98.90

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.



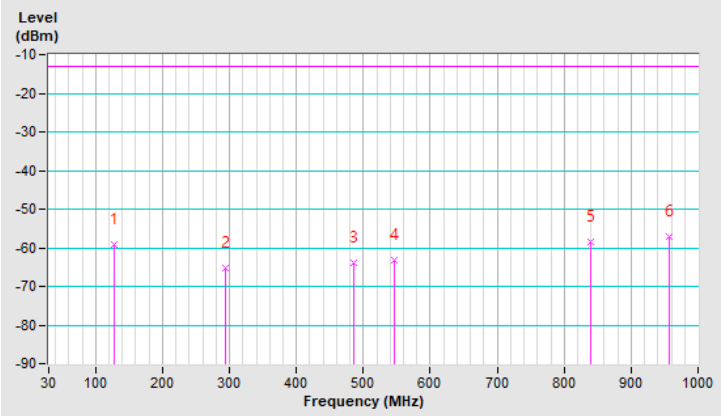
EDGE 850

Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

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	127.00	-59.32	-13.00	-46.32	1.50 H	251	51.82	-111.14
2	293.84	-65.29	-13.00	-52.29	2.00 H	191	44.03	-109.32
3	484.93	-63.87	-13.00	-50.87	1.50 H	189	40.82	-104.69
4	547.01	-63.29	-13.00	-50.29	1.00 H	12	40.42	-103.71
5	839.95	-58.62	-13.00	-45.62	1.50 H	57	40.28	-98.90
6	956.35	-57.27	-13.00	-44.27	2.00 H	2	40.45	-97.72

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.

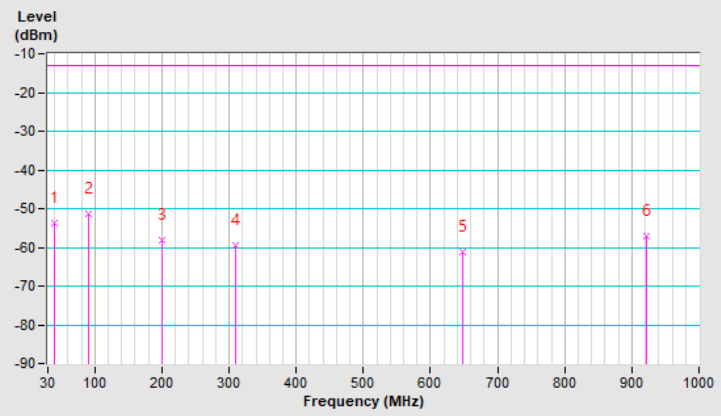


Mode	TX channel 189 (836.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Vertical 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	40.67	-53.59	-13.00	-40.59	2.00 V	135	56.26	-109.85
2	91.11	-51.44	-13.00	-38.44	1.00 V	167	63.89	-115.33
3	199.75	-58.13	-13.00	-45.13	1.50 V	5	54.91	-113.04
4	309.36	-59.58	-13.00	-46.58	1.00 V	131	49.37	-108.95
5	648.86	-61.11	-13.00	-48.11	1.50 V	14	40.64	-101.75
6	921.43	-57.15	-13.00	-44.15	2.00 V	192	41.07	-98.22

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.



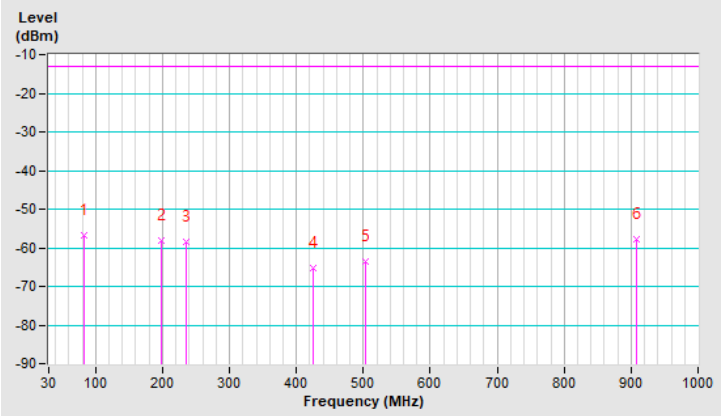
WCDMA Band 5

Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

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	82.38	-56.62	-13.00	-43.62	2.00 H	212	58.11	-114.73
2	198.78	-57.98	-13.00	-44.98	1.50 H	288	55.05	-113.03
3	234.67	-58.35	-13.00	-45.35	2.00 H	4	53.51	-111.86
4	424.79	-65.40	-13.00	-52.40	1.50 H	115	40.80	-106.20
5	503.36	-63.63	-13.00	-50.63	1.00 H	9	40.58	-104.21
6	907.85	-57.96	-13.00	-44.96	1.50 H	242	40.38	-98.34

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.

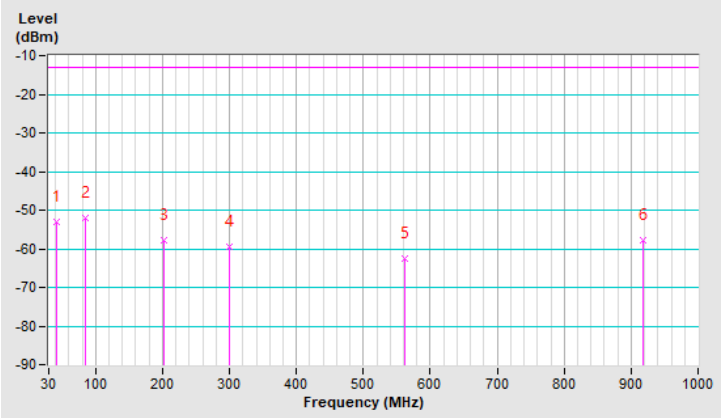


Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Vertical 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	42.61	-52.89	-13.00	-39.89	1.00 V	120	56.87	-109.76
2	84.32	-51.87	-13.00	-38.87	2.00 V	173	63.19	-115.06
3	202.66	-57.75	-13.00	-44.75	1.50 V	2	55.32	-113.07
4	300.63	-59.52	-13.00	-46.52	1.00 V	162	49.63	-109.15
5	562.53	-62.63	-13.00	-49.63	1.50 V	72	40.92	-103.55
6	917.55	-57.80	-13.00	-44.80	2.00 V	187	40.44	-98.24

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.



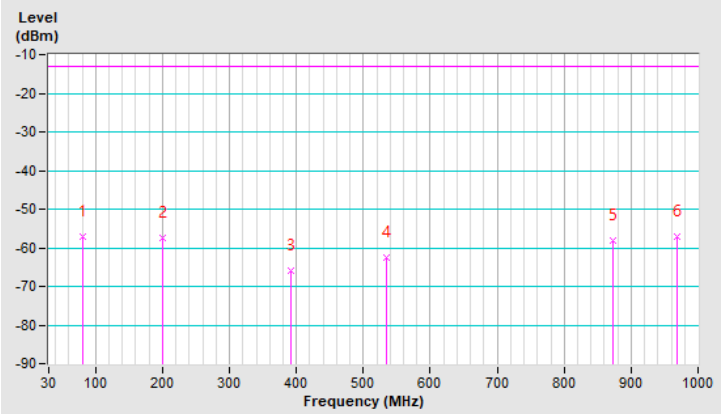
LTE Band 5, Channel Bandwidth 5MHz

Mode	TX channel 20425 (826.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

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	81.41	-57.21	-13.00	-44.21	1.00 H	216	57.37	-114.58
2	199.75	-57.51	-13.00	-44.51	1.50 H	272	55.53	-113.04
3	391.81	-66.09	-13.00	-53.09	2.00 H	161	40.97	-107.06
4	535.37	-62.46	-13.00	-49.46	1.50 H	157	41.26	-103.72
5	871.96	-58.14	-13.00	-45.14	1.00 H	62	40.68	-98.82
6	968.96	-57.13	-13.00	-44.13	1.50 H	8	40.37	-97.50

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.

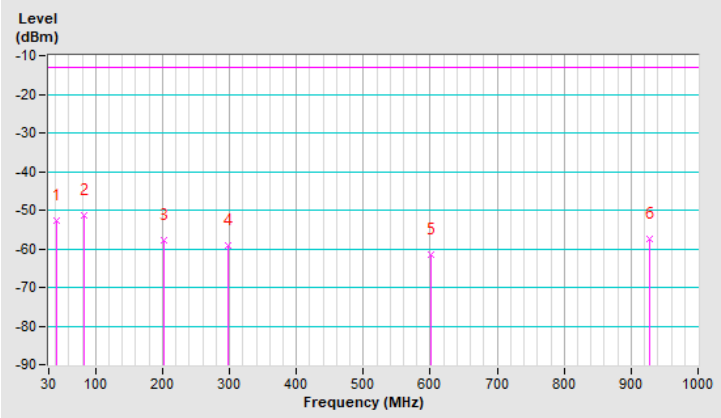


Mode	TX channel 20425 (826.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Vertical 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	41.64	-52.80	-13.00	-39.80	1.00 V	66	56.94	-109.74
2	82.38	-51.25	-13.00	-38.25	1.50 V	176	63.48	-114.73
3	202.66	-57.79	-13.00	-44.79	2.00 V	3	55.28	-113.07
4	297.72	-59.23	-13.00	-46.23	1.50 V	161	50.01	-109.24
5	601.33	-61.43	-13.00	-48.43	1.50 V	265	41.33	-102.76
6	927.25	-57.33	-13.00	-44.33	2.00 V	96	40.82	-98.15

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.



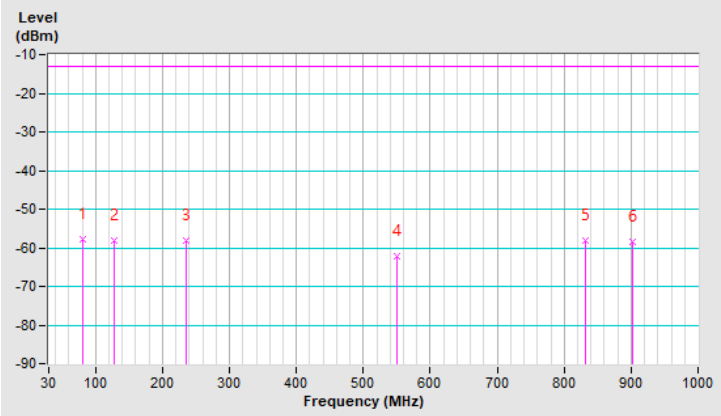
LTE Band 26, Channel Bandwidth 15MHz

Mode	TX channel 26765 (821.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

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	81.41	-57.64	-13.00	-44.64	2.00 H	194	56.94	-114.58
2	127.00	-58.09	-13.00	-45.09	1.50 H	249	53.05	-111.14
3	234.67	-58.20	-13.00	-45.20	2.00 H	17	53.66	-111.86
4	549.92	-62.18	-13.00	-49.18	1.50 H	322	41.54	-103.72
5	831.22	-58.12	-13.00	-45.12	1.00 H	16	40.80	-98.92
6	903.00	-58.51	-13.00	-45.51	1.50 H	115	39.93	-98.44

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.

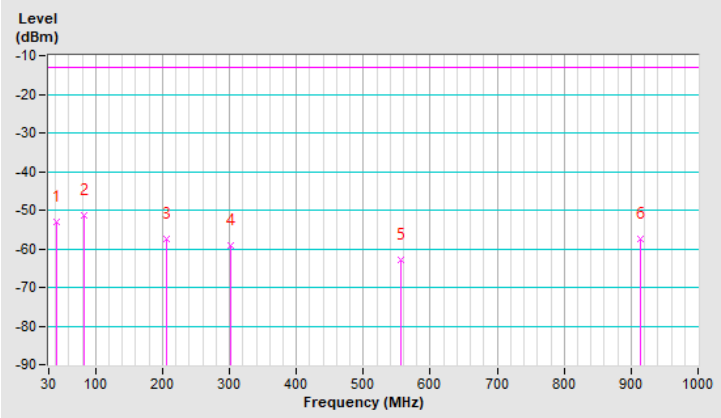


Mode	TX channel 26765 (821.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	24deg. C, 78%RH	Input Power	120Vac, 60Hz (System)
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Vertical 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	41.64	-53.06	-13.00	-40.06	1.00 V	150	56.68	-109.74
2	83.35	-51.36	-13.00	-38.36	1.00 V	201	63.55	-114.91
3	205.57	-57.56	-13.00	-44.56	1.50 V	351	55.53	-113.09
4	301.60	-59.06	-13.00	-46.06	2.00 V	171	50.08	-109.14
5	556.71	-62.89	-13.00	-49.89	1.00 V	3	40.74	-103.63
6	914.64	-57.38	-13.00	-44.38	1.50 V	280	40.89	-98.27

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
GSM 850

Mode	TX channel 128 (824.2MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1648.40	-41.26	-13.00	-28.26	1.68 H	215	76.72	-117.98
Antenna Polarity & Test Distance : Vertical 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	1648.40	-39.31	-13.00	-26.31	1.23 V	147	78.67	-117.98

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.

Mode	TX channel 189 (836.4MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-41.01	-13.00	-28.01	1.58 H	208	76.98	-117.99
Antenna Polarity & Test Distance : Vertical 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**	**-39.11**	**-13.00**	**-26.11**	**1.39 V**	**159**	**78.88**	**-117.99**

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.

Mode	TX channel 251 (848.8MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1697.60	-41.18	-13.00	-28.18	1.42 H	196	76.82	-118.00
Antenna Polarity & Test Distance : Vertical 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	1697.60	-39.25	-13.00	-26.25	1.26 V	152	78.75	-118.00

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.

EDGE 850

Mode	TX channel 128 (824.2MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1648.40	-41.28	-13.00	-28.28	1.35 H	225	76.70	-117.98
Antenna Polarity & Test Distance : Vertical 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	1648.40	-39.35	-13.00	-26.35	1.12 V	157	78.63	-117.98

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.

Mode	TX channel 189 (836.4MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-41.06	-13.00	-28.06	1.52 H	205	76.93	-117.99
Antenna Polarity & Test Distance : Vertical 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	-39.13	-13.00	-26.13	1.42 V	149	78.86	-117.99

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.

Mode	TX channel 251 (848.8MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1697.60	-41.21	-13.00	-28.21	1.39 H	185	76.79	-118.00
Antenna Polarity & Test Distance : Vertical 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	1697.60	-39.28	-13.00	-26.28	1.20 V	141	78.72	-118.00

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.

WCDMA Band 5

Mode	TX channel 4132 (826.4MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-54.14	-13.00	-41.14	2.51 H	131	63.84	-117.98
Antenna Polarity & Test Distance : Vertical 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	-53.27	-13.00	-40.27	1.89 V	101	64.71	-117.98

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.

Mode	TX channel 4182 (836.4MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-54.58	-13.00	-41.58	2.50 H	263	63.41	-117.99
Antenna Polarity & Test Distance : Vertical 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	-53.54	-13.00	-40.54	2.21 V	56	64.45	-117.99

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.

Mode	TX channel 4233 (846.6MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-54.52	-13.00	-41.52	1.67 H	178	63.48	-118.00
Antenna Polarity & Test Distance : Vertical 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	-53.30	-13.00	-40.30	2.22 V	282	64.70	-118.00

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.

LTE Band 5, Channel Bandwidth 1.4MHz

Mode	TX channel 20407 (824.7MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.38	-13.00	-40.38	1.65 H	218	64.60	-117.98
Antenna Polarity & Test Distance : Vertical 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	-49.55	-13.00	-36.55	2.66 V	346	68.43	-117.98

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.

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.20	-13.00	-40.20	1.60 H	209	64.79	-117.99
Antenna Polarity & Test Distance : Vertical 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	-49.47	-13.00	-36.47	2.45 V	261	68.52	-117.99

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.

Mode	TX channel 20643 (848.3MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.34	-13.00	-40.34	3.28 H	204	64.66	-118.00
Antenna Polarity & Test Distance : Vertical 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	-49.59	-13.00	-36.59	1.45 V	302	68.41	-118.00

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.

LTE Band 5, Channel Bandwidth 5MHz

Mode	TX channel 20425 (826.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.53	-13.00	-40.53	2.26 H	116	64.45	-117.98
Antenna Polarity & Test Distance : Vertical 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	-49.36	-13.00	-36.36	1.03 V	250	68.62	-117.98

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.

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.19	-13.00	-40.19	1.99 H	314	64.80	-117.99
Antenna Polarity & Test Distance : Vertical 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	-49.44	-13.00	-36.44	2.94 V	278	68.55	-117.99

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.

Mode	TX channel 20625 (846.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.29	-13.00	-40.29	1.96 H	94	64.71	-118.00
Antenna Polarity & Test Distance : Vertical 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	-49.47	-13.00	-36.47	3.36 V	263	68.53	-118.00

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.

LTE Band 5, Channel Bandwidth 10MHz

Mode	TX channel 20450 (829.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.29	-13.00	-40.29	3.75 H	352	64.69	-117.98
Antenna Polarity & Test Distance : Vertical 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	-49.44	-13.00	-36.44	1.88 V	298	68.54	-117.98

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.

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.36	-13.00	-40.36	3.09 H	149	64.63	-117.99
Antenna Polarity & Test Distance : Vertical 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	-49.51	-13.00	-36.51	2.11 V	125	68.48	-117.99

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.

Mode	TX channel 20600 (844.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-53.45	-13.00	-40.45	1.09 H	57	64.54	-117.99
Antenna Polarity & Test Distance : Vertical 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	-49.56	-13.00	-36.56	1.30 V	352	68.43	-117.99

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.

LTE Band 26, Channel Bandwidth 1.4MHz

Mode	TX channel 26797 (824.7MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1629.40	-47.33	-13.00	-34.33	2.01 H	230	70.67	-118.00
Antenna Polarity & Test Distance : Vertical 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	1629.40	-46.52	-13.00	-33.52	1.54 V	360	71.48	-118.00

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.

Mode	TX channel 26915 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-47.19	-13.00	-34.19	1.24 H	145	70.80	-117.99
Antenna Polarity & Test Distance : Vertical 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	-46.20	-13.00	-33.20	2.22 V	252	71.79	-117.99

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.

Mode	TX channel 27033 (848.3MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-47.15	-13.00	-34.15	1.07 H	24	70.85	-118.00
Antenna Polarity & Test Distance : Vertical 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	-46.40	-13.00	-33.40	1.43 V	262	71.60	-118.00

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.

LTE Band 26, Channel Bandwidth 5MHz

Mode	TX channel 26815 (826.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-47.57	-13.00	-34.57	2.43 H	303	70.41	-117.98
Antenna Polarity & Test Distance : Vertical 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	-46.20	-13.00	-33.20	3.91 V	215	71.78	-117.98

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.

Mode	TX channel 26915 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-46.10	-13.00	-33.10	2.73 H	144	71.89	-117.99
Antenna Polarity & Test Distance : Vertical 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	-46.45	-13.00	-33.45	2.72 V	332	71.54	-117.99

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.

Mode	TX channel 27015 (846.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-47.18	-13.00	-34.18	3.72 H	300	70.82	-118.00
Antenna Polarity & Test Distance : Vertical 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	-47.47	-13.00	-34.47	1.68 V	26	70.53	-118.00

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.

LTE Band 26, Channel Bandwidth 15MHz

Mode	TX channel 26765 (821.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1643.00	-47.01	-13.00	-34.01	2.52 H	236	70.98	-117.99
Antenna Polarity & Test Distance : Vertical 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	1643.00	-47.91	-13.00	-34.91	1.19 V	214	70.08	-117.99

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.

Mode	TX channel 26915 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	-47.17	-13.00	-34.17	3.50 H	281	70.82	-117.99
Antenna Polarity & Test Distance : Vertical 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	-46.17	-13.00	-33.17	2.73 V	223	71.82	-117.99

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.

Mode	TX channel 26965 (841.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Thomas Cheng		

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	1683.00	-47.27	-13.00	-34.27	1.81 H	222	70.73	-118.00
Antenna Polarity & Test Distance : Vertical 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	1683.00	-46.13	-13.00	-33.13	3.00 V	263	71.87	-118.00

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

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