

Partial FCC Test Report (Part 27)

Report No.: RFBBGM-WTW-P22010900-2

FCC ID: WIYLE910C1NF

Test Model: LE910C1-NF

Received Date: Feb. 06, 2022

Test Date: Feb. 21 ~ Apr. 08, 2022

Issued Date: Apr. 21, 2022

Applicant: CASTLES TECHNOLOGY CO., LTD.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Test Location(2): No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan

FCC Registration /

Designation Number(1): 788550 / TW0003

FCC Registration /

Designation Number(2): 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFBBGM-WTW-P22010900-2	Original release	Apr. 21, 2022

1 Certificate of Conformity

Product: WCDMA and LTE cellular wireless module

Brand:  **CASTLES
TECHNOLOGY**

Test Model: LE910C1-NF

Sample Status: Identical Prototype

Applicant: CASTLES TECHNOLOGY CO., LTD.

Test Date: Feb. 21 ~ Apr. 08, 2022

Standards: FCC Part 27, Subpart C, F, H, L

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:** Apr. 21, 2022
Polly Chien / Specialist

Approved by :  , **Date:** Apr. 21, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2						
FCC Clause				Test Item	Result	Remarks
WCDMA B4 / LTE B4	LTE B12	LTE B13	LTE B66			
2.1046 27.50(d)	2.1046 27.50(c)	2.1046 27.50(b)	2.1046 27.50 (d)(4)	Equivalent Isotropically Radiated Power / Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	2.1047	2.1047	2.1047	Modulation characteristics	N/A	Refer to Note
2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	Frequency Stability	N/A	Refer to Note
2.1049	2.1049	2.1049	2.1049	Emission Bandwidth	N/A	Refer to Note
2.1051 27.53(h)	2.1051 27.53(g)	2.1051 27.53(c)	2.1051 27.53(h)	Out of Band Emission Measurements	N/A	Refer to Note
27.50(d)(5)	--	--	27.50 (d)(5)	Peak To Average Ratio	N/A	Refer to Note
2.1051 27.53(h)	2.1051 27.53(g)	2.1051 27.53(c)(f)	2.1051 27.53(h)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(h)	2.1053 27.53(g)	2.1053 27.53(c)(f)	2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -4.88dB at 1564.00MHz.

Note:

- This report is a partial report. Therefore, only test item of Effective Radiated Power / Equivalent Isotropically Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to DEKRA report no.: 1980255R-HPUSP17V00-B & 1980255R-HPUSP17V00-C (LTE Module, Brand: Telit, Model: LE910C1-NF, FCC ID: WIYLE910C1NF).
- 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) (\pm)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~ 1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB


2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Rohde & Schwarz	ESR3	102782	Dec. 10, 2021	Dec. 09, 2022
Spectrum Analyzer Rohde & Schwarz	FSW43	460230	Jan. 07, 2022	Jan. 06, 2023
BILOG Antenna SCHWARZBECK	VULB9168	9168-1213	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna RF SPIN	DRH18-E	210103A18E	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1048	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC330N	980782	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI	EMC118A45SE	980808	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI	EMC184045SE	980788	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9 000+2000+1000)	201243+ 201231+ 210102	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-N M-(9000+300+500)	201236+ 201235+ 201233	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM- (5000+3000+2000)	201260+201257+201254	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_V7. 6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 24, 2021	Dec. 23, 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 WM Chamber 8.

3 General Information

3.1 General Description of EUT

Product	WCDMA and LTE cellular wireless module		
Brand			
Test Model	LE910C1-NF		
Status of EUT	Identical Prototype		
Power Supply Rating	3.8 Vdc		
Modulation Type	WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM		
Operating Frequency	WCDMA Band 4		1712.4MHz ~ 1752.6MHz
	LTE Band 4	Channel Bandwidth 1.4MHz	1710.7MHz ~ 1754.3MHz
		Channel Bandwidth 3MHz	1711.5MHz ~ 1753.5MHz
		Channel Bandwidth 5MHz	1712.5MHz ~ 1752.5MHz
		Channel Bandwidth 10MHz	1715.0MHz ~ 1750.0MHz
		Channel Bandwidth 15MHz	1717.5MHz ~ 1747.5MHz
		Channel Bandwidth 20MHz	1720.0MHz ~ 1745.0MHz
	LTE Band 12	Channel Bandwidth 1.4MHz	699.7MHz ~ 715.3MHz
		Channel Bandwidth 3MHz	700.5MHz ~ 714.5MHz
		Channel Bandwidth 5MHz	701.5MHz ~ 713.5MHz
		Channel Bandwidth 10MHz	704.0MHz ~ 711.0MHz
	LTE Band 13	Channel Bandwidth 5MHz	779.5MHz ~ 784.5MHz
		Channel Bandwidth 10MHz	782.0MHz
	LTE Band 66	Channel Bandwidth 1.4MHz	1710.7MHz ~ 1779.3MHz
		Channel Bandwidth 3MHz	1711.5MHz ~ 1778.5MHz
		Channel Bandwidth 5MHz	1712.5MHz ~ 1777.5MHz
		Channel Bandwidth 10MHz	1715.0MHz ~ 1775.0MHz
Channel Bandwidth 15MHz		1717.5MHz ~ 1772.5MHz	
Channel Bandwidth 20MHz		1720.0MHz ~ 1770.0MHz	

Max. EIRP Power	WCDMA Band 4		377.572mW(25.77dBm)		
			QPSK	16QAM	
	LTE Band 4	Channel Bandwidth 1.4MHz	181.552mW(22.59dBm)	133.352mW(21.25dBm)	
		Channel Bandwidth 3MHz	165.577mW(22.19dBm)	132.739mW(21.23dBm)	
		Channel Bandwidth 5MHz	164.059mW(22.15dBm)	131.522mW(21.19dBm)	
		Channel Bandwidth 10MHz	182.810mW(22.62dBm)	130.317mW(21.15dBm)	
		Channel Bandwidth 15MHz	187.932mW(22.74dBm)	139.637mW(21.45dBm)	
		Channel Bandwidth 20MHz	175.388mW(22.44dBm)	131.522mW(21.19dBm)	
	LTE Band 66	Channel Bandwidth 1.4MHz	180.302mW(22.56dBm)	132.739mW(21.23dBm)	
		Channel Bandwidth 3MHz	171.396mW(22.34dBm)	129.718mW(21.13dBm)	
		Channel Bandwidth 5MHz	170.216mW(22.31dBm)	127.057mW(21.04dBm)	
		Channel Bandwidth 10MHz	177.419mW(22.49dBm)	130.918mW(21.17dBm)	
		Channel Bandwidth 15MHz	175.388mW(22.44dBm)	136.144mW(21.34dBm)	
		Channel Bandwidth 20MHz	168.267mW(22.26dBm)	138.038mW(21.40dBm)	
Max. ERP Power			QPSK	16QAM	
	LTE Band 12	Channel Bandwidth 1.4MHz	221.309mW(23.45dBm)	171.396mW(22.34dBm)	
		Channel Bandwidth 3MHz	220.293mW(23.43dBm)	171.396mW(22.34dBm)	
		Channel Bandwidth 5MHz	217.270mW(23.37dBm)	164.816mW(22.17dBm)	
		Channel Bandwidth 10MHz	224.388mW(23.51dBm)	179.473mW(22.54dBm)	
	LTE Band 13	Channel Bandwidth 5MHz	228.034mW(23.58dBm)	191.426mW(22.82dBm)	
		Channel Bandwidth 10MHz	232.274mW(23.66dBm)	197.242mW(22.95dBm)	
	Antenna Type	Refer to Note			
Accessory Device	NA				
Cable Supplied	NA				


Note:

- This report is a partial report. Therefore, only test item of Effective Radiated Power / Equivalent Isotropically Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to DEKRA report no.: 1980255R-HPUSP17V00-B & 1980255R-HPUSP17V00-C (LTE Module, Brand: Telit, Model: LE910C1-NF, FCC ID: WIYLE910C1NF). For radiated spurious emission test, the worst mode according to the maximum conducted power reported by the original module.
- The antenna information of POS Terminal is listed as below.

Antenna Type	Dipole	Brand	Aristotle
Antenna Connector	SMA R/A PLUG	Model	RFA-US-T1000G-2M-A5
Antenna Gain (dBi)	WCDMA Band 4	0.7	
	LTE Band 4	0.7	
	LTE Band 12	2	
	LTE Band 13	2	
	LTE Band 66	0.7	

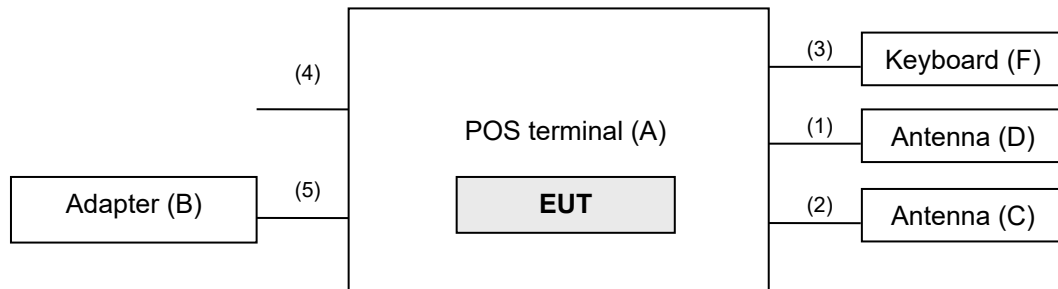
*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

- The EUT was installed in a specific End-product.

Product	Brand	Model
POS Terminal	 CASTLES TECHNOLOGY	UPT1000B

- The EUT support Category 1 only. Above bandwidth 10MHz of 16QAM modulation supports only 25RB.

3.2 Configuration of System under Test





Remote site



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	UPT1000B	NA	WIYUPT1000-BV	Provided by client.
B.	Adapter	 CASTLES TECHNOLOGY	PW04-945A	NA	NA	Provided by client.
C.	Antenna	Aristotle	RFA-US-T1000G-2M-A5	NA	NA	Provided by client.
D.	Antenna	Aristotle	RFA-25-T100-41-3M-A2	NA	NA	Provided by client.
E.	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	NA	-
F.	Keyboard	DELL	SK-8115	CN-OJ4635-716 16-53-OCAE	FCC DoC Approved	-

Note:

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	ANT cable	1	2	Y	0	Provided by client.
2.	ANT cable	1	3	Y	0	Provided by client.
3.	USB cable	1	1.8	Y	0	-
4.	LAN cable	1	1	N	0	Cat.5e, RJ45
5.	Power cable	1	1.5	-	0	Provided by client.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Y-plane. Following channel(s) was (were) selected for the final test as listed below.

WCDMA Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	1312 to 1513	1312(1712.4MHz), 1413(1732.6MHz), 1513(1752.6MHz)	WCDMA
-	Radiated Emission Below 1GHz	1312 to 1513	1312(1712.4MHz)	WCDMA
-	Radiated Emission Above 1GHz	1312 to 1513	1312(1712.4MHz)	WCDMA

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		19975 to 20375	19975(1712.5MHz), 20175(1732.5MHz), 20375(1752.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		20000 to 20350	20000(1715.0MHz), 20175(1732.5MHz), 20350(1750.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK / 16QAM	1 Half Full

LTE Band 12

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		23060 to 23130	23060(704.0MHz), 23095(707.5 MHz), 23130(711.0 MHz)	10MHz	QPSK / 16QAM	1 Half Full

LTE Band 13

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205(779.5MHz), 23230(782.0MHz), 23255(784.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		23230	23230(782.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
-	Radiated Emission Below 1GHz	23205 to 23255	23230(782.0MHz)	5MHz	QPSK	1
-	Radiated Emission Above 1GHz	23205 to 23255	23230(782.0MHz)	5MHz	QPSK	1

LTE Band 66

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK / 16QAM	1 Half Full

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	23deg. C, 66%RH	120Vac, 60Hz	Adair Peng
Radiated Emission	23deg. C, 66%RH 23deg. C, 69%RH	120Vac, 60Hz	Randy Wu, Edison Lee

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 27

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

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

WCDMA, LTE Band 4, LTE Band 66:
Mobile / Portable station are limited to 1 watts e.i.r.p.

LTE Band 12:

Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP.

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

LTE Band 13:

Control and mobile stations in the 746-757 MHz, 787-788 MHz and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

Portable stations (hand-held devices) in the 746-757 MHz, 787-788 MHz and 805-806 MHz band are limited to 3 watts ERP.

4.1.2 Test Procedures

Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

EIRP / ERP Measurement:

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

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

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

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 Band 4		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	24.33	25.07	24.31

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	21.03	21.14	21.19
		1	50	21.38	21.28	21.74
		1	99	20.99	21.12	21.01
		50	0	20.05	19.92	20.13
		50	25	20.02	19.91	20.11
		50	50	20.01	19.88	19.92
		100	0	19.97	19.86	19.90
20M	16QAM	1	0	19.97	20.23	20.22
		1	50	20.49	20.46	20.41
		1	99	20.12	20.21	20.03

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	20.94	21.42	21.14
		1	37	21.44	22.04	21.92
		1	74	21.24	21.19	21.01
		36	0	19.95	20.07	20.07
		36	19	19.94	20.04	20.03
		36	39	19.92	20.02	19.99
		75	0	19.89	20.01	19.95
15M	16QAM	1	0	19.83	19.91	20.22
		1	37	20.17	20.33	20.75
		1	74	20.11	20.07	20.25

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	21.26	21.53	21.45
		1	24	21.75	21.92	21.62
		1	49	21.39	21.45	20.22
		25	0	20.15	20.21	20.16
		25	12	20.13	20.18	20.14
		25	25	20.11	20.15	20.13
		50	0	20.09	20.14	20.11
10M	16QAM	1	0	20.02	20.30	20.41
		1	24	20.06	20.31	20.45
		1	49	20.01	20.23	20.36
		25	0	19.27	19.28	19.42
		25	12	19.17	19.27	19.40
		25	25	19.15	19.16	19.29

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	21.26	21.33	21.29
		1	12	21.29	21.45	21.38
		1	24	21.18	21.24	21.22
		12	0	20.05	20.07	20.15
		12	6	20.01	20.05	20.13
		12	13	19.98	20.03	20.06
		25	0	19.96	20.01	20.04
5M	16QAM	1	0	19.82	20.31	20.35
		1	12	19.88	20.45	20.49
		1	24	19.77	20.08	20.08
		12	0	19.02	19.25	19.27
		12	6	18.97	19.17	19.25
		12	13	18.94	19.14	19.23
		25	0	18.91	19.11	19.22

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	21.35	21.37	21.22
		1	7	21.47	21.49	21.29
		1	14	21.10	21.32	21.11
		8	0	20.05	20.17	20.01
		8	3	19.99	20.15	19.99
		8	7	19.96	20.11	19.95
		15	0	19.93	20.08	19.93
3M	16QAM	1	0	20.35	20.41	20.06
		1	7	20.45	20.53	20.19
		1	14	20.23	20.35	19.91
		8	0	19.33	19.45	19.23
		8	3	19.31	19.33	19.11
		8	7	19.29	19.22	19.09
		15	0	19.05	19.12	19.05

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	21.43	21.80	21.47
		1	2	21.52	21.89	21.54
		1	5	21.26	21.71	21.31
		3	0	21.23	21.41	21.17
		3	1	21.06	21.38	21.10
		3	3	21.04	21.36	21.09
		6	0	20.19	20.37	20.02
1.4M	16QAM	1	0	20.39	20.41	20.12
		1	2	20.47	20.55	20.28
		1	5	20.12	20.33	20.02
		3	0	20.07	20.22	19.96
		3	1	20.04	20.17	19.94
		3	3	20.02	20.15	19.92
		6	0	19.04	19.46	19.07

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	22.82	23.05	23.32
		1	24	23.34	23.45	23.66
		1	49	23.42	23.60	23.31
		25	0	22.17	22.41	22.42
		25	12	22.15	22.36	22.40
		25	25	22.11	22.33	22.38
		50	0	22.01	22.31	22.34
10M	16QAM	1	0	21.47	22.28	22.67
		1	24	22.33	22.47	22.69
		1	49	22.27	22.41	22.45
		25	0	20.91	21.52	21.57
		25	12	20.87	21.48	21.55
		25	25	20.85	21.45	21.51

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	22.43	23.20	23.26
		1	12	23.11	23.52	23.48
		1	24	23.05	23.35	23.13
		12	0	21.82	22.39	22.33
		12	6	21.77	22.35	22.29
		12	13	21.73	22.29	22.25
		25	0	21.69	22.26	22.18
5M	16QAM	1	0	21.36	21.89	22.05
		1	12	22.11	22.32	22.13
		1	24	21.89	22.04	22.07
		12	0	20.64	21.39	21.59
		12	6	20.61	21.35	21.53
		12	13	20.59	21.32	21.50
		25	0	20.57	21.29	21.47

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	22.45	23.34	23.48
		1	7	23.01	23.58	23.51
		1	14	22.99	23.47	23.33
		8	0	21.88	22.28	22.32
		8	3	21.85	22.15	22.28
		8	7	21.82	22.11	22.26
		15	0	21.76	22.08	22.19
3M	16QAM	1	0	21.65	22.42	22.35
		1	7	21.92	22.49	22.42
		1	14	21.81	22.21	21.98
		8	0	20.67	21.39	21.52
		8	3	20.63	21.37	21.49
		8	7	20.59	21.31	21.45
		15	0	20.55	21.28	21.42

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	22.72	23.52	23.51
		1	2	23.29	23.60	23.52
		1	5	22.92	23.54	23.54
		3	0	22.78	23.47	23.44
		3	1	22.75	23.44	23.42
		3	3	22.73	23.43	23.40
		6	0	21.76	22.53	22.52
1.4M	16QAM	1	0	21.69	22.25	22.22
		1	2	21.75	22.43	22.49
		1	5	21.71	22.34	22.25
		3	0	21.66	22.23	22.21
		3	1	21.64	22.19	22.18
		3	3	21.61	22.16	22.16
		6	0	20.66	21.31	21.19

LTE Band 13				
BW	MCS Index	RB Size	RB Offset	Mid
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	22.69
		1	24	21.66
		1	49	23.81
		25	0	21.11
		25	12	20.41
		25	25	21.74
		50	0	21.08
10M	16QAM	1	0	21.44
		1	24	20.54
		1	49	23.10
		25	0	20.22
		25	12	19.56
		25	25	20.61

LTE Band 13						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	22.61	22.12	21.79
		1	12	22.28	22.05	22.86
		1	24	21.75	22.78	23.73
		12	0	21.48	20.86	21.22
		12	6	21.34	20.69	21.75
		12	13	21.28	21.07	22.27
		25	0	21.15	20.60	21.82
5M	16QAM	1	0	21.74	20.93	20.72
		1	12	21.27	20.57	21.86
		1	24	20.52	21.58	22.97
		12	0	20.39	19.69	20.14
		12	6	20.21	19.66	20.64
		12	13	19.72	19.72	21.02
		25	0	20.21	19.61	20.72

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132575
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	21.19	21.23	20.90
		1	50	21.33	21.36	21.56
		1	99	21.11	21.21	20.86
		50	0	20.02	20.19	19.86
		50	25	19.99	20.22	19.82
		50	50	19.96	20.18	19.80
		100	0	19.93	20.12	19.78
20M	16QAM	1	0	20.04	20.50	20.11
		1	50	20.36	20.70	20.27
		1	99	20.03	20.07	20.08

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	20.91	21.42	20.99
		1	37	21.56	21.74	21.03
		1	74	20.82	21.32	20.91
		36	0	19.98	20.41	19.88
		36	19	19.95	20.36	19.85
		36	39	19.92	20.33	19.82
		75	0	19.90	20.31	19.80
15M	16QAM	1	0	20.11	20.23	20.03
		1	37	20.25	20.64	20.29
		1	74	20.03	20.17	19.95

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	21.08	21.46	20.96
		1	24	21.30	21.79	21.24
		1	49	21.02	21.44	20.93
		25	0	20.04	20.35	19.87
		25	12	20.01	20.33	19.84
		25	25	19.98	20.30	19.83
		50	0	19.95	20.25	19.81
10M	16QAM	1	0	20.10	20.35	20.11
		1	24	20.25	20.47	20.15
		1	49	20.08	20.31	20.08
		25	0	19.08	19.42	19.05
		25	12	19.05	19.39	19.01
		25	25	19.03	19.36	18.98

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	20.95	21.37	20.99
		1	12	21.09	21.61	21.12
		1	24	20.93	21.35	20.96
		12	0	19.98	20.31	19.95
		12	6	19.96	20.27	19.91
		12	13	19.93	20.25	19.89
		25	0	19.90	20.22	19.87
5M	16QAM	1	0	20.03	20.29	19.98
		1	12	20.23	20.34	20.17
		1	24	19.99	20.26	19.96
		12	0	19.05	19.35	18.98
		12	6	19.02	19.33	18.95
		12	13	18.99	19.30	18.91
		25	0	18.94	19.26	18.90

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	20.99	21.59	20.95
		1	7	21.12	21.64	21.25
		1	14	20.97	21.45	20.86
		8	0	20.03	20.41	19.92
		8	3	19.98	20.37	19.89
		8	7	19.96	20.35	19.86
		15	0	19.94	20.32	19.81
3M	16QAM	1	0	20.02	20.14	19.98
		1	7	20.11	20.43	20.03
		1	14	19.98	20.11	19.95
		8	0	19.07	19.45	18.75
		8	3	19.02	19.41	18.71
		8	7	18.95	19.40	18.67
		15	0	18.72	19.38	18.48

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	21.01	21.70	21.02
		1	2	21.13	21.86	21.20
		1	5	21.02	21.69	21.12
		3	0	20.94	21.55	21.01
		3	1	20.91	21.51	20.92
		3	3	20.89	21.48	20.88
		6	0	19.93	20.40	20.12
1.4M	16QAM	1	0	20.13	20.42	20.17
		1	2	20.15	20.53	20.27
		1	5	20.10	20.41	20.16
		3	0	19.91	20.37	20.25
		3	1	19.89	20.35	20.22
		3	3	19.87	20.31	20.19
		6	0	18.68	19.53	19.07

EIRP Power (dBm)

Band	WCDMA Band 4		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	25.03	25.77	25.01

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	21.73	21.84	21.89
		1	50	22.08	21.98	22.44
		1	99	21.69	21.82	21.71
		50	0	20.75	20.62	20.83
		50	25	20.72	20.61	20.81
		50	50	20.71	20.58	20.62
		100	0	20.67	20.56	20.60
20M	16QAM	1	0	20.67	20.93	20.92
		1	50	21.19	21.16	21.11
		1	99	20.82	20.91	20.73

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	21.64	22.12	21.84
		1	37	22.14	22.74	22.62
		1	74	21.94	21.89	21.71
		36	0	20.65	20.77	20.77
		36	19	20.64	20.74	20.73
		36	39	20.62	20.72	20.69
		75	0	20.59	20.71	20.65
15M	16QAM	1	0	20.53	20.61	20.92
		1	37	20.87	21.03	21.45
		1	74	20.81	20.77	20.95

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	21.96	22.23	22.15
		1	24	22.45	22.62	22.32
		1	49	22.09	22.15	20.92
		25	0	20.85	20.91	20.86
		25	12	20.83	20.88	20.84
		25	25	20.81	20.85	20.83
		50	0	20.79	20.84	20.81
10M	16QAM	1	0	20.72	21.00	21.11
		1	24	20.76	21.01	21.15
		1	49	20.71	20.93	21.06
		25	0	19.97	19.98	20.12
		25	12	19.87	19.97	20.10
		25	25	19.85	19.86	19.99

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	21.96	22.03	21.99
		1	12	21.99	22.15	22.08
		1	24	21.88	21.94	21.92
		12	0	20.75	20.77	20.85
		12	6	20.71	20.75	20.83
		12	13	20.68	20.73	20.76
		25	0	20.66	20.71	20.74
5M	16QAM	1	0	20.52	21.01	21.05
		1	12	20.58	21.15	21.19
		1	24	20.47	20.78	20.78
		12	0	19.72	19.95	19.97
		12	6	19.67	19.87	19.95
		12	13	19.64	19.84	19.93
		25	0	19.61	19.81	19.92

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	22.05	22.07	21.92
		1	7	22.17	22.19	21.99
		1	14	21.80	22.02	21.81
		8	0	20.75	20.87	20.71
		8	3	20.69	20.85	20.69
		8	7	20.66	20.81	20.65
		15	0	20.63	20.78	20.63
3M	16QAM	1	0	21.05	21.11	20.76
		1	7	21.15	21.23	20.89
		1	14	20.93	21.05	20.61
		8	0	20.03	20.15	19.93
		8	3	20.01	20.03	19.81
		8	7	19.99	19.92	19.79
		15	0	19.75	19.82	19.75

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	22.13	22.50	22.17
		1	2	22.22	22.59	22.24
		1	5	21.96	22.41	22.01
		3	0	21.93	22.11	21.87
		3	1	21.76	22.08	21.80
		3	3	21.74	22.06	21.79
		6	0	20.89	21.07	20.72
1.4M	16QAM	1	0	21.09	21.11	20.82
		1	2	21.17	21.25	20.98
		1	5	20.82	21.03	20.72
		3	0	20.77	20.92	20.66
		3	1	20.74	20.87	20.64
		3	3	20.72	20.85	20.62
		6	0	19.74	20.16	19.77

ERP Power (dBm)

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	22.67	22.90	23.17
		1	24	23.19	23.30	23.51
		1	49	23.27	23.45	23.16
		25	0	22.02	22.26	22.27
		25	12	22.00	22.21	22.25
		25	25	21.96	22.18	22.23
		50	0	21.86	22.16	22.19
10M	16QAM	1	0	21.32	22.13	22.52
		1	24	22.18	22.32	22.54
		1	49	22.12	22.26	22.30
		25	0	20.76	21.37	21.42
		25	12	20.72	21.33	21.40
		25	25	20.70	21.30	21.36

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	22.28	23.05	23.11
		1	12	22.96	23.37	23.33
		1	24	22.90	23.20	22.98
		12	0	21.67	22.24	22.18
		12	6	21.62	22.20	22.14
		12	13	21.58	22.14	22.10
		25	0	21.54	22.11	22.03
5M	16QAM	1	0	21.21	21.74	21.90
		1	12	21.96	22.17	21.98
		1	24	21.74	21.89	21.92
		12	0	20.49	21.24	21.44
		12	6	20.46	21.20	21.38
		12	13	20.44	21.17	21.35
		25	0	20.42	21.14	21.32

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	22.30	23.19	23.33
		1	7	22.86	23.43	23.36
		1	14	22.84	23.32	23.18
		8	0	21.73	22.13	22.17
		8	3	21.70	22.00	22.13
		8	7	21.67	21.96	22.11
		15	0	21.61	21.93	22.04
3M	16QAM	1	0	21.50	22.27	22.20
		1	7	21.77	22.34	22.27
		1	14	21.66	22.06	21.83
		8	0	20.52	21.24	21.37
		8	3	20.48	21.22	21.34
		8	7	20.44	21.16	21.30
		15	0	20.40	21.13	21.27

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	22.57	23.37	23.36
		1	2	23.14	23.45	23.37
		1	5	22.77	23.39	23.39
		3	0	22.63	23.32	23.29
		3	1	22.60	23.29	23.27
		3	3	22.58	23.28	23.25
		6	0	21.61	22.38	22.37
1.4M	16QAM	1	0	21.54	22.10	22.07
		1	2	21.60	22.28	22.34
		1	5	21.56	22.19	22.10
		3	0	21.51	22.08	22.06
		3	1	21.49	22.04	22.03
		3	3	21.46	22.01	22.01
		6	0	20.51	21.16	21.04

ERP Power (dBm)

LTE Band 13				
BW	MCS Index	RB Size	RB Offset	Mid
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	22.54
		1	24	21.51
		1	49	23.66
		25	0	20.96
		25	12	20.26
		25	25	21.59
		50	0	20.93
10M	16QAM	1	0	21.29
		1	24	20.39
		1	49	22.95
		25	0	20.07
		25	12	19.41
		25	25	20.46

LTE Band 13							
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	
		Channel			23205	23230	23255
		Frequency (MHz)			779.5	782	784.5
5M	QPSK	1	0	22.46	21.97	21.64	
		1	12	22.13	21.90	22.71	
		1	24	21.60	22.63	23.58	
		12	0	21.33	20.71	21.07	
		12	6	21.19	20.54	21.60	
		12	13	21.13	20.92	22.12	
		25	0	21.00	20.45	21.67	
5M	16QAM	1	0	21.59	20.78	20.57	
		1	12	21.12	20.42	21.71	
		1	24	20.37	21.43	22.82	
		12	0	20.24	19.54	19.99	
		12	6	20.06	19.51	20.49	
		12	13	19.57	19.57	20.87	
		25	0	20.06	19.46	20.57	

EIRP Power (dBm)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132575
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	21.89	21.93	21.60
		1	50	22.03	22.06	22.26
		1	99	21.81	21.91	21.56
		50	0	20.72	20.89	20.56
		50	25	20.69	20.92	20.52
		50	50	20.66	20.88	20.50
		100	0	20.63	20.82	20.48
20M	16QAM	1	0	20.74	21.20	20.81
		1	50	21.06	21.40	20.97
		1	99	20.73	20.77	20.78

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	21.61	22.12	21.69
		1	37	22.26	22.44	21.73
		1	74	21.52	22.02	21.61
		36	0	20.68	21.11	20.58
		36	19	20.65	21.06	20.55
		36	39	20.62	21.03	20.52
		75	0	20.60	21.01	20.50
15M	16QAM	1	0	20.81	20.93	20.73
		1	37	20.95	21.34	20.99
		1	74	20.73	20.87	20.65

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	21.78	22.16	21.66
		1	24	22.00	22.49	21.94
		1	49	21.72	22.14	21.63
		25	0	20.74	21.05	20.57
		25	12	20.71	21.03	20.54
		25	25	20.68	21.00	20.53
		50	0	20.65	20.95	20.51
10M	16QAM	1	0	20.80	21.05	20.81
		1	24	20.95	21.17	20.85
		1	49	20.78	21.01	20.78
		25	0	19.78	20.12	19.75
		25	12	19.75	20.09	19.71
		25	25	19.73	20.06	19.68

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	21.65	22.07	21.69
		1	12	21.79	22.31	21.82
		1	24	21.63	22.05	21.66
		12	0	20.68	21.01	20.65
		12	6	20.66	20.97	20.61
		12	13	20.63	20.95	20.59
		25	0	20.60	20.92	20.57
5M	16QAM	1	0	20.73	20.99	20.68
		1	12	20.93	21.04	20.87
		1	24	20.69	20.96	20.66
		12	0	19.75	20.05	19.68
		12	6	19.72	20.03	19.65
		12	13	19.69	20.00	19.61
		25	0	19.64	19.96	19.60

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	21.69	22.29	21.65
		1	7	21.82	22.34	21.95
		1	14	21.67	22.15	21.56
		8	0	20.73	21.11	20.62
		8	3	20.68	21.07	20.59
		8	7	20.66	21.05	20.56
		15	0	20.64	21.02	20.51
3M	16QAM	1	0	20.72	20.84	20.68
		1	7	20.81	21.13	20.73
		1	14	20.68	20.81	20.65
		8	0	19.77	20.15	19.45
		8	3	19.72	20.11	19.41
		8	7	19.65	20.10	19.37
		15	0	19.42	20.08	19.18

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	21.71	22.40	21.72
		1	2	21.83	22.56	21.90
		1	5	21.72	22.39	21.82
		3	0	21.64	22.25	21.71
		3	1	21.61	22.21	21.62
		3	3	21.59	22.18	21.58
		6	0	20.63	21.10	20.82
1.4M	16QAM	1	0	20.83	21.12	20.87
		1	2	20.85	21.23	20.97
		1	5	20.80	21.11	20.86
		3	0	20.61	21.07	20.95
		3	1	20.59	21.05	20.92
		3	3	20.57	21.01	20.89
		6	0	19.38	20.23	19.77

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

For WCDMA Band 4, LTE Band 4 and Band 66:

According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log (P)$ dB.

For LTE Band 12:

According to FCC 27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. The limit of emissions is equal to -13 dBm.

For LTE Band 13

According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

According to FCC 27.53(f) for operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm

4.2.2 Test Procedure

- a. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 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.
 - $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
 - $ERP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note:

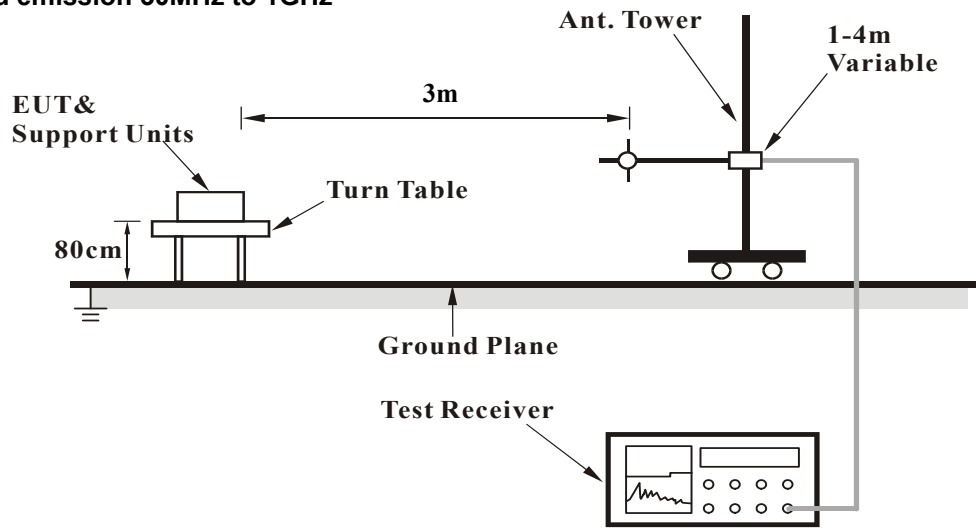
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.3 Deviation from Test Standard

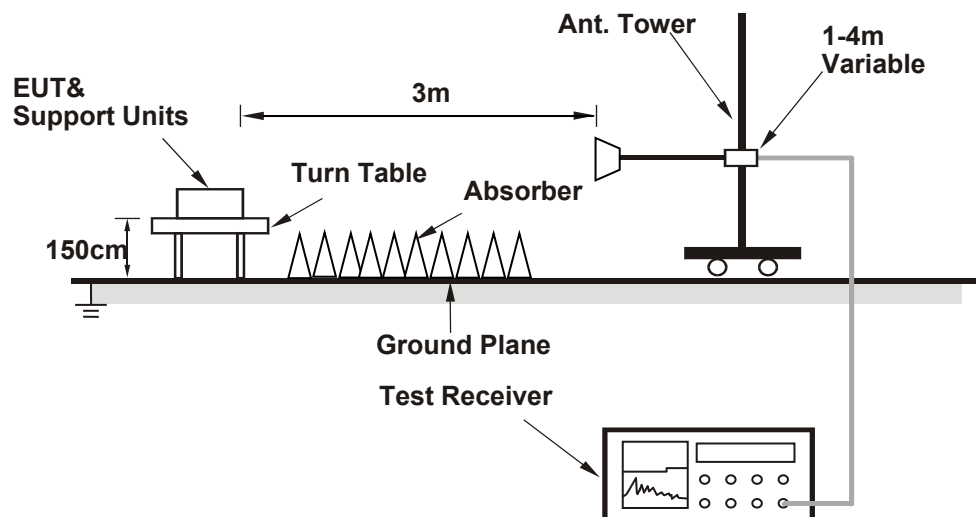
No deviation.

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

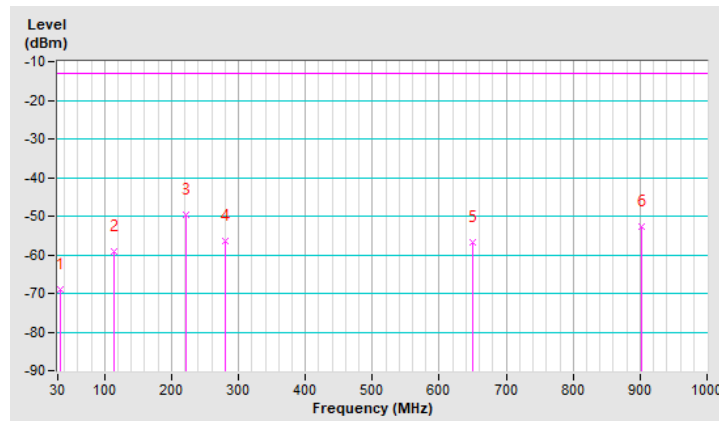
Below 1GHz
WCDMA Band 4

Mode	TX channel 1312 (1712.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee		

Antenna Polarity & Test Distance: Horizontal at 3 M								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	34.85	-69.10	-13.00	-56.10	1.00 H	309	45.71	-114.81
2	113.42	-59.25	-13.00	-46.25	1.50 H	30	57.00	-116.25
3	221.09	-49.70	-13.00	-36.70	1.00 H	256	67.15	-116.85
4	280.26	-56.40	-13.00	-43.40	2.00 H	10	56.90	-113.30
5	650.80	-56.67	-13.00	-43.67	1.50 H	304	48.28	-104.95
6	902.03	-52.73	-13.00	-39.73	1.00 H	222	48.71	-101.44

Remarks:

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

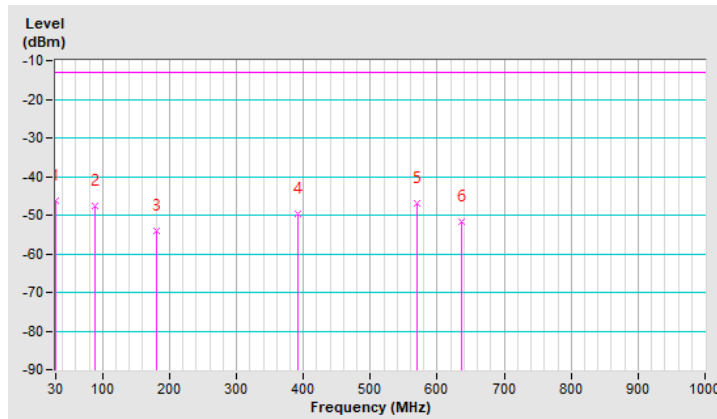


Mode	TX channel 1312 (1712.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee		

Antenna Polarity & Test Distance: Vertical at 3 M								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-46.17	-13.00	-33.17	1.00 V	115	68.93	-115.10
2	88.20	-47.48	-13.00	-34.48	1.50 V	106	71.76	-119.24
3	181.32	-54.21	-13.00	-41.21	1.00 V	198	60.89	-115.10
4	390.84	-49.59	-13.00	-36.59	1.50 V	293	61.03	-110.62
5	569.32	-46.98	-13.00	-33.98	1.50 V	31	59.71	-106.69
6	635.28	-51.76	-13.00	-38.76	1.50 V	287	53.37	-105.13

Remarks:

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



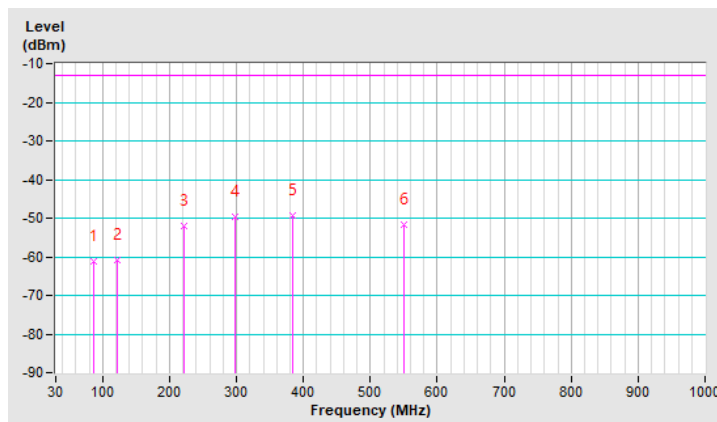
LTE Band 13, Channel Bandwidth: 10MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee		

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	87.23	-61.06	-13.00	-48.06	1.50 H	244	60.37	-121.43
2	122.15	-60.93	-13.00	-47.93	1.00 H	59	56.76	-117.69
3	221.09	-52.05	-13.00	-39.05	1.50 H	222	66.95	-119.00
4	298.69	-49.57	-13.00	-36.57	1.00 H	172	65.50	-115.07
5	383.08	-49.33	-13.00	-36.33	1.50 H	203	63.62	-112.95
6	549.92	-51.86	-13.00	-38.86	1.50 H	304	57.53	-109.39

Remarks:

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

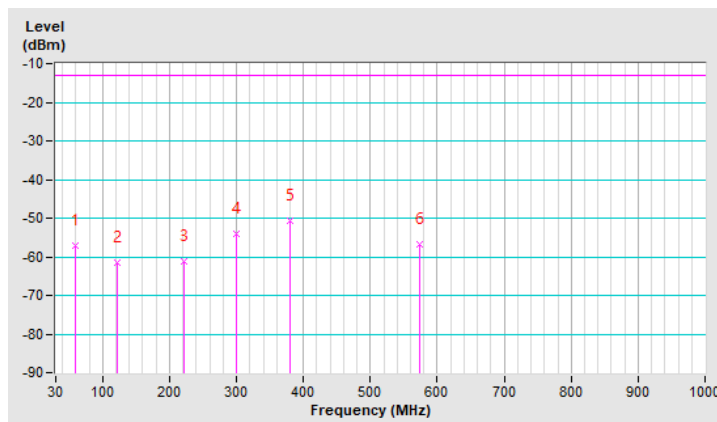


Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee		

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	60.07	-57.15	-13.00	-44.15	1.00 V	2	59.20	-116.35
2	121.18	-61.52	-13.00	-48.52	1.50 V	148	56.17	-117.69
3	222.06	-61.11	-13.00	-48.11	1.50 V	106	57.86	-118.97
4	299.66	-53.91	-13.00	-40.91	1.00 V	17	61.14	-115.05
5	379.20	-50.82	-13.00	-37.82	1.00 V	111	62.25	-113.07
6	574.17	-56.82	-13.00	-43.82	1.50 V	355	51.81	-108.63

Remarks:

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



Above 1GHz
WCDMA Band 4

Mode	TX channel 1312 (1712.4MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Randy Wu		

Antenna Polarity & Test Distance: Horizontal at 3 M								
No.	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3424.80	-50.20	-13.00	-37.20	1.67 H	222	46.66	-96.86
Antenna Polarity & Test Distance: Vertical at 3 M								
No.	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3424.80	-50.87	-13.00	-37.87	1.86 V	112	45.99	-96.86

Remarks:

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

LTE Band 13, Channel Bandwidth: 10MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	23deg. C, 69%RH	Input Power	120Vac, 60Hz
Tested By	Edison Lee		

Antenna Polarity & Test Distance: Horizontal at 3 M

No.	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1564.00	-44.88	-40.00	-4.88	1.33 H	353	57.20	-102.08

Antenna Polarity & Test Distance: Vertical at 3 M

No.	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1564.00	-48.63	-40.00	-8.63	1.09 V	121	53.45	-102.08

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV/m) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. Margin value = EIRP – Limit value
4. The other EIRP 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.

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Web Site: www.bureauveritas-adt.com

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

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