FCC Test Report

(PART 24)

Report No.:	RF200605C24-7 R1
FCC ID:	V65E7110
Test Model:	E7110
Received Date:	Jun. 29, 2020
Test Date:	Jul. 27 ~ Aug. 11, 2020
Issued Date:	Nov. 16, 2020
Applicant:	Kyocera Corporation ℅ Kyocera International, Inc.
Address:	8611 Balboa Avenue, San Diego, CA 92123
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
RF200605C24-7	Original Release	Oct. 16, 2020
RF200605C24-7 R1	Revise applicant, accessory information and add EDGE data	Nov. 16, 2020

1 Certificate of Conformity

Product:	Smart Phone
Brand:	Kyocera
Test Model:	E7110
Sample Status:	Identical Prototype
Applicant:	Kyocera Corporation ℅ Kyocera International, Inc.
Test Date:	Jul. 27 ~ Aug. 11, 2020
Standards:	FCC Part 24, Subpart E

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Gina Liu , **Date:** Nov. 16, 2020

Gina Liu / Specialist

Approved by : , **Date:** Nov. 16, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 24.232	Effective Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
24.232(d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -35.1 dB at 3819.60 MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	**Frequency**	**Expanded Uncertainty (k=2) (±)**
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	3.86 dB
	200 MHz ~ 1000 MHz	3.87 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101582	Mar. 31, 2020	Mar. 30, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	9120D	209	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-161	Nov. 08, 2019	Nov. 07, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 20, 2019	Aug. 19, 2020
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM- 8000	Cable-CH3-03 (309224+170907)	Aug. 20, 2019	Aug. 19, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber GIANT FORCE	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2019	Sep. 09, 2020
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun 06, 2020	Jun 05, 2021
DC power supply Keysight	U8002A	MY56330015	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 25, 2019	Dec. 24, 2020
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Jan. 18, 2020	Jan. 17, 2021
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2019	Nov. 24, 2020

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.

3 GENERAL INFORMATION

3.1 General Description of EUT

Product	Smart Phone	
Brand	Kyocera	
Test Model	E7110	
Status of EUT	Identical Prototype	
Power Supply Rating	3.85 Vdc (Battery) 5 Vdc / 9 Vdc / 12 Vdc (Adapter)	
Modulation Type	GSM/GPRS	GMSK
	EDGE	GMSK, 8PSK
	WCDMA	QPSK
	LTE	QPSK, 16QAM, 64QAM
Frequency Range	GSM/GPRS/EDGE	1850.2 ~ 1909.8 MHz
	WCDMA	1852.4 ~ 1907.6 MHz
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1909.3 MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1908.5 MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1907.5 MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1905.0 MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1902.5 MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1900.0 MHz
Max. EIRP Power	GSM/GPRS	1380.384 mW (31.4 dBm)
	EDGE	416.869 mW (26.2 dBm)
	WCDMA	323.594 mW (25.1 dBm)
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	281.838 mW (24.5 dBm)
	LTE Band 2 (Channel Bandwidth: 3 MHz)	275.423 mW (24.4 dBm)
	LTE Band 2 (Channel Bandwidth: 5 MHz)	269.153 mW (24.3 dBm)
	LTE Band 2 (Channel Bandwidth: 10 MHz)	288.403 mW (24.6 dBm)
	LTE Band 2 (Channel Bandwidth: 15 MHz)	275.423 mW (24.4 dBm)
	LTE Band 2 (Channel Bandwidth: 20 MHz)	275.423 mW (24.4 dBm)
Emission Designator	GSM/GPRS	245KGXW
	EDGE	244KG7W
	WCDMA	4M16F9W
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 2 (Channel Bandwidth: 3 MHz)	2M70D7W
	LTE Band 2 (Channel Bandwidth: 5 MHz)	4M49D7W
	LTE Band 2 (Channel Bandwidth: 10 MHz)	8M96D7W
	LTE Band 2 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 2 (Channel Bandwidth: 20 MHz)	17M9D7W
Antenna Type	Monopole Antenna with -1.5 dBi gain	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

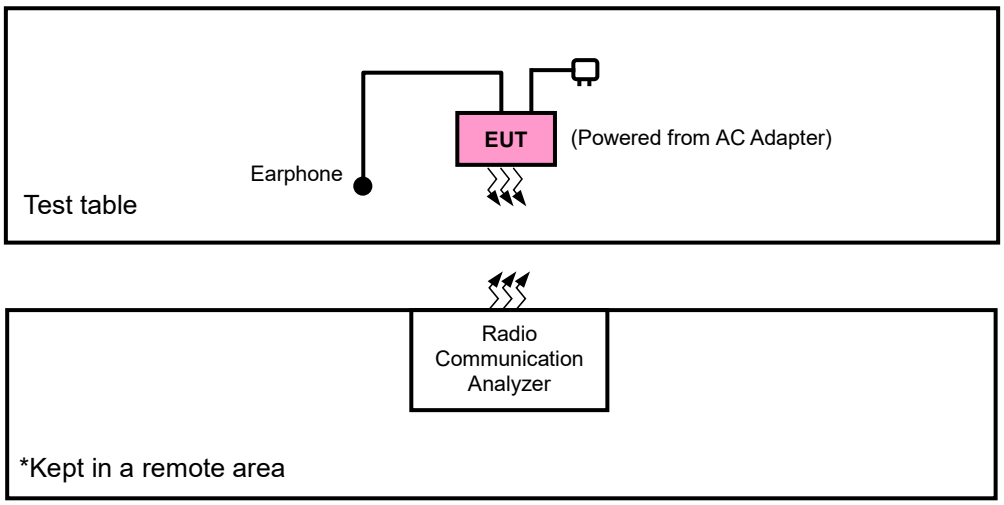
Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	Kyocera	SCP-53ADT	I/P: 100-240 Vac, 50/60 Hz, 0.6 A O/P: 5 Vdc, 3 A; 9 Vdc, 3 A; 15 Vdc, 1.8 A; 20 Vdc, 1.35 A
USB Cable	Kyocera	SCP-27SDC	-

2. 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. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3 Test Mode Applicability and Tested Channel Detail

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

Band	EIRP	Radiated Emission
GSM	X-plane	X-plane
EDGE	X-plane	X-plane
WCDMA	X-plane	X-plane
LTE Band 2	X-plane	X-plane

GSM

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	512 to 810	512, 661, 810	GSM, EDGE
-	Modulation Characteristics	512 to 810	661	GSM, EDGE
-	Frequency Stability	512 to 810	512, 810	GSM, EDGE
-	Occupied Bandwidth	512 to 810	512, 661, 810	GSM, EDGE
-	Band Edge	512 to 810	512, 810	GSM, EDGE
-	Peak to Average Ratio	512 to 810	512, 661, 810	GSM, EDGE
-	Conducted Emission	512 to 810	512, 661, 810	GSM, EDGE
-	Radiated Emission	512 to 810	512, 661, 810	GSM, EDGE

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

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
-	Modulation Characteristics	9262 to 9538	9400	WCDMA
-	Frequency Stability	9262 to 9538	9262, 9538	WCDMA
-	Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA
-	Band Edge	9262 to 9538	9262, 9538	WCDMA
-	Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA
-	Conducted Emission	9262 to 9538	9262, 9400, 9538	WCDMA
-	Radiated Emission	9262 to 9538	9262, 9400, 9538	WCDMA

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

LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM, 64QAM	3 RB / 1 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	18700 to 19100	18900	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Frequency Stability	18607 to 19193	18607, 19193	1.4 MHz	QPSK	6 RB / 0 RB Offset
		18615 to 19185	18615, 19185	3 MHz	QPSK	15 RB / 0 RB Offset
		18625 to 19175	18625, 19175	5 MHz	QPSK	25 RB / 0 RB Offset
		18650 to 19150	18650, 19150	10 MHz	QPSK	50 RB / 0 RB Offset
		18675 to 19125	18675, 19125	15 MHz	QPSK	75 RB / 0 RB Offset
		18700 to 19100	18700, 19100	20 MHz	QPSK	100 RB / 0 RB Offset
-	Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Peak to Average Ratio	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM, 64QAM	3 RB / 1 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Band Edge	18607 to 19193	18607	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19193	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18615 to 19185	18615	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			19185	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		18625 to 19175	18625	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			19175	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		18650 to 19150	18650	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			19150	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		18675 to 19125	18675	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			19125	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		18700 to 19100	18700	20 MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			19100	20 MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
-	Conducted Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	3 RB / 1 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	3 RB / 1 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. Therefore, only EIRP, modulation characteristics, occupied bandwidth and peak to average ratio items had been tested under QPSK, 16QAM, 64QAM mode, the other items were performed under QPSK mode only.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	26 deg. C, 58 % RH	120 Vac, 60 Hz	Titan Hsu, Luis Lee, Adair Peng
Modulation Characteristics	26 deg. C, 58 % RH	120 Vac, 60 Hz	Wayne Lin
Frequency Stability	26 deg. C, 58 % RH	3.85Vdc	Wayne Lin
Occupied Bandwidth	26 deg. C, 58 % RH	120 Vac, 60 Hz	Wayne Lin
Band Edge	26 deg. C, 58 % RH	120 Vac, 60 Hz	Wayne Lin
Peak to Average Ratio	26 deg. C, 58 % RH	120 Vac, 60 Hz	Wayne Lin
Conducted Emission	26 deg. C, 58 % RH	120 Vac, 60 Hz	Wayne Lin
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Noah Chang, Titan Hsu

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 24
ANSI 63.26-2015

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

References Test Guidance:
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016
3GPP TS 36.521-1 V16.3.0 (2019-12)

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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

4.1.2 Test Procedures

EIRP / ERP Measurement:

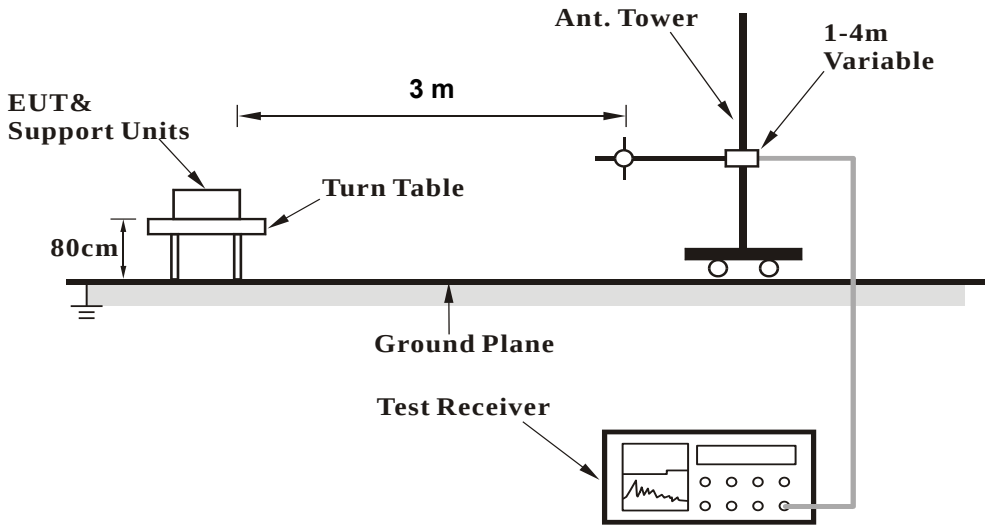
a. All measurements were done at low, middle and high operational frequency range. RBW is 1 MHz for GSM, GPRS & EDGE, and 5 MHz for WCDMA, and 5 MHz、10 MHz、15 MHz、20 MHz for LTE mode, VBW ≥ 3 x RBW.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

Conducted Power Measurement:

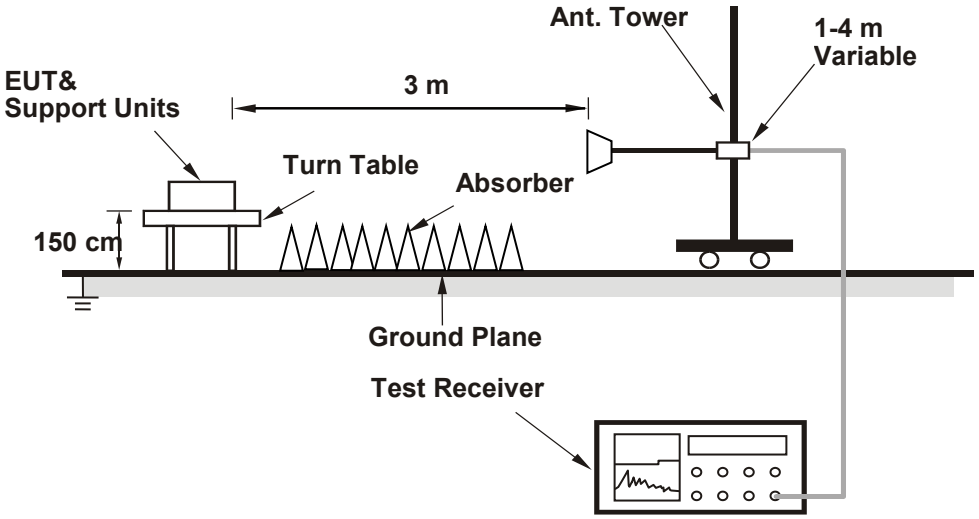
The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:
<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM (GMSK, 1Tx-slot)	**30.59**	30.54	30.19
GPRS (GMSK, 1Tx-slot)	30.05	30.00	29.65
GPRS (GMSK, 2Tx-slot)	26.69	26.64	26.29
GPRS (GMSK, 3Tx-slot)	24.84	24.79	24.44
GPRS (GMSK, 4Tx-slot)	23.42	23.37	23.02
EDGE (8PSK, 1Tx-slot)	25.33	25.28	24.93
EDGE (8PSK, 2Tx-slot)	22.47	22.42	22.07
EDGE (8PSK, 3Tx-slot)	20.61	20.56	20.21
EDGE (8PSK, 4Tx-slot)	19.42	19.37	19.02

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	23.86	**24.03**	23.52
HSDPA Subtest-1	22.75	22.77	22.31
HSDPA Subtest-2	22.77	22.87	22.35
HSDPA Subtest-3	22.24	22.37	21.85
HSDPA Subtest-4	22.25	22.35	21.84
HSUPA Subtest-1	22.89	23.13	22.64
HSUPA Subtest-2	20.85	20.87	20.51
HSUPA Subtest-3	21.80	21.90	21.47
HSUPA Subtest-4	20.87	20.91	20.50
HSUPA Subtest-5	22.90	23.00	22.50

LTE Band 2																
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		18700	18900	19100				Channel		18675	18900	19125	
		Frequency (MHz)		1860.0	1880.0	1900.0				Frequency (MHz)		1857.5	1880.0	1902.5	
20M	QPSK	1	0	**25.19**	25.13	24.94	0	15M	QPSK	1	0	25.17	25.15	24.93	0
		1	50	25.18	25.08	24.89	0			1	37	25.16	25.17	24.80	0
		1	99	25.17	25.10	24.68	0			1	74	25.12	25.08	24.65	0
		50	0	24.19	24.16	23.99	1			36	0	24.17	24.13	23.96	1
		50	25	24.09	24.11	23.97	1			36	19	24.15	24.16	23.95	1
		50	50	24.18	24.06	23.92	1			36	39	24.09	24.19	23.84	1
		100	0	24.16	24.10	24.03	1			75	0	24.08	24.00	23.93	1
	16QAM	1	0	24.19	24.06	24.11	1		16QAM	1	0	24.11	24.12	24.03	1
		1	50	24.10	24.09	23.92	1			1	37	24.14	24.18	23.90	1
		1	99	24.15	24.19	23.82	1			1	74	24.02	24.19	23.82	1
		50	0	23.20	23.11	22.80	2			36	0	23.06	23.04	22.72	2
		50	25	23.10	22.98	22.88	2			36	19	23.14	23.16	22.84	2
		50	50	22.98	23.10	22.79	2			36	39	23.19	23.10	22.74	2
		100	0	23.20	23.10	22.82	2			75	0	23.18	23.06	22.82	2
	64QAM	1	0	23.16	23.11	23.20	2		64QAM	1	0	23.19	23.15	23.16	2
		1	50	23.16	23.05	22.92	2			1	37	23.09	23.00	22.91	2
		1	99	23.14	23.04	22.87	2			1	74	23.17	23.17	22.77	2
		50	0	22.19	22.12	22.07	3			36	0	22.17	22.18	22.12	3
		50	25	22.16	22.06	22.05	3			36	19	22.14	22.08	22.15	3
		50	50	22.14	22.14	22.01	3			36	39	22.04	22.05	22.05	3
		100	0	22.12	22.06	22.03	3			75	0	22.07	22.06	22.13	3
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		18650	18900	19150				Channel		18625	18900	19175	
		Frequency (MHz)		1855.0	1880.0	1905.0				Frequency (MHz)		1852.5	1880.0	1907.5	
10M	QPSK	1	0	25.18	25.03	24.81	0	5M	QPSK	1	0	25.14	25.17	24.71	0
		1	24	25.10	25.08	24.73	0			1	12	25.14	25.15	24.71	0
		1	49	25.03	24.97	24.59	0			1	24	25.18	25.00	24.56	0
		25	0	24.11	24.12	23.82	1			12	0	24.15	24.01	23.85	1
		25	12	24.15	24.19	23.83	1			12	6	24.06	24.20	23.71	1
		25	25	24.20	24.15	23.81	1			12	13	24.04	24.18	23.73	1
		50	0	24.17	24.18	23.90	1			25	0	24.16	24.04	23.85	1
	16QAM	1	0	24.19	24.12	23.95	1		16QAM	1	0	24.06	24.19	23.93	1
		1	24	24.12	24.16	23.75	1			1	12	24.18	24.02	23.81	1
		1	49	24.11	24.15	23.65	1			1	24	24.06	24.10	23.73	1
		25	0	22.85	23.01	22.71	2			12	0	23.06	22.87	22.66	2
		25	12	23.19	23.09	22.87	2			12	6	23.02	23.12	22.77	2
		25	25	23.13	23.09	22.65	2			12	13	23.17	22.89	22.57	2
		50	0	23.06	22.90	22.62	2			25	0	22.98	22.87	22.66	2
	64QAM	1	0	23.20	23.20	23.07	2		64QAM	1	0	23.18	23.09	23.14	2
		1	24	23.04	22.95	22.89	2			1	12	23.00	22.95	22.75	2
		1	49	23.13	23.00	22.71	2			1	24	23.13	23.10	22.74	2
		25	0	22.07	22.09	22.17	3			12	0	22.09	22.00	22.07	3
		25	12	22.19	22.16	22.19	3			12	6	22.12	22.15	21.99	3
		25	25	22.11	22.10	22.08	3			12	13	22.07	22.09	22.07	3
		50	0	22.09	21.99	22.10	3			25	0	22.18	22.19	22.02	3
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		18615	18900	19185				Channel		18607	18900	19193	
		Frequency (MHz)		1851.5	1880.0	1908.5				Frequency (MHz)		1850.7	1880.0	1909.3	
3M	QPSK	1	0	25.16	25.15	24.63	0	1.4M	QPSK	1	0	25.13	25.08	24.91	0
		1	7	25.15	25.06	24.71	0			1	2	25.12	25.15	24.71	0
		1	14	25.12	25.02	24.45	0			1	5	25.18	25.08	24.51	0
		8	0	24.16	24.12	23.81	1			3	0	25.11	25.12	24.93	0
		8	3	24.10	24.10	23.83	1			3	1	25.12	25.13	24.92	0
		8	7	24.16	24.10	23.72	1			3	3	**25.19**	25.04	24.79	0
		15	0	24.19	24.09	23.77	1			6	0	24.19	24.09	23.92	1
	16QAM	1	0	24.16	24.19	23.92	1		16QAM	1	0	24.14	24.16	23.92	1
		1	7	24.20	24.07	23.79	1			1	2	24.11	24.13	23.85	1
		1	14	24.10	24.06	23.75	1			1	5	24.20	24.05	23.70	1
		8	0	22.90	22.96	22.65	2			3	0	23.87	23.96	23.71	1
		8	3	23.05	23.17	22.87	2			3	1	24.03	23.98	23.87	1
		8	7	23.10	23.01	22.66	2			3	3	24.08	23.98	23.77	1
		15	0	23.16	22.96	22.65	2			6	0	23.15	22.93	22.67	2
	64QAM	1	0	23.15	23.04	23.10	2		64QAM	1	0	23.20	23.12	23.12	2
		1	7	22.97	23.02	22.80	2			1	2	23.04	22.98	22.75	2
		1	14	23.12	23.02	22.74	2			1	5	23.09	23.03	22.69	2
		8	0	22.11	22.02	22.07	3			3	0	23.13	23.07	23.14	2
		8	3	22.15	22.17	22.09	3			3	1	23.11	23.17	23.13	2
		8	7	22.11	22.16	22.07	3			3	3	22.97	22.96	22.93	2
		15	0	22.16	22.19	22.07	3			6	0	21.95	21.98	21.94	3

EIRP Power (dBm)

GSM1900

MODE		TX channel 512, 661, 810					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.10	-9.5	30.4	1.0	31.4	33.0	-1.6
2	1880.00	-10.0	30.1	1.1	31.2	33.0	-1.8
3	1909.80	-10.5	29.9	1.1	31.0	33.0	-2.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.20	-11.0	27.8	1.0	28.8	33.0	-4.2
2	1880.00	-11.4	27.1	1.1	28.2	33.0	-4.8
3	1909.80	-11.5	26.9	1.1	28.0	33.0	-5.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

EDGE1900

MODE		TX channel 512, 661, 810					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.10	-14.7	25.2	1.0	26.2	33.0	-6.8
2	1880.00	-15.5	24.6	1.1	25.7	33.0	-7.3
3	1909.80	-15.9	24.5	1.1	25.6	33.0	-7.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.20	-16.3	22.5	1.0	23.5	33.0	-9.5
2	1880.00	-16.6	21.9	1.1	23.0	33.0	-10.0
3	1909.80	-16.5	21.9	1.1	23.0	33.0	-10.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

WCDMA Band 2

MODE		TX channel 9262, 9400, 9538					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.40	-15.8	24.1	1.0	25.1	33.0	-7.9
2	1880.00	-16.1	24.0	1.1	25.1	33.0	-7.9
3	1907.60	-16.9	23.5	1.1	24.6	33.0	-8.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.40	-22.7	16.1	1.0	17.1	33.0	-15.9
2	1880.00	-23.2	15.3	1.1	16.4	33.0	-16.6
3	1907.60	-23.6	14.8	1.1	15.9	33.0	-17.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: QPSK

LTE Band 2, Channel Bandwidth 1.4MHz

MODE	TX channel 18607, 18900, 19193						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-15.7	23.2	1.0	24.2	33.0	-8.8
2	1880.00	-15.9	23.4	1.1	24.5	33.0	-8.5
3	1909.30	-17.1	22.6	1.1	23.7	33.0	-9.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-23.1	15.3	1.0	16.3	33.0	-16.7
2	1880.00	-23.0	15.4	1.1	16.5	33.0	-16.5
3	1909.30	-23.6	14.9	1.1	16.0	33.0	-17.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 3MHz

MODE	TX channel 18615, 18900, 19185						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-15.6	23.3	1.0	24.3	33.0	-8.7
2	1880.00	-16.0	23.3	1.1	24.4	33.0	-8.6
3	1908.50	-16.5	23.2	1.1	24.3	33.0	-8.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-22.8	15.6	1.0	16.6	33.0	-16.4
2	1880.00	-22.6	15.8	1.1	16.9	33.0	-16.1
3	1908.50	-22.6	15.9	1.1	17.0	33.0	-16.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 5MHz

MODE	TX channel 18625, 18900, 19175						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-16.0	22.9	1.0	23.9	33.0	-9.1
2	1880.00	-16.1	23.2	1.1	24.3	33.0	-8.7
3	1907.50	-17.0	22.7	1.1	23.8	33.0	-9.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-22.8	15.6	1.0	16.6	33.0	-16.4
2	1880.00	-22.8	15.6	1.1	16.7	33.0	-16.3
3	1907.50	-22.7	15.8	1.1	16.9	33.0	-16.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 10MHz

MODE		TX channel 18650, 18900, 19150					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-15.8	23.1	1.0	24.1	33.0	-8.9
2	1880.00	-15.8	23.5	1.1	24.6	33.0	-8.4
3	1905.00	-16.4	23.2	1.1	24.3	33.0	-8.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-22.6	15.8	1.0	16.8	33.0	-16.2
2	1880.00	-22.9	15.5	1.1	16.6	33.0	-16.4
3	1905.00	-22.8	15.7	1.1	16.8	33.0	-16.2

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 15MHz

MODE		TX channel 18675, 18900, 19125					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-16.0	22.9	1.1	24.0	33.0	-9.0
2	1880.00	-16.0	23.3	1.1	24.4	33.0	-8.6
3	1902.50	-16.3	23.3	1.1	24.4	33.0	-8.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-22.5	15.8	1.1	16.9	33.0	-16.1
2	1880.00	-23.0	15.4	1.1	16.5	33.0	-16.5
3	1902.50	-22.6	15.9	1.1	17.0	33.0	-16.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 20MHz

MODE		TX channel 18700, 18900, 19100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-15.9	23.0	1.1	24.1	33.0	-8.9
2	1880.00	-16.0	23.3	1.1	24.4	33.0	-8.6
3	1900.00	-16.8	22.8	1.1	23.9	33.0	-9.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-23.1	15.2	1.1	16.3	33.0	-16.7
2	1880.00	-23.4	15.0	1.1	16.1	33.0	-16.9
3	1900.00	-22.6	15.8	1.1	16.9	33.0	-16.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: 16QAM

LTE Band 2, Channel Bandwidth 1.4MHz

MODE		TX channel 18607, 18900, 19193					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-16.9	22.0	1.0	23.0	33.0	-10.0
2	1880.00	-16.8	22.5	1.1	23.6	33.0	-9.4
3	1909.30	-18.3	21.4	1.1	22.5	33.0	-10.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-24.0	14.4	1.0	15.4	33.0	-17.6
2	1880.00	-23.9	14.5	1.1	15.6	33.0	-17.4
3	1909.30	-24.4	14.0	1.1	15.1	33.0	-17.9

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 3MHz

MODE		TX channel 18615, 18900, 19185					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-16.5	22.4	1.0	23.4	33.0	-9.6
2	1880.00	-17.1	22.2	1.1	23.3	33.0	-9.7
3	1908.50	-17.3	22.4	1.1	23.5	33.0	-9.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-23.6	14.8	1.0	15.8	33.0	-17.2
2	1880.00	-23.4	15.0	1.1	16.1	33.0	-16.9
3	1908.50	-23.9	14.6	1.1	15.7	33.0	-17.3

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 5MHz

MODE		TX channel 18625, 18900, 19175					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-16.9	22.0	1.0	23.0	33.0	-10.0
2	1880.00	-16.8	22.5	1.1	23.6	33.0	-9.4
3	1907.50	-18.2	21.5	1.1	22.6	33.0	-10.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-23.7	14.7	1.0	15.7	33.0	-17.3
2	1880.00	-23.6	14.8	1.1	15.9	33.0	-17.1
3	1907.50	-24.0	14.5	1.1	15.6	33.0	-17.4

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 10MHz

MODE		TX channel 18650, 18900, 19150					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-16.7	22.2	1.0	23.2	33.0	-9.8
2	1880.00	-17.0	22.3	1.1	23.4	33.0	-9.6
3	1905.00	-17.6	22.0	1.1	23.1	33.0	-9.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-23.4	15.0	1.0	16.0	33.0	-17.0
2	1880.00	-24.0	14.4	1.1	15.5	33.0	-17.5
3	1905.00	-23.9	14.6	1.1	15.7	33.0	-17.3

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 15MHz

MODE		TX channel 18675, 18900, 19125					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-17.2	21.7	1.1	22.8	33.0	-10.2
2	1880.00	-16.9	22.4	1.1	23.5	33.0	-9.5
3	1902.50	-17.4	22.2	1.1	23.3	33.0	-9.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-23.2	15.1	1.1	16.2	33.0	-16.8
2	1880.00	-23.9	14.5	1.1	15.6	33.0	-17.4
3	1902.50	-24.0	14.5	1.1	15.6	33.0	-17.4

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 20MHz

MODE		TX channel 18700, 18900, 19100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-16.5	22.4	1.1	23.5	33.0	-9.5
2	1880.00	-17.0	22.3	1.1	23.4	33.0	-9.6
3	1900.00	-18.1	21.5	1.1	22.6	33.0	-10.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-23.9	14.4	1.1	15.5	33.0	-17.5
2	1880.00	-24.2	14.2	1.1	15.3	33.0	-17.7
3	1900.00	-23.4	15.0	1.1	16.1	33.0	-16.9

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: 64QAM

LTE Band 2, Channel Bandwidth 1.4MHz

MODE	TX channel 18607, 18900, 19193						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-17.7	21.2	1.0	22.2	33.0	-10.8
2	1880.00	-17.2	22.1	1.1	23.2	33.0	-9.8
3	1909.30	-18.2	21.5	1.1	22.6	33.0	-10.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1850.70	-24.4	14.0	1.0	15.0	33.0	-18.0
2	1880.00	-24.4	14.0	1.1	15.1	33.0	-17.9
3	1909.30	-24.9	13.6	1.1	14.7	33.0	-18.3

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 3MHz

MODE	TX channel 18615, 18900, 19185						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-16.9	22.0	1.0	23.0	33.0	-10.0
2	1880.00	-18.1	21.2	1.1	22.3	33.0	-10.7
3	1908.50	-18.3	21.4	1.1	22.5	33.0	-10.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1851.50	-24.0	14.4	1.0	15.4	33.0	-17.6
2	1880.00	-23.8	14.6	1.1	15.7	33.0	-17.3
3	1908.50	-24.3	14.2	1.1	15.3	33.0	-17.7

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 5MHz

MODE	TX channel 18625, 18900, 19175						
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-17.5	21.4	1.0	22.4	33.0	-10.6
2	1880.00	-18.3	21.0	1.1	22.1	33.0	-10.9
3	1907.50	-18.7	21.0	1.1	22.1	33.0	-10.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1852.50	-24.1	14.3	1.0	15.3	33.0	-17.7
2	1880.00	-24.1	14.3	1.1	15.4	33.0	-17.6
3	1907.50	-24.5	14.0	1.1	15.1	33.0	-17.9

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 10MHz

MODE		TX channel 18650, 18900, 19150					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-17.0	21.9	1.0	22.9	33.0	-10.1
2	1880.00	-17.6	21.7	1.1	22.8	33.0	-10.2
3	1905.00	-18.3	21.3	1.1	22.4	33.0	-10.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1855.00	-23.9	14.5	1.0	15.5	33.0	-17.5
2	1880.00	-24.4	14.0	1.1	15.1	33.0	-17.9
3	1905.00	-24.4	14.1	1.1	15.2	33.0	-17.8

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 15MHz

MODE		TX channel 18675, 18900, 19125					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-17.5	21.4	1.1	22.5	33.0	-10.5
2	1880.00	-17.8	21.5	1.1	22.6	33.0	-10.4
3	1902.50	-17.8	21.8	1.1	22.9	33.0	-10.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1857.50	-23.6	14.7	1.1	15.8	33.0	-17.2
2	1880.00	-24.3	14.1	1.1	15.2	33.0	-17.8
3	1902.50	-24.6	13.9	1.1	15.0	33.0	-18.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 2, Channel Bandwidth 20MHz

MODE		TX channel 18700, 18900, 19100					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-17.3	21.6	1.1	22.7	33.0	-10.3
2	1880.00	-17.4	21.9	1.1	23.0	33.0	-10.0
3	1900.00	-18.7	20.9	1.1	22.0	33.0	-11.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1860.00	-24.4	13.9	1.1	15.0	33.0	-18.0
2	1880.00	-25.0	13.4	1.1	14.5	33.0	-18.5
3	1900.00	-23.9	14.5	1.1	15.6	33.0	-17.4

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

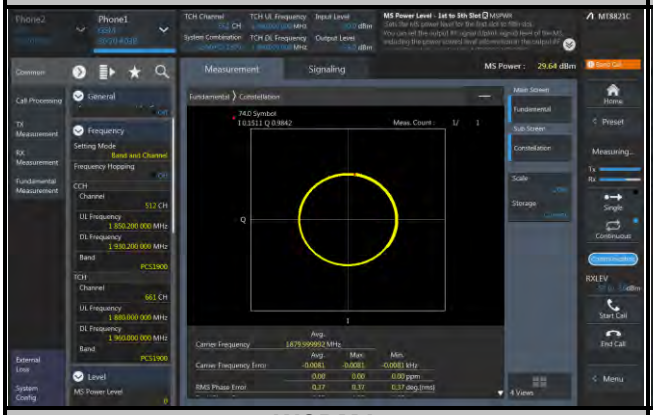
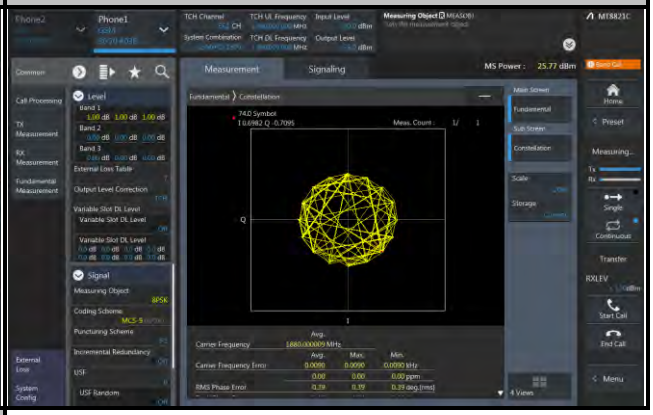
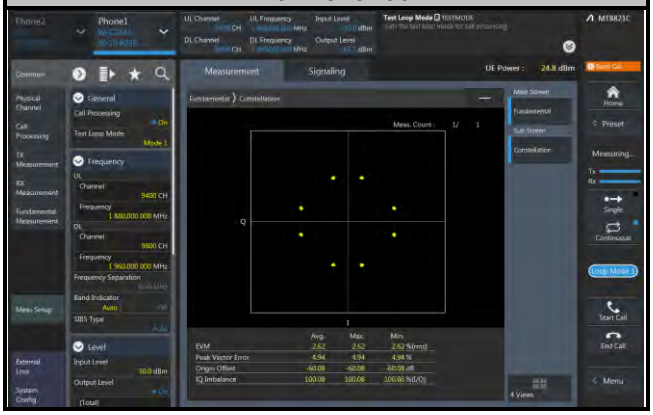
N/A

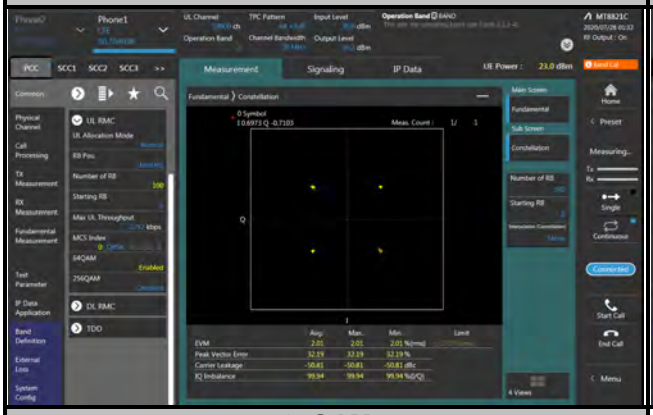
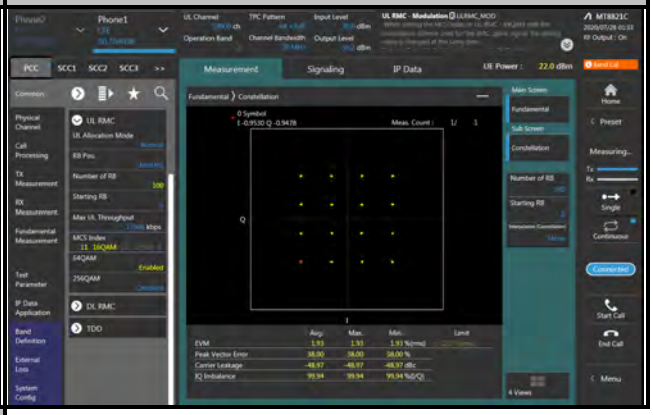
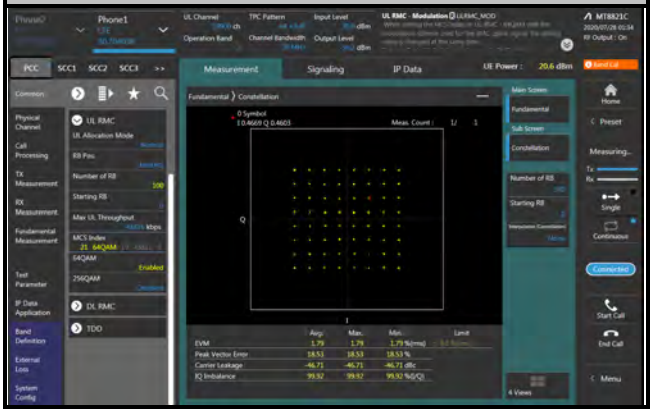
4.2.2 Test Setup

4.2.3 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

Spectrum Plot of Measurement	
GSM	**EDGE**
Channel 661	**Channel 661**
	
WCDMA	
Channel 9400	
	

Spectrum Plot of Measurement	
LTE Band 2	
Channel 18900	
QPSK	16QAM
	
64QAM	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

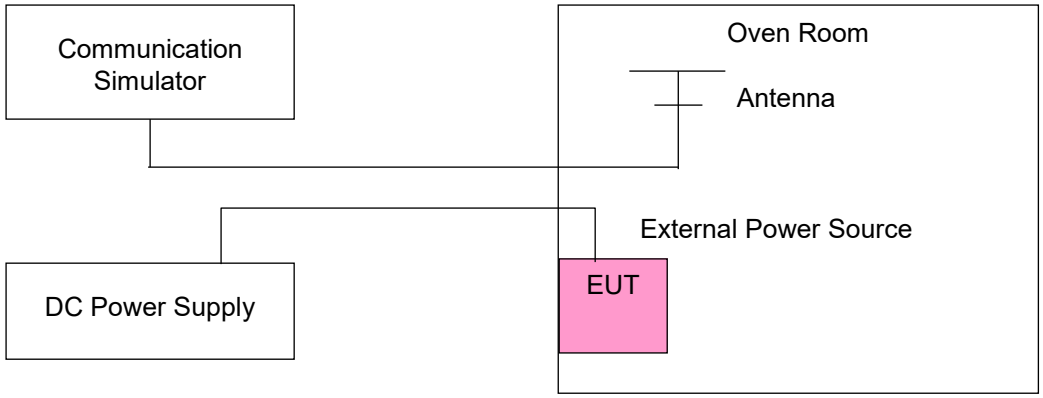
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.3.2 Test Procedure

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	GSM			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1850.200003	0.002	1909.800002	0.001
3.2	1850.200002	0.001	1909.800001	0.001
4.2	1850.200002	0.001	1909.800004	0.002

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

c.

Frequency Error vs. Temperature

Temp. (℃)	GSM			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1850.200003	0.002	1909.800002	0.001
-10	1850.199998	-0.001	1909.799998	-0.001
0	1850.199997	-0.002	1909.799997	-0.002
10	1850.199999	-0.001	1909.799997	-0.002
20	1850.199996	-0.002	1909.799998	-0.001
30	1850.199997	-0.002	1909.799999	-0.001
40	1850.199998	-0.001	1909.799996	-0.002
50	1850.199998	-0.001	1909.799996	-0.002
60	1850.199997	-0.002	1909.799999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1850.200004	0.002	1909.800002	0.001
3.2	1850.200002	0.001	1909.800003	0.002
4.2	1850.200001	0.001	1909.800003	0.002

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1850.200002	0.001	1909.800003	0.002
-10	1850.199998	-0.001	1909.799999	-0.001
0	1850.199998	-0.001	1909.799997	-0.002
10	1850.199997	-0.002	1909.799999	-0.001
20	1850.199996	-0.002	1909.799999	-0.001
30	1850.199998	-0.001	1909.799996	-0.002
40	1850.199999	-0.001	1909.799996	-0.002
50	1850.199998	-0.001	1909.799998	-0.001
60	1850.199996	-0.002	1909.799997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1852.400004	0.002	1907.600001	0.001
3.2	1852.400003	0.002	1907.600003	0.002
4.2	1852.400001	0.001	1907.600002	0.001

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1852.400003	0.002	1907.600002	0.001
-10	1852.399998	-0.001	1907.599998	-0.001
0	1852.399999	-0.001	1907.599996	-0.002
10	1852.399997	-0.002	1907.599996	-0.002
20	1852.399996	-0.002	1907.599998	-0.001
30	1852.399998	-0.001	1907.599997	-0.001
40	1852.399999	-0.001	1907.599998	-0.001
50	1852.399998	-0.001	1907.599997	-0.002
60	1852.399997	-0.002	1907.599998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1850.700001	0.001	1909.300000	-0.002
3.2	1850.700002	0.001	1909.299996	-0.002
4.2	1850.700003	0.002	1909.299997	-0.002

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1850.700003	0.001	1909.300002	0.001
-10	1850.699998	-0.001	1909.300002	0.001
0	1850.699996	-0.002	1909.300002	0.001
10	1850.699997	-0.002	1909.300004	0.002
20	1850.699998	-0.001	1909.299997	-0.002
30	1850.699999	-0.001	1909.299996	-0.002
40	1850.699997	-0.001	1909.299996	-0.002
50	1850.699998	-0.001	1909.299999	-0.001
60	1850.699996	-0.002	1909.299996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1851.500003	0.001	1908.499998	-0.001
3.2	1851.500004	0.002	1908.499997	-0.001
4.2	1851.500004	0.002	1908.499998	-0.001

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1851.500004	0.002	1908.500002	0.001
-10	1851.499997	-0.001	1908.500003	0.002
0	1851.499996	-0.002	1908.500004	0.002
10	1851.499996	-0.002	1908.500002	0.001
20	1851.499998	-0.001	1908.499997	-0.001
30	1851.499998	-0.001	1908.499997	-0.002
40	1851.499996	-0.002	1908.499996	-0.002
50	1851.499996	-0.002	1908.499998	-0.001
60	1851.499996	-0.002	1908.499996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1852.500003	0.002	1907.499997	-0.002
3.2	1852.500003	0.002	1907.499997	-0.002
4.2	1852.500002	0.001	1907.499998	-0.001

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1852.500002	0.001	1907.500003	0.002
-10	1852.499997	-0.002	1907.500003	0.001
0	1852.499997	-0.001	1907.500003	0.002
10	1852.499998	-0.001	1907.500003	0.002
20	1852.499998	-0.001	1907.499999	-0.001
30	1852.499996	-0.002	1907.499999	-0.001
40	1852.499998	-0.001	1907.499998	-0.001
50	1852.499999	-0.001	1907.499996	-0.002
60	1852.499997	-0.002	1907.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1855.000002	0.001	1904.999998	-0.001
3.2	1855.000004	0.002	1904.999996	-0.002
4.2	1855.000001	0.001	1904.999996	-0.002

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1855.000004	0.002	1905.000003	0.002
-10	1854.999997	-0.001	1905.000003	0.002
0	1854.999998	-0.001	1905.000002	0.001
10	1854.999997	-0.001	1905.000002	0.001
20	1854.999996	-0.002	1904.999999	-0.001
30	1854.999996	-0.002	1904.999997	-0.002
40	1854.999996	-0.002	1904.999999	-0.001
50	1854.999998	-0.001	1904.999998	-0.001
60	1854.999997	-0.002	1904.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1857.500002	0.001	1902.499997	-0.001
3.2	1857.500004	0.002	1902.499997	-0.002
4.2	1857.500003	0.002	1902.499997	-0.002

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1857.500002	0.001	1902.500001	0.001
-10	1857.499996	-0.002	1902.500003	0.001
0	1857.499997	-0.001	1902.500002	0.001
10	1857.499997	-0.001	1902.500004	0.002
20	1857.499997	-0.001	1902.499998	-0.001
30	1857.499997	-0.002	1902.499997	-0.002
40	1857.499996	-0.002	1902.499997	-0.002
50	1857.499997	-0.002	1902.499997	-0.002
60	1857.499998	-0.001	1902.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1860.000003	0.001	1899.999997	-0.002
3.2	1860.000001	0.001	1899.999996	-0.002
4.2	1860.000001	0.001	1899.999997	-0.001

Note: The applicant defined the normal working voltage is from 3.2 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

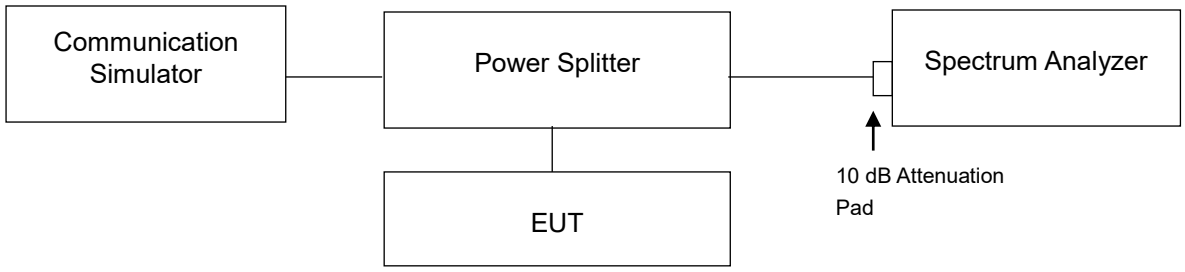
Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-20	1860.000004	0.002	1900.000002	0.001
-10	1859.999998	-0.001	1900.000004	0.002
0	1859.999997	-0.002	1900.000002	0.001
10	1859.999997	-0.002	1900.000002	0.001
20	1859.999998	-0.001	1899.999998	-0.001
30	1859.999998	-0.001	1899.999998	-0.001
40	1859.999997	-0.002	1899.999998	-0.001
50	1859.999999	-0.001	1899.999999	-0.001
60	1859.999998	-0.001	1899.999997	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

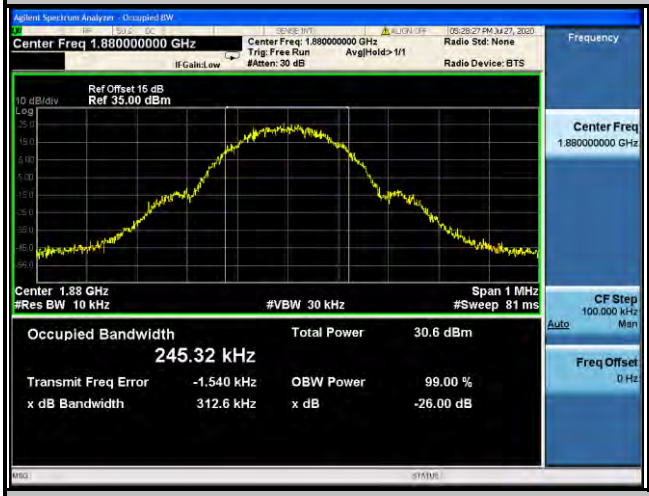
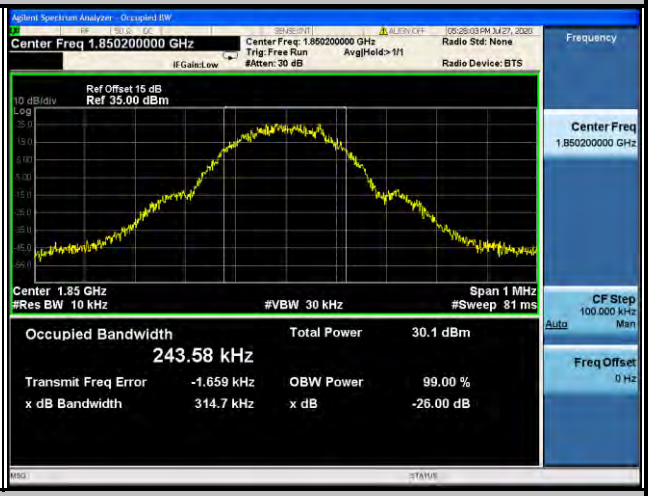
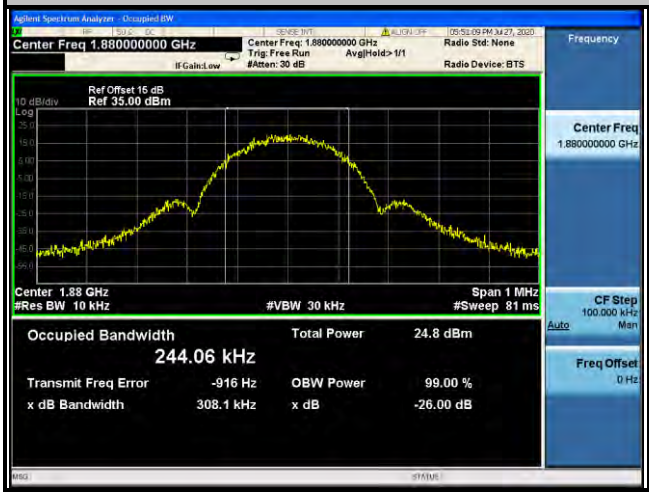
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.2 Test Setup



4.4.3 Test Result

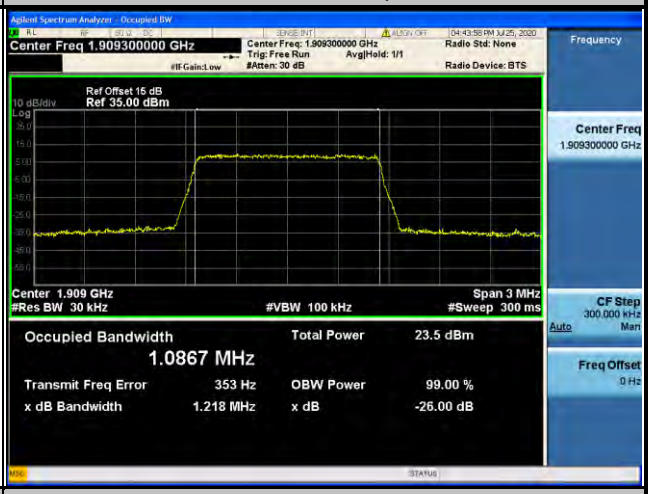
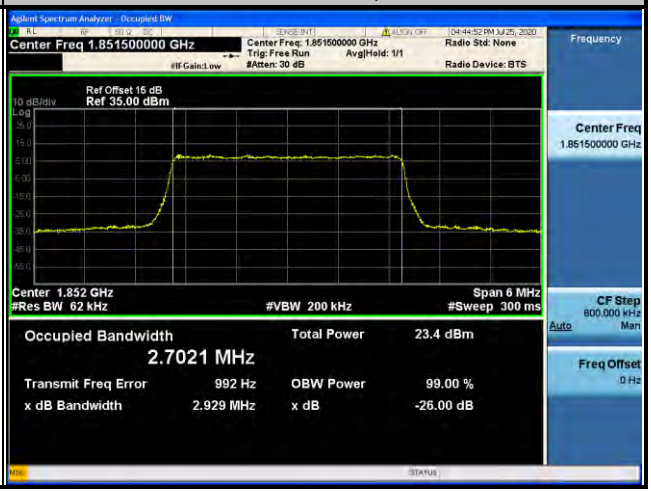
GSM				EDGE			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)	Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	243.58	314.70	512	1850.2	242.54	302.20
661	1880.0	245.32	312.60	661	1880.0	244.06	308.10
810	1909.8	244.23	306.70	810	1909.8	242.66	305.20

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
GSM	
	
EDGE	
	

WCDMA			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1543	4.734
9400	1880.0	4.1588	4.730
9538	1907.6	4.1552	4.738

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
WCDMA	

LTE Band 2							
Channel Bandwidth: 1.4 MHz							
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**			**26 dB Bandwidth (MHz)**		
		QPSK	**16QAM**	**64QAM**	**QPSK**	**16QAM**	**64QAM**
18607	1850.7	1.0846	1.0892	1.0865	1.210	1.216	1.211
18900	1880.0	1.0859	1.0880	1.0867	1.209	1.211	1.217
19193	1909.3	1.0858	1.0876	1.0867	1.213	1.214	1.218
Channel Bandwidth: 3 MHz							
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**			**26 dB Bandwidth (MHz)**		
		QPSK	**16QAM**	**64QAM**	**QPSK**	**16QAM**	**64QAM**
18615	1851.5	2.6988	2.6939	2.7021	2.908	2.924	2.929
18900	1880.0	2.6991	2.6965	2.7011	2.912	2.916	2.928
19185	1908.5	2.6973	2.6944	2.7003	2.911	2.924	2.927

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
1.4 MHz / 16QAM	**1.4 MHz / 64QAM**
	
3 MHz / 64QAM	**3 MHz / 64QAM**
	

LTE Band 2							
Channel Bandwidth: 5 MHz							
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**			**26 dB Bandwidth (MHz)**		
		QPSK	**16QAM**	**64QAM**	**QPSK**	**16QAM**	**64QAM**
18625	1852.5	4.4853	4.4850	4.4873	4.782	4.798	4.796
18900	1880.0	4.4850	4.4878	4.4911	4.800	4.791	4.807
19175	1907.5	4.4869	4.4882	4.4873	4.809	4.807	4.796
Channel Bandwidth: 10 MHz							
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**			**26 dB Bandwidth (MHz)**		
		QPSK	**16QAM**	**64QAM**	**QPSK**	**16QAM**	**64QAM**
18650	1855.0	8.9538	8.9542	8.9510	9.496	9.503	9.514
18900	1880.0	8.9533	8.9608	8.9553	9.501	9.514	9.504
19150	1905.0	8.9571	8.9547	8.9550	9.487	9.507	9.498

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
5 MHz / 64QAM	**5 MHz / QPSK**
	
10 MHz / 16QAM	**10 MHz / 16QAM**
	

LTE Band 2							
Channel Bandwidth: 15 MHz							
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**			**26 dB Bandwidth (MHz)**		
		QPSK	**16QAM**	**64QAM**	**QPSK**	**16QAM**	**64QAM**
18675	1857.5	13.452	13.438	13.440	14.25	14.25	14.25
18900	1880.0	13.454	13.443	13.437	14.26	14.26	14.22
19125	1902.5	13.460	13.453	13.446	14.24	14.25	14.24
Channel Bandwidth: 20 MHz							
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**			**26 dB Bandwidth (MHz)**		
		QPSK	**16QAM**	**64QAM**	**QPSK**	**16QAM**	**64QAM**
18700	1860.0	17.911	17.921	17.932	19.01	19.01	19.03
18900	1880.0	17.918	17.944	17.939	19.01	19.03	19.01
19100	1900.0	17.929	17.939	17.934	19.03	19.02	19.03

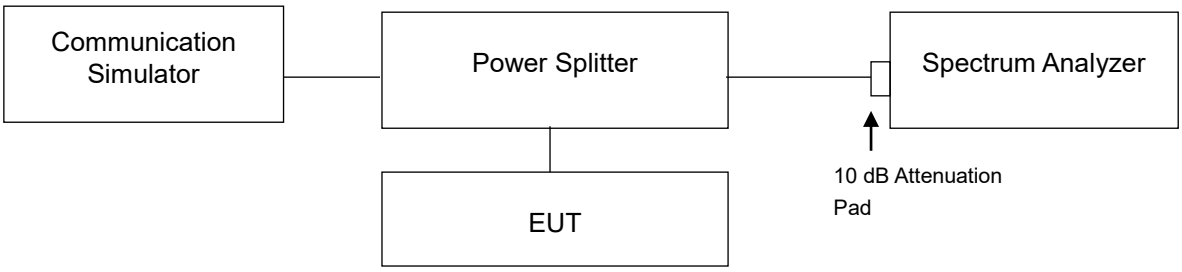
Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
15 MHz / QPSK	**15 MHz / QPSK**
	
20 MHz / 16QAM	**20 MHz / 16QAM**
	

4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

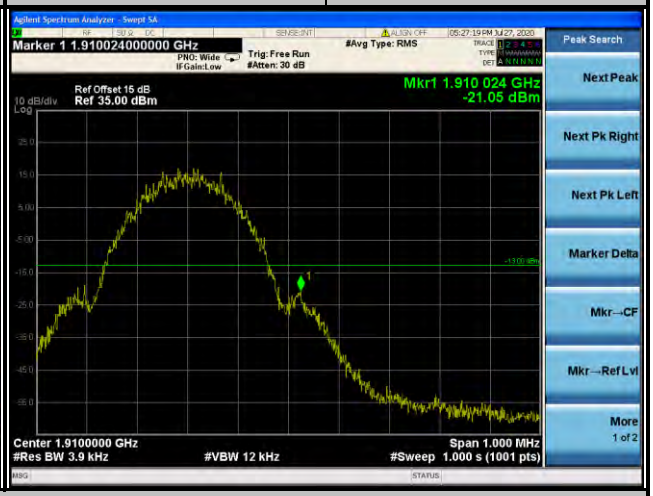
4.5.2 Test Setup



4.5.3 Test Procedures

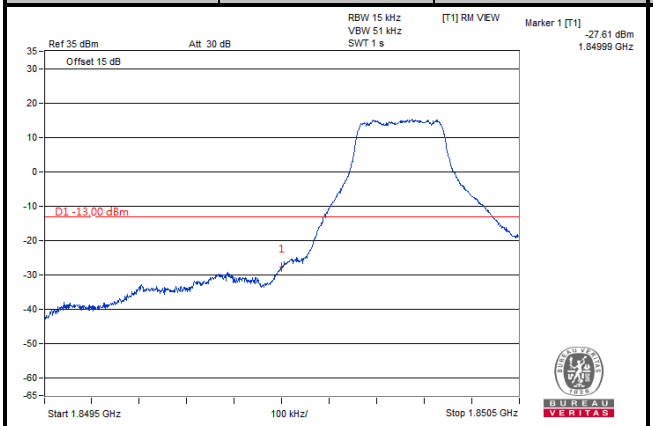
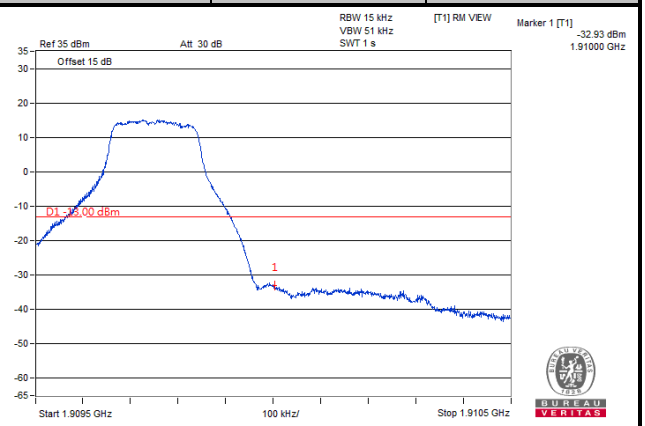
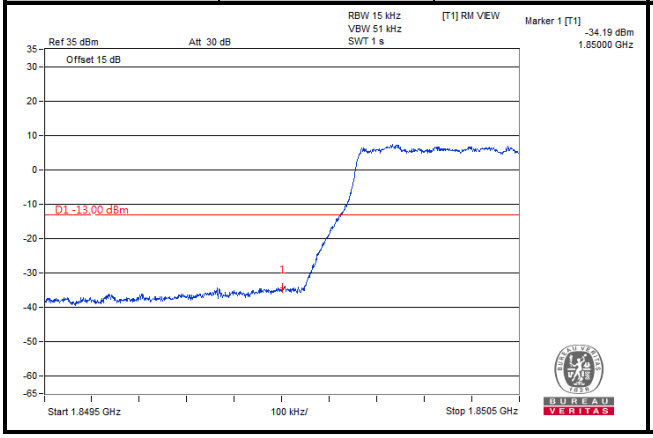
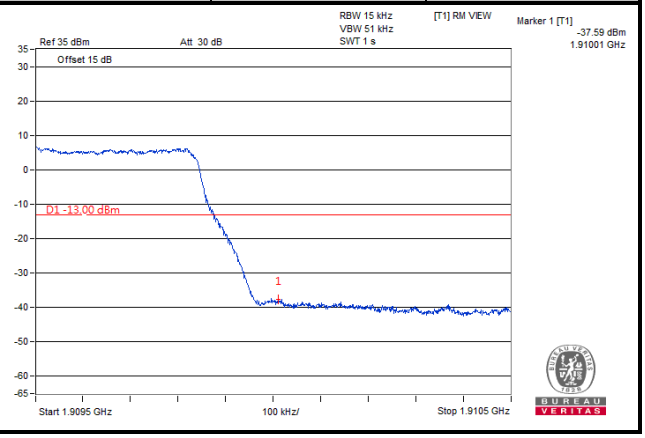
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 3.9 kHz and VB of the spectrum is 12 kHz (GSM/GPRS/EDGE).
c. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (WCDMA).
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (LTE Bandwidth 5 MHz).
g. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
h. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
i. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (LTE Bandwidth 20 MHz).
j. Record the max trace plot into the test report.

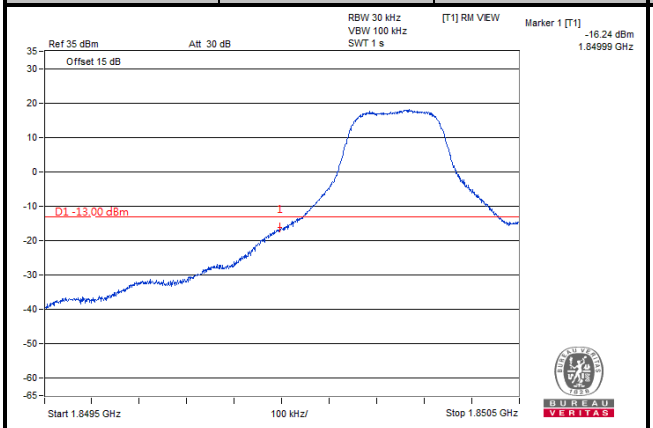
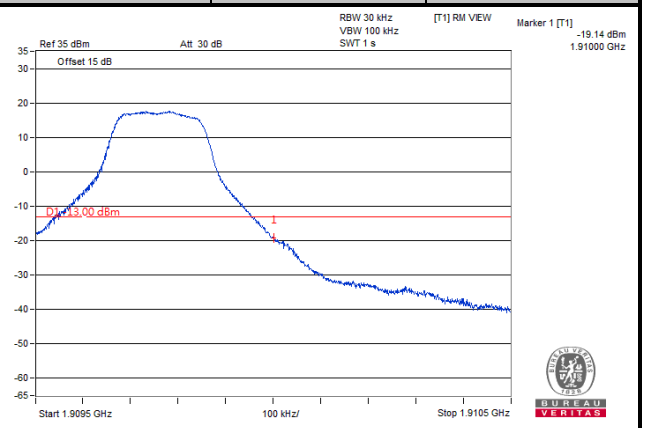
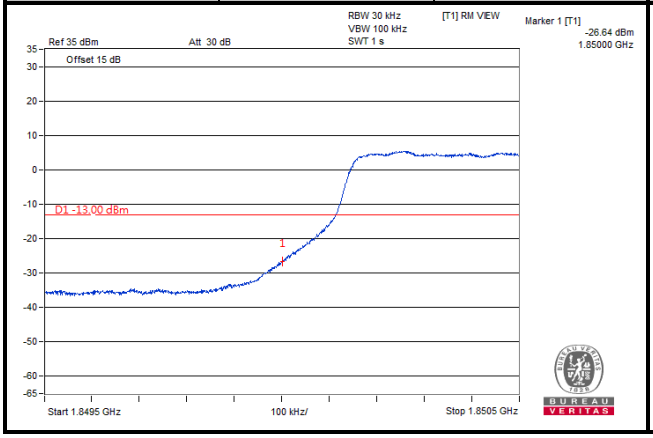
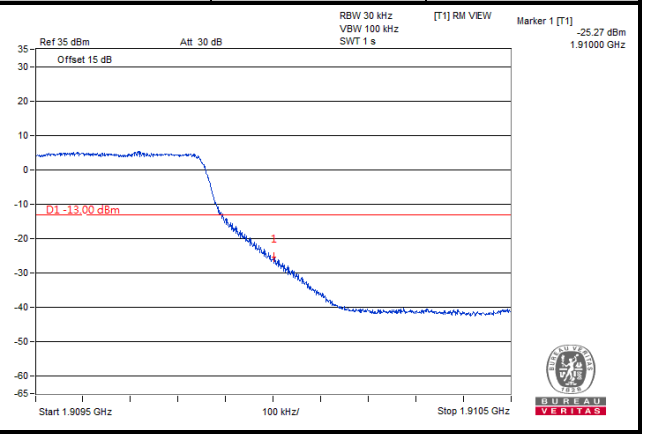
4.5.4 Test Results

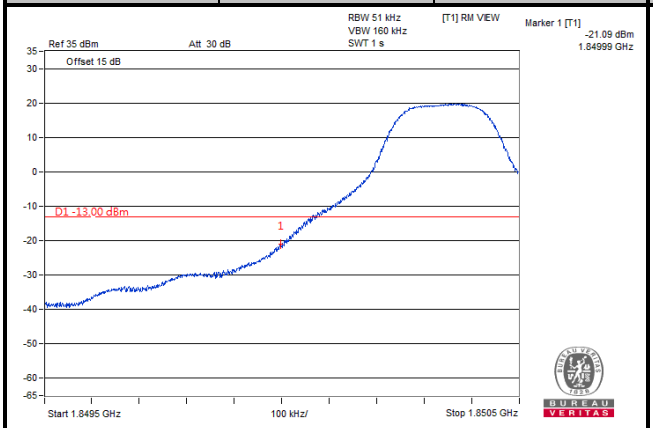
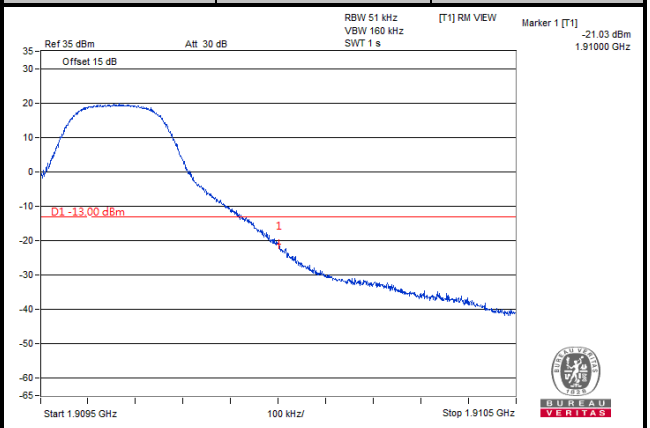
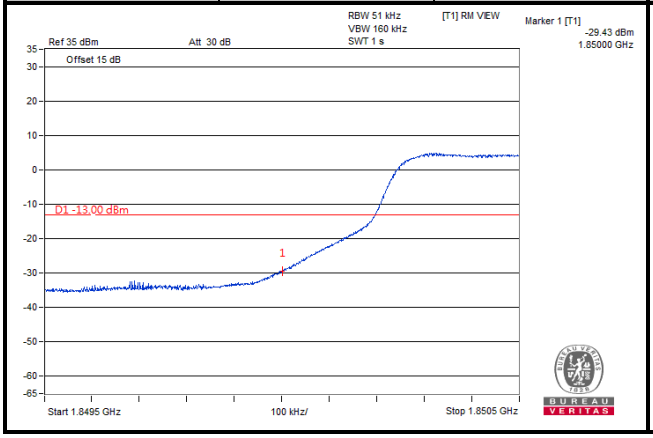
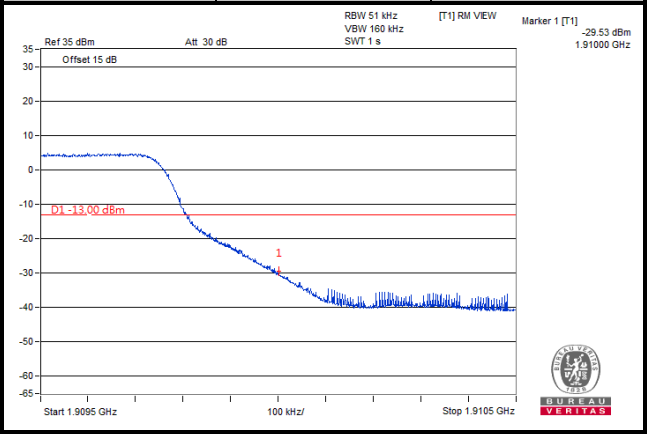
GSM			
Channel	512	Channel	810
			

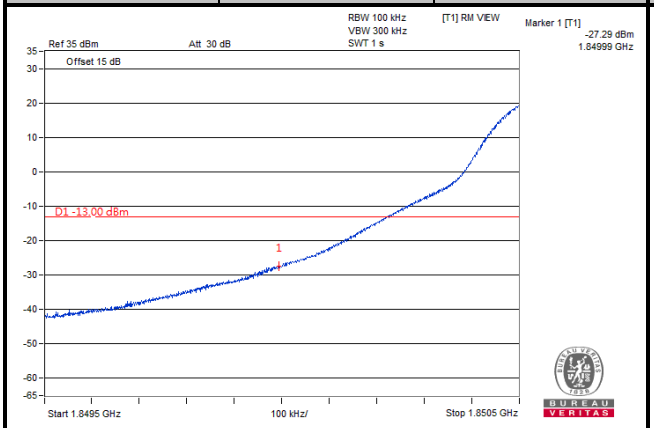
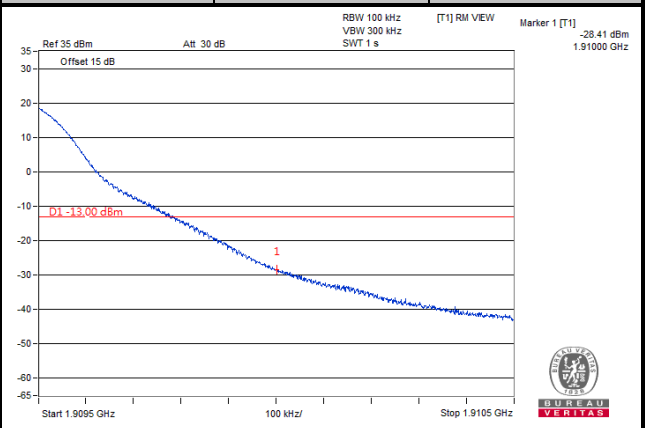
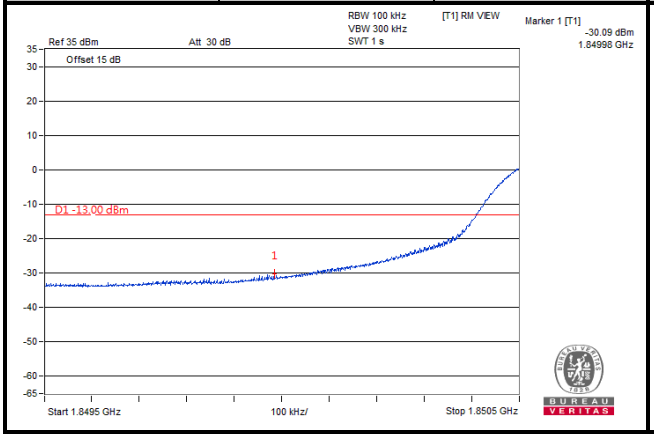
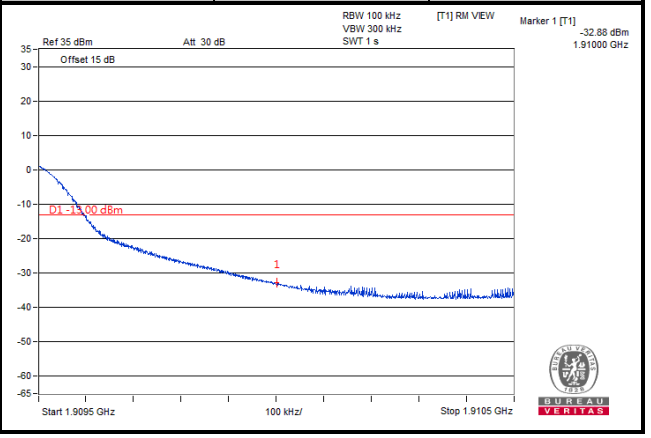
EDGE			
Channel	512	Channel	810
			

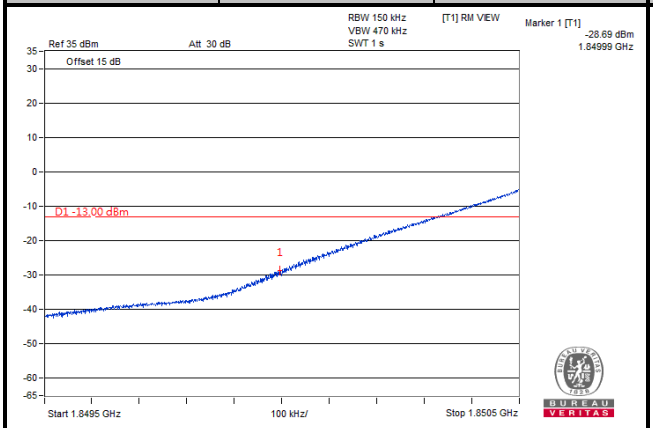
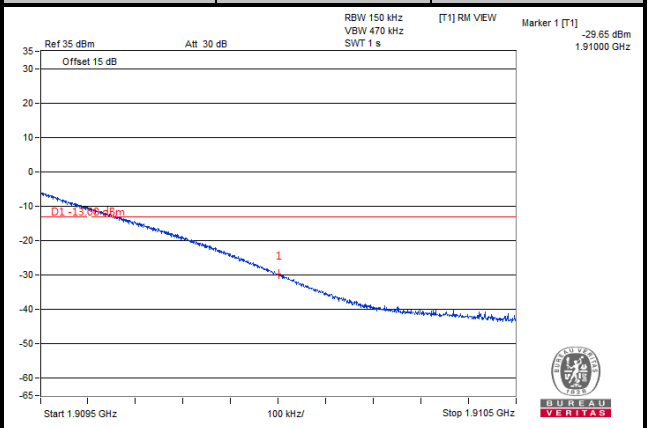
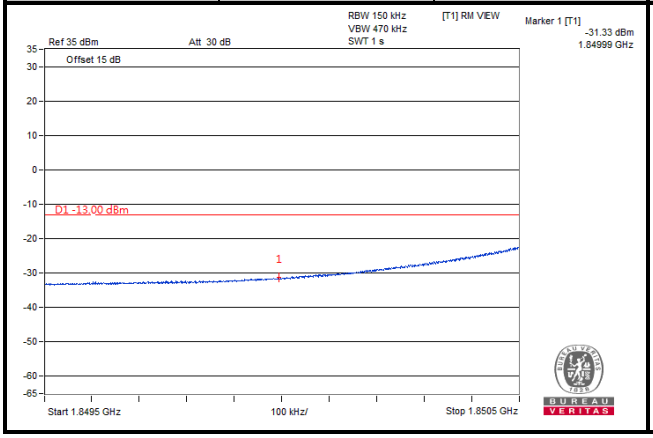
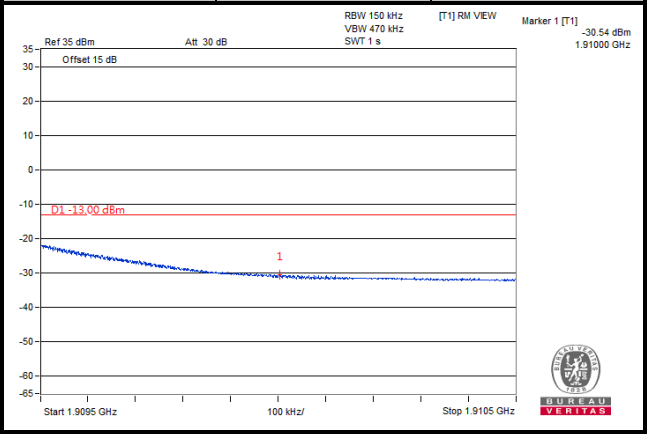
WCDMA			
Channel	9262	Channel	9538
			

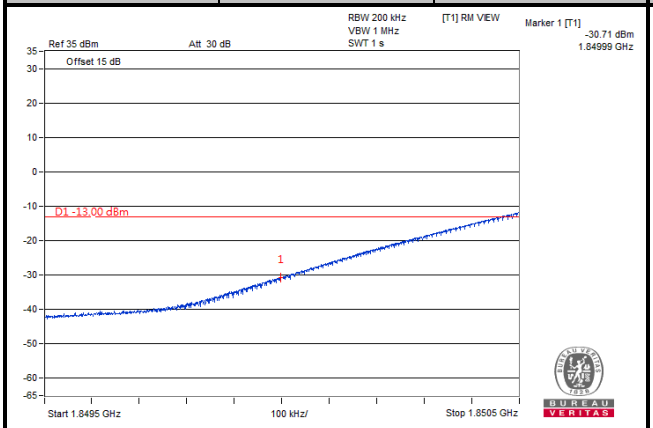
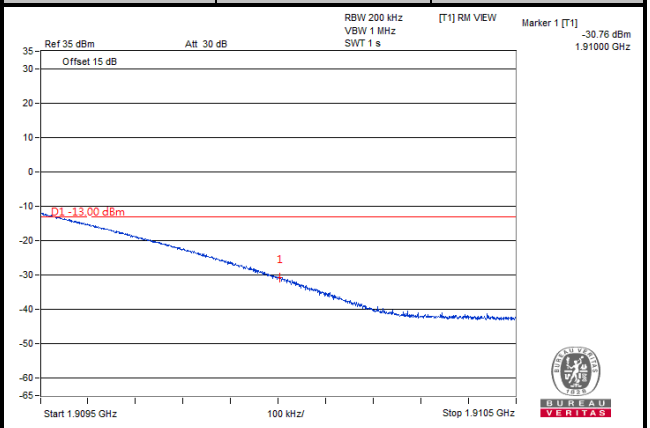
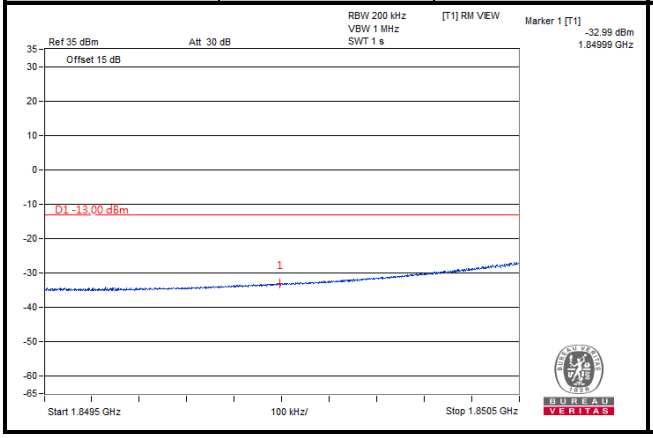
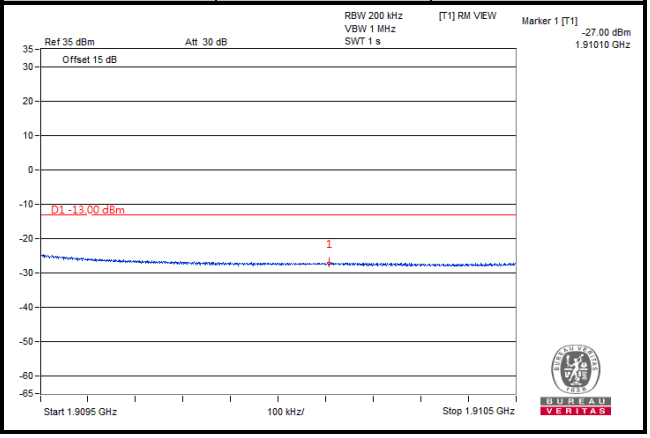
LTE Band 2					
Channel Bandwidth: 1.4 MHz					
Channel	18607	1 RB	Channel	19193	1 RB
					
Channel	18607	6 RB	Channel	19193	6 RB
					

LTE Band 2					
Channel Bandwidth: 3 MHz					
Channel	18615	1 RB	Channel	19185	1 RB
					
Channel	18615	15 RB	Channel	19185	15 RB
					

LTE Band 2					
Channel Bandwidth: 5 MHz					
Channel	18625	1 RB	Channel	19175	1 RB
					
Channel	18625	25 RB	Channel	19175	25 RB
					

LTE Band 2					
Channel Bandwidth: 10 MHz					
Channel	18650	1 RB	Channel	19150	1 RB
					
Channel	18650	50 RB	Channel	19150	50 RB
					

LTE Band 2					
Channel Bandwidth: 15 MHz					
Channel	18675	1 RB	Channel	19125	1 RB
					
Channel	18675	75 RB	Channel	19125	75 RB
					

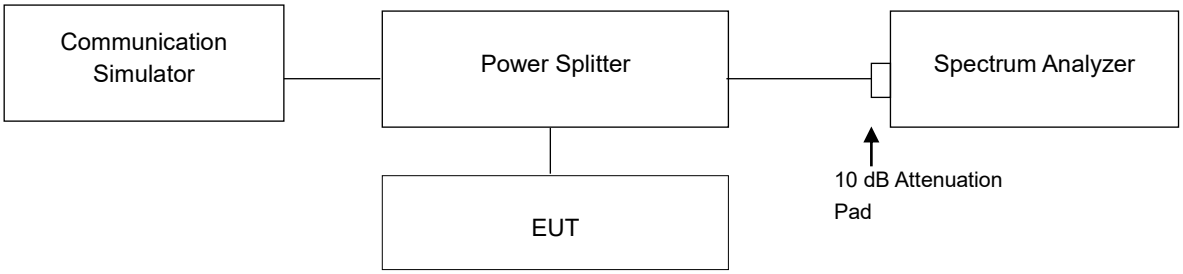
LTE Band 2					
Channel Bandwidth: 20 MHz					
Channel	18700	1 RB	Channel	19100	1 RB
					
Channel	18700	100 RB	Channel	19100	100 RB
					

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.6.2 Test Setup



4.6.3 Test Procedures

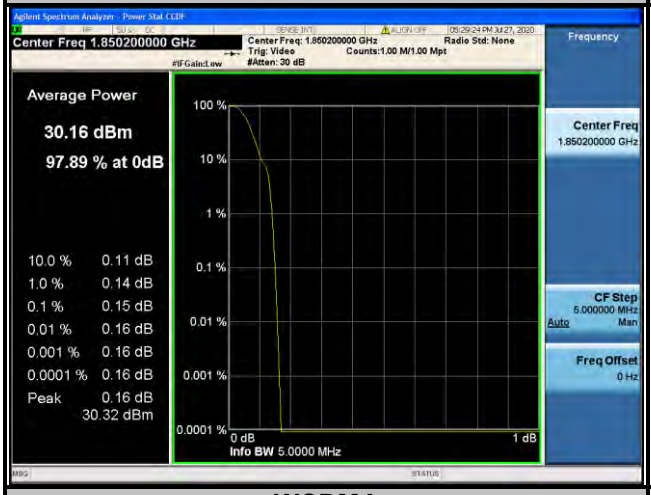
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

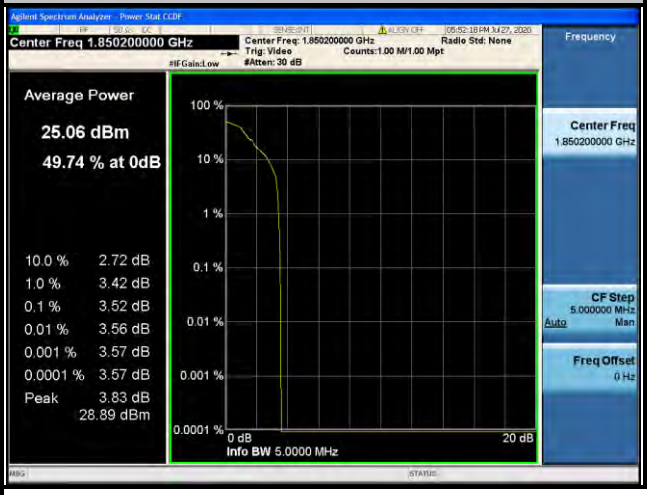
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		GSM	EDGE			WCDMA
512	1850.2	0.15	3.52	9262	1852.4	2.90
661	1880.0	0.12	3.48	9400	1880.0	2.91
810	1909.8	0.13	3.51	9538	1907.6	2.89

Spectrum Plot of Worst Value

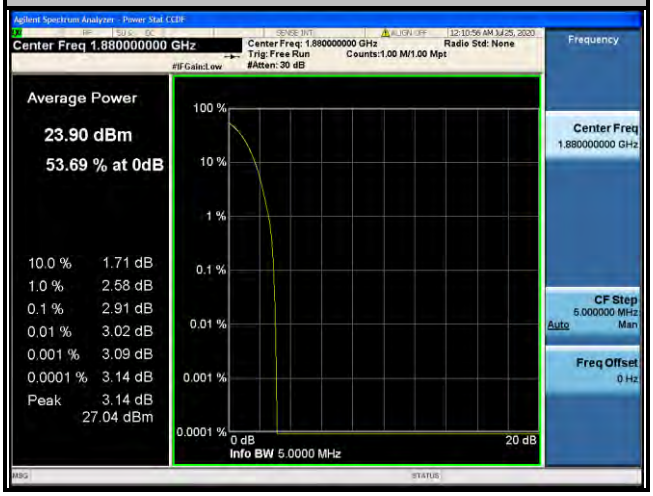
GSM



EDGE



WCDMA



LTE Band 2									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18607	1850.7	4.03	5.73	5.82	18615	1851.5	3.77	5.61	5.76
18900	1880.0	3.97	5.80	5.87	18900	1880.0	3.78	5.63	5.52
19193	1909.3	3.92	5.65	5.61	19185	1908.5	3.74	5.48	5.56

Spectrum Plot of Worst Value	
1.4 MHz / 64QAM	3 MHz / 64QAM
	

LTE Band 2									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18625	1852.5	3.74	5.46	5.64	18650	1855.0	3.81	5.57	5.79
18900	1880.0	3.66	5.53	5.60	18900	1880.0	3.82	5.53	5.78
19175	1907.5	3.78	5.45	5.55	19150	1905.0	3.81	5.32	5.50

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM

LTE Band 2									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18675	1857.5	3.85	5.61	5.62	18700	1860.0	3.79	5.48	5.73
18900	1880.0	3.82	5.52	5.66	18900	1880.0	3.55	5.25	5.45
19125	1902.5	3.79	5.39	5.40	19100	1900.0	3.66	5.30	5.40

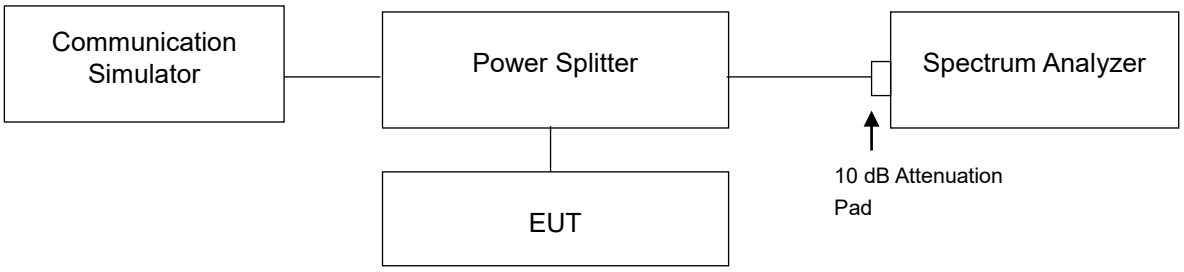
Spectrum Plot of Worst Value	
15 MHz / 64QAM	20 MHz / 64QAM
	

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions 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 -13 dBm.

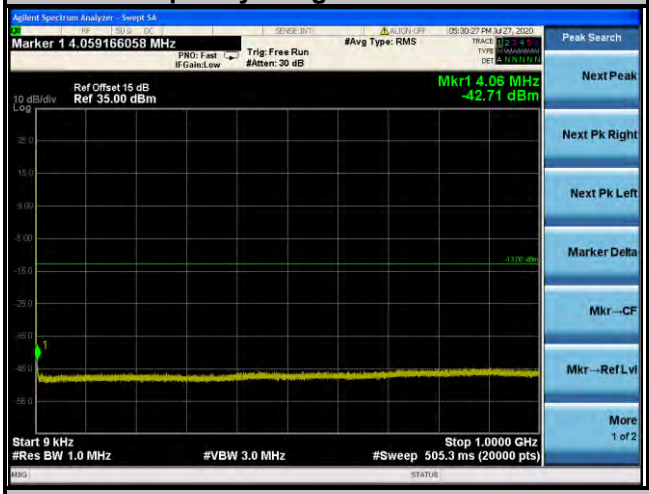
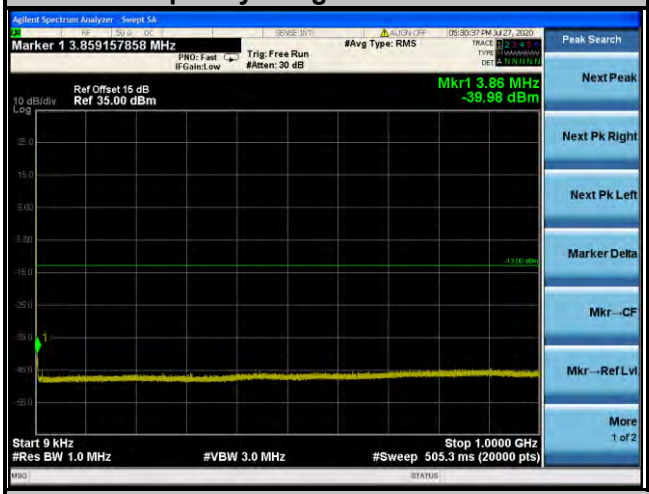
4.7.2 Test Setup



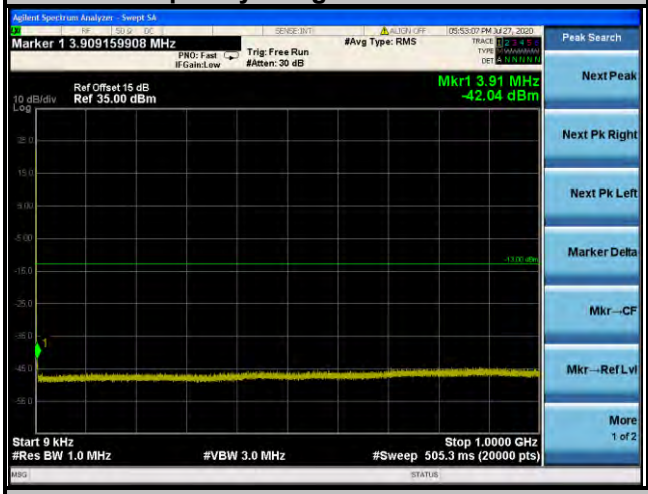
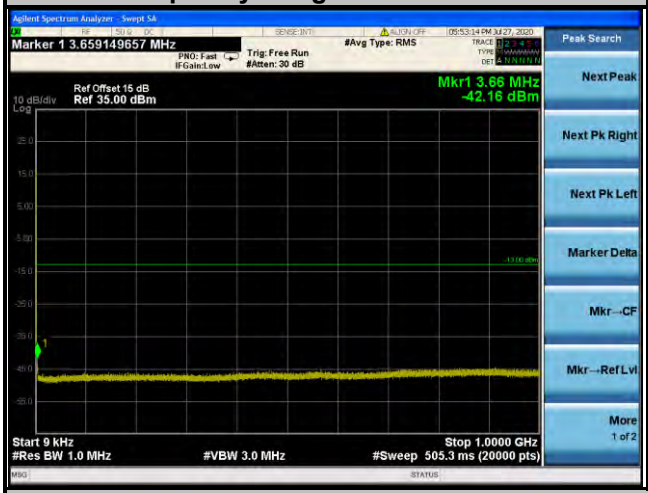
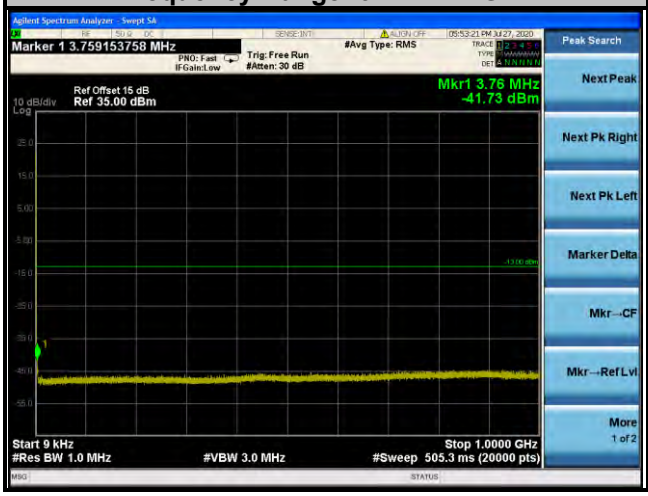
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 20 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

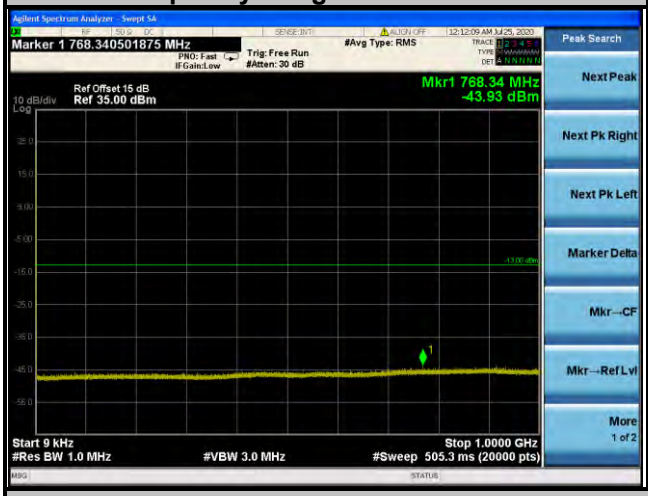
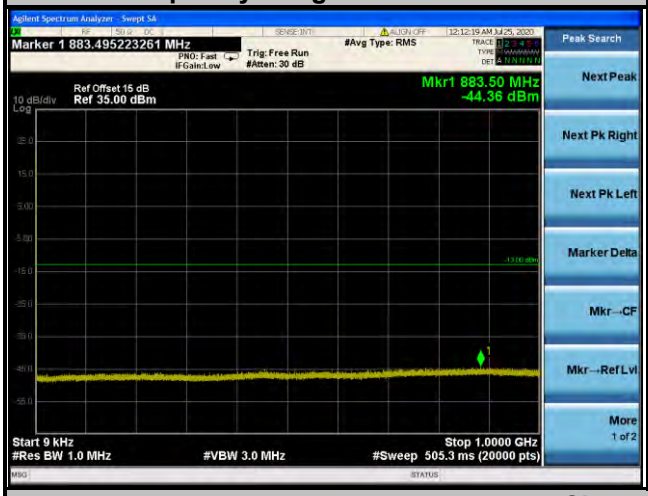
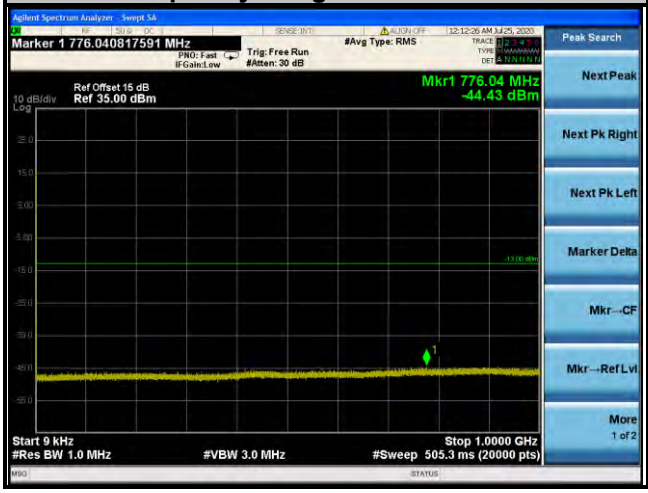
4.7.4 Test Results

GSM	
Channel 512	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 661	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 810	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

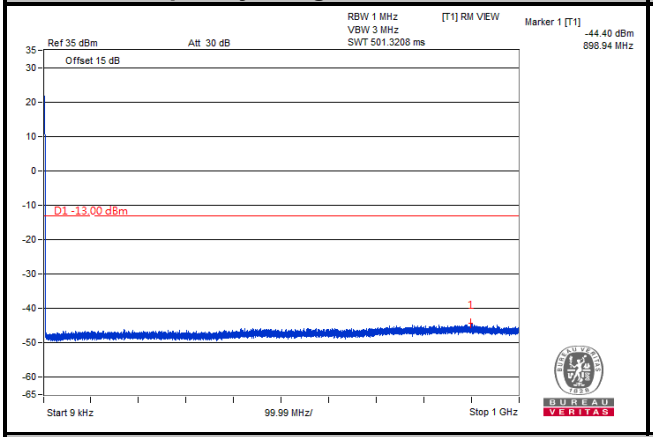
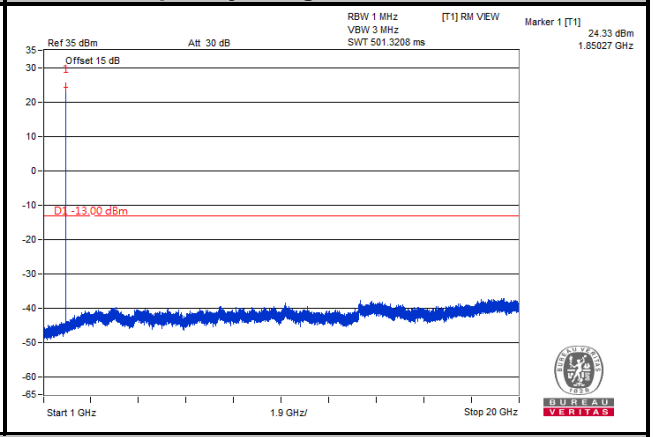
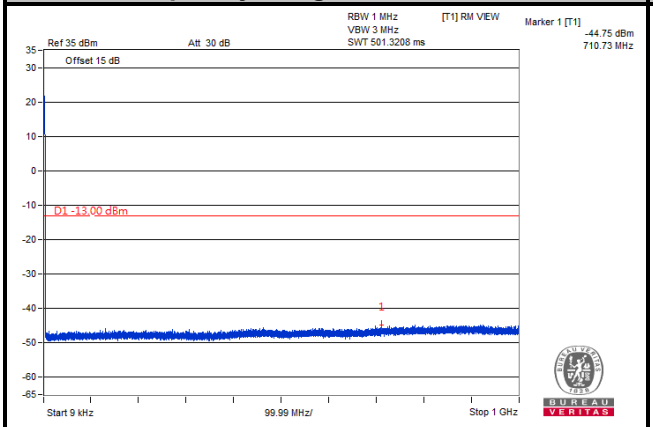
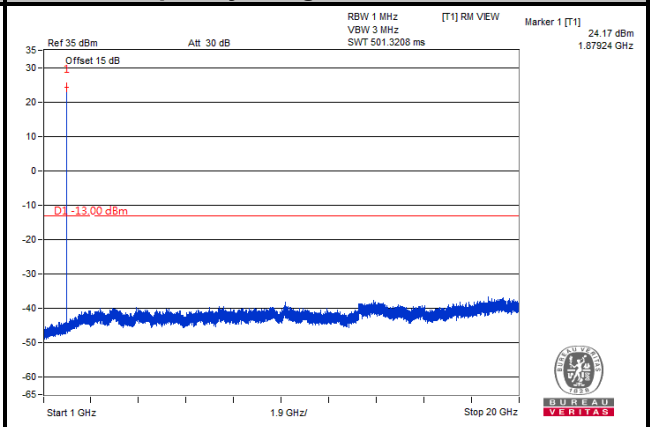
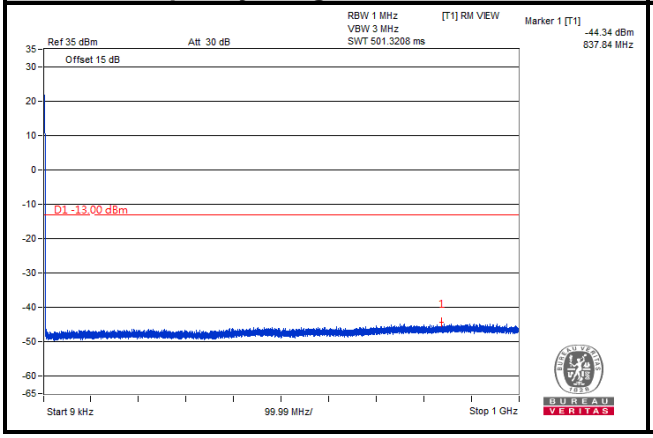
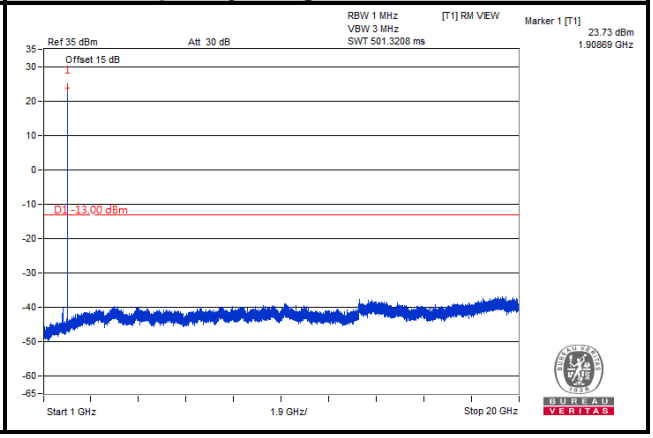
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

EDGE	
Channel 512	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 661	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 810	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

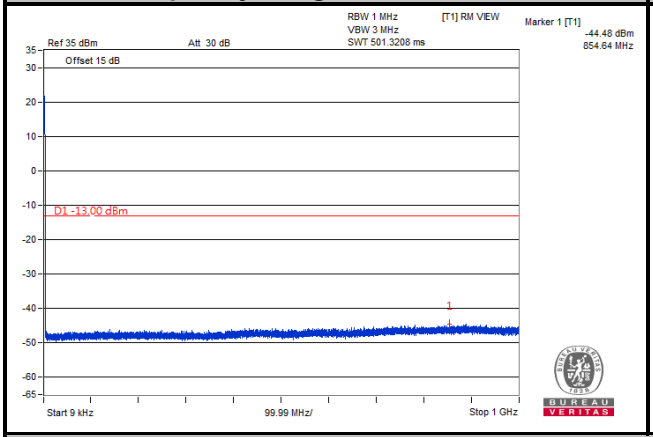
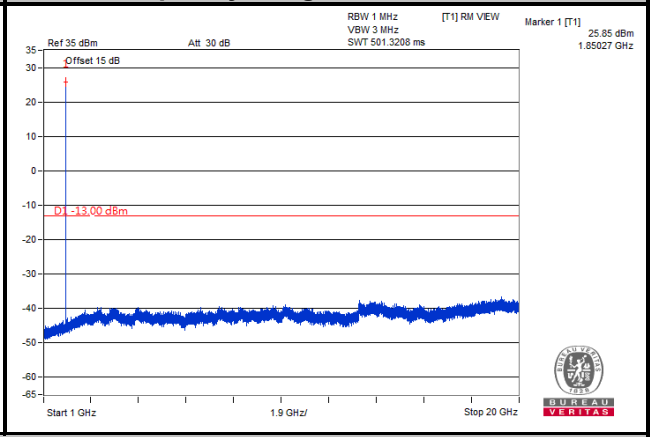
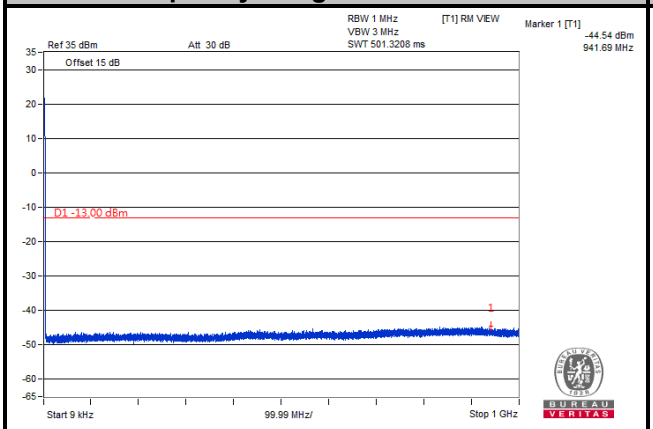
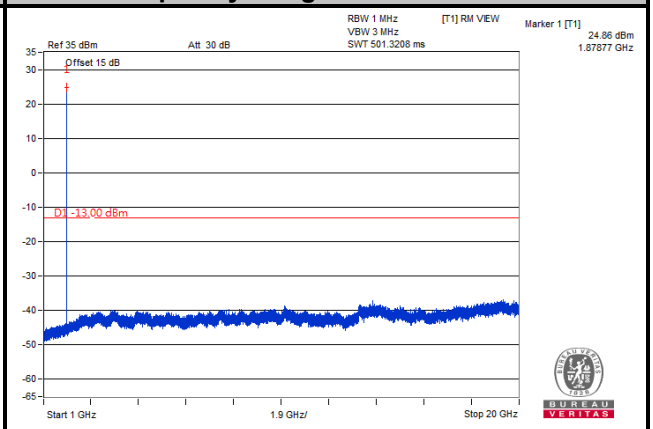
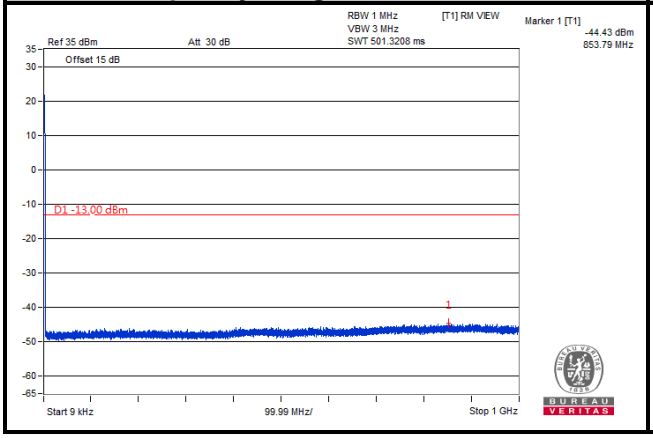
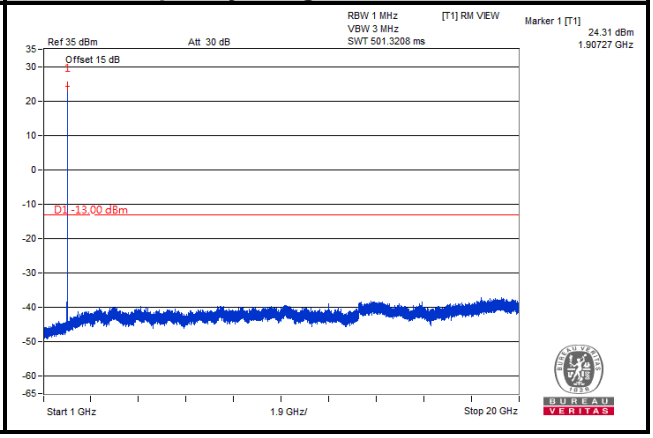
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

WCDMA	
Channel 9262	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 9400	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 9538	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

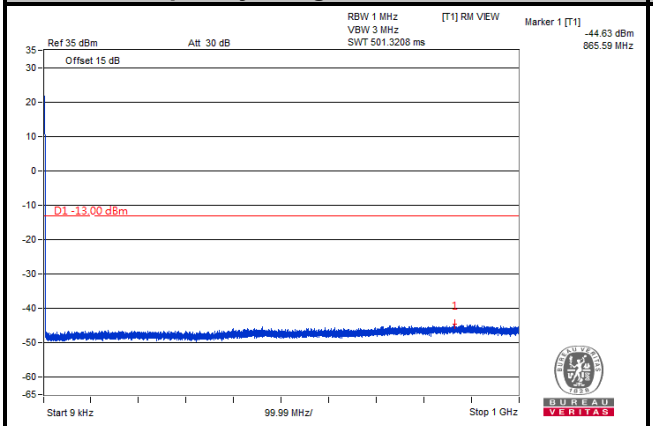
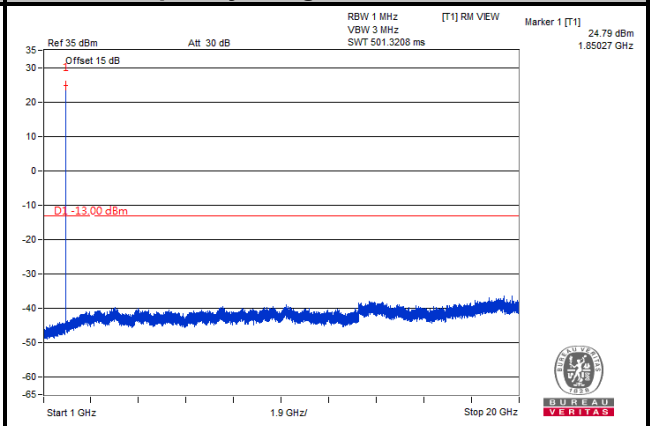
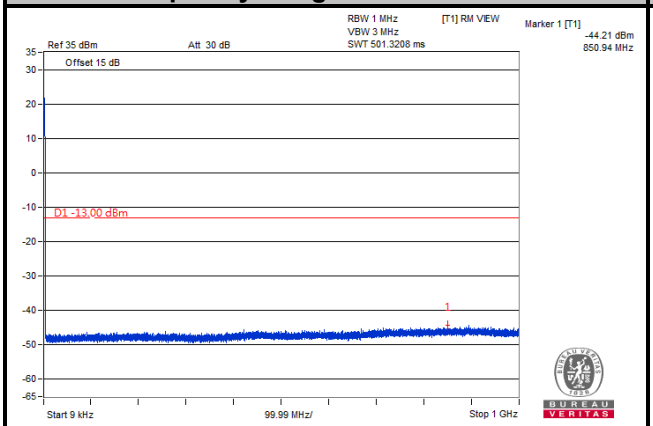
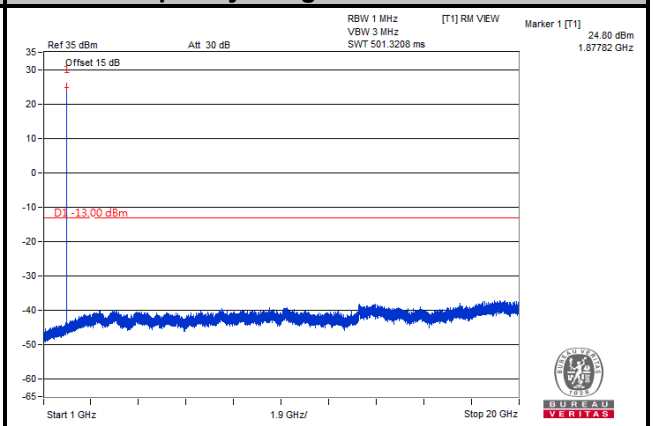
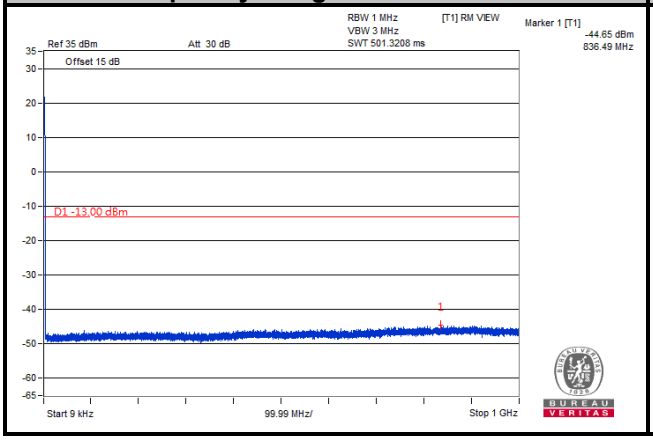
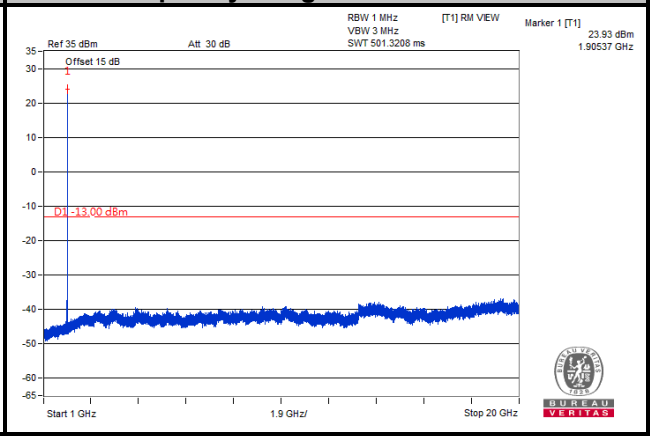
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 1.4 MHz	
Channel 18607	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 1.4 MHz	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 1.4 MHz	
Channel 19193	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

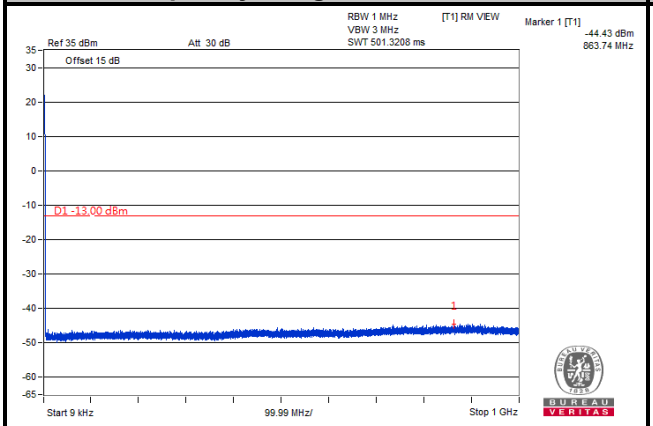
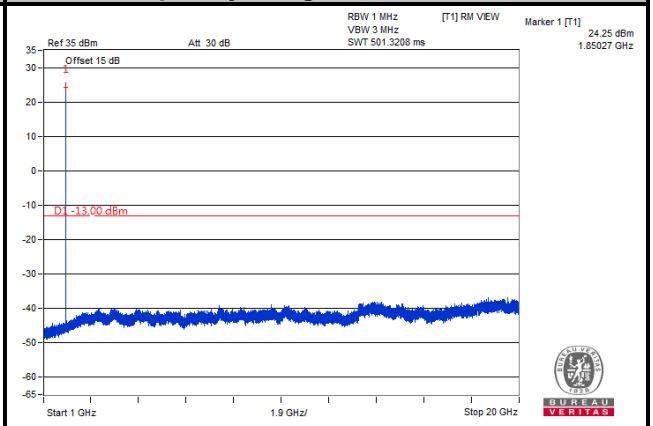
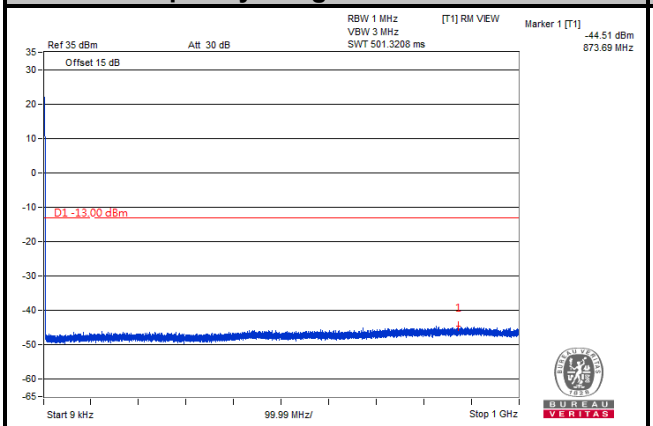
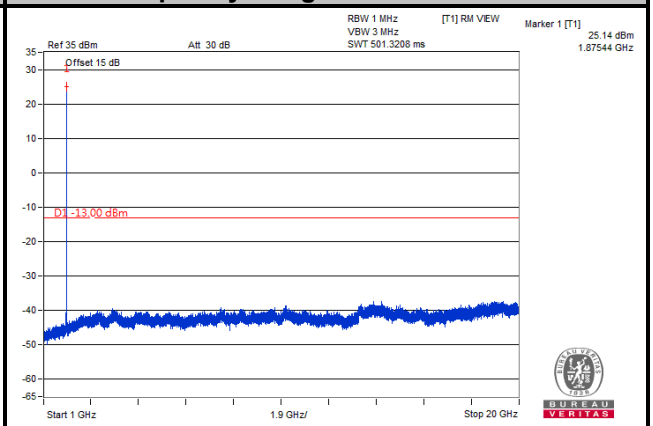
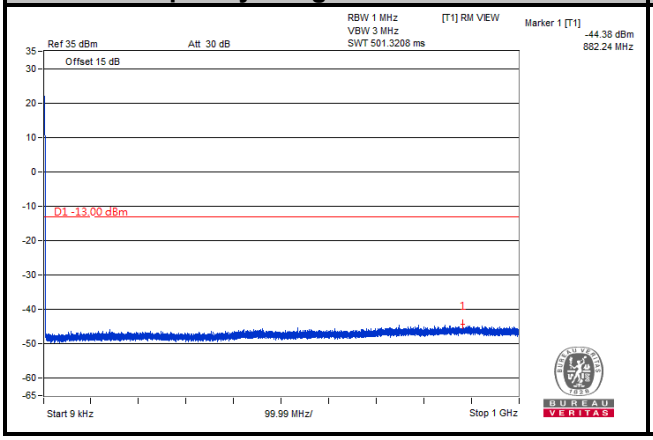
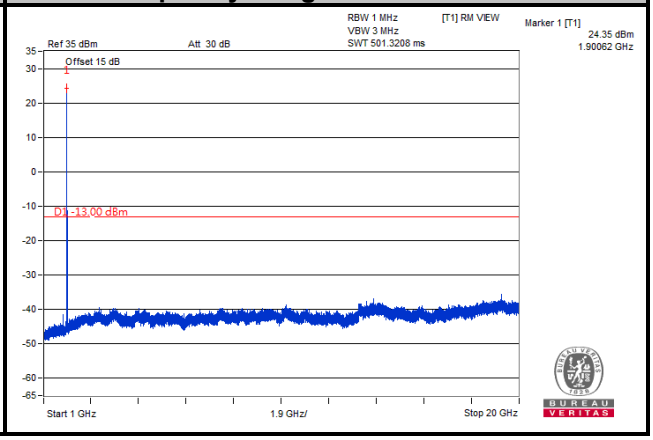
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 3 MHz	
Channel 18615	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 3 MHz	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 3 MHz	
Channel 19185	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

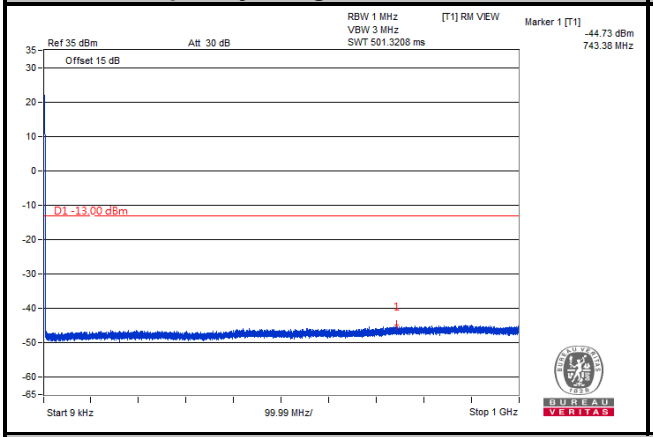
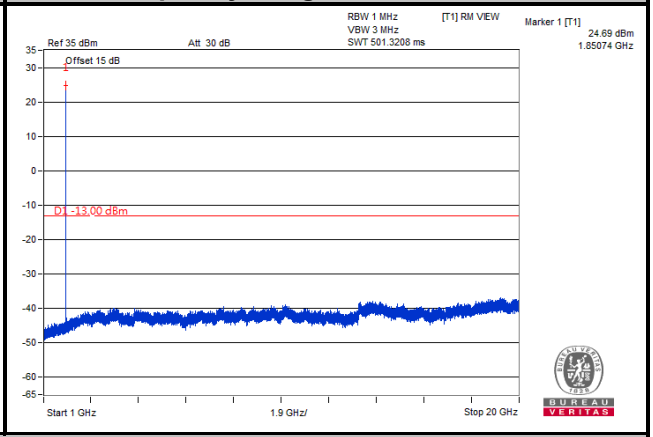
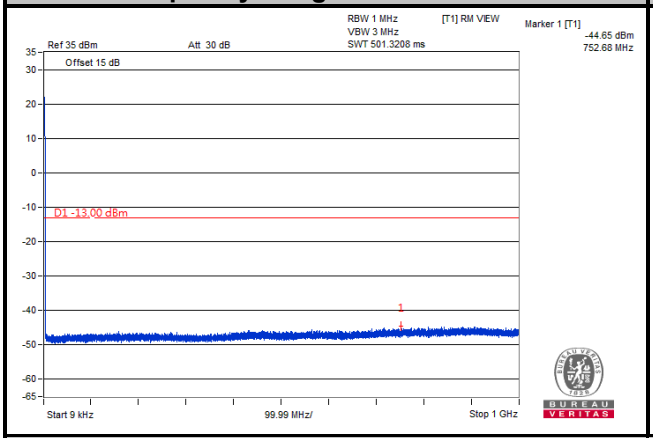
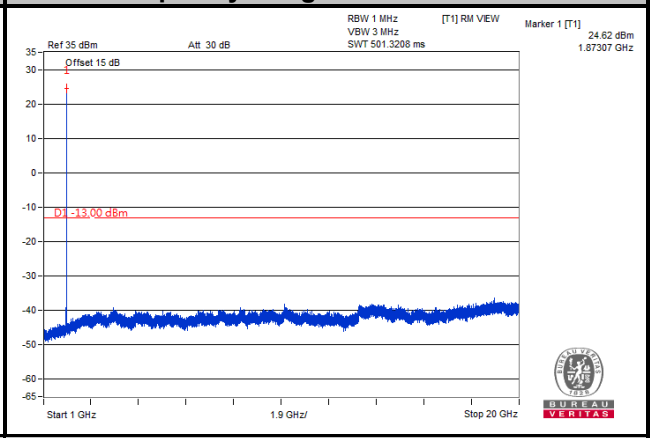
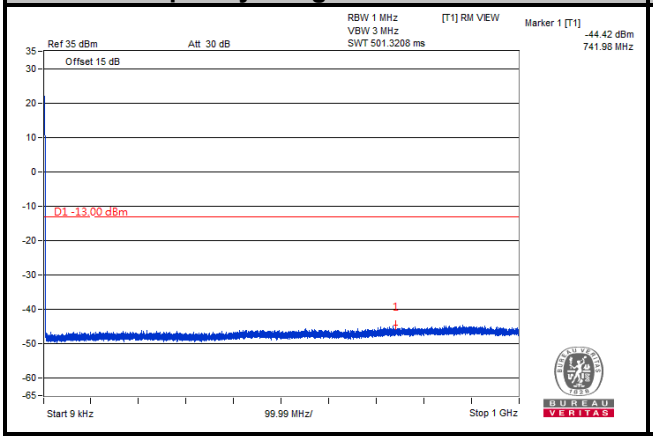
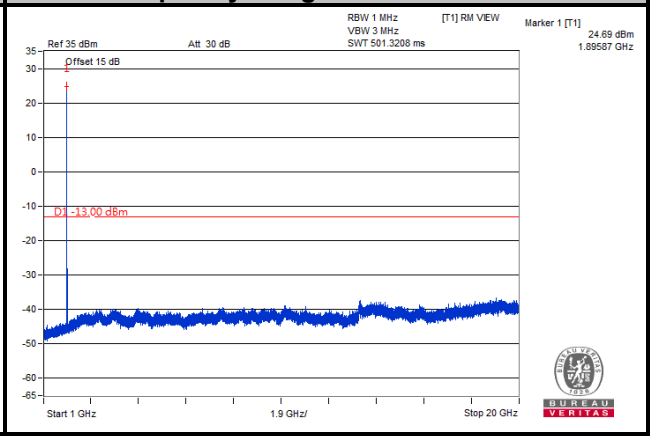
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 5 MHz	
Channel 18625	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 5 MHz	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 5 MHz	
Channel 19175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

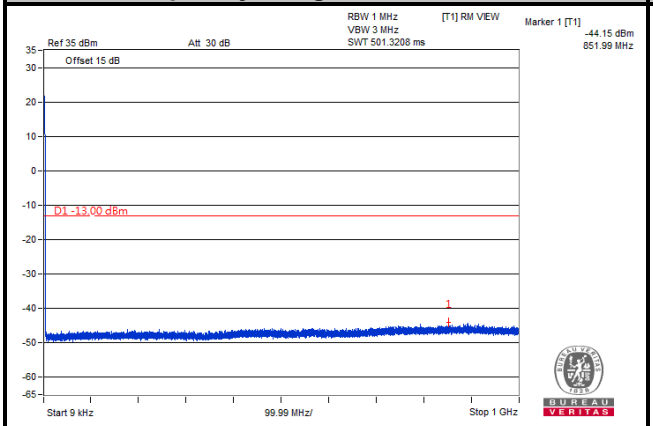
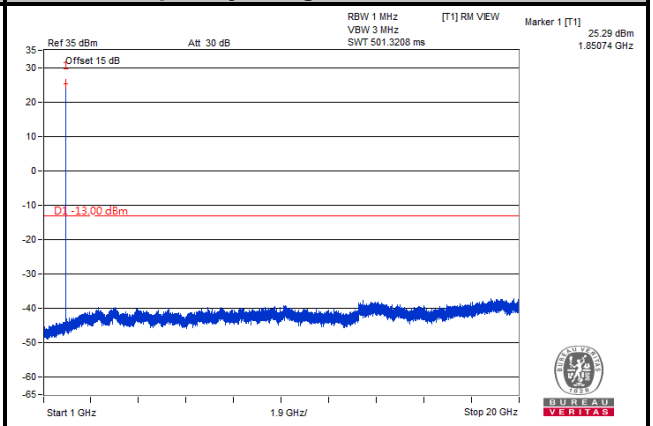
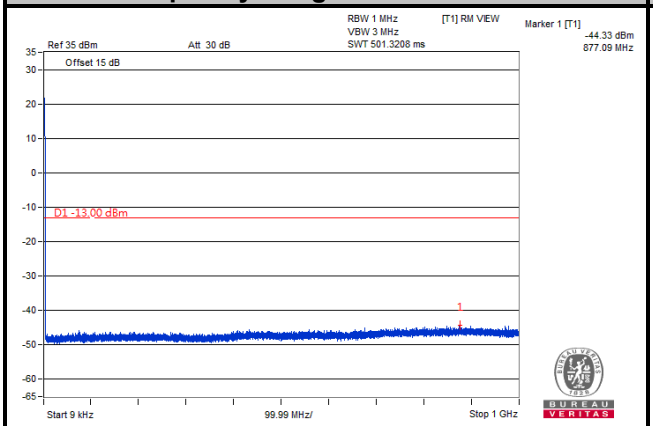
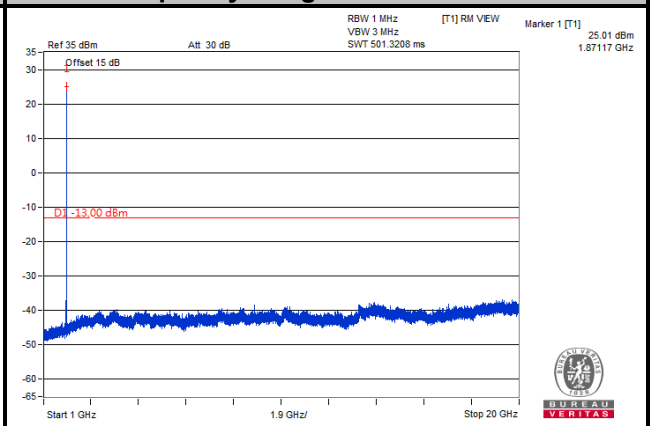
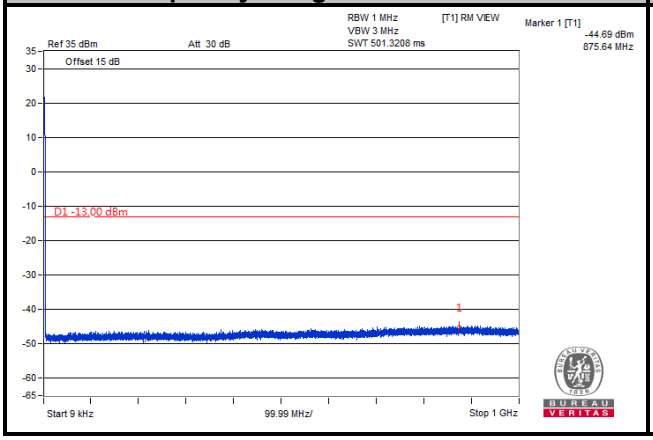
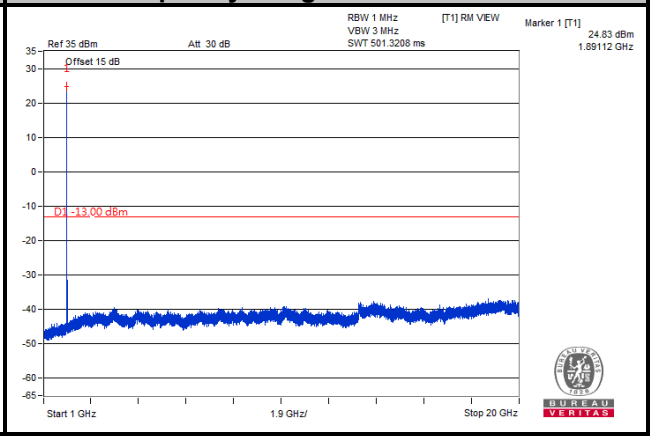
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 10 MHz	
Channel 18650	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 10 MHz	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 10 MHz	
Channel 19150	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 15 MHz	
Channel 18675	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 15 MHz	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 15 MHz	
Channel 19125	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 20 MHz	
Channel 18700	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 20 MHz	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel Bandwidth: 20 MHz	
Channel 19100	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

Note: The signal over the limit in 9 kHz is from spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

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

4.8.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
c. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

NOTE:

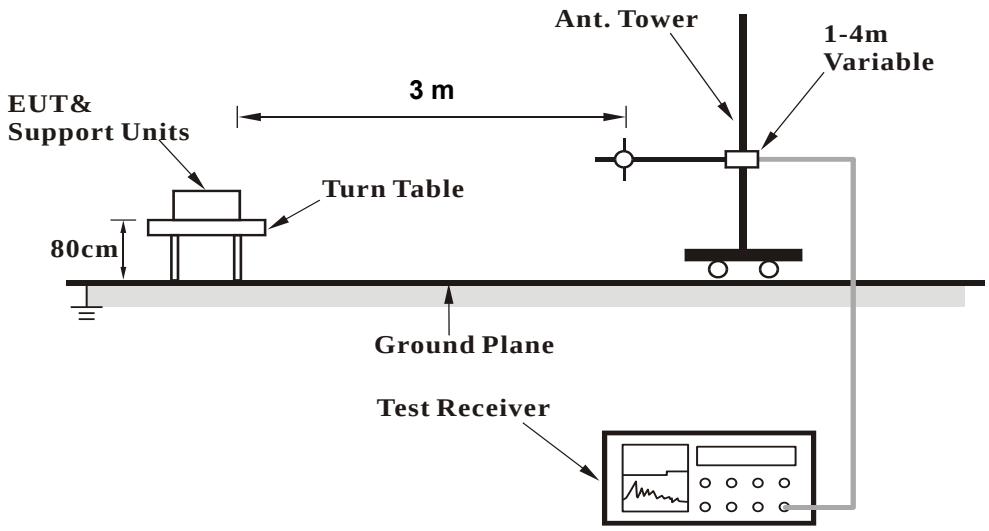
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
   The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

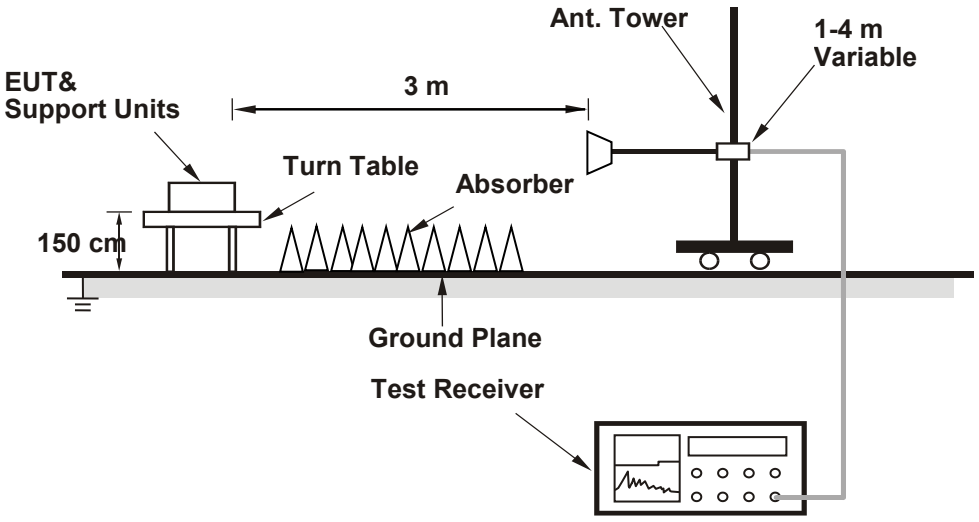
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

Below 1GHz

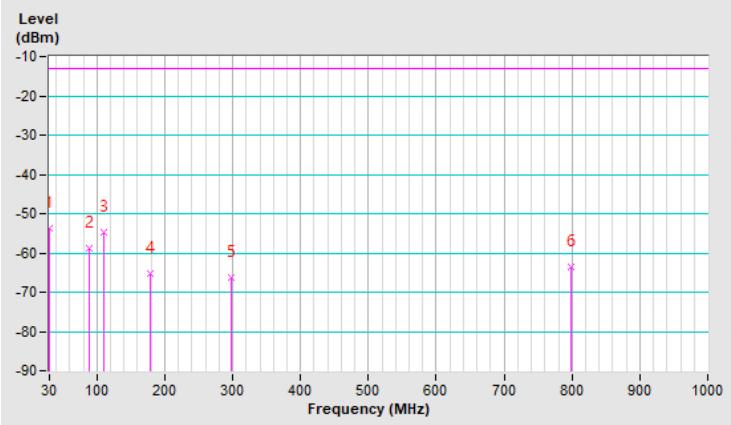
GSM1900

Mode	TX channel 810 (1909.8MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.0	-56.6	-41.4	-12.2	-53.6	-13.0	-40.6
2	89.0	-50.5	-59.6	0.9	-58.7	-13.0	-45.7
3	110.1	-46.1	-55.2	0.4	-54.8	-13.0	-41.8
4	179.0	-57.3	-68.2	2.8	-65.4	-13.0	-52.4
5	298.5	-63.9	-71.3	5.1	-66.2	-13.0	-53.2
6	799.0	-69.9	-67.4	4.0	-63.4	-13.0	-50.4

Remarks:

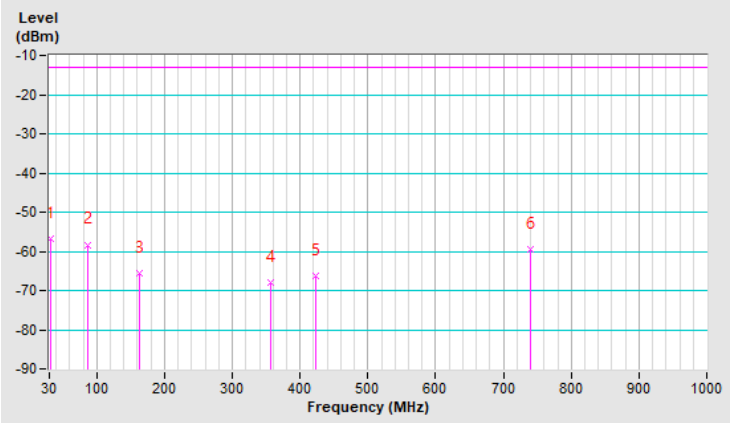
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 810 (1909.8MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	32.8	-48.7	-44.9	-11.8	-56.7	-13.0	-43.7
2	87.6	-52.1	-58.8	0.5	-58.3	-13.0	-45.3
3	162.1	-63.4	-66.4	0.7	-65.7	-13.0	-52.7
4	357.6	-67.5	-73.2	5.2	-68.0	-13.0	-55.0
5	423.6	-66.4	-71.4	5.2	-66.2	-13.0	-53.2
6	739.9	-66.6	-64.4	4.8	-59.6	-13.0	-46.6

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

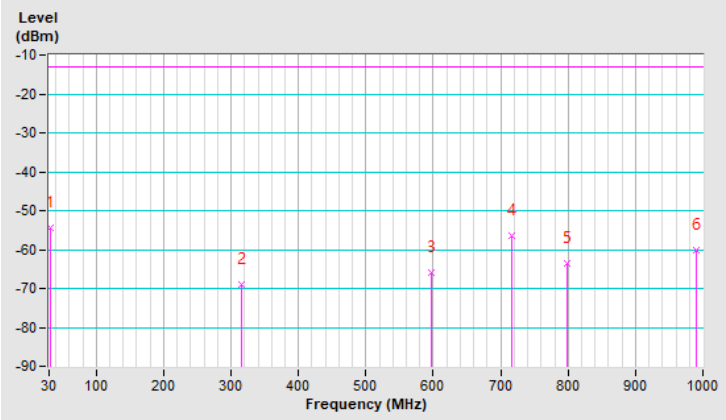


EDGE1900

Mode	TX channel 810 (1909.8MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.41	-56.9	-42.3	-12.0	-54.3	-13.0	-41.3
2	315.38	-65.2	-74.3	5.2	-69.1	-13.0	-56.1
3	596.54	-67.5	-70.3	4.4	-65.9	-13.0	-52.9
4	716.03	-59.9	-61.4	5.0	-56.4	-13.0	-43.4
5	798.97	-69.9	-67.4	4.0	-63.4	-13.0	-50.4
6	990.16	-70.0	-64.2	3.9	-60.3	-13.0	-47.3

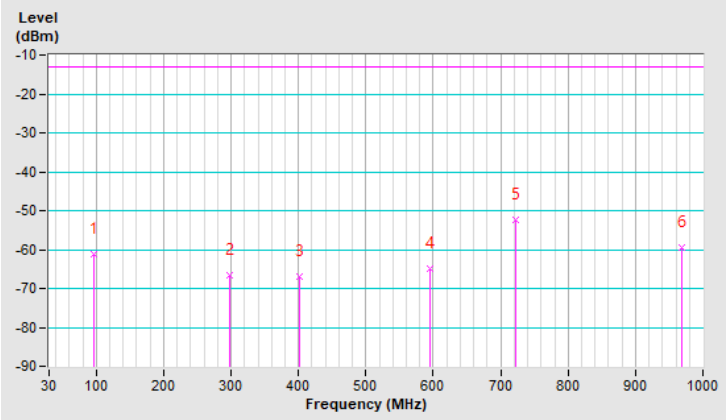
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 810 (1909.8MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	96.07	-54.1	-62.2	1.0	-61.2	-13.0	-48.2
2	298.51	-67.5	-71.8	5.1	-66.7	-13.0	-53.7
3	402.54	-66.5	-72.0	5.2	-66.8	-13.0	-53.8
4	595.13	-68.8	-69.5	4.5	-65.0	-13.0	-52.0
5	721.65	-59.2	-57.3	5.0	-52.3	-13.0	-39.3
6	969.07	-69.7	-63.5	3.9	-59.6	-13.0	-46.6

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

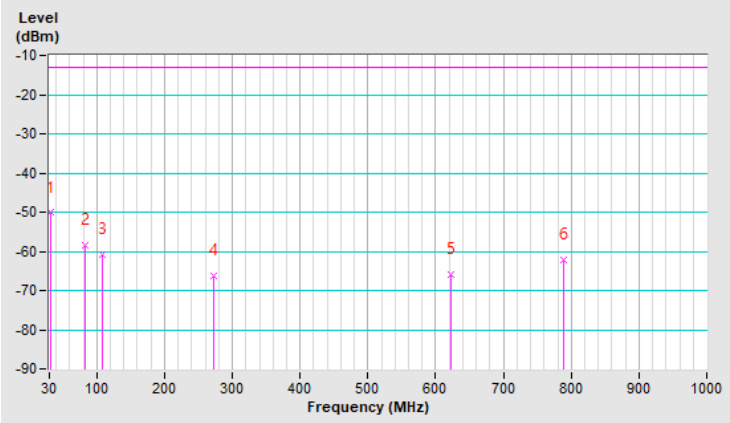


WCDMA Band 2

Mode	TX channel 9400 (1880MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.4	-52.8	-38.2	-12.0	-50.2	-13.0	-37.2
2	83.4	-52.3	-57.9	-0.7	-58.6	-13.0	-45.6
3	107.3	-52.1	-61.2	0.5	-60.7	-13.0	-47.7
4	273.2	-62.4	-71.7	5.3	-66.4	-13.0	-53.4
5	621.8	-68.3	-70.6	4.6	-66.0	-13.0	-53.0
6	789.1	-68.3	-66.3	4.1	-62.2	-13.0	-49.2

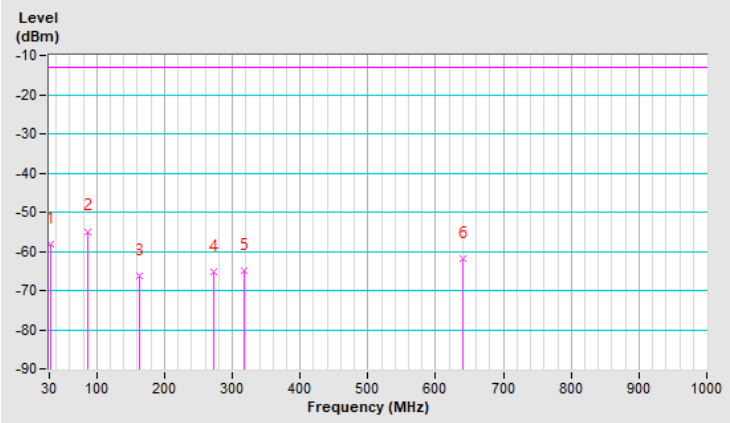
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 9400 (1880MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.4	-50.4	-46.1	-12.0	-58.1	-13.0	-45.1
2	87.6	-48.7	-55.4	0.5	-54.9	-13.0	-41.9
3	162.1	-63.9	-66.9	0.7	-66.2	-13.0	-53.2
4	273.2	-67.1	-70.7	5.3	-65.4	-13.0	-52.4
5	316.8	-65.2	-70.1	5.2	-64.9	-13.0	-51.9
6	640.1	-68.2	-66.6	4.7	-61.9	-13.0	-48.9

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

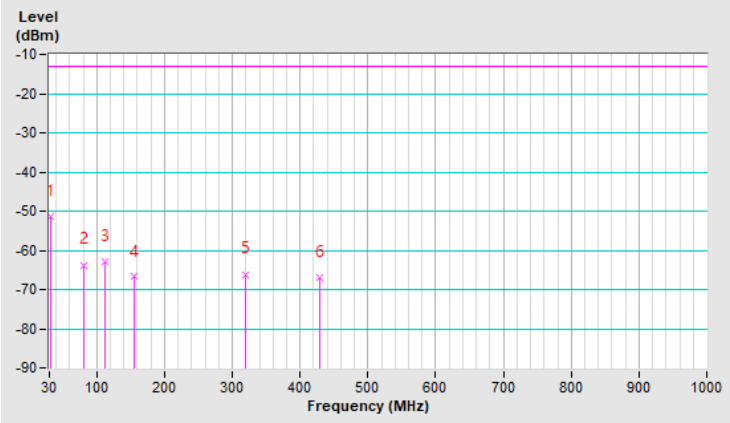


LTE Band 2, Channel Bandwidth: 1.4MHz

Mode	TX channel 19193 (1909.3MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.4	-53.8	-39.2	-12.0	-51.2	-13.0	-38.2
2	80.6	-57.8	-62.2	-1.5	-63.7	-13.0	-50.7
3	112.9	-54.8	-63.3	0.3	-63.0	-13.0	-50.0
4	155.1	-61.7	-66.9	0.1	-66.8	-13.0	-53.8
5	319.6	-62.2	-71.3	5.2	-66.1	-13.0	-53.1
6	429.3	-66.7	-72.0	5.2	-66.8	-13.0	-53.8

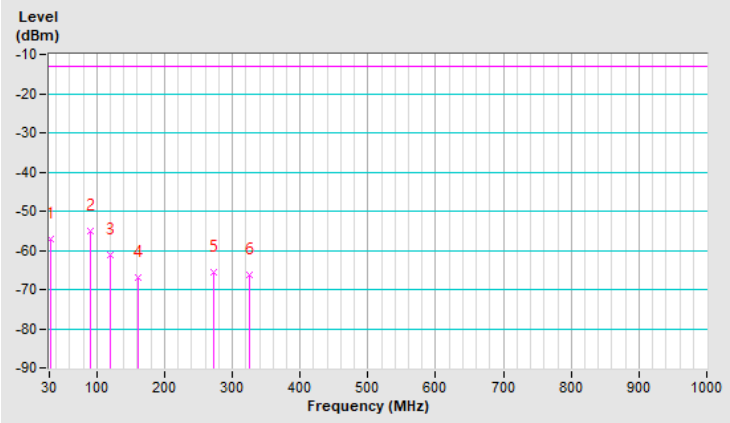
Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 19193 (1909.3MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.4	-49.5	-45.2	-12.0	-57.2	-13.0	-44.2
2	90.5	-48.9	-56.2	1.1	-55.1	-13.0	-42.1
3	120.0	-54.3	-61.4	0.1	-61.3	-13.0	-48.3
4	160.7	-64.5	-67.3	0.5	-66.8	-13.0	-53.8
5	271.8	-67.5	-71.0	5.3	-65.7	-13.0	-52.7
6	325.2	-66.5	-71.6	5.2	-66.4	-13.0	-53.4

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Above 1GHz
GSM1900

Mode	TX channel 512 (1850.1MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3700.40 (PK)	-64.3	-58.3	7.1	-51.2	-13.0	-38.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3700.40 (PK)	-62.3	-55.3	7.1	-48.2	-13.0	-35.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 661 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-63.7	-57.2	7.1	-50.1	-13.0	-37.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-63.4	-56.0	7.1	-48.9	-13.0	-35.9

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 810 (1909.8MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3819.60 (PK)	-63.7	-57.0	7.1	-49.9	-13.0	-36.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**3819.60 (PK)**	**-62.9**	**-55.2**	**7.1**	**-48.1**	**-13.0**	**-35.1**

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

EDGE1900

Mode	TX channel 512 (1850.1MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3700.40 (PK)	-67.3	-61.3	7.1	-54.2	-13.0	-41.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3700.40 (PK)	-65.1	-58.1	7.1	-51.0	-13.0	-38.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 661 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-66.9	-60.4	7.1	-53.3	-13.0	-40.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-67.0	-59.6	7.1	-52.5	-13.0	-39.5

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 810 (1909.8MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3819.60 (PK)	-67.8	-61.1	7.1	-54.0	-13.0	-41.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3819.60 (PK)	-68.1	-60.4	7.1	-53.3	-13.0	-40.3

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

WCDMA Band 2

Mode	TX channel 9262 (1852.4MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3704.80 (PK)	-69.5	-63.5	7.1	-56.4	-13.0	-43.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3704.80 (PK)	-69.0	-61.9	7.1	-54.8	-13.0	-41.8

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 9400 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-69.7	-63.2	7.1	-56.1	-13.0	-43.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-68.6	-61.2	7.1	-54.1	-13.0	-41.1

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 9538 (1907.6MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3815.20 (PK)	-69.2	-62.4	7.1	-55.3	-13.0	-42.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3815.20 (PK)	-69.2	-61.5	7.1	-54.4	-13.0	-41.4

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 2, Channel Bandwidth 1.4MHz

Mode	TX channel 18607 (1850.70MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3701.40 (PK)	-64.3	-58.3	7.1	-51.2	-13.0	-38.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3701.40 (PK)	-65.4	-58.4	7.1	-51.3	-13.0	-38.3

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 18900 (1880.00MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-64.3	-57.8	7.1	-50.7	-13.0	-37.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-65.7	-58.3	7.1	-51.2	-13.0	-38.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 19193 (1909.30MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3818.60 (PK)	-64.0	-57.3	7.1	-50.2	-13.0	-37.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3818.60 (PK)	-65.5	-57.8	7.1	-50.7	-13.0	-37.7

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 2, Channel Bandwidth 5MHz

Mode	TX channel 18625 (1852.50MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3705.00 (PK)	-64.1	-58.1	7.1	-51.0	-13.0	-38.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3705.00 (PK)	-65.9	-58.8	7.1	-51.7	-13.0	-38.7

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 18900 (1880.00MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-64.3	-57.8	7.1	-50.7	-13.0	-37.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-65.6	-58.2	7.1	-51.1	-13.0	-38.1

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 19175 (1907.50MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3815.00 (PK)	-64.1	-57.3	7.1	-50.2	-13.0	-37.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3815.00 (PK)	-65.8	-58.1	7.1	-51.0	-13.0	-38.0

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

LTE Band 2, Channel Bandwidth 20MHz

Mode	TX channel 18700 (1860.00MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3720.00 (PK)	-64.7	-58.5	7.1	-51.4	-13.0	-38.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3720.00 (PK)	-65.5	-58.3	7.1	-51.2	-13.0	-38.2

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 18900 (1880.00MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-64.4	-57.9	7.1	-50.8	-13.0	-37.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3760.00 (PK)	-65.8	-58.4	7.1	-51.3	-13.0	-38.3

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

Mode	TX channel 19100 (1900.00MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3800.00 (PK)	-64.6	-57.7	7.1	-50.6	-13.0	-37.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	3800.00 (PK)	-65.2	-57.5	7.1	-50.4	-13.0	-37.4

Remarks:
1. EIRP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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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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