FCC Test Report

(PART 24)

Report No.:	RFBFKV-WTW-P21060810-1
FCC ID:	L6AITF100-2
Test Model:	ITF100-2, ITF100-3 (Refer to item 3.1 for more details)
Received Date:	Jul. 10, 2021
Test Date:	Sep. 30, 2021 ~ Oct. 06, 2021
Issued Date:	Oct. 27, 2021
Applicant:	BlackBerry Limited
Address:	2200 University Avenue East, Waterloo, Ontario, Canada N2K 0A7
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBFKV-WTW-P21060810-1	Original Release	Oct. 27, 2021

1 Certificate of Conformity

Product:	Radar H2
Brand:	BlackBerry
Test Model:	ITF100-2, ITF100-3 (Refer to item 3.1 for more details)
Sample Status:	Identical Prototype
Applicant:	BlackBerry Limited
Test Date:	Sep. 30, 2021 ~ Oct. 06, 2021
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 : Lena Wang , **Date:** Oct. 27, 2021

Lena Wang / Specialist

Approved by : , **Date:** Oct. 27, 2021

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 -27.76 dB at 922.40 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	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 09, 2021	Apr. 08, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 10, 2021	Jun. 09, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 06, 2020	Nov. 05, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 05, 2021	Jun. 04, 2022
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 17, 2021	Feb. 16, 2022
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 16, 2021	Jan. 15, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 16, 2021	Jan. 15, 2022
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 05, 2021	Jun. 04, 2022
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber TERCHY	MHU-225AU	920842	Jun. 15, 2021	Jun. 14, 2022
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 02, 2021	Jun. 01, 2022
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 26, 2021	Aug. 25, 2022
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 07, 2021	Feb. 06, 2022
Radio Communication Tester ROHDE & SCHWARZ	CMU200	101095	Nov. 18, 2020	Nov. 17, 2021
DC power supply Keysight	U8002A	MY56330015	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

Product	Radar H2		
Brand	BlackBerry		
Test Model	ITF100-2, ITF100-3		
Model Difference	Refer to Note as below		
Status of EUT	Identical Prototype		
Power Supply Rating	7.2 Vdc (battery)		
Modulation Type	GPRS	GMSK	
	EDGE	GMSK, 8PSK	
	WCDMA	QPSK	
	LTE	QPSK, 16QAM	
Frequency Range	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	GPRS	1309.182 mW (31.17 dBm)	
	EDGE	1122.018 mW (30.50 dBm)	
	WCDMA	212.814 mW (23.28 dBm)	
		QPSK	16QAM
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	225.424 mW (23.53 dBm)	185.780 mW (22.69 dBm)
	LTE Band 2 (Channel Bandwidth: 3 MHz)	223.872 mW (23.50 dBm)	196.336 mW (22.93 dBm)
	LTE Band 2 (Channel Bandwidth: 5 MHz)	217.771 mW (23.38 dBm)	182.390 mW (22.61 dBm)
	LTE Band 2 (Channel Bandwidth: 10 MHz)	223.872 mW (23.50 dBm)	179.473 mW (22.54 dBm)
	LTE Band 2 (Channel Bandwidth: 15 MHz)	222.331 mW (23.47 dBm)	181.552 mW (22.59 dBm)
	LTE Band 2 (Channel Bandwidth: 20 MHz)	226.464 mW (23.55 dBm)	184.502 mW (22.66 dBm)
Emission Designator	GPRS	249KGXW	
	EDGE	247KG7W	
	WCDMA	4M15F9W	
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1M09D7W	
	LTE Band 2 (Channel Bandwidth: 3 MHz)	2M70G7D	
	LTE Band 2 (Channel Bandwidth: 5 MHz)	4M49D7W	
	LTE Band 2 (Channel Bandwidth: 10 MHz)	8M98D7W	
	LTE Band 2 (Channel Bandwidth: 15 MHz)	13M5G7D	

	LTE Band 2 (Channel Bandwidth: 20 MHz)	18M0D7W
Antenna Type	Refer to Note as below	
Accessory Device	Refer to Note as below	
Data Cable Supplied	N/A	

Note:

1. All models are listed as below.

Mode	Brand	Supplier Code	Model	Difference
A	BlackBerry	B13	ITF100-3	with battery model 63320-001 /7.2V,38Ah
B		B12	ITF100-2	with battery model 63318-001 /7.2V,19Ah

2. The EUT contains following accessory devices.

Product	Brand	Model	Description	Remark
Battery 1	BlackBerry	BAT-63320-001	7.2 Vdc, 38 A	(for ITF100-3)
Battery 2	BlackBerry	BAT-63318-001	7.2 Vdc, 19 A	(for ITF100-2)

*The both difference are only in battery, therefore ITF100-2 only verifies the Radiated Spurious Emissions below 1GHz

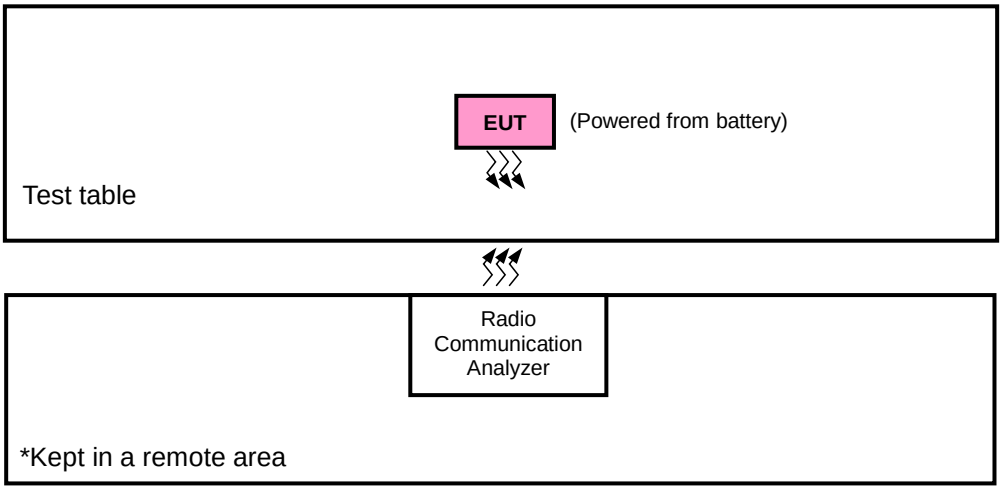
3. The antenna information is listed as below.

Antenna Type	Monopole with gnd resonator
Band	PCS1900 / WCDMA / LTE
	2
Gain (dBi)	2.01

4. 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.
5. 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

<Radiated Emission Test> & <E.I.R.P. 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:

For Mode A

Band	Radiated Emission
PCS1900	Y-plane
WCDMA	Y-plane
LTE Band 2	Y-plane

For Mode B

Band	Radiated Emission
PCS1900	X-plane
WCDMA	X-plane
LTE Band 2	X-plane

PCS1900

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

Note:
1. According ERP power test, pre-tested GPRS, EDGE modulation type and found GPRS was the worst. For radiated emission test, pre-tested GPRS, EDGE modulation type and found GPRS was the worst, therefore chosen for the final test.
2. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.
3. For Mode B only radiated emissions below 1 GHz test had been performed and presented in this report.

WCDMA

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

Note:

1. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.
2. For Mode B only radiated emissions below 1 GHz test had been performed and presented in this report.

LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
A	Modulation Characteristics	18700 to 19100	18900	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
A	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
A	Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
A	Peak to Average Ratio	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	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
A	Conducted Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK	1 RB / 7 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 / 24 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
A, B	Radiated Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 0 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 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.
4. For Mode B only radiated emissions below 1 GHz test had been performed and presented in this report.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Modulation Characteristics	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Frequency Stability	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Occupied Bandwidth	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Band Edge	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Peak to Average Ratio	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Conducted Emission	26 deg. C, 58 % RH	7.2 Vdc	Noah Chen
Radiated Emission	25 deg. C, 65 % RH	7.2 Vdc	Greg Lin, Rex Wang

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

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

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

Maximum EIRP / ERP

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

$EIRP = P_{Meas} + G_T$

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

where

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

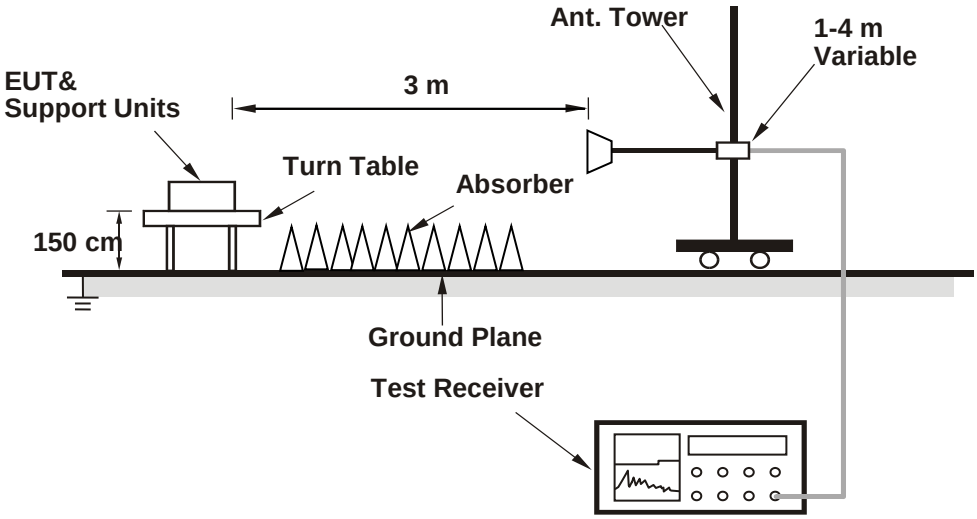
P_{Meas} measured transmitter output power or PSD, in dBm or dBW

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

4.1.3 Test Setup

EIRP / ERP Measurement:

<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	PCS1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GPRS 8	29.14	29.01	29.01
GPRS 10	29.04	28.95	29.10
GPRS 11	29.15	28.91	**29.16**
GPRS 12	28.90	28.94	28.99
GPRS 30	29.00	28.82	29.02
GPRS 31	29.02	28.92	28.91
GPRS 32	28.93	29.02	29.03
GPRS 33	29.00	28.91	28.94
GPRS 34	29.02	29.02	29.06
DTM 9 (GPRS)	29.03	28.94	29.04
DTM 11 (GPRS)	29.04	28.93	29.00
EDGE 8 (MCS9)	28.25	28.39	28.30
EDGE 10 (MCS9)	28.11	28.24	28.36
EDGE 11 (MCS9)	28.39	28.37	28.27
EDGE 12 (MCS9)	28.36	28.20	28.32
EDGE 30 (MCS9)	28.24	28.29	28.25
EDGE 31 (MCS9)	28.15	28.23	28.31
EDGE 32 (MCS9)	28.27	28.22	28.38
EDGE 33 (MCS9)	28.23	28.38	28.28
EDGE 34 (MCS9)	28.40	28.12	28.32
DTM 9 (EDGE)	28.41	28.18	28.40
DTM 11 (EDGE)	28.40	28.20	28.49

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	21.26	21.23	**21.27**
HSDPA Subtest-1	20.56	20.32	20.45
HSDPA Subtest-2	20.41	20.20	20.36
HSDPA Subtest-3	20.39	20.41	20.45
HSDPA Subtest-4	20.37	20.51	20.45
HSUPA Subtest-1	19.78	19.76	19.68
HSUPA Subtest-2	19.81	19.87	19.71
HSUPA Subtest-3	19.74	19.69	19.75
HSUPA Subtest-4	19.79	19.72	19.79
HSUPA Subtest-5	19.82	19.78	19.76

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	21.42	21.23	21.23
		1	2	21.47	21.29	**21.52**
		1	5	21.33	21.46	21.19
		3	0	20.26	20.30	20.15
		3	1	20.54	20.35	20.35
		3	3	20.32	20.41	20.58
		6	0	20.39	20.27	20.36
	16QAM	1	0	**20.68**	20.27	20.48
		1	2	20.52	20.46	20.60
		1	5	20.62	20.53	20.21
		3	0	19.51	19.32	19.42
		3	1	20.01	19.66	19.82
		3	3	19.59	19.53	19.69
		6	0	19.54	19.61	19.49
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	21.27	21.34	21.30
		1	7	21.19	21.47	21.46
		1	14	**21.49**	21.17	21.31
		8	0	20.45	20.31	20.22
		8	3	20.43	20.28	20.40
		8	7	20.38	20.37	20.49
		15	0	20.29	20.33	20.37
	16QAM	1	0	20.27	20.80	20.60
		1	7	20.44	20.79	**20.92**
		1	14	20.60	20.53	20.67
		8	0	19.75	19.52	19.65
		8	3	19.62	19.57	19.59
		8	7	19.46	19.59	19.62
		15	0	19.41	19.75	19.64

LTE Band 2						
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	21.35	21.32	21.35
		1	12	21.28	21.29	21.30
		1	24	**21.37**	21.34	21.25
		12	0	20.15	20.32	20.56
		12	6	20.47	20.20	20.49
		12	13	20.59	20.43	20.47
		25	0	20.45	20.25	20.23
	16QAM	1	0	20.59	20.41	20.55
		1	12	20.58	20.39	20.59
		1	24	**20.60**	20.49	**20.60**
		12	0	19.20	19.82	19.71
		12	6	19.61	19.59	19.60
		12	13	19.80	19.60	19.61
		25	0	19.71	19.63	19.66
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	21.25	**21.49**	21.34
		1	24	21.43	21.47	21.48
		1	49	21.39	21.11	21.36
		25	0	20.18	20.57	20.34
		25	12	20.32	20.31	20.38
		25	25	20.55	20.33	20.37
		50	0	20.48	20.28	20.41
	16QAM	1	0	20.40	20.46	**20.53**
		1	24	20.31	20.36	20.31
		1	49	20.44	20.39	20.27
		25	0	19.25	19.42	19.61
		25	12	19.48	19.33	19.58
		25	25	19.76	19.57	19.47
		50	0	19.65	19.35	19.31

LTE Band 2						
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	21.36	**21.46**	21.32
		1	37	21.32	21.34	21.39
		1	74	21.26	21.30	21.28
		36	0	20.41	20.31	20.40
		36	19	20.37	20.19	20.31
		36	39	20.23	20.42	20.24
		75	0	20.35	20.26	20.32
	16QAM	1	0	20.44	**20.58**	20.36
		1	37	20.43	20.36	20.42
		1	74	20.42	20.34	20.33
		36	0	19.60	19.51	19.58
		36	19	19.38	19.27	19.48
		36	39	19.24	19.60	19.29
		75	0	19.44	19.30	19.34
BW	MCS Index	Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	21.34	**21.54**	21.48
		1	50	21.42	21.43	21.19
		1	99	21.32	21.24	21.44
		50	0	20.35	20.33	20.38
		50	25	20.37	20.35	20.27
		50	50	20.28	20.26	20.28
		100	0	20.16	20.19	20.25
	16QAM	1	0	20.54	20.57	**20.65**
		1	50	20.57	20.44	20.26
		1	99	20.39	20.43	20.60
		50	0	19.52	19.36	19.40
		50	25	19.42	19.48	19.30
		50	50	19.37	19.34	19.44
		100	0	19.16	19.26	19.37

EIRP Power (dBm)

Band	PCS1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GPRS 8	31.15	31.02	31.02
GPRS 10	31.05	30.96	31.11
GPRS 11	31.16	30.92	**31.17**
GPRS 12	30.91	30.95	31.00
GPRS 30	31.01	30.83	31.03
GPRS 31	31.03	30.93	30.92
GPRS 32	30.94	31.03	31.04
GPRS 33	31.01	30.92	30.95
GPRS 34	31.03	31.03	31.07
DTM 9 (GPRS)	31.04	30.95	31.05
DTM 11 (GPRS)	31.05	30.94	31.01
EDGE 8 (MCS9)	30.26	30.40	30.31
EDGE 10 (MCS9)	30.12	30.25	30.37
EDGE 11 (MCS9)	30.40	30.38	30.28
EDGE 12 (MCS9)	30.37	30.21	30.33
EDGE 30 (MCS9)	30.25	30.30	30.26
EDGE 31 (MCS9)	30.16	30.24	30.32
EDGE 32 (MCS9)	30.28	30.23	30.39
EDGE 33 (MCS9)	30.24	30.39	30.29
EDGE 34 (MCS9)	30.41	30.13	30.33
DTM 9 (EDGE)	30.42	30.19	30.41
DTM 11 (EDGE)	30.41	30.21	**30.50**

*EIRP = Conducted + antenna gain (2.01dBi)

Band	WCDMA II		
Channel	9262	9400	9538
Frequency	1852.4	1880	1907.6
RMC 12.2K	23.27	23.24	**23.28**
HSDPA Subtest-1	22.57	22.33	22.46
HSDPA Subtest-2	22.42	22.21	22.37
HSDPA Subtest-3	22.40	22.42	22.46
HSDPA Subtest-4	22.38	22.52	22.46
HSUPA Subtest-1	21.79	21.77	21.69
HSUPA Subtest-2	21.82	21.88	21.72
HSUPA Subtest-3	21.75	21.70	21.76
HSUPA Subtest-4	21.80	21.73	21.80

*EIRP = Conducted + antenna gain (2.01dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	23.43	23.24	23.24
		1	2	23.48	23.30	**23.53**
		1	5	23.34	23.47	23.20
		3	0	22.27	22.31	22.16
		3	1	22.55	22.36	22.36
		3	3	22.33	22.42	22.59
		6	0	22.40	22.28	22.37
	16QAM	1	0	**22.69**	22.28	22.49
		1	2	22.53	22.47	22.61
		1	5	22.63	22.54	22.22
		3	0	21.52	21.33	21.43
		3	1	22.02	21.67	21.83
		3	3	21.60	21.54	21.70
		6	0	21.55	21.62	21.50
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	23.28	23.35	23.31
		1	7	23.20	23.48	23.47
		1	14	**23.50**	23.18	23.32
		8	0	22.46	22.32	22.23
		8	3	22.44	22.29	22.41
		8	7	22.39	22.38	22.50
		15	0	22.30	22.34	22.38
	16QAM	1	0	22.28	22.81	22.61
		1	7	22.45	22.80	**22.93**
		1	14	22.61	22.54	22.68
		8	0	21.76	21.53	21.66
		8	3	21.63	21.58	21.60
		8	7	21.47	21.60	21.63
		15	0	21.42	21.76	21.65

*EIRP = Conducted + antenna gain (2.01dBi)

LTE Band 2						
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	23.36	23.33	23.36
		1	12	23.29	23.30	23.31
		1	24	**23.38**	23.35	23.26
		12	0	22.16	22.33	22.57
		12	6	22.48	22.21	22.50
		12	13	22.60	22.44	22.48
		25	0	22.46	22.26	22.24
	16QAM	1	0	22.60	22.42	22.56
		1	12	22.59	22.40	22.60
		1	24	**22.61**	22.50	**22.61**
		12	0	21.21	21.83	21.72
		12	6	21.62	21.60	21.61
		12	13	21.81	21.61	21.62
		25	0	21.72	21.64	21.67
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	23.26	**23.50**	23.35
		1	24	23.44	23.48	23.49
		1	49	23.40	23.12	23.37
		25	0	22.19	22.58	22.35
		25	12	22.33	22.32	22.39
		25	25	22.56	22.34	22.38
		50	0	22.49	22.29	22.42
	16QAM	1	0	22.41	22.47	**22.54**
		1	24	22.32	22.37	22.32
		1	49	22.45	22.40	22.28
		25	0	21.26	21.43	21.62
		25	12	21.49	21.34	21.59
		25	25	21.77	21.58	21.48
		50	0	21.66	21.36	21.32

*EIRP = Conducted + antenna gain (2.01dBi)

LTE Band 2						
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	23.37	**23.47**	23.33
		1	37	23.33	23.35	23.40
		1	74	23.27	23.31	23.29
		36	0	22.42	22.32	22.41
		36	19	22.38	22.20	22.32
		36	39	22.24	22.43	22.25
		75	0	22.36	22.27	22.33
	16QAM	1	0	22.45	**22.59**	22.37
		1	37	22.44	22.37	22.43
		1	74	22.43	22.35	22.34
		36	0	21.61	21.52	21.59
		36	19	21.39	21.28	21.49
		36	39	21.25	21.61	21.30
		75	0	21.45	21.31	21.35
BW	MCS Index	Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	23.35	**23.55**	23.49
		1	50	23.43	23.44	23.20
		1	99	23.33	23.25	23.45
		50	0	22.36	22.34	22.39
		50	25	22.38	22.36	22.28
		50	50	22.29	22.27	22.29
		100	0	22.17	22.20	22.26
	16QAM	1	0	22.55	22.58	**22.66**
		1	50	22.58	22.45	22.27
		1	99	22.40	22.44	22.61
		50	0	21.53	21.37	21.41
		50	25	21.43	21.49	21.31
		50	50	21.38	21.35	21.45
		100	0	21.17	21.27	21.38

*EIRP = Conducted + antenna gain (2.01dBi)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

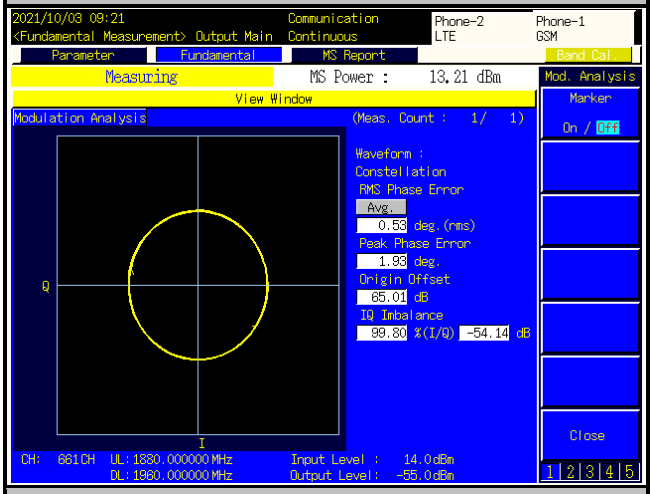
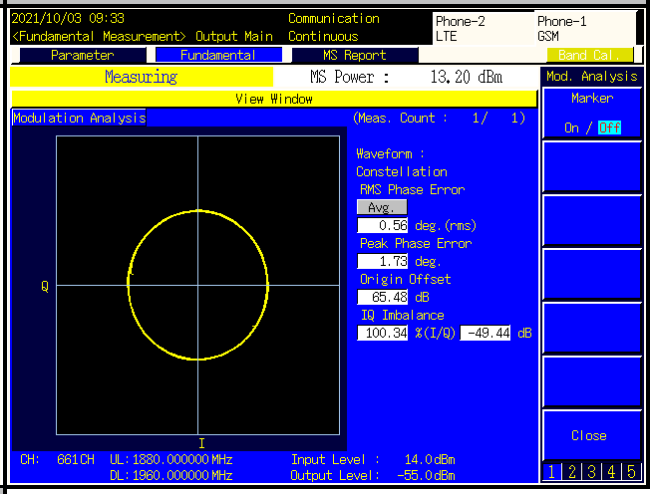
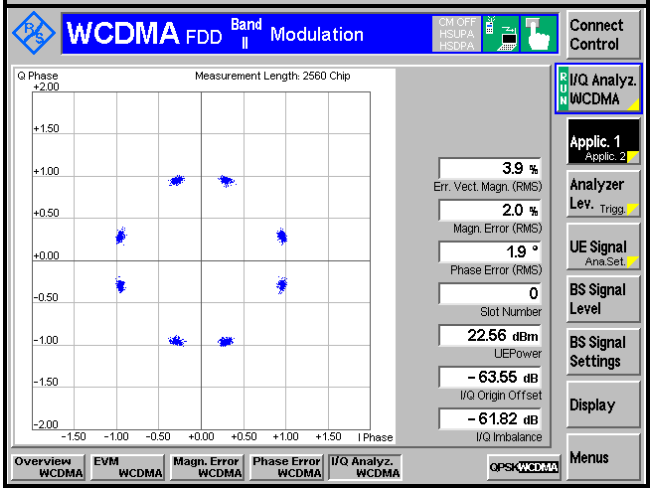
N/A

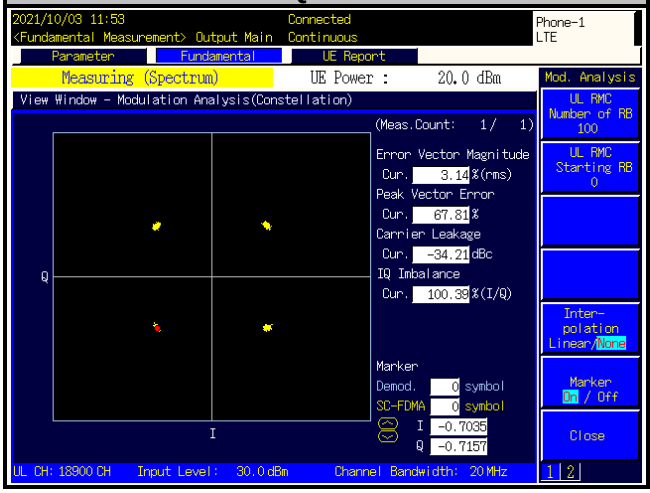
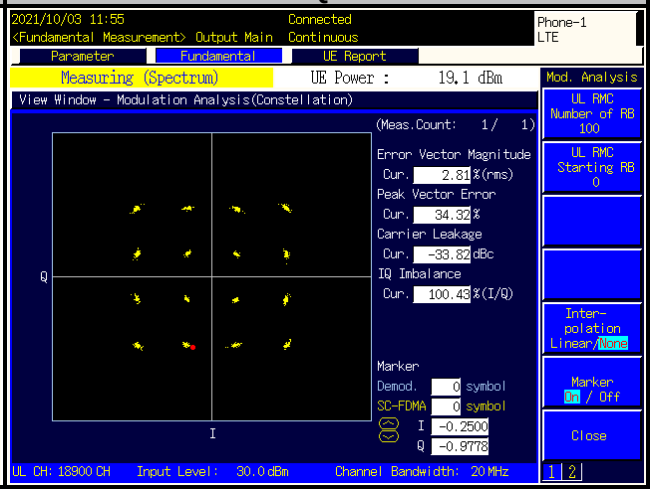
4.2.2 Test Setup

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	
GPRS	**EDGE**
Channel 661	**Channel 661**
	
WCDMA	
Channel 9400	
	

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

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

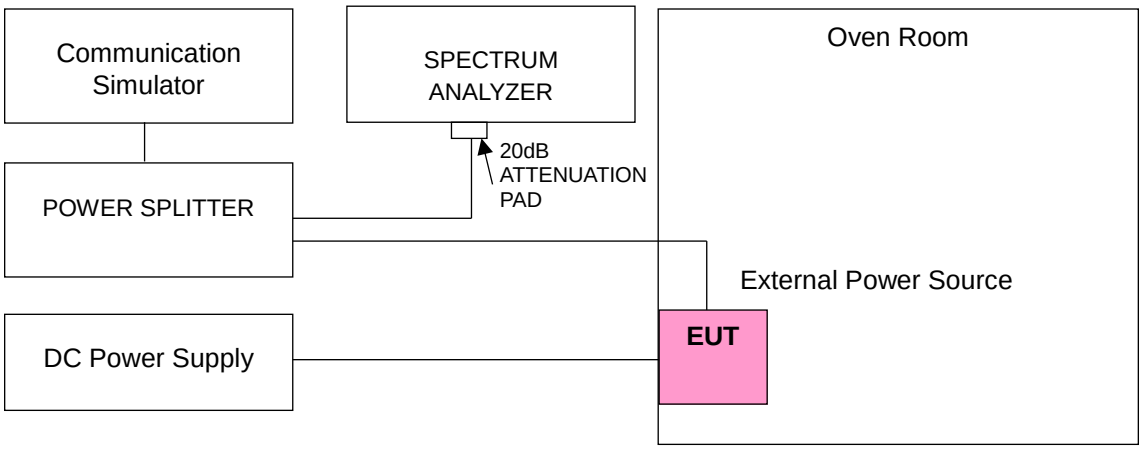
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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)	GPRS			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
7.2	1850.200003	0.001	1909.800002	0.001
6.12	1850.200002	0.001	1909.800002	0.001
8.28	1850.200003	0.001	1909.800003	0.002

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	GPRS			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1850.200002	0.001	1909.800002	0.001
-30	1850.200002	0.001	1909.800002	0.001
-20	1850.200002	0.001	1909.800004	0.002
-10	1850.200003	0.002	1909.800002	0.001
0	1850.200002	0.001	1909.800003	0.001
10	1850.200002	0.001	1909.800004	0.002
20	1850.199996	-0.002	1909.799997	-0.002
30	1850.199998	-0.001	1909.799999	-0.001
40	1850.199996	-0.002	1909.799999	-0.001
50	1850.199997	-0.002	1909.799997	-0.001
60	1850.199998	-0.001	1909.799997	-0.002
70	1850.199997	-0.002	1909.799998	-0.001
85	1850.199999	-0.001	1909.799997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
7.2	1850.200001	0.001	1909.800004	0.002
6.12	1850.200002	0.001	1909.800003	0.001
8.28	1850.200003	0.002	1909.800003	0.002

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1850.200003	0.001	1909.800002	0.001
-30	1850.200003	0.001	1909.800002	0.001
-20	1850.200004	0.002	1909.800001	0.001
-10	1850.200003	0.002	1909.800002	0.001
0	1850.200003	0.002	1909.800003	0.002
10	1850.200002	0.001	1909.800001	0.001
20	1850.199998	-0.001	1909.799996	-0.002
30	1850.199998	-0.001	1909.799996	-0.002
40	1850.199999	-0.001	1909.799999	-0.001
50	1850.199997	-0.002	1909.799996	-0.002
60	1850.200002	0.001	1909.800002	0.001
70	1850.199999	0.000	1909.799998	-0.001
85	1850.200001	0.000	1909.799999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
7.2	1852.400001	0.001	1907.600002	0.001
6.12	1852.400002	0.001	1907.600002	0.001
8.28	1852.400002	0.001	1907.600002	0.001

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1852.400003	0.001	1907.600003	0.001
-30	1852.400003	0.002	1907.600002	0.001
-20	1852.400004	0.002	1907.600002	0.001
-10	1852.400004	0.002	1907.600001	0.001
0	1852.400003	0.001	1907.600004	0.002
10	1852.400003	0.002	1907.600001	0.001
20	1852.399998	-0.001	1907.599996	-0.002
30	1852.399999	-0.001	1907.599996	-0.002
40	1852.399999	-0.001	1907.599997	-0.002
50	1852.399999	-0.001	1907.599998	-0.001
60	1852.400001	0.001	1907.600002	0.001
70	1852.400004	0.002	1907.600001	0.001
85	1852.400002	0.001	1907.600003	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)
7.2	1850.700002	0.001	1909.300000	0.001
6.12	1850.700003	0.001	1909.300002	0.001
8.28	1850.700004	0.002	1909.300002	0.001

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 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)
-40	1850.700003	0.002	1909.300003	0.002
-30	1850.700004	0.002	1909.300002	0.001
-20	1850.700004	0.002	1909.300004	0.002
-10	1850.700004	0.002	1909.300004	0.002
0	1850.700002	0.001	1909.300003	0.002
10	1850.700001	0.001	1909.300004	0.002
20	1850.699998	-0.001	1909.300003	0.002
30	1850.699998	-0.001	1909.300002	0.001
40	1850.699999	-0.001	1909.299997	-0.001
50	1850.699997	-0.001	1909.299999	-0.001
60	1850.699999	-0.001	1909.299998	-0.001
70	1850.699998	-0.001	1909.299997	-0.002
85	1850.699998	-0.001	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)
7.2	1851.500002	0.001	1908.500003	0.002
6.12	1851.500003	0.002	1908.500002	0.001
8.28	1851.500002	0.001	1908.500003	0.001

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 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)
-40	1851.500002	0.001	1908.500003	0.001
-30	1851.500003	0.002	1908.500002	0.001
-20	1851.500002	0.001	1908.500004	0.002
-10	1851.500004	0.002	1908.500003	0.002
0	1851.500004	0.002	1908.500002	0.001
10	1851.500003	0.002	1908.500002	0.001
20	1851.499999	-0.001	1908.499998	-0.001
30	1851.499996	-0.002	1908.499998	-0.001
40	1851.499998	-0.001	1908.499997	-0.002
50	1851.499997	-0.002	1908.499998	-0.001
60	1851.500004	0.002	1908.499999	0.000
70	1851.500002	0.001	1908.500001	0.001
85	1851.499997	-0.002	1908.500004	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)
7.2	1852.500001	0.001	1907.500004	0.002
6.12	1852.500003	0.002	1907.500004	0.002
8.28	1852.500003	0.002	1907.500004	0.002

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 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)
-40	1852.500001	0.001	1907.500002	0.001
-30	1852.500001	0.001	1907.500002	0.001
-20	1852.500002	0.001	1907.500002	0.001
-10	1852.500001	0.001	1907.500004	0.002
0	1852.500002	0.001	1907.500004	0.002
10	1852.500003	0.001	1907.500004	0.002
20	1852.499997	-0.001	1907.499997	-0.001
30	1852.499996	-0.002	1907.499997	-0.001
40	1852.499996	-0.002	1907.499998	-0.001
50	1852.499998	-0.001	1907.499996	-0.002
60	1852.500004	0.002	1907.500003	0.002
70	1852.499998	-0.001	1907.500003	0.002
85	1852.500000	0.000	1907.500002	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)
7.2	1855.000002	0.001	1905.000002	0.001
6.12	1855.000004	0.002	1905.000003	0.001
8.28	1855.000002	0.001	1905.000003	0.001

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 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)
-40	1855.000002	0.001	1905.000002	0.001
-30	1855.000002	0.001	1905.000003	0.001
-20	1855.000002	0.001	1905.000002	0.001
-10	1855.000001	0.001	1905.000002	0.001
0	1855.000004	0.002	1905.000002	0.001
10	1855.000002	0.001	1905.000001	0.001
20	1854.999996	-0.002	1904.999997	-0.002
30	1854.999997	-0.002	1904.999999	-0.001
40	1854.999998	-0.001	1904.999998	-0.001
50	1854.999999	-0.001	1904.999999	-0.001
60	1854.999998	-0.001	1904.999998	-0.001
70	1854.999999	-0.001	1904.999997	-0.002
85	1854.999999	-0.001	1904.999997	-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)
7.2	1857.500003	0.002	1902.500003	0.001
6.12	1857.500003	0.001	1902.500003	0.001
8.28	1857.500003	0.001	1902.500003	0.001

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 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)
-40	1857.500002	0.001	1902.500002	0.001
-30	1857.500001	0.001	1902.500002	0.001
-20	1857.500002	0.001	1902.500003	0.002
-10	1857.500002	0.001	1902.500001	0.001
0	1857.500001	0.001	1902.500001	0.001
10	1857.500002	0.001	1902.500003	0.002
20	1857.499999	-0.001	1902.499998	-0.001
30	1857.499997	-0.002	1902.499999	-0.001
40	1857.499997	-0.002	1902.499996	-0.002
50	1857.499996	-0.002	1902.499997	-0.001
60	1857.500001	0.001	1902.500004	0.002
70	1857.500001	0.001	1902.500001	0.001
85	1857.500002	0.001	1902.499999	-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)
7.2	1860.000002	0.001	1900.000004	0.002
6.12	1860.000002	0.001	1900.000003	0.002
8.28	1860.000003	0.002	1900.000002	0.001

Note: The applicant defined the normal working voltage of the battery is from 6.12 Vdc to 8.28 Vdc.

Frequency Error vs. Temperature

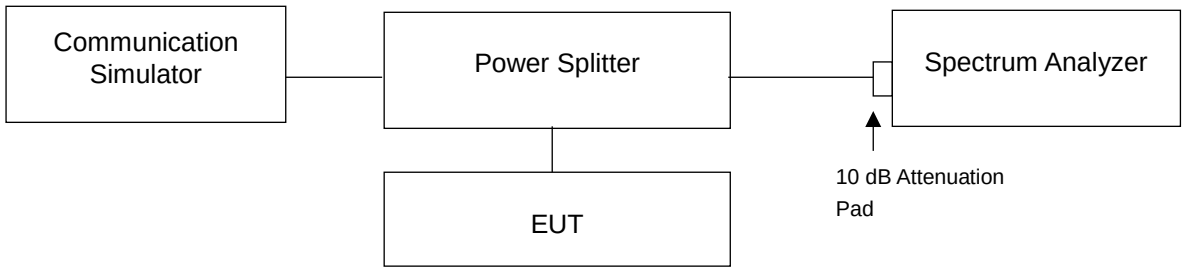
Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1860.000002	0.001	1900.000004	0.002
-30	1860.000002	0.001	1900.000004	0.002
-20	1860.000001	0.001	1900.000004	0.002
-10	1860.000001	0.001	1900.000002	0.001
0	1860.000004	0.002	1900.000002	0.001
10	1860.000003	0.002	1900.000003	0.002
20	1859.999999	-0.001	1899.999996	-0.002
30	1859.999997	-0.002	1899.999996	-0.002
40	1859.999998	-0.001	1899.999997	-0.002
50	1859.999998	-0.001	1899.999998	-0.001
60	1860.000001	0.001	1899.999997	-0.002
70	1860.000004	0.002	1899.999999	-0.001
85	1860.000002	0.001	1899.999998	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

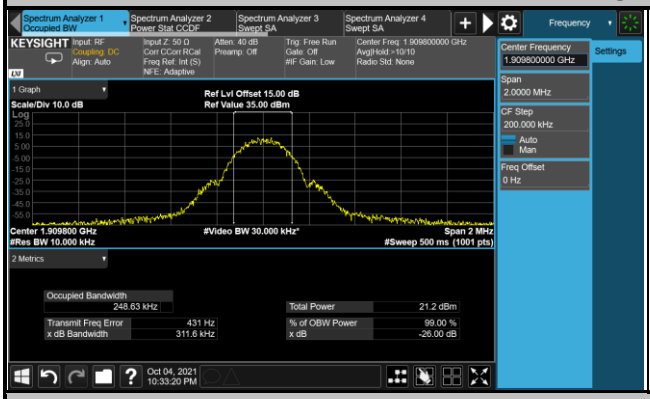
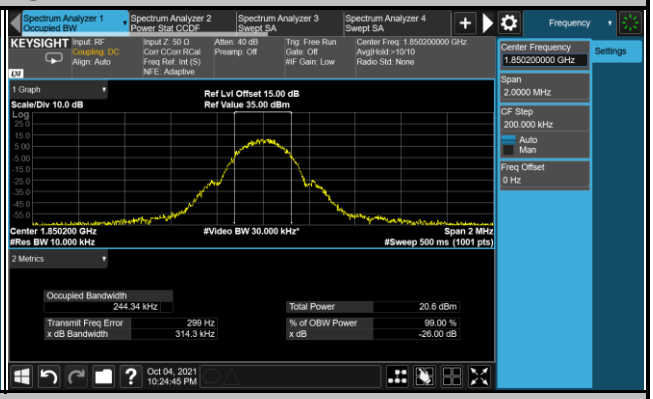
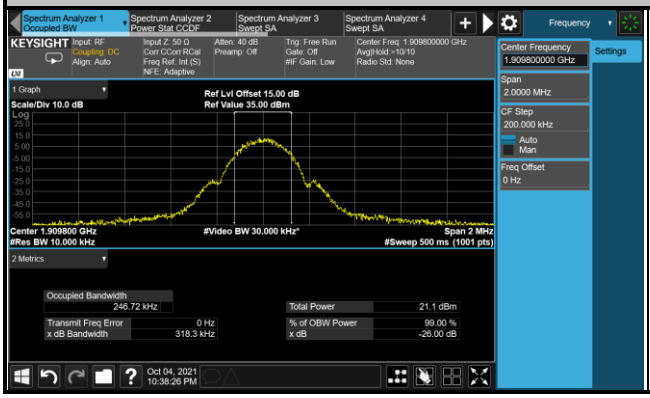
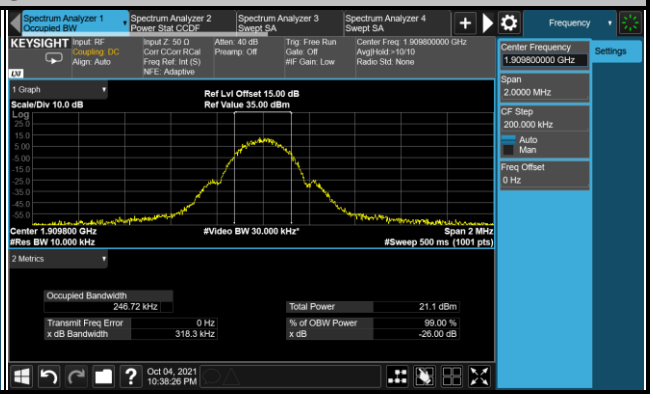
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Refer to ANSI C63.26 section 5.4.4. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth. For the 26dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

4.4.2 Test Setup

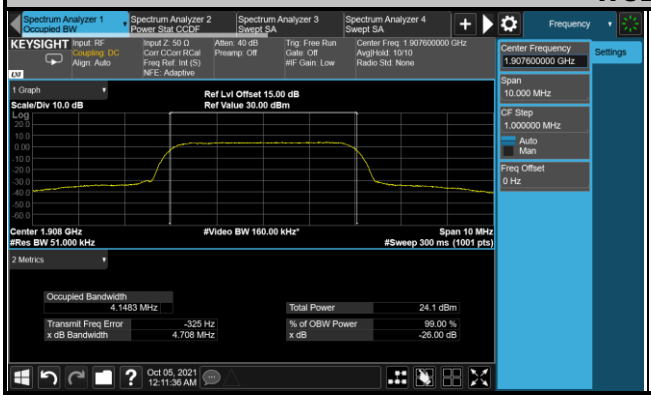
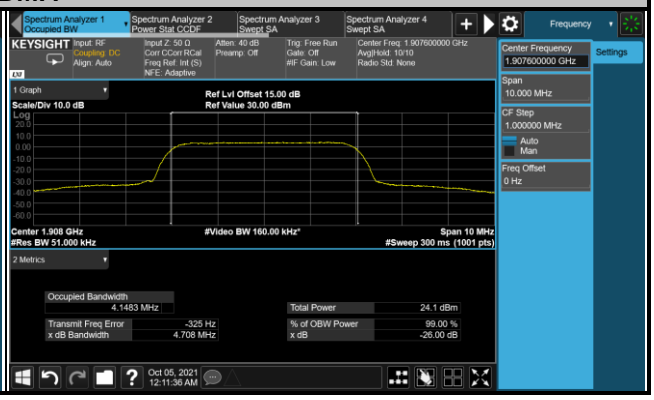


4.4.3 Test Result

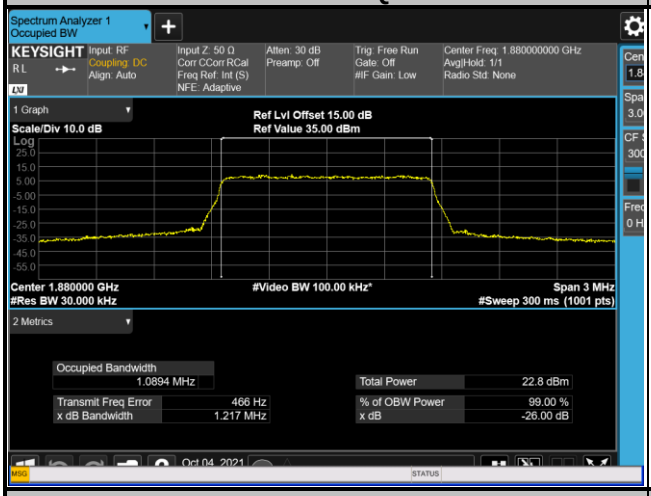
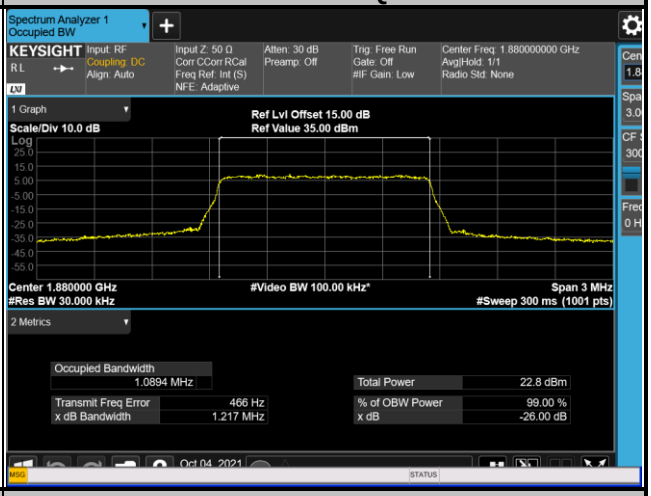
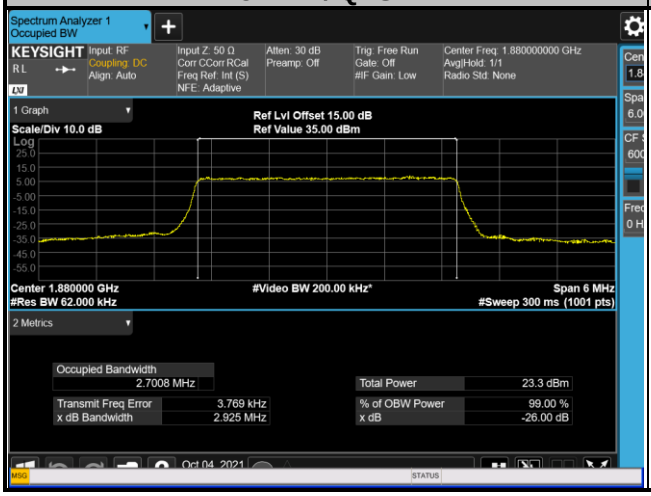
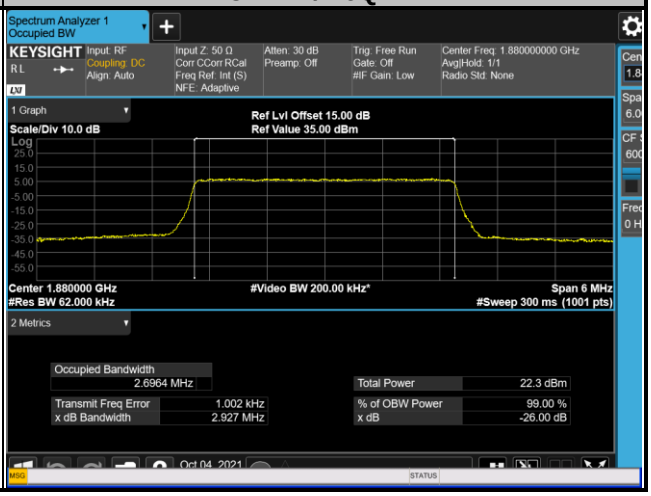
GPRS				EDGE			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)	Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	244.34	314.30	512	1850.2	246.22	312.20
661	1880.0	245.21	309.20	661	1880.0	243.31	315.30
810	1909.8	248.63	311.60	810	1909.8	246.72	318.30

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

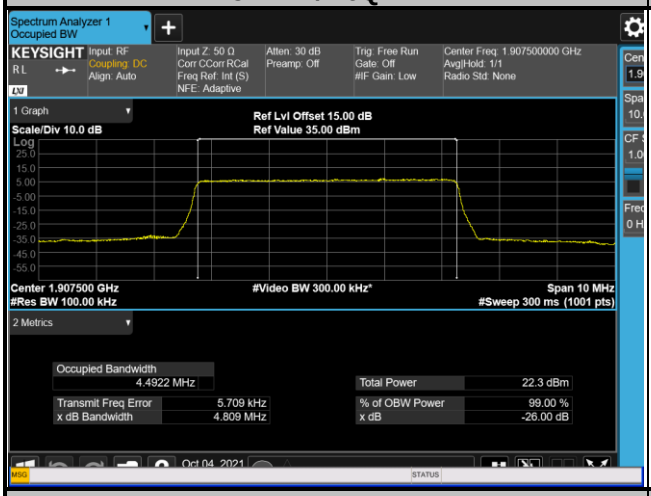
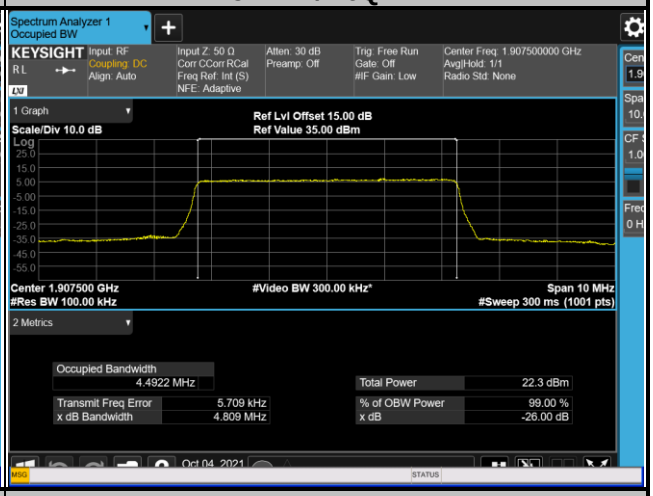
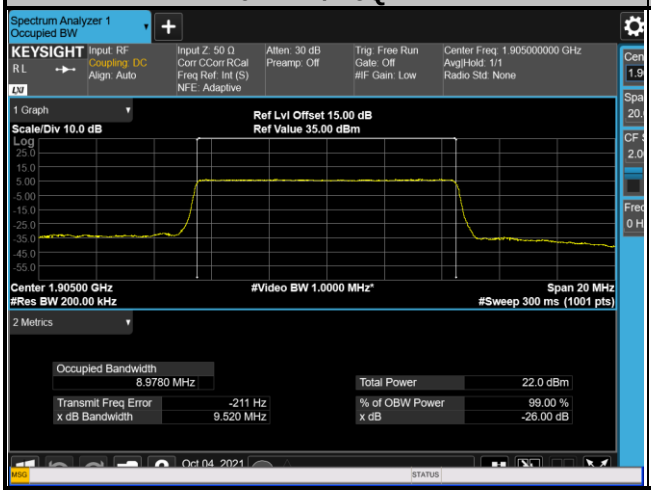
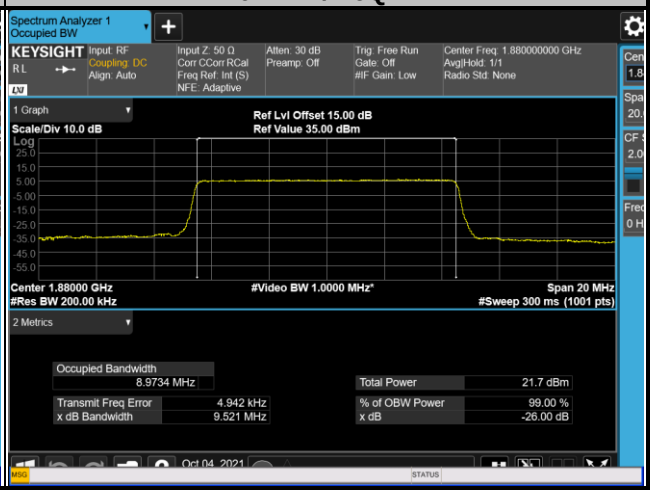
WCDMA			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.15	4.70
9400	1880.0	4.15	4.71
9538	1907.6	4.15	4.71

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

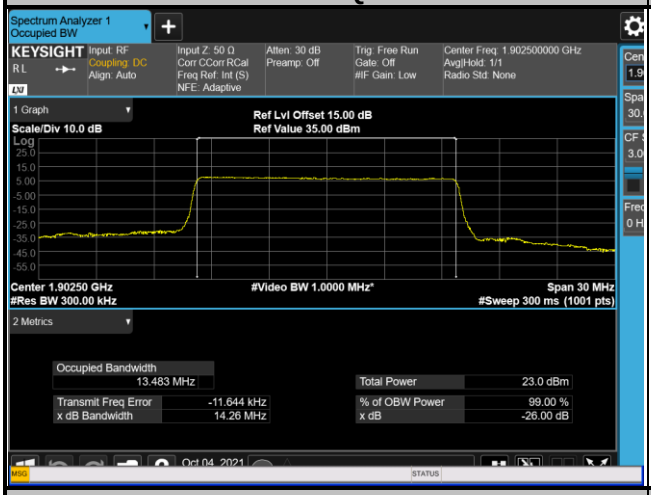
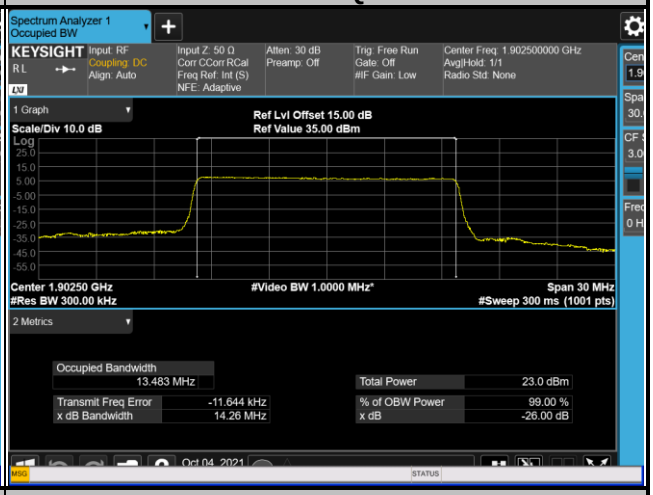
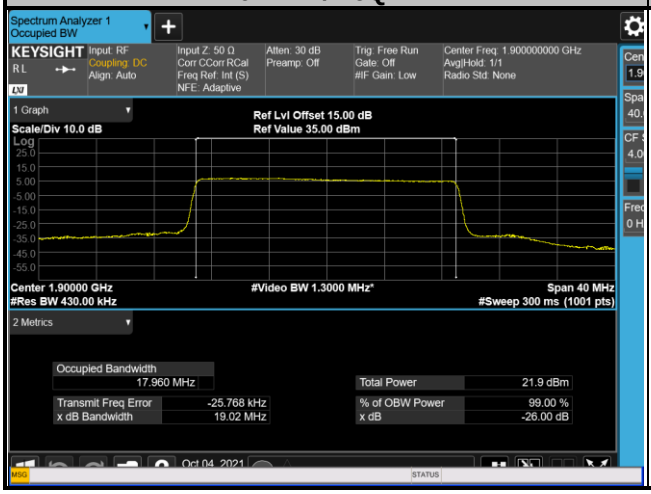
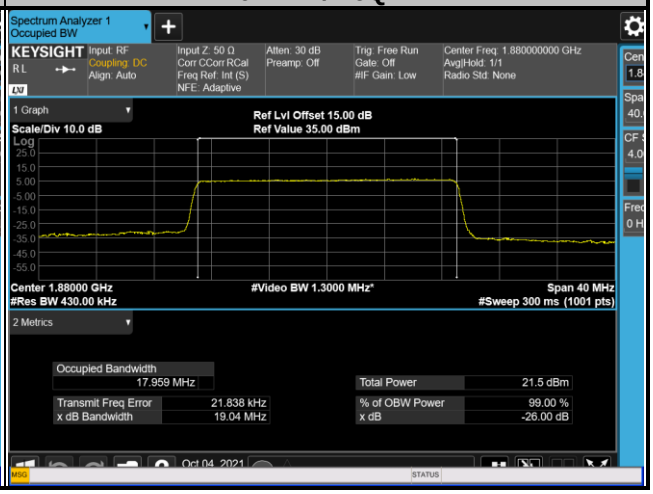
LTE Band 2					
Channel Bandwidth: 1.4 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
18607	1850.7	1.09	1.09	1.21	1.22
18900	1880.0	1.09	1.09	1.21	1.22
19193	1909.3	1.09	1.09	1.21	1.22
Channel Bandwidth: 3 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
18615	1851.5	2.70	2.69	2.91	2.92
18900	1880.0	2.70	2.70	2.93	2.93
19185	1908.5	2.70	2.70	2.90	2.92

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

LTE Band 2					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18625	1852.5	4.49	4.49	4.80	4.81
18900	1880.0	4.49	4.49	4.81	4.79
19175	1907.5	4.49	4.49	4.79	4.81
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18650	1855.0	8.96	8.96	9.50	9.50
18900	1880.0	8.97	8.97	9.50	9.52
19150	1905.0	8.98	8.98	9.52	9.52

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
5 MHz / 16QAM	5 MHz / 16QAM
	
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**	**QPSK**	**16QAM**
18675	1857.5	13.43	13.43	14.23	14.23
18900	1880.0	13.47	13.45	14.25	14.25
19125	1902.5	13.48	13.47	14.26	14.25
Channel Bandwidth: 20 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
18700	1860.0	17.88	17.90	18.99	19.01
18900	1880.0	17.94	17.96	19.04	19.04
19100	1900.0	17.94	17.96	19.02	19.02

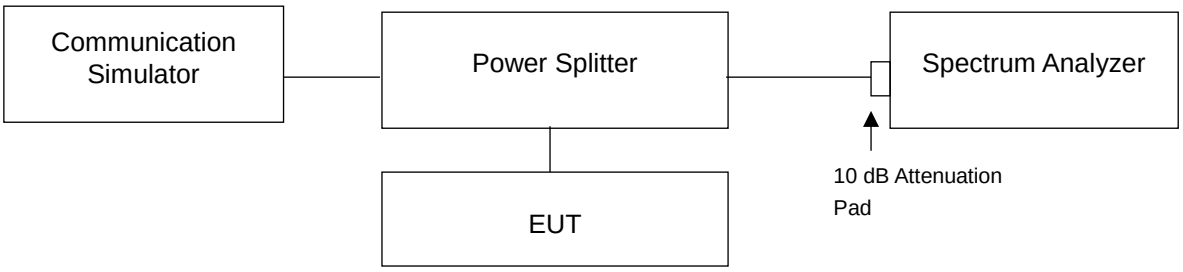
Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
15 MHz / QPSK	**15 MHz / QPSK**
	
20 MHz / 16QAM	**20 MHz / 16QAM**
	

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.

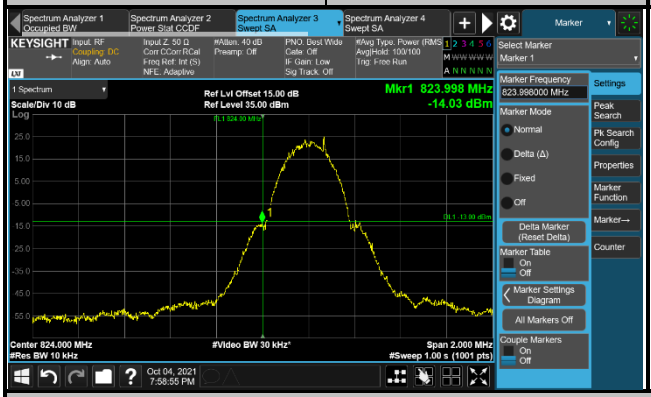
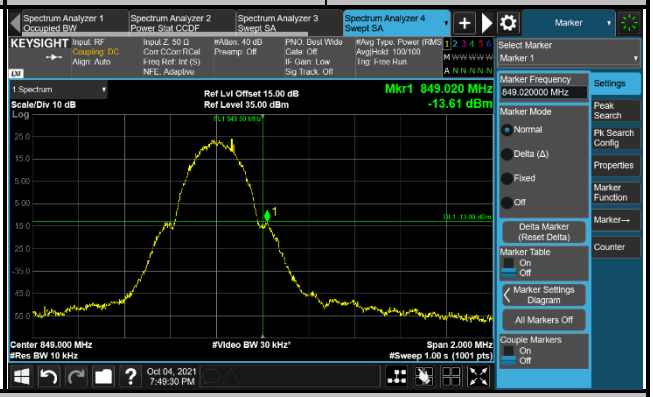
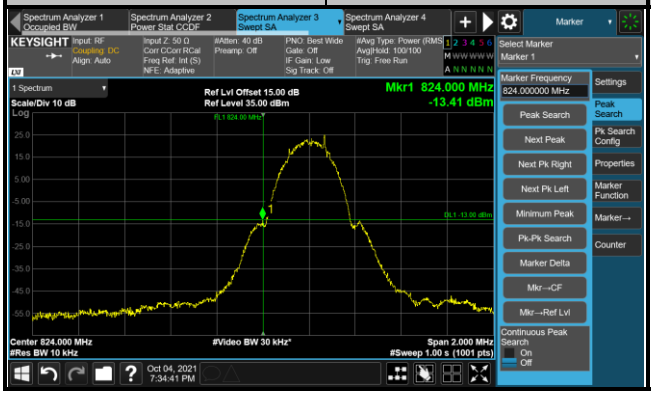
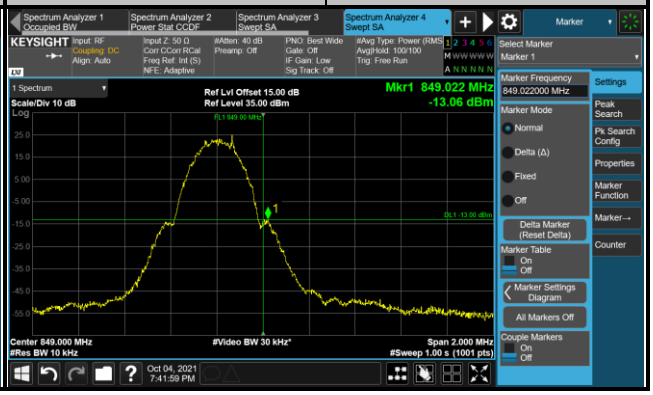
4.5.2 Test Setup

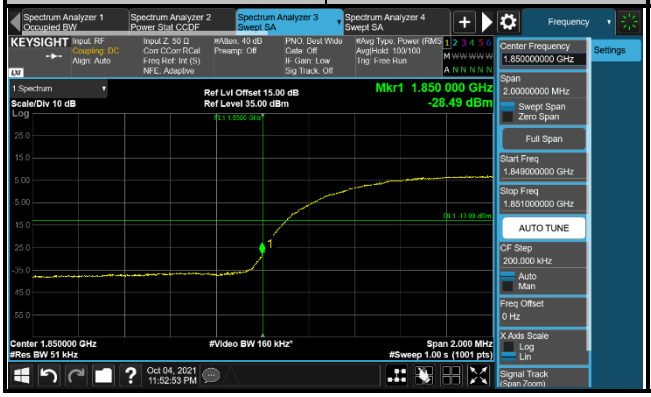
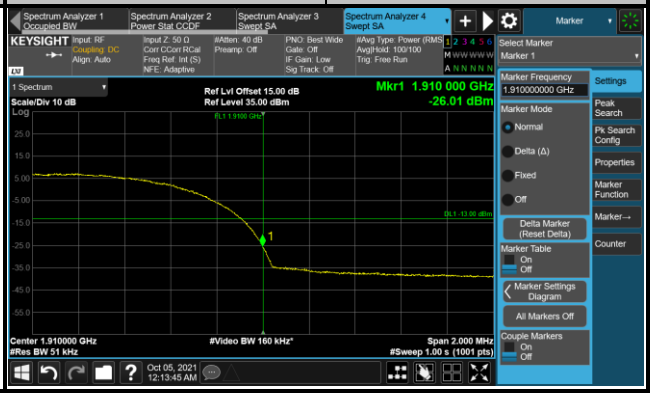


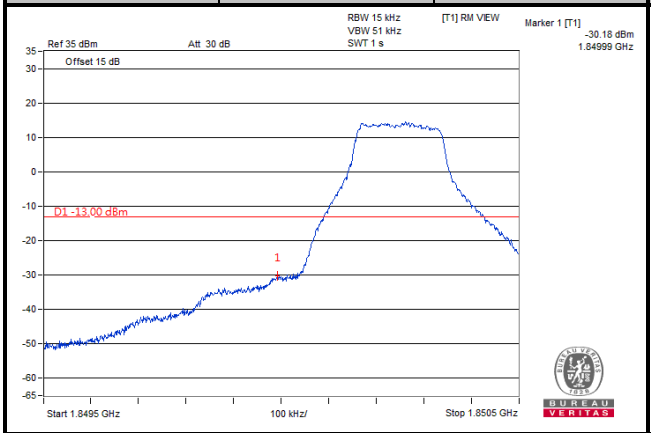
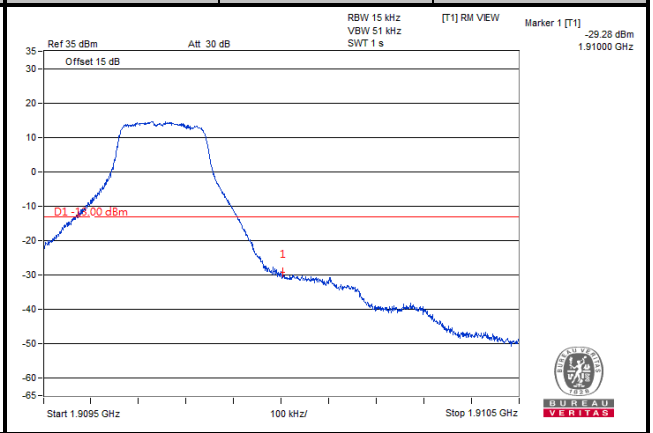
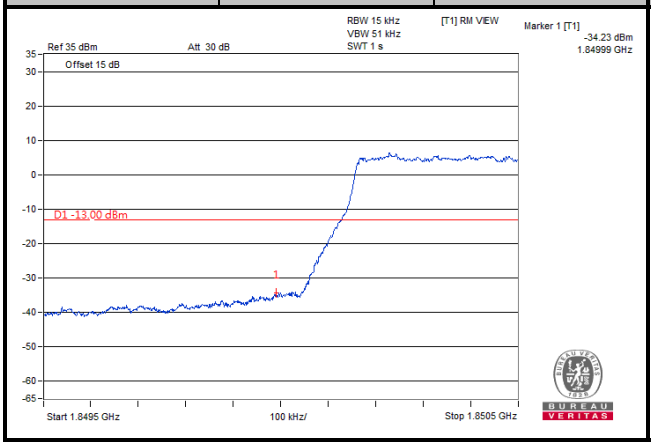
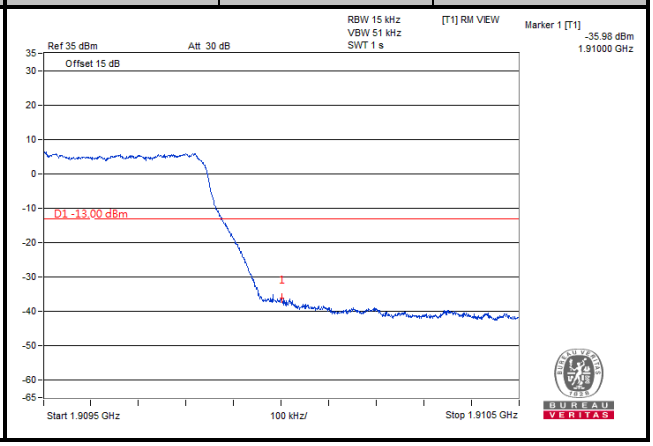
4.5.3 Test Procedures

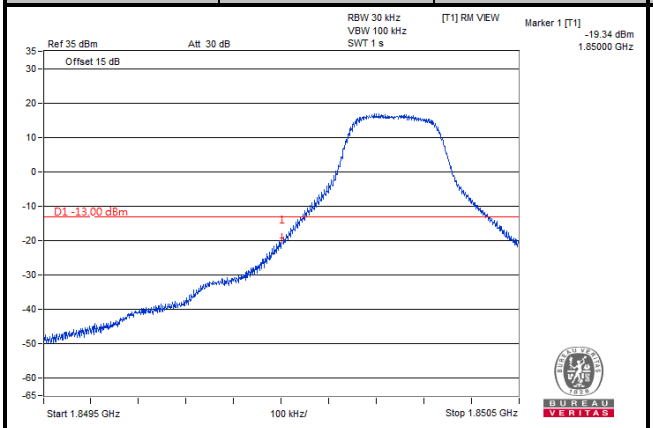
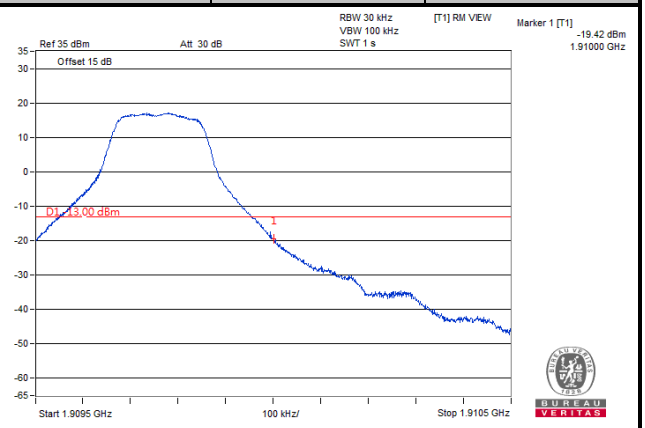
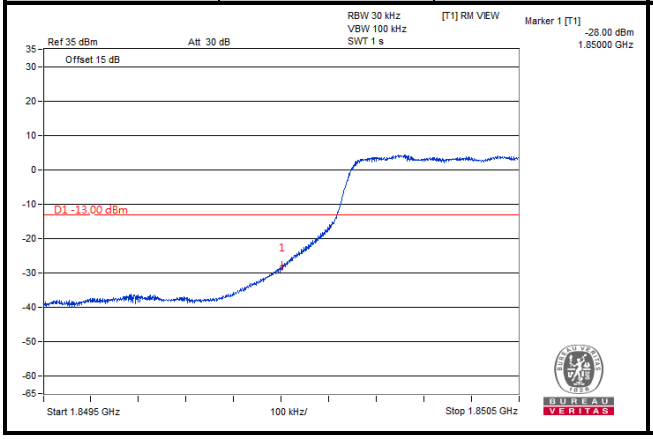
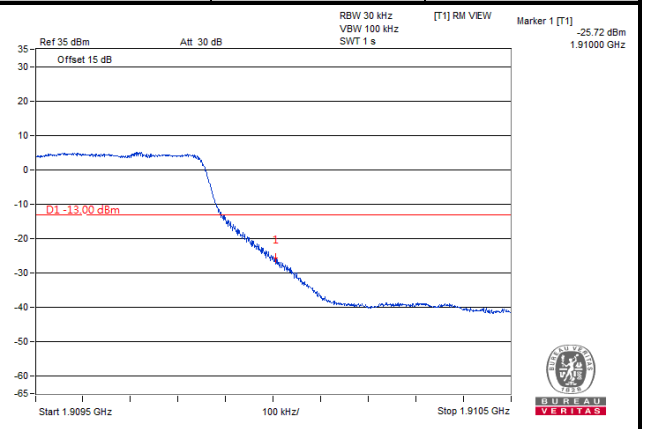
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 2 MHz. RB of the spectrum is 10 kHz and VB of the spectrum is 30 kHz (GPRS/EDGE).
c. The center frequency of spectrum is the band edge frequency and span is 2 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.

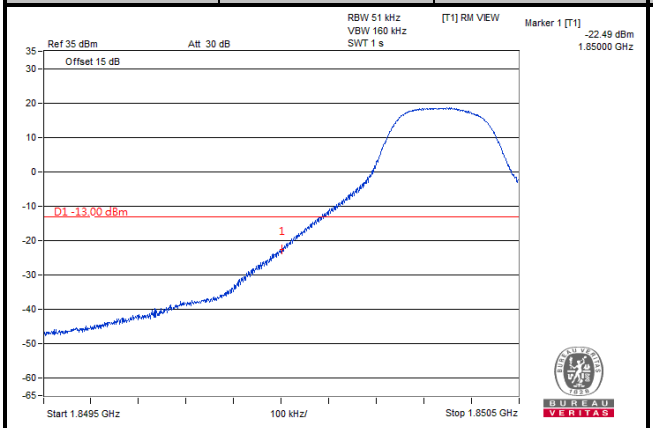
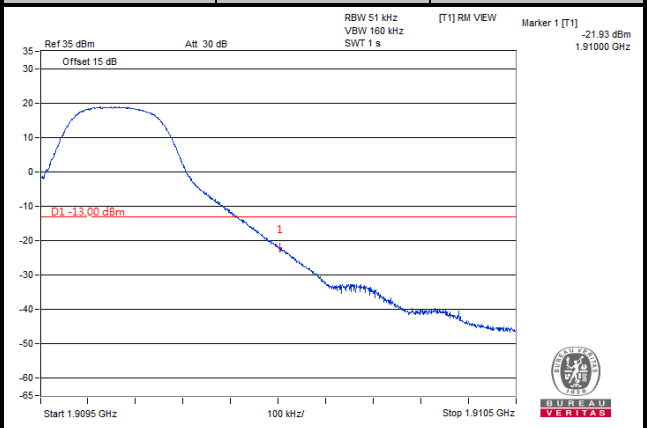
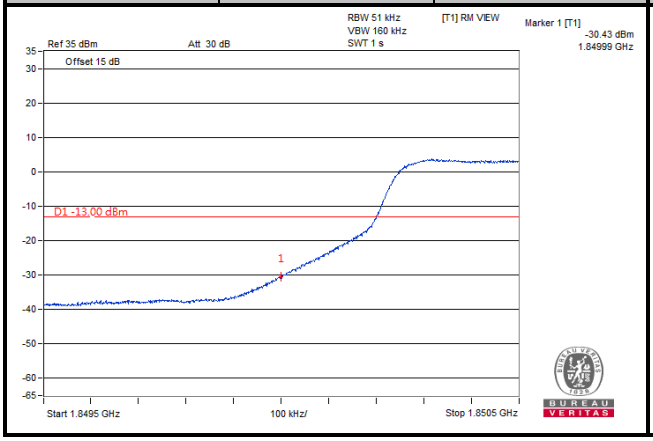
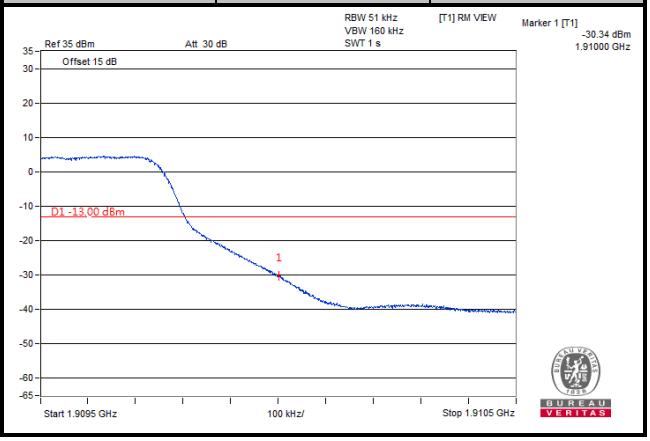
4.5.4 Test Results

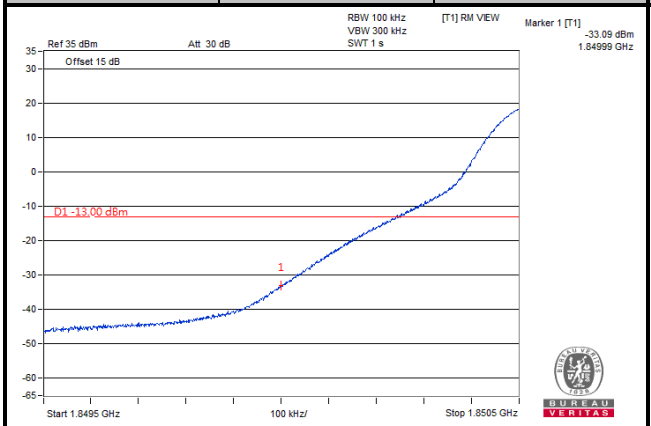
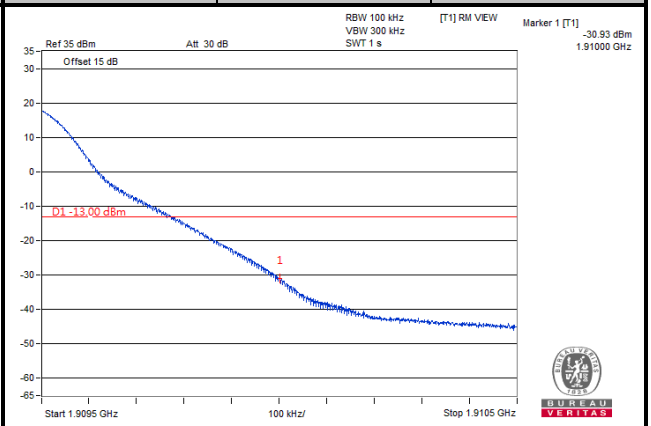
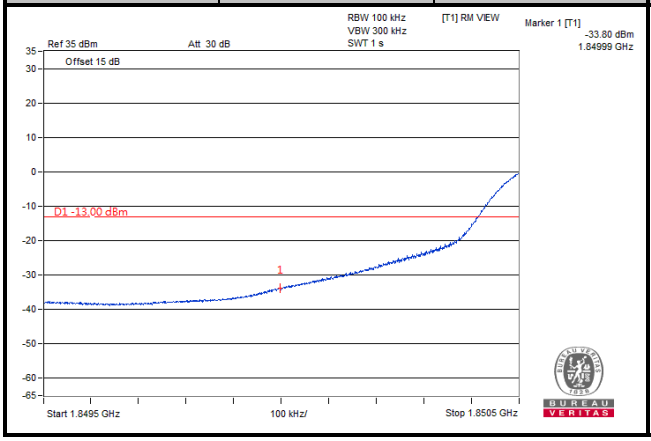
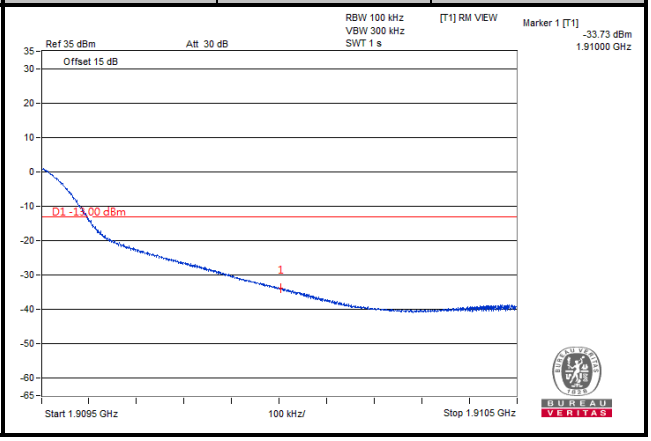
GPRS			
Channel	512	Channel	810
			
EDGE			
Channel	512	Channel	810
			

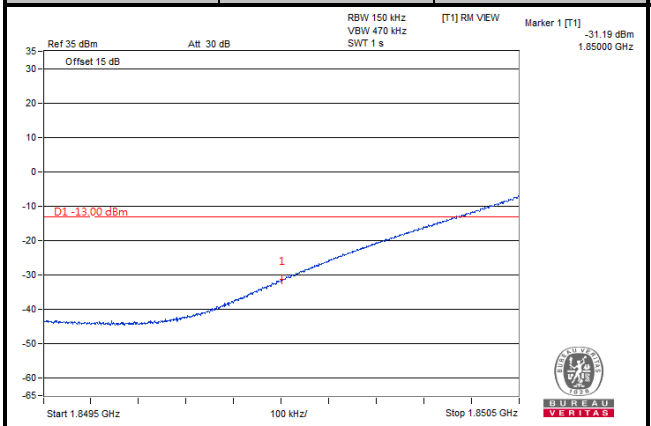
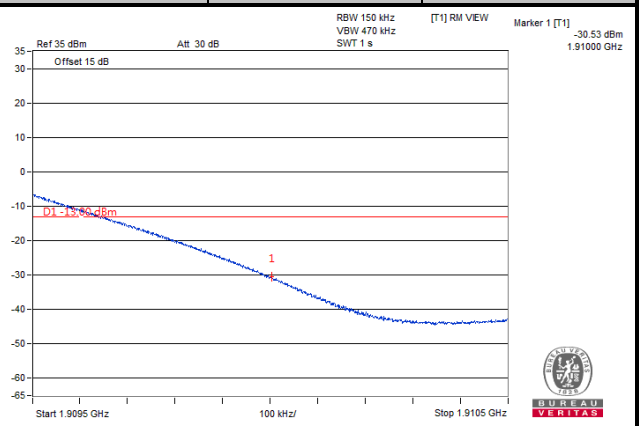
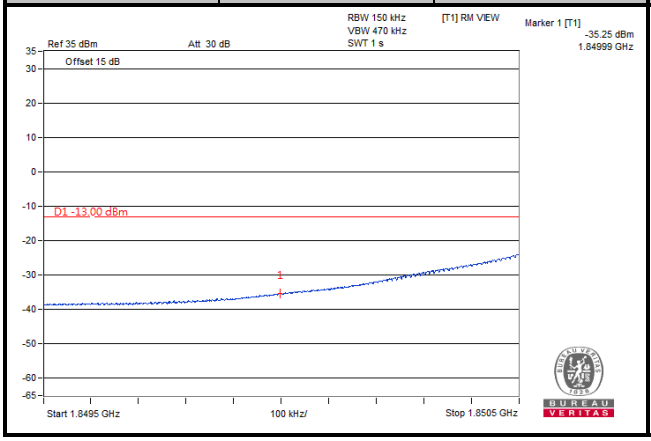
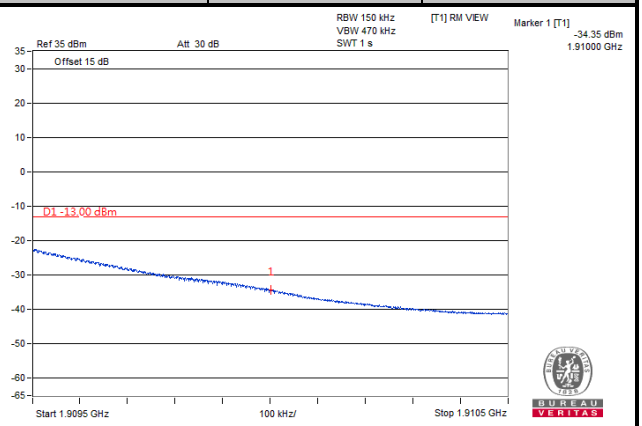
WCDMA			
Channel	9262	Channel	9538
			

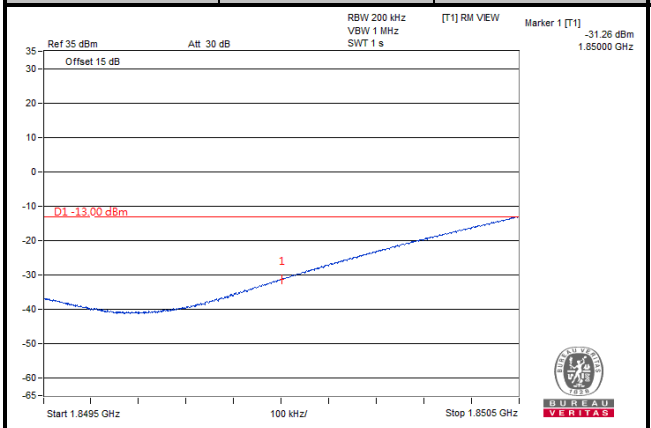
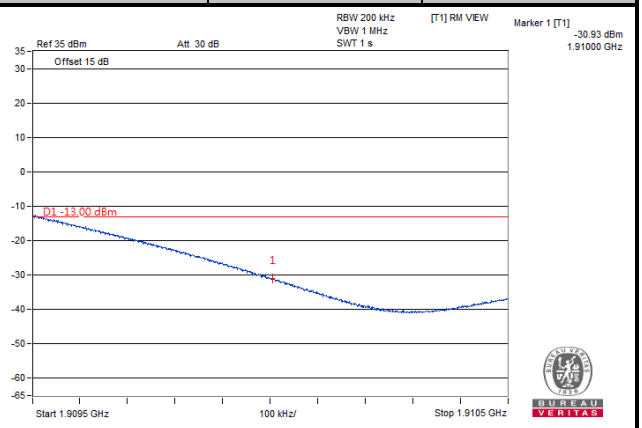
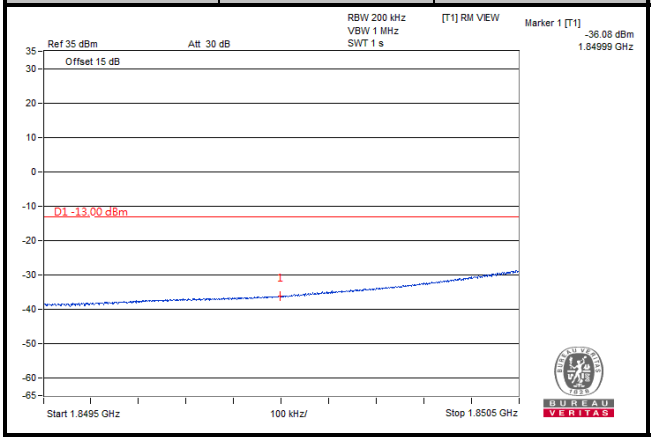
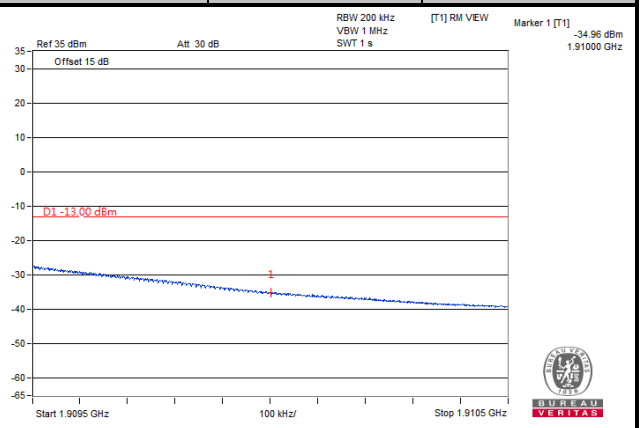
LTE Band 2					
Channel Bandwidth: 1.4 MHz					
Channel	18607	1 RB	Channel	19193	1 RB
					
Channel	18607	6 RB	Channel	19193	6 RB
					

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
					

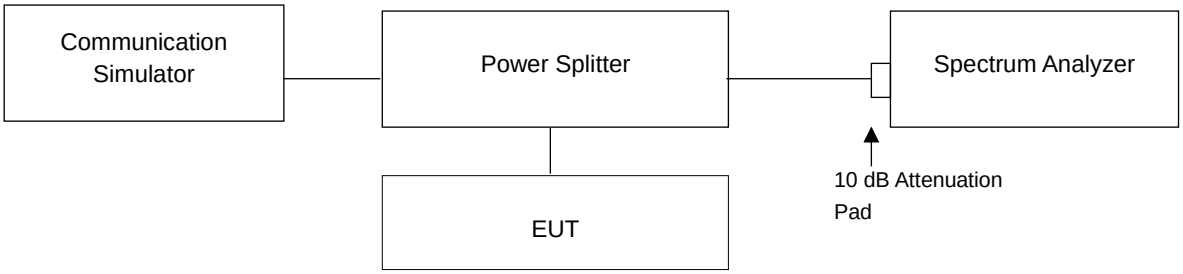
LTE Band 2					
Channel Bandwidth: 20 MHz					
Channel	18700	1 RB	Channel	19100	1 RB
					
Channel	18700	100 RB	Channel	19100	100 RB
					

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

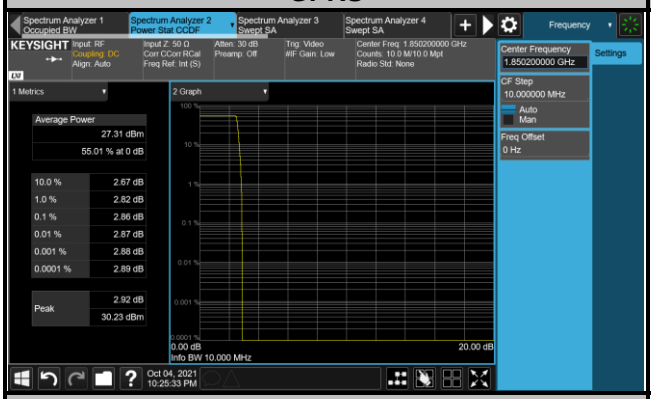
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

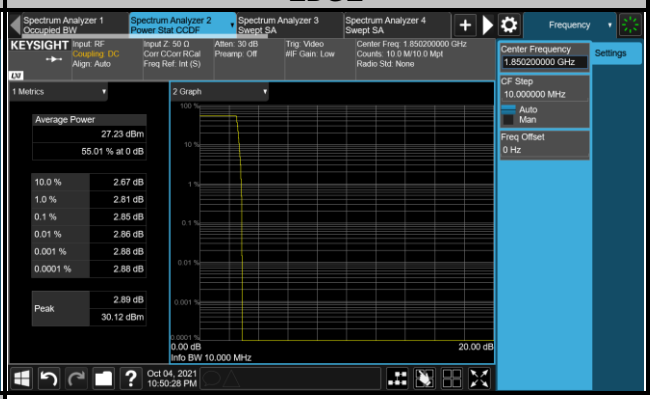
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		GPRS	EDGE			WCDMA
512	1850.2	2.86	2.85	9262	1852.4	3.01
661	1880.0	2.81	2.81	9400	1880.0	2.91
810	1909.8	2.79	2.79	9538	1907.6	2.87

Spectrum Plot of Worst Value

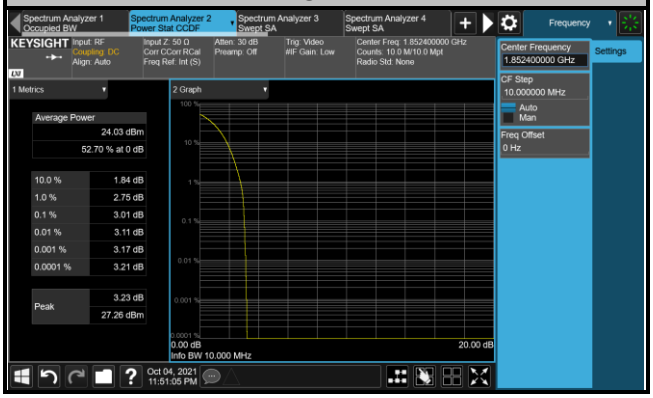
GPRS



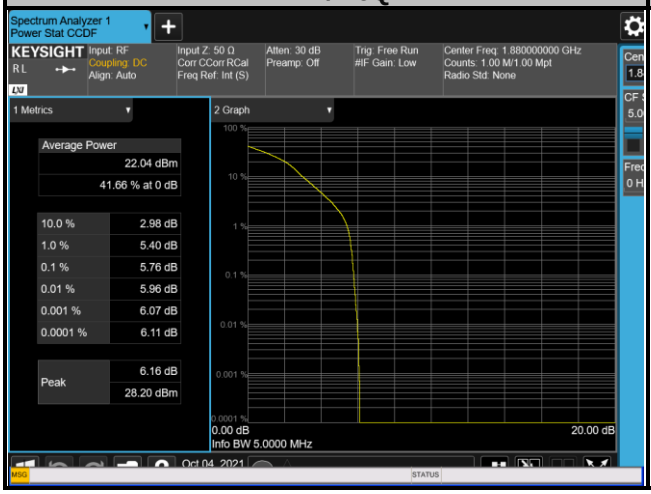
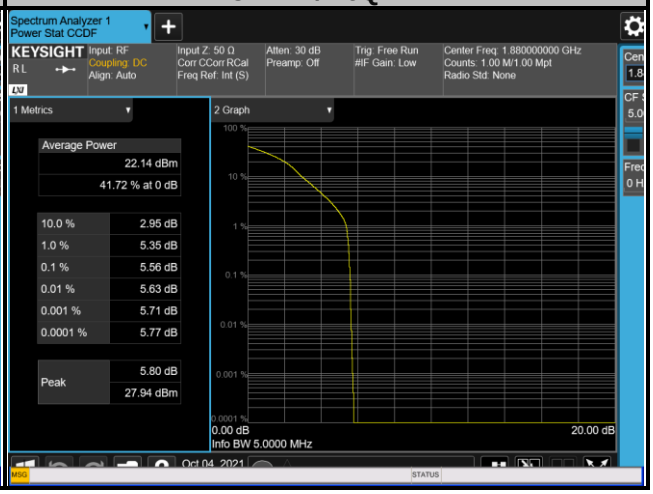
EDGE



WCDMA

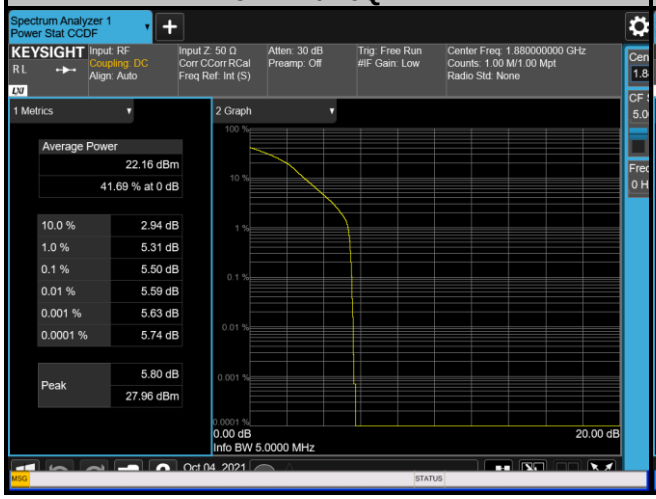


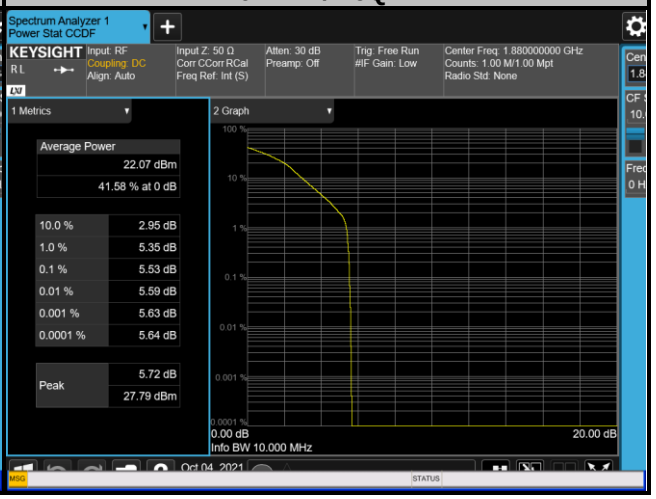
LTE Band 2							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	4.83	5.56	18615	1851.5	4.66	5.43
18900	1880.0	4.94	5.76	18900	1880.0	4.76	5.56
19193	1909.3	4.63	5.39	19185	1908.5	4.66	5.41

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 16QAM
	

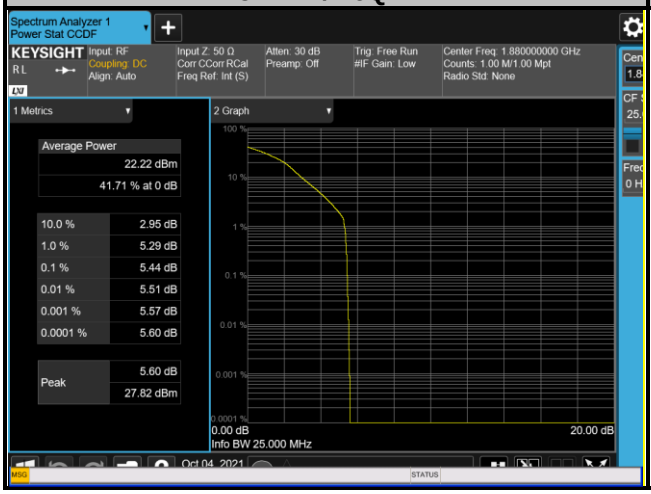
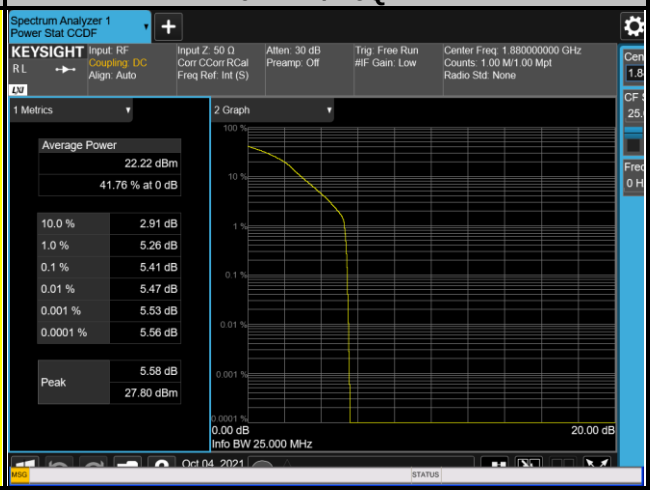
LTE Band 2							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	4.66	5.39	18650	1855.0	4.62	5.40
18900	1880.0	4.77	5.50	18900	1880.0	4.73	5.53
19175	1907.5	4.64	5.43	19150	1905.0	4.59	5.39

Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM





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			QPSK	16QAM
18675	1857.5	4.58	5.31	18700	1860.0	4.56	5.28
18900	1880.0	4.71	5.44	18900	1880.0	4.71	5.41
19125	1902.5	4.44	5.18	19100	1900.0	4.49	5.20

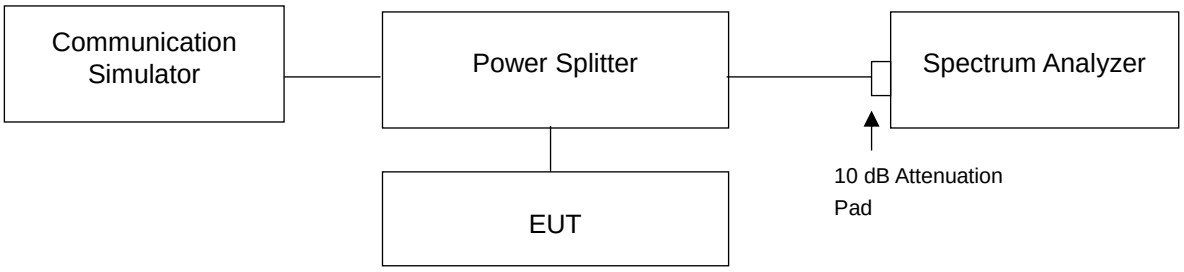
Spectrum Plot of Worst Value	
15 MHz / 16QAM	20 MHz / 16QAM
	

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.

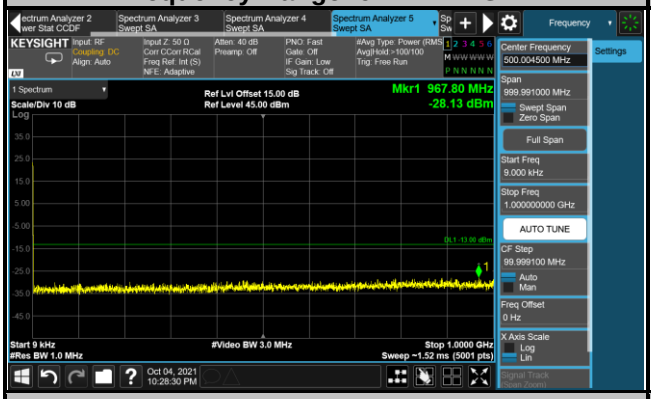
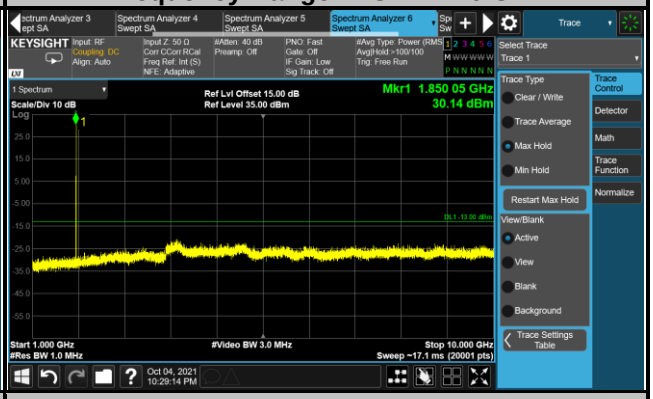
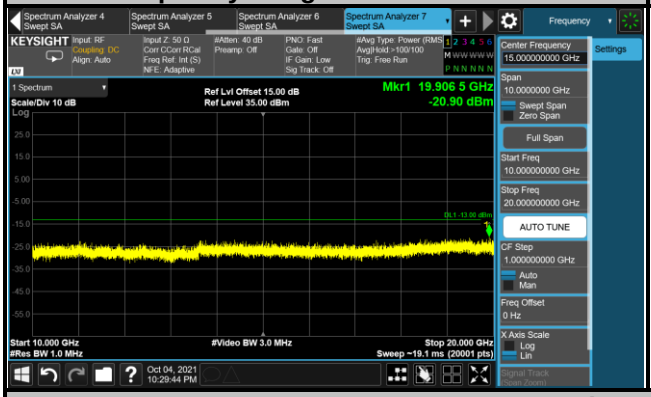
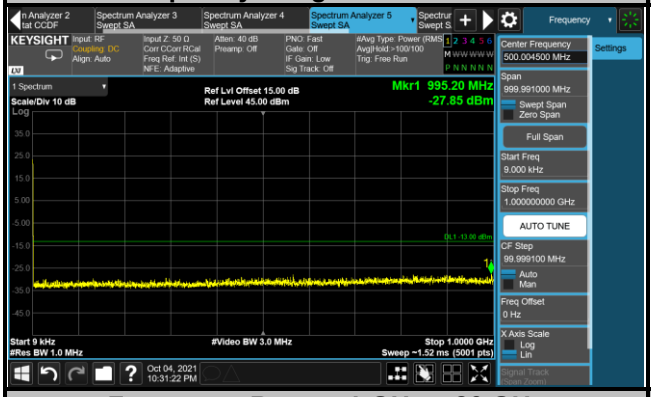
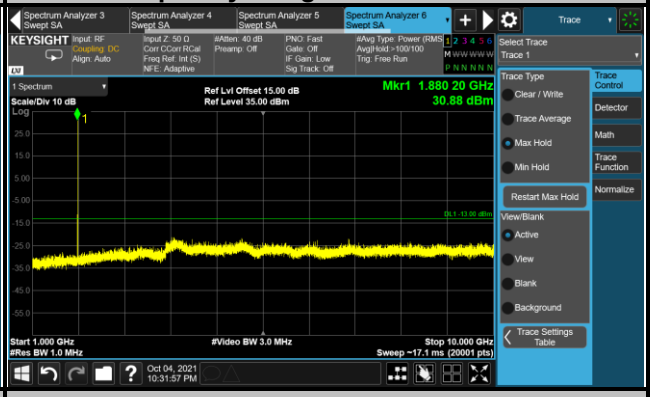
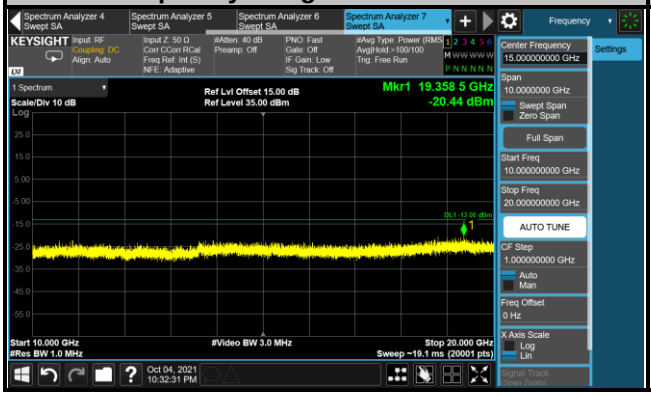
4.7.2 Test Setup

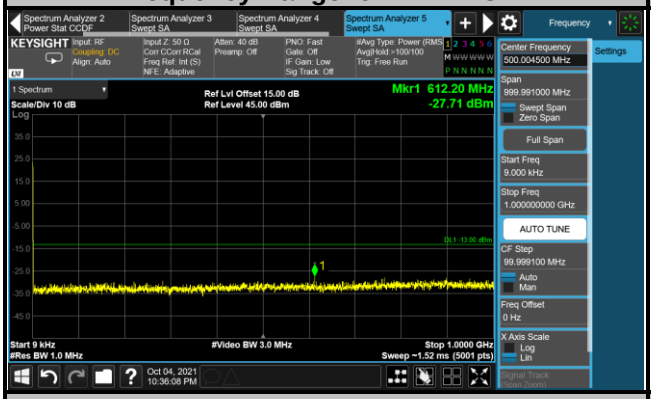
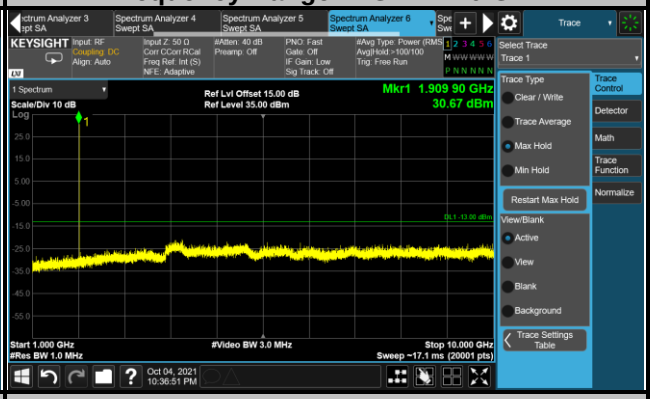
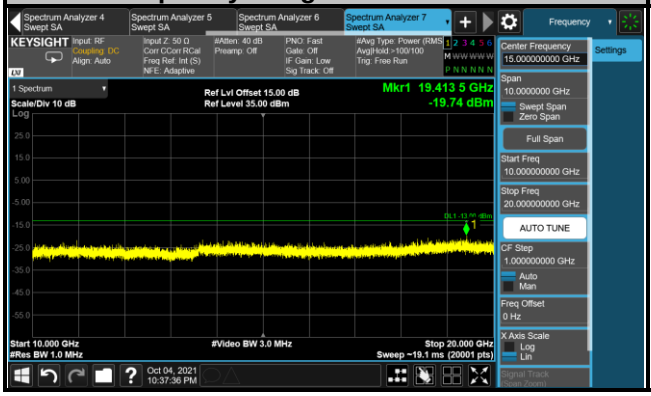


4.7.3 Test Procedure

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

GPRS	
Channel 512	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 1 GHz ~ 20 GHz	
	
Channel 661	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 1 GHz ~ 20 GHz	
	

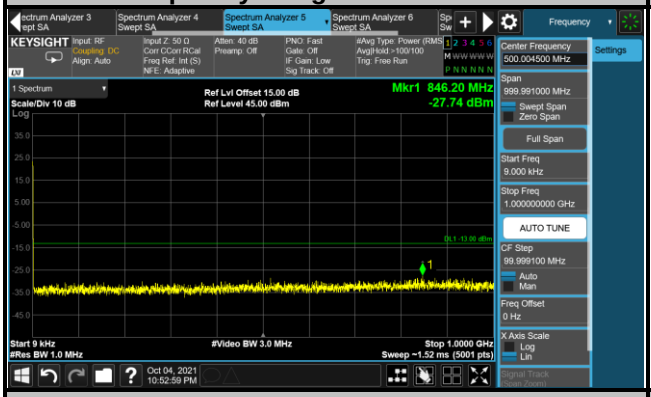
Channel 810	
Frequency Range: 9 kHz ~ 1 GHz	**Frequency Range: 1 GHz ~ 10 GHz**
	
Frequency Range: 1 GHz ~ 20 GHz	
	

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

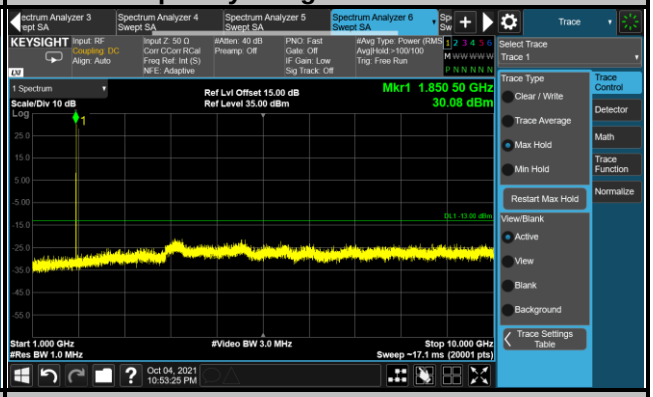
EDGE

Channel 512

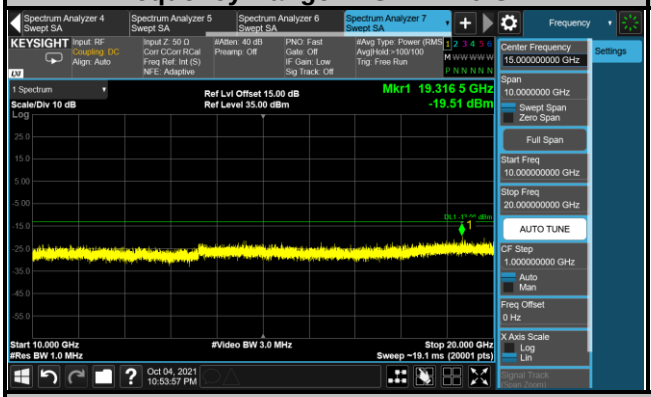
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz

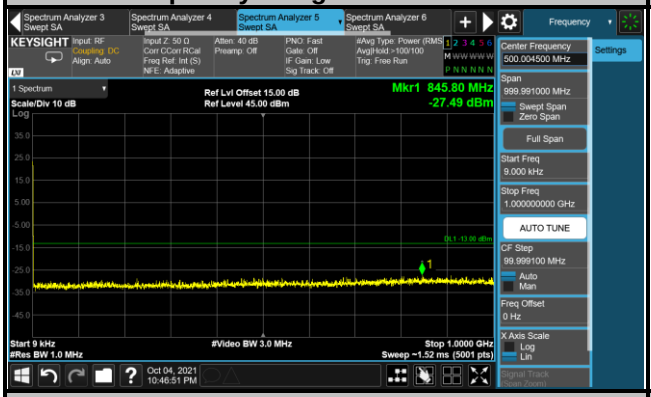


Frequency Range: 1 GHz ~ 20 GHz

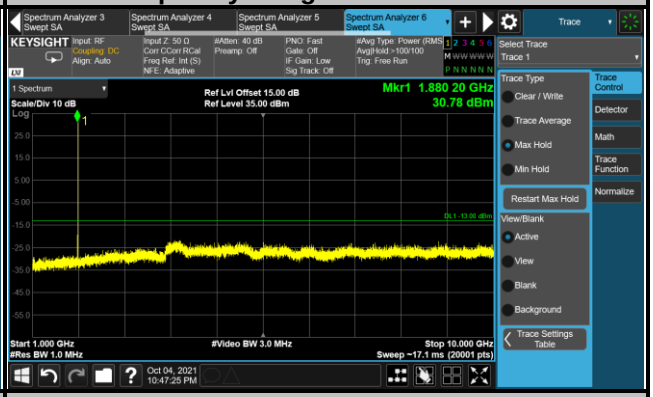


Channel 661

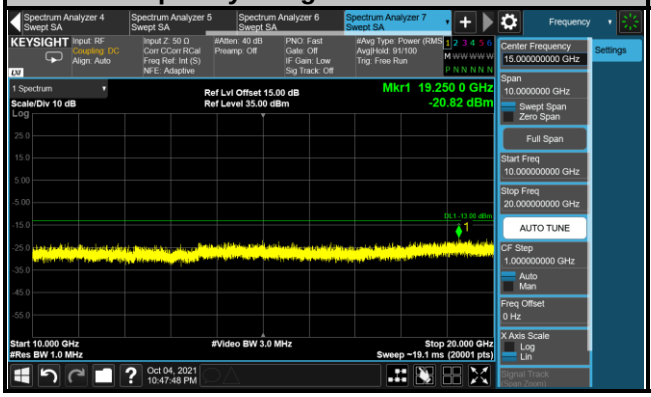
Frequency Range: 9 kHz ~ 1 GHz

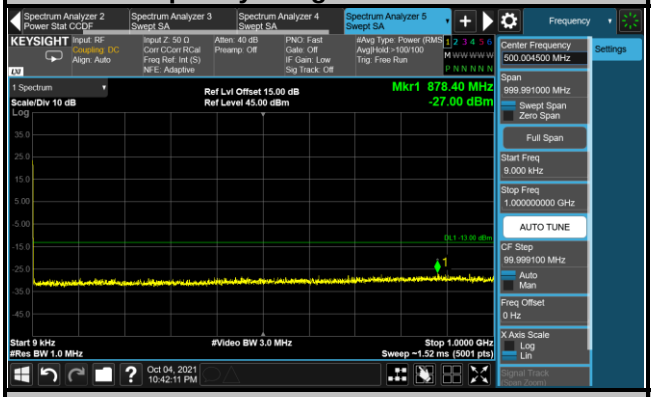
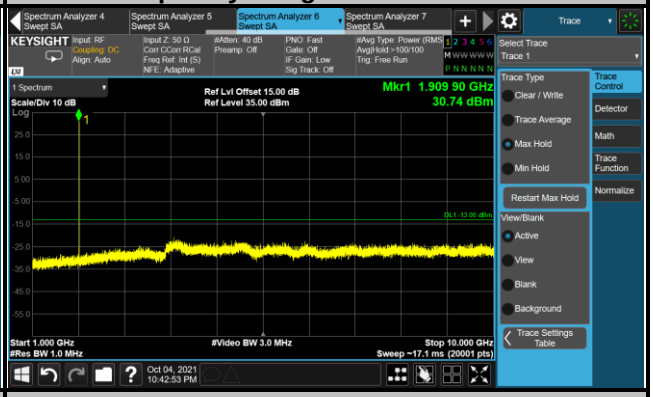
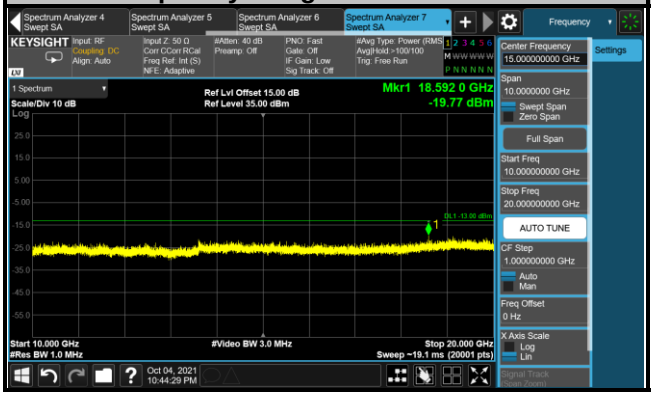


Frequency Range: 1 GHz ~ 10 GHz

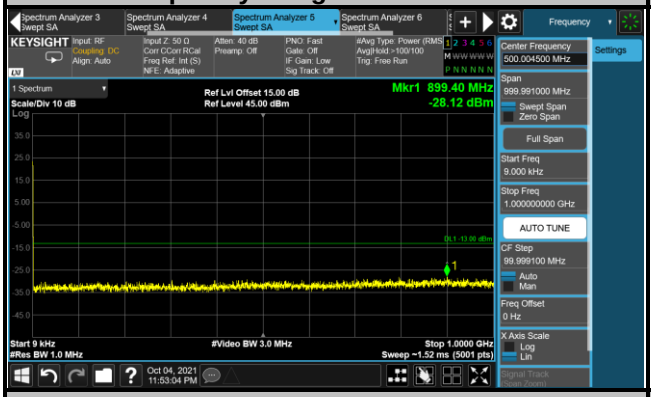
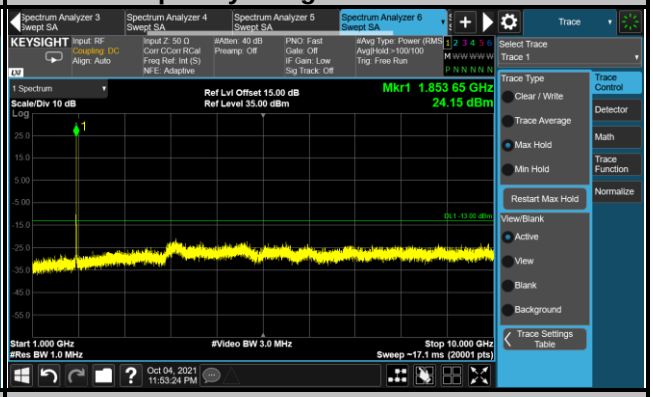
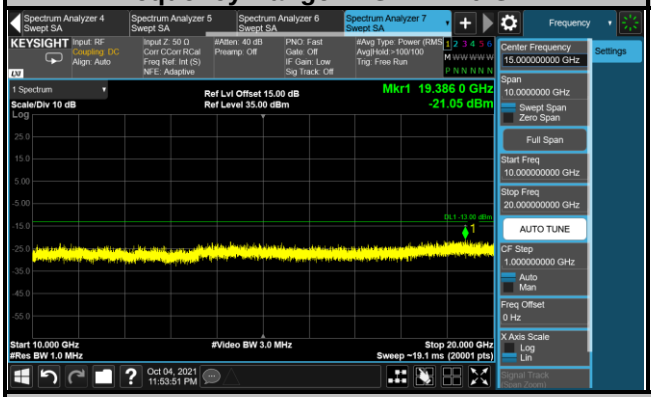
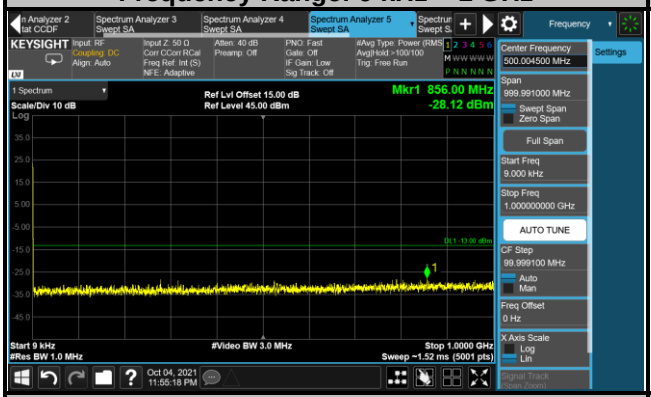
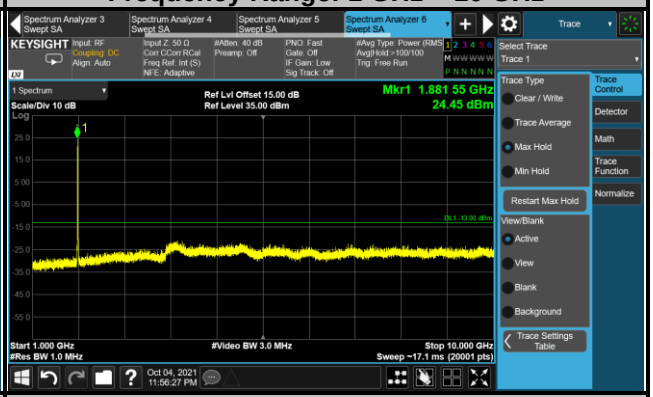
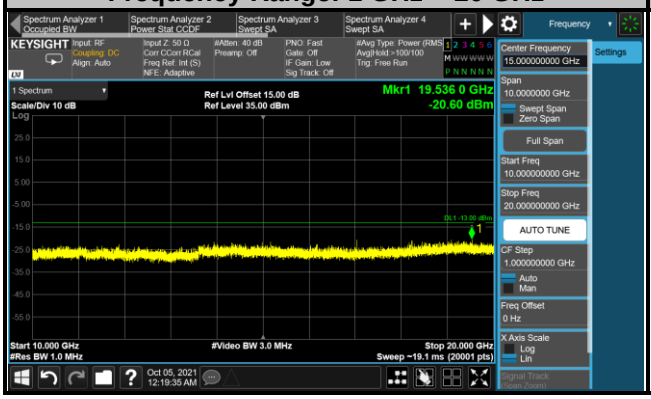


Frequency Range: 1 GHz ~ 20 GHz

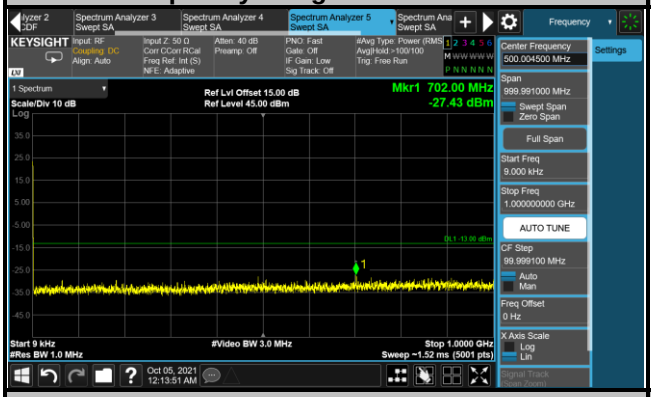
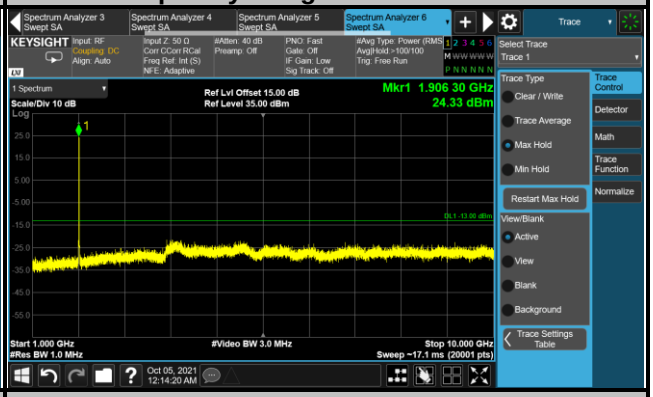
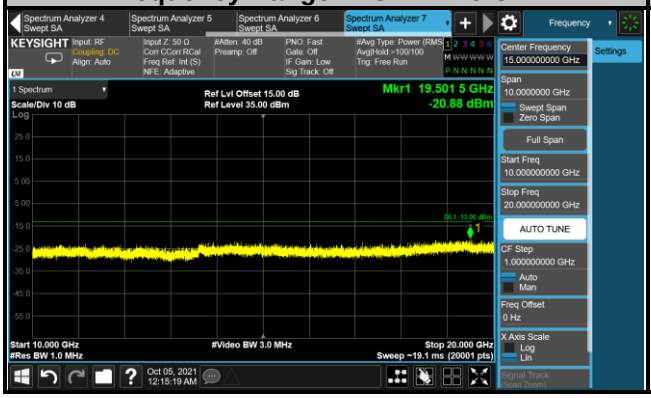


Channel 810	
Frequency Range: 9 kHz ~ 1 GHz	**Frequency Range: 1 GHz ~ 10 GHz**
	
Frequency Range: 1 GHz ~ 20 GHz	
	

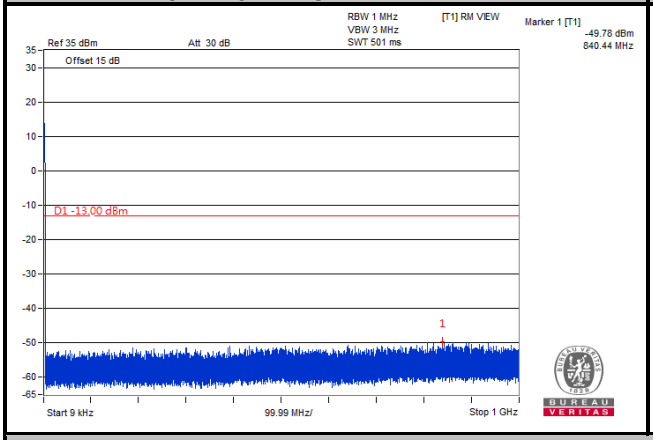
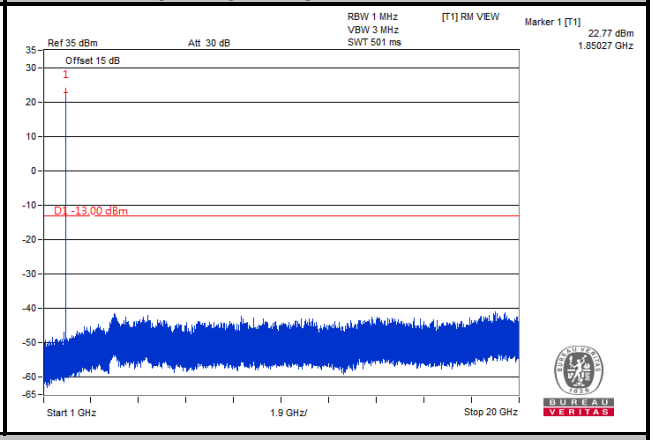
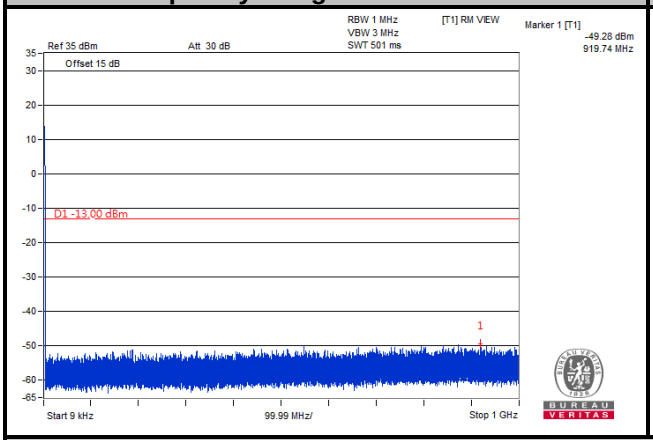
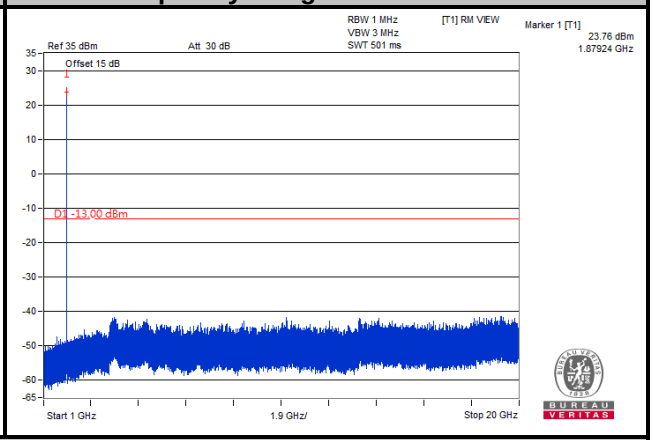
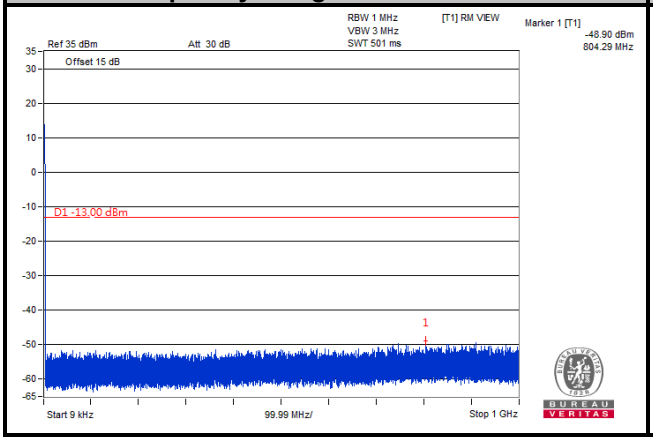
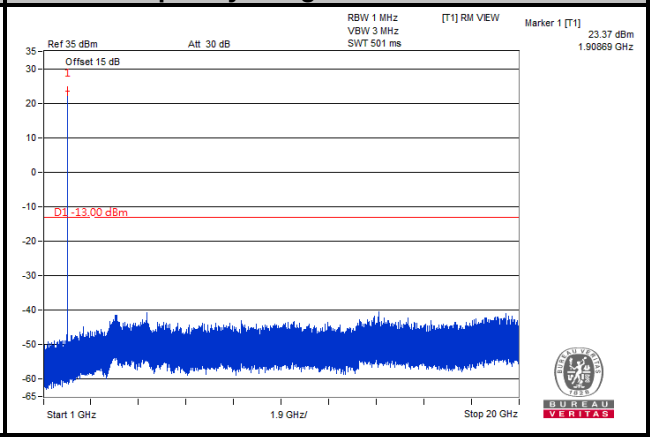
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

WCDMA	
Channel 9262	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 1 GHz ~ 20 GHz	
	
Channel 9400	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 1 GHz ~ 20 GHz	
	

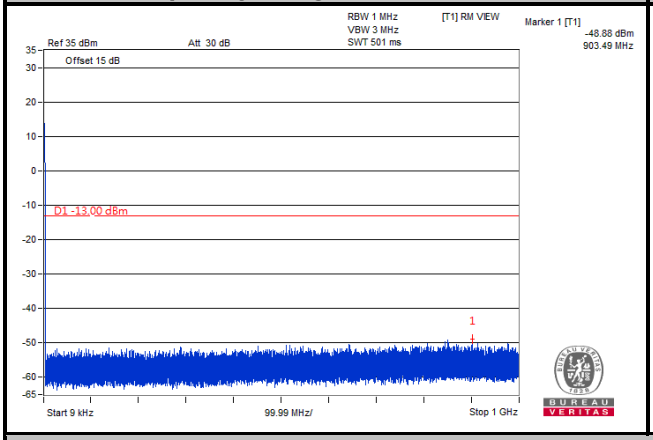
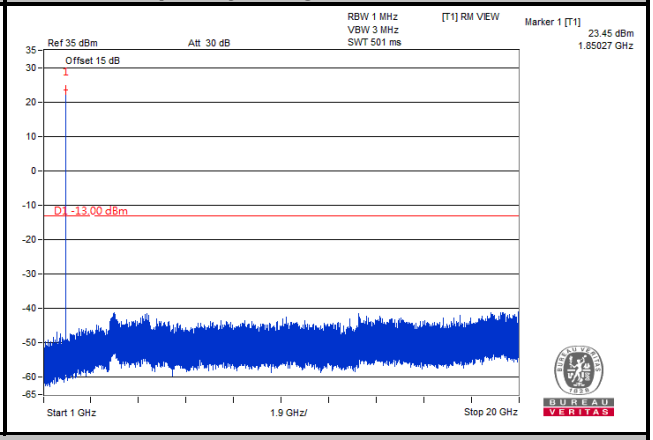
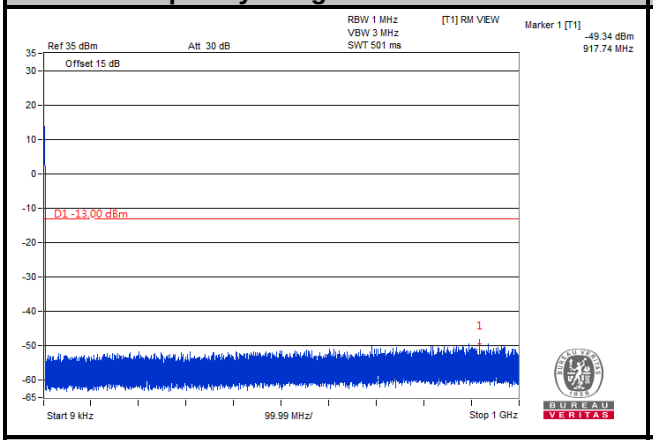
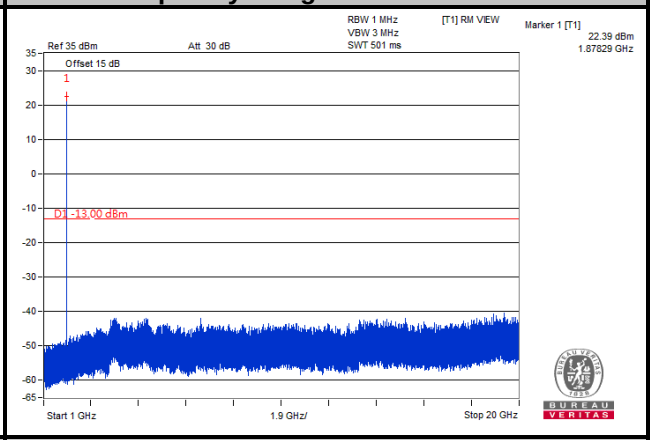
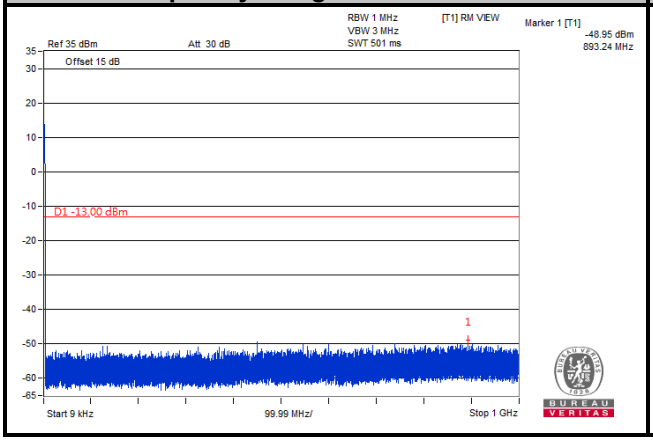
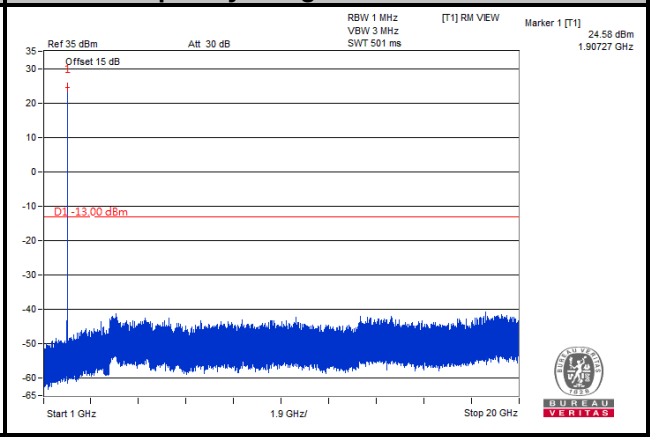
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

WCDMA	
Channel 9538	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 1 GHz ~ 20 GHz	
	

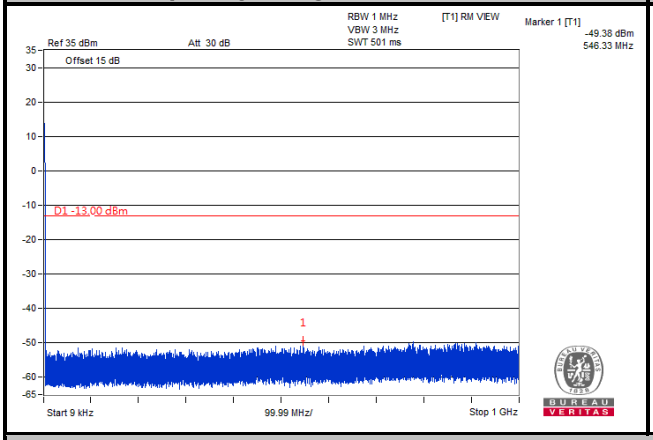
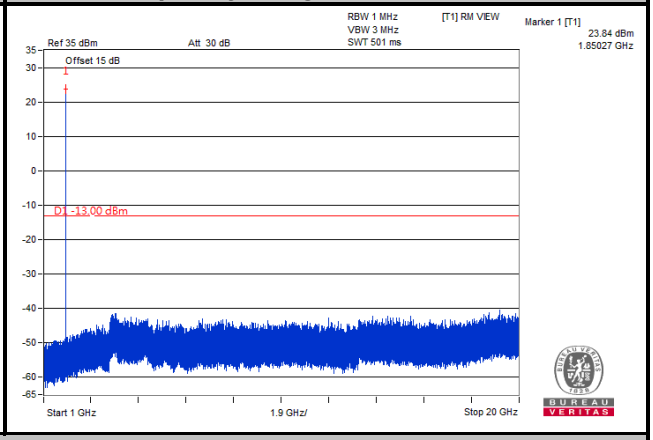
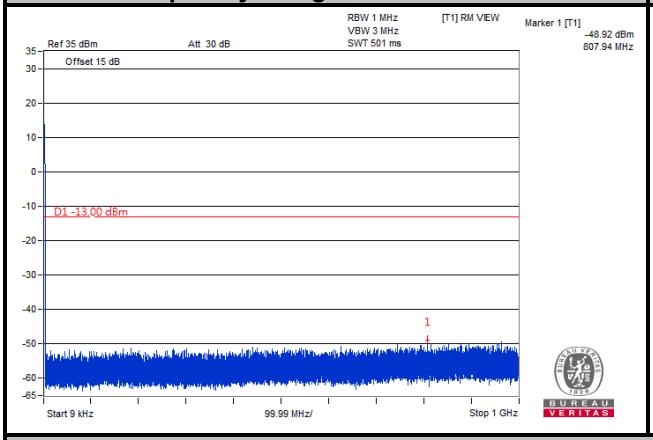
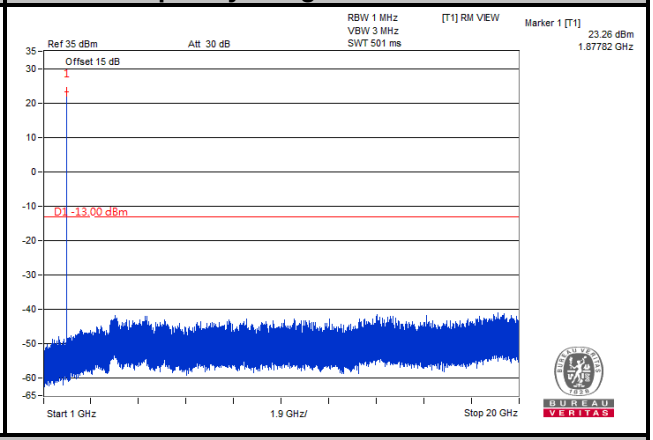
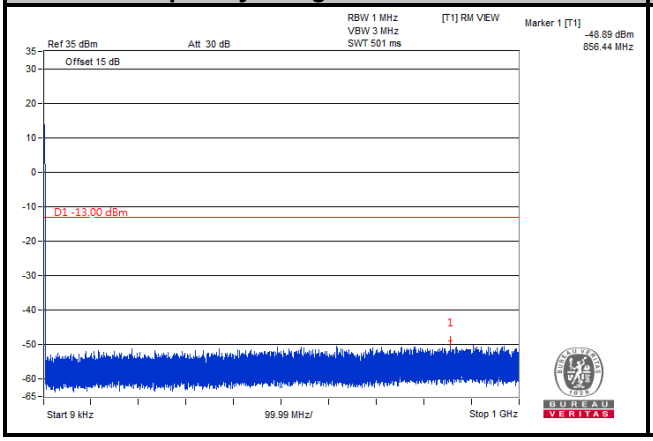
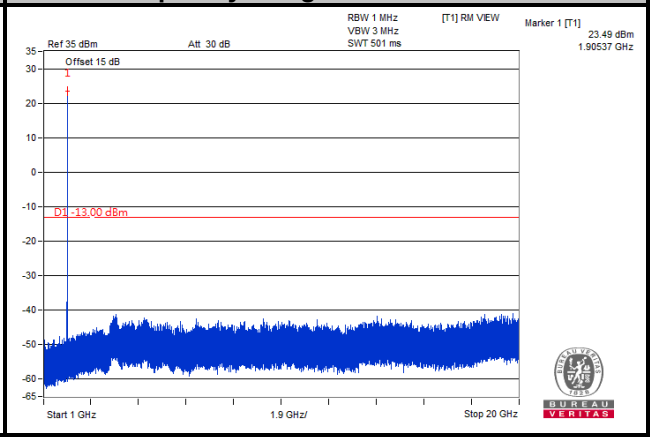
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

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

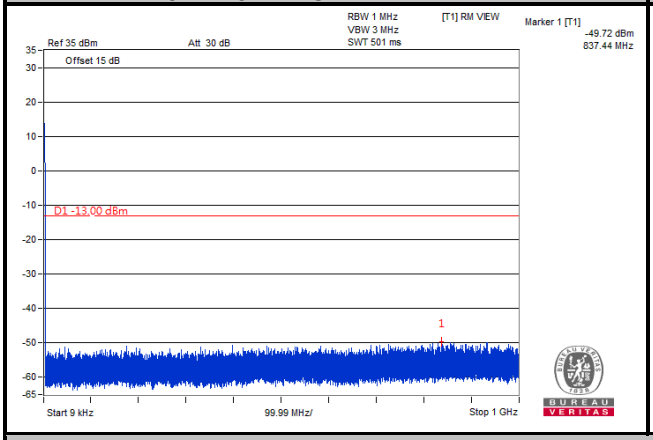
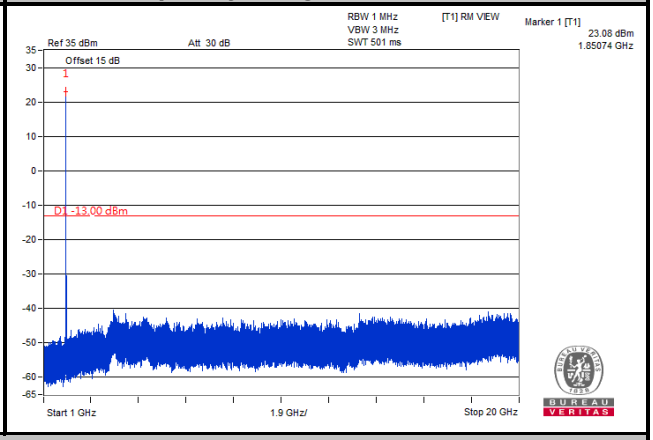
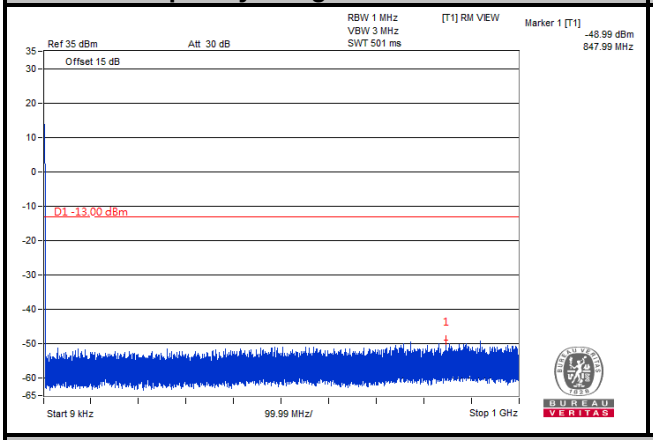
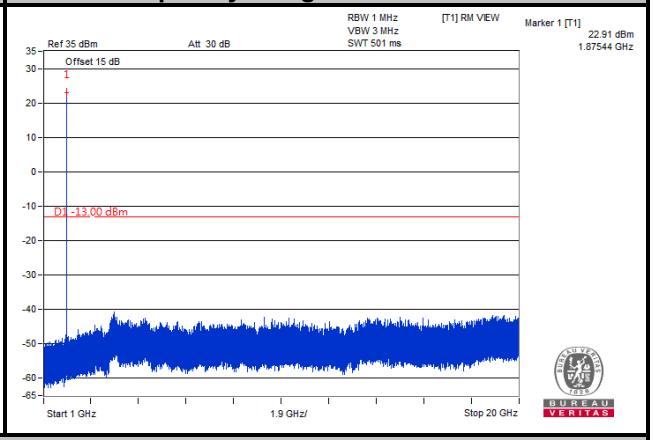
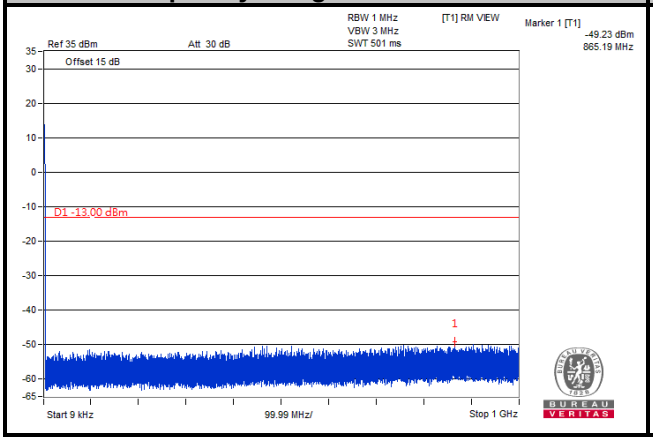
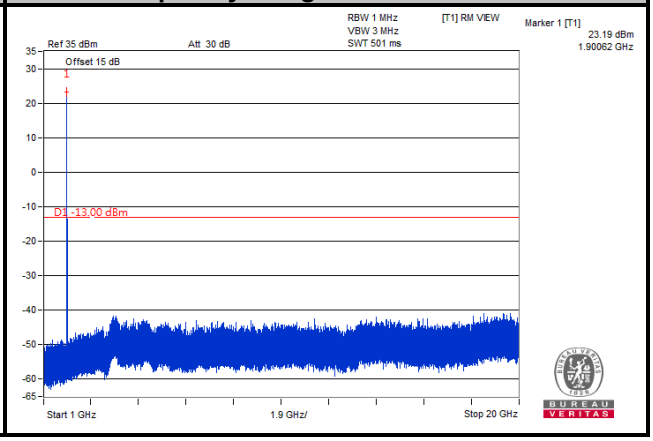
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

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

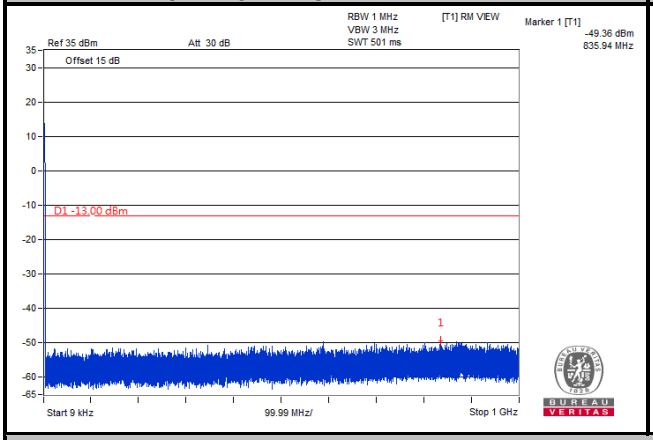
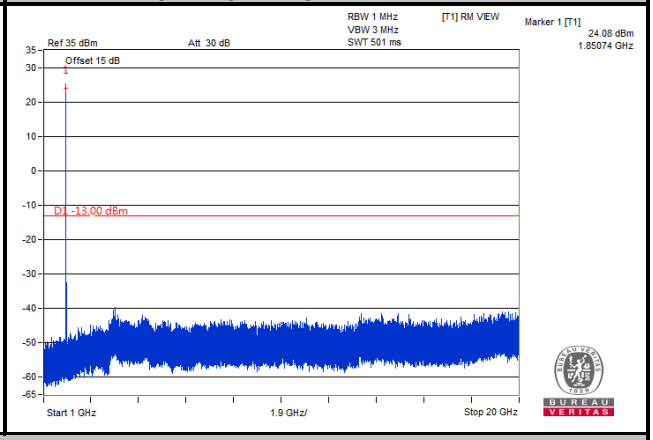
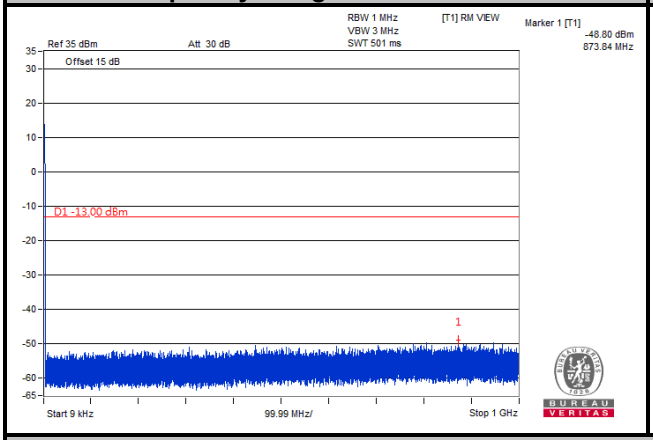
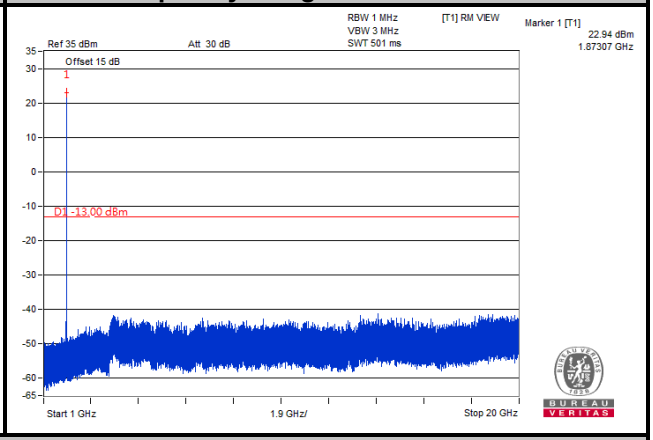
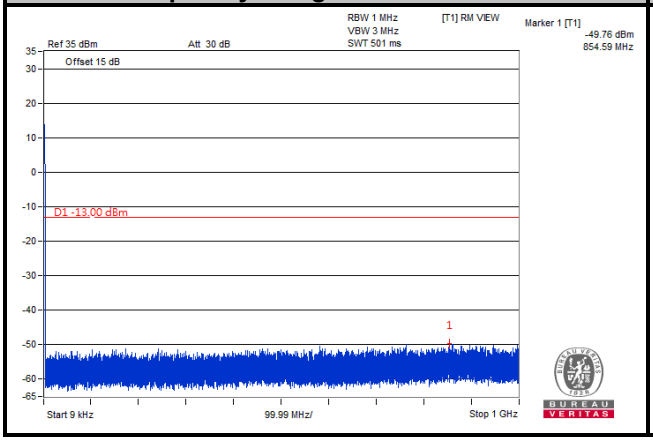
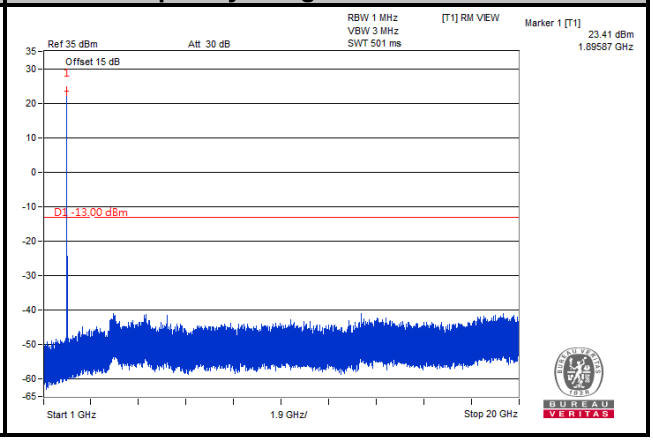
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

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

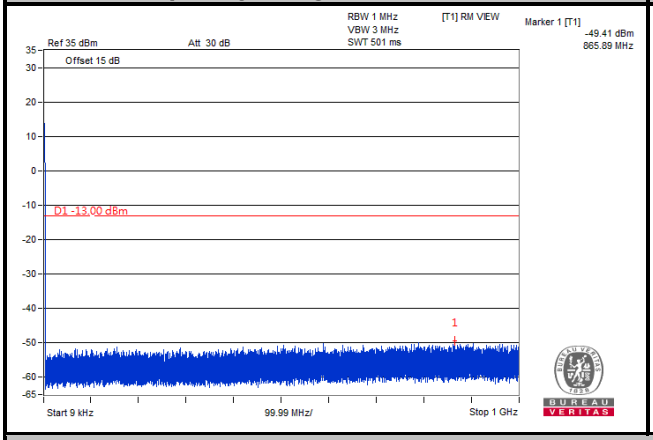
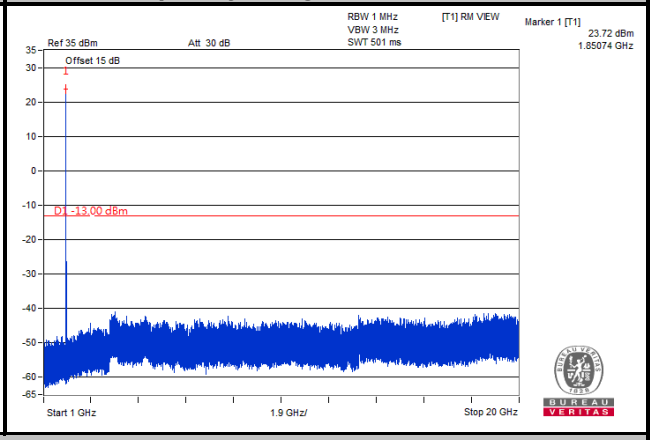
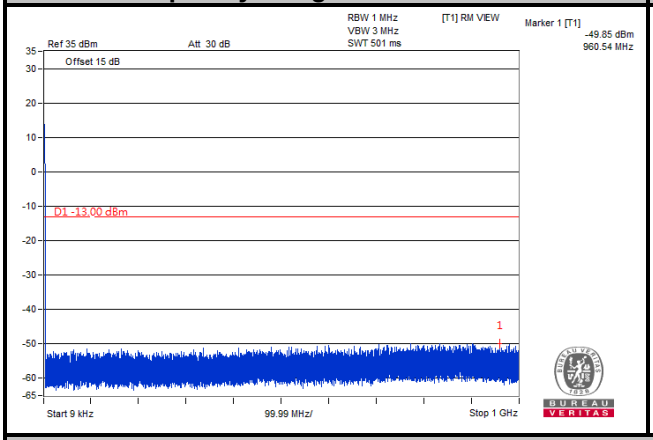
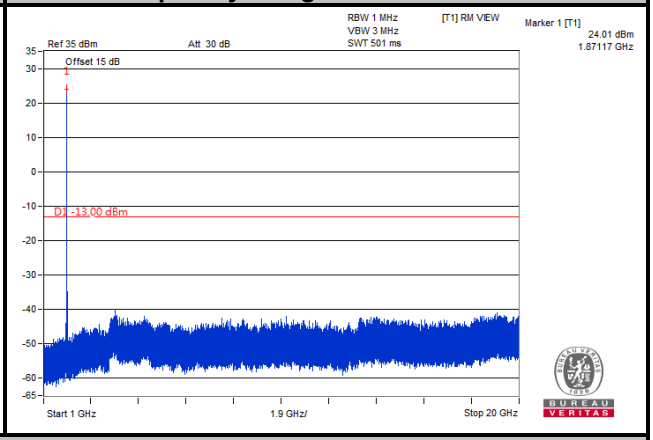
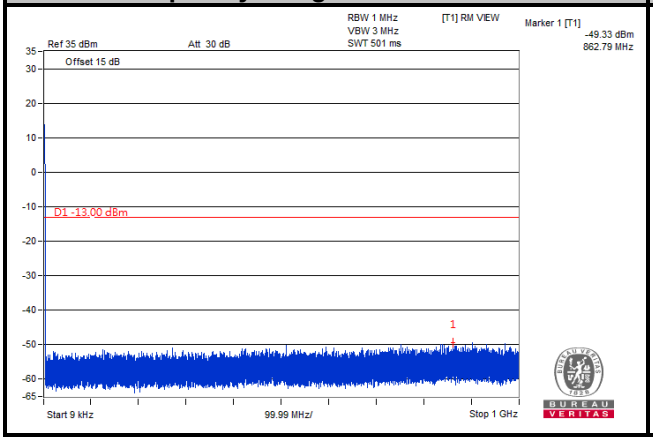
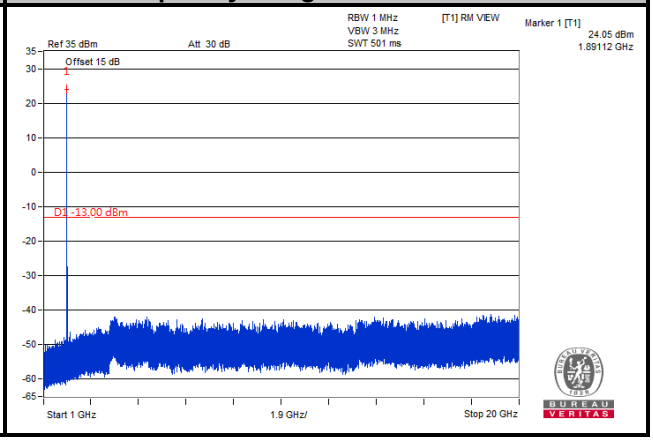
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 2	
Channel Bandwidth: 10 MHz	
Channel 18650	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
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 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
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 18900	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 19100	
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.

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. E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

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

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

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

NOTE:

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

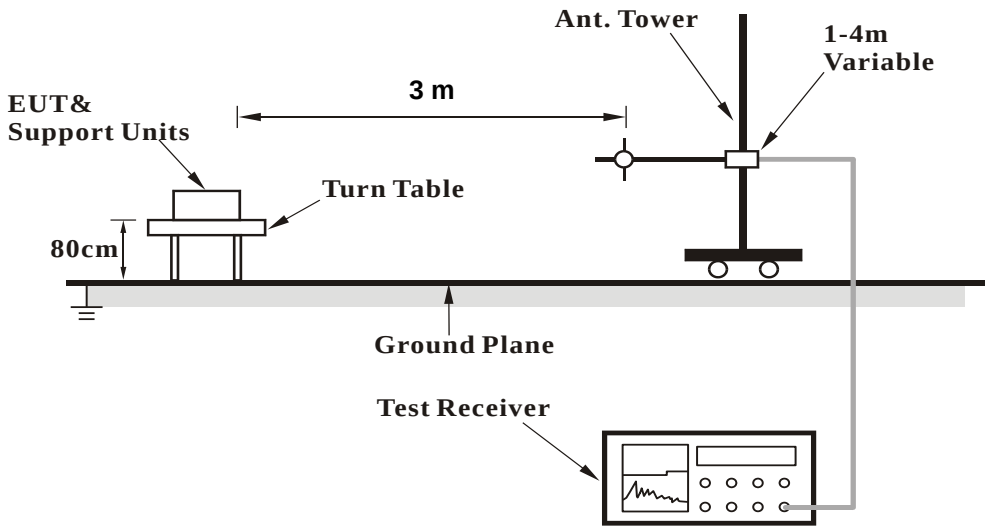
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

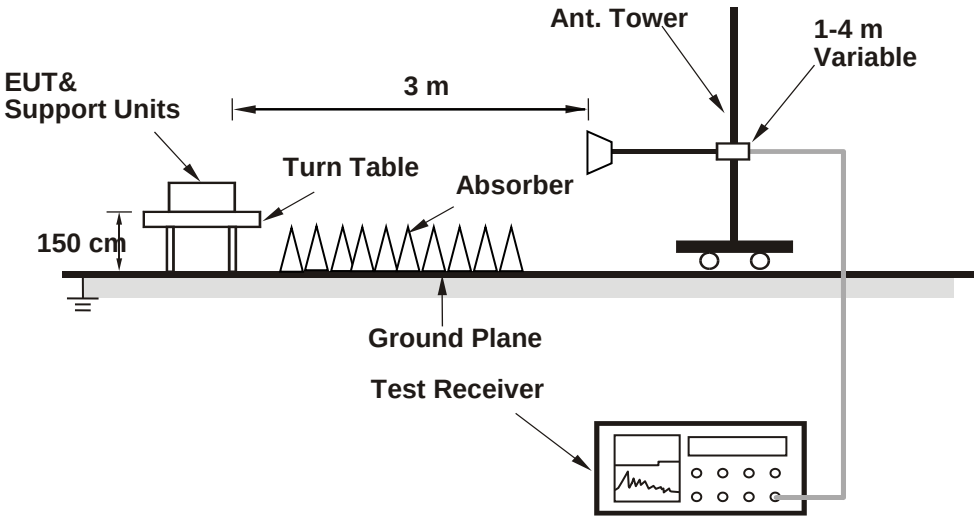
No deviation.

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

Mode A

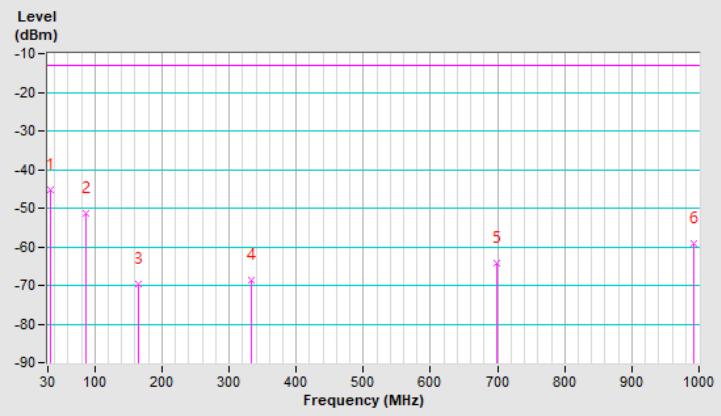
PCS Mode

RF Mode	TX PCS 1900	**Channel**	CH 810：1909.8 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	33.88	-45.10	-13.00	-32.10	1.25 H	17	60.20	-105.30
2	87.23	-51.20	-13.00	-38.20	1.00 H	196	58.63	-109.83
3	165.80	-69.78	-13.00	-56.78	1.25 H	48	34.19	-103.97
4	333.61	-68.60	-13.00	-55.60	1.50 H	297	32.49	-101.09
5	698.33	-64.18	-13.00	-51.18	2.00 H	3	29.90	-94.08
6	992.24	-59.27	-13.00	-46.27	1.00 H	31	29.49	-88.76

Remarks:

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

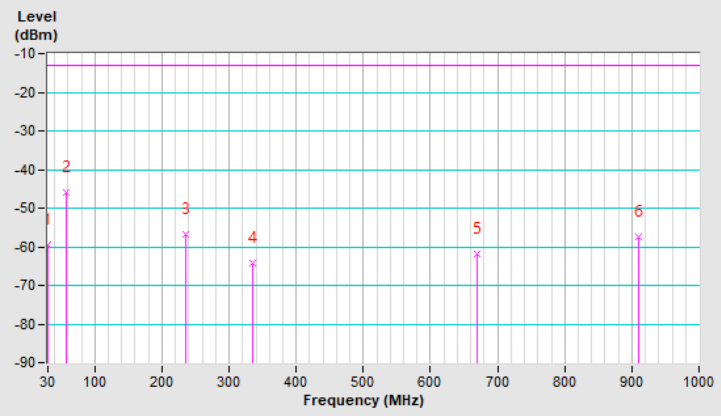


RF Mode	TX PCS 1900	Channel	CH 810：1909.8 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-59.51	-13.00	-46.51	1.50 V	5	45.97	-105.48
2	58.13	-45.84	-13.00	-32.84	1.00 V	20	58.77	-104.61
3	234.67	-56.66	-13.00	-43.66	1.25 V	244	48.35	-105.01
4	335.55	-64.36	-13.00	-51.36	1.00 V	12	36.72	-101.08
5	670.20	-61.71	-13.00	-48.71	1.50 V	352	32.77	-94.48
6	909.79	-57.51	-13.00	-44.51	1.00 V	264	31.85	-89.36

Remarks:

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



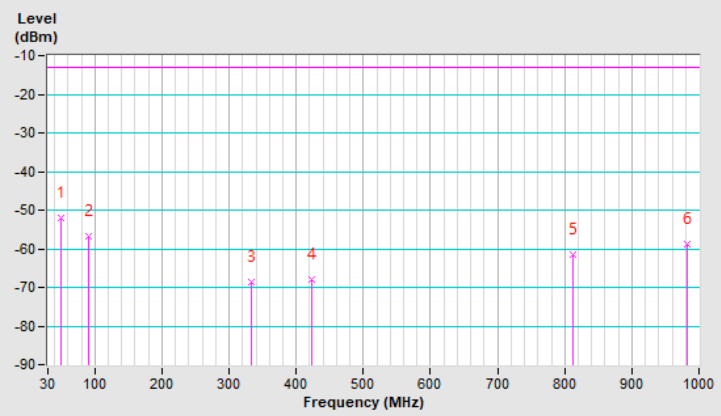
WCDMA Band 2

RF Mode	TX WCDMA Band II	Channel	CH 9400：1880 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.40	-52.14	-13.00	-39.14	1.00 H	351	52.00	-104.14
2	91.11	-56.71	-13.00	-43.71	1.25 H	53	53.10	-109.81
3	333.61	-68.60	-13.00	-55.60	1.00 H	297	32.49	-101.09
4	422.85	-68.07	-13.00	-55.07	1.50 H	72	31.17	-99.24
5	811.82	-61.43	-13.00	-48.43	1.00 H	161	30.33	-91.76
6	981.57	-58.97	-13.00	-45.97	1.00 H	18	29.65	-88.62

Remarks:

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

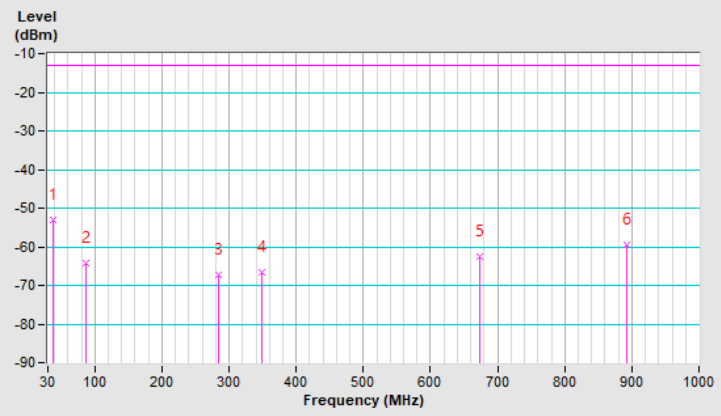


RF Mode	TX WCDMA Band II	Channel	CH 9400：1880 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	37.76	-52.99	-13.00	-39.99	1.25 V	8	52.08	-105.07
2	87.23	-64.17	-13.00	-51.17	1.00 V	355	45.66	-109.83
3	285.11	-67.29	-13.00	-54.29	1.50 V	133	35.10	-102.39
4	348.16	-66.60	-13.00	-53.60	1.00 V	312	34.49	-101.09
5	674.08	-62.47	-13.00	-49.47	1.25 V	354	31.94	-94.41
6	892.33	-59.39	-13.00	-46.39	1.00 V	98	30.62	-90.01

Remarks:

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



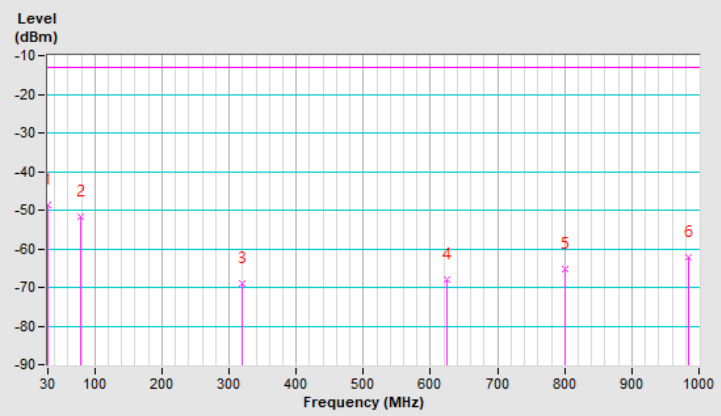
LTE Band 2, Channel Bandwidth: 20MHz

RF Mode	TX LTE Band II-20MHz	Channel	CH 18700：1860 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-48.79	-13.00	-35.79	1.00 H	168	56.69	-105.48
2	79.47	-51.74	-13.00	-38.74	1.00 H	297	56.78	-108.52
3	320.03	-69.05	-13.00	-56.05	1.50 H	119	32.41	-101.46
4	623.64	-67.93	-13.00	-54.93	1.25 H	350	27.08	-95.01
5	801.15	-65.20	-13.00	-52.20	1.00 H	8	26.52	-91.72
6	984.48	-62.33	-13.00	-49.33	1.50 H	251	26.30	-88.63

Remarks:

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

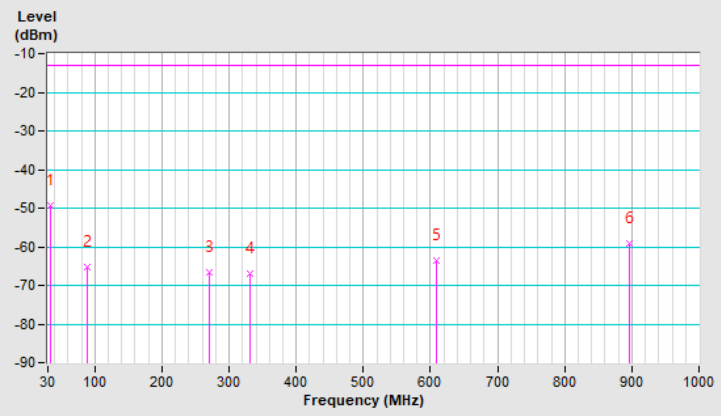


RF Mode	TX LTE Band II-20MHz	Channel	CH 18700：1860 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.88	-49.22	-13.00	-36.22	1.50 V	247	56.08	-105.30
2	88.20	-65.14	-13.00	-52.14	1.25 V	3	44.72	-109.86
3	270.56	-66.73	-13.00	-53.73	1.25 V	336	36.21	-102.94
4	330.70	-66.95	-13.00	-53.95	1.00 V	205	34.17	-101.12
5	609.09	-63.41	-13.00	-50.41	1.00 V	18	31.95	-95.36
6	896.21	-59.31	-13.00	-46.31	1.00 V	6	30.61	-89.92

Remarks:

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



Mode B

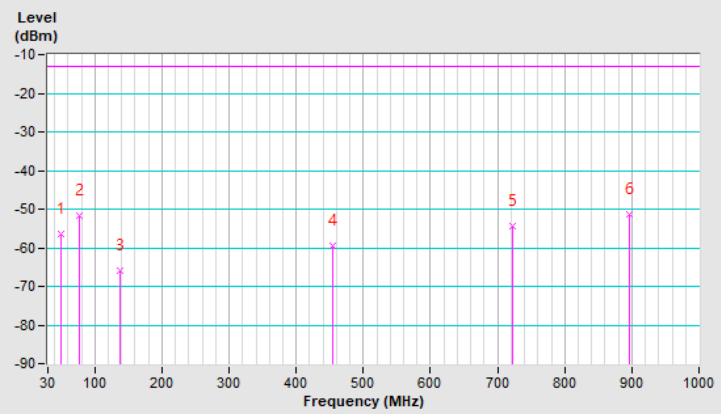
PCS Mode

RF Mode	TX PCS 1900	Channel	CH 810：1909.8 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.40	-56.37	-13.00	-43.37	1.00 H	129	47.77	-104.14
2	77.53	-51.63	-13.00	-38.63	1.50 H	264	56.47	-108.10
3	136.70	-65.93	-13.00	-52.93	1.25 H	265	38.74	-104.67
4	454.86	-59.52	-13.00	-46.52	1.25 H	354	38.75	-98.27
5	722.58	-54.33	-13.00	-41.33	1.00 H	287	39.33	-93.66
6	896.21	-51.50	-13.00	-38.50	1.00 H	22	38.42	-89.92

Remarks:

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

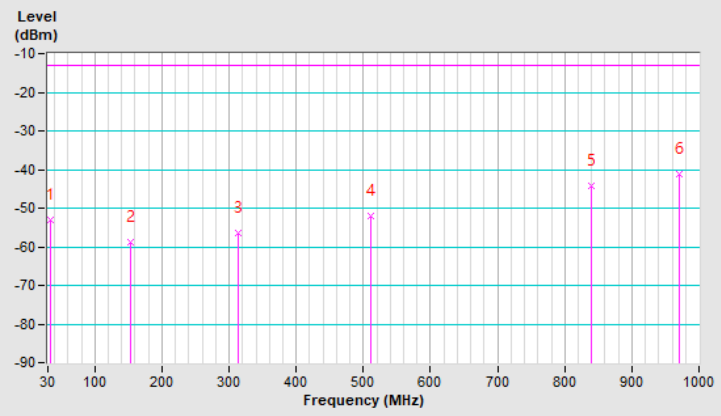


RF Mode	TX PCS 1900	Channel	CH 810：1909.8 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.88	-53.06	-13.00	-40.06	1.25 V	317	52.24	-105.30
2	154.16	-58.72	-13.00	-45.72	1.00 V	244	44.99	-103.71
3	314.21	-56.35	-13.00	-43.35	1.50 V	166	45.16	-101.51
4	510.15	-52.07	-13.00	-39.07	1.00 V	82	45.19	-97.26
5	838.98	-44.14	-13.00	-31.14	1.25 V	237	46.98	-91.12
6	970.90	-41.33	-13.00	-28.33	1.00 V	94	47.32	-88.65

Remarks:

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



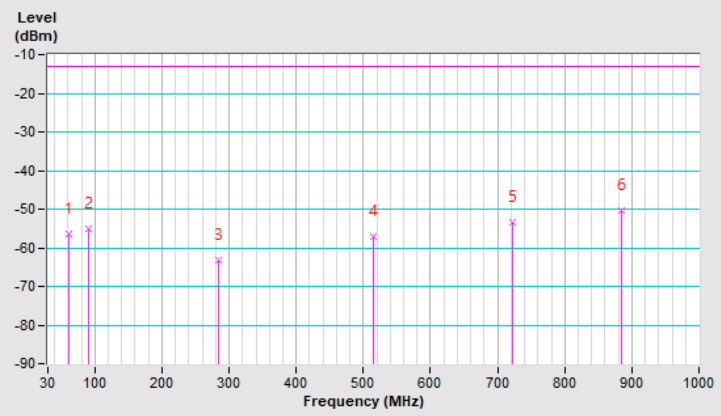
WCDMA Band 2

RF Mode	TX WCDMA Band II	Channel	CH 9400：1880 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	62.01	-56.35	-13.00	-43.35	1.25 H	12	48.80	-105.15
2	90.14	-55.13	-13.00	-42.13	1.00 H	289	54.74	-109.87
3	285.11	-63.15	-13.00	-50.15	1.00 H	1	39.24	-102.39
4	515.97	-57.03	-13.00	-44.03	1.50 H	37	40.16	-97.19
5	722.58	-53.28	-13.00	-40.28	1.25 H	278	40.38	-93.66
6	885.54	-50.49	-13.00	-37.49	1.25 H	294	39.74	-90.23

Remarks:

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

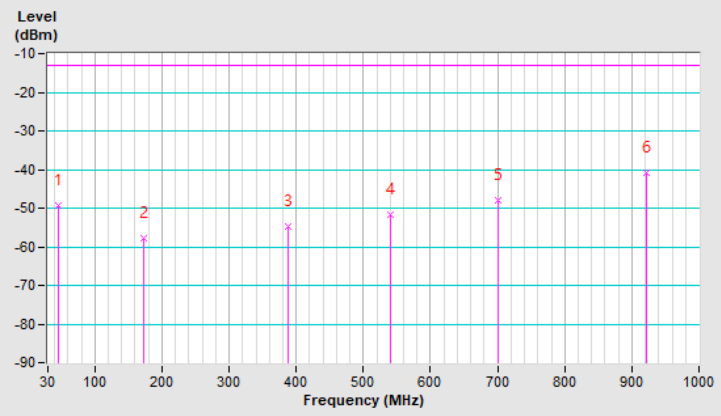


RF Mode	TX WCDMA Band II	Channel	CH 9400：1880 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	45.52	-49.47	-13.00	-36.47	1.25 V	236	54.79	-104.26
2	173.56	-57.94	-13.00	-44.94	1.25 V	17	46.57	-104.51
3	386.96	-54.60	-13.00	-41.60	1.25 V	134	45.54	-100.14
4	540.22	-51.82	-13.00	-38.82	1.00 V	5	45.08	-96.90
5	700.27	-47.84	-13.00	-34.84	1.50 V	109	46.22	-94.06
6	**922.40**	**-40.76**	**-13.00**	**-27.76**	**1.25 V**	**243**	**48.34**	**-89.10**

Remarks:

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



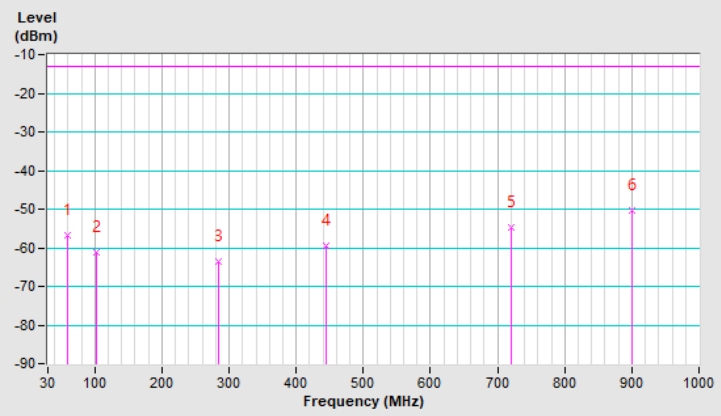
LTE Band 2, Channel Bandwidth: 20MHz

RF Mode	TX LTE Band II-20MHz	Channel	CH 18700：1860 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	59.10	-56.67	-13.00	-43.67	1.50 H	269	47.97	-104.64
2	102.75	-61.07	-13.00	-48.07	1.00 H	5	47.15	-108.22
3	284.14	-63.40	-13.00	-50.40	1.00 H	114	39.02	-102.42
4	445.16	-59.64	-13.00	-46.64	1.25 H	323	38.93	-98.57
5	720.64	-54.62	-13.00	-41.62	1.00 H	292	39.09	-93.71
6	901.06	-50.20	-13.00	-37.20	1.00 H	76	39.58	-89.78

Remarks:

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

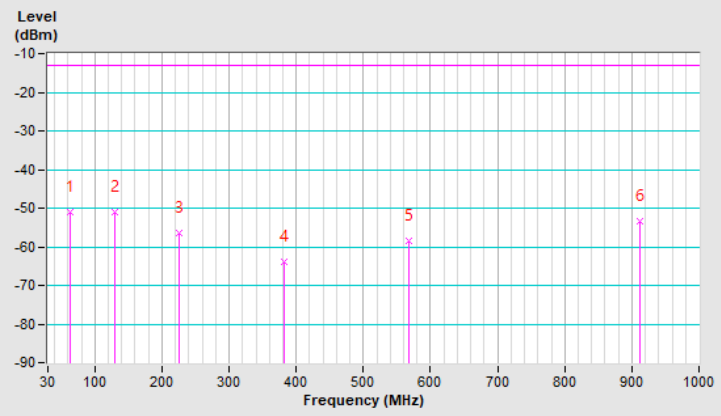


RF Mode	TX LTE Band II-20MHz	Channel	CH 18700：1860 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	63.95	-51.04	-13.00	-38.04	1.50 V	141	54.27	-105.31
2	129.91	-51.10	-13.00	-38.10	1.00 V	141	54.14	-105.24
3	224.97	-56.53	-13.00	-43.53	1.00 V	141	49.74	-106.27
4	381.14	-63.97	-13.00	-50.97	1.00 V	335	36.24	-100.21
5	567.38	-58.41	-13.00	-45.41	1.25 V	0	37.94	-96.35
6	911.73	-53.35	-13.00	-40.35	1.50 V	96	35.96	-89.31

Remarks:

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



Above 1GHz
PCS 1900

RF Mode	TX PCS 1900	Channel	CH 512：1850.2 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3700.40	-50.69	-13.00	-37.69	3.18 H	211	40.94	-91.63
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3700.40	-48.92	-13.00	-35.92	1.58 V	73	42.71	-91.63

Remarks:

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

RF Mode	TX PCS 1900	Channel	CH 661：1880 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-50.08	-13.00	-37.08	3.10 H	202	41.34	-91.42
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-48.52	-13.00	-35.52	1.63 V	84	42.90	-91.42

Remarks:

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

RF Mode	TX PCS 1900	Channel	CH 810：1909.8 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3819.60	-50.36	-13.00	-37.36	3.26 H	218	40.73	-91.09
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3819.60	-48.24	-13.00	-35.24	1.66 V	89	42.85	-91.09

Remarks:

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

WCDMA Band 2

RF Mode	TX WCDMA Band II	Channel	CH 9262：1852.4 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3704.80	-50.13	-13.00	-37.13	3.23 H	206	41.49	-91.62
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3704.80	-47.92	-13.00	-34.92	1.34 V	76	43.70	-91.62

Remarks:

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

RF Mode	TX WCDMA Band II	Channel	CH 9400：1880 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-50.26	-13.00	-37.26	3.12 H	203	41.16	-91.42
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-47.82	-13.00	-34.82	1.61 V	84	43.60	-91.42

Remarks:

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

RF Mode	TX WCDMA Band II	Channel	CH 9538：1907.6 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3815.20	-50.14	-13.00	-37.14	3.36 H	217	40.96	-91.10
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3815.20	-48.26	-13.00	-35.26	1.38 V	69	42.84	-91.10

Remarks:

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

LTE Band 2, Channel Bandwidth 1.4MHz

RF Mode	TX LTE Band II-1.4MHz	Channel	CH 18607：1850.7 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3701.40	-52.37	-13.00	-39.37	3.28 H	198	39.26	-91.63
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3701.40	-50.07	-13.00	-37.07	1.48 V	88	41.56	-91.63

Remarks:

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

RF Mode	TX LTE Band II-1.4MHz	Channel	CH 18900：1880 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-52.38	-13.00	-39.38	3.06 H	217	39.04	-91.42
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-50.14	-13.00	-37.14	1.49 V	97	41.28	-91.42

Remarks:

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

RF Mode	TX LTE Band II-1.4MHz	Channel	CH 19193：1909.3 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3818.60	-51.83	-13.00	-38.83	3.29 H	223	39.26	-91.09
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3818.60	-50.33	-13.00	-37.33	1.29 V	85	40.76	-91.09

Remarks:

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

LTE Band 2, Channel Bandwidth 5MHz

RF Mode	TX LTE Band II-5MHz	Channel	CH 18625：1852.5 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3705.00	-51.84	-13.00	-38.84	3.22 H	234	39.78	-91.62
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3705.00	-49.96	-13.00	-36.96	1.32 V	94	41.66	-91.62

Remarks:

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

RF Mode	TX LTE Band II-5MHz	Channel	CH 18900：1880 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-52.54	-13.00	-39.54	3.36 H	218	38.88	-91.42
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-50.13	-13.00	-37.13	1.17 V	72	41.29	-91.42

Remarks:

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

RF Mode	TX LTE Band II-5MHz	Channel	CH 19175：1907.5 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3815.00	-52.24	-13.00	-39.24	3.09 H	197	38.86	-91.10
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3815.00	-50.42	-13.00	-37.42	1.38 V	75	40.68	-91.10

Remarks:

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

LTE Band 2, Channel Bandwidth 20MHz

RF Mode	TX LTE Band II-20MHz	Channel	CH 18700：1860 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3720.00	-52.34	-13.00	-39.34	3.18 H	204	39.23	-91.57
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3720.00	-49.86	-13.00	-36.86	1.52 V	74	41.71	-91.57

Remarks:

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

RF Mode	TX LTE Band II-20MHz	Channel	CH 18900：1880 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-51.98	-13.00	-38.98	3.36 H	218	39.44	-91.42
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-50.43	-13.00	-37.43	1.26 V	79	40.99	-91.42

Remarks:

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

RF Mode	TX LTE Band II-20MHz	Channel	CH 19100：1900 MHz
Frequency Range	1GMHz ~ 20GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3800.00	-52.48	-13.00	-39.48	3.36 H	217	38.66	-91.14
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3800.00	-50.62	-13.00	-37.62	1.22 V	71	40.52	-91.14

Remarks:

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

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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