FCC Test Report

(PART 22)

Report No.:	RFBGSN-WTW-P21120080-5
FCC ID:	2AX8C-3545
Test Model:	FL44TE
Received Date:	Dec. 09, 2021
Test Date:	Dec. 29, 2021 ~ Jan. 10, 2022
Issued Date:	Jan. 19, 2022
Applicant:	Amazon.com Services LLC
Address:	410 Terry Ave N, Seattle, Washington 98109
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

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBGSN-WTW-P21120080-5	Original Release	Jan. 19, 2022

1 Certificate of Conformity

Product:	Fleet Edge
Brand:	N/A
Test Model:	FL44TE
Sample Status:	Engineering Sample
Applicant:	Amazon.com Services LLC
Test Date:	Dec. 29, 2021 ~ Jan. 10, 2022
Standards:	FCC Part 22, Subpart H

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

Prepared by : Vera Huang , **Date:** Jan. 19, 2022

Vera Huang / Specialist

Approved by : Jeremy Lin , **Date:** Jan. 19, 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
22.913 (d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -30.33 dB at 969.93 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 Agilent	N9038A	MY51210203	Sep. 22, 2021	Sep. 21, 2022
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 03, 2021	Dec. 02, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 28, 2021	Oct. 27, 2022
HORN Antenna SCHWARZBECK	BBHA 9120 D	209	Nov. 14, 2021	Nov. 13, 2022
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 330H	980112	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable EMCI	EMC104-SM-SM-8000	171005	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 05, 2021	Oct. 04, 2022
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 26, 2021	Aug. 25, 2022
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 07, 2021	Feb. 06, 2022
Temperature & Humidity Chamber GIANT FORCE	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2021	Sep. 09, 2022
DC power supply Keysight	U8002A	MY56330015	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 24, 2021	Jun. 23, 2022

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 10.

3 General Information

3.1 General Description of EUT

Product	Fleet Edge	
Brand	N/A	
Test Model	FL44TE	
Status of EUT	Engineering Sample	
Power Supply Rating	12 Vdc (adapter)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA	826.4 ~ 846.6 MHz
	LTE 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 26 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 26 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 26 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 15 MHz)	831.5 ~ 841.5 MHz
Max. ERP Power	WCDMA	281.190 mW (24.49dBm)
	LTE 5 (Channel Bandwidth: 1.4 MHz)	253.513 mW (24.04dBm)
	LTE 5 (Channel Bandwidth: 3 MHz)	258.821 mW (24.13dBm)
	LTE 5 (Channel Bandwidth: 5 MHz)	261.216 mW (24.17dBm)
	LTE 5 (Channel Bandwidth: 10 MHz)	259.418 mW (24.14dBm)
	LTE 26 (Channel Bandwidth: 1.4 MHz)	249.459 mW (23.97dBm)
	LTE 26 (Channel Bandwidth: 3 MHz)	261.216 mW (24.17dBm)
	LTE 26 (Channel Bandwidth: 5 MHz)	256.448 mW (24.09dBm)
	LTE 26 (Channel Bandwidth: 10 MHz)	257.632 mW (24.11dBm)
	LTE 26 (Channel Bandwidth: 15 MHz)	249.459 mW (23.97dBm)
Emission Designator	WCDMA	4M15F9W
	LTE 5 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE 5 (Channel Bandwidth: 3 MHz)	2M70D7W
	LTE 5 (Channel Bandwidth: 5 MHz)	4M50G7D
	LTE 5 (Channel Bandwidth: 10 MHz)	8M98G7D
	LTE 26 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE 26 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE 26 (Channel Bandwidth: 5 MHz)	4M50G7D
	LTE 26 (Channel Bandwidth: 10 MHz)	8M98D7W
	LTE 26 (Channel Bandwidth: 15 MHz)	13M5G7D
Antenna Type	Refer to Note as below	
Accessory Device	Refer to Note as below	
Data Cable Supplied	N/A	

Note:

1. The EUT contains following accessory devices.

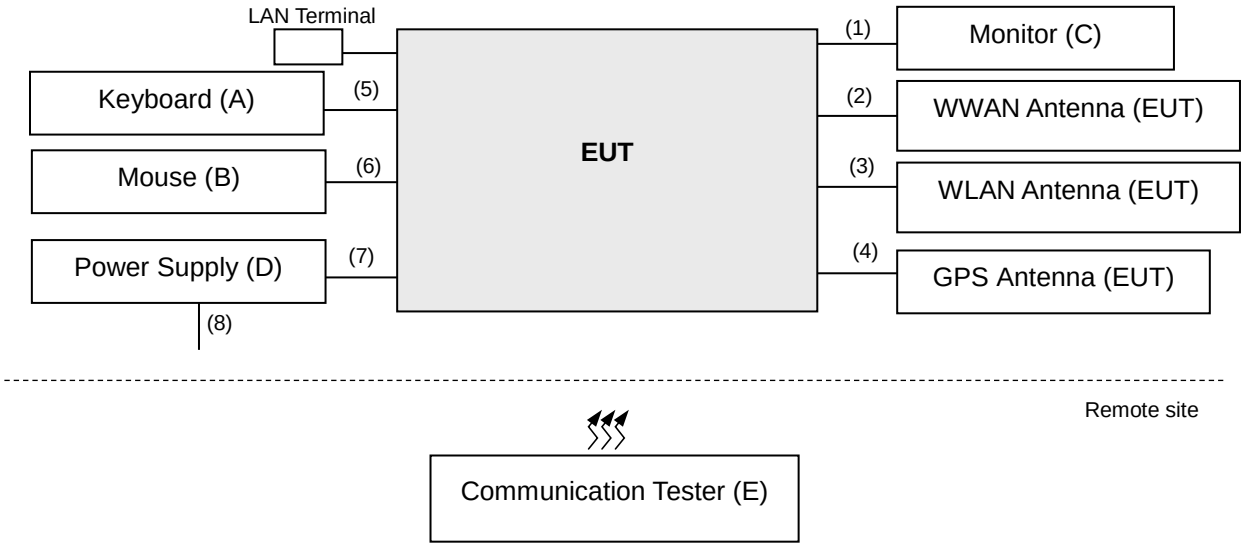
Product	Brand	Model	Description
BT/WLAN Module	Intel	9560NGW	802.11 a/b/g/n/ac Wireless LAN + Bluetooth 5
WWAN Module	Quectel	EM06-A	WCDMA, LTE
CPU	Intel	i5-9500TE	CFL-S, 6C 35W
SO-DIMM	Innodisk	--	2667MHz, 8G&16G
LTE Main Antenna	Rivian	N/A	Cable length: 2445mm P/N: J7-1
LTE Aux Antenna	Rivian	N/A	Cable length: 3520mm P/N: J6-1
WiFi Main Antenna	Rivian	PT00206181-A	Cable length: 3550mm P/N: J5-1
WiFi Aux Antenna	Rivian	PT00207642-A	Cable length: 2475mm P/N: J4-1

2. The antenna information is listed as below.

Antenna information		Antenna Gain (dBi)	
Type	Ant.	WCDMA 5 / LTE 5	LTE 26
Multiband Antennas	Main	1.11	1.11
	Aux	2.37	2.37

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Keyboard	Lenovo	KB1021	N/A	N/A	--
B	Mouse	DELL	MS111-P	CN-011D3V-71581-1CJ-092E	N/A	--
C	Monitor	HP	HP Z24s	6CM5172L56	N/A	--
D	Power Supply	NA	NA	NA	NA	--
E	Communication Tester	R&S	CMU200	123295	N/A	For WCDMA
		ANRITSU	MT8821C	6201502978	NA	For LTE

Note:

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

ID	Descriptions	Qty.	Length	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	HDMI Cable	1	2 m	N	0	-
2.	RF Cable	1	2445 mm	N	0	Accessory of the EUT
		1	3520 mm	N	0	Accessory of the EUT
3.	RF Cable	1	3550 mm	N	0	Accessory of the EUT
		1	2475 mm	N	0	Accessory of the EUT
4.	RF Cable	1	0.5 m	N	0	Accessory of the EUT
5.	USB Cable	1	2.4 m	N	0	-
6.	USB Cable	1	2.2 m	N	0	-
7.	DC power Cable	1	1.2 m	N	0	-
8.	AC power Cable	1	1.8 m	N	0	-

3.3 Test Mode Applicability and Tested Channel Detail

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

Band	ERP	Radiated Emission
WCDMA	X-plane	X-axis
LTE Band 5	X-plane	X-axis
LTE Band 26	X-plane	X-axis

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
-	Modulation Characteristics	4132 to 4233	4182	WCDMA
-	Frequency Stability	4132 to 4233	4132, 4233	WCDMA
-	Occupied Bandwidth	4132 to 4233	4132, 4182, 4233	WCDMA
-	Band Edge	4132 to 4233	4132, 4233	WCDMA
-	Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA
-	Conducted Emission	4132 to 4233	4132, 4182, 4233	WCDMA
-	Radiated Emission	4132 to 4233	4132, 4182, 4233	WCDMA

LTE Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20450 to 20600	20525	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	20407 to 20643	20407, 20643	1.4 MHz	QPSK	6 RB / 0 RB Offset
		20415 to 20635	20415, 20635	3 MHz	QPSK	15 RB / 0 RB Offset
		20425 to 20625	20425, 20625	5 MHz	QPSK	25 RB / 0 RB Offset
		20450 to 20600	20450, 20600	10 MHz	QPSK	50 RB / 0 RB Offset
-	Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Band Edge	20407 to 20643	20407	1.4MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20643	1.4MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		20415 to 20635	20415	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			20635	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		20425 to 20625	20425	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			20625	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20450 to 20600	20450	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			20600	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Peak to Average Ratio	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. Therefore, only ERP, 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 (above 1GHz) for final testing.

LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	26865 to 26965	26915	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
-	Frequency Stability	26797 to 27033	26797, 27033	1.4 MHz	QPSK	6 RB / 0 RB Offset
		26805 to 27025	26805, 27025	3 MHz	QPSK	15 RB / 0 RB Offset
		26815 to 27015	26815, 27015	5 MHz	QPSK	25 RB / 0 RB Offset
		26840 to 26990	26840, 26990	10 MHz	QPSK	50 RB / 0 RB Offset
		26865 to 26965	26865, 26965	15 MHz	QPSK	75 RB / 0 RB Offset
-	Occupied Bandwidth	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
-	Band Edge	26797 to 27033	26797	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			27033	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26805 to 27025	26805	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			27025	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		26815 to 27015	26815	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			27015	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		26840 to 26990	26840	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			26990	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		26865 to 26965	26865	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			26965	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
-	Peak to Average Ratio	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3 MHz	QPSK	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10 MHz	QPSK	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	26797 to 27033	26797, 26915, 27033	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5 MHz	QPSK	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15 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 ERP, 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 (above 1GHz) for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Modulation Characteristics	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Frequency Stability	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Occupied Bandwidth	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Band Edge	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Peak to Average Ratio	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Conducted Emission	25 deg. C, 65 % RH	12 Vdc	Rui Chan
Radiated Emission	21 deg. C, 63 % RH	120 Vac, 60 Hz	Tim Chen

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

3.5 General Description of Applied Standards and references

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

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

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

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

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 Test Procedures

Conducted Power Measurement:

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

Maximum EIRP / ERP

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

$EIRP = P_{Meas} + G_T$

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

where

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

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

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

4.1.3 Test Setup

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	**24.27**	24.25	24.26

LTE Band 5																	
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20450	20525	20600				Channel		20425	20525	20625	
		Frequency (MHz)		829.0	836.5	844.0				Frequency (MHz)		826.5	836.5	846.5	
10M	QPSK	1	0	23.83	**23.92**	23.88	0	5M	QPSK	1	0	23.85	23.91	**23.95**	0
		1	24	23.72	23.88	23.82	0			1	12	23.80	23.82	23.84	0
		1	49	23.63	23.84	23.88	0			1	24	23.83	23.86	23.80	0
		25	0	22.86	23.02	22.96	1			12	0	22.96	22.94	22.80	1
		25	12	22.80	23.01	22.92	1			12	6	23.04	22.96	22.84	1
		25	25	22.77	22.94	22.79	1			12	13	23.09	22.94	22.81	1
		50	0	22.80	23.05	22.88	1			25	0	23.05	22.96	22.74	1
	16QAM	1	0	23.20	23.12	23.15	1		16QAM	1	0	23.13	23.37	23.15	1
		1	24	23.15	23.03	23.04	1			1	12	22.96	23.18	23.04	1
		1	49	23.17	23.07	23.15	1			1	24	22.82	23.07	22.99	1
		25	0	22.23	22.03	22.09	2			12	0	21.59	21.85	21.70	2
		25	12	22.15	21.97	22.06	2			12	6	21.79	21.97	21.90	2
		25	25	21.97	21.87	21.92	2			12	13	21.61	21.84	21.75	2
		50	0	21.95	21.95	21.93	2			25	0	21.72	21.98	21.98	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20415	20525	20635				Channel		20407	20525	20643	
		Frequency (MHz)		825.5	836.5	847.5				Frequency (MHz)		824.7	836.5	848.3	
3M	QPSK	1	0	**23.91**	23.87	23.82	0	1.4M	QPSK	1	0	23.72	23.81	**23.82**	0
		1	7	23.78	23.82	23.78	0			1	2	23.52	23.67	23.56	0
		1	14	23.66	23.74	23.67	0			1	5	23.50	23.68	23.55	0
		8	0	22.87	22.95	22.94	1			3	0	23.50	23.76	23.62	0
		8	3	22.87	22.97	22.94	1			3	1	23.55	23.73	23.67	0
		8	7	22.71	22.89	22.79	1			3	3	23.59	23.80	23.79	0
		15	0	22.76	22.91	22.75	1			6	0	22.65	22.85	22.91	1
	16QAM	1	0	23.11	23.26	23.15	1		16QAM	1	0	23.17	23.22	23.07	1
		1	7	22.99	23.19	23.02	1			1	2	23.11	23.14	22.97	1
		1	14	22.98	23.22	23.13	1			1	5	23.21	23.17	23.07	1
		8	0	21.71	21.91	21.75	2			3	0	22.96	22.86	22.71	1
		8	3	21.77	21.94	21.79	2			3	1	22.95	22.91	22.76	1
		8	7	21.85	21.97	21.72	2			3	3	22.93	22.87	22.66	1
		15	0	21.77	21.98	21.75	2			6	0	22.00	21.87	21.69	2

LTE Band 26

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26865	26915	26965	
		Frequency (MHz)		831.5	836.5	841.5	
15M	QPSK	1	0	23.72	23.69	**23.75**	0
		1	37	23.67	23.67	23.68	0
		1	74	23.55	23.61	23.71	0
		36	0	22.73	22.83	23.01	1
		36	19	22.79	22.83	22.99	1
		36	39	22.79	22.76	22.85	1
		75	0	22.84	22.82	22.88	1
	16QAM	1	0	22.87	22.94	22.71	1
		1	37	22.79	22.82	22.55	1
		1	74	22.51	22.62	22.29	1
		36	0	21.77	21.91	21.65	2
		36	19	21.67	21.84	21.67	2
		36	39	21.59	21.75	21.49	2
		75	0	21.76	21.87	21.51	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26840	26915	26990	
		Frequency (MHz)		829.0	836.5	844.0	
10M	QPSK	1	0	23.81	**23.89**	23.77	0
		1	24	23.69	23.76	23.59	0
		1	49	23.42	23.52	23.38	0
		25	0	22.66	22.82	22.76	1
		25	12	22.61	22.85	22.73	1
		25	25	22.65	22.86	22.75	1
		50	0	22.52	22.81	22.76	1
	16QAM	1	0	23.17	23.31	23.23	1
		1	24	23.05	23.21	23.13	1
		1	49	22.94	23.12	22.95	1
		25	0	21.64	21.81	21.68	2
		25	12	21.71	21.83	21.71	2
		25	25	21.71	21.91	21.78	2
		50	0	21.56	21.72	21.62	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26815	26915	27015	
		Frequency (MHz)		826.5	836.5	846.5	
5M	QPSK	1	0	23.81	**23.87**	23.80	0
		1	12	23.62	23.74	23.70	0
		1	24	23.70	23.75	23.71	0
		12	0	22.88	22.89	22.78	1
		12	6	22.78	22.81	22.64	1
		12	13	22.74	22.76	22.51	1
		25	0	22.68	22.74	22.59	1
	16QAM	1	0	22.97	23.29	22.89	1
		1	12	22.64	23.02	22.67	1
		1	24	22.58	22.98	22.60	1
		12	0	21.55	21.88	21.55	2
		12	6	21.36	21.72	21.42	2
		12	13	21.52	21.81	21.57	2
		25	0	21.37	21.76	21.58	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26805	26915	27025	
		Frequency (MHz)		825.5	836.5	847.5	
3M	QPSK	1	0	23.87	23.86	**23.95**	1
		1	7	23.77	23.82	23.94	1
		1	14	23.75	23.82	23.85	1
		8	0	22.79	22.79	23.00	3
		8	3	22.79	22.84	22.96	3
		8	7	22.64	22.79	23.00	3
		15	0	22.57	22.78	22.91	6
	16QAM	1	0	23.17	23.29	23.22	1
		1	7	23.11	23.19	23.20	1
		1	14	22.88	23.04	23.14	1
		8	0	21.63	21.87	22.01	2
		8	3	21.60	21.94	22.11	2
		8	7	21.49	21.82	22.01	2
		15	0	21.37	21.76	22.05	2

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26797	26915	27033	
		Frequency (MHz)		824.7	836.5	848.3	
1.4M	QPSK	1	0	23.54	**23.75**	23.55	0
		1	2	23.40	23.54	23.35	0
		1	5	23.39	23.59	23.42	0
		3	0	23.33	23.48	23.26	0
		3	1	23.63	23.72	23.48	0
		3	3	23.63	23.66	23.49	0
		6	0	22.75	22.87	22.60	1
	16QAM	1	0	23.27	23.47	23.17	1
		1	2	23.34	23.46	23.12	1
		1	5	23.27	23.39	22.97	1
		3	0	23.22	23.41	23.05	1
		3	1	23.24	23.37	23.09	1
		3	3	23.19	23.39	23.19	1
		6	0	22.60	22.87	22.61	2

ERP Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	**24.49**	24.47	24.48

*ERP = Conducted + antenna gain (2.37dBi)-2.15

LTE Band 5																
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20450	20525	20600				Channel		20425	20525	20625	
		Frequency (MHz)		829.0	836.5	844.0				Frequency (MHz)		826.5	836.5	846.5	
10M	QPSK	1	0	24.05	**24.14**	24.10	0	5M	QPSK	1	0	24.07	24.13	**24.17**	0
		1	24	23.94	24.10	24.04	0			1	12	24.02	24.04	24.06	0
		1	49	23.85	24.06	24.10	0			1	24	24.05	24.08	24.02	0
		25	0	23.08	23.24	23.18	1			12	0	23.18	23.16	23.02	1
		25	12	23.02	23.23	23.14	1			12	6	23.26	23.18	23.06	1
		25	25	22.99	23.16	23.01	1			12	13	23.31	23.16	23.03	1
		50	0	23.02	23.27	23.10	1			25	0	23.27	23.18	22.96	1
	16QAM	1	0	23.42	23.34	23.37	1		16QAM	1	0	23.35	23.59	23.37	1
		1	24	23.37	23.25	23.26	1			1	12	23.18	23.40	23.26	1
		1	49	23.39	23.29	23.37	1			1	24	23.04	23.29	23.21	1
		25	0	22.45	22.25	22.31	2			12	0	21.81	22.07	21.92	2
		25	12	22.37	22.19	22.28	2			12	6	22.01	22.19	22.12	2
		25	25	22.19	22.09	22.14	2			12	13	21.83	22.06	21.97	2
		50	0	22.17	22.17	22.15	2			25	0	21.94	22.20	22.20	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20415	20525	20635				Channel		20407	20525	20643	
		Frequency (MHz)		825.5	836.5	847.5				Frequency (MHz)		824.7	836.5	848.3	
3M	QPSK	1	0	**24.13**	24.09	24.04	0	1.4M	QPSK	1	0	23.94	24.03	**24.04**	0
		1	7	24.00	24.04	24.00	0			1	2	23.74	23.89	23.78	0
		1	14	23.88	23.96	23.89	0			1	5	23.72	23.90	23.77	0
		8	0	23.09	23.17	23.16	1			3	0	23.72	23.98	23.84	0
		8	3	23.09	23.19	23.16	1			3	1	23.77	23.95	23.89	0
		8	7	22.93	23.11	23.01	1			3	3	23.81	24.02	24.01	0
		15	0	22.98	23.13	22.97	1			6	0	22.87	23.07	23.13	1
	16QAM	1	0	23.33	23.48	23.37	1		16QAM	1	0	23.39	23.44	23.29	1
		1	7	23.21	23.41	23.24	1			1	2	23.33	23.36	23.19	1
		1	14	23.20	23.44	23.35	1			1	5	23.43	23.39	23.29	1
		8	0	21.93	22.13	21.97	2			3	0	23.18	23.08	22.93	1
		8	3	21.99	22.16	22.01	2			3	1	23.17	23.13	22.98	1
		8	7	22.07	22.19	21.94	2			3	3	23.15	23.09	22.88	1
		15	0	21.99	22.20	21.97	2			6	0	22.22	22.09	21.91	2

*ERP = Conducted + antenna gain (2.37dBi)-2.15

LTE Band 26																
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26865	26915	26965				Channel		26840	26915	26990	
		Frequency (MHz)		831.5	836.5	841.5				Frequency (MHz)		829.0	836.5	844.0	
15M	QPSK	1	0	23.94	23.91	**23.97**	0	10M	QPSK	1	0	24.03	**24.11**	23.99	0
		1	37	23.89	23.89	23.90	0			1	24	23.91	23.98	23.81	0
		1	74	23.77	23.83	23.93	0			1	49	23.64	23.74	23.60	0
		36	0	22.95	23.05	23.23	1			25	0	22.88	23.04	22.98	1
		36	19	23.01	23.05	23.21	1			25	12	22.83	23.07	22.95	1
		36	39	23.01	22.98	23.07	1			25	25	22.87	23.08	22.97	1
		75	0	23.06	23.04	23.10	1			50	0	22.74	23.03	22.98	1
	16QAM	1	0	23.09	23.16	22.93	1		16QAM	1	0	23.39	23.53	23.45	1
		1	37	23.01	23.04	22.77	1			1	24	23.27	23.43	23.35	1
		1	74	22.73	22.84	22.51	1			1	49	23.16	23.34	23.17	1
		36	0	21.99	22.13	21.87	2			25	0	21.86	22.03	21.90	2
		36	19	21.89	22.06	21.89	2			25	12	21.93	22.05	21.93	2
		36	39	21.81	21.97	21.71	2			25	25	21.93	22.13	22.00	2
		75	0	21.98	22.09	21.73	2			50	0	21.78	21.94	21.84	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26815	26915	27015				Channel		26805	26915	27025	
		Frequency (MHz)		826.5	836.5	846.5				Frequency (MHz)		825.5	836.5	847.5	
5M	QPSK	1	0	24.03	**24.09**	24.02	0	3M	QPSK	1	0	24.09	24.08	**24.17**	1
		1	12	23.84	23.96	23.92	0			1	7	23.99	24.04	24.16	1
		1	24	23.92	23.97	23.93	0			1	14	23.97	24.04	24.07	1
		12	0	23.10	23.11	23.00	1			8	0	23.01	23.01	23.22	3
		12	6	23.00	23.03	22.86	1			8	3	23.01	23.06	23.18	3
		12	13	22.96	22.98	22.73	1			8	7	22.86	23.01	23.22	3
		25	0	22.90	22.96	22.81	1			15	0	22.79	23.00	23.13	6
	16QAM	1	0	23.19	23.51	23.11	1		16QAM	1	0	23.39	23.51	23.44	1
		1	12	22.86	23.24	22.89	1			1	7	23.33	23.41	23.42	1
		1	24	22.80	23.20	22.82	1			1	14	23.10	23.26	23.36	1
		12	0	21.77	22.10	21.77	2			8	0	21.85	22.09	22.23	2
		12	6	21.58	21.94	21.64	2			8	3	21.82	22.16	22.33	2
		12	13	21.74	22.03	21.79	2			8	7	21.71	22.04	22.23	2
		25	0	21.59	21.98	21.80	2			15	0	21.59	21.98	22.27	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)								
		Channel		26797	26915	27033									
		Frequency (MHz)		824.7	836.5	848.3									
1.4M	QPSK	1	0	23.76	**23.97**	23.77	0								
		1	2	23.62	23.76	23.57	0								
		1	5	23.61	23.81	23.64	0								
		3	0	23.55	23.70	23.48	0								
		3	1	23.85	23.94	23.70	0								
		3	3	23.85	23.88	23.71	0								
		6	0	22.97	23.09	22.82	1								
	16QAM	1	0	23.49	23.69	23.39	1								
		1	2	23.56	23.68	23.34	1								
		1	5	23.49	23.61	23.19	1								
		3	0	23.44	23.63	23.27	1								
		3	1	23.46	23.59	23.31	1								
		3	3	23.41	23.61	23.41	1								
		6	0	22.82	23.09	22.83	2								

*ERP = Conducted + antenna gain (2.37dBi)-2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

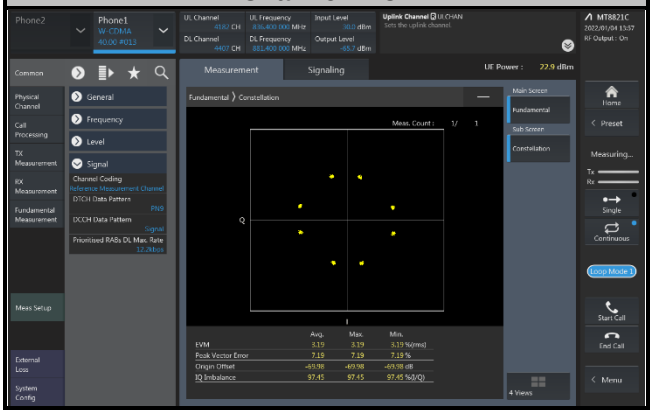
N/A

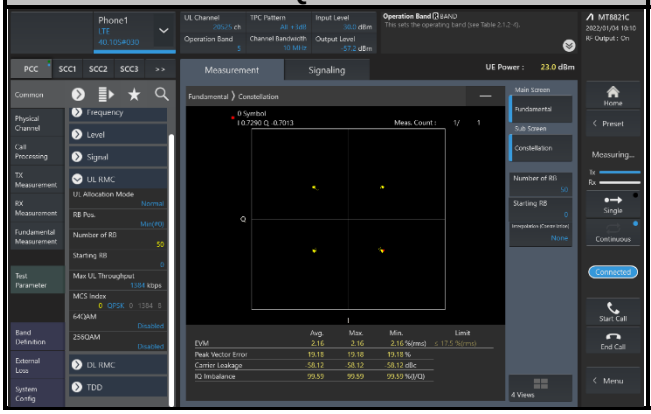
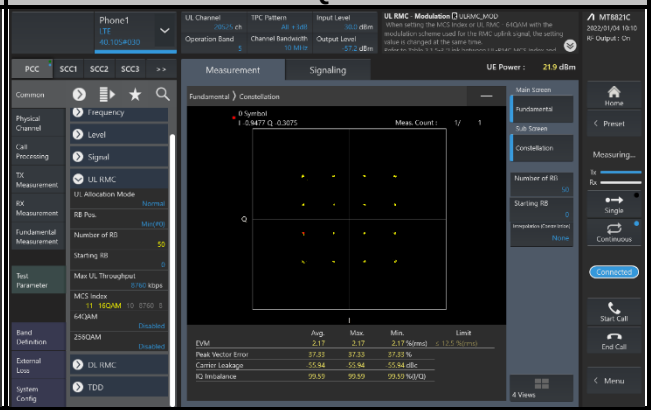
4.2.2 Test Setup

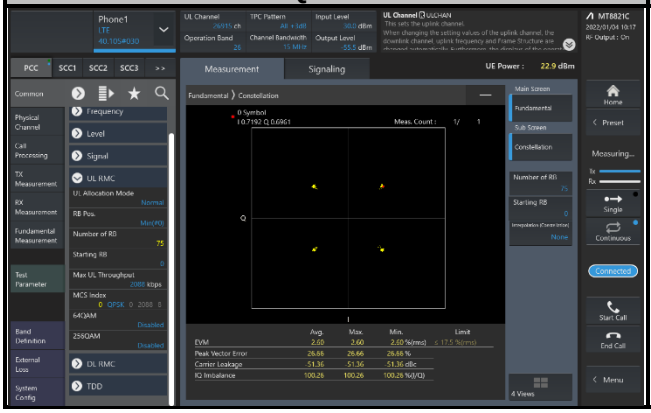
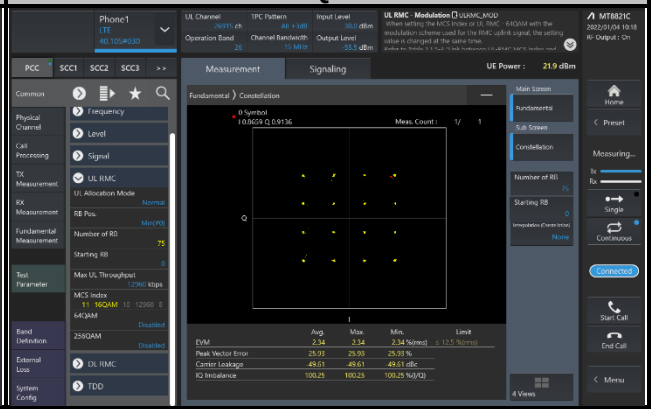
4.2.3 Test Procedure

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
WCDMA
Channel 4182


Spectrum Plot of Measurement	
LTE Band 5	
Channel 20525	
QPSK	16QAM
	

Spectrum Plot of Measurement	
LTE Band 26	
Channel 26915	
QPSK	16QAM
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

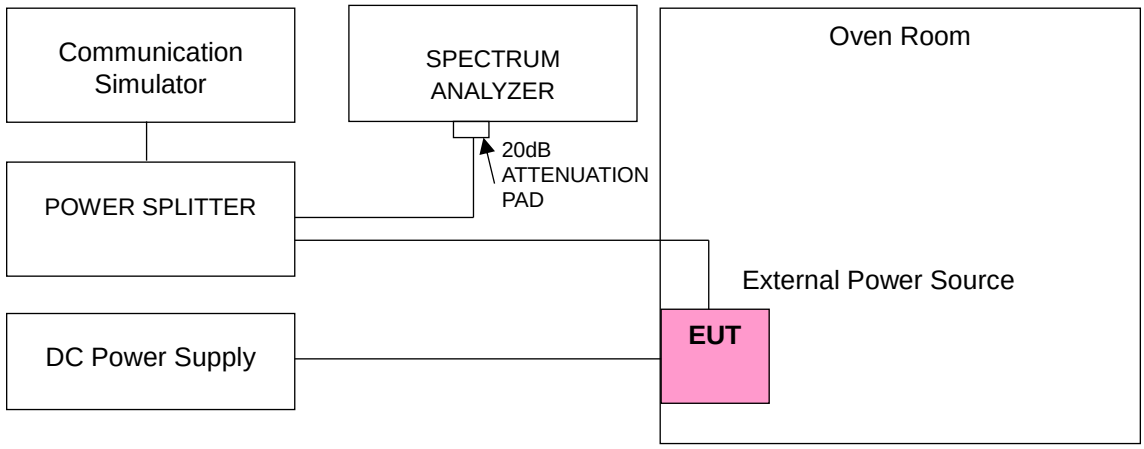
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	826.400002	0.002	846.600001	0.001	2.5
10.2	826.400004	0.005	846.600003	0.004	2.5
13.8	826.400003	0.003	846.600003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.400003	0.004	846.600002	0.002	2.5
-20	826.400004	0.005	846.600004	0.005	2.5
-10	826.400002	0.002	846.600001	0.001	2.5
0	826.400003	0.004	846.600003	0.004	2.5
10	826.400002	0.003	846.600002	0.002	2.5
20	826.399998	-0.003	846.600004	0.004	2.5
30	826.399997	-0.003	846.600002	0.002	2.5
40	826.399997	-0.003	846.599999	-0.002	2.5
50	826.399996	-0.004	846.599997	-0.004	2.5
60	826.399999	-0.002	846.599999	-0.001	2.5
70	826.400004	0.005	846.599998	-0.002	2.5
80	826.400002	0.002	846.599997	-0.004	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	824.700002	0.003	848.300002	0.002	2.5
10.2	824.700001	0.002	848.300001	0.002	2.5
13.8	824.700004	0.005	848.300004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.700003	0.004	848.300003	0.004	2.5
-20	824.699998	-0.003	848.300004	0.004	2.5
-10	824.700004	0.005	848.300002	0.002	2.5
0	824.700004	0.005	848.300003	0.004	2.5
10	824.700003	0.004	848.300003	0.003	2.5
20	824.700004	0.005	848.300003	0.004	2.5
30	824.700002	0.002	848.300001	0.001	2.5
40	824.699996	-0.004	848.299998	-0.003	2.5
50	824.699998	-0.002	848.299997	-0.004	2.5
60	824.699996	-0.005	848.299998	-0.003	2.5
70	824.699997	-0.004	848.299998	-0.002	2.5
80	824.699998	-0.002	848.299997	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	825.500003	0.003	847.500002	0.002	2.5
10.2	825.500002	0.002	847.500004	0.005	2.5
13.8	825.500003	0.004	847.500004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	825.500004	0.004	847.499996	-0.004	2.5
-20	825.499997	-0.004	847.499996	-0.004	2.5
-10	825.500002	0.003	847.500002	0.003	2.5
0	825.500003	0.003	847.500003	0.004	2.5
10	825.500001	0.001	847.500002	0.003	2.5
20	825.500003	0.004	847.500003	0.003	2.5
30	825.500002	0.002	847.500003	0.003	2.5
40	825.499999	-0.001	847.499997	-0.004	2.5
50	825.499996	-0.004	847.499997	-0.003	2.5
60	825.499998	-0.003	847.499997	-0.004	2.5
70	825.499997	-0.003	847.499998	-0.002	2.5
80	825.499997	-0.004	847.499998	-0.002	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	826.500004	0.004	846.500003	0.004	2.5
10.2	826.500002	0.002	846.500004	0.004	2.5
13.8	826.500003	0.004	846.500002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.500001	0.002	846.499996	-0.005	2.5
-20	826.499999	-0.001	846.499998	-0.002	2.5
-10	826.500002	0.002	846.500002	0.002	2.5
0	826.500002	0.003	846.500003	0.004	2.5
10	826.500001	0.001	846.500001	0.001	2.5
20	826.500003	0.003	846.500004	0.005	2.5
30	826.500004	0.005	846.500003	0.004	2.5
40	826.499998	-0.003	846.499996	-0.004	2.5
50	826.499997	-0.003	846.499998	-0.003	2.5
60	826.499997	-0.003	846.499999	-0.001	2.5
70	826.499998	-0.002	846.499998	-0.002	2.5
80	826.499998	-0.003	846.499997	-0.004	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	829.000003	0.003	844.000003	0.003	2.5
10.2	829.000002	0.002	844.000002	0.002	2.5
13.8	829.000002	0.002	844.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	829.000004	0.004	843.999996	-0.005	2.5
-20	828.999999	-0.002	843.999997	-0.003	2.5
-10	829.000002	0.002	844.000001	0.002	2.5
0	829.000002	0.002	844.000003	0.003	2.5
10	829.000002	0.003	844.000002	0.002	2.5
20	829.000003	0.003	844.000004	0.004	2.5
30	829.000003	0.003	844.000002	0.002	2.5
40	828.999997	-0.004	843.999996	-0.004	2.5
50	828.999998	-0.002	843.999997	-0.003	2.5
60	828.999997	-0.004	843.999998	-0.002	2.5
70	828.999997	-0.004	843.999997	-0.003	2.5
80	828.999996	-0.005	843.999997	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	824.700002	0.002	848.300001	0.001	2.5
10.2	824.700001	0.001	848.300002	0.002	2.5
13.8	824.700001	0.001	848.300003	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.700003	0.004	848.300001	0.002	2.5
-20	824.700002	0.002	848.300002	0.002	2.5
-10	824.700003	0.004	848.300003	0.004	2.5
0	824.700004	0.005	848.300003	0.003	2.5
10	824.700002	0.003	848.300002	0.002	2.5
20	824.699997	-0.004	848.299998	-0.002	2.5
30	824.699997	-0.003	848.299999	-0.002	2.5
40	824.699998	-0.003	848.299999	-0.001	2.5
50	824.699996	-0.004	848.299998	-0.002	2.5
60	824.699997	-0.004	848.299998	-0.003	2.5
70	824.699997	-0.004	848.299999	-0.002	2.5
80	824.699999	-0.002	848.299998	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	825.500003	0.004	847.500003	0.004	2.5
10.2	825.500002	0.003	847.500002	0.003	2.5
13.8	825.500003	0.004	847.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	825.500001	0.001	847.500004	0.004	2.5
-20	825.500001	0.001	847.500003	0.004	2.5
-10	825.500001	0.002	847.500001	0.001	2.5
0	825.500001	0.001	847.500004	0.004	2.5
10	825.500002	0.003	847.500003	0.004	2.5
20	825.499997	-0.004	847.499998	-0.002	2.5
30	825.499998	-0.003	847.499999	-0.002	2.5
40	825.499997	-0.004	847.499999	-0.001	2.5
50	825.499998	-0.003	847.499998	-0.002	2.5
60	825.499997	-0.003	847.499997	-0.003	2.5
70	825.499996	-0.004	847.499997	-0.004	2.5
80	825.499997	-0.004	847.499998	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	826.500003	0.004	846.500002	0.002	2.5
10.2	826.500003	0.004	846.500002	0.003	2.5
13.8	826.500004	0.005	846.500002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.500001	0.001	846.500001	0.001	2.5
-20	826.500002	0.003	846.500001	0.001	2.5
-10	826.500003	0.003	846.500001	0.001	2.5
0	826.500001	0.001	846.500004	0.004	2.5
10	826.500003	0.004	846.500003	0.004	2.5
20	826.499999	-0.001	846.499997	-0.004	2.5
30	826.499998	-0.002	846.499998	-0.003	2.5
40	826.499998	-0.002	846.499999	-0.001	2.5
50	826.499999	-0.002	846.499997	-0.004	2.5
60	826.499998	-0.003	846.499996	-0.004	2.5
70	826.499998	-0.002	846.499998	-0.003	2.5
80	826.499997	-0.003	846.499998	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	829.000002	0.003	844.000002	0.002	2.5
10.2	829.000002	0.002	844.000003	0.004	2.5
13.8	829.000002	0.002	844.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	829.000002	0.002	844.000003	0.004	2.5
-20	829.000004	0.004	844.000003	0.003	2.5
-10	829.000003	0.004	844.000004	0.005	2.5
0	829.000002	0.002	844.000002	0.003	2.5
10	829.000003	0.004	844.000001	0.002	2.5
20	828.999998	-0.003	843.999998	-0.003	2.5
30	828.999997	-0.004	843.999996	-0.004	2.5
40	828.999997	-0.004	843.999997	-0.003	2.5
50	828.999997	-0.003	843.999996	-0.005	2.5
60	828.999998	-0.002	843.999999	-0.001	2.5
70	828.999996	-0.005	843.999998	-0.002	2.5
80	828.999998	-0.002	843.999998	-0.003	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	831.500004	0.004	841.500002	0.002	2.5
10.2	831.500001	0.001	841.500002	0.002	2.5
13.8	831.500003	0.004	841.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 10.2 Vdc to 13.8 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	831.500004	0.005	841.500002	0.002	2.5
-20	831.500002	0.003	841.500003	0.003	2.5
-10	831.500001	0.002	841.500004	0.004	2.5
0	831.500002	0.002	841.500002	0.002	2.5
10	831.500003	0.003	841.500004	0.005	2.5
20	831.499996	-0.005	841.499999	-0.001	2.5
30	831.499997	-0.004	841.499998	-0.002	2.5
40	831.499997	-0.003	841.499996	-0.005	2.5
50	831.499998	-0.002	841.499997	-0.003	2.5
60	831.499997	-0.003	841.499999	-0.001	2.5
70	831.499996	-0.005	841.499996	-0.004	2.5
80	831.499997	-0.004	841.499997	-0.004	2.5

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -30˚C to 80˚C.
2. The EUT would shut down automatically as below -30˚C.

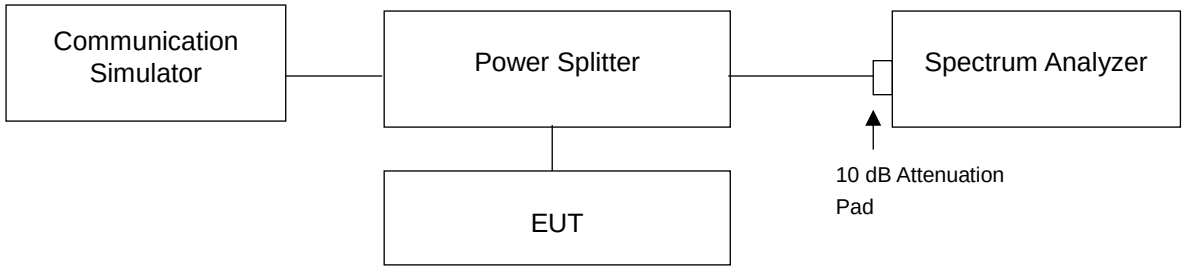
4.4 Occupied Bandwidth Measurement

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. Measurement method, please refer to section 5.4.4 of ANSI C63.26. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

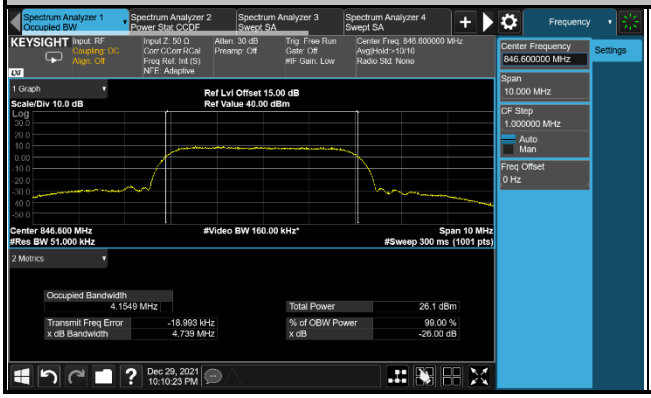
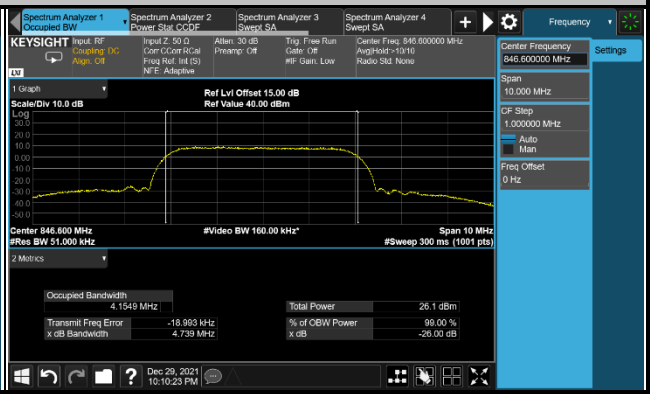
For the 26dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

4.4.2 Test Setup

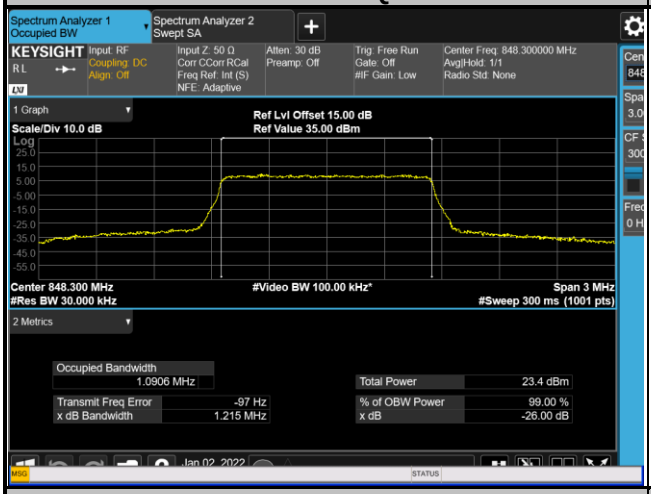
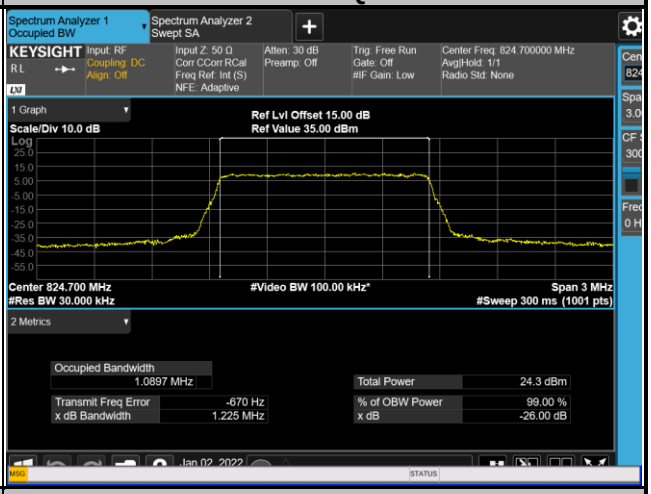
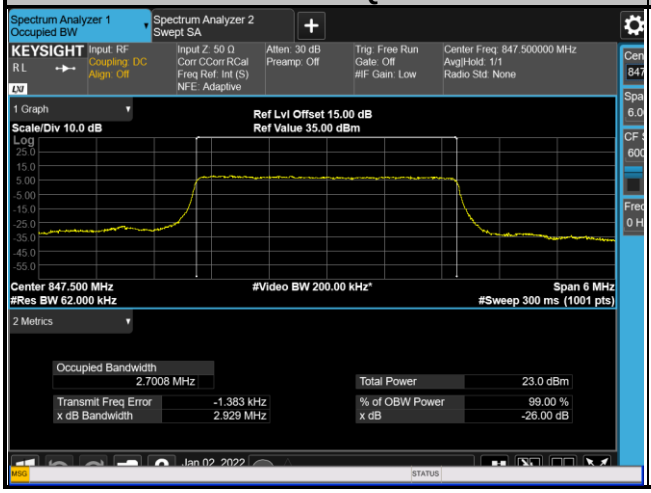
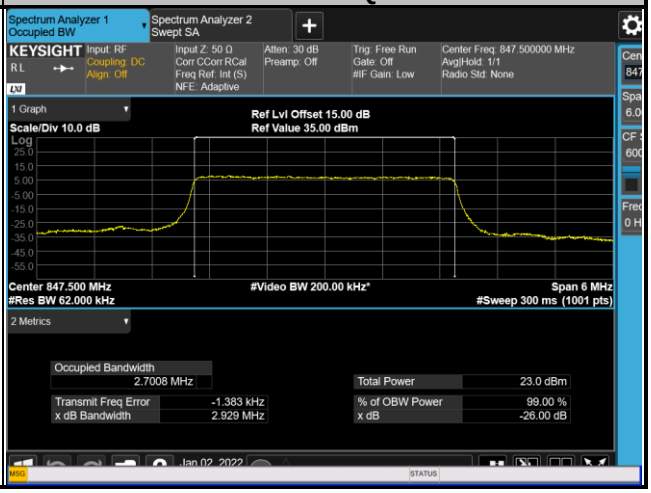


4.4.3 Test Result

WCDMA			
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**	**26 dB Bandwidth (MHz)**
4132	826.4	4.14	4.72
4182	836.4	4.14	4.71
4233	846.6	4.15	4.73

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

LTE Band 5					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20407	824.7	1.09	1.09	1.23	1.22
20525	836.5	1.09	1.09	1.22	1.22
20643	848.3	1.09	1.09	1.22	1.22
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20415	825.5	2.70	2.70	2.92	2.93
20525	836.5	2.70	2.70	2.92	2.93
20635	847.5	2.70	2.70	2.92	2.93

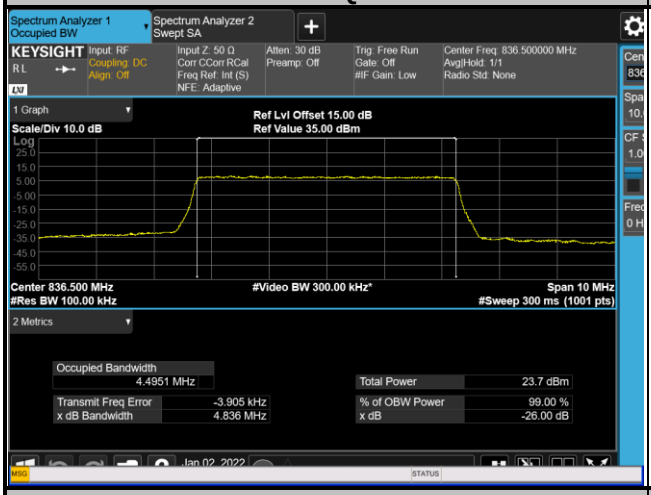
Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / 16QAM	1.4 MHz / QPSK
	
3 MHz / 16QAM	3 MHz / 16QAM
	

LTE Band 5					
Channel Bandwidth: 5 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
20425	826.5	4.49	4.49	4.81	4.80
20525	836.5	4.50	4.49	4.84	4.81
20625	846.5	4.49	4.49	4.83	4.81
Channel Bandwidth: 10 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
20450	829.0	8.96	8.96	9.51	9.50
20525	836.5	8.98	8.98	9.52	9.52
20600	844.0	8.95	8.95	9.50	9.51

Spectrum Plot of Worst Value

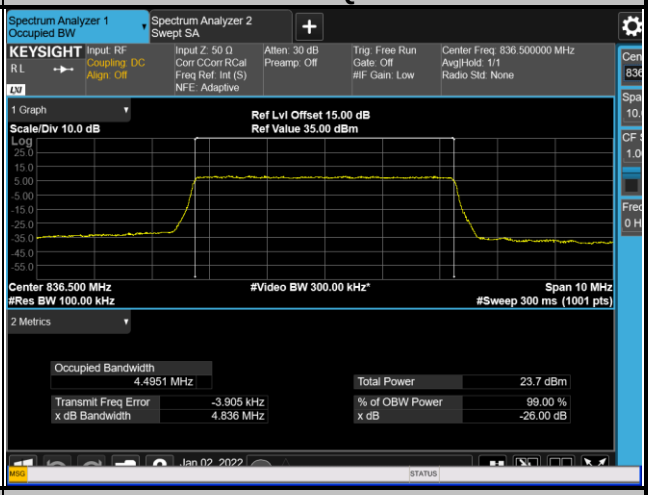
99 % Occupied Bandwidth

5 MHz / QPSK

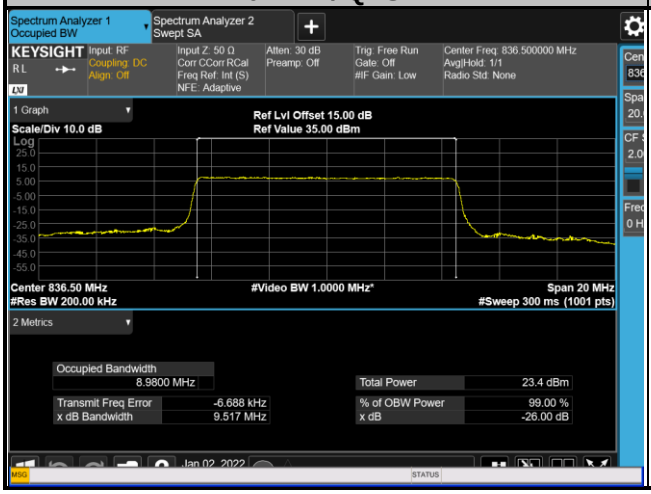


26 dB Bandwidth

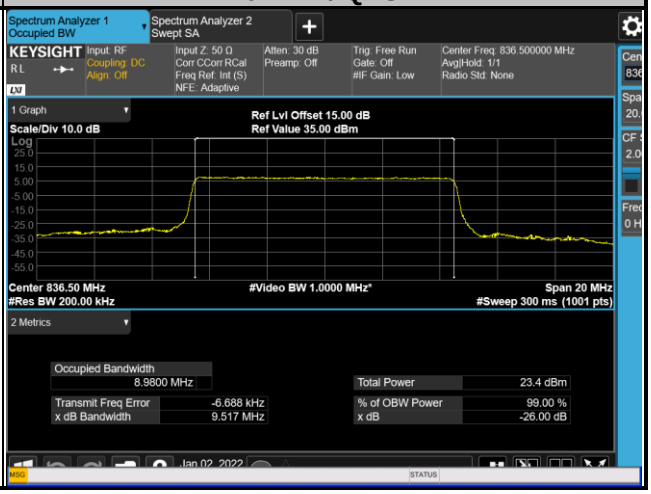
5 MHz / QPSK



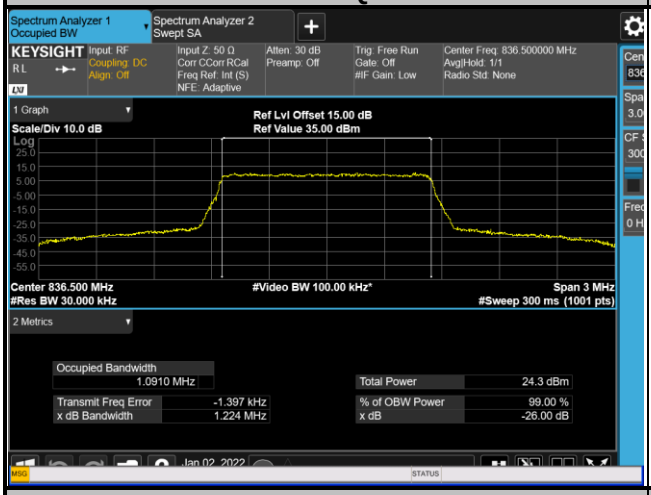
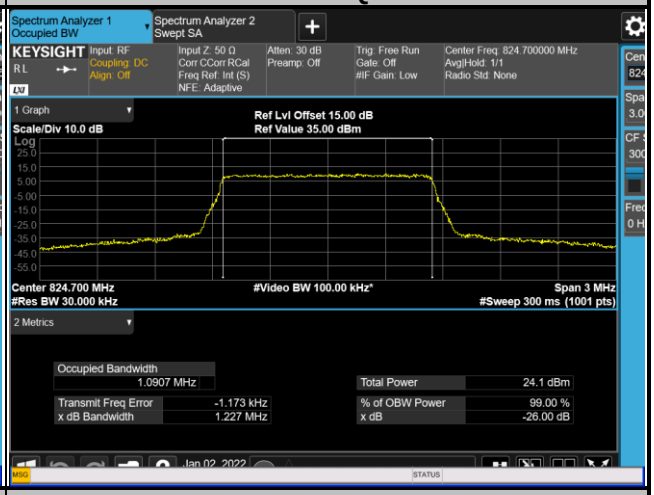
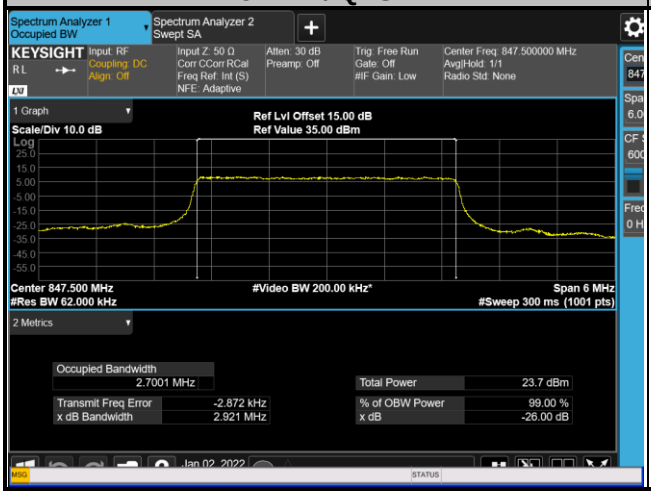
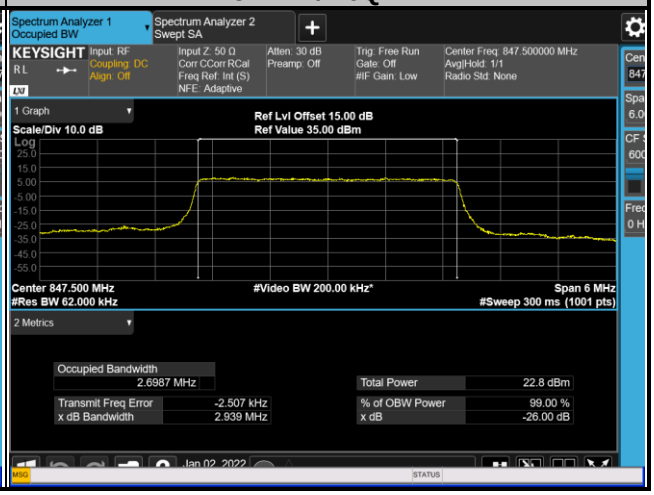
10 MHz / QPSK



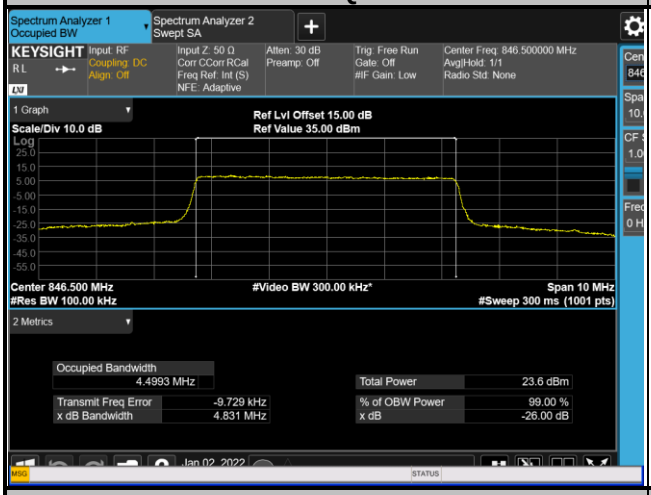
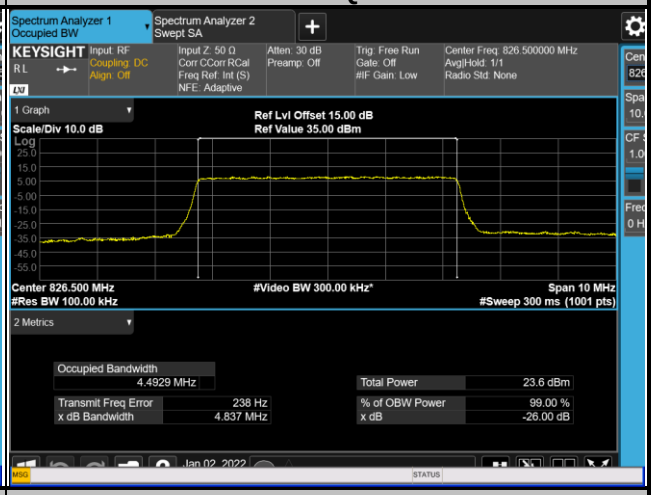
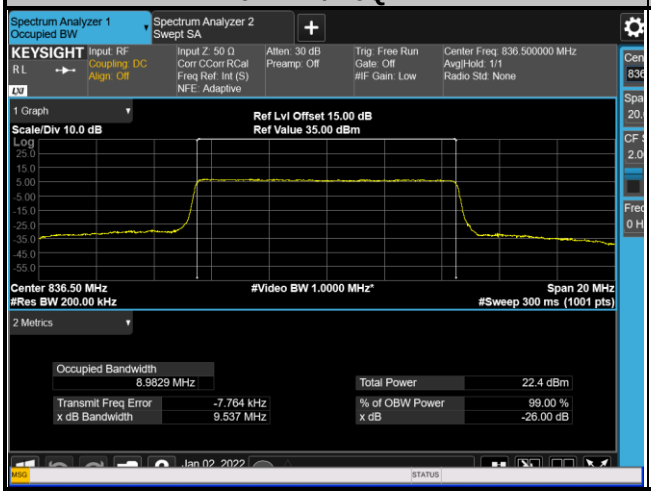
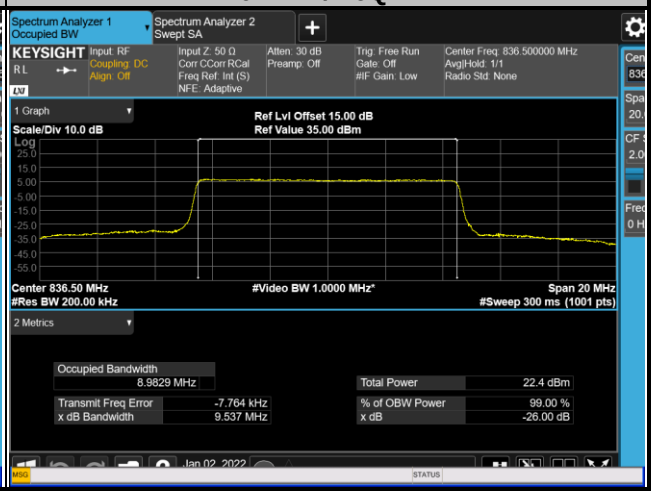
10 MHz / QPSK



LTE Band 26					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26797	824.7	1.09	1.09	1.23	1.22
26915	836.5	1.09	1.09	1.22	1.22
27033	848.3	1.09	1.09	1.23	1.21
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26805	825.5	2.70	2.69	2.92	2.93
26915	836.5	2.70	2.70	2.92	2.93
27025	847.5	2.70	2.70	2.92	2.94

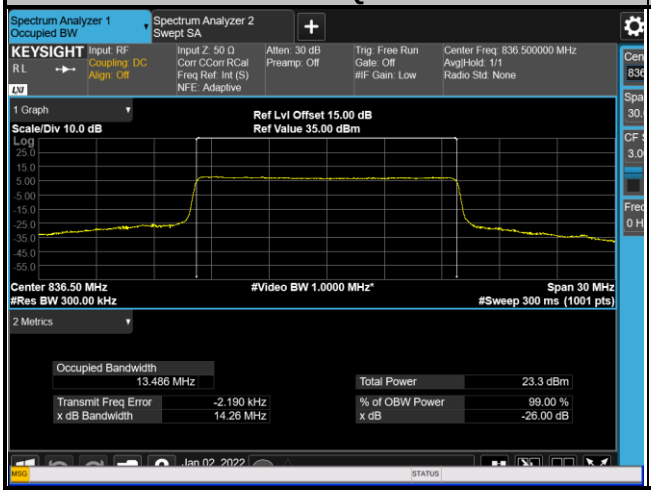
Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / QPSK	1.4 MHz / QPSK
	
3 MHz / QPSK	3 MHz / 16QAM
	

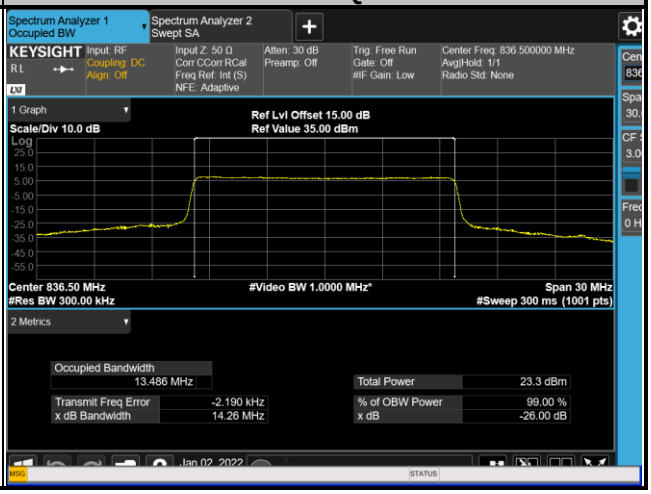
LTE Band 26					
Channel Bandwidth: 5 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
26815	826.5	4.49	4.49	4.84	4.81
26915	836.5	4.50	4.49	4.83	4.81
27015	846.5	4.50	4.49	4.83	4.81
Channel Bandwidth: 10 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
26840	829.0	8.96	8.96	9.52	9.52
26915	836.5	8.98	8.98	9.54	9.54
26990	844.0	8.95	8.95	9.50	9.50

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

LTE Band 26					
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26865	831.5	13.47	13.44	14.25	14.24
26915	836.5	13.49	13.47	14.26	14.25
26965	841.5	13.44	13.43	14.25	14.24

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
15 MHz / QPSK	15 MHz / QPSK



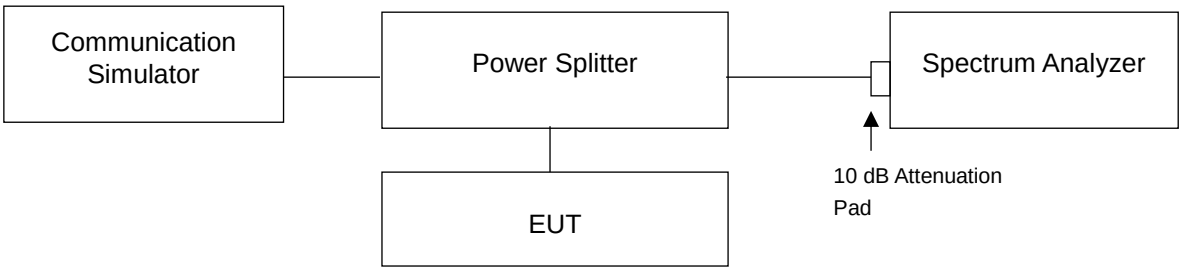


4.5 Band Edge Measurement

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



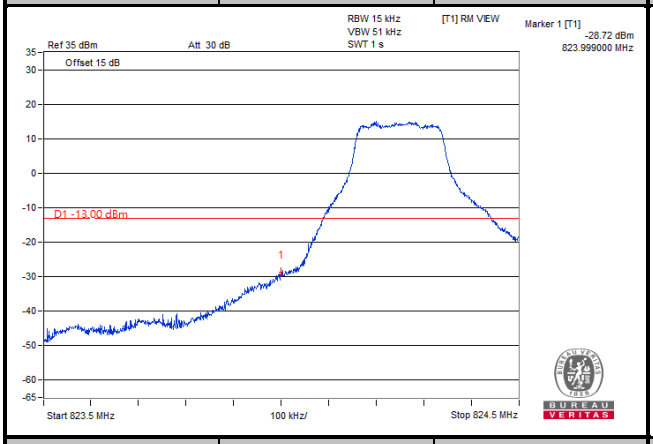
4.5.3 Test Procedures

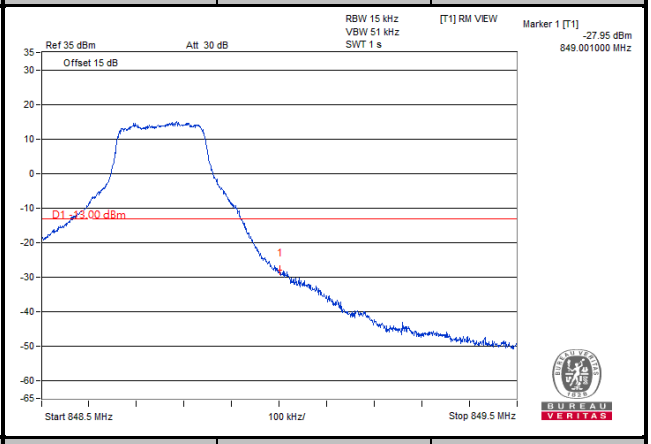
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 2 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (WCDMA).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
d. 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).
e. 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).
f. 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).
g. 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).
h. Record the max trace plot into the test report.

4.5.4 Test Results

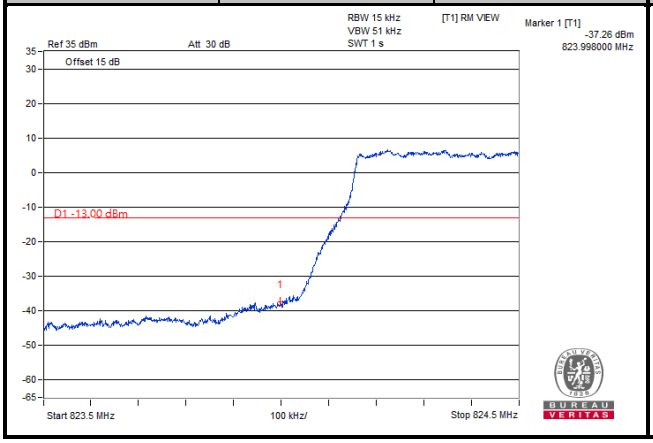
WCDMA			
Channel	4132	Channel	4233

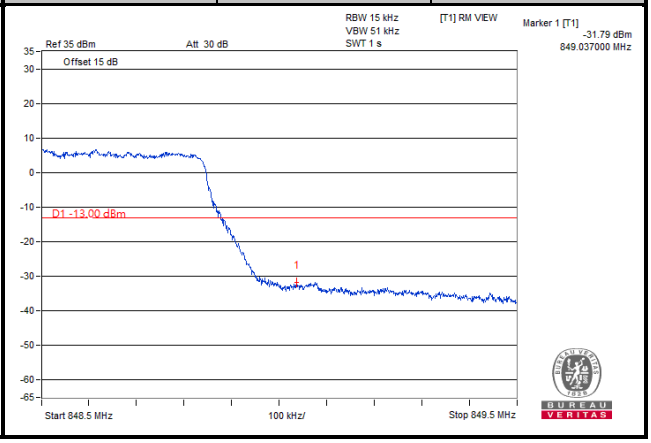
LTE Band 5					
Channel Bandwidth: 1.4 MHz					
Channel	20407	1 RB	Channel	20643	1 RB

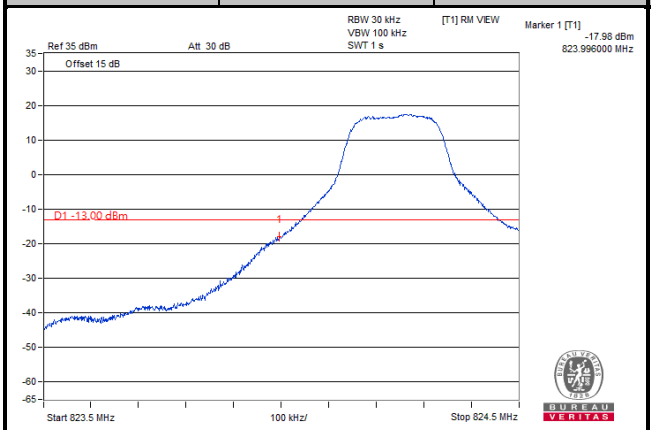
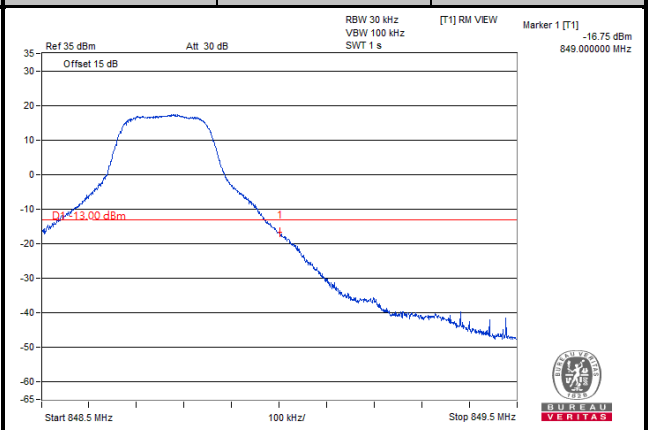
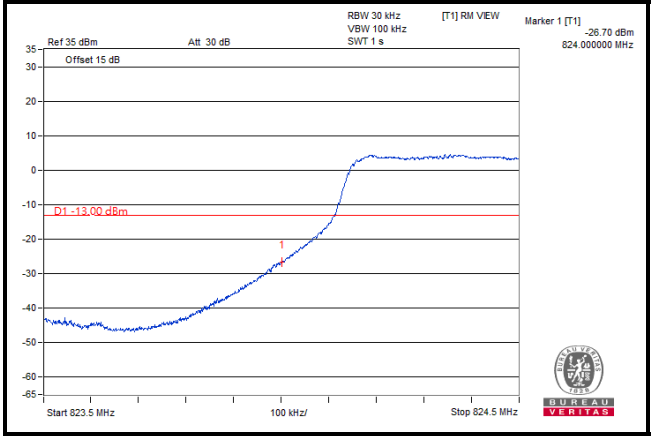
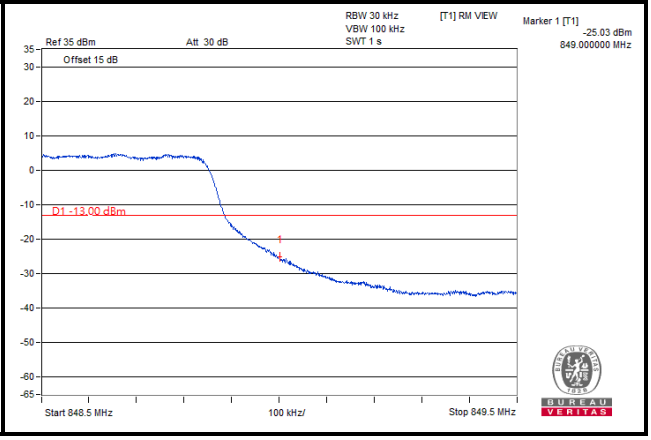


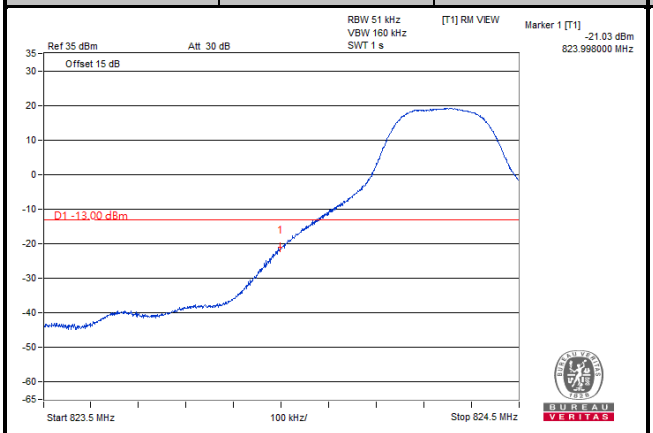
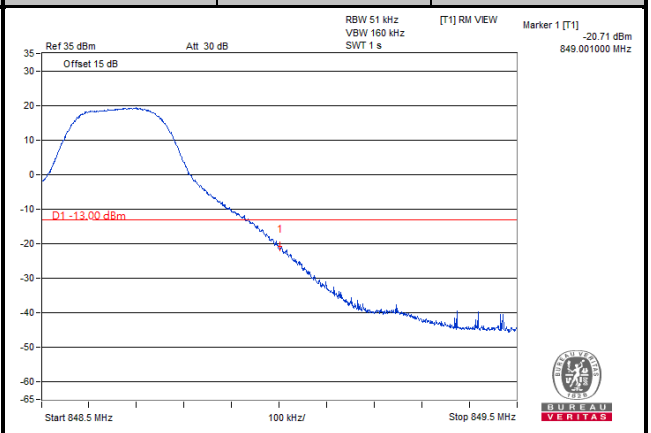
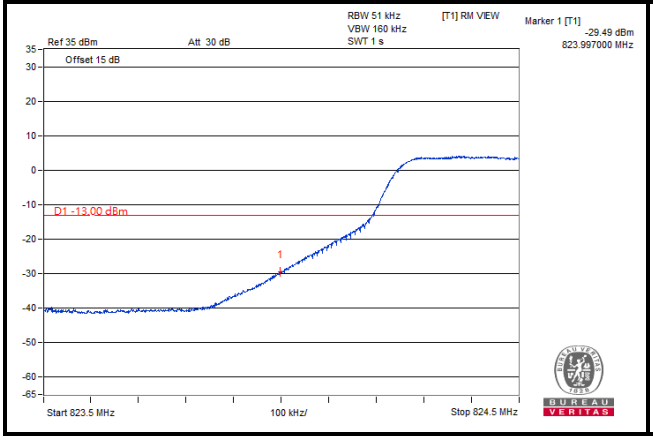
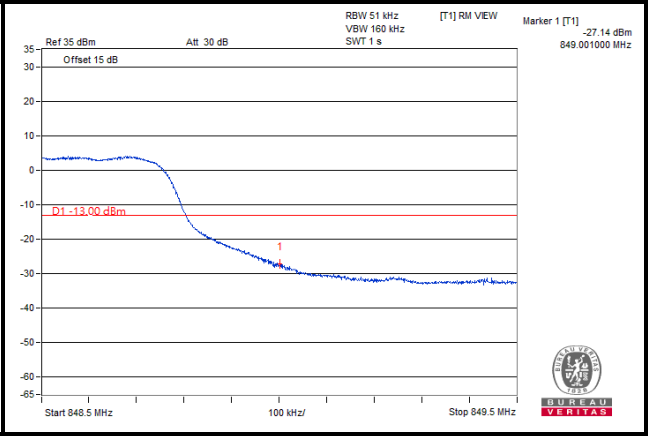


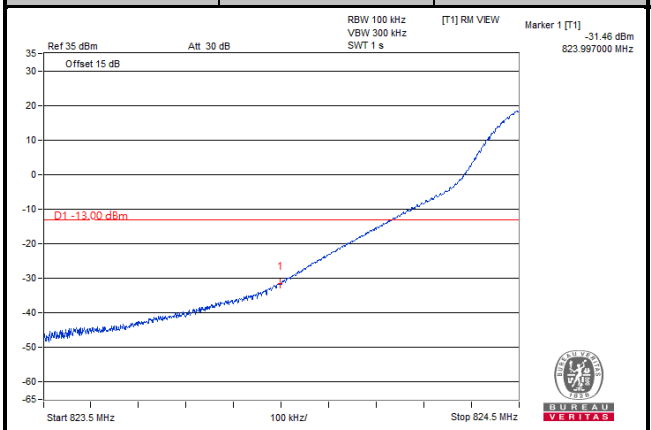
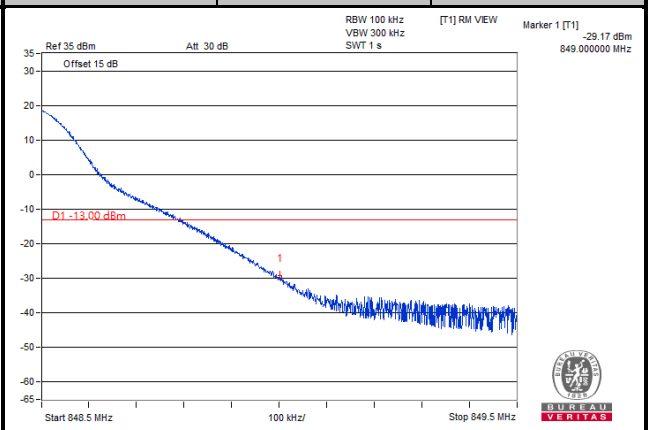
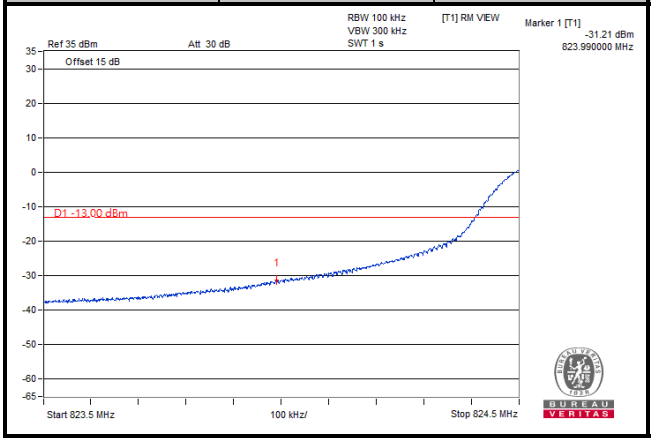
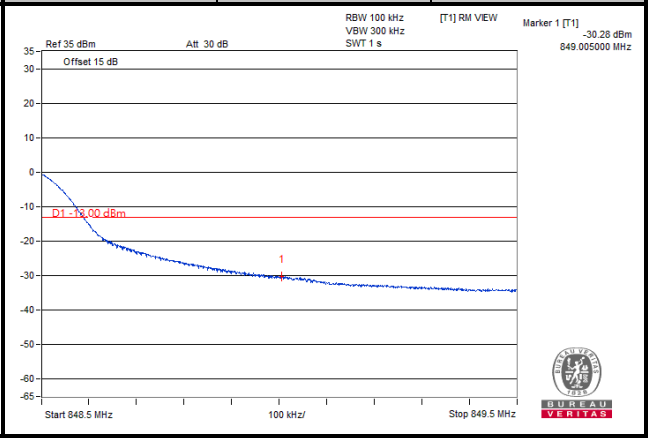
Channel	20407	6 RB	Channel	20643	6 RB

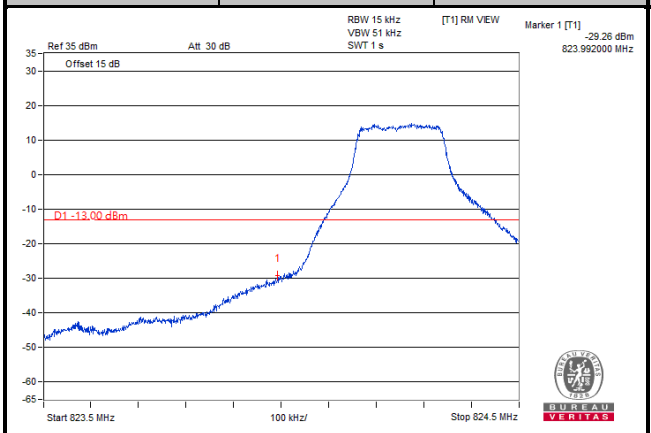
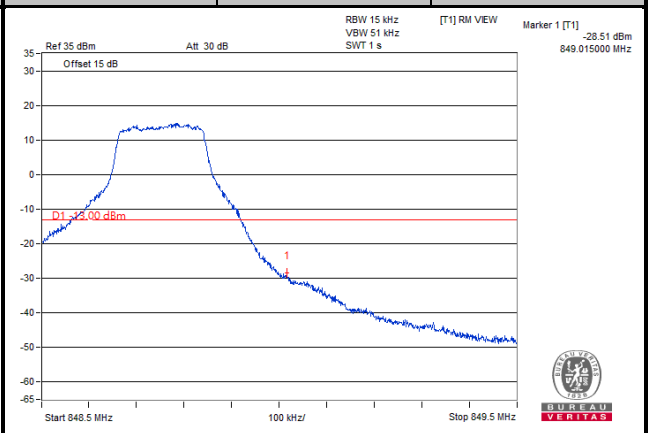
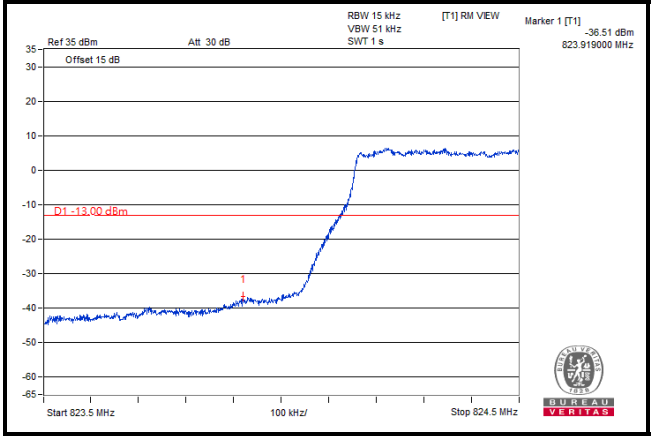
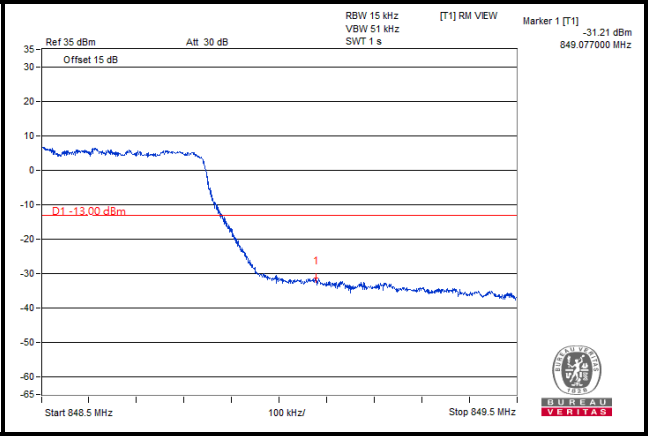


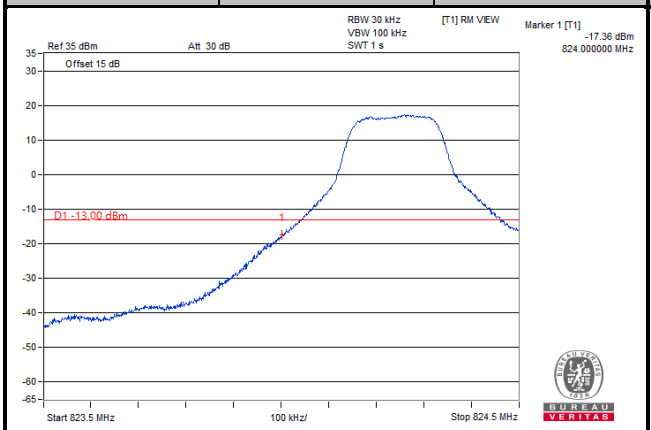
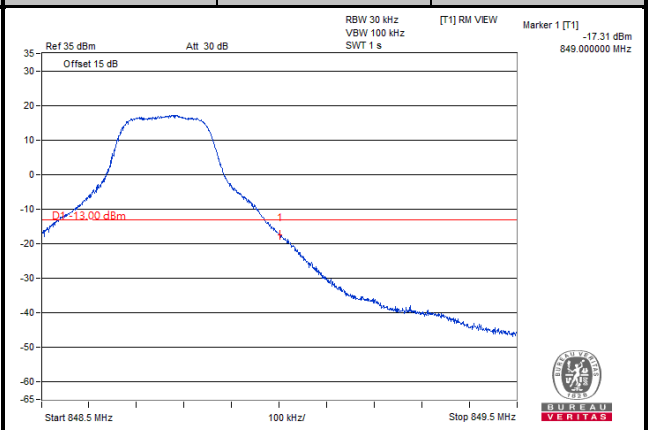
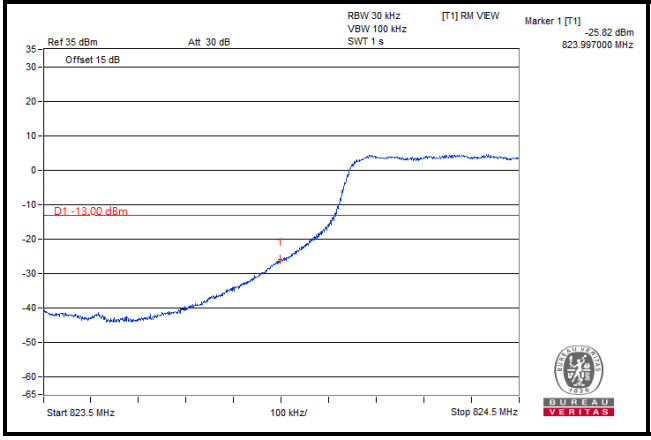
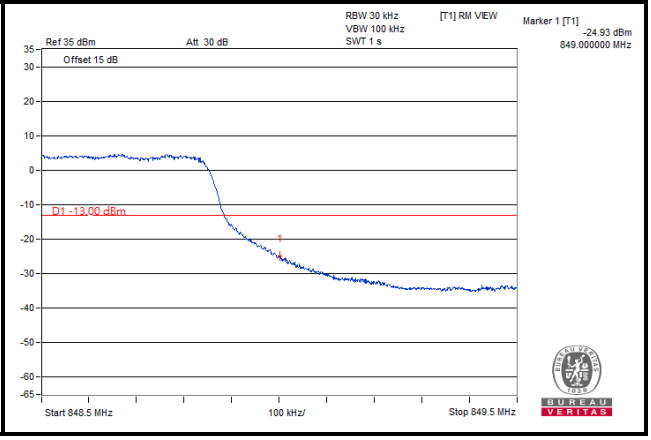


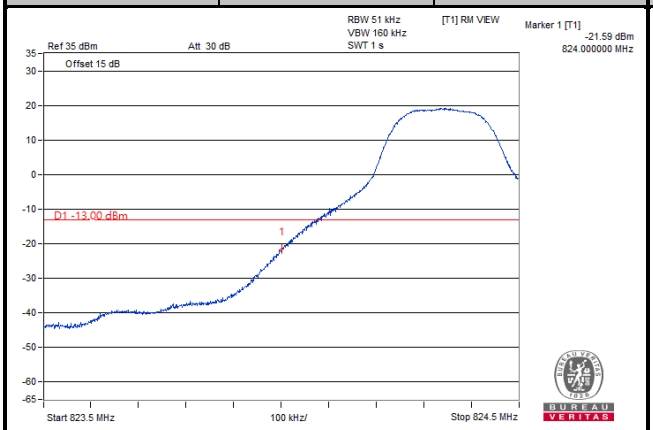
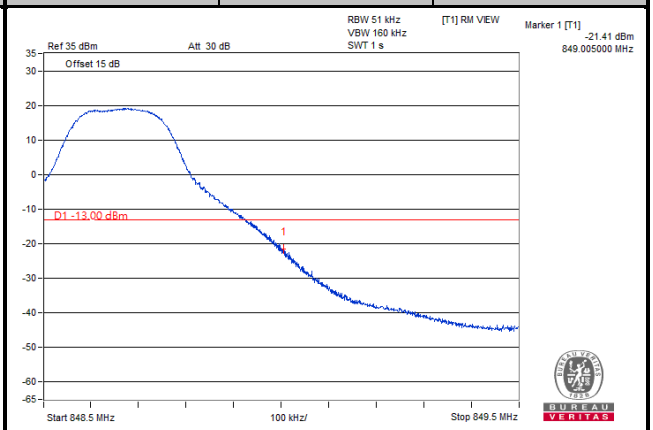
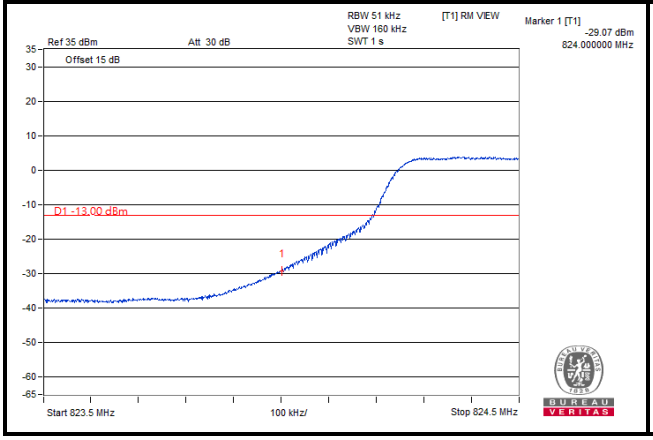
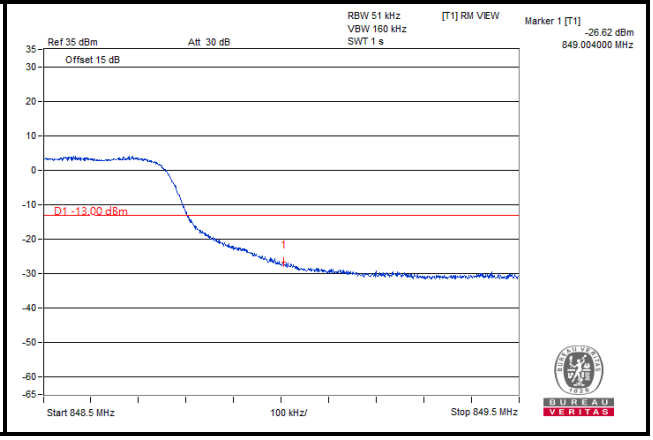
LTE Band 5					
Channel Bandwidth: 3 MHz					
Channel	20415	1 RB	Channel	20635	1 RB
					
Channel	20415	15 RB	Channel	20635	15 RB
					

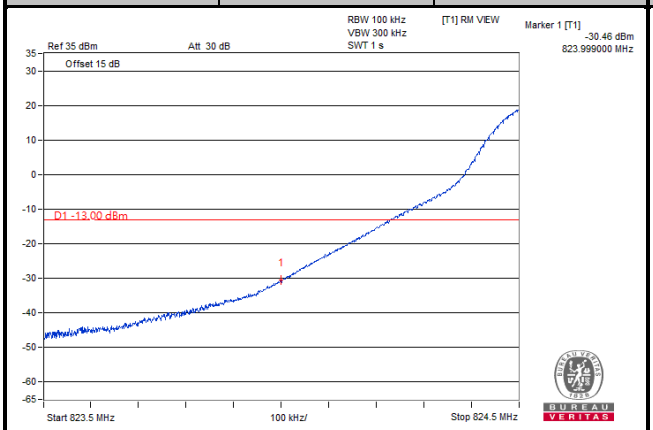
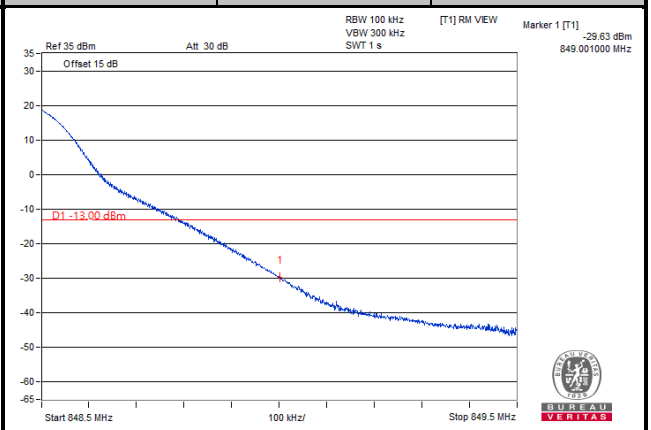
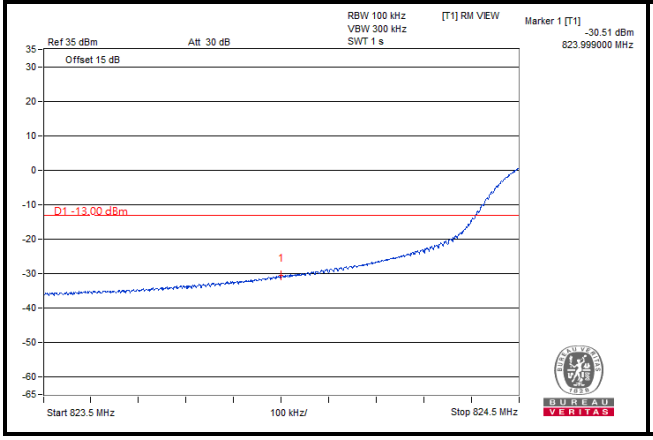
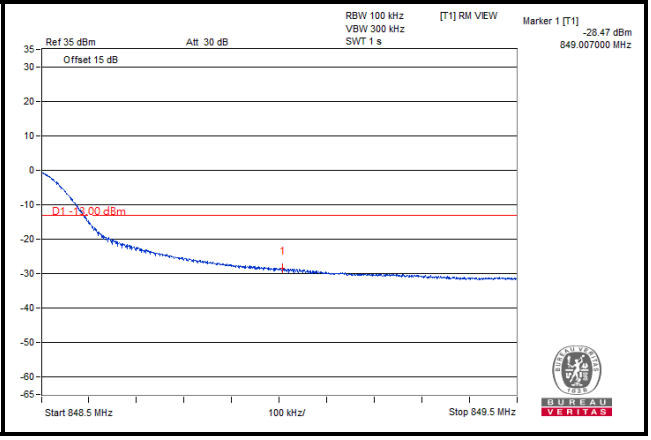
LTE Band 5					
Channel Bandwidth: 5 MHz					
Channel	20425	1 RB	Channel	20625	1 RB
					
Channel	20425	25 RB	Channel	20625	25 RB
					

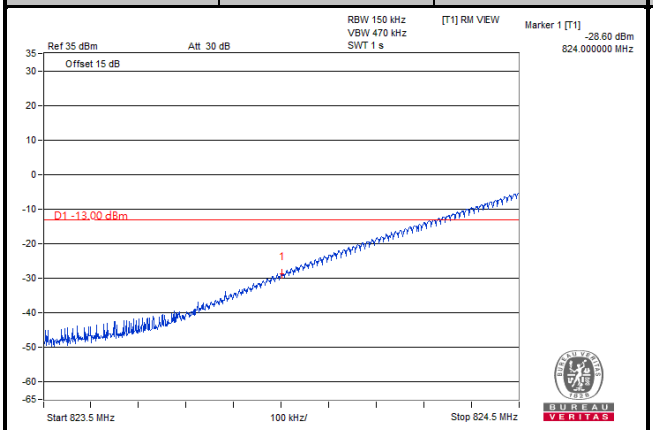
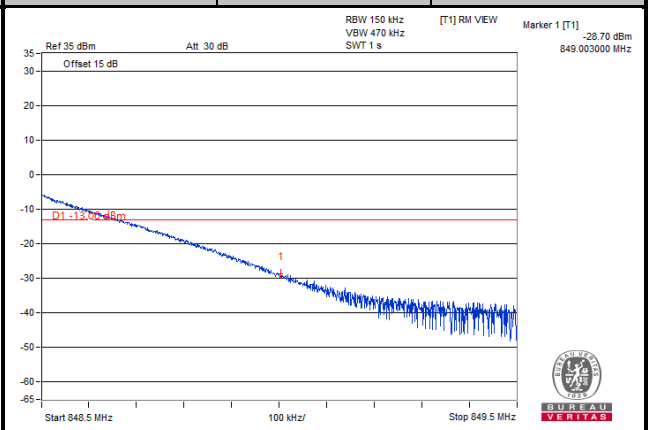
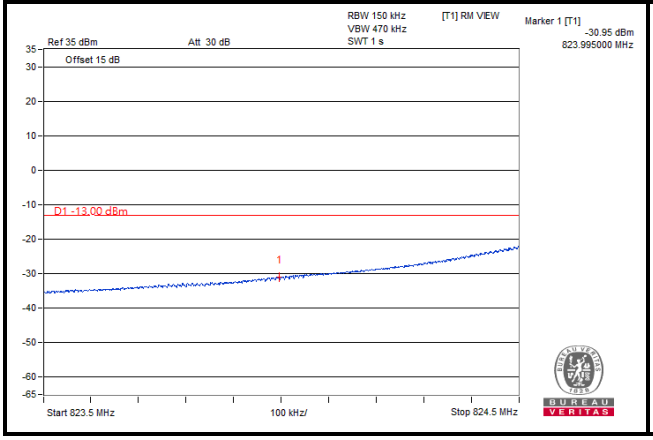
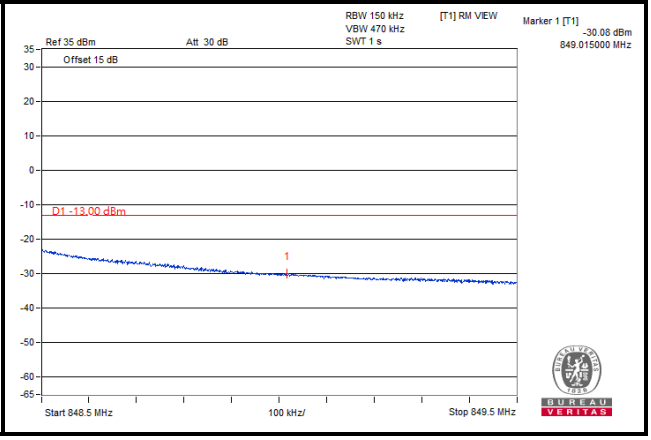
LTE Band 5					
Channel Bandwidth: 10 MHz					
Channel	20450	1 RB	Channel	20600	1 RB
					
Channel	20450	50 RB	Channel	20600	50 RB
					

LTE Band 26					
Channel Bandwidth: 1.4 MHz					
Channel	26797	1 RB	Channel	27033	1 RB
					
Channel	26797	6 RB	Channel	27033	6 RB
					

LTE Band 26					
Channel Bandwidth: 3 MHz					
Channel	26805	1 RB	Channel	27025	1 RB
					
Channel	26805	15 RB	Channel	27025	6 RB
					

LTE Band 26					
Channel Bandwidth: 5 MHz					
Channel	26815	1 RB	Channel	27015	1 RB
					
Channel	26815	25 RB	Channel	27015	25 RB
					

LTE Band 26					
Channel Bandwidth: 10 MHz					
Channel	26840	1 RB	Channel	26990	1 RB
					
Channel	26840	50 RB	Channel	26990	50 RB
					

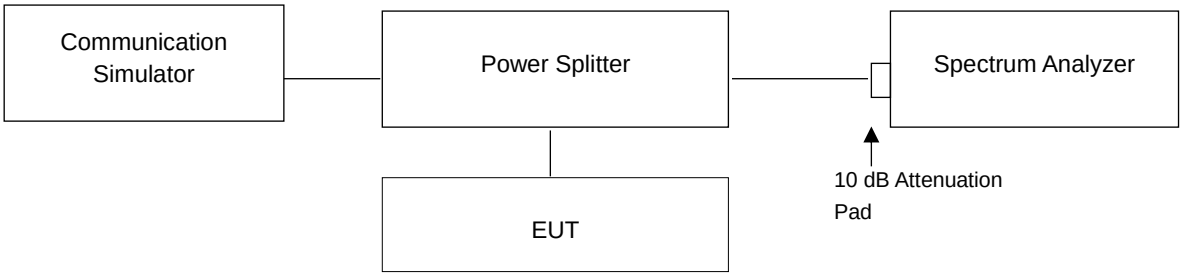
LTE Band 26					
Channel Bandwidth: 15 MHz					
Channel	26865	1 RB	Channel	26965	1 RB
					
Channel	26865	75 RB	Channel	26965	75 RB
					

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



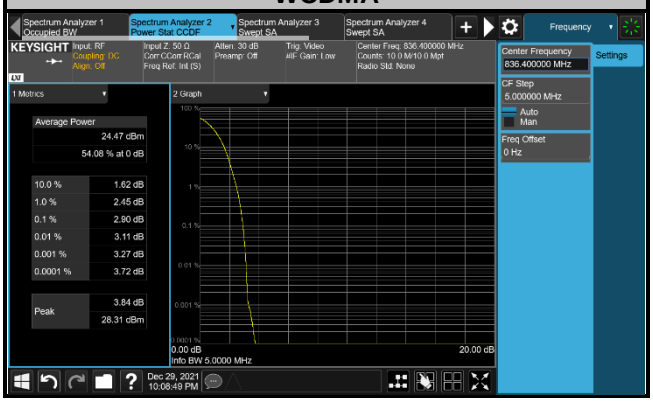
4.6.3 Test Procedures

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 %.

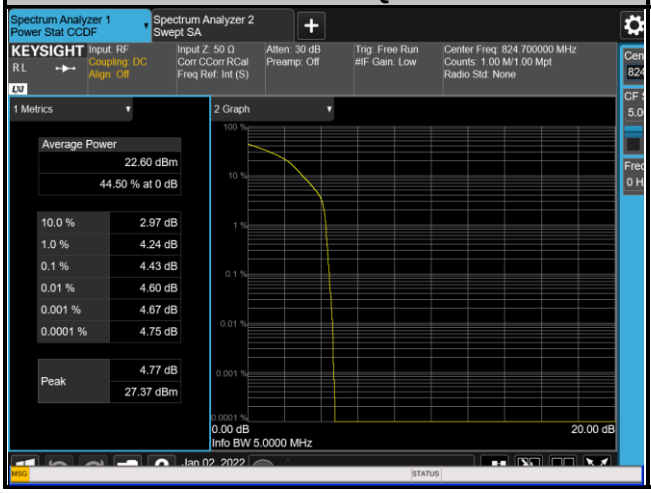
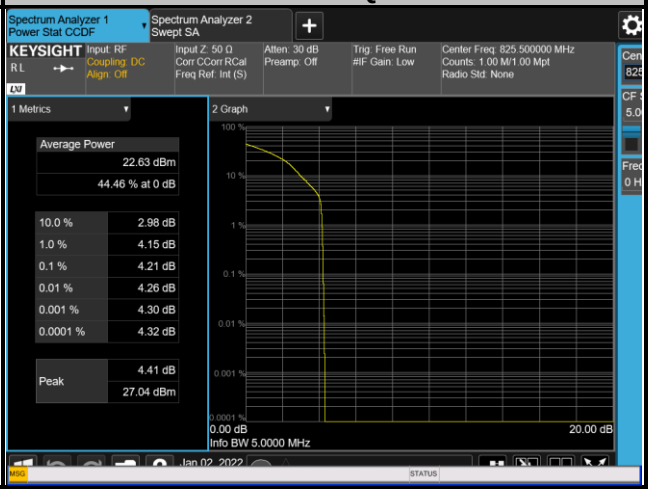
4.6.4 Test Results

Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		WCDMA
4132	826.4	2.78
4182	836.4	2.90
4233	846.6	2.75

Spectrum Plot of Worst Value
WCDMA



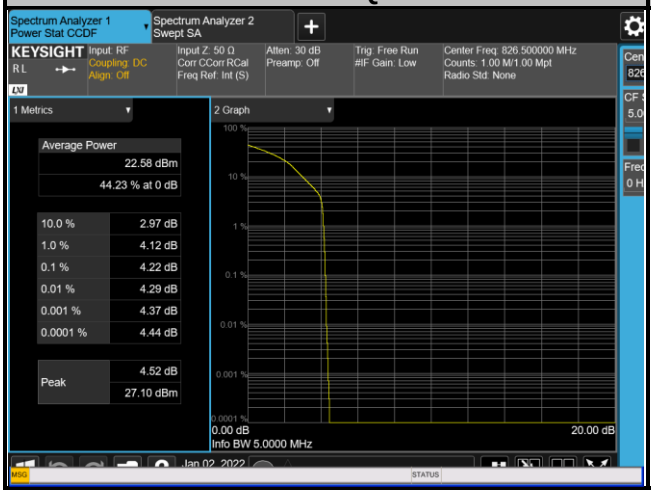
LTE Band 5							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	3.73	4.43	20415	825.5	3.50	4.21
20525	836.5	3.56	4.32	20525	836.5	3.34	4.18
20643	848.3	3.37	4.08	20635	847.5	3.12	3.92

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

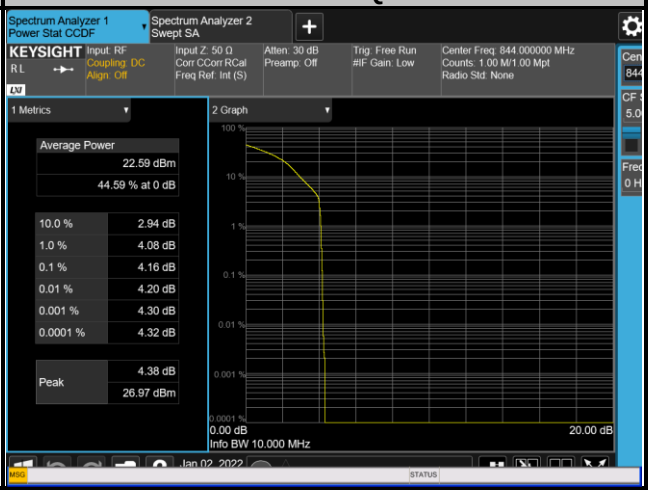
LTE Band 5							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	3.47	4.22	20450	829.0	3.40	4.14
20525	836.5	3.26	4.09	20525	836.5	3.15	3.91
20625	846.5	3.11	3.88	20600	844.0	3.43	4.16

Spectrum Plot of Worst Value

5 MHz / 16QAM



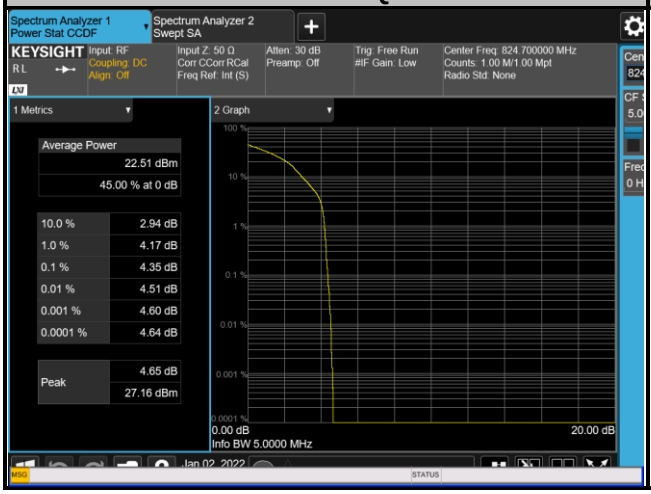
10 MHz / 16QAM



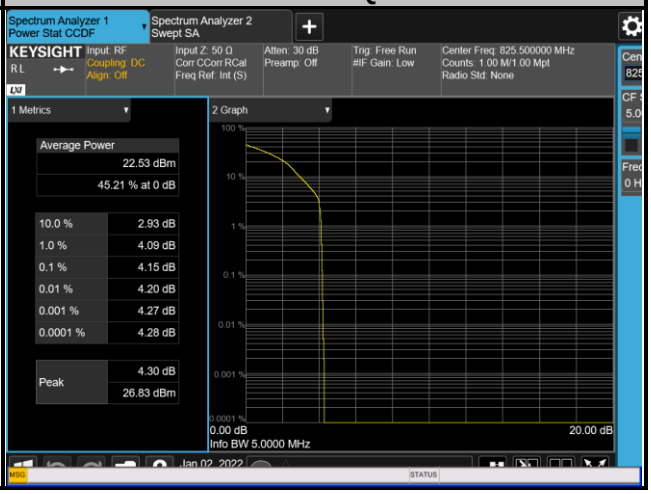
LTE Band 26							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26797	824.7	3.60	4.35	26805	825.5	3.38	4.15
26915	836.5	3.52	4.30	26915	836.5	3.26	4.08
27033	848.3	3.35	4.07	27025	847.5	3.13	3.87

Spectrum Plot of Worst Value

1.4 MHz / 16QAM



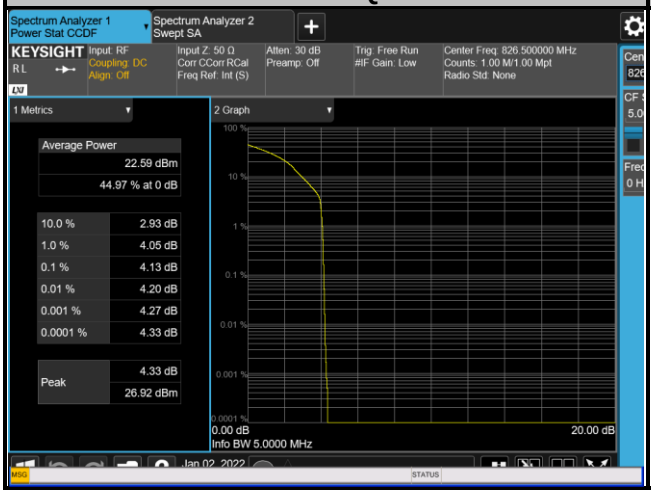
3 MHz / 16QAM



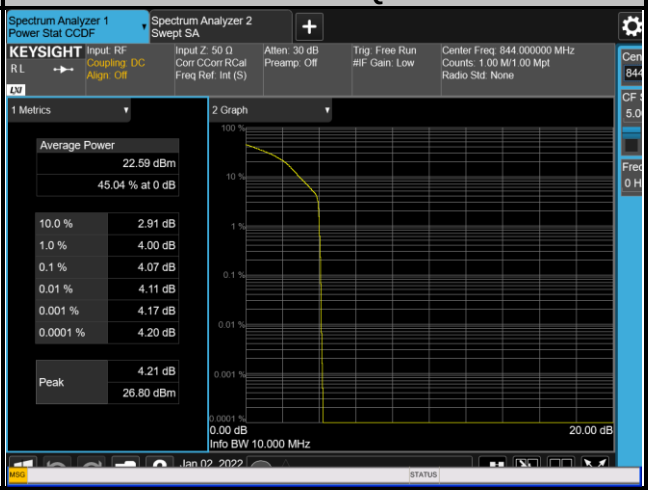
LTE Band 26							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26815	826.5	3.36	4.13	26840	829.0	3.35	4.06
26915	836.5	3.26	4.05	26915	836.5	3.07	3.81
27015	846.5	3.08	3.89	26990	844.0	3.33	4.07

Spectrum Plot of Worst Value

5 MHz / 16QAM

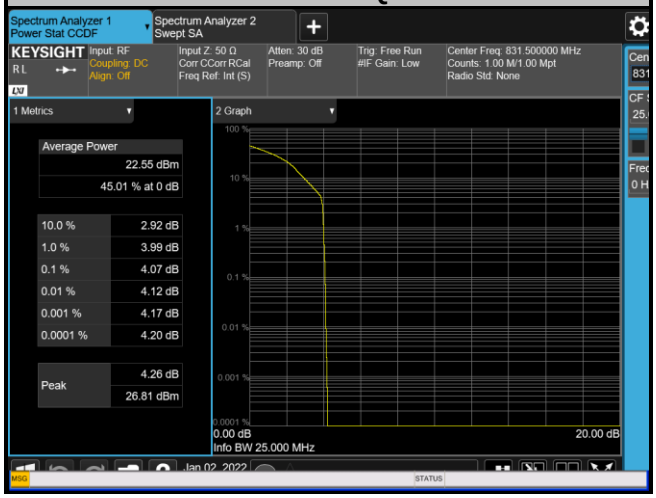


10 MHz / 16QAM



LTE Band 26			
Channel Bandwidth: 15 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM
26865	831.5	3.39	4.07
26915	836.5	3.11	3.86
26965	841.5	3.21	3.91

Spectrum Plot of Worst Value
15 MHz / 16QAM

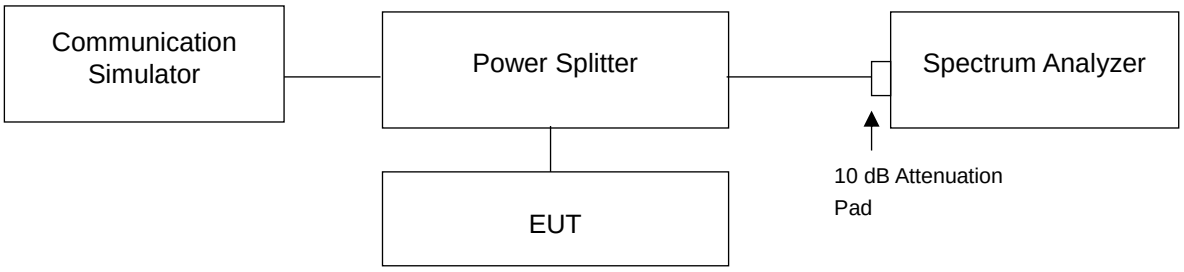


4.7 Conducted Spurious Emissions

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.

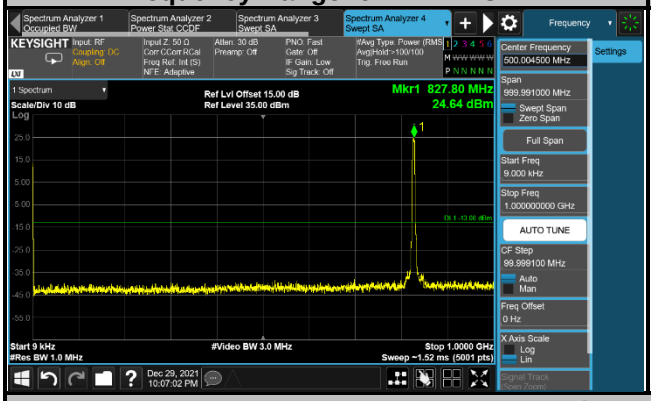
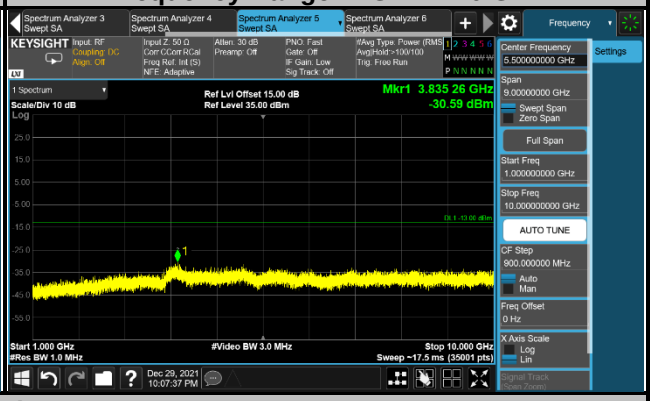
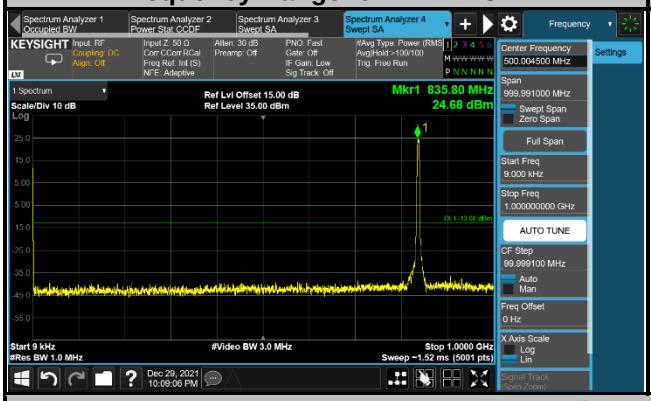
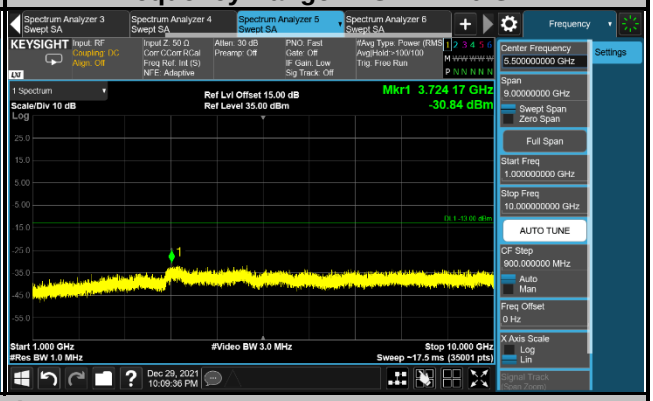
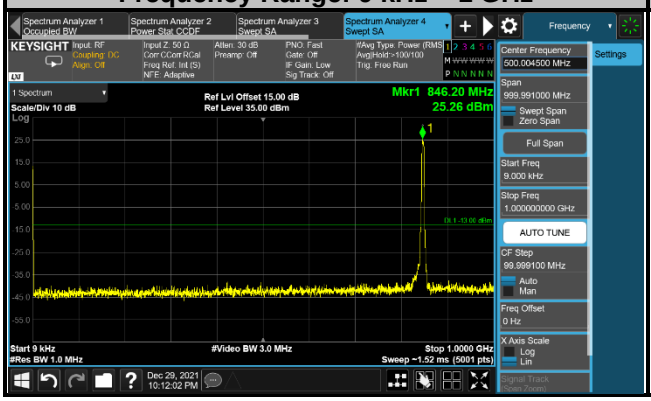
4.7.2 Test Setup



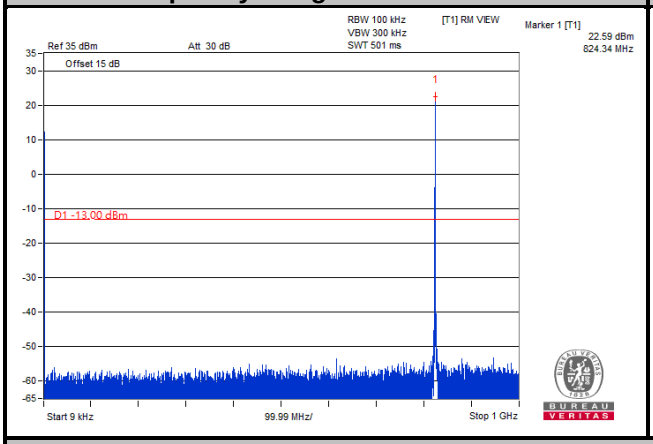
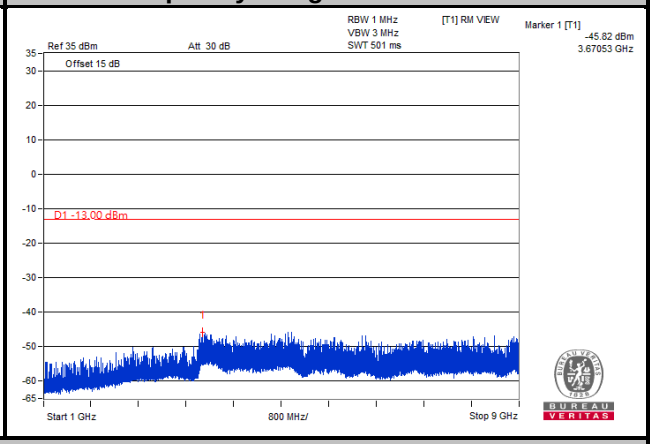
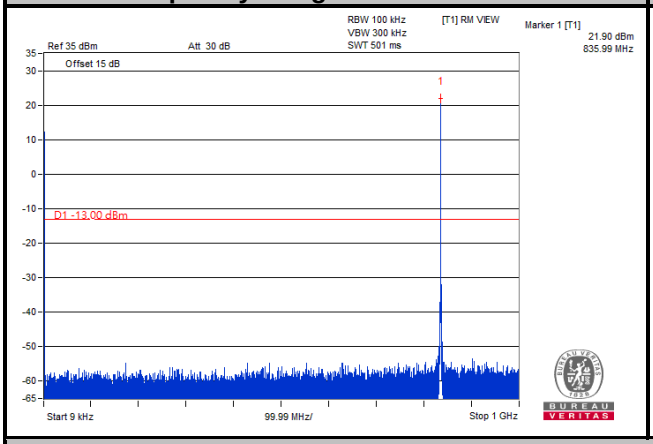
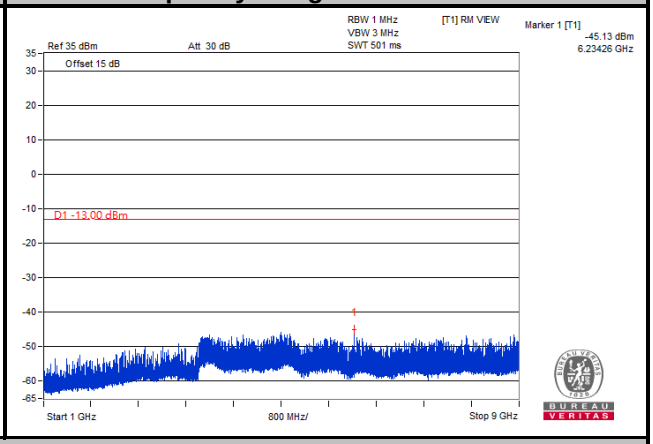
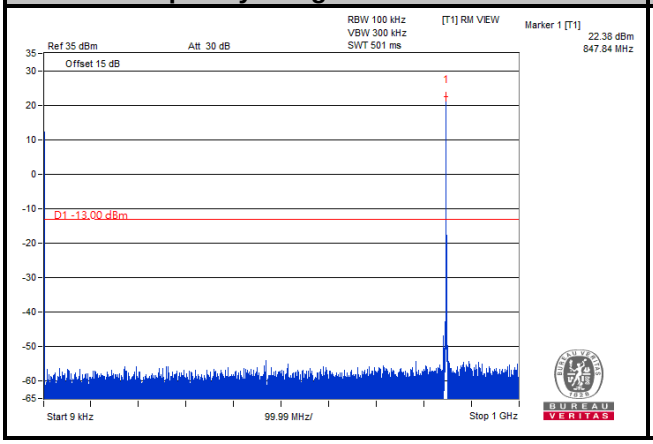
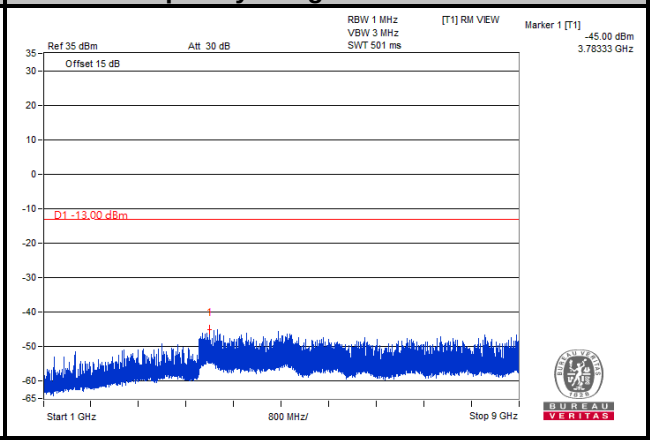
4.7.3 Test Procedure

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. WCDMA: RBW = 1 MHz, VBW = 3 MHz and LTE: RBW = 100 kHz, VBW = 300 kHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 10 GHz for WCDMA and 1 GHz to 9 GHz for LTE. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

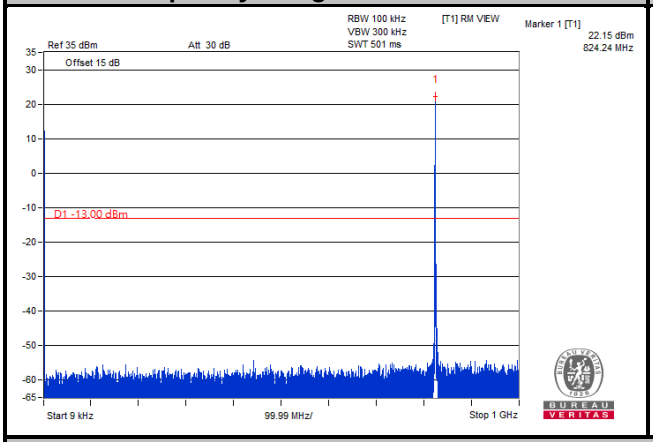
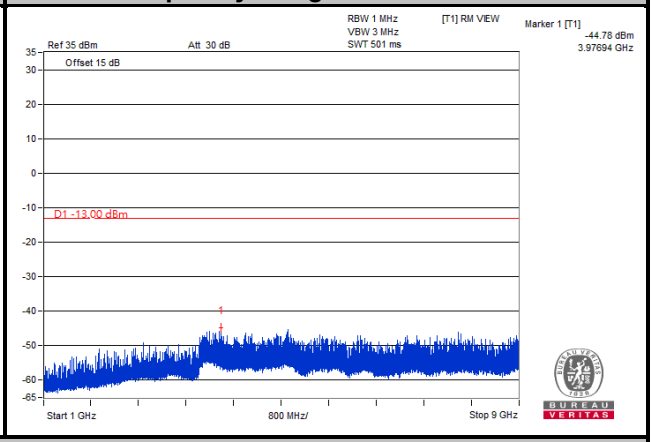
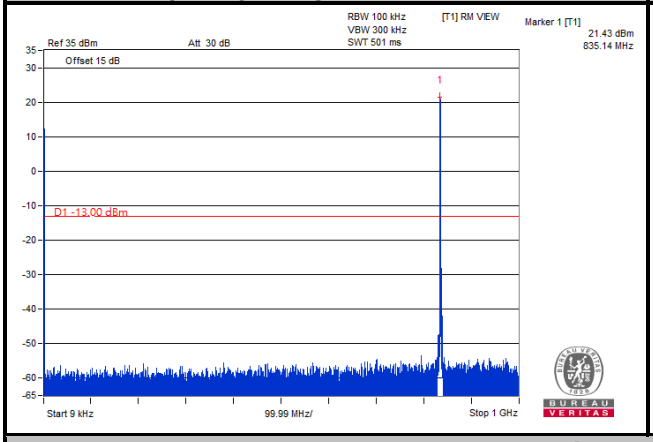
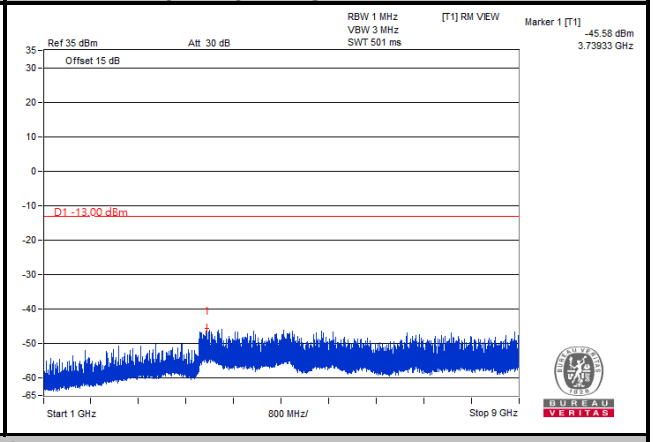
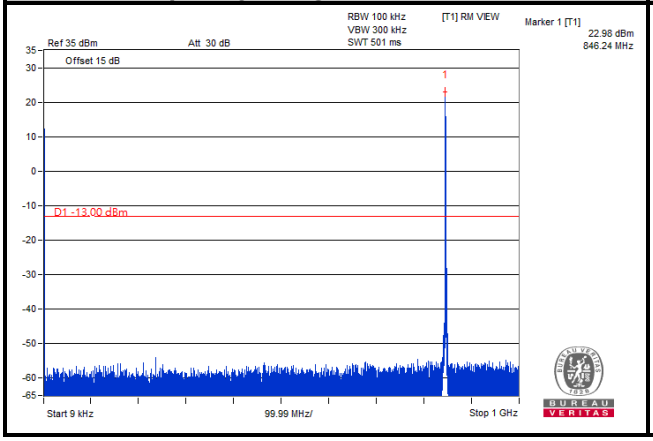
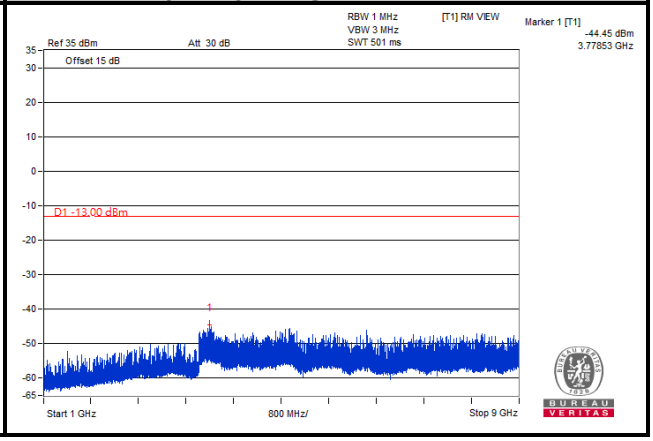
4.7.4 Test Results

WCDMA	
Channel 4132	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 4182	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 4233	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

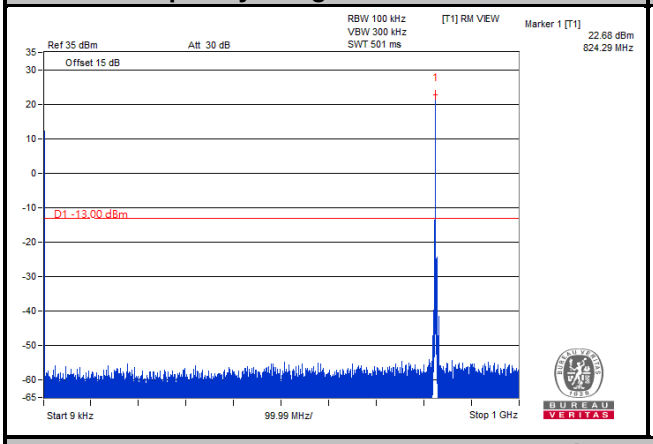
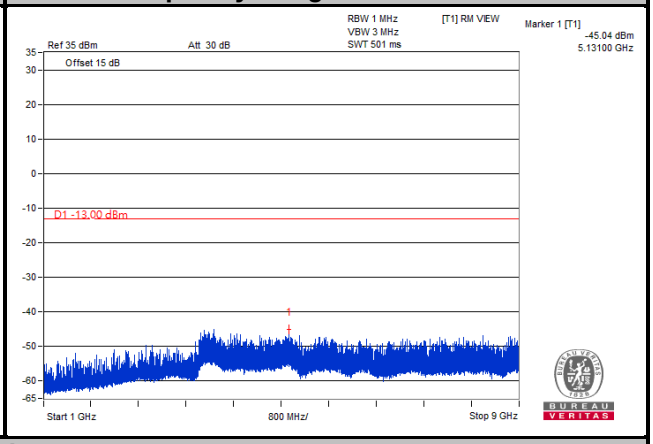
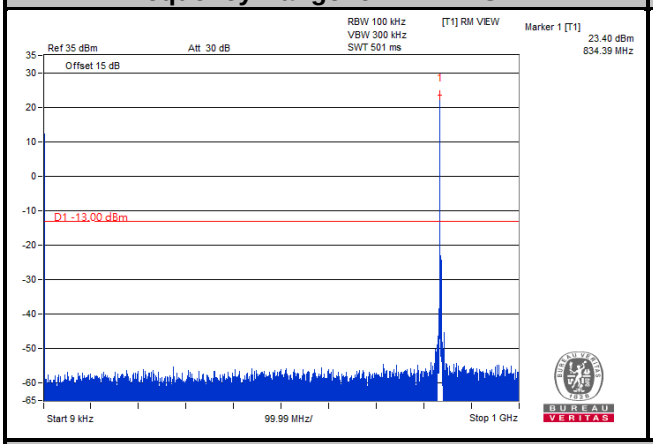
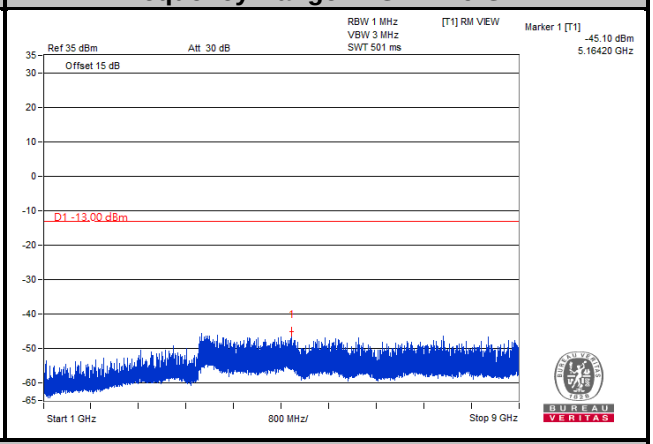
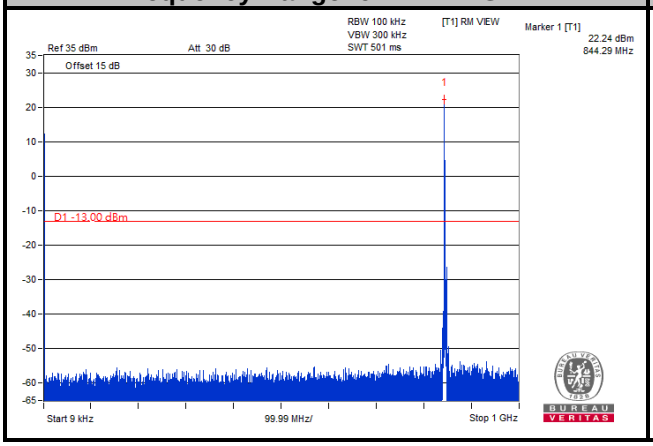
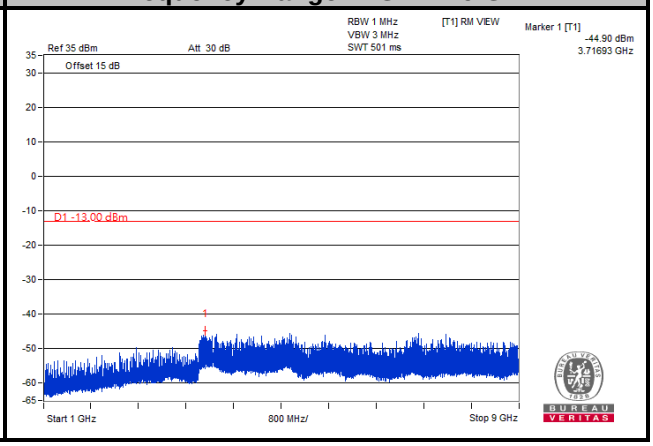
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 1.4 MHz	
Channel 20407	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20643	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

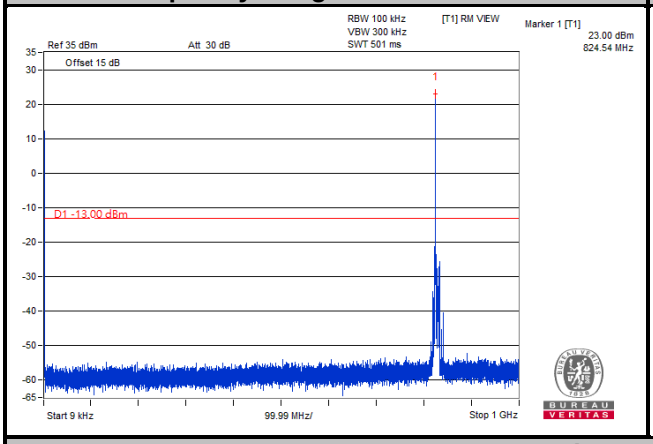
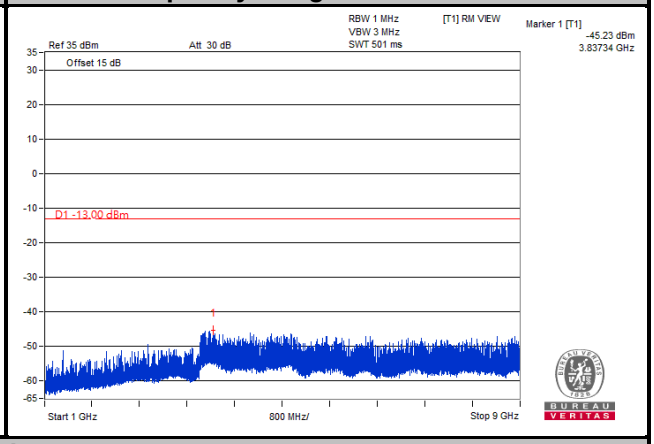
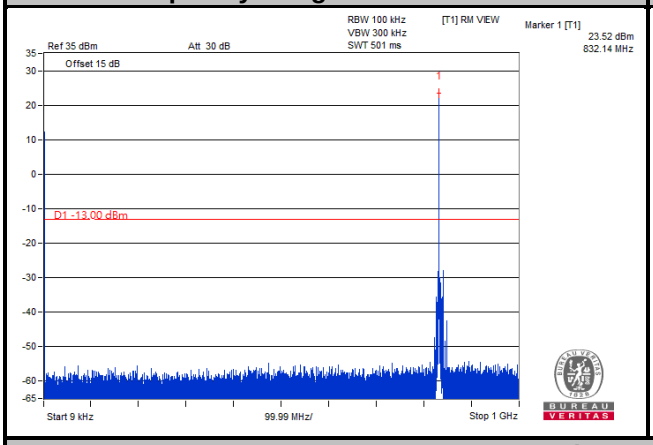
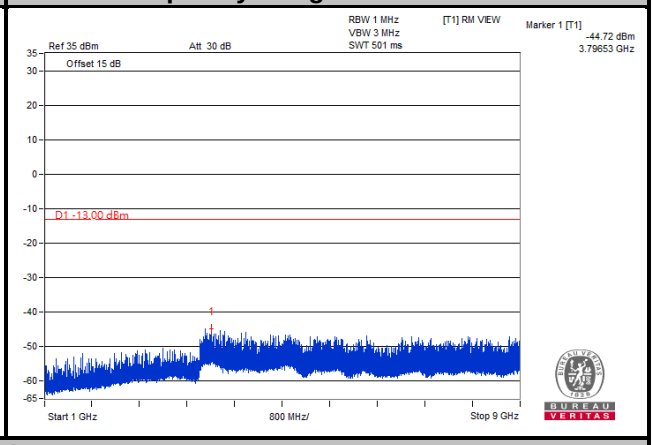
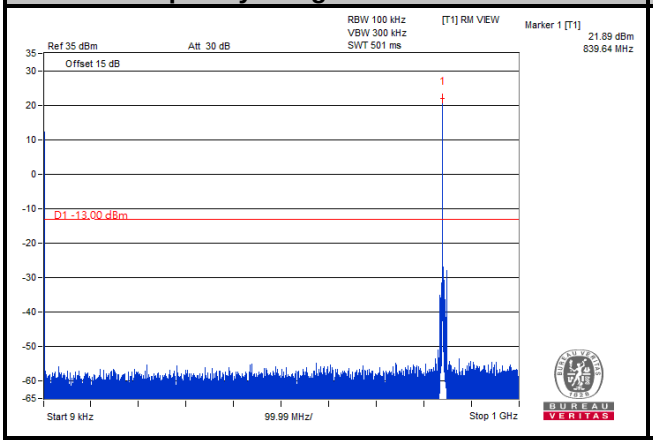
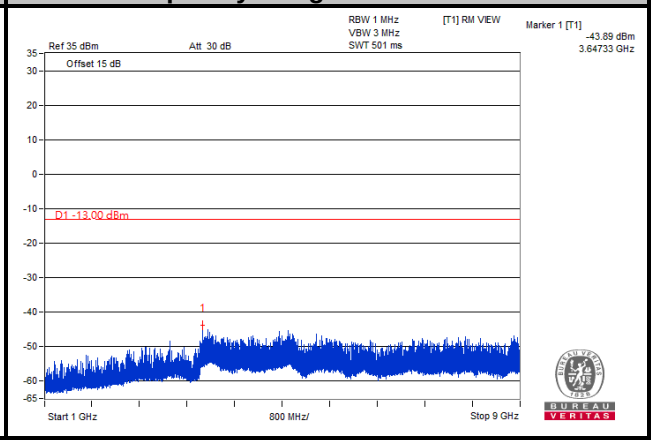
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 3 MHz	
Channel 20415	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20635	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

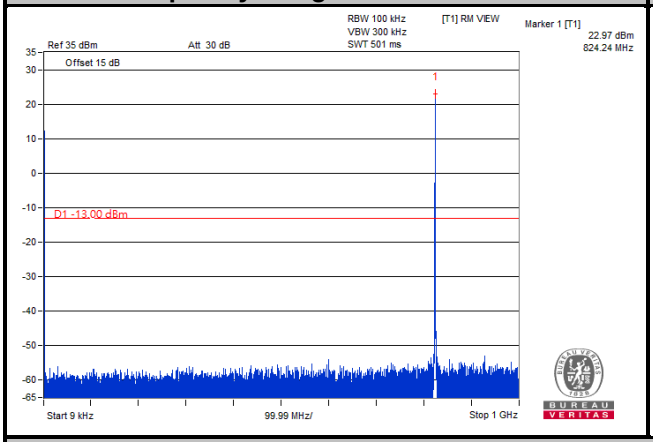
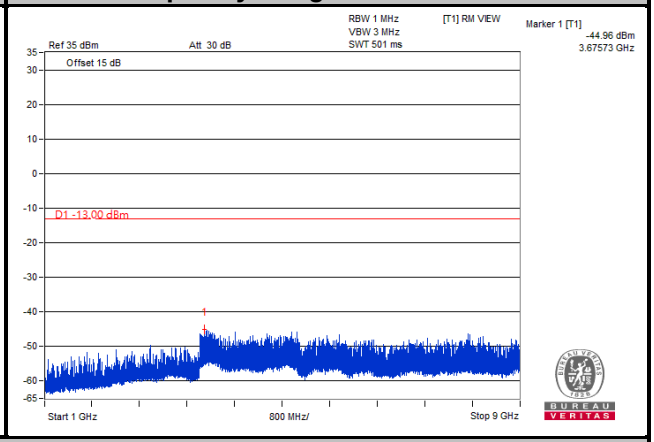
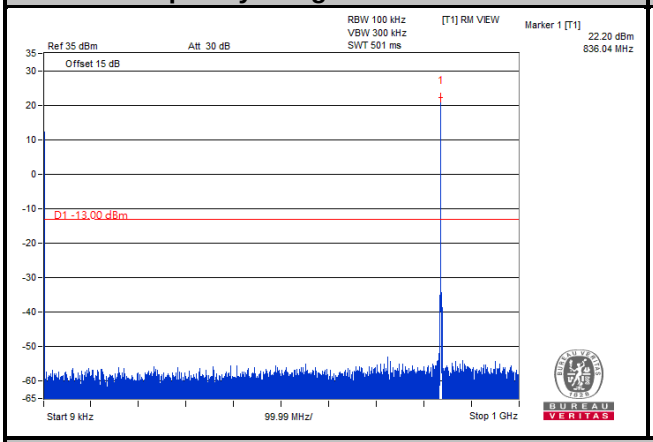
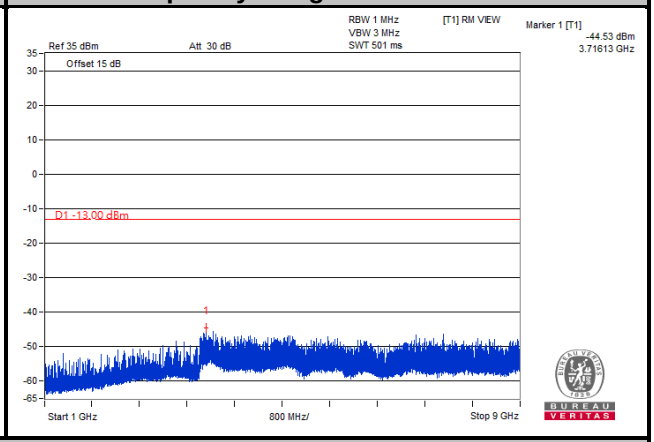
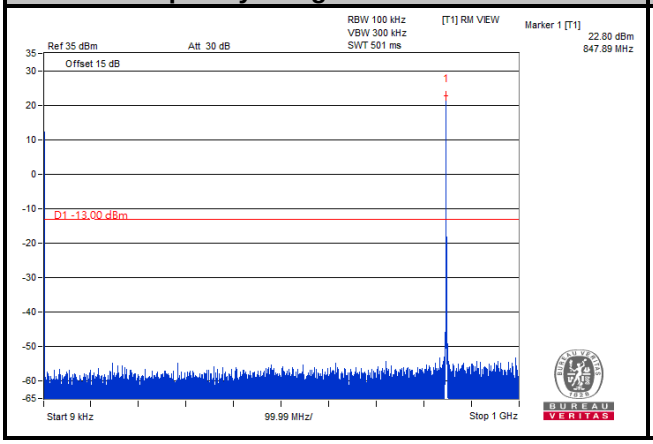
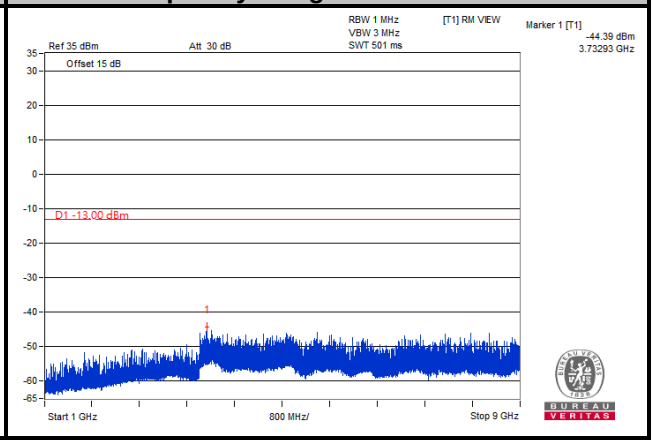
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 5 MHz	
Channel 20425	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20625	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

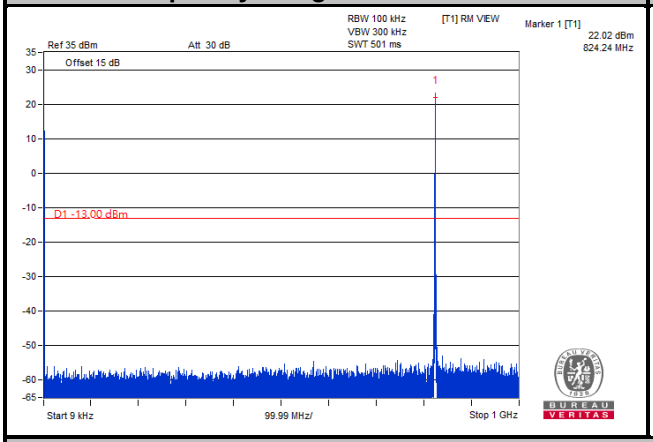
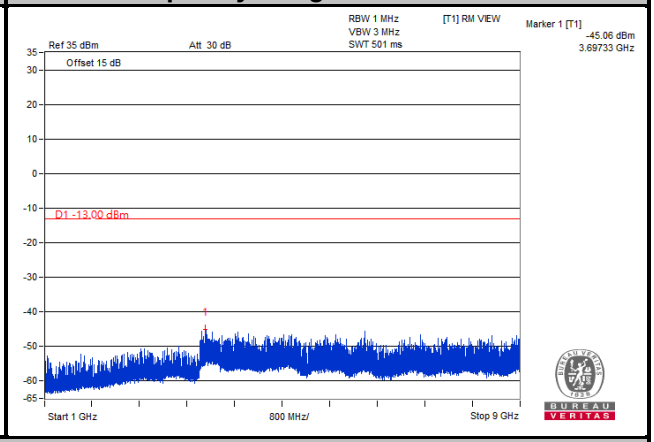
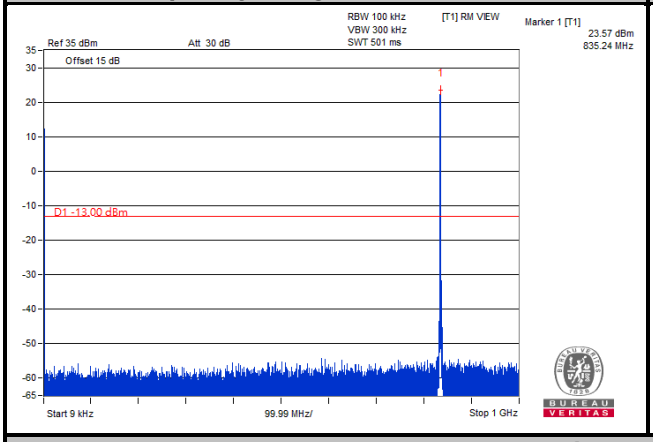
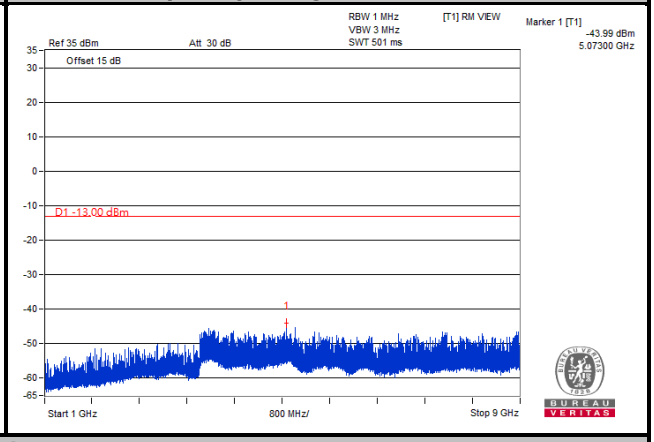
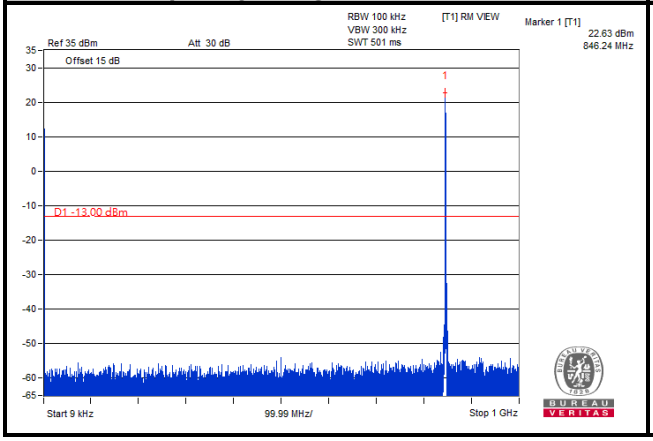
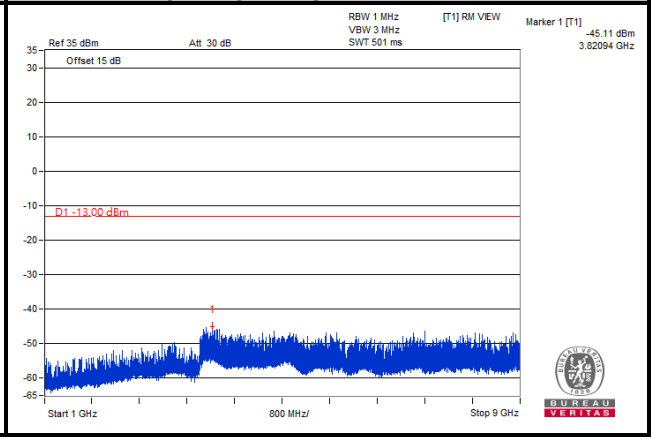
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 5	
Channel Bandwidth: 10 MHz	
Channel 20450	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20525	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 20600	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

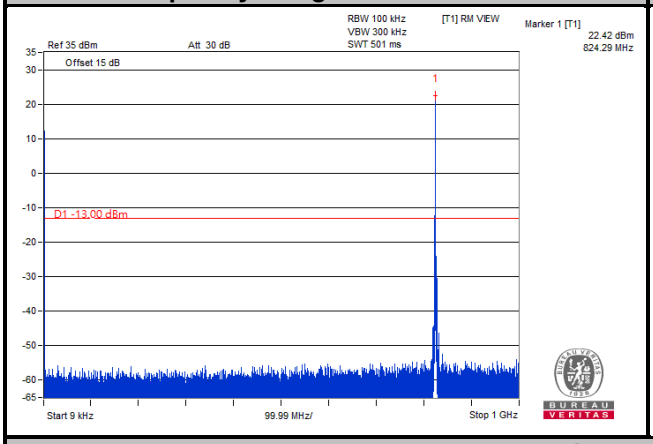
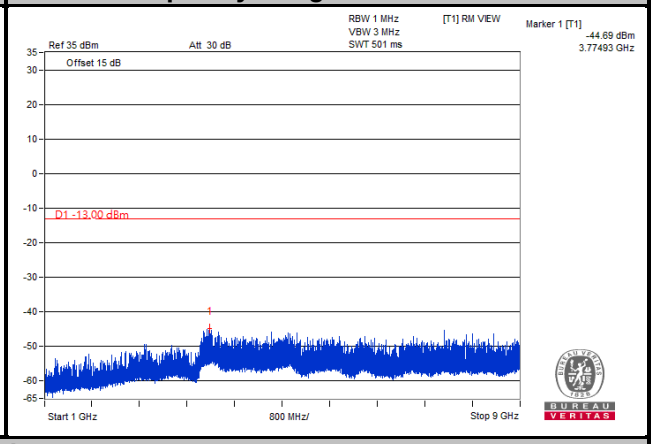
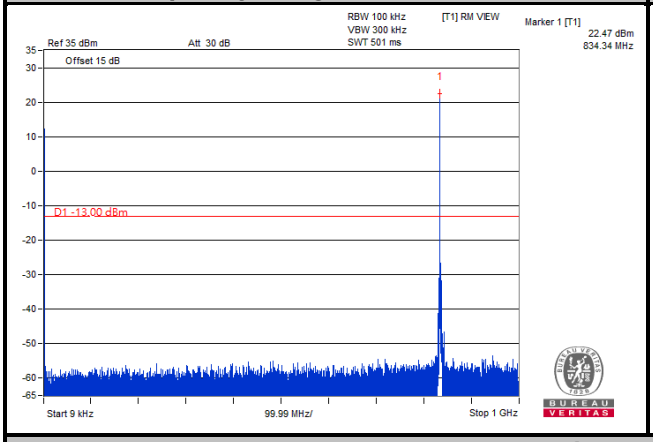
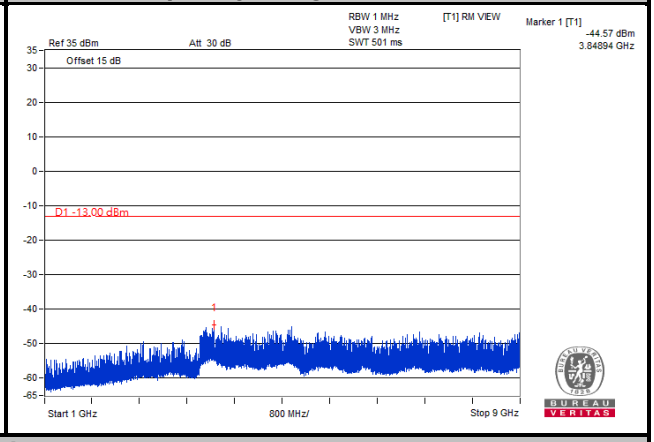
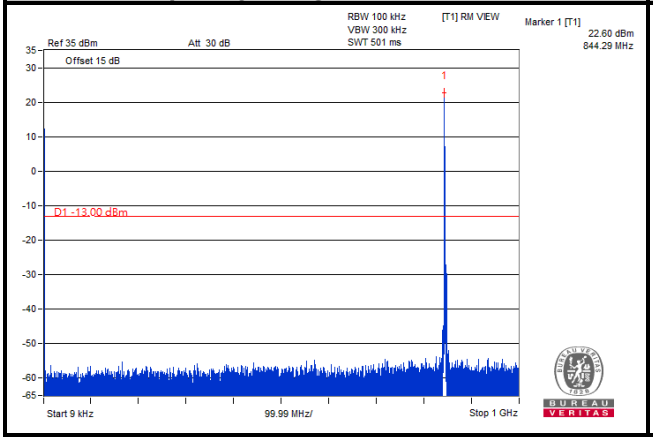
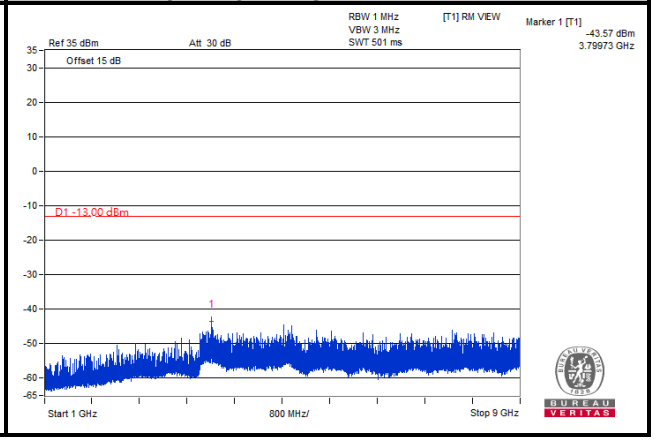
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 1.4 MHz	
Channel 26797	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 27033	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

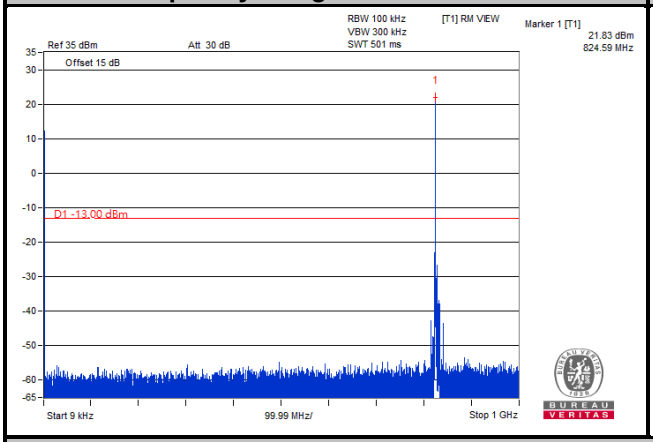
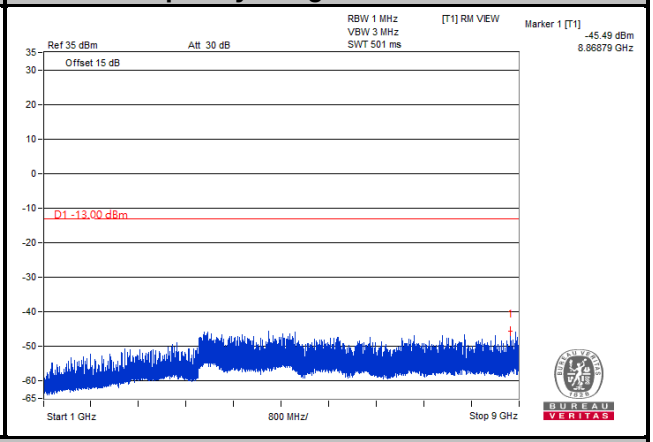
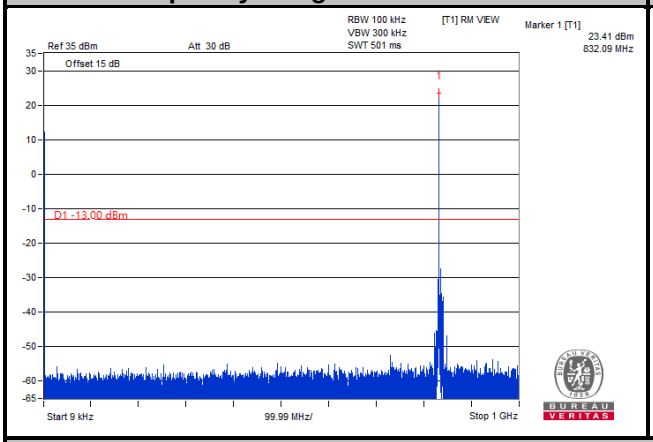
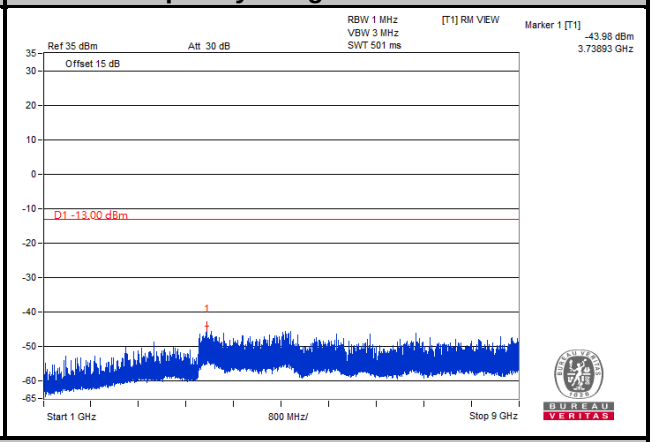
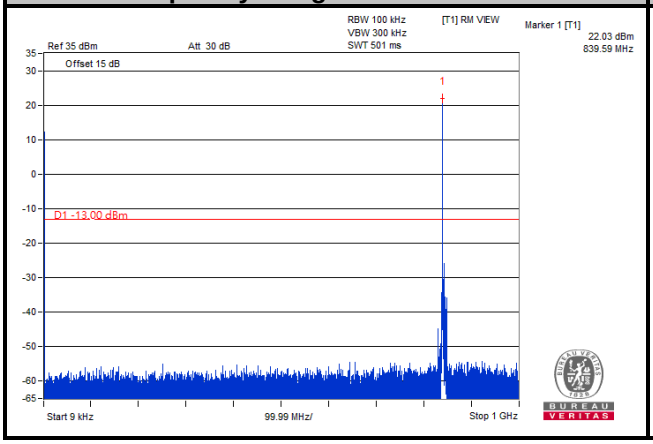
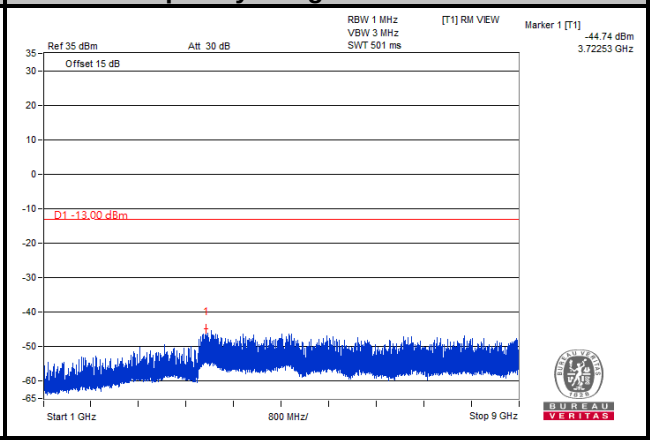
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 3 MHz	
Channel 26805	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 27025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

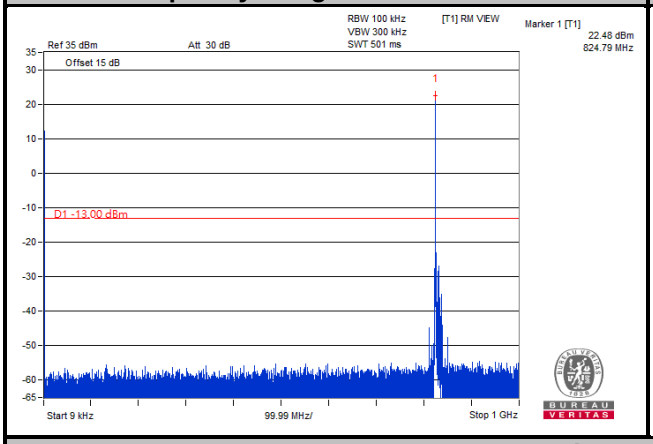
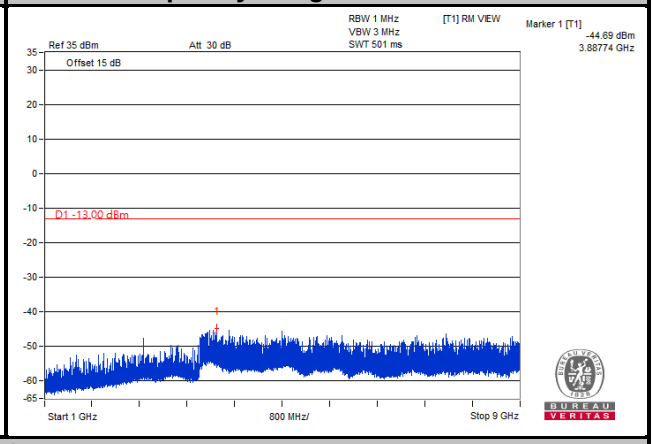
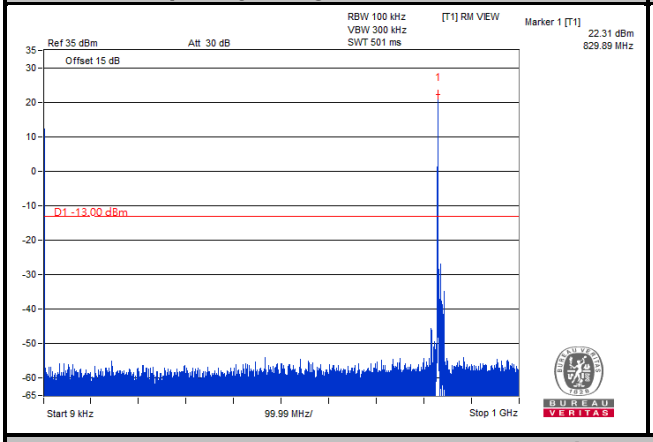
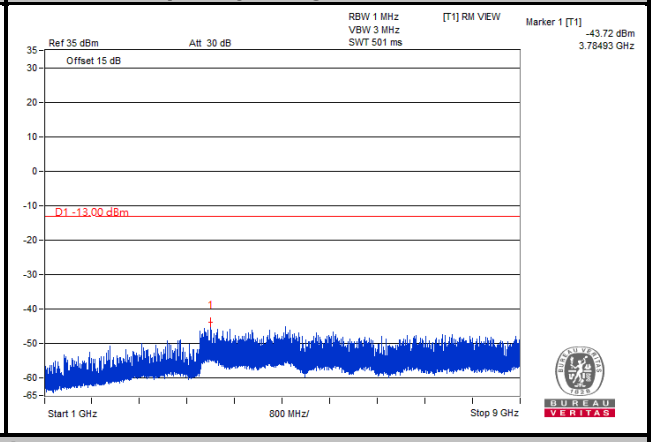
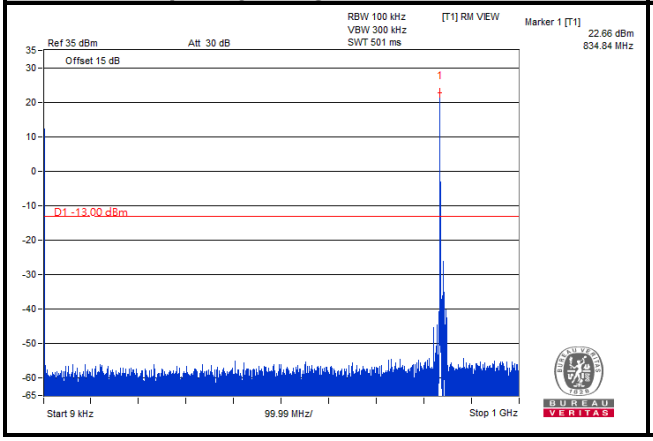
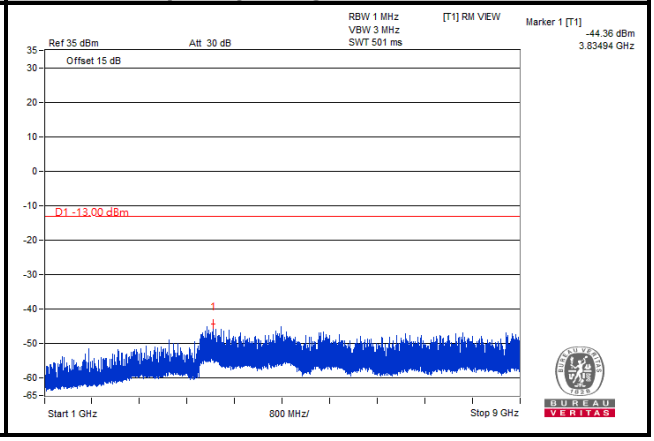
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 5 MHz	
Channel 26815	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 27015	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

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

LTE Band 26	
Channel Bandwidth: 10 MHz	
Channel 26840	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26990	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

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

LTE Band 26	
Channel Bandwidth: 15 MHz	
Channel 26865	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26915	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26965	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 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. 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:

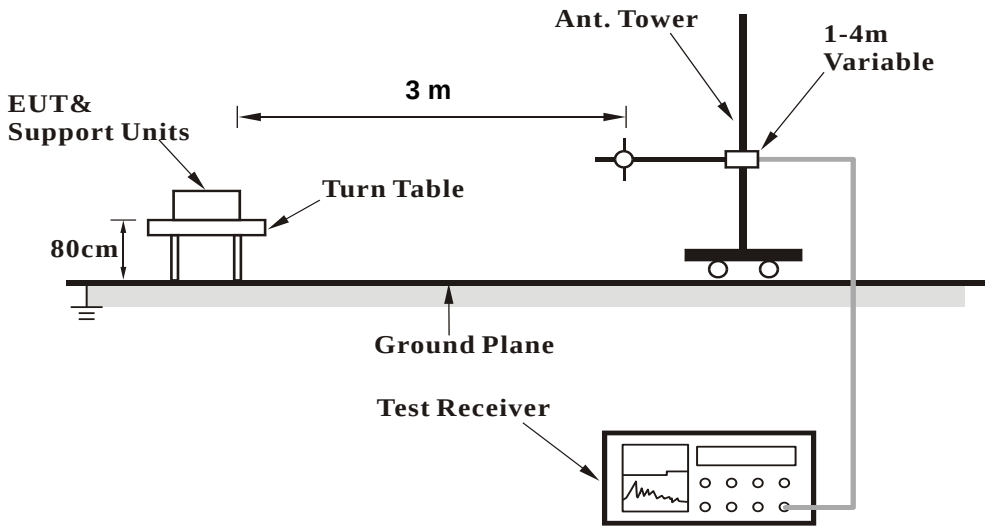
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

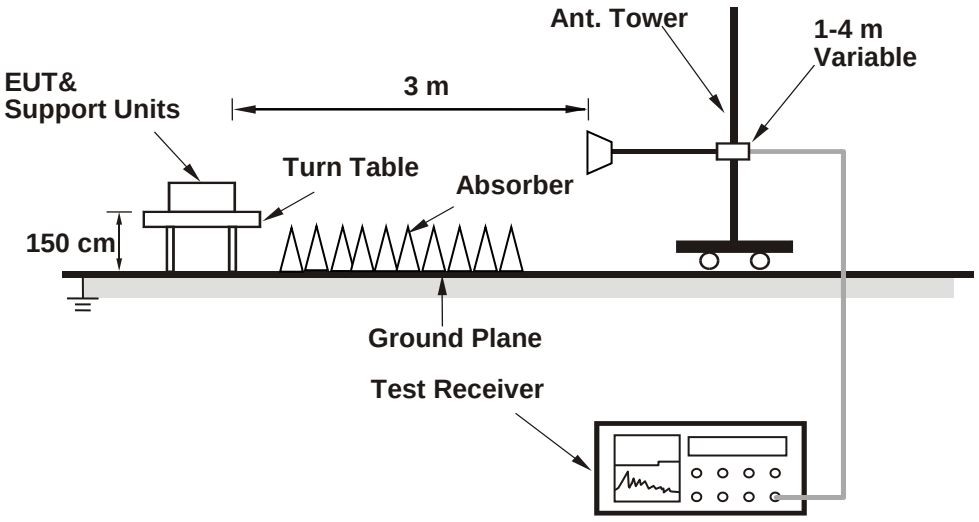
No deviation.

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

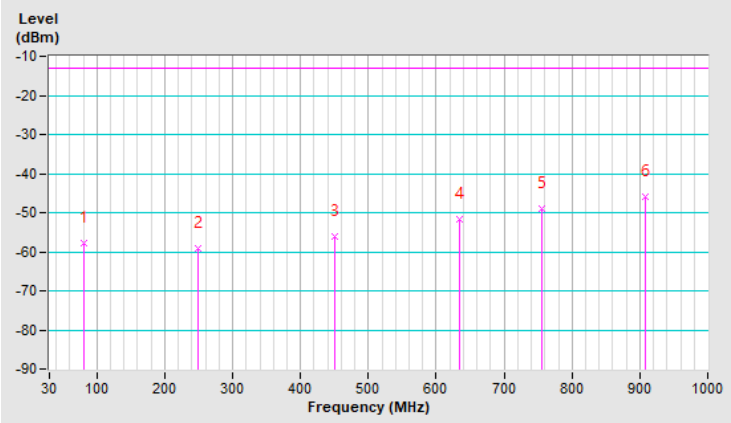
Below 1 GHz

RF Mode	TX WCDMA Band 5	Channel	CH 4233：846.6 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	81.41	-57.63	-13.00	-44.63	1.07 H	255	57.70	-115.33
2	249.22	-59.03	-13.00	-46.03	1.24 H	48	52.83	-111.86
3	450.98	-56.14	-13.00	-43.14	1.09 H	199	48.62	-104.76
4	633.34	-51.59	-13.00	-38.59	1.17 H	117	48.54	-100.13
5	755.56	-48.97	-13.00	-35.97	1.31 H	136	48.93	-97.90
6	907.85	-45.86	-13.00	-32.86	1.22 H	141	49.73	-95.59

Remarks:

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

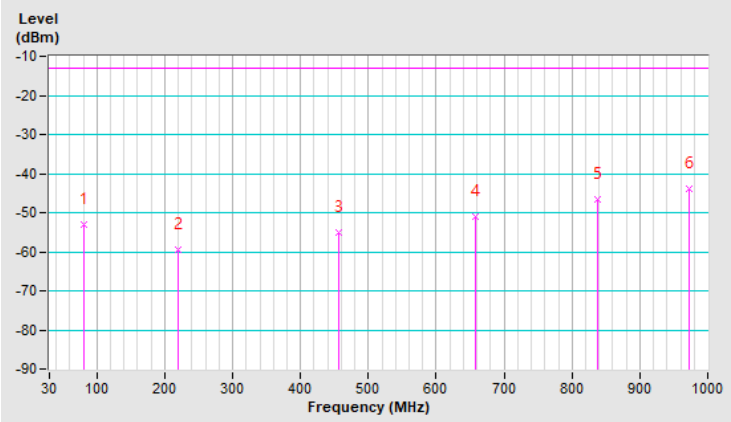


RF Mode	TX WCDMA Band 5	Channel	CH 4233：846.6 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	81.41	-53.15	-13.00	-40.15	1.36 V	242	62.18	-115.33
2	220.12	-59.60	-13.00	-46.60	1.03 V	73	54.15	-113.75
3	456.80	-54.92	-13.00	-41.92	1.22 V	168	49.64	-104.56
4	658.56	-51.04	-13.00	-38.04	1.09 V	255	48.85	-99.89
5	838.01	-46.60	-13.00	-33.60	1.15 V	2	49.69	-96.29
6	971.87	-43.73	-13.00	-30.73	1.20 V	53	50.66	-94.39

Remarks:

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

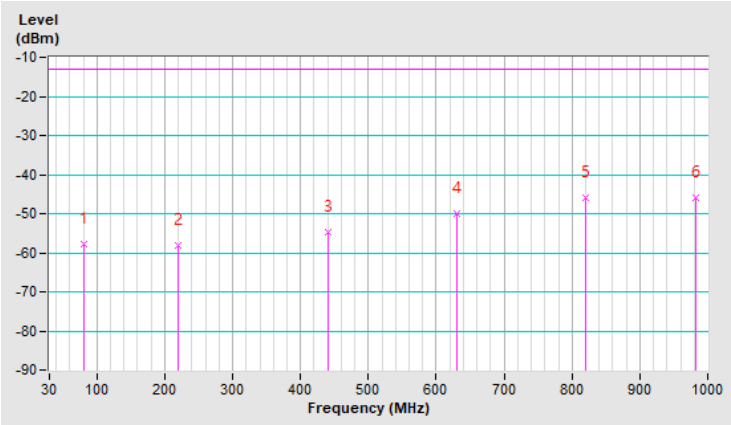


RF Mode	TX LTE Band 5-10MHz	Channel	CH 20600：844 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	81.41	-57.83	-13.00	-44.83	1.29 H	160	57.50	-115.33
2	220.12	-58.05	-13.00	-45.05	1.00 H	198	55.70	-113.75
3	441.28	-54.84	-13.00	-41.84	1.41 H	176	50.01	-104.85
4	630.43	-49.96	-13.00	-36.96	1.19 H	52	50.14	-100.10
5	819.58	-46.01	-13.00	-33.01	1.12 H	91	50.58	-96.59
6	981.57	-45.81	-13.00	-32.81	1.39 H	50	48.59	-94.40

Remarks:

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

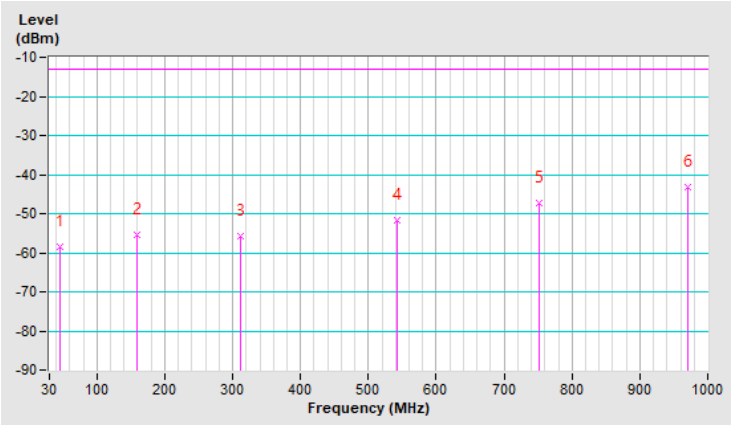


RF Mode	TX LTE Band 5-10MHz	Channel	CH 20600：844 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.49	-58.62	-13.00	-45.62	1.11 V	205	51.46	-110.08
2	159.98	-55.55	-13.00	-42.55	1.01 V	13	54.22	-109.77
3	311.30	-55.62	-13.00	-42.62	1.25 V	161	53.33	-108.95
4	543.13	-51.86	-13.00	-38.86	1.09 V	37	50.83	-102.69
5	750.71	-47.17	-13.00	-34.17	1.07 V	310	50.74	-97.91
6	**969.93**	**-43.33**	**-13.00**	**-30.33**	**1.27 V**	**254**	**51.10**	**-94.43**

Remarks:

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

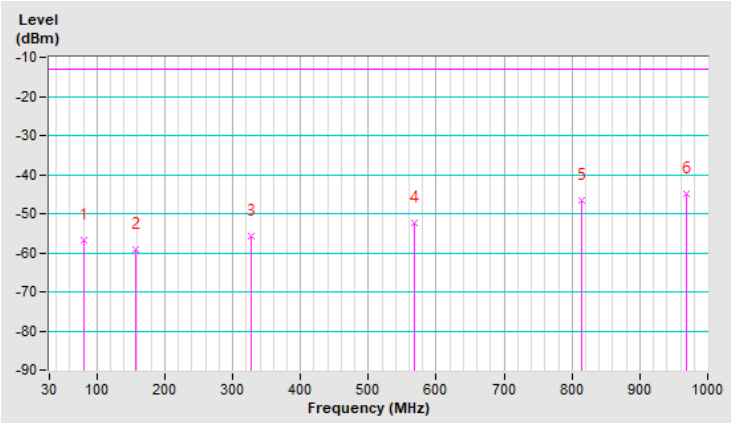


RF Mode	TX LTE Band 26-15MHz	Channel	CH 26915：836.5 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	80.44	-56.62	-13.00	-43.62	1.10 H	21	58.49	-115.11
2	157.07	-59.05	-13.00	-46.05	1.32 H	259	50.62	-109.67
3	327.79	-55.72	-13.00	-42.72	1.40 H	311	52.63	-108.35
4	567.38	-52.54	-13.00	-39.54	1.66 H	18	49.73	-102.27
5	813.76	-46.49	-13.00	-33.49	1.33 H	32	50.32	-96.81
6	968.96	-44.96	-13.00	-31.96	1.28 H	310	49.49	-94.45

Remarks:

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

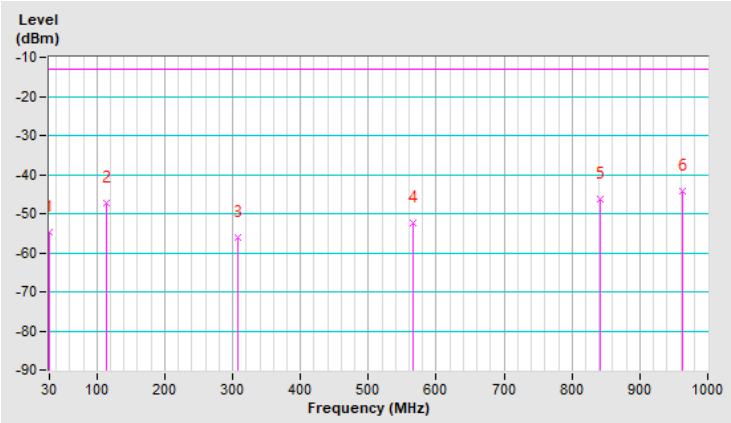


RF Mode	TX LTE Band 26-15MHz	Channel	CH 26915：836.5 MHz
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.97	-54.68	-13.00	-41.68	1.10 V	129	57.05	-111.73
2	113.42	-47.34	-13.00	-34.34	1.00 V	131	64.94	-112.28
3	308.39	-56.24	-13.00	-43.24	1.00 V	69	52.85	-109.09
4	566.41	-52.35	-13.00	-39.35	1.33 V	129	49.93	-102.28
5	841.89	-46.38	-13.00	-33.38	1.01 V	33	49.96	-96.34
6	962.17	-44.19	-13.00	-31.19	1.22 V	333	50.37	-94.56

Remarks:

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



Above 1GHz

WCDMA Band 5

RF Mode	TX WCDMA Band 5	Channel	CH 4132：826.4 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1652.80	-56.56	-13.00	-43.56	1.61 H	202	65.64	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1652.80	-54.91	-13.00	-41.91	1.05 V	223	67.29	-122.20

Remarks:

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

RF Mode	TX WCDMA Band 5	Channel	CH 4182：836.4 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-55.88	-13.00	-42.88	1.57 H	201	66.31	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-53.46	-13.00	-40.46	1.04 V	255	68.73	-122.19

Remarks:

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

RF Mode	TX WCDMA Band 5	Channel	CH 4233：846.6 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.20	-55.11	-13.00	-42.11	1.51 H	200	67.08	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.20	-52.84	-13.00	-39.84	1.15 V	249	69.35	-122.19

Remarks:

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

LTE Band 5

RF Mode	TX LTE Band 5-1.4MHz	Channel	CH 20407：824.7 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-57.83	-13.00	-44.83	1.63 H	205	64.37	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-55.67	-13.00	-42.67	1.04 V	242	66.53	-122.20

Remarks:

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

RF Mode	TX LTE Band 5-1.4MHz	Channel	CH 20525：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.92	-13.00	-43.92	1.74 H	214	65.27	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-54.47	-13.00	-41.47	1.14 V	245	67.72	-122.19

Remarks:

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

RF Mode	TX LTE Band 5-1.4MHz	Channel	CH 20643：848.3 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-56.11	-13.00	-43.11	1.77 H	226	66.08	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-54.02	-13.00	-41.02	1.23 V	255	68.17	-122.19

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-56.99	-13.00	-43.99	1.68 H	188	65.21	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-55.12	-13.00	-42.12	1.06 V	244	67.08	-122.20

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.00	-13.00	-43.00	1.60 H	199	66.19	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-53.96	-13.00	-40.96	1.01 V	229	68.23	-122.19

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-55.47	-13.00	-42.47	1.69 H	205	66.72	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-53.35	-13.00	-40.35	1.17 V	248	68.84	-122.19

Remarks:

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

RF Mode	TX LTE Band 5-10MHz	Channel	CH 20450：829 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-56.83	-13.00	-43.83	1.72 H	223	65.37	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-55.05	-13.00	-42.05	1.01 V	229	67.15	-122.20

Remarks:

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

RF Mode	TX LTE Band 5-10MHz	Channel	CH 20525：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-55.51	-13.00	-42.51	1.66 H	212	66.68	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-53.35	-13.00	-40.35	1.00 V	237	68.84	-122.19

Remarks:

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

RF Mode	TX LTE Band 5-10MHz	Channel	CH 20600：844 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-55.14	-13.00	-42.14	1.74 H	208	67.06	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-51.88	-13.00	-38.88	1.07 V	247	70.32	-122.20

Remarks:

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

LTE Band 26

RF Mode	TX LTE Band 26-1.4MHz	Channel	CH 26797：824.7 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-56.75	-13.00	-43.75	3.81 H	60	65.45	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-55.82	-13.00	-42.82	2.19 V	340	66.38	-122.20

Remarks:

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

RF Mode	TX LTE Band 26-1.4MHz	Channel	CH 26915：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.70	-13.00	-43.70	3.09 H	144	65.49	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-55.84	-13.00	-42.84	1.78 V	157	66.35	-122.19

Remarks:

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

RF Mode	TX LTE Band 26-1.4MHz	Channel	CH 27033：848.3 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-56.77	-13.00	-43.77	3.03 H	148	65.42	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-55.82	-13.00	-42.82	3.45 V	124	66.37	-122.19

Remarks:

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

RF Mode	TX LTE Band 26-5MHz	Channel	CH 26815：826.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-56.52	-13.00	-43.52	1.75 H	65	65.68	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-55.63	-13.00	-42.63	2.74 V	234	66.57	-122.20

Remarks:

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

RF Mode	TX LTE Band 26-5MHz	Channel	CH 26915：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.53	-13.00	-43.53	2.75 H	122	65.66	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-55.61	-13.00	-42.61	1.94 V	229	66.58	-122.19

Remarks:

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

RF Mode	TX LTE Band 26-5MHz	Channel	CH 27015：846.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-56.50	-13.00	-43.50	1.95 H	356	65.69	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-55.63	-13.00	-42.63	2.45 V	137	66.56	-122.19

Remarks:

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

RF Mode	TX LTE Band 26-15MHz	Channel	CH 26865：831.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1663.00	-56.30	-13.00	-43.30	1.89 H	159	65.89	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1663.00	-55.47	-13.00	-42.47	3.15 V	83	66.72	-122.19

Remarks:

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

RF Mode	TX LTE Band 26-15MHz	Channel	CH 26915：836.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.33	-13.00	-43.33	1.63 H	146	65.86	-122.19
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-55.40	-13.00	-42.40	2.29 V	141	66.79	-122.19

Remarks:

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

RF Mode	TX LTE Band 26-15MHz	Channel	CH 26965：841.5 MHz
Frequency Range	1GMHz ~ 18GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1683.00	-56.24	-13.00	-43.24	2.91 H	232	65.96	-122.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1683.00	-55.49	-13.00	-42.49	1.93 V	84	66.71	-122.20

Remarks:

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

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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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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