FCC Test Report

(PART 90)

Report No.:	RF200518C05-10
FCC ID:	B94HHF135P
Test Model:	TPC-F135P
Marketing Name:	HP Bridge
Received Date:	May 18, 2020
Test Date:	Jun. 16 ~ Sep. 08, 2020
Issued Date:	Oct. 08, 2020
Applicant:	HP Inc.
Address:	3390 East Harmony Road Fort Collins, Colorado 80528 United States
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
RF200518C05-10	Original Release	Oct. 08, 2020

1 Certificate of Conformity

Product:	HP tablet
Brand:	HP
Test Model:	TPC-F135P
Marketing Name:	HP Bridge
Sample Status:	Engineering Sample
Applicant:	HP Inc.
Test Date:	Jun. 16 ~ Sep. 08, 2020
Standards:	FCC Part 90, Subpart I, S, R FCC Part 2

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

Prepared by : Gina Liu , **Date:** Oct. 08, 2020

Gina Liu / Specialist

Approved by : , **Date:** Oct. 08, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2 (LTE 14)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 90.542 (a)(7)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 90.539 (e)	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
90.210 (n)	Emission Masks	Pass	Meet the requirement of limit.
90.543 (e)(2)(3)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 90.543 (e)(3)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 90.543 (e)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.70 dB at 1581.00 MHz.

Applied Standard: FCC Part 90 & Part 2 (LTE 26)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 90.635 (b)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 90.213	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 90.209	Occupied Bandwidth	Pass	Meet the requirement of limit.
90.691	Emission Masks	Pass	Meet the requirement of limit.
2.1051 90.691	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 90.691	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -26.40 dB at 39.70 MHz.

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

2.1 Measurement Uncertainty

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

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

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jun. 27, 2019	Jun. 26, 2020
			Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101582	Mar. 31, 2020	Mar. 30, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
			Jul. 06, 2020	Jul. 05, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	9120D	209	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-161	Nov. 08, 2019	Nov. 07, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 20, 2019	Aug. 19, 2020
			Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 20, 2019	Aug. 19, 2020
			Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03(223653/4)	Aug. 20, 2019	Aug. 19, 2020
			Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8000	Cable-CH3-03(309224+170907)	Aug. 20, 2019	Aug. 19, 2020
			Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber GIANT FORCE	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2019	Sep. 09, 2020
			Sep. 09, 2020	Sep. 08, 2021
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun 06, 2020	Jun05, 2021
DC power supply Keysight	U8002A	MY56330015	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 25, 2019	Dec. 24, 2020
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Jan. 18, 2020	Jan. 17, 2021
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2019	Nov. 24, 2020

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

3 General Information

3.1 General Description of EUT

Product	HP tablet	
Brand	HP	
Test Model	TPC-F135P	
Marketing Name	HP Bridge	
Status of EUT	Engineering Sample	
Power Supply Rating	3.8 Vdc (Li-ion battery) 5.0 / 9.0 / 12.0 Vdc (adapter)	
Modulation Type	LTE	QPSK, 16QAM, 64QAM
Frequency Range	LTE Band 14 (Channel Bandwidth: 5 MHz)	790.5 ~ 795.5 MHz
	LTE Band 14 (Channel Bandwidth: 10 MHz)	793 MHz
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	814.7 ~ 823.3 MHz
	LTE Band 26 (Channel Bandwidth: 3 MHz)	815.5 ~ 822.5 MHz
	LTE Band 26 (Channel Bandwidth: 5 MHz)	816.5 ~ 821.5 MHz
	LTE Band 26 (Channel Bandwidth: 10 MHz)	819 MHz
Emission Designator	LTE Band 14 (Channel Bandwidth: 5 MHz)	4M51D7W
	LTE Band 14 (Channel Bandwidth: 10 MHz)	9M00D7W
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 26 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 26 (Channel Bandwidth: 5 MHz)	4M50G7D
	LTE Band 26 (Channel Bandwidth: 10 MHz)	8M99D7W
Max. ERP Power	LTE Band 14 (Channel Bandwidth: 5 MHz)	79.433 mW (19.00 dBm)
	LTE Band 14 (Channel Bandwidth: 10 MHz)	70.795 mW (18.50 dBm)
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	93.325 mW (19.70 dBm)
	LTE Band 26 (Channel Bandwidth: 3 MHz)	91.201 mW (19.60 dBm)
	LTE Band 26 (Channel Bandwidth: 5 MHz)	93.325 mW (19.70 dBm)
	LTE Band 26 (Channel Bandwidth: 10 MHz)	91.201 mW (19.60 dBm)
Antenna Type	PIFA Antenna with -4.32 dBi gain (for LTE Band 14) PIFA Antenna with -3.75 dBi gain(for LTE Band 26	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

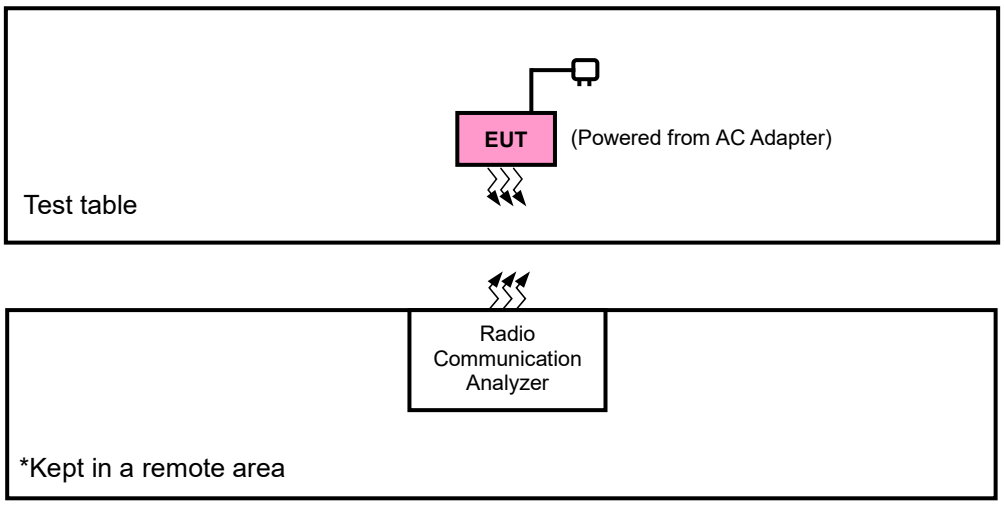
Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	HP	DSA-18QFE FUS A	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 5.0 Vdc, 3 A, 15.0 W; +9.0 Vdc, 2.0 A ,18.0 W; 12.0 Vdc, 1.5A, 18 W
Battery	HP	HSP 1CP5/34/77	3.8 Vdc, 1500 mAh, 5.7 Wh
BT/WLAN Module	Qualcomm	SDM660-3	--
USB Cable	HP	WU-0093-00	1.47 m shielded cable w/o core
Holster	HP	HP Bridge Holster	HP holster Marketing Name: HP Bridge Holster

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

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP	Radiated Emission
LTE Band 14	X-plane	X-axis
LTE Band 26	X-plane	X-axis

LTE Band 14

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	23330	23330	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Frequency Stability	23305 to 23355	23305, 23355	5 MHz	QPSK	25 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK	50 RB / 0 RB Offset
-	Occupied Bandwidth	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Emission Mask	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Band Edge	23305 to 23355	23305, 23355	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK	1 RB / 0 RB Offset
		23330	23330	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK	1 RB / 0 RB Offset
		23330	23330	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, emission mask and band edge items had been tested under QPSK, 16QAM, 64QAM mode, the other items were performed under QPSK mode only.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing

LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM, 64QAM	3 RB / 1 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 14 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
-	Modulation Characteristics	26740	26740	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Frequency Stability	26697 to 26783	26697, 26783	1.4 MHz	QPSK	6 RB / 0 RB Offset
		26705 to 26775	26705, 26775	3 MHz	QPSK	15 RB / 0 RB Offset
		26715 to 26765	26715, 26765	5 MHz	QPSK	25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK	50 RB / 0 RB Offset
-	Occupied Bandwidth	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Emission Mask	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
-	Conducted Emission	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK	3 RB / 1 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK	1 RB / 14 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK	1 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK	1 RB / 24 RB Offset
-	Radiated Emission	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK	3 RB / 1 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK	1 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK	1 RB / 24 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 emission mask items had been tested under QPSK, 16QAM, 64QAM mode, the other items were performed under QPSK mode only.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Noah Chang
Modulation Characteristics	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu, Getaz Yang
Frequency Stability	25 deg. C, 65 % RH	3.8Vdc	Gavin Wu, Getaz Yang
Occupied Bandwidth	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu, Getaz Yang
Peak to Average Ratio	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu, Getaz Yang
Emission Mask	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu, Getaz Yang
Band Edge	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu, Getaz Yang
Conducted Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu, Getaz Yang
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Luis Lee, Titan Hsu

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and references

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

Test Standard:
FCC 47 CFR Part 2
FCC 47 CFR Part 90
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
KDB 971168 D02 Misc Rev Approv License Devices v02r01
ANSI/TIA/EIA-603-E 2016
3GPP TS 36.521-1 V16.3.0 (2019-12)

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

LTE Band 14

Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

LTE Band 26

The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw) ERP.

4.1.2 Test Procedures

EIRP / ERP Measurement:

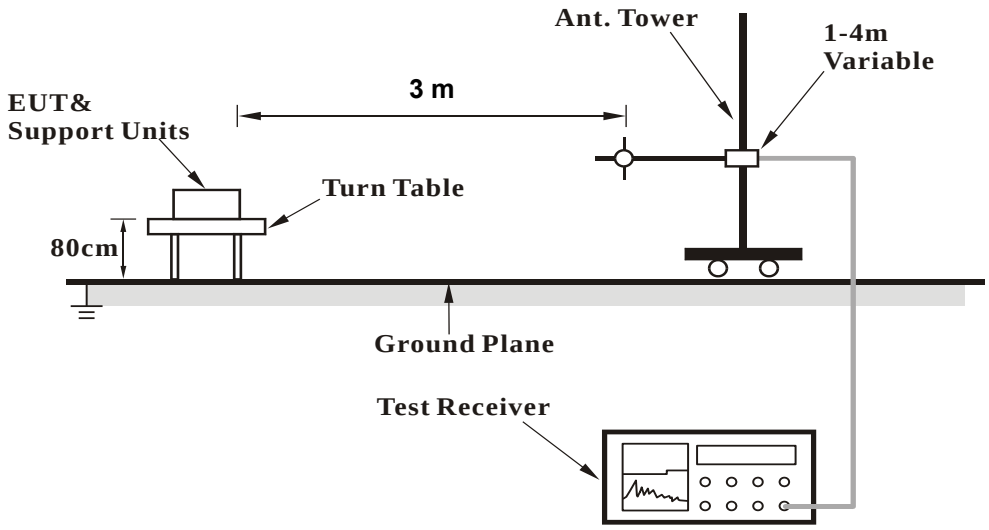
a. All measurements were done at low, middle and high operational frequency range. RBW 5 MHz、10MHz for LTE mode, VBW ≥ 3 x RBW.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn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

Conducted Power Measurement:

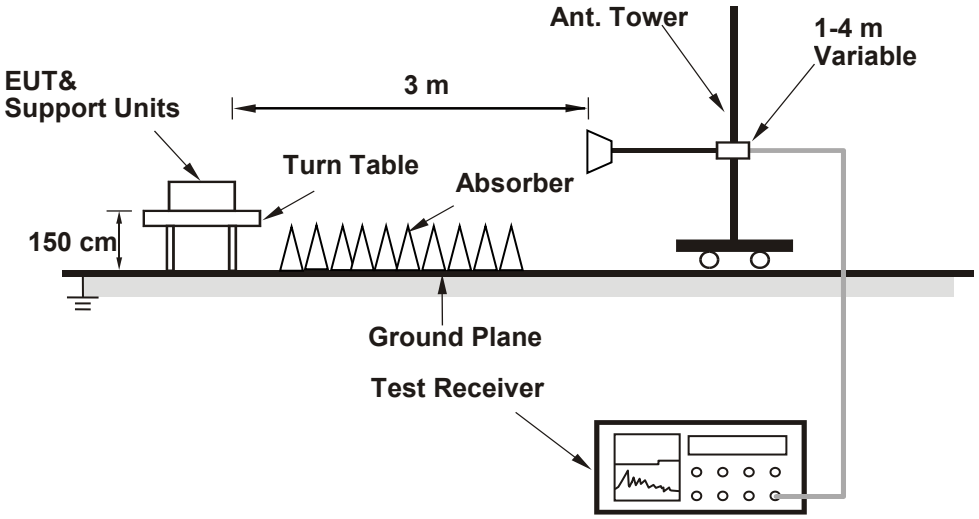
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

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



<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 14

BW	MCS Index	RB Size	RB Offset	Mid	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23330				Channel		23355	23330	23355	
		Frequency (MHz)		793				Frequency (MHz)		795.5	793	795.5	
10M	QPSK	1	0	23.03	0	5M	QPSK	1	0	22.93	22.89	23.02	0
		1	24	22.95	0			1	12	22.92	22.88	23.02	0
		1	49	22.99	0			1	24	22.99	22.95	23.01	0
		25	0	22.05	1			12	0	22.17	22.12	22.36	1
		25	12	22.02	1			12	6	22.19	22.15	22.37	1
		25	25	21.95	1			12	13	22.15	22.12	22.37	1
		50	0	22.01	1			25	0	22.18	22.14	22.36	1
	16QAM	1	0	22.19	1		16QAM	1	0	22.17	22.13	22.35	1
		1	24	22.16	1			1	12	22.31	22.25	22.49	1
		1	49	22.46	1			1	24	22.31	22.27	22.49	1
		25	0	21.11	2			12	0	21.15	21.11	21.37	2
		25	12	21.11	2			12	6	21.15	21.09	21.31	2
		25	25	21.07	2			12	13	21.11	21.07	21.31	2
		50	0	21.11	2			25	0	21.13	21.09	21.31	2
	64QAM	1	0	21.16	2		64QAM	1	0	21.14	21.13	21.27	2
		1	24	21.08	2			1	12	21.31	21.22	21.46	2
		1	49	21.40	2			1	24	21.22	21.23	21.40	2
		25	0	20.10	3			12	0	20.06	20.11	20.27	3
		25	12	20.04	3			12	6	20.14	20.02	20.21	3
		25	25	20.02	3			12	13	20.10	20.05	20.24	3
		50	0	20.10	3			25	0	20.04	20.02	20.21	3

LTE Band 26

BW	MCS Index	RB Size	RB Offset	Mid	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26740				Channel		26715	26740	26765	
		Frequency (MHz)		819.0				Frequency (MHz)		816.5	819.0	821.5	
10M	QPSK	1	0	22.63	0	5M	QPSK	1	0	22.63	22.63	22.71	0
		1	24	22.64	0			1	12	22.59	22.64	22.64	0
		1	49	22.63	0			1	24	22.54	22.63	22.68	0
		25	0	21.75	1			12	0	21.55	21.75	21.77	1
		25	12	21.72	1			12	6	21.74	21.72	21.75	1
		25	25	21.56	1			12	13	21.53	21.56	21.63	1
		50	0	21.67	1			25	0	21.65	21.67	21.72	1
	16QAM	1	0	22.09	1		16QAM	1	0	22.00	22.09	22.11	1
		1	24	21.99	1			1	12	21.93	21.99	22.08	1
		1	49	21.95	1			1	24	21.90	21.95	22.00	1
		25	0	20.80	2			12	0	20.78	20.80	20.87	2
		25	12	20.79	2			12	6	20.70	20.79	20.80	2
		25	25	20.70	2			12	13	20.57	20.70	20.74	2
		50	0	20.79	2			25	0	20.71	20.79	20.82	2
	64QAM	1	0	21.07	2		64QAM	1	0	21.10	21.07	21.09	2
		1	24	20.87	2			1	12	21.05	20.87	21.02	2
		1	49	20.91	2			1	24	20.80	20.91	20.99	2
		25	0	19.73	3			12	0	19.75	19.73	19.78	3
		25	12	19.69	3			12	6	19.67	19.69	19.72	3
		25	25	19.63	3			12	13	19.62	19.63	19.64	3
		50	0	19.62	3			25	0	19.72	19.62	19.82	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26705	26740	26775				Channel		26697	26740	26783	
		Frequency (MHz)		815.5	819.0	822.5				Frequency (MHz)		814.7	819.0	823.3	
3M	QPSK	1	0	22.59	22.52	22.61	0	1.4M	QPSK	1	0	22.66	22.55	22.67	0
		1	7	22.57	22.53	22.50	0			1	2	22.49	22.62	22.57	0
		1	14	22.48	22.60	22.61	0			1	5	22.49	22.60	22.66	0
		8	0	21.67	21.65	21.76	1			3	0	22.66	22.64	22.69	0
		8	3	21.64	21.57	21.75	1			3	1	22.68	22.71	22.65	0
		8	7	21.53	21.56	21.55	1			3	3	22.45	22.52	22.60	0
		15	0	21.63	21.53	21.69	1			6	0	21.48	21.52	21.58	1
	16QAM	1	0	21.90	22.03	22.07	1		16QAM	1	0	22.06	21.95	22.06	1
		1	7	21.92	21.95	22.03	1			1	2	22.02	21.90	22.04	1
		1	14	21.85	21.90	22.00	1			1	5	21.98	21.80	21.94	1
		8	0	20.65	20.68	20.82	2			3	0	21.69	21.77	21.80	1
		8	3	20.75	20.76	20.72	2			3	1	21.70	21.68	21.67	1
		8	7	20.62	20.57	20.72	2			3	3	21.61	21.69	21.63	1
		15	0	20.75	20.72	20.81	2			6	0	20.69	20.75	20.79	2
	64QAM	1	0	21.02	20.95	21.00	2		64QAM	1	0	20.98	20.95	20.99	2
		1	7	20.88	20.81	20.88	2			1	2	21.03	20.80	20.99	2
		1	14	20.90	20.91	20.92	2			1	5	20.84	20.82	20.99	2
		8	0	19.73	19.71	19.66	3			3	0	20.76	20.70	20.65	2
		8	3	19.58	19.61	19.62	3			3	1	20.73	20.63	20.70	2
		8	7	19.54	19.49	19.50	3			3	3	20.64	20.50	20.49	2
		15	0	19.64	19.60	19.80	3			6	0	19.80	19.59	19.73	3

ERP Power (dBm)

Modulation Type: QPSK

LTE Band 14, Channel Bandwidth 5MHz

MODE		TX channel 23305, 23330, 23355					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	790.50	-12.40	18.80	-0.30	18.50	34.80	-16.30
2	793.00	-12.50	18.60	-0.20	18.40	34.80	-16.40
3	795.50	-11.80	19.20	-0.20	19.00	34.80	-15.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	790.50	-19.20	12.80	-0.30	12.50	34.80	-22.30
2	793.00	-18.90	13.00	-0.20	12.80	34.80	-22.00
3	795.50	-18.80	13.20	-0.20	13.00	34.80	-21.80

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

LTE Band 14, Channel Bandwidth 10MHz

MODE		TX channel 23330					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	793.00	-12.40	18.70	-0.20	18.50	34.80	-16.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	793.00	-19.60	12.40	-0.20	12.20	34.80	-22.60

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

LTE Band 26, Channel Bandwidth 1.4MHz

MODE		TX channel 26697, 26740, 26783					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-11.80	19.70	-0.30	19.40	50.00	-30.60
2	819.00	-11.60	19.70	-0.20	19.50	50.00	-30.50
3	823.30	-11.60	19.80	-0.10	19.70	50.00	-30.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-18.40	13.80	-0.30	13.50	50.00	-36.50
2	819.00	-17.80	14.30	-0.20	14.10	50.00	-35.90
3	823.30	-18.00	14.10	-0.10	14.00	50.00	-36.00

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

LTE Band 26, Channel Bandwidth 3MHz

MODE		TX channel 26705, 26740, 26775					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-11.90	19.50	-0.30	19.20	50.00	-30.80
2	819.00	-11.50	19.80	-0.20	19.60	50.00	-30.40
3	822.50	-11.90	19.40	-0.10	19.30	50.00	-30.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-18.20	14.00	-0.30	13.70	50.00	-36.30
2	819.00	-18.40	13.70	-0.20	13.50	50.00	-36.50
3	822.50	-18.70	13.30	-0.10	13.20	50.00	-36.80

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

LTE Band 26, Channel Bandwidth 5MHz

MODE		TX channel 26715, 26740, 26765					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-11.80	19.50	-0.20	19.30	50.00	-30.70
2	819.00	-11.40	19.90	-0.20	19.70	50.00	-30.30
3	821.50	-12.10	19.30	-0.10	19.20	50.00	-30.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-18.80	13.30	-0.20	13.10	50.00	-36.90
2	819.00	-18.60	13.50	-0.20	13.30	50.00	-36.70
3	821.50	-18.20	13.70	-0.10	13.60	50.00	-36.40

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

LTE Band 26, Channel Bandwidth 10MHz

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-11.50	19.80	-0.20	19.60	50.00	-30.40
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-17.90	14.20	-0.20	14.00	50.00	-36.00

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

Modulation Type: 16QAM

LTE Band 14, Channel Bandwidth 5MHz

MODE		TX channel 23305, 23330, 23355					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	790.50	-13.20	17.90	-0.30	17.60	34.80	-17.20
2	793.00	-13.40	17.70	-0.20	17.50	34.80	-17.30
3	795.50	-12.80	18.20	-0.20	18.00	34.80	-16.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	790.50	-20.10	11.90	-0.30	11.60	34.80	-23.20
2	793.00	-19.90	12.00	-0.20	11.80	34.80	-23.00
3	795.50	-19.60	12.30	-0.20	12.10	34.80	-22.70

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

LTE Band 14, Channel Bandwidth 10MHz

MODE		TX channel 23330					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	793.00	-13.20	17.80	-0.20	17.60	34.80	-17.20
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	793.00	-20.40	11.60	-0.20	11.40	34.80	-23.40

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

LTE Band 26, Channel Bandwidth 1.4MHz

MODE		TX channel 26697, 26740, 26783					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-12.60	18.80	-0.30	18.50	50.00	-31.50
2	819.00	-12.50	18.80	-0.20	18.60	50.00	-31.40
3	823.30	-12.40	19.00	-0.10	18.90	50.00	-31.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-19.40	12.80	-0.30	12.50	50.00	-37.50
2	819.00	-18.70	13.40	-0.20	13.20	50.00	-36.80
3	823.30	-19.00	13.10	-0.10	13.00	50.00	-37.00

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

LTE Band 26, Channel Bandwidth 3MHz

MODE		TX channel 26705, 26740, 26775					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-12.90	18.50	-0.30	18.20	50.00	-31.80
2	819.00	-12.60	18.70	-0.20	18.50	50.00	-31.50
3	822.50	-12.90	18.40	-0.10	18.30	50.00	-31.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-19.10	13.10	-0.30	12.80	50.00	-37.20
2	819.00	-19.40	12.70	-0.20	12.50	50.00	-37.50
3	822.50	-19.60	12.40	-0.10	12.30	50.00	-37.70

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

LTE Band 26, Channel Bandwidth 5MHz

MODE		TX channel 26715, 26740, 26765					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-12.90	18.40	-0.20	18.20	50.00	-31.80
2	819.00	-12.30	19.00	-0.20	18.80	50.00	-31.20
3	821.50	-13.10	18.20	-0.10	18.10	50.00	-31.90
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-19.90	12.20	-0.20	12.00	50.00	-38.00
2	819.00	-19.60	12.50	-0.20	12.30	50.00	-37.70
3	821.50	-19.10	12.90	-0.10	12.80	50.00	-37.20

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

LTE Band 26, Channel Bandwidth 10MHz

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-12.60	18.70	-0.20	18.50	50.00	-31.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-18.90	13.20	-0.20	13.00	50.00	-37.00

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

Modulation Type: 64QAM

LTE Band 14, Channel Bandwidth 5MHz

MODE		TX channel 23305, 23330, 23355					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	790.50	-14.40	16.80	-0.30	16.50	34.80	-18.30
2	793.00	-14.50	16.60	-0.20	16.40	34.80	-18.40
3	795.50	-13.80	17.20	-0.20	17.00	34.80	-17.80
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	790.50	-21.10	11.00	-0.30	10.70	34.80	-24.10
2	793.00	-20.90	11.00	-0.20	10.80	34.80	-24.00
3	795.50	-20.60	11.30	-0.20	11.10	34.80	-23.70

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

LTE Band 14, Channel Bandwidth 10MHz

MODE		TX channel 23330					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	793.00	-14.60	16.50	-0.20	16.30	34.80	-18.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	793.00	-21.20	10.70	-0.20	10.50	34.80	-24.30

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

LTE Band 26, Channel Bandwidth 1.4MHz

MODE		TX channel 26697, 26740, 26783					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-13.60	17.80	-0.30	17.50	50.00	-32.50
2	819.00	-13.30	18.00	-0.20	17.80	50.00	-32.20
3	823.30	-13.40	18.00	-0.10	17.90	50.00	-32.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	814.70	-20.20	12.00	-0.30	11.70	50.00	-38.30
2	819.00	-19.80	12.30	-0.20	12.10	50.00	-37.90
3	823.30	-20.00	12.10	-0.10	12.00	50.00	-38.00

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

LTE Band 26, Channel Bandwidth 3MHz

MODE		TX channel 26705, 26740, 26775					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-13.70	17.70	-0.30	17.40	50.00	-32.60
2	819.00	-13.90	17.40	-0.20	17.20	50.00	-32.80
3	822.50	-14.20	17.10	-0.10	17.00	50.00	-33.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	815.50	-20.10	12.10	-0.30	11.80	50.00	-38.20
2	819.00	-20.20	11.90	-0.20	11.70	50.00	-38.30
3	822.50	-20.50	11.50	-0.10	11.40	50.00	-38.60

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

LTE Band 26, Channel Bandwidth 5MHz

MODE		TX channel 26715, 26740, 26765					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-13.80	17.50	-0.20	17.30	50.00	-32.70
2	819.00	-13.60	17.70	-0.20	17.50	50.00	-32.50
3	821.50	-13.90	17.40	-0.10	17.30	50.00	-32.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	816.50	-20.90	11.20	-0.20	11.00	50.00	-39.00
2	819.00	-20.50	11.60	-0.20	11.40	50.00	-38.60
3	821.50	-20.20	11.80	-0.10	11.70	50.00	-38.30

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

LTE Band 26, Channel Bandwidth 10MHz

MODE		TX channel 26740					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-13.60	17.70	-0.20	17.50	50.00	-32.50
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	819.00	-19.80	12.30	-0.20	12.10	50.00	-37.90

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

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

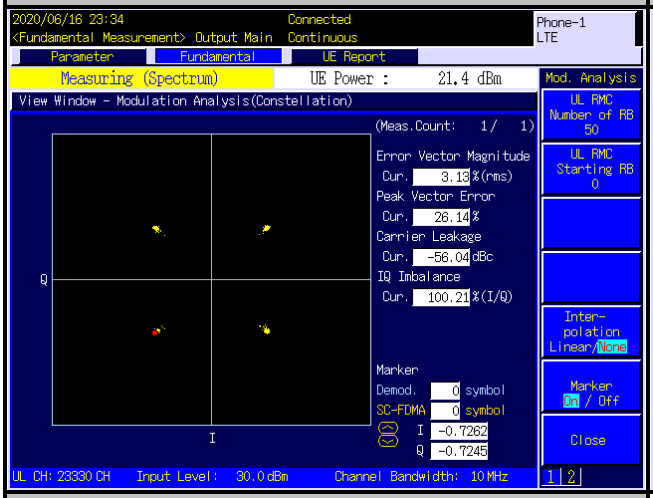
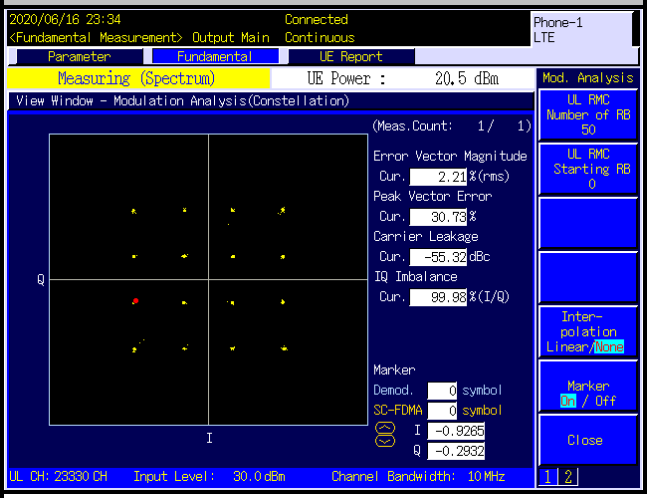
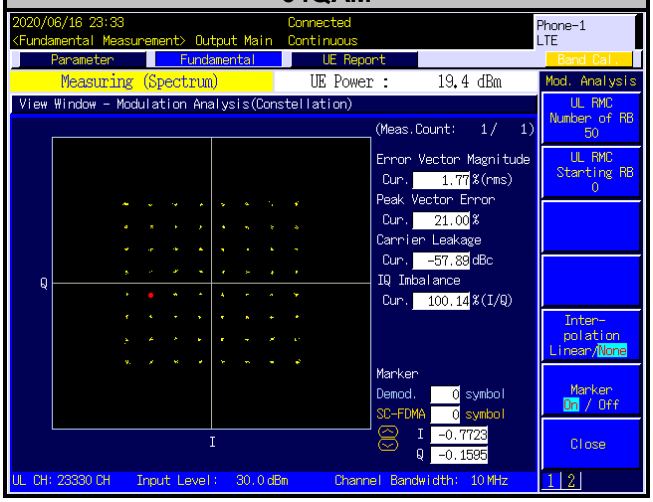
N/A

4.2.2 Test Setup

4.2.3 Test Procedure

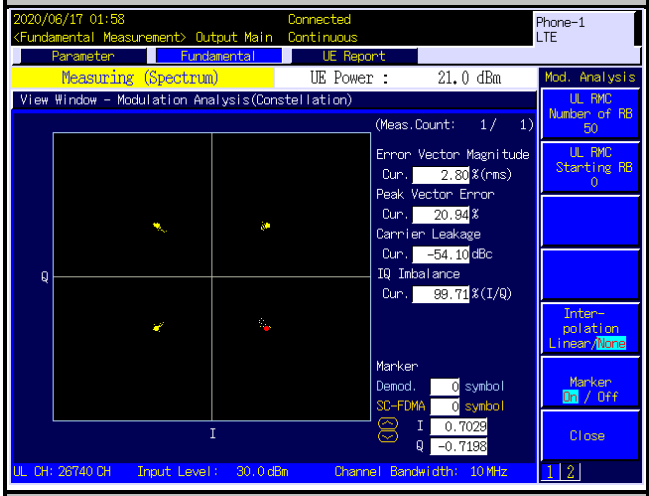
Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

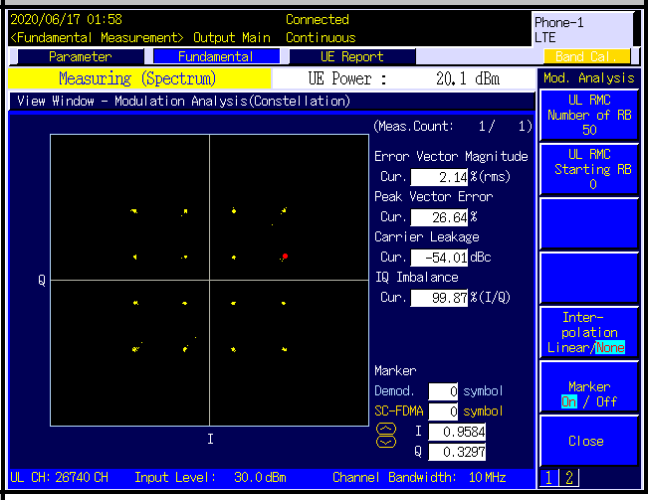
Spectrum Plot of Measurement	
LTE Band 14	
Channel 23330	
QPSK	16QAM
	
64QAM	
	

Spectrum Plot of Measurement
LTE Band 26
Channel 26740

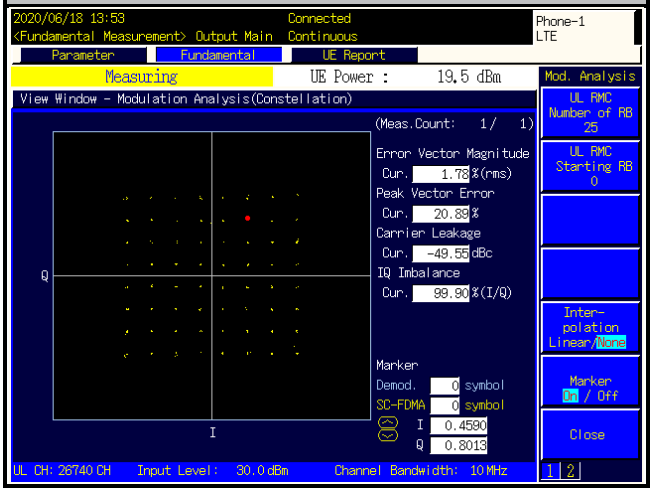
QPSK



16QAM



64QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

LTE Band 14

The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

LTE Band 26

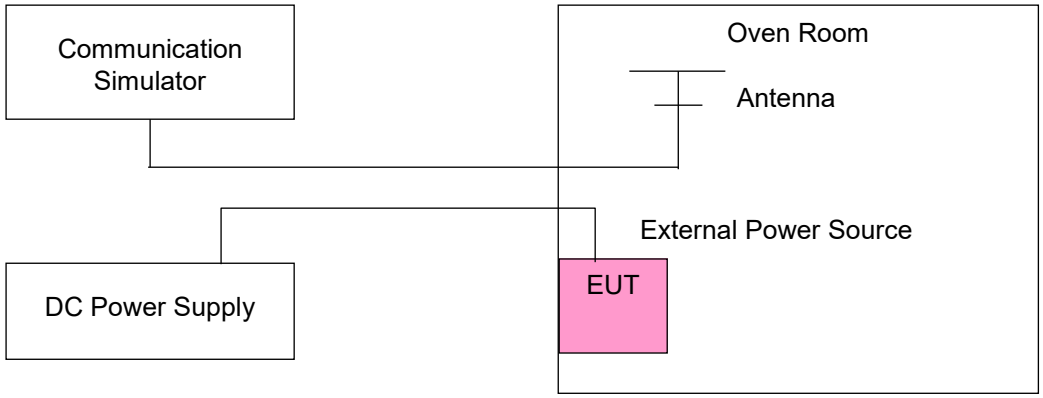
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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)	LTE Band 14				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	790.500001	0.002	795.500002	0.002	1.25
3.23	790.500002	0.003	795.500002	0.003	1.25
4.37	790.500003	0.004	795.500003	0.003	1.25

Note: The applicant defined the normal working voltage is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 14				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	790.500004	0.005	795.500001	0.001	1.25
-20	790.500004	0.005	795.500001	0.002	1.25
-10	790.500004	0.004	795.500002	0.002	1.25
0	790.499998	-0.002	795.499998	-0.003	1.25
10	790.499996	-0.005	795.499996	-0.005	1.25
20	790.499998	-0.002	795.499998	-0.003	1.25
30	790.499999	-0.002	795.499997	-0.004	1.25
40	790.499996	-0.005	795.499997	-0.004	1.25
50	790.499997	-0.004	795.499998	-0.003	1.25

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 14		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
3.8	793.000001	0.002	1.25
3.23	793.000001	0.001	1.25
4.37	793.000001	0.001	1.25

Note: The applicant defined the normal working voltage is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 14		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	793.000002	0.002	1.25
-20	793.000003	0.003	1.25
-10	793.000003	0.004	1.25
0	792.999999	-0.002	1.25
10	792.999999	-0.002	1.25
20	792.999998	-0.002	1.25
30	792.999996	-0.005	1.25
40	792.999996	-0.005	1.25
50	792.999997	-0.003	1.25

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)	
3.8	814.700002	0.003	823.300003	0.003	2.5
3.23	814.700001	0.001	823.300003	0.003	2.5
4.37	814.700003	0.004	823.300004	0.005	2.5

Note: The applicant defined the normal working voltage is from 3.23 Vdc to 4.37 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	814.700002	0.002	823.300002	0.003	2.5
-20	814.700003	0.004	823.300004	0.005	2.5
-10	814.700004	0.004	823.300002	0.002	2.5
0	814.699997	-0.004	823.299999	-0.001	2.5
10	814.699997	-0.003	823.299999	-0.002	2.5
20	814.699997	-0.004	823.299998	-0.003	2.5
30	814.699997	-0.004	823.299999	-0.002	2.5
40	814.699996	-0.005	823.299999	-0.002	2.5
50	814.699997	-0.004	823.299999	-0.002	2.5

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)	
3.8	815.500003	0.004	822.500001	0.001	2.5
3.23	815.500003	0.004	822.500002	0.003	2.5
4.37	815.500002	0.003	822.500003	0.004	2.5

Note: The applicant defined the normal working voltage is from 3.23 Vdc to 4.37 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	815.500003	0.004	822.500002	0.002	2.5
-20	815.500002	0.002	822.500003	0.003	2.5
-10	815.500004	0.004	822.500004	0.005	2.5
0	815.499999	-0.001	822.499997	-0.004	2.5
10	815.499998	-0.003	822.499997	-0.003	2.5
20	815.499996	-0.005	822.499999	-0.002	2.5
30	815.499999	-0.001	822.499997	-0.003	2.5
40	815.499997	-0.003	822.499998	-0.003	2.5
50	815.499997	-0.004	822.499998	-0.003	2.5

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)	
3.8	816.500004	0.004	821.500002	0.002	2.5
3.23	816.500003	0.003	821.500004	0.004	2.5
4.37	816.500001	0.001	821.500002	0.003	2.5

Note: The applicant defined the normal working voltage is from 3.23 Vdc to 4.37 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	816.500003	0.003	821.500003	0.003	2.5
-20	816.500002	0.003	821.500001	0.001	2.5
-10	816.500002	0.003	821.500001	0.002	2.5
0	816.499997	-0.004	821.499999	-0.001	2.5
10	816.499999	-0.002	821.499998	-0.003	2.5
20	816.499998	-0.002	821.499997	-0.004	2.5
30	816.499997	-0.004	821.499998	-0.002	2.5
40	816.499999	-0.002	821.499996	-0.005	2.5
50	816.499998	-0.002	821.499996	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
3.8	819.000002	0.002	2.5
3.23	819.000002	0.002	2.5
4.37	819.000003	0.004	2.5

Note: The applicant defined the normal working voltage is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	819.000002	0.003	2.5
-20	819.000002	0.003	2.5
-10	819.000003	0.004	2.5
0	818.999998	-0.002	2.5
10	818.999996	-0.004	2.5
20	818.999997	-0.004	2.5
30	818.999996	-0.005	2.5
40	818.999997	-0.004	2.5
50	818.999998	-0.003	2.5

4.4 Occupied Bandwidth Measurement

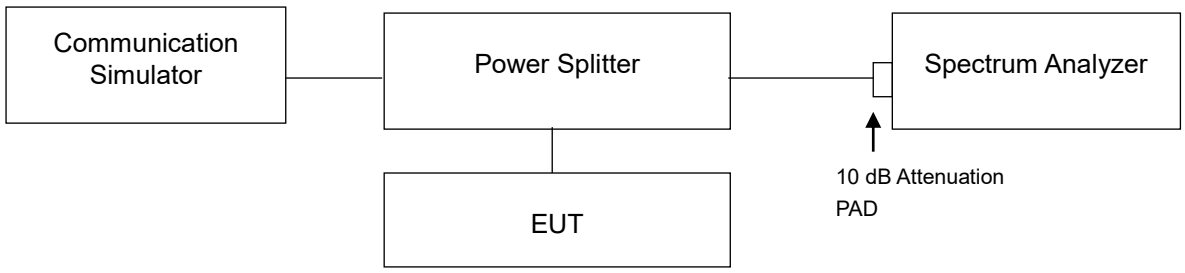
4.4.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.2 Test Procedure

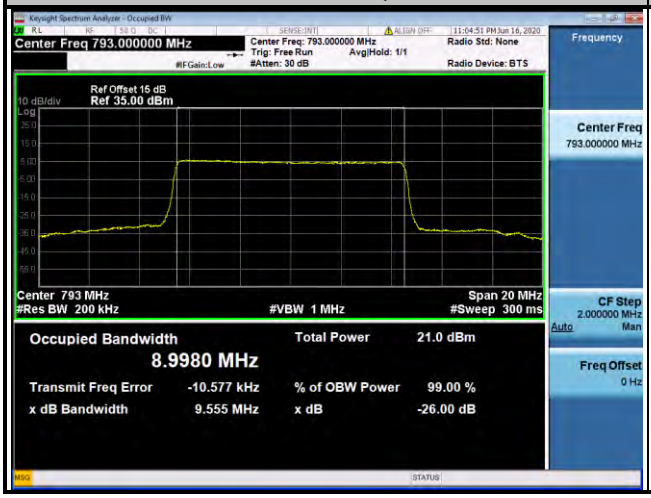
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

4.4.3 Test Setup

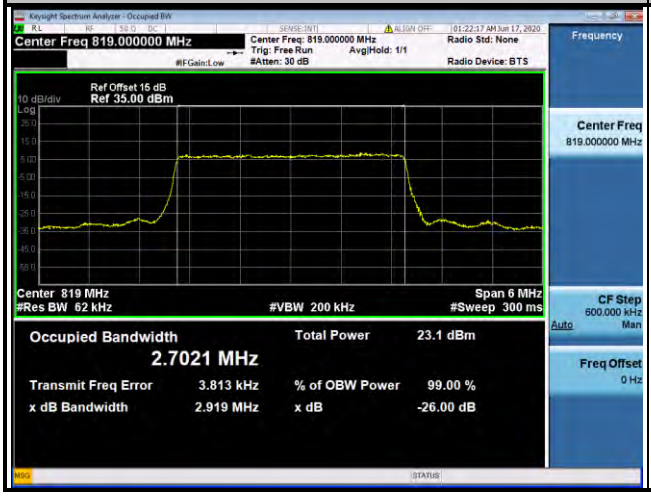


4.4.4 Test Results

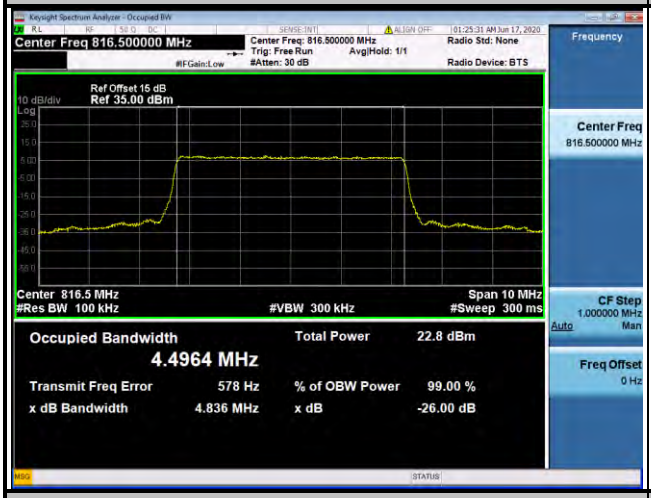
LTE Band 14							
Channel Bandwidth: 5 MHz							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
23305	790.5	4.4934	4.4942	4.5003	4.824	4.801	4.828
23330	793.0	4.4975	4.4986	4.5075	4.827	4.809	4.840
23355	795.5	4.4972	4.4982	4.5090	4.835	4.812	4.856
Channel Bandwidth: 10 MHz							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
23330	793.0	8.9944	8.9941	8.9980	9.559	9.526	9.555

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

LTE Band 26							
Channel Bandwidth: 1.4 MHz							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26697	814.7	1.0869	1.0891	1.0890	1.216	1.213	1.214
26740	819.0	1.0867	1.0889	1.0883	1.213	1.219	1.218
26783	823.3	1.0863	1.0901	1.0882	1.218	1.217	1.221
Channel Bandwidth: 3 MHz							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26705	815.5	2.6997	2.6990	2.6997	2.931	2.917	2.931
26740	819.0	2.7021	2.6997	2.6982	2.919	2.929	2.928
26775	822.5	2.6997	2.6971	2.6976	2.924	2.930	2.923

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

LTE Band 26							
Channel Bandwidth: 5 MHz							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26715	816.5	4.4964	4.4951	4.4942	4.836	4.815	4.808
26740	819.0	4.4961	4.4961	4.4960	4.824	4.806	4.794
26765	821.5	4.4919	4.4926	4.4930	4.814	4.801	4.790
Channel Bandwidth: 10 MHz							
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26740	819.0	8.9798	8.9928	8.9844	9.518	9.515	9.516

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

4.5 Emission Mask Measurement

4.5.1 Limits of Emission Mask Measurement

LTE Band 14

1. On any frequency removed from the assigned frequency by more than 50 percent, but not more than100 percent of the authorized bandwidth: At least 25 dB.
2. On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
3. On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

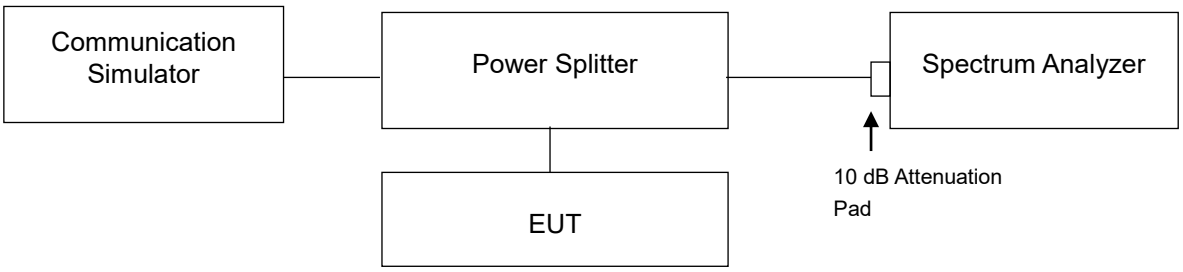
LTE Band 26

According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 $Log_{10}(f/6.1)$ decibels or 50 + $10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + $10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

For §90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed.

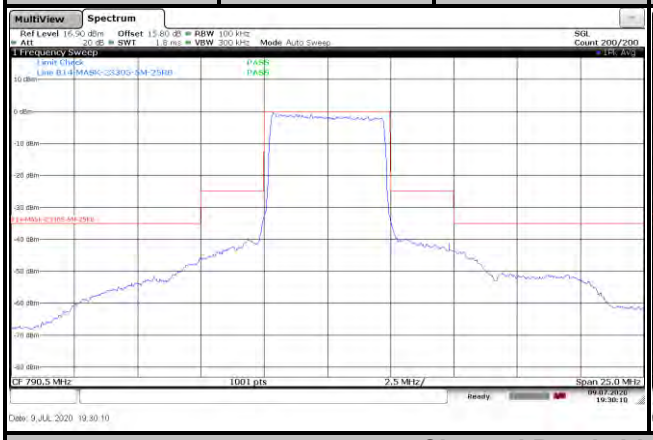
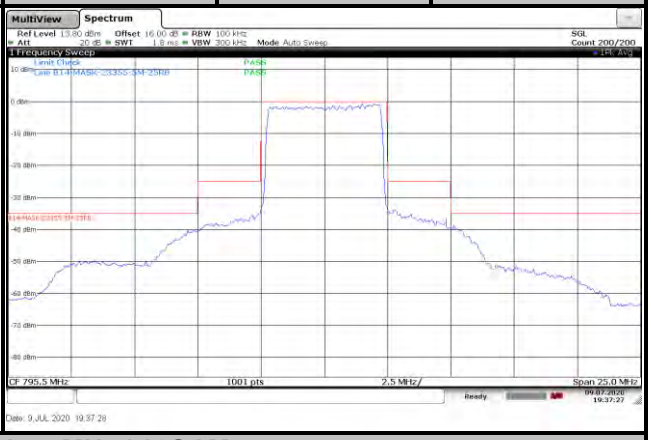
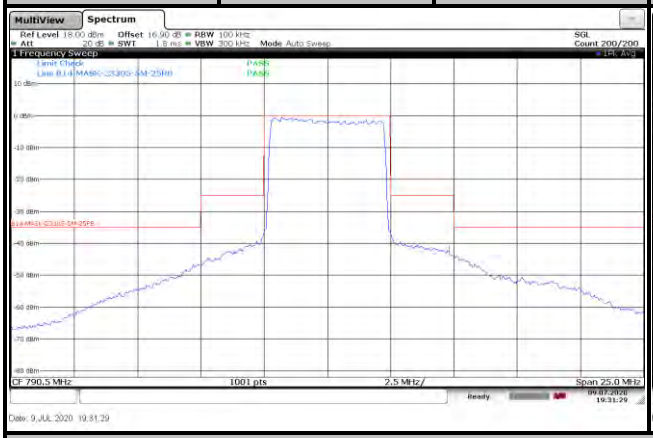
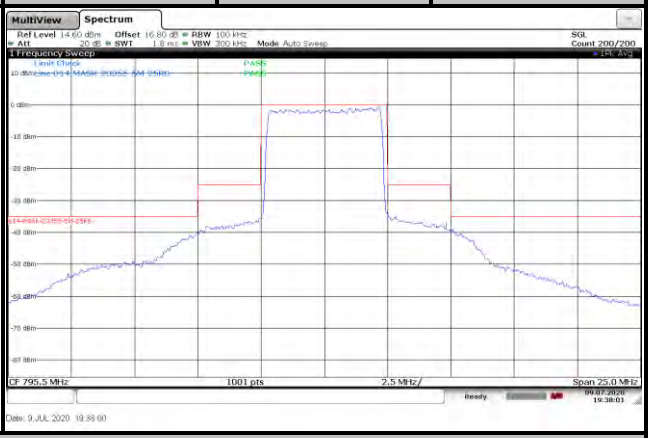
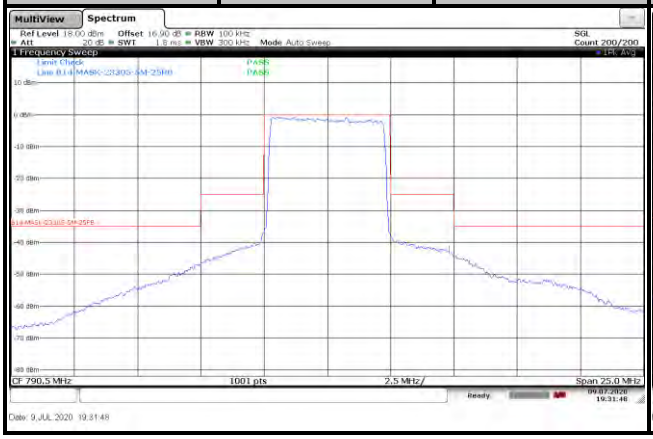
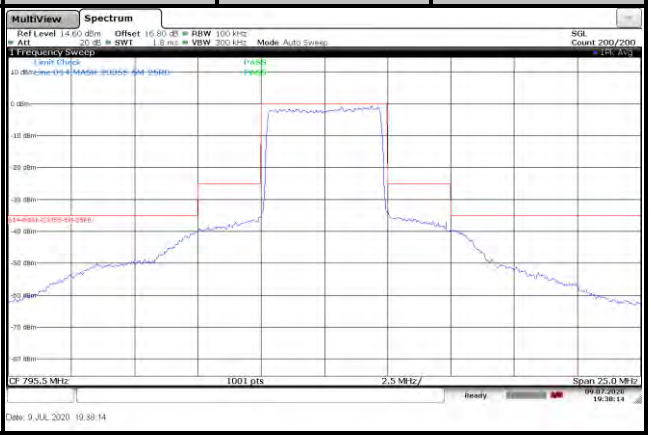
4.5.2 Test Setup



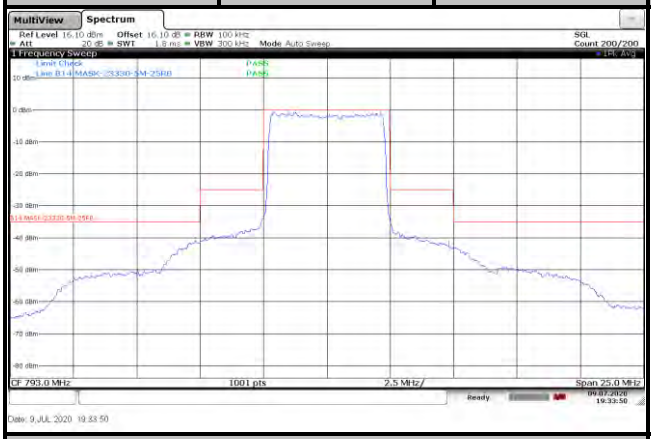
4.5.3 Test Procedures

a. The measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Record the test plot.

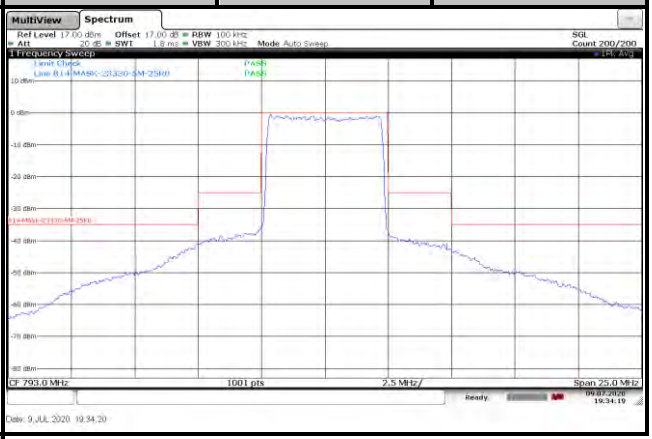
4.5.4 Test Results

LTE Band 14					
Channel Bandwidth: 5 MHz / QPSK					
Channel	23305	25 RB	Channel	23355	25 RB
					
Channel Bandwidth: 5 MHz / 16QAM					
Channel	23305	25 RB	Channel	23355	25 RB
					
Channel Bandwidth: 5 MHz / 64QAM					
Channel	23305	25 RB	Channel	23355	25 RB
					

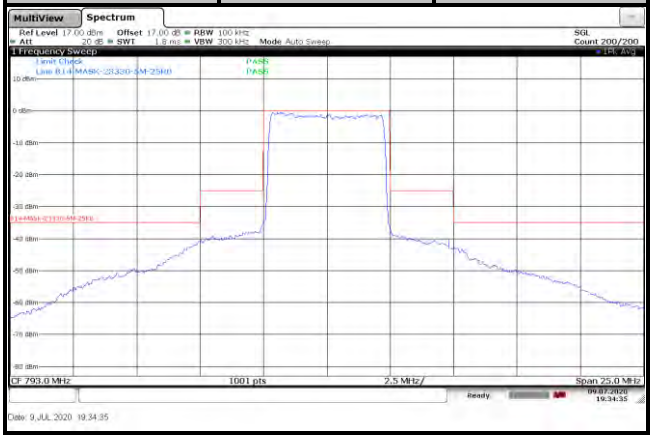
LTE Band 14		
Channel Bandwidth: 10 MHz / QPSK		
Channel	23330	25 RB

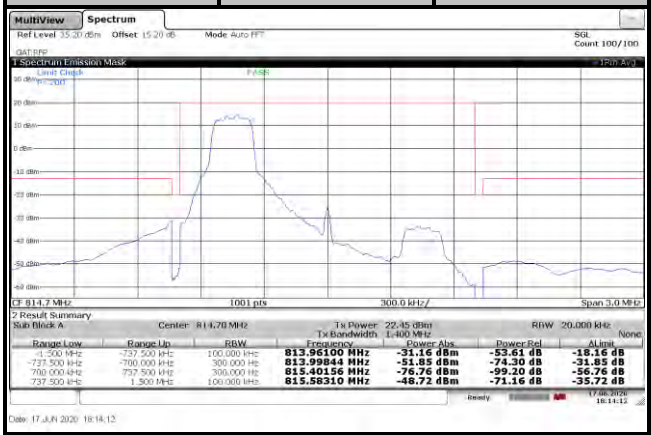
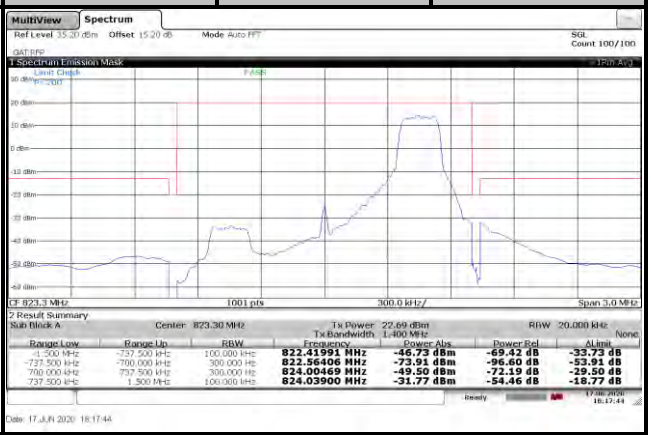
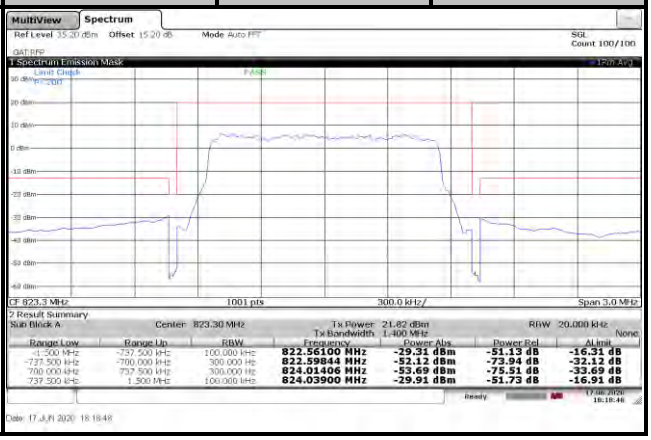


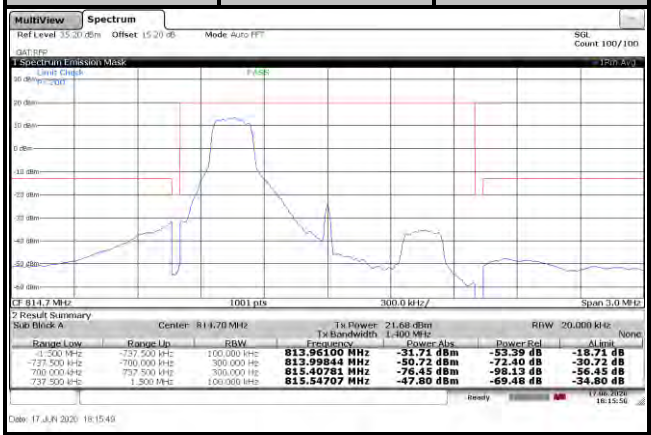
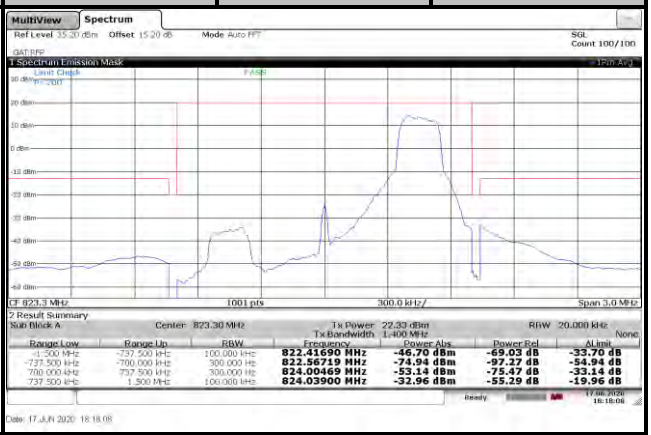
Channel Bandwidth: 10 MHz / 16QAM		
Channel	23330	25 RB

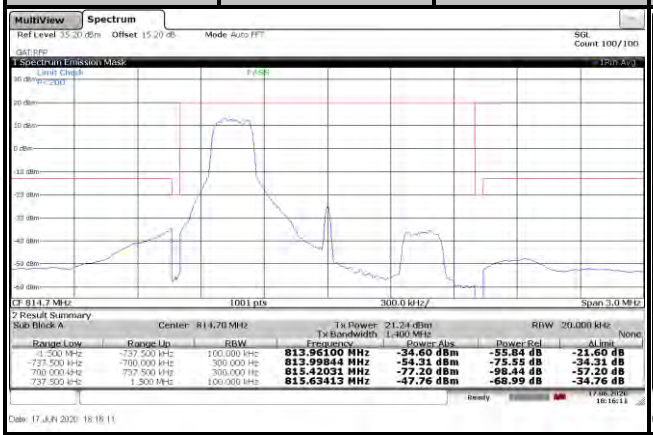
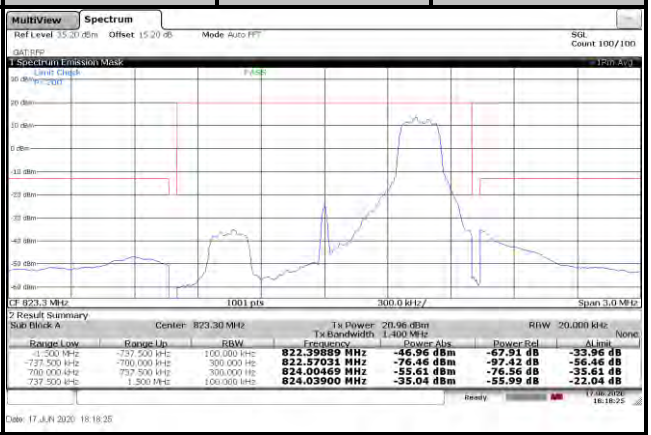


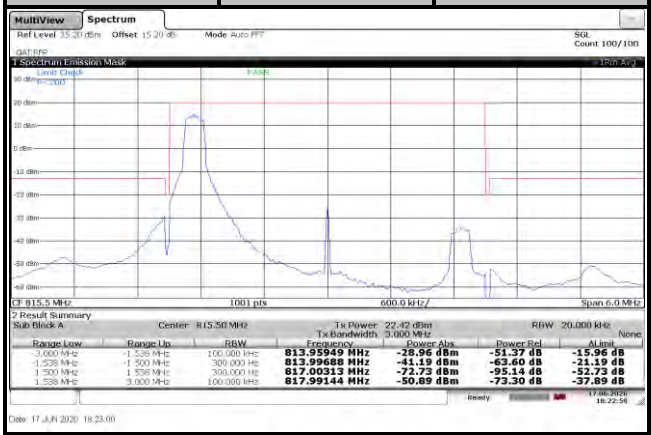
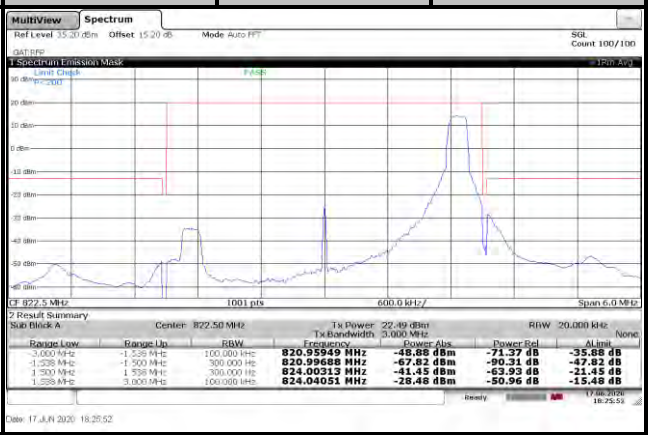
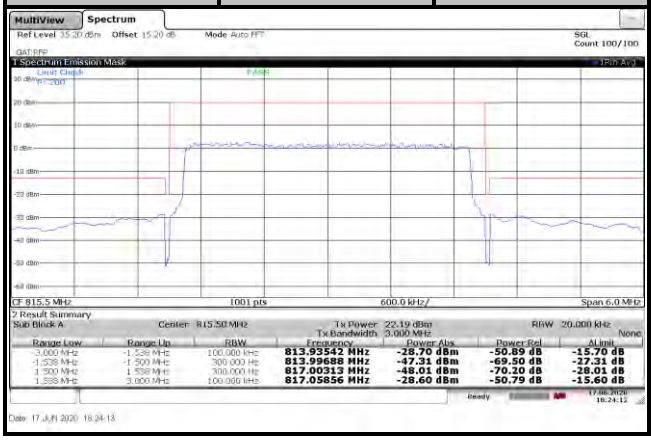
Channel Bandwidth: 10 MHz / 64QAM		
Channel	23330	25 RB

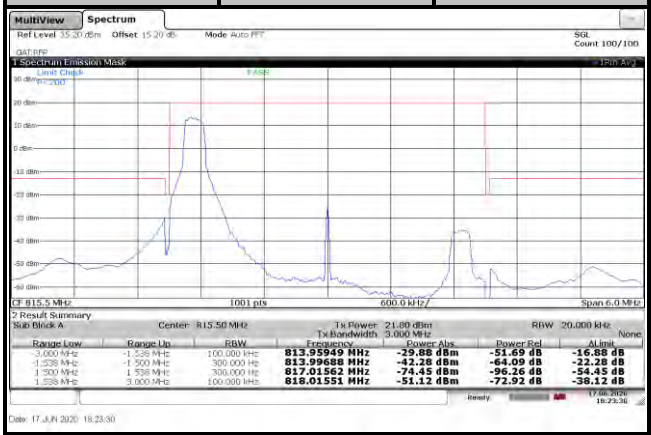
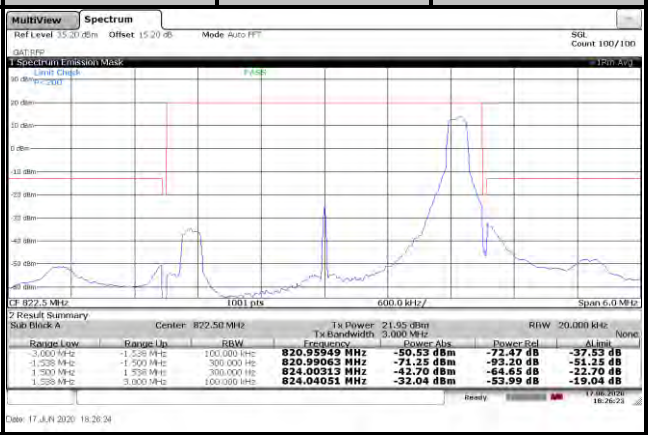


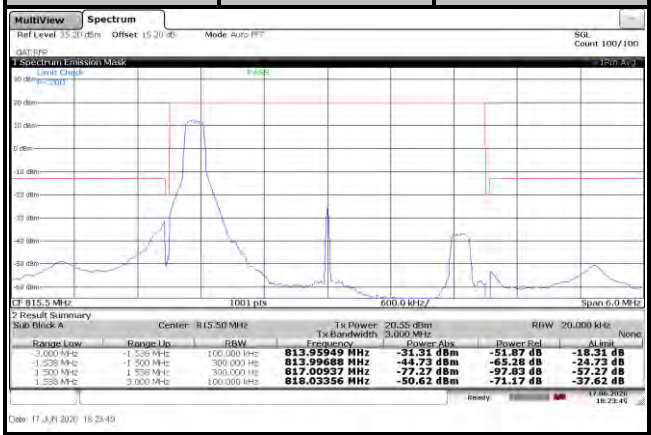
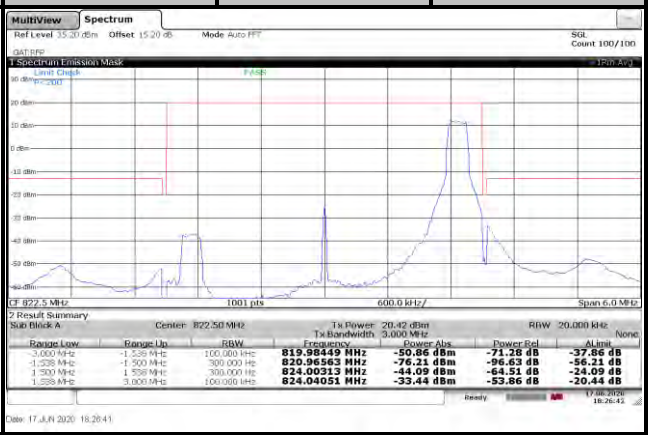
LTE Band 26					
Channel Bandwidth: 1.4 MHz / QPSK					
Channel	26697	1 RB	Channel	26783	1 RB
					
Channel	26697	6 RB	Channel	26783	6 RB
					

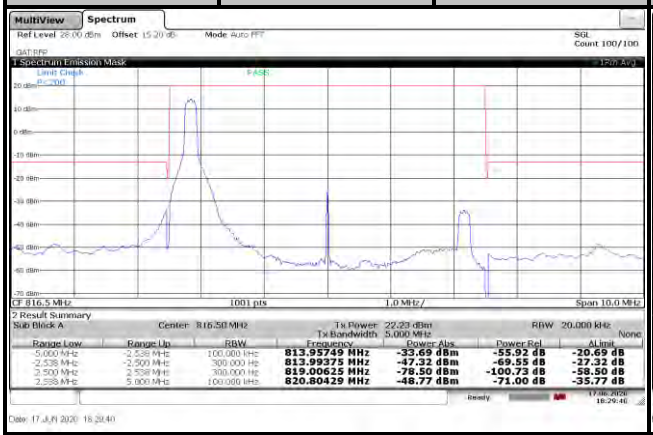
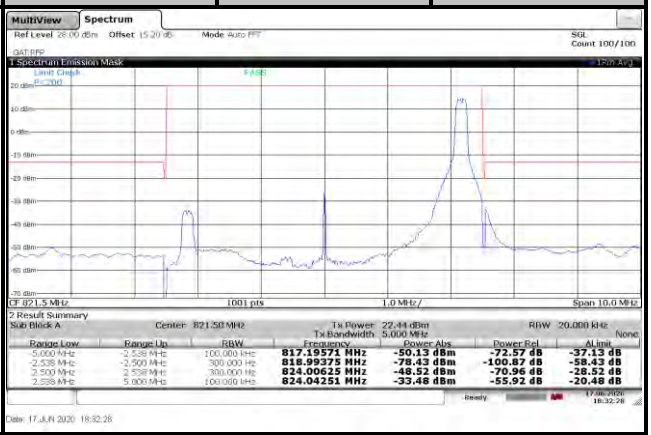
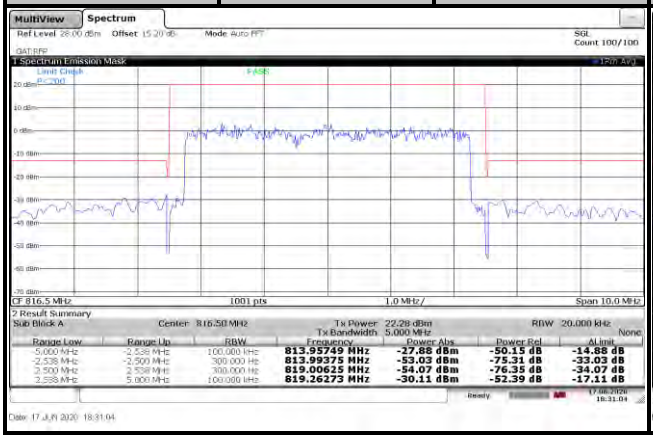
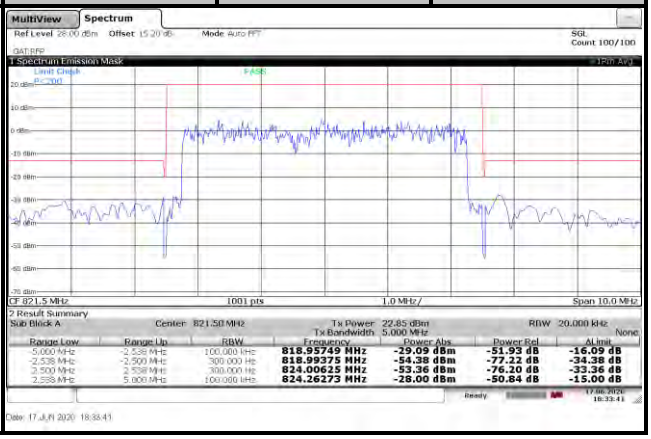
LTE Band 26					
Channel Bandwidth: 1.4 MHz / 16QAM					
Channel	26697	1 RB	Channel	26783	1 RB
					
Channel	26697	6 RB	Channel	26783	6 RB
					

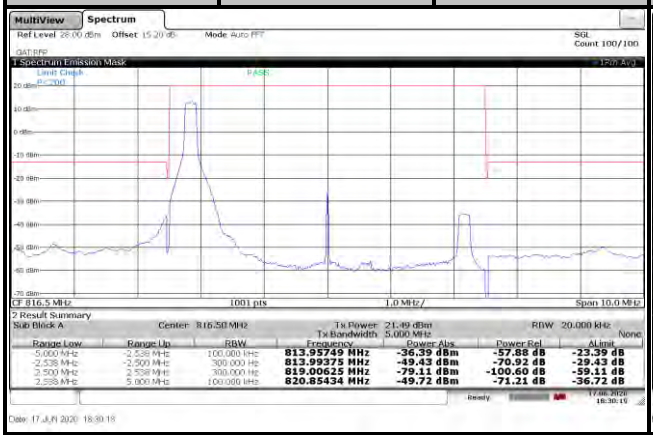
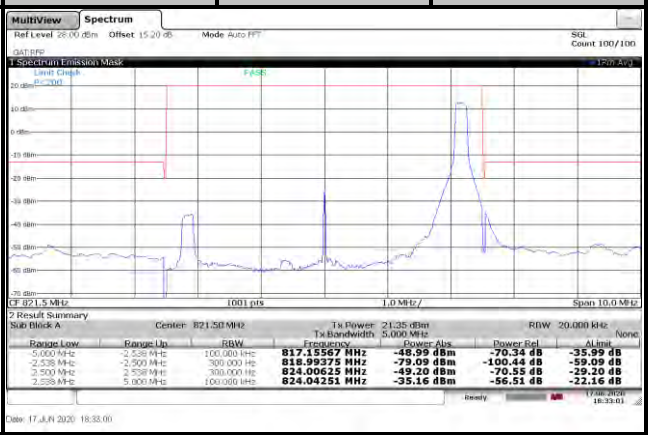
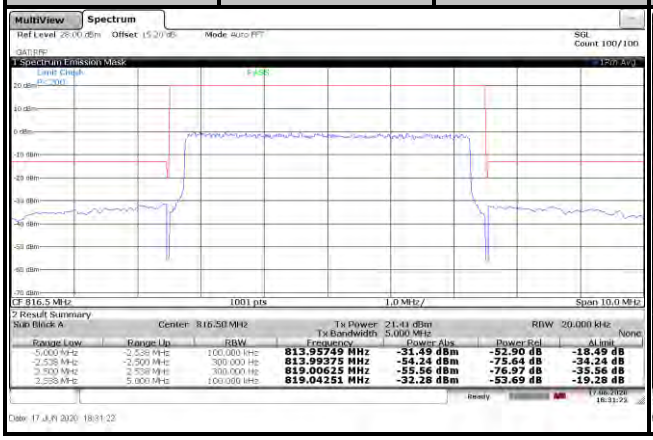
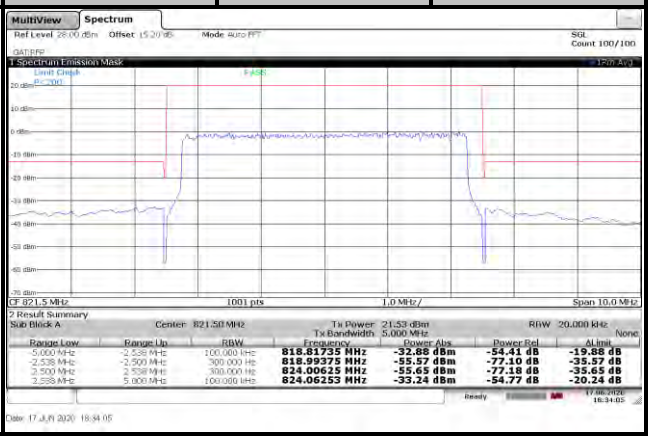
LTE Band 26					
Channel Bandwidth: 1.4 MHz / 64QAM					
Channel	26697	1 RB	Channel	26783	1 RB
					
Channel	26697	6 RB	Channel	26783	6 RB
					

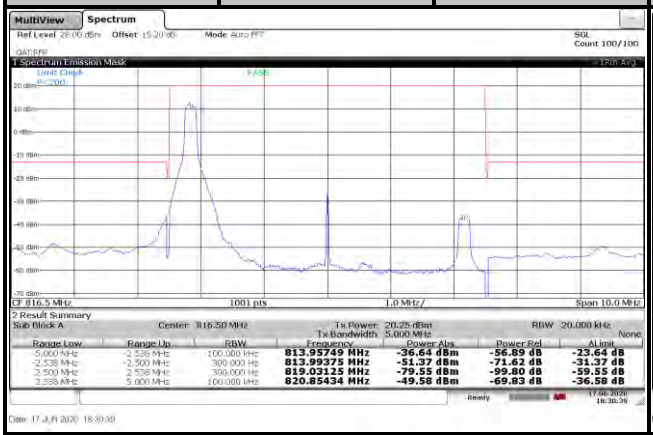
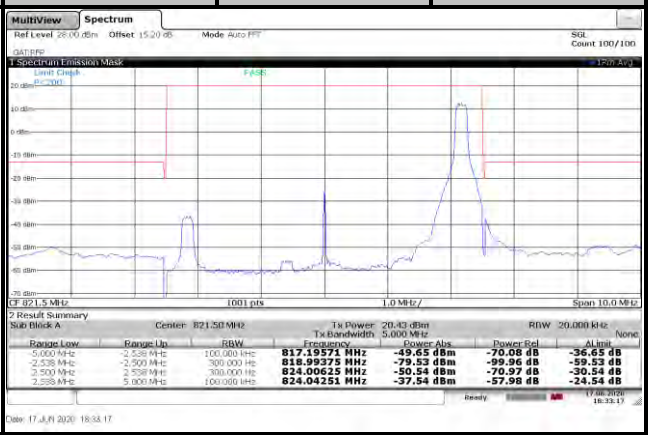
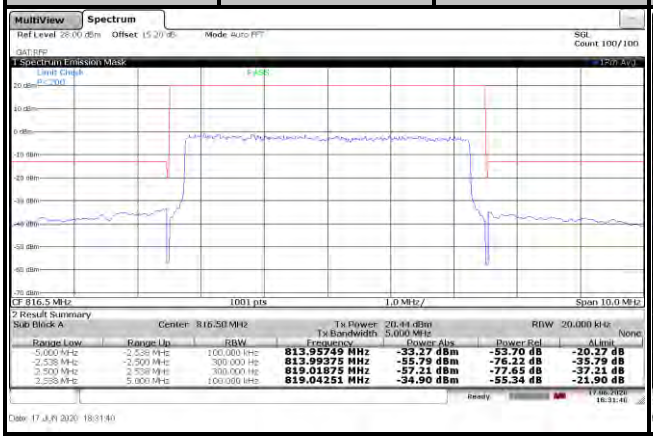
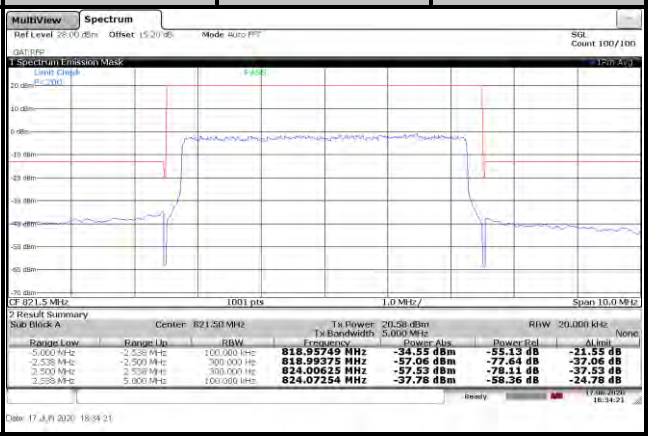
LTE Band 26					
Channel Bandwidth: 3 MHz / QPSK					
Channel	26705	1 RB	Channel	26775	1 RB
					
Channel	26705	15 RB	Channel	26775	15 RB
					

LTE Band 26					
Channel Bandwidth: 3 MHz / 16QAM					
Channel	26705	1 RB	Channel	26775	1 RB
					
Channel	26705	15 RB	Channel	26775	15 RB
					

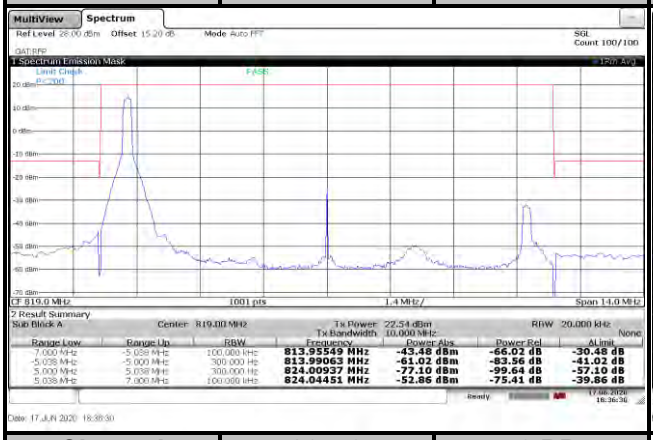
LTE Band 26					
Channel Bandwidth: 3 MHz / 64QAM					
Channel	26705	1 RB	Channel	26775	1 RB
					
Channel	26705	15 RB	Channel	26775	15 RB
					

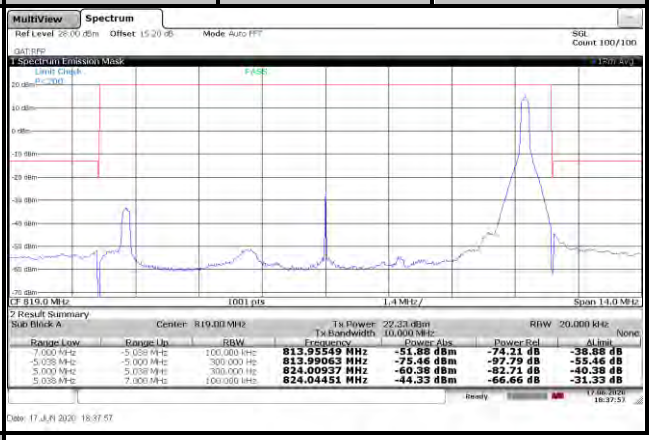
LTE Band 26					
Channel Bandwidth: 5 MHz / QPSK					
Channel	26715	1 RB	Channel	26765	1 RB
					
Channel	26715	25 RB	Channel	26765	25 RB
					

LTE Band 26					
Channel Bandwidth: 5 MHz / 16QAM					
Channel	26715	1 RB	Channel	26765	1 RB
					
Channel	26715	25 RB	Channel	26765	25 RB
					

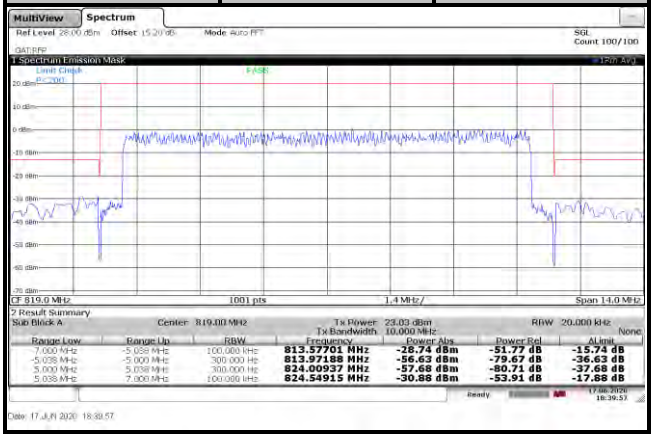
LTE Band 26					
Channel Bandwidth: 5 MHz / 64QAM					
Channel	26715	1 RB	Channel	26765	1 RB
					
Channel	26715	25 RB	Channel	26765	25 RB
					

LTE Band 26					
Channel Bandwidth: 10 MHz / QPSK					
Channel	26740	1 RB	Channel	26740	1 RB

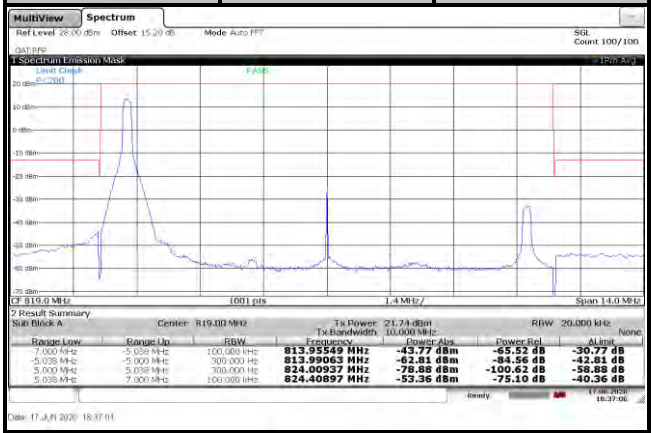


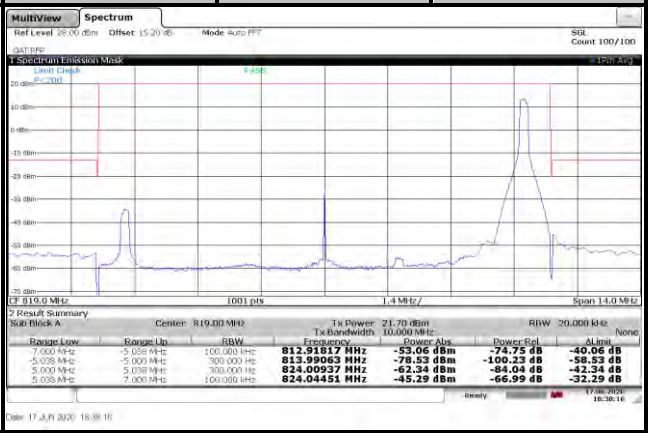


Channel	26740	50 RB

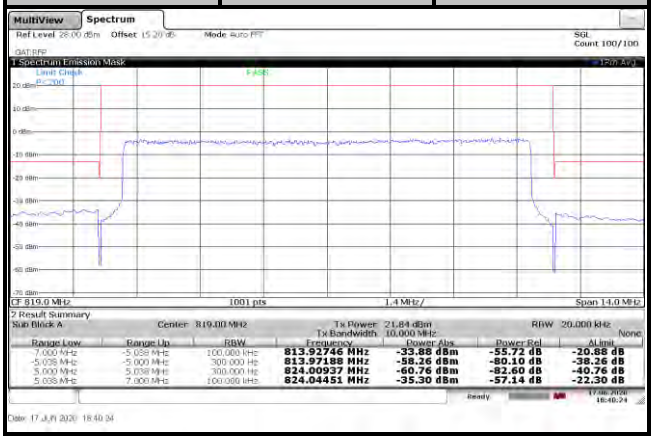


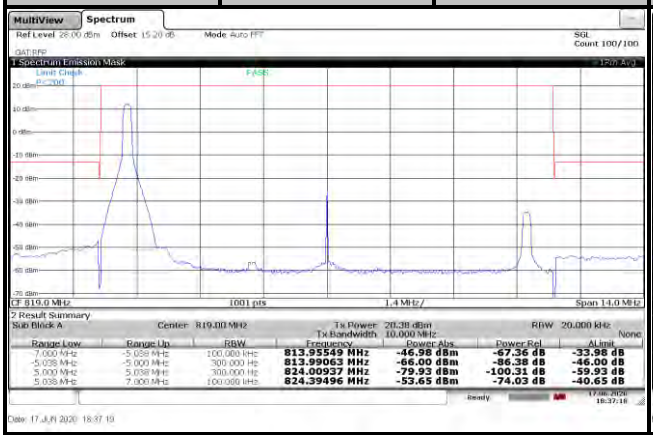
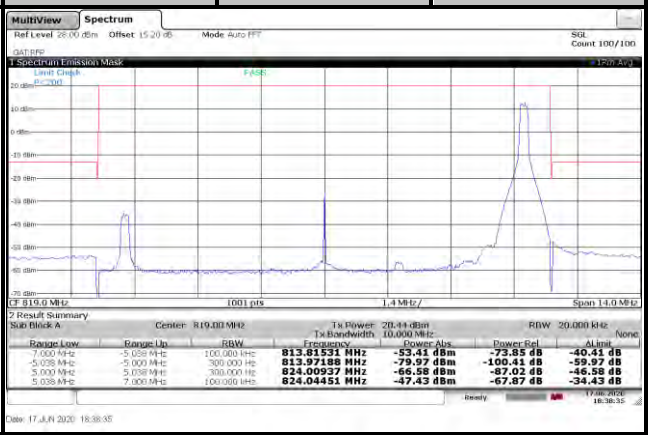
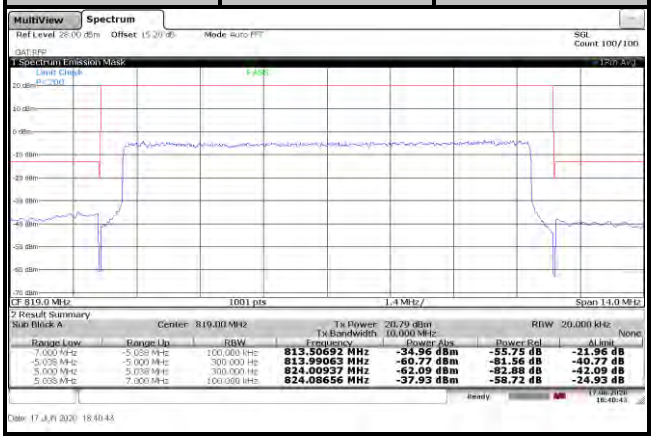
LTE Band 26					
Channel Bandwidth: 10 MHz / 16QAM					
Channel	26740	1 RB	Channel	26740	1 RB





Channel	26740	50 RB



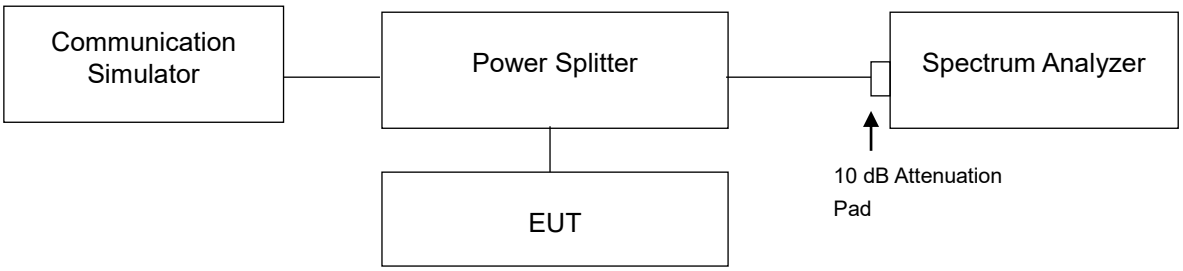
LTE Band 26					
Channel Bandwidth: 10 MHz / 64QAM					
Channel	26740	1 RB	Channel	26740	1 RB
					
Channel	26740	50 RB			
					

4.6 Band Edge Measurement

4.6.1 Limits of Band Edge Measurement

(1) On all frequencies between 769 - 775 MHz and 799 - 805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.
(2) On all frequencies between 769 - 775 MHz and 799 - 805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
(3) On any frequency between 775 - 788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P).

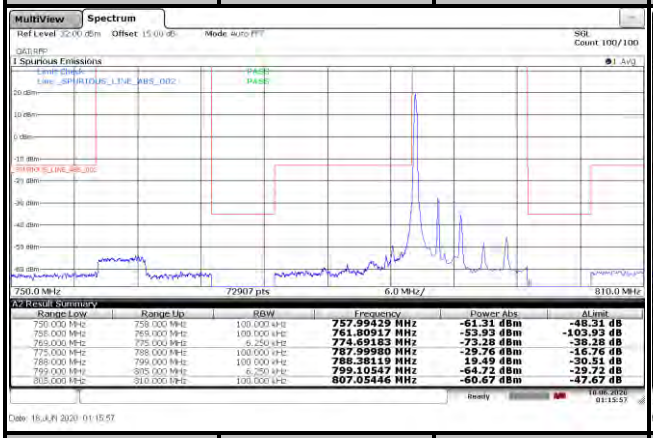
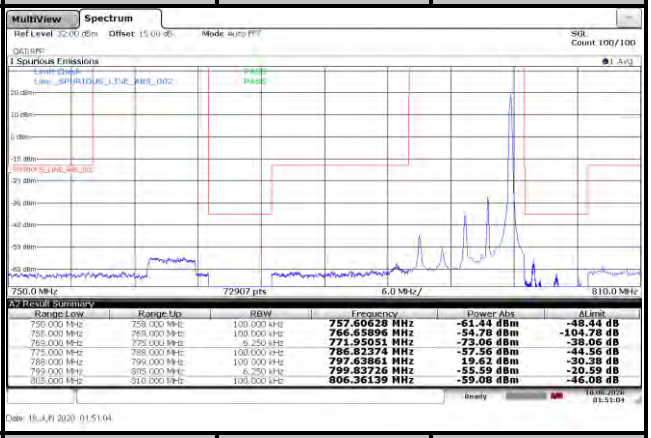
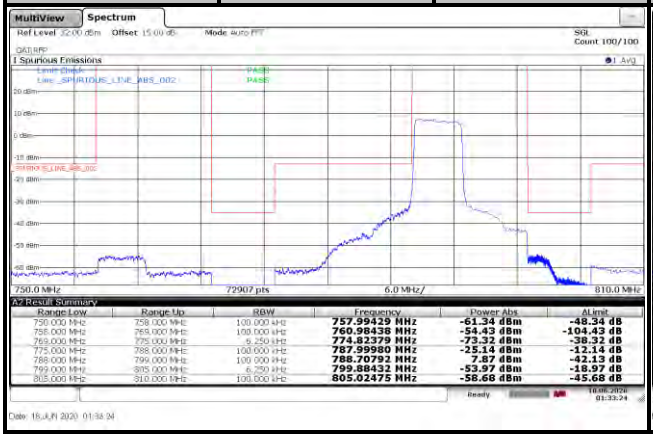
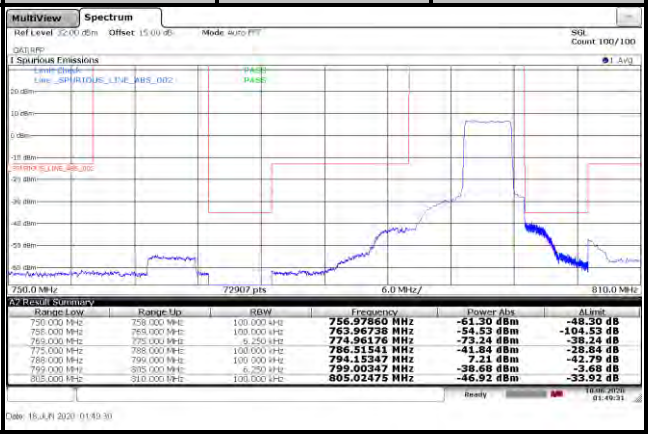
4.6.2 Test Setup

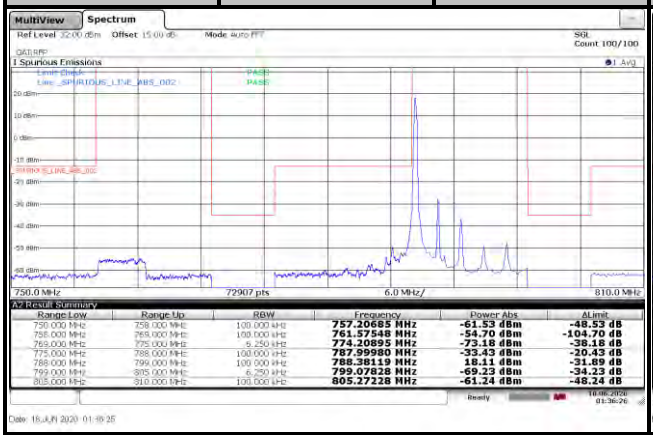
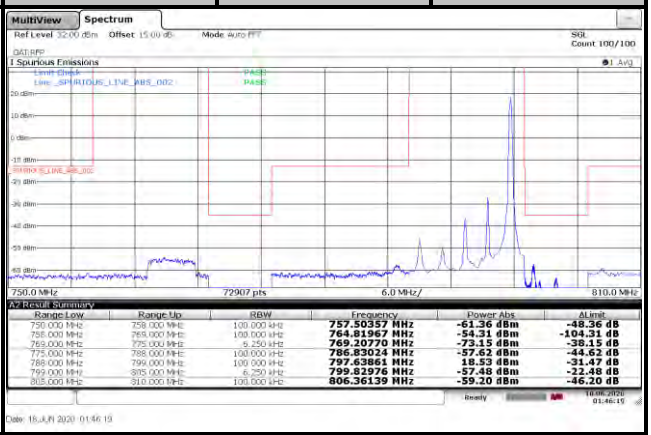
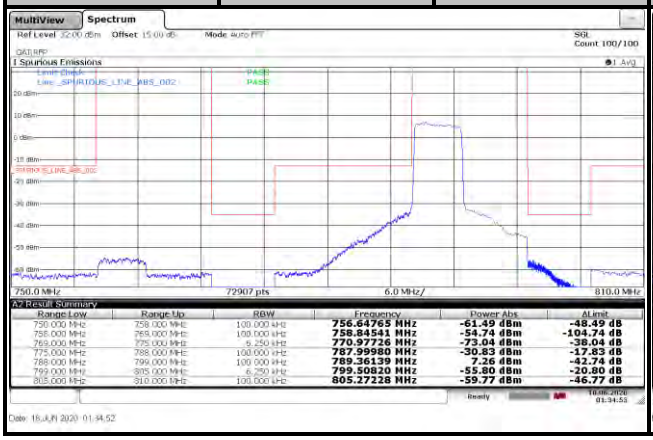
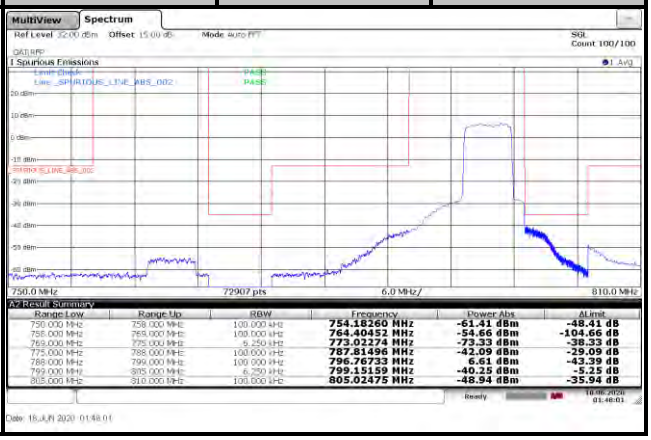


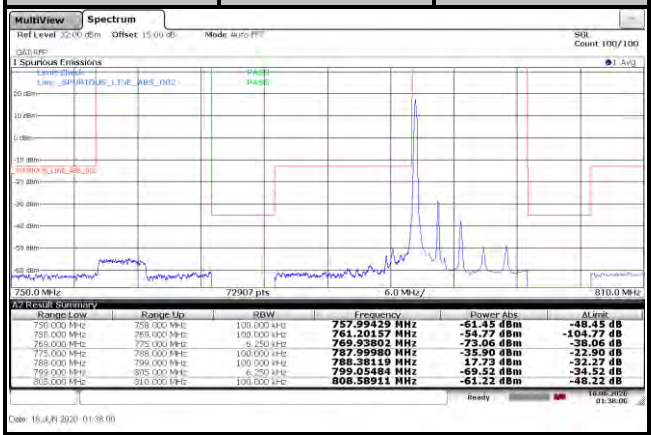
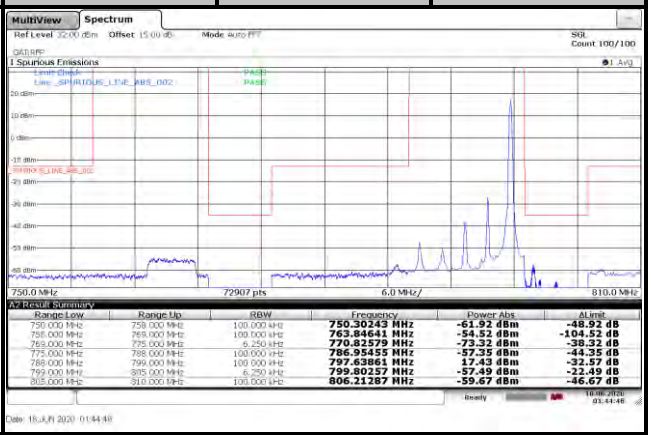
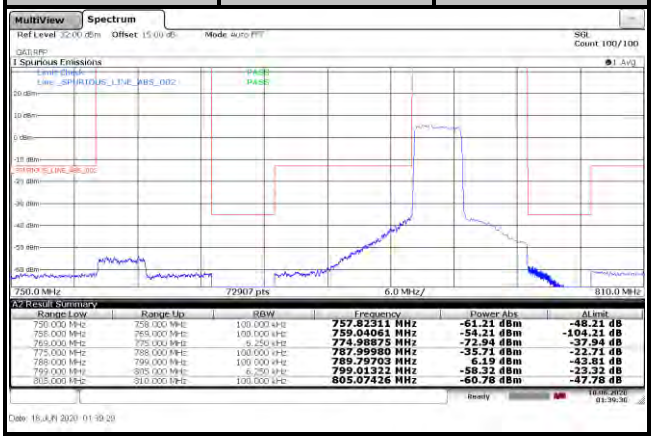
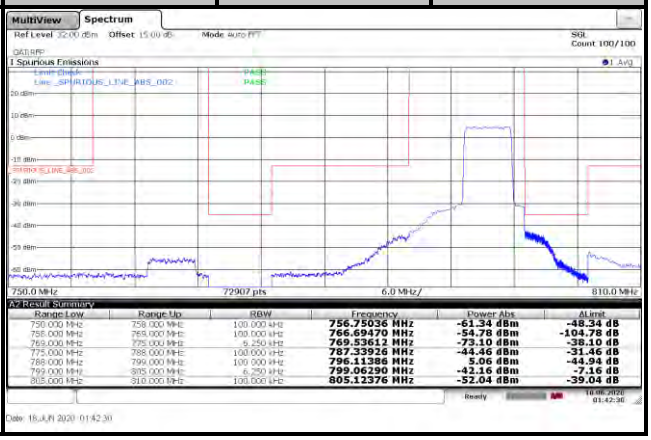
4.6.3 Test Procedures

a. All measurements were done at low and high operational frequency range.
b. The band edge measurement used the power splitter via EUT RF power connector between signal generator and spectrum analyzer. This splitter loss, attenuator loss and cable loss are the worst loss 15 dB in the transmitted path track.
c. Record the max. trace plot into the test report.

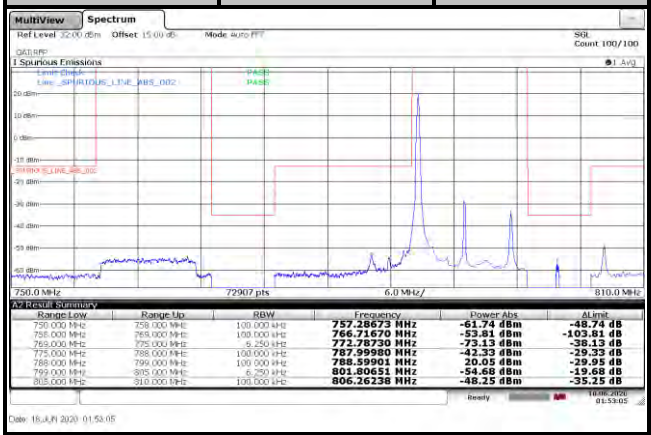
4.6.4 Test Results

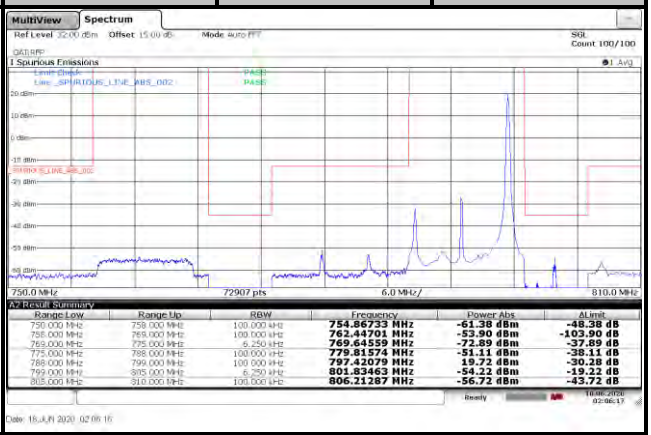
LTE Band 14					
Channel Bandwidth: 5 MHz / QPSK					
Channel	23305	1 RB	Channel	23355	1 RB
					
Channel	23305	25 RB	Channel	23355	25 RB
					

LTE Band 14					
Channel Bandwidth: 5 MHz / 16QAM					
Channel	23305	1 RB	Channel	23355	1 RB
					
Channel	23305	25 RB	Channel	23355	25 RB
					

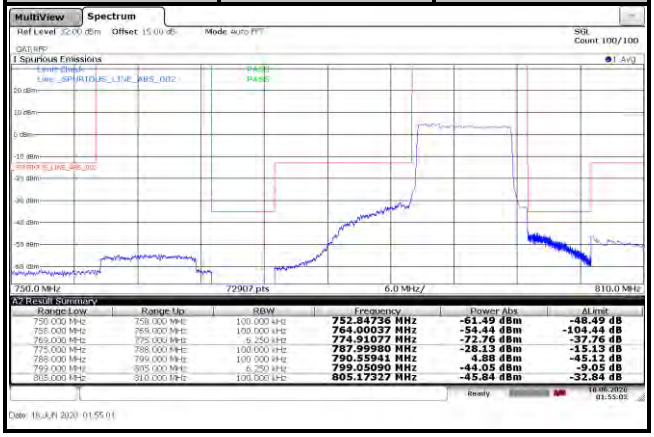
LTE Band 14					
Channel Bandwidth: 5 MHz / 64QAM					
Channel	23305	1 RB	Channel	23355	1 RB
					
Channel	23305	25 RB	Channel	23355	25 RB
					

LTE Band 14					
Channel Bandwidth: 10 MHz / QPSK					
Channel	23330	1 RB	Channel	23330	1 RB

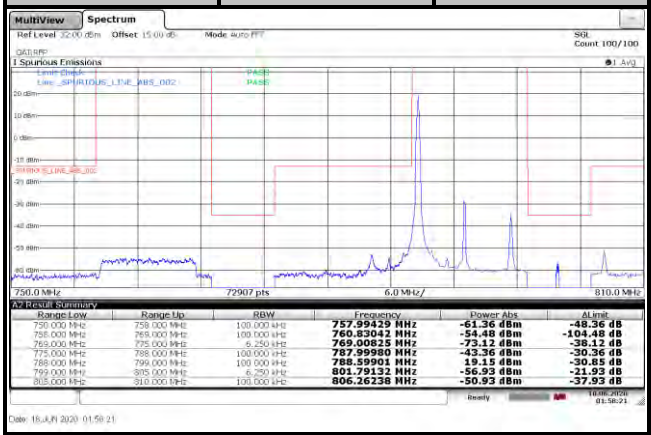


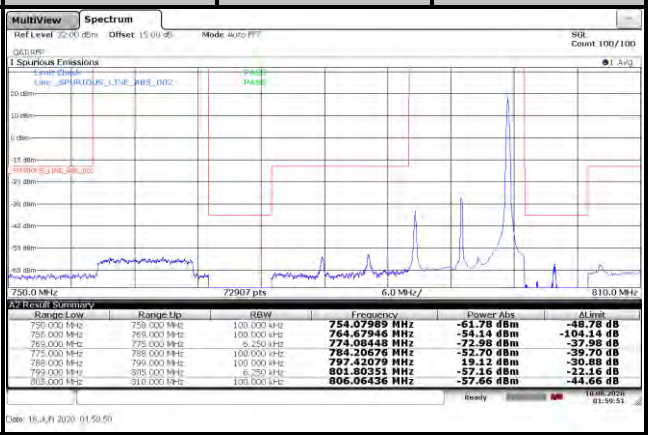


Channel	23330	50 RB

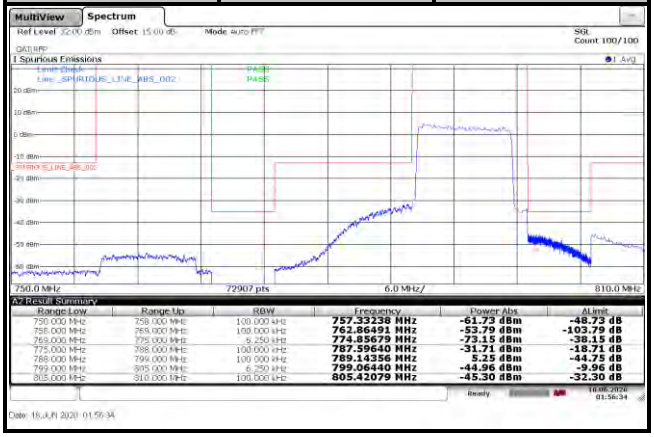


LTE Band 14					
Channel Bandwidth: 10 MHz / 16QAM					
Channel	23330	1 RB	Channel	23330	1 RB

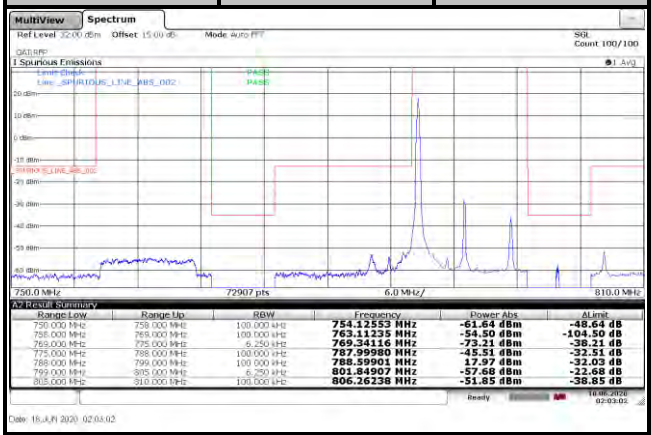


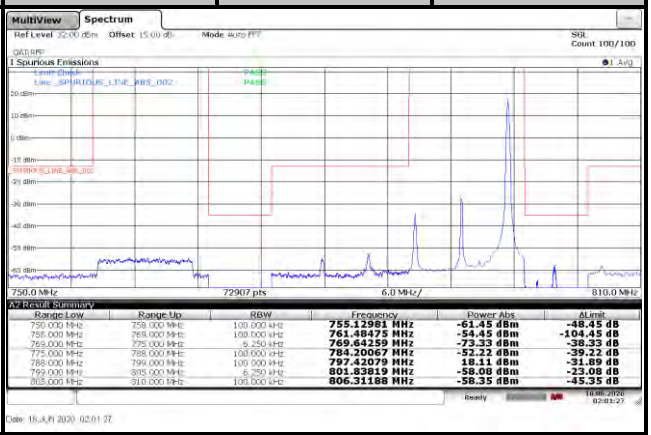


Channel	23330	50 RB

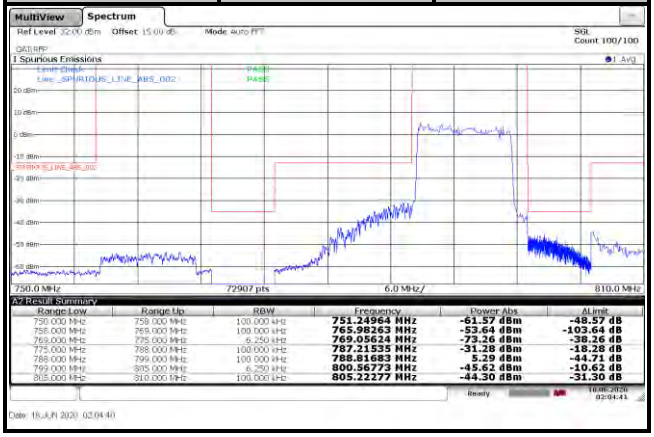


LTE Band 14					
Channel Bandwidth: 10 MHz / 64QAM					
Channel	23330	1 RB	Channel	23330	1 RB





Channel	23330	50 RB



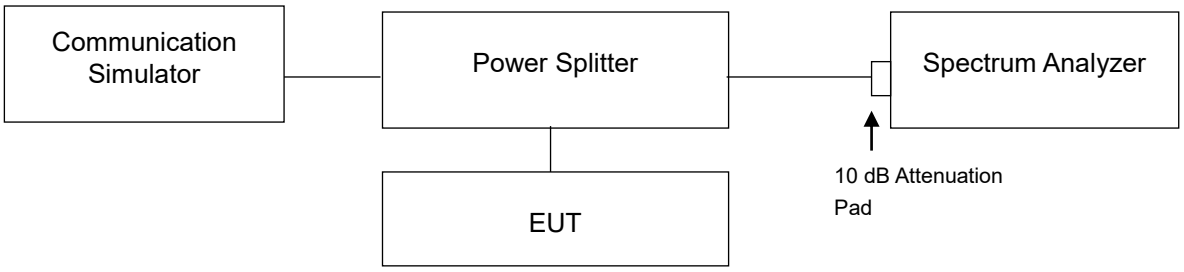
4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 $\log_{10}$(P) dB. The limit of emission is equal to -13 dBm.

On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz. The limit of emission is equal to -40dBm.

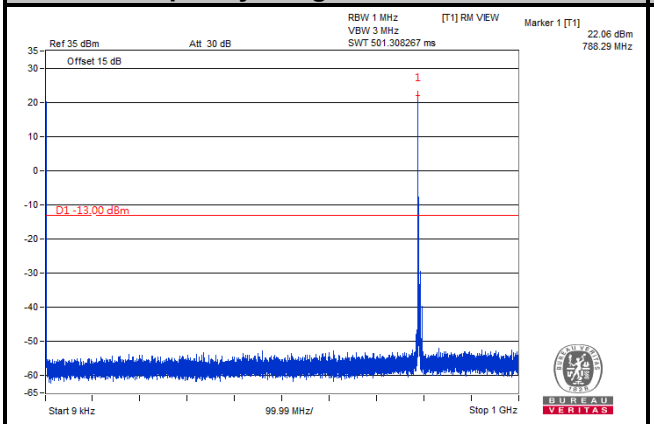
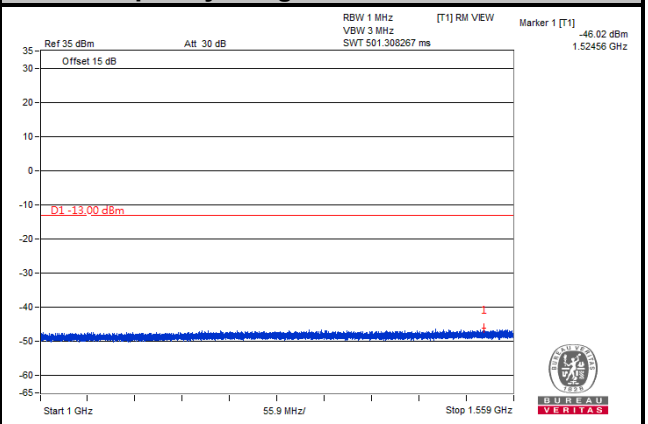
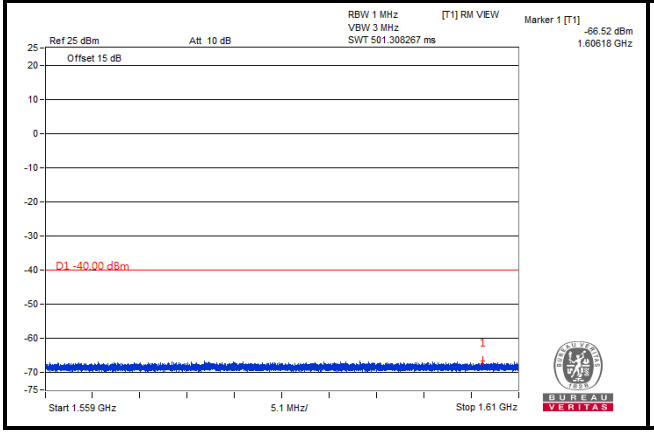
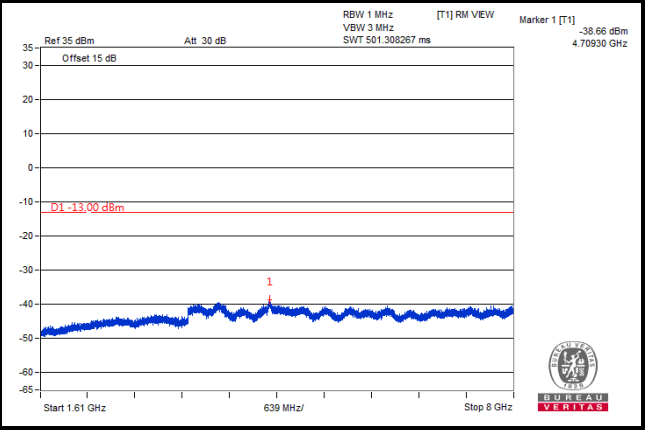
4.7.2 Test Setup



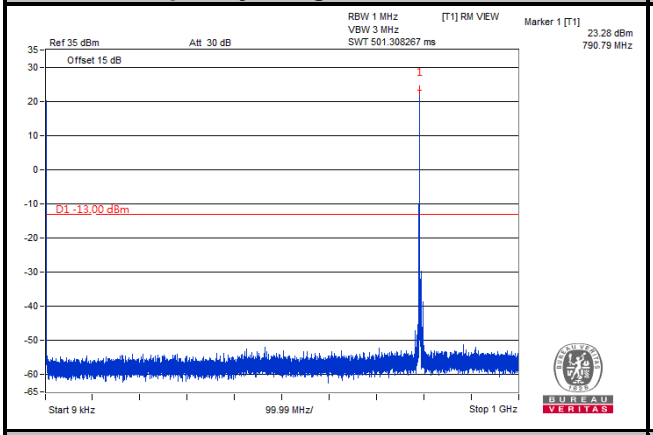
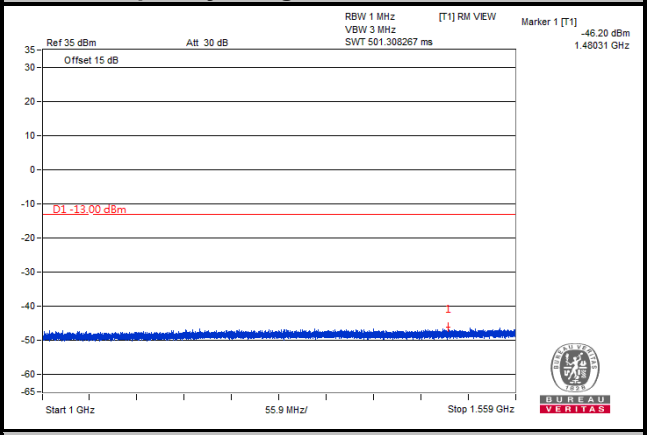
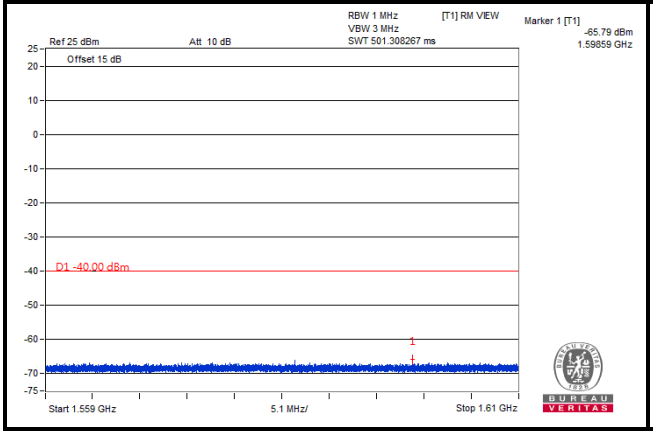
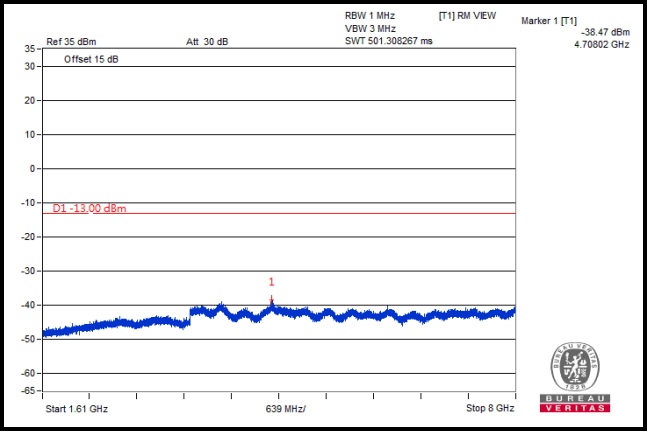
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW= 1 MHz and VBW= 3 MHz are used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 8 / 9 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted emission measurement.

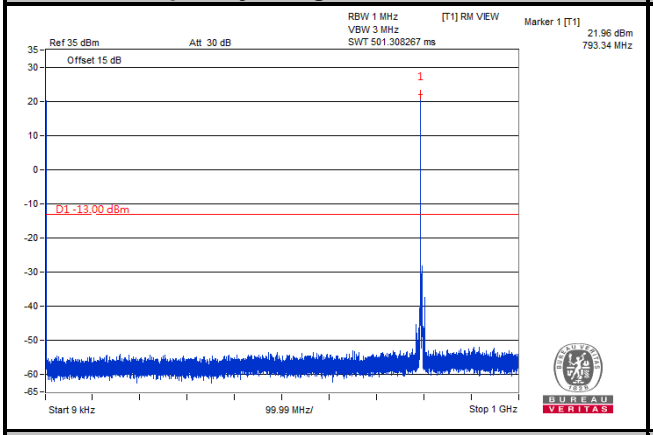
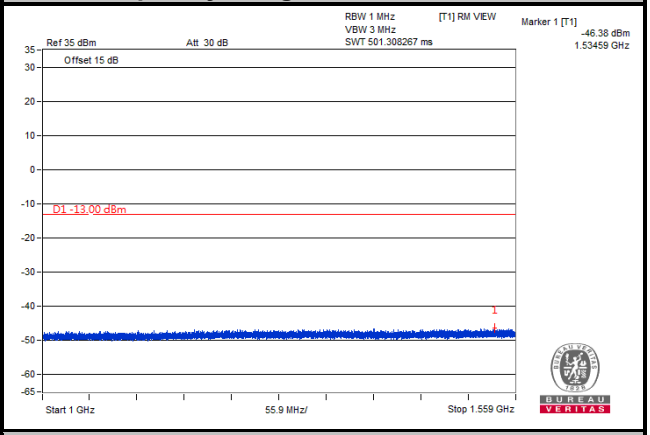
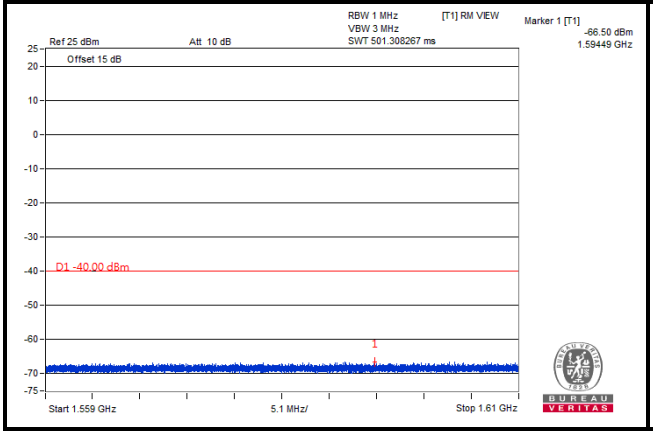
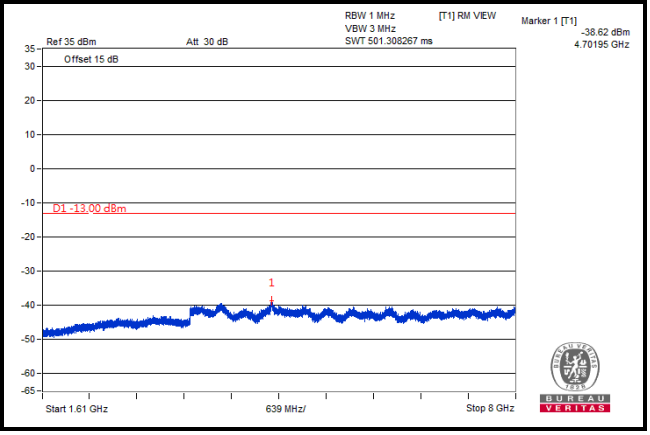
4.7.4 Test Results

LTE Band 14	
Channel Bandwidth: 5 MHz	
Channel 23305	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

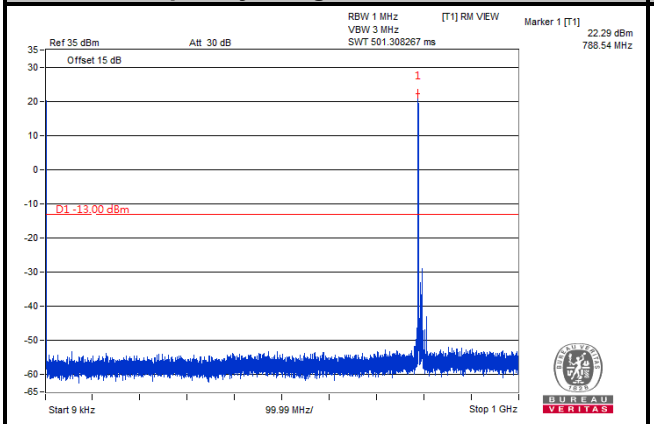
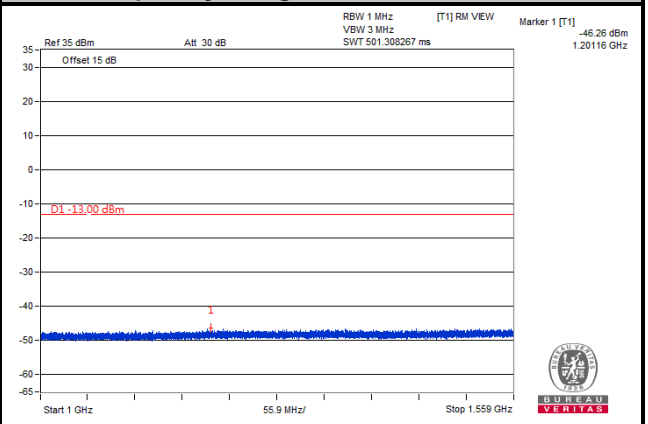
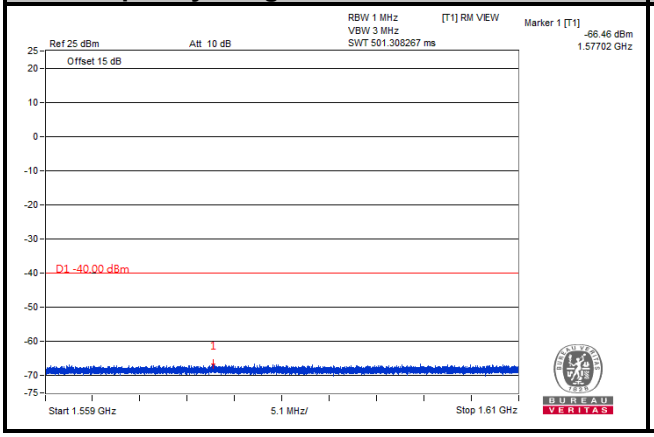
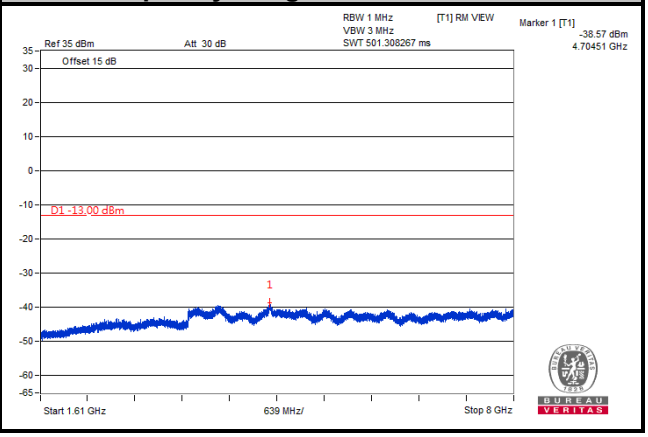
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 14	
Channel Bandwidth: 5 MHz	
Channel 23330	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

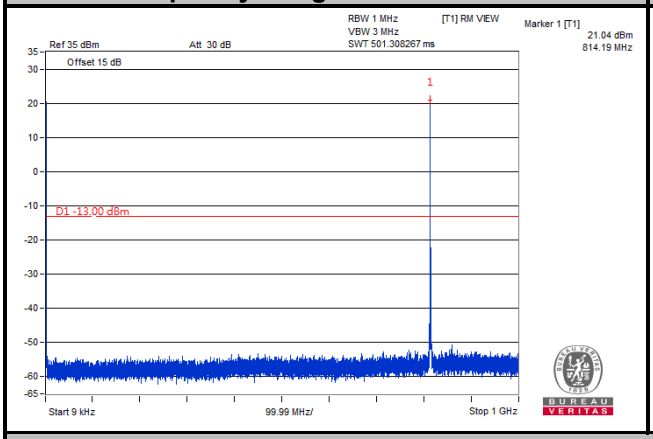
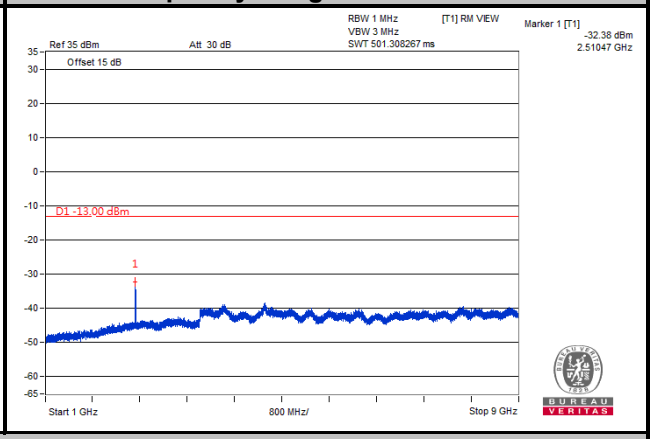
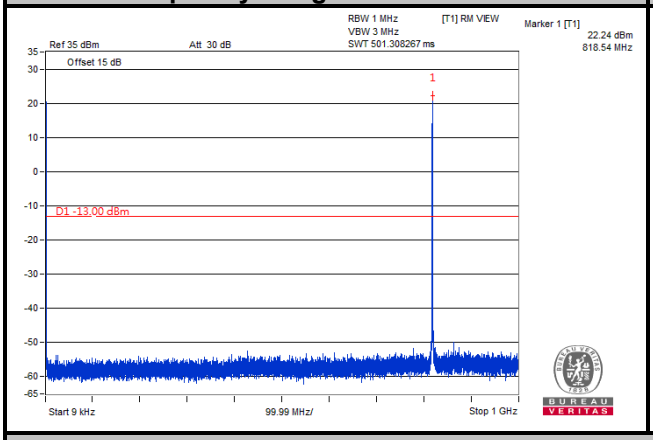
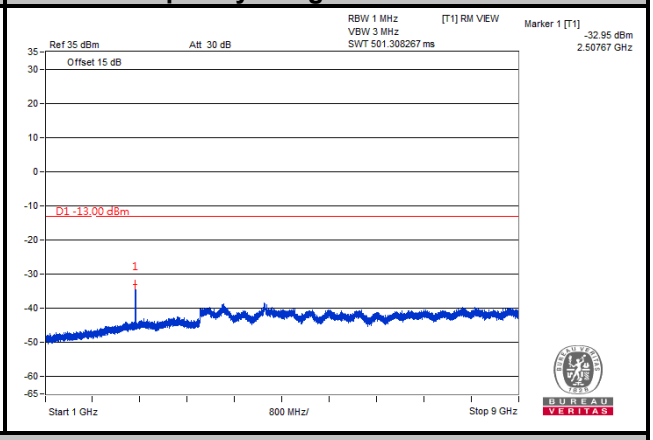
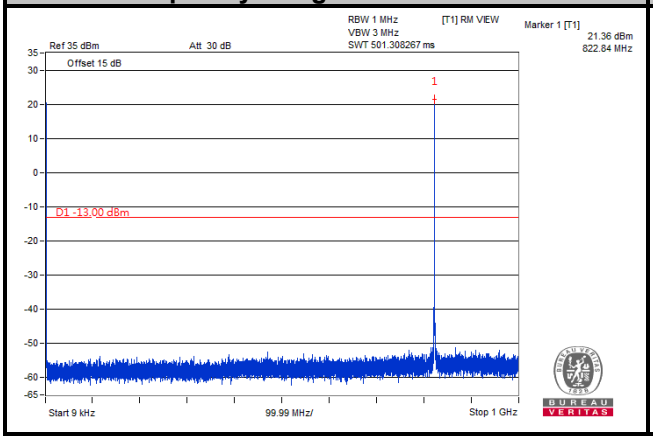
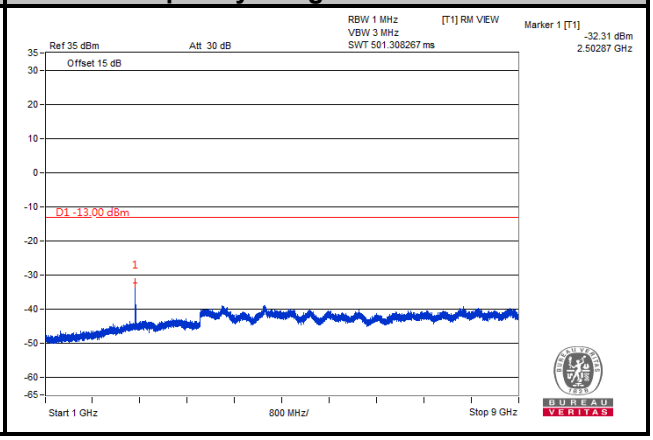
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 14	
Channel Bandwidth: 5 MHz	
Channel 23355	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

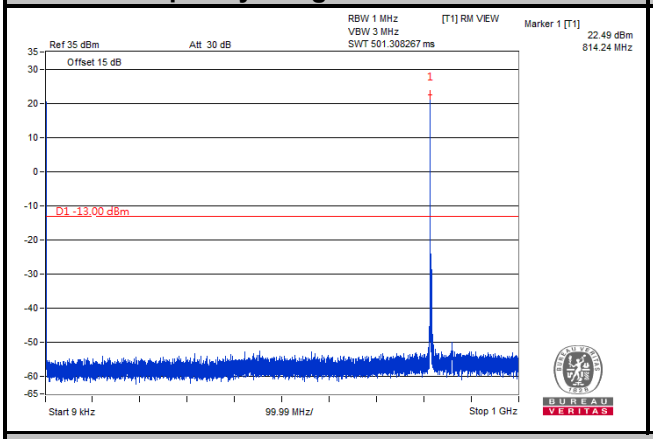
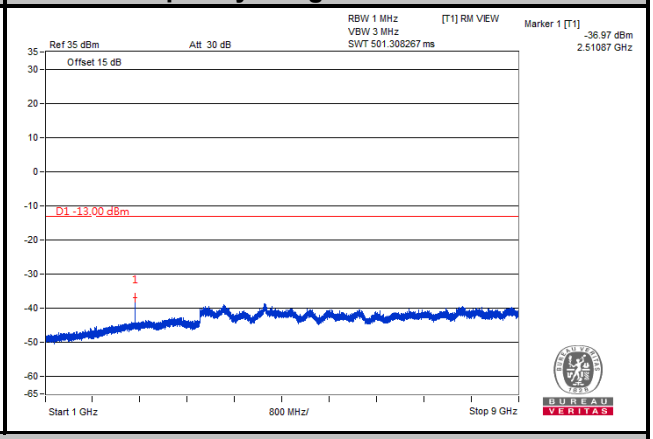
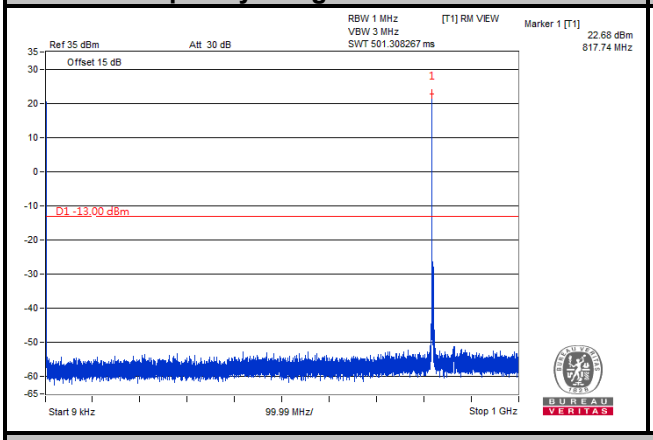
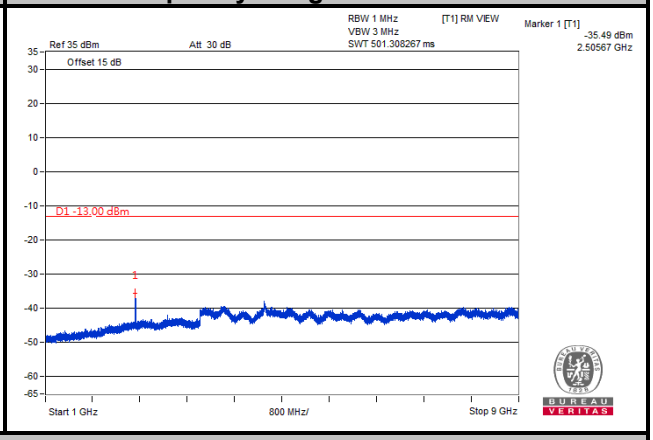
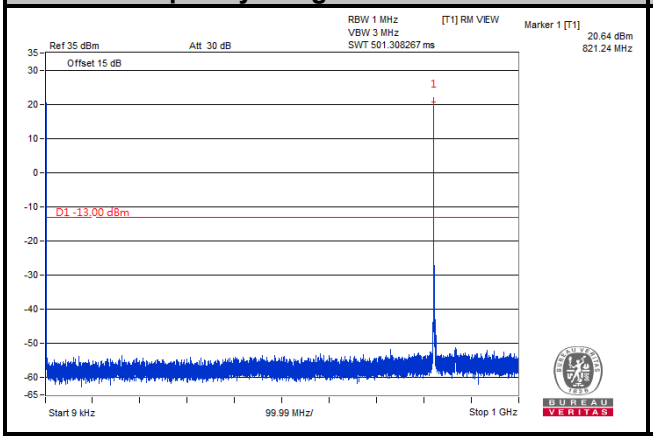
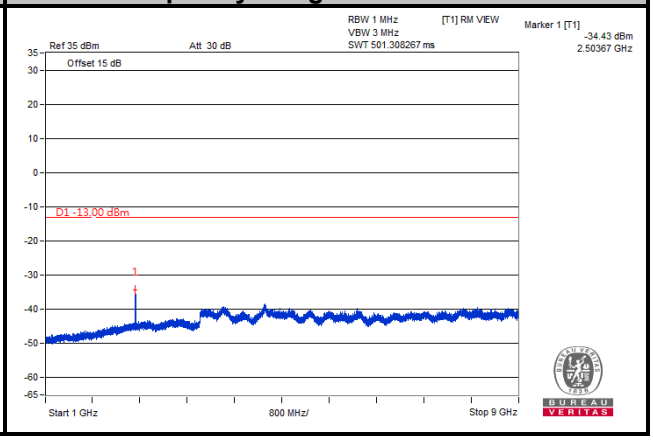
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 14	
Channel Bandwidth: 10 MHz	
Channel 23330	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

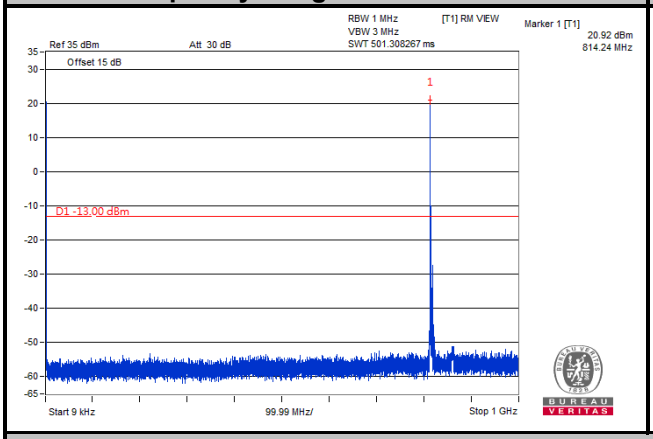
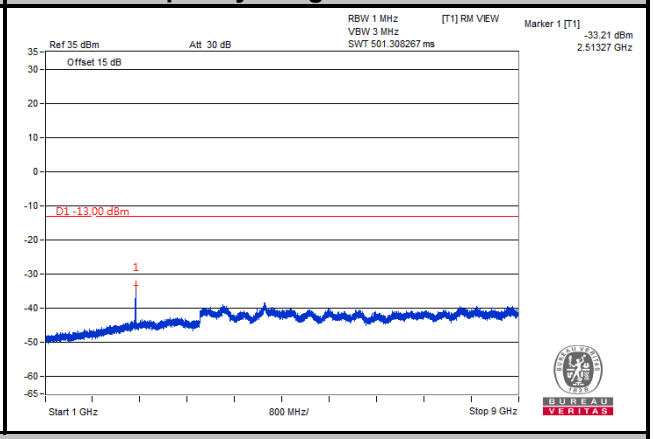
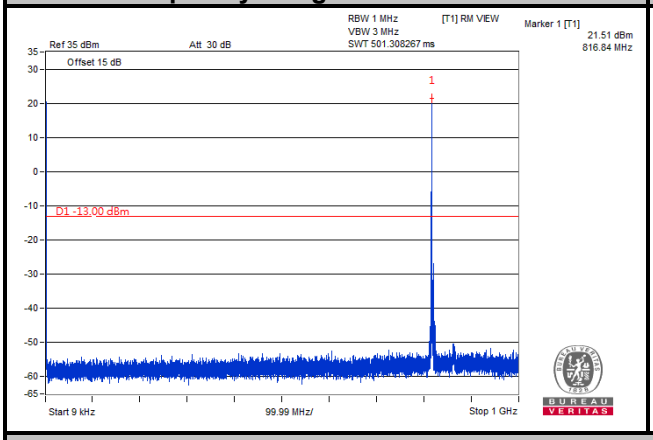
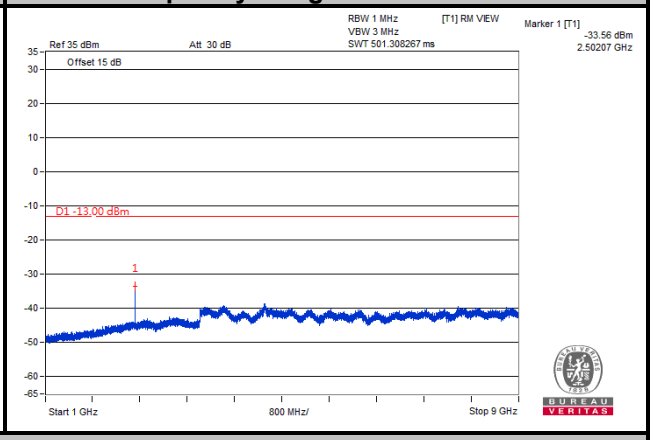
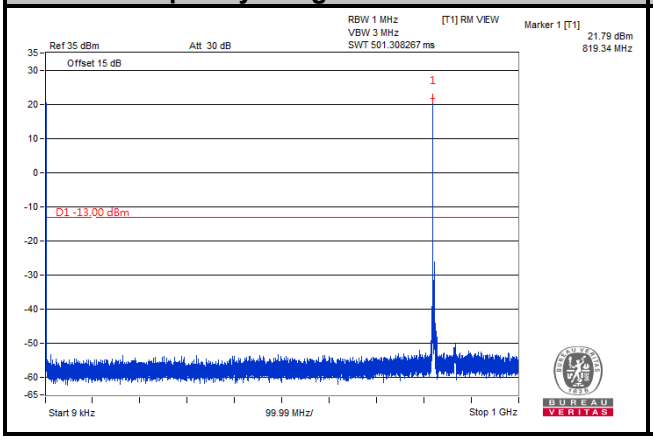
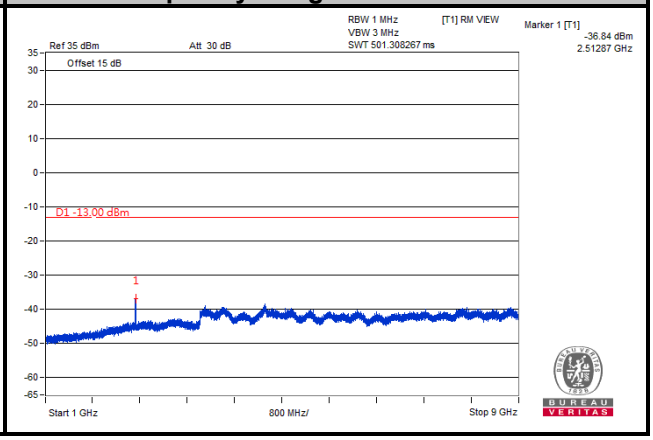
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 1.4 MHz	
Channel 26697	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26783	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	

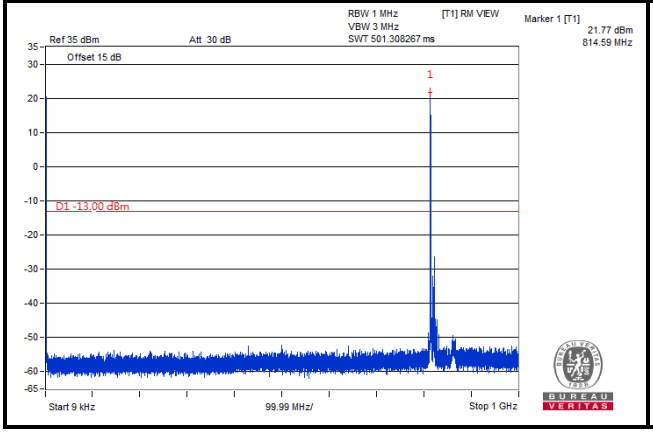
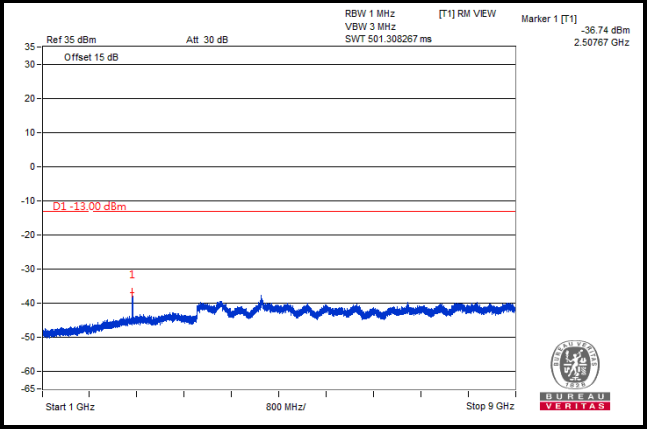
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 3 MHz	
Channel 26705	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26775	
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 26715	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 9 GHz
	
Channel 26765	
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 26740	
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

(1) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission is equal to -13 dBm.

(2) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

4.8.2 Test Procedure

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

b. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

c. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dB.

Note:

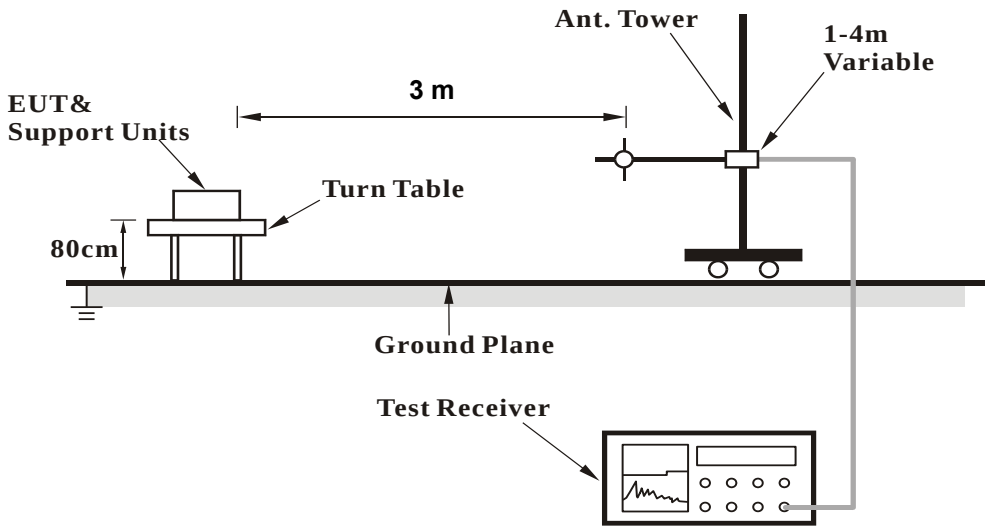
1. The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
   The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

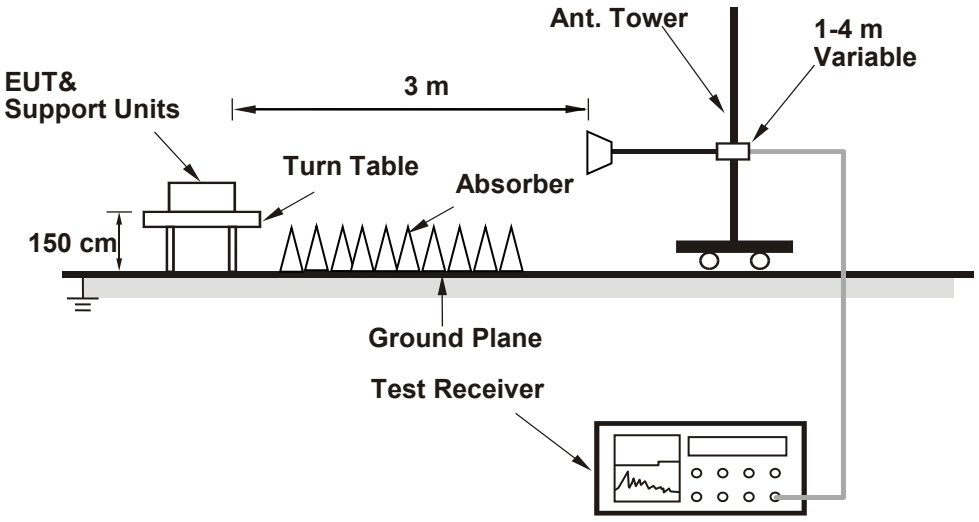
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

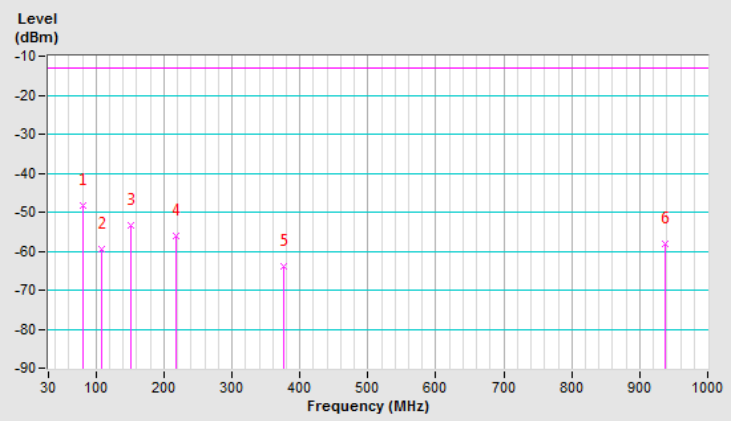
4.8.5 Test Results

Below 1GHz
LTE Band 14, Channel Bandwidth 5MHz

Mode	TX channel 23305 (790.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Luis Lee		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	80.44	-40.20	-46.70	-1.60	-48.30	-13.00	-35.30
2	107.60	-49.80	-60.10	0.50	-59.60	-13.00	-46.60
3	152.22	-47.00	-53.40	0.00	-53.40	-13.00	-40.40
4	218.18	-45.90	-61.40	5.40	-56.00	-13.00	-43.00
5	375.32	-59.90	-69.10	5.30	-63.80	-13.00	-50.80
6	937.92	-63.00	-62.00	3.90	-58.10	-13.00	-45.10

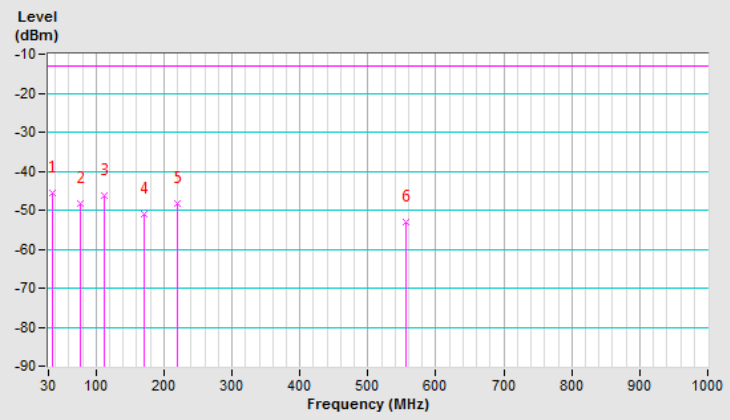
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 23305 (790.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Luis Lee		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	35.82	-35.00	-34.20	-11.40	-45.60	-13.00	-32.60
2	76.56	-41.80	-45.50	-2.80	-48.30	-13.00	-35.30
3	111.48	-37.50	-46.60	0.40	-46.20	-13.00	-33.20
4	171.62	-49.10	-52.70	1.80	-50.90	-13.00	-37.90
5	220.12	-45.90	-53.80	5.40	-48.40	-13.00	-35.40
6	555.74	-52.10	-57.80	4.70	-53.10	-13.00	-40.10

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

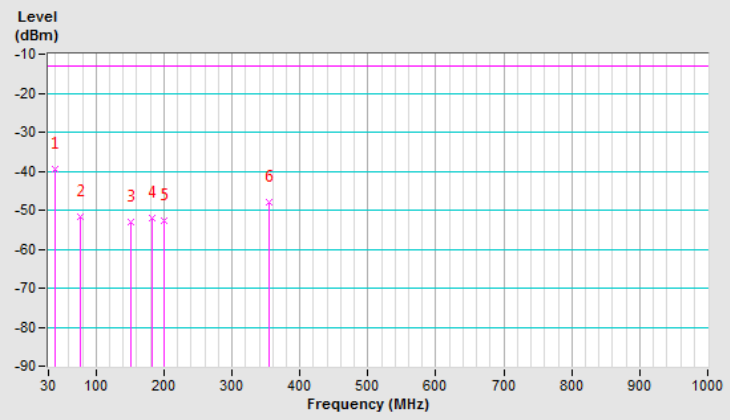


LTE Band 26, Channel Bandwidth 5MHz

Mode	TX channel 26740 (819.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Luis Lee		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-39.50	-28.50	-10.90	-39.40	-13.00	-26.40
2	76.56	-43.40	-48.80	-2.80	-51.60	-13.00	-38.60
3	152.22	-46.50	-53.00	0.00	-53.00	-13.00	-40.00
4	183.26	-41.20	-55.20	3.30	-51.90	-13.00	-38.90
5	200.72	-41.90	-58.10	5.40	-52.70	-13.00	-39.70
6	353.98	-42.60	-53.00	5.20	-47.80	-13.00	-34.80

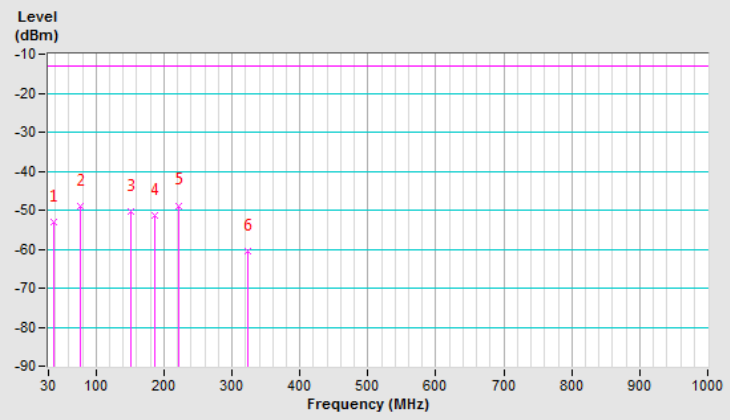
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB).



Mode	TX channel 26740 (819.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Luis Lee		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	37.76	-42.60	-42.00	-11.20	-53.20	-13.00	-40.20
2	76.56	-42.50	-46.20	-2.80	-49.00	-13.00	-36.00
3	152.22	-46.80	-50.20	0.00	-50.20	-13.00	-37.20
4	187.14	-47.00	-55.10	3.80	-51.30	-13.00	-38.30
5	222.06	-45.80	-54.20	5.40	-48.80	-13.00	-35.80
6	322.94	-57.20	-65.60	5.20	-60.40	-13.00	-47.40

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



Above 1GHz
LTE Band 14, Channel Bandwidth 5MHz

Mode	TX channel 23305 (790.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	**1581.00**	**-57.60**	**-59.00**	**5.30**	**-53.70**	**-40.00**	**-13.70**
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1581.00	-59.10	-59.60	5.30	-54.30	-40.00	-14.30

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

Mode	TX channel 23330 (793.0MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1586.00	-58.40	-59.90	5.30	-54.60	-40.00	-14.60
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1586.00	-59.20	-59.70	5.30	-54.40	-40.00	-14.40

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

Mode	TX channel 23355 (795.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1591.00	-59.80	-61.40	5.30	-56.10	-40.00	-16.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1591.00	-59.90	-60.40	5.30	-55.10	-40.00	-15.10

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

LTE Band 26, Channel Bandwidth 10MHz

Mode	TX channel 23330 (793.0MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 68%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1586.00	-58.90	-60.40	5.30	-55.10	-40.00	-15.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1586.00	-59.20	-59.70	5.30	-54.40	-40.00	-14.40

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

LTE Band 26, Channel Bandwidth 1.4MHz

Mode	TX channel 26697 (814.7MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1629.40	-55.90	-59.50	5.40	-54.10	-13.00	-41.10
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1629.40	-58.50	-60.90	5.40	-55.50	-13.00	-42.50

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

Mode	TX channel 26740 (819.0MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-55.10	-58.80	5.50	-53.30	-13.00	-40.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-59.80	-62.10	5.50	-56.60	-13.00	-43.60

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

Mode	TX channel 26783 (823.3MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1646.60	-55.20	-58.80	5.50	-53.30	-13.00	-40.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1646.60	-58.00	-60.30	5.50	-54.80	-13.00	-41.80

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

LTE Band 26, Channel Bandwidth 5MHz

Mode	TX channel 26715 (816.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1633.00	-55.90	-59.50	5.50	-54.00	-13.00	-41.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1633.00	-58.50	-61.00	5.50	-55.50	-13.00	-42.50

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

Mode	TX channel 26740 (819MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-54.60	-58.20	5.50	-52.70	-13.00	-39.70
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-58.50	-60.90	5.50	-55.40	-13.00	-42.40

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

Mode	TX channel 26765 (821.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1643.00	-55.00	-58.50	5.50	-53.00	-13.00	-40.00
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1643.00	-58.10	-60.50	5.50	-55.00	-13.00	-42.00

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

LTE Band 26, Channel Bandwidth 10MHz

Mode	TX channel 26740 (819.0MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	25deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-55.10	-58.80	5.50	-53.30	-13.00	-40.30
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-59.00	-61.40	5.50	-55.90	-13.00	-42.90

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

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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