FCC Test Report
(Part 90)

Report No.:	RF200519C01-2
FCC ID:	A3LSMT975
Test Model:	SM-T975
Received Date:	May 11, 2020
Test Date:	May 29 ~ Jul. 08, 2020
Issued Date:	Jul. 08, 2020
Applicant:	SAMSUNG ELECTRONICS CO. LTD.
Address:	129 Samsung-ro, Yeongtong-gu, Suwon-Si Gyeonggi-do 16677 Korea (Republic Of)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RF200519C01-2	Original release	Jul. 08, 2020

1 Certificate of Conformity

Product:	Tablet
Brand:	Samsung
Test Model:	SM-T975
Sample Status:	Engineering Sample
Applicant:	SAMSUNG ELECTRONICS CO. LTD.
Test Date:	May 29 ~ Jul. 08, 2020
Standards:	FCC Part 90, Subpart I, S

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 : Polly Chien , **Date:** Jul. 08, 2020

Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Jul. 08, 2020

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2			
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	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 -37.5dB at 1633.00MHz & 1643.00MHz.

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	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
PXA Signal Analyzer	N9030B	MY57140938	Mar. 04, 2020	Mar. 03, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2019	Jun. 11, 2020
			Jun. 12, 2020	Jun. 11, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101582	Mar. 31, 2020	Mar. 30, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 07, 2019	Nov. 06, 2020
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-158	Nov. 08, 2019	Nov. 07, 2020
Loop Antenna TESEQ	EM-6879	269	Sep. 16, 2019	Sep. 15, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jul. 11, 2019	Jul. 10, 2020
			Jun. 08, 2020	Jun. 07, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 18, 2020	Feb. 17, 2021
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	BAF-02	5	NA	NA
Standard Temperature And Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 12, 2019	Dec. 11, 2020
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
DC Power Supply Keysight	U8002A	MY56330015	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 13, 2020	Feb. 12, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 27, 2019	Jun. 26, 2020
			Jun. 23, 2020	Jun. 22, 2021
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2019	Nov. 24, 2020

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

3 General Information

3.1 General Description of EUT

Product	Tablet			
Brand	Samsung			
Test Model	SM-T975			
Sample Status	Engineering Sample			
Power Supply Rating	5.0 or 9.0 Vdc (Adapter) 3.4Vdc (Battery)			
Modulation Type	QPSK, 16QAM, 64QAM			
Operating Frequency	LTE Band 26 (Channel Bandwidth 1.4MHz)	814.7MHz ~ 823.3MHz		
	LTE Band 26 (Channel Bandwidth 3MHz)	815.5MHz ~ 822.5MHz		
	LTE Band 26 (Channel Bandwidth 5MHz)	816.5MHz ~ 821.5MHz		
	LTE Band 26 (Channel Bandwidth 10MHz)	819.0MHz		
	LTE Band 26 (Channel Bandwidth 15MHz)	821.5MHz		
Max. ERP Power		QPSK	16QAM	64QAM
	LTE Band 26 (Channel Bandwidth 1.4MHz)	27.542mW (14.4dBm)	21.878mW (13.4dBm)	19.498mW (12.9dBm)
	LTE Band 26 (Channel Bandwidth 3MHz)	30.200mW (14.8dBm)	25.119mW (14.0dBm)	22.909mW (13.6dBm)
	LTE Band 26 (Channel Bandwidth 5MHz)	30.200mW (14.8dBm)	23.442mW (13.7dBm)	20.893mW (13.2dBm)
	LTE Band 26 (Channel Bandwidth 10MHz)	30.903mW (14.9dBm)	25.119mW (14.0dBm)	22.909mW (13.6dBm)
	LTE Band 26 (Channel Bandwidth 15MHz)	32.359mW (15.1dBm)	25.704mW (14.1dBm)	23.442mW (13.7dBm)
Emission Designator		QPSK	16QAM	64QAM
	LTE Band 26 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09W7D	1M09W7D
	LTE Band 26 (Channel Bandwidth 3MHz)	2M70G7D	2M70W7D	2M70W7D
	LTE Band 26 (Channel Bandwidth 5MHz)	4M49G7D	4M49W7D	4M49W7D
	LTE Band 26 (Channel Bandwidth 10MHz)	8M96G7D	8M96W7D	8M96W7D
	LTE Band 26 (Channel Bandwidth 15MHz)	13M4G7D	13M4D7W	13M4D7W
Antenna Type	Refer to Note as below			
Antenna Connector	Refer to Note as below			
Accessory Device	Refer to Note as below			
Cable Supplied	Refer to Note as below			

Note:

1. The EUT uses following antennas.

Antenna Type	Antenna Connector	Band	Frequency (MHz)	Antenna Gain (dBi)
Metal Antenna	C-clip	LTE Band 26	814	-5.03
			831	-5.03
			849	-5.03
			859	-6.93
			876	-6.93
			894	-7.04

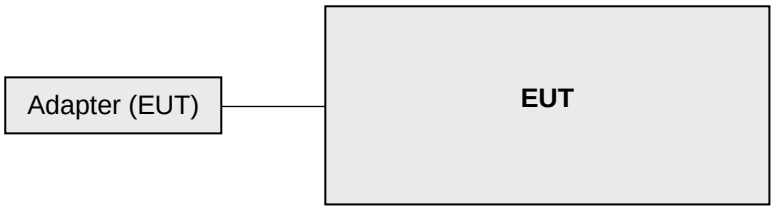
*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2. The EUT uses following accessory devices.

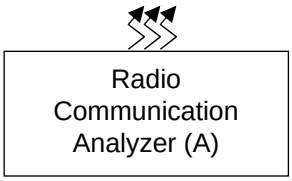
Accessories	Brand	Model	Manufacturer	Specification
Earphone	Samsung	EHS64	Samsung	3.5mm
S-pen	Samsung	EJ-PT870	Samsung	Bluetooth
Keyboard	Samsung	EF-DT970	Samsung	N/A
Cable	Samsung	EP-DG930M	Samsung	A to C type, shielded, 1.0m
Adapter	Samsung	EP-TA200	Samsung	I/P: 100-240Vac, 50-60Hz, 0.5A O/P: 9.0Vdc, 1.67A or 5.0Vdc, 2.0A
Battery	Samsung	EB-BT975ABY	Samsung	Rating: 3.86Vdc, 9800mAh, 37.83Wh

3. LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. 15MHz bandwidth is straddle channels. For 15MHz bandwidth the ERP and Emission of test items are complies the limit line of part22 rule.

3.2 Configuration of System under Test



Remote site



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	NA	-

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

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

LTE Band 26

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	26697 to 26783	26697 (814.7MHz), 26740 (819.0MHz), 26783 (823.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	3 RB / 3 RB Offset
		26705 to 26775	26705 (815.5MHz), 26740 (819.0MHz), 26775 (822.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1 RB / 0 RB Offset
		26715 to 26765	26715 (816.5MHz), 26740 (819.0MHz), 26765 (821.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 RB / 0 RB Offset
		26740	26740 (819.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1 RB / 0 RB Offset
		26765	26765 (821.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	26740	26740 (819.0MHz)	10MHz	QPSK / 16QAM / 64QAM	50 RB / 0 RB Offset
-	Frequency Stability	26697 to 26783	26697 (814.7MHz), 26783 (823.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		26705 to 26775	26705 (815.5MHz), 26775 (822.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		26715 to 26765	26715 (816.5MHz), 26765 (821.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		26740	26740 (819.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
		26765	26765 (821.5MHz)	15MHz	QPSK	75 RB / 0 RB Offset
-	Occupied Bandwidth	26697 to 26783	26697 (814.7MHz), 26740 (819.0MHz), 26783 (823.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	6 RB / 0 RB Offset
		26705 to 26775	26705 (815.5MHz), 26740 (819.0MHz), 26775 (822.5MHz)	3MHz	QPSK / 16QAM / 64QAM	15 RB / 0 RB Offset
		26715 to 26765	26715 (816.5MHz), 26740 (819.0MHz), 26765 (821.5MHz)	5MHz	QPSK / 16QAM / 64QAM	25 RB / 0 RB Offset
		26740	26740 (819.0MHz)	10MHz	QPSK / 16QAM / 64QAM	50 RB / 0 RB Offset
		26765	26765 (821.5MHz)	15MHz	QPSK / 16QAM / 64QAM	75 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Emission Masks	26697 to 26783	26697 (814.7MHz), 26740 (819.0MHz), 26783 (823.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		26705 to 26775	26705 (815.5MHz), 26740 (819.0MHz), 26775 (822.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		26715 to 26765	26715 (816.5MHz), 26740 (819.0MHz), 26765 (821.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		26740	26740 (819.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		26765	26765 (821.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
-	Conducted Emission	26697 to 26783	26697 (814.7MHz), 26740 (819.0MHz), 26783 (823.3MHz)	1.4MHz	QPSK	3 RB / 3 RB Offset
		26705 to 26775	26705 (815.5MHz), 26740 (819.0MHz), 26775 (822.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26715 (816.5MHz), 26740 (819.0MHz), 26765 (821.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		26740	26740 (819.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		26765	26765 (821.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	26715 to 26765	26715 (816.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	26697 to 26783	26697 (814.7MHz), 26740 (819.0MHz), 26783 (823.3MHz)	1.4MHz	QPSK	3 RB / 3 RB Offset
		26715 to 26765	26715 (816.5MHz), 26740 (819.0MHz), 26765 (821.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		26740	26740 (819.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		26765	26765 (821.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset

Note:

1. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
2. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel for final testing.
3. The conducted output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, only ERP, Modulation Characteristics and Emission Bandwidth had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 70%RH	120Vac, 60Hz	James Yang
Modulation characteristics	24deg. C, 64%RH	3.28Vdc	James Yang
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Emission Mask	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Conducted Emission	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Radiated Emission	22deg. C, 66%RH	120Vac, 60Hz	Greg Lin, Han Wu

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:

Test Standard:

FCC 47 CFR Part 2
FCC 47 CFR Part 90
ANSI/TIA/EIA-603-E 2016
ANSI 63.26-2015

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

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01
KDB 971168 D02 Misc Rev Approv License Devices v02r01

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

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. RWB is 5MHz, 10MHz, 15MHz and VBW ≥ 3 x RBW.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

Where:

$ERP/EIRP = P_{Meas} + G_T - L_C$

P_{Meas} : Measure transmitter output power.
G_T : Gain of the transmitting antenna.
L_C : signal attenuation in the connecting cable between the transmitter and antenna.

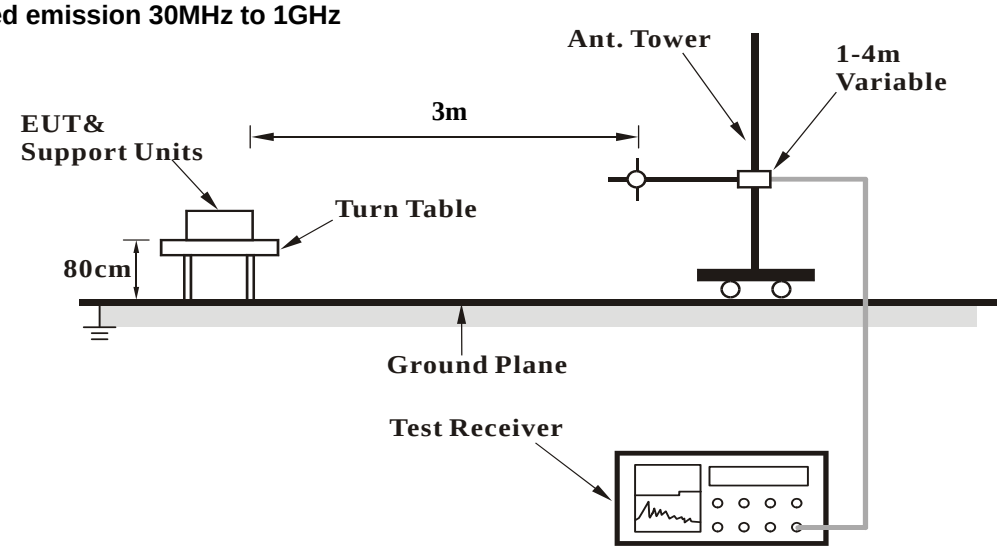
Conducted Power Measurement:

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

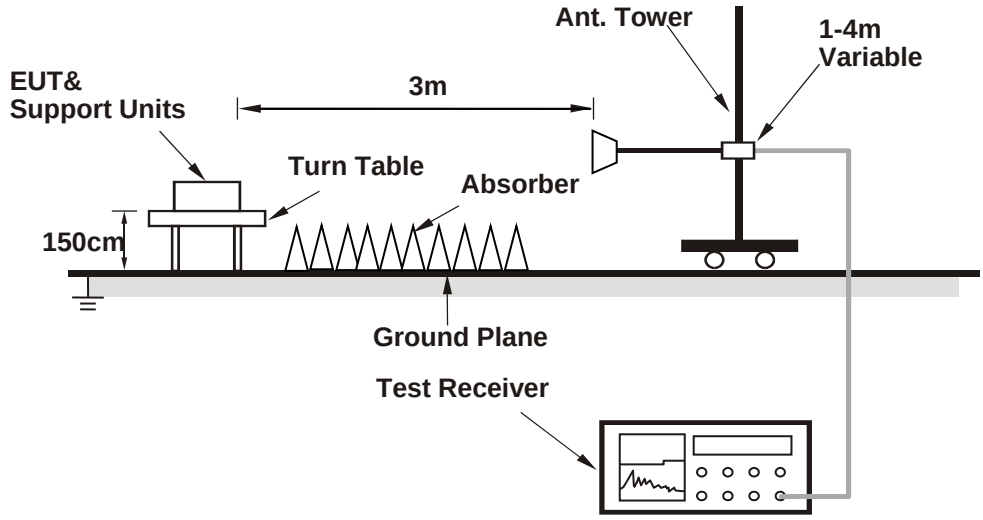
4.1.3 Test Setup

EIRP / ERP Measurement:

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



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

Conducted Power Measurement:

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

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26697	26740	26783
		Frequency (MHz)		814.7	819	823.3
1.4M	QPSK	1	0	23.66	23.71	23.70
		1	2	23.63	23.66	23.68
		1	5	23.74	23.60	23.77
		3	0	23.71	23.78	23.70
		3	1	23.66	23.68	23.77
		3	3	23.67	23.70	23.83
		6	0	22.65	22.67	22.79
	16QAM	1	0	22.89	23.05	23.00
		1	2	22.91	22.88	23.00
		1	5	22.91	22.95	22.91
		3	0	22.75	22.72	22.83
		3	1	22.73	22.63	22.83
		3	3	22.73	22.68	22.85
		6	0	21.72	21.69	21.76
	64QAM	1	0	22.05	21.97	22.05
		1	2	21.75	21.74	21.85
		1	5	21.51	21.49	21.50
		3	0	21.79	21.69	21.89
		3	1	21.61	21.49	21.65
		3	3	21.23	21.29	21.32
		6	0	20.44	20.34	20.40

LTE Band 26						
BW	MCS Index	Channel		26705	26740	26775
		Frequency (MHz)		815.5	819	822.5
3M	QPSK	1	0	23.59	23.64	23.74
		1	7	23.60	23.59	23.73
		1	14	23.62	23.65	23.71
		8	0	22.65	22.66	22.72
		8	3	22.67	22.75	22.78
		8	7	22.76	22.76	22.78
		15	0	22.75	22.74	22.69
	16QAM	1	0	22.99	23.12	22.97
		1	7	23.01	22.94	23.04
		1	14	22.94	22.94	22.96
		8	0	21.77	21.82	21.71
		8	3	21.69	21.63	21.76
		8	7	21.74	21.71	21.86
		15	0	21.65	21.77	21.79
	64QAM	1	0	22.04	21.94	22.06
		1	7	21.76	21.62	21.85
		1	14	21.42	21.49	21.58
		8	0	20.74	20.77	20.85
		8	3	20.62	20.62	20.64
		8	7	20.38	20.32	20.41
		15	0	20.38	20.25	20.35

LTE Band 26						
BW	MCS Index	Channel		26715	26740	26765
		Frequency (MHz)		816.5	819	821.5
5M	QPSK	1	0	23.67	23.79	23.79
		1	12	23.76	23.73	23.76
		1	24	23.54	23.71	23.78
		12	0	22.61	22.81	22.84
		12	6	22.66	22.81	22.82
		12	13	22.67	22.81	22.83
		25	0	22.69	22.82	22.82
	16QAM	1	0	23.00	23.12	23.12
		1	12	22.94	23.02	23.05
		1	24	22.86	22.96	22.99
		12	0	21.80	21.84	21.85
		12	6	21.82	21.76	21.84
		12	13	21.66	21.80	21.88
		25	0	21.75	21.84	21.85
	64QAM	1	0	21.89	22.03	22.09
		1	12	21.68	21.77	21.86
		1	24	21.49	21.63	21.65
		12	0	20.77	20.83	20.93
		12	6	20.54	20.64	20.72
		12	13	20.29	20.35	20.43
		25	0	20.27	20.39	20.45

LTE Band 26				
BW	MCS Index	Channel		26740
		Frequency (MHz)		819
10M	QPSK	1	0	23.79
		1	24	23.73
		1	49	23.71
		25	0	22.81
		25	12	22.81
		25	25	22.81
		50	0	22.82
	16QAM	1	0	23.12
		1	24	23.02
		1	49	22.96
		25	0	21.84
		25	12	21.76
		25	25	21.80
		50	0	21.84
	64QAM	1	0	22.03
		1	24	21.77
		1	49	21.63
		25	0	20.83
		25	12	20.64
		25	25	20.35
		50	0	20.39

LTE Band 26				
BW	MCS Index	Channel		26765
		Frequency (MHz)		821.5
15M	QPSK	1	0	23.79
		1	37	23.76
		1	74	23.78
		36	0	22.84
		36	19	22.82
		36	39	22.83
		75	0	22.82
	16QAM	1	0	23.12
		1	37	23.05
		1	74	22.99
		36	0	21.85
		36	19	21.84
		36	39	21.88
		75	0	21.85
	64QAM	1	0	22.09
		1	37	21.86
		1	74	21.65
		36	0	20.93
		36	19	20.72
		36	39	20.43
		75	0	20.45

ERP Power (dBm)

Modulation Type: QPSK

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	-16.4	10.5	3.9	**14.4**	50.0	-35.6
2	819.00	-17.1	10.1	3.9	14.0	50.0	-36.0
3	823.30	-17.2	10.4	3.9	14.3	50.0	-35.7
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	-20.8	7.1	3.9	11.0	50.0	-39.0
2	819.00	-21.0	7.1	3.9	11.0	50.0	-39.0
3	823.30	-21.1	7.3	3.9	11.2	50.0	-38.8

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	-16.1	10.9	3.9	**14.8**	50.0	-35.2
2	819.00	-16.3	10.9	3.9	**14.8**	50.0	-35.2
3	822.50	-16.7	10.8	3.9	14.7	50.0	-35.3
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	-20.1	7.8	3.9	11.7	50.0	-38.3
2	819.00	-20.3	7.8	3.9	11.7	50.0	-38.3
3	822.50	-22.0	6.2	3.9	10.1	50.0	-39.9

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	-16.2	10.7	3.9	14.6	50.0	-35.4
2	819.00	-16.8	10.4	3.9	14.3	50.0	-35.7
3	821.50	-16.4	10.9	3.9	**14.8**	50.0	-35.2
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	-20.7	7.3	3.9	11.2	50.0	-38.8
2	819.00	-20.7	7.4	3.9	11.3	50.0	-38.7
3	821.50	-20.3	7.9	3.9	11.8	50.0	-38.2

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	-16.2	11.0	3.9	**14.9**	50.0	-35.1
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	-20.1	8.0	3.9	11.9	50.0	-38.1

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

LTE Band 26, Channel Bandwidth 15MHz

MODE		TX channel 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	821.50	-16.2	11.2	3.9	**15.1**	50.0	-34.9
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	821.50	-20.0	8.2	3.9	12.1	50.0	-37.9

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

Modulation Type: 16QAM

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	-17.4	9.5	3.9	**13.4**	50.0	-36.6
2	819.00	-18.0	9.2	3.9	13.1	50.0	-36.9
3	823.30	-18.3	9.3	3.9	13.2	50.0	-36.8
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	-21.4	6.5	3.9	10.4	50.0	-39.6
2	819.00	-22.2	5.9	3.9	9.8	50.0	-40.2
3	823.30	-22.1	6.3	3.9	10.2	50.0	-39.8

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	-16.9	10.1	3.9	**14.0**	50.0	-36.0
2	819.00	-17.2	10.0	3.9	13.9	50.0	-36.1
3	822.50	-17.9	9.6	3.9	13.5	50.0	-36.5
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	-21.1	6.8	3.9	10.7	50.0	-39.3
2	819.00	-21.2	6.9	3.9	10.8	50.0	-39.2
3	822.50	-22.0	6.2	3.9	10.1	50.0	-39.9

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	-17.5	9.5	3.9	13.4	50.0	-36.6
2	819.00	-17.8	9.4	3.9	13.3	50.0	-36.7
3	821.50	-17.6	9.8	3.9	**13.7**	50.0	-36.3
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	-21.7	6.3	3.9	10.2	50.0	-39.8
2	819.00	-21.9	6.2	3.9	10.1	50.0	-39.9
3	821.50	-21.3	6.9	3.9	10.8	50.0	-39.2

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	-17.1	10.1	3.9	**14.0**	50.0	-36.0
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	-21.3	6.8	3.9	10.7	50.0	-39.3

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

LTE Band 26, Channel Bandwidth 15MHz

MODE		TX channel 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	821.50	-17.2	10.2	3.9	**14.1**	50.0	-35.9
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	821.50	-21.1	7.1	3.9	11.0	50.0	-39.0

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

Modulation Type: 64QAM

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	-17.9	9.0	3.9	**12.9**	50.0	-37.1
2	819.00	-18.5	8.7	3.9	12.6	50.0	-37.4
3	823.30	-18.9	8.7	3.9	12.6	50.0	-37.4
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	-21.8	6.1	3.9	10.0	50.0	-40.0
2	819.00	-22.8	5.3	3.9	9.2	50.0	-40.8
3	823.30	-22.6	5.7	3.9	9.6	50.0	-40.4

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	-17.2	9.7	3.9	**13.6**	50.0	-36.4
2	819.00	-17.6	9.6	3.9	13.5	50.0	-36.5
3	822.50	-18.4	9.1	3.9	13.0	50.0	-37.0
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	-21.6	6.3	3.9	10.2	50.0	-39.8
2	819.00	-21.7	6.4	3.9	10.3	50.0	-39.7
3	822.50	-22.6	5.6	3.9	9.5	50.0	-40.5

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	-18.1	8.9	3.9	12.8	50.0	-37.2
2	819.00	-18.3	8.9	3.9	12.8	50.0	-37.2
3	821.50	-18.1	9.3	3.9	**13.2**	50.0	-36.8
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	-22.2	5.8	3.9	9.7	50.0	-40.3
2	819.00	-22.3	5.8	3.9	9.7	50.0	-40.3
3	821.50	-22.0	6.2	3.9	10.1	50.0	-39.9

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	-17.5	9.7	3.9	**13.6**	50.0	-36.4
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	-21.6	6.5	3.9	10.4	50.0	-39.6

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

LTE Band 26, Channel Bandwidth 15MHz

MODE		TX channel 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	821.50	-17.6	9.8	3.9	**13.7**	50.0	-36.3
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	821.50	-21.5	6.7	3.9	10.6	50.0	-39.4

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

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

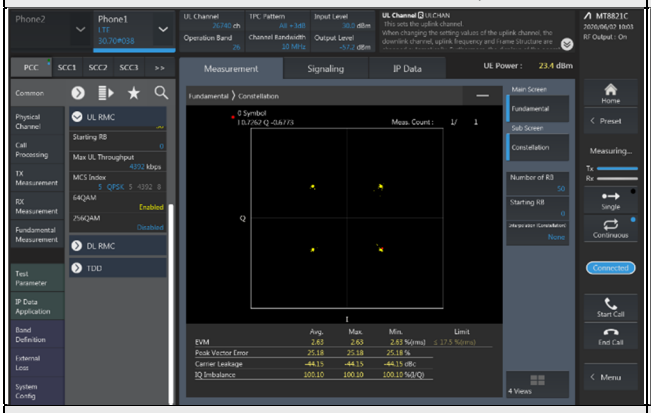
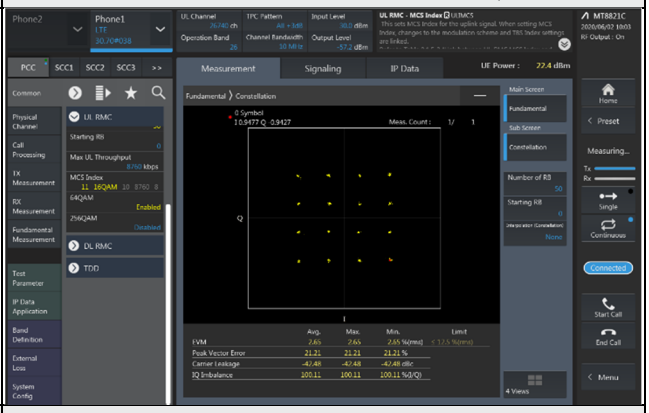
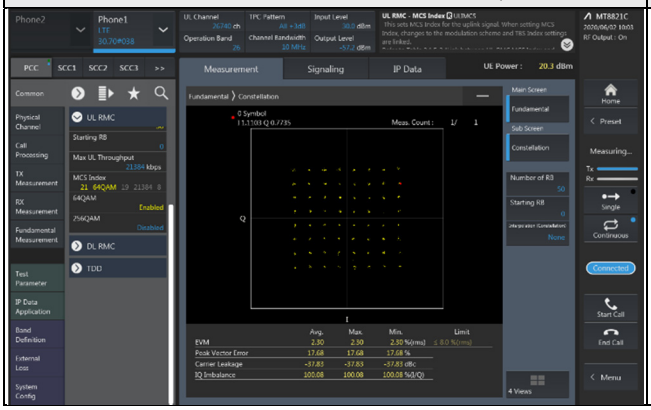
N/A

4.2.2 Test 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.

4.2.3 Test Setup

4.2.4 Test Results

LTE Band 26	
Spectrum Plot of Measurement Value	
Channel: 26740 / Frequency (MHz): 819.0MHz	
Channel Bandwidth 10MHz / QPSK	Channel Bandwidth 10MHz / 16QAM
	
Channel Bandwidth 10MHz / 64QAM	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

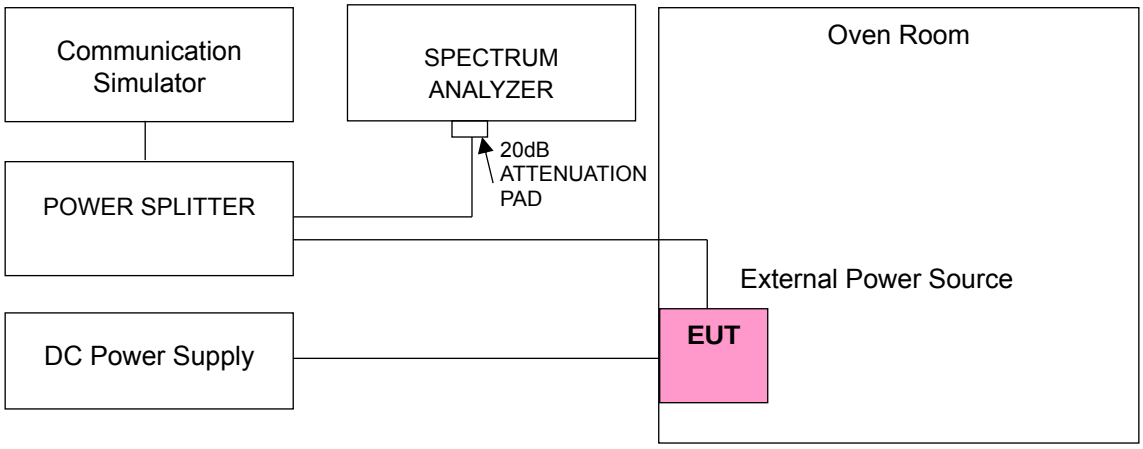
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.86	814.700003	0.003	823.300001	0.002
3.28	814.700002	0.002	823.300001	0.002
4.44	814.700001	0.002	823.300002	0.002

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.44Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	814.700001	0.001	823.300002	0.002
-20	814.700004	0.004	823.300003	0.004
-10	814.700003	0.003	823.300001	0.001
0	814.700002	0.002	823.300002	0.003
10	814.700003	0.003	823.300004	0.004
20	814.699999	-0.001	823.299996	-0.004
30	814.699998	-0.002	823.299997	-0.004
40	814.699998	-0.003	823.299997	-0.004
50	814.699997	-0.004	823.299997	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26			
	Channel Bandwidth: 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.86	815.500001	0.001	822.500002	0.002
3.28	815.500002	0.002	822.500003	0.004
4.44	815.500003	0.004	822.500003	0.004

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.44Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26			
	Channel Bandwidth: 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	815.500004	0.005	822.500003	0.003
-20	815.500004	0.005	822.500002	0.002
-10	815.500002	0.002	822.500002	0.003
0	815.500003	0.004	822.500002	0.002
10	815.500002	0.003	822.500004	0.005
20	815.499998	-0.003	822.499998	-0.002
30	815.499999	-0.001	822.499998	-0.002
40	815.499999	-0.002	822.499998	-0.003
50	815.499997	-0.004	822.499997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26			
	Channel Bandwidth: 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.86	816.500002	0.002	821.500003	0.004
3.28	816.500001	0.001	821.500001	0.001
4.44	816.500002	0.002	821.500003	0.003

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.44Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26			
	Channel Bandwidth: 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	816.500002	0.002	821.500004	0.004
-20	816.500002	0.003	821.500002	0.002
-10	816.500004	0.004	821.500004	0.005
0	816.500004	0.004	821.500003	0.003
10	816.500002	0.002	821.500001	0.001
20	816.499998	-0.003	821.499997	-0.003
30	816.499996	-0.005	821.499996	-0.005
40	816.499998	-0.002	821.499998	-0.002
50	816.499997	-0.004	821.499999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
3.86	819.000001	0.001
3.28	819.000003	0.004
4.44	819.000004	0.005

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.44Vdc.

Frequency Error vs. Temperature

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

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26	
	Channel Bandwidth: 15 MHz	
	Frequency (MHz)	Frequency Error (ppm)
3.86	821.500004	0.005
3.28	821.500004	0.004
4.44	821.500004	0.005

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.44Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26	
	Channel Bandwidth: 15 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	821.500004	0.004
-20	821.500004	0.005
-10	821.500004	0.005
0	821.500003	0.004
10	821.500004	0.004
20	821.499996	-0.005
30	821.499999	-0.002
40	821.499999	-0.001
50	821.499996	-0.004

4.4 Occupied Bandwidth Measurement

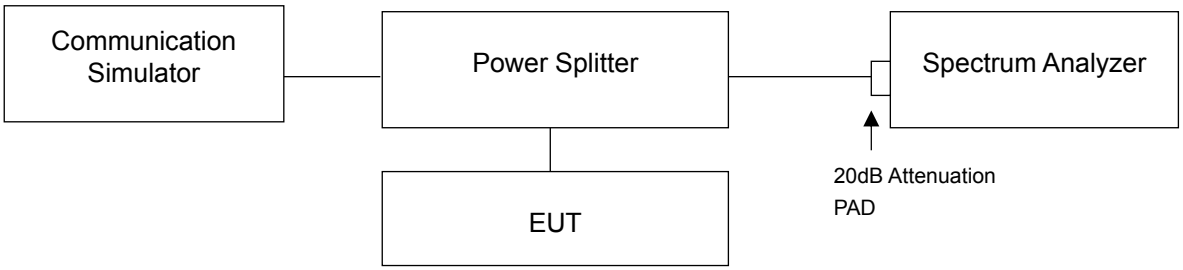
4.4.1 Limits of Occupied Bandwidth Measurement

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 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.

4.4.3 Test Setup



4.4.4 Test Result

Occupied Bandwidth

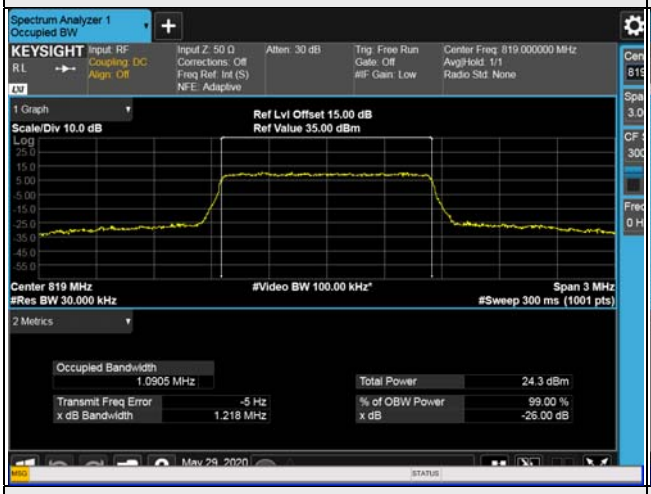
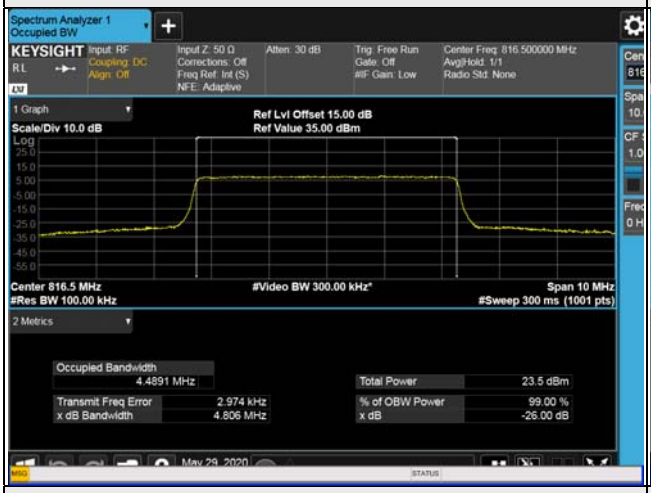
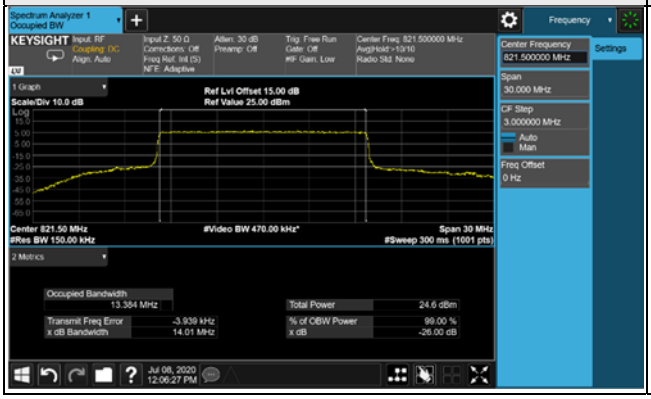
LTE Band 26, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26697	814.7	1.09	1.09	1.09
26740	819.0	1.09	1.09	1.09
26783	823.3	1.09	1.09	1.09

LTE Band 26, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26705	815.5	2.70	2.69	2.69
26740	819.0	2.70	2.69	2.70
26775	822.5	2.70	2.70	2.70

LTE Band 26, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26715	816.5	4.49	4.49	4.49
26740	819.0	4.49	4.49	4.49
26765	821.5	4.49	4.49	4.49

LTE Band 26, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26740	819.0	8.96	8.96	8.96

LTE Band 26, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26765	821.5	13.38	13.37	13.36

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / 64QAM
	
5MHz / 64QAM	10MHz / 16QAM
	
15MHz / QPSK	
	

26dB Bandwidth

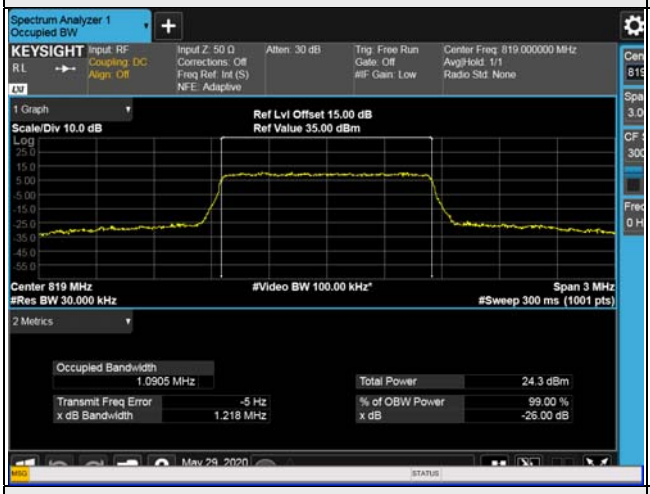
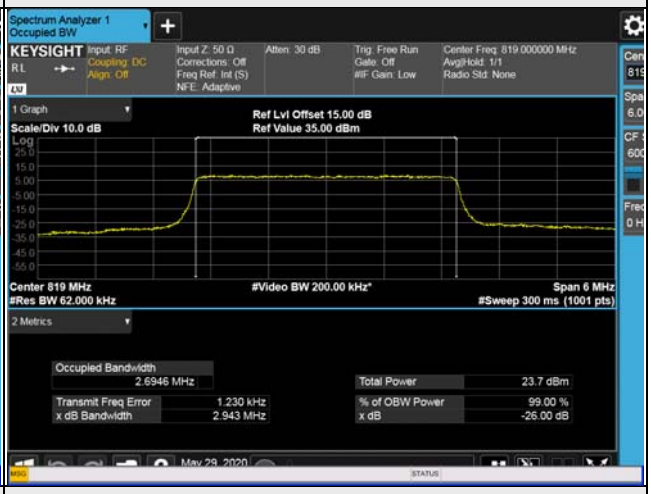
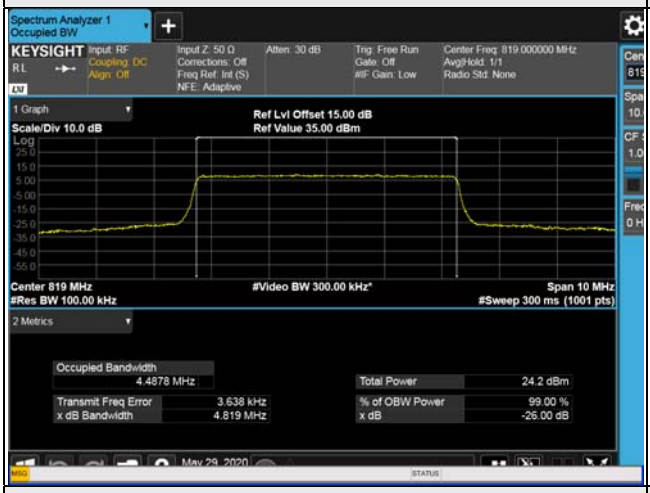
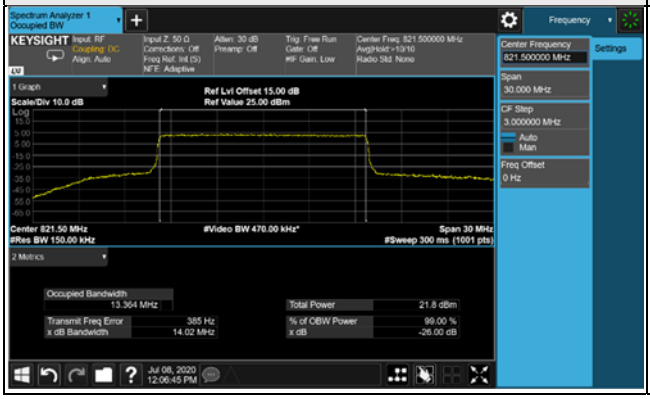
LTE Band 26, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26697	814.7	1.21	1.21	1.21
26740	819.0	1.22	1.22	1.21
26783	823.3	1.21	1.21	1.21

LTE Band 26, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26705	815.5	2.93	2.92	2.93
26740	819.0	2.92	2.94	2.94
26775	822.5	2.93	2.94	2.93

LTE Band 26, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26715	816.5	4.80	4.79	4.81
26740	819.0	4.82	4.80	4.81
26765	821.5	4.80	4.81	4.79

LTE Band 26, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26740	819.0	9.52	9.52	9.51

LTE Band 26, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26765	821.5	14.01	13.99	14.02

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / 16QAM
	
5MHz / QPSK	10MHz / 16QAM
	
15MHz / 64QAM	
	

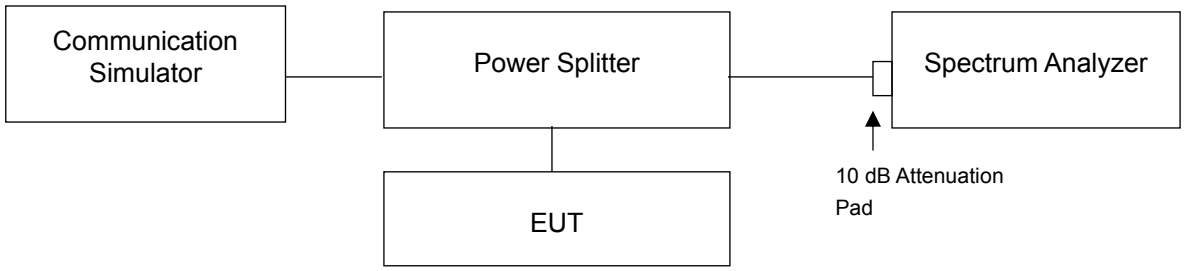
4.5 Emission Mask Measurement

4.5.1 Limits of Emission Mask Measurement

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, tested in accordance with FCC KDB 971168 D02 section VIII.

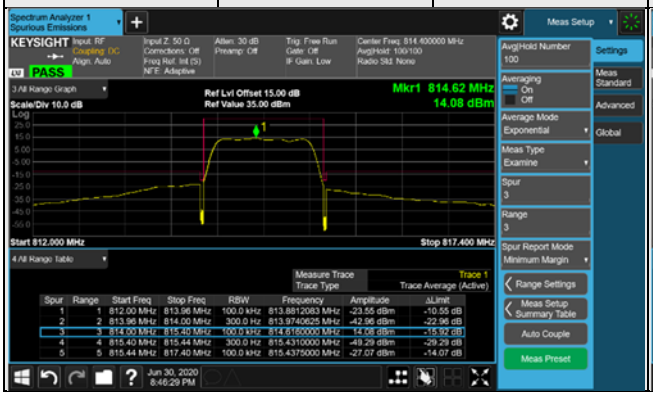
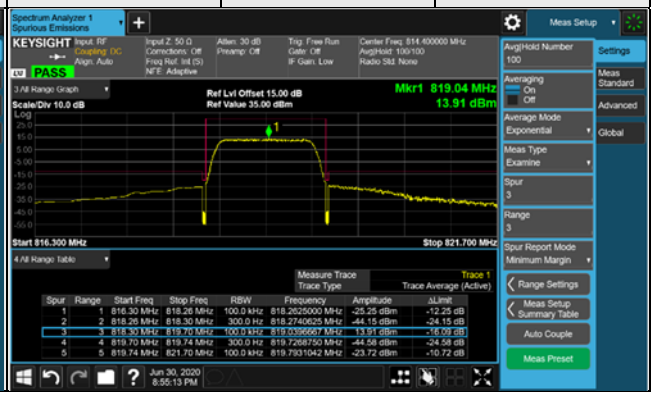
4.5.2 Test Setup

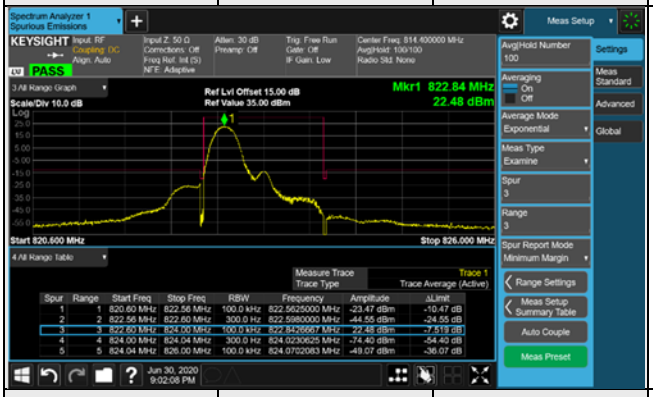


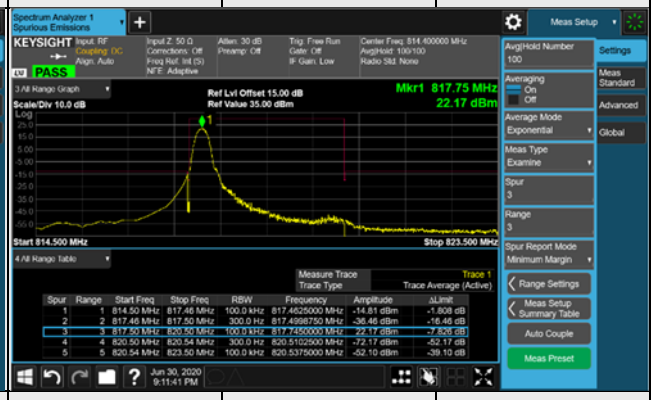
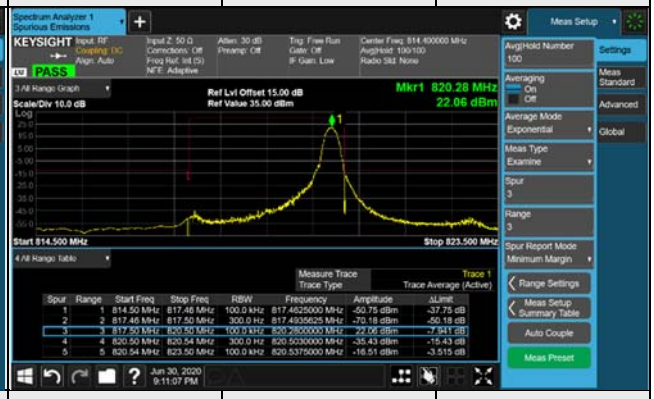
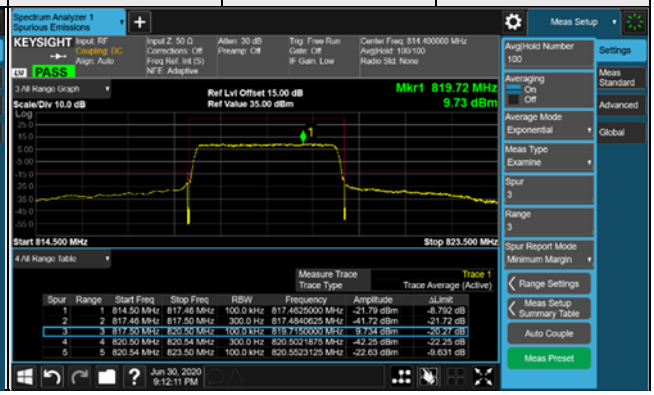
4.5.3 Test Procedures

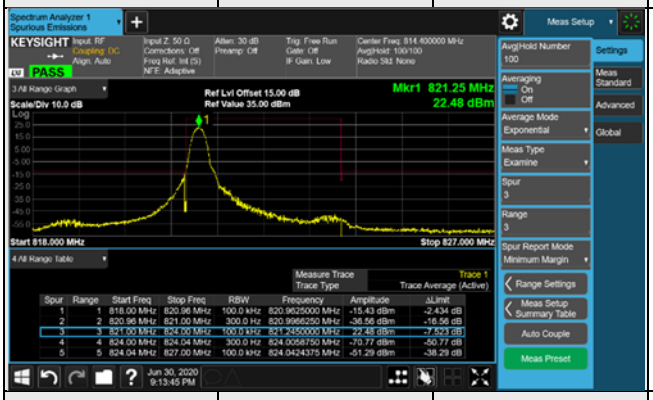
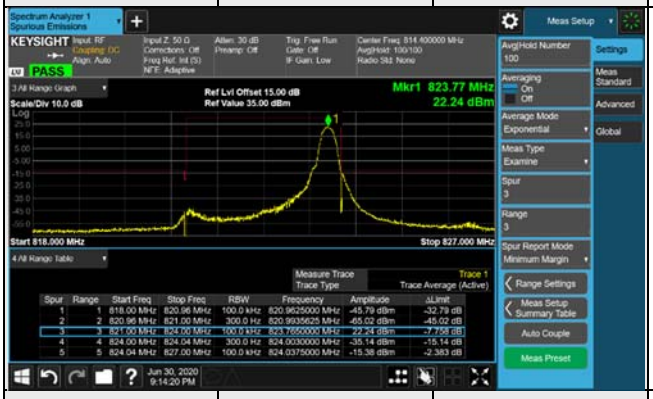
a. The measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Record the test plot.

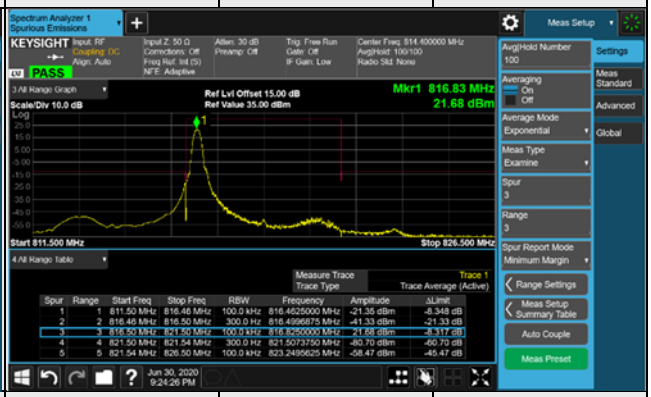
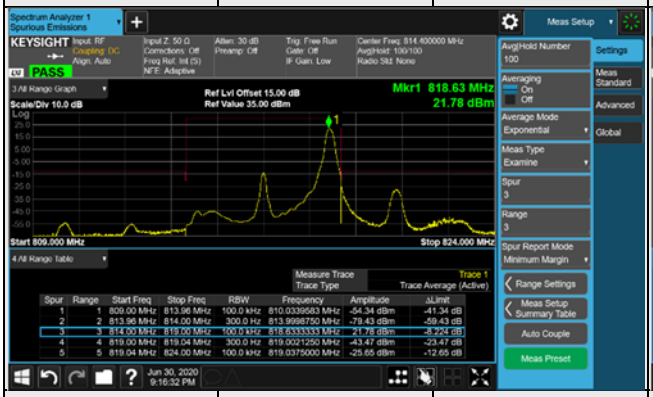
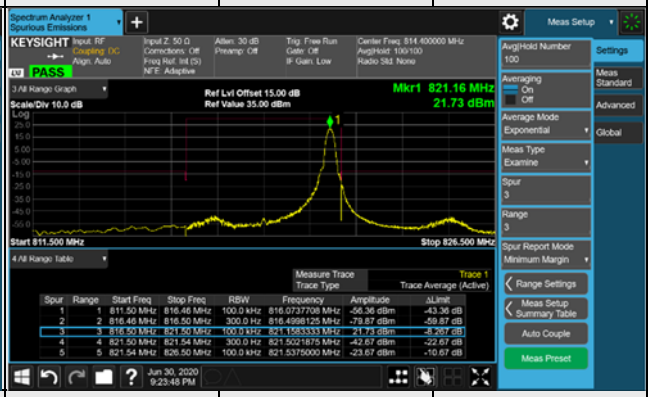
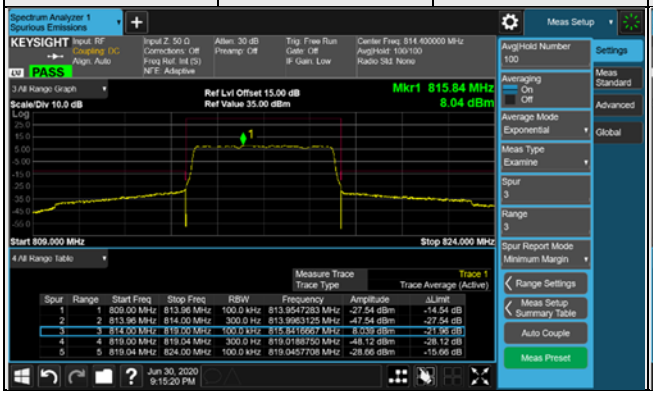
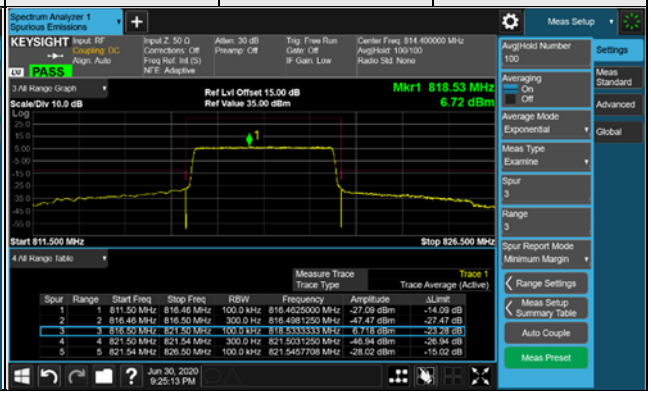
4.5.4 Test Results

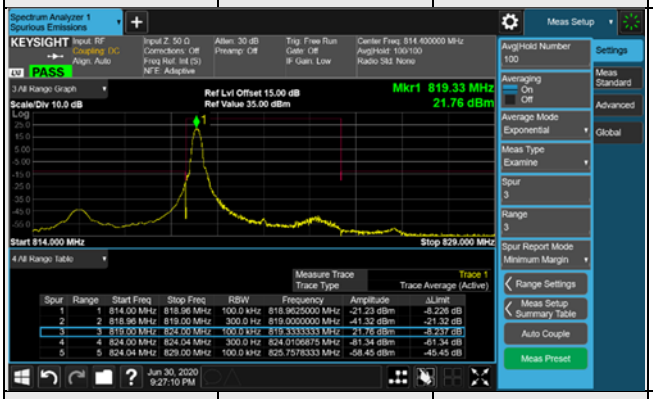
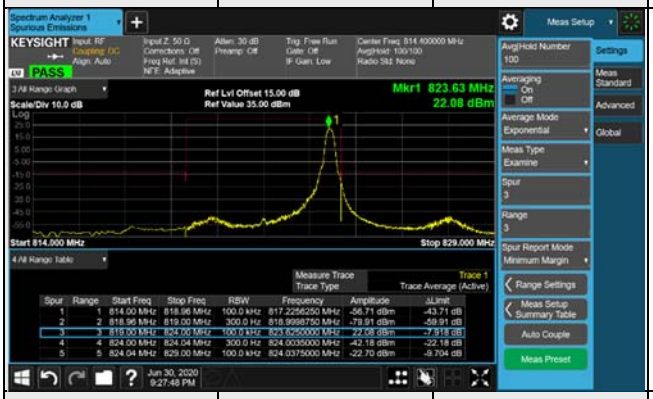
LTE Band 26					
Channel Bandwidth: 1.4 MHz / QPSK					
Channel	26697	1 RB 0	Channel	26740	1 RB 0
					
Channel	26697	1 RB 5	Channel	26740	1 RB 5
					
Channel	26697	Full RB	Channel	26740	Full RB
					

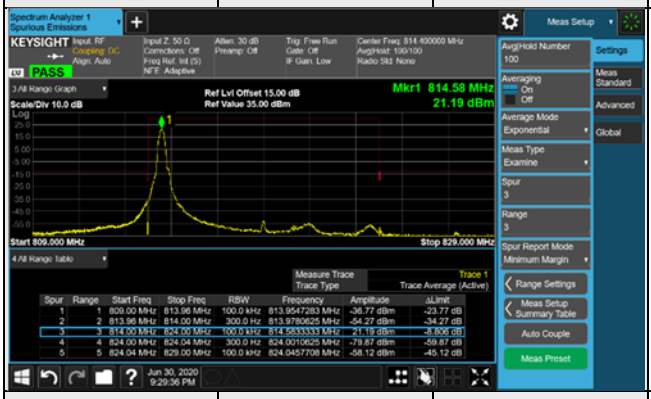
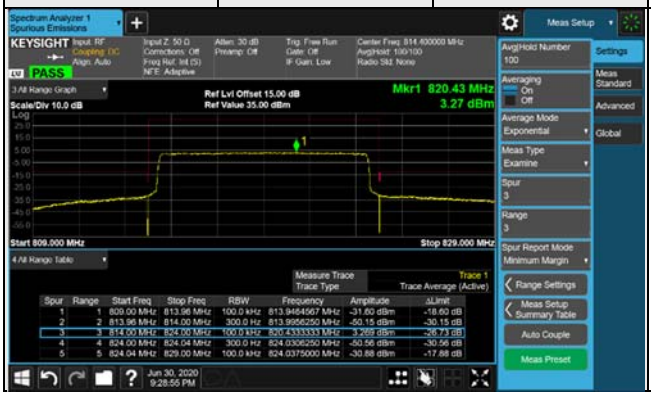
LTE Band 26					
Channel Bandwidth: 1.4 MHz / QPSK					
Channel	26783	1 RB 0			
					
Channel	26783	1 RB 5			
					
Channel	26783	Full RB			
					

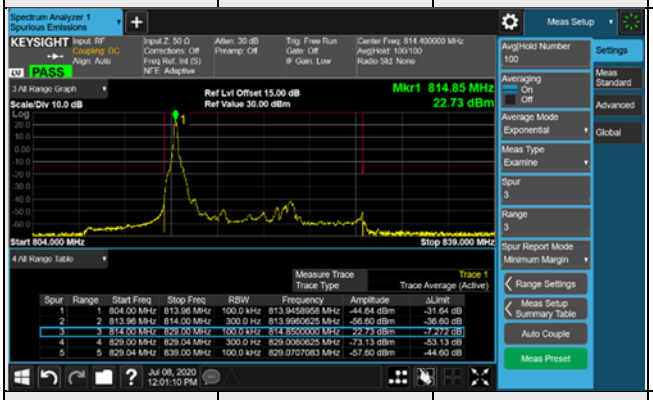
LTE Band 26					
Channel Bandwidth: 3 MHz / QPSK					
Channel	26705	1 RB 0	Channel	26740	1 RB 0
					
Channel	26705	1 RB 14	Channel	26740	1 RB 14
					
Channel	26705	Full RB	Channel	26740	Full RB
					

LTE Band 26					
Channel Bandwidth: 3 MHz / QPSK					
Channel	26775	1 RB 0			
					
Channel	26775	1 RB 14			
					
Channel	26775	Full RB			
					

LTE Band 26					
Channel Bandwidth: 5 MHz / QPSK					
Channel	26715	1 RB 0	Channel	26740	1 RB 0
					
Channel	26715	1 RB 24	Channel	26740	1 RB 24
					
Channel	26715	Full RB	Channel	26740	Full RB
					

LTE Band 26					
Channel Bandwidth: 5 MHz / QPSK					
Channel	26765	1 RB 0			
					
Channel	26765	1 RB 24			
					
Channel	26765	Full RB			
					

LTE Band 26					
Channel Bandwidth: 10 MHz / QPSK					
Channel	26740	1 RB 0			
					
Channel	26740	1 RB 49			
					
Channel	26740	Full RB			
					

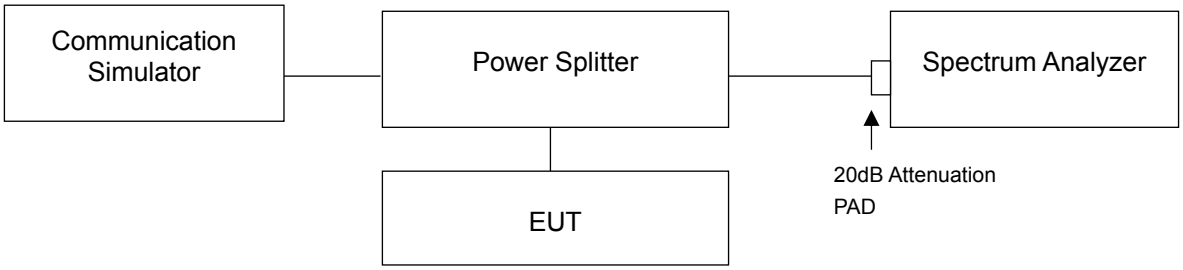
LTE Band 26					
Channel Bandwidth: 15 MHz / QPSK					
Channel	26765	1 RB 0			
					
Channel	26765	1 RB 74			
					
Channel	26765	Full RB			
					

4.6 Conducted Spurious Emissions

4.6.1 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 equal to –13dBm.

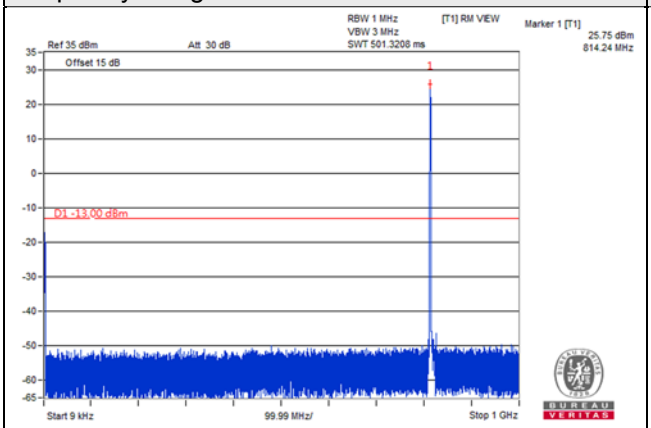
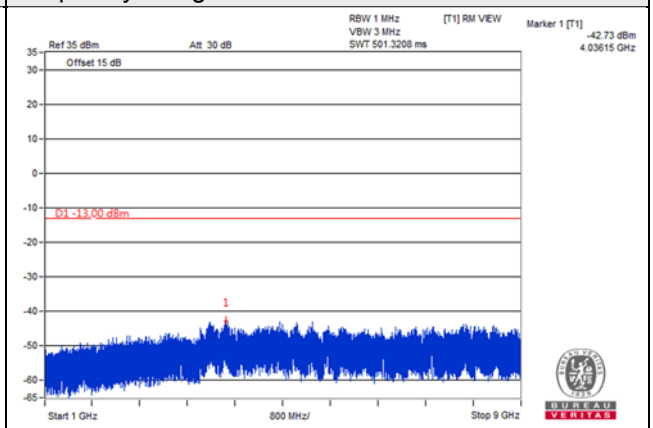
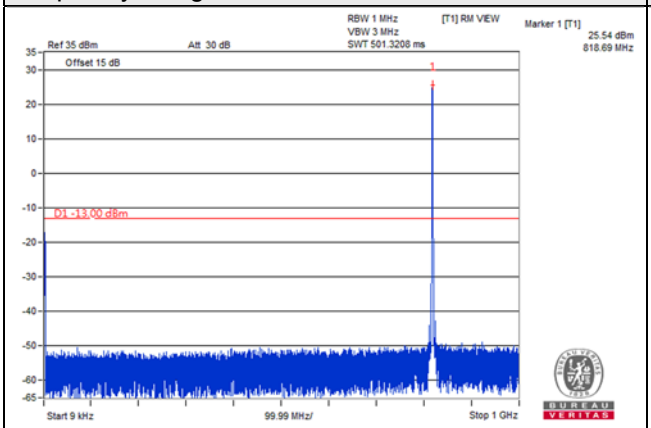
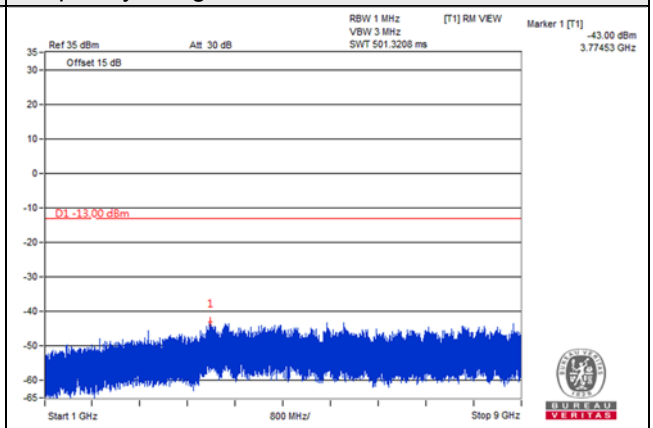
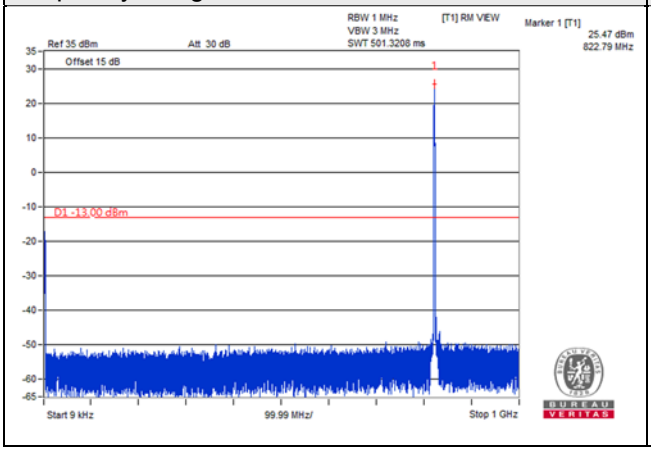
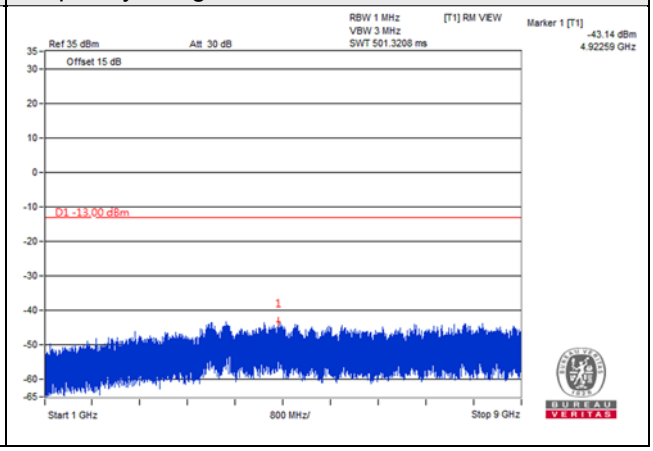
4.6.2 Test Setup

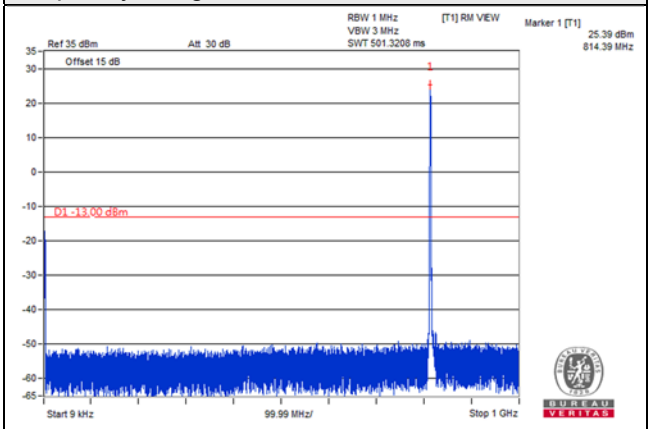
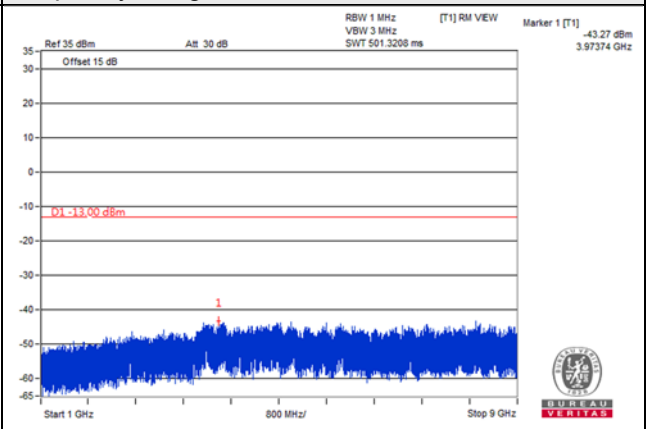
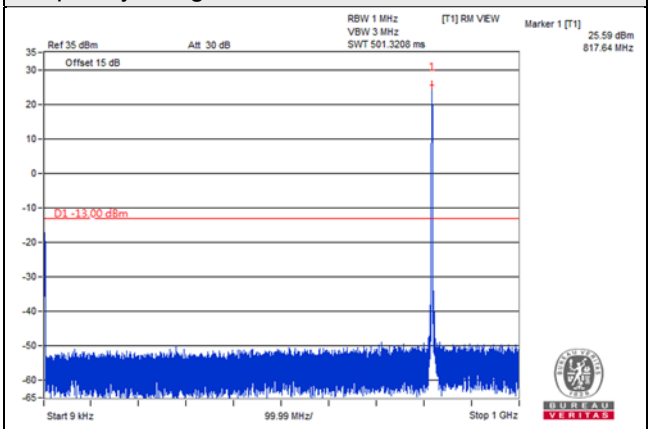
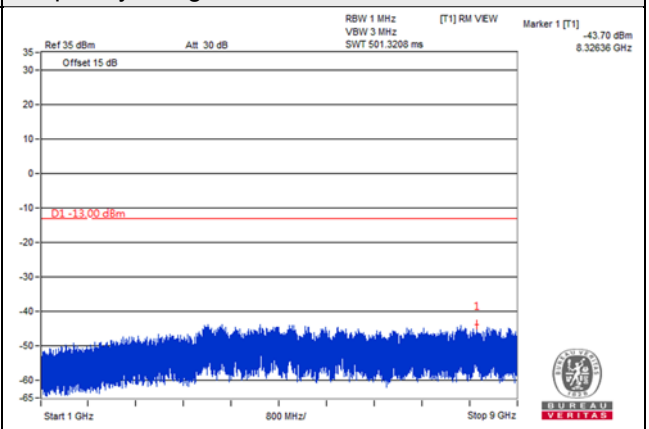
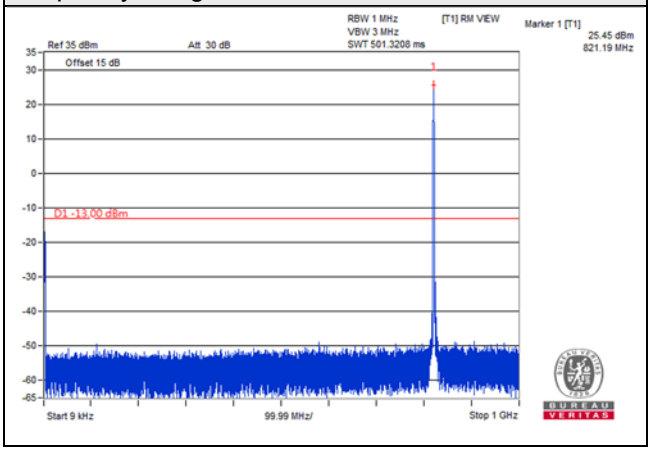
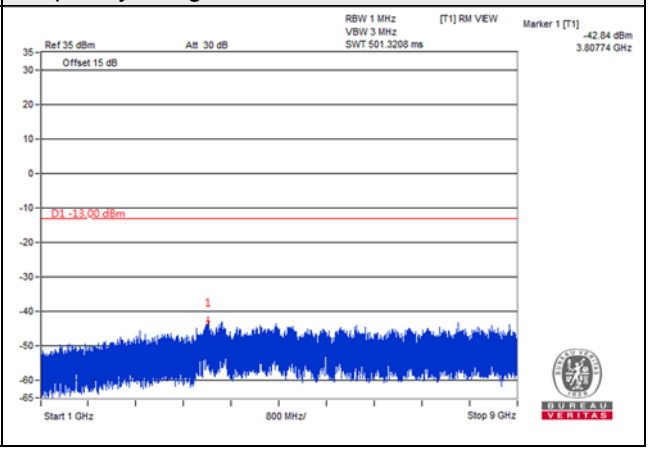


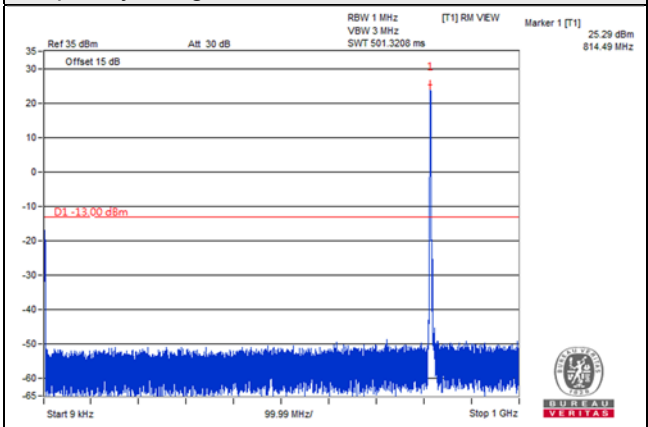
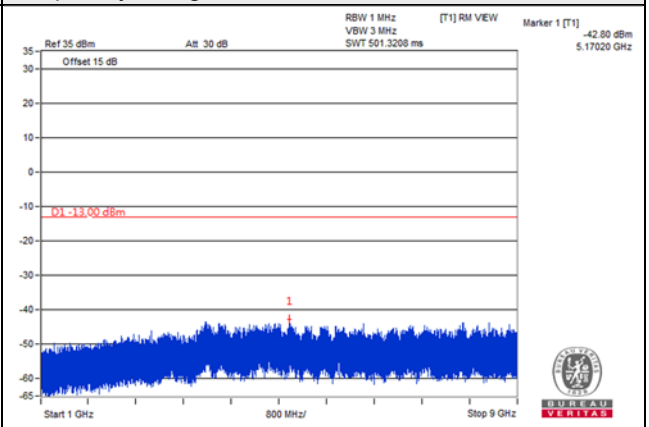
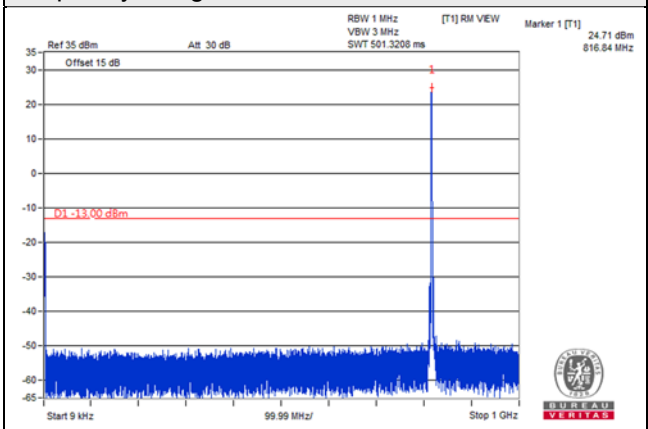
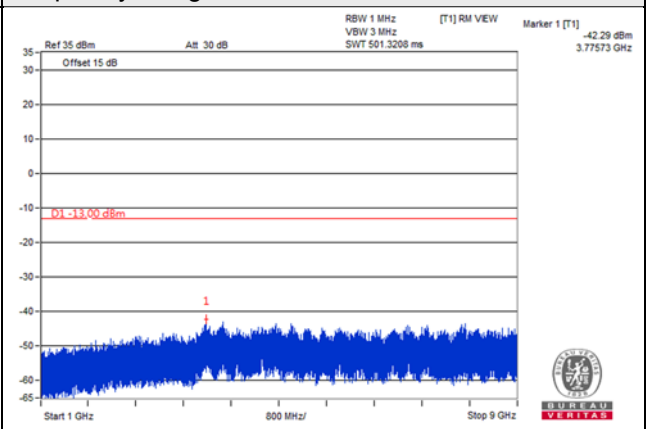
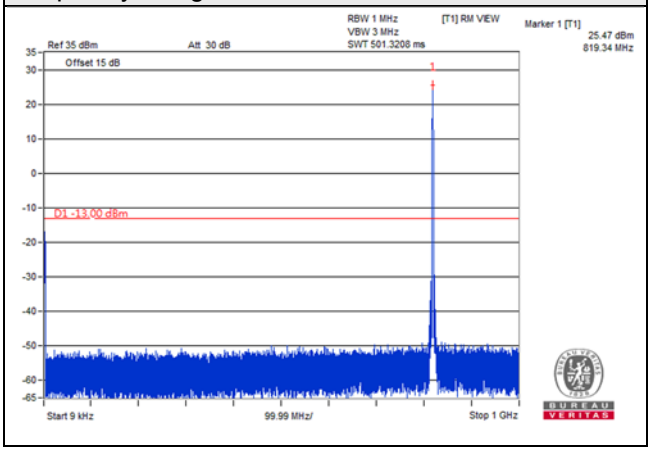
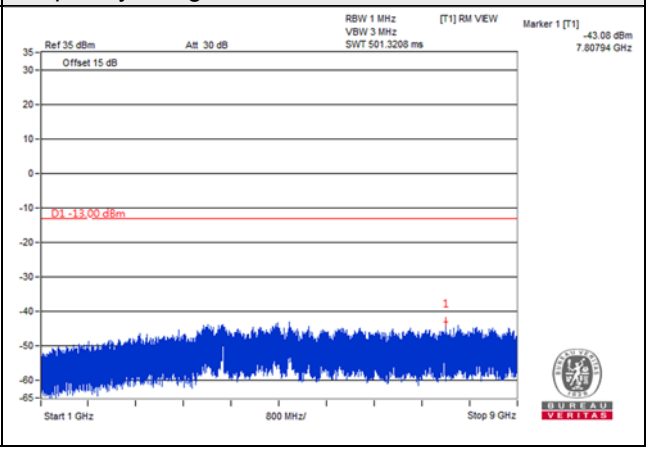
4.6.3 Test Procedure

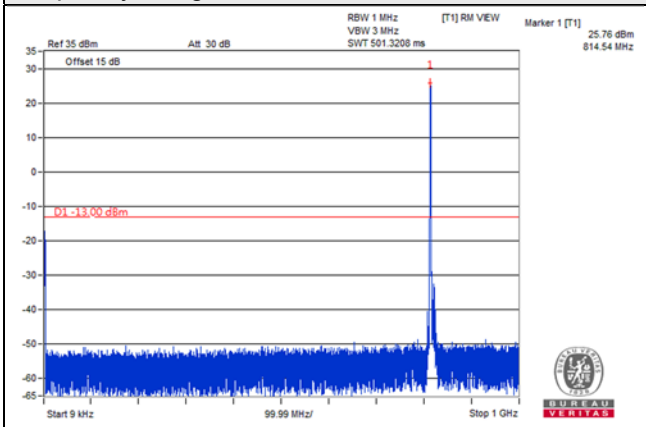
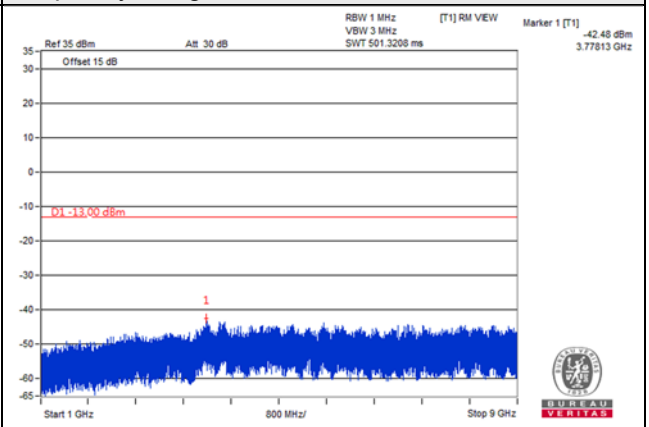
a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with Agilent Spectrum Analyzer.
b. The conducted spurious emission used the power splitter via EUT RF power connector between signal generator and spectrum analyzer.
c. When the spectrum scanned from 9 kHz to 9GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted emission measurement.

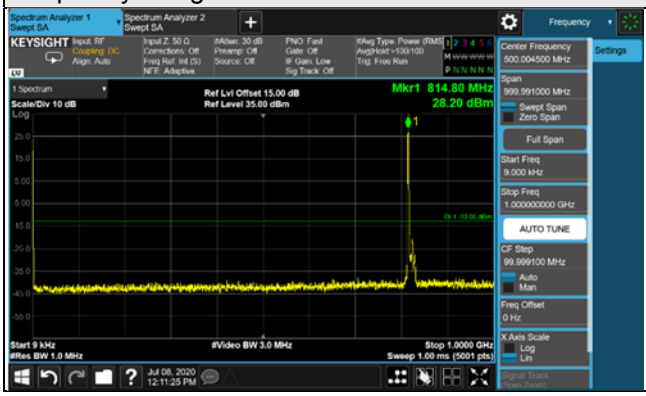
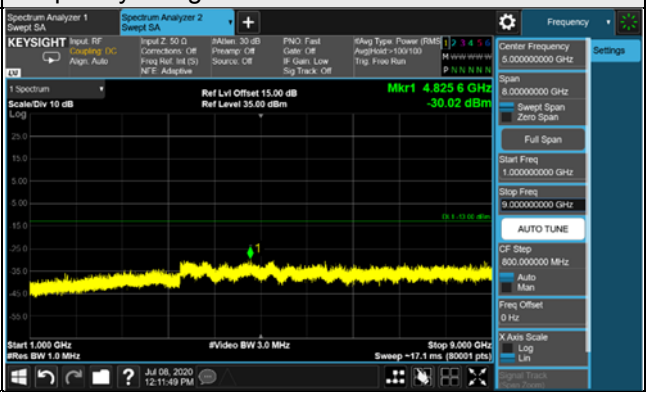
4.6.4 Test Results

LTE Band 26, Channel Bandwidth 1.4MHz	
Channel 26697 (814.7MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	
Channel 26740 (819.0MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	
Channel 26783 (823.3MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	

LTE Band 26, Channel Bandwidth 3MHz	
Channel 26705 (815.5MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	
Channel 26740 (819.0MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	
Channel 26775 (822.5MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	

LTE Band 26, Channel Bandwidth 5MHz	
Channel 26715 (816.5MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	
Channel 26740 (819.0MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	
Channel 26765 (821.5MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	

LTE Band 26, Channel Bandwidth 10MHz	
Channel 26740 (819.0MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	

LTE Band 26, Channel Bandwidth 15MHz	
Channel 26765 (821.5MHz)	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~9GHz
	

4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission 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 log10(P) dB. The limit of emission equal to –13dBm.

4.7.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m (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 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

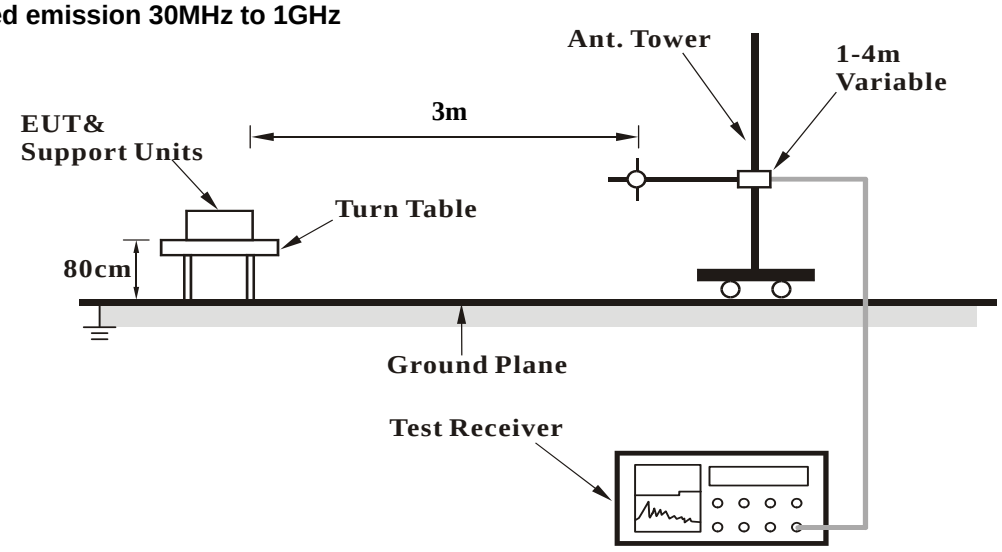
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.7.3 Deviation from Test Standard

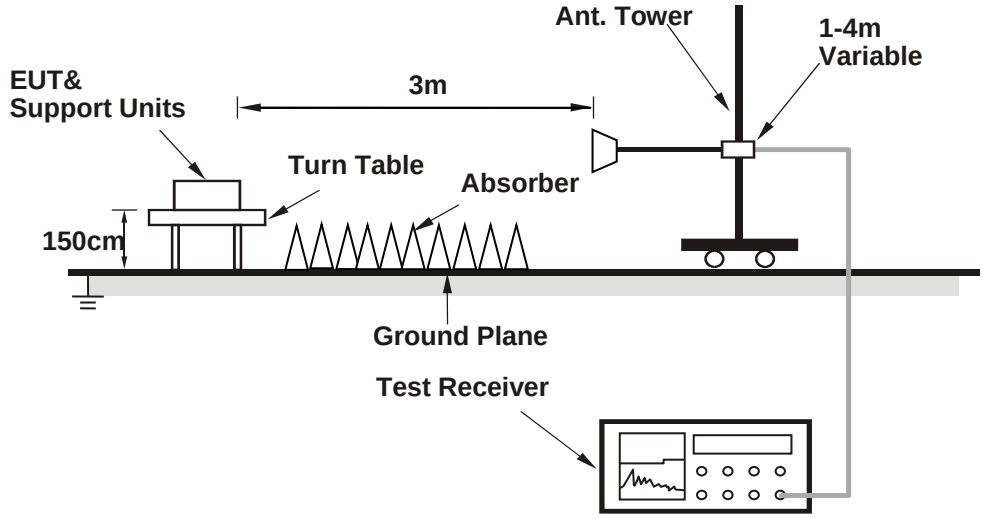
No deviation.

4.7.4 Test Setup

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



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

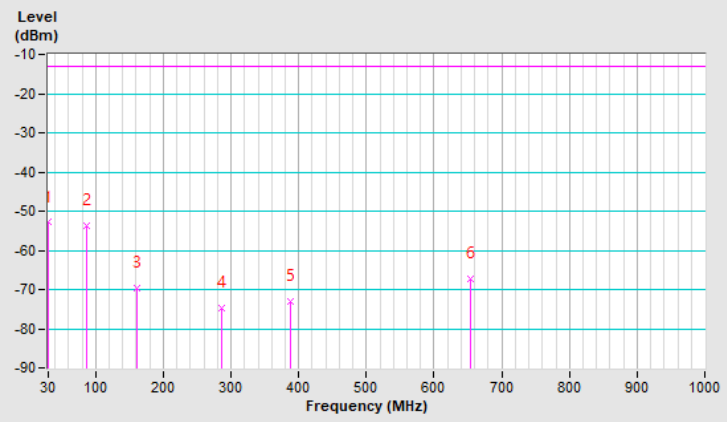
4.7.5 Test Results

Below 1GHz
LTE Band 26, Channel Bandwidth 5MHz

Mode	TX channel 26715 (816.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	30.00	-54.8	-33.5	-19.4	-52.9	-13.0	-39.9
2	87.23	-44.2	-53.5	-0.1	-53.6	-13.0	-40.6
3	160.95	-62.0	-66.6	-3.0	-69.6	-13.0	-56.6
4	286.08	-68.8	-73.0	-1.7	-74.7	-13.0	-61.7
5	386.96	-70.2	-76.7	3.5	-73.2	-13.0	-60.2
6	653.71	-67.5	-70.9	3.6	-67.3	-13.0	-54.3

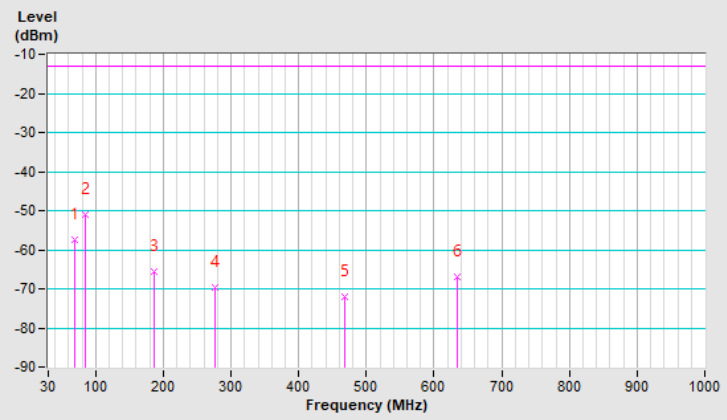
Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.



Mode	TX channel 26715 (816.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	69.77	-49.0	-57.0	-0.6	-57.6	-13.0	-44.6
2	84.32	-44.0	-51.5	0.4	-51.1	-13.0	-38.1
3	187.14	-61.2	-63.0	-2.7	-65.7	-13.0	-52.7
4	277.35	-70.8	-68.0	-1.6	-69.6	-13.0	-56.6
5	468.44	-69.9	-75.7	3.5	-72.2	-13.0	-59.2
6	634.31	-69.8	-70.6	3.6	-67.0	-13.0	-54.0

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.



Above 1GHz
LTE Band 26, Channel Bandwidth 1.4MHz

Mode	TX channel 26697 (814.7MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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	-59.6	-51.7	1.0	-50.7	-13.0	-37.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1629.40	-62.2	-55.0	1.0	-54.0	-13.0	-41.0

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

Mode	TX channel 26740 (819.0MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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	-59.4	-51.6	1.0	-50.6	-13.0	-37.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-61.9	-54.6	1.0	-53.6	-13.0	-40.6

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

Mode	TX channel 26783 (823.3MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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	-60.0	-52.3	0.9	-51.4	-13.0	-38.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1646.60	-62.4	-55.0	0.9	-54.1	-13.0	-41.1

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

LTE Band 26, Channel Bandwidth 5MHz

Mode	TX channel 26715 (816.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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**	**-59.4**	**-51.5**	**1.0**	**-50.5**	**-13.0**	**-37.5**
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	-62.1	-54.9	1.0	-53.9	-13.0	-40.9

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

Mode	TX channel 26740 (819MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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	-59.5	-51.7	1.0	-50.7	-13.0	-37.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-61.8	-54.5	1.0	-53.5	-13.0	-40.5

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

Mode	TX channel 26765 (821.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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**	**-59.2**	**-51.5**	**1.0**	**-50.5**	**-13.0**	**-37.5**
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	-62.5	-55.2	1.0	-54.2	-13.0	-41.2

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

LTE Band 26, Channel Bandwidth 10MHz

Mode	TX channel 26740 (819.0MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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	-60.0	-52.2	1.0	-51.2	-13.0	-38.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1638.00	-61.8	-54.5	1.0	-53.5	-13.0	-40.5

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

LTE Band 26, Channel Bandwidth 15MHz

Mode	TX channel 26765 (821.5MHz)	Frequency Range	1 ~ 18GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Han Wu		

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	-59.8	-52.0	1.0	-51.0	-13.0	-38.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1643.00	-61.4	-54.1	1.0	-53.1	-13.0	-40.1

Remarks:
1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) - Cable Loss (dB) + 2.15dB.

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

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

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