

FCC Test Report (Part 24 – LTE B2)

Report No.: RFBFOK-WTW-P22010278-6

FCC ID: RYQSTTM21VAPP

Test Model: STTM21VAPP

Received Date: Feb. 10, 2022

Test Date: Feb. 24 ~ Mar. 02, 2022

Issued Date: Mar. 15, 2022

Applicant: FIH CO., LTD.

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FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RFBFOK-WTW-P22010278-6	Original release	Mar. 15, 2022

1 Certificate of Conformity

Product: 4G cellular phone

Brand: SHARP

Test Model: STTM21VAPP

Applicant: FIH CO., LTD.

Test Date: Feb. 24 ~ Mar. 02, 2022

Standards: FCC Part 24, Subpart E

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

Prepared by : Celine Chou , **Date:** Mar. 15, 2022
Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Mar. 15, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1046 24.232 (d)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -33.32dB at 3760.00MHz.

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

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 03, 2021	Dec. 02, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 28, 2021	Oct. 27, 2022
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC001340	980201	Sep. 15, 2021	Sep. 14, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 330H	980112	Oct. 05, 2021	Oct. 04, 2022
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 18, 2022	Jan. 17, 2023
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 17, 2022	Jan. 16, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-800 0	171005	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000 (140807)	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 05, 2021	Oct. 04, 2022
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 02, 2021	Jun. 01, 2022
DC power supply Keysight	U8002A	MY56330015	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Feb. 16, 2022	Feb. 15, 2023

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.

3 General Information

3.1 General Description of EUT

Product	4G cellular phone		
Brand	SHARP		
Test Model	STTM21VAPP		
Power Supply Rating	5Vdc from adapter or host equipment 3.85Vdc from battery		
Modulation Type	QPSK, 16QAM		
Operating Frequency	LTE Band 2 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1909.3MHz	
	LTE Band 2 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1908.5MHz	
	LTE Band 2 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1907.5MHz	
	LTE Band 2 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1905.0MHz	
	LTE Band 2 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1902.5MHz	
	LTE Band 2 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1900.0MHz	
Max. EIRP Power		QPSK	16QAM
	LTE Band 2 (Channel Bandwidth 1.4MHz)	216.770mW (23.36dBm)	181.970mW (22.60dBm)
	LTE Band 2 (Channel Bandwidth 3MHz)	217.270mW (23.37dBm)	185.353mW (22.68dBm)
	LTE Band 2 (Channel Bandwidth 5MHz)	221.309mW (23.45dBm)	187.499mW (22.73dBm)
	LTE Band 2 (Channel Bandwidth 10MHz)	219.786mW (23.42dBm)	186.638mW (22.71dBm)
	LTE Band 2 (Channel Bandwidth 15MHz)	221.309mW (23.45dBm)	183.654mW (22.64dBm)
	LTE Band 2 (Channel Bandwidth 20MHz)	222.331mW (23.47dBm)	187.499mW (22.73dBm)
Emission Designator		QPSK	16QAM
	LTE Band 2 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 2 (Channel Bandwidth 3MHz)	2M69G7D	2M69D7W
	LTE Band 2 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 2 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W
	LTE Band 2 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W
	LTE Band 2 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W
Antenna Type	Refer to note		
Antenna Connector	Refer to note		
Accessory Device	Adapter, Battery		
Cable Supplied	0.95m shielded USB cable without core		

Note:

1. The EUT consumes power from the following Adapter & Battery.

Adapter	
Brand	RTF
Model	RT-C6
Input Power	100-240Vac, 50/60Hz, 0.35A
Output Power	5Vdc, 2A

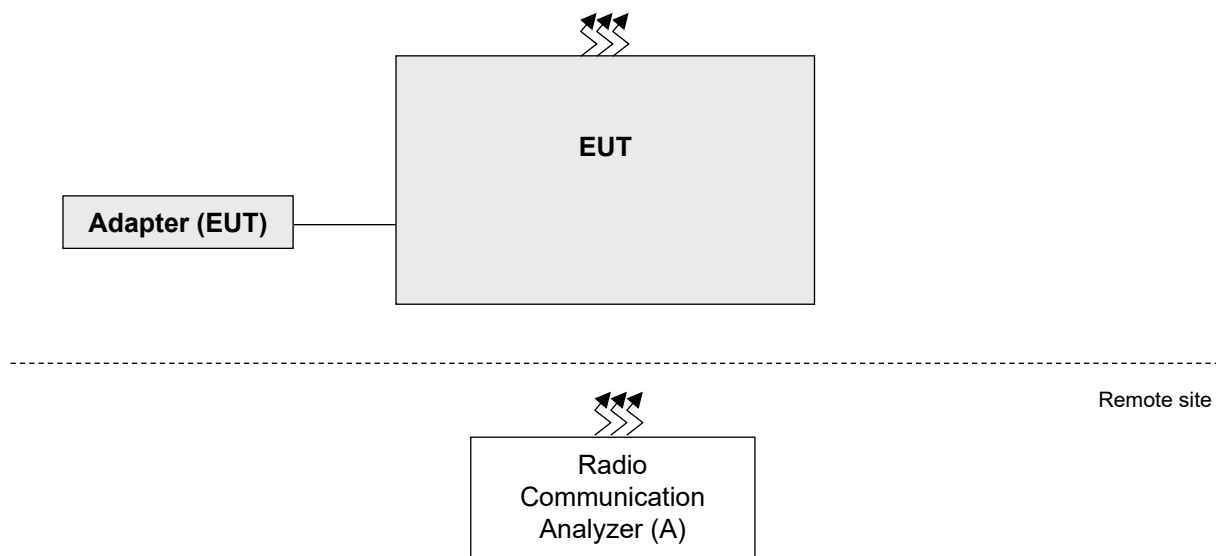
Battery	
Brand	ZHONGSHAN TIANMAO BATTERY CO., LTD.
Model	HE401
Rating	3.85Vdc, 3500mAh

2. The antenna information is listed as below.

No.	Type	Connector	Function	Gain (dBi)					
				B2	B4	B5	B12	B13	B66
Main Ant.	Loop	FIT	TX	1.0	-1.3	-4.8	-2.5	-4.3	-1.3
			RX	1.7	0.5	-6.5	-2.0	-4.3	0.5
Div Ant.	Loop	FIT	RX	-4.8	-2.8	-2.5	-4.6	-5.0	-2.8

* 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.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	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 as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	Radiated Emission
LTE Band 2	X-plane

LTE Band 2

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 2 RB Offset 1 RB / 5 RB Offset 3 RB / 0 RB Offset 3 RB / 1 RB Offset 3 RB / 3 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 7 RB Offset 1 RB / 14 RB Offset 8 RB / 0 RB Offset 8 RB / 3 RB Offset 8 RB / 7 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 12 RB Offset 1 RB / 24 RB Offset 12 RB / 0 RB Offset 12 RB / 6 RB Offset 12 RB / 13 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 1 RB / 49 RB Offset 25 RB / 0 RB Offset 25 RB / 12 RB Offset 25 RB / 25 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 37 RB Offset 1 RB / 74 RB Offset 36 RB / 0 RB Offset 36 RB / 19 RB Offset 36 RB / 39 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 50 RB Offset 1 RB / 99 RB Offset 50 RB / 0 RB Offset 50 RB / 25 RB Offset 50 RB / 50 RB Offset 100 RB / 0 RB Offset
-	Modulation Characteristics	18700 to 19100	18900 (1880.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Frequency Stability	18607 to 19193	18607 (1850.7MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 19185 (1908.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 19175 (1907.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 19125 (1902.5MHz)	15MHz	QPSK	75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	100 RB / 0 RB Offset
-	Occupied Bandwidth	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	6 RB / 0RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	15 RB / 0RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	25RB / 0RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	50RB / 0RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
-	Band Edge	18607 to 19193	18607 (1850.7MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 19185 (1908.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 19125 (1902.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Peak to Average Ratio	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	3 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	3 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	3 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM, and measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	25deg. C, 60%RH	3.85Vdc	James Yang
Modulation Characteristics	25deg. C, 60%RH	3.85Vdc	James Yang
Frequency Stability	25deg. C, 60%RH	3.85Vdc	James Yang
Occupied Bandwidth	25deg. C, 60%RH	3.85Vdc	James Yang
Band Edge	25deg. C, 60%RH	3.85Vdc	James Yang
Peak To Average Ratio	25deg. C, 60%RH	3.85Vdc	James Yang
Conducted Emission	25deg. C, 60%RH	3.85Vdc	James Yang
Radiated Emission	19deg. C, 65%RH 21deg. C, 71%RH	120Vac, 60Hz	Thomas Cheng Vincent Chen

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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

4.1.2 Test Procedures

Conducted Power Measurement:

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

Maximum EIRP / ERP

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

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

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

where

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

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

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

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	22.31	22.47	22.15
		1	50	22.09	22.24	22.03
		1	99	22.01	22.15	22.01
		50	0	21.27	21.42	21.21
		50	25	21.23	21.38	21.17
		50	50	21.20	21.35	21.14
		100	0	21.22	21.37	21.16
20M	16QAM	1	0	21.58	21.73	21.52
		1	50	21.53	21.68	21.47
		1	99	21.37	21.52	21.31
		50	0	20.30	20.45	20.24
		50	25	20.26	20.41	20.20
		50	50	20.25	20.40	20.19
		100	0	20.28	20.43	20.22
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	22.25	22.45	22.05
		1	37	22.03	22.23	22.03
		1	74	22.01	22.12	22.01
		36	0	21.22	21.33	21.21
		36	19	21.23	21.29	21.11
		36	39	21.20	21.32	21.04
		75	0	21.12	21.28	21.07
15M	16QAM	1	0	21.51	21.64	21.44
		1	37	21.49	21.61	21.44
		1	74	21.36	21.44	21.22
		36	0	20.23	20.39	20.23
		36	19	20.16	20.36	20.19
		36	39	20.18	20.31	20.10
		75	0	20.21	20.42	20.17

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	22.23	22.42	22.05
		1	24	22.13	22.20	22.03
		1	49	22.01	22.11	22.01
		25	0	21.20	21.33	21.20
		25	12	21.13	21.35	21.16
		25	25	21.20	21.32	21.04
		50	0	21.19	21.35	21.13
10M	16QAM	1	0	21.52	21.71	21.44
		1	24	21.45	21.68	21.40
		1	49	21.28	21.51	21.29
		25	0	20.27	20.39	20.19
		25	12	20.23	20.40	20.11
		25	25	20.20	20.33	20.15
		50	0	20.20	20.43	20.21
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	22.24	22.45	22.13
		1	12	22.04	22.21	22.03
		1	24	22.01	22.12	22.01
		12	0	21.23	21.40	21.21
		12	6	21.23	21.29	21.09
		12	13	21.10	21.28	21.05
		25	0	21.20	21.29	21.08
5M	16QAM	1	0	21.54	21.73	21.47
		1	12	21.47	21.63	21.38
		1	24	21.28	21.51	21.23
		12	0	20.21	20.42	20.23
		12	6	20.23	20.38	20.19
		12	13	20.23	20.40	20.17
		25	0	20.18	20.33	20.13

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	22.27	22.37	22.10
		1	7	22.06	22.18	22.03
		1	14	22.01	22.08	22.01
		8	0	21.22	21.40	21.15
		8	3	21.15	21.37	21.10
		8	7	21.13	21.33	21.05
		15	0	21.21	21.32	21.14
3M	16QAM	1	0	21.48	21.63	21.50
		1	7	21.52	21.68	21.41
		1	14	21.29	21.45	21.29
		8	0	20.28	20.37	20.15
		8	3	20.21	20.37	20.20
		8	7	20.23	20.30	20.17
		15	0	20.23	20.39	20.20
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	22.24	22.33	22.06
		1	2	22.21	22.11	22.03
		1	5	22.18	22.01	22.01
		3	0	22.09	22.36	22.05
		3	1	22.06	22.21	22.01
		3	3	22.03	22.17	22.02
		6	0	21.04	21.27	21.01
1.4M	16QAM	1	0	21.57	21.60	21.42
		1	2	21.47	21.58	21.31
		1	5	21.24	21.45	21.16
		3	0	21.22	21.34	21.17
		3	1	21.06	21.29	21.07
		3	3	21.09	21.36	21.05
		6	0	20.26	20.24	20.08

EIRP Power (dBm)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	23.31	23.47	23.15
		1	50	23.09	23.24	23.03
		1	99	23.01	23.15	23.01
		50	0	22.27	22.42	22.21
		50	25	22.23	22.38	22.17
		50	50	22.20	22.35	22.14
		100	0	22.22	22.37	22.16
20M	16QAM	1	0	22.58	22.73	22.52
		1	50	22.53	22.68	22.47
		1	99	22.37	22.52	22.31
		50	0	21.30	21.45	21.24
		50	25	21.26	21.41	21.20
		50	50	21.25	21.40	21.19
		100	0	21.28	21.43	21.22
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	23.25	23.45	23.05
		1	37	23.03	23.23	23.03
		1	74	23.01	23.12	23.01
		36	0	22.22	22.33	22.21
		36	19	22.23	22.29	22.11
		36	39	22.20	22.32	22.04
		75	0	22.12	22.28	22.07
15M	16QAM	1	0	22.51	22.64	22.44
		1	37	22.49	22.61	22.44
		1	74	22.36	22.44	22.22
		36	0	21.23	21.39	21.23
		36	19	21.16	21.36	21.19
		36	39	21.18	21.31	21.10
		75	0	21.21	21.42	21.17

*EIRP = Conducted + antenna gain (1.0 dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	23.23	23.42	23.05
		1	24	23.13	23.20	23.03
		1	49	23.01	23.11	23.01
		25	0	22.20	22.33	22.20
		25	12	22.13	22.35	22.16
		25	25	22.20	22.32	22.04
		50	0	22.19	22.35	22.13
10M	16QAM	1	0	22.52	22.71	22.44
		1	24	22.45	22.68	22.40
		1	49	22.28	22.51	22.29
		25	0	21.27	21.39	21.19
		25	12	21.23	21.40	21.11
		25	25	21.20	21.33	21.15
		50	0	21.20	21.43	21.21
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	23.24	23.45	23.13
		1	12	23.04	23.21	23.03
		1	24	23.01	23.12	23.01
		12	0	22.23	22.40	22.21
		12	6	22.23	22.29	22.09
		12	13	22.10	22.28	22.05
		25	0	22.20	22.29	22.08
5M	16QAM	1	0	22.54	22.73	22.47
		1	12	22.47	22.63	22.38
		1	24	22.28	22.51	22.23
		12	0	21.21	21.42	21.23
		12	6	21.23	21.38	21.19
		12	13	21.23	21.40	21.17
		25	0	21.18	21.33	21.13

*EIRP = Conducted + antenna gain (1.0 dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	23.27	23.37	23.10
		1	7	23.06	23.18	23.03
		1	14	23.01	23.08	23.01
		8	0	22.22	22.40	22.15
		8	3	22.15	22.37	22.10
		8	7	22.13	22.33	22.05
		15	0	22.21	22.32	22.14
3M	16QAM	1	0	22.48	22.63	22.50
		1	7	22.52	22.68	22.41
		1	14	22.29	22.45	22.29
		8	0	21.28	21.37	21.15
		8	3	21.21	21.37	21.20
		8	7	21.23	21.30	21.17
		15	0	21.23	21.39	21.20
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	23.24	23.33	23.06
		1	2	23.21	23.11	23.03
		1	5	23.18	23.01	23.01
		3	0	23.09	23.36	23.05
		3	1	23.06	23.21	23.01
		3	3	23.03	23.17	23.02
		6	0	22.04	22.27	22.01
1.4M	16QAM	1	0	22.57	22.60	22.42
		1	2	22.47	22.58	22.31
		1	5	22.24	22.45	22.16
		3	0	22.22	22.34	22.17
		3	1	22.06	22.29	22.07
		3	3	22.09	22.36	22.05
		6	0	21.26	21.24	21.08

*EIRP = Conducted + antenna gain (1.0 dBi)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

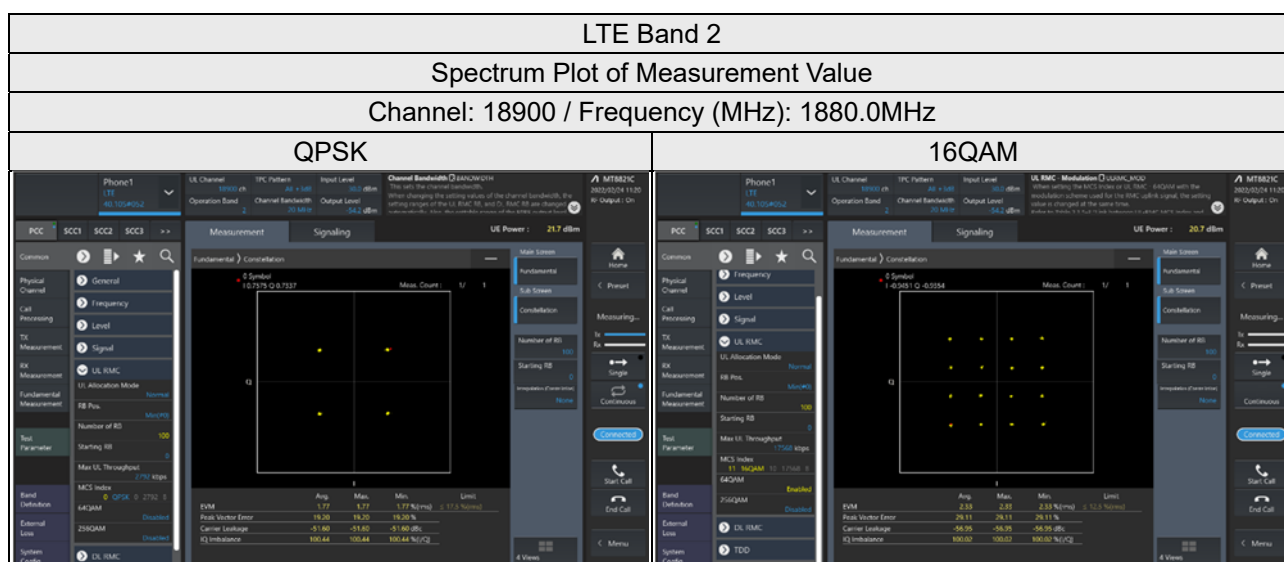
4.2.2 Test Procedure

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



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

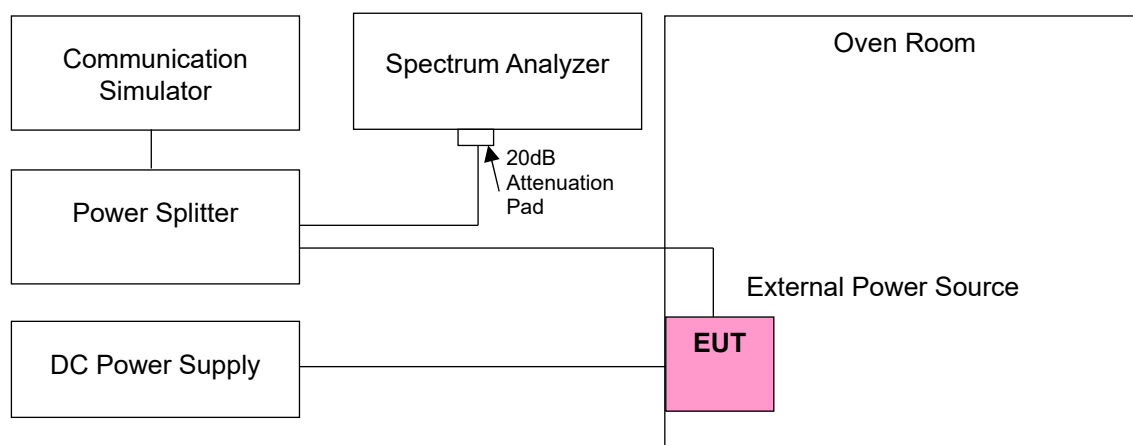
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.3.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ 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 Conducted Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1850.700027	0.015	1909.300000	0.012
3.30	1850.700018	0.010	1909.300012	0.006
4.43	1850.700028	0.015	1909.300031	0.016

Note: The applicant defined the normal working voltage is from 3.30Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700031	0.017	1909.300011	0.006
-20	1850.700016	0.009	1909.300036	0.019
-10	1850.700031	0.017	1909.300028	0.015
0	1850.700012	0.006	1909.300038	0.020
10	1850.700022	0.012	1909.300012	0.006
20	1850.699988	-0.006	1909.299973	-0.014
30	1850.699967	-0.018	1909.299972	-0.015
40	1850.699975	-0.014	1909.299962	-0.020
50	1850.699979	-0.011	1909.299986	-0.007

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1851.500012	0.006	1908.500034	0.018
3.30	1851.500030	0.016	1908.500035	0.018
4.43	1851.500030	0.016	1908.500014	0.007

Note: The applicant defined the normal working voltage is from 3.30Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500020	0.011	1908.500036	0.019
-20	1851.500027	0.015	1908.500030	0.016
-10	1851.500033	0.018	1908.500035	0.018
0	1851.500022	0.012	1908.500020	0.010
10	1851.500024	0.013	1908.500032	0.017
20	1851.499986	-0.008	1908.499967	-0.017
30	1851.499974	-0.014	1908.499966	-0.018
40	1851.499966	-0.018	1908.499986	-0.007
50	1851.499963	-0.020	1908.499989	-0.006

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1852.500026	0.014	1907.500030	0.016
3.30	1852.500020	0.011	1907.500019	0.010
4.43	1852.500017	0.009	1907.500014	0.007

Note: The applicant defined the normal working voltage is from 3.30Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500025	0.013	1907.500040	0.021
-20	1852.500036	0.019	1907.500012	0.006
-10	1852.500034	0.018	1907.500024	0.013
0	1852.500017	0.009	1907.500033	0.017
10	1852.500032	0.017	1907.500025	0.013
20	1852.499978	-0.012	1907.499965	-0.018
30	1852.499970	-0.016	1907.499964	-0.019
40	1852.499968	-0.017	1907.499975	-0.013
50	1852.499963	-0.020	1907.499976	-0.013

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1855.000015	0.008	1905.000024	0.013
3.30	1855.000036	0.019	1905.000011	0.006
4.43	1855.000011	0.006	1905.000010	0.005

Note: The applicant defined the normal working voltage is from 3.30Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000033	0.018	1905.000039	0.020
-20	1855.000032	0.017	1905.000027	0.014
-10	1855.000027	0.015	1905.000026	0.014
0	1855.000033	0.018	1905.000037	0.019
10	1855.000026	0.014	1905.000029	0.015
20	1854.999962	-0.020	1904.999966	-0.018
30	1854.999976	-0.013	1904.999961	-0.020
40	1854.999985	-0.008	1904.999980	-0.010
50	1854.999964	-0.019	1904.999972	-0.015

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1857.500039	0.021	1902.500038	0.020
3.30	1857.500027	0.015	1902.500032	0.017
4.43	1857.500023	0.012	1902.500010	0.005

Note: The applicant defined the normal working voltage is from 3.30Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500037	0.020	1902.500027	0.014
-20	1857.500012	0.006	1902.500037	0.019
-10	1857.500017	0.009	1902.500038	0.020
0	1857.500039	0.021	1902.500030	0.016
10	1857.500036	0.019	1902.500034	0.018
20	1857.499963	-0.020	1902.499975	-0.013
30	1857.499966	-0.018	1902.499961	-0.020
40	1857.499963	-0.020	1902.499972	-0.015
50	1857.499981	-0.010	1902.499964	-0.019

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1860.000017	0.009	1900.000039	0.021
3.30	1860.000012	0.006	1900.000013	0.007
4.43	1860.000022	0.012	1900.000031	0.016

Note: The applicant defined the normal working voltage is from 3.30Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000031	0.017	1900.000033	0.017
-20	1860.000016	0.009	1900.000029	0.015
-10	1860.000013	0.007	1900.000022	0.012
0	1860.000021	0.011	1900.000014	0.007
10	1860.000029	0.016	1900.000021	0.011
20	1859.999978	-0.012	1899.999972	-0.015
30	1859.999989	-0.006	1899.999983	-0.009
40	1859.999960	-0.022	1899.999984	-0.008
50	1859.999988	-0.006	1899.999979	-0.011

4.4 Occupied Bandwidth Measurement

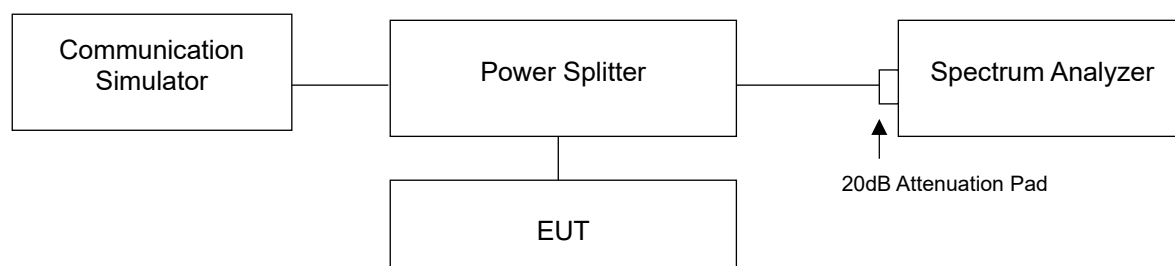
4.4.1 Test Procedure

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

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- Determine the following reference values: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

4.4.2 Test Setup



4.4.3 Test Result

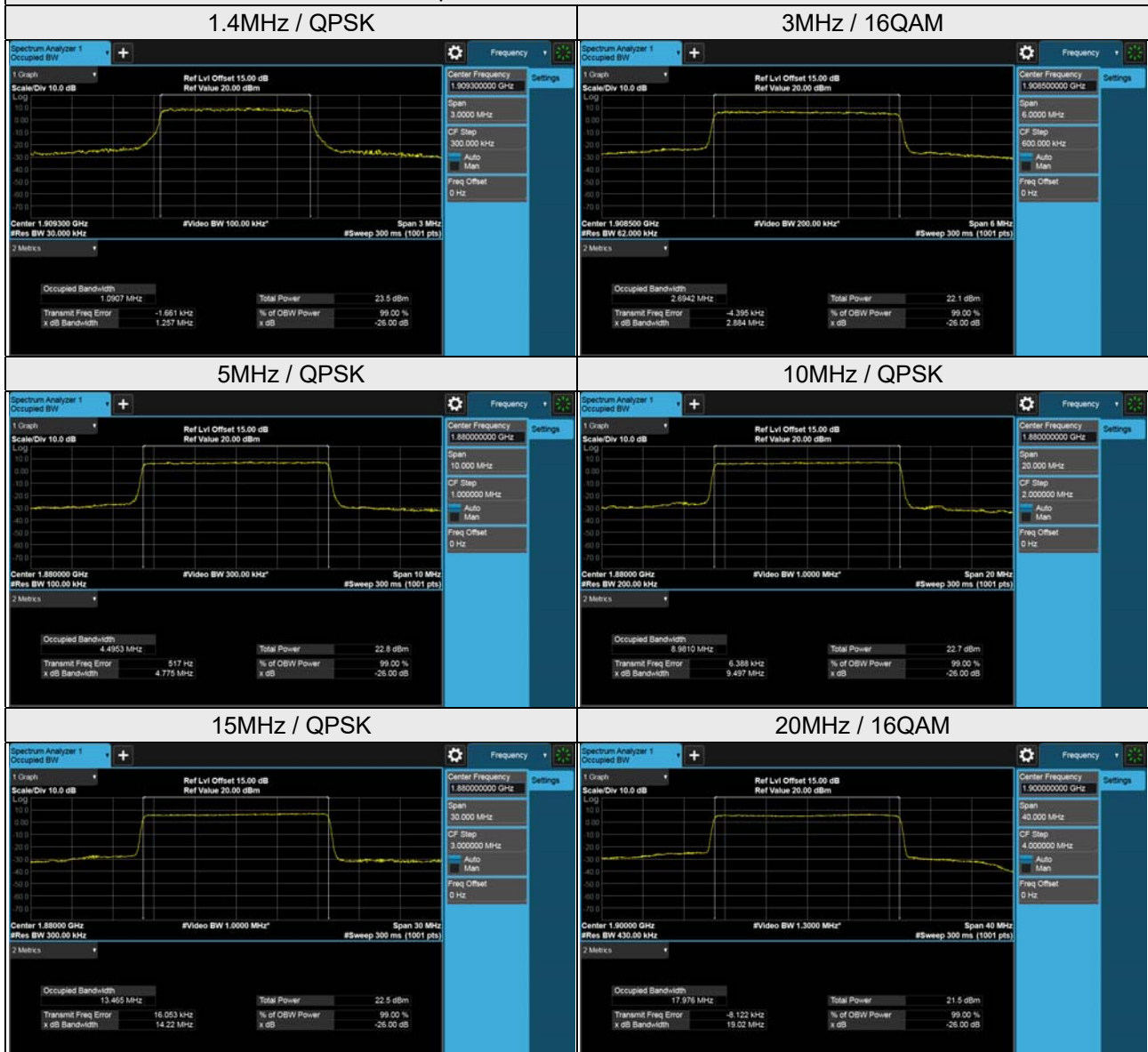
Occupied Bandwidth

LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18607	1850.7	1.09	1.09
18900	1880.0	1.09	1.09
19193	1909.3	1.09	1.09
LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18615	1851.5	2.69	2.69
18900	1880.0	2.69	2.69
19185	1908.5	2.69	2.69
LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18625	1852.5	4.49	4.49
18900	1880.0	4.50	4.49
19175	1907.5	4.49	4.49
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18650	1855.0	8.97	8.97
18900	1880.0	8.98	8.98
19150	1905.0	8.97	8.97
LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18675	1857.5	13.45	13.44
18900	1880.0	13.46	13.46
19125	1902.5	13.45	13.45

LTE Band 2, Channel Bandwidth 20MHz

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18700	1860.0	17.93	17.94
18900	1880.0	17.93	17.94
19100	1900.0	17.97	17.98

Spectrum Plot of Worst Value



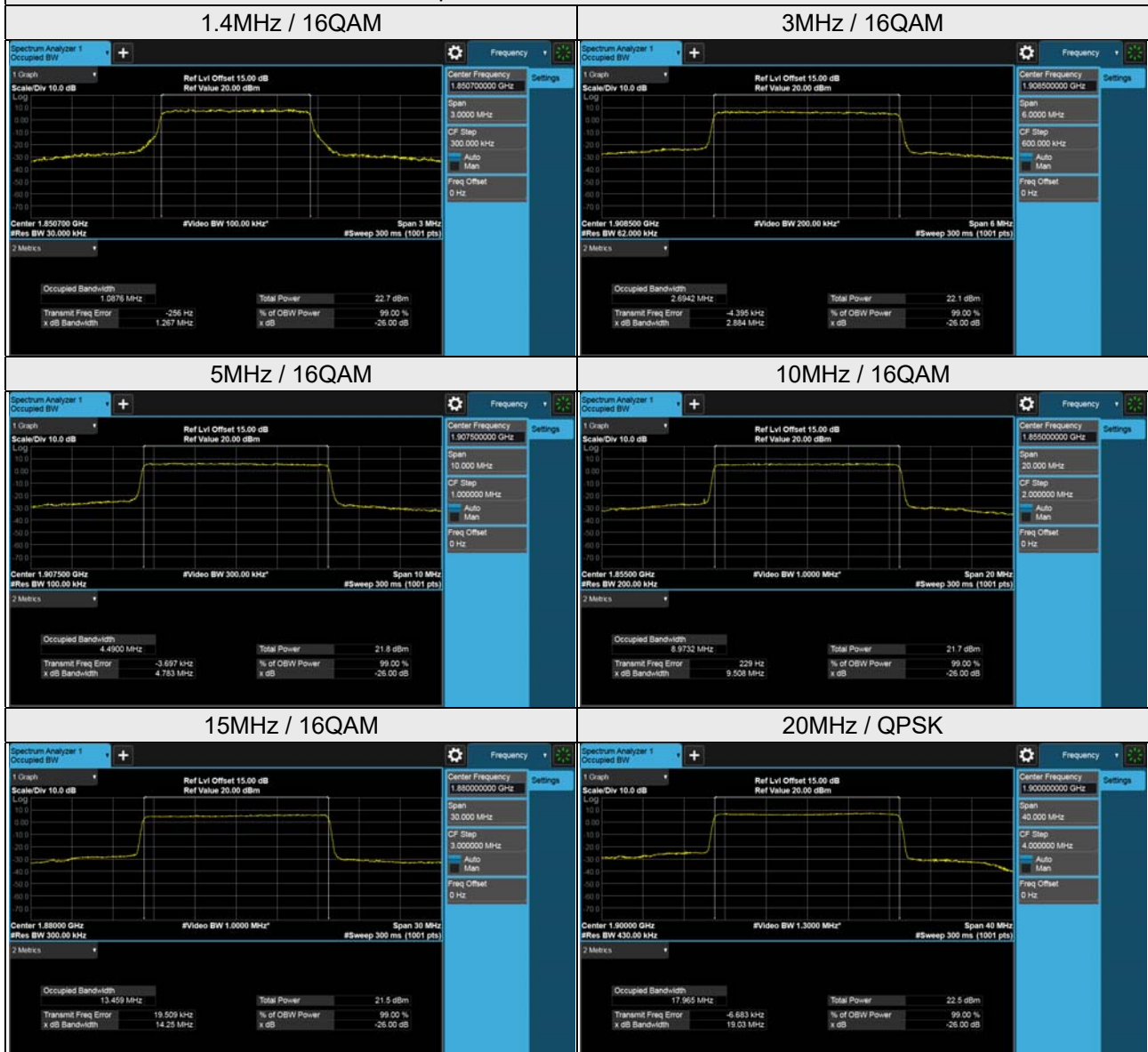
26dB Bandwidth

LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18607	1850.7	1.26	1.27
18900	1880.0	1.26	1.26
19193	1909.3	1.26	1.25
LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18615	1851.5	2.87	2.88
18900	1880.0	2.87	2.87
19185	1908.5	2.87	2.88
LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18625	1852.5	4.78	4.77
18900	1880.0	4.78	4.77
19175	1907.5	4.78	4.78
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18650	1855.0	9.49	9.51
18900	1880.0	9.50	9.50
19150	1905.0	9.49	9.51
LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18675	1857.5	14.22	14.22
18900	1880.0	14.22	14.25
19125	1902.5	14.22	14.24

LTE Band 2, Channel Bandwidth 20MHz

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18700	1860.0	19.01	19.02
18900	1880.0	19.02	19.01
19100	1900.0	19.03	19.02

Spectrum Plot of Worst Value

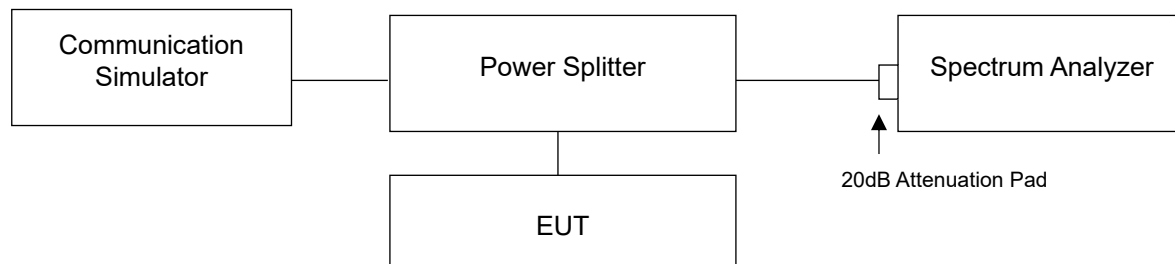


4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.5.2 Test Setup

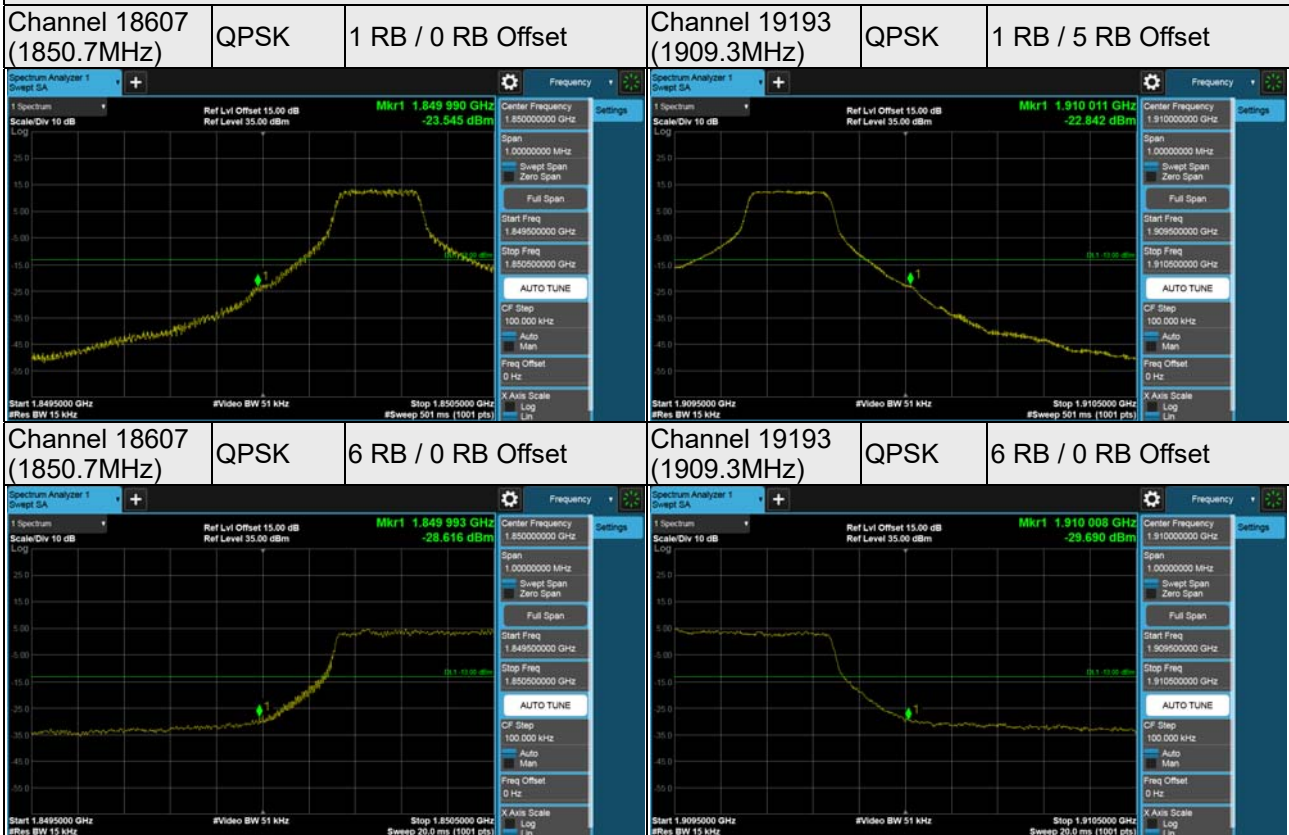


4.5.3 Test Procedures

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
- Record the max trace plot into the test report.

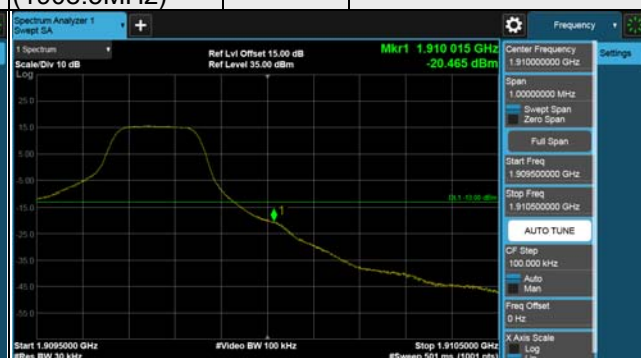
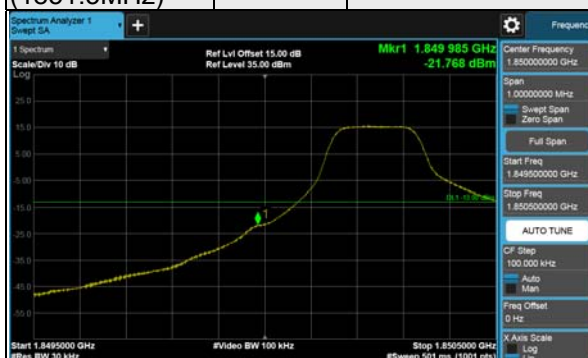
4.5.4 Test Results

LTE Band 2, Channel Bandwidth 1.4MHz

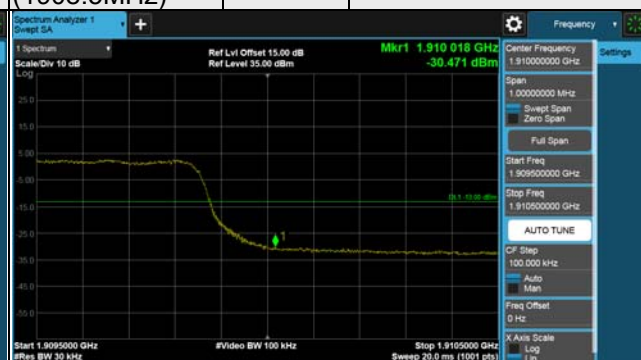


LTE Band 2, Channel Bandwidth 3MHz

Channel 18615 (1851.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 19185 (1908.5MHz)	QPSK	1 RB / 14 RB Offset
------------------------------	------	--------------------	------------------------------	------	---------------------

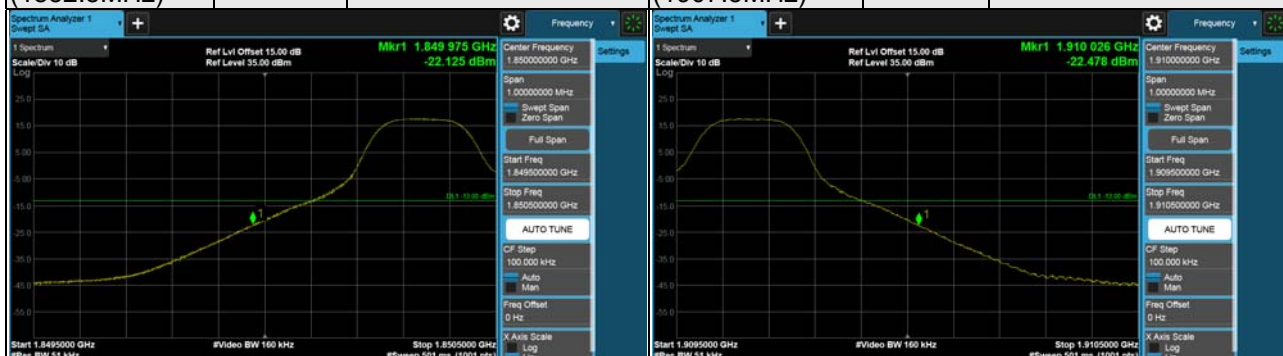


Channel 18615 (1851.5MHz)	QPSK	15 RB / 0 RB Offset	Channel 19185 (1908.5MHz)	QPSK	15 RB / 0 RB Offset
------------------------------	------	---------------------	------------------------------	------	---------------------

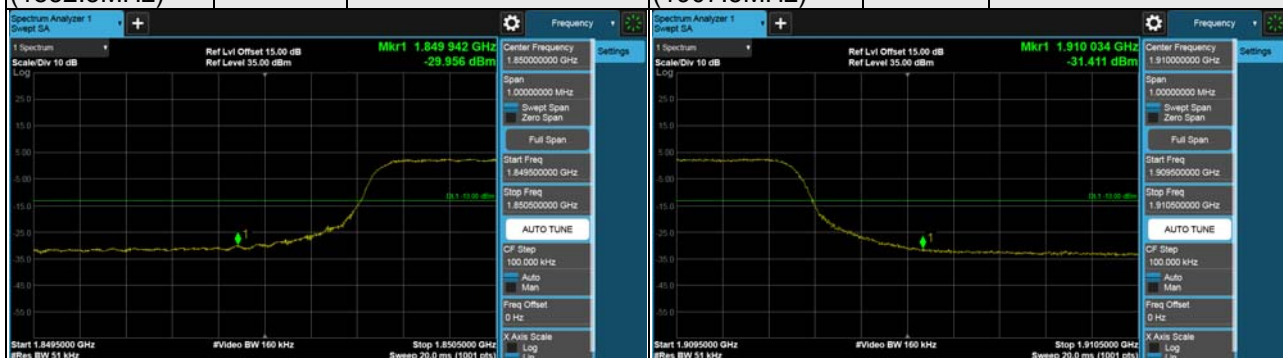


LTE Band 2, Channel Bandwidth 5MHz

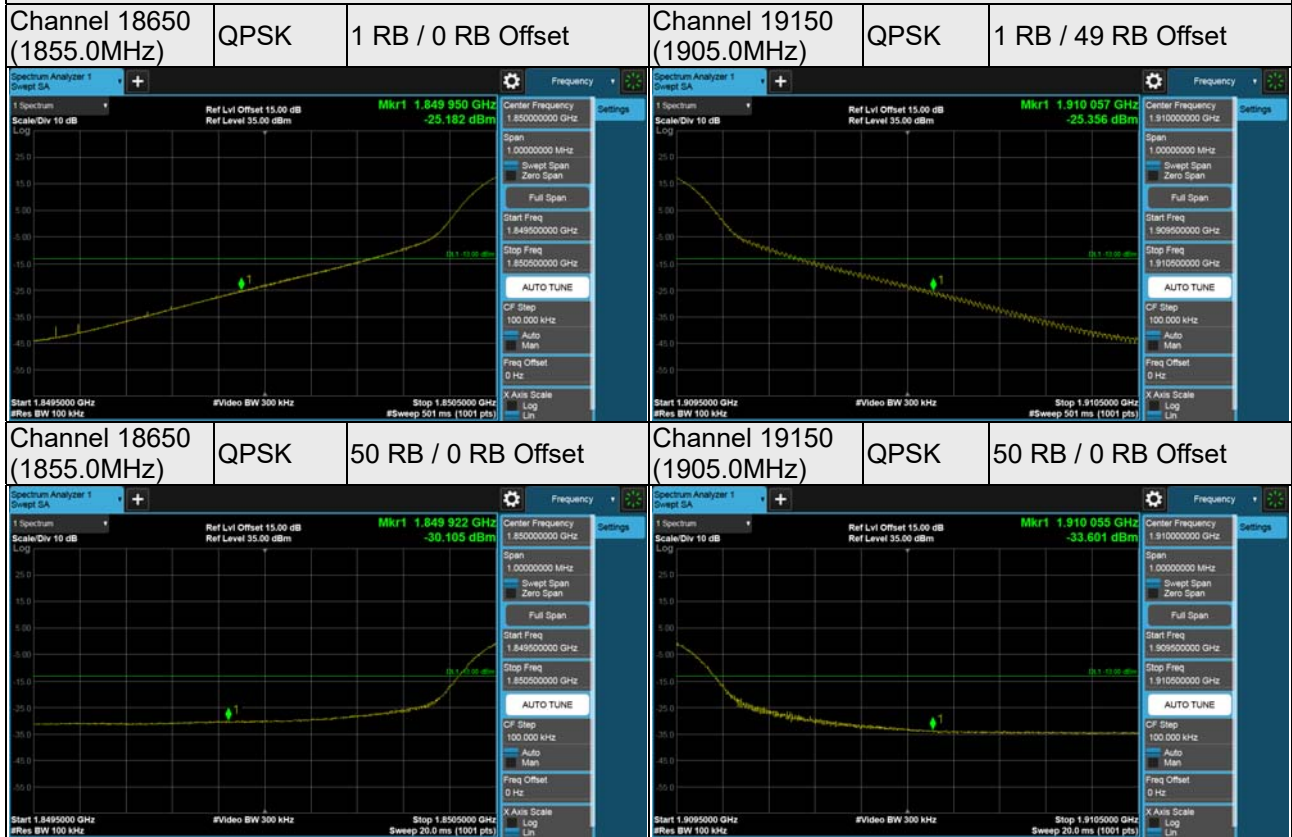
Channel 18625 (1852.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 19175 (1907.5MHz)	QPSK	1 RB / 24 RB Offset
------------------------------	------	--------------------	------------------------------	------	---------------------



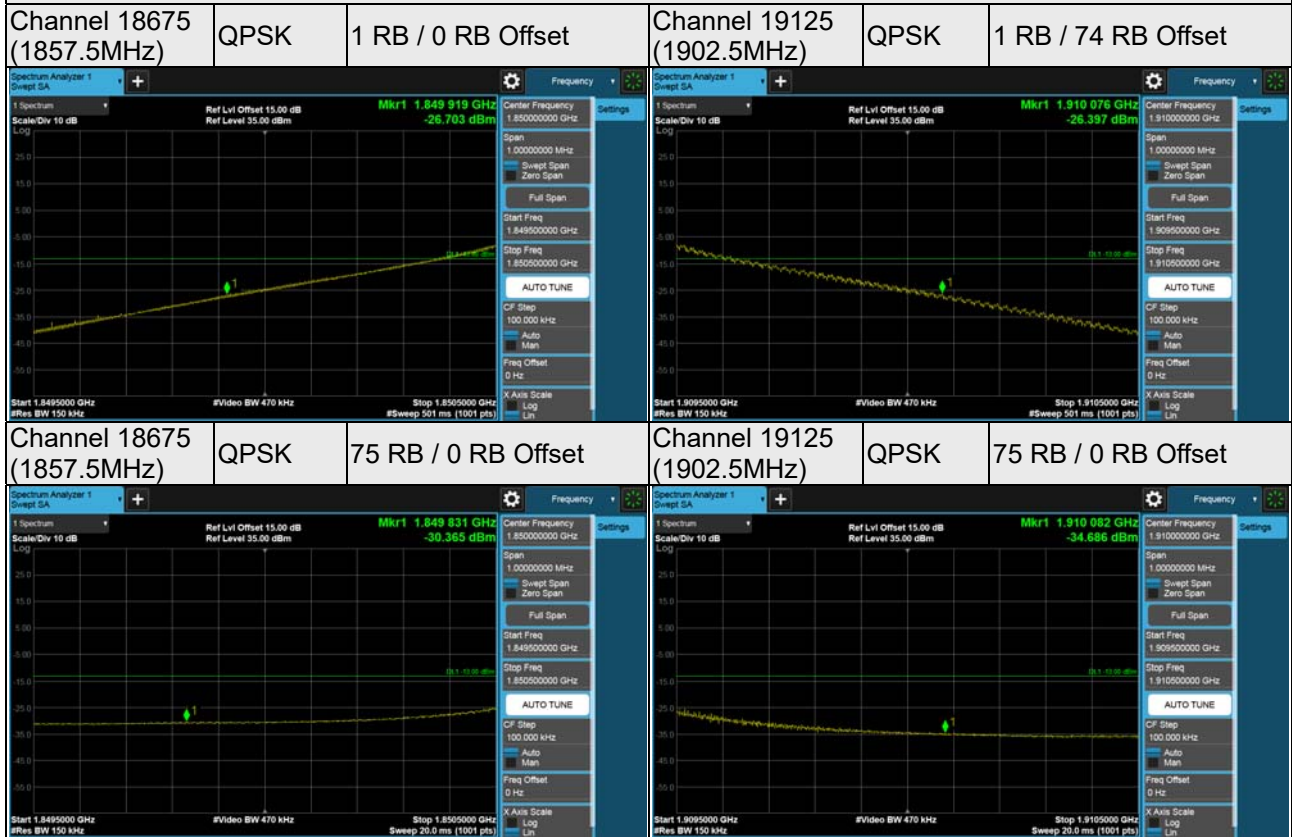
Channel 18625 (1852.5MHz)	QPSK	25 RB / 0 RB Offset	Channel 19175 (1907.5MHz)	QPSK	25 RB / 0 RB Offset
------------------------------	------	---------------------	------------------------------	------	---------------------



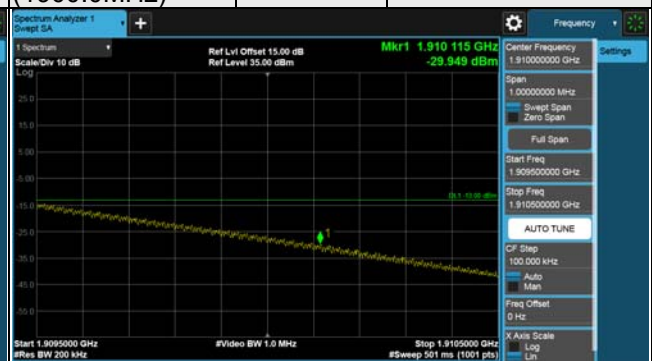
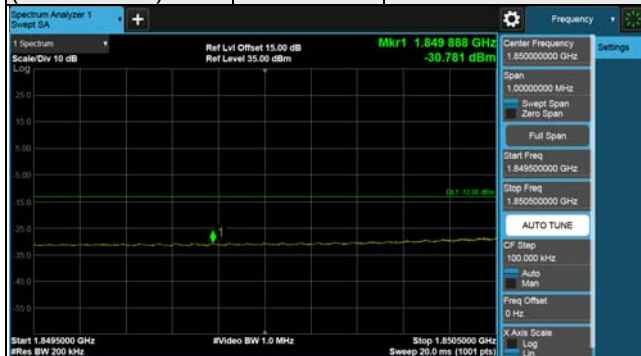
LTE Band 2, Channel Bandwidth 10MHz



LTE Band 2, Channel Bandwidth 15MHz



LTE Band 2, Channel Bandwidth 20MHz

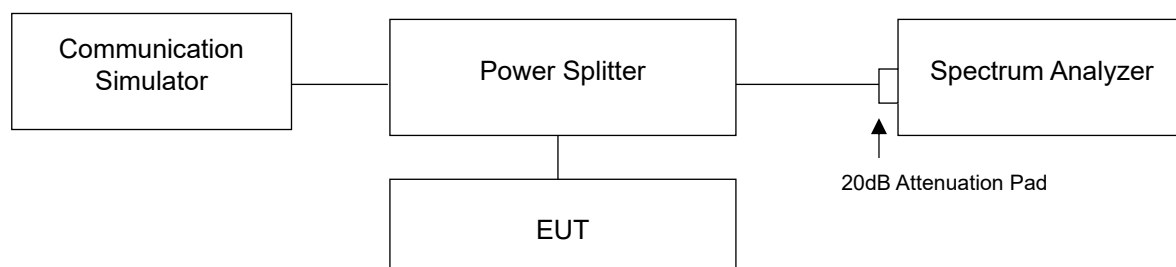
Channel 18700 (1860.0MHz)	QPSK	1 RB / 0 RB Offset	Channel 19100 (1900.0MHz)	QPSK	1 RB / 99 RB Offset
					
Channel 18700 (1860.0MHz)	QPSK	100 RB / 0 RB Offset	Channel 19100 (1900.0MHz)	QPSK	100 RB / 0 RB Offset
					

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

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

4.6.2 Test Setup



4.6.3 Test Procedures

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

4.6.4 Test Results

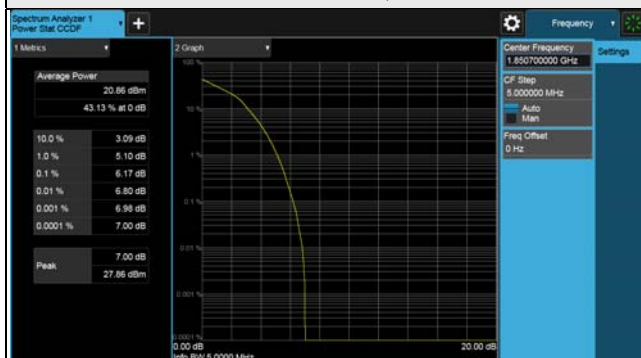
LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18607	1850.7	5.23	6.17
18900	1880.0	5.33	6.17
19193	1909.3	5.10	5.96
LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18615	1851.5	5.36	6.24
18900	1880.0	5.34	6.21
19185	1908.5	5.32	6.24
LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18625	1852.5	5.52	6.30
18900	1880.0	5.47	6.27
19175	1907.5	5.42	6.13
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18650	1855.0	5.55	6.26
18900	1880.0	5.49	6.24
19150	1905.0	5.46	6.21
LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18675	1857.5	5.43	6.16
18900	1880.0	5.37	6.06
19125	1902.5	5.47	6.17

LTE Band 2, Channel Bandwidth 20MHz

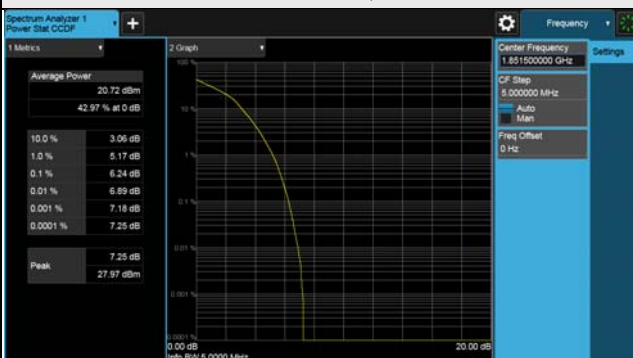
Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		QPSK	16QAM
18700	1860.0	5.50	6.29
18900	1880.0	5.44	6.21
19100	1900.0	5.52	6.31

Spectrum Plot of Worst Value

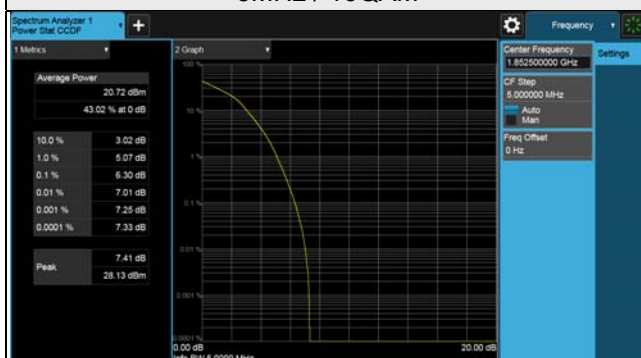
1.4MHz / 16QAM



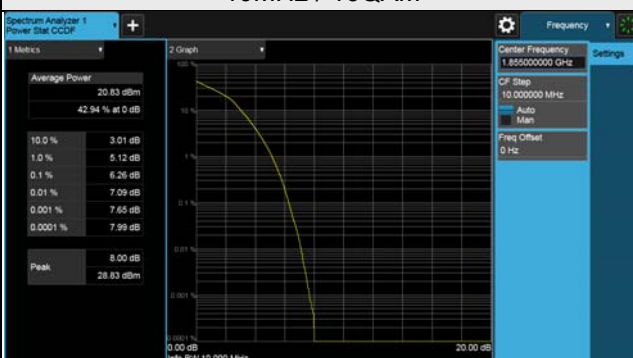
3MHz / 16QAM



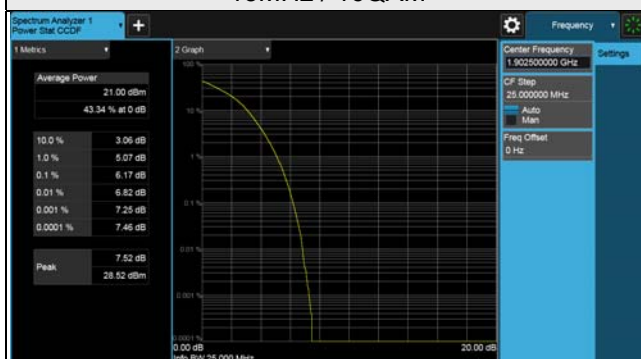
5MHz / 16QAM



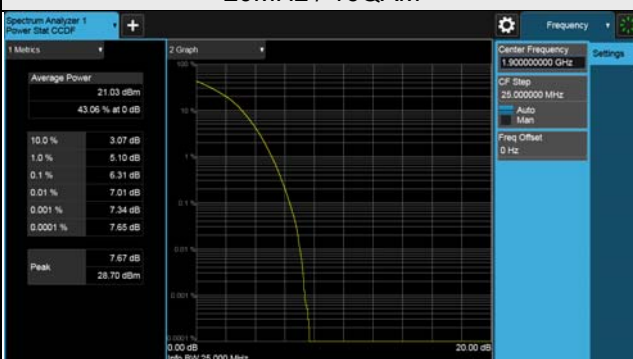
10MHz / 16QAM



15MHz / 16QAM



20MHz / 16QAM

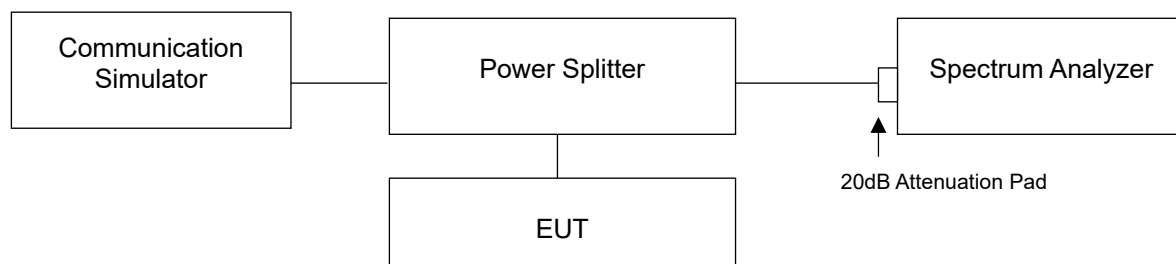


4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

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

4.7.2 Test Setup



4.7.3 Test Procedure

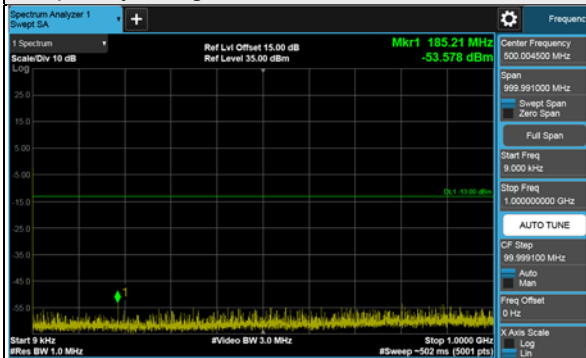
- All measurements were done at low, middle and high channels operational frequency range.
- Measuring frequency range is from 9kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

4.7.4 Test Results

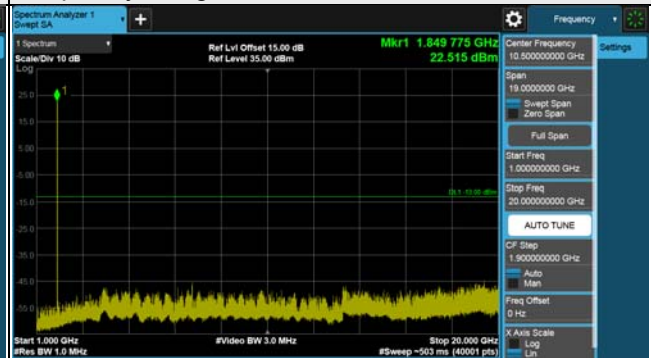
LTE Band 2, Channel Bandwidth 1.4MHz

Channel 18607 (1850.7MHz)

Frequency Range : 9kHz ~ 1GHz

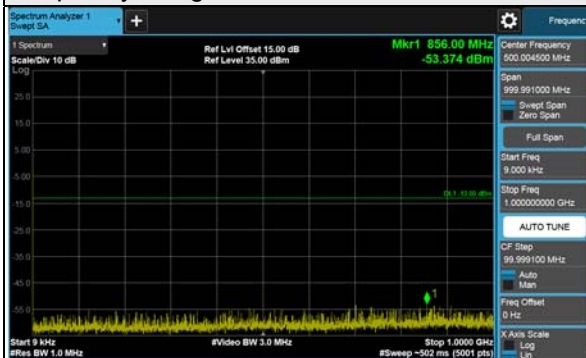


Frequency Range : 1GHz ~ 20GHz

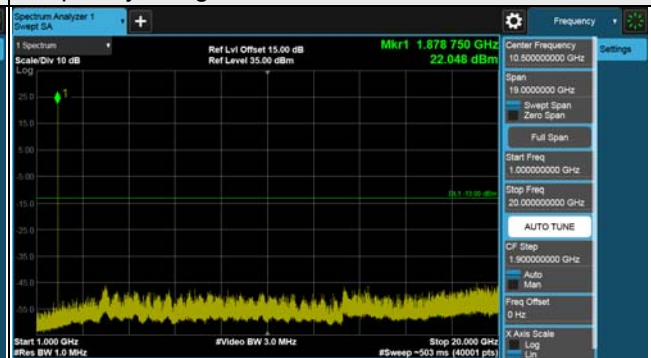


Channel 18900 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

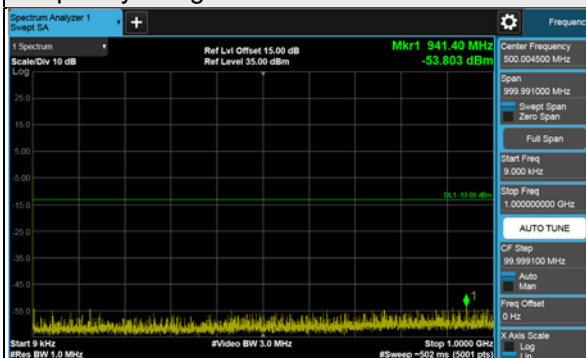


Frequency Range : 1GHz ~ 20GHz

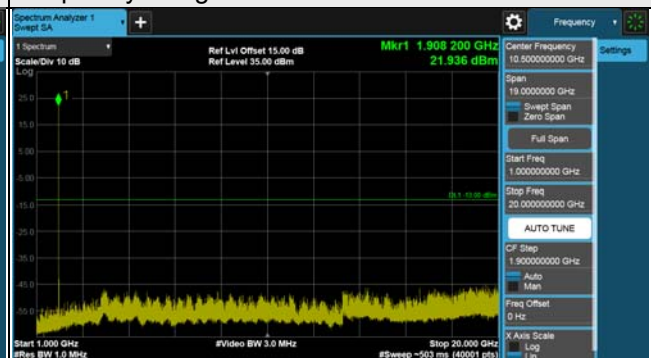


Channel 19193 (1909.3MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

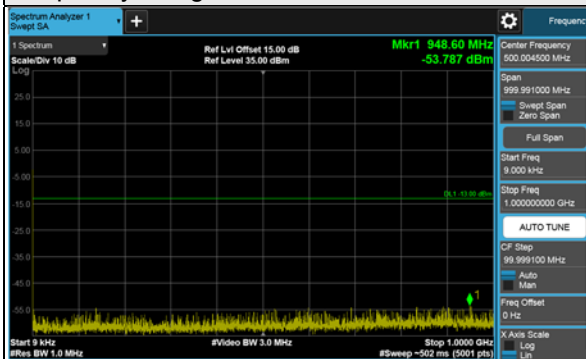


*The 9kHz signal over the limit is from Spectrum.

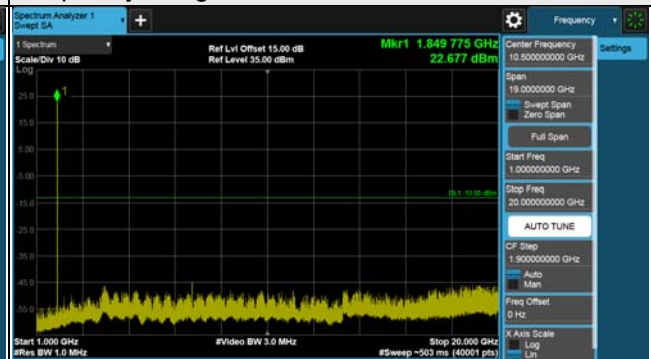
LTE Band 2, Channel Bandwidth 3MHz

Channel 18615 (1851.5MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

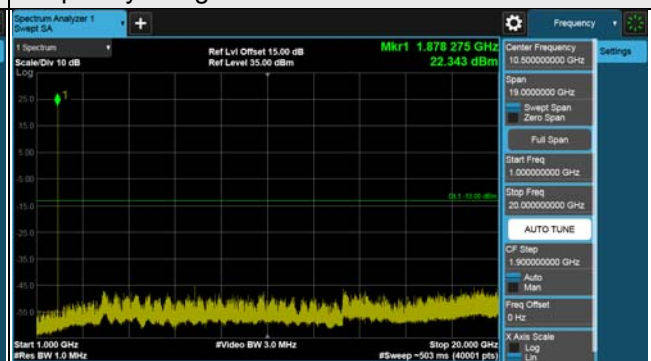


Channel 18900 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

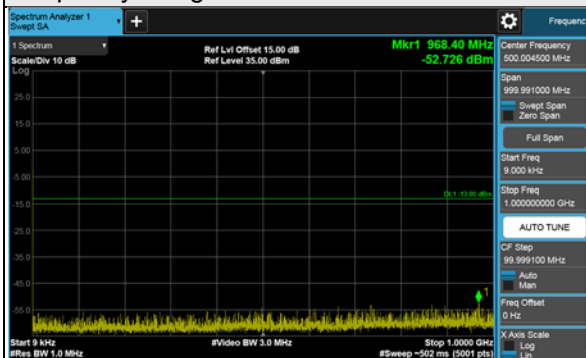


Frequency Range : 1GHz ~ 20GHz

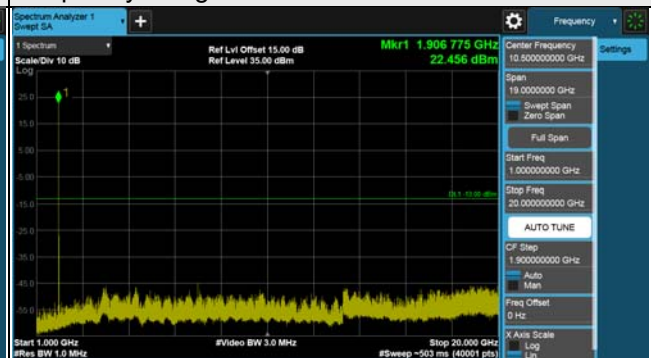


Channel 19185 (1908.5MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

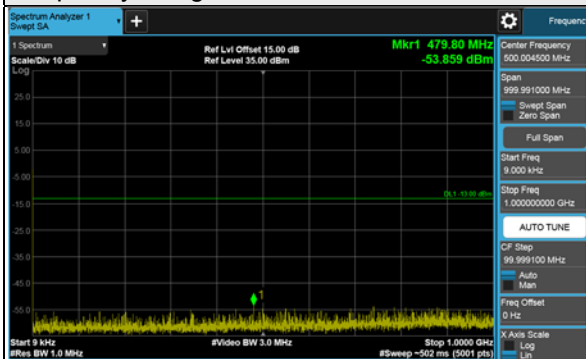


*The 9kHz signal over the limit is from Spectrum.

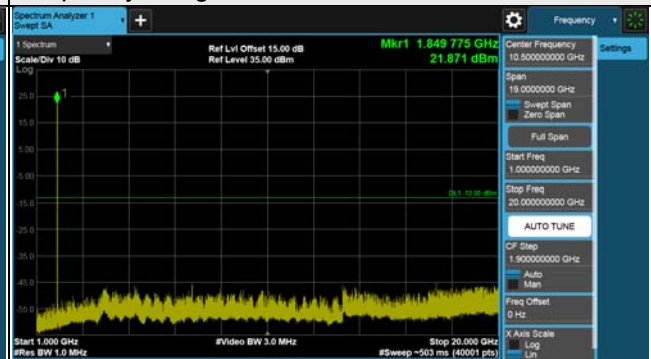
LTE Band 2, Channel Bandwidth 5MHz

Channel 18625 (1852.5MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

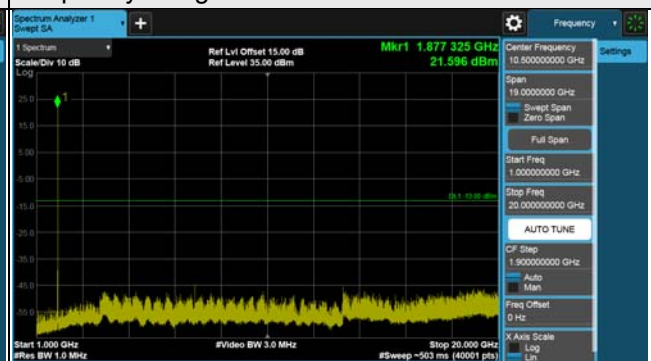


Channel 18900 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

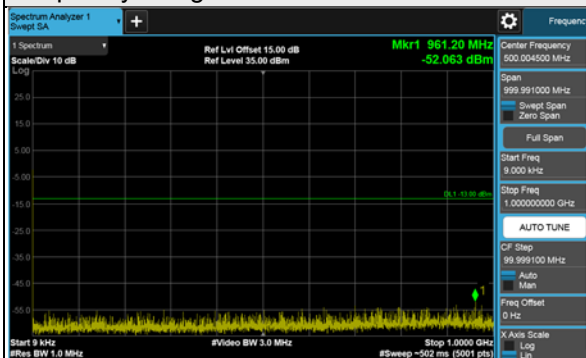


Frequency Range : 1GHz ~ 20GHz

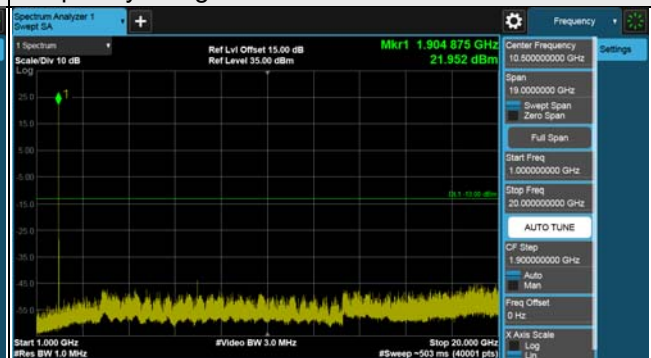


Channel 19175 (1907.5MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

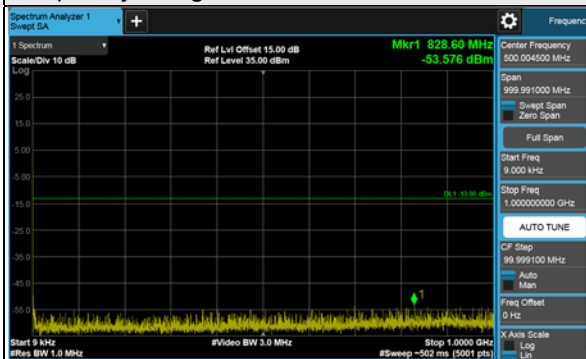


*The 9kHz signal over the limit is from Spectrum.

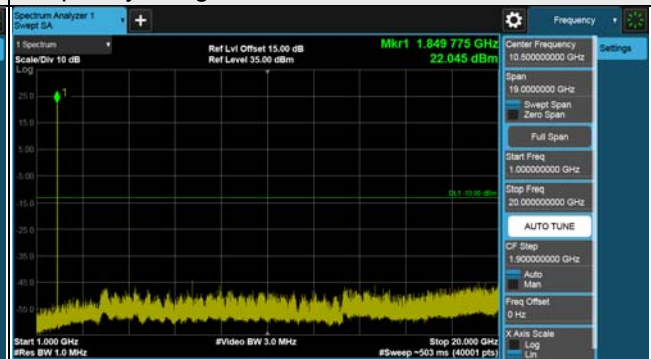
LTE Band 2, Channel Bandwidth 10MHz

Channel 18650 (1855.0MHz)

Frequency Range : 9kHz ~ 1GHz

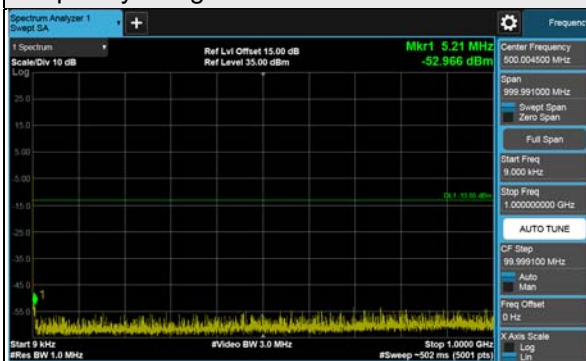


Frequency Range : 1GHz ~ 20GHz

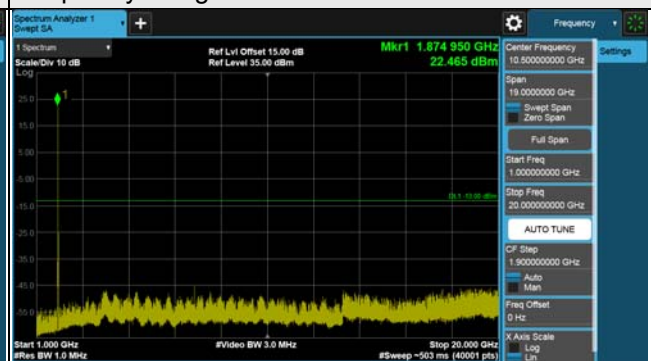


Channel 18900 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

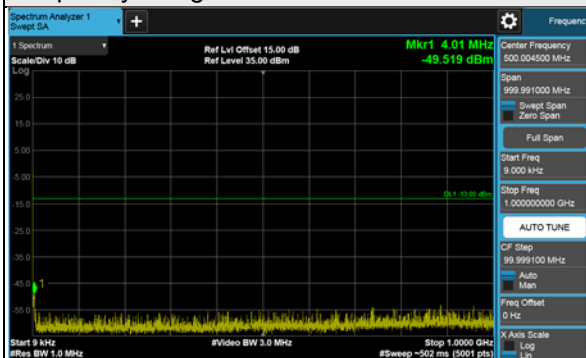


Frequency Range : 1GHz ~ 20GHz

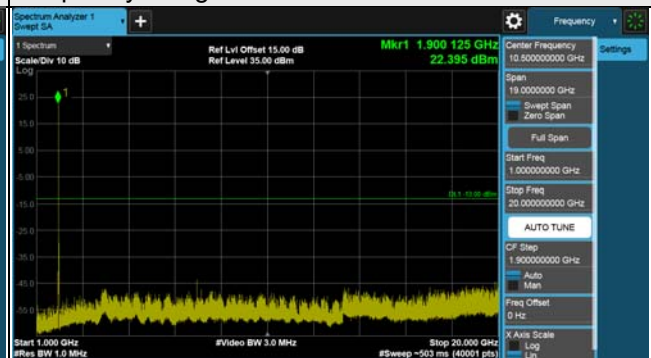


Channel 19150 (1905.0MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

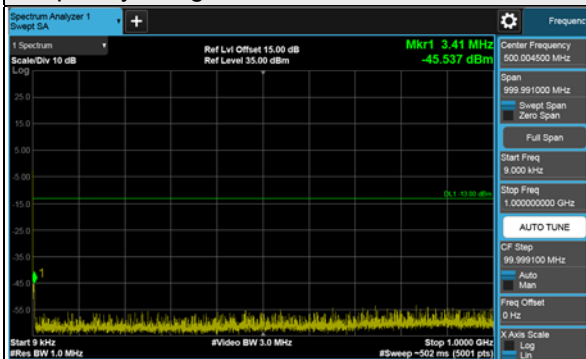


*The 9kHz signal over the limit is from Spectrum.

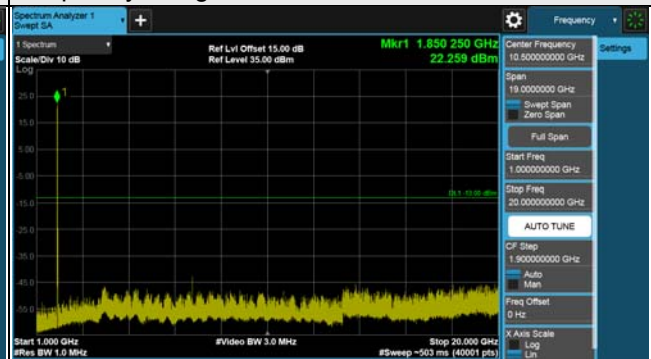
LTE Band 2, Channel Bandwidth 15MHz

Channel 18675 (1857.5MHz)

Frequency Range : 9kHz ~ 1GHz

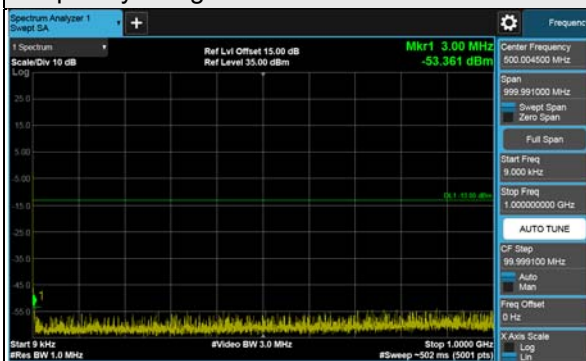


Frequency Range : 1GHz ~ 20GHz

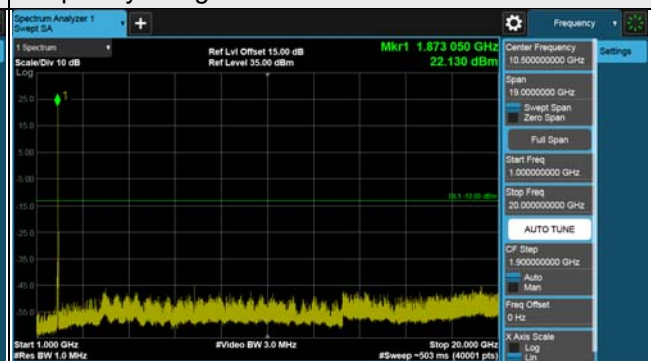


Channel 18900 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

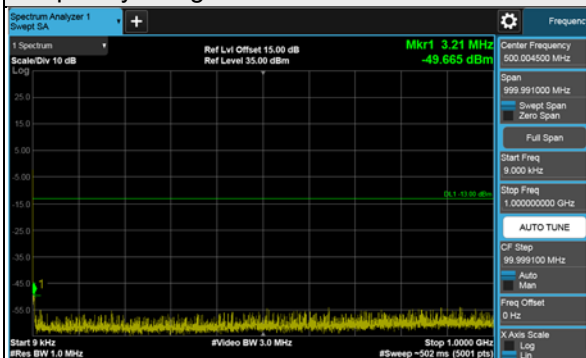


Frequency Range : 1GHz ~ 20GHz

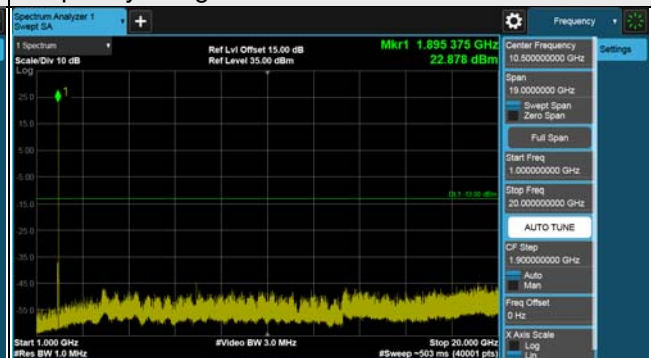


Channel 19125 (1902.5MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz

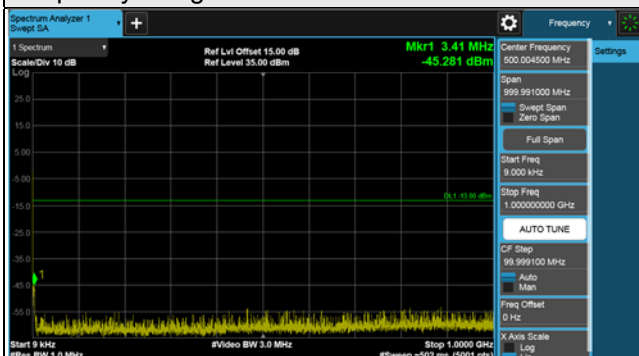


*The 9kHz signal over the limit is from Spectrum.

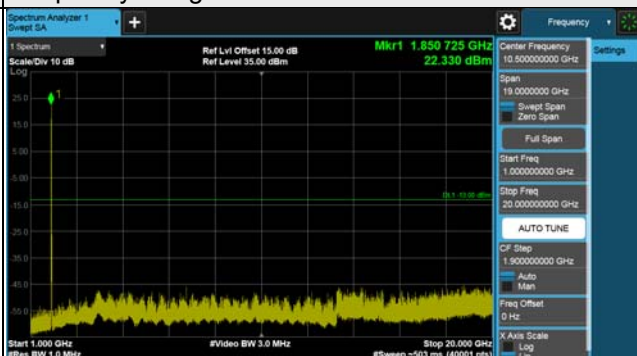
LTE Band 2, Channel Bandwidth 20MHz

Channel 18700 (1860.0MHz)

Frequency Range : 9kHz ~ 1GHz

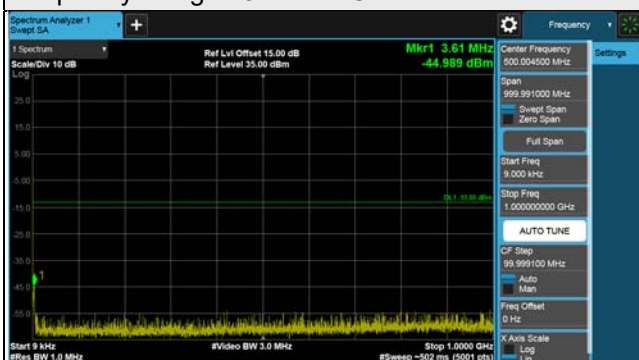


Frequency Range : 1GHz ~ 20GHz

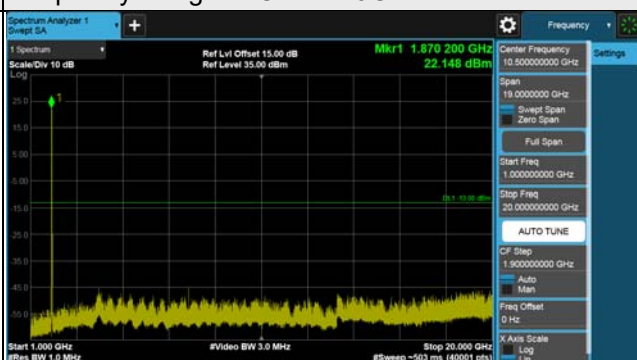


Channel 18900 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

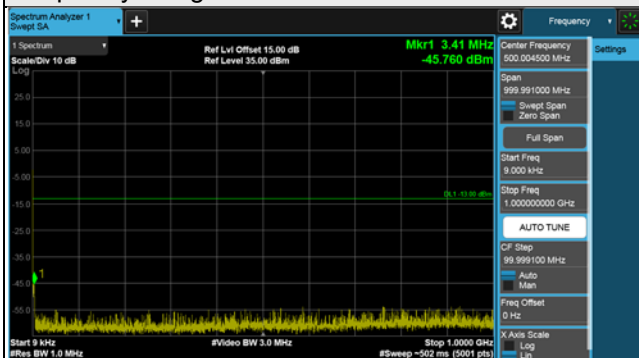


Frequency Range : 1GHz ~ 20GHz

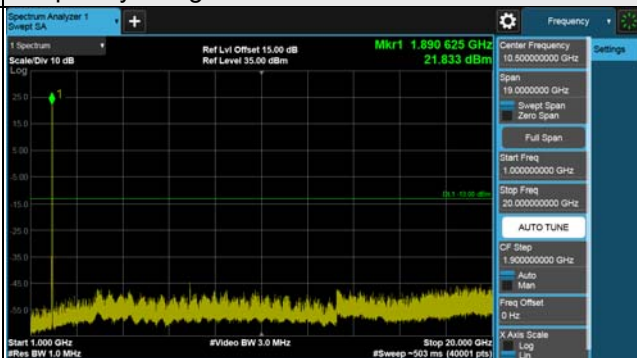


Channel 19100 (1900.0MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 20GHz



*The 9kHz signal over the limit is from Spectrum.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

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

4.8.2 Test Procedure

- a. In the semi-anechoic chamber, EUT placed on the 0.8m (below or equal 1GHz) and/or 1.5m (above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- d. Following C63.26 section 5.5 and 5.2.7
 - $\text{EIRP (dBm)} = E (\text{dB}\mu\text{V/m}) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
 - $\text{ERP (dBm)} = E (\text{dB}\mu\text{V/m}) + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note:

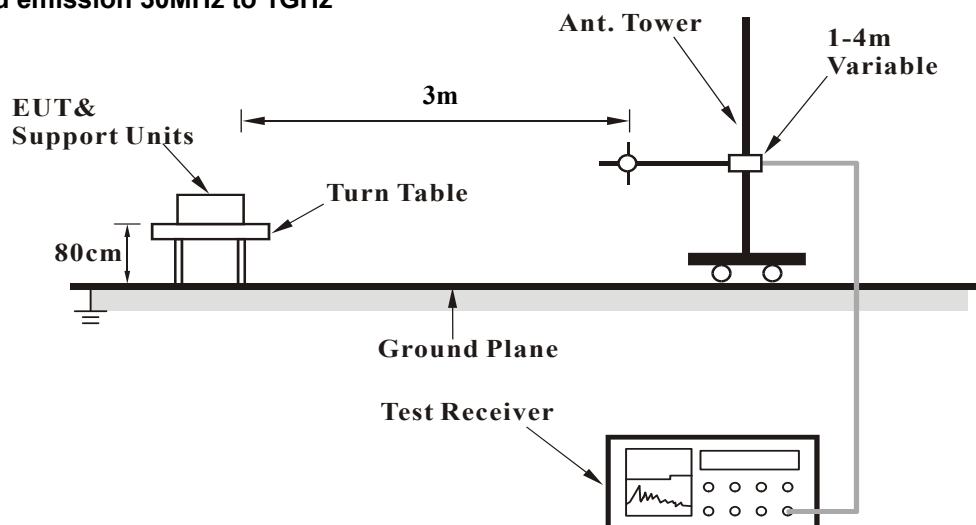
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

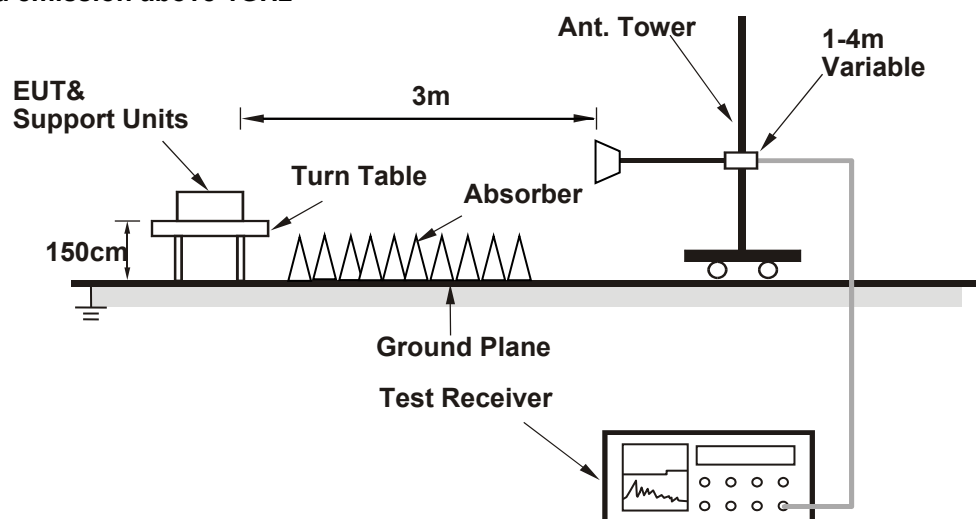
No deviation.

4.8.4 Test Setup

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).

4.8.5 Test Results

Below 1GHz

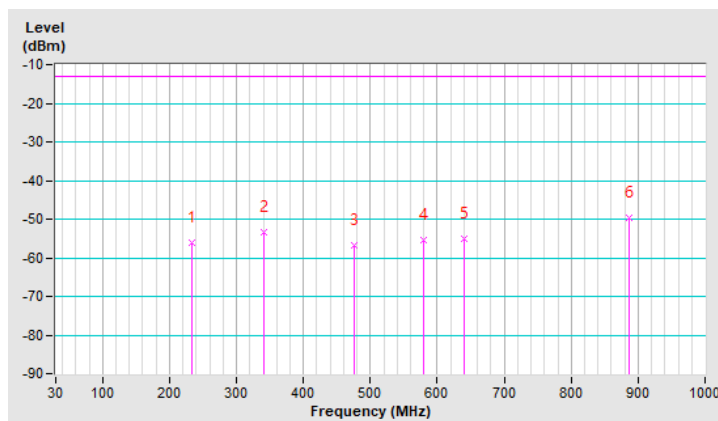
LTE Band 2, Channel Bandwidth 5MHz

Mode	TX channel 18900 (1880.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	19deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Thomas Cheng		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	232.73	-56.13	-13.00	-43.13	2.25 H	17	54.55	-110.68
2	340.40	-53.51	-13.00	-40.51	1.23 H	205	52.29	-105.80
3	476.20	-56.80	-13.00	-43.80	3.74 H	350	45.31	-102.11
4	579.99	-55.53	-13.00	-42.53	1.71 H	177	43.98	-99.51
5	640.13	-55.04	-13.00	-42.04	2.80 H	127	42.89	-97.93
6	886.51	-49.81	-13.00	-36.81	2.37 H	227	43.93	-93.74

Remarks:

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

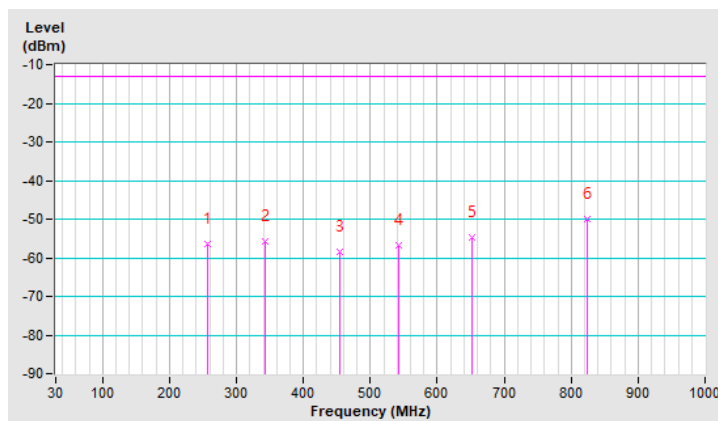


Mode	TX channel 18900 (1880.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	19deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Thomas Cheng		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	256.98	-56.28	-13.00	-43.28	1.87 V	106	53.29	-109.57
2	342.34	-55.68	-13.00	-42.68	2.02 V	158	50.12	-105.80
3	453.89	-58.40	-13.00	-45.40	2.49 V	25	44.08	-102.48
4	543.13	-56.76	-13.00	-43.76	2.14 V	118	43.78	-100.54
5	652.74	-54.59	-13.00	-41.59	2.09 V	32	43.23	-97.82
6	823.46	-49.98	-13.00	-36.98	3.23 V	229	44.43	-94.41

Remarks:

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



Above 1GHz

LTE Band 2, Channel Bandwidth 1.4MHz

Mode	TX channel 18607 (1850.7MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3701.40	-47.11	-13.00	-34.11	1.49 H	151	68.65	-115.76
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3701.40	-54.39	-13.00	-41.39	1.43 V	209	61.37	-115.76

Remarks:

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

Mode	TX channel 18900 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-46.52	-13.00	-33.52	3.78 H	41	69.05	-115.57
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-53.80	-13.00	-40.80	1.55 V	57	61.77	-115.57

Remarks:

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

Mode	TX channel 19193 (1909.3MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3818.60	-46.54	-13.00	-33.54	1.14 H	258	68.87	-115.41
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3818.60	-53.88	-13.00	-40.88	1.78 V	323	61.53	-115.41

Remarks:

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

LTE Band 2, Channel Bandwidth 5MHz

Mode	TX channel 18625 (1852.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3705.00	-47.00	-13.00	-34.00	3.62 H	201	68.74	-115.74
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3705.00	-54.27	-13.00	-41.27	2.22 V	142	61.47	-115.74

Remarks:

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

Mode	TX channel 18900 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-46.45	-13.00	-33.45	3.14 H	207	69.12	-115.57
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-53.74	-13.00	-40.74	2.78 V	222	61.83	-115.57

Remarks:

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

Mode	TX channel 19175 (1907.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3815.00	-46.43	-13.00	-33.43	1.52 H	227	68.98	-115.41
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3815.00	-53.76	-13.00	-40.76	1.37 V	217	61.65	-115.41

Remarks:

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

LTE Band 2, Channel Bandwidth 20MHz

Mode	TX channel 18700 (1860.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3720.00	-46.96	-13.00	-33.96	1.85 H	230	68.74	-115.70
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3720.00	-55.25	-13.00	-42.25	2.31 V	178	60.45	-115.70

Remarks:

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

Mode	TX channel 18900 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-46.32	-13.00	-33.32	2.29 H	209	69.25	-115.57
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3760.00	-53.65	-13.00	-40.65	2.34 V	332	61.92	-115.57

Remarks:

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

Mode	TX channel 19100 (1900.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	21deg. C, 71%RH	Input Power	120Vac, 60Hz
Tested By	Vincent Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3800.00	-46.89	-13.00	-33.89	3.21 H	251	68.56	-115.45
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3800.00	-54.58	-13.00	-41.58	2.83 V	221	60.87	-115.45

Remarks:

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

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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