FCC Test Report
(ENDC: n2 + LTE B5/B13)

Report No.: RFBFJZ-WTW-P21050403-12

FCC ID: V65C6930

Test Model: C6930

Received Date: May 18, 2021

Test Date: Jun. 24 ~ Aug. 06, 2021

Issued Date: Aug. 10, 2021

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FCC Registration / Designation Number: 788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RFBFJZ-WTW-P21050403-12	Original release	Aug. 10, 2021

1 Certificate of Conformity

Product: SmartPhone

Brand: Kyocera

Test Model: C6930

Sample Status: Engineering sample

Applicant: Kyocera Corporation c/o Kyocera International, Inc.

Test Date: Jun. 24 ~ Aug. 06, 2021

Standards: FCC Part 22, Subpart H
FCC Part 24, Subpart E
FCC Part 27, Subpart C, F

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 : Pettie Chen , **Date:** Aug. 10, 2021

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Aug. 10, 2021

Bruce Chen / Senior Engineer

2 Summary of Test Results

For n2

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 -29.54dB at 30.00MHz.

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

For LTE Band 5

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Refer to Note 1
22.913 (d)	Peak To Average Ratio	Pass	Refer to Note 1
2.1055 22.355	Frequency Stability	Pass	Refer to Note 1
2.1049	Occupied Bandwidth	Pass	Refer to Note 1
22.917	Band Edge Measurements	Pass	Refer to Note 1
2.1051 22.917	Conducted Spurious Emissions	Pass	Refer to Note 1
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -28.10dB at 111.48MHz.

Note:

1. This report is a partial report. Therefore, only test item of Transmitter Output Power and Effective Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RFBFLF-WTW-P21010278-8.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

For LTE Band 13

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (b)	Equivalent Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Refer to Note 1
----	Peak To Average Ratio	Pass	Refer to Note 1
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Refer to Note 1
2.1049	Occupied Bandwidth	Pass	Refer to Note 1
2.1051 27.53 (c)	Band Edge / Out of Band Emissions Measurements	Pass	Refer to Note 1
2.1051 27.53 (c)(f)	Conducted Spurious Emissions	Pass	Refer to Note 1
2.1053 27.53 (c)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -16.53dB at 1564.00MHz.

Note:

1. This report is a partial report. Therefore, only test item of Transmitter Output Power and Equivalent Isotropically Radiated Power / Equivalent Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RFBFJZ-WTW-P21050403-10.
2. 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. 09, 2021	Apr. 08, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 10, 2021	Jun. 09, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101866	Dec. 14, 2020	Dec. 13, 2021
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2020	Nov. 24, 2021
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Jan. 22, 2021	Jan. 21, 2022
Universal Radio Communication Tester R&S	CMU200	101095	Nov. 18, 2020	Nov. 17, 2021
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 05, 2021	Jun. 04, 2022
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 17, 2021	Feb. 16, 2022
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 16, 2021	Jan. 15, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 16, 2021	Jan. 15, 2022
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 05, 2021	Jun. 04, 2022
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower 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	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber GIANT FORCE	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2020	Sep. 09, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 02, 2021	Jun. 01, 2022
DC power supply Keysight	U8002A	MY56330015	NA	NA

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	SmartPhone
Brand	Kyocera
Test Model	C6930
Sample Status	Engineering sample
Power Supply Rating	3.87Vdc from battery 5Vdc / 9Vdc / 12Vdc from adapter

n2

Modulation Type	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM					
Waveform Type	CP-OFDM, DFT-s-OFDM					
Operating Frequency	n2 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1907.5MHz				
	n2 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1905.0MHz				
	n2 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1902.5MHz				
	n2 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1900.0MHz				
Max. EIRP Power		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n2 (Channel Bandwidth 5MHz)	177.011mW (22.48dBm)	179.473mW (22.54dBm)	134.586mW (21.29dBm)	93.541mW (19.71dBm)	59.020mW (17.71dBm)
	n2 (Channel Bandwidth 10MHz)	175.792mW (22.45dBm)	178.649mW (22.52dBm)	134.896mW (21.30dBm)	92.897mW (19.68dBm)	59.429mW (17.74dBm)
	n2 (Channel Bandwidth 15MHz)	177.828mW (22.50dBm)	179.473mW (22.54dBm)	136.773mW (21.36dBm)	93.972mW (19.73dBm)	58.884mW (17.70dBm)
	n2 (Channel Bandwidth 20MHz)	179.887mW (22.55dBm)	185.353mW (22.68dBm)	137.404mW (21.38dBm)	95.060mW (19.78dBm)	59.566mW (17.75dBm)
Emission Designator		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n2 (Channel Bandwidth 5MHz)	4M47G7D	4M48G7D	4M48D7W	4M48D7W	4M48D7W
	n2 (Channel Bandwidth 10MHz)	9M24G7D	9M30G7D	9M29D7W	9M29D7W	9M30D7W
	n2 (Channel Bandwidth 15MHz)	14M1G7D	14M1G7D	14M1D7W	14M1D7W	14M1D7W
	n2 (Channel Bandwidth 20MHz)	18M8G7D	19M0G7D	19M0D7W	19M0D7W	19M0D7W

LTE Band

Modulation Type	QPSK, 16QAM, 64QAM, 256QAM				
Operating Frequency	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz			
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz			
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz			
	LTE Band 5 (Channel Bandwidth 10MHz)	829.0MHz ~ 844.0MHz			
	LTE Band 13 (Channel Bandwidth 5MHz)	779.5MHz ~ 784.5MHz			
	LTE Band 13 (Channel Bandwidth 10MHz)	782.0MHz			
Max. ERP Power		QPSK	16QAM	64QAM	256QAM
	LTE Band 5 (Channel Bandwidth 1.4MHz)	55.719mW (17.46dBm)	49.091mW (16.91dBm)	35.645mW (15.52dBm)	17.378mW (12.40dBm)
	LTE Band 5 (Channel Bandwidth 3MHz)	54.954mW (17.40dBm)	41.976mW (16.23dBm)	34.594mW (15.39dBm)	17.579mW (12.45dBm)
	LTE Band 5 (Channel Bandwidth 5MHz)	54.828mW (17.39dBm)	42.756mW (16.31dBm)	33.343mW (15.23dBm)	17.100mW (12.33dBm)
	LTE Band 5 (Channel Bandwidth 10MHz)	55.847mW (17.47dBm)	45.604mW (16.59dBm)	34.119mW (15.33dBm)	18.535mW (12.68dBm)
	LTE Band 13 (Channel Bandwidth 5MHz)	52.723mW (17.22dBm)	44.875mW (16.52dBm)	42.756mW (16.31dBm)	17.378mW (12.40dBm)
	LTE Band 13 (Channel Bandwidth 10MHz)	52.845mW (17.23dBm)	42.073mW (16.24dBm)	43.053mW (16.34dBm)	18.793mW (12.74dBm)
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 contains following accessory devices.

Battery	
Brand	KYOCERA
Model	SCP-75LBPS
Rating	3.87 V typ / 4500 mAh/17.5 Wh typ

Adapter	
Brand	KYOCERA Corporation
Model	SCP-49ADT
Input Power	AC 100-240V, 50/60Hz 0.4A
Output Power	DC 5.0V, 1.8A / 9.0V, 1.8A / 12.0V, 1.2A

USB Cable	
Brand	KYOCERA Corporation
Model	SCP-24SDC
Signal Line	1m shielded Type A to Type C USB cable

2. The following antennas were provided to the EUT.

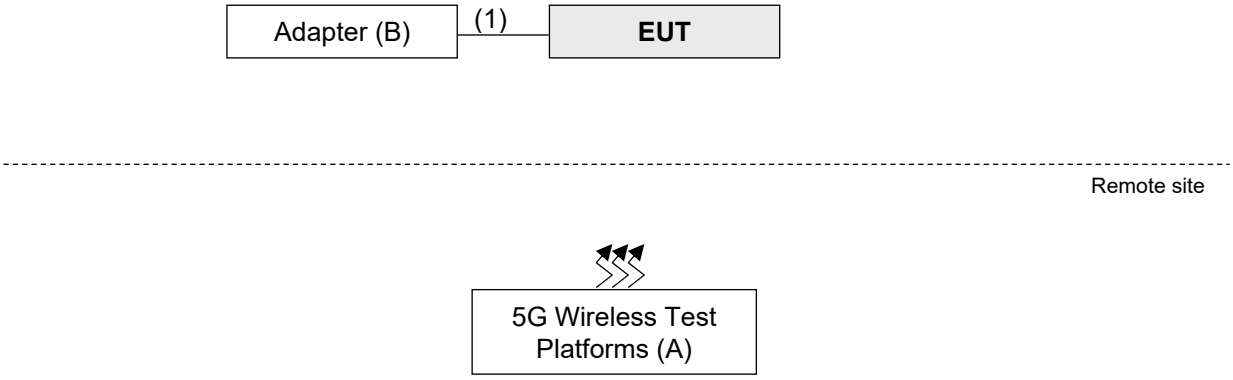
Band	Freq. Range (MHz)	Gain (dBi)
n2	1852.5 ~ 1907.5	-0.8 (Tx1), -1.3 (Tx2) (diversity)
LTE Band 5	824.7 ~ 848.3	-3.5 (Tx1)
LTE Band 13	779.5 ~ 784.5	-3.4 (Tx1)

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

3. The EUT supports the following ENDC configuration.

	FCC 5G FR1			ENDC
	Band	SCS	Bandwidth (MHz)	
5GNR	n2	15kHz	5/10/15/20	Band 5/13
	n5	15kHz	5/10/15/20	Band 2/48/66
	n66	15kHz	5/10/15/20	Band 5/13
	n71	15kHz	5/10/15/20	Band 2/66

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.	5G Wireless Test Platforms	Keysight	E7515B	MY58300759	NA	-
B.	Adapter	KYOCERA	SCP-49ADT	NA	NA	Accessory

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.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Type A to Type C USB cable	1	1	Y	0	Accessory

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
n2	X-plane
LTE Band 5	X-plane
LTE Band 13	X-plane

n2

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	EIRP	370500 to 381500	370500 (1852.5MHz), 376000 (1880.0MHz), 381500 (1907.5MHz)	5MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 13 RB Offset 1 RB / 23 RB Offset 12 RB / 0 RB Offset 12 RB / 7 RB Offset 12 RB / 13 RB Offset 25 RB / 0 RB Offset
		371000 to 381000	371000 (1855.0MHz), 376000 (1880.0MHz), 381000 (1905.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 26 RB Offset 1 RB / 50 RB Offset 25 RB / 0 RB Offset 25 RB / 14 RB Offset 25 RB / 27 RB Offset 50 RB / 0 RB Offset
		371500 to 380500	371500 (1857.5MHz), 376000 (1880.0MHz), 380500 (1902.5MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 40 RB Offset 1 RB / 77 RB Offset 36 RB / 0 RB Offset 36 RB / 22 RB Offset 36 RB / 43 RB Offset 75 RB / 0 RB Offset
		372000 to 380000	372000 (1860.0MHz), 376000 (1880.0MHz), 380000 (1900.0MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 53 RB Offset 1 RB / 104 RB Offset 50RB / 0 RB Offset 50 RB / 28 RB Offset 50 RB / 56 RB Offset 100 RB / 0 RB Offset
-	Modulation characteristics	372000 to 380000	376000 (1880.0MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	106 RB / 0 RB Offset
-	Frequency Stability	370500 to 381500	370500 (1852.5MHz), 381500 (1907.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		371000 to 381000	371000 (1855.0MHz), 381000 (1905.0MHz)	10MHz	QPSK	52 RB / 0 RB Offset
		371500 to 380500	371500 (1857.5MHz), 380500 (1902.5MHz)	15MHz	QPSK	79 RB / 0 RB Offset
		372000 to 380000	372000 (1860.0MHz), 380000 (1900.0MHz)	20MHz	QPSK	106 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Occupied Bandwidth	370500 to 381500	370500 (1852.5MHz), 376000 (1880.0MHz), 381500 (1907.5MHz)	5MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	25 RB / 0 RB Offset
		371000 to 381000	371000 (1855.0MHz), 376000 (1880.0MHz), 381000 (1905.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	52 RB / 0 RB Offset
		371500 to 380500	371500 (1857.5MHz), 376000 (1880.0MHz), 380500 (1902.5MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	79 RB / 0 RB Offset
		372000 to 380000	372000 (1860.0MHz), 376000 (1880.0MHz), 380000 (1900.0MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	106 RB / 0 RB Offset
-	Band Edge	370500 to 381500	370500 (1852.5MHz), 381500 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		371000 to 381000	371000 (1855.0MHz), 381000 (1905.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 51 RB Offset 52 RB / 0 RB Offset
		371500 to 380500	371500 (1857.5MHz), 380500 (1902.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 78 RB Offset 79 RB / 0 RB Offset
		372000 to 380000	372000 (1860.0MHz), 380000 (1900.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset 1 RB / 105 RB Offset 106 RB / 0 RB Offset
-	Peak to Average Ratio	370500 to 381500	370500 (1852.5MHz), 376000 (1880.0MHz), 381500 (1907.5MHz)	5MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		371000 to 381000	371000 (1855.0MHz), 376000 (1880.0MHz), 381000 (1905.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		371500 to 380500	371500 (1857.5MHz), 376000 (1880.0MHz), 380500 (1902.5MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		372000 to 380000	372000 (1860.0MHz), 376000 (1880.0MHz), 380000 (1900.0MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	370500 to 381500	370500 (1852.5MHz), 376000 (1880.0MHz), 381500 (1907.5MHz)	5MHz	QPSK	1 RB / 1 RB Offset
		371000 to 381000	371000 (1855.0MHz), 376000 (1880.0MHz), 381000 (1905.0MHz)	10MHz	QPSK	1 RB / 1 RB Offset
		371500 to 380500	371500 (1857.5MHz), 376000 (1880.0MHz), 380500 (1902.5MHz)	15MHz	QPSK	1 RB / 1 RB Offset
		372000 to 380000	372000 (1860.0MHz), 376000 (1880.0MHz), 380000 (1900.0MHz)	20MHz	QPSK	1 RB / 1 RB Offset
-	Radiated Emission Below 1GHz	372000 to 380000	380000 (1900.0MHz)	20MHz	QPSK	1 RB / 1 RB Offset
-	Radiated Emission Above 1GHz	370500 to 381500	370500 (1852.5MHz), 376000 (1880.0MHz), 381500 (1907.5MHz)	5MHz	QPSK	1 RB / 1 RB Offset
		372000 to 380000	372000 (1860.0MHz), 376000 (1880.0MHz), 380000 (1900.0MHz)	20MHz	QPSK	1 RB / 1 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 38.521-1 Section 6.5.3.1.4, choose the lowest and highest channel bandwidth for final test.
3. Only output power, modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under $\pi/2$ BPSK, QPSK, 16QAM, 64QAM and 256QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 5

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM / 256QAM	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
		20415 to 20635	20415 (825.5MHz), 20525 (836.5MHz), 20635 (847.5MHz)	3MHz	QPSK / 16QAM / 64QAM / 256QAM	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
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK / 16QAM / 64QAM / 256QAM	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
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK / 16QAM / 64QAM / 256QAM	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
-	Radiated Emission Below 1GHz	20450 to 20600	20525 (836.5MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	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 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The measured output power for QPSK mode is higher than the measured output power for 16QAM, 64QAM and 256QAM modes. Therefore the radiated emission test items was performed under QPSK mode only.

LTE Band 13

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK / 16QAM / 64QAM / 256QAM	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
		23230	23230 (782.0MHz)	10MHz	QPSK / 16QAM / 64QAM / 256QAM	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
-	Radiated Emission Below 1GHz	23230	23230 (782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230 (782.0MHz)	10MHz	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 Section 6.6.3.1.4, choose the lowest & highest channel bandwidth for final test.
3. The measured output power for QPSK mode is higher than the measured output power for 16QAM, 64QAM and 256QAM modes. Therefore the radiated emission test items was performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP / ERP	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Frequency Stability	25deg. C, 60%RH	3.87Vdc	James Yang
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Band Edge	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Peak To Average Ratio	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Radiated Emission	22deg. C, 66%RH	120Vac, 60Hz	Greg Lin

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 22

FCC 47 CFR Part 24

FCC 47 CFR Part 27

ANSI/TIA/EIA-603-D-2010

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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 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

For n2:
Mobile / Portable station are limited to 2 watts e.i.r.p.

For LTE Band 5:
Mobile / Portable station are limited to 7 watts e.r.p.

For LTE Band 13:
Control and mobile stations in the 698-746 MHz, 746-757 MHz, 787-788 MHz and 805-806 MHz band are limited to 30 watts ERP.
Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink, 746-757 MHz,787-788 MHz and 805-806 MHz band are limited to 3 watts ERP.

4.1.2 Test Procedures

Conducted Power Measurement:

The EUT was set up for the maximum power with 5GNR and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Maximum EIRP / ERP

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

$EIRP = P_{Meas} + G_T$

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

where

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

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

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

4.1.3 Test Setup

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

NR Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		372000	376000	380000
		Frequency (MHz)		1860	1880	1900
20M	$\pi/2$ BPSK	1	1	23.35	22.91	23.09
20M	QPSK	1	1	23.48	22.95	23.29
		1	53	23.11	22.89	22.88
		1	104	22.83	22.71	22.70
		50	0	22.14	21.95	21.90
		50	28	23.46	22.87	22.90
		50	56	22.10	21.85	21.88
		100	0	22.12	21.97	21.84
20M	16QAM	1	1	22.18	21.96	21.96
20M	64QAM	1	1	20.58	20.36	20.25
20M	256QAM	1	1	18.55	18.33	18.29
BW	MCS Index	Channel		371500	376000	380500
		Frequency (MHz)		1857.5	1880	1902.5
15M	$\pi/2$ BPSK	1	1	23.30	22.87	22.99
15M	QPSK	1	1	23.34	22.94	23.28
		1	40	23.08	22.87	22.78
		1	77	22.80	22.85	22.70
		36	0	22.09	21.91	21.82
		36	22	23.19	22.86	22.85
		36	43	22.07	21.77	21.88
		75	0	22.02	21.95	21.78
15M	16QAM	1	1	22.16	21.90	21.89
15M	64QAM	1	1	20.53	20.36	20.21
15M	256QAM	1	1	18.50	18.24	18.27

NR Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		371000	376000	381000
		Frequency (MHz)		1855	1880	1905
10M	$\pi/2$ BPSK	1	1	23.25	22.82	22.99
10M	QPSK	1	1	23.32	22.86	23.24
		1	26	23.08	22.84	22.82
		1	50	22.78	22.83	22.70
		25	0	22.04	21.91	21.81
		25	14	23.18	22.75	22.86
		25	27	22.07	21.85	21.85
		50	0	22.02	21.89	21.83
10M	16QAM	1	1	22.10	21.89	21.95
10M	64QAM	1	1	20.48	20.32	20.22
10M	256QAM	1	1	18.54	18.33	18.22
BW	MCS Index	Channel		370500	376000	381500
		Frequency (MHz)		1852.5	1880	1907.5
5M	$\pi/2$ BPSK	1	1	23.28	22.81	23.08
5M	QPSK	1	1	23.34	22.85	23.27
		1	13	23.11	22.81	22.78
		1	23	22.83	22.70	22.70
		12	0	22.07	21.92	21.82
		12	7	23.19	22.84	22.86
		12	13	22.01	21.79	21.88
		25	0	22.02	21.90	21.74
5M	16QAM	1	1	22.09	21.96	21.96
5M	64QAM	1	1	20.51	20.28	20.25
5M	256QAM	1	1	18.51	18.30	18.21

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	23.12	23.01	22.93
		1	24	23.06	22.81	22.78
		1	49	22.74	22.74	22.89
		25	0	21.88	22.20	21.90
		25	12	22.23	21.88	21.73
		25	25	21.81	22.01	21.76
		50	0	21.79	21.77	21.90
10M	16QAM	1	0	22.24	22.23	22.22
		1	24	22.19	22.17	22.15
		1	49	22.17	22.12	22.07
		25	0	21.12	21.18	20.85
		25	12	21.21	20.88	21.17
		25	25	20.83	20.72	21.08
		50	0	20.90	20.85	20.83
10M	64QAM	1	0	20.98	20.82	20.78
		1	24	20.89	20.78	20.87
		1	49	20.77	20.78	20.80
		25	0	19.77	19.79	19.80
		25	12	19.75	19.98	19.74
		25	25	19.71	19.90	19.76
		50	0	19.71	19.83	19.73
10M	256QAM	1	0	17.94	18.33	18.20
		1	24	17.84	17.93	17.88
		1	49	18.11	18.21	18.23
		25	0	17.75	17.80	17.75
		25	12	17.78	17.74	17.82
		25	25	17.72	17.73	17.87
		50	0	17.89	18.05	17.91

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	22.84	22.91	23.04
		1	12	22.79	22.86	22.94
		1	24	22.76	22.90	22.87
		12	0	21.88	21.95	22.04
		12	6	21.77	21.71	21.76
		12	13	21.79	21.86	21.71
		25	0	21.76	21.80	21.73
5M	16QAM	1	0	21.96	21.87	21.86
		1	12	21.95	21.84	21.84
		1	24	21.86	21.76	21.86
		12	0	20.93	20.90	21.00
		12	6	20.84	20.89	21.01
		12	13	20.85	21.25	20.87
		25	0	20.80	20.73	20.79
5M	64QAM	1	0	20.86	20.88	20.84
		1	12	20.81	20.79	20.78
		1	24	20.79	20.78	20.77
		12	0	19.76	19.78	19.91
		12	6	19.86	19.88	19.81
		12	13	19.83	19.85	19.85
		25	0	19.96	19.97	19.88
5M	256QAM	1	0	17.89	17.83	17.90
		1	12	17.90	17.77	17.88
		1	24	17.94	17.80	17.73
		12	0	17.75	17.91	17.82
		12	6	17.76	17.89	17.85
		12	13	17.98	17.72	17.98
		25	0	17.92	17.92	17.95

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	23.05	23.05	22.98
		1	7	22.83	22.96	22.93
		1	14	22.84	22.86	22.98
		8	0	22.02	22.00	21.91
		8	3	22.15	22.00	21.90
		8	7	21.82	21.97	21.87
		15	0	21.78	21.98	21.79
3M	16QAM	1	0	21.73	21.84	21.88
		1	7	21.72	21.73	21.79
		1	14	21.81	21.73	21.74
		8	0	20.89	21.05	21.06
		8	3	20.85	21.09	21.12
		8	7	21.07	20.80	20.89
		15	0	20.74	20.75	21.73
3M	64QAM	1	0	21.04	20.86	20.91
		1	7	20.81	20.85	20.88
		1	14	20.74	20.80	20.79
		8	0	19.77	19.98	19.76
		8	3	19.75	19.86	19.74
		8	7	19.80	19.82	19.79
		15	0	19.71	19.75	19.71
3M	256QAM	1	0	18.10	18.00	18.06
		1	7	18.08	17.82	18.05
		1	14	17.80	17.83	17.87
		8	0	17.75	18.00	17.92
		8	3	17.91	18.06	17.99
		8	7	17.84	17.85	17.92
		15	0	17.85	17.95	17.93

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	22.86	23.11	23.10
		1	2	22.84	22.82	22.81
		1	5	22.85	22.83	22.87
		3	0	22.90	22.75	22.77
		3	1	22.94	23.08	22.94
		3	3	22.84	22.91	22.80
		6	0	22.50	22.19	22.40
1.4M	16QAM	1	0	22.48	22.56	22.36
		1	2	21.77	22.18	22.30
		1	5	21.76	21.86	22.04
		3	0	21.87	21.85	22.05
		3	1	21.77	22.13	21.84
		3	3	21.79	21.85	21.74
		6	0	20.77	20.76	20.75
1.4M	64QAM	1	0	20.79	20.75	20.76
		1	2	20.72	20.74	20.74
		1	5	20.71	20.82	20.73
		3	0	20.80	20.85	20.92
		3	1	20.79	21.17	20.78
		3	3	20.76	20.78	20.71
		6	0	19.85	19.82	19.86
1.4M	256QAM	1	0	17.76	18.00	18.05
		1	2	17.97	17.95	17.82
		1	5	17.80	17.89	17.99
		3	0	17.76	17.74	17.97
		3	1	17.89	18.05	17.75
		3	3	17.88	17.88	17.74
		6	0	17.86	17.85	17.77

LTE Band 13				
BW	MCS Index	RB Size	RB Offset	Low
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	22.78
		1	24	22.77
		1	49	22.75
		25	0	21.75
		25	12	21.75
		25	25	21.75
		50	0	21.71
10M	16QAM	1	0	21.75
		1	24	21.72
		1	49	21.79
		25	0	21.35
		25	12	21.60
		25	25	21.00
		50	0	20.74
10M	64QAM	1	0	21.57
		1	24	21.89
		1	49	21.12
		25	0	19.83
		25	12	20.17
		25	25	19.82
		50	0	19.78
10M	256QAM	1	0	18.29
		1	24	17.81
		1	49	17.92
		25	0	17.85
		25	12	17.86
		25	25	18.03
		50	0	18.00

LTE Band 13						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	22.77	22.77	22.76
		1	12	22.72	22.71	22.73
		1	24	22.72	22.71	22.71
		12	0	21.73	21.74	21.72
		12	6	21.74	21.79	21.72
		12	13	21.76	21.74	21.75
		25	0	21.74	21.75	21.71
5M	16QAM	1	0	21.84	21.87	22.07
		1	12	21.80	21.78	21.85
		1	24	21.71	21.74	21.72
		12	0	20.86	20.87	20.87
		12	6	20.86	20.84	20.86
		12	13	20.71	20.71	20.74
		25	0	20.75	20.75	20.71
5M	64QAM	1	0	21.86	21.44	21.65
		1	12	21.58	21.86	21.70
		1	24	20.79	20.76	20.90
		12	0	19.98	20.04	20.03
		12	6	19.80	20.55	20.45
		12	13	19.78	20.00	20.09
		25	0	19.83	19.86	19.85
5M	256QAM	1	0	17.77	17.79	17.76
		1	12	17.80	17.71	17.83
		1	24	17.78	17.72	17.80
		12	0	17.80	17.91	17.78
		12	6	17.78	17.87	17.85
		12	13	17.88	17.89	17.79
		25	0	17.87	17.94	17.95

EIRP / ERP Power (dBm)

NR Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		372000	376000	380000
		Frequency (MHz)		1860	1880	1900
20M	$\pi/2$ BPSK	1	1	22.55	22.11	22.29
20M	QPSK	1	1	22.68	22.15	22.49
		1	53	22.31	22.09	22.08
		1	104	22.03	21.91	21.90
		50	0	21.34	21.15	21.10
		50	28	22.66	22.07	22.10
		50	56	21.30	21.05	21.08
		100	0	21.32	21.17	21.04
20M	16QAM	1	1	21.38	21.16	21.16
20M	64QAM	1	1	19.78	19.56	19.45
20M	256QAM	1	1	17.75	17.53	17.49
BW	MCS Index	Channel		371500	376000	380500
		Frequency (MHz)		1857.5	1880	1902.5
15M	$\pi/2$ BPSK	1	1	22.50	22.07	22.19
15M	QPSK	1	1	22.54	22.14	22.48
		1	40	22.28	22.07	21.98
		1	77	22.00	22.05	21.90
		36	0	21.29	21.11	21.02
		36	22	22.39	22.06	22.05
		36	43	21.27	20.97	21.08
		75	0	21.22	21.15	20.98
15M	16QAM	1	1	21.36	21.10	21.09
15M	64QAM	1	1	19.73	19.56	19.41
15M	256QAM	1	1	17.70	17.44	17.47

*EIRP = Conducted + antenna gain (-0.8dBi)

NR Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		371000	376000	381000
		Frequency (MHz)		1855	1880	1905
10M	$\pi/2$ BPSK	1	1	22.45	22.02	22.19
10M	QPSK	1	1	22.52	22.06	22.44
		1	26	22.28	22.04	22.02
		1	50	21.98	22.03	21.90
		25	0	21.24	21.11	21.01
		25	14	22.38	21.95	22.06
		25	27	21.27	21.05	21.05
		50	0	21.22	21.09	21.03
10M	16QAM	1	1	21.30	21.09	21.15
10M	64QAM	1	1	19.68	19.52	19.42
10M	256QAM	1	1	17.74	17.53	17.42
BW	MCS Index	Channel		370500	376000	381500
		Frequency (MHz)		1852.5	1880	1907.5
5M	$\pi/2$ BPSK	1	1	22.48	22.01	22.28
5M	QPSK	1	1	22.54	22.05	22.47
		1	13	22.31	22.01	21.98
		1	23	22.03	21.90	21.90
		12	0	21.27	21.12	21.02
		12	7	22.39	22.04	22.06
		12	13	21.21	20.99	21.08
		25	0	21.22	21.10	20.94
5M	16QAM	1	1	21.29	21.16	21.16
5M	64QAM	1	1	19.71	19.48	19.45
5M	256QAM	1	1	17.71	17.50	17.41

*EIRP = Conducted + antenna gain (-0.8dBi)

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	17.47	17.36	17.28
		1	24	17.41	17.16	17.13
		1	49	17.09	17.09	17.24
		25	0	16.23	16.55	16.25
		25	12	16.58	16.23	16.08
		25	25	16.16	16.36	16.11
		50	0	16.14	16.12	16.25
10M	16QAM	1	0	16.59	16.58	16.57
		1	24	16.54	16.52	16.50
		1	49	16.52	16.47	16.42
		25	0	15.47	15.53	15.20
		25	12	15.56	15.23	15.52
		25	25	15.18	15.07	15.43
		50	0	15.25	15.20	15.18
10M	64QAM	1	0	15.33	15.17	15.13
		1	24	15.24	15.13	15.22
		1	49	15.12	15.13	15.15
		25	0	14.12	14.14	14.15
		25	12	14.10	14.33	14.09
		25	25	14.06	14.25	14.11
		50	0	14.06	14.18	14.08
10M	256QAM	1	0	12.29	12.68	12.55
		1	24	12.19	12.28	12.23
		1	49	12.46	12.56	12.58
		25	0	12.10	12.15	12.10
		25	12	12.13	12.09	12.17
		25	25	12.07	12.08	12.22
		50	0	12.24	12.40	12.26

*ERP = Conducted + antenna gain (-3.5dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	17.19	17.26	17.39
		1	12	17.14	17.21	17.29
		1	24	17.11	17.25	17.22
		12	0	16.23	16.30	16.39
		12	6	16.12	16.06	16.11
		12	13	16.14	16.21	16.06
		25	0	16.11	16.15	16.08
5M	16QAM	1	0	16.31	16.22	16.21
		1	12	16.30	16.19	16.19
		1	24	16.21	16.11	16.21
		12	0	15.28	15.25	15.35
		12	6	15.19	15.24	15.36
		12	13	15.20	15.60	15.22
		25	0	15.15	15.08	15.14
5M	64QAM	1	0	15.21	15.23	15.19
		1	12	15.16	15.14	15.13
		1	24	15.14	15.13	15.12
		12	0	14.11	14.13	14.26
		12	6	14.21	14.23	14.16
		12	13	14.18	14.20	14.20
		25	0	14.31	14.32	14.23
5M	256QAM	1	0	12.24	12.18	12.25
		1	12	12.25	12.12	12.23
		1	24	12.29	12.15	12.08
		12	0	12.10	12.26	12.17
		12	6	12.11	12.24	12.20
		12	13	12.33	12.07	12.33
		25	0	12.27	12.27	12.30

*ERP = Conducted + antenna gain (-3.5dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	17.40	17.40	17.33
		1	7	17.18	17.31	17.28
		1	14	17.19	17.21	17.33
		8	0	16.37	16.35	16.26
		8	3	16.50	16.35	16.25
		8	7	16.17	16.32	16.22
		15	0	16.13	16.33	16.14
3M	16QAM	1	0	16.08	16.19	16.23
		1	7	16.07	16.08	16.14
		1	14	16.16	16.08	16.09
		8	0	15.24	15.40	15.41
		8	3	15.20	15.44	15.47
		8	7	15.42	15.15	15.24
		15	0	15.09	15.10	16.08
3M	64QAM	1	0	15.39	15.21	15.26
		1	7	15.16	15.20	15.23
		1	14	15.09	15.15	15.14
		8	0	14.12	14.33	14.11
		8	3	14.10	14.21	14.09
		8	7	14.15	14.17	14.14
		15	0	14.06	14.10	14.06
3M	256QAM	1	0	12.45	12.35	12.41
		1	7	12.43	12.17	12.40
		1	14	12.15	12.18	12.22
		8	0	12.10	12.35	12.27
		8	3	12.26	12.41	12.34
		8	7	12.19	12.20	12.27
		15	0	12.20	12.30	12.28

*ERP = Conducted + antenna gain (-3.5dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	17.21	17.46	17.45
		1	2	17.19	17.17	17.16
		1	5	17.20	17.18	17.22
		3	0	17.25	17.10	17.12
		3	1	17.29	17.43	17.29
		3	3	17.19	17.26	17.15
		6	0	16.85	16.54	16.75
1.4M	16QAM	1	0	16.83	16.91	16.71
		1	2	16.12	16.53	16.65
		1	5	16.11	16.21	16.39
		3	0	16.22	16.20	16.40
		3	1	16.12	16.48	16.19
		3	3	16.14	16.20	16.09
		6	0	15.12	15.11	15.10
1.4M	64QAM	1	0	15.14	15.10	15.11
		1	2	15.07	15.09	15.09
		1	5	15.06	15.17	15.08
		3	0	15.15	15.20	15.27
		3	1	15.14	15.52	15.13
		3	3	15.11	15.13	15.06
		6	0	14.20	14.17	14.21
1.4M	256QAM	1	0	12.11	12.35	12.40
		1	2	12.32	12.30	12.17
		1	5	12.15	12.24	12.34
		3	0	12.11	12.09	12.32
		3	1	12.24	12.40	12.10
		3	3	12.23	12.23	12.09
		6	0	12.21	12.20	12.12

*ERP = Conducted + antenna gain (-3.5dBi)-2.15

LTE Band 13				
BW	MCS Index	RB Size	RB Offset	Low
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	17.23
		1	24	17.22
		1	49	17.20
		25	0	16.20
		25	12	16.20
		25	25	16.20
		50	0	16.16
10M	16QAM	1	0	16.20
		1	24	16.17
		1	49	16.24
		25	0	15.80
		25	12	16.05
		25	25	15.45
		50	0	15.19
10M	64QAM	1	0	16.02
		1	24	16.34
		1	49	15.57
		25	0	14.28
		25	12	14.62
		25	25	14.27
		50	0	14.23
10M	256QAM	1	0	12.74
		1	24	12.26
		1	49	12.37
		25	0	12.30
		25	12	12.31
		25	25	12.48
		50	0	12.45

*ERP = Conducted + antenna gain (-3.4dBi)-2.15

LTE Band 13						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	17.22	17.22	17.21
		1	12	17.17	17.16	17.18
		1	24	17.17	17.16	17.16
		12	0	16.18	16.19	16.17
		12	6	16.19	16.24	16.17
		12	13	16.21	16.19	16.20
		25	0	16.19	16.20	16.16
5M	16QAM	1	0	16.29	16.32	16.52
		1	12	16.25	16.23	16.30
		1	24	16.16	16.19	16.17
		12	0	15.31	15.32	15.32
		12	6	15.31	15.29	15.31
		12	13	15.16	15.16	15.19
		25	0	15.20	15.20	15.16
5M	64QAM	1	0	16.31	15.89	16.10
		1	12	16.03	16.31	16.15
		1	24	15.24	15.21	15.35
		12	0	14.43	14.49	14.48
		12	6	14.25	15.00	14.90
		12	13	14.23	14.45	14.54
		25	0	14.28	14.31	14.30
5M	256QAM	1	0	12.22	12.24	12.21
		1	12	12.25	12.16	12.28
		1	24	12.23	12.17	12.25
		12	0	12.25	12.36	12.23
		12	6	12.23	12.32	12.30
		12	13	12.33	12.34	12.24
		25	0	12.32	12.39	12.40

*ERP = Conducted + antenna gain (-3.4dBi)-2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

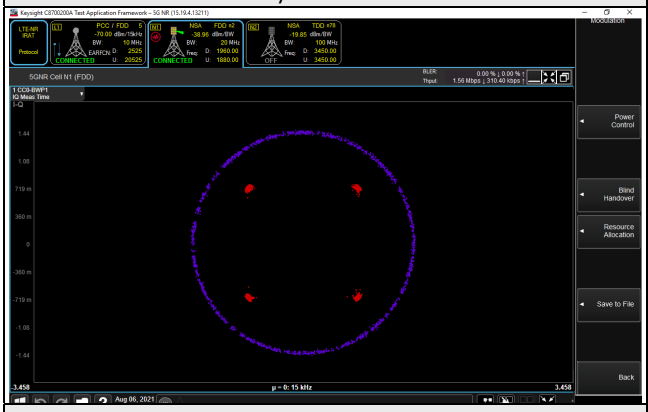
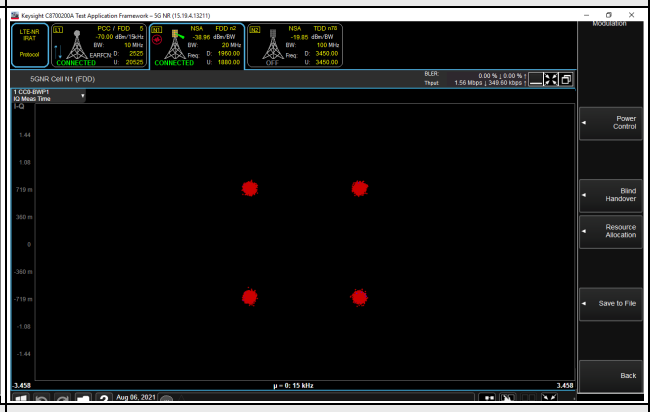
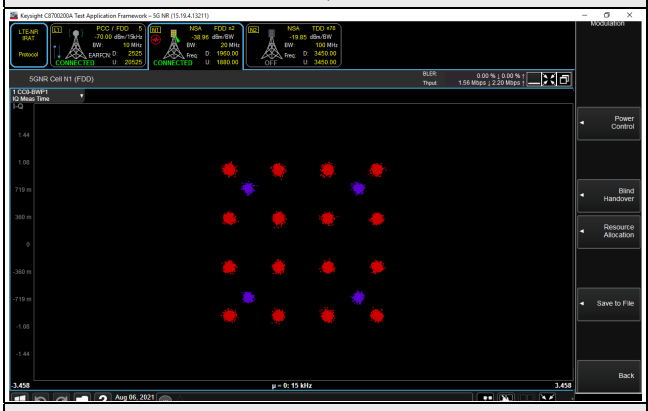
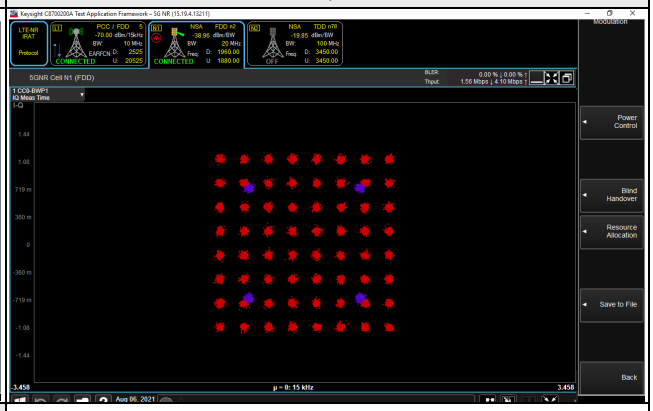
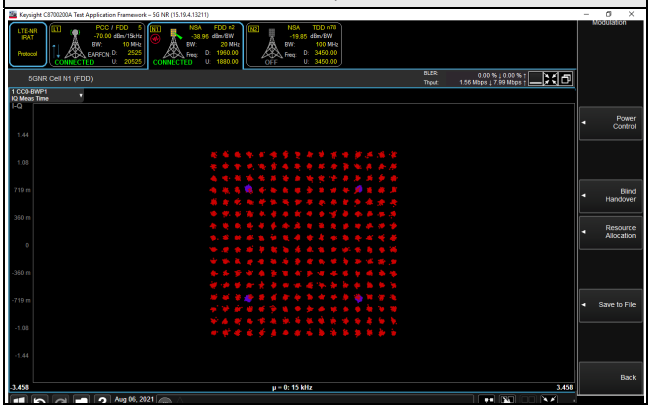
N/A

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

n2	
Spectrum Plot of Measurement Value	
Channel: 376000 / Frequency (MHz): 1880.0MHz	
$\pi/2$ BPSK	QPSK
	
16QAM	64QAM
	
256QAM	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stabiliity Measurement

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

4.3.2 Test Procedure

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

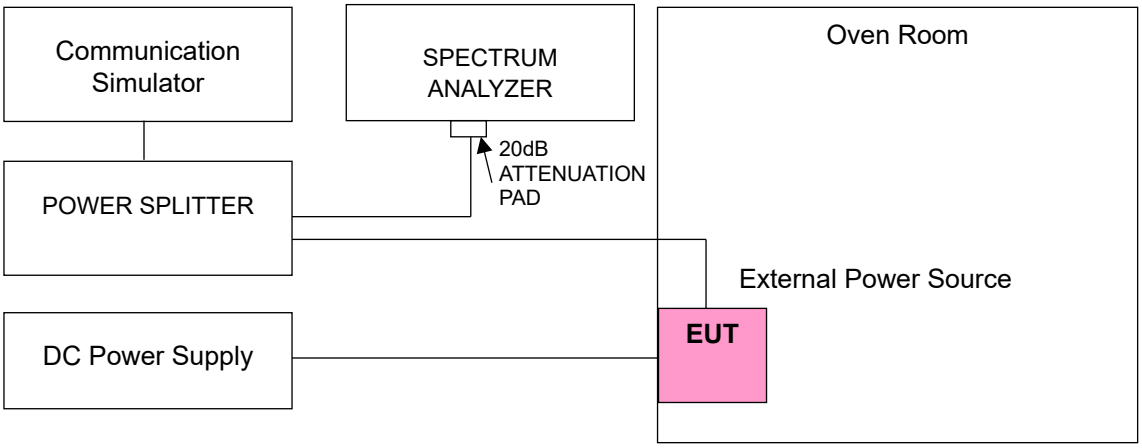
Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
5G Wireless Test Platforms Keysight	E7515B	MY60102114	May 21, 2021	May 20, 2022
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
Digital Multimeter Fluke	87-III	70360755	Jul. 10, 2020	Jul. 09, 2021
			Jul. 08, 2021	Jul. 07, 2022
DC Power Supply Topward	6306A	727263	NA	NA

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

4.3.4 Conducted Setup



4.3.5 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	n2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.87	1852.500028	0.015	1907.500023	0.012
3.28	1852.500015	0.008	1907.500019	0.010
4.45	1852.500010	0.005	1907.500011	0.006

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.45Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500033	0.018	1907.500014	0.007
-20	1852.500029	0.016	1907.500012	0.006
-10	1852.500028	0.015	1907.500025	0.013
0	1852.500010	0.005	1907.500016	0.008
10	1852.500026	0.014	1907.500019	0.010
20	1852.499978	-0.012	1907.499976	-0.013
30	1852.499970	-0.016	1907.499983	-0.009
40	1852.499983	-0.009	1907.499977	-0.012
50	1852.499963	-0.020	1907.499963	-0.019
60	1852.499985	-0.008	1907.499961	-0.020

Frequency Error vs. Voltage

Voltage (Vdc)	n2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.87	1855.000016	0.009	1905.000023	0.012
3.28	1855.000016	0.009	1905.000029	0.015
4.45	1855.000015	0.008	1905.000033	0.017

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.45Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000032	0.017	1905.000035	0.018
-20	1855.000040	0.022	1905.000033	0.017
-10	1855.000030	0.016	1905.000014	0.007
0	1855.000026	0.014	1905.000017	0.009
10	1855.000038	0.021	1905.000021	0.011
20	1854.999977	-0.012	1904.999961	-0.020
30	1854.999980	-0.011	1904.999960	-0.021
40	1854.999960	-0.022	1904.999968	-0.017
50	1854.999982	-0.010	1904.999989	-0.006
60	1854.999967	-0.018	1904.999981	-0.010

Frequency Error vs. Voltage

Voltage (Vdc)	n2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.87	1857.500034	0.018	1902.500021	0.011
3.28	1857.500015	0.008	1902.500020	0.010
4.45	1857.500023	0.012	1902.500037	0.019

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.45Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500040	0.022	1902.500019	0.010
-20	1857.500038	0.021	1902.500015	0.008
-10	1857.500024	0.013	1902.500010	0.005
0	1857.500027	0.015	1902.500030	0.016
10	1857.500022	0.012	1902.500034	0.018
20	1857.499985	-0.008	1902.499980	-0.010
30	1857.499977	-0.012	1902.499972	-0.015
40	1857.499968	-0.017	1902.499971	-0.015
50	1857.499981	-0.010	1902.499989	-0.006
60	1857.499981	-0.010	1902.499981	-0.010

Frequency Error vs. Voltage

Voltage (Vdc)	n2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.87	1860.000028	0.015	1900.000033	0.017
3.28	1860.000011	0.006	1900.000022	0.012
4.45	1860.000026	0.014	1900.000028	0.015

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.45Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000018	0.010	1900.000020	0.010
-20	1860.000027	0.015	1900.000016	0.008
-10	1860.000022	0.012	1900.000030	0.016
0	1860.000017	0.009	1900.000024	0.013
10	1860.000025	0.013	1900.000024	0.013
20	1859.999987	-0.007	1899.999961	-0.020
30	1859.999982	-0.010	1899.999987	-0.007
40	1859.999985	-0.008	1899.999962	-0.020
50	1859.999986	-0.008	1899.999967	-0.017
60	1859.999967	-0.018	1899.999986	-0.007

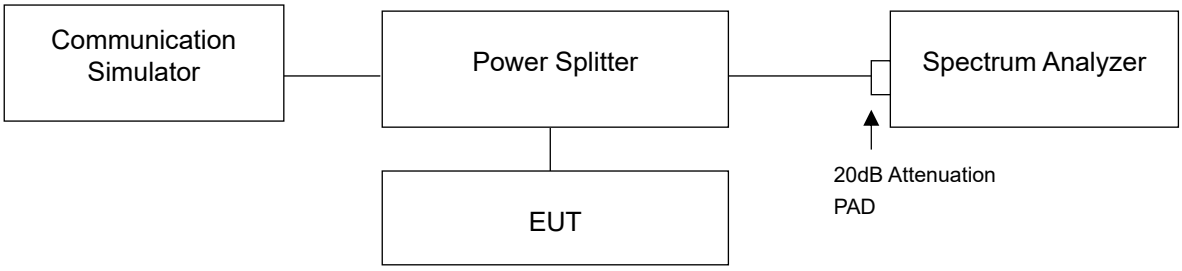
4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

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

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

4.4.2 Test Setup



4.4.3 Test Result

Occupied Bandwidth

n2, Channel Bandwidth: 5MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
370500	1852.5	4.47	4.47	4.48	4.47	4.48
376000	1880.0	4.47	4.48	4.48	4.48	4.47
381500	1907.5	4.47	4.47	4.47	4.48	4.47
n2, Channel Bandwidth: 10MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
371000	1855.0	9.18	9.29	9.29	9.29	9.30
376000	1880.0	9.22	9.29	9.29	9.29	9.30
381000	1905.0	9.24	9.30	9.29	9.29	9.30
n2, Channel Bandwidth: 15MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
371500	1857.5	13.99	14.11	14.11	14.11	14.12
376000	1880.0	14.05	14.13	14.12	14.13	14.13
380500	1902.5	14.05	14.12	14.12	14.12	14.12
n2, Channel Bandwidth: 20MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
372000	1860.0	18.74	18.91	18.91	18.92	18.92
376000	1880.0	18.82	18.98	18.98	18.98	18.98
380000	1900.0	18.81	18.92	18.92	18.92	18.96

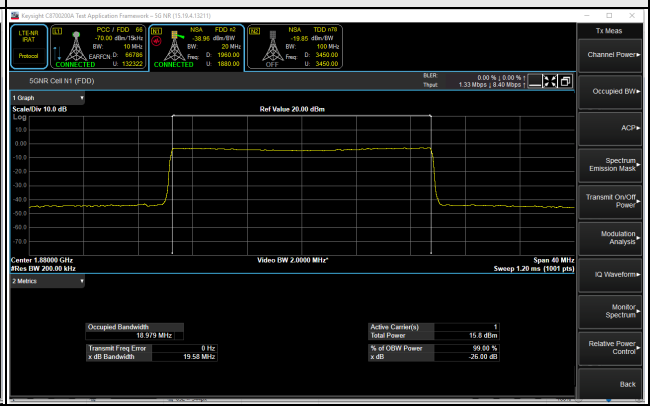
Spectrum Plot of Worst Value

5MHz / 16QAM

10MHz / 256QAM

15MHz / 256QAM

20MHz / 256QAM

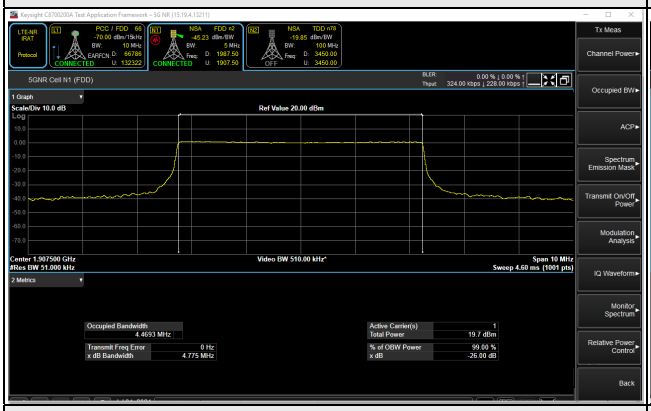


26dB Bandwidth

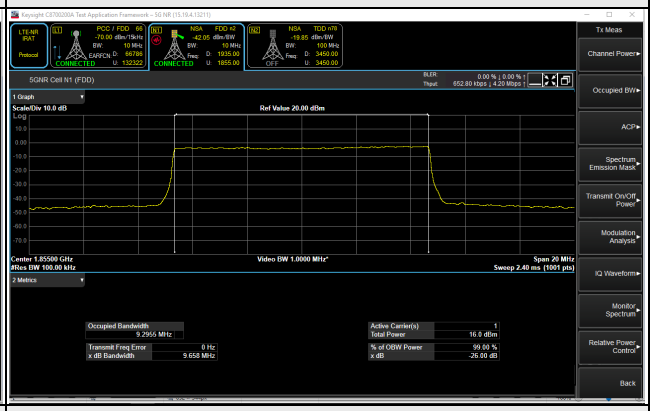
n2, Channel Bandwidth: 5MHz						
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
370500	1852.5	4.75	4.75	4.76	4.74	4.72
376000	1880.0	4.76	4.74	4.71	4.75	4.69
381500	1907.5	4.76	4.78	4.76	4.76	4.71
n2, Channel Bandwidth: 10MHz						
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
371000	1855.0	9.29	9.65	9.62	9.65	9.66
376000	1880.0	9.29	9.63	9.63	9.64	9.65
381000	1905.0	9.28	9.64	9.63	9.64	9.63
n2, Channel Bandwidth: 15MHz						
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
371500	1857.5	13.89	14.60	14.61	14.61	14.61
376000	1880.0	13.89	14.62	14.62	14.61	14.60
380500	1902.5	13.89	14.61	14.61	14.60	14.59
n2, Channel Bandwidth: 20MHz						
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
372000	1860.0	18.49	19.57	19.58	19.57	19.57
376000	1880.0	18.50	19.58	19.59	19.57	19.58
380000	1900.0	18.49	19.57	19.58	19.56	19.57

Spectrum Plot of Worst Value

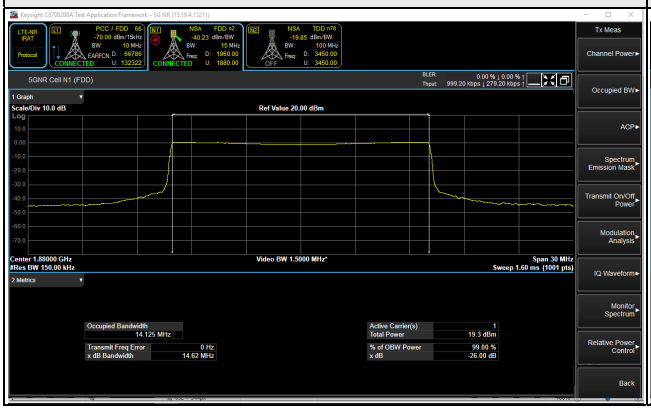
5MHz / QPSK



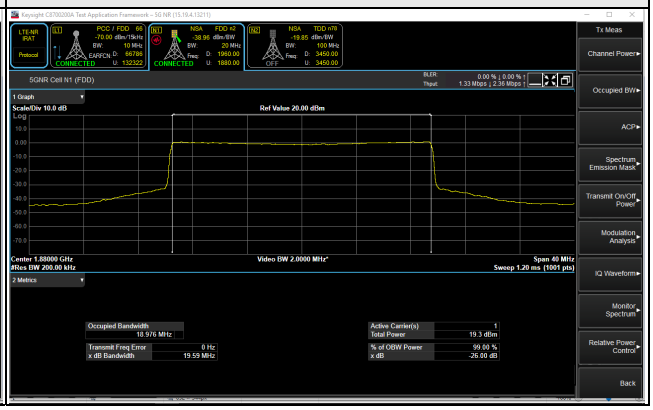
10MHz / 256QAM



15MHz / QPSK



20MHz / 16QAM

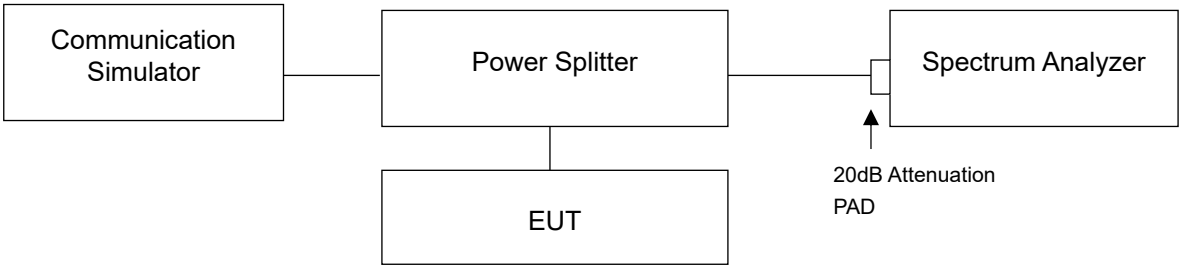


4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

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

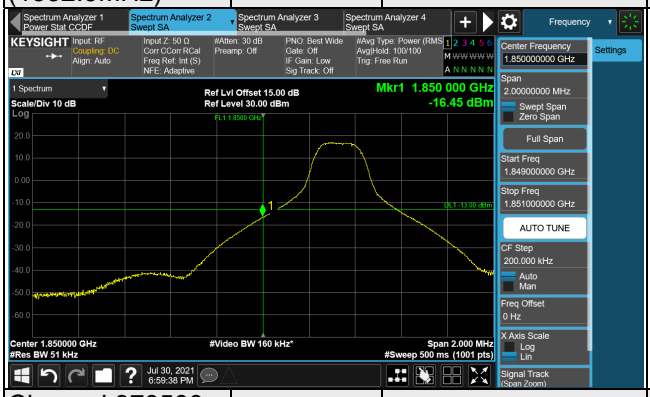
4.5.2 Test Setup

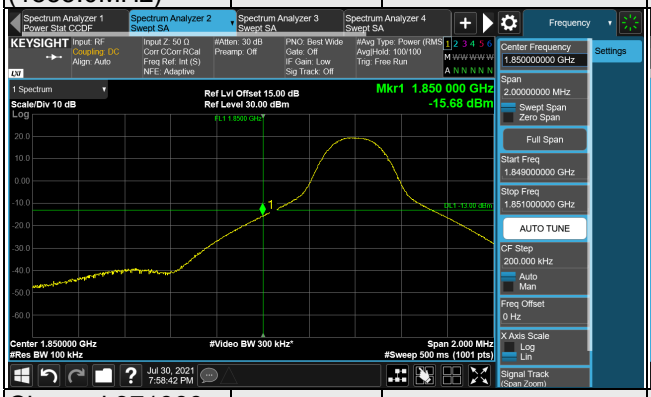
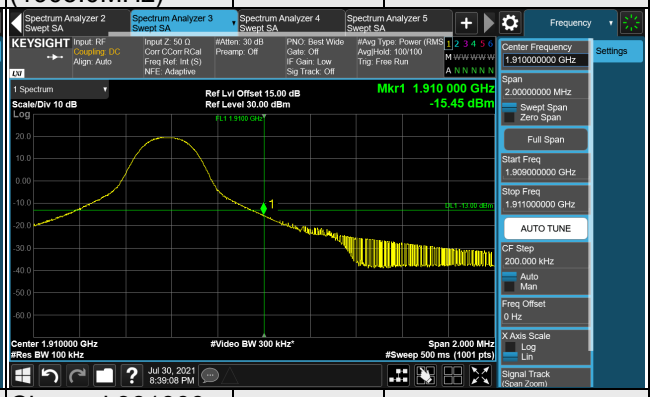
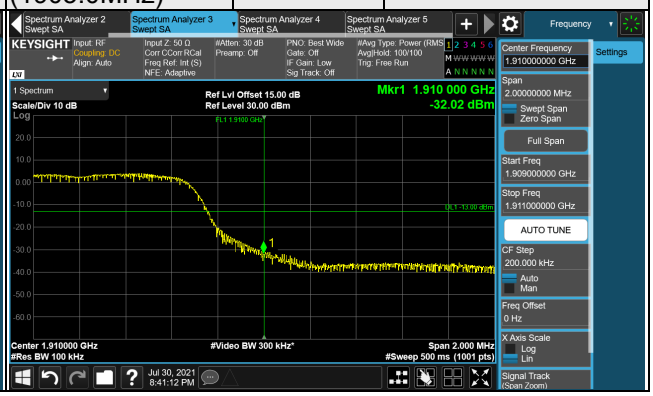


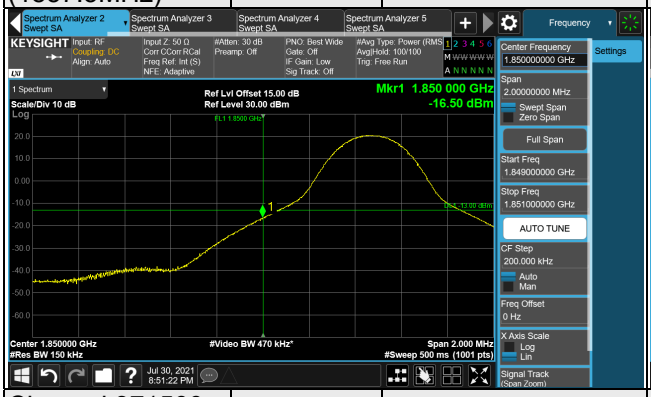
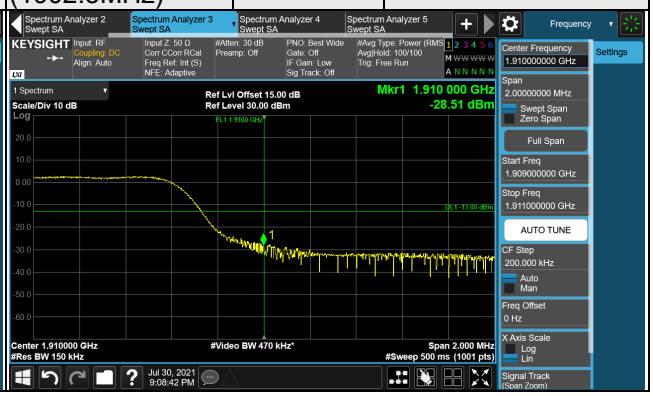
4.5.3 Test Procedures

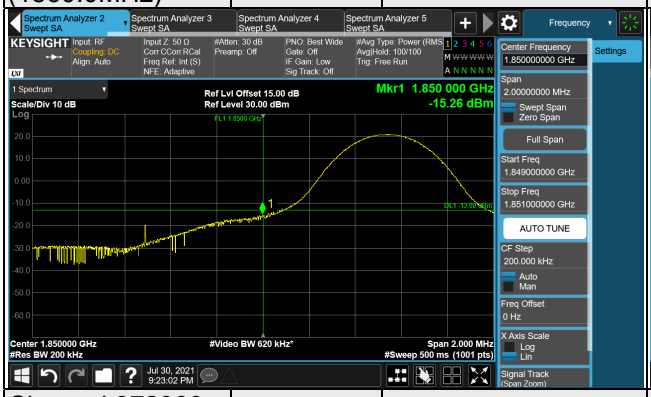
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (Channel Bandwidth 5MHz).
c. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (Channel Bandwidth 10MHz).
d. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (Channel Bandwidth 15MHz).
e. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (Channel Bandwidth 20MHz).
f. Record the max trace plot into the test report.

4.5.4 Test Results

n2, Channel Bandwidth 5MHz					
Channel 370500 (1852.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 381500 (1907.5MHz)	QPSK	1 RB / 24 RB Offset
					
Channel 370500 (1852.5MHz)	QPSK	25 RB / 0 RB Offset	Channel 381500 (1907.5MHz)	QPSK	25 RB / 0 RB Offset

n2, Channel Bandwidth 10MHz					
Channel 371000 (1855.0MHz)	QPSK	1 RB / 0 RB Offset	Channel 381000 (1905.0MHz)	QPSK	1 RB / 51 RB Offset
					
Channel 371000 (1855.0MHz)	QPSK	52 RB / 0 RB Offset	Channel 381000 (1905.0MHz)	QPSK	52 RB / 0 RB Offset
					

n2, Channel Bandwidth 15MHz					
Channel 371500 (1857.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 380500 (1902.5MHz)	QPSK	1 RB / 78 RB Offset
					
Channel 371500 (1857.5MHz)	QPSK	79 RB / 0 RB Offset	Channel 380500 (1902.5MHz)	QPSK	79 RB / 0 RB Offset
					

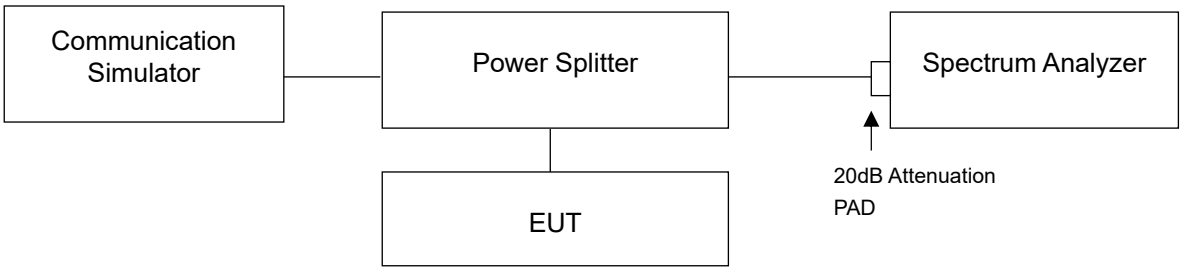
n2, Channel Bandwidth 20MHz					
Channel 372000 (1860.0MHz)	QPSK	1 RB / 0 RB Offset	Channel 380000 (1900.0MHz)	QPSK	1 RB / 105 RB Offset
					
Channel 372000 (1860.0MHz)	QPSK	106 RB / 0 RB Offset	Channel 380000 (1900.0MHz)	QPSK	106 RB / 0 RB Offset

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

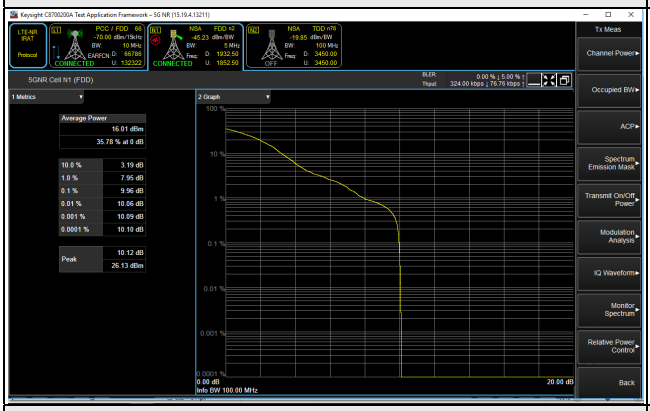
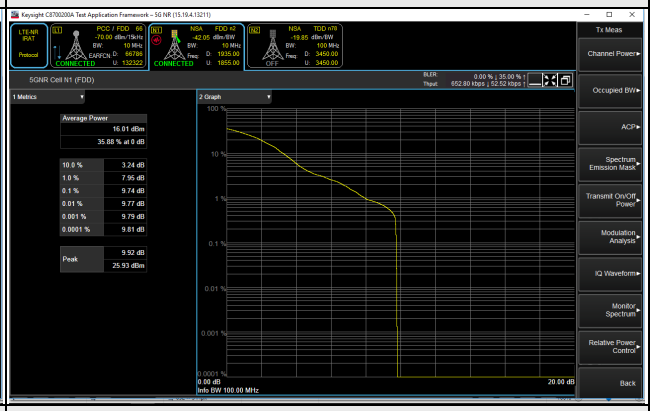
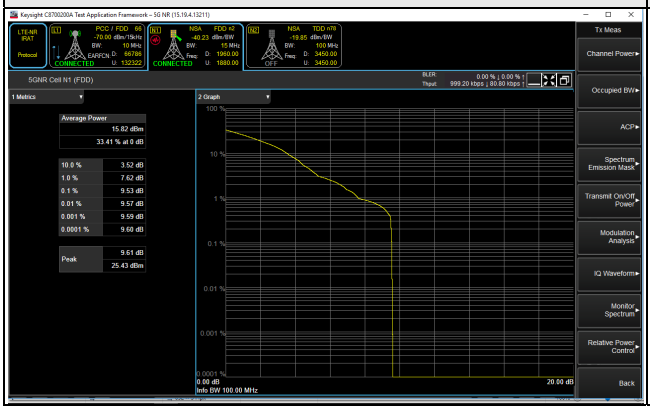
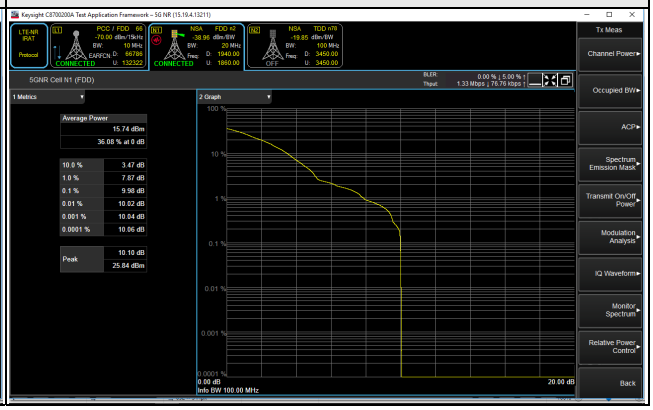


4.6.3 Test Procedures

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

4.6.4 Test Results

n2, Channel Bandwidth: 5MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
370500	1852.5	3.42	7.15	7.32	7.79	9.96
376000	1880.0	3.45	7.01	7.11	7.31	9.72
381500	1907.5	3.23	6.58	6.60	6.44	9.77
n2, Channel Bandwidth: 10MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
371000	1855.0	3.40	6.25	7.16	7.67	9.74
376000	1880.0	3.43	6.77	6.66	7.33	9.11
381000	1905.0	3.26	5.99	6.68	7.07	8.24
n2, Channel Bandwidth: 15MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
371500	1857.5	3.41	6.13	6.80	7.48	9.07
376000	1880.0	3.47	6.11	6.80	7.42	9.53
380500	1902.5	3.26	6.14	6.24	6.54	8.54
n2, Channel Bandwidth: 20MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
372000	1860.0	3.44	6.39	6.75	7.24	9.98
376000	1880.0	3.47	6.44	6.84	6.54	9.60
380000	1900.0	3.34	6.37	5.99	6.30	8.71

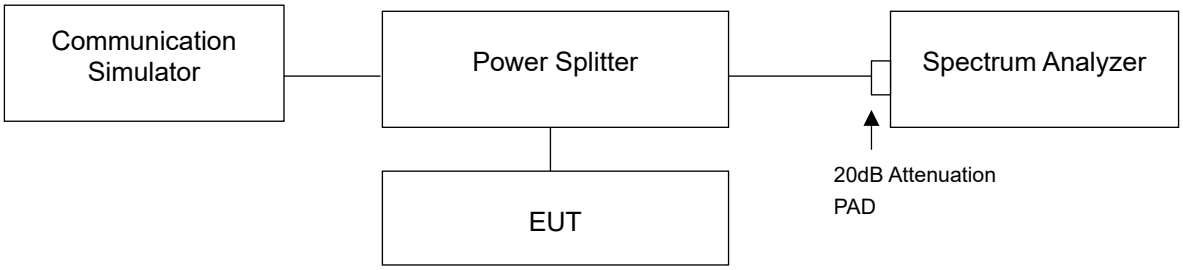
Spectrum Plot of Worst Value	
5MHz / 256QAM	10MHz / 256QAM
	
15MHz / 256QAM	20MHz / 256QAM
	

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

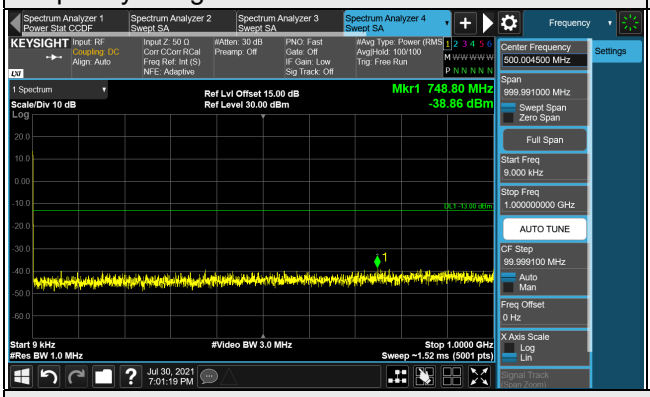
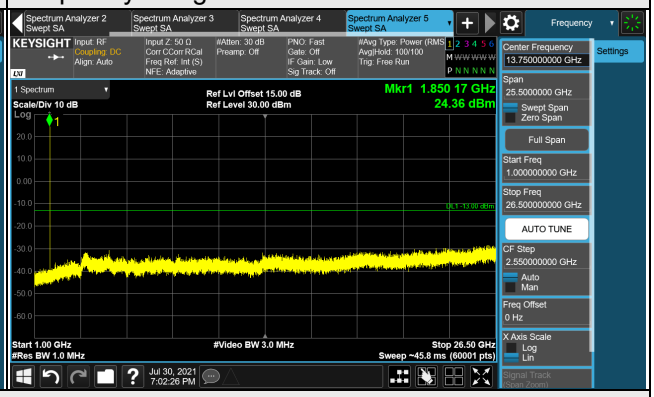
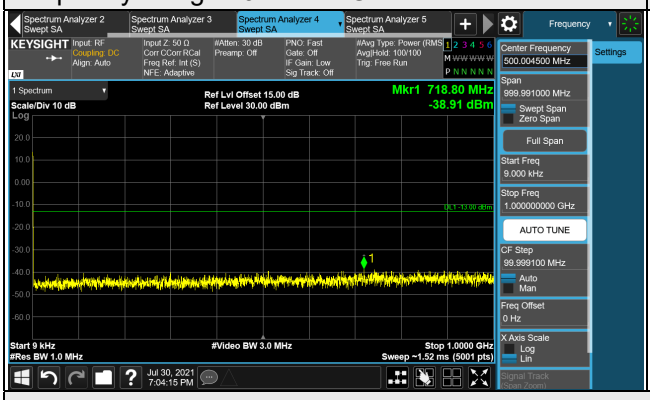
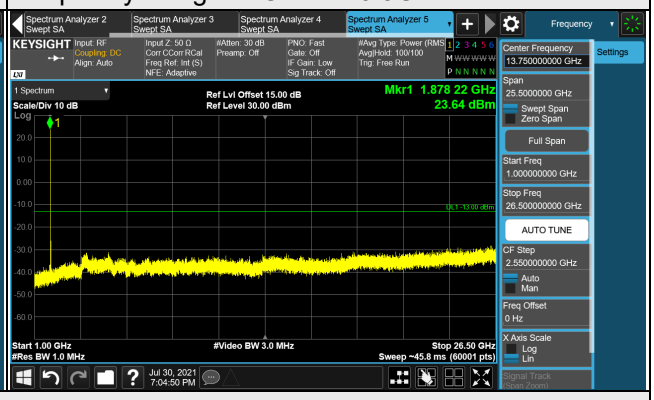
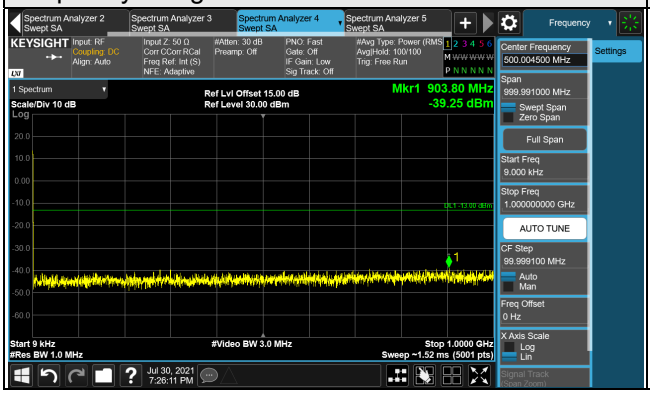
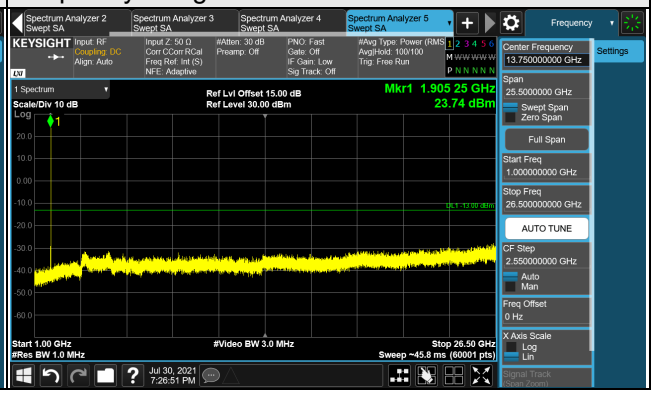


4.7.3 Test Procedure

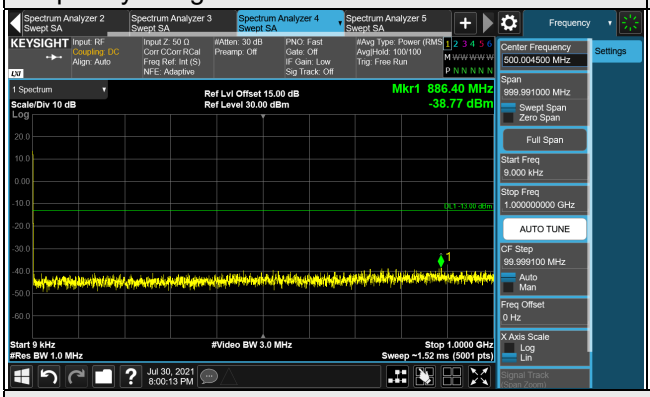
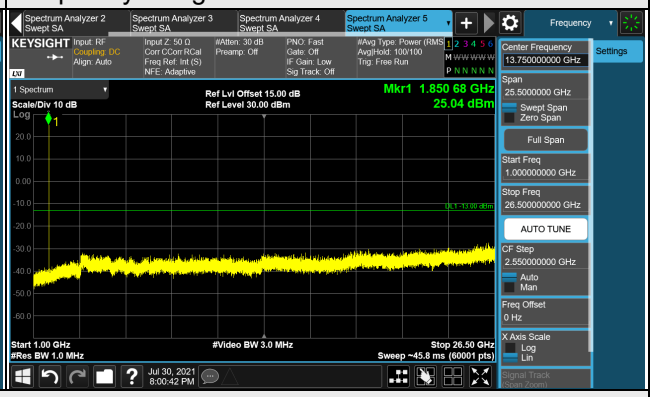
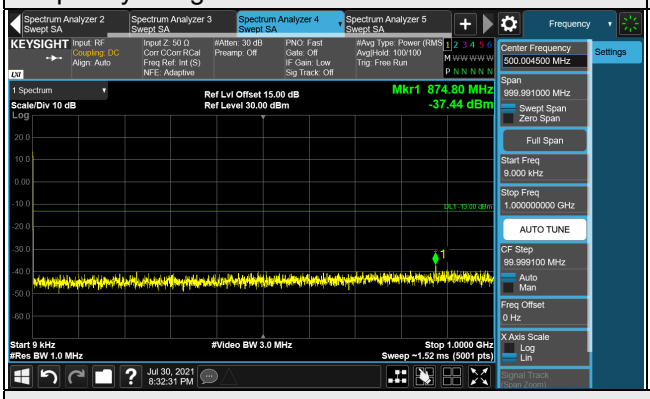
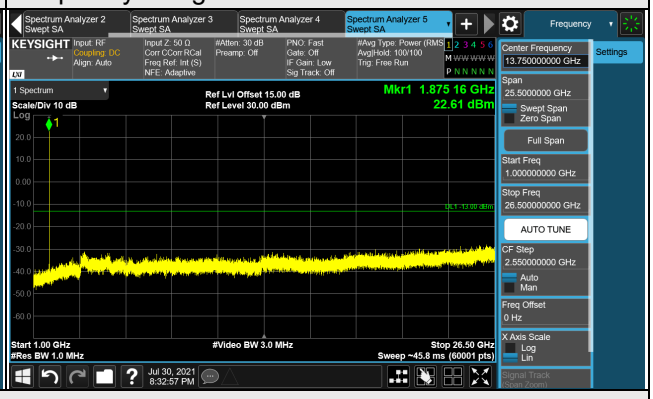
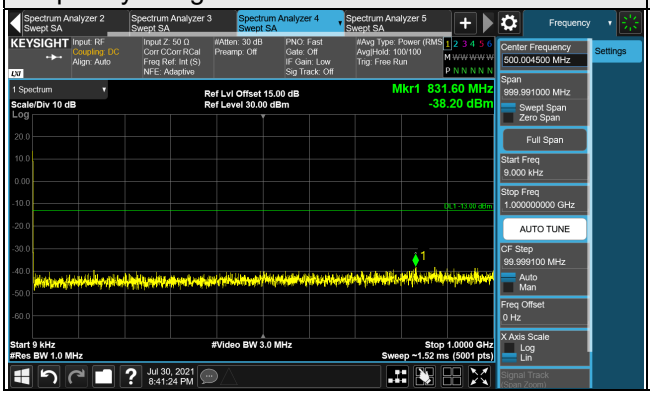
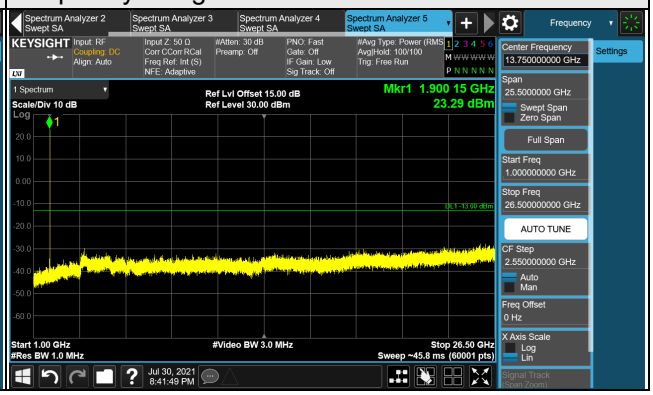
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 9kHz to 20GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

4.7.4 Test Results

n2, Channel Bandwidth 5MHz	
Channel 370500 (1852.5MHz)	
Frequency Range : 9kHz ~ 1GHz	Frequency Range : 1GHz ~ 26.5GHz
	
Channel 376000 (1880.0MHz)	
Frequency Range : 9kHz ~ 1GHz	Frequency Range : 1GHz ~ 26.5GHz
	
Channel 381500 (1907.5MHz)	
Frequency Range : 9kHz ~ 1GHz	Frequency Range : 1GHz ~ 26.5GHz
	

*The 9 kHz tone is from the spectrum analyzer.

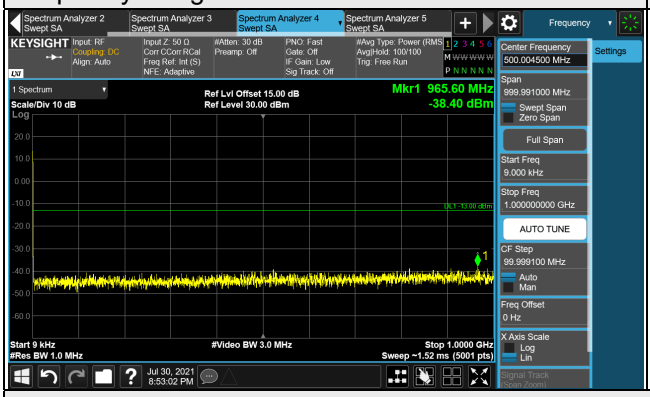
n2, Channel Bandwidth 10MHz	
Channel 371000 (1855.0MHz)	
Frequency Range : 9kHz ~ 1GHz	Frequency Range : 1GHz ~ 26.5GHz
	
Channel 376000 (1880.0MHz)	
Frequency Range : 9kHz ~ 1GHz	Frequency Range : 1GHz ~ 26.5GHz
	
Channel 381000 (1905.0MHz)	
Frequency Range : 9kHz ~ 1GHz	Frequency Range : 1GHz ~ 26.5GHz
	

*The 9 kHz tone is from the spectrum analyzer.

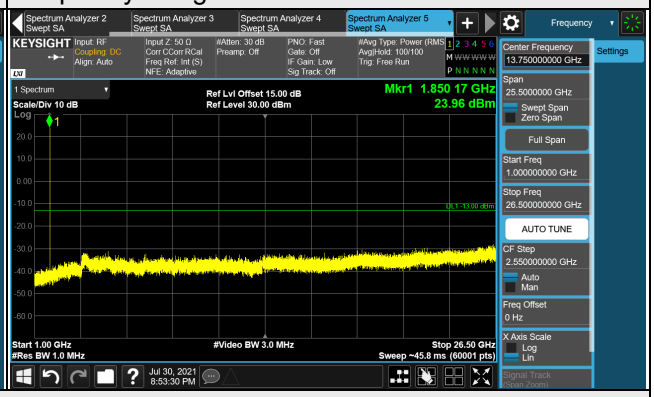
n2, Channel Bandwidth 15MHz

Channel 371500 (1857.5MHz)

Frequency Range : 9kHz ~ 1GHz

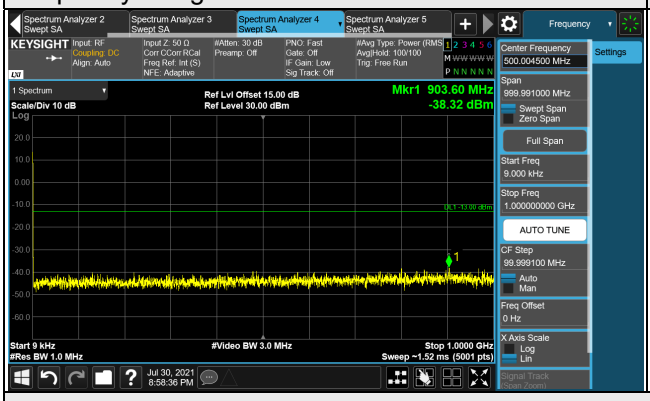


Frequency Range : 1GHz ~ 26.5GHz

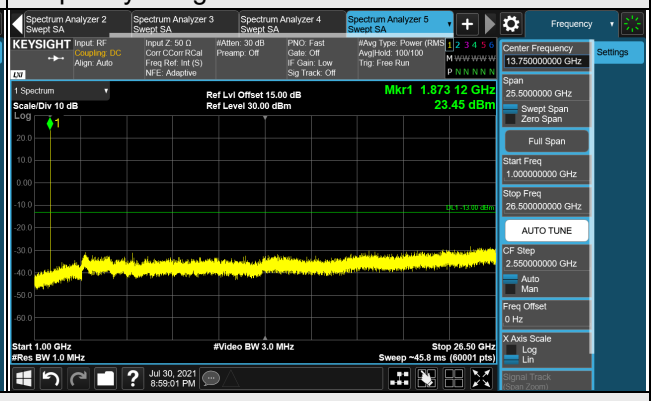


Channel 376000 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

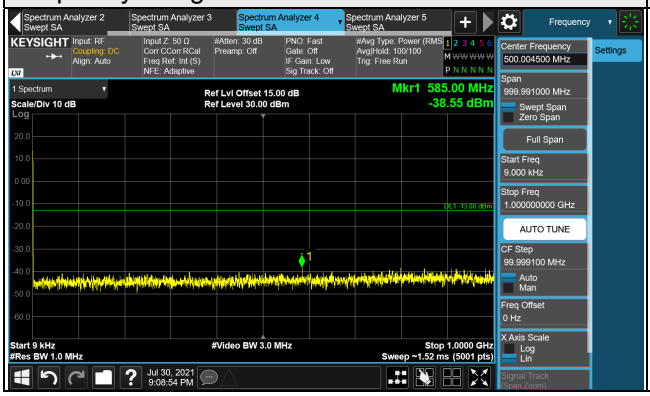


Frequency Range : 1GHz ~ 26.5GHz

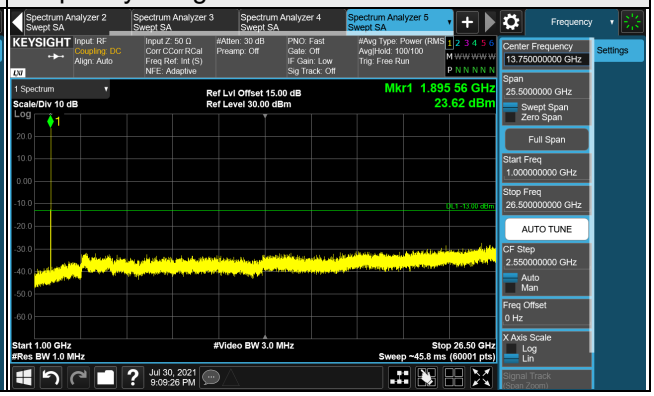


Channel 380500 (1902.5MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 26.5GHz

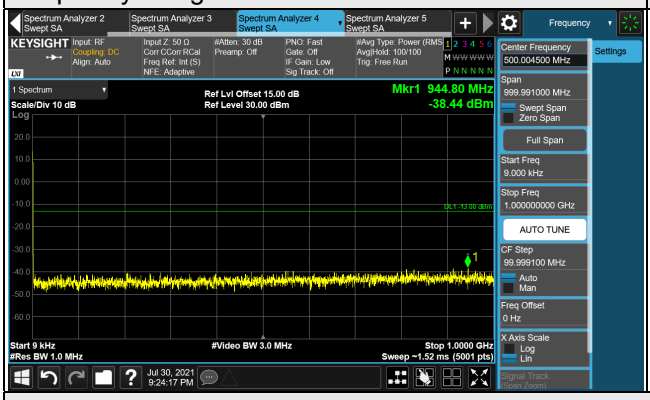


*The 9 kHz tone is from the spectrum analyzer.

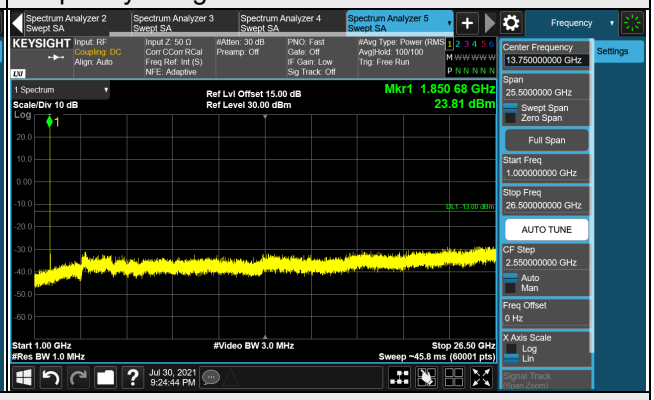
n2, Channel Bandwidth 20MHz

Channel 372000 (1860.0MHz)

Frequency Range : 9kHz ~ 1GHz

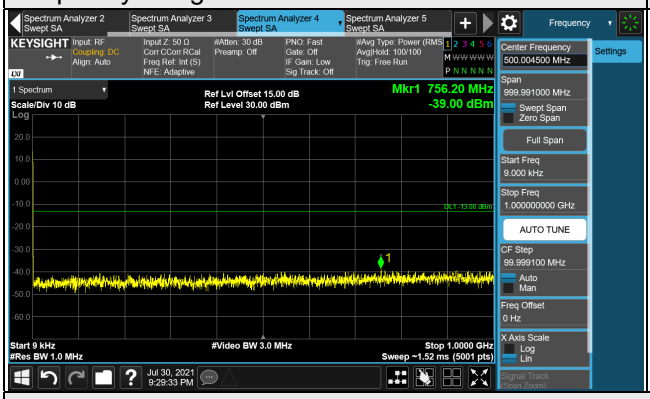


Frequency Range : 1GHz ~ 26.5GHz

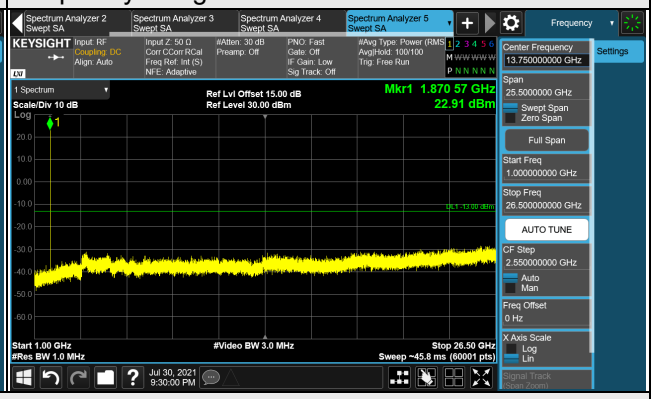


Channel 376000 (1880.0MHz)

Frequency Range : 9kHz ~ 1GHz

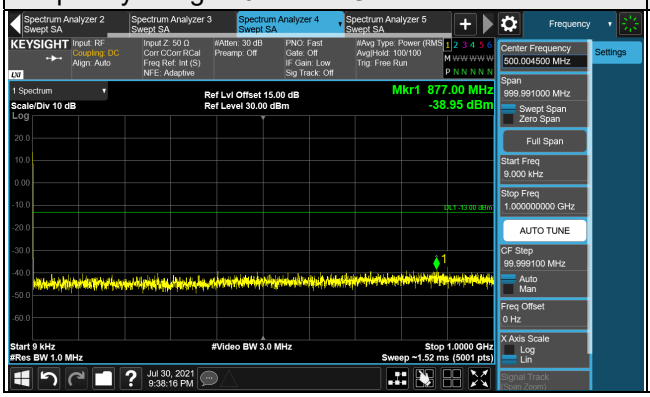


Frequency Range : 1GHz ~ 26.5GHz

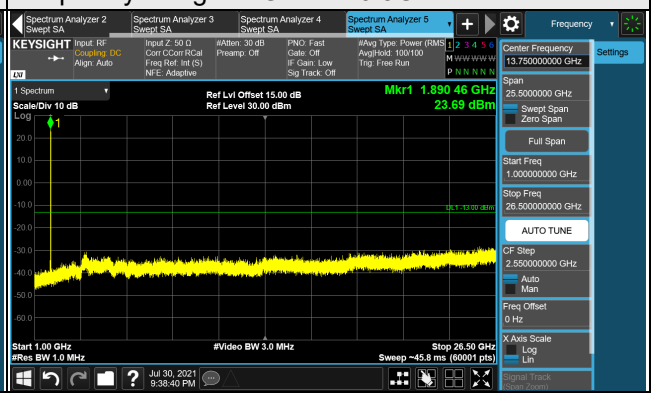


Channel 380000 (1900.0MHz)

Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 26.5GHz



*The 9 kHz tone is from the spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

For n2, LTE Band 5:
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.

For LTE Band 13:
According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

According to FCC 27.53(f) for operations in the 775-788 MHz, emissions in the band 1559-1610MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm

4.8.2 Test Procedure

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

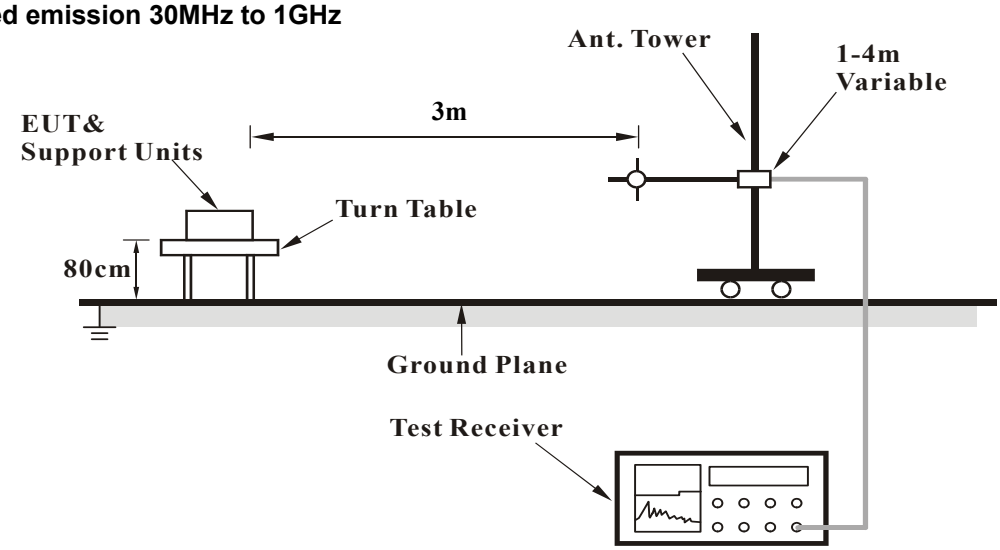
Note:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
   The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

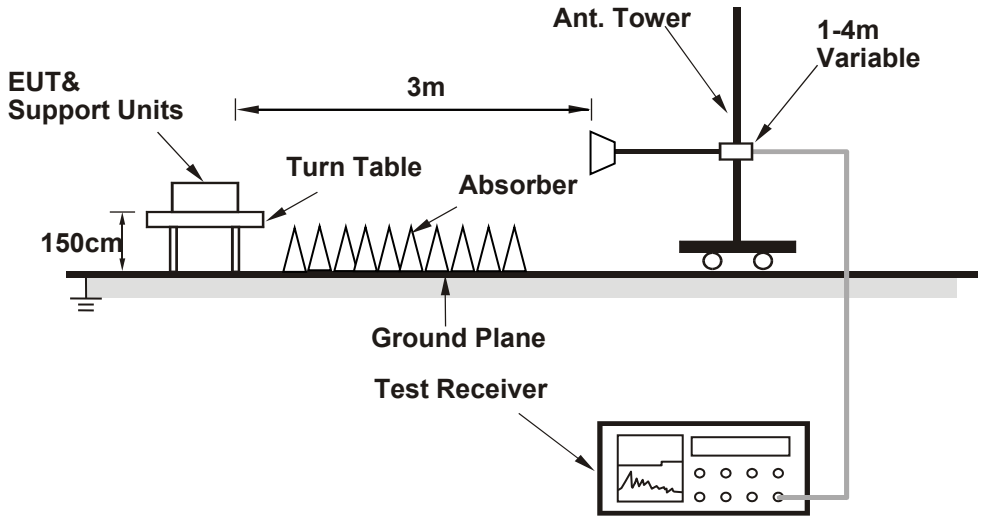
No deviation.

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

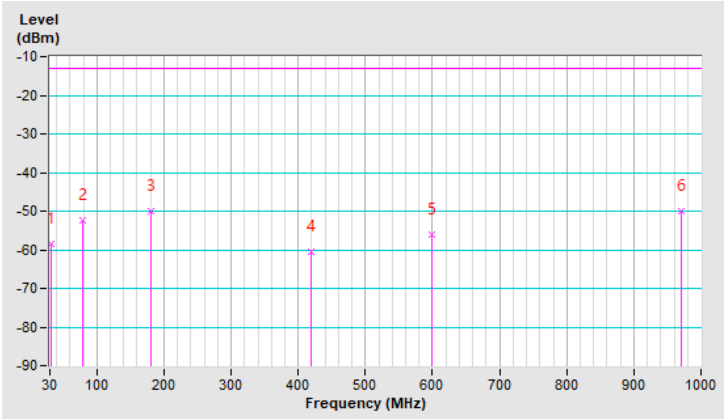
n2, Channel Bandwidth 20MHz

Mode	TX channel 380000 (1900.0MHz)	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	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	-58.58	-13.00	-45.58	1.00 H	94	46.92	-105.50
2	79.47	-52.31	-13.00	-39.31	1.00 H	25	56.21	-108.52
3	180.35	-50.05	-13.00	-37.05	1.50 H	241	55.29	-105.34
4	418.97	-60.63	-13.00	-47.63	1.25 H	190	38.78	-99.41
5	599.39	-56.19	-13.00	-43.19	1.00 H	127	39.28	-95.47
6	969.93	-49.87	-13.00	-36.87	1.25 H	111	38.78	-88.65

Remarks:

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

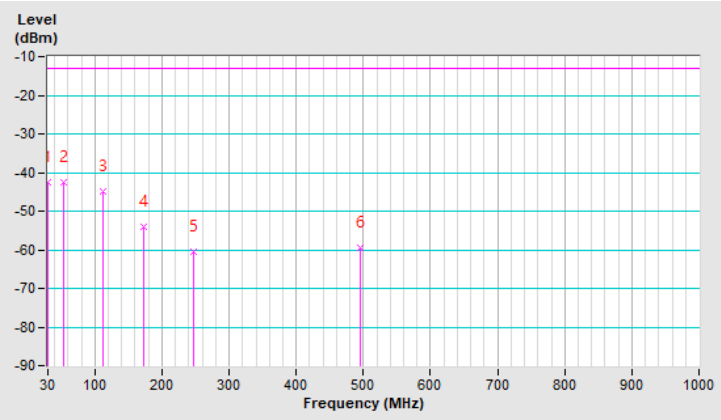


Mode	TX channel 380000 (1900.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**30.00**	**-42.54**	**-13.00**	**-29.54**	**1.25 V**	**221**	**62.94**	**-105.48**
2	53.28	-42.65	-13.00	-29.65	1.00 V	125	61.58	-104.23
3	111.48	-44.80	-13.00	-31.80	1.00 V	100	62.30	-107.10
4	173.56	-54.16	-13.00	-41.16	1.50 V	56	50.35	-104.51
5	247.28	-60.65	-13.00	-47.65	1.00 V	4	43.49	-104.14
6	494.63	-59.44	-13.00	-46.44	1.25 V	4	38.24	-97.68

Remarks:

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



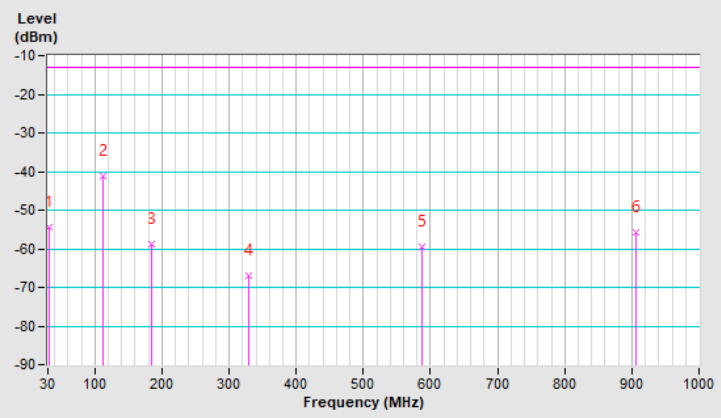
LTE Band 5, Channel Bandwidth 10MHz

Mode	TX channel 20525 (836.5MHz)	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	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	32.91	-54.41	-13.00	-41.41	1.25 H	162	53.37	-107.78
2	111.48	-41.10	-13.00	-28.10	1.00 H	294	68.15	-109.25
3	185.20	-58.70	-13.00	-45.70	1.50 H	284	49.39	-108.09
4	328.76	-66.92	-13.00	-53.92	1.25 H	315	36.39	-103.31
5	586.78	-59.61	-13.00	-46.61	1.00 H	131	38.33	-97.94
6	905.91	-55.60	-13.00	-42.60	1.50 H	8	36.05	-91.65

Remarks:

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

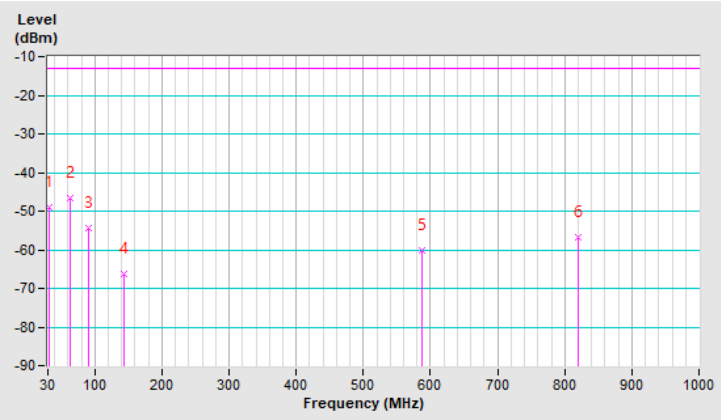


Mode	TX channel 20525 (836.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	-48.92	-13.00	-35.92	1.50 V	173	58.73	-107.65
2	63.95	-46.46	-13.00	-33.46	1.50 V	276	61.00	-107.46
3	90.14	-54.33	-13.00	-41.33	1.00 V	66	57.69	-112.02
4	143.49	-66.32	-13.00	-53.32	1.00 V	173	39.98	-106.30
5	587.75	-60.01	-13.00	-47.01	1.25 V	194	37.90	-97.91
6	819.58	-56.83	-13.00	-43.83	1.00 V	61	36.80	-93.63

Remarks:

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



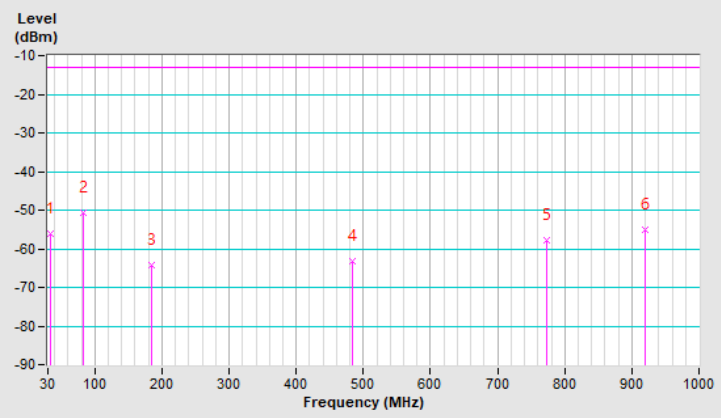
LTE Band 13, Channel Bandwidth 10MHz

Mode	TX channel 23230 (782.0MHz)	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	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.88	-56.15	-13.00	-43.15	1.25 H	16	51.30	-107.45
2	82.38	-50.59	-13.00	-37.59	1.00 H	24	60.75	-111.34
3	185.20	-64.40	-13.00	-51.40	1.00 H	268	43.69	-108.09
4	482.99	-63.07	-13.00	-50.07	1.25 H	310	37.00	-100.07
5	773.02	-57.67	-13.00	-44.67	1.00 H	169	36.77	-94.44
6	920.46	-55.03	-13.00	-42.03	1.50 H	6	36.27	-91.30

Remarks:

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

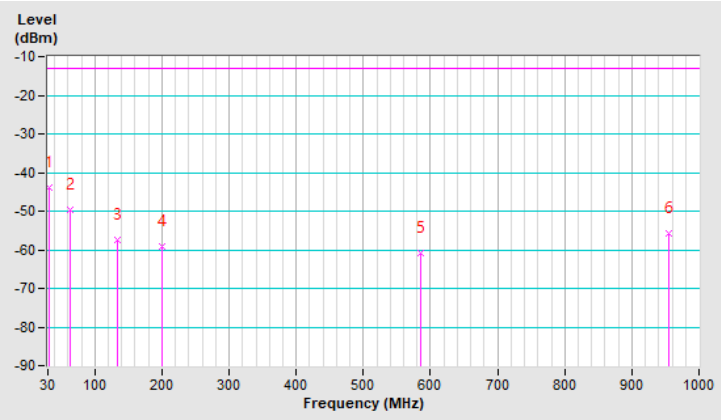


Mode	TX channel 23230 (782.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	-43.86	-13.00	-30.86	1.00 V	147	63.79	-107.65
2	63.95	-49.60	-13.00	-36.60	1.50 V	240	57.86	-107.46
3	132.82	-57.41	-13.00	-44.41	1.25 V	258	49.69	-107.10
4	200.72	-59.03	-13.00	-46.03	1.00 V	258	49.76	-108.79
5	584.84	-60.88	-13.00	-47.88	1.00 V	4	37.11	-97.99
6	955.38	-55.73	-13.00	-42.73	1.25 V	120	35.23	-90.96

Remarks:

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



Above 1GHz
n2, Channel Bandwidth 5MHz

Mode	TX channel 370500 (1852.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-48.30	-13.00	-35.30	1.63 H	253	43.40	-91.70
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	3705.00	-50.20	-13.00	-37.20	1.17 V	299	41.50	-91.70

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) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

Mode	TX channel 376000 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-47.10	-13.00	-34.10	1.62 H	247	44.30	-91.40
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	3760.00	-49.89	-13.00	-36.89	1.62 V	247	41.53	-91.42

Remarks:

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

Mode	TX channel 381500 (1907.5MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-47.38	-13.00	-34.38	1.53 H	254	43.72	-91.10
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	3815.00	-49.52	-13.00	-36.52	1.20 V	298	41.58	-91.10

Remarks:

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

n2, Channel Bandwidth 20MHz

Mode	TX channel 372000 (1860.0MHz),	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-47.61	-13.00	-34.61	1.55 H	249	43.96	-91.57
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	3720.00	-50.08	-13.00	-37.08	1.10 V	300	41.49	-91.57

Remarks:

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

Mode	TX channel 376000 (1880.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-47.22	-13.00	-34.22	1.56 H	253	44.20	-91.42
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	3760.00	-49.57	-13.00	-36.57	1.17 V	304	41.85	-91.42

Remarks:

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

Mode	TX channel 380000 (1900.0MHz)	Frequency Range	1GHz ~ 20GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	-46.96	-13.00	-33.96	1.56 H	254	44.18	-91.14
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	3800.00	-49.79	-13.00	-36.79	1.12 V	299	41.35	-91.14

Remarks:

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

LTE Band 5, Channel Bandwidth 1.4MHz

Mode	TX channel 20407 (824.7MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-55.96	-13.00	-42.96	1.71 H	281	46.07	-102.03
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-59.33	-13.00	-46.33	1.36 V	316	42.70	-102.03

Remarks:

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

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.17	-13.00	-43.17	1.65 H	278	45.79	-101.96
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-58.75	-13.00	-45.75	1.41 V	318	43.21	-101.96

Remarks:

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

Mode	TX channel 20643 (848.3MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-56.37	-13.00	-43.37	1.63 H	281	45.52	-101.89
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-59.21	-13.00	-46.21	1.38 V	317	42.68	-101.89

Remarks:

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

LTE Band 5, Channel Bandwidth 5MHz

Mode	TX channel 20425 (826.5MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-56.46	-13.00	-43.46	1.69 H	285	45.57	-102.03
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-58.97	-13.00	-45.97	1.41 V	321	43.06	-102.03

Remarks:

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

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-56.09	-13.00	-43.09	1.66 H	280	45.87	-101.96
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-58.88	-13.00	-45.88	1.36 V	317	43.08	-101.96

Remarks:

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

Mode	TX channel 20625 (846.5MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-55.92	-13.00	-42.92	1.71 H	282	45.98	-101.90
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-58.75	-13.00	-45.75	1.37 V	315	43.15	-101.90

Remarks:

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

LTE Band 5, Channel Bandwidth 10MHz

Mode	TX channel 20450 (829.0MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-56.19	-13.00	-43.19	1.67 H	284	45.82	-102.01
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-58.91	-13.00	-45.91	1.40 V	321	43.10	-102.01

Remarks:

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

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-55.84	-13.00	-42.84	1.69 H	284	46.12	-101.96
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-58.85	-13.00	-45.85	1.32 V	319	43.11	-101.96

Remarks:

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

Mode	TX channel 20600 (844.0MHz)	Frequency Range	1GHz ~ 9GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-55.92	-13.00	-42.92	1.70 H	282	45.99	-101.91
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-59.13	-13.00	-46.13	1.37 V	316	42.78	-101.91

Remarks:

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

LTE Band 13, Channel Bandwidth 5MHz

Mode	TX channel 23205 (779.5MHz)	Frequency Range	1GHz ~ 8GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	1559.00	-56.97	-40.00	-16.97	1.71 H	278	42.85	-99.82
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	1559.00	-56.86	-40.00	-16.86	1.33 V	322	42.96	-99.82

Remarks:

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

Mode	TX channel 23230 (782.0MHz)	Frequency Range	1GHz ~ 8GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	1564.00	-56.55	-40.00	-16.55	1.72 H	281	43.29	-99.84
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	1564.00	-56.74	-40.00	-16.74	1.38 V	315	43.10	-99.84

Remarks:

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

Mode	TX channel 23255 (784.5MHz)	Frequency Range	1GHz ~ 8GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	1569.00	-56.74	-40.00	-16.74	1.68 H	284	43.11	-99.85
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	1569.00	-57.16	-40.00	-17.16	1.32 V	320	42.69	-99.85

Remarks:

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

LTE Band 13, Channel Bandwidth 10MHz

Mode	TX channel 23230 (782.0MHz)	Frequency Range	1GHz ~ 8GHz
Environmental Conditions	22deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Greg Lin		

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	**1564.00**	**-56.53**	**-40.00**	**-16.53**	**1.66 H**	**278**	**43.31**	**-99.84**
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	1564.00	-56.80	-40.00	-16.80	1.30 V	321	43.04	-99.84

Remarks:

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

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited 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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The address and road map of all our labs can be found in our web site also.

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