

FCC Test Report (ENDC: n14 + LTE B2)

Report No.: RFBFLF-WTW-P21010278-25

FCC ID: MSQI007D

Test Model: ASUS_I007D

Received Date: Jan. 04, 2021

Test Date: Feb. 26 ~ Apr. 19, 2021

Issued Date: Apr. 19, 2021

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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RFBFLF-WTW-P21010278-25	Original release	Apr. 19, 2021

1 Certificate of Conformity

Product: EXP21 Smartphone

Brand: ASUS

Test Model: ASUS_I007D

Sample Status: Engineering sample

Applicant: ASUSTeK COMPUTER INC.

Test Date: Feb. 26 ~ Apr. 19, 2021

Standards: FCC Part 24, Subpart E
FCC Part 90, Subpart R

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

Prepared by : Celine Chou , **Date:** Apr. 19, 2021
Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Apr. 19, 2021
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

For n14

Applied Standard: FCC Part 90 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 90.542 (a)(7)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
2.1055 90.539 (e)	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
-	Emission Masks	Pass	Meet the requirement of limit.
2.1053 90.543 (e)(2)(3)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 90.543 (e)(3)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 90.543 (e)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -10.70dB at 1586.00MHz.

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

For LTE Band 2

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	Refer to Note 1
2.1047	Modulation Characteristics	Pass	Refer to Note 1
2.1055 24.235	Frequency Stability	Pass	Refer to Note 1
2.1049	Occupied Bandwidth	Pass	Refer to Note 1
24.238	Band Edge Measurements	Pass	Refer to Note 1
2.1051 24.238	Conducted Spurious Emissions	Pass	Refer to Note 1
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -38.05dB at 3705.00MHz.

Note:

1. This report is a partial report. Therefore, only test item of Transmitter Output Power and Effective Isotropically Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RFBFLF-WTW-P21010278-10.
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) (\pm)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
			Apr. 09, 2021	Apr. 08, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
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
5G Wireless Test Platforms Keysight	E7515B	MY60102114	May 28, 2020	May 27, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Nov. 06, 2020	Nov. 05, 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. 08, 2020	Jun. 07, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 17, 2021	Feb. 16, 2022
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM80 00	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. 08, 2020	Jun. 07, 2021
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-A R	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. 06, 2020	Jun. 05, 2021
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	EXP21 Smartphone
Brand	ASUS
Test Model	ASUS_I007D
Sample Status	Engineering sample
Power Supply Rating	7.74 Vdc (Battery) 5 Vdc / 9 Vdc / 12 Vdc / 15Vdc / 20Vdc (Adapter)

n14

Modulation Type	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM					
Waveform Type	CP-OFDM, DFT-s-OFDM					
Operating Frequency	n14 (Channel Bandwidth 5MHz)	790.5MHz ~ 795.5MHz				
	n14 (Channel Bandwidth 10MHz)	793.0MHz				
Max. ERP Power		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n14 (Channel Bandwidth 5MHz)	66.222mW (18.21dBm)	66.988mW (18.26dBm)	49.091mW (16.91dBm)	35.645mW (15.52dBm)	22.080mW (13.44dBm)
	n14 (Channel Bandwidth 10MHz)	66.681mW (18.24dBm)	67.453mW (18.29dBm)	49.888mW (16.98dBm)	35.645mW (15.52dBm)	22.080mW (13.44dBm)
Emission Designator		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n14 (Channel Bandwidth 5MHz)	4M47G7D	4M47G7D	4M47D7W	4M48D7W	4M48D7W
	n14 (Channel Bandwidth 10MHz)	9M20G7D	9M29G7D	9M29D7W	9M28D7W	9M28D7W

LTE Band

Modulation Type	QPSK, 16QAM, 64QAM, 256QAM				
Operating Frequency	LTE Band 2 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1909.3MHz			
	LTE Band 2 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1908.5MHz			
	LTE Band 2 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1907.5MHz			
	LTE Band 2 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1905.0MHz			
	LTE Band 2 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1902.5MHz			
	LTE Band 2 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1900.0MHz			
Max. EIRP Power		QPSK	16QAM	64QAM	256QAM
	LTE Band 2 (Channel Bandwidth 1.4MHz)	168.655mW (22.27dBm)	139.637mW (21.45dBm)	105.925mW (20.25dBm)	50.933mW (17.07dBm)
	LTE Band 2 (Channel Bandwidth 3MHz)	166.341mW (22.21dBm)	139.637mW (21.45dBm)	107.647mW (20.32dBm)	49.545mW (16.95dBm)
	LTE Band 2 (Channel Bandwidth 5MHz)	167.494mW (22.24dBm)	139.637mW (21.45dBm)	109.396mW (20.39dBm)	48.753mW (16.88dBm)
	LTE Band 2 (Channel Bandwidth 10MHz)	170.608mW (22.32dBm)	139.959mW (21.46dBm)	107.399mW (20.31dBm)	49.659mW (16.96dBm)
	LTE Band 2 (Channel Bandwidth 15MHz)	171.791mW (22.35dBm)	140.605mW (21.48dBm)	107.895mW (20.33dBm)	50.003mW (16.99dBm)
	LTE Band 2 (Channel Bandwidth 20MHz)	174.181mW (22.41dBm)	139.637mW (21.45dBm)	108.143mW (20.34dBm)	53.088mW (17.25dBm)
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.

Product	Brand	Model	Description
Battery	SCUD	C21P2002	Rating: 7.74Vdc, 15.2Wh
Adapter	AOHAI	A320Q-200325C-US	I/P: 100-240Vac, 50/60Hz, 1.5A O/P: 5Vdc, 3A; 9Vdc, 3A; 12Vdc, 3A; 15Vdc, 3A; 20Vdc, 3.25A
Type A to Type C USB Cable	Luxshare	LA9U2026-CS-R	0.5m
Type C to Type C Cable	Luxshare	LA9UC006-CS-R	1.2m
Bluetooth Earphone	Bang & Olufsen	EQ Earbud R	FCC ID: TTUBEOPLAYEQR IC: 3775B-BEOPLAYEQR
		EQ Earbud L	FCC ID: TTUBEOPLAYEQL IC: 3775B-BEOPLAYEQL
Bluetooth Earphone Charging Case	Bang & Olufsen	EQ Charging case	I/P: 5Vdc/500mA O/P: 5Vdc/ R170mA; L170mA

2. The following antennas were provided to the EUT.

Ant. No.	Brand	Model	Ant. Type	Connector	Frequency Range
Ant 0	ASUS	ZS675KW	PIFA	LCP+lpex	610-960MHz, 1710-2690MHz
Ant 1	ASUS	ZS675KW	PIFA	LCP+lpex	1427-1510MHz, 1710-2690MHz
Ant 2	ASUS	ZS675KW	PIFA	LCP+lpex	610-960MHz, 1427-1510MHz, 1710-2690MHz
Ant 3	INPAQ	ZS675KW	PIFA	lpex	1575-1610MHz, 2400-2500MHz, 5150-5850MHz, 5925-7125MHz
Ant 4	INPAQ	ZS675KW	PIFA	lpex	1176±10MHz, 2400-2500MHz, 5150-5850MHz, 5925-7125MHz
Ant 5	INPAQ	ZS675KW	PIFA	LCP+lpex	3300-4000MHz, 4400-5000MHz
Ant 6	INPAQ	ZS675KW	PIFA	lpex	1427-1510MHz, 2400-2500MHz, 5150-5850MHz, 5925-7125MHz
Ant 7	INPAQ	ZS675KW	PIFA	LCP+lpex	3300-4000MHz, 4400-5000MHz
Ant 8	ASUS	ZS675KW	PIFA	LCP+lpex	1427-1510MHz, 1710-2690MHz
Ant 9	ASUS	ZS675KW	PIFA	LCP+lpex	1710-2690MHz
Ant 10	INPAQ	ZS675KW	PIFA	lpex	3300-4000MHz, 4400-5000MHz
Ant 11	INPAQ	ZS675KW	PIFA	lpex	3300-4000MHz, 4400-5000MHz

2G / 3G Band													
Band	Freq. Range (MHz)	Gain (dBi)											
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6	Ant. 7	Ant. 8	Ant. 9	Ant. 10	Ant. 11
GSM-850	824 ~ 849	-1.891		-4.526									
GSM-1900	1850 ~ 1910		-1.887	-1.394						-2.89579			
WCDMA B2	1850 ~ 1910		-1.887	-1.394						-2.89579			
WCDMA B4	1710 ~ 1755		-2.884	-3.228						-3.13552			
WCDMA B5	824 ~ 849	-1.891		-4.526									
CDMA BC0	815 ~ 849	-1.891		-4.526									
CDMA BC1	1850 ~ 1910		-1.887	-1.394						-2.89579			
CDMA BC10	806 ~ 901	-1.891		-4.526									

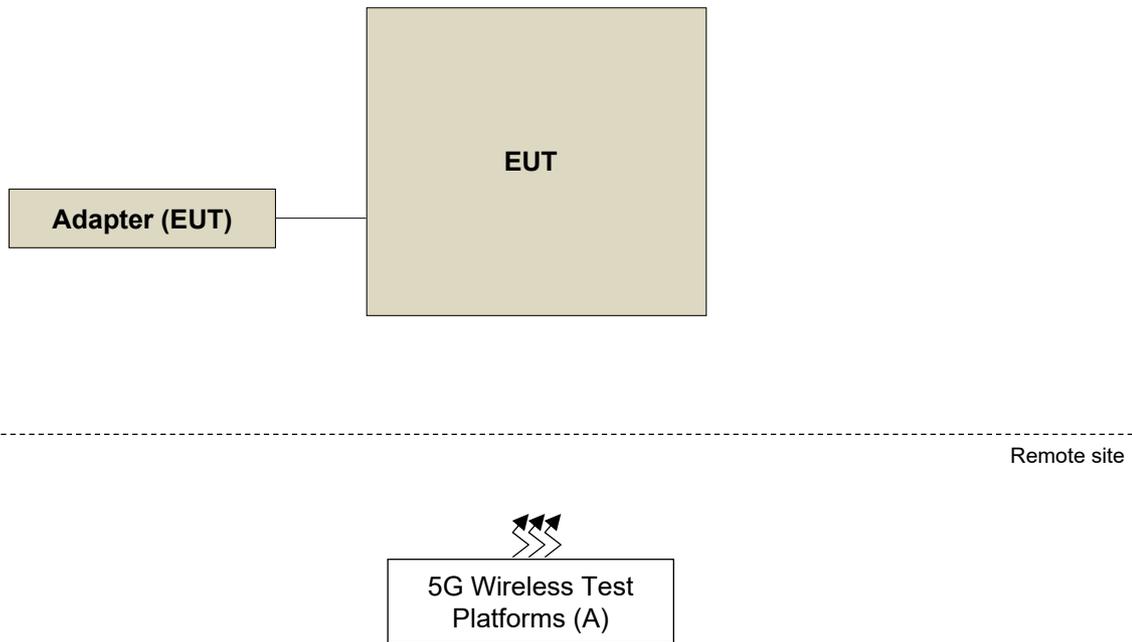
LTE Band													
Band	Freq. Range (MHz)	Gain (dBi)											
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6	Ant. 7	Ant. 8	Ant. 9	Ant. 10	Ant. 11
LTE B2	1850 ~ 1910		-1.887	-1.394						-2.89579	-1.804		
LTE B4	1710 ~ 1755		-2.884	-3.228						-3.13552	-1.706		
LTE B5	824 ~ 849	-1.891		-4.526									
LTE B7	2500 ~ 2570		0.185	-0.657						-0.50837	-1.117		
LTE B12	698 ~ 716	-2.135		-4.343									
LTE B13	777 ~ 787	-4.37		-8.13									
LTE B14	788 ~ 798	-4.37		-7.931									
LTE B17	704 ~ 716	-2.135		-4.343									
LTE B25	1850 ~ 1915		-1.887	-1.394						-2.89579			
LTE B26	814 ~ 849	-1.891		-4.526									
LTE B30	2305 ~ 2315		-1.326	-2.669						-1.28433			
LTE B66	1710 ~ 1780		-2.884	-2.478						-3.0668	-1.685		
LTE B71	663 ~ 698	-5.741		-7.388									
T-LTE B38	2570 ~ 2620		0.724	-0.912						-0.59557			
T-LTE B40	2300 ~ 2400		-1.326	-2.669						-1.28433			
T-LTE B41	2496 ~ 2690		1.143	-0.657						-0.59557			
T-LTE B42	3400 ~ 3600						0.313		0.5277			-2.493	-0.35195
T-LTE B43	3600 ~ 3800						-0.434		0.5277			-0.477	-0.161
T-LTE B48	3550 ~ 3700						-0.434		0.5277			-0.477	-0.161
5G FR1 Band													
Band	Freq. Range (MHz)	Gain (dBi)											
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Ant. 5	Ant. 6	Ant. 7	Ant. 8	Ant. 9	Ant. 10	Ant. 11
n2	1850 ~ 1910		-1.887	-1.394						-2.89579	-1.804		
n5	824 ~ 849	-1.891		-4.526									
n7	2500 ~ 2570		0.185	-0.657						-0.50837	-1.117		
n12	699 ~ 716	-2.135		-4.343									
n13	777 ~ 787	-4.37		-8.13									
n14	788 ~ 798	-4.37		-7.931									
n25	1850 ~ 1915		-1.887	-1.394						-2.89579	-1.627		
n26	814 ~ 849	-1.891		-4.526									
n30	2305 ~ 2315		-1.326	-2.669						-1.28433			
n38	2570 ~ 2620		0.724	-0.912						-0.59557	-1.3		
n41	2496 ~ 2690		1.143	-0.657						-0.59557	-0.076		
n66	1710 ~ 1780		-2.884	-2.478						-3.0668	-1.685		
n71	663 ~ 698	-5.741		-7.388									
n77	3300 ~ 4200						0.313		0.5277			2.017	0.19902
n78	3300 ~ 3800						0.313		0.5277			2.017	-0.161

* 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.

5GNR	FCC 5G FR1			ENDC
	Band	SCS	Bandwidth (MHz)	
	n2	15kHz	5/10/15/20	Band 5/12/13/14/30/66
	n5	15kHz	5/10/15/20	Band 2/7/12/30/48/66
	n7	15kHz	5/10/15/20/25/30/40	Band 2/5/12/13/66
	n12	15kHz	5/10/15	Band 2/66
	n14	15kHz	5/10	Band 2
	n25	15kHz	5/10/15/20/25/30/40	Band 12/66
	n30	15kHz	5/10	Band 2/5/66
	n38	30kHz	20/30/40	Band 2/4/5/12/66/71
	n41	30kHz	20/30/40/50/60/80/90/100	Band 2/4/12/25/26/66
	n66	15kHz	5/10/15/20/30/40	Band 2/5/7/12/13/14/30/48/71
	n71	15kHz	5/10/15/20	Band 2/7/66
	n77	30kHz	20/30/40/50/60/70/80/90/100	Band 7/41
	n78	30kHz	20/30/40/50/60/70/80/90/100	Band 2/4/5/7/12/13/38/66/71

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	-

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

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

Band	Radiated Emission
n14	Y-plane
LTE Band 2	Y-plane

n14

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	158100 to 159100	158100 (790.5MHz), 158600 (793.0MHz), 159100 (795.5MHz)	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
		158600	158600 (793.0MHz)	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
-	Modulation characteristics	158600	158600 (793.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	52 RB / 0 RB Offset
-	Frequency Stability	158100 to 159100	158100 (790.5MHz), 159100 (795.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		158600	158600 (793.0MHz)	10MHz	QPSK	52 RB / 0 RB Offset
-	Occupied Bandwidth	158100 to 159100	158100 (790.5MHz), 158600 (793.0MHz), 159100 (795.5MHz)	5MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	25 RB / 0 RB Offset
		158600	158600 (793.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	52 RB / 0 RB Offset
-	Emission Mask	158100 to 159100	158100 (790.5MHz), 158600 (793.0MHz), 159100 (795.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		158600	158600 (793.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 51 RB Offset 52 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	158100 to 159100	158100 (790.5MHz), 158600 (793.0MHz), 159100 (795.5MHz)	5MHz	QPSK	1 RB / 1 RB Offset
		158600	158600 (793.0MHz)	10MHz	QPSK	1 RB / 1 RB Offset
-	Radiated Emission Below 1GHz	158600	158600 (793.0MHz)	10MHz	QPSK	1 RB / 1 RB Offset
-	Radiated Emission Above 1GHz	158100 to 159100	158100 (790.5MHz), 158600 (793.0MHz), 159100 (795.5MHz)	5MHz	QPSK	1 RB / 1 RB Offset
		158600	158600 (793.0MHz)	10MHz	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 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 2

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM / 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
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	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
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	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
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	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
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB / 0 RB Offset 1 RB / 37 RB Offset 1 RB / 74 RB Offset 36 RB / 0 RB Offset 36 RB / 19 RB Offset 36 RB / 39 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB / 0 RB Offset 1 RB / 50 RB Offset 1 RB / 99 RB Offset 50 RB / 0 RB Offset 50 RB / 25 RB Offset 50 RB / 50 RB Offset 100 RB / 0 RB Offset

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

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM, 64QAM and 256QAM, measured value of QPSK is higher than 16QAM, 64QAM and 256QAM mode. 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	7.74Vdc	James Yang
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Emission Mask	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Radiated Emission	23deg. C, 67%RH 25deg. C, 65%RH	120Vac, 60Hz	Adair Peng Tank Wu

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

FCC 47 CFR Part 90

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 n14:

Control stations and mobile stations transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 30 watts ERP. Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

For LTE Band 2:

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

4.1.2 Test Procedures

Conducted Power Measurement:

The EUT was set up for the maximum power with 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:

$$\text{EIRP} = P_{\text{Meas}} + G_{\text{T}}$$

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

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 14						
BW	MCS Index	RB Size	RB Offset	Mid		
		Channel		158600		
		Frequency (MHz)		793		
10M	$\pi/2$ BPSK	1	1	24.76		
		1	26	24.71		
		1	50	24.70		
		25	0	24.08		
		25	14	24.70		
		25	27	23.87		
		50	0	23.98		
10M	QPSK	1	1	24.81		
		1	26	24.78		
		1	50	24.72		
		25	0	23.62		
		25	14	24.72		
		25	27	23.44		
		50	0	23.54		
10M	16QAM	1	1	23.50		
10M	64QAM	1	1	22.04		
10M	256QAM	1	1	19.96		
BW	MCS Index	Channel		158100	158600	159100
		Frequency (MHz)		790.5	793	795.5
5M	$\pi/2$ BPSK	1	1	24.67	24.73	24.73
		1	13	24.65	24.64	24.56
		1	23	24.60	24.66	24.51
		12	0	24.01	23.97	23.91
		12	7	24.66	24.57	24.57
		12	13	23.83	23.67	23.58
		25	0	23.96	23.89	23.85
5M	QPSK	1	1	24.74	24.77	24.70
		1	13	24.78	24.75	24.64
		1	23	24.67	24.53	24.58
		12	0	23.57	23.53	23.48
		12	7	24.69	24.59	24.55
		12	13	23.39	23.41	23.35
		25	0	23.52	23.40	23.32
5M	16QAM	1	1	23.40	23.43	23.36
5M	64QAM	1	1	22.04	21.99	21.94
5M	256QAM	1	1	19.87	19.96	19.82

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	23.75	23.66	23.80
		1	50	23.70	23.45	23.46
		1	99	23.77	23.57	23.75
		50	0	22.83	22.54	22.66
		50	25	22.61	22.66	22.63
		50	50	22.60	22.47	22.75
		100	0	22.65	22.50	22.70
20M	16QAM	1	0	22.85	22.84	22.81
		1	50	22.73	22.67	22.69
		1	99	22.53	22.47	22.53
		50	0	21.49	21.70	21.64
		50	25	21.46	21.50	21.53
		50	50	21.48	21.50	21.65
		100	0	21.50	21.46	21.36
20M	64QAM	1	0	21.52	21.50	21.62
		1	50	21.74	21.61	21.50
		1	99	21.64	21.74	21.45
		50	0	20.70	20.55	20.45
		50	25	20.62	20.44	20.70
		50	50	20.51	20.54	20.44
		100	0	20.61	20.64	20.71
20M	256QAM	1	0	18.64	18.47	18.52
		1	50	18.21	18.18	18.34
		1	99	18.10	18.00	18.00
		50	0	18.18	18.21	17.88
		50	25	18.14	18.24	18.42
		50	50	18.32	18.09	18.26
		100	0	18.29	18.29	18.25

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	23.74	23.46	23.61
		1	37	23.65	23.59	23.47
		1	74	23.62	23.37	23.37
		36	0	22.65	22.51	22.52
		36	19	22.70	22.63	22.76
		36	39	22.76	22.40	22.51
		75	0	22.55	22.44	22.67
15M	16QAM	1	0	22.85	22.87	22.83
		1	37	22.78	22.58	22.69
		1	74	22.46	22.38	22.64
		36	0	21.69	21.60	21.58
		36	19	21.39	21.61	21.31
		36	39	21.53	21.35	21.59
		75	0	21.67	21.40	21.61
15M	64QAM	1	0	21.54	21.51	21.44
		1	37	21.66	21.53	21.54
		1	74	21.72	21.38	21.55
		36	0	20.56	20.46	20.70
		36	19	20.60	20.26	20.59
		36	39	20.52	20.32	20.27
		75	0	20.57	20.70	20.65
15M	256QAM	1	0	18.16	17.88	18.38
		1	37	18.14	18.08	18.23
		1	74	17.91	18.12	18.19
		36	0	17.39	17.35	17.37
		36	19	17.32	16.95	17.38
		36	39	17.20	17.40	17.34
		75	0	17.26	17.19	17.15

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	23.57	23.72	23.51
		1	24	23.54	23.57	23.51
		1	49	23.40	23.43	23.31
		25	0	22.72	22.46	22.64
		25	12	22.42	22.37	22.68
		25	25	22.54	22.41	22.42
		50	0	22.40	22.58	22.42
10M	16QAM	1	0	22.51	22.85	22.67
		1	24	22.33	22.71	22.58
		1	49	22.54	22.32	22.49
		25	0	21.51	21.44	21.51
		25	12	21.44	21.38	21.32
		25	25	21.55	21.36	21.25
		50	0	21.22	21.29	21.22
10M	64QAM	1	0	21.70	21.59	21.39
		1	24	21.52	21.49	21.37
		1	49	21.43	21.40	21.29
		25	0	20.39	20.49	20.63
		25	12	20.43	20.35	20.51
		25	25	20.37	20.53	20.55
		50	0	20.63	20.37	20.54
10M	256QAM	1	0	18.36	18.23	18.35
		1	24	17.78	17.97	18.08
		1	49	18.05	18.10	17.96
		25	0	17.34	17.20	17.17
		25	12	17.06	17.19	17.18
		25	25	17.21	17.39	17.12
		50	0	17.23	16.99	17.22

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	23.53	23.63	23.32
		1	12	23.44	23.49	23.36
		1	24	23.59	23.49	23.48
		12	0	22.61	22.65	22.43
		12	6	22.64	22.38	22.52
		12	13	22.57	22.48	22.30
		25	0	22.61	22.59	22.43
5M	16QAM	1	0	22.69	22.84	22.55
		1	12	22.73	22.45	22.39
		1	24	22.38	22.55	22.42
		12	0	21.48	21.23	21.35
		12	6	21.35	21.24	21.39
		12	13	21.47	21.21	21.53
		25	0	21.22	21.34	21.37
5M	64QAM	1	0	21.54	21.60	21.23
		1	12	21.79	21.35	21.58
		1	24	21.48	21.36	21.60
		12	0	20.62	20.37	20.31
		12	6	20.44	20.34	20.26
		12	13	20.48	20.29	20.49
		25	0	20.37	20.29	20.44
5M	256QAM	1	0	17.97	18.00	17.98
		1	12	18.06	18.03	17.89
		1	24	18.27	18.14	17.90
		12	0	17.44	17.36	17.02
		12	6	17.34	17.08	17.23
		12	13	17.20	17.05	17.05
		25	0	17.40	17.00	16.82

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	23.61	23.38	23.56
		1	7	23.46	23.26	23.57
		1	14	23.60	23.41	23.32
		8	0	22.61	22.62	22.43
		8	3	22.58	22.58	22.70
		8	7	22.71	22.50	22.41
		15	0	22.71	22.42	22.68
3M	16QAM	1	0	22.70	22.84	22.53
		1	7	22.59	22.62	22.59
		1	14	22.64	22.62	22.58
		8	0	21.48	21.34	21.23
		8	3	21.30	21.51	21.09
		8	7	21.16	21.33	21.32
		15	0	21.28	21.25	21.47
3M	64QAM	1	0	21.72	21.52	21.62
		1	7	21.53	21.70	21.43
		1	14	21.49	21.33	21.52
		8	0	20.40	20.49	20.53
		8	3	20.52	20.53	20.32
		8	7	20.18	20.33	20.39
		15	0	20.50	20.42	20.43
3M	256QAM	1	0	18.34	18.15	18.18
		1	7	18.12	17.99	18.19
		1	14	18.24	18.17	18.28
		8	0	17.01	17.12	17.13
		8	3	17.11	16.98	17.30
		8	7	17.28	17.13	17.12
		15	0	17.09	17.03	17.43

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	23.66	23.44	23.50
		1	2	23.52	23.37	23.36
		1	5	23.48	23.16	23.29
		3	0	23.52	23.67	23.59
		3	1	23.50	23.64	23.66
		3	3	23.62	23.58	23.62
		6	0	22.36	22.33	22.44
1.4M	16QAM	1	0	22.85	22.56	22.66
		1	2	22.36	22.38	22.44
		1	5	22.52	22.27	22.35
		3	0	22.52	22.22	22.61
		3	1	22.20	22.49	22.29
		3	3	22.18	22.24	22.28
		6	0	21.21	21.42	21.57
1.4M	64QAM	1	0	21.52	21.25	21.44
		1	2	21.26	21.37	21.64
		1	5	21.59	21.58	21.41
		3	0	21.42	21.47	21.53
		3	1	21.54	21.37	21.41
		3	3	21.57	21.41	21.45
		6	0	20.36	20.65	20.48
1.4M	256QAM	1	0	17.94	17.76	18.30
		1	2	18.14	18.10	18.38
		1	5	17.92	18.03	18.14
		3	0	18.22	18.23	18.20
		3	1	18.46	18.01	18.05
		3	3	18.30	18.02	18.03
		6	0	17.22	17.28	17.06

EIRP / ERP Power (dBm)

NR Band 14						
BW	MCS Index	RB Size	RB Offset	Mid		
		Channel		158600		
		Frequency (MHz)		793		
10M	$\pi/2$ BPSK	1	1	18.24		
		1	26	18.19		
		1	50	18.18		
		25	0	17.56		
		25	14	18.18		
		25	27	17.35		
		50	0	17.46		
10M	QPSK	1	1	18.29		
		1	26	18.26		
		1	50	18.20		
		25	0	17.10		
		25	14	18.20		
		25	27	16.92		
		50	0	17.02		
10M	16QAM	1	1	16.98		
10M	64QAM	1	1	15.52		
10M	256QAM	1	1	13.44		
BW	MCS Index	Channel		158100	158600	159100
		Frequency (MHz)		790.5	793	795.5
5M	$\pi/2$ BPSK	1	1	18.15	18.21	18.21
		1	13	18.13	18.12	18.04
		1	23	18.08	18.14	17.99
		12	0	17.49	17.45	17.39
		12	7	18.14	18.05	18.05
		12	13	17.31	17.15	17.06
		25	0	17.44	17.37	17.33
5M	QPSK	1	1	18.22	18.25	18.18
		1	13	18.26	18.23	18.12
		1	23	18.15	18.01	18.06
		12	0	17.05	17.01	16.96
		12	7	18.17	18.07	18.03
		12	13	16.87	16.89	16.83
		25	0	17.00	16.88	16.80
5M	16QAM	1	1	16.88	16.91	16.84
5M	64QAM	1	1	15.52	15.47	15.42
5M	256QAM	1	1	13.35	13.44	13.30

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	22.36	22.26	22.41
		1	50	22.31	22.05	22.06
		1	99	22.38	22.18	22.35
		50	0	21.43	21.15	21.26
		50	25	21.21	21.26	21.24
		50	50	21.21	21.08	21.36
		100	0	21.26	21.11	21.30
20M	16QAM	1	0	21.45	21.44	21.42
		1	50	21.34	21.28	21.29
		1	99	21.14	21.08	21.14
		50	0	20.10	20.30	20.25
		50	25	20.07	20.10	20.14
		50	50	20.08	20.10	20.26
		100	0	20.11	20.07	19.97
20M	64QAM	1	0	20.13	20.10	20.22
		1	50	20.34	20.21	20.10
		1	99	20.25	20.34	20.06
		50	0	19.30	19.16	19.06
		50	25	19.23	19.04	19.31
		50	50	19.11	19.15	19.04
		100	0	19.22	19.24	19.32
20M	256QAM	1	0	17.25	17.07	17.13
		1	50	16.82	16.78	16.94
		1	99	16.70	16.60	16.61
		50	0	16.78	16.82	16.48
		50	25	16.74	16.85	17.03
		50	50	16.93	16.70	16.86
		100	0	16.90	16.90	16.86

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	22.35	22.06	22.22
		1	37	22.26	22.20	22.07
		1	74	22.22	21.97	21.98
		36	0	21.26	21.11	21.13
		36	19	21.31	21.24	21.37
		36	39	21.37	21.01	21.11
		75	0	21.16	21.04	21.27
15M	16QAM	1	0	21.46	21.48	21.44
		1	37	21.39	21.19	21.29
		1	74	21.07	20.98	21.25
		36	0	20.30	20.21	20.19
		36	19	19.99	20.22	19.91
		36	39	20.14	19.96	20.20
		75	0	20.27	20.01	20.22
15M	64QAM	1	0	20.15	20.12	20.05
		1	37	20.26	20.14	20.14
		1	74	20.33	19.98	20.16
		36	0	19.17	19.06	19.31
		36	19	19.21	18.86	19.20
		36	39	19.13	18.92	18.88
		75	0	19.18	19.30	19.25
15M	256QAM	1	0	16.77	16.49	16.99
		1	37	16.75	16.69	16.84
		1	74	16.51	16.72	16.80
		36	0	16.00	15.96	15.98
		36	19	15.93	15.55	15.99
		36	39	15.81	16.01	15.95
		75	0	15.87	15.80	15.76

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	22.18	22.32	22.12
		1	24	22.14	22.18	22.12
		1	49	22.01	22.04	21.92
		25	0	21.32	21.06	21.24
		25	12	21.02	20.98	21.28
		25	25	21.15	21.02	21.03
		50	0	21.00	21.19	21.03
10M	16QAM	1	0	21.12	21.46	21.28
		1	24	20.94	21.32	21.18
		1	49	21.15	20.93	21.10
		25	0	20.12	20.04	20.12
		25	12	20.05	19.99	19.92
		25	25	20.16	19.97	19.86
		50	0	19.83	19.89	19.82
10M	64QAM	1	0	20.31	20.20	19.99
		1	24	20.12	20.10	19.97
		1	49	20.04	20.01	19.90
		25	0	19.00	19.10	19.23
		25	12	19.03	18.95	19.11
		25	25	18.97	19.13	19.16
		50	0	19.24	18.98	19.14
10M	256QAM	1	0	16.96	16.84	16.96
		1	24	16.39	16.57	16.69
		1	49	16.65	16.71	16.57
		25	0	15.94	15.81	15.78
		25	12	15.67	15.79	15.78
		25	25	15.82	16.00	15.73
		50	0	15.83	15.59	15.82

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	22.13	22.24	21.93
		1	12	22.04	22.09	21.97
		1	24	22.20	22.10	22.08
		12	0	21.22	21.26	21.03
		12	6	21.25	20.99	21.12
		12	13	21.18	21.09	20.91
		25	0	21.22	21.20	21.04
5M	16QAM	1	0	21.30	21.45	21.16
		1	12	21.34	21.06	20.99
		1	24	20.99	21.16	21.03
		12	0	20.09	19.84	19.95
		12	6	19.96	19.84	19.99
		12	13	20.07	19.82	20.14
		25	0	19.83	19.95	19.98
5M	64QAM	1	0	20.14	20.21	19.84
		1	12	20.39	19.96	20.19
		1	24	20.09	19.97	20.20
		12	0	19.23	18.97	18.92
		12	6	19.05	18.95	18.86
		12	13	19.09	18.90	19.10
		25	0	18.98	18.89	19.04
5M	256QAM	1	0	16.57	16.61	16.59
		1	12	16.66	16.64	16.50
		1	24	16.88	16.75	16.50
		12	0	16.04	15.97	15.63
		12	6	15.95	15.69	15.83
		12	13	15.80	15.65	15.66
		25	0	16.01	15.61	15.43

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	22.21	21.98	22.16
		1	7	22.07	21.86	22.18
		1	14	22.21	22.02	21.93
		8	0	21.22	21.23	21.04
		8	3	21.19	21.19	21.31
		8	7	21.32	21.10	21.02
		15	0	21.32	21.02	21.28
3M	16QAM	1	0	21.31	21.45	21.14
		1	7	21.20	21.23	21.19
		1	14	21.25	21.22	21.19
		8	0	20.09	19.95	19.84
		8	3	19.91	20.12	19.70
		8	7	19.77	19.94	19.93
		15	0	19.89	19.85	20.07
3M	64QAM	1	0	20.32	20.12	20.23
		1	7	20.14	20.31	20.04
		1	14	20.10	19.94	20.13
		8	0	19.00	19.10	19.14
		8	3	19.12	19.14	18.93
		8	7	18.79	18.94	19.00
		15	0	19.11	19.02	19.03
3M	256QAM	1	0	16.95	16.75	16.78
		1	7	16.73	16.60	16.79
		1	14	16.85	16.78	16.89
		8	0	15.61	15.73	15.74
		8	3	15.71	15.58	15.91
		8	7	15.88	15.73	15.73
		15	0	15.70	15.64	16.03

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	22.26	22.05	22.11
		1	2	22.12	21.98	21.97
		1	5	22.08	21.77	21.90
		3	0	22.13	22.27	22.19
		3	1	22.10	22.24	22.27
		3	3	22.23	22.19	22.22
		6	0	20.96	20.94	21.05
1.4M	16QAM	1	0	21.45	21.17	21.27
		1	2	20.96	20.99	21.05
		1	5	21.12	20.88	20.95
		3	0	21.12	20.82	21.22
		3	1	20.80	21.10	20.90
		3	3	20.79	20.84	20.89
		6	0	19.81	20.03	20.18
1.4M	64QAM	1	0	20.13	19.85	20.05
		1	2	19.87	19.97	20.25
		1	5	20.19	20.19	20.01
		3	0	20.02	20.07	20.14
		3	1	20.15	19.98	20.01
		3	3	20.18	20.01	20.06
		6	0	18.97	19.25	19.09
1.4M	256QAM	1	0	16.55	16.37	16.91
		1	2	16.74	16.70	16.99
		1	5	16.53	16.63	16.74
		3	0	16.82	16.84	16.81
		3	1	17.07	16.62	16.65
		3	3	16.91	16.63	16.63
		6	0	15.83	15.88	15.67

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

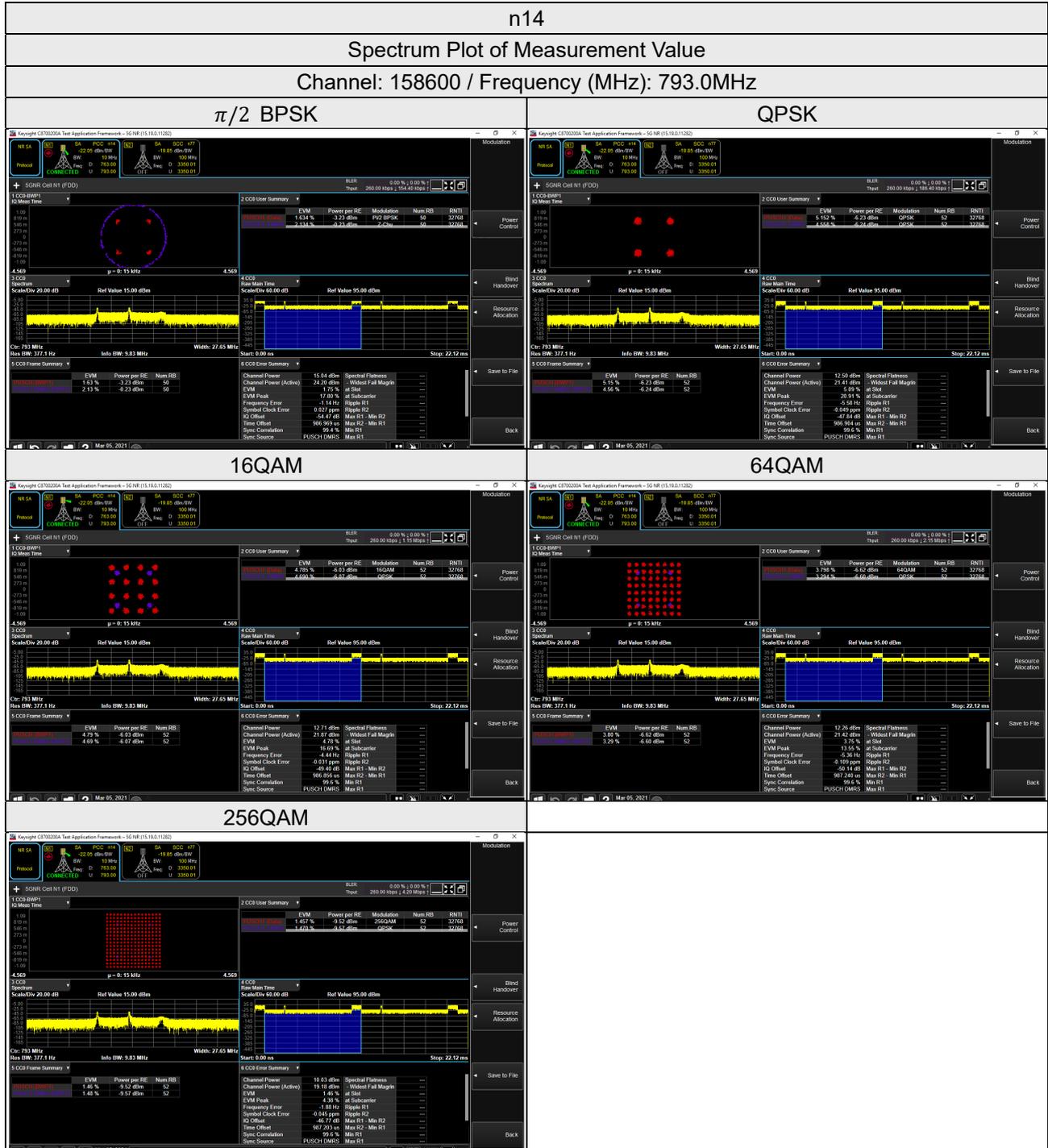
4.2.2 Test Procedure

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

4.2.3 Test Setup



4.2.4 Test Results



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

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

4.3.2 Test Procedure

- 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 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

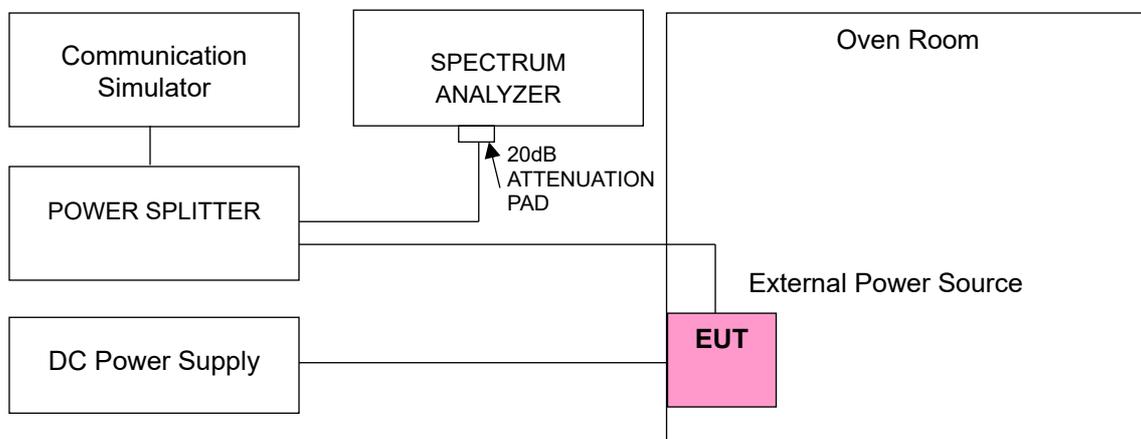
Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
5G Wireless Test Platforms Keysight	E7515B	MY60102114	May 28, 2020	May 27, 2021
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021
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)	n14			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
8.90	790.500003	0.003	795.500000	0.002
7.74	790.500004	0.005	795.500000	0.003
6.58	790.500004	0.005	795.500000	0.005

Note: The applicant defined the normal working voltage is from 6.58Vdc to 8.90Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n14			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	790.500004	0.005	795.500000	0.003
-20	790.500003	0.004	795.500000	0.002
-10	790.500003	0.004	795.500000	0.002
0	790.500004	0.005	795.500000	0.002
10	790.499997	-0.004	795.500000	-0.005
20	790.499997	-0.004	795.500000	-0.002
30	790.499998	-0.003	795.500000	-0.004
40	790.499996	-0.005	795.500000	-0.004
50	790.499997	-0.003	795.500000	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	n14	
	Channel Bandwidth 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
8.90	793.000003	0.004
7.74	793.000004	0.005
6.58	793.000001	0.002

Note: The applicant defined the normal working voltage is from 6.58Vdc to 8.90Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n14	
	Channel Bandwidth 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	793.000003	0.004
-20	793.000002	0.002
-10	793.000002	0.003
0	793.000001	0.001
10	792.999997	-0.004
20	792.999997	-0.004
30	792.999998	-0.002
40	792.999997	-0.004
50	792.999999	-0.001

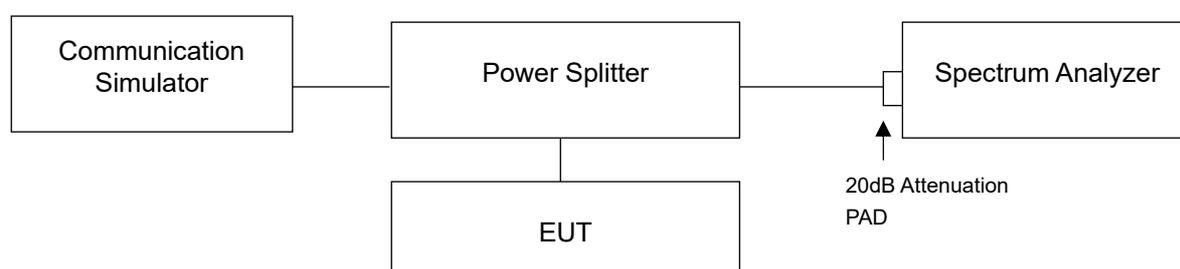
4.4 Occupied Bandwidth Measurement

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

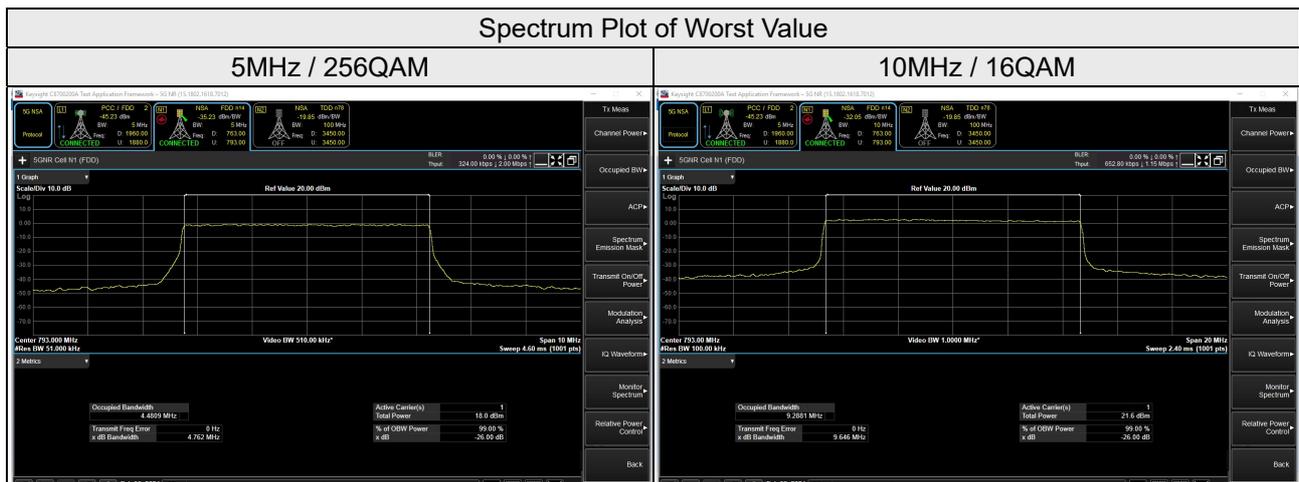


4.4.3 Test Result

Occupied Bandwidth

n14, Channel Bandwidth 5MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
158100	790.5	4.46	4.47	4.47	4.47	4.47
158600	793.0	4.47	4.47	4.47	4.46	4.48
159100	795.5	4.47	4.47	4.46	4.48	4.47

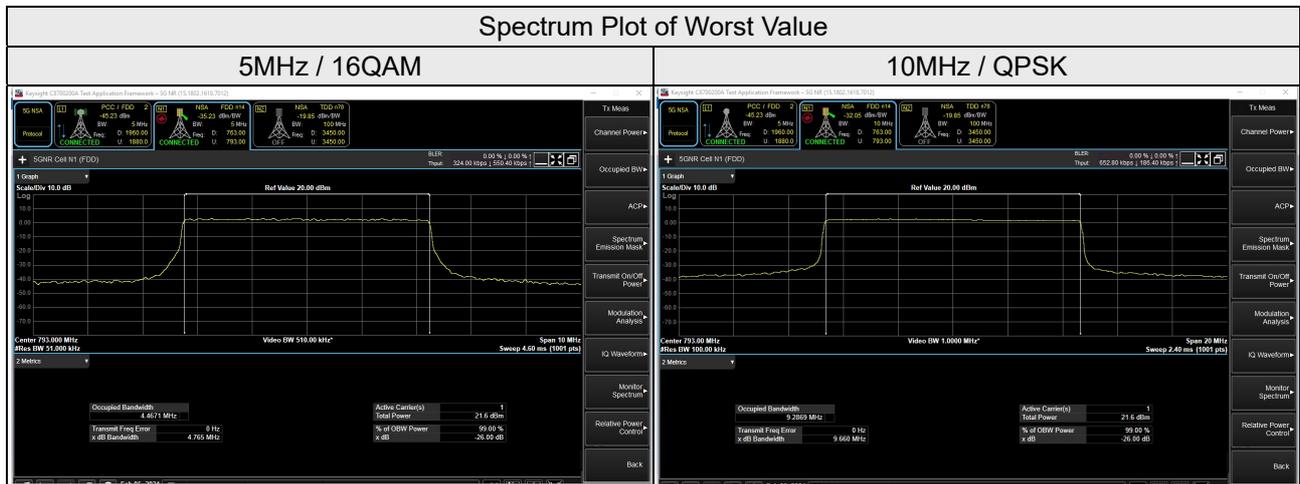
n14, Channel Bandwidth 10MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
158600	793.0	9.20	9.29	9.29	9.28	9.28



26dB Bandwidth

n14, Channel Bandwidth 5MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
158100	790.5	4.75	4.72	4.72	4.72	4.76
158600	793.0	4.76	4.74	4.77	4.71	4.76
159100	795.5	4.75	4.72	4.72	4.77	4.70

n14, Channel Bandwidth 10MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
158600	793.0	9.26	9.66	9.65	9.63	9.66

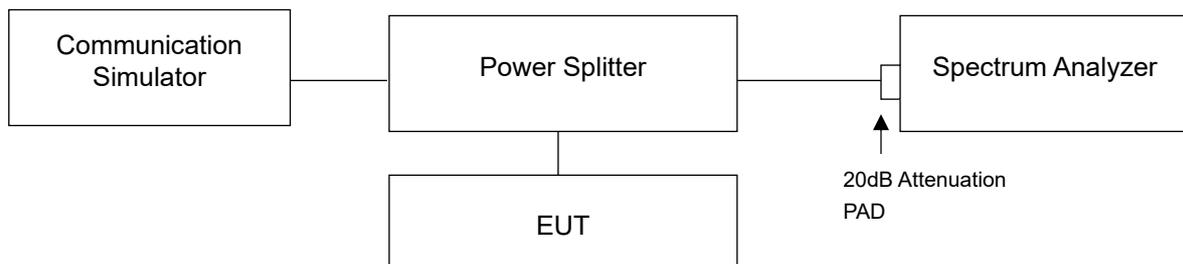


4.5 Emission Mask Measurement

4.5.1 Limits of Emission Mask Measurement

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

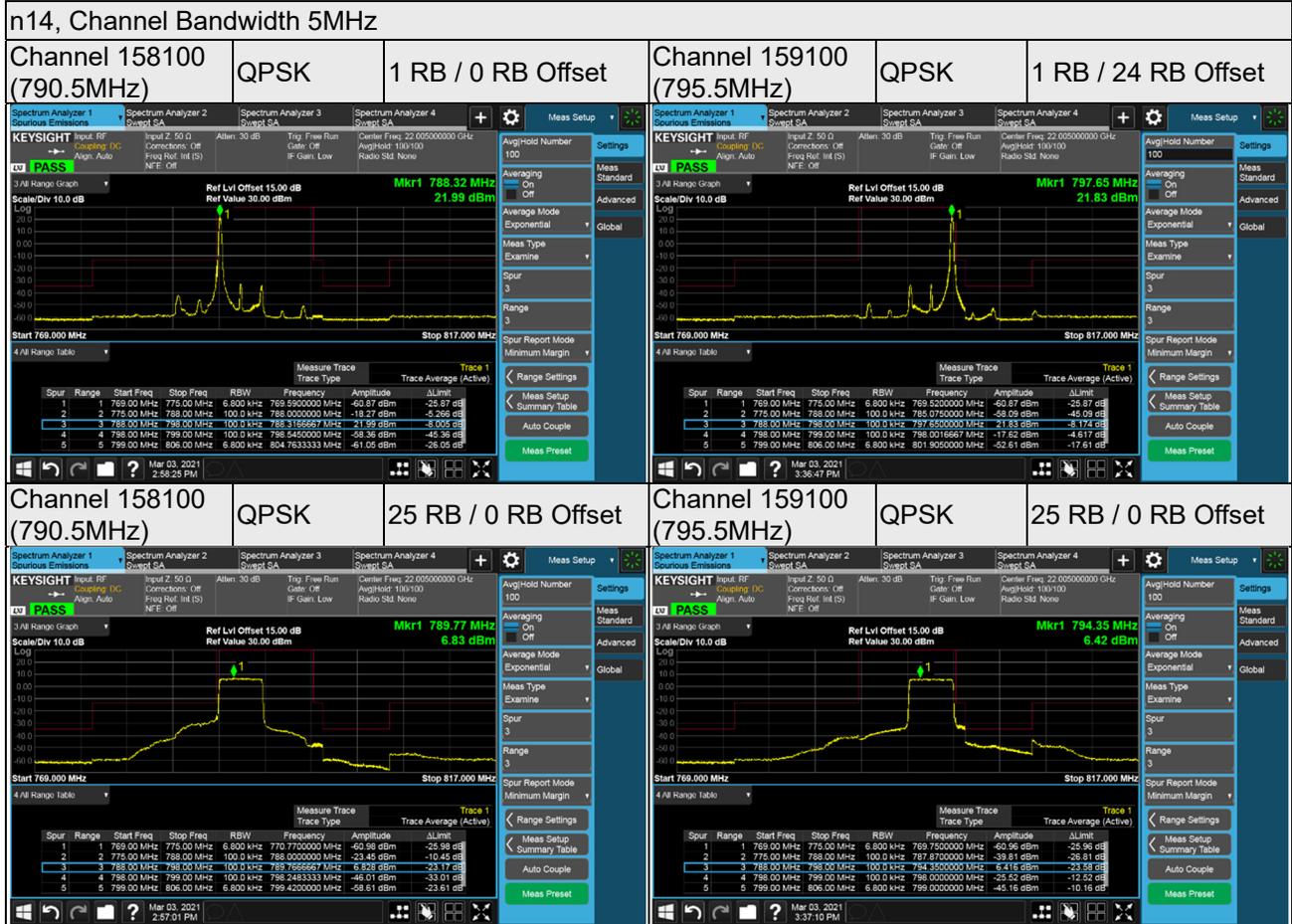
4.5.2 Test Setup



4.5.3 Test Procedures

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

4.5.4 Test Results



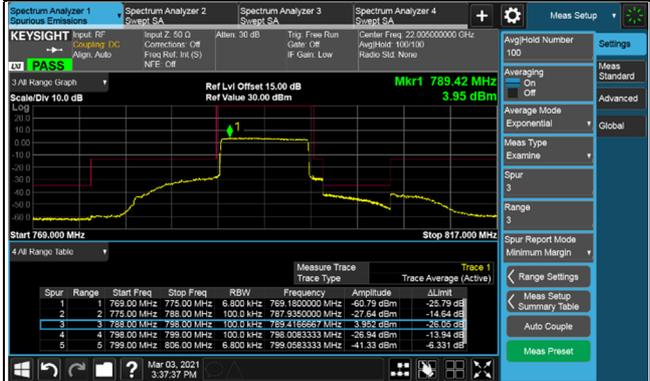
n14, Channel Bandwidth 10MHz

Channel 158600 (793.0MHz)	QPSK	1 RB / 0 RB Offset	Channel 158600 (793.0MHz)	QPSK	1 RB / 50 RB Offset
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Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	769.00 MHz	775.00 MHz	6.800 kHz	771.8800000 MHz	-60.75 dBm	-25.75 dB
2	2	775.00 MHz	780.00 MHz	100.0 kHz	788.0000000 MHz	-33.87 dBm	-20.87 dB
3	3	785.00 MHz	790.00 MHz	100.0 kHz	789.3500000 MHz	-41.93 dBm	-31.93 dB
4	4	798.00 MHz	799.00 MHz	100.0 kHz	798.0566667 MHz	-51.34 dBm	-38.34 dB
5	5	799.00 MHz	806.00 MHz	6.800 kHz	804.9956667 MHz	-60.88 dBm	-25.88 dB

Channel 158600 (793.0MHz)	QPSK	51 RB / 0 RB Offset			
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Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	769.00 MHz	775.00 MHz	6.800 kHz	769.1800000 MHz	-60.79 dBm	-25.79 dB
2	2	775.00 MHz	780.00 MHz	100.0 kHz	787.9300000 MHz	-21.64 dBm	-14.64 dB
3	3	788.00 MHz	789.00 MHz	100.0 kHz	789.4186667 MHz	3.95 dBm	-26.05 dB
4	4	798.00 MHz	799.00 MHz	100.0 kHz	798.0083333 MHz	-25.94 dBm	-13.94 dB
5	5	799.00 MHz	806.00 MHz	6.800 kHz	799.0503333 MHz	-41.33 dBm	-8.33 dB

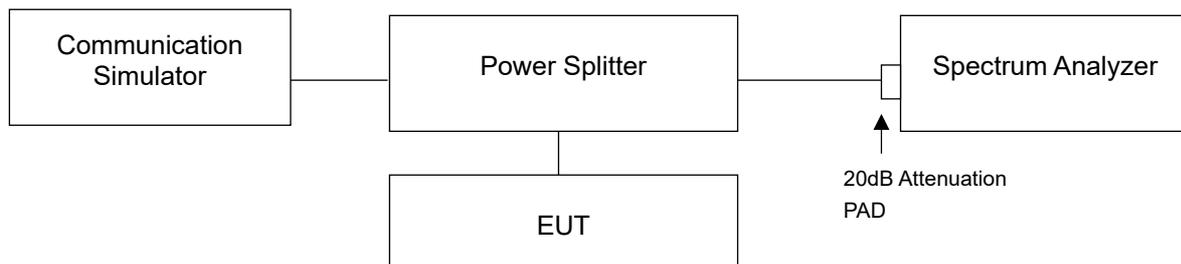
4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

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

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz . The limit of emissions is equal to -40 dBm .

4.6.2 Test Setup



4.6.3 Test Procedure

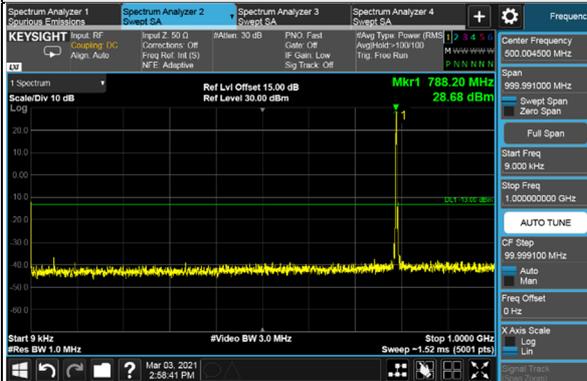
- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9kHz to 10GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

4.6.4 Test Results

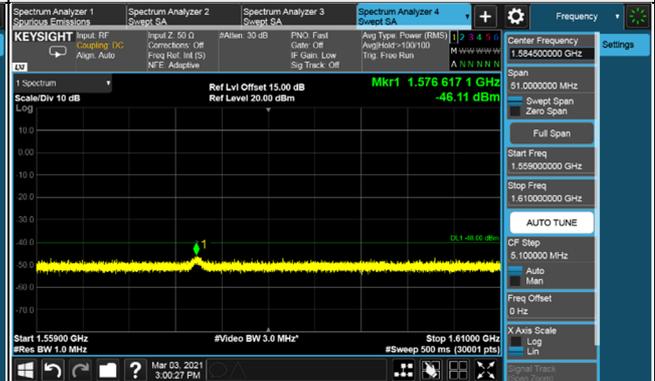
n14, Channel Bandwidth 5MHz

Channel 158100 (790.5MHz)

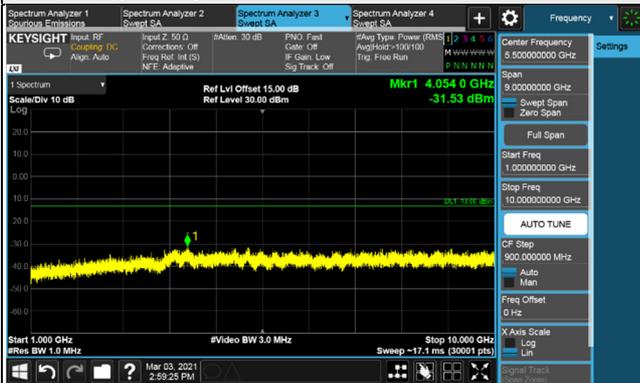
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1.559GHz ~ 1.61GHz



Frequency Range : 1GHz ~ 10GHz

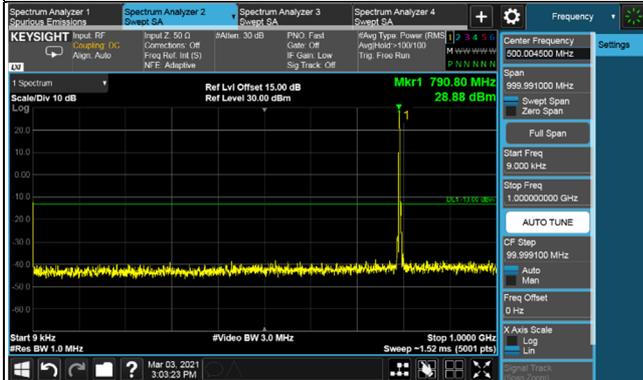


*The 9kHz signal over the limit is from Spectrum.

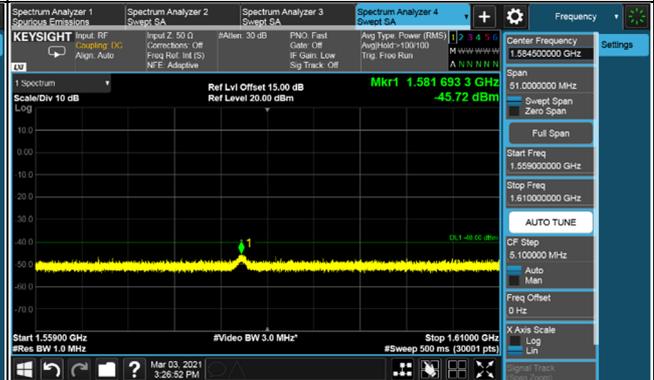
n14, Channel Bandwidth 5MHz

Channel 158600 (793.0MHz)

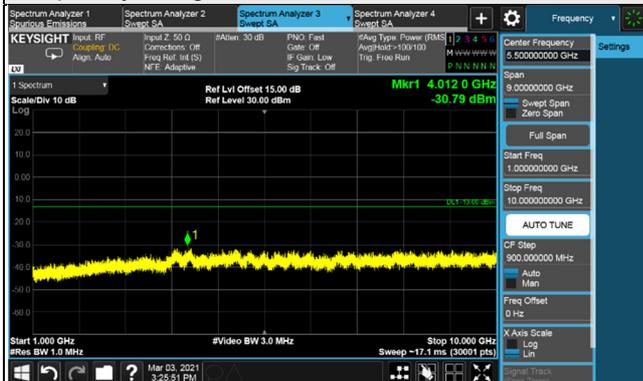
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1.559GHz ~ 1.61GHz



Frequency Range : 1GHz ~ 10GHz

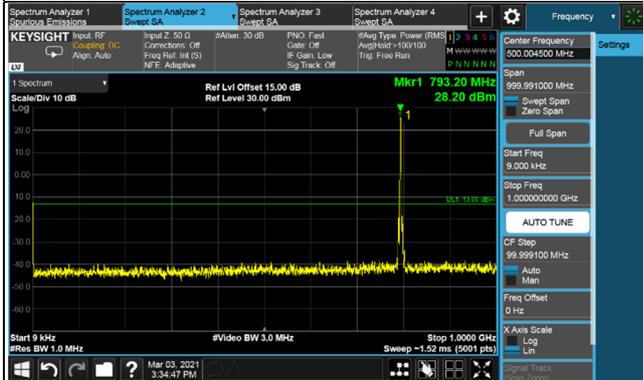


*The 9kHz signal over the limit is from Spectrum.

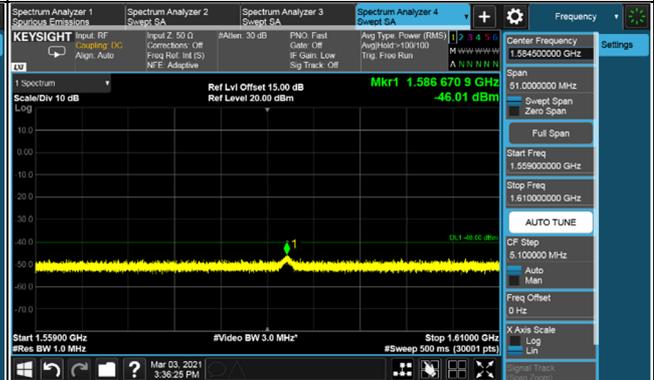
n14, Channel Bandwidth 5MHz

Channel 159100 (795.5MHz)

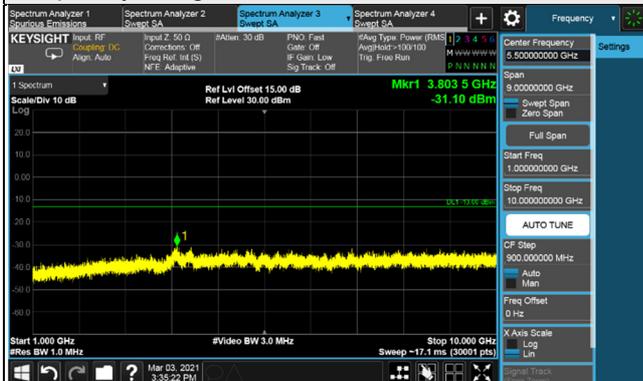
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1.559GHz ~ 1.61GHz



Frequency Range : 1GHz ~ 10GHz



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