

FCC Test Report (ENDC: n41 + LTE B2/B66)

Report No.: RFBCKT-WTW-P21031102-11

FCC ID: HFSQTAD53

Test Model: QTAD53

Received Date: Mar. 31, 2021

Test Date: Apr. 28 ~ May 25, 2021

Issued Date: May 25, 2021

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RFBCKT-WTW-P21031102-11	Original release	May 25, 2021

1 Certificate of Conformity

Product: 5G Hotspot
Brand: T-Mobile
Test Model: QTAD53
Sample Status: Engineering sample
Applicant: QUANTA COMPUTER INC
Test Date: Apr. 28 ~ May 25, 2021
Standards: FCC Part 24, Subpart E
FCC Part 27, Subpart C, L, M

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:** May 25, 2021
Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** May 25, 2021
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

For n41

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (h)(2)	Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
----	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Out of Band Emissions Measurements	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -18.65dB at 38.43MHz.

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 -32.77dB at 37.03MHz.

Note:

1. This report is a partial report. Therefore, only test item of Transmitter Output Power and Equivalent Isotropically Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RFBCKT-WTW-P21031102-4.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

For LTE Band 66

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (d)(4)	Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Refer to Note 1
27.50 (d)(5)	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 (h)	Band Edge / Out of Band Emissions Measurements	Pass	Refer to Note 1
2.1051 27.53 (h)	Conducted Spurious Emissions	Pass	Refer to Note 1
2.1053 27.53 (h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -32.27dB at 37.03MHz.

Note:

1. This report is a partial report. Therefore, only test item of Transmitter Output Power and Equivalent Isotropically Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RFBCKT-WTW-P21031102-5.
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	3.86 dB
	200MHz ~ 1000MHz	3.87 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 ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 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	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 22, 2021	Mar. 21, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber GIANT FORCE	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2020	Sep. 09, 2021
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 3.

3 General Information

3.1 General Description of EUT

Product	5G Hotspot
Brand	T-Mobile
Test Model	QTAD53
Sample Status	Engineering sample
Power Supply Rating	5Vdc / 9Vdc / 12Vdc (Adapter) 3.85Vdc (Battery)

n41

Modulation Type	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM					
Waveform Type	CP-OFDM, DFT-s-OFDM					
Operating Frequency	n41 (Channel Bandwidth 10MHz)	2501.01MHz ~ 2685.00MHz				
	n41 (Channel Bandwidth 15MHz)	2503.50MHz ~ 2682.48MHz				
	n41 (Channel Bandwidth 20MHz)	2506.02MHz ~ 2679.99MHz				
	n41 (Channel Bandwidth 40MHz)	2516.01MHz ~ 2670.00MHz				
	n41 (Channel Bandwidth 50MHz)	2521.02MHz ~ 2664.99MHz				
	n41 (Channel Bandwidth 60MHz)	2526.00MHz ~ 2659.98MHz				
	n41 (Channel Bandwidth 80MHz)	2536.02MHz ~ 2649.99MHz				
	n41 (Channel Bandwidth 90MHz)	2541.00MHz ~ 2644.98MHz				
Max. EIRP Power		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n41 (Channel Bandwidth 10MHz)	554.626mW (27.44dBm)	564.937mW (27.52dBm)	237.684mW (23.76dBm)	210.378mW (23.23dBm)	166.341mW (22.21dBm)
	n41 (Channel Bandwidth 15MHz)	559.758mW (27.48dBm)	564.937mW (27.52dBm)	240.991mW (23.82dBm)	211.349mW (23.25dBm)	167.494mW (22.24dBm)
	n41 (Channel Bandwidth 20MHz)	563.638mW (27.51dBm)	567.545mW (27.54dBm)	242.661mW (23.85dBm)	211.349mW (23.25dBm)	168.267mW (22.26dBm)
	n41 (Channel Bandwidth 40MHz)	562.341mW (27.50dBm)	579.429mW (27.63dBm)	240.436mW (23.81dBm)	220.800mW (23.44dBm)	166.725mW (22.22dBm)
	n41 (Channel Bandwidth 50MHz)	570.164mW (27.56dBm)	578.096mW (27.62dBm)	246.604mW (23.92dBm)	215.278mW (23.33dBm)	172.187mW (22.36dBm)
	n41 (Channel Bandwidth 60MHz)	571.479mW (27.57dBm)	583.445mW (27.66dBm)	246.037mW (23.91dBm)	216.272mW (23.35dBm)	171.396mW (22.34dBm)
	n41 (Channel Bandwidth 80MHz)	576.766mW (27.61dBm)	584.790mW (27.67dBm)	248.886mW (23.96dBm)	218.273mW (23.39dBm)	174.181mW (22.41dBm)
	n41 (Channel Bandwidth 90MHz)	583.445mW (27.66dBm)	590.201mW (27.71dBm)	252.930mW (24.03dBm)	219.786mW (23.42dBm)	174.985mW (22.43dBm)
	n41 (Channel Bandwidth 100MHz)	586.138mW (27.68dBm)	597.035mW (27.76dBm)	252.348mW (24.02dBm)	221.309mW (23.45dBm)	177.419mW (22.49dBm)

Emission Designator		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n41 (Channel Bandwidth 10MHz)	8M56G7D	8M56G7D	8M56D7W	8M57D7W	8M56D7W
	n41 (Channel Bandwidth 15MHz)	13M5G7D	13M5G7D	13M5D7W	13M5D7W	13M6D7W
	n41 (Channel Bandwidth 20MHz)	18M2G7D	18M2G7D	18M2D7W	18M2D7W	18M2D7W
	n41 (Channel Bandwidth 40MHz)	37M8G7D	37M8G7D	37M8D7W	37M8D7W	37M8D7W
	n41 (Channel Bandwidth 50MHz)	47M4G7D	47M4G7D	47M4D7W	47M4D7W	47M4D7W
	n41 (Channel Bandwidth 60MHz)	57M7G7D	57M7G7D	57M7D7W	57M7D7W	57M7D7W
	n41 (Channel Bandwidth 80MHz)	77M3G7D	77M3G7D	77M3D7W	77M3D7W	77M3D7W
	n41 (Channel Bandwidth 90MHz)	87M3G7D	87M3G7D	87M3D7W	87M3D7W	87M3D7W
n41 (Channel Bandwidth 100MHz)	97M2G7D	97M3G7D	97M3D7W	97M2D7W	97M2D7W	

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			
	LTE Band 66 (Channel Bandwidth 1.4MHz)	1710.7MHz ~ 1779.3MHz			
	LTE Band 66 (Channel Bandwidth 3MHz)	1711.5MHz ~ 1778.5MHz			
	LTE Band 66 (Channel Bandwidth 5MHz)	1712.5MHz ~ 1777.5MHz			
	LTE Band 66 (Channel Bandwidth 10MHz)	1715.0MHz ~ 1775.0MHz			
	LTE Band 66 (Channel Bandwidth 15MHz)	1717.5MHz ~ 1772.5MHz			
	LTE Band 66 (Channel Bandwidth 20MHz)	1720.0MHz ~ 1770.0MHz			
Max. EIRP Power		QPSK	16QAM	64QAM	256QAM
	LTE Band 2 (Channel Bandwidth 1.4MHz)	261.818mW (24.18dBm)	230.144mW (23.62dBm)	177.419mW (22.49dBm)	92.470mW (19.66dBm)
	LTE Band 2 (Channel Bandwidth 3MHz)	264.850mW (24.23dBm)	212.814mW (23.28dBm)	179.473mW (22.54dBm)	93.972mW (19.73dBm)
	LTE Band 2 (Channel Bandwidth 5MHz)	257.632mW (24.11dBm)	230.144mW (23.62dBm)	182.390mW (22.61dBm)	93.325mW (19.70dBm)
	LTE Band 2 (Channel Bandwidth 10MHz)	262.422mW (24.19dBm)	225.944mW (23.54dBm)	184.927mW (22.67dBm)	95.280mW (19.79dBm)
	LTE Band 2 (Channel Bandwidth 15MHz)	260.016mW (24.15dBm)	219.786mW (23.42dBm)	181.552mW (22.59dBm)	92.257mW (19.65dBm)
	LTE Band 2 (Channel Bandwidth 20MHz)	265.461mW (24.24dBm)	228.560mW (23.59dBm)	181.552mW (22.59dBm)	93.756mW (19.72dBm)
	LTE Band 66 (Channel Bandwidth 1.4MHz)	392.645mW (25.94dBm)	355.631mW (25.51dBm)	269.153mW (24.30dBm)	147.231mW (21.68dBm)
	LTE Band 66 (Channel Bandwidth 3MHz)	393.550mW (25.95dBm)	368.978mW (25.67dBm)	263.027mW (24.20dBm)	148.594mW (21.72dBm)
	LTE Band 66 (Channel Bandwidth 5MHz)	391.742mW (25.93dBm)	357.273mW (25.53dBm)	276.058mW (24.41dBm)	145.881mW (21.64dBm)
	LTE Band 66 (Channel Bandwidth 10MHz)	389.942mW (25.91dBm)	354.813mW (25.50dBm)	259.418mW (24.14dBm)	147.231mW (21.68dBm)
	LTE Band 66 (Channel Bandwidth 15MHz)	391.742mW (25.93dBm)	356.451mW (25.52dBm)	265.461mW (24.24dBm)	146.893mW (21.67dBm)
	LTE Band 66 (Channel Bandwidth 20MHz)	394.457mW (25.96dBm)	363.915mW (25.61dBm)	276.058mW (24.41dBm)	148.936mW (21.73dBm)
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
Adapter 1	TEN PAO INTERNATIONAL LTD.	S018BYU1200150	I/P: 100-240Vac, 50/60Hz, 600mA O/P: 5Vdc/9Vdc/12Vdc=3A/2A/1.5A
Adapter 2	Aohai Technology Co., Ltd	A138A-120150U-US2	I/P: 100-240V~50/60Hz, 0.5A O/P: 5Vdc, 2.5A/9Vdc, 2A/12Vdc, 1.5A
USB Cable	Electronics Taiwai Ltd.	DDEMU110079	0.95m shielded USB cable without core
Battery	VEKEN	141033	3.85Vdc, 6240mAh, 24.02Wh

2. There are two sources for EUT's main board and memory. Only the supplier is different and the rest of the specifications are the same.

Sample	Item	Brand	Model
A	PCB - Main	Unimicron Technology Corporation.	12VPL4024C for MODEM board, 06VPL4028C for Main board
	Memory - Main	Nanya Technology Corporation	NM4888KSPAXAI-3E
B	PCB -Second	AKM Meadville	HI12C124A for MODEM board, HI06T221A for Main board
	Memory - Second	Jeju Semiconductor Corp.	JSFDDQ5QHAFGD-405

* After pre-tested, sample A was the worse and chosen for final test.

3. The following antennas were provided to the EUT.

LTE Band														
Ant. No.	Type	Connector	Gain (dBi)											
			B2	B4	B5	B7	B12	B13	B25	B26	B38	B41	B66	B71
0	PIFA	MUR	1.23871	3.16163	0.345671	1.15435	0.154297	-3.23099	1.23871	0.702007	0.371642	1.15435	3.16163	0.426023
1	PIFA	IPEX	-	-	-	-	-	-	-	-	-	-	-	-
2	PIFA	IPEX	0.861738	0.805343	-	-	-	-	-	-	-	-	0.805343	-
3	PIFA	MUR	-	-	-	-	-	-	-	-	-	-	-	-
4	PIFA	IPEX	-	-	-	-	-	-	-	-	-	-	-	-

5G FR1 Band						
Ant. No.	Type	Connector	Gain (dBi)			
			n25	n41	n66	n71
0	PIFA	MUR	1.23871	-	3.16163	0.426023
1	PIFA	IPEX	-	-	-	-
2	PIFA	IPEX	-	0.854078	-	-
3	PIFA	MUR	-	-	-	-
4	PIFA	IPEX	-	-0.283214	-	-

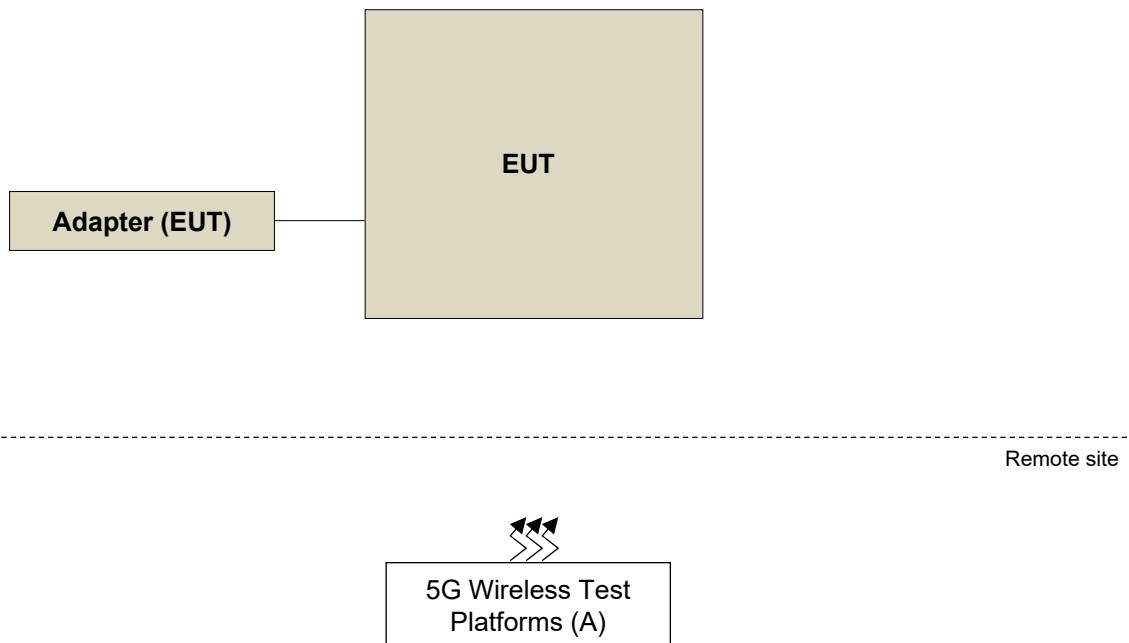
* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

* The Ant. No. 2 and Ant. No. 4 output power were evaluated for the n41 frequency band, and it was found that the worst power was in the Ant. No. 2. Therefore chosen for the final test and record in the test report.

4. The EUT supports the following ENDC configuration.

5GNR	FCC 5G FR1			ENDC
	Band	SCS	Bandwidth (MHz)	
	n25	15kHz	5/10/15/20	Band 66
	n41	30kHz	10/15/20/40/50/60/80/90/100	Band 2/66
	n66	15kHz	5/10/15/20/30/40	Band 2
	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	-

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
n41	X-plane
LTE Band 2	X-plane
LTE Band 66	X-plane

n41

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	EIRP	500202 to 537000	500202 (2501.01MHz), 518598 (2592.99MHz), 537000 (2685.00MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 11 RB Offset 1 RB / 22 RB Offset 12 RB / 0 RB Offset 12 RB / 6 RB Offset 12 RB / 12 RB Offset 24 RB / 0 RB Offset
		500700 to 536496	500700 (2503.50MHz), 518598 (2592.99MHz), 536496 (2682.48MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 19 RB Offset 1 RB / 36 RB Offset 18 RB / 0 RB Offset 18 RB / 10 RB Offset 18 RB / 20 RB Offset 36 RB / 0 RB Offset
		501204 to 535998	501204 (2506.02MHz), 518598 (2592.99MHz), 535998 (2679.99MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 26 RB Offset 1 RB / 49 RB Offset 25 RB / 0 RB Offset 25 RB / 13 RB Offset 25 RB / 26 RB Offset 50 RB / 0 RB Offset
		503202 to 534000	503202 (2516.01MHz), 518598 (2592.99MHz), 534000 (2670.00MHz)	40MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 53 RB Offset 1 RB / 104 RB Offset 50 RB / 0 RB Offset 50 RB / 28 RB Offset 50 RB / 56 RB Offset 100 RB / 0 RB Offset
		504204 to 532998	504204 (2521.02MHz), 518598 (2592.99MHz), 532998 (2664.99MHz)	50MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 67 RB Offset 1 RB / 131 RB Offset 64 RB / 0 RB Offset 64 RB / 35 RB Offset 64 RB / 69 RB Offset 128 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	EIRP	505200 to 531996	505200 (2526.00MHz), 518598 (2592.99MHz), 531996 (2659.98MHz)	60MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 81 RB Offset 1 RB / 160 RB Offset 81 RB / 0 RB Offset 81 RB / 41 RB Offset 81 RB / 81 RB Offset 162 RB / 0 RB Offset
		507204 to 529998	507204 (2536.02MHz), 518598 (2592.99MHz), 529998 (2649.99MHz)	80MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 109 RB Offset 1 RB / 215 RB Offset 108 RB / 0 RB Offset 108 RB / 55 RB Offset 108 RB / 109 RB Offset 216 RB / 0 RB Offset
		508200 to 528996	508200 (2541.00MHz), 518598 (2592.99MHz), 528996 (2644.98MHz)	90MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 123 RB Offset 1 RB / 243 RB Offset 120 RB / 0 RB Offset 120 RB / 63 RB Offset 120 RB / 125 RB Offset 243 RB / 0 RB Offset
-	EIRP	509202 to 528000	509202 (2546.01MHz), 518598 (2592.99MHz), 528000 (2640.00MHz)	100MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset 1 RB / 137 RB Offset 1 RB / 271 RB Offset 135 RB / 0 RB Offset 135 RB / 69 RB Offset 135 RB / 138 RB Offset 270 RB / 0 RB Offset
-	Modulation Characteristics	509202 to 528000	518598 (2592.99MHz)	100MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	273 RB / 0 RB Offset
-	Frequency Stability	500202 to 537000	500202 (2501.01MHz), 537000 (2685.00MHz)	10MHz	QPSK	24 RB / 0 RB Offset
		500700 to 536496	500700 (2503.50MHz), 536496 (2682.48MHz)	15MHz	QPSK	38 RB / 0 RB Offset
		501204 to 535998	501204 (2506.02MHz), 535998 (2679.99MHz)	20MHz	QPSK	51 RB / 0 RB Offset
		503202 to 534000	503202 (2516.01MHz), 534000 (2670.00MHz)	40MHz	QPSK	106 RB / 0 RB Offset
		504204 to 532998	504204 (2521.02MHz), 532998 (2664.99MHz)	50MHz	QPSK	133 RB / 0 RB Offset
		505200 to 531996	505200 (2526.00MHz), 531996 (2659.98MHz)	60MHz	QPSK	162 RB / 0 RB Offset
		507204 to 529998	507204 (2536.02MHz), 529998 (2649.99MHz)	80MHz	QPSK	217 RB / 0 RB Offset
		508200 to 528996	508200 (2541.00MHz), 528996 (2644.98MHz)	90MHz	QPSK	245 RB / 0 RB Offset
		509202 to 528000	509202 (2546.01MHz), 528000 (2640.00MHz)	100MHz	QPSK	273 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Emission Bandwidth	500202 to 537000	500202 (2501.01MHz), 518598 (2592.99MHz), 537000 (2685.00MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	24 RB / 0 RB Offset
		500700 to 536496	500700 (2503.50MHz), 518598 (2592.99MHz), 536496 (2682.48MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	38 RB / 0 RB Offset
		501204 to 535998	501204 (2506.02MHz), 518598 (2592.99MHz), 535998 (2679.99MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	51 RB / 0 RB Offset
		503202 to 534000	503202 (2516.01MHz), 518598 (2592.99MHz), 534000 (2670.00MHz)	40MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	106 RB / 0 RB Offset
		504204 to 532998	504204 (2521.02MHz), 518598 (2592.99MHz), 532998 (2664.99MHz)	50MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	133 RB / 0 RB Offset
		505200 to 531996	505200 (2526.00MHz), 518598 (2592.99MHz), 531996 (2659.98MHz)	60MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	162 RB / 0 RB Offset
		507204 to 529998	507204 (2536.02MHz), 518598 (2592.99MHz), 529998 (2649.99MHz)	80MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	217 RB / 0 RB Offset
		508200 to 528996	508200 (2541.00MHz), 518598 (2592.99MHz), 528996 (2644.98MHz)	90MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	245 RB / 0 RB Offset
		509202 to 528000	509202 (2546.01MHz), 518598 (2592.99MHz), 528000 (2640.00MHz)	100MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	273 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Out-of-Band Emissions	500202 to 537000	500202 (2501.01MHz), 537000 (2685.00MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 23 RB Offset 24 RB / 0 RB Offset
		500700 to 536496	500700 (2503.50MHz), 536496 (2682.48MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 37 RB Offset 38 RB / 0 RB Offset
		501204 to 535998	501204 (2506.02MHz), 535998 (2679.99MHz)	20MHz	QPSK	1 RB / 0 RB Offset 1 RB / 50 RB Offset 51 RB / 0 RB Offset
		503202 to 534000	503202 (2516.01MHz), 534000 (2670.00MHz)	40MHz	QPSK	1 RB / 0 RB Offset 1 RB / 105 RB Offset 106 RB / 0 RB Offset
		504204 to 532998	504204 (2521.02MHz), 532998 (2664.99MHz)	50MHz	QPSK	1 RB / 0 RB Offset 1 RB / 132 RB Offset 133 RB / 0 RB Offset
		505200 to 531996	505200 (2526.00MHz), 531996 (2659.98MHz)	60MHz	QPSK	1 RB / 0 RB Offset 1 RB / 161 RB Offset 162 RB / 0 RB Offset
		507204 to 529998	507204 (2536.02MHz), 529998 (2649.99MHz)	80MHz	QPSK	1 RB / 0 RB Offset 1 RB / 216 RB Offset 217 RB / 0 RB Offset
		508200 to 528996	508200 (2541.00MHz), 528996 (2644.98MHz)	90MHz	QPSK	1 RB / 0 RB Offset 1 RB / 244 RB Offset 245 RB / 0 RB Offset
		509202 to 528000	509202 (2546.01MHz), 528000 (2640.00MHz)	100MHz	QPSK	1 RB / 0 RB Offset 1 RB / 272 RB Offset 273 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Peak to Average Ratio	500202 to 537000	500202 (2501.01MHz), 518598 (2592.99MHz), 537000 (2685.00MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		500700 to 536496	500700 (2503.50MHz), 518598 (2592.99MHz), 536496 (2682.48MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		501204 to 535998	501204 (2506.02MHz), 518598 (2592.99MHz), 535998 (2679.99MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		503202 to 534000	503202 (2516.01MHz), 518598 (2592.99MHz), 534000 (2670.00MHz)	40MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		504204 to 532998	504204 (2521.02MHz), 518598 (2592.99MHz), 532998 (2664.99MHz)	50MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		505200 to 531996	505200 (2526.00MHz), 518598 (2592.99MHz), 531996 (2659.98MHz)	60MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		507204 to 529998	507204 (2536.02MHz), 518598 (2592.99MHz), 529998 (2649.99MHz)	80MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		508200 to 528996	508200 (2541.00MHz), 518598 (2592.99MHz), 528996 (2644.98MHz)	90MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 1 RB Offset
		509202 to 528000	509202 (2546.01MHz), 518598 (2592.99MHz), 528000 (2640.00MHz)	100MHz	$\pi/2$ 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	500202 to 537000	500202 (2501.01MHz), 518598 (2592.99MHz), 537000 (2685.00MHz)	10MHz	QPSK	1 RB / 1 RB Offset
		500700 to 536496	500700 (2503.50MHz), 518598 (2592.99MHz), 536496 (2682.48MHz)	15MHz	QPSK	1 RB / 1 RB Offset
		501204 to 535998	501204 (2506.02MHz), 518598 (2592.99MHz), 535998 (2679.99MHz)	20MHz	QPSK	1 RB / 1 RB Offset
		503202 to 534000	503202 (2516.01MHz), 518598 (2592.99MHz), 534000 (2670.00MHz)	40MHz	QPSK	1 RB / 1 RB Offset
		504204 to 532998	504204 (2521.02MHz), 518598 (2592.99MHz), 532998 (2664.99MHz)	50MHz	QPSK	1 RB / 1 RB Offset
		505200 to 531996	505200 (2526.00MHz), 518598 (2592.99MHz), 531996 (2659.98MHz)	60MHz	QPSK	1 RB / 1 RB Offset
		507204 to 529998	507204 (2536.02MHz), 518598 (2592.99MHz), 529998 (2649.99MHz)	80MHz	QPSK	1 RB / 1 RB Offset
		508200 to 528996	508200 (2541.00MHz), 518598 (2592.99MHz), 528996 (2644.98MHz)	90MHz	QPSK	1 RB / 1 RB Offset
		509202 to 528000	509202 (2546.01MHz), 518598 (2592.99MHz), 528000 (2640.00MHz)	100MHz	QPSK	1 RB / 1 RB Offset
-	Radiated Emission Below 1GHz	509202 to 528000	509202 (2546.01MHz)	100MHz	QPSK	1 RB / 1 RB Offset
-	Radiated Emission Above 1GHz	500202 to 537000	500202 (2501.01MHz), 518598 (2592.99MHz), 537000 (2685.00MHz)	10MHz	QPSK	1 RB / 1 RB Offset
		504204 to 532998	504204 (2521.02MHz), 518598 (2592.99MHz), 532998 (2664.99MHz)	50MHz	QPSK	1 RB / 1 RB Offset
		509202 to 528000	509202 (2546.01MHz), 518598 (2592.99MHz), 528000 (2640.00MHz)	100MHz	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, mid 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 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	18607 to 19193	18607 (1850.7MHz)	1.4MHz	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.

LTE Band 66

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	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
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	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
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	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
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	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
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	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
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	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	131997 to 132647	132647 (1777.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	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	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Frequency Stability	25deg. C, 60%RH	3.85Vdc	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	23deg. C, 67%RH 23deg. C, 66%RH	120Vac, 60Hz	Adair Peng Titan Hsu

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

FCC 47 CFR Part 27

ANSI/TIA/EIA-603-D-2010

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 971168 D02 Misc Rev Approv License Devices v02r01

All test items have been performed 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 n41:

Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

For LTE Band 2:

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

For LTE Band 66:

Mobile / Portable station are limited to 1 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 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		509202	518598	528000
		Frequency (MHz)		2546.01	2592.99	2640
100M	$\pi/2$ BPSK	1	1	26.77	26.83	25.44
100M	QPSK	1	1	26.91	26.87	25.78
		1	137	25.37	25.27	25.37
		1	271	26.55	25.83	25.30
		135	0	25.83	25.62	25.30
		135	69	25.76	25.25	25.26
		135	138	25.03	25.08	25.08
		270	0	25.86	25.63	25.42
100M	16QAM	1	1	23.09	22.83	23.17
100M	64QAM	1	1	22.32	22.60	22.38
100M	256QAM	1	1	21.43	21.64	21.38
BW	MCS Index	Channel		508200	518598	528996
		Frequency (MHz)		2541	2592.99	2644.98
		90M	$\pi/2$ BPSK	1	1	26.75
90M	QPSK	1	1	26.86	26.84	25.77
		1	123	25.33	25.24	25.33
		1	243	26.53	25.84	25.24
		120	0	25.69	25.57	25.25
		120	63	25.04	25.19	25.23
		120	125	24.99	25.05	25.04
		243	0	25.68	25.64	25.39
90M	16QAM	1	1	23.04	22.81	23.18
90M	64QAM	1	1	22.26	22.57	22.35
90M	256QAM	1	1	21.40	21.58	21.34
BW	MCS Index	Channel		507204	518598	529998
		Frequency (MHz)		2536.02	2592.99	2649.99
		80M	$\pi/2$ BPSK	1	1	26.70
80M	QPSK	1	1	26.82	26.79	25.71
		1	109	25.29	25.21	25.32
		1	215	26.47	25.77	25.23
		108	0	25.65	25.52	25.23
		108	55	25.01	25.14	25.17
		108	109	24.97	25.03	25.02
		216	0	25.63	25.56	25.38
80M	16QAM	1	1	23.03	22.77	23.11
80M	64QAM	1	1	22.26	22.54	22.34
80M	256QAM	1	1	21.35	21.56	21.31

NR Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		505200	518598	531996
		Frequency (MHz)		2526	2592.99	2659.98
60M	$\pi/2$ BPSK	1	1	26.68	26.72	25.30
60M	QPSK	1	1	26.81	26.75	25.65
		1	81	25.22	25.19	25.25
		1	160	26.41	25.71	25.16
		81	0	25.63	25.49	25.17
		81	41	24.97	25.09	25.13
		81	81	24.90	24.94	24.95
		162	0	25.59	25.53	25.32
60M	16QAM	1	1	22.97	22.71	23.06
60M	64QAM	1	1	22.20	22.50	22.29
60M	256QAM	1	1	21.29	21.49	21.26
BW	MCS Index	Channel		504204	518598	532998
		Frequency (MHz)		2521.02	2592.99	2664.99
50M	$\pi/2$ BPSK	1	1	26.66	26.71	25.31
50M	QPSK	1	1	26.77	26.72	25.66
		1	67	25.19	25.17	25.23
		1	131	26.40	25.70	25.17
		64	0	25.61	25.46	25.16
		64	35	24.94	25.08	25.08
		64	69	24.89	24.92	24.94
		128	0	25.56	25.51	25.32
50M	16QAM	1	1	22.93	22.69	23.07
50M	64QAM	1	1	22.19	22.48	22.28
50M	256QAM	1	1	21.28	21.51	21.25
BW	MCS Index	Channel		503202	518598	534000
		Frequency (MHz)		2516.01	2592.99	2670
40M	$\pi/2$ BPSK	1	1	26.65	26.53	25.35
40M	QPSK	1	1	26.78	26.59	25.67
		1	53	25.22	25.02	25.59
		1	104	26.42	26.25	25.45
		50	0	25.61	25.49	25.25
		50	28	24.96	25.01	24.99
		50	56	24.89	24.84	24.88
		100	0	25.58	25.67	25.45
40M	16QAM	1	1	22.96	22.88	22.95
40M	64QAM	1	1	22.18	22.59	22.33
40M	256QAM	1	1	21.29	21.37	21.14

NR Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		501204	518598	535998
		Frequency (MHz)		2506.02	2592.99	2679.99
20M	$\pi/2$ BPSK	1	1	26.55	26.66	25.24
20M	QPSK	1	1	26.68	26.69	25.58
		1	26	25.13	25.07	25.19
		1	49	26.35	25.62	25.08
		25	0	25.55	25.40	25.08
		25	13	24.89	25.03	25.04
		25	26	24.80	24.89	24.85
		50	0	25.48	25.42	25.25
20M	16QAM	1	1	22.89	22.61	23.00
20M	64QAM	1	1	22.12	22.40	22.21
20M	256QAM	1	1	21.22	21.41	21.20
BW	MCS Index	Channel		500700	518598	536496
		Frequency (MHz)		2503.5	2592.99	2682.48
15M	$\pi/2$ BPSK	1	1	26.54	26.63	25.21
15M	QPSK	1	1	26.67	26.62	25.54
		1	19	25.13	25.05	25.12
		1	36	26.33	25.63	25.04
		18	0	25.48	25.37	25.06
		18	10	24.83	24.98	24.99
		18	20	24.76	24.86	24.84
		36	0	25.46	25.41	25.22
15M	16QAM	1	1	22.83	22.57	22.97
15M	64QAM	1	1	22.06	22.40	22.15
15M	256QAM	1	1	21.17	21.39	21.13
BW	MCS Index	Channel		500202	518598	537000
		Frequency (MHz)		2501.01	2592.99	2685
10M	$\pi/2$ BPSK	1	1	26.53	26.59	25.16
10M	QPSK	1	1	26.67	26.60	25.50
		1	11	25.11	25.02	25.10
		1	22	26.31	25.58	25.03
		12	0	25.49	25.34	25.03
		12	6	24.85	24.97	24.97
		12	12	24.75	24.82	24.82
		24	0	25.43	25.41	25.16
10M	16QAM	1	1	22.84	22.57	22.91
10M	64QAM	1	1	22.06	22.38	22.14
10M	256QAM	1	1	21.17	21.36	21.13

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	22.90	23.00	22.64
		1	50	22.87	22.59	22.68
		1	99	22.84	22.62	22.66
		50	0	22.53	22.22	22.23
		50	25	22.45	21.64	21.59
		50	50	22.28	21.95	21.73
		100	0	21.92	22.18	22.12
20M	16QAM	1	0	21.70	21.94	21.60
		1	50	22.35	21.85	22.28
		1	99	22.28	21.95	21.95
		50	0	21.46	20.97	21.04
		50	25	21.09	21.11	20.88
		50	50	20.85	21.33	21.24
		100	0	21.38	20.97	20.87
20M	64QAM	1	0	21.32	20.92	20.58
		1	50	21.35	20.92	21.07
		1	99	21.06	21.00	20.60
		50	0	20.44	20.19	19.72
		50	25	20.26	19.85	20.01
		50	50	20.54	19.93	20.41
		100	0	20.35	19.76	19.90
20M	256QAM	1	0	17.80	17.64	18.37
		1	50	17.86	18.37	17.98
		1	99	17.89	17.70	18.22
		50	0	17.88	18.23	18.17
		50	25	18.12	18.48	18.02
		50	50	18.10	18.18	17.63
		100	0	18.24	18.08	18.40

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	22.91	22.85	22.90
		1	37	22.85	22.41	22.90
		1	74	22.89	22.46	22.59
		36	0	21.74	21.74	21.96
		36	19	22.40	21.98	21.78
		36	39	22.11	22.39	21.85
		75	0	22.08	21.82	21.43
15M	16QAM	1	0	22.11	22.00	22.18
		1	37	21.67	21.83	21.75
		1	74	21.79	21.77	22.08
		36	0	21.26	21.21	20.64
		36	19	21.34	21.27	21.12
		36	39	20.81	20.96	20.74
		75	0	21.00	20.64	21.00
15M	64QAM	1	0	21.34	20.63	20.75
		1	37	21.35	21.32	20.77
		1	74	20.56	21.13	21.06
		36	0	19.70	20.18	19.93
		36	19	19.82	20.21	20.31
		36	39	20.38	20.38	20.06
		75	0	19.54	20.16	19.98
15M	256QAM	1	0	18.41	17.83	17.91
		1	37	17.85	17.75	17.69
		1	74	17.83	17.77	17.76
		36	0	18.17	17.64	17.65
		36	19	18.30	18.38	17.72
		36	39	18.23	17.74	17.67
		75	0	17.60	17.95	18.04

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	22.95	22.89	22.83
		1	24	22.73	22.73	22.83
		1	49	22.89	22.49	22.74
		25	0	22.04	22.40	22.36
		25	12	22.22	22.11	22.27
		25	25	21.68	22.09	21.51
		50	0	22.00	22.04	21.99
10M	16QAM	1	0	21.78	21.87	21.50
		1	24	21.89	21.65	21.73
		1	49	21.97	21.97	22.30
		25	0	20.80	21.33	20.85
		25	12	20.64	20.48	21.00
		25	25	21.09	20.72	20.47
		50	0	20.52	21.12	21.11
10M	64QAM	1	0	20.54	21.21	20.81
		1	24	21.43	20.84	20.61
		1	49	20.78	21.06	21.03
		25	0	19.89	20.35	20.33
		25	12	20.04	19.76	20.34
		25	25	20.10	20.42	20.36
		50	0	20.05	19.90	19.46
10M	256QAM	1	0	17.97	17.72	17.78
		1	24	18.55	18.17	18.19
		1	49	17.90	17.89	18.40
		25	0	18.27	17.54	18.05
		25	12	18.26	17.87	17.80
		25	25	18.22	17.53	17.66
		50	0	18.50	17.75	18.07

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	22.75	22.87	22.82
		1	12	22.82	22.79	22.82
		1	24	22.75	22.46	22.55
		12	0	22.16	21.92	21.75
		12	6	21.72	21.65	22.12
		12	13	22.23	22.31	21.91
		25	0	21.80	21.76	21.49
5M	16QAM	1	0	21.90	22.30	21.99
		1	12	21.65	22.30	22.14
		1	24	22.38	21.57	22.01
		12	0	20.71	21.32	20.66
		12	6	21.45	21.16	20.62
		12	13	20.93	20.55	20.79
		25	0	21.26	20.84	20.81
5M	64QAM	1	0	21.37	20.67	21.18
		1	12	20.96	20.75	20.87
		1	24	21.13	21.04	20.48
		12	0	20.02	19.83	19.88
		12	6	20.02	20.13	20.33
		12	13	19.77	19.86	19.90
		25	0	19.92	19.71	20.28
5M	256QAM	1	0	17.95	18.30	17.58
		1	12	18.26	17.85	17.82
		1	24	18.36	17.82	18.13
		12	0	18.01	17.96	18.34
		12	6	17.99	17.95	18.36
		12	13	18.11	17.60	17.86
		25	0	18.40	18.46	17.97

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	22.99	22.93	22.82
		1	7	22.89	22.79	22.87
		1	14	22.90	22.90	22.88
		8	0	22.41	22.29	22.06
		8	3	22.23	22.03	21.70
		8	7	22.41	21.63	22.18
		15	0	21.92	22.03	22.02
3M	16QAM	1	0	21.89	21.66	21.56
		1	7	22.00	21.99	22.04
		1	14	21.76	21.87	21.94
		8	0	21.00	20.70	20.90
		8	3	20.89	21.21	20.87
		8	7	20.60	21.11	20.52
		15	0	20.78	20.72	20.95
3M	64QAM	1	0	21.30	21.27	20.67
		1	7	20.53	20.54	20.44
		1	14	20.99	20.81	20.64
		8	0	20.52	20.55	20.15
		8	3	20.42	20.15	19.68
		8	7	20.38	19.87	19.87
		15	0	20.36	19.66	20.41
3M	256QAM	1	0	17.96	18.14	18.36
		1	7	18.38	18.00	18.38
		1	14	17.69	18.34	18.17
		8	0	17.62	18.39	18.04
		8	3	17.85	17.91	17.81
		8	7	17.89	17.82	18.20
		15	0	18.49	17.73	17.48

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	22.72	22.83	22.80
		1	2	22.75	22.86	22.91
		1	5	22.94	22.74	22.42
		3	0	21.67	21.77	22.06
		3	1	21.63	21.65	22.13
		3	3	21.81	22.04	22.09
		6	0	21.87	22.18	21.64
1.4M	16QAM	1	0	21.83	21.81	21.88
		1	2	21.92	22.15	22.37
		1	5	21.60	22.38	22.18
		3	0	20.74	20.81	21.20
		3	1	20.83	20.49	20.55
		3	3	20.73	21.24	21.31
		6	0	21.38	20.95	20.59
1.4M	64QAM	1	0	21.25	20.90	20.52
		1	2	20.61	21.16	21.00
		1	5	20.53	20.86	20.52
		3	0	19.97	20.25	20.36
		3	1	19.69	19.70	20.43
		3	3	19.80	20.40	19.69
		6	0	20.41	19.51	19.57
1.4M	256QAM	1	0	18.29	18.05	17.96
		1	2	18.23	18.03	18.35
		1	5	17.61	18.42	17.89
		3	0	18.16	17.59	18.19
		3	1	17.76	18.28	18.03
		3	3	18.31	18.21	18.23
		6	0	17.62	18.38	18.19

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	22.78	22.78	22.80
		1	50	22.65	22.56	22.70
		1	99	22.65	22.63	22.38
		50	0	21.79	21.74	22.26
		50	25	21.80	21.91	21.81
		50	50	22.38	21.83	21.67
		100	0	21.86	22.32	21.89
20M	16QAM	1	0	21.70	21.85	21.61
		1	50	22.40	22.15	21.97
		1	99	22.45	22.24	21.84
		50	0	20.96	21.38	21.08
		50	25	21.38	20.57	20.39
		50	50	20.67	20.73	20.64
		100	0	21.01	20.96	21.06
20M	64QAM	1	0	20.76	20.92	21.03
		1	50	21.10	21.25	20.91
		1	99	20.82	21.18	21.00
		50	0	20.26	20.17	19.84
		50	25	19.90	19.65	19.80
		50	50	20.03	20.17	19.49
		100	0	19.98	19.98	20.16
20M	256QAM	1	0	18.24	18.06	18.18
		1	50	17.87	17.96	17.55
		1	99	18.57	18.08	17.99
		50	0	18.38	17.91	17.89
		50	25	17.87	18.03	18.24
		50	50	18.52	17.68	17.61
		100	0	18.24	17.84	18.27

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	22.57	22.77	22.68
		1	37	22.43	22.67	22.65
		1	74	22.68	22.70	22.61
		36	0	22.32	22.44	21.69
		36	19	22.28	22.43	22.02
		36	39	21.93	22.31	22.17
		75	0	21.73	22.13	22.13
15M	16QAM	1	0	22.00	21.96	21.71
		1	37	22.12	22.08	22.26
		1	74	22.36	22.26	22.00
		36	0	20.59	20.53	20.68
		36	19	21.15	20.94	20.85
		36	39	21.14	20.51	20.50
		75	0	20.92	20.90	20.60
15M	64QAM	1	0	20.67	20.73	21.03
		1	37	20.53	21.01	20.43
		1	74	20.54	20.42	21.08
		36	0	19.64	20.13	19.75
		36	19	20.41	20.02	19.66
		36	39	19.94	19.73	19.72
		75	0	20.03	20.04	19.83
15M	256QAM	1	0	18.28	17.99	17.77
		1	37	17.82	17.74	18.15
		1	74	18.51	17.89	17.53
		36	0	18.37	17.72	18.01
		36	19	17.91	17.83	18.07
		36	39	17.84	18.01	17.73
		75	0	18.02	18.18	18.30

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	22.75	22.68	22.43
		1	24	22.60	22.47	22.29
		1	49	22.51	22.60	22.73
		25	0	21.63	22.49	21.88
		25	12	21.85	21.68	22.05
		25	25	22.08	22.06	21.59
		50	0	22.00	21.63	22.08
10M	16QAM	1	0	22.18	22.34	21.68
		1	24	21.94	21.99	21.97
		1	49	21.69	22.00	21.51
		25	0	20.83	20.74	20.38
		25	12	21.21	20.91	20.72
		25	25	20.80	21.14	20.70
		50	0	20.47	21.03	21.05
10M	64QAM	1	0	20.86	20.83	20.25
		1	24	20.98	20.81	20.42
		1	49	20.71	20.97	20.93
		25	0	20.49	20.27	19.73
		25	12	20.14	19.92	20.26
		25	25	19.67	19.55	19.85
		50	0	20.21	19.87	19.52
10M	256QAM	1	0	18.15	17.75	18.31
		1	24	18.22	18.52	17.60
		1	49	18.46	18.36	17.83
		25	0	17.68	18.29	18.13
		25	12	18.10	17.57	18.18
		25	25	17.88	18.30	18.10
		50	0	18.04	17.86	18.12

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	22.77	22.71	22.69
		1	12	22.68	22.63	22.70
		1	24	22.46	22.65	22.67
		12	0	22.36	22.27	21.88
		12	6	21.91	21.79	21.82
		12	13	22.32	22.39	21.87
		25	0	22.15	21.57	22.04
5M	16QAM	1	0	22.26	21.77	22.03
		1	12	22.37	21.82	21.70
		1	24	22.24	21.66	22.05
		12	0	21.34	21.06	20.67
		12	6	20.60	20.75	20.42
		12	13	20.94	20.84	20.45
		25	0	20.97	20.64	20.31
5M	64QAM	1	0	20.53	21.25	20.44
		1	12	20.67	21.22	20.68
		1	24	20.42	20.74	20.82
		12	0	19.65	20.14	19.57
		12	6	20.18	20.10	19.56
		12	13	19.77	19.76	20.00
		25	0	19.82	19.73	19.57
5M	256QAM	1	0	18.38	17.73	17.65
		1	12	18.45	18.48	17.84
		1	24	18.17	18.12	17.86
		12	0	18.45	18.41	17.48
		12	6	17.94	17.80	17.45
		12	13	17.90	17.79	17.60
		25	0	18.25	18.26	17.46

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	22.66	22.60	22.70
		1	7	22.79	22.70	22.71
		1	14	22.78	22.71	22.65
		8	0	21.67	21.97	22.33
		8	3	22.32	22.39	21.86
		8	7	22.38	21.59	21.62
		15	0	22.16	22.04	22.16
3M	16QAM	1	0	22.37	22.27	21.43
		1	7	22.31	22.16	21.63
		1	14	22.51	22.00	22.23
		8	0	20.73	20.54	20.56
		8	3	20.53	21.22	20.69
		8	7	20.80	20.74	21.04
		15	0	21.16	20.57	20.89
3M	64QAM	1	0	20.50	20.84	20.95
		1	7	21.02	20.92	20.99
		1	14	21.04	20.58	20.70
		8	0	20.49	20.24	20.08
		8	3	19.78	19.58	19.65
		8	7	19.80	19.99	19.95
		15	0	20.16	19.52	19.34
3M	256QAM	1	0	18.45	18.32	17.80
		1	7	17.92	18.22	18.24
		1	14	18.56	18.44	17.99
		8	0	17.92	17.90	17.49
		8	3	18.48	17.96	18.19
		8	7	18.44	17.70	17.86
		15	0	18.41	18.35	18.17

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	22.73	22.61	22.78
		1	2	22.76	22.71	22.70
		1	5	22.76	22.77	22.69
		3	0	22.03	21.73	21.75
		3	1	21.68	22.29	21.58
		3	3	22.40	21.62	21.47
		6	0	21.97	21.91	21.53
1.4M	16QAM	1	0	22.27	21.64	21.60
		1	2	21.99	21.93	21.70
		1	5	22.35	21.91	22.23
		3	0	21.13	21.10	20.88
		3	1	21.20	21.03	20.79
		3	3	20.78	21.05	20.94
		6	0	21.18	20.57	20.26
1.4M	64QAM	1	0	20.56	20.84	20.99
		1	2	20.34	20.47	21.03
		1	5	21.14	20.51	20.66
		3	0	20.25	20.34	19.60
		3	1	20.17	19.61	19.81
		3	3	19.95	20.27	19.72
		6	0	20.36	20.09	19.60
1.4M	256QAM	1	0	18.10	17.80	18.01
		1	2	18.48	17.77	18.10
		1	5	18.40	17.81	18.05
		3	0	18.12	17.72	17.96
		3	1	18.49	17.60	18.08
		3	3	18.52	17.70	18.08
		6	0	18.45	18.46	17.54

EIRP Power (dBm)

NR Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		509202	518598	528000
		Frequency (MHz)		2546.01	2592.99	2640
100M	$\pi/2$ BPSK	1	1	27.62	27.68	26.29
100M	QPSK	1	1	27.76	27.72	26.63
		1	137	26.22	26.12	26.22
		1	271	27.40	26.68	26.15
		135	0	26.68	26.47	26.15
		135	69	26.61	26.10	26.11
		135	138	25.88	25.93	25.93
		270	0	26.71	26.48	26.27
100M	16QAM	1	1	23.94	23.68	24.02
100M	64QAM	1	1	23.17	23.45	23.23
100M	256QAM	1	1	22.28	22.49	22.23
BW	MCS Index	Channel		508200	518598	528996
		Frequency (MHz)		2541	2592.99	2644.98
90M	$\pi/2$ BPSK	1	1	27.60	27.66	26.28
90M	QPSK	1	1	27.71	27.69	26.62
		1	123	26.18	26.09	26.18
		1	243	27.38	26.69	26.09
		120	0	26.54	26.42	26.10
		120	63	25.89	26.04	26.08
		120	125	25.84	25.90	25.89
		243	0	26.53	26.49	26.24
90M	16QAM	1	1	23.89	23.66	24.03
90M	64QAM	1	1	23.11	23.42	23.20
90M	256QAM	1	1	22.25	22.43	22.19
BW	MCS Index	Channel		507204	518598	529998
		Frequency (MHz)		2536.02	2592.99	2649.99
80M	$\pi/2$ BPSK	1	1	27.55	27.61	26.22
80M	QPSK	1	1	27.67	27.64	26.56
		1	109	26.14	26.06	26.17
		1	215	27.32	26.62	26.08
		108	0	26.50	26.37	26.08
		108	55	25.86	25.99	26.02
		108	109	25.82	25.88	25.87
		216	0	26.48	26.41	26.23
80M	16QAM	1	1	23.88	23.62	23.96
80M	64QAM	1	1	23.11	23.39	23.19
80M	256QAM	1	1	22.20	22.41	22.16

NR Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		505200	518598	531996
		Frequency (MHz)		2526	2592.99	2659.98
60M	$\pi/2$ BPSK	1	1	27.53	27.57	26.15
60M	QPSK	1	1	27.66	27.60	26.50
		1	81	26.07	26.04	26.10
		1	160	27.26	26.56	26.01
		81	0	26.48	26.34	26.02
		81	41	25.82	25.94	25.98
		81	81	25.75	25.79	25.80
		162	0	26.44	26.38	26.17
60M	16QAM	1	1	23.82	23.56	23.91
60M	64QAM	1	1	23.05	23.35	23.14
60M	256QAM	1	1	22.14	22.34	22.11
BW	MCS Index	Channel		504204	518598	532998
		Frequency (MHz)		2521.02	2592.99	2664.99
		50M	$\pi/2$ BPSK	1	1	27.51
50M	QPSK	1	1	27.62	27.57	26.51
		1	67	26.04	26.02	26.08
		1	131	27.25	26.55	26.02
		64	0	26.46	26.31	26.01
		64	35	25.79	25.93	25.93
		64	69	25.74	25.77	25.79
		128	0	26.41	26.36	26.17
50M	16QAM	1	1	23.78	23.54	23.92
50M	64QAM	1	1	23.04	23.33	23.13
50M	256QAM	1	1	22.13	22.36	22.10
BW	MCS Index	Channel		503202	518598	534000
		Frequency (MHz)		2516.01	2592.99	2670
		40M	$\pi/2$ BPSK	1	1	27.50
40M	QPSK	1	1	27.63	27.44	26.52
		1	53	26.07	25.87	26.44
		1	104	27.27	27.10	26.30
		50	0	26.46	26.34	26.10
		50	28	25.81	25.86	25.84
		50	56	25.74	25.69	25.73
		100	0	26.43	26.52	26.30
40M	16QAM	1	1	23.81	23.73	23.80
40M	64QAM	1	1	23.03	23.44	23.18
40M	256QAM	1	1	22.14	22.22	21.99

NR Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		501204	518598	535998
		Frequency (MHz)		2506.02	2592.99	2679.99
20M	$\pi/2$ BPSK	1	1	27.40	27.51	26.09
20M	QPSK	1	1	27.53	27.54	26.43
		1	26	25.98	25.92	26.04
		1	49	27.20	26.47	25.93
		25	0	26.40	26.25	25.93
		25	13	25.74	25.88	25.89
		25	26	25.65	25.74	25.70
		50	0	26.33	26.27	26.10
20M	16QAM	1	1	23.74	23.46	23.85
20M	64QAM	1	1	22.97	23.25	23.06
20M	256QAM	1	1	22.07	22.26	22.05
BW	MCS Index	Channel		500700	518598	536496
		Frequency (MHz)		2503.5	2592.99	2682.48
15M	$\pi/2$ BPSK	1	1	27.39	27.48	26.06
15M	QPSK	1	1	27.52	27.47	26.39
		1	19	25.98	25.90	25.97
		1	36	27.18	26.48	25.89
		18	0	26.33	26.22	25.91
		18	10	25.68	25.83	25.84
		18	20	25.61	25.71	25.69
		36	0	26.31	26.26	26.07
15M	16QAM	1	1	23.68	23.42	23.82
15M	64QAM	1	1	22.91	23.25	23.00
15M	256QAM	1	1	22.02	22.24	21.98
BW	MCS Index	Channel		500202	518598	537000
		Frequency (MHz)		2501.01	2592.99	2685
10M	$\pi/2$ BPSK	1	1	27.38	27.44	26.01
10M	QPSK	1	1	27.52	27.45	26.35
		1	11	25.96	25.87	25.95
		1	22	27.16	26.43	25.88
		12	0	26.34	26.19	25.88
		12	6	25.70	25.82	25.82
		12	12	25.60	25.67	25.67
		24	0	26.28	26.26	26.01
10M	16QAM	1	1	23.69	23.42	23.76
10M	64QAM	1	1	22.91	23.23	22.99
10M	256QAM	1	1	22.02	22.21	21.98

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	24.14	24.24	23.88
		1	50	24.11	23.83	23.92
		1	99	24.08	23.86	23.90
		50	0	23.77	23.46	23.47
		50	25	23.69	22.88	22.83
		50	50	23.52	23.19	22.97
		100	0	23.16	23.42	23.36
20M	16QAM	1	0	22.94	23.18	22.84
		1	50	23.59	23.09	23.52
		1	99	23.52	23.19	23.19
		50	0	22.70	22.21	22.28
		50	25	22.33	22.35	22.12
		50	50	22.09	22.57	22.48
		100	0	22.62	22.21	22.11
20M	64QAM	1	0	22.56	22.16	21.82
		1	50	22.59	22.16	22.31
		1	99	22.30	22.24	21.84
		50	0	21.68	21.43	20.96
		50	25	21.50	21.09	21.25
		50	50	21.78	21.17	21.65
		100	0	21.59	21.00	21.14
20M	256QAM	1	0	19.04	18.88	19.61
		1	50	19.10	19.61	19.22
		1	99	19.13	18.94	19.46
		50	0	19.12	19.47	19.41
		50	25	19.36	19.72	19.26
		50	50	19.34	19.42	18.87
		100	0	19.48	19.32	19.64

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	24.15	24.09	24.14
		1	37	24.09	23.65	24.14
		1	74	24.13	23.70	23.83
		36	0	22.98	22.98	23.20
		36	19	23.64	23.22	23.02
		36	39	23.35	23.63	23.09
		75	0	23.32	23.06	22.67
15M	16QAM	1	0	23.35	23.24	23.42
		1	37	22.91	23.07	22.99
		1	74	23.03	23.01	23.32
		36	0	22.50	22.45	21.88
		36	19	22.58	22.51	22.36
		36	39	22.05	22.20	21.98
		75	0	22.24	21.88	22.24
15M	64QAM	1	0	22.58	21.87	21.99
		1	37	22.59	22.56	22.01
		1	74	21.80	22.37	22.30
		36	0	20.94	21.42	21.17
		36	19	21.06	21.45	21.55
		36	39	21.62	21.62	21.30
		75	0	20.78	21.40	21.22
15M	256QAM	1	0	19.65	19.07	19.15
		1	37	19.09	18.99	18.93
		1	74	19.07	19.01	19.00
		36	0	19.41	18.88	18.89
		36	19	19.54	19.62	18.96
		36	39	19.47	18.98	18.91
		75	0	18.84	19.19	19.28

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	24.19	24.13	24.07
		1	24	23.97	23.97	24.07
		1	49	24.13	23.73	23.98
		25	0	23.28	23.64	23.60
		25	12	23.46	23.35	23.51
		25	25	22.92	23.33	22.75
		50	0	23.24	23.28	23.23
10M	16QAM	1	0	23.02	23.11	22.74
		1	24	23.13	22.89	22.97
		1	49	23.21	23.21	23.54
		25	0	22.04	22.57	22.09
		25	12	21.88	21.72	22.24
		25	25	22.33	21.96	21.71
		50	0	21.76	22.36	22.35
10M	64QAM	1	0	21.78	22.45	22.05
		1	24	22.67	22.08	21.85
		1	49	22.02	22.30	22.27
		25	0	21.13	21.59	21.57
		25	12	21.28	21.00	21.58
		25	25	21.34	21.66	21.60
		50	0	21.29	21.14	20.70
10M	256QAM	1	0	19.21	18.96	19.02
		1	24	19.79	19.41	19.43
		1	49	19.14	19.13	19.64
		25	0	19.51	18.78	19.29
		25	12	19.50	19.11	19.04
		25	25	19.46	18.77	18.90
		50	0	19.74	18.99	19.31

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	23.99	24.11	24.06
		1	12	24.06	24.03	24.06
		1	24	23.99	23.70	23.79
		12	0	23.40	23.16	22.99
		12	6	22.96	22.89	23.36
		12	13	23.47	23.55	23.15
		25	0	23.04	23.00	22.73
5M	16QAM	1	0	23.14	23.54	23.23
		1	12	22.89	23.54	23.38
		1	24	23.62	22.81	23.25
		12	0	21.95	22.56	21.90
		12	6	22.69	22.40	21.86
		12	13	22.17	21.79	22.03
		25	0	22.50	22.08	22.05
5M	64QAM	1	0	22.61	21.91	22.42
		1	12	22.20	21.99	22.11
		1	24	22.37	22.28	21.72
		12	0	21.26	21.07	21.12
		12	6	21.26	21.37	21.57
		12	13	21.01	21.10	21.14
		25	0	21.16	20.95	21.52
5M	256QAM	1	0	19.19	19.54	18.82
		1	12	19.50	19.09	19.06
		1	24	19.60	19.06	19.37
		12	0	19.25	19.20	19.58
		12	6	19.23	19.19	19.60
		12	13	19.35	18.84	19.10
		25	0	19.64	19.70	19.21

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	24.23	24.17	24.06
		1	7	24.13	24.03	24.11
		1	14	24.14	24.14	24.12
		8	0	23.65	23.53	23.30
		8	3	23.47	23.27	22.94
		8	7	23.65	22.87	23.42
		15	0	23.16	23.27	23.26
3M	16QAM	1	0	23.13	22.90	22.80
		1	7	23.24	23.23	23.28
		1	14	23.00	23.11	23.18
		8	0	22.24	21.94	22.14
		8	3	22.13	22.45	22.11
		8	7	21.84	22.35	21.76
		15	0	22.02	21.96	22.19
3M	64QAM	1	0	22.54	22.51	21.91
		1	7	21.77	21.78	21.68
		1	14	22.23	22.05	21.88
		8	0	21.76	21.79	21.39
		8	3	21.66	21.39	20.92
		8	7	21.62	21.11	21.11
		15	0	21.60	20.90	21.65
3M	256QAM	1	0	19.20	19.38	19.60
		1	7	19.62	19.24	19.62
		1	14	18.93	19.58	19.41
		8	0	18.86	19.63	19.28
		8	3	19.09	19.15	19.05
		8	7	19.13	19.06	19.44
		15	0	19.73	18.97	18.72

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	23.96	24.07	24.04
		1	2	23.99	24.10	24.15
		1	5	24.18	23.98	23.66
		3	0	22.91	23.01	23.30
		3	1	22.87	22.89	23.37
		3	3	23.05	23.28	23.33
		6	0	23.11	23.42	22.88
1.4M	16QAM	1	0	23.07	23.05	23.12
		1	2	23.16	23.39	23.61
		1	5	22.84	23.62	23.42
		3	0	21.98	22.05	22.44
		3	1	22.07	21.73	21.79
		3	3	21.97	22.48	22.55
		6	0	22.62	22.19	21.83
1.4M	64QAM	1	0	22.49	22.14	21.76
		1	2	21.85	22.40	22.24
		1	5	21.77	22.10	21.76
		3	0	21.21	21.49	21.60
		3	1	20.93	20.94	21.67
		3	3	21.04	21.64	20.93
		6	0	21.65	20.75	20.81
1.4M	256QAM	1	0	19.53	19.29	19.20
		1	2	19.47	19.27	19.59
		1	5	18.85	19.66	19.13
		3	0	19.40	18.83	19.43
		3	1	19.00	19.52	19.27
		3	3	19.55	19.45	19.47
		6	0	18.86	19.62	19.43

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	25.94	25.94	25.96
		1	50	25.81	25.72	25.86
		1	99	25.81	25.79	25.54
		50	0	24.95	24.90	25.42
		50	25	24.96	25.07	24.97
		50	50	25.54	24.99	24.83
		100	0	25.02	25.48	25.05
20M	16QAM	1	0	24.86	25.01	24.77
		1	50	25.56	25.31	25.13
		1	99	25.61	25.40	25.00
		50	0	24.12	24.54	24.24
		50	25	24.54	23.73	23.55
		50	50	23.83	23.89	23.80
		100	0	24.17	24.12	24.22
20M	64QAM	1	0	23.92	24.08	24.19
		1	50	24.26	24.41	24.07
		1	99	23.98	24.34	24.16
		50	0	23.42	23.33	23.00
		50	25	23.06	22.81	22.96
		50	50	23.19	23.33	22.65
		100	0	23.14	23.14	23.32
20M	256QAM	1	0	21.40	21.22	21.34
		1	50	21.03	21.12	20.71
		1	99	21.73	21.24	21.15
		50	0	21.54	21.07	21.05
		50	25	21.03	21.19	21.40
		50	50	21.68	20.84	20.77
		100	0	21.40	21.00	21.43

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	25.73	25.93	25.84
		1	37	25.59	25.83	25.81
		1	74	25.84	25.86	25.77
		36	0	25.48	25.60	24.85
		36	19	25.44	25.59	25.18
		36	39	25.09	25.47	25.33
		75	0	24.89	25.29	25.29
15M	16QAM	1	0	25.16	25.12	24.87
		1	37	25.28	25.24	25.42
		1	74	25.52	25.42	25.16
		36	0	23.75	23.69	23.84
		36	19	24.31	24.10	24.01
		36	39	24.30	23.67	23.66
		75	0	24.08	24.06	23.76
15M	64QAM	1	0	23.83	23.89	24.19
		1	37	23.69	24.17	23.59
		1	74	23.70	23.58	24.24
		36	0	22.80	23.29	22.91
		36	19	23.57	23.18	22.82
		36	39	23.10	22.89	22.88
		75	0	23.19	23.20	22.99
15M	256QAM	1	0	21.44	21.15	20.93
		1	37	20.98	20.90	21.31
		1	74	21.67	21.05	20.69
		36	0	21.53	20.88	21.17
		36	19	21.07	20.99	21.23
		36	39	21.00	21.17	20.89
		75	0	21.18	21.34	21.46

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	25.91	25.84	25.59
		1	24	25.76	25.63	25.45
		1	49	25.67	25.76	25.89
		25	0	24.79	25.65	25.04
		25	12	25.01	24.84	25.21
		25	25	25.24	25.22	24.75
		50	0	25.16	24.79	25.24
10M	16QAM	1	0	25.34	25.50	24.84
		1	24	25.10	25.15	25.13
		1	49	24.85	25.16	24.67
		25	0	23.99	23.90	23.54
		25	12	24.37	24.07	23.88
		25	25	23.96	24.30	23.86
		50	0	23.63	24.19	24.21
10M	64QAM	1	0	24.02	23.99	23.41
		1	24	24.14	23.97	23.58
		1	49	23.87	24.13	24.09
		25	0	23.65	23.43	22.89
		25	12	23.30	23.08	23.42
		25	25	22.83	22.71	23.01
		50	0	23.37	23.03	22.68
10M	256QAM	1	0	21.31	20.91	21.47
		1	24	21.38	21.68	20.76
		1	49	21.62	21.52	20.99
		25	0	20.84	21.45	21.29
		25	12	21.26	20.73	21.34
		25	25	21.04	21.46	21.26
		50	0	21.20	21.02	21.28

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	25.93	25.87	25.85
		1	12	25.84	25.79	25.86
		1	24	25.62	25.81	25.83
		12	0	25.52	25.43	25.04
		12	6	25.07	24.95	24.98
		12	13	25.48	25.55	25.03
		25	0	25.31	24.73	25.20
5M	16QAM	1	0	25.42	24.93	25.19
		1	12	25.53	24.98	24.86
		1	24	25.40	24.82	25.21
		12	0	24.50	24.22	23.83
		12	6	23.76	23.91	23.58
		12	13	24.10	24.00	23.61
		25	0	24.13	23.80	23.47
5M	64QAM	1	0	23.69	24.41	23.60
		1	12	23.83	24.38	23.84
		1	24	23.58	23.90	23.98
		12	0	22.81	23.30	22.73
		12	6	23.34	23.26	22.72
		12	13	22.93	22.92	23.16
		25	0	22.98	22.89	22.73
5M	256QAM	1	0	21.54	20.89	20.81
		1	12	21.61	21.64	21.00
		1	24	21.33	21.28	21.02
		12	0	21.61	21.57	20.64
		12	6	21.10	20.96	20.61
		12	13	21.06	20.95	20.76
		25	0	21.41	21.42	20.62

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	25.82	25.76	25.86
		1	7	25.95	25.86	25.87
		1	14	25.94	25.87	25.81
		8	0	24.83	25.13	25.49
		8	3	25.48	25.55	25.02
		8	7	25.54	24.75	24.78
		15	0	25.32	25.20	25.32
3M	16QAM	1	0	25.53	25.43	24.59
		1	7	25.47	25.32	24.79
		1	14	25.67	25.16	25.39
		8	0	23.89	23.70	23.72
		8	3	23.69	24.38	23.85
		8	7	23.96	23.90	24.20
		15	0	24.32	23.73	24.05
3M	64QAM	1	0	23.66	24.00	24.11
		1	7	24.18	24.08	24.15
		1	14	24.20	23.74	23.86
		8	0	23.65	23.40	23.24
		8	3	22.94	22.74	22.81
		8	7	22.96	23.15	23.11
		15	0	23.32	22.68	22.50
3M	256QAM	1	0	21.61	21.48	20.96
		1	7	21.08	21.38	21.40
		1	14	21.72	21.60	21.15
		8	0	21.08	21.06	20.65
		8	3	21.64	21.12	21.35
		8	7	21.60	20.86	21.02
		15	0	21.57	21.51	21.33

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	25.89	25.77	25.94
		1	2	25.92	25.87	25.86
		1	5	25.92	25.93	25.85
		3	0	25.19	24.89	24.91
		3	1	24.84	25.45	24.74
		3	3	25.56	24.78	24.63
		6	0	25.13	25.07	24.69
1.4M	16QAM	1	0	25.43	24.80	24.76
		1	2	25.15	25.09	24.86
		1	5	25.51	25.07	25.39
		3	0	24.29	24.26	24.04
		3	1	24.36	24.19	23.95
		3	3	23.94	24.21	24.10
		6	0	24.34	23.73	23.42
1.4M	64QAM	1	0	23.72	24.00	24.15
		1	2	23.50	23.63	24.19
		1	5	24.30	23.67	23.82
		3	0	23.41	23.50	22.76
		3	1	23.33	22.77	22.97
		3	3	23.11	23.43	22.88
		6	0	23.52	23.25	22.76
1.4M	256QAM	1	0	21.26	20.96	21.17
		1	2	21.64	20.93	21.26
		1	5	21.56	20.97	21.21
		3	0	21.28	20.88	21.12
		3	1	21.65	20.76	21.24
		3	3	21.68	20.86	21.24
		6	0	21.61	21.62	20.70

4.2 Modulation Characteristics Measurement

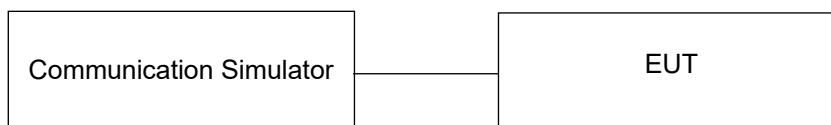
4.2.1 Limits of Modulation Characteristics

N/A

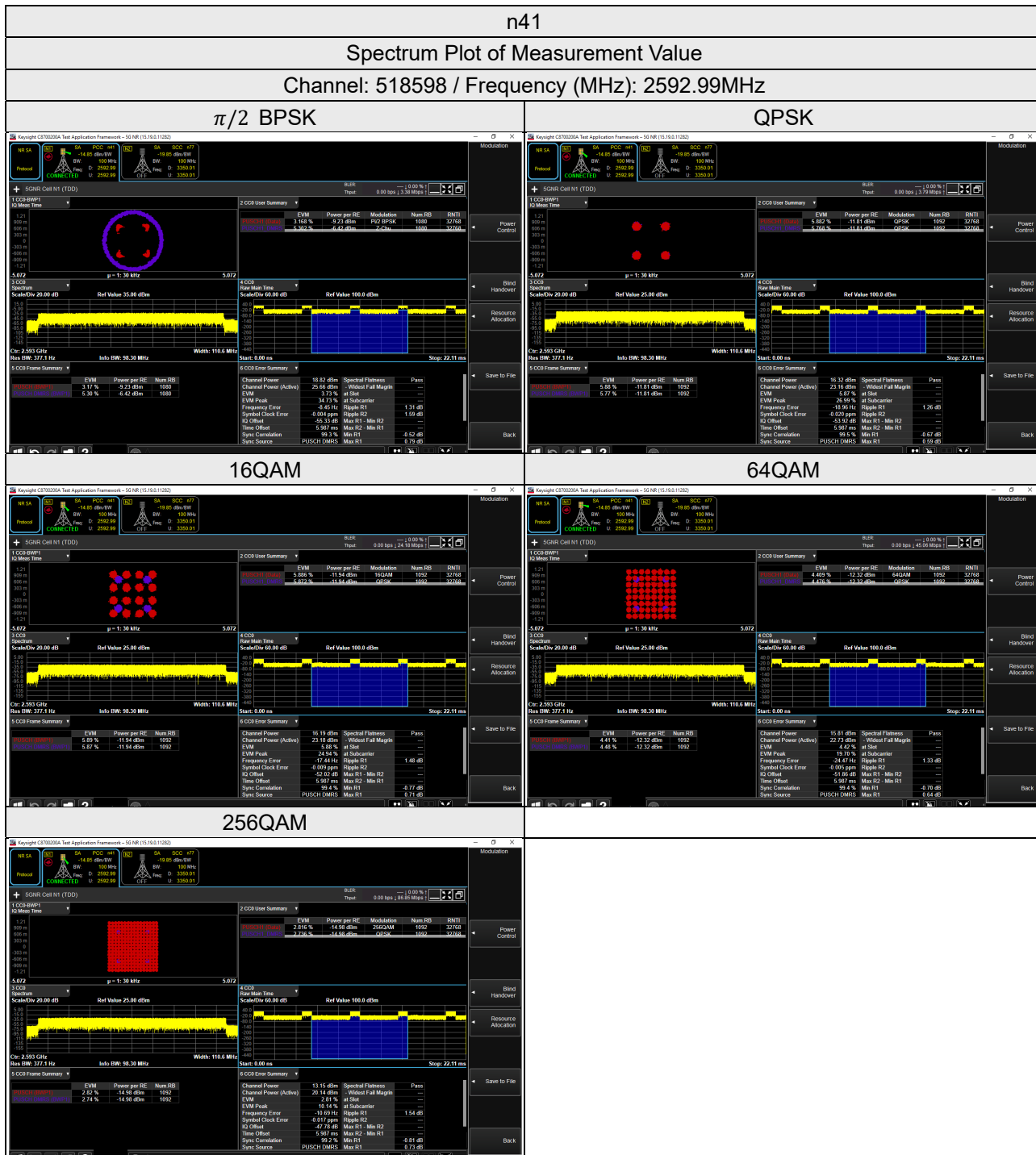
4.2.2 Test Procedure

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

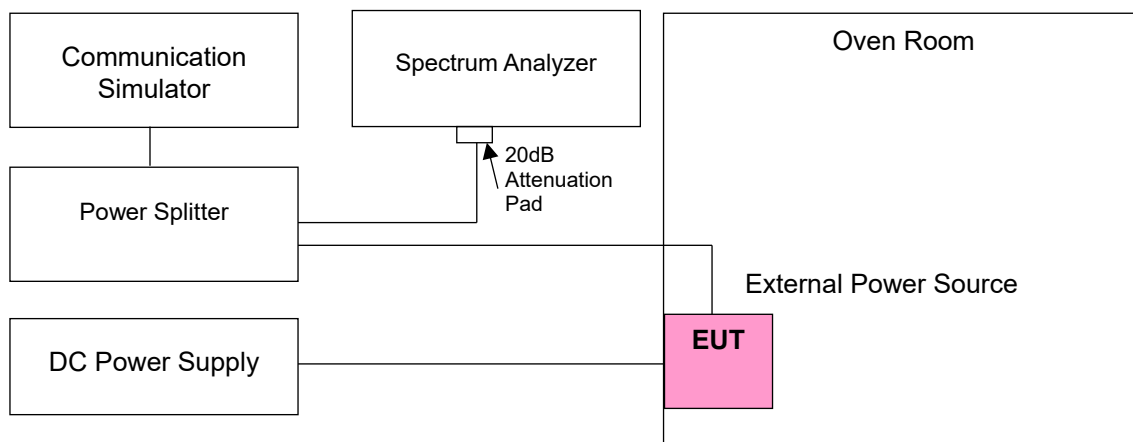
According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2501.010002	0.001	2685.000004	0.001
3.85	2501.010001	0.000	2685.000003	0.001
3.28	2501.010001	0.001	2685.000003	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2501.010003	0.001	2685.000002	0.001
-20	2501.010003	0.001	2685.000004	0.001
-10	2501.010004	0.002	2685.000004	0.001
0	2501.010002	0.001	2685.000003	0.001
10	2501.009997	-0.001	2684.999997	-0.001
20	2501.009998	-0.001	2684.999999	0.000
30	2501.009998	-0.001	2684.999997	-0.001
40	2501.009996	-0.002	2684.999997	-0.001
50	2501.009998	-0.001	2684.999996	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2503.500001	0.000	2682.480002	0.001
3.85	2503.500001	0.001	2682.480001	0.001
3.28	2503.500003	0.001	2682.480003	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2503.500003	0.001	2682.480002	0.001
-20	2503.500003	0.001	2682.480004	0.001
-10	2503.500001	0.000	2682.480002	0.001
0	2503.500004	0.002	2682.480003	0.001
10	2503.499998	-0.001	2682.479998	-0.001
20	2503.499996	-0.001	2682.479998	-0.001
30	2503.499997	-0.001	2682.479997	-0.001
40	2503.499998	-0.001	2682.479996	-0.001
50	2503.499996	-0.001	2682.479999	0.000

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2506.020003	0.001	2679.990004	0.001
3.85	2506.020003	0.001	2679.990003	0.001
3.28	2506.020002	0.001	2679.990003	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2506.020003	0.001	2679.990003	0.001
-20	2506.020004	0.002	2679.990003	0.001
-10	2506.020004	0.002	2679.990003	0.001
0	2506.020003	0.001	2679.990002	0.001
10	2506.019998	-0.001	2679.989998	-0.001
20	2506.019996	-0.001	2679.989998	-0.001
30	2506.019996	-0.002	2679.989998	-0.001
40	2506.019996	-0.001	2679.989998	-0.001
50	2506.019996	-0.001	2679.989998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 40 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2516.010004	0.002	2670.000002	0.001
3.85	2516.010003	0.001	2670.000002	0.001
3.28	2516.010002	0.001	2670.000001	0.000

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 40 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2516.010004	0.002	2670.000004	0.001
-20	2516.010004	0.002	2670.000003	0.001
-10	2516.010003	0.001	2670.000003	0.001
0	2516.010003	0.001	2670.000001	0.000
10	2516.009998	-0.001	2669.999997	-0.001
20	2516.009997	-0.001	2669.999997	-0.001
30	2516.009996	-0.001	2669.999997	-0.001
40	2516.009997	-0.001	2669.999999	0.000
50	2516.009997	-0.001	2669.999996	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 50 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2521.020004	0.002	2664.990004	0.001
3.85	2521.020001	0.001	2664.990004	0.001
3.28	2521.020004	0.001	2664.990003	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 50 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2521.020002	0.001	2664.990004	0.001
-20	2521.020002	0.001	2664.990004	0.001
-10	2521.020001	0.000	2664.990001	0.001
0	2521.020001	0.001	2664.990003	0.001
10	2521.019997	-0.001	2664.989998	-0.001
20	2521.019997	-0.001	2664.989998	-0.001
30	2521.019998	-0.001	2664.989999	0.000
40	2521.019999	-0.001	2664.989999	0.000
50	2521.019997	-0.001	2664.989996	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 60 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2526.000003	0.001	2659.980001	0.000
3.85	2526.000003	0.001	2659.980003	0.001
3.28	2526.000002	0.001	2659.980004	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 60 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2526.000002	0.001	2659.980004	0.001
-20	2526.000003	0.001	2659.980003	0.001
-10	2526.000002	0.001	2659.980003	0.001
0	2526.000002	0.001	2659.980003	0.001
10	2525.999997	-0.001	2659.979999	-0.001
20	2525.999997	-0.001	2659.979999	0.000
30	2525.999998	-0.001	2659.979999	0.000
40	2525.999998	-0.001	2659.979997	-0.001
50	2525.999997	-0.001	2659.979999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 80 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2536.020003	0.001	2649.990003	0.001
3.85	2536.020002	0.001	2649.990003	0.001
3.28	2536.020004	0.002	2649.990003	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 80 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2536.020004	0.002	2649.990001	0.000
-20	2536.020003	0.001	2649.990004	0.001
-10	2536.020001	0.000	2649.990003	0.001
0	2536.020002	0.001	2649.990002	0.001
10	2536.019998	-0.001	2649.989998	-0.001
20	2536.019996	-0.001	2649.989997	-0.001
30	2536.019999	0.000	2649.989997	-0.001
40	2536.019998	-0.001	2649.989997	-0.001
50	2536.019999	0.000	2649.989998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 90 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2541.000002	0.001	2644.980002	0.001
3.85	2541.000002	0.001	2644.980001	0.000
3.28	2541.000003	0.001	2644.980002	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 90 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2541.000004	0.001	2644.980003	0.001
-20	2541.000002	0.001	2644.980004	0.001
-10	2541.000004	0.002	2644.980003	0.001
0	2541.000001	0.001	2644.980004	0.001
10	2540.999997	-0.001	2644.979998	-0.001
20	2540.999996	-0.002	2644.979997	-0.001
30	2540.999996	-0.002	2644.979997	-0.001
40	2540.999996	-0.002	2644.979999	-0.001
50	2540.999999	0.000	2644.979999	0.000

Frequency Error vs. Voltage

Voltage (Vdc)	n41			
	Channel Bandwidth 100 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.43	2546.010003	0.001	2640.000004	0.001
3.85	2546.010003	0.001	2640.000003	0.001
3.28	2546.010002	0.001	2640.000003	0.001

Note: The applicant defined the normal working voltage is from 3.28Vdc to 4.43Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n41			
	Channel Bandwidth 100 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2546.010003	0.001	2640.000002	0.001
-20	2546.010004	0.002	2640.000001	0.000
-10	2546.010003	0.001	2640.000003	0.001
0	2546.010002	0.001	2640.000002	0.001
10	2546.009998	-0.001	2639.999997	-0.001
20	2546.009998	-0.001	2639.999997	-0.001
30	2546.009996	-0.002	2639.999996	-0.001
40	2546.009996	-0.002	2639.999998	-0.001
50	2546.009998	-0.001	2639.999998	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Limits of Occupied Bandwidth Measurement

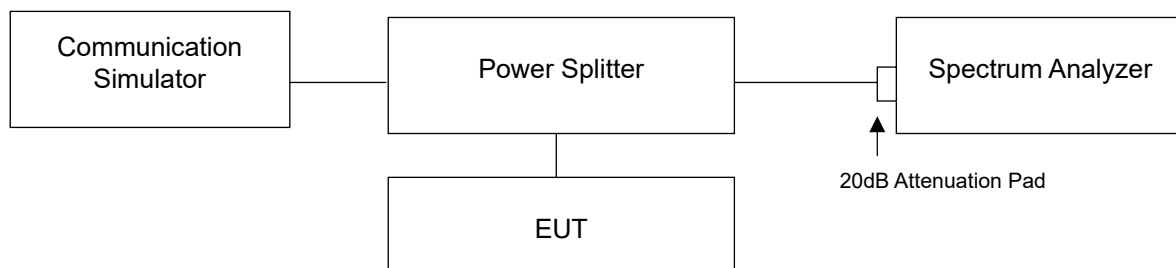
The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission.

4.4.2 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. 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.

4.4.3 Test Setup



4.4.4 Test Result

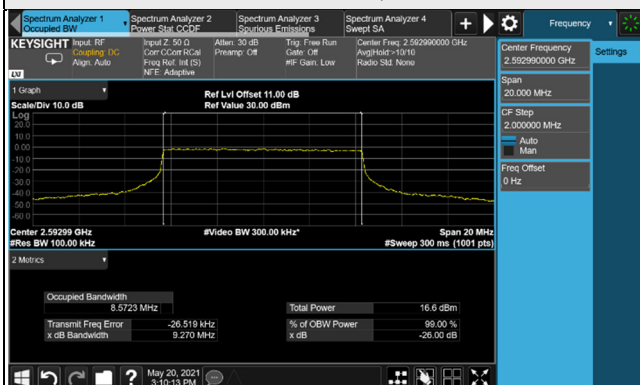
Occupied Bandwidth

n41, Channel Bandwidth: 10MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
500202	2501.01	8.56	8.56	8.56	8.57	8.56
518598	2592.99	8.56	8.56	8.56	8.57	8.56
537000	2685.00	8.56	8.56	8.56	8.57	8.56
n41, Channel Bandwidth: 15MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
500700	2503.50	13.54	13.54	13.54	13.52	13.56
518598	2592.99	13.54	13.54	13.54	13.52	13.56
536496	2682.48	13.54	13.54	13.54	13.51	13.55
n41, Channel Bandwidth 20MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
501204	2506.02	18.19	18.19	18.19	18.19	18.19
518598	2592.99	18.19	18.20	18.20	18.19	18.19
535998	2679.99	18.18	18.18	18.19	18.18	18.19
n41, Channel Bandwidth 40MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
503202	2516.01	37.81	37.82	37.80	37.80	37.79
518598	2592.99	37.84	37.84	37.82	37.83	37.82
534000	2670.00	37.74	37.43	37.72	37.74	37.72
n41, Channel Bandwidth 50MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
504204	2521.02	47.35	47.36	47.35	47.35	47.35
518598	2592.99	47.39	47.40	47.39	47.39	47.39
532998	2664.99	47.23	47.24	47.24	47.23	47.24

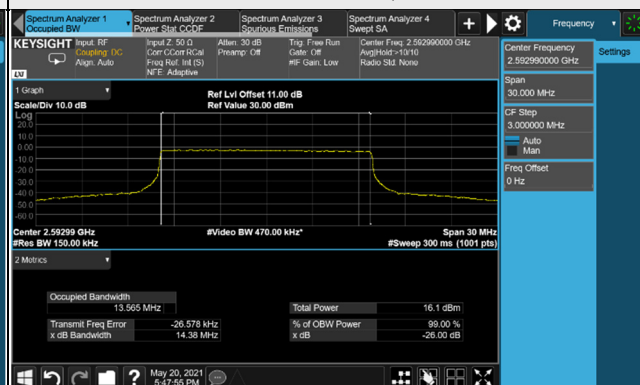
n41, Channel Bandwidth 60MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
505200	2526.00	57.61	57.63	57.62	57.61	57.63
518598	2592.99	57.70	57.71	57.70	57.70	57.71
531996	2659.98	57.45	57.47	57.45	57.45	57.47
n41, Channel Bandwidth 80MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
507204	2536.02	77.14	77.12	77.12	77.11	77.10
518598	2592.99	77.34	77.32	77.33	77.32	77.30
529998	2649.99	76.98	76.97	76.97	76.95	76.94
n41, Channel Bandwidth 90MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
508200	2541.00	87.02	87.01	86.97	86.99	87.04
518598	2592.99	87.30	87.30	87.26	87.27	87.32
528996	2644.98	86.87	86.86	86.81	86.84	86.90
n41, Channel Bandwidth 100MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
509202	2546.01	96.88	96.89	96.90	96.87	96.86
518598	2592.99	97.24	97.25	97.26	97.23	97.22
528000	2640.00	96.75	96.76	96.77	96.73	96.72

Spectrum Plot of Worst Value

10MHz / 64QAM



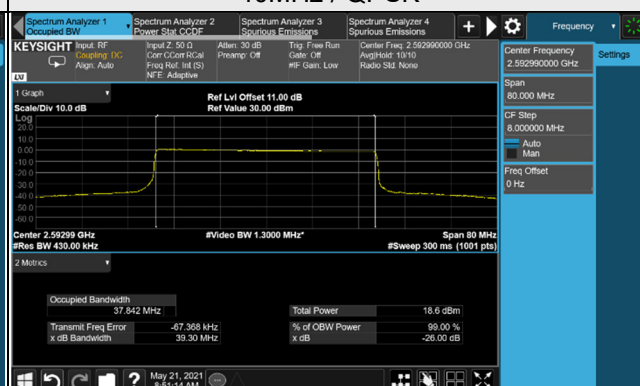
15MHz / 256QAM



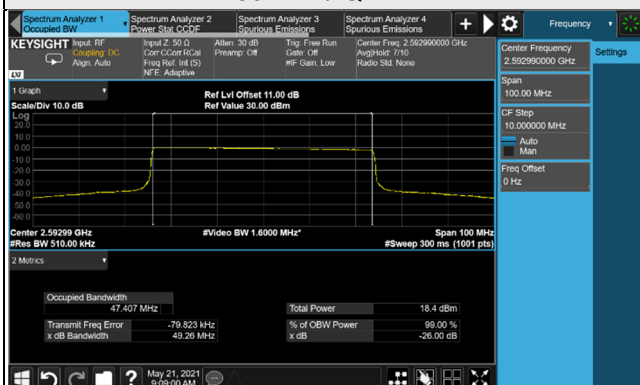
20MHz / 16QAM



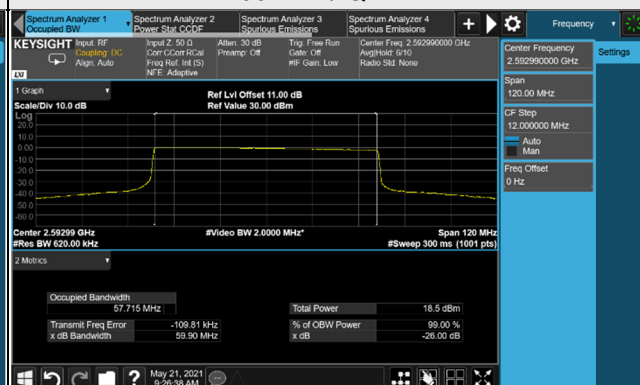
40MHz / QPSK



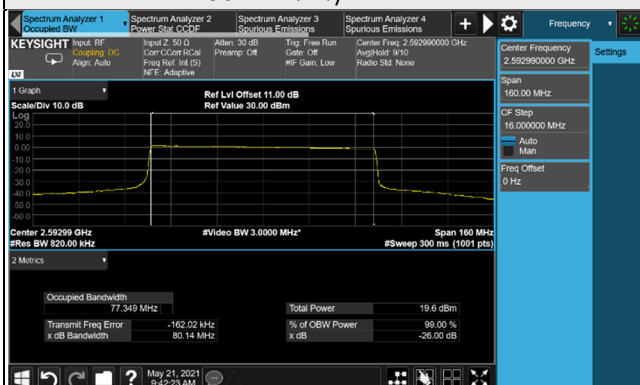
50MHz / QPSK



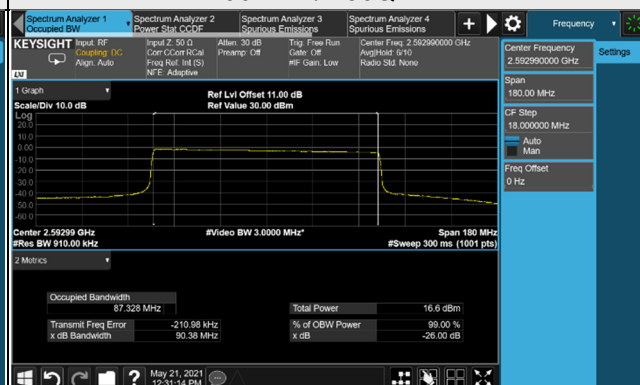
60MHz / QPSK

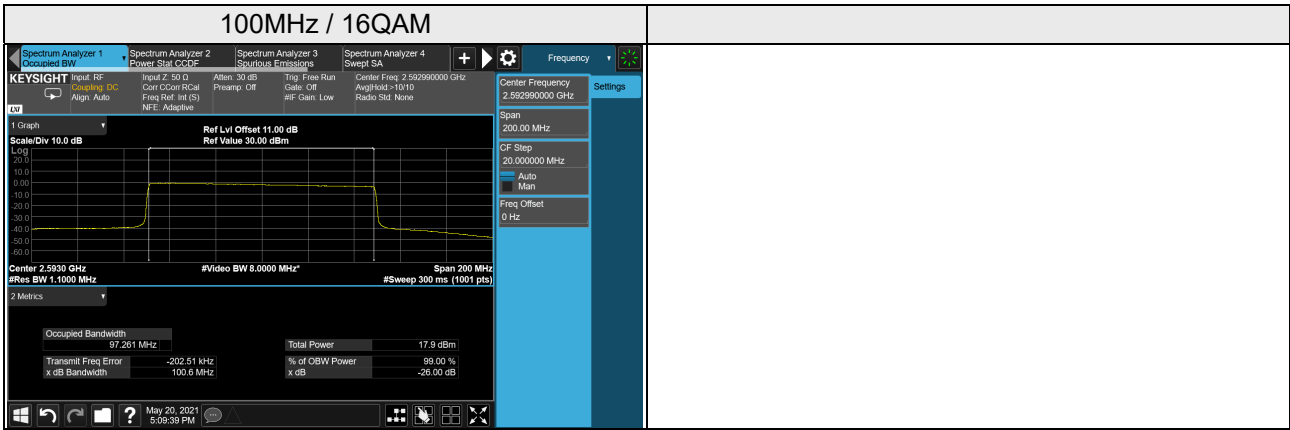


80MHz / $\pi/2$ BPSK



90MHz / 256QAM





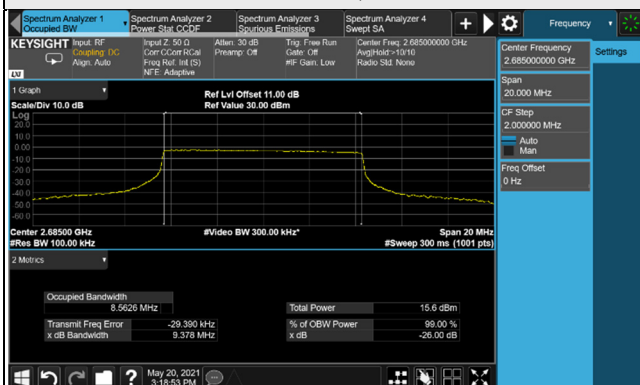
26dB Bandwidth

n41, Channel Bandwidth: 10MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
500202	2501.01	9.21	9.36	9.24	9.28	9.23
518598	2592.99	9.20	9.37	9.24	9.27	9.25
537000	2685.00	9.19	9.37	9.23	9.28	9.23
n41, Channel Bandwidth: 15MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
500700	2503.50	14.29	14.38	14.43	14.18	14.35
518598	2592.99	14.29	14.35	14.47	14.17	14.38
536496	2682.48	14.27	14.34	14.45	14.17	14.31
n41, Channel Bandwidth 20MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
501204	2506.02	19.10	19.07	19.12	19.01	18.97
518598	2592.99	19.10	19.05	19.13	19.00	19.00
535998	2679.99	19.02	19.01	19.04	18.99	19.00
n41, Channel Bandwidth 40MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
503202	2516.01	39.41	39.33	39.38	39.38	39.30
518598	2592.99	39.34	39.30	39.31	39.31	39.26
534000	2670.00	39.29	39.27	39.25	39.25	39.21
n41, Channel Bandwidth 50MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
504204	2521.02	49.22	49.20	49.16	49.18	49.16
518598	2592.99	49.25	49.26	49.16	49.17	49.19
532998	2664.99	49.17	49.15	49.08	49.13	49.09

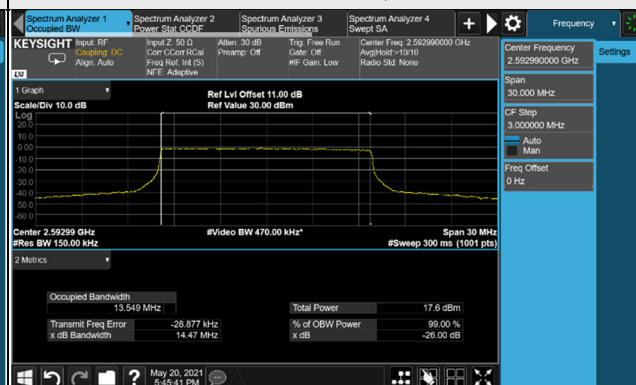
n41, Channel Bandwidth 60MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
505200	2526.00	59.85	59.85	59.82	59.83	59.86
518598	2592.99	59.86	59.90	59.84	59.85	59.87
531996	2659.98	59.80	59.82	59.79	59.80	59.81
n41, Channel Bandwidth 80MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
507204	2536.02	80.12	80.04	80.06	80.10	80.05
518598	2592.99	80.14	80.08	80.11	80.13	80.09
529998	2649.99	80.10	80.01	80.06	80.09	80.04
n41, Channel Bandwidth 90MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
508200	2541.00	90.33	90.38	90.30	90.31	90.31
518598	2592.99	90.40	90.44	90.39	90.38	90.38
528996	2644.98	90.32	90.36	90.29	90.31	90.31
n41, Channel Bandwidth 100MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
509202	2546.01	100.60	100.60	100.50	100.50	100.50
518598	2592.99	100.60	100.60	100.60	100.60	100.60
528000	2640.00	100.60	100.60	100.50	100.60	100.60

Spectrum Plot of Worst Value

10MHz / QPSK



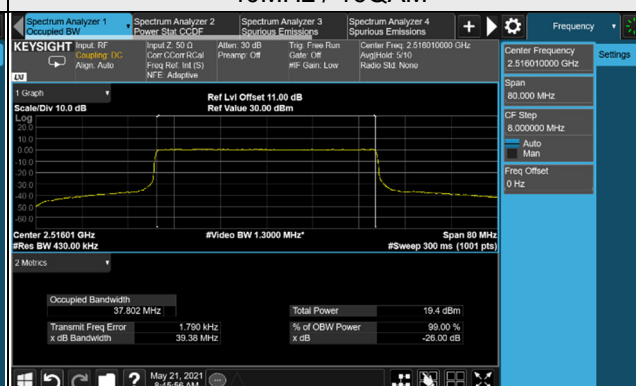
15MHz / 16QAM



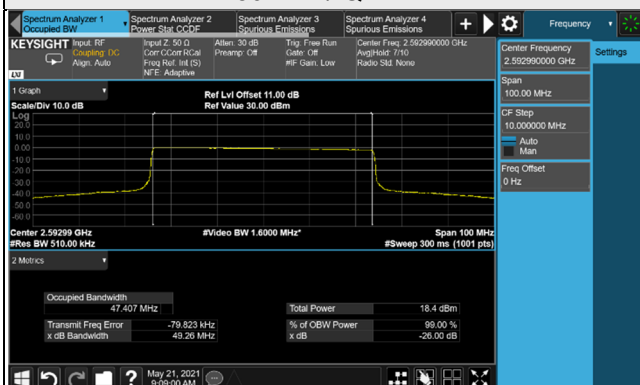
20MHz / 16QAM



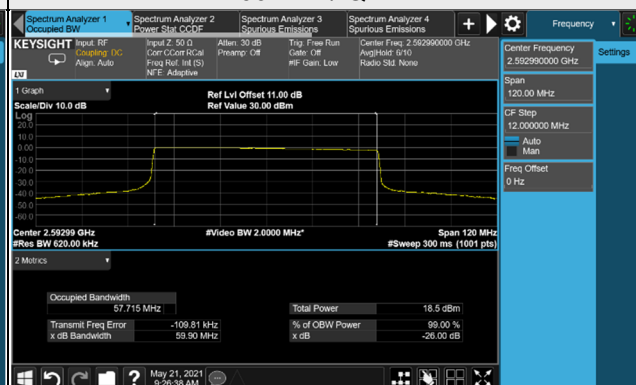
40MHz / 16QAM



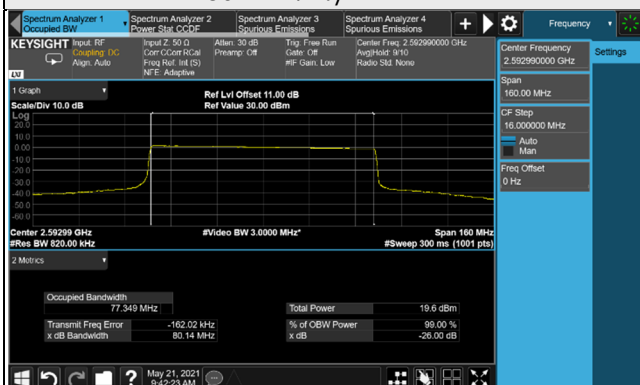
50MHz / QPSK



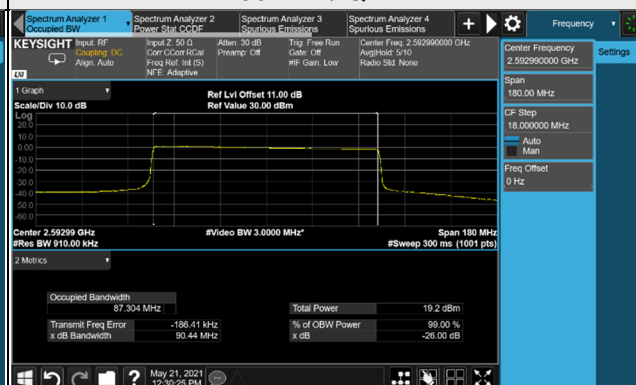
60MHz / QPSK

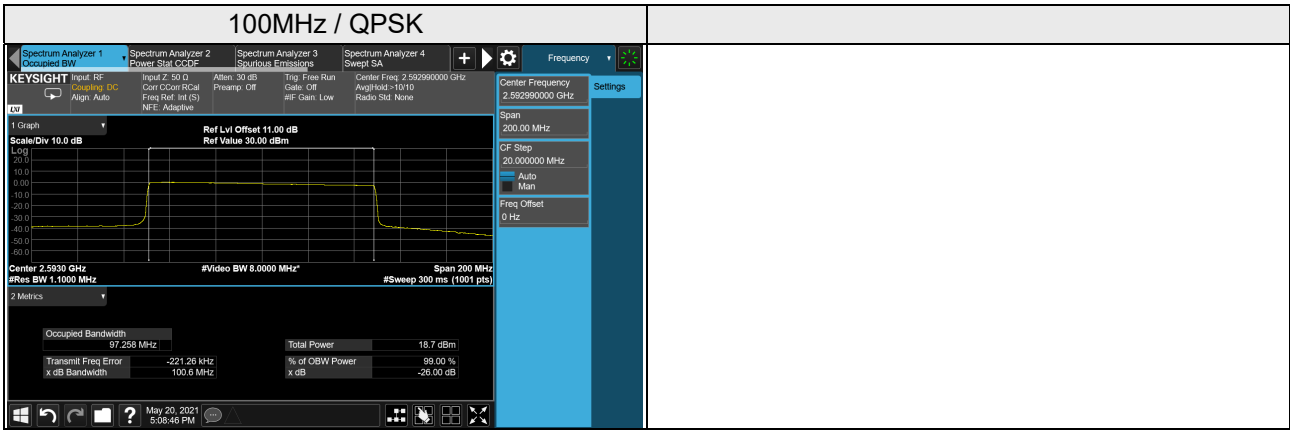


80MHz / $\pi/2$ BPSK



90MHz / QPSK



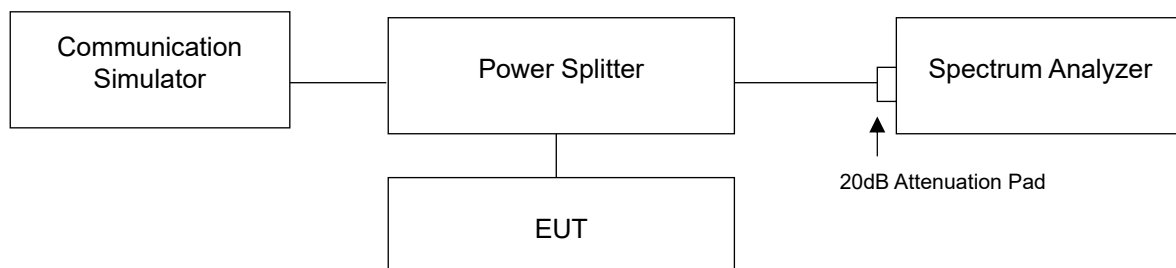


4.5 Out-of-Band Emissions Measurement

4.5.1 Limits of Out-of-Band Emissions Measurement

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that $43 + 10 \log (P)$ dB on all frequencies between 2490.5MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

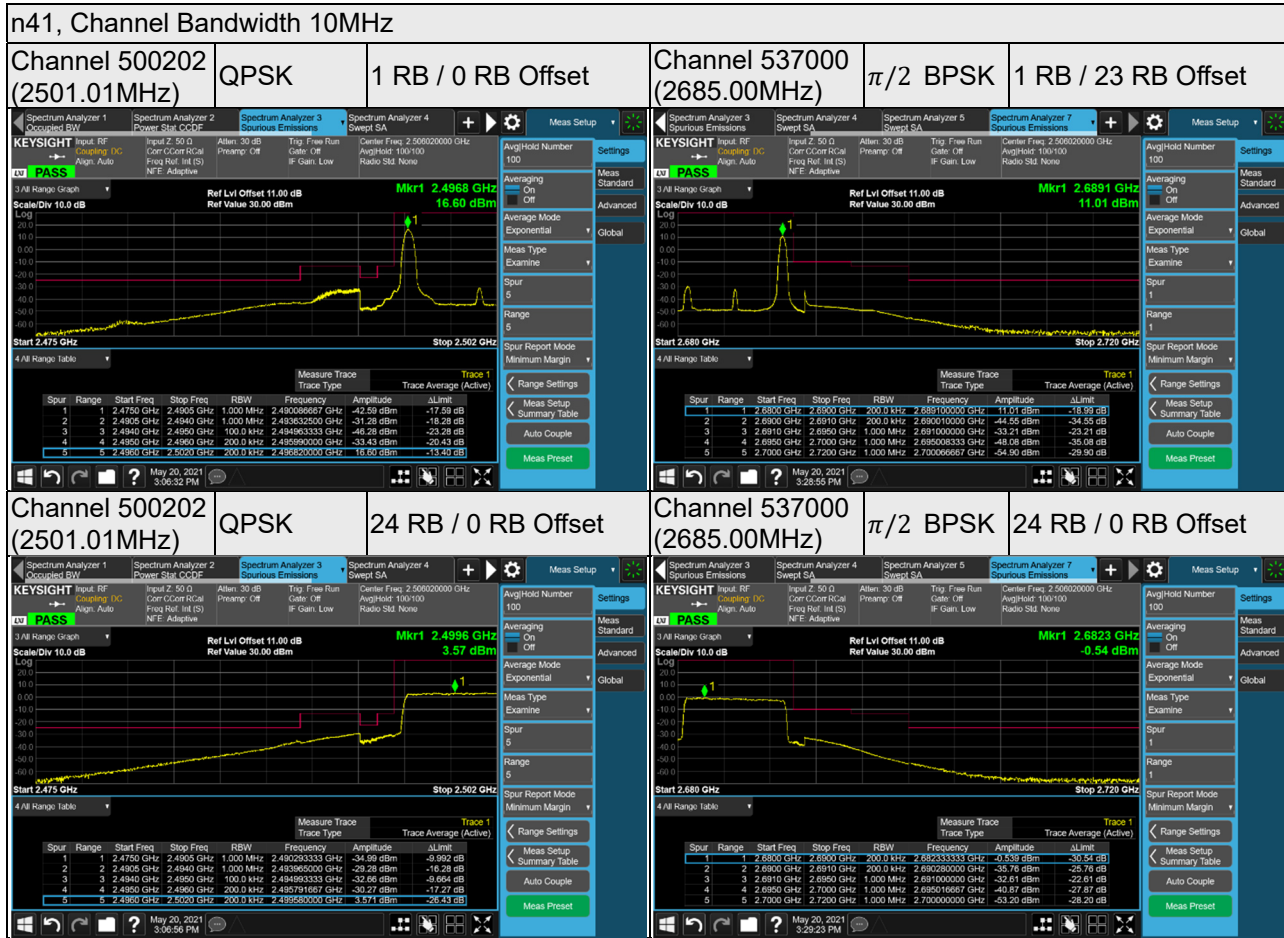
4.5.2 Test Setup



4.5.3 Test Procedures

- The testing follows ANSI C63.26 section 5.7
- The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The band edges of low and high channels for the highest RF powers were measured.
- Set RBW \geq 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
- Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
- Set spectrum analyzer with RMS detector.
- Checked that all the results comply with the emission limit line.

4.5.4 Test Results



n41, Channel Bandwidth 15MHz

Channel 500700
(2503.50MHz)

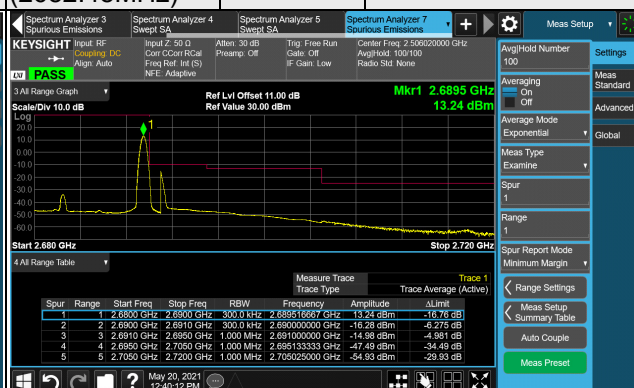
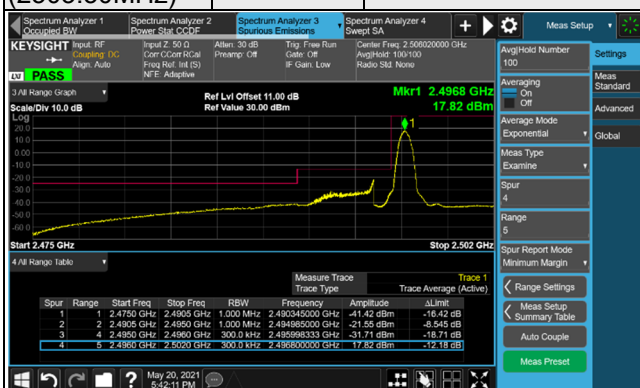
QPSK

1 RB / 0 RB Offset

Channel 536496
(2682.48MHz)

QPSK

1 RB / 37 RB Offset



Channel 500700
(2503.50MHz)

QPSK

38 RB / 0 RB Offset

Channel 536496
(2682.48MHz)

QPSK

38 RB / 0 RB Offset

