FCC Test Report
(ENDC: n5+Band 2/7/12/48/66)

Report No.:	RF200109E02B-9
FCC ID:	2AQ68T99W175
Test Model:	T99W175
Received Date:	Jan. 10, 2020
Test Date:	Feb. 26 ~ May 18, 2020
Issued Date:	May 26, 2020
Applicant:	Hon Lin Technology Co., Ltd.
Address:	11F, No. 32, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF200109E02B-9	Original release	May 26, 2020

1 Certificate of Conformity

Product:	5G WWAN Module
Brand:	Foxconn
Test Model:	T99W175
Sample Status:	Engineering Sample
Applicant:	Hon Lin Technology Co., Ltd.
Test Date:	Feb. 26 ~ May 18, 2020
Standards:	FCC Part 22, Subpart H FCC Part 24, Subpart E FCC Part 27, Subpart H, L, M FCC Part 96

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

Prepared by : Pettie Chen , **Date:** May 26, 2020

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** May 26, 2020

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement
22.913 (d)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -16.2dB at 30.00MHz.

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

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective radiated power	Pass	Meet the requirement of limit.
2.1046 24.232(d)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -26.8dB at 32.91MHz.

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

Applied Standard: FCC Part 27 & Part 2					
FCC Clause			Test Item	Result	Remarks
LTE B7	LTE B12	LTE B66			
2.1046 27.50 (h)(2)	2.1046 27.50 (c)	2.1046 27.50 (d)(4)	Equivalent Isotropically Radiated Power / Equivalent Radiated Power	Pass	Meet the requirement of limit.
----	----	27.50 (d)(5)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	2.1055 27.54	2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.
2.1049	2.1049	2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	2.1051 27.53(g)	2.1051 27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	2.1051 27.53(g)	2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (m)(4)(6)	2.1053 27.53(g)	2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -22.5dB at 5070.00MHz.

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

47 CFR FCC Part 96			
FCC Clause	Test Item	Result	Remarks
2.1046 96.41(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1046 96.41(b)	Maximum Power Spectral Density	Pass	Meet the requirement of limit.
96.41(g)	Peak to Average Ration	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1055	Frequency Stability	Pass	Meet the requirement of limit.
2.1051 96.41(e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 96.41(e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -3.3dB at 7380.00MHz.

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

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 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	ESCI	100424	Dec. 31, 2019	Dec. 30, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 23, 2019	Sep. 22, 2020
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 03, 2019	Jul. 02, 2020
Radio Communication Analyzer Anritsu	MT8000A	6262012865	Dec. 12, 2019	Dec. 11, 2020
MXG Vector signal generator Agilent	N5182B	MY53050162	Jan. 14, 2020	Jan. 13, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-158	Nov. 08, 2019	Nov. 07, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jul. 11, 2019	Jul. 10, 2020
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 11, 2019	Jun. 10, 2020
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH4-01	Aug. 20, 2019	Aug. 19, 2020
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Aug. 20, 2019	Aug. 19, 2020
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jul. 11, 2019	Jul. 10, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jul. 11, 2019	Jul. 10, 2020
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber	MHU-225AU	920842	May 31, 2019	May 30, 2020
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	May 21, 2019	May 20, 2020
DC power supply	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 4.

3 General Information

3.1 General Description of EUT

Product	5G WWAN Module
Brand	Foxconn
Test Model	T99W175
Sample Status	Engineering Sample
Power Supply Rating	5 Vdc (Host equipment) 3.135Vdc~3.63Vdc (Module)

n5

Modulation Type	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM					
Waveform Type	CP-OFDM, DFT-s-OFDM					
Operating Frequency	n5 (Channel Bandwidth 5MHz)	826.5~846.5MHz				
	n5 (Channel Bandwidth 10MHz)	829.0~844.0MHz				
	n5 (Channel Bandwidth 15MHz)	831.5~841.5MHz				
	n5 (Channel Bandwidth 20MHz)	834.0~839.0MHz				
Max. ERP Power		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n5 (Channel Bandwidth 5MHz)	311.172mW (24.93dBm)	297.852mW (24.74dBm)	295.801mW (24.71dBm)	267.917mW (24.28dBm)	157.036mW (21.96dBm)
	n5 (Channel Bandwidth 10MHz)	308.319mW (24.89dBm)	298.538mW (24.75dBm)	298.538mW (24.75dBm)	272.270mW (24.35dBm)	148.252mW (21.71dBm)
	n5 (Channel Bandwidth 15MHz)	313.329mW (24.96dBm)	294.442mW (24.69dBm)	299.226mW (24.76dBm)	271.644mW (24.34dBm)	154.882mW (21.90dBm)
	n5 (Channel Bandwidth 20MHz)	309.742mW (24.91dBm)	295.121mW (24.70dBm)	271.644mW (24.34dBm)	157.036mW (21.96dBm)	157.036mW (21.96dBm)
Emission Designator		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
	n5 (Channel Bandwidth 5MHz)	4M49G7D	4M49G7D	4M49D7W	4M49D7W	4M49D7W
	n5 (Channel Bandwidth 10MHz)	8M95G7D	8M95G7D	8M96D7W	8M95D7W	8M96D7W
	n5 (Channel Bandwidth 15MHz)	13M5G7D	13M5G7D	13M4D7W	13M4D7W	13M4D7W
	n5 (Channel Bandwidth 20MHz)	17M9G7D	17M9G7D	18M0D7W	17M9D7W	17M9D7W

LTE Band

Modulation Type	QPSK, 16QAM, 64QAM, 256QAM		
Operating Frequency	LTE Band 2	Channel Bandwidth 1.4MHz	1850.7MHz ~1909.3MHz
		Channel Bandwidth 3MHz	1851.5MHz ~1908.5MHz
		Channel Bandwidth 5MHz	1852.5MHz ~1907.5MHz
		Channel Bandwidth 10MHz	1855.0MHz ~1905.0MHz
		Channel Bandwidth 15MHz	1857.5MHz ~1902.5MHz
		Channel Bandwidth 20MHz	1860.0MHz ~1900.0MHz
	LTE Band 7	Channel Bandwidth 5MHz	2502.5MHz ~ 2567.5MHz
		Channel Bandwidth 10MHz	2505.0MHz ~ 2565.0MHz
		Channel Bandwidth 15MHz	2507.5MHz ~ 2562.5MHz
		Channel Bandwidth 20MHz	2510.0MHz ~ 2560.0MHz
	LTE Band 12	Channel Bandwidth 1.4MHz	699.7MHz ~ 715.3MHz
		Channel Bandwidth 3MHz	700.5MHz ~ 714.5MHz
		Channel Bandwidth 5MHz	701.5MHz ~ 713.5MHz
		Channel Bandwidth 10MHz	704.0MHz ~ 711.0MHz
	LTE Band 48	Channel Bandwidth 5MHz	TX: 3552.5MHz ~ 3697.5MHz
			RX: 3552.5MHz ~ 3697.5MHz
		Channel Bandwidth 10MHz	TX: 3555MHz ~ 3695MHz
			RX: 3555MHz ~ 3695MHz
		Channel Bandwidth 15MHz	TX: 3557.5MHz ~ 3692.5MHz
			RX: 3557.5MHz ~ 3692.5MHz
		Channel Bandwidth 20MHz	TX: 3560MHz ~ 3690MHz
			RX: 3560MHz ~ 3690MHz
	LTE Band 66	Channel Bandwidth 1.4MHz	1710.7MHz ~ 1779.3MHz
		Channel Bandwidth 3MHz	1711.5MHz ~ 1778.5MHz
		Channel Bandwidth 5MHz	1712.5MHz ~ 1777.5MHz
		Channel Bandwidth 10MHz	1715.0MHz ~ 1775.0MHz
		Channel Bandwidth 15MHz	1717.5MHz ~ 1772.5MHz
		Channel Bandwidth 20MHz	1720.0MHz ~ 1770.0MHz

			QPSK	16QAM	64QAM	256QAM
Max. ERP Power	LTE Band 12	Channel Bandwidth 1.4MHz	339.625mW (25.31dBm)	278.612mW (24.45dBm)	218.273mW (23.39dBm)	169.824mW (22.30dBm)
		Channel Bandwidth 3MHz	350.752mW (25.45dBm)	279.254mW (24.46dBm)	216.770mW (23.36dBm)	167.494mW (22.24dBm)
		Channel Bandwidth 5MHz	346.737mW (25.40dBm)	279.254mW (24.46dBm)	221.309mW (23.45dBm)	167.109mW (22.23dBm)
		Channel Bandwidth 10MHz	349.945mW (25.44dBm)	279.254mW (24.46dBm)	218.273mW (23.39dBm)	166.725mW (22.22dBm)
Max. EIRP Power	LTE Band 2	Channel Bandwidth 1.4MHz	582.103mW (27.65dBm)	464.515mW (26.67dBm)	368.978mW (25.67dBm)	281.190mW (24.49dBm)
		Channel Bandwidth 3MHz	567.545mW (27.54dBm)	463.447mW (26.66dBm)	358.096mW (25.54dBm)	285.759mW (24.56dBm)
		Channel Bandwidth 5MHz	583.445mW (27.66dBm)	463.447mW (26.66dBm)	364.754mW (25.62dBm)	285.759mW (24.56dBm)
		Channel Bandwidth 10MHz	580.764mW (27.64dBm)	449.780mW (26.53dBm)	368.978mW (25.67dBm)	295.121mW (24.70dBm)
		Channel Bandwidth 15MHz	580.764mW (27.64dBm)	456.037mW (26.59dBm)	368.129mW (25.66dBm)	296.483mW (24.72dBm)
		Channel Bandwidth 20MHz	568.853mW (27.55dBm)	464.515mW (26.67dBm)	368.129mW (25.66dBm)	295.121mW (24.70dBm)
	LTE Band 7	Channel Bandwidth 5MHz	698.232mW (28.44dBm)	563.638mW (27.51dBm)	445.656mW (26.49dBm)	361.410mW (25.58dBm)
		Channel Bandwidth 10MHz	704.693mW (28.48dBm)	552.077mW (27.42dBm)	437.522mW (26.41dBm)	363.915mW (25.61dBm)
		Channel Bandwidth 15MHz	703.072mW (28.47dBm)	563.638mW (27.51dBm)	439.542mW (26.43dBm)	358.922mW (25.55dBm)
		Channel Bandwidth 20MHz	706.318mW (28.49dBm)	562.341mW (27.50dBm)	447.713mW (26.51dBm)	363.915mW (25.61dBm)
	LTE Band 48	**Per 10M**				
		Channel Bandwidth 5MHz	185.780mW (22.69dBm)	145.546mW (21.63dBm)	117.761mW (20.71dBm)	96.161mW (19.83dBm)
		Channel Bandwidth 10MHz	184.502mW (22.66dBm)	148.252mW (21.71dBm)	118.032mW (20.72dBm)	97.724mW (19.90dBm)
		Channel Bandwidth 15MHz	186.638mW (22.71dBm)	148.594mW (21.72dBm)	116.413mW (20.66dBm)	93.541mW (19.71dBm)
		Channel Bandwidth 20MHz	184.077mW (22.65dBm)	147.571mW (21.69dBm)	118.032mW (20.72dBm)	88.920mW (19.49dBm)
		Full Power				
		Channel Bandwidth 5MHz	185.780mW (22.69dBm)	145.546mW (21.63dBm)	117.761mW (20.71dBm)	96.161mW (19.83dBm)
		Channel Bandwidth 10MHz	184.502mW (22.66dBm)	148.252mW (21.71dBm)	118.032mW (20.72dBm)	97.724mW (19.90dBm)
		Channel Bandwidth 15MHz	185.353mW (22.68dBm)	147.231mW (21.68dBm)	117.490mW (20.70dBm)	96.605mW (19.85dBm)
		Channel Bandwidth 20MHz	185.780mW (22.69dBm)	146.893mW (21.67dBm)	116.950mW (20.68dBm)	96.383mW (19.84dBm)
	LTE Band 66	Channel Bandwidth 1.4MHz	554.626mW (27.44dBm)	441.570mW (26.45dBm)	351.560mW (25.46dBm)	277.971mW (24.44dBm)
		Channel Bandwidth 3MHz	552.077mW (27.42dBm)	443.609mW (26.47dBm)	350.752mW (25.45dBm)	274.789mW (24.39dBm)
		Channel Bandwidth 5MHz	554.626mW (27.44dBm)	442.588mW (26.46dBm)	348.337mW (25.42dBm)	277.971mW (24.44dBm)
		Channel Bandwidth 10MHz	553.350mW (27.43dBm)	428.549mW (26.32dBm)	351.560mW (25.46dBm)	281.190mW (24.49dBm)
		Channel Bandwidth 15MHz	552.077mW (27.42dBm)	443.609mW (26.47dBm)	348.337mW (25.42dBm)	279.898mW (24.47dBm)
		Channel Bandwidth 20MHz	554.626mW (27.44dBm)	438.531mW (26.42dBm)	351.560mW (25.46dBm)	270.396mW (24.32dBm)

			QPSK	16QAM	64QAM	256QAM
Emission Designator	LTE Band 2	Channel Bandwidth 1.4MHz	1M09G7D	1M09D7W	1M09D7W	1M09D7W
		Channel Bandwidth 3MHz	2M70G7D	2M70D7W	2M70D7W	2M70D7W
		Channel Bandwidth 5MHz	4M49G7D	4M49D7W	4M50D7W	4M49D7W
		Channel Bandwidth 10MHz	8M96G7D	8M96D7W	8M97D7W	8M96D7W
		Channel Bandwidth 15MHz	13M5G7D	13M5D7W	13M5D7W	13M5D7W
		Channel Bandwidth 20MHz	18M0G7D	18M0D7W	18M0D7W	18M0D7W
	LTE Band 7	Channel Bandwidth 5MHz	4M49G7D	4M49D7W	4M50D7W	4M49D7W
		Channel Bandwidth 10MHz	8M96G7D	8M96D7W	8M97D7W	8M96D7W
		Channel Bandwidth 15MHz	13M5G7D	13M5D7W	13M5D7W	13M5D7W
		Channel Bandwidth 20MHz	17M9G7D	18M0D7W	18M0D7W	18M0D7W
	LTE Band 12	Channel Bandwidth 1.4MHz	1M09G7D	1M09D7W	1M09D7W	1M09D7W
		Channel Bandwidth 3MHz	2M70G7D	2M70D7W	2M70D7W	2M70D7W
		Channel Bandwidth 5MHz	4M49G7D	4M49D7W	4M50D7W	4M49D7W
		Channel Bandwidth 10MHz	8M96G7D	8M96D7W	8M96D7W	8M96D7W
	LTE Band 48	Channel Bandwidth 5MHz	4M49G7D	4M49D7W	4M50D7W	4M48D7W
		Channel Bandwidth 10MHz	8M96G7D	8M97D7W	8M97D7W	8M96D7W
		Channel Bandwidth 15MHz	13M5G7D	13M5D7W	13M5D7W	13M5D7W
		Channel Bandwidth 20MHz	17M9G7D	17M9D7W	17M9D7W	17M9D7W
	LTE Band 66	Channel Bandwidth 1.4MHz	1M09G7D	1M09D7W	1M09D7W	1M09D7W
		Channel Bandwidth 3MHz	2M70G7D	2M70D7W	2M70D7W	2M70D7W
		Channel Bandwidth 5MHz	4M49G7D	4M49D7W	4M50D7W	4M49D7W
		Channel Bandwidth 10MHz	8M96G7D	8M97D7W	8M97D7W	8M97D7W
		Channel Bandwidth 15MHz	13M5G7D	13M5D7W	13M5D7W	13M5D7W
		Channel Bandwidth 20MHz	18M0G7D	18M0D7W	18M0D7W	18M0D7W
Antenna Type	Refer to Note as below					
Antenna Connector	Refer to Note as below					
Accessory Device	NA					
Cable Supplied	NA					

Output Power / Emission Designator	n5+LTE Band 2		Maximum EIRP / ERP	Sum Bandwidth
		n5 (ERP)	313.329mW (24.96dBm)	26M9D7W
		LTE Band 2 (EIRP)	296.483mW (24.72dBm)	
			EIRP / ERP	MAX Sum Bandwidth
		n5 (ERP)	133.352mW (21.25dBm)	35M9D7W
		LTE Band 2 (EIRP)	279.898mW (24.47dBm)	
	n5+LTE Band 7		Maximum EIRP / ERP	Sum Bandwidth
		n5 (ERP)	313.329mW (24.96dBm)	31M4D7W
		LTE Band 7 (EIRP)	363.915mW (25.61dBm)	
			EIRP / ERP	MAX Sum Bandwidth
		n5 (ERP)	133.352mW (21.25dBm)	35M9D7W
		LTE Band 7 (EIRP)	319.154mW (25.04dBm)	
	n5+LTE Band 12		Maximum ERP	Sum Bandwidth
		n5 (ERP)	313.329mW (24.96dBm)	14M5D7W
		LTE Band 12 (ERP)	169.824mW (22.30dBm)	
			ERP	MAX Sum Bandwidth
		n5 (ERP)	133.352mW (21.25dBm)	26M9D7W
		LTE Band 12 (ERP)	165.577mW (22.19dBm)	
	n5+LTE Band 48		Maximum EIRP / ERP	Sum Bandwidth
		n5 (ERP)	313.329mW (24.96dBm)	22M4D7W
		LTE Band 48 (EIRP)	97.724mW (19.90dBm)	
			EIRP / ERP	MAX Sum Bandwidth
		n5 (ERP)	133.352mW (21.25dBm)	35M9D7W
		LTE Band 48 (EIRP)	85.310mW (19.31dBm)	
	n5+LTE Band 66		Maximum EIRP / ERP	Sum Bandwidth
		n5 (ERP)	313.329mW (24.96dBm)	22M4D7W
		LTE Band 66 (EIRP)	281.190mW (24.49dBm)	
			EIRP / ERP	MAX Sum Bandwidth
		n5 (ERP)	133.352mW (21.25dBm)	36M0D7W
		LTE Band 66 (EIRP)	263.027mW (24.20dBm)	

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of BV CPS report no.: RF200109E02-10. Difference compared with the original report is adding Modulation Type 256QAM by software. In this software changed, will not impact the 5G NR characteristic, therefore all test results are keeping as original report stated. Therefore, the EUT was tested all tests for 256QAM and presented in the test report.
2. There are four Difference HW of T99W175.

Brand	Model	HW
Foxconn	T99W175	1. 3G+LTE+Sub6+eSIM
		2. 3G+LTE+Sub6 only w/o eSIM
		3. 3G+LTE+Sub6+eSIM+GNSS connector
		4. 3G+LTE+Sub6 only+w/o eSIM+GNSS connector

*After pre-testing, “HW: 1. 3G+LTE+Sub6+eSIM” is the worst for the final tests.

3. After pre-testing, “DFT-s-OFDM” is the worst for the final tests.

4. The following antennas were provided to the EUT.

Antenna No.	RF Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency range (MHz)	Antenna Type	Connector Type
1		WHA YU	C107-511720-A	4.41	660~803	PCB	I-PEX
2		WHA YU	C107-511721-A	3.81 4.03	791~960 1447.9~1606	PCB	I-PEX
3		WHA YU	C107-511722-A	4.27 5.31	1710~2170 2500~2690	PCB	I-PEX
4		WHA YU	C107-511723-A	2.99 0.92	2300~2400 3500~3700	PCB	I-PEX
5		WHA YU	C107-511724-A	6.45	5150~5925	PCB	I-PEX
6		WHA YU	C107-511725-A	4.89	3400~3700	PCB	I-PEX
7		AVX	5000106-R1-X01	2.91	699~803	Monopole	I-PEX
8		AVX	5000107-R1-X01	2.59	791~960	Monopole	I-PEX
9		AVX	5000108-R1-X01	2.85	1427~1610	Monopole	I-PEX
10		AVX	5000109-R1-X01	2.23 2.94	1710~2200 5150~5925	Monopole	I-PEX
11		AVX	5000110-R1-X01	0.9	2300~2690	Monopole	I-PEX
12		AVX	5000111-R1-X01	0.87	3300~5000	Monopole	I-PEX
13	Tx1/ Rx1	Ethertronics	5003806	0.4 -1.61 0.39 2.95 1.98 0.38 0.83 2.31	698-821 824-960 1425-1515 1710-2200 2300-2690 3300-4200 4400-5000 5150-5925	PIFA	I-PEX
	Rx2	Ethertronics	5003807	-2.24 -4.52 2.87 2.99 2.93 2.91 2.23 -0.85 -3.04	716-821 824-960 1425-1515 1557-1610 1805-2200 2300-2690 3300-4200 4400-5000 5150-5925	PIFA	I-PEX
	Tx2/ Rx3	Ethertronics	5003806	2.21 2.25 -0.45 2.6	1710-2200 2300-2690 3300-4200 4400-5000	PIFA	I-PEX
	Rx4	Ethertronics	5003700	1.38 2.87 0.6 -2.09	1805-2200 2300-2690 3300-4200 4400-5000	PIFA	I-PEX

Antenna No.	RF Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency range (MHz)	Antenna Type	Connector Type
14	Ant. 0 (TX/RX)	Master Wave	NA	2.4 2.2 2.9 2.9 2.9 NA	880~960 1020~2170 2545~2595 3565~3600 3900~4000 GPS	PCB	I-PEX
	Ant. 2 (TX/RX)	Master Wave	NA	NA 2.2 2.8 2.9 2.8 NA	880~960 1020~2170 2545~2595 3565~3600 3900~4000 GPS	PCB	I-PEX
	Ant. 1 (RX)	Master Wave	NA	NA 5.3 5.1 4.3 4.5 NA	880~960 1020~2170 2545~2595 3565~3600 3900~4000 GPS	PCB	I-PEX
	Ant. 3 (RX)	Master Wave	NA	1.3 6.8 3.7 6.4 6.2 3.7	880~960 1020~2170 2545~2595 3565~3600 3900~4000 GPS	PCB	I-PEX

*The antenna for the final tests as following table.

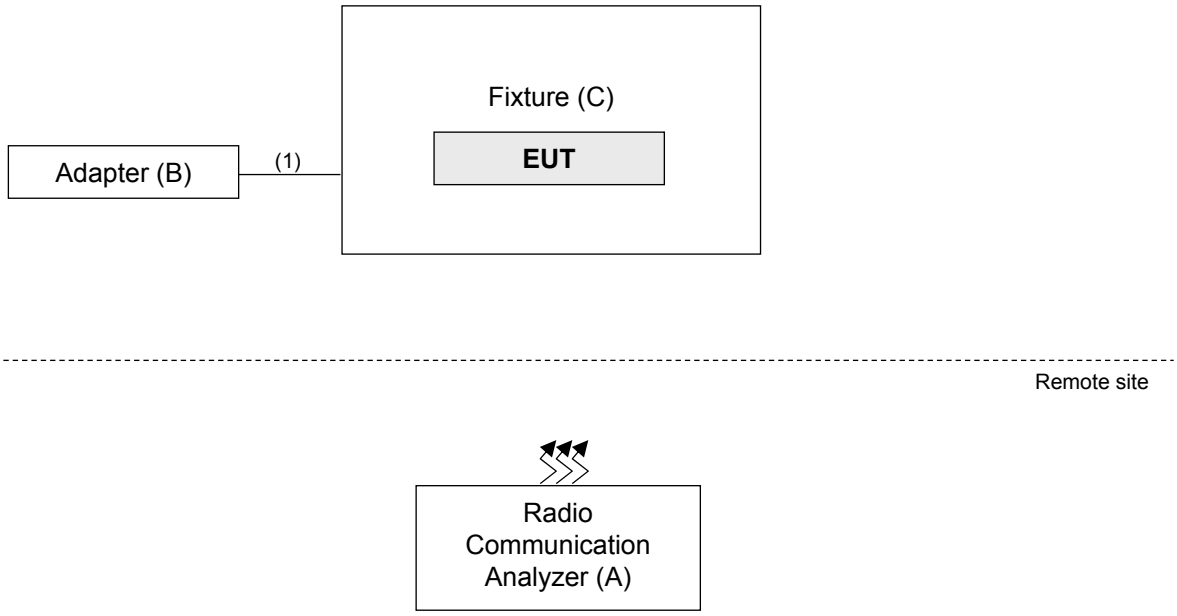
	Band	Antenna
5GNR	5 (15kHz) /5/10/15/20	Antenna 2

	Band	Antenna
LTE	2	Antenna 3
	7	Antenna 3
	12	Antenna 1
	48	Antenna 4
	66	Antenna 3

5. The EUT supports the following ENDC configuration.

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

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.	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	NA	-
B.	Adapter	LITEON	PA-1050-39	NA	NA	-
C.	Fixture	NA	NA	NA	NA	Provided by client.

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	1.5	Y	0	-

3.3 Test Mode Applicability and Tested Channel Detail

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

n5

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK / 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
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK / 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
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK / 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
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK / 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
-	Modulation characteristics	166800 to 167800	167300(836.5MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	106 RB / 0 RB Offset
-	Frequency Stability	165300 to 169300	165300(826.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK	12 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK	26 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK	39 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK	50 RB / 0 RB Offset
-	Occupied Bandwidth	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	12 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	26 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	39 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	50 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	165300 to 169300	165300(826.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset 1 RB / 51 RB Offset 52 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset 1 RB / 78 RB Offset 79 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset 1 RB / 105 RB Offset 106 RB / 0 RB Offset
-	Peak to Average Ratio	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK / QPSK / 16QAM / 64QAM / 256QAM	1 RB / 0 RB Offset
-	Conducted Emission	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	165300 to 169300	165300(826.5MHz)	5MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz)	20MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset

Note:
1. The conducted output power for $\pi/2$ BPSK, QPSK, 16QAM, 64QAM and 256QAM, measured value of $\pi/2$ BPSK is higher than QPSK, 16QAM, 64QAM and 256QAM mode. Therefore, only EIRP, 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 $\pi/2$ BPSK mode only.

LTE Band 2

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607 (1850.70MHz), 18900 (1880.00MHz), 19193 (1909.30MHz)	1.4MHz	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 (1851.50MHz), 18900 (1880.00MHz), 19185 (1908.50MHz)	3MHz	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 (1852.50MHz), 18900 (1880.00MHz), 19175 (1907.50MHz)	5MHz	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 (1855.00MHz), 18900 (1880.00MHz), 19150 (1905.00MHz)	10MHz	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 (1857.50MHz), 18900 (1880.00MHz), 19125 (1902.50MHz)	15MHz	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 (1860.00MHz), 18900 (1880.00MHz), 19100 (1900.00MHz)	20MHz	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
-	Frequency Stability	18607 to 19193	18607 (1850.70MHz), 19193 (1909.30MHz)	1.4MHz	256QAM	5 RB / 0 RB Offset
		18615 to 19185	18615 (1851.50MHz), 19185 (1908.50MHz)	3MHz	256QAM	15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.50MHz), 19175 (1907.50MHz)	5MHz	256QAM	25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.00MHz), 19150 (1905.00MHz)	10MHz	256QAM	50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.50MHz), 19125 (1902.50MHz)	15MHz	256QAM	75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.00MHz), 19100 (1900.00MHz)	20MHz	256QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Occupied Bandwidth	18607 to 19193	18607 (1850.70MHz), 18900 (1880.00MHz), 19193 (1909.30MHz)	1.4MHz	256QAM	5 RB / 0 RB Offset
		18615 to 19185	18615 (1851.50MHz), 18900 (1880.00MHz), 19185 (1908.50MHz)	3MHz	256QAM	15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.50MHz), 18900 (1880.00MHz), 19175 (1907.50MHz)	5MHz	256QAM	25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.00MHz), 18900 (1880.00MHz), 19150 (1905.00MHz)	10MHz	256QAM	50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.50MHz), 18900 (1880.00MHz), 19125 (1902.50MHz)	15MHz	256QAM	75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.00MHz), 18900 (1880.00MHz), 19100 (1900.00MHz)	20MHz	256QAM	100 RB / 0 RB Offset
-	Band Edge	18607 to 19193	18607 (1850.70MHz), 19193 (1909.30MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.50MHz), 19185 (1908.50MHz)	3MHz	256QAM	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.50MHz), 19175 (1907.50MHz)	5MHz	256QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.00MHz), 19150 (1905.00MHz)	10MHz	256QAM	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.50MHz), 19125 (1902.50MHz)	15MHz	256QAM	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.00MHz), 19100 (1900.00MHz)	20MHz	256QAM	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
-	Peak to Average Ratio	18607 to 19193	18607 (1850.70MHz), 18900 (1880.00MHz), 19193 (1909.30MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		18615 to 19185	18615 (1851.50MHz), 18900 (1880.00MHz), 19185 (1908.50MHz)	3MHz	256QAM	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.50MHz), 18900 (1880.00MHz), 19175 (1907.50MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		18650 to 19150	18650 (1855.00MHz), 18900 (1880.00MHz), 19150 (1905.00MHz)	10MHz	256QAM	1 RB / 0 RB Offset
		18675 to 19125	18675 (1857.50MHz), 18900 (1880.00MHz), 19125 (1902.50MHz)	15MHz	256QAM	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.00MHz), 18900 (1880.00MHz), 19100 (1900.00MHz)	20MHz	256QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	18607 to 19193	18607 (1850.70MHz), 18900 (1880.00MHz), 19193 (1909.30MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		18615 to 19185	18615 (1851.50MHz), 18900 (1880.00MHz), 19185 (1908.50MHz)	3MHz	256QAM	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.50MHz), 18900 (1880.00MHz), 19175 (1907.50MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		18650 to 19150	18650 (1855.00MHz), 18900 (1880.00MHz), 19150 (1905.00MHz)	10MHz	256QAM	1 RB / 0 RB Offset
		18675 to 19125	18675 (1857.50MHz), 18900 (1880.00MHz), 19125 (1902.50MHz)	15MHz	256QAM	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.00MHz), 18900 (1880.00MHz), 19100 (1900.00MHz)	20MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	18700 to 19100	18700 (1860.00MHz)	20MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	18607 to 19193	18607 (1850.70MHz), 18900 (1880.00MHz), 19193 (1909.30MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.50MHz), 18900 (1880.00MHz), 19175 (1907.50MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.00MHz), 18900 (1880.00MHz), 19100 (1900.00MHz)	20MHz	256QAM	1 RB / 0 RB Offset

Note: 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.

LTE Band 7

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	EIRP	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	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
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	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
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	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
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	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
-	Modulation Characteristics	20850 to 21350	21100 (2535.0MHz)	20MHz	256QAM	100 RB / 0 RB Offset
-	Frequency Stability	20775 to 21425	20775 (2502.5MHz), 21425 (2567.5MHz)	5 MHz	256QAM	25 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21400 (2565.0MHz)	10 MHz	256QAM	50 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21375 (2562.5MHz)	15 MHz	256QAM	75 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21350 (2560.0MHz)	20 MHz	256QAM	100 RB / 0 RB Offset
-	Emission Bandwidth	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	256QAM	25 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	256QAM	50 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	256QAM	75 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	256QAM	100 RB / 0 RB Offset
-	Emission Mask	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	256QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	256QAM	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	256QAM	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	256QAM	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Peak to Average Ratio	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	256QAM	1 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	256QAM	1 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	256QAM	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	256QAM	1 RB / 0 RB Offset
-	Conducted Emission	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	256QAM	1 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	256QAM	1 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	256QAM	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	20850 to 21350	21100 (2535.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset

Note: For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose 5MHz & 20 MHz channel bandwidth for final test.

LTE Band 12

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	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
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	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
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	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
		23060 to 23130	23060(704.0MHz), 23095(707.5 MHz), 23130(711.0 MHz)	10MHz	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
-	Frequency Stability	23017 to 23173	23017(699.7MHz), 23173(715.3MHz)	1.4MHz	256QAM	6 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23165(714.5MHz)	3MHz	256QAM	15 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23155(713.5MHz)	5MHz	256QAM	25 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23130(711.0MHz)	10MHz	256QAM	50 RB / 0 RB Offset
-	Emission Bandwidth	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	256QAM	6 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	256QAM	15 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	256QAM	25 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	256QAM	50 RB / 0 RB Offset
-	Band Edge	23017 to 23173	23017(699.7MHz), 23173(715.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23165(714.5MHz)	3MHz	256QAM	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23155(713.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23130(711.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Peak to Average Ratio	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	256QAM	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset
-	Conducted Emission	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	256QAM	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	23060 to 23130	23095(707.5MHz)	10MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset

Note: 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.

LTE Band 48

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Maximum Output Power	55265 to 56715	55265 (3552.5MHz), 55990 (3625.0MHz), 56715 (3697.5MHz)	5MHz	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
	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	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
	55315 to 56665	55315 (3557.5MHz), 55990 (3625.0MHz), 56665 (3692.5MHz)	15MHz	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
	55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	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
Frequency Stability	55265 to 56715	55265 (3552.5MHz), 56715 (3697.5MHz)	5MHz	256QAM	25 RB / 0 RB Offset
	55290 to 56690	55290 (3555.0MHz), 56690 (3695.0MHz)	10MHz	256QAM	50 RB / 0 RB Offset
	55315 to 56665	55315 (3557.5MHz), 56665 (3692.5MHz)	15MHz	256QAM	75 RB / 0 RB Offset
	55340 to 56640	55340 (3560.0MHz), 56640 (3690.0MHz)	20MHz	256QAM	100 RB / 0 RB Offset
Occupied Bandwidth	55265 to 56715	55265 (3552.5MHz), 55990 (3625.0MHz), 56715 (3697.5MHz)	5MHz	256QAM	25 RB / 0 RB Offset
	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	256QAM	50 RB / 0 RB Offset
	55315 to 56665	55315 (3557.5MHz), 55990 (3625.0MHz), 56665 (3692.5MHz)	15MHz	256QAM	75 RB / 0 RB Offset
	55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	256QAM	100 RB / 0 RB Offset
Peak to Average Ratio	55265 to 56715	55265 (3552.5MHz), 55990 (3625.0MHz), 56715 (3697.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset
	55315 to 56665	55315 (3557.5MHz), 55990 (3625.0MHz), 56665 (3692.5MHz)	15MHz	256QAM	1 RB / 0 RB Offset
	55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset

Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Conducted Emission	55265 to 56715	55265 (3552.5MHz), 55990 (3625.0MHz), 56715 (3697.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset
	55315 to 56665	55315 (3557.5MHz), 55990 (3625.0MHz), 56665 (3692.5MHz)	15MHz	256QAM	1 RB / 0 RB Offset
	55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset
Radiated Emission Below 1GHz	55340 to 56640	56640 (3690.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset
Radiated Emission Above 1GHz	55265 to 56715	55265 (3552.5MHz), 55990 (3625.0MHz), 56715 (3697.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
	55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset

Note: For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose 5MHz & 20 MHz channel bandwidth for final test.

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	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	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	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	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	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	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
-	Frequency Stability	131979 to 132665	131979 (1710.7MHz), 132665 (1779.3MHz)	1.4MHz	256QAM	6 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132657 (1778.5MHz)	3MHz	256QAM	15 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132647 (1777.5MHz)	5MHz	256QAM	25 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132622 (1775.0MHz)	10MHz	256QAM	50 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132597 (1772.5MHz)	15MHz	256QAM	75 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132572 (1770.0MHz)	20MHz	256QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Emission Bandwidth	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	256QAM	6 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	256QAM	15 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	256QAM	25 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	256QAM	50 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	256QAM	75 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	256QAM	100 RB / 0 RB Offset
-	Band Edge	131979 to 132665	131979 (1710.7MHz), 132665 (1779.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132657 (1778.5MHz)	3MHz	256QAM	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132647 (1777.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132622 (1775.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132597 (1772.5MHz)	15MHz	256QAM	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132572 (1770.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
-	Peak to Average Ratio	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	256QAM	1 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	256QAM	1 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	256QAM	1 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	256QAM	1 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	256QAM	1 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	132072 to 132572	132322 (1745.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	256QAM	1 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	256QAM	1 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	256QAM	1 RB / 0 RB Offset

Note: 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.

Test Condition:

Test Item	Environmental Conditions	Input Power (system)	Tested By
ERP	25deg. C, 70%RH	5Vdc	James Yang
Frequency Stability	24deg. C, 64%RH	5Vdc	James Yang
Occupied Bandwidth	24deg. C, 64%RH	5Vdc	James Yang
Band Edge	24deg. C, 64%RH	5Vdc	James Yang
Peak To Average Ratio	24deg. C, 64%RH	5Vdc	James Yang
Conducted Emission	24deg. C, 64%RH	5Vdc	James Yang
Radiated Emission	22deg. C, 68%RH 24deg. C, 64%RH	120Vac, 60Hz	Greg Lin Match Tsui

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 22

FCC 47 CFR Part 24

FCC 47 CFR Part 27

FCC 47 CFR Part 96

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

KDB 940660 D01 Part 96 CBRS Eqpt v02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

For n5:
Mobile / Portable station are limited to 7 watts e.r.p.

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

For LTE Band 7:
Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

For LTE Band 12:
Control and mobile stations in the 698-746 MHz, 746-757 MHz, 787-788 MHz and 805-806 MHz band are limited to 30 watts ERP.
Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink, 746-757 MHz,787-788 MHz and 805-806 MHz band are limited to 3 watts ERP.

For LTE Band 48

Device		Maximum Output Power (dBm/10 MHz)
☒	End User Device	23
☐	Category A CBSD	30
☐	Category B CBSD	47

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 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

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:
ERP or EIRP = P_{Meas} + G_T
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:

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

4.1.4 Test Results

Conducted Output Power (dBm)

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		165300	167300	169300
		Frequency (MHz)		826.5	836.5	846.5
5M	$\pi/2$ BPSK	1	0	23.02	22.89	**23.27**
		1	12	22.99	23.26	22.81
		1	24	23.06	22.96	22.91
		12	0	22.85	22.80	22.88
		12	6	22.51	22.89	22.56
		12	13	22.89	22.60	22.81
		25	0	22.92	22.98	22.63
	QPSK	1	0	22.81	22.85	22.84
		1	12	22.94	22.85	23.05
		1	24	22.81	**23.08**	23.03
		12	0	22.66	22.63	22.72
		12	6	22.67	22.65	22.62
		12	13	22.60	22.76	22.79
		25	0	22.81	22.71	22.78
	16QAM	1	0	22.83	23.03	22.96
		1	12	22.92	22.71	**23.05**
		1	24	22.85	22.87	22.69
		12	0	22.74	22.78	22.86
		12	6	22.65	22.83	22.55
		12	13	22.51	22.80	22.73
		25	0	22.68	22.44	22.71
	64QAM	1	0	22.37	22.45	22.45
		1	12	**22.62**	22.59	22.20
		1	24	22.34	22.45	22.31
		12	0	22.44	22.27	22.33
		12	6	22.17	22.00	22.01
		12	13	22.09	22.37	22.46
		25	0	22.08	22.37	22.43
	256QAM	1	0	20.07	20.06	19.90
		1	12	**20.30**	20.12	19.93
		1	24	19.87	19.69	19.62
		12	0	19.21	19.51	19.17
		12	6	19.61	19.43	19.39
		12	13	19.44	19.33	19.81
		25	0	19.43	19.11	19.34

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		165800	167300	168800
		Frequency (MHz)		829.0	836.5	844.0
10M	$\pi/2$ BPSK	1	0	22.98	**23.23**	23.14
		1	26	23.05	23.17	22.97
		1	51	23.11	23.18	22.98
		26	0	22.58	23.00	22.50
		26	13	22.97	22.56	22.57
		26	26	22.67	22.66	22.93
		52	0	22.97	22.73	22.77
	QPSK	1	0	23.04	22.84	23.03
		1	26	22.94	**23.09**	22.99
		1	51	23.07	22.88	22.82
		26	0	22.62	22.68	22.62
		26	13	22.78	22.88	22.62
		26	26	22.85	22.68	22.85
		52	0	22.83	22.85	22.63
	16QAM	1	0	22.81	22.77	22.97
		1	26	**23.09**	22.82	22.82
		1	51	22.81	22.62	22.79
		26	0	22.71	22.78	22.42
		26	13	22.61	22.73	22.59
		26	26	22.52	22.56	22.47
		52	0	22.56	22.54	22.41
	64QAM	1	0	22.21	22.23	22.43
		1	26	22.34	22.62	22.58
		1	51	**22.69**	22.62	22.51
		26	0	22.37	22.27	22.48
		26	13	22.43	22.14	21.92
		26	26	22.47	21.96	22.48
		52	0	22.28	22.40	22.26
	256QAM	1	0	19.68	19.72	19.94
		1	26	19.70	19.99	**20.05**
		1	51	19.85	19.65	19.79
		26	0	19.92	19.75	19.37
		26	13	19.95	19.58	19.64
		26	26	19.68	19.89	19.38
		52	0	19.78	19.88	19.23

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		166300	167300	168300
		Frequency (MHz)		831.5	836.5	841.5
15M	$\pi/2$ BPSK	1	0	22.96	23.08	**23.30**
		1	39	22.85	23.13	23.15
		1	78	22.90	23.16	22.90
		39	0	22.95	22.71	22.53
		39	19	22.92	22.60	22.96
		39	40	22.75	23.00	22.92
		79	0	22.74	22.96	22.71
	QPSK	1	0	22.96	22.83	23.01
		1	39	**23.03**	22.87	22.91
		1	78	22.87	22.88	22.86
		39	0	22.79	22.72	22.63
		39	19	22.85	22.75	22.86
		39	40	22.90	22.72	22.88
		79	0	22.69	22.85	22.76
	16QAM	1	0	22.84	22.70	23.08
		1	39	22.63	23.06	**23.10**
		1	78	22.89	22.77	22.80
		39	0	22.54	22.85	22.69
		39	19	22.60	22.70	22.70
		39	40	22.62	22.53	22.79
		79	0	22.40	22.47	22.44
	64QAM	1	0	22.39	22.37	22.53
		1	39	22.24	22.59	22.51
		1	78	**22.68**	22.53	22.65
		39	0	21.92	21.98	22.37
		39	19	22.36	22.42	22.46
		39	40	22.15	22.47	22.13
		79	0	22.24	22.22	22.12
	256QAM	1	0	**20.24**	19.71	19.70
		1	39	20.11	20.07	20.05
		1	78	20.15	20.17	20.18
		39	0	19.71	19.17	19.99
		39	19	19.86	19.91	19.78
		39	40	19.82	19.19	19.65
		79	0	19.70	19.98	19.84

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		166800	167300	167800
		Frequency (MHz)		834	836.5	839
20M	$\pi/2$ BPSK	1	0	23.22	23.15	23.08
		1	53	23.02	**23.25**	22.96
		1	105	23.24	23.07	23.03
		50	0	22.95	22.55	22.63
		50	25	22.57	22.85	22.50
		50	50	22.86	22.96	22.90
		106	0	22.50	22.99	22.61
	QPSK	1	0	23.03	23.02	22.82
		1	53	**23.06**	22.90	23.05
		1	105	22.90	23.02	22.83
		50	0	22.84	22.73	22.87
		50	25	22.85	22.87	22.75
		50	50	22.87	22.87	22.90
		106	0	22.63	22.82	22.86
	16QAM	1	0	22.73	22.69	22.91
		1	53	22.83	22.84	22.99
		1	105	22.79	22.86	**23.04**
		50	0	22.66	22.77	22.48
		50	25	22.45	22.49	22.76
		50	50	22.71	22.86	22.43
		106	0	22.51	22.79	22.66
	64QAM	1	0	22.51	22.35	**22.68**
		1	53	22.34	22.53	22.65
		1	105	22.38	22.42	22.30
		50	0	22.08	22.09	22.23
		50	25	21.96	21.91	22.03
		50	50	22.02	22.16	22.16
		106	0	22.30	22.36	22.40
	256QAM	1	0	19.79	20.05	20.21
		1	53	20.12	19.77	19.85
		1	105	**20.30**	19.79	19.71
		50	0	19.89	19.84	19.29
		50	25	19.50	19.98	19.94
		50	50	19.43	19.21	19.98
		106	0	19.75	19.11	19.59

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	256QAM	1	0	19.69	20.07	20.09
		1	2	20.12	19.80	19.86
		1	5	20.20	20.02	19.78
		3	0	19.61	20.12	20.04
		3	1	**20.22**	20.12	20.09
		3	3	19.80	20.06	19.82
		6	0	20.19	20.02	19.99
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	256QAM	1	0	20.04	20.03	19.97
		1	7	19.81	20.05	19.76
		1	14	20.25	20.25	19.76
		8	0	**20.29**	20.09	19.79
		8	3	20.08	20.08	19.84
		8	7	19.69	20.11	19.71
		15	0	19.86	19.73	19.70
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	256QAM	1	0	20.12	19.72	19.86
		1	12	19.66	20.24	19.72
		1	24	**20.29**	19.77	19.69
		12	0	19.83	20.15	19.74
		12	6	20.02	20.12	19.99
		12	13	19.94	19.73	20.02
		25	0	19.82	19.93	19.98

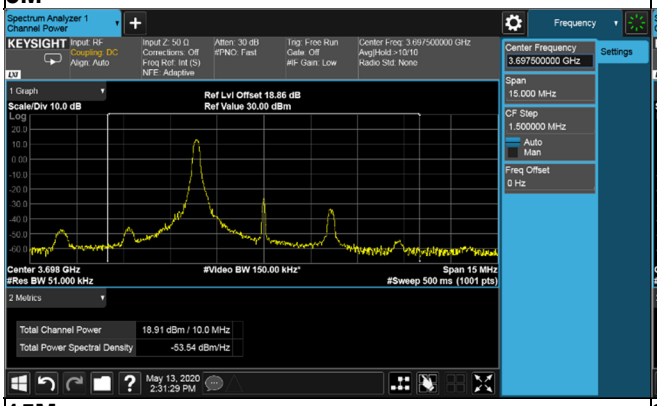
LTE Band 2						
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	256QAM	1	0	19.80	19.88	20.26
		1	24	19.92	20.30	20.16
		1	49	19.75	**20.43**	19.84
		25	0	20.01	19.99	20.26
		25	12	20.17	20.11	20.06
		25	25	19.84	19.84	20.06
		50	0	20.22	20.32	20.34
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	256QAM	1	0	19.73	20.00	19.93
		1	37	19.84	19.85	19.95
		1	74	19.80	19.87	19.80
		36	0	20.40	20.11	20.07
		36	19	20.09	20.41	20.17
		36	39	20.05	20.32	20.09
		75	0	20.30	**20.45**	20.15
BW	MCS Index	Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	256QAM	1	0	20.10	20.39	19.72
		1	50	**20.43**	19.88	19.95
		1	99	19.97	19.83	20.08
		50	0	19.59	20.17	19.72
		50	25	19.98	20.33	20.27
		50	50	19.91	20.06	20.14
		100	0	19.85	19.77	20.20

LTE Band 7						
BW	MCS Index	Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	256QAM	1	0	19.91	19.99	**20.27**
		1	12	20.06	19.96	19.80
		1	24	19.90	19.91	19.83
		12	0	19.68	19.55	20.21
		12	6	20.07	20.02	19.57
		12	13	20.20	20.05	20.23
		25	0	19.85	19.79	20.00
BW	MCS Index	Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	256QAM	1	0	20.05	20.04	20.25
		1	24	19.62	20.10	**20.30**
		1	49	19.81	19.95	19.55
		25	0	20.18	19.84	19.68
		25	12	19.75	20.00	20.26
		25	25	19.78	19.79	20.22
		50	0	20.02	19.75	19.93
BW	MCS Index	Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	256QAM	1	0	**20.24**	20.16	20.19
		1	37	20.16	19.97	19.93
		1	74	19.74	19.93	19.50
		36	0	19.74	19.96	19.99
		36	19	20.19	19.56	19.84
		36	39	19.77	19.71	19.47
		75	0	19.62	19.63	20.11
BW	MCS Index	Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	256QAM	1	0	20.16	19.61	**20.30**
		1	50	20.08	20.07	19.72
		1	99	19.96	20.10	19.47
		50	0	20.05	19.71	19.55
		50	25	19.77	19.79	20.30
		50	50	19.95	19.56	19.84
		100	0	19.66	19.73	19.78

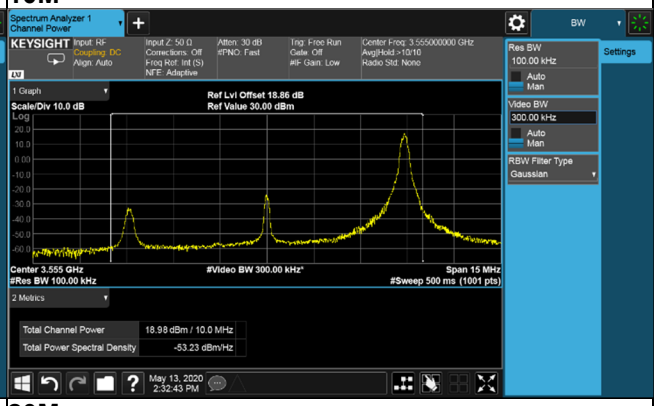
LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	256QAM	1	0	19.79	19.24	20.00
		1	2	19.41	19.30	19.14
		1	5	19.43	19.36	19.34
		3	0	19.55	19.51	19.16
		3	1	19.89	19.33	19.28
		3	3	**20.04**	19.53	19.54
		6	0	19.96	19.73	19.86
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	256QAM	1	0	19.39	**19.98**	19.86
		1	7	19.58	19.61	19.48
		1	14	19.48	19.97	19.53
		8	0	19.95	19.73	19.45
		8	3	19.80	19.73	19.50
		8	7	19.70	19.56	19.42
		15	0	19.92	19.30	19.23
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	256QAM	1	0	19.93	19.65	19.84
		1	12	19.33	19.97	19.64
		1	24	19.47	**19.97**	19.23
		12	0	19.66	19.29	19.16
		12	6	19.90	19.31	19.41
		12	13	19.61	19.31	19.72
		25	0	19.40	19.49	19.42
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	256QAM	1	0	19.56	19.56	19.56
		1	24	**19.96**	19.51	19.39
		1	49	19.62	19.66	19.73
		25	0	19.49	19.69	19.88
		25	12	19.38	19.96	19.71
		25	25	19.42	19.75	19.82
		50	0	19.93	19.48	19.64

LTE Band 48 (Per 10M)						
BW	MCS Index	Channel		55265	55990	56715
		Frequency (MHz)		3552.5	3625	3697.5
5M	256QAM	1	0	18.54	18.77	**18.91**
		1	12	18.74	18.79	18.83
		1	24	18.59	18.50	18.71
		12	0	17.69	18.19	17.30
		12	6	17.77	18.32	17.91
		12	13	18.09	17.70	18.12
		25	0	18.30	18.19	18.07
BW	MCS Index	Channel		55290	55990	56690
		Frequency (MHz)		3555	3625	3695
10M	256QAM	1	0	18.58	18.39	18.67
		1	24	18.52	18.71	18.48
		1	49	**18.98**	18.69	18.63
		25	0	17.72	18.11	18.01
		25	12	17.88	18.27	18.04
		25	25	17.97	18.19	17.78
		50	0	17.80	18.30	17.57
BW	MCS Index	Channel		55315	55990	56665
		Frequency (MHz)		3557.5	3625	3692.5
15M	256QAM	1	0	**18.79**	18.27	18.32
		1	37	18.23	18.67	18.25
		1	74	18.06	18.56	18.54
		36	0	17.90	17.87	17.45
		36	19	17.39	17.82	17.75
		36	39	18.18	17.88	17.79
		75	0	17.59	17.63	17.55
BW	MCS Index	Channel		55340	55990	56640
		Frequency (MHz)		3560	3625	3690
20M	256QAM	1	0	18.15	18.30	**18.57**
		1	50	18.55	18.47	18.49
		1	99	18.40	17.98	18.25
		50	0	17.50	17.45	17.56
		50	25	17.58	17.43	17.57
		50	50	17.36	17.06	17.89
		100	0	17.42	18.12	17.31

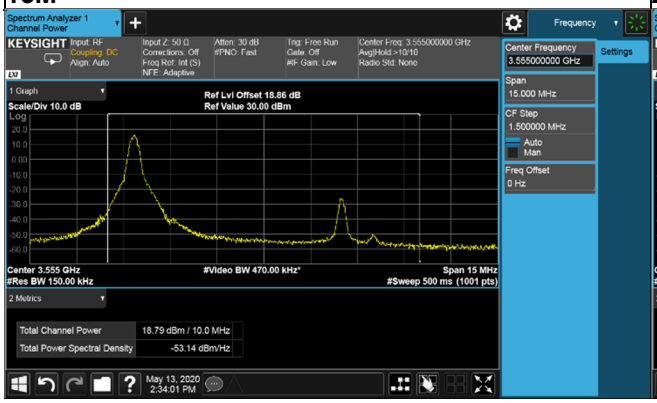
5M



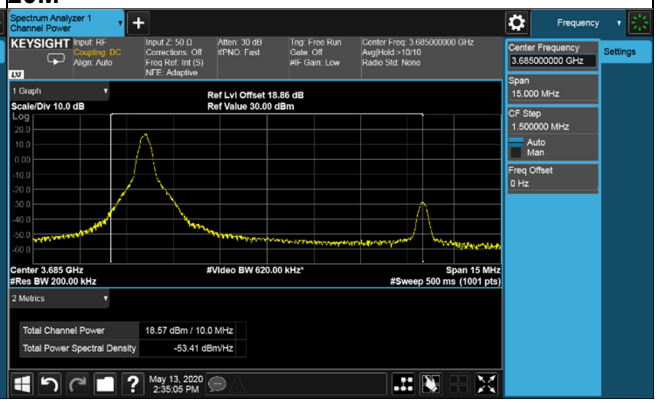
10M



15M

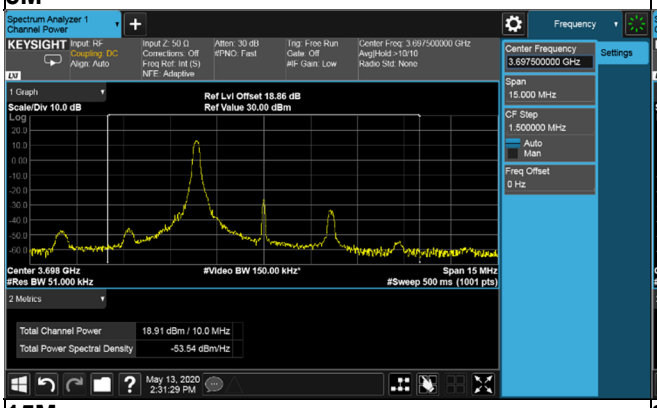


20M

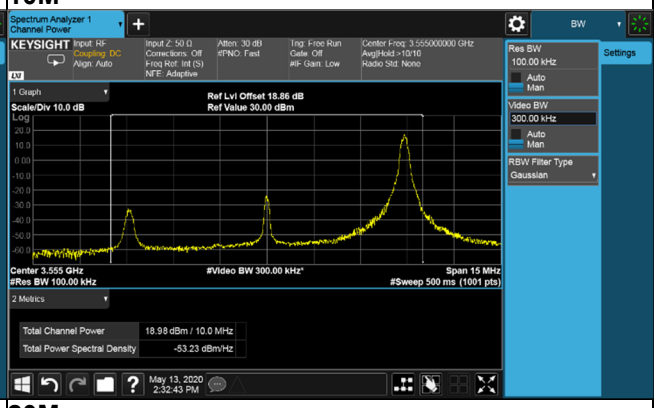


LTE Band 48 (Full Power)						
BW	MCS Index	Channel		55265	55990	56715
		Frequency (MHz)		3552.5	3625	3697.5
5M	256QAM	1	0	18.54	18.77	**18.91**
		1	12	18.74	18.79	18.83
		1	24	18.59	18.50	18.71
		12	0	17.69	18.19	17.30
		12	6	17.77	18.32	17.91
		12	13	18.09	17.70	18.12
		25	0	18.30	18.19	18.07
BW	MCS Index	Channel		55290	55990	56690
		Frequency (MHz)		3555	3625	3695
10M	256QAM	1	0	18.58	18.39	18.67
		1	24	18.52	18.71	18.48
		1	49	**18.98**	18.69	18.63
		25	0	17.72	18.11	18.01
		25	12	17.88	18.27	18.04
		25	25	17.97	18.19	17.78
		50	0	17.80	18.30	17.57
BW	MCS Index	Channel		55315	55990	56665
		Frequency (MHz)		3557.5	3625	3692.5
15M	256QAM	1	0	**18.93**	18.37	18.64
		1	37	18.44	18.81	18.47
		1	74	18.31	18.89	18.75
		36	0	18.04	18.06	17.62
		36	19	17.50	18.13	17.87
		36	39	18.46	18.26	18.03
		75	0	17.73	18.01	17.89
BW	MCS Index	Channel		55340	55990	56640
		Frequency (MHz)		3560	3625	3690
20M	256QAM	1	0	18.29	18.51	18.82
		1	50	**18.92**	18.63	18.75
		1	99	18.67	18.29	18.40
		50	0	17.77	17.83	17.85
		50	25	17.89	17.75	17.91
		50	50	17.69	17.45	17.99
		100	0	17.70	18.39	17.42

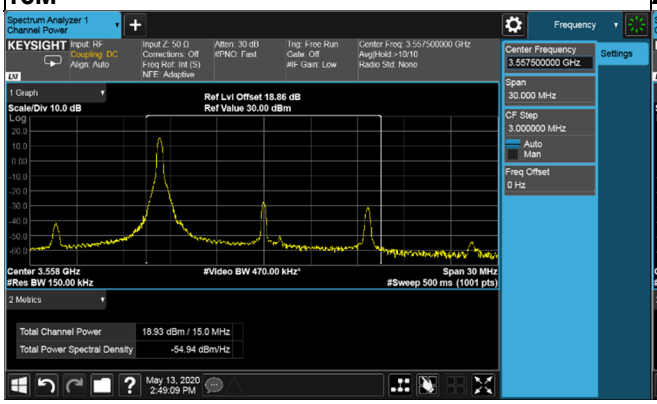
5M



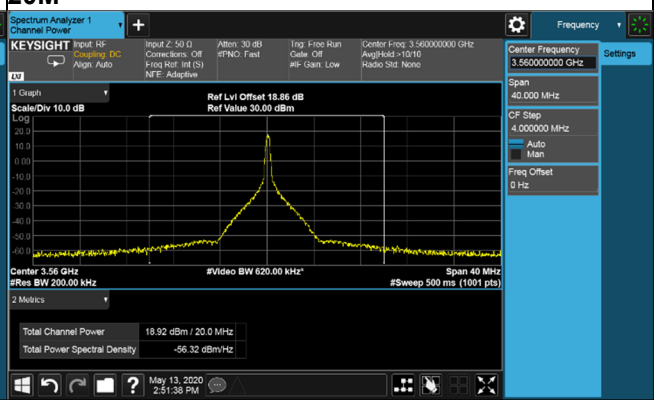
10M



15M



20M



LTE Band 66						
BW	MCS Index	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	256QAM	1	0	19.72	19.71	19.90
		1	2	19.92	20.09	19.66
		1	5	**20.17**	19.78	19.65
		3	0	20.17	19.81	19.67
		3	1	20.11	19.83	19.72
		3	3	20.00	19.81	20.14
		6	0	19.94	19.53	20.07
BW	MCS Index	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	256QAM	1	0	20.04	19.87	19.86
		1	7	19.90	19.80	19.83
		1	14	19.56	19.91	19.72
		8	0	19.93	**20.12**	19.82
		8	3	19.78	19.94	19.77
		8	7	20.05	19.52	19.84
		15	0	19.94	19.47	20.06
BW	MCS Index	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	256QAM	1	0	19.85	20.02	19.66
		1	12	20.04	20.07	19.93
		1	24	**20.17**	19.71	19.83
		12	0	19.88	19.52	19.68
		12	6	19.80	19.49	19.76
		12	13	20.04	19.81	19.86
		25	0	19.96	19.52	19.81

LTE Band 66						
BW	MCS Index	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	256QAM	1	0	19.66	19.67	20.14
		1	24	20.06	20.01	19.68
		1	49	19.72	19.99	19.95
		25	0	19.67	19.95	20.06
		25	12	19.79	19.66	**20.22**
		25	25	19.86	19.98	19.83
		50	0	20.20	19.94	19.67
BW	MCS Index	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	256QAM	1	0	19.76	19.82	20.19
		1	37	20.11	20.11	19.88
		1	74	19.88	19.66	19.66
		36	0	19.58	19.70	19.93
		36	19	20.07	19.53	19.99
		36	39	20.12	19.72	20.03
		75	0	**20.20**	19.59	20.13
BW	MCS Index	Channel		132072	132322	132575
		Frequency (MHz)		1720	1745	1770
20M	256QAM	1	0	19.87	19.99	20.02
		1	50	**20.05**	19.54	19.93
		1	99	19.80	19.65	19.66
		50	0	19.91	19.78	20.02
		50	25	20.00	19.83	19.96
		50	50	19.87	19.87	19.98
		100	0	19.82	19.81	19.93

ERP Power (dBm)

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		165300	167300	169300
		Frequency (MHz)		826.5	836.5	846.5
5M	$\pi/2$ BPSK	1	0	24.68	24.55	**24.93**
		1	12	24.65	24.92	24.47
		1	24	24.72	24.62	24.57
		12	0	24.51	24.46	24.54
		12	6	24.17	24.55	24.22
		12	13	24.55	24.26	24.47
		25	0	24.58	24.64	24.29
	QPSK	1	0	24.47	24.51	24.50
		1	12	24.60	24.51	24.71
		1	24	24.47	**24.74**	24.69
		12	0	24.32	24.29	24.38
		12	6	24.33	24.31	24.28
		12	13	24.26	24.42	24.45
		25	0	24.47	24.37	24.44
	16QAM	1	0	24.49	24.69	24.62
		1	12	24.58	24.37	**24.71**
		1	24	24.51	24.53	24.35
		12	0	24.40	24.44	24.52
		12	6	24.31	24.49	24.21
		12	13	24.17	24.46	24.39
		25	0	24.34	24.10	24.37
	64QAM	1	0	24.03	24.11	24.11
		1	12	**24.28**	24.25	23.86
		1	24	24.00	24.11	23.97
		12	0	24.10	23.93	23.99
		12	6	23.83	23.66	23.67
		12	13	23.75	24.03	24.12
		25	0	23.74	24.03	24.09
	256QAM	1	0	21.73	21.72	21.56
		1	12	**21.96**	21.78	21.59
		1	24	21.53	21.35	21.28
		12	0	20.87	21.17	20.83
		12	6	21.27	21.09	21.05
		12	13	21.10	20.99	21.47
		25	0	21.09	20.77	21.00

*ERP = Conducted + antenna gain (3.81dBi)-2.15

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		165800	167300	168800
		Frequency (MHz)		829.0	836.5	844.0
10M	$\pi/2$ BPSK	1	0	24.64	**24.89**	24.80
		1	26	24.71	24.83	24.63
		1	51	24.77	24.84	24.64
		26	0	24.24	24.66	24.16
		26	13	24.63	24.22	24.23
		26	26	24.33	24.32	24.59
		52	0	24.63	24.39	24.43
	QPSK	1	0	24.70	24.50	24.69
		1	26	24.60	**24.75**	24.65
		1	51	24.73	24.54	24.48
		26	0	24.28	24.34	24.28
		26	13	24.44	24.54	24.28
		26	26	24.51	24.34	24.51
		52	0	24.49	24.51	24.29
	16QAM	1	0	24.47	24.43	24.63
		1	26	**24.75**	24.48	24.48
		1	51	24.47	24.28	24.45
		26	0	24.37	24.44	24.08
		26	13	24.27	24.39	24.25
		26	26	24.18	24.22	24.13
		52	0	24.22	24.20	24.07
	64QAM	1	0	23.87	23.89	24.09
		1	26	24.00	24.28	24.24
		1	51	**24.35**	24.28	24.17
		26	0	24.03	23.93	24.14
		26	13	24.09	23.80	23.58
		26	26	24.13	23.62	24.14
		52	0	23.94	24.06	23.92
	256QAM	1	0	21.34	21.38	21.60
		1	26	21.36	21.65	**21.71**
		1	51	21.51	21.31	21.45
		26	0	21.58	21.41	21.03
		26	13	21.61	21.24	21.30
		26	26	21.34	21.55	21.04
		52	0	21.44	21.54	20.89

*ERP = Conducted + antenna gain (3.81dBi)-2.15

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		166300	167300	168300
		Frequency (MHz)		831.5	836.5	841.5
15M	$\pi/2$ BPSK	1	0	24.62	24.74	**24.96**
		1	39	24.51	24.79	24.81
		1	78	24.56	24.82	24.56
		39	0	24.61	24.37	24.19
		39	19	24.58	24.26	24.62
		39	40	24.41	24.66	24.58
		79	0	24.40	24.62	24.37
	QPSK	1	0	24.62	24.49	24.67
		1	39	**24.69**	24.53	24.57
		1	78	24.53	24.54	24.52
		39	0	24.45	24.38	24.29
		39	19	24.51	24.41	24.52
		39	40	24.56	24.38	24.54
		79	0	24.35	24.51	24.42
	16QAM	1	0	24.50	24.36	24.74
		1	39	24.29	24.72	**24.76**
		1	78	24.55	24.43	24.46
		39	0	24.20	24.51	24.35
		39	19	24.26	24.36	24.36
		39	40	24.28	24.19	24.45
		79	0	24.06	24.13	24.10
	64QAM	1	0	24.05	24.03	24.19
		1	39	23.90	24.25	24.17
		1	78	**24.34**	24.19	24.31
		39	0	23.58	23.64	24.03
		39	19	24.02	24.08	24.12
		39	40	23.81	24.13	23.79
		79	0	23.90	23.88	23.78
	256QAM	1	0	**21.90**	21.37	21.36
		1	39	21.77	21.73	21.71
		1	78	21.81	21.83	21.84
		39	0	21.37	20.83	21.65
		39	19	21.52	21.57	21.44
		39	40	21.48	20.85	21.31
		79	0	21.36	21.64	21.50

*ERP = Conducted + antenna gain (3.81dBi)-2.15

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		166800	167300	167800
		Frequency (MHz)		834	836.5	839
20M	$\pi/2$ BPSK	1	0	24.88	24.81	24.74
		1	53	24.68	**24.91**	24.62
		1	105	24.90	24.73	24.69
		50	0	24.61	24.21	24.29
		50	25	24.23	24.51	24.16
		50	50	24.52	24.62	24.56
		106	0	24.16	24.65	24.27
	QPSK	1	0	24.39	24.35	24.57
		1	53	24.49	24.50	24.65
		1	105	24.45	24.52	**24.70**
		50	0	24.32	24.43	24.14
		50	25	24.11	24.15	24.42
		50	50	24.37	24.52	24.09
		106	0	24.17	24.45	24.32
	16QAM	1	0	24.17	24.01	**24.34**
		1	53	24.00	24.19	24.31
		1	105	24.04	24.08	23.96
		50	0	23.74	23.75	23.89
		50	25	23.62	23.57	23.69
		50	50	23.68	23.82	23.82
		106	0	23.96	24.02	24.06
	64QAM	1	0	21.45	21.71	21.87
		1	53	21.78	21.43	21.51
		1	105	**21.96**	21.45	21.37
		50	0	21.55	21.50	20.95
		50	25	21.16	21.64	21.60
		50	50	21.09	20.87	21.64
		106	0	21.41	20.77	21.25
	256QAM	1	0	21.45	21.71	21.87
		1	53	21.78	21.43	21.51
		1	105	**21.96**	21.45	21.37
		50	0	21.55	21.50	20.95
		50	25	21.16	21.64	21.60
		50	50	21.09	20.87	21.64
		106	0	21.41	20.77	21.25

*ERP = Conducted + antenna gain (3.81dBi)-2.15

LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	256QAM	1	0	22.05	21.50	22.26
		1	2	21.67	21.56	21.40
		1	5	21.69	21.62	21.60
		3	0	21.81	21.77	21.42
		3	1	22.15	21.59	21.54
		3	3	**22.30**	21.79	21.80
		6	0	22.22	21.99	22.12
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	256QAM	1	0	21.65	**22.24**	22.12
		1	7	21.84	21.87	21.74
		1	14	21.74	22.23	21.79
		8	0	22.21	21.99	21.71
		8	3	22.06	21.99	21.76
		8	7	21.96	21.82	21.68
		15	0	22.18	21.56	21.49
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	256QAM	1	0	22.19	21.91	22.10
		1	12	21.59	22.23	21.90
		1	24	21.73	**22.23**	21.49
		12	0	21.92	21.55	21.42
		12	6	22.16	21.57	21.67
		12	13	21.87	21.57	21.98
		25	0	21.66	21.75	21.68
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	256QAM	1	0	21.82	21.82	21.82
		1	24	**22.22**	21.77	21.65
		1	49	21.88	21.92	21.99
		25	0	21.75	21.95	22.14
		25	12	21.64	22.22	21.97
		25	25	21.68	22.01	22.08
		50	0	22.19	21.74	21.90

*ERP = Conducted + antenna gain (4.41dBi)-2.15

EIRP

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	256QAM	1	0	23.96	24.34	24.36
		1	2	24.39	24.07	24.13
		1	5	24.47	24.29	24.05
		3	0	23.88	24.39	24.31
		3	1	**24.49**	24.39	24.36
		3	3	24.07	24.33	24.09
		6	0	24.46	24.29	24.26
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	256QAM	1	0	24.31	24.30	24.24
		1	7	24.08	24.32	24.03
		1	14	24.52	24.52	24.03
		8	0	**24.56**	24.36	24.06
		8	3	24.35	24.35	24.11
		8	7	23.96	24.38	23.98
		15	0	24.13	24.00	23.97
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	256QAM	1	0	24.39	23.99	24.13
		1	12	23.93	24.51	23.99
		1	24	**24.56**	24.04	23.96
		12	0	24.10	24.42	24.01
		12	6	24.29	24.39	24.26
		12	13	24.21	24.00	24.29
		25	0	24.09	24.20	24.25

*EIRP = Conducted + antenna gain (4.27dBi)

LTE Band 2						
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	256QAM	1	0	24.07	24.15	24.53
		1	24	24.19	24.57	24.43
		1	49	24.02	**24.70**	24.11
		25	0	24.28	24.26	24.53
		25	12	24.44	24.38	24.33
		25	25	24.11	24.11	24.33
		50	0	24.49	24.59	24.61
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	256QAM	1	0	24.00	24.27	24.20
		1	37	24.11	24.12	24.22
		1	74	24.07	24.14	24.07
		36	0	24.67	24.38	24.34
		36	19	24.36	24.68	24.44
		36	39	24.32	24.59	24.36
		75	0	24.57	**24.72**	24.42
BW	MCS Index	Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	256QAM	1	0	24.37	24.66	23.99
		1	50	**24.70**	24.15	24.22
		1	99	24.24	24.10	24.35
		50	0	23.86	24.44	23.99
		50	25	24.25	24.60	24.54
		50	50	24.18	24.33	24.41
		100	0	24.12	24.04	24.47

*EIRP = Conducted + antenna gain (4.27dBi)

LTE Band 7						
BW	MCS Index	Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	256QAM	1	0	25.22	25.30	**25.58**
		1	12	25.37	25.27	25.11
		1	24	25.21	25.22	25.14
		12	0	24.99	24.86	25.52
		12	6	25.38	25.33	24.88
		12	13	25.51	25.36	25.54
		25	0	25.16	25.10	25.31
BW	MCS Index	Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	256QAM	1	0	25.36	25.35	25.56
		1	24	24.93	25.41	**25.61**
		1	49	25.12	25.26	24.86
		25	0	25.49	25.15	24.99
		25	12	25.06	25.31	25.57
		25	25	25.09	25.10	25.53
		50	0	25.33	25.06	25.24
BW	MCS Index	Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	256QAM	1	0	**25.55**	25.47	25.50
		1	37	25.47	25.28	25.24
		1	74	25.05	25.24	24.81
		36	0	25.05	25.27	25.30
		36	19	25.50	24.87	25.15
		36	39	25.08	25.02	24.78
		75	0	24.93	24.94	25.42
BW	MCS Index	Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	256QAM	1	0	25.47	24.92	**25.61**
		1	50	25.39	25.38	25.03
		1	99	25.27	25.41	24.78
		50	0	25.36	25.02	24.86
		50	25	25.08	25.10	25.61
		50	50	25.26	24.87	25.15
		100	0	24.97	25.04	25.09

*EIRP = Conducted + antenna gain (5.31dBi)

LTE Band 48 (Per 10M)						
BW	MCS Index	Channel		55265	55990	56715
		Frequency (MHz)		3552.5	3625	3697.5
5M	256QAM	1	0	19.46	19.69	**19.83**
		1	12	19.66	19.71	19.75
		1	24	19.51	19.42	19.63
		12	0	18.61	19.11	18.22
		12	6	18.69	19.24	18.83
		12	13	19.01	18.62	19.04
		25	0	19.22	19.11	18.99
BW	MCS Index	Channel		55290	55990	56690
		Frequency (MHz)		3555	3625	3695
10M	256QAM	1	0	19.50	19.31	19.59
		1	24	19.44	19.63	19.40
		1	49	**19.90**	19.61	19.55
		25	0	18.64	19.03	18.93
		25	12	18.80	19.19	18.96
		25	25	18.89	19.11	18.70
		50	0	18.72	19.22	18.49
BW	MCS Index	Channel		55315	55990	56665
		Frequency (MHz)		3557.5	3625	3692.5
15M	256QAM	1	0	**19.71**	19.19	19.24
		1	37	19.15	19.59	19.17
		1	74	18.98	19.48	19.46
		36	0	18.82	18.79	18.37
		36	19	18.31	18.74	18.67
		36	39	19.10	18.80	18.71
		75	0	18.51	18.55	18.47
BW	MCS Index	Channel		55340	55990	56640
		Frequency (MHz)		3560	3625	3690
20M	256QAM	1	0	19.07	19.22	**19.49**
		1	50	19.47	19.39	19.41
		1	99	19.32	18.90	19.17
		50	0	18.42	18.37	18.48
		50	25	18.50	18.35	18.49
		50	50	18.28	17.98	18.81
		100	0	18.34	19.04	18.23

*EIRP = Conducted + antenna gain (0.92dBi)

LTE Band 48 (Full Power)						
BW	MCS Index	Channel		55265	55990	56715
		Frequency (MHz)		3552.5	3625	3697.5
5M	256QAM	1	0	19.46	19.69	**19.83**
		1	12	19.66	19.71	19.75
		1	24	19.51	19.42	19.63
		12	0	18.61	19.11	18.22
		12	6	18.69	19.24	18.83
		12	13	19.01	18.62	19.04
		25	0	19.22	19.11	18.99
BW	MCS Index	Channel		55290	55990	56690
		Frequency (MHz)		3555	3625	3695
10M	256QAM	1	0	19.50	19.31	19.59
		1	24	19.44	19.63	19.40
		1	49	**19.90**	19.61	19.55
		25	0	18.64	19.03	18.93
		25	12	18.80	19.19	18.96
		25	25	18.89	19.11	18.70
		50	0	18.72	19.22	18.49
BW	MCS Index	Channel		55315	55990	56665
		Frequency (MHz)		3557.5	3625	3692.5
15M	256QAM	1	0	**19.85**	19.29	19.56
		1	37	19.36	19.73	19.39
		1	74	19.23	19.81	19.67
		36	0	18.96	18.98	18.54
		36	19	18.42	19.05	18.79
		36	39	19.38	19.18	18.95
		75	0	18.65	18.93	18.81
BW	MCS Index	Channel		55340	55990	56640
		Frequency (MHz)		3560	3625	3690
20M	256QAM	1	0	19.21	19.43	19.74
		1	50	**19.84**	19.55	19.67
		1	99	19.59	19.21	19.32
		50	0	18.69	18.75	18.77
		50	25	18.81	18.67	18.83
		50	50	18.61	18.37	18.91
		100	0	18.62	19.31	18.34

*EIRP = Conducted + antenna gain (0.92dBi)

LTE Band 66						
BW	MCS Index	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	256QAM	1	0	23.99	23.98	24.17
		1	2	24.19	24.36	23.93
		1	5	**24.44**	24.05	23.92
		3	0	24.44	24.08	23.94
		3	1	24.38	24.10	23.99
		3	3	24.27	24.08	24.41
		6	0	24.21	23.80	24.34
BW	MCS Index	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	256QAM	1	0	24.31	24.14	24.13
		1	7	24.17	24.07	24.10
		1	14	23.83	24.18	23.99
		8	0	24.20	**24.39**	24.09
		8	3	24.05	24.21	24.04
		8	7	24.32	23.79	24.11
		15	0	24.21	23.74	24.33
BW	MCS Index	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	256QAM	1	0	24.12	24.29	23.93
		1	12	24.31	24.34	24.20
		1	24	**24.44**	23.98	24.10
		12	0	24.15	23.79	23.95
		12	6	24.07	23.76	24.03
		12	13	24.31	24.08	24.13
		25	0	24.23	23.79	24.08

*EIRP = Conducted + antenna gain (4.27dBi)

LTE Band 66						
BW	MCS Index	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	256QAM	1	0	23.93	23.94	24.41
		1	24	24.33	24.28	23.95
		1	49	23.99	24.26	24.22
		25	0	23.94	24.22	24.33
		25	12	24.06	23.93	**24.49**
		25	25	24.13	24.25	24.10
		50	0	24.47	24.21	23.94
BW	MCS Index	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	256QAM	1	0	24.03	24.09	24.46
		1	37	24.38	24.38	24.15
		1	74	24.15	23.93	23.93
		36	0	23.85	23.97	24.20
		36	19	24.34	23.80	24.26
		36	39	24.39	23.99	24.30
		75	0	**24.47**	23.86	24.40
BW	MCS Index	Channel		132072	132322	132575
		Frequency (MHz)		1720	1745	1770
20M	256QAM	1	0	24.14	24.26	24.29
		1	50	**24.32**	23.81	24.20
		1	99	24.07	23.92	23.93
		50	0	24.18	24.05	24.29
		50	25	24.27	24.10	24.23
		50	50	24.14	24.14	24.25
		100	0	24.09	24.08	24.20

*EIRP = Conducted + antenna gain (4.27dBi)

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

n5	
Spectrum Plot of Measurement Value	
Channel: 167300 / Frequency (MHz): 836.5MHz	
$\pi/2$ BPSK	QPSK
	
16QAM	64QAM
	
256QAM	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

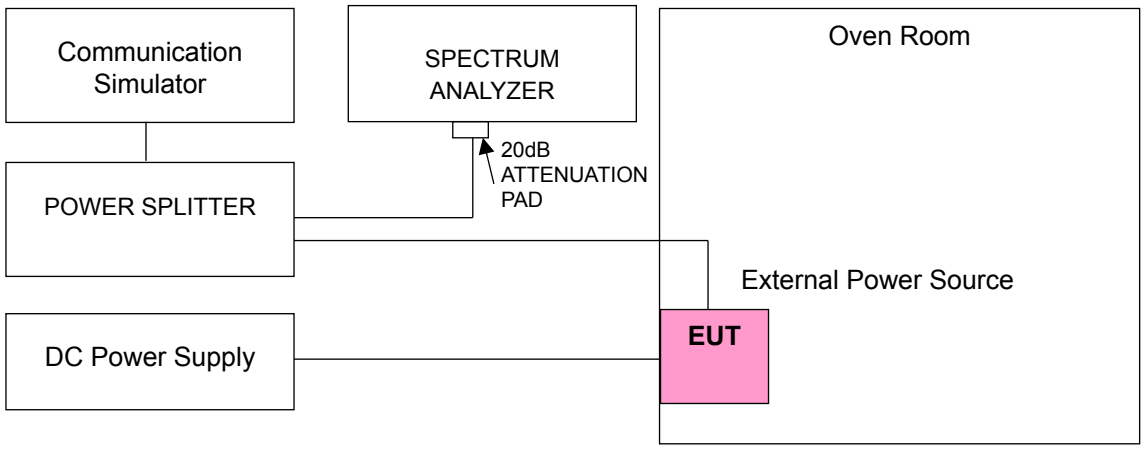
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	n5			
	Channel Bandwidth: 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	826.500003	0.003	846.500004	0.004
5	826.500002	0.003	846.500002	0.002
5.75	826.500001	0.001	846.500002	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n5			
	Channel Bandwidth: 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	826.500002	0.003	846.500002	0.002
-20	826.500003	0.004	846.500002	0.002
-10	826.500004	0.005	846.500003	0.004
0	826.500002	0.003	846.500002	0.002
10	826.500002	0.002	846.500004	0.005
20	826.499997	-0.004	846.499998	-0.002
30	826.499998	-0.003	846.499997	-0.004
40	826.499996	-0.004	846.499997	-0.004
50	826.499998	-0.002	846.499997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	n5			
	Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	829.000003	0.003	844.000003	0.003
5	829.000003	0.004	844.000004	0.005
5.75	829.000003	0.004	844.000003	0.003

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n5			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	829.000002	0.002	844.000002	0.002
-20	829.000002	0.002	844.000004	0.004
-10	829.000002	0.002	844.000003	0.003
0	829.000002	0.003	844.000004	0.005
10	829.000002	0.002	844.000003	0.004
20	828.999998	-0.003	843.999997	-0.004
30	828.999996	-0.004	843.999999	-0.002
40	828.999997	-0.004	843.999996	-0.004
50	828.999999	-0.001	843.999999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	n5			
	Channel Bandwidth: 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	831.500002	0.002	841.500001	0.001
5	831.500002	0.002	841.500003	0.003
5.75	831.500001	0.001	841.500003	0.004

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n5			
	Channel Bandwidth: 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	831.500003	0.004	841.500002	0.003
-20	831.500003	0.003	841.500002	0.003
-10	831.500002	0.002	841.500003	0.004
0	831.500004	0.004	841.500002	0.003
10	831.500002	0.002	841.500002	0.003
20	831.499998	-0.003	841.499997	-0.004
30	831.499998	-0.002	841.499998	-0.003
40	831.499997	-0.003	841.499996	-0.005
50	831.499998	-0.002	841.499997	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	n5			
	Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	834.000002	0.002	839.000001	0.001
5	834.000002	0.003	839.000002	0.002
5.75	834.000003	0.003	839.000002	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	n5			
	Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	834.000002	0.002	839.000002	0.002
-20	834.000003	0.003	839.000002	0.002
-10	834.000001	0.001	839.000004	0.004
0	834.000004	0.004	839.000002	0.002
10	834.000003	0.004	839.000003	0.003
20	833.999999	-0.002	838.999997	-0.004
30	833.999999	-0.001	838.999997	-0.004
40	833.999997	-0.003	838.999997	-0.004
50	833.999998	-0.002	838.999998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1850.700002	0.001	1909.300000	0.002
5	1850.700003	0.001	1909.300003	0.002
5.75	1850.700001	0.001	1909.300002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700002	0.001	1909.300001	0.001
-20	1850.700003	0.001	1909.300002	0.001
-10	1850.700001	0.001	1909.300002	0.001
0	1850.700003	0.001	1909.300003	0.002
10	1850.700002	0.001	1909.300002	0.001
20	1850.699997	-0.002	1909.299998	-0.001
30	1850.699997	-0.002	1909.299997	-0.002
40	1850.699998	-0.001	1909.299996	-0.002
50	1850.699997	-0.002	1909.299998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1851.500003	0.001	1908.500003	0.002
5	1851.500002	0.001	1908.500003	0.002
5.75	1851.500004	0.002	1908.500003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500002	0.001	1908.500003	0.002
-20	1851.500002	0.001	1908.500004	0.002
-10	1851.500003	0.002	1908.500001	0.001
0	1851.500004	0.002	1908.500003	0.002
10	1851.500002	0.001	1908.500003	0.002
20	1851.499997	-0.002	1908.499998	-0.001
30	1851.499999	-0.001	1908.499998	-0.001
40	1851.499998	-0.001	1908.499996	-0.002
50	1851.499996	-0.002	1908.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1852.500003	0.001	1907.500002	0.001
5	1852.500002	0.001	1907.500002	0.001
5.75	1852.500003	0.002	1907.500001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500002	0.001	1907.500003	0.001
-20	1852.500003	0.001	1907.500001	0.001
-10	1852.500002	0.001	1907.500001	0.001
0	1852.500003	0.002	1907.500001	0.001
10	1852.500002	0.001	1907.500003	0.002
20	1852.499997	-0.002	1907.499997	-0.002
30	1852.499997	-0.002	1907.499998	-0.001
40	1852.499999	-0.001	1907.499999	-0.001
50	1852.499999	-0.001	1907.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1855.000002	0.001	1905.000002	0.001
5	1855.000002	0.001	1905.000002	0.001
5.75	1855.000003	0.002	1905.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000002	0.001	1905.000002	0.001
-20	1855.000004	0.002	1905.000002	0.001
-10	1855.000002	0.001	1905.000001	0.001
0	1855.000004	0.002	1905.000003	0.001
10	1855.000003	0.001	1905.000004	0.002
20	1854.999998	-0.001	1904.999997	-0.002
30	1854.999999	-0.001	1904.999997	-0.002
40	1854.999999	-0.001	1904.999998	-0.001
50	1854.999998	-0.001	1904.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1857.500002	0.001	1902.500004	0.002
5	1857.500002	0.001	1902.500003	0.002
5.75	1857.500002	0.001	1902.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500003	0.002	1902.500003	0.002
-20	1857.500003	0.002	1902.500004	0.002
-10	1857.500002	0.001	1902.500003	0.001
0	1857.500002	0.001	1902.500002	0.001
10	1857.500004	0.002	1902.500002	0.001
20	1857.499998	-0.001	1902.499998	-0.001
30	1857.499997	-0.002	1902.499998	-0.001
40	1857.499996	-0.002	1902.499999	-0.001
50	1857.499997	-0.002	1902.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1860.000004	0.002	1900.000004	0.002
5	1860.000001	0.001	1900.000002	0.001
5.75	1860.000002	0.001	1900.000003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000002	0.001	1900.000003	0.002
-20	1860.000002	0.001	1900.000004	0.002
-10	1860.000004	0.002	1900.000002	0.001
0	1860.000002	0.001	1900.000002	0.001
10	1860.000001	0.001	1900.000003	0.001
20	1859.999999	-0.001	1899.999999	-0.001
30	1859.999997	-0.002	1899.999997	-0.002
40	1859.999997	-0.002	1899.999997	-0.002
50	1859.999996	-0.002	1899.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2502.500003	0.001	2567.500004	0.001
5	2502.500002	0.001	2567.500003	0.001
5.75	2502.500003	0.001	2567.500001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2502.500002	0.001	2567.500002	0.001
-20	2502.500001	0.001	2567.500001	0.000
-10	2502.500003	0.001	2567.500001	0.001
0	2502.500002	0.001	2567.500003	0.001
10	2502.500002	0.001	2567.500002	0.001
20	2502.499998	-0.001	2567.499998	-0.001
30	2502.499997	-0.001	2567.499998	-0.001
40	2502.499997	-0.001	2567.499996	-0.001
50	2502.499997	-0.001	2567.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2505.000003	0.001	2565.000002	0.001
5	2505.000003	0.001	2565.000002	0.001
5.75	2505.000002	0.001	2565.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2505.000002	0.001	2565.000002	0.001
-20	2505.000002	0.001	2565.000002	0.001
-10	2505.000003	0.001	2565.000002	0.001
0	2505.000002	0.001	2565.000003	0.001
10	2505.000004	0.002	2565.000002	0.001
20	2504.999998	-0.001	2564.999998	-0.001
30	2504.999999	0.000	2564.999998	-0.001
40	2504.999997	-0.001	2564.999998	-0.001
50	2504.999997	-0.001	2564.999999	0.000

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2507.500004	0.001	2562.500003	0.001
5	2507.500002	0.001	2562.500004	0.001
5.75	2507.500003	0.001	2562.500004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2507.500002	0.001	2562.500004	0.001
-20	2507.500004	0.001	2562.500002	0.001
-10	2507.500002	0.001	2562.500004	0.002
0	2507.500003	0.001	2562.500003	0.001
10	2507.500004	0.002	2562.500004	0.001
20	2507.499997	-0.001	2562.499999	0.000
30	2507.499999	0.000	2562.499997	-0.001
40	2507.499998	-0.001	2562.499996	-0.001
50	2507.499998	-0.001	2562.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2510.000004	0.001	2560.000002	0.001
5	2510.000004	0.001	2560.000002	0.001
5.75	2510.000003	0.001	2560.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2510.000001	0.000	2560.000002	0.001
-20	2510.000004	0.002	2560.000004	0.001
-10	2510.000004	0.001	2560.000002	0.001
0	2510.000003	0.001	2560.000001	0.000
10	2510.000003	0.001	2560.000004	0.001
20	2509.999999	0.000	2559.999999	0.000
30	2509.999999	-0.001	2559.999999	-0.001
40	2509.999998	-0.001	2559.999998	-0.001
50	2509.999996	-0.002	2559.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	699.700002	0.003	715.300003	0.004
5	699.700004	0.006	715.300004	0.006
5.75	699.700004	0.005	715.300002	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	699.700002	0.003	715.300004	0.005
-20	699.700004	0.005	715.300004	0.005
-10	699.700001	0.001	715.300001	0.002
0	699.700002	0.003	715.300004	0.005
10	699.700001	0.002	715.300001	0.001
20	699.699999	-0.002	715.299998	-0.003
30	699.699998	-0.002	715.299998	-0.003
40	699.699999	-0.001	715.299997	-0.004
50	699.699997	-0.005	715.299998	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	700.500001	0.002	714.500003	0.004
5	700.500003	0.004	714.500003	0.004
5.75	700.500003	0.005	714.500004	0.006

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	700.500002	0.003	714.500002	0.003
-20	700.500001	0.002	714.500004	0.005
-10	700.500003	0.005	714.500003	0.005
0	700.500001	0.002	714.500002	0.002
10	700.500002	0.002	714.500004	0.005
20	700.499996	-0.005	714.499998	-0.003
30	700.499997	-0.004	714.499997	-0.004
40	700.499997	-0.004	714.499998	-0.003
50	700.499998	-0.002	714.499999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	701.500004	0.005	713.500003	0.004
5	701.500001	0.002	713.500002	0.003
5.75	701.500003	0.004	713.500001	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	701.500002	0.002	713.500004	0.005
-20	701.500001	0.002	713.500004	0.005
-10	701.500003	0.004	713.500002	0.003
0	701.500003	0.004	713.500002	0.003
10	701.500002	0.002	713.500003	0.004
20	701.499998	-0.004	713.499996	-0.005
30	701.499997	-0.004	713.499997	-0.004
40	701.499997	-0.005	713.499998	-0.003
50	701.499997	-0.005	713.499997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	704.000004	0.005	711.000001	0.002
5	704.000003	0.004	711.000003	0.005
5.75	704.000002	0.002	711.000003	0.004

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	704.000002	0.002	711.000002	0.003
-20	704.000002	0.003	711.000003	0.004
-10	704.000004	0.006	711.000004	0.005
0	704.000002	0.003	711.000004	0.005
10	704.000003	0.005	711.000002	0.003
20	703.999998	-0.003	710.999998	-0.002
30	703.999998	-0.003	710.999998	-0.002
40	703.999997	-0.005	710.999998	-0.003
50	703.999999	-0.002	710.999997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	3552.500002	0.001	3697.500002	0.001
5	3552.500001	0.000	3697.500001	0.000
5.75	3552.500003	0.001	3697.500002	0.000

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3552.500003	0.001	3697.500004	0.001
-20	3552.500003	0.001	3697.500002	0.000
-10	3552.500003	0.001	3697.500001	0.000
0	3552.500001	0.000	3697.500003	0.001
10	3552.500002	0.001	3697.500003	0.001
20	3552.499997	-0.001	3697.499998	-0.001
30	3552.499997	-0.001	3697.499998	-0.001
40	3552.499999	0.000	3697.499997	-0.001
50	3552.499999	0.000	3697.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	3555.000003	0.001	3695.000002	0.001
5	3555.000002	0.001	3695.000002	0.001
5.75	3555.000002	0.001	3695.000001	0.000

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3555.000002	0.001	3695.000003	0.001
-20	3555.000004	0.001	3695.000003	0.001
-10	3555.000003	0.001	3695.000001	0.000
0	3555.000004	0.001	3695.000001	0.000
10	3555.000002	0.001	3695.000002	0.000
20	3554.999998	0.000	3694.999997	-0.001
30	3554.999998	-0.001	3694.999997	-0.001
40	3554.999997	-0.001	3694.999998	0.000
50	3554.999999	0.000	3694.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	3557.500003	0.001	3692.500002	0.000
5	3557.500002	0.000	3692.500003	0.001
5.75	3557.500002	0.000	3692.500003	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3557.500001	0.000	3692.500002	0.000
-20	3557.500003	0.001	3692.500004	0.001
-10	3557.500002	0.000	3692.500004	0.001
0	3557.500003	0.001	3692.500002	0.001
10	3557.500002	0.001	3692.500003	0.001
20	3557.499998	-0.001	3692.499998	-0.001
30	3557.499996	-0.001	3692.499998	-0.001
40	3557.499999	0.000	3692.499997	-0.001
50	3557.499996	-0.001	3692.499996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	3560.000002	0.001	3690.000004	0.001
5	3560.000003	0.001	3690.000003	0.001
5.75	3560.000002	0.001	3690.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	3560.000002	0.001	3690.000001	0.000
-20	3560.000003	0.001	3690.000003	0.001
-10	3560.000001	0.000	3690.000001	0.000
0	3560.000002	0.001	3690.000002	0.001
10	3560.000004	0.001	3690.000003	0.001
20	3559.999999	0.000	3689.999996	-0.001
30	3559.999997	-0.001	3689.999998	0.000
40	3559.999997	-0.001	3689.999998	0.000
50	3559.999999	0.000	3689.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1710.700001	0.001	1779.300004	0.002
5	1710.700001	0.001	1779.300003	0.001
5.75	1710.700001	0.001	1779.300002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1710.700004	0.002	1779.300001	0.001
-20	1710.700004	0.002	1779.300002	0.001
-10	1710.700002	0.001	1779.300003	0.002
0	1710.700002	0.001	1779.300004	0.002
10	1710.700001	0.001	1779.300004	0.002
20	1710.699999	-0.001	1779.299998	-0.001
30	1710.699999	-0.001	1779.299997	-0.002
40	1710.699999	-0.001	1779.299999	-0.001
50	1710.699999	-0.001	1779.299997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1711.500003	0.002	1778.500003	0.002
5	1711.500003	0.002	1778.500002	0.001
5.75	1711.500004	0.002	1778.500001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1711.500002	0.001	1778.500004	0.002
-20	1711.500001	0.001	1778.500003	0.001
-10	1711.500002	0.001	1778.500004	0.002
0	1711.500002	0.001	1778.500002	0.001
10	1711.500002	0.001	1778.500004	0.002
20	1711.499998	-0.001	1778.499999	-0.001
30	1711.499998	-0.001	1778.499998	-0.001
40	1711.499997	-0.002	1778.499997	-0.002
50	1711.499998	-0.001	1778.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1712.500003	0.002	1777.500003	0.001
5	1712.500002	0.001	1777.500002	0.001
5.75	1712.500003	0.002	1777.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.500004	0.002	1777.500004	0.002
-20	1712.500002	0.001	1777.500002	0.001
-10	1712.500004	0.002	1777.500001	0.001
0	1712.500003	0.001	1777.500002	0.001
10	1712.500002	0.001	1777.500003	0.001
20	1712.499997	-0.002	1777.499997	-0.002
30	1712.499997	-0.002	1777.499999	-0.001
40	1712.499998	-0.001	1777.499998	-0.001
50	1712.499997	-0.002	1777.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1715.000002	0.001	1775.000002	0.001
5	1715.000003	0.001	1775.000004	0.002
5.75	1715.000002	0.001	1775.000004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1715.000002	0.001	1775.000004	0.002
-20	1715.000002	0.001	1775.000001	0.001
-10	1715.000002	0.001	1775.000003	0.001
0	1715.000002	0.001	1775.000002	0.001
10	1715.000003	0.002	1775.000003	0.002
20	1714.999997	-0.002	1774.999997	-0.002
30	1714.999996	-0.002	1774.999997	-0.001
40	1714.999996	-0.002	1774.999999	-0.001
50	1714.999998	-0.001	1774.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1717.500002	0.001	1772.500002	0.001
5	1717.500002	0.001	1772.500004	0.002
5.75	1717.500001	0.001	1772.500001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1717.500004	0.002	1772.500003	0.002
-20	1717.500004	0.002	1772.500003	0.002
-10	1717.500003	0.002	1772.500003	0.002
0	1717.500001	0.001	1772.500003	0.002
10	1717.500003	0.002	1772.500003	0.002
20	1717.499999	-0.001	1772.499998	-0.001
30	1717.499999	-0.001	1772.499998	-0.001
40	1717.499997	-0.002	1772.499998	-0.001
50	1717.499996	-0.002	1772.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1720.000003	0.002	1770.000002	0.001
5	1720.000002	0.001	1770.000003	0.002
5.75	1720.000004	0.002	1770.000004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000001	0.001	1770.000004	0.002
-20	1720.000001	0.001	1770.000004	0.002
-10	1720.000002	0.001	1770.000001	0.001
0	1720.000004	0.002	1770.000003	0.001
10	1720.000004	0.002	1770.000001	0.001
20	1719.999998	-0.001	1769.999997	-0.002
30	1719.999999	-0.001	1769.999998	-0.001
40	1719.999999	-0.001	1769.999998	-0.001
50	1719.999997	-0.002	1769.999997	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

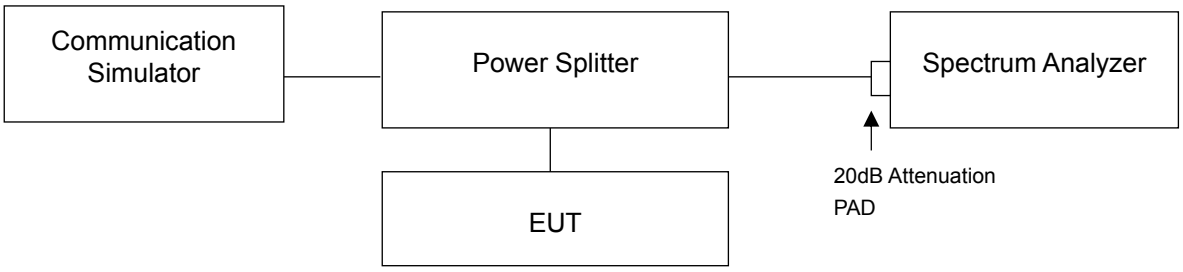
For LTE Band 2:
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

For LTE Band 7, LTE Band 12, LTE Band 66:
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.

For LTE Band 48:
Occupied Bandwidth:
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. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

26dBc Bandwidth:
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW =51 kHz (5 MHz bandwidth), 100 kHz (10 MHz bandwidth), 150 kHz (15 MHz bandwidth), 200 kHz (20 MHz bandwidth). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.4.2 Test Setup



4.4.3 Test Result

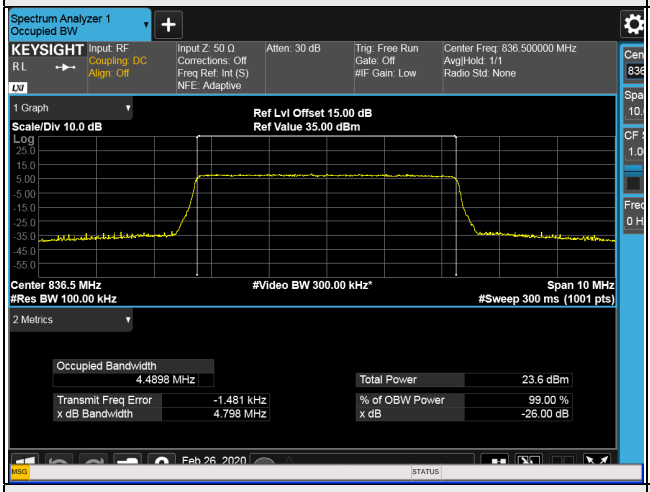
Occupied Bandwidth

n5

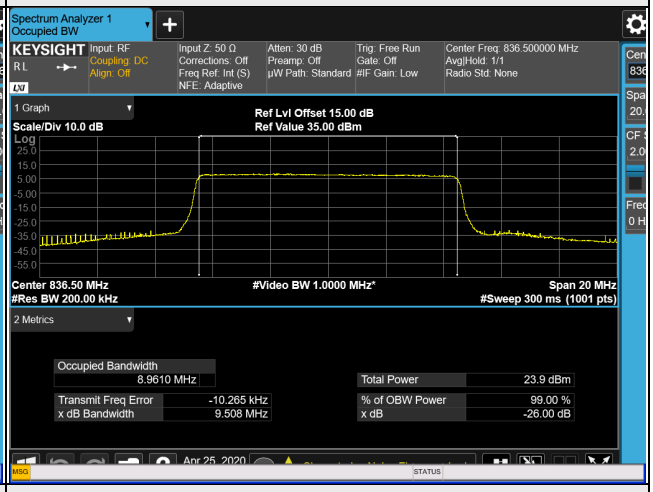
n5, Channel Bandwidth 5MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
165300	826.5	4.4859	4.4853	4.4844	4.4865	4.4894
167300	836.5	4.4854	4.4876	4.4882	4.4898	4.4882
169300	846.5	4.4871	4.4845	4.4865	4.4850	4.4878
n5, Channel Bandwidth 10MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
165800	829.0	8.9520	8.9445	8.9497	8.9449	8.9548
167300	836.5	8.9552	8.9541	8.9588	8.9485	8.9610
168800	844.0	8.9437	8.9406	8.9377	8.9391	8.9430
n5, Channel Bandwidth 15MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
166300	831.5	13.448	13.453	13.433	13.432	13.437
167300	836.5	13.456	13.449	13.435	13.433	13.440
168300	841.5	13.452	13.451	13.442	13.441	13.443
n5, Channel Bandwidth 20MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
166800	834.0	17.893	17.903	17.921	17.915	17.914
167300	836.5	17.907	17.900	17.918	17.922	17.933
167800	839.0	17.931	17.923	17.951	17.942	17.958

Spectrum Plot of Worst Value

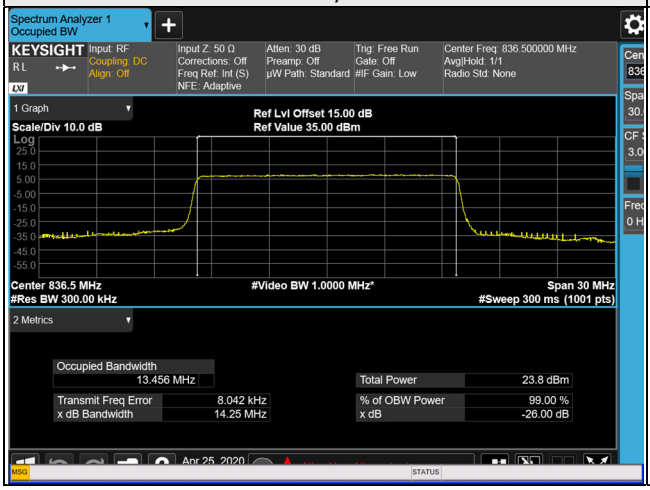
5MHz / 64QAM



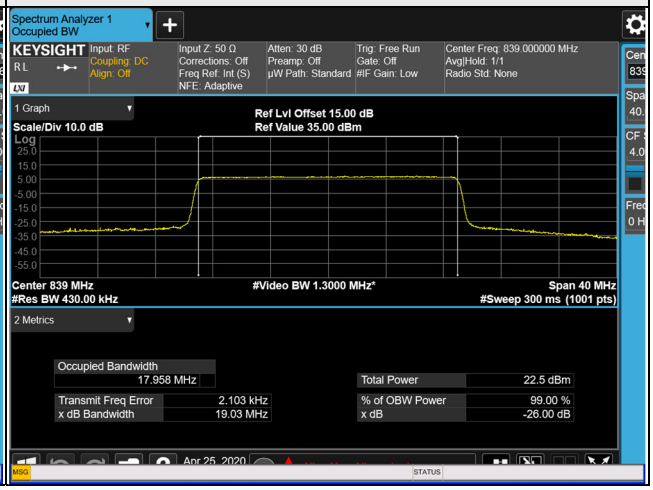
10MHz / 256QAM



15MHz / $\pi/2$ BPSK



20MHz / 256QAM

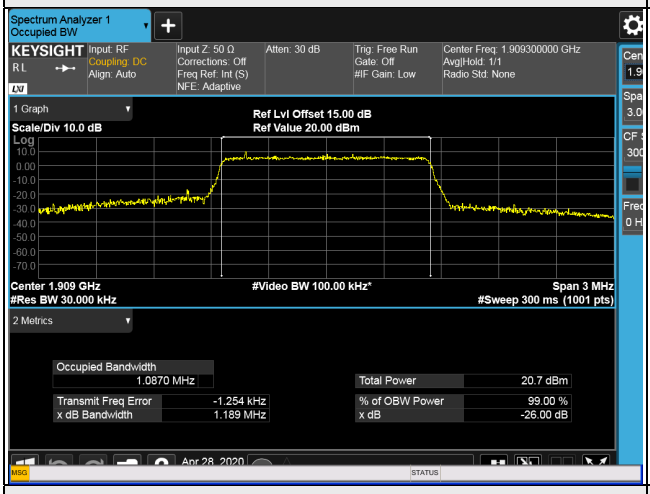


LTE Band 2, Channel Bandwidth 1.4MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
18607	1850.7	1.09
18900	1880.0	1.09
19193	1909.3	1.09
LTE Band 2, Channel Bandwidth 3MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
18615	1851.5	2.70
18900	1880.0	2.70
19185	1908.5	2.70
LTE Band 2, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
18625	1852.5	4.49
18900	1880.0	4.49
19175	1907.5	4.48
LTE Band 2, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
18650	1855.0	8.95
18900	1880.0	8.96
19150	1905.0	8.96
LTE Band 2, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
18675	1857.5	13.43
18900	1880.0	13.45
19125	1902.5	13.48

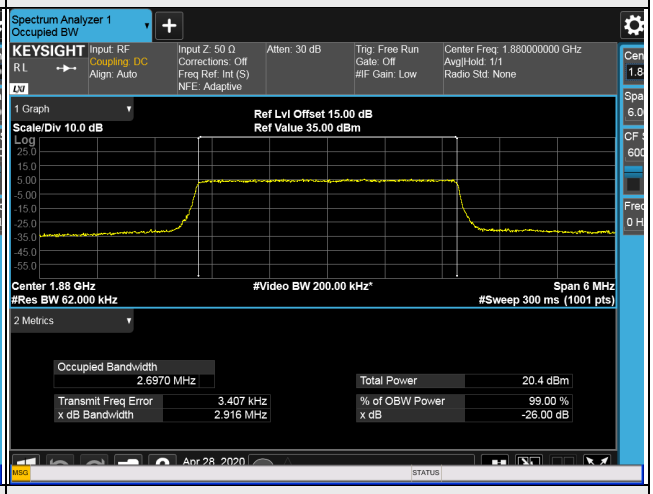
LTE Band 2, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
18700	1860.0	17.91
18900	1880.0	17.93
19100	1900.0	17.99

Spectrum Plot of Worst Value

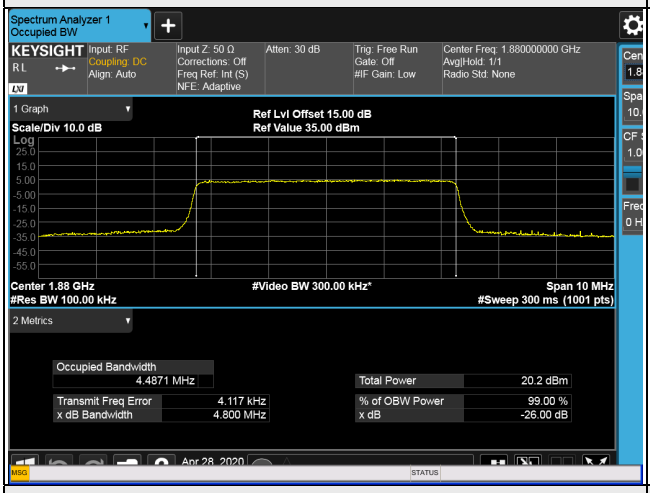
1.4MHz / 256QAM



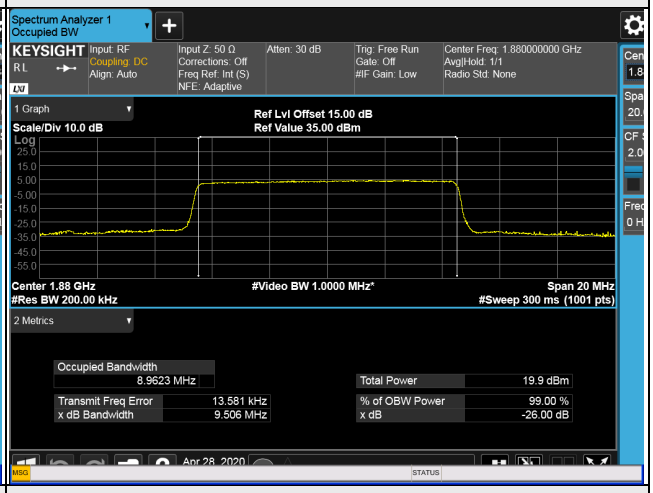
3MHz / 256QAM



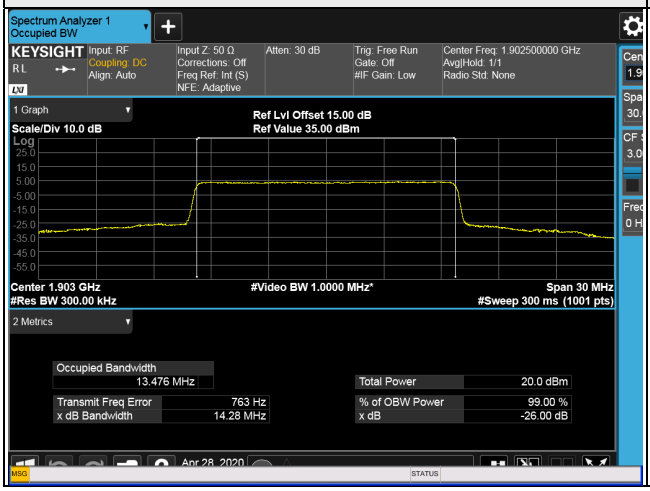
5MHz / 256QAM



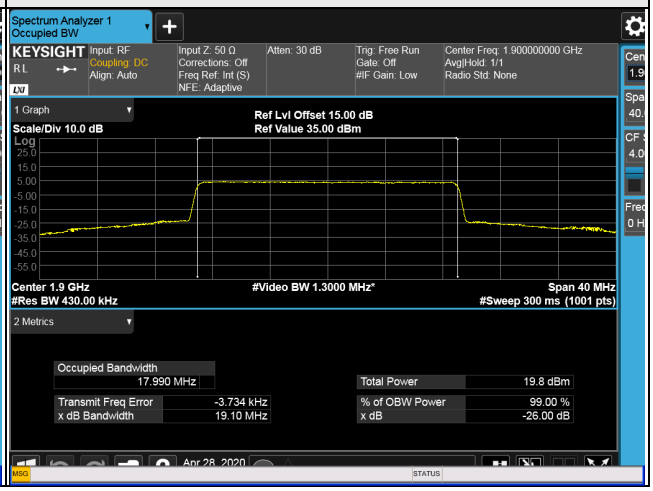
10MHz / 256QAM



15MHz / 256QAM



20MHz / 256QAM

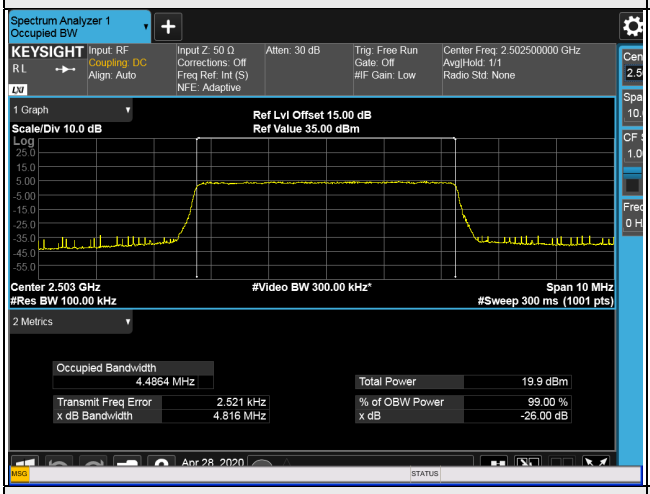


LTE Band 7

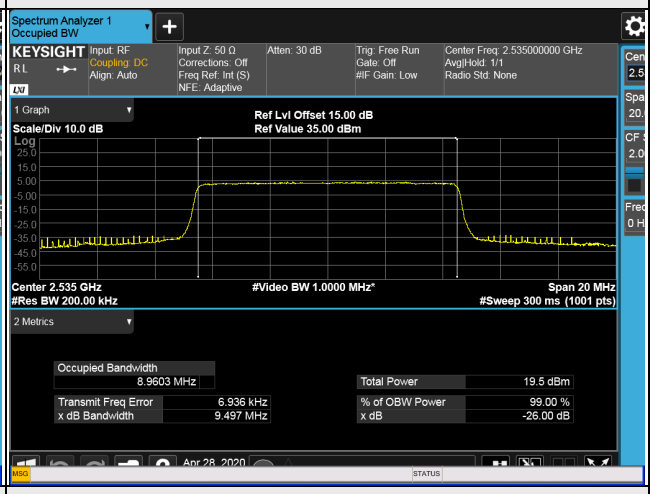
LTE Band 7, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
20775	2502.5	4.49
21100	2535.0	4.49
21425	2567.5	4.49
LTE Band 7, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
20800	2505.0	8.95
21100	2535.0	8.96
21400	2565.0	8.96
LTE Band 7, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
20825	2507.5	13.44
21100	2535.0	13.45
21375	2562.5	13.45
LTE Band 7, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
20850	2510.0	17.90
21100	2535.0	17.95
21350	2560.0	17.92

Spectrum Plot of Worst Value

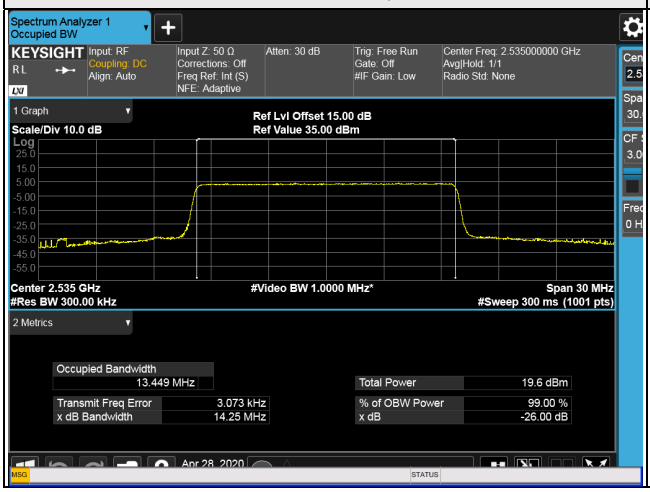
5MHz / 256QAM



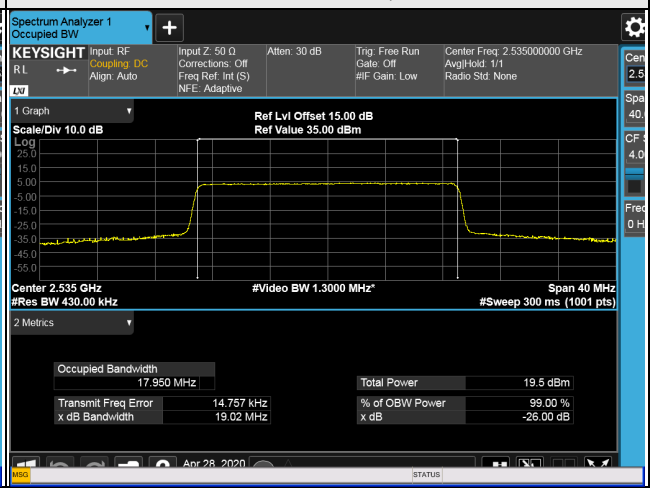
10MHz / 256QAM



15MHz / 256QAM

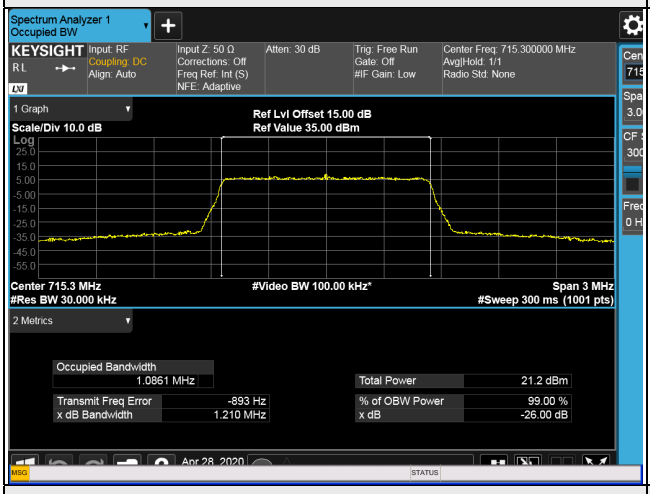
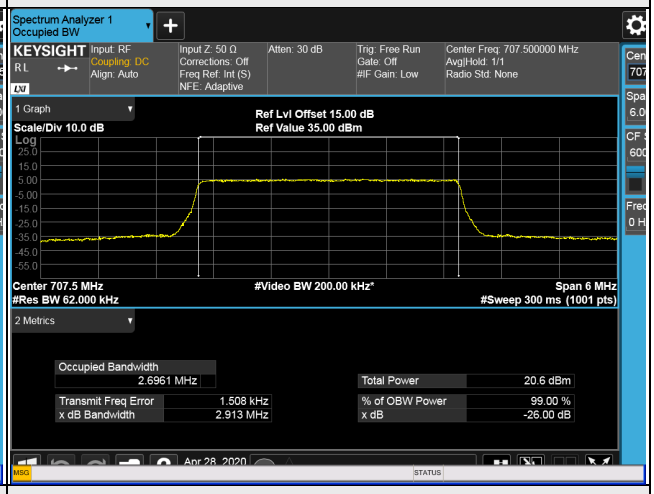
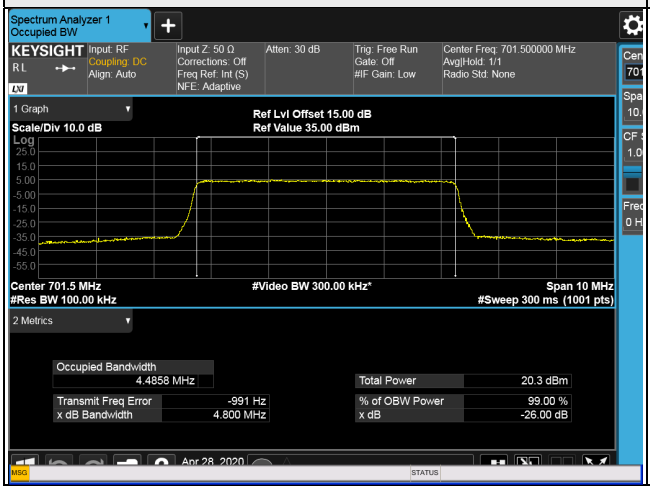
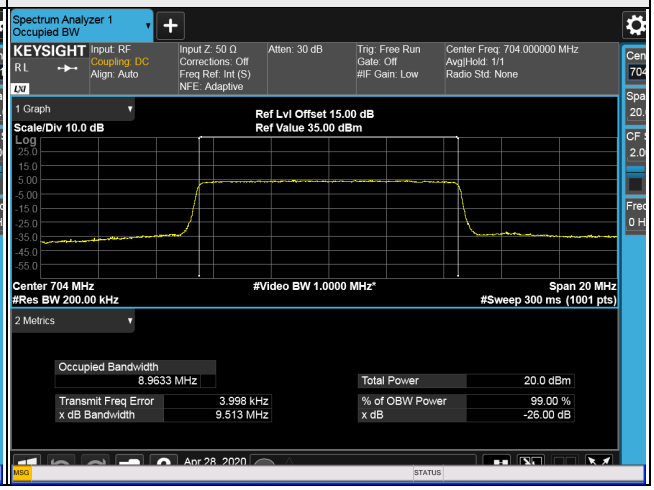


20MHz / 256QAM



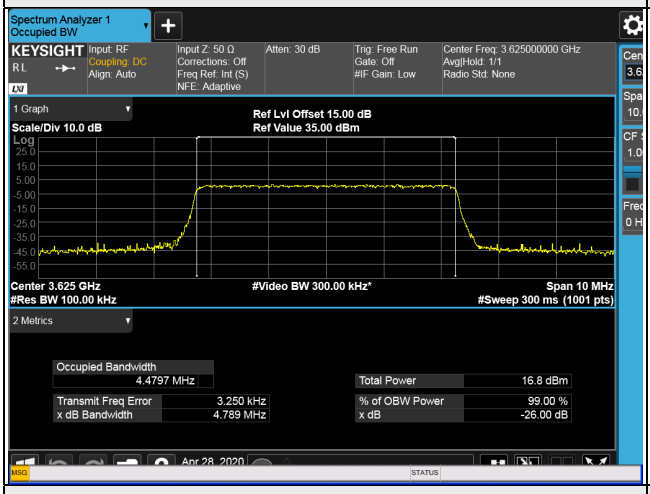
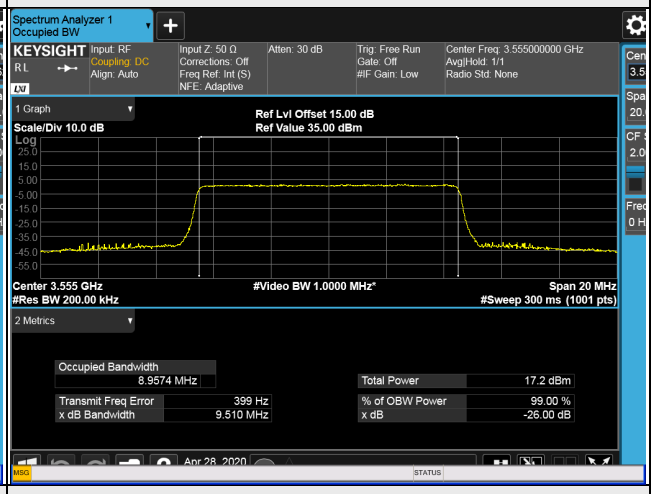
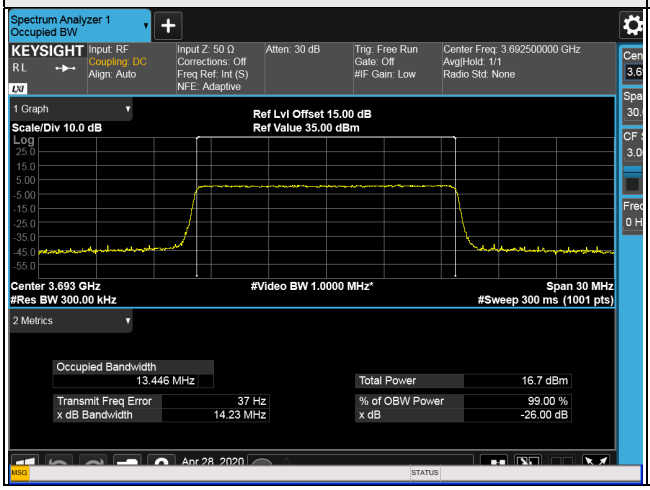
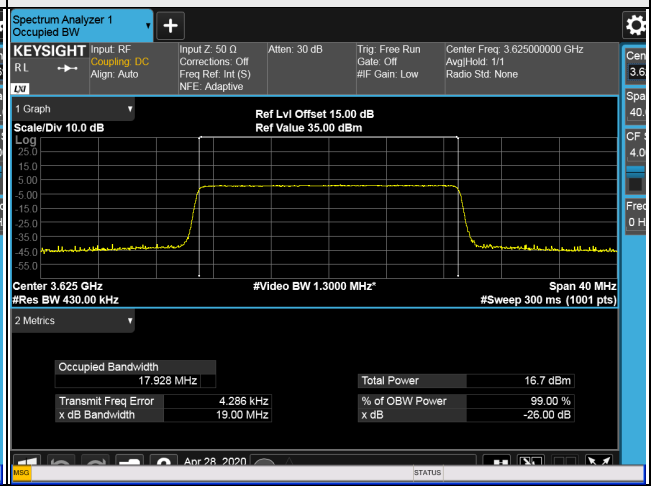
LTE Band 12

LTE Band 12, Channel Bandwidth 1.4MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
23017	699.7	1.09
23095	707.5	1.08
23173	715.3	1.09
LTE Band 12, Channel Bandwidth 3MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
23025	700.5	2.70
23095	707.5	2.70
23165	714.5	2.70
LTE Band 12, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
23035	701.5	4.49
23095	707.5	4.49
23155	713.5	4.48
LTE Band 12, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
23060	704.0	8.96
23095	707.5	8.96
23130	711.0	8.94

Spectrum Plot of Worst Value	
1.4MHz / 256QAM	3MHz / 256QAM
	
5MHz / 256QAM	10MHz / 256QAM
	

LTE Band 48

LTE Band 48, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
55265	3552.5	4.48
55990	3625.0	4.48
56715	3697.5	4.48
LTE Band 48, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
55290	3555.0	8.96
55990	3625.0	8.93
56690	3695.0	8.96
LTE Band 48, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
55315	3557.5	13.45
55990	3625.0	13.44
56665	3692.5	13.45
LTE Band 48, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
55340	3560.0	17.92
55990	3625.0	17.93
56640	3690.0	17.93

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

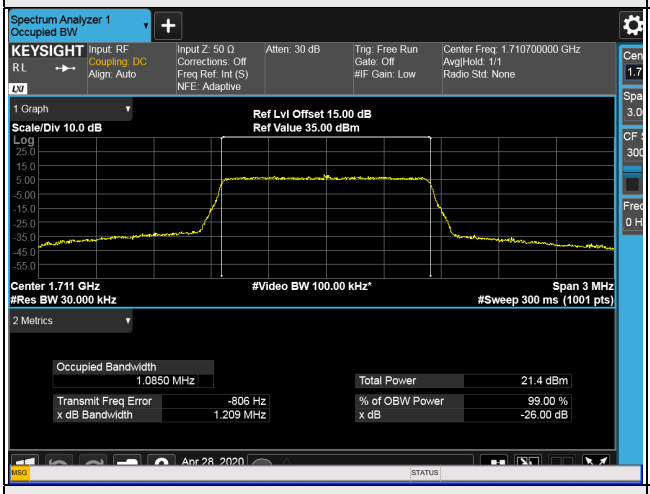
LTE Band 66

LTE Band 66, Channel Bandwidth 1.4MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
131979	1710.7	1.09
132322	1745.0	1.08
132665	1779.3	1.08
LTE Band 66, Channel Bandwidth 3MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
131987	1711.5	2.70
132322	1745.0	2.70
132657	1778.5	2.69
LTE Band 66, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
131997	1712.5	4.49
132322	1745.0	4.49
132647	1777.5	4.47
LTE Band 66, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
132022	1715.0	8.96
132322	1745.0	8.97
132622	1775.0	8.97
LTE Band 66, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
132047	1717.5	13.46
132322	1745.0	13.47
132597	1772.5	13.49

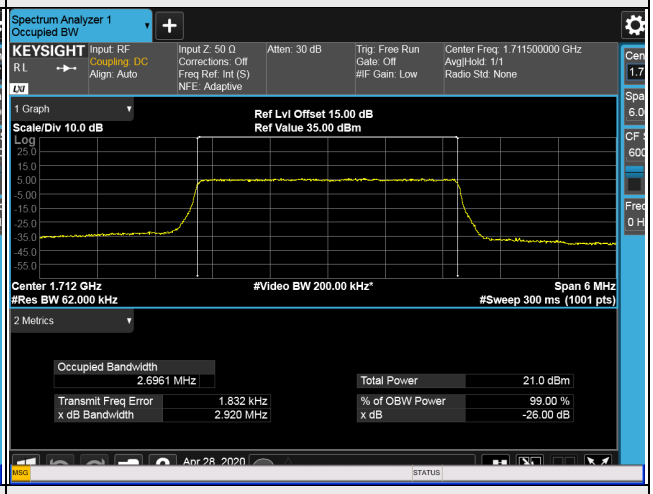
LTE Band 66, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
		256QAM
132072	1720.0	17.92
132322	1745.0	17.99
132572	1770.0	18.01

Spectrum Plot of Worst Value

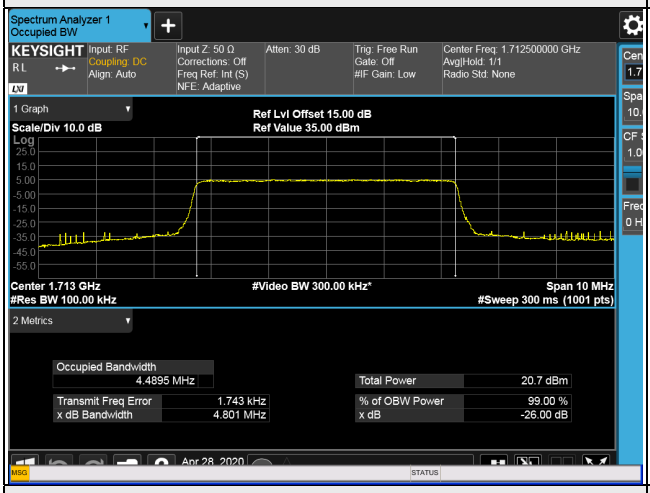
1.4MHz / 256QAM



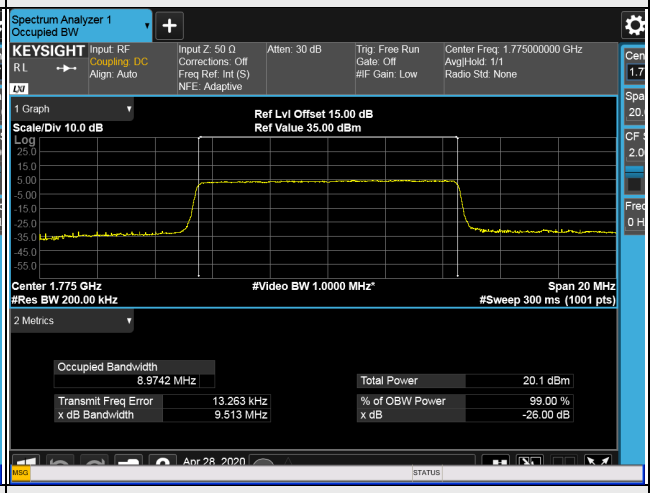
3MHz / 256QAM



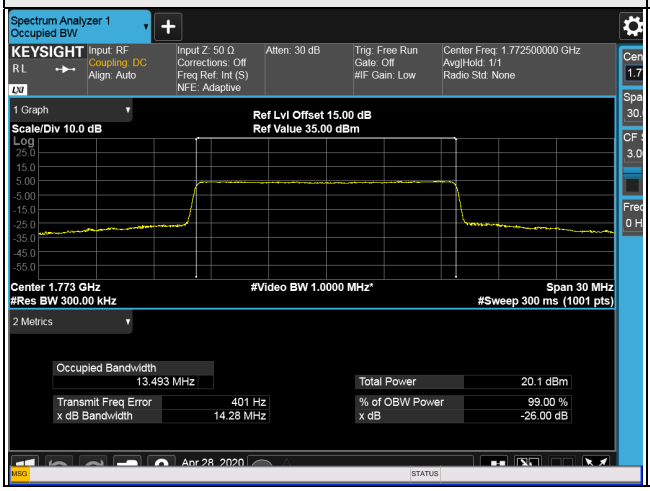
5MHz / 256QAM



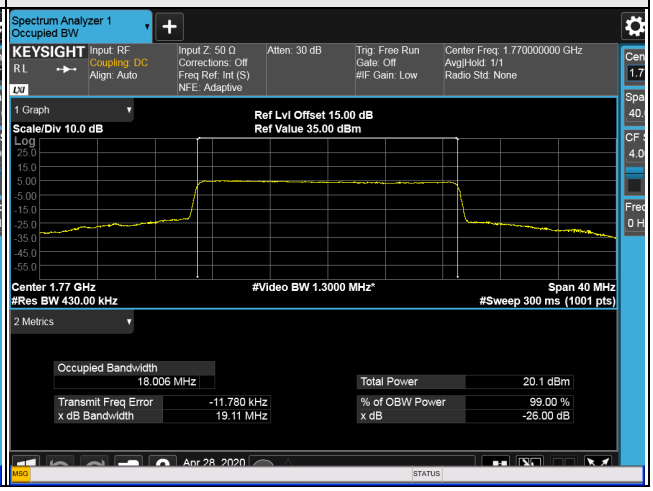
10MHz / 256QAM



15MHz / 256QAM



20MHz / 256QAM



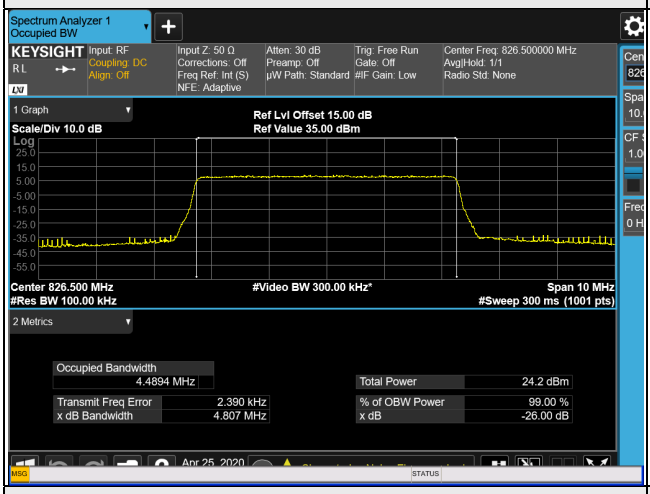
26dB Bandwidth

n5

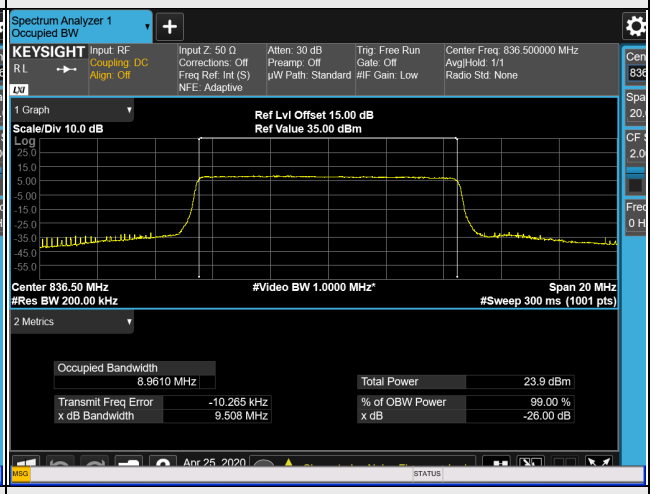
n5, Channel Bandwidth 5MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
165300	826.5	4.796	4.776	4.797	4.803	4.807
167300	836.5	4.794	4.791	4.791	4.798	4.796
169300	846.5	4.790	4.792	4.785	4.803	4.802
n5, Channel Bandwidth 10MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
165800	829.0	9.488	9.477	9.511	9.499	9.502
167300	836.5	9.500	9.504	9.495	9.502	9.508
168800	844.0	9.473	9.493	9.493	9.496	9.501
n5, Channel Bandwidth 15MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
166300	831.5	14.26	14.25	14.24	14.23	14.25
167300	836.5	14.25	14.24	14.25	14.24	14.25
168300	841.5	14.25	14.27	14.25	14.26	14.24
n5, Channel Bandwidth 20MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
166800	834.0	19.03	19.01	19.02	19.00	19.02
167300	836.5	19.02	19.01	19.00	19.03	19.03
167800	839.0	19.04	19.03	19.04	19.04	19.03

Spectrum Plot of Worst Value

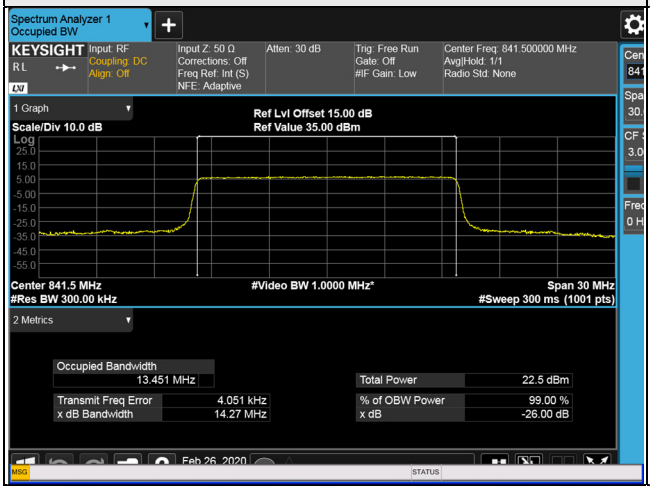
5MHz / 256QAM



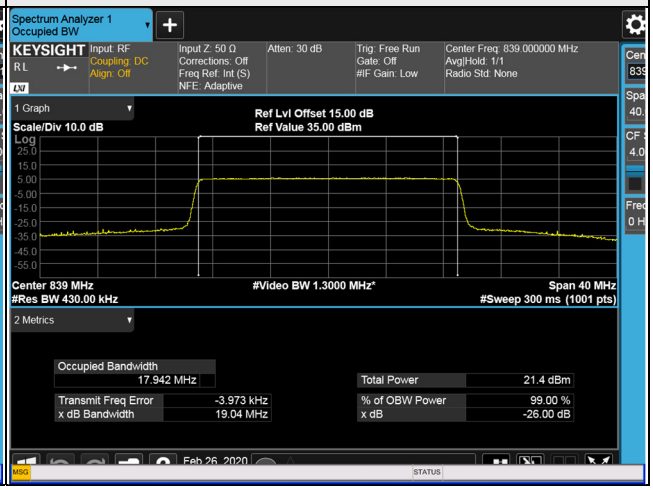
10MHz / 256QAM



15MHz / QPSK



20MHz / 64QAM

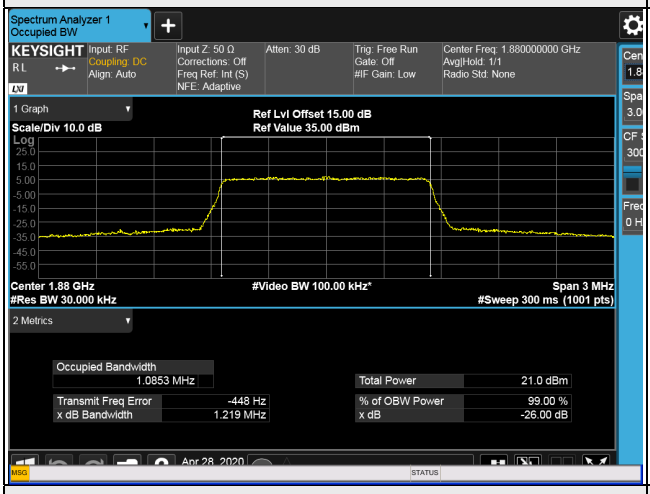


LTE Band 2, Channel Bandwidth 1.4MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
18607	1850.7	1.22
18900	1880.0	1.22
19193	1909.3	1.19
LTE Band 2, Channel Bandwidth 3MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
18615	1851.5	2.93
18900	1880.0	2.92
19185	1908.5	2.92
LTE Band 2, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
18625	1852.5	4.81
18900	1880.0	4.80
19175	1907.5	4.81
LTE Band 2, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
18650	1855.0	9.51
18900	1880.0	9.51
19150	1905.0	9.51
LTE Band 2, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
18675	1857.5	14.23
18900	1880.0	14.25
19125	1902.5	14.28

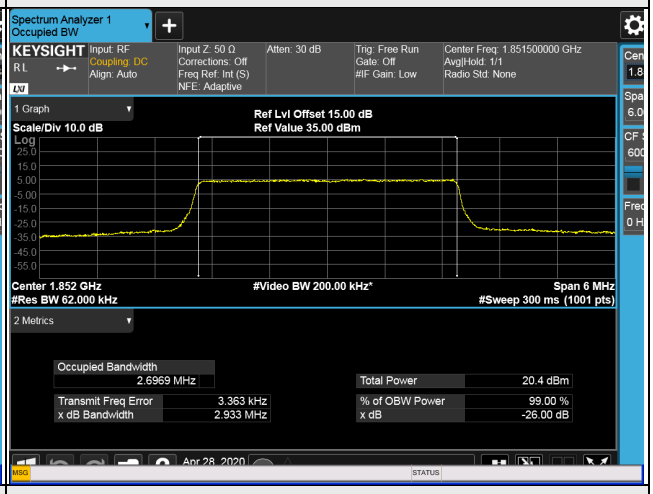
LTE Band 2, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
18700	1860.0	19.02
18900	1880.0	19.01
19100	1900.0	19.10

Spectrum Plot of Worst Value

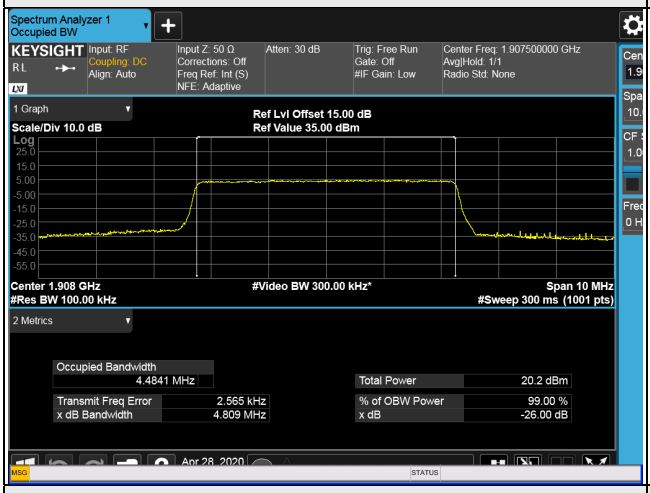
1.4MHz / 256QAM



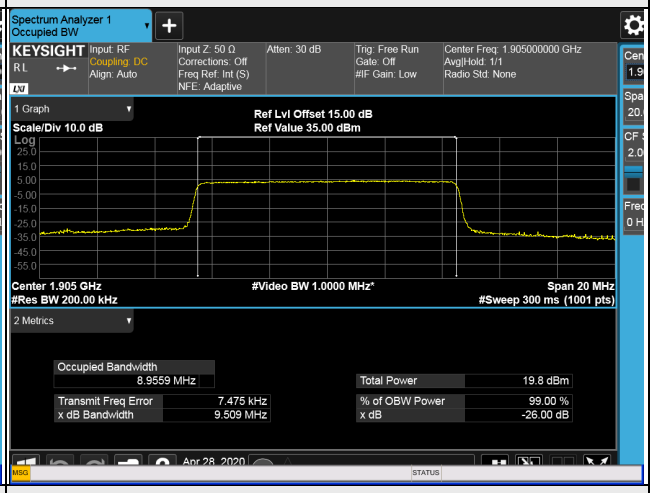
3MHz / 256QAM



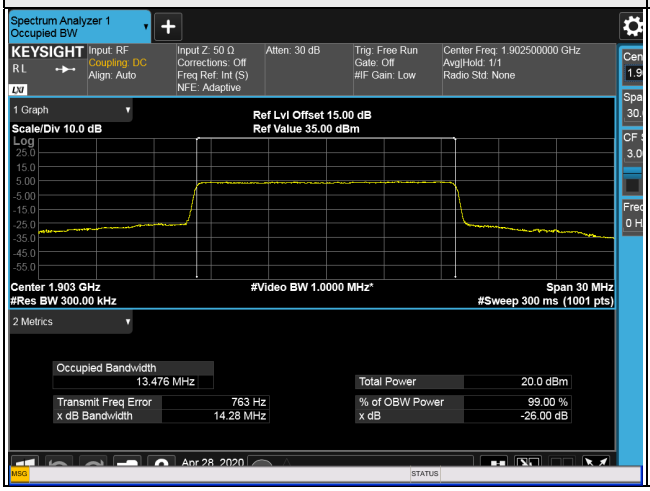
5MHz / 256QAM



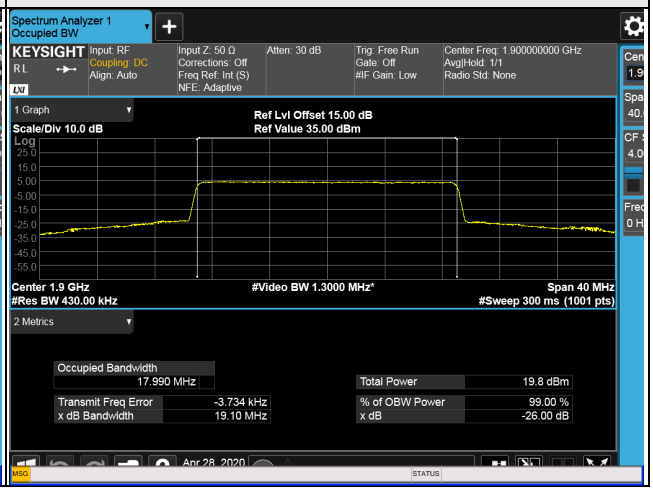
10MHz / 256QAM



15MHz / 256QAM

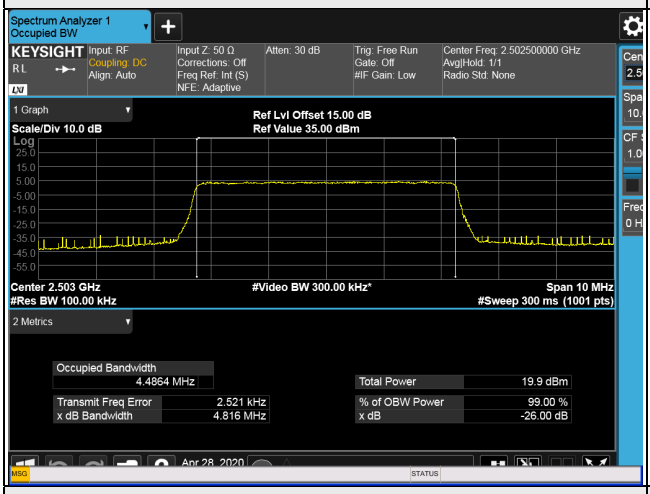
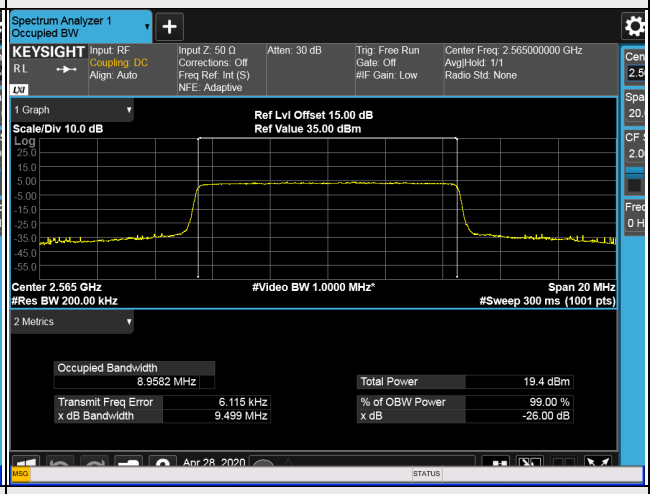
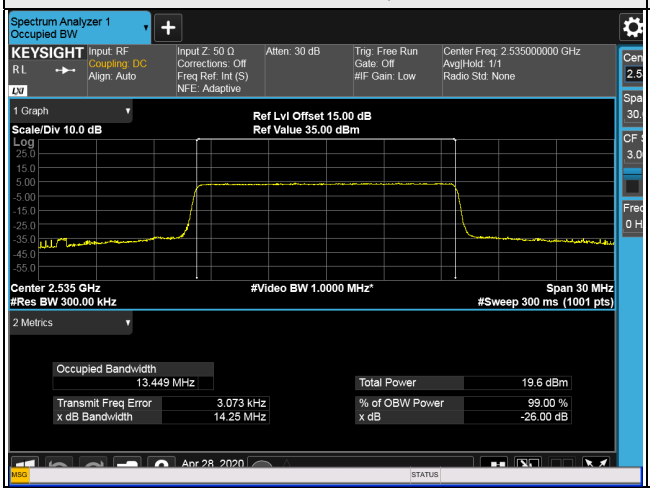
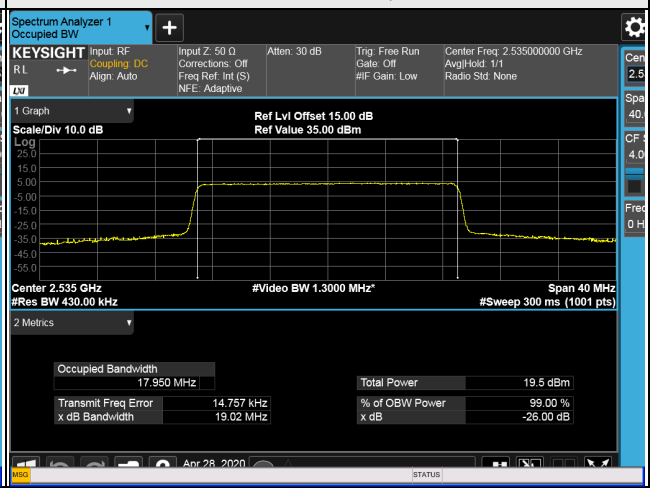


20MHz / 256QAM



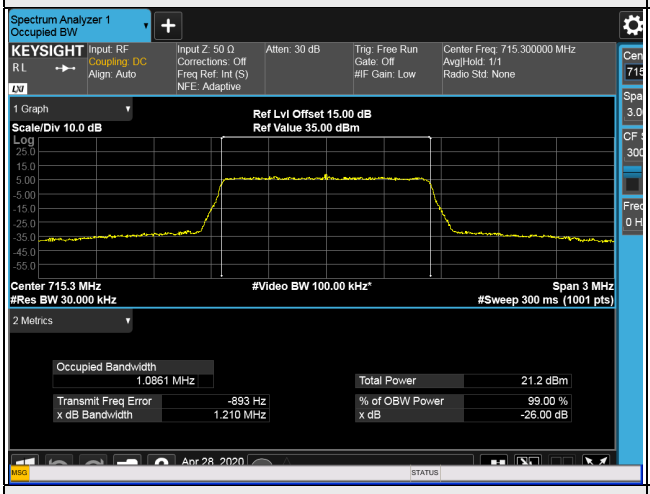
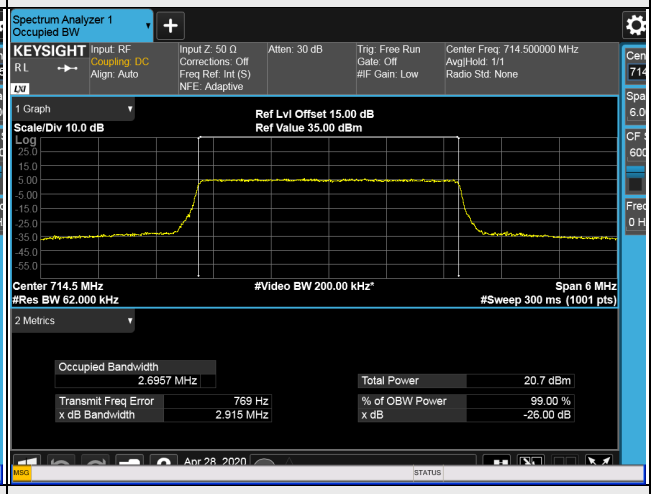
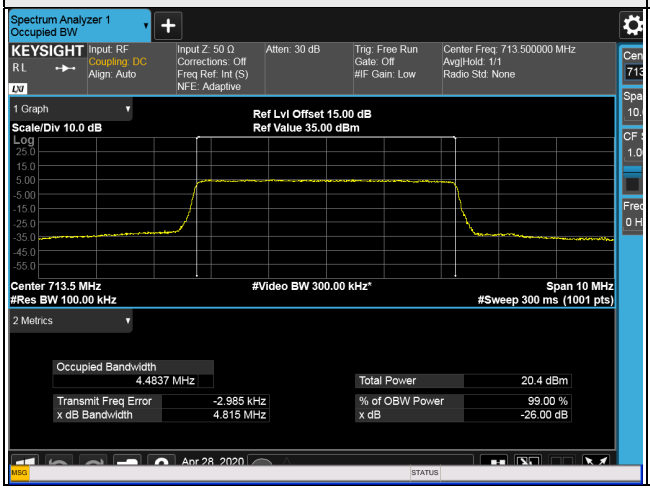
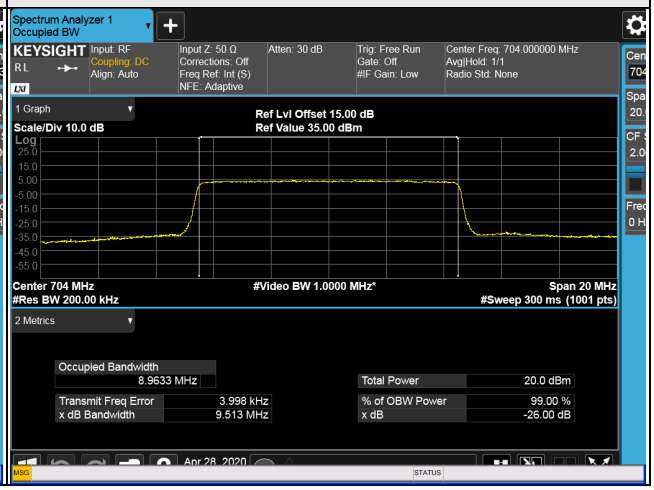
LTE Band 7

LTE Band 7, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
20775	2502.5	4.82
21100	2535.0	4.81
21425	2567.5	4.78
LTE Band 7, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
20800	2505.0	9.50
21100	2535.0	9.50
21400	2565.0	9.50
LTE Band 7, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
20825	2507.5	14.23
21100	2535.0	14.25
21375	2562.5	14.24
LTE Band 7, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
20850	2510.0	18.99
21100	2535.0	19.02
21350	2560.0	19.02

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

LTE Band 12

LTE Band 12, Channel Bandwidth 1.4MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
23017	699.7	1.21
23095	707.5	1.21
23173	715.3	1.21
LTE Band 12, Channel Bandwidth 3MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
23025	700.5	2.91
23095	707.5	2.91
23165	714.5	2.92
LTE Band 12, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
23035	701.5	4.80
23095	707.5	4.81
23155	713.5	4.82
LTE Band 12, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
23060	704.0	9.51
23095	707.5	9.51
23130	711.0	9.50

Spectrum Plot of Worst Value	
1.4MHz / 256QAM	3MHz / 256QAM
	
5MHz / 256QAM	10MHz / 256QAM
	

LTE Band 48

LTE Band 48, Channel Bandwidth 5MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
55265	3552.5	4.78
55990	3625.0	4.79
56715	3697.5	4.79
LTE Band 48, Channel Bandwidth 10MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
55290	3555.0	9.51
55990	3625.0	9.49
56690	3695.0	9.51
LTE Band 48, Channel Bandwidth 15MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
55315	3557.5	14.26
55990	3625.0	14.22
56665	3692.5	14.23
LTE Band 48, Channel Bandwidth 20MHz		
Channel	Frequency (MHz)	26dB Bandwidth (MHz)
		256QAM
55340	3560.0	19.00
55990	3625.0	19.00
56640	3690.0	19.01