FCC Test Report
(Part 27 – LTE B4/B7/B12/B17/B66/B71)

Report No.:	RFBHKI-WTW-P22030722-2
FCC ID:	NKRUMC-STD31BPN
Test Model:	UMC-STD31BPN
Received Date:	May 05, 2022
Test Date:	May 09 ~ May 17, 2022
Issued Date:	Jul. 19. 2022
Applicant:	Wistron NeWeb Corporation
Address:	20 Park Ave. II, Hsinchu Science Park,Hsinchu 308, Taiwan
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 (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003
Test Location (2):	No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
FCC Registration / Designation Number:	281270 / TW0032

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Release Control Record

Issue No.	Description	Date Issued
RFBHKI-WTW-P22030722-2	Original release	Jul. 19. 2022

1 Certificate of Conformity

Product:	Cellular module
Brand:	WNC
Test Model:	UMC-STD31BPN
Sample Status:	Engineering sample
Applicant:	Wistron NeWeb Corporation
Test Date:	May 09 ~ May 17, 2022
Standards:	FCC Part 27, Subpart C, H, L, M, N

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

Prepared by : Celine Chou , **Date:** Jul. 19. 2022

Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jul. 19. 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

For LTE Band 4, B66

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (d)	Equivalent Isotropically radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	Out of Band Emission Measurements	Pass	Meet the requirement of limit.
27.50 (d)(5)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -30.21dB at 3465.00MHz.

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

For LTE Band 7

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (h)(2)	Equivalent Isotropically radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Channel Edge / Out of Band Emission Measurements	Pass	Meet the requirement of limit.
--	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -9.72dB at 33.88MHz.

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

For LTE Band 12, LTE Band 17, LTE Band 71

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (c)	Effective radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (g)	Out of Band Emission Measurements	Pass	Meet the requirement of limit.
--	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53 (g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -23.51dB at 33.88MHz.

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	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.92 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038B	MY60180018	Feb. 18, 2022	Feb. 17, 2023
Spectrum Analyzer KEYSIGHT	N9020B	MY60110462	Dec. 21, 2021	Dec. 20, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-995	Oct. 28, 2021	Oct. 27, 2022
HORN Antenna RF SPIN	DRH18-E	210104A18E	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-995	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC330N	980783	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI	EMC118A45SE	980810	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI	EMC184045SE	980787	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9000+2000+1000)	201230+ 201242+ 210101	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-NM-(9000+300+500)	201252+ 201250+ 201245	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM-(5000+3000+2000)	201259+201256+201253	Jan. 17, 2022	Jan. 16, 2023
Software BV CPS	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Turn Table Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208675	NA	NA
Antenna Tower KaiTuo	NA	NA	NA	NA
Antenna Tower Controller KaiTuo	KT-2000	NA	NA	NA
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 02, 2021	Jun. 01, 2022
DC power supply Keysight	U8002A	MY56330015	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6272278310	Jun. 23, 2021	Jun. 22, 2022
Universal Radio Communication Tester R&S	CMU200	101095	Nov. 18, 2021	Nov. 17, 2022

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 WM Chamber 7.

3 General Information

3.1 General Description of EUT

Product	Cellular module	
Brand	WNC	
Test Model	UMC-STD31BPN	
Sample Status	Engineering sample	
Power Supply Rating	4.0Vdc	
Modulation Type	QPSK, 16QAM, 64QAM	
Operating Frequency	LTE Band 4 (Channel Bandwidth 1.4MHz)	1710.7MHz ~ 1754.3MHz
	LTE Band 4 (Channel Bandwidth 3MHz)	1711.5MHz ~ 1753.5MHz
	LTE Band 4 (Channel Bandwidth 5MHz)	1712.5MHz ~ 1752.5MHz
	LTE Band 4 (Channel Bandwidth 10MHz)	1715.0MHz ~ 1750.0MHz
	LTE Band 4 (Channel Bandwidth 15MHz)	1717.5MHz ~ 1747.5MHz
	LTE Band 4 (Channel Bandwidth 20MHz)	1720.0MHz ~ 1745.0MHz
	LTE Band 7 (Channel Bandwidth 5MHz)	2502.5MHz ~ 2567.5MHz
	LTE Band 7 (Channel Bandwidth 10MHz)	2505.0MHz ~ 2565.0MHz
	LTE Band 7 (Channel Bandwidth 15MHz)	2507.5MHz ~ 2562.5MHz
	LTE Band 7 (Channel Bandwidth 20MHz)	2510.0MHz ~ 2560.0MHz
	LTE Band 12 (Channel Bandwidth 1.4MHz)	699.7MHz ~ 715.3MHz
	LTE Band 12 (Channel Bandwidth 3MHz)	700.5MHz ~ 714.5MHz
	LTE Band 12 (Channel Bandwidth 5MHz)	701.5MHz ~ 713.5MHz
	LTE Band 12 (Channel Bandwidth 10MHz)	704.0MHz ~ 711.0MHz
	LTE Band 17 (Channel Bandwidth 5MHz)	706.5MHz ~ 713.5MHz
	LTE Band 17 (Channel Bandwidth 10MHz)	709.0MHz ~ 711.0MHz
	LTE Band 66 (Channel Bandwidth 1.4MHz)	1710.7MHz ~ 1779.3MHz
	LTE Band 66 (Channel Bandwidth 3MHz)	1711.5MHz ~ 1778.5MHz
	LTE Band 66 (Channel Bandwidth 5MHz)	1712.5MHz ~ 1777.5MHz
	LTE Band 66 (Channel Bandwidth 10MHz)	1715.0MHz ~ 1775.0MHz
	LTE Band 66 (Channel Bandwidth 15MHz)	1717.5MHz ~ 1772.5MHz
	LTE Band 66 (Channel Bandwidth 20MHz)	1720.0MHz ~ 1770.0MHz
	LTE Band 71 (Channel Bandwidth 5MHz)	665.5MHz ~ 695.5MHz
	LTE Band 71 (Channel Bandwidth 10MHz)	668.0MHz ~ 693.0MHz
	LTE Band 71 (Channel Bandwidth 15MHz)	670.5MHz ~ 690.5MHz
	LTE Band 71 (Channel Bandwidth 20MHz)	673.0MHz ~ 688.0MHz

		QPSK	16QAM	64QAM
Max. EIRP Power	LTE Band 4 (Channel Bandwidth 1.4MHz)	266.073mW (24.25dBm)	216.272mW (23.35dBm)	158.125mW (21.99dBm)
	LTE Band 4 (Channel Bandwidth 3MHz)	266.073mW (24.25dBm)	210.378mW (23.23dBm)	154.882mW (21.90dBm)
	LTE Band 4 (Channel Bandwidth 5MHz)	258.226mW (24.12dBm)	208.930mW (23.20dBm)	158.489mW (22.00dBm)
	LTE Band 4 (Channel Bandwidth 10MHz)	263.633mW (24.21dBm)	214.289mW (23.31dBm)	159.956mW (22.04dBm)
	LTE Band 4 (Channel Bandwidth 15MHz)	260.016mW (24.15dBm)	208.449mW (23.19dBm)	154.525mW (21.89dBm)
	LTE Band 4 (Channel Bandwidth 20MHz)	266.073mW (24.25dBm)	213.796mW (23.30dBm)	161.065mW (22.07dBm)
	LTE Band 7 (Channel Bandwidth 5MHz)	270.396mW (24.32dBm)	219.786mW (23.42dBm)	165.959mW (22.20dBm)
	LTE Band 7 (Channel Bandwidth 10MHz)	267.917mW (24.28dBm)	212.814mW (23.28dBm)	161.065mW (22.07dBm)
	LTE Band 7 (Channel Bandwidth 15MHz)	264.850mW (24.23dBm)	209.411mW (23.21dBm)	157.398mW (21.97dBm)
	LTE Band 7 (Channel Bandwidth 20MHz)	274.157mW (24.38dBm)	221.820mW (23.46dBm)	167.880mW (22.25dBm)
	LTE Band 66 (Channel Bandwidth 1.4MHz)	272.270mW (24.35dBm)	214.289mW (23.31dBm)	161.808mW (22.09dBm)
	LTE Band 66 (Channel Bandwidth 3MHz)	267.301mW (24.27dBm)	211.836mW (23.26dBm)	156.675mW (21.95dBm)
	LTE Band 66 (Channel Bandwidth 5MHz)	264.241mW (24.22dBm)	210.378mW (23.23dBm)	154.525mW (21.89dBm)
	LTE Band 66 (Channel Bandwidth 10MHz)	269.153mW (24.30dBm)	215.278mW (23.33dBm)	159.588mW (22.03dBm)
	LTE Band 66 (Channel Bandwidth 15MHz)	267.917mW (24.28dBm)	214.783mW (23.32dBm)	155.955mW (21.93dBm)
	LTE Band 66 (Channel Bandwidth 20MHz)	269.153mW (24.30dBm)	209.894mW (23.22dBm)	153.815mW (21.87dBm)

Max. ERP Power		QPSK	16QAM	64QAM
	LTE Band 12 (Channel Bandwidth 1.4MHz)	183.654mW (22.64dBm)	146.218mW (21.65dBm)	108.893mW (20.37dBm)
	LTE Band 12 (Channel Bandwidth 3MHz)	182.390mW (22.61dBm)	146.555mW (21.66dBm)	109.901mW (20.41dBm)
	LTE Band 12 (Channel Bandwidth 5MHz)	183.231mW (22.63dBm)	146.555mW (21.66dBm)	107.152mW (20.30dBm)
	LTE Band 12 (Channel Bandwidth 10MHz)	185.353mW (22.68dBm)	149.968mW (21.76dBm)	112.720mW (20.52dBm)
	LTE Band 17 (Channel Bandwidth 5MHz)	177.419mW (22.49dBm)	142.561mW (21.54dBm)	103.992mW (20.17dBm)
	LTE Band 17 (Channel Bandwidth 10MHz)	173.780mW (22.40dBm)	138.038mW (21.40dBm)	103.753mW (20.16dBm)
	LTE Band 71 (Channel Bandwidth 5MHz)	187.932mW (22.74dBm)	148.936mW (21.73dBm)	110.408mW (20.43dBm)
	LTE Band 71 (Channel Bandwidth 10MHz)	197.242mW (22.95dBm)	157.761mW (21.98dBm)	115.611mW (20.63dBm)
	LTE Band 71 (Channel Bandwidth 15MHz)	196.789mW (22.94dBm)	153.815mW (21.87dBm)	114.551mW (20.59dBm)
	LTE Band 71 (Channel Bandwidth 20MHz)	190.985mW (22.81dBm)	149.624mW (21.75dBm)	111.944mW (20.49dBm)
Emission Designator		QPSK	16QAM	64QAM
	LTE Band 4 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W	1M09D7W
	LTE Band 4 (Channel Bandwidth 3MHz)	2M69G7D	2M69D7W	2M69D7W
	LTE Band 4 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W	4M50D7W
	LTE Band 4 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W	8M98D7W
	LTE Band 4 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 4 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
	LTE Band 7 (Channel Bandwidth 5MHz)	4M49G7D	4M49D7W	4M50D7W
	LTE Band 7 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W	8M98D7W
	LTE Band 7 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 7 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
	LTE Band 12 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W	1M09D7W
	LTE Band 12 (Channel Bandwidth 3MHz)	2M69G7D	2M69D7W	2M69D7W
	LTE Band 12 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M50D7W
	LTE Band 12 (Channel Bandwidth 10MHz)	9M01G7D	9M02D7W	9M02D7W
	LTE Band 17 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M50D7W
	LTE Band 17 (Channel Bandwidth 10MHz)	8M96G7D	8M96D7W	8M96D7W
	LTE Band 66 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W	1M09D7W
	LTE Band 66 (Channel Bandwidth 3MHz)	2M69G7D	2M69D7W	2M69D7W
	LTE Band 66 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M50D7W
	LTE Band 66 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W	8M99D7W
	LTE Band 66 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 66 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W

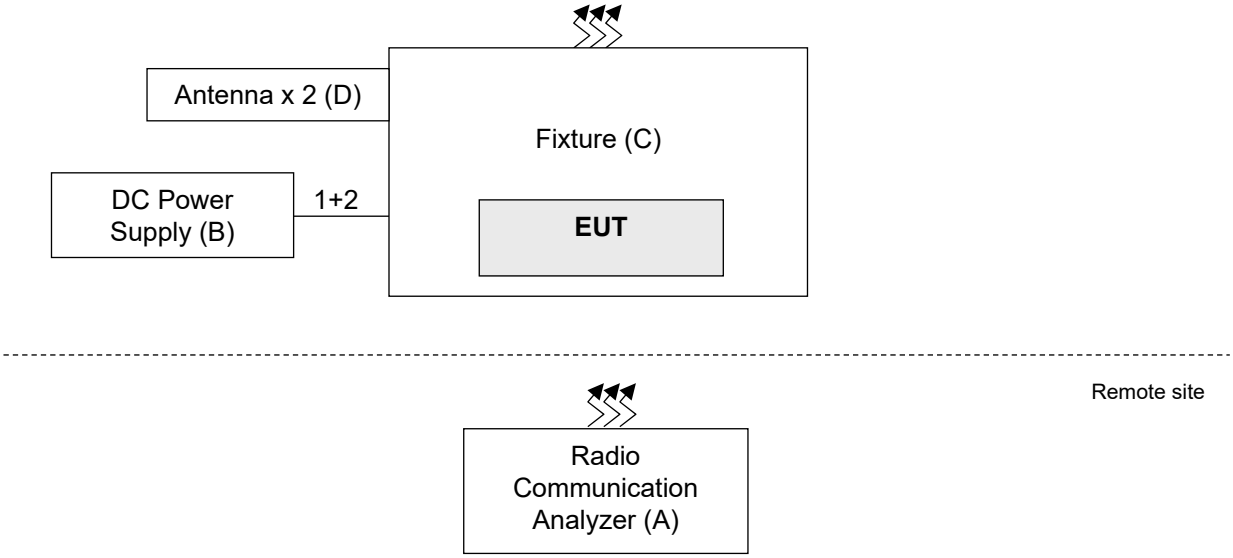
Emission Designator		QPSK	16QAM	64QAM
	LTE Band 71 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M50D7W
	LTE Band 71 (Channel Bandwidth 10MHz)	8M99G7D	8M99D7W	8M99D7W
	LTE Band 71 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 71 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
Antenna Type	Refer to note			
Antenna Connector	Refer to note			
Accessory Device	NA			
Cable Supplied	NA			

Note: The antenna information is listed as below. (For support unit only)

Type	Connector	Gain (dBi)											
		GSM 850	GSM 1900	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B17	LTE B25	LTE B26	LTE B66	LTE B71
Dipole	SMA	1.82	1.80	1.80	1.57	1.82	2.15	2.02	2.02	1.80	1.82	1.57	2.02

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

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Radio Communication Analyzer	Anritsu	MT8821C	6272278310	NA	-
B.	DC Power Supply	JIN YIH Technology	SP3051	SP30512113422	NA	-
C.	Fixture	NA	NA	NA	NA	Provided by manufacturer
D.	Antenna x 2	WNC	RF21S00802A	NA	NA	Provided by manufacturer

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.	DC Power Cable	1	1.8	N	0	-
2.	DC Cable	1	0.12	N	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 as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	Radiated Emission
LTE Band 4	X-plane
LTE Band 7	X-plane
LTE Band 12	X-plane
LTE Band 17	X-plane
LTE Band 66	X-plane
LTE Band 71	X-plane

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	EIRP	19957 to 20393	19957 (1710.7MHz), 20175 (1732.5MHz), 20393 (1754.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	1 Half Full
		19965 to 20385	19965 (1711.5MHz), 20175 (1732.5MHz), 20385 (1753.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1 Half Full
		19975 to 20375	19975 (1712.5MHz), 20175 (1732.5MHz), 20375 (1752.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 Half Full
		20000 to 20350	20000 (1715.0MHz), 20175 (1732.5MHz), 20350 (1750.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1 Half Full
		20025 to 20325	20025 (1717.5MHz), 20175 (1732.5MHz), 20325 (1747.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1 Half Full
		20050 to 20300	20050 (1720.0MHz), 20175 (1732.5MHz), 20300 (1745.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1 Half Full
-	Modulation Characteristics	20050 to 20300	20175 (1732.5MHz)	20MHz	QPSK / 16QAM / 64QAM	Full
-	Frequency Stability	19957 to 20393	19957 (1710.7MHz), 20393 (1754.3MHz)	1.4MHz	QPSK	Full
		19965 to 20385	19965 (1711.5MHz), 20385 (1753.5MHz)	3MHz	QPSK	Full
		19975 to 20375	19975 (1712.5MHz), 20375 (1752.5MHz)	5MHz	QPSK	Full
		20000 to 20350	20000 (1715.0MHz), 20350 (1750.0MHz)	10MHz	QPSK	Full
		20025 to 20325	20025 (1717.5MHz), 20325 (1747.5MHz)	15MHz	QPSK	Full
		20050 to 20300	20050 (1720.0MHz), 20300 (1745.0MHz)	20MHz	QPSK	Full
-	Emission Bandwidth	19957 to 20393	19957 (1710.7MHz), 20175 (1732.5MHz), 20393 (1754.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	Full
		19965 to 20385	19965 (1711.5MHz), 20175 (1732.5MHz), 20385 (1753.5MHz)	3MHz	QPSK / 16QAM / 64QAM	Full
		19975 to 20375	19975 (1712.5MHz), 20175 (1732.5MHz), 20375 (1752.5MHz)	5MHz	QPSK / 16QAM / 64QAM	Full
		20000 to 20350	20000 (1715.0MHz), 20175 (1732.5MHz), 20350 (1750.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
		20025 to 20325	20025 (1717.5MHz), 20175 (1732.5MHz), 20325 (1747.5MHz)	15MHz	QPSK / 16QAM / 64QAM	Full
		20050 to 20300	20050 (1720.0MHz), 20175 (1732.5MHz), 20300 (1745.0MHz)	20MHz	QPSK / 16QAM / 64QAM	Full

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Band Edge	19957 to 20393	19957 (1710.7MHz), 20393 (1754.3MHz)	1.4MHz	QPSK	1 Half Full
		19965 to 20385	19965 (1711.5MHz), 20385 (1753.5MHz)	3MHz	QPSK	1 Half Full
		19975 to 20375	19975 (1712.5MHz), 20375 (1752.5MHz)	5MHz	QPSK	1 Half Full
		20000 to 20350	20000 (1715.0MHz), 20350 (1750.0MHz)	10MHz	QPSK	1 Half Full
		20025 to 20325	20025 (1717.5MHz), 20325 (1747.5MHz)	15MHz	QPSK	1 Half Full
		20050 to 20300	20050 (1720.0MHz), 20300 (1745.0MHz)	20MHz	QPSK	1 Half Full
-	Peak To Average Ratio	19957 to 20393	19957 (1710.7MHz), 20175 (1732.5MHz), 20393 (1754.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	1
		19965 to 20385	19965 (1711.5MHz), 20175 (1732.5MHz), 20385 (1753.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1
		19975 to 20375	19975 (1712.5MHz), 20175 (1732.5MHz), 20375 (1752.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1
		20000 to 20350	20000 (1715.0MHz), 20175 (1732.5MHz), 20350 (1750.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1
		20025 to 20325	20025 (1717.5MHz), 20175 (1732.5MHz), 20325 (1747.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1
		20050 to 20300	20050 (1720.0MHz), 20175 (1732.5MHz), 20300 (1745.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Conducted Emission	19957 to 20393	19957 (1710.7MHz), 20175 (1732.5MHz), 20393 (1754.3MHz)	1.4MHz	QPSK	1
		19965 to 20385	19965 (1711.5MHz), 20175 (1732.5MHz), 20385 (1753.5MHz)	3MHz	QPSK	1
		19975 to 20375	19975 (1712.5MHz), 20175 (1732.5MHz), 20375 (1752.5MHz)	5MHz	QPSK	1
		20000 to 20350	20000 (1715.0MHz), 20175 (1732.5MHz), 20350 (1750.0MHz)	10MHz	QPSK	1
		20025 to 20325	20025 (1717.5MHz), 20175 (1732.5MHz), 20325 (1747.5MHz)	15MHz	QPSK	1
		20050 to 20300	20050 (1720.0MHz), 20175 (1732.5MHz), 20300 (1745.0MHz)	20MHz	QPSK	1
-	Radiated Emission	19957 to 20393	19957 (1710.7MHz), 20175 (1732.5MHz), 20393 (1754.3MHz)	1.4MHz	QPSK	1
		19975 to 20375	19975 (1712.5MHz), 20175 (1732.5MHz), 20375 (1752.5MHz)	5MHz	QPSK	1
		20050 to 20300	20050 (1720.0MHz), 20175 (1732.5MHz), 20300 (1745.0MHz)	20MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM, and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 7

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	EIRP	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 Half Full
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1 Half Full
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1 Half Full
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1 Half Full
-	Modulation Characteristics	20850 to 21350	21100 (2535.0MHz)	20MHz	QPSK / 16QAM / 64QAM	Full
-	Frequency Stability	20775 to 21425	20775 (2502.5MHz), 21425 (2567.5MHz)	5MHz	QPSK	Full
		20800 to 21400	20800 (2505.0MHz), 21400 (2565.0MHz)	10MHz	QPSK	Full
		20825 to 21375	20825 (2507.5MHz), 21375 (2562.5MHz)	15MHz	QPSK	Full
		20850 to 21350	20850 (2510.0MHz), 21350 (2560.0MHz)	20MHz	QPSK	Full
-	Emission Bandwidth	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5MHz	QPSK / 16QAM / 64QAM	Full
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15MHz	QPSK / 16QAM / 64QAM	Full
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20MHz	QPSK / 16QAM / 64QAM	Full
-	Out-of-Band Emissions	20775 to 21425	20775 (2502.5MHz), 21425 (2567.5MHz)	5MHz	QPSK	1 Half Full
		20800 to 21400	20800 (2505.0MHz), 21400 (2565.0MHz)	10MHz	QPSK	1 Half Full
		20825 to 21375	20825 (2507.5MHz), 21375 (2562.5MHz)	15MHz	QPSK	1 Half Full
		20850 to 21350	20850 (2510.0MHz), 21350 (2560.0MHz)	20MHz	QPSK	1 Half Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	Peak to Average Ratio	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1
-	Conducted Emission	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5MHz	QPSK	1
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10MHz	QPSK	1
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15MHz	QPSK	1
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20MHz	QPSK	1
-	Radiated Emission	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5MHz	QPSK	1
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM, and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 12

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	ERP	23017 to 23173	23017 (699.7MHz), 23095 (707.5MHz), 23173 (715.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	1 Half Full
		23025 to 23165	23025 (700.5MHz), 23095 (707.5MHz), 23165 (714.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1 Half Full
		23035 to 23155	23035 (701.5MHz), 23095 (707.5MHz), 23155 (713.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 Half Full
		23060 to 23130	23060 (704.0MHz), 23095 (707.5MHz), 23130 (711.0 MHz)	10MHz	QPSK / 16QAM / 64QAM	1 Half Full
-	Modulation Characteristics	23060 to 23130	23095 (707.5MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
-	Frequency Stability	23017 to 23173	23017 (699.7MHz), 23173 (715.3MHz)	1.4MHz	QPSK	Full
		23025 to 23165	23025 (700.5MHz), 23165 (714.5MHz)	3MHz	QPSK	Full
		23035 to 23155	23035 (701.5MHz), 23155 (713.5MHz)	5MHz	QPSK	Full
		23060 to 23130	23060 (704.0MHz), 23130 (711.0MHz)	10MHz	QPSK	Full
-	Emission Bandwidth	23017 to 23173	23017 (699.7MHz), 23095 (707.5MHz), 23173 (715.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	Full
		23025 to 23165	23025 (700.5MHz), 23095 (707.5MHz), 23165 (714.5MHz)	3MHz	QPSK / 16QAM / 64QAM	Full
		23035 to 23155	23035 (701.5MHz), 23095 (707.5MHz), 23155 (713.5MHz)	5MHz	QPSK / 16QAM / 64QAM	Full
		23060 to 23130	23060 (704.0MHz), 23095 (707.5MHz), 23130 (711.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
-	Band Edge	23017 to 23173	23017 (699.7MHz), 23173 (715.3MHz)	1.4MHz	QPSK	1 Half Full
		23025 to 23165	23025 (700.5MHz), 23165 (714.5MHz)	3MHz	QPSK	1 Half Full
		23035 to 23155	23035 (701.5MHz), 23155 (713.5MHz)	5MHz	QPSK	1 Half Full
		23060 to 23130	23060 (704.0MHz), 23130 (711.0MHz)	10MHz	QPSK	1 Half Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	Peak to Average Ratio	23017 to 23173	23017 (699.7MHz), 23095 (707.5MHz), 23173 (715.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	1
		23025 to 23165	23025 (700.5MHz), 23095 (707.5MHz), 23165 (714.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1
		23035 to 23155	23035 (701.5MHz), 23095 (707.5MHz), 23155 (713.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1
		23060 to 23130	23060 (704.0MHz), 23095 (707.5MHz), 23130 (711.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1
-	Conducted Emission	23017 to 23173	23017 (699.7MHz), 23095 (707.5MHz), 23173 (715.3MHz)	1.4MHz	QPSK	1
		23025 to 23165	23025 (700.5MHz), 23095 (707.5MHz), 23165 (714.5MHz)	3MHz	QPSK	1
		23035 to 23155	23035 (701.5MHz), 23095 (707.5MHz), 23155 (713.5MHz)	5MHz	QPSK	1
		23060 to 23130	23060 (704.0MHz), 23095 (707.5MHz), 23130 (711.0MHz)	10MHz	QPSK	1
-	Radiated Emission	23017 to 23173	23017 (699.7MHz), 23095 (707.5MHz), 23173 (715.3MHz)	1.4MHz	QPSK	1
		23035 to 23155	23035 (701.5MHz), 23095 (707.5MHz), 23155 (713.5MHz)	5MHz	QPSK	1
		23060 to 23130	23060 (704.0MHz), 23095 (707.5MHz), 23130 (711.0MHz)	10MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM, and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 17

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	ERP	23755 to 23825	23755 (706.5MHz), 23790 (710.0MHz), 23825 (713.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 Half Full
		23780 to 23800	23780 (709.0MHz), 23790 (710.0MHz), 23800 (711.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1 Half Full
-	Modulation Characteristics	23780 to 23800	23790 (710.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
-	Frequency Stability	23755 to 23825	23755 (706.5MHz), 23825 (713.5MHz)	5MHz	QPSK	Full
		23780 to 23800	23780 (709.0MHz), 23800 (711.0MHz)	10MHz	QPSK	Full
-	Emission Bandwidth	23755 to 23825	23755 (706.5MHz), 23790 (710.0MHz), 23825 (713.5MHz)	5MHz	QPSK / 16QAM / 64QAM	Full
		23780 to 23800	23780 (709.0MHz), 23790 (710.0MHz), 23800 (711.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
-	Band Edge	23755 to 23825	23755 (706.5MHz), 23825 (713.5MHz)	5MHz	QPSK	1 Half Full
		23780 to 23800	23780 (709.0MHz), 23800 (711.0MHz)	10MHz	QPSK	1 Half Full
-	Peak to Average Ratio	23755 to 23825	23755 (706.5MHz), 23790 (710.0MHz), 23825 (713.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1
		23780 to 23800	23780 (709.0MHz), 23790 (710.0MHz), 23800 (711.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1
-	Conducted Emission	23755 to 23825	23755 (706.5MHz), 23790 (710.0MHz), 23825 (713.5MHz)	5MHz	QPSK	1
		23780 to 23800	23780 (709.0MHz), 23790 (710.0MHz), 23800 (711.0MHz)	10MHz	QPSK	1
-	Radiated Emission	23755 to 23825	23755 (706.5MHz), 23790 (710.0MHz), 23825 (713.5MHz)	5MHz	QPSK	1
		23780 to 23800	23780 (709.0MHz), 23790 (710.0MHz), 23800 (711.0MHz)	10MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM, and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 66

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	EIRP	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	1 Half Full
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1 Half Full
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 Half Full
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1 Half Full
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1 Half Full
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1 Half Full
-	Modulation Characteristics	132072 to 132572	132322 (1745.0MHz)	20MHz	QPSK / 16QAM / 64QAM	Full
-	Frequency Stability	131979 to 132665	131979 (1710.7MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	Full
		131987 to 132657	131987 (1711.5MHz), 132657 (1778.5MHz)	3MHz	QPSK	Full
		131997 to 132647	131997 (1712.5MHz), 132647 (1777.5MHz)	5MHz	QPSK	Full
		132022 to 132622	132022 (1715.0MHz), 132622 (1775.0MHz)	10MHz	QPSK	Full
		132047 to 132597	132047 (1717.5MHz), 132597 (1772.5MHz)	15MHz	QPSK	Full
		132072 to 132572	132072 (1720.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	Full
-	Emission Bandwidth	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	Full
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK / 16QAM / 64QAM	Full
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK / 16QAM / 64QAM	Full
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK / 16QAM / 64QAM	Full
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK / 16QAM / 64QAM	Full

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Band Edge	131979 to 132665	131979 (1710.7MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	1 Half Full
		131987 to 132657	131987 (1711.5MHz), 132657 (1778.5MHz)	3MHz	QPSK	1 Half Full
		131997 to 132647	131997 (1712.5MHz), 132647 (1777.5MHz)	5MHz	QPSK	1 Half Full
		132022 to 132622	132022 (1715.0MHz), 132622 (1775.0MHz)	10MHz	QPSK	1 Half Full
		132047 to 132597	132047 (1717.5MHz), 132597 (1772.5MHz)	15MHz	QPSK	1 Half Full
		132072 to 132572	132072 (1720.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	1 Half Full
-	Peak to Average Ratio	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK / 16QAM / 64QAM	1
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK / 16QAM / 64QAM	1
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1

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

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM, and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 71

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	ERP	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1 Half Full
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1 Half Full
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1 Half Full
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1 Half Full
-	Modulation Characteristics	133222 to 133372	133297 (680.5MHz)	20MHz	QPSK / 16QAM / 64QAM	Full
-	Frequency Stability	133147 to 133447	133147 (665.5MHz), 133447 (695.5MHz)	5MHz	QPSK	Full
		133172 to 133422	133172 (668.0MHz), 133422 (693.0MHz)	10MHz	QPSK	Full
		133197 to 133397	133197 (670.5MHz), 133397 (690.5MHz)	15MHz	QPSK	Full
		133222 to 133372	133222 (673.0MHz), 133372 (688.0MHz)	20MHz	QPSK	Full
-	Emission Bandwidth	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5MHz	QPSK / 16QAM / 64QAM	Full
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10MHz	QPSK / 16QAM / 64QAM	Full
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15MHz	QPSK / 16QAM / 64QAM	Full
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20MHz	QPSK / 16QAM / 64QAM	Full
-	Band Edge	133147 to 133447	133147 (665.5MHz), 133447 (695.5MHz)	5MHz	QPSK	1 Half Full
		133172 to 133422	133172 (668.0MHz), 133422 (693.0MHz)	10MHz	QPSK	1 Half Full
		133197 to 133397	133197 (670.5MHz), 133397 (690.5MHz)	15MHz	QPSK	1 Half Full
		133222 to 133372	133222 (673.0MHz), 133372 (688.0MHz)	20MHz	QPSK	1 Half Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	Peak to Average Ratio	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5MHz	QPSK / 16QAM / 64QAM	1
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10MHz	QPSK / 16QAM / 64QAM	1
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15MHz	QPSK / 16QAM / 64QAM	1
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20MHz	QPSK / 16QAM / 64QAM	1
-	Conducted Emission	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5MHz	QPSK	1
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10MHz	QPSK	1
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15MHz	QPSK	1
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20MHz	QPSK	1
-	Radiated Emission	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5MHz	QPSK	1
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM, and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under worse mode according to the maximum output power.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP / ERP	25deg. C, 60%RH	4.0Vdc	Noah Chang
Modulation Characteristics	25deg. C, 60%RH	4.0Vdc	Noah Chang
Frequency Stability	25deg. C, 60%RH	4.0Vdc	Noah Chang
Occupied Bandwidth	25deg. C, 60%RH	4.0Vdc	Noah Chang
Band Edge	25deg. C, 60%RH	4.0Vdc	Noah Chang
Peak To Average Ratio	25deg. C, 60%RH	4.0Vdc	Noah Chang
Conducted Emission	25deg. C, 60%RH	4.0Vdc	Noah Chang
Radiated Emission	23deg. C, 72%RH	4.0Vdc	Edison Lee

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 27

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

All test items have been performed 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 LTE Band 4, LTE Band 66:
Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

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, LTE Band 17, LTE Band 71:
Control and mobile stations in the 698-746 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 band are limited to 3 watts ERP.

4.1.2 Test Procedures

Conducted Power Measurement:

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

Maximum EIRP / ERP

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

$EIRP = P_{Meas} + G_T$

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

where

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

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

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

4.1.3 Test Setup

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	22.42	22.42	22.57
		1	50	**22.68**	22.67	22.67
		1	99	22.33	22.26	22.42
		50	0	21.43	21.47	21.51
		50	25	21.50	**21.64**	21.63
		50	50	21.53	21.38	21.45
		100	0	**21.52**	21.39	21.39
20M	16QAM	1	0	21.45	21.37	21.65
		1	50	21.63	21.73	21.57
		1	99	21.26	21.24	21.50
		50	0	20.39	20.47	20.61
		50	25	20.42	20.72	20.56
		50	50	20.62	20.32	20.36
		100	0	20.60	20.45	20.39
20M	64QAM	1	0	20.24	20.03	20.34
		1	50	20.36	20.50	20.21
		1	99	19.88	19.98	20.30
		50	0	19.14	19.22	19.25
		50	25	19.15	19.49	19.16
		50	50	19.31	19.01	19.15
		100	0	19.33	19.21	19.01

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	22.52	22.28	22.57
		1	37	22.58	22.40	22.56
		1	74	22.41	22.20	22.21
		36	0	21.53	21.62	21.35
		36	19	21.65	21.47	21.43
		36	39	21.52	21.35	21.55
		75	0	21.59	21.59	21.45
15M	16QAM	1	0	21.50	21.29	21.58
		1	37	21.62	21.31	21.51
		1	74	21.37	21.25	21.17
		36	0	20.45	20.53	20.33
		36	19	20.57	20.40	20.53
		36	39	20.44	20.31	20.56
		75	0	20.66	20.53	20.38
15M	64QAM	1	0	20.30	19.97	20.32
		1	37	20.25	20.06	20.30
		1	74	20.15	20.02	19.85
		36	0	19.06	19.31	19.08
		36	19	19.22	19.15	19.27
		36	39	19.17	18.95	19.35
		75	0	19.34	19.26	19.11

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	22.38	22.35	22.54
		1	24	22.41	22.57	22.64
		1	49	22.35	22.18	22.43
		25	0	21.59	21.45	21.53
		25	12	21.47	21.38	21.52
		25	25	21.27	21.32	21.43
		50	0	21.41	21.65	21.63
10M	16QAM	1	0	21.40	21.45	21.55
		1	24	21.42	21.60	21.74
		1	49	21.36	21.09	21.36
		25	0	20.61	20.41	20.53
		25	12	20.51	20.39	20.61
		25	25	20.29	20.35	20.42
		50	0	20.41	20.55	20.59
10M	64QAM	1	0	20.02	20.17	20.25
		1	24	20.20	20.22	**20.47**
		1	49	20.10	19.73	20.14
		25	0	19.29	19.11	19.18
		25	12	19.24	19.07	19.25
		25	25	18.89	19.02	19.04
		50	0	19.19	19.20	19.24

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	22.55	22.41	22.50
		1	12	22.51	22.51	22.55
		1	24	22.28	22.38	22.21
		12	0	21.63	21.33	21.58
		12	6	21.57	21.49	21.64
		12	13	21.41	21.32	21.45
		25	0	21.62	21.47	21.50
5M	16QAM	1	0	21.54	21.33	21.51
		1	12	21.60	21.46	21.63
		1	24	21.27	21.42	21.25
		12	0	20.63	20.29	20.61
		12	6	20.47	20.45	20.57
		12	13	20.43	20.25	20.38
		25	0	20.65	20.49	20.56
5M	64QAM	1	0	20.34	19.95	20.21
		1	12	20.35	20.09	**20.43**
		1	24	19.99	20.04	19.87
		12	0	19.29	19.01	19.31
		12	6	19.18	19.11	19.34
		12	13	19.18	18.91	19.02
		25	0	19.31	19.24	19.16

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	22.35	22.45	22.38
		1	7	22.55	22.68	22.45
		1	14	22.20	22.42	22.35
		8	0	21.40	21.53	21.49
		8	3	21.46	21.61	21.47
		8	7	21.32	21.34	21.36
		15	0	21.43	21.57	21.42
3M	16QAM	1	0	21.32	21.37	21.29
		1	7	21.58	21.66	21.37
		1	14	21.11	21.41	21.45
		8	0	20.32	20.56	20.40
		8	3	20.55	20.56	20.42
		8	7	20.22	20.36	20.30
		15	0	20.48	20.60	20.45
3M	64QAM	1	0	19.95	20.16	19.98
		1	7	20.24	20.33	20.02
		1	14	19.78	20.08	20.19
		8	0	18.95	19.20	19.10
		8	3	19.19	19.34	19.04
		8	7	18.91	18.98	18.92
		15	0	19.14	19.38	19.12

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	22.26	22.27	22.38
		1	2	22.65	22.40	22.68
		1	5	22.39	22.09	22.10
		3	0	22.51	22.62	22.63
		3	1	22.52	22.52	22.53
		3	3	22.47	22.21	22.26
		6	0	21.50	21.38	21.51
1.4M	16QAM	1	0	21.20	21.26	21.28
		1	2	21.64	21.38	21.78
		1	5	21.34	21.10	21.01
		3	0	21.53	21.68	21.57
		3	1	21.59	21.61	21.47
		3	3	21.39	21.30	21.31
		6	0	20.40	20.45	20.58
1.4M	64QAM	1	0	19.96	19.91	19.96
		1	2	20.33	20.13	**20.42**
		1	5	20.07	19.90	19.72
		3	0	20.15	20.36	20.32
		3	1	20.23	20.37	20.10
		3	3	20.09	20.03	20.10
		6	0	19.17	19.21	19.21

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	QPSK	1	0	22.14	22.06	21.94
		1	50	22.17	**22.23**	22.22
		1	99	21.83	21.89	21.85
		50	0	20.94	21.06	**21.22**
		50	25	20.95	21.08	20.95
		50	50	21.12	21.19	21.16
		100	0	21.04	**21.31**	21.18
20M	16QAM	1	0	21.15	21.15	20.90
		1	50	21.09	21.31	21.18
		1	99	20.91	20.83	20.87
		50	0	19.97	20.16	20.21
		50	25	19.90	20.01	19.89
		50	50	20.16	20.12	20.09
		100	0	20.05	20.39	20.08
20M	64QAM	1	0	19.76	19.92	19.52
		1	50	19.84	20.10	19.82
		1	99	19.57	19.48	19.49
		50	0	18.69	18.88	18.97
		50	25	18.65	18.67	18.64
		50	50	18.83	18.86	18.89
		100	0	18.65	19.17	18.75

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	QPSK	1	0	21.95	21.94	21.89
		1	37	22.08	22.03	22.08
		1	74	21.78	21.99	21.75
		36	0	21.01	20.99	21.19
		36	19	21.17	21.03	21.13
		36	39	21.12	21.17	20.96
		75	0	21.21	21.30	21.26
15M	16QAM	1	0	20.87	21.04	20.88
		1	37	21.05	21.02	20.98
		1	74	20.69	21.06	20.81
		36	0	19.91	20.09	20.23
		36	19	20.17	20.11	20.22
		36	39	20.20	20.16	19.97
		75	0	20.13	20.30	20.33
15M	64QAM	1	0	19.61	19.64	19.67
		1	37	19.75	19.82	19.63
		1	74	19.48	19.75	19.61
		36	0	18.69	18.84	19.01
		36	19	18.96	18.86	18.93
		36	39	18.92	18.82	18.63
		75	0	18.73	19.01	19.04

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	QPSK	1	0	21.89	21.97	22.09
		1	24	22.07	22.01	22.13
		1	49	22.01	21.96	21.81
		25	0	21.00	21.22	21.12
		25	12	21.07	20.94	21.18
		25	25	21.10	21.07	21.12
		50	0	21.15	21.16	21.24
10M	16QAM	1	0	20.91	21.01	21.05
		1	24	21.13	20.96	21.08
		1	49	21.02	20.94	20.89
		25	0	19.92	20.28	20.03
		25	12	20.16	19.99	20.17
		25	25	20.07	20.10	20.10
		50	0	20.15	20.20	20.26
10M	64QAM	1	0	19.60	19.62	19.79
		1	24	19.92	19.70	19.70
		1	49	19.65	19.65	19.62
		25	0	18.61	19.02	18.64
		25	12	18.77	18.61	18.93
		25	25	18.79	18.79	18.86
		50	0	18.88	18.86	18.95

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	QPSK	1	0	22.11	22.17	22.01
		1	12	22.10	22.03	21.97
		1	24	21.94	21.98	21.99
		12	0	21.22	21.01	21.13
		12	6	21.05	20.94	20.96
		12	13	21.02	21.13	20.91
		25	0	21.20	21.18	21.31
5M	16QAM	1	0	21.06	21.27	21.07
		1	12	21.04	21.00	21.07
		1	24	20.91	20.90	21.04
		12	0	20.22	20.07	20.05
		12	6	20.07	19.87	20.04
		12	13	20.05	20.16	19.97
		25	0	20.22	20.26	20.33
5M	64QAM	1	0	19.85	20.05	19.80
		1	12	19.64	19.61	19.71
		1	24	19.63	19.56	19.67
		12	0	18.90	18.82	18.77
		12	6	18.83	18.50	18.71
		12	13	18.72	18.80	18.57
		25	0	18.94	18.95	19.13

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	22.61	22.38	22.51
		1	24	22.74	22.63	**22.81**
		1	49	22.59	22.52	22.54
		25	0	21.66	21.81	21.89
		25	12	21.84	21.59	21.69
		25	25	21.71	21.78	**21.91**
		50	0	**21.92**	21.91	21.91
10M	16QAM	1	0	21.68	21.43	21.56
		1	24	21.76	21.61	21.89
		1	49	21.58	21.58	21.44
		25	0	20.59	20.74	20.94
		25	12	20.92	20.55	20.67
		25	25	20.67	20.75	20.84
		50	0	20.90	20.87	20.93
10M	64QAM	1	0	20.31	20.04	20.25
		1	24	20.48	20.41	20.65
		1	49	20.20	20.25	20.18
		25	0	19.19	19.37	19.59
		25	12	19.67	19.27	19.37
		25	25	19.45	19.51	19.49
		50	0	19.61	19.67	19.55

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	22.66	22.65	22.49
		1	12	22.67	22.76	22.64
		1	24	22.75	22.51	22.64
		12	0	21.72	21.70	21.87
		12	6	21.78	21.56	21.71
		12	13	21.80	21.82	21.65
		25	0	21.92	21.65	21.67
5M	16QAM	1	0	21.66	21.59	21.43
		1	12	21.65	21.79	21.63
		1	24	21.66	21.51	21.70
		12	0	20.71	20.75	20.77
		12	6	20.87	20.60	20.67
		12	13	20.79	20.89	20.74
		25	0	20.88	20.60	20.61
5M	64QAM	1	0	20.37	20.30	20.10
		1	12	20.35	20.43	20.25
		1	24	20.31	20.22	20.31
		12	0	19.50	19.43	19.44
		12	6	19.48	19.37	19.29
		12	13	19.41	19.63	19.41
		25	0	19.59	19.31	19.23

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	22.53	22.66	22.47
		1	7	22.74	22.70	22.67
		1	14	22.55	22.53	22.53
		8	0	21.73	21.94	21.85
		8	3	21.65	21.76	21.75
		8	7	21.84	21.74	21.74
		15	0	21.92	21.78	21.72
3M	16QAM	1	0	21.50	21.63	21.51
		1	7	21.79	21.61	21.59
		1	14	21.52	21.51	21.48
		8	0	20.76	20.90	20.82
		8	3	20.56	20.72	20.73
		8	7	20.78	20.83	20.77
		15	0	21.00	20.86	20.82
3M	64QAM	1	0	20.17	20.37	20.28
		1	7	20.54	20.35	20.32
		1	14	20.12	20.17	20.19
		8	0	19.55	19.58	19.51
		8	3	19.31	19.47	19.44
		8	7	19.38	19.62	19.44
		15	0	19.67	19.65	19.48

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	22.37	22.42	22.67
		1	2	22.77	22.66	22.66
		1	5	22.68	22.51	22.55
		3	0	21.90	21.87	21.75
		3	1	21.58	21.72	21.78
		3	3	21.66	21.74	21.75
		6	0	21.78	21.73	21.71
1.4M	16QAM	1	0	21.44	21.33	21.57
		1	2	21.78	21.62	21.72
		1	5	21.59	21.48	21.58
		3	0	20.85	20.85	20.75
		3	1	20.62	20.70	20.83
		3	3	20.63	20.75	20.75
		6	0	20.84	20.63	20.81
1.4M	64QAM	1	0	20.18	20.03	20.35
		1	2	20.38	20.30	20.50
		1	5	20.25	20.22	20.19
		3	0	19.60	19.49	19.47
		3	1	19.41	19.36	19.61
		3	3	19.27	19.45	19.37
		6	0	19.57	19.32	19.44

LTE Band 17						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23780	23790	23800
		Frequency (MHz)		709	710	711
10M	QPSK	1	0	**22.47**	22.35	22.32
		1	24	22.53	22.49	22.43
		1	49	22.46	22.21	22.40
		25	0	21.46	21.55	21.35
		25	12	21.50	**21.60**	21.43
		25	25	21.25	21.35	21.39
		50	0	21.33	21.35	**21.37**
10M	16QAM	1	0	21.37	21.27	21.27
		1	24	21.53	21.50	21.51
		1	49	21.42	21.21	21.42
		25	0	20.49	20.65	20.33
		25	12	20.51	20.64	20.45
		25	25	20.19	20.36	20.40
		50	0	20.38	20.34	20.37
10M	64QAM	1	0	20.15	19.90	19.91
		1	24	20.19	20.29	20.24
		1	49	20.22	19.99	20.06
		25	0	19.17	19.44	19.03
		25	12	19.29	19.36	19.22
		25	25	18.84	19.02	19.06
		50	0	19.13	19.11	19.13

LTE Band 17						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23755	23790	23825
		Frequency (MHz)		706.5	710	713.5
5M	QPSK	1	0	22.38	22.40	22.47
		1	12	22.61	22.62	22.57
		1	24	22.41	22.34	22.40
		12	0	21.32	21.29	21.46
		12	6	21.47	21.39	21.48
		12	13	21.45	21.44	21.44
		25	0	21.25	21.29	21.31
5M	16QAM	1	0	21.47	21.39	21.43
		1	12	21.57	21.67	21.48
		1	24	21.32	21.27	21.41
		12	0	20.38	20.21	20.47
		12	6	20.45	20.30	20.47
		12	13	20.49	20.41	20.48
		25	0	20.23	20.32	20.35
5M	64QAM	1	0	20.12	20.08	20.09
		1	12	20.22	20.30	20.12
		1	24	20.02	19.98	20.11
		12	0	18.99	18.91	19.18
		12	6	19.08	19.06	19.17
		12	13	19.23	19.11	19.08
		25	0	18.94	18.94	18.99

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	22.30	22.23	22.19
		1	50	22.58	22.55	22.73
		1	99	22.30	22.30	22.21
		50	0	21.40	21.36	**21.44**
		50	25	21.32	21.40	21.30
		50	50	21.17	21.19	21.32
		100	0	21.23	21.17	**21.43**
20M	16QAM	1	0	21.39	21.16	21.21
		1	50	21.58	21.57	21.65
		1	99	21.35	21.35	21.25
		50	0	20.30	20.32	20.36
		50	25	20.39	20.48	20.30
		50	50	20.19	20.28	20.39
		100	0	20.24	20.18	20.36
20M	64QAM	1	0	20.05	19.91	19.86
		1	50	20.30	20.23	20.29
		1	99	20.05	20.13	20.02
		50	0	18.97	18.93	18.99
		50	25	19.10	19.09	19.02
		50	50	18.98	18.92	19.06
		100	0	18.85	18.92	18.97

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	22.10	22.37	22.08
		1	37	22.67	22.56	22.71
		1	74	22.33	22.31	22.22
		36	0	21.53	21.43	21.44
		36	19	21.37	21.48	21.50
		36	39	21.30	21.37	21.43
		75	0	21.46	21.19	21.23
15M	16QAM	1	0	21.05	21.29	21.11
		1	37	21.67	21.60	21.75
		1	74	21.29	21.40	21.26
		36	0	20.59	20.50	20.39
		36	19	20.37	20.47	20.49
		36	39	20.23	20.38	20.43
		75	0	20.49	20.16	20.28
15M	64QAM	1	0	19.75	19.98	19.83
		1	50	20.33	20.35	20.36
		1	99	20.04	20.14	19.87
		50	0	19.28	19.29	19.09
		50	25	19.09	19.14	19.27
		50	50	18.92	19.10	19.15
		100	0	19.27	18.93	19.01

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	22.30	22.31	22.25
		1	24	22.73	22.44	22.69
		1	49	22.36	22.28	22.33
		25	0	21.41	21.49	21.40
		25	12	21.33	21.37	21.48
		25	25	21.24	21.39	21.41
		50	0	21.32	21.41	21.28
10M	16QAM	1	0	21.20	21.21	21.20
		1	24	21.71	21.49	21.76
		1	49	21.36	21.20	21.38
		25	0	20.33	20.51	20.44
		25	12	20.37	20.40	20.47
		25	25	20.32	20.38	20.48
		50	0	20.37	20.46	20.33
10M	64QAM	1	0	19.93	19.85	19.93
		1	50	20.46	20.18	20.43
		1	99	20.04	19.83	20.04
		50	0	19.02	19.26	19.21
		50	25	18.98	19.15	19.19
		50	50	19.08	19.12	19.22
		100	0	19.02	19.09	18.96

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	22.15	22.33	22.14
		1	12	22.56	22.55	22.65
		1	24	22.34	22.23	22.32
		12	0	21.49	21.46	21.34
		12	6	21.24	21.34	21.51
		12	13	21.22	21.29	21.39
		25	0	21.24	21.23	21.37
5M	16QAM	1	0	21.08	21.23	21.12
		1	12	21.51	21.54	21.66
		1	24	21.31	21.28	21.30
		12	0	20.55	20.39	20.43
		12	6	20.20	20.35	20.57
		12	13	20.12	20.36	20.47
		25	0	20.18	20.28	20.36
5M	64QAM	1	0	19.78	19.91	19.83
		1	50	20.12	20.32	20.26
		1	99	19.93	19.90	19.99
		50	0	19.24	18.99	19.19
		50	25	18.81	19.13	19.18
		50	50	18.91	19.01	19.23
		100	0	18.90	19.02	19.01

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	22.12	22.11	22.13
		1	7	22.70	22.60	22.50
		1	14	22.19	22.35	22.15
		8	0	21.57	21.43	21.32
		8	3	21.36	21.24	21.28
		8	7	21.45	21.39	21.40
		15	0	21.20	21.19	21.41
3M	16QAM	1	0	21.06	21.18	21.17
		1	7	21.69	21.63	21.57
		1	14	21.17	21.42	21.23
		8	0	20.58	20.51	20.35
		8	3	20.29	20.17	20.37
		8	7	20.48	20.48	20.32
		15	0	20.26	20.23	20.36
3M	64QAM	1	0	19.85	19.88	19.81
		1	50	20.38	20.27	20.29
		1	99	19.86	20.08	20.02
		50	0	19.37	19.29	19.07
		50	25	19.04	18.95	19.14
		50	50	19.25	19.24	19.11
		100	0	18.89	18.91	19.11

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	22.17	22.16	22.41
		1	2	22.71	22.59	22.78
		1	5	22.42	22.32	22.20
		3	0	22.26	22.11	22.26
		3	1	22.40	22.38	22.44
		3	3	22.10	22.32	22.33
		6	0	21.34	21.37	21.50
1.4M	16QAM	1	0	21.25	21.21	21.50
		1	2	21.66	21.63	21.74
		1	5	21.43	21.26	21.26
		3	0	21.27	21.05	21.35
		3	1	21.42	21.35	21.51
		3	3	21.06	21.42	21.42
		6	0	20.41	20.27	20.47
1.4M	64QAM	1	0	19.98	19.93	20.12
		1	50	20.33	20.30	20.52
		1	99	20.03	19.91	19.99
		50	0	19.95	19.85	20.05
		50	25	20.13	20.04	20.28
		50	50	19.73	20.18	20.12
		100	0	19.12	18.99	19.25

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133222	133297	133372
		Frequency (MHz)		673	680.5	688
20M	QPSK	1	0	22.86	22.67	22.79
		1	50	22.90	22.89	22.94
		1	99	22.66	22.49	22.47
		50	0	21.69	21.69	21.68
		50	25	21.79	21.69	21.70
		50	50	21.56	21.78	21.56
		100	0	21.79	21.80	21.73
20M	16QAM	1	0	21.88	21.68	21.71
		1	50	21.84	21.82	21.85
		1	99	21.57	21.47	21.41
		50	0	20.74	20.72	20.62
		50	25	20.77	20.61	20.63
		50	50	20.63	20.79	20.63
		100	0	20.70	20.86	20.75
20M	64QAM	1	0	20.57	20.48	20.49
		1	50	20.57	20.62	20.62
		1	99	20.23	20.13	20.07
		50	0	19.37	19.43	19.26
		50	25	19.45	19.40	19.33
		50	50	19.40	19.55	19.32
		100	0	19.30	19.54	19.43

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133197	133297	133397
		Frequency (MHz)		670.5	680.5	690.5
15M	QPSK	1	0	22.81	22.63	22.80
		1	37	22.86	23.07	22.96
		1	74	22.51	22.62	22.52
		36	0	21.67	21.55	21.64
		36	19	21.89	21.93	21.69
		36	39	21.77	21.77	21.53
		75	0	21.77	21.80	21.71
15M	16QAM	1	0	21.78	21.63	21.81
		1	37	21.93	22.00	21.97
		1	74	21.42	21.61	21.53
		36	0	20.70	20.50	20.54
		36	19	20.92	20.87	20.77
		36	39	20.74	20.69	20.58
		75	0	20.68	20.88	20.72
15M	64QAM	1	0	20.57	20.41	20.42
		1	50	20.72	20.70	20.63
		1	99	20.20	20.26	20.22
		50	0	19.46	19.22	19.31
		50	25	19.58	19.56	19.42
		50	50	19.50	19.41	19.21
		100	0	19.34	19.52	19.51

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133172	133297	133422
		Frequency (MHz)		668	680.5	693
10M	QPSK	1	0	22.67	22.68	22.88
		1	24	22.90	23.08	23.02
		1	49	22.59	22.52	22.74
		25	0	21.55	21.74	21.69
		25	12	21.87	21.82	21.83
		25	25	21.65	21.54	21.67
		50	0	21.64	21.81	21.65
10M	16QAM	1	0	21.70	21.64	21.90
		1	24	21.87	22.01	22.11
		1	49	21.49	21.51	21.71
		25	0	20.61	20.71	20.78
		25	12	20.83	20.76	20.75
		25	25	20.60	20.50	20.72
		50	0	20.68	20.78	20.63
10M	64QAM	1	0	20.37	20.34	20.68
		1	50	20.56	20.69	20.76
		1	99	20.21	20.29	20.39
		50	0	19.38	19.43	19.46
		50	25	19.63	19.39	19.38
		50	50	19.39	19.26	19.48
		100	0	19.43	19.43	19.41

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133147	133297	133447
		Frequency (MHz)		665.5	680.5	695.5
5M	QPSK	1	0	22.65	22.82	22.84
		1	12	22.86	22.87	22.82
		1	24	22.48	22.54	22.59
		12	0	21.61	21.69	21.76
		12	6	21.74	21.96	21.88
		12	13	21.68	21.54	21.52
		25	0	21.77	21.59	21.64
5M	16QAM	1	0	21.69	21.86	21.74
		1	12	21.80	21.81	21.81
		1	24	21.45	21.44	21.66
		12	0	20.66	20.61	20.80
		12	6	20.66	20.94	20.97
		12	13	20.74	20.54	20.58
		25	0	20.80	20.61	20.71
5M	64QAM	1	0	20.38	20.56	20.53
		1	50	20.51	20.41	20.49
		1	99	20.20	20.13	20.35
		50	0	19.33	19.25	19.52
		50	25	19.29	19.55	19.65
		50	50	19.35	19.24	19.19
		100	0	19.41	19.22	19.41

EIRP / ERP Power (dBm)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	23.99	23.99	24.14
		1	50	24.25	24.24	24.24
		1	99	23.90	23.83	23.99
		50	0	23.00	23.04	23.08
		50	25	23.07	23.21	23.20
		50	50	23.10	22.95	23.02
		100	0	23.09	22.96	22.96
20M	16QAM	1	0	23.02	22.94	23.22
		1	50	23.20	23.30	23.14
		1	99	22.83	22.81	23.07
		50	0	21.96	22.04	22.18
		50	25	21.99	22.29	22.13
		50	50	22.19	21.89	21.93
		100	0	22.17	22.02	21.96
20M	64QAM	1	0	21.81	21.60	21.91
		1	50	21.93	22.07	21.78
		1	99	21.45	21.55	21.87
		50	0	20.71	20.79	20.82
		50	25	20.72	21.06	20.73
		50	50	20.88	20.58	20.72
		100	0	20.90	20.78	20.58

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	24.09	23.85	24.14
		1	37	24.15	23.97	24.13
		1	74	23.98	23.77	23.78
		36	0	23.10	23.19	22.92
		36	19	23.22	23.04	23.00
		36	39	23.09	22.92	23.12
		75	0	23.16	23.16	23.02
15M	16QAM	1	0	23.07	22.86	23.15
		1	37	23.19	22.88	23.08
		1	74	22.94	22.82	22.74
		36	0	22.02	22.10	21.90
		36	19	22.14	21.97	22.10
		36	39	22.01	21.88	22.13
		75	0	22.23	22.10	21.95
15M	64QAM	1	0	21.87	21.54	21.89
		1	37	21.82	21.63	21.87
		1	74	21.72	21.59	21.42
		36	0	20.63	20.88	20.65
		36	19	20.79	20.72	20.84
		36	39	20.74	20.52	20.92
		75	0	20.91	20.83	20.68

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	23.95	23.92	24.11
		1	24	23.98	24.14	24.21
		1	49	23.92	23.75	24.00
		25	0	23.16	23.02	23.10
		25	12	23.04	22.95	23.09
		25	25	22.84	22.89	23.00
		50	0	22.98	23.22	23.20
10M	16QAM	1	0	22.97	23.02	23.12
		1	24	22.99	23.17	23.31
		1	49	22.93	22.66	22.93
		25	0	22.18	21.98	22.10
		25	12	22.08	21.96	22.18
		25	25	21.86	21.92	21.99
		50	0	21.98	22.12	22.16
10M	64QAM	1	0	21.59	21.74	21.82
		1	24	21.77	21.79	22.04
		1	49	21.67	21.30	21.71
		25	0	20.86	20.68	20.75
		25	12	20.81	20.64	20.82
		25	25	20.46	20.59	20.61
		50	0	20.76	20.77	20.81

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	24.12	23.98	24.07
		1	12	24.08	24.08	24.12
		1	24	23.85	23.95	23.78
		12	0	23.20	22.90	23.15
		12	6	23.14	23.06	23.21
		12	13	22.98	22.89	23.02
		25	0	23.19	23.04	23.07
5M	16QAM	1	0	23.11	22.90	23.08
		1	12	23.17	23.03	23.20
		1	24	22.84	22.99	22.82
		12	0	22.20	21.86	22.18
		12	6	22.04	22.02	22.14
		12	13	22.00	21.82	21.95
		25	0	22.22	22.06	22.13
5M	64QAM	1	0	21.91	21.52	21.78
		1	12	21.92	21.66	22.00
		1	24	21.56	21.61	21.44
		12	0	20.86	20.58	20.88
		12	6	20.75	20.68	20.91
		12	13	20.75	20.48	20.59
		25	0	20.88	20.81	20.73

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	23.92	24.02	23.95
		1	7	24.12	24.25	24.02
		1	14	23.77	23.99	23.92
		8	0	22.97	23.10	23.06
		8	3	23.03	23.18	23.04
		8	7	22.89	22.91	22.93
		15	0	23.00	23.14	22.99
3M	16QAM	1	0	22.89	22.94	22.86
		1	7	23.15	23.23	22.94
		1	14	22.68	22.98	23.02
		8	0	21.89	22.13	21.97
		8	3	22.12	22.13	21.99
		8	7	21.79	21.93	21.87
		15	0	22.05	22.17	22.02
3M	64QAM	1	0	21.52	21.73	21.55
		1	7	21.81	21.90	21.59
		1	14	21.35	21.65	21.76
		8	0	20.52	20.77	20.67
		8	3	20.76	20.91	20.61
		8	7	20.48	20.55	20.49
		15	0	20.71	20.95	20.69

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	23.83	23.84	23.95
		1	2	24.22	23.97	24.25
		1	5	23.96	23.66	23.67
		3	0	24.08	24.19	24.20
		3	1	24.09	24.09	24.10
		3	3	24.04	23.78	23.83
		6	0	23.07	22.95	23.08
1.4M	16QAM	1	0	22.77	22.83	22.85
		1	2	23.21	22.95	23.35
		1	5	22.91	22.67	22.58
		3	0	23.10	23.25	23.14
		3	1	23.16	23.18	23.04
		3	3	22.96	22.87	22.88
		6	0	21.97	22.02	22.15
1.4M	64QAM	1	0	21.53	21.48	21.53
		1	2	21.90	21.70	21.99
		1	5	21.64	21.47	21.29
		3	0	21.72	21.93	21.89
		3	1	21.80	21.94	21.67
		3	3	21.66	21.60	21.67
		6	0	20.74	20.78	20.78

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	QPSK	1	0	24.29	24.21	24.09
		1	50	24.32	24.38	24.37
		1	99	23.98	24.04	24.00
		50	0	23.09	23.21	23.37
		50	25	23.10	23.23	23.10
		50	50	23.27	23.34	23.31
		100	0	23.19	23.46	23.33
20M	16QAM	1	0	23.30	23.30	23.05
		1	50	23.24	23.46	23.33
		1	99	23.06	22.98	23.02
		50	0	22.12	22.31	22.36
		50	25	22.05	22.16	22.04
		50	50	22.31	22.27	22.24
		100	0	22.20	22.54	22.23
20M	64QAM	1	0	21.91	22.07	21.67
		1	50	21.99	22.25	21.97
		1	99	21.72	21.63	21.64
		50	0	20.84	21.03	21.12
		50	25	20.80	20.82	20.79
		50	50	20.98	21.01	21.04
		100	0	20.80	21.32	20.90

*EIRP = Conducted + antenna gain (2.15dBi)

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	QPSK	1	0	24.10	24.09	24.04
		1	37	24.23	24.18	24.23
		1	74	23.93	24.14	23.90
		36	0	23.16	23.14	23.34
		36	19	23.32	23.18	23.28
		36	39	23.27	23.32	23.11
		75	0	23.36	23.45	23.41
15M	16QAM	1	0	23.02	23.19	23.03
		1	37	23.20	23.17	23.13
		1	74	22.84	23.21	22.96
		36	0	22.06	22.24	22.38
		36	19	22.32	22.26	22.37
		36	39	22.35	22.31	22.12
		75	0	22.28	22.45	22.48
15M	64QAM	1	0	21.76	21.79	21.82
		1	37	21.90	21.97	21.78
		1	74	21.63	21.90	21.76
		36	0	20.84	20.99	21.16
		36	19	21.11	21.01	21.08
		36	39	21.07	20.97	20.78
		75	0	20.88	21.16	21.19

*EIRP = Conducted + antenna gain (2.15dBi)

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	QPSK	1	0	24.04	24.12	24.24
		1	24	24.22	24.16	24.28
		1	49	24.16	24.11	23.96
		25	0	23.15	23.37	23.27
		25	12	23.22	23.09	23.33
		25	25	23.25	23.22	23.27
		50	0	23.30	23.31	23.39
10M	16QAM	1	0	23.06	23.16	23.20
		1	24	23.28	23.11	23.23
		1	49	23.17	23.09	23.04
		25	0	22.07	22.43	22.18
		25	12	22.31	22.14	22.32
		25	25	22.22	22.25	22.25
		50	0	22.30	22.35	22.41
10M	64QAM	1	0	21.75	21.77	21.94
		1	24	22.07	21.85	21.85
		1	49	21.80	21.80	21.77
		25	0	20.76	21.17	20.79
		25	12	20.92	20.76	21.08
		25	25	20.94	20.94	21.01
		50	0	21.03	21.01	21.10

*EIRP = Conducted + antenna gain (2.15dBi)

LTE Band 7						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	QPSK	1	0	24.26	24.32	24.16
		1	12	24.25	24.18	24.12
		1	24	24.09	24.13	24.14
		12	0	23.37	23.16	23.28
		12	6	23.20	23.09	23.11
		12	13	23.17	23.28	23.06
		25	0	23.35	23.33	23.46
5M	16QAM	1	0	23.21	23.42	23.22
		1	12	23.19	23.15	23.22
		1	24	23.06	23.05	23.19
		12	0	22.37	22.22	22.20
		12	6	22.22	22.02	22.19
		12	13	22.20	22.31	22.12
		25	0	22.37	22.41	22.48
5M	64QAM	1	0	22.00	22.20	21.95
		1	12	21.79	21.76	21.86
		1	24	21.78	21.71	21.82
		12	0	21.05	20.97	20.92
		12	6	20.98	20.65	20.86
		12	13	20.87	20.95	20.72
		25	0	21.09	21.10	21.28

*EIRP = Conducted + antenna gain (2.15dBi)

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	22.48	22.25	22.38
		1	24	22.61	22.50	22.68
		1	49	22.46	22.39	22.41
		25	0	21.53	21.68	21.76
		25	12	21.71	21.46	21.56
		25	25	21.58	21.65	21.78
		50	0	21.79	21.78	21.78
10M	16QAM	1	0	21.55	21.30	21.43
		1	24	21.63	21.48	21.76
		1	49	21.45	21.45	21.31
		25	0	20.46	20.61	20.81
		25	12	20.79	20.42	20.54
		25	25	20.54	20.62	20.71
		50	0	20.77	20.74	20.80
10M	64QAM	1	0	20.18	19.91	20.12
		1	24	20.35	20.28	20.52
		1	49	20.07	20.12	20.05
		25	0	19.06	19.24	19.46
		25	12	19.54	19.14	19.24
		25	25	19.32	19.38	19.36
		50	0	19.48	19.54	19.42

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	22.53	22.52	22.36
		1	12	22.54	22.63	22.51
		1	24	22.62	22.38	22.51
		12	0	21.59	21.57	21.74
		12	6	21.65	21.43	21.58
		12	13	21.67	21.69	21.52
		25	0	21.79	21.52	21.54
5M	16QAM	1	0	21.53	21.46	21.30
		1	12	21.52	21.66	21.50
		1	24	21.53	21.38	21.57
		12	0	20.58	20.62	20.64
		12	6	20.74	20.47	20.54
		12	13	20.66	20.76	20.61
		25	0	20.75	20.47	20.48
5M	64QAM	1	0	20.24	20.17	19.97
		1	12	20.22	20.30	20.12
		1	24	20.18	20.09	20.18
		12	0	19.37	19.30	19.31
		12	6	19.35	19.24	19.16
		12	13	19.28	19.50	19.28
		25	0	19.46	19.18	19.10

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	22.40	22.53	22.34
		1	7	22.61	22.57	22.54
		1	14	22.42	22.40	22.40
		8	0	21.60	21.81	21.72
		8	3	21.52	21.63	21.62
		8	7	21.71	21.61	21.61
		15	0	21.79	21.65	21.59
3M	16QAM	1	0	21.37	21.50	21.38
		1	7	21.66	21.48	21.46
		1	14	21.39	21.38	21.35
		8	0	20.63	20.77	20.69
		8	3	20.43	20.59	20.60
		8	7	20.65	20.70	20.64
		15	0	20.87	20.73	20.69
3M	64QAM	1	0	20.04	20.24	20.15
		1	7	20.41	20.22	20.19
		1	14	19.99	20.04	20.06
		8	0	19.42	19.45	19.38
		8	3	19.18	19.34	19.31
		8	7	19.25	19.49	19.31
		15	0	19.54	19.52	19.35

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 12						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	22.24	22.29	22.54
		1	2	22.64	22.53	22.53
		1	5	22.55	22.38	22.42
		3	0	21.77	21.74	21.62
		3	1	21.45	21.59	21.65
		3	3	21.53	21.61	21.62
		6	0	21.65	21.60	21.58
1.4M	16QAM	1	0	21.31	21.20	21.44
		1	2	21.65	21.49	21.59
		1	5	21.46	21.35	21.45
		3	0	20.72	20.72	20.62
		3	1	20.49	20.57	20.70
		3	3	20.50	20.62	20.62
		6	0	20.71	20.50	20.68
1.4M	64QAM	1	0	20.05	19.90	20.22
		1	2	20.25	20.17	20.37
		1	5	20.12	20.09	20.06
		3	0	19.47	19.36	19.34
		3	1	19.28	19.23	19.48
		3	3	19.14	19.32	19.24
		6	0	19.44	19.19	19.31

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 17						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23780	23790	23800
		Frequency (MHz)		709	710	711
10M	QPSK	1	0	22.34	22.22	22.19
		1	24	22.40	22.36	22.30
		1	49	22.33	22.08	22.27
		25	0	21.33	21.42	21.22
		25	12	21.37	21.47	21.30
		25	25	21.12	21.22	21.26
		50	0	21.20	21.22	21.24
10M	16QAM	1	0	21.24	21.14	21.14
		1	24	21.40	21.37	21.38
		1	49	21.29	21.08	21.29
		25	0	20.36	20.52	20.20
		25	12	20.38	20.51	20.32
		25	25	20.06	20.23	20.27
		50	0	20.25	20.21	20.24
10M	64QAM	1	0	20.02	19.77	19.78
		1	24	20.06	20.16	20.11
		1	49	20.09	19.86	19.93
		25	0	19.04	19.31	18.90
		25	12	19.16	19.23	19.09
		25	25	18.71	18.89	18.93
		50	0	19.00	18.98	19.00

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 17						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23755	23790	23825
		Frequency (MHz)		706.5	710	713.5
5M	QPSK	1	0	22.25	22.27	22.34
		1	12	22.48	22.49	22.44
		1	24	22.28	22.21	22.27
		12	0	21.19	21.16	21.33
		12	6	21.34	21.26	21.35
		12	13	21.32	21.31	21.31
		25	0	21.12	21.16	21.18
5M	16QAM	1	0	21.34	21.26	21.30
		1	12	21.44	21.54	21.35
		1	24	21.19	21.14	21.28
		12	0	20.25	20.08	20.34
		12	6	20.32	20.17	20.34
		12	13	20.36	20.28	20.35
		25	0	20.10	20.19	20.22
5M	64QAM	1	0	19.99	19.95	19.96
		1	12	20.09	20.17	19.99
		1	24	19.89	19.85	19.98
		12	0	18.86	18.78	19.05
		12	6	18.95	18.93	19.04
		12	13	19.10	18.98	18.95
		25	0	18.81	18.81	18.86

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	23.87	23.80	23.76
		1	50	24.15	24.12	24.30
		1	99	23.87	23.87	23.78
		50	0	22.97	22.93	23.01
		50	25	22.89	22.97	22.87
		50	50	22.74	22.76	22.89
		100	0	22.80	22.74	23.00
20M	16QAM	1	0	22.96	22.73	22.78
		1	50	23.15	23.14	23.22
		1	99	22.92	22.92	22.82
		50	0	21.87	21.89	21.93
		50	25	21.96	22.05	21.87
		50	50	21.76	21.85	21.96
		100	0	21.81	21.75	21.93
20M	64QAM	1	0	21.62	21.48	21.43
		1	50	21.87	21.80	21.86
		1	99	21.62	21.70	21.59
		50	0	20.54	20.50	20.56
		50	25	20.67	20.66	20.59
		50	50	20.55	20.49	20.63
		100	0	20.42	20.49	20.54

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	23.67	23.94	23.65
		1	37	24.24	24.13	24.28
		1	74	23.90	23.88	23.79
		36	0	23.10	23.00	23.01
		36	19	22.94	23.05	23.07
		36	39	22.87	22.94	23.00
		75	0	23.03	22.76	22.80
15M	16QAM	1	0	22.62	22.86	22.68
		1	37	23.24	23.17	23.32
		1	74	22.86	22.97	22.83
		36	0	22.16	22.07	21.96
		36	19	21.94	22.04	22.06
		36	39	21.80	21.95	22.00
		75	0	22.06	21.73	21.85
15M	64QAM	1	0	21.32	21.55	21.40
		1	50	21.90	21.92	21.93
		1	99	21.61	21.71	21.44
		50	0	20.85	20.86	20.66
		50	25	20.66	20.71	20.84
		50	50	20.49	20.67	20.72
		100	0	20.84	20.50	20.58

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	23.87	23.88	23.82
		1	24	24.30	24.01	24.26
		1	49	23.93	23.85	23.90
		25	0	22.98	23.06	22.97
		25	12	22.90	22.94	23.05
		25	25	22.81	22.96	22.98
		50	0	22.89	22.98	22.85
10M	16QAM	1	0	22.77	22.78	22.77
		1	24	23.28	23.06	23.33
		1	49	22.93	22.77	22.95
		25	0	21.90	22.08	22.01
		25	12	21.94	21.97	22.04
		25	25	21.89	21.95	22.05
		50	0	21.94	22.03	21.90
10M	64QAM	1	0	21.50	21.42	21.50
		1	50	22.03	21.75	22.00
		1	99	21.61	21.40	21.61
		50	0	20.59	20.83	20.78
		50	25	20.55	20.72	20.76
		50	50	20.65	20.69	20.79
		100	0	20.59	20.66	20.53

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	23.72	23.90	23.71
		1	12	24.13	24.12	24.22
		1	24	23.91	23.80	23.89
		12	0	23.06	23.03	22.91
		12	6	22.81	22.91	23.08
		12	13	22.79	22.86	22.96
		25	0	22.81	22.80	22.94
5M	16QAM	1	0	22.65	22.80	22.69
		1	12	23.08	23.11	23.23
		1	24	22.88	22.85	22.87
		12	0	22.12	21.96	22.00
		12	6	21.77	21.92	22.14
		12	13	21.69	21.93	22.04
		25	0	21.75	21.85	21.93
5M	64QAM	1	0	21.35	21.48	21.40
		1	50	21.69	21.89	21.83
		1	99	21.50	21.47	21.56
		50	0	20.81	20.56	20.76
		50	25	20.38	20.70	20.75
		50	50	20.48	20.58	20.80
		100	0	20.47	20.59	20.58

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	23.69	23.68	23.70
		1	7	24.27	24.17	24.07
		1	14	23.76	23.92	23.72
		8	0	23.14	23.00	22.89
		8	3	22.93	22.81	22.85
		8	7	23.02	22.96	22.97
		15	0	22.77	22.76	22.98
3M	16QAM	1	0	22.63	22.75	22.74
		1	7	23.26	23.20	23.14
		1	14	22.74	22.99	22.80
		8	0	22.15	22.08	21.92
		8	3	21.86	21.74	21.94
		8	7	22.05	22.05	21.89
		15	0	21.83	21.80	21.93
3M	64QAM	1	0	21.42	21.45	21.38
		1	50	21.95	21.84	21.86
		1	99	21.43	21.65	21.59
		50	0	20.94	20.86	20.64
		50	25	20.61	20.52	20.71
		50	50	20.82	20.81	20.68
		100	0	20.46	20.48	20.68

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	23.74	23.73	23.98
		1	2	24.28	24.16	24.35
		1	5	23.99	23.89	23.77
		3	0	23.83	23.68	23.83
		3	1	23.97	23.95	24.01
		3	3	23.67	23.89	23.90
		6	0	22.91	22.94	23.07
1.4M	16QAM	1	0	22.82	22.78	23.07
		1	2	23.23	23.20	23.31
		1	5	23.00	22.83	22.83
		3	0	22.84	22.62	22.92
		3	1	22.99	22.92	23.08
		3	3	22.63	22.99	22.99
		6	0	21.98	21.84	22.04
1.4M	64QAM	1	0	21.55	21.50	21.69
		1	50	21.90	21.87	22.09
		1	99	21.60	21.48	21.56
		50	0	21.52	21.42	21.62
		50	25	21.70	21.61	21.85
		50	50	21.30	21.75	21.69
		100	0	20.69	20.56	20.82

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133222	133297	133372
		Frequency (MHz)		673	680.5	688
20M	QPSK	1	0	22.73	22.54	22.66
		1	50	22.77	22.76	22.81
		1	99	22.53	22.36	22.34
		50	0	21.56	21.56	21.55
		50	25	21.66	21.56	21.57
		50	50	21.43	21.65	21.43
		100	0	21.66	21.67	21.60
20M	16QAM	1	0	21.75	21.55	21.58
		1	50	21.71	21.69	21.72
		1	99	21.44	21.34	21.28
		50	0	20.61	20.59	20.49
		50	25	20.64	20.48	20.50
		50	50	20.50	20.66	20.50
		100	0	20.57	20.73	20.62
20M	64QAM	1	0	20.44	20.35	20.36
		1	50	20.44	20.49	20.49
		1	99	20.10	20.00	19.94
		50	0	19.24	19.30	19.13
		50	25	19.32	19.27	19.20
		50	50	19.27	19.42	19.19
		100	0	19.17	19.41	19.30

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133197	133297	133397
		Frequency (MHz)		670.5	680.5	690.5
15M	QPSK	1	0	22.68	22.50	22.67
		1	37	22.73	22.94	22.83
		1	74	22.38	22.49	22.39
		36	0	21.54	21.42	21.51
		36	19	21.76	21.80	21.56
		36	39	21.64	21.64	21.40
		75	0	21.64	21.67	21.58
15M	16QAM	1	0	21.65	21.50	21.68
		1	37	21.80	21.87	21.84
		1	74	21.29	21.48	21.40
		36	0	20.57	20.37	20.41
		36	19	20.79	20.74	20.64
		36	39	20.61	20.56	20.45
		75	0	20.55	20.75	20.59
15M	64QAM	1	0	20.44	20.28	20.29
		1	50	20.59	20.57	20.50
		1	99	20.07	20.13	20.09
		50	0	19.33	19.09	19.18
		50	25	19.45	19.43	19.29
		50	50	19.37	19.28	19.08
		100	0	19.21	19.39	19.38

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133172	133297	133422
		Frequency (MHz)		668	680.5	693
10M	QPSK	1	0	22.54	22.55	22.75
		1	24	22.77	22.95	22.89
		1	49	22.46	22.39	22.61
		25	0	21.42	21.61	21.56
		25	12	21.74	21.69	21.70
		25	25	21.52	21.41	21.54
		50	0	21.51	21.68	21.52
10M	16QAM	1	0	21.57	21.51	21.77
		1	24	21.74	21.88	21.98
		1	49	21.36	21.38	21.58
		25	0	20.48	20.58	20.65
		25	12	20.70	20.63	20.62
		25	25	20.47	20.37	20.59
		50	0	20.55	20.65	20.50
10M	64QAM	1	0	20.24	20.21	20.55
		1	50	20.43	20.56	20.63
		1	99	20.08	20.16	20.26
		50	0	19.25	19.30	19.33
		50	25	19.50	19.26	19.25
		50	50	19.26	19.13	19.35
		100	0	19.30	19.30	19.28

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

LTE Band 71						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		133147	133297	133447
		Frequency (MHz)		665.5	680.5	695.5
5M	QPSK	1	0	22.52	22.69	22.71
		1	12	22.73	22.74	22.69
		1	24	22.35	22.41	22.46
		12	0	21.48	21.56	21.63
		12	6	21.61	21.83	21.75
		12	13	21.55	21.41	21.39
		25	0	21.64	21.46	21.51
5M	16QAM	1	0	21.56	21.73	21.61
		1	12	21.67	21.68	21.68
		1	24	21.32	21.31	21.53
		12	0	20.53	20.48	20.67
		12	6	20.53	20.81	20.84
		12	13	20.61	20.41	20.45
		25	0	20.67	20.48	20.58
5M	64QAM	1	0	20.25	20.43	20.40
		1	50	20.38	20.28	20.36
		1	99	20.07	20.00	20.22
		50	0	19.20	19.12	19.39
		50	25	19.16	19.42	19.52
		50	50	19.22	19.11	19.06
		100	0	19.28	19.09	19.28

*ERP = Conducted + antenna gain (2.02dBi) - 2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

4.2.2 Test Procedure

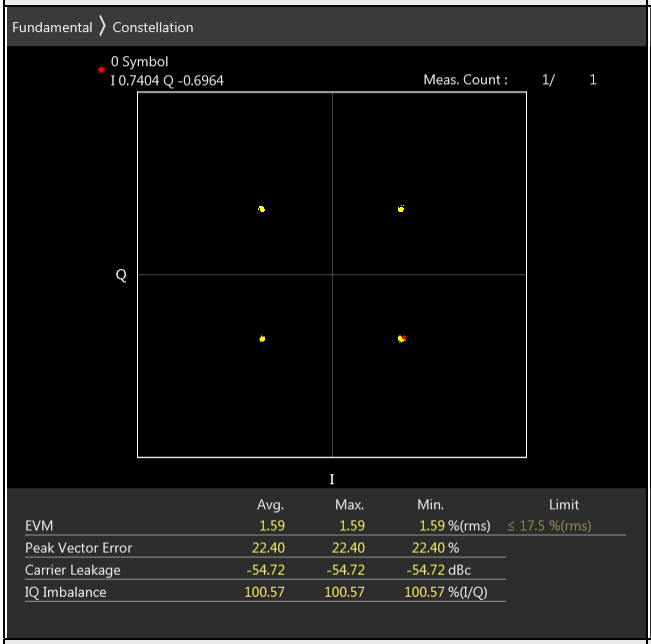
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup

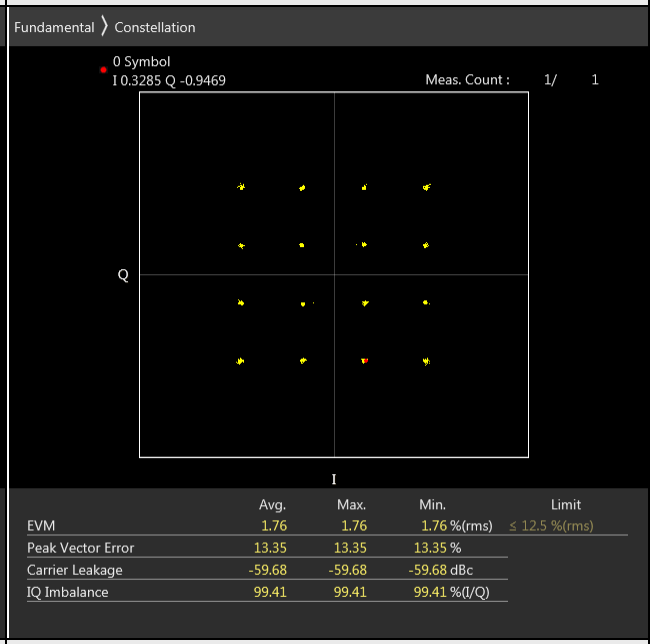
4.2.4 Test Results

LTE Band 4

Spectrum Plot of Measurement Value	
Channel: 20175 / Frequency (MHz): 1732.5MHz	
QPSK	16QAM

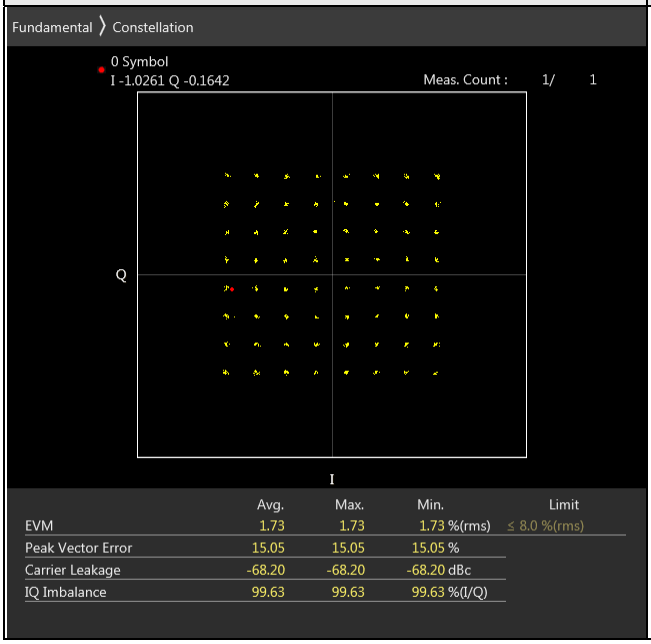


	Avg.	Max.	Min.	Limit
EVM	1.59	1.59	1.59 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	22.40	22.40	22.40 %	
Carrier Leakage	-54.72	-54.72	-54.72 dBc	
IQ Imbalance	100.57	100.57	100.57 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	1.76	1.76	1.76 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	13.35	13.35	13.35 %	
Carrier Leakage	-59.68	-59.68	-59.68 dBc	
IQ Imbalance	99.41	99.41	99.41 %(I/Q)	

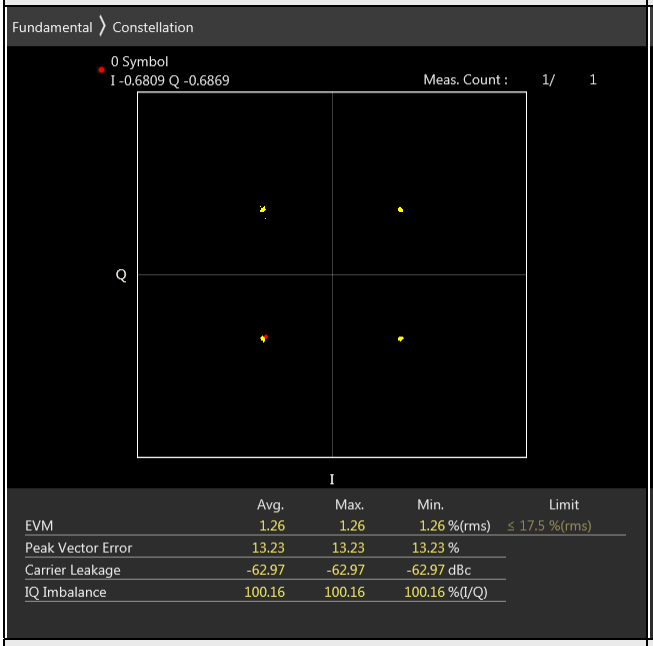
64QAM



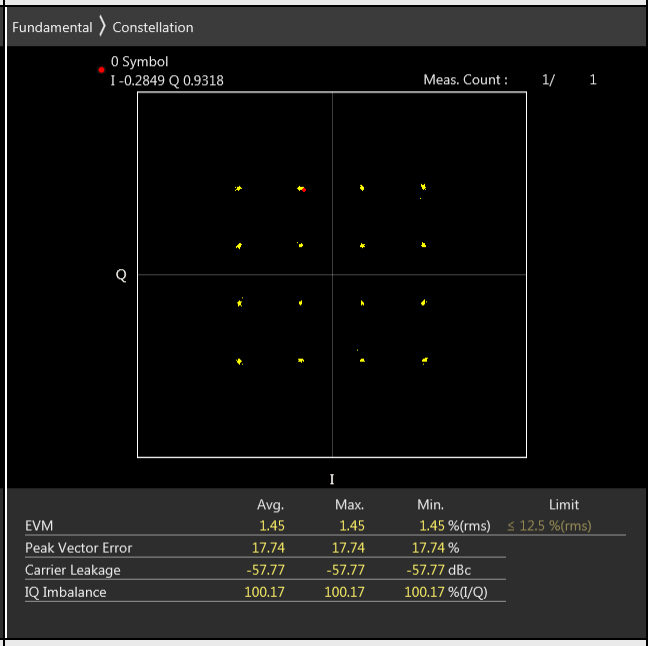
	Avg.	Max.	Min.	Limit
EVM	1.73	1.73	1.73 %(rms)	≤ 8.0 %(rms)
Peak Vector Error	15.05	15.05	15.05 %	
Carrier Leakage	-68.20	-68.20	-68.20 dBc	
IQ Imbalance	99.63	99.63	99.63 %(I/Q)	

LTE Band 7

Spectrum Plot of Measurement Value	
Channel: 21100 / Frequency (MHz): 2535.0MHz	
QPSK	16QAM

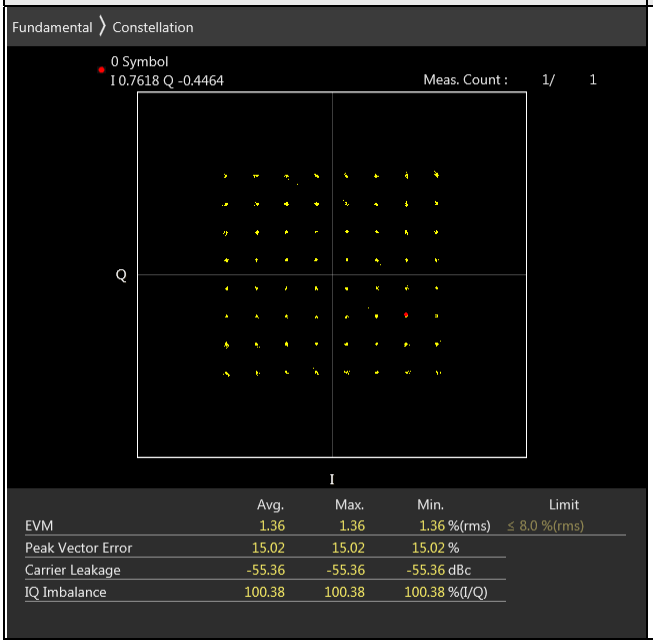


	Avg.	Max.	Min.	Limit
EVM	1.26	1.26	1.26 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	13.23	13.23	13.23 %	
Carrier Leakage	-62.97	-62.97	-62.97 dBc	
IQ Imbalance	100.16	100.16	100.16 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	1.45	1.45	1.45 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	17.74	17.74	17.74 %	
Carrier Leakage	-57.77	-57.77	-57.77 dBc	
IQ Imbalance	100.17	100.17	100.17 %(I/Q)	

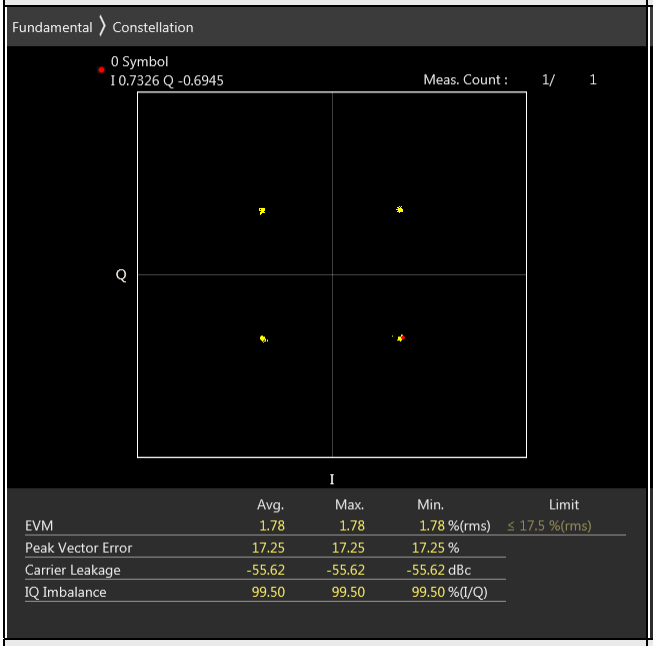
64QAM	



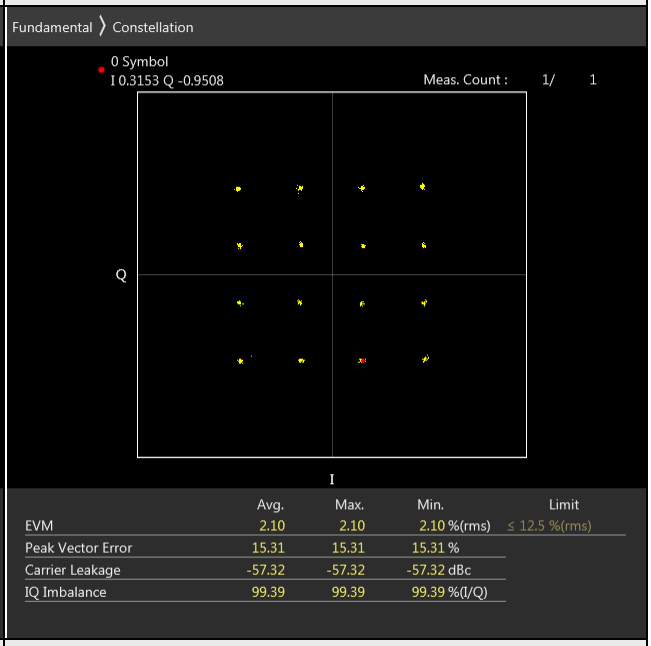
	Avg.	Max.	Min.	Limit
EVM	1.36	1.36	1.36 %(rms)	≤ 8.0 %(rms)
Peak Vector Error	15.02	15.02	15.02 %	
Carrier Leakage	-55.36	-55.36	-55.36 dBc	
IQ Imbalance	100.38	100.38	100.38 %(I/Q)	

LTE Band 12

Spectrum Plot of Measurement Value	
Channel: 23095 / Frequency (MHz): 707.5MHz	
QPSK	16QAM

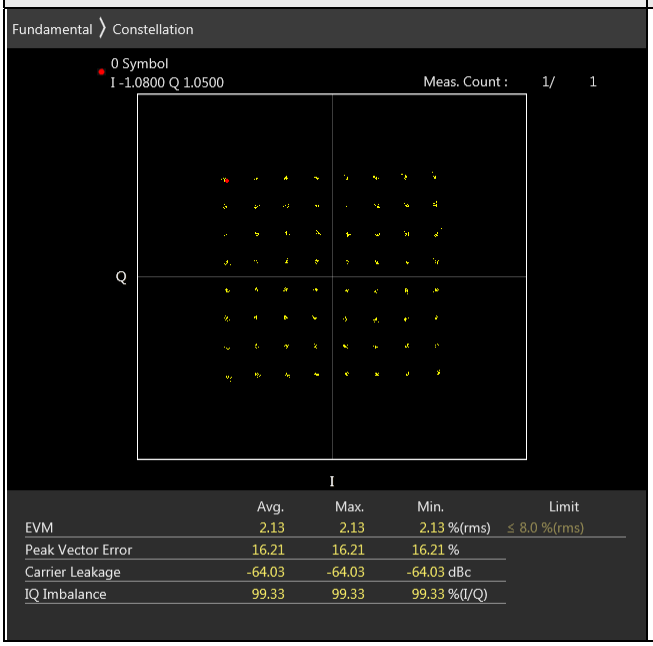


	Avg.	Max.	Min.	Limit
EVM	1.78	1.78	1.78 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	17.25	17.25	17.25 %	
Carrier Leakage	-55.62	-55.62	-55.62 dBc	
IQ Imbalance	99.50	99.50	99.50 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	2.10	2.10	2.10 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	15.31	15.31	15.31 %	
Carrier Leakage	-57.32	-57.32	-57.32 dBc	
IQ Imbalance	99.39	99.39	99.39 %(I/Q)	

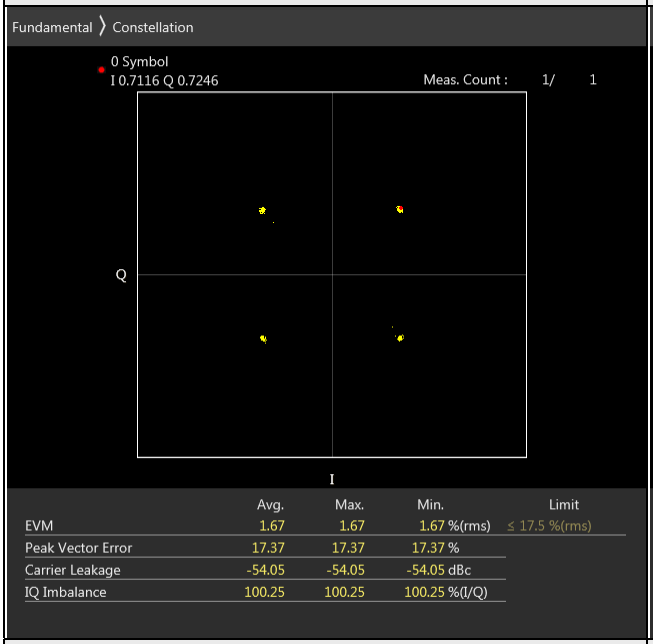
64QAM	



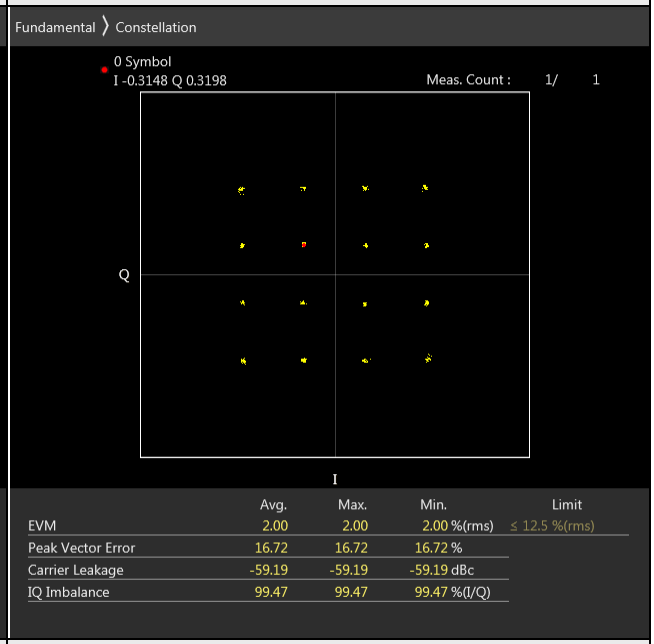
	Avg.	Max.	Min.	Limit
EVM	2.13	2.13	2.13 %(rms)	≤ 8.0 %(rms)
Peak Vector Error	16.21	16.21	16.21 %	
Carrier Leakage	-64.03	-64.03	-64.03 dBc	
IQ Imbalance	99.33	99.33	99.33 %(I/Q)	

LTE Band 17

Spectrum Plot of Measurement Value	
Channel: 23790 / Frequency (MHz): 710.0MHz	
QPSK	16QAM

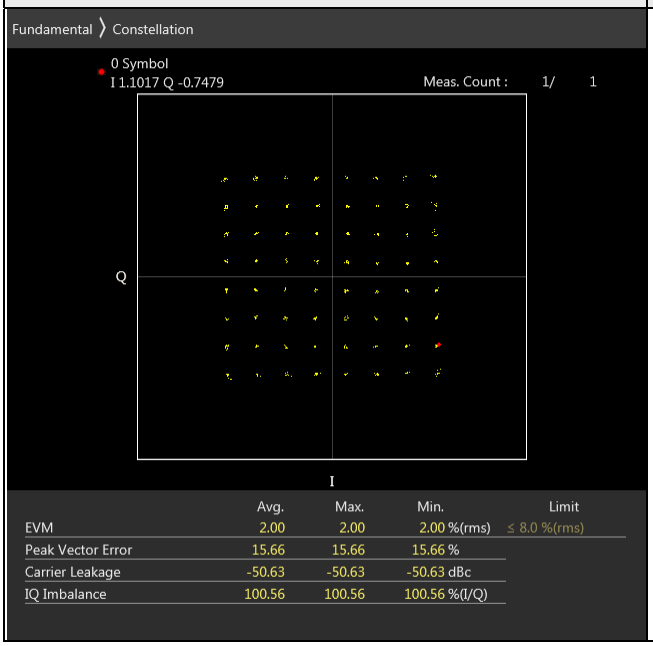


	Avg.	Max.	Min.	Limit
EVM	1.67	1.67	1.67 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	17.37	17.37	17.37 %	
Carrier Leakage	-54.05	-54.05	-54.05 dBc	
IQ Imbalance	100.25	100.25	100.25 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	2.00	2.00	2.00 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	16.72	16.72	16.72 %	
Carrier Leakage	-59.19	-59.19	-59.19 dBc	
IQ Imbalance	99.47	99.47	99.47 %(I/Q)	

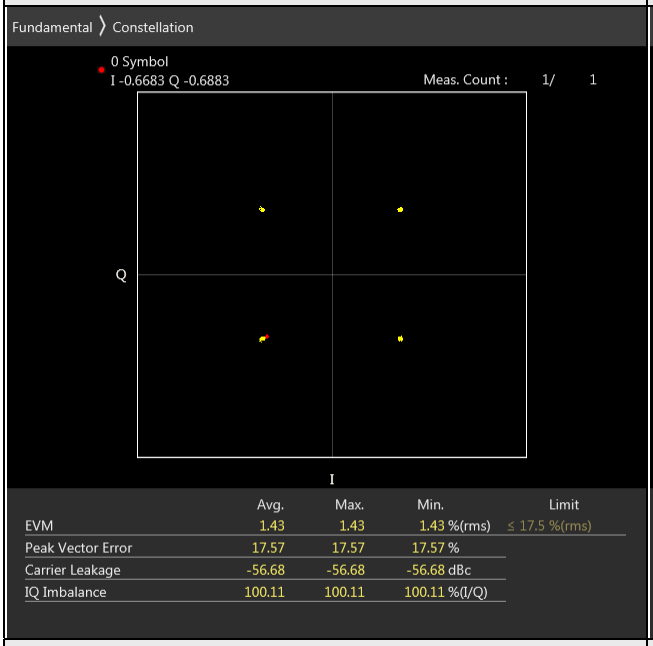
64QAM	



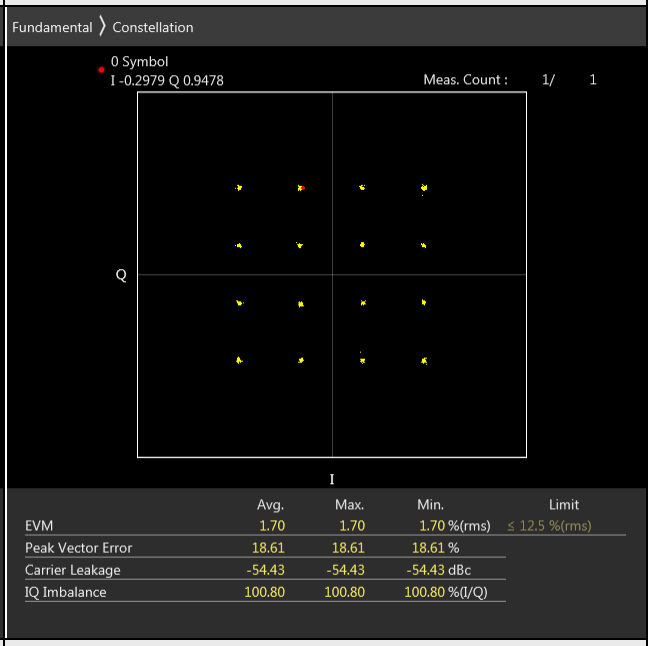
	Avg.	Max.	Min.	Limit
EVM	2.00	2.00	2.00 %(rms)	≤ 8.0 %(rms)
Peak Vector Error	15.66	15.66	15.66 %	
Carrier Leakage	-50.63	-50.63	-50.63 dBc	
IQ Imbalance	100.56	100.56	100.56 %(I/Q)	

LTE Band 66

Spectrum Plot of Measurement Value	
Channel: 132322 / Frequency (MHz): 1745.0MHz	
QPSK	16QAM

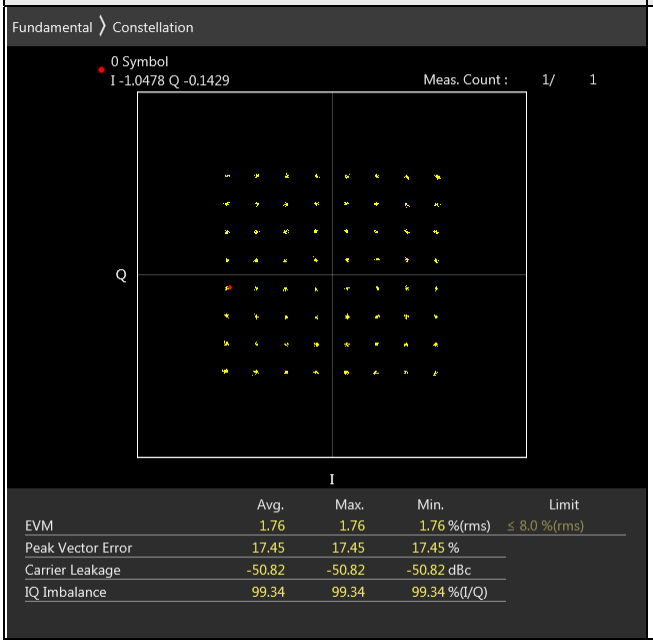


	Avg.	Max.	Min.	Limit
EVM	1.43	1.43	1.43 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	17.57	17.57	17.57 %	
Carrier Leakage	-56.68	-56.68	-56.68 dBc	
IQ Imbalance	100.11	100.11	100.11 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	1.70	1.70	1.70 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	18.61	18.61	18.61 %	
Carrier Leakage	-54.43	-54.43	-54.43 dBc	
IQ Imbalance	100.80	100.80	100.80 %(I/Q)	

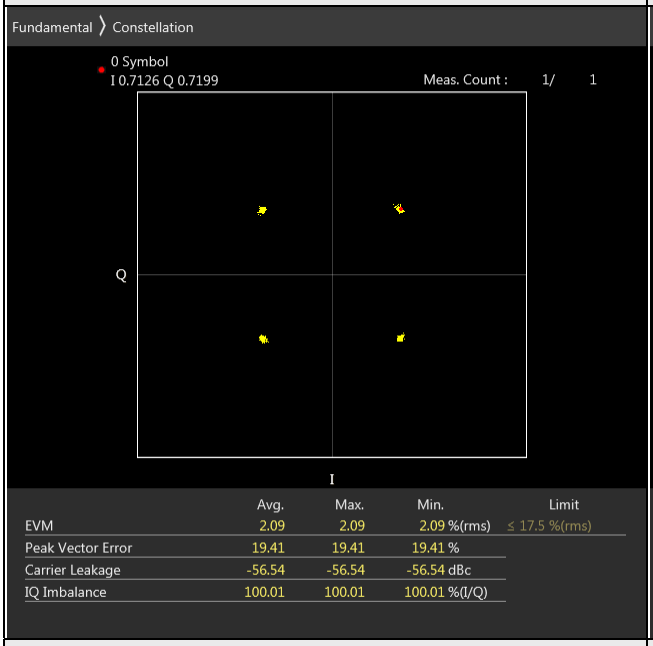
64QAM	



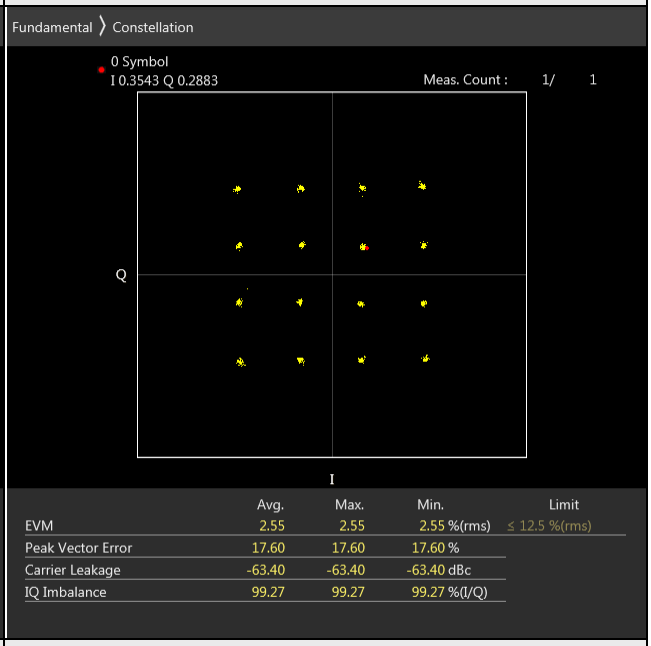
	Avg.	Max.	Min.	Limit
EVM	1.76	1.76	1.76 %(rms)	≤ 8.0 %(rms)
Peak Vector Error	17.45	17.45	17.45 %	
Carrier Leakage	-50.82	-50.82	-50.82 dBc	
IQ Imbalance	99.34	99.34	99.34 %(I/Q)	

LTE Band 71

Spectrum Plot of Measurement Value	
Channel: 133297 / Frequency (MHz): 680.5MHz	
QPSK	16QAM

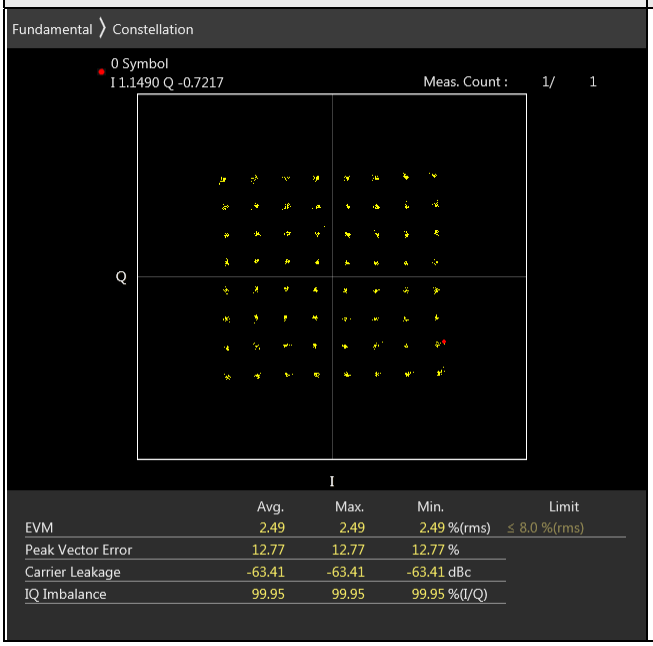


	Avg.	Max.	Min.	Limit
EVM	2.09	2.09	2.09 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	19.41	19.41	19.41 %	
Carrier Leakage	-56.54	-56.54	-56.54 dBc	
IQ Imbalance	100.01	100.01	100.01 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	2.55	2.55	2.55 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	17.60	17.60	17.60 %	
Carrier Leakage	-63.40	-63.40	-63.40 dBc	
IQ Imbalance	99.27	99.27	99.27 %(I/Q)	

64QAM	



	Avg.	Max.	Min.	Limit
EVM	2.49	2.49	2.49 %(rms)	≤ 8.0 %(rms)
Peak Vector Error	12.77	12.77	12.77 %	
Carrier Leakage	-63.41	-63.41	-63.41 dBc	
IQ Imbalance	99.95	99.95	99.95 %(I/Q)	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.3.2 Test Procedure

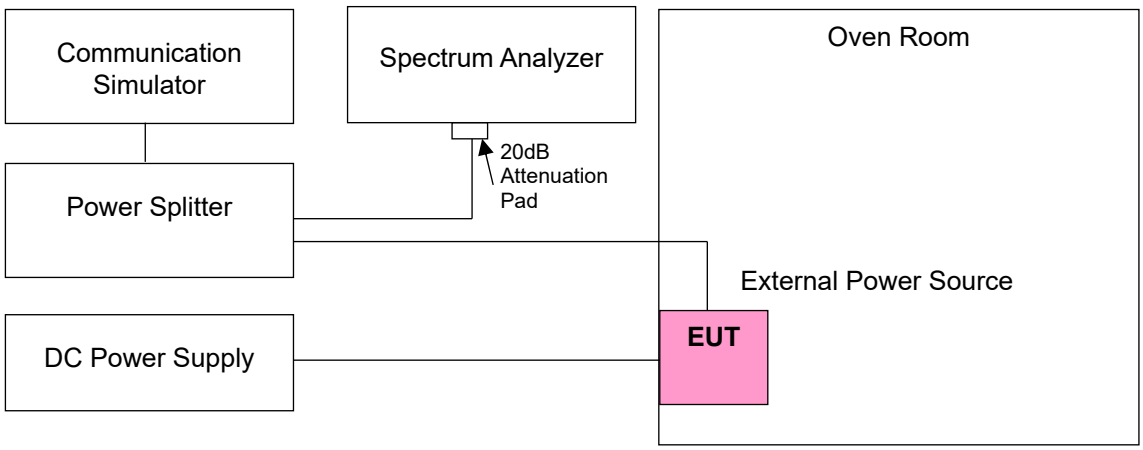
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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 (Vdc)	LTE Band 4			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1710.700004	0.002	1754.300005	0.003
3.4	1710.700001	0.001	1754.299996	-0.002
4.6	1710.700004	0.002	1754.300001	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.699998	-0.001	1754.299997	-0.002
-30	1710.699995	-0.003	1754.299998	-0.001
-20	1710.700002	0.001	1754.300005	0.003
-10	1710.700002	0.001	1754.299997	-0.002
0	1710.700005	0.003	1754.300003	0.002
10	1710.700001	0.001	1754.300004	0.002
20	1710.700003	0.002	1754.299997	-0.002
30	1710.699998	-0.001	1754.300001	0.001
40	1710.699995	-0.003	1754.300004	0.002
50	1710.699995	-0.003	1754.299997	-0.002
60	1710.699995	-0.003	1754.299995	-0.003
70	1710.700003	0.002	1754.300004	0.002
80	1710.700003	0.002	1754.300004	0.002
85	1710.700004	0.002	1754.300001	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1711.500003	0.002	1753.499996	-0.002
3.4	1711.499998	-0.001	1753.499999	-0.001
4.6	1711.500005	0.003	1753.499996	-0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1711.500004	0.002	1753.500002	0.001
-30	1711.500005	0.003	1753.499998	-0.001
-20	1711.499999	-0.001	1753.499995	-0.003
-10	1711.499997	-0.002	1753.499998	-0.001
0	1711.500005	0.003	1753.499998	-0.001
10	1711.500004	0.002	1753.499995	-0.003
20	1711.500003	0.002	1753.499995	-0.003
30	1711.500003	0.002	1753.499995	-0.003
40	1711.499995	-0.003	1753.499996	-0.002
50	1711.500003	0.002	1753.500004	0.002
60	1711.500001	0.001	1753.500002	0.001
70	1711.499998	-0.001	1753.500004	0.002
80	1711.499999	-0.001	1753.500004	0.002
85	1711.499999	-0.001	1753.499997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1712.500003	0.002	1752.500001	0.001
3.4	1712.499997	-0.002	1752.499999	-0.001
4.6	1712.499997	-0.002	1752.499997	-0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.500003	0.002	1752.500005	0.003
-30	1712.500004	0.002	1752.499995	-0.003
-20	1712.499998	-0.001	1752.499999	-0.001
-10	1712.500002	0.001	1752.499999	-0.001
0	1712.499995	-0.003	1752.500002	0.001
10	1712.500003	0.002	1752.500005	0.003
20	1712.500002	0.001	1752.500005	0.003
30	1712.499996	-0.002	1752.499999	-0.001
40	1712.500004	0.002	1752.500004	0.002
50	1712.499998	-0.001	1752.500004	0.002
60	1712.500005	0.003	1752.500001	0.001
70	1712.499999	-0.001	1752.499999	-0.001
80	1712.499998	-0.001	1752.500001	0.001
85	1712.500001	0.001	1752.500002	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1715.000004	0.002	1749.999996	-0.002
3.4	1715.000001	0.001	1750.000003	0.002
4.6	1715.000003	0.002	1750.000002	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1714.999996	-0.002	1750.000002	0.001
-30	1715.000005	0.003	1750.000002	0.001
-20	1714.999996	-0.002	1750.000001	0.001
-10	1715.000005	0.003	1750.000005	0.003
0	1714.999999	-0.001	1749.999999	-0.001
10	1715.000003	0.002	1749.999999	-0.001
20	1714.999996	-0.002	1749.999998	-0.001
30	1714.999996	-0.002	1750.000003	0.002
40	1714.999998	-0.001	1750.000002	0.001
50	1714.999997	-0.002	1750.000002	0.001
60	1714.999996	-0.002	1750.000004	0.002
70	1715.000002	0.001	1749.999996	-0.002
80	1715.000003	0.002	1749.999999	-0.001
85	1715.000001	0.001	1749.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1717.499999	-0.001	1747.499998	-0.001
3.4	1717.500003	0.002	1747.499995	-0.003
4.6	1717.500001	0.001	1747.500004	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1717.500005	0.003	1747.499998	-0.001
-30	1717.499999	-0.001	1747.499997	-0.002
-20	1717.500005	0.003	1747.499995	-0.003
-10	1717.499995	-0.003	1747.499997	-0.002
0	1717.500004	0.002	1747.500002	0.001
10	1717.499998	-0.001	1747.499996	-0.002
20	1717.500005	0.003	1747.500002	0.001
30	1717.500002	0.001	1747.500005	0.003
40	1717.500005	0.003	1747.499999	-0.001
50	1717.500003	0.002	1747.500001	0.001
60	1717.500003	0.002	1747.499995	-0.003
70	1717.500003	0.002	1747.500003	0.002
80	1717.500004	0.002	1747.499996	-0.002
85	1717.500003	0.002	1747.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1719.999997	-0.002	1744.999995	-0.003
3.4	1719.999997	-0.002	1745.000005	0.003
4.6	1720.000003	0.002	1745.000001	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1719.999995	-0.003	1744.999995	-0.003
-30	1720.000003	0.002	1744.999995	-0.003
-20	1719.999998	-0.001	1745.000002	0.001
-10	1720.000004	0.002	1745.000005	0.003
0	1720.000002	0.001	1745.000004	0.002
10	1720.000001	0.001	1745.000005	0.003
20	1719.999995	-0.003	1744.999998	-0.001
30	1719.999999	-0.001	1745.000002	0.001
40	1720.000004	0.002	1744.999999	-0.001
50	1719.999997	-0.002	1745.000005	0.003
60	1720.000005	0.003	1744.999999	-0.001
70	1720.000003	0.002	1744.999999	-0.001
80	1720.000005	0.003	1745.000005	0.003
85	1719.999997	-0.002	1744.999998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2502.500002	0.001	2567.500001	0.000
3.4	2502.499998	-0.001	2567.500002	0.001
4.6	2502.499999	0.000	2567.500002	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2502.500003	0.001	2567.500003	0.001
-30	2502.500003	0.001	2567.500001	0.000
-20	2502.499995	-0.002	2567.500005	0.002
-10	2502.499996	-0.002	2567.499998	-0.001
0	2502.499998	-0.001	2567.499996	-0.002
10	2502.499998	-0.001	2567.499998	-0.001
20	2502.500002	0.001	2567.499999	0.000
30	2502.500001	0.000	2567.499996	-0.002
40	2502.500001	0.000	2567.500005	0.002
50	2502.500002	0.001	2567.500001	0.000
60	2502.499999	0.000	2567.500001	0.000
70	2502.499998	-0.001	2567.499999	0.000
80	2502.500005	0.002	2567.499997	-0.001
85	2502.499995	-0.002	2567.499995	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2504.999996	-0.002	2564.999999	0.000
3.4	2504.999997	-0.001	2565.000005	0.002
4.6	2504.999996	-0.002	2564.999995	-0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2505.000005	0.002	2565.000003	0.001
-30	2504.999997	-0.001	2565.000004	0.002
-20	2504.999999	0.000	2565.000005	0.002
-10	2505.000004	0.002	2565.000004	0.002
0	2505.000003	0.001	2564.999998	-0.001
10	2504.999997	-0.001	2564.999996	-0.002
20	2504.999997	-0.001	2565.000002	0.001
30	2505.000004	0.002	2565.000005	0.002
40	2505.000005	0.002	2564.999998	-0.001
50	2504.999998	-0.001	2565.000002	0.001
60	2505.000001	0.000	2564.999998	-0.001
70	2505.000003	0.001	2564.999995	-0.002
80	2505.000003	0.001	2564.999998	-0.001
85	2504.999997	-0.001	2565.000003	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2507.499997	-0.001	2562.500005	0.002
3.4	2507.499997	-0.001	2562.500003	0.001
4.6	2507.500004	0.002	2562.499995	-0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2507.499997	-0.001	2562.500001	0.000
-30	2507.500002	0.001	2562.500005	0.002
-20	2507.500003	0.001	2562.499996	-0.002
-10	2507.499996	-0.002	2562.500003	0.001
0	2507.500004	0.002	2562.499997	-0.001
10	2507.500001	0.000	2562.499998	-0.001
20	2507.500002	0.001	2562.499999	0.000
30	2507.499996	-0.002	2562.500001	0.000
40	2507.500005	0.002	2562.500001	0.000
50	2507.500003	0.001	2562.499995	-0.002
60	2507.500004	0.002	2562.500002	0.001
70	2507.500001	0.000	2562.500004	0.002
80	2507.499998	-0.001	2562.500005	0.002
85	2507.500001	0.000	2562.499999	0.000

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2509.999999	0.000	2559.999995	-0.002
3.4	2510.000001	0.000	2559.999995	-0.002
4.6	2509.999997	-0.001	2560.000002	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2509.999995	-0.002	2559.999995	-0.002
-30	2510.000003	0.001	2559.999997	-0.001
-20	2509.999999	0.000	2559.999995	-0.002
-10	2509.999995	-0.002	2559.999995	-0.002
0	2510.000004	0.002	2559.999999	0.000
10	2510.000003	0.001	2560.000003	0.001
20	2509.999996	-0.002	2559.999999	0.000
30	2509.999997	-0.001	2559.999997	-0.001
40	2510.000005	0.002	2560.000001	0.000
50	2509.999997	-0.001	2559.999997	-0.001
60	2509.999998	-0.001	2560.000003	0.001
70	2509.999997	-0.001	2559.999998	-0.001
80	2510.000003	0.001	2559.999995	-0.002
85	2510.000004	0.002	2560.000003	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	699.699995	-0.007	715.300002	0.003
3.4	699.700004	0.006	715.300005	0.007
4.6	699.700004	0.006	715.300003	0.004

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	699.700002	0.003	715.300005	0.007
-30	699.699995	-0.007	715.299997	-0.004
-20	699.700005	0.007	715.299996	-0.006
-10	699.700002	0.003	715.299995	-0.007
0	699.699998	-0.003	715.299995	-0.007
10	699.700004	0.006	715.299998	-0.003
20	699.700004	0.006	715.299996	-0.006
30	699.700004	0.006	715.299999	-0.001
40	699.700005	0.007	715.299995	-0.007
50	699.700003	0.004	715.299996	-0.006
60	699.699999	-0.001	715.299995	-0.007
70	699.700001	0.001	715.299999	-0.001
80	699.699999	-0.001	715.299998	-0.003
85	699.700003	0.004	715.299999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	700.500005	0.007	714.499995	-0.007
3.4	700.499995	-0.007	714.500003	0.004
4.6	700.500004	0.006	714.500005	0.007

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	700.500005	0.007	714.499997	-0.004
-30	700.500004	0.006	714.500001	0.001
-20	700.499999	-0.001	714.500004	0.006
-10	700.499997	-0.004	714.500005	0.007
0	700.500001	0.001	714.499997	-0.004
10	700.499996	-0.006	714.499999	-0.001
20	700.499996	-0.006	714.499998	-0.003
30	700.500003	0.004	714.499996	-0.006
40	700.500004	0.006	714.500003	0.004
50	700.499995	-0.007	714.499995	-0.007
60	700.500004	0.006	714.500005	0.007
70	700.500002	0.003	714.499996	-0.006
80	700.499999	-0.001	714.499996	-0.006
85	700.500005	0.007	714.499998	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	701.499997	-0.004	713.500001	0.001
3.4	701.500001	0.001	713.500005	0.007
4.6	701.499997	-0.004	713.500005	0.007

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	701.500001	0.001	713.499996	-0.006
-30	701.499995	-0.007	713.500002	0.003
-20	701.500003	0.004	713.500001	0.001
-10	701.500003	0.004	713.499999	-0.001
0	701.500003	0.004	713.499998	-0.003
10	701.499999	-0.001	713.500002	0.003
20	701.500001	0.001	713.500003	0.004
30	701.500005	0.007	713.500003	0.004
40	701.500003	0.004	713.500003	0.004
50	701.499996	-0.006	713.500005	0.007
60	701.500001	0.001	713.499996	-0.006
70	701.499999	-0.001	713.500001	0.001
80	701.500001	0.001	713.500005	0.007
85	701.499997	-0.004	713.500004	0.006

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	704.000005	0.007	710.999998	-0.003
3.4	703.999999	-0.001	710.999999	-0.001
4.6	703.999995	-0.007	710.999998	-0.003

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	704.000002	0.003	711.000002	0.003
-30	703.999997	-0.004	710.999995	-0.007
-20	703.999995	-0.007	711.000002	0.003
-10	704.000004	0.006	710.999996	-0.006
0	704.000001	0.001	710.999996	-0.006
10	703.999999	-0.001	710.999996	-0.006
20	703.999997	-0.004	710.999998	-0.003
30	703.999996	-0.006	710.999999	-0.001
40	703.999997	-0.004	710.999997	-0.004
50	704.000003	0.004	710.999999	-0.001
60	703.999995	-0.007	710.999998	-0.003
70	703.999998	-0.003	711.000005	0.007
80	703.999997	-0.004	710.999999	-0.001
85	703.999997	-0.004	711.000004	0.006

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 17			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	706.499997	-0.004	713.499995	-0.007
3.4	706.500002	0.003	713.500004	0.006
4.6	706.500001	0.001	713.499997	-0.004

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 17			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	706.499998	-0.003	713.500004	0.006
-30	706.499996	-0.006	713.499998	-0.003
-20	706.499995	-0.007	713.500005	0.007
-10	706.500004	0.006	713.499996	-0.006
0	706.500001	0.001	713.499997	-0.004
10	706.499998	-0.003	713.500003	0.004
20	706.499999	-0.001	713.499997	-0.004
30	706.499997	-0.004	713.499997	-0.004
40	706.499995	-0.007	713.499997	-0.004
50	706.499998	-0.003	713.500001	0.001
60	706.499999	-0.001	713.499999	-0.001
70	706.499996	-0.006	713.499996	-0.006
80	706.500004	0.006	713.500001	0.001
85	706.500003	0.004	713.500005	0.007

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 17			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	709.000002	0.003	711.000003	0.004
3.4	708.999995	-0.007	711.000002	0.003
4.6	708.999997	-0.004	710.999996	-0.006

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 17			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	708.999997	-0.004	710.999997	-0.004
-30	709.000004	0.006	710.999997	-0.004
-20	708.999999	-0.001	711.000002	0.003
-10	709.000005	0.007	711.000004	0.006
0	709.000004	0.006	711.000004	0.006
10	708.999995	-0.007	710.999996	-0.006
20	708.999999	-0.001	711.000004	0.006
30	709.000001	0.001	710.999996	-0.006
40	708.999996	-0.006	711.000003	0.004
50	709.000002	0.003	710.999999	-0.001
60	709.000005	0.007	711.000002	0.003
70	709.000005	0.007	710.999998	-0.003
80	708.999996	-0.006	711.000001	0.001
85	709.000001	0.001	710.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1710.700004	0.002	1779.300003	0.002
3.4	1710.699995	-0.003	1779.299995	-0.003
4.6	1710.700005	0.003	1779.300005	0.003

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	1710.699995	-0.003	1779.300001	0.001
-30	1710.700003	0.002	1779.299996	-0.002
-20	1710.699998	-0.001	1779.300004	0.002
-10	1710.699999	-0.001	1779.299997	-0.002
0	1710.699997	-0.002	1779.299998	-0.001
10	1710.699997	-0.002	1779.299996	-0.002
20	1710.700001	0.001	1779.300005	0.003
30	1710.699995	-0.003	1779.300002	0.001
40	1710.699998	-0.001	1779.299995	-0.003
50	1710.700002	0.001	1779.299998	-0.001
60	1710.700001	0.001	1779.300005	0.003
70	1710.699997	-0.002	1779.300002	0.001
80	1710.700004	0.002	1779.299997	-0.002
85	1710.699995	-0.003	1779.300002	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1711.500003	0.002	1778.500004	0.002
3.4	1711.500003	0.002	1778.500004	0.002
4.6	1711.500001	0.001	1778.500003	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	1711.500005	0.003	1778.500003	0.002
-30	1711.499999	-0.001	1778.500002	0.001
-20	1711.500002	0.001	1778.500001	0.001
-10	1711.500005	0.003	1778.500003	0.002
0	1711.499997	-0.002	1778.499997	-0.002
10	1711.499998	-0.001	1778.500005	0.003
20	1711.499997	-0.002	1778.499999	-0.001
30	1711.500004	0.002	1778.499998	-0.001
40	1711.499995	-0.003	1778.499995	-0.003
50	1711.500005	0.003	1778.500005	0.003
60	1711.499995	-0.003	1778.499999	-0.001
70	1711.500002	0.001	1778.499996	-0.002
80	1711.499995	-0.003	1778.500001	0.001
85	1711.499999	-0.001	1778.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1712.499998	-0.001	1777.500001	0.001
3.4	1712.499997	-0.002	1777.499999	-0.001
4.6	1712.499997	-0.002	1777.499998	-0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	1712.499997	-0.002	1777.500004	0.002
-30	1712.499998	-0.001	1777.500003	0.002
-20	1712.499996	-0.002	1777.500001	0.001
-10	1712.499997	-0.002	1777.499999	-0.001
0	1712.499995	-0.003	1777.499998	-0.001
10	1712.499997	-0.002	1777.499998	-0.001
20	1712.500003	0.002	1777.499997	-0.002
30	1712.500005	0.003	1777.499996	-0.002
40	1712.499997	-0.002	1777.499999	-0.001
50	1712.500001	0.001	1777.499998	-0.001
60	1712.499997	-0.002	1777.500005	0.003
70	1712.500001	0.001	1777.500002	0.001
80	1712.499998	-0.001	1777.499997	-0.002
85	1712.499999	-0.001	1777.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1714.999997	-0.002	1775.000003	0.002
3.4	1714.999995	-0.003	1775.000004	0.002
4.6	1714.999999	-0.001	1774.999995	-0.003

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	1715.000005	0.003	1774.999996	-0.002
-30	1715.000004	0.002	1774.999995	-0.003
-20	1715.000002	0.001	1775.000004	0.002
-10	1715.000002	0.001	1775.000002	0.001
0	1714.999998	-0.001	1774.999995	-0.003
10	1715.000004	0.002	1775.000001	0.001
20	1714.999996	-0.002	1774.999998	-0.001
30	1715.000005	0.003	1775.000003	0.002
40	1715.000003	0.002	1775.000004	0.002
50	1715.000004	0.002	1774.999995	-0.003
60	1714.999996	-0.002	1774.999995	-0.003
70	1715.000005	0.003	1775.000003	0.002
80	1715.000001	0.001	1775.000005	0.003
85	1714.999999	-0.001	1774.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1717.500005	0.003	1772.499999	-0.001
3.4	1717.500002	0.001	1772.499995	-0.003
4.6	1717.500001	0.001	1772.500004	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	1717.500001	0.001	1772.500004	0.002
-30	1717.499998	-0.001	1772.499996	-0.002
-20	1717.499996	-0.002	1772.499996	-0.002
-10	1717.499995	-0.003	1772.499999	-0.001
0	1717.500005	0.003	1772.500004	0.002
10	1717.499998	-0.001	1772.499997	-0.002
20	1717.499997	-0.002	1772.500002	0.001
30	1717.499997	-0.002	1772.500005	0.003
40	1717.500002	0.001	1772.499996	-0.002
50	1717.500001	0.001	1772.500004	0.002
60	1717.499996	-0.002	1772.500003	0.002
70	1717.499995	-0.003	1772.499998	-0.001
80	1717.500001	0.001	1772.500005	0.003
85	1717.500002	0.001	1772.500003	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1720.000002	0.001	1769.999996	-0.002
3.4	1720.000003	0.002	1770.000004	0.002
4.6	1719.999995	-0.003	1770.000001	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

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)
-40	1720.000004	0.002	1769.999999	-0.001
-30	1719.999995	-0.003	1769.999996	-0.002
-20	1719.999995	-0.003	1770.000005	0.003
-10	1719.999996	-0.002	1770.000002	0.001
0	1719.999998	-0.001	1769.999996	-0.002
10	1719.999999	-0.001	1769.999998	-0.001
20	1719.999995	-0.003	1770.000004	0.002
30	1719.999999	-0.001	1770.000002	0.001
40	1720.000004	0.002	1769.999995	-0.003
50	1719.999998	-0.001	1769.999996	-0.002
60	1719.999997	-0.002	1769.999995	-0.003
70	1719.999999	-0.001	1770.000004	0.002
80	1719.999999	-0.001	1769.999997	-0.002
85	1719.999995	-0.003	1770.000004	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	665.499997	-0.005	695.500002	0.003
3.4	665.500005	0.008	695.500004	0.006
4.6	665.500004	0.006	695.499995	-0.007

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	665.500002	0.003	695.500002	0.003
-30	665.500005	0.008	695.500005	0.007
-20	665.499999	-0.002	695.500004	0.006
-10	665.499995	-0.008	695.499998	-0.003
0	665.500005	0.008	695.499995	-0.007
10	665.500002	0.003	695.500004	0.006
20	665.499997	-0.005	695.499999	-0.001
30	665.499997	-0.005	695.499995	-0.007
40	665.500005	0.008	695.499998	-0.003
50	665.499995	-0.008	695.500002	0.003
60	665.500002	0.003	695.499999	-0.001
70	665.500001	0.002	695.499997	-0.004
80	665.500001	0.002	695.499995	-0.007
85	665.500003	0.005	695.500004	0.006

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	667.999998	-0.003	693.000003	0.004
3.4	667.999998	-0.003	693.000004	0.006
4.6	668.000002	0.003	693.000005	0.007

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	668.000004	0.006	693.000001	0.001
-30	667.999999	-0.001	693.000002	0.003
-20	668.000004	0.006	693.000002	0.003
-10	667.999998	-0.003	693.000002	0.003
0	667.999998	-0.003	692.999996	-0.006
10	668.000001	0.001	692.999995	-0.007
20	667.999997	-0.004	693.000003	0.004
30	667.999996	-0.006	692.999995	-0.007
40	667.999999	-0.001	693.000001	0.001
50	668.000004	0.006	692.999998	-0.003
60	667.999995	-0.007	693.000002	0.003
70	668.000001	0.001	693.000005	0.007
80	668.000003	0.004	693.000003	0.004
85	668.000001	0.001	692.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	670.500005	0.007	690.500001	0.001
3.4	670.499998	-0.003	690.499995	-0.007
4.6	670.499998	-0.003	690.500005	0.007

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	670.500005	0.007	690.500004	0.006
-30	670.499996	-0.006	690.499998	-0.003
-20	670.500003	0.004	690.499997	-0.004
-10	670.500004	0.006	690.499999	-0.001
0	670.500003	0.004	690.500004	0.006
10	670.500004	0.006	690.499997	-0.004
20	670.500005	0.007	690.499997	-0.004
30	670.500002	0.003	690.500003	0.004
40	670.500005	0.007	690.499997	-0.004
50	670.499996	-0.006	690.499995	-0.007
60	670.499999	-0.001	690.499996	-0.006
70	670.499999	-0.001	690.499997	-0.004
80	670.500005	0.007	690.499997	-0.004
85	670.499998	-0.003	690.500003	0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	672.999996	-0.006	687.999997	-0.004
3.4	672.999998	-0.003	688.000004	0.006
4.6	673.000003	0.004	688.000004	0.006

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	672.999998	-0.003	688.000001	0.001
-30	673.000004	0.006	688.000005	0.007
-20	673.000004	0.006	687.999995	-0.007
-10	673.000004	0.006	687.999998	-0.003
0	672.999999	-0.001	687.999996	-0.006
10	673.000002	0.003	688.000001	0.001
20	672.999999	-0.001	687.999999	-0.001
30	673.000002	0.003	687.999997	-0.004
40	673.000005	0.007	688.000005	0.007
50	673.000002	0.003	687.999998	-0.003
60	672.999999	-0.001	687.999997	-0.004
70	673.000004	0.006	688.000005	0.007
80	673.000004	0.006	688.000005	0.007
85	672.999995	-0.007	688.000003	0.004

4.4 Emission Bandwidth Measurement

4.4.1 Limits of Emission Bandwidth Measurement

According to FCC 2.1049, the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission.

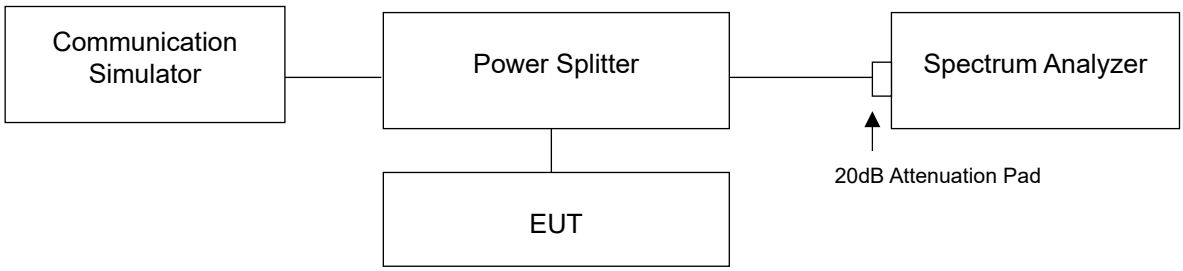
4.4.2 Test Procedure

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

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

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

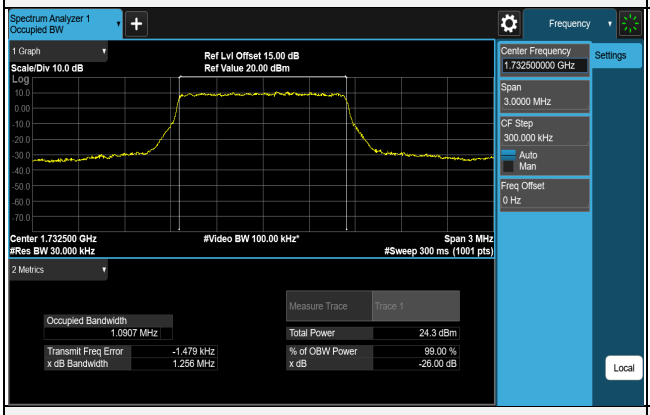
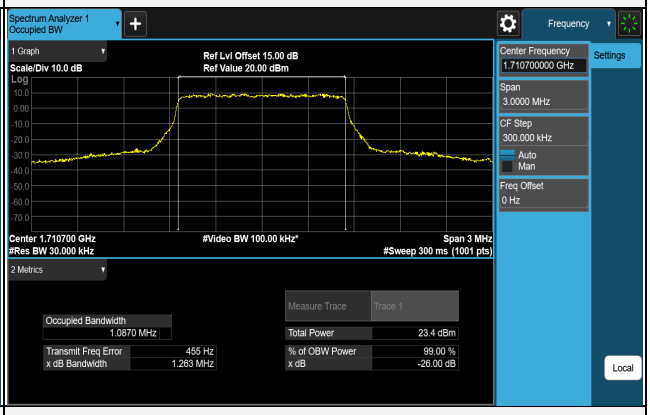
4.4.3 Test Setup



4.4.4 Test Result

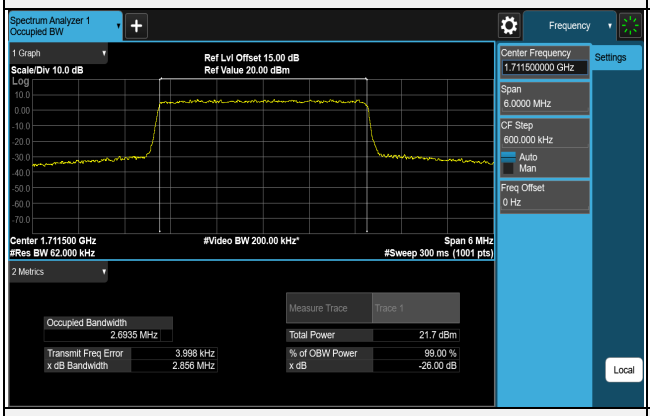
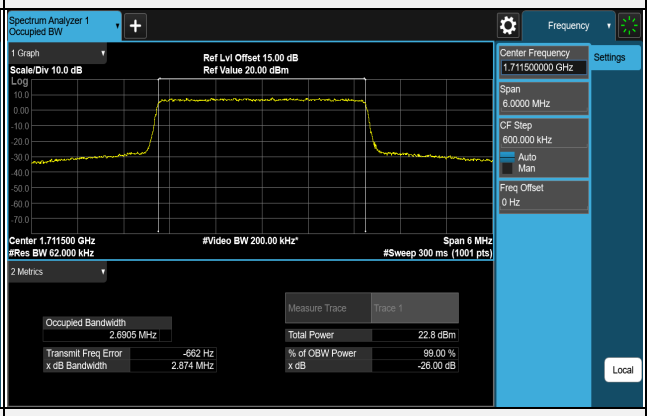
LTE Band 4 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	19957	1710.7	1.0888	1.249
QPSK	20175	1732.5	1.0907	1.256
QPSK	20393	1754.3	1.0903	1.259
16QAM	19957	1710.7	1.0870	1.263
16QAM	20175	1732.5	1.0876	1.256
16QAM	20393	1754.3	1.0871	1.257
64QAM	19957	1710.7	1.0878	1.258
64QAM	20175	1732.5	1.0877	1.250
64QAM	20393	1754.3	1.0870	1.260

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20175 (1732.5MHz)	16QAM CH 19957 (1710.7MHz)

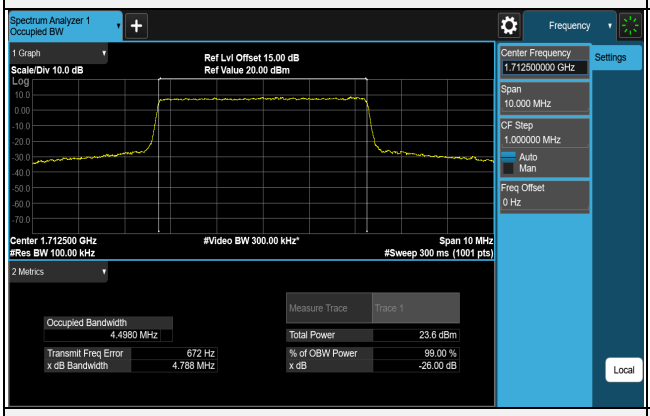
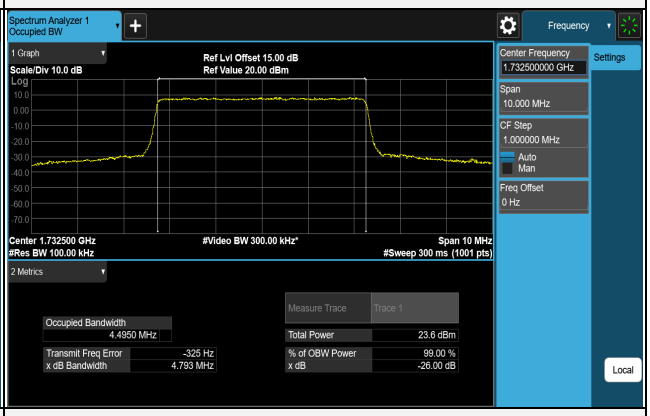
LTE Band 4 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	19965	1711.5	2.6918	2.870
QPSK	20175	1732.5	2.6894	2.860
QPSK	20385	1753.5	2.6920	2.871
16QAM	19965	1711.5	2.6905	2.874
16QAM	20175	1732.5	2.6897	2.867
16QAM	20385	1753.5	2.6894	2.874
64QAM	19965	1711.5	2.6935	2.856
64QAM	20175	1732.5	2.6909	2.861
64QAM	20385	1753.5	2.6932	2.860

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 19965 (1711.5MHz)	16QAM CH 19965 (1711.5MHz)

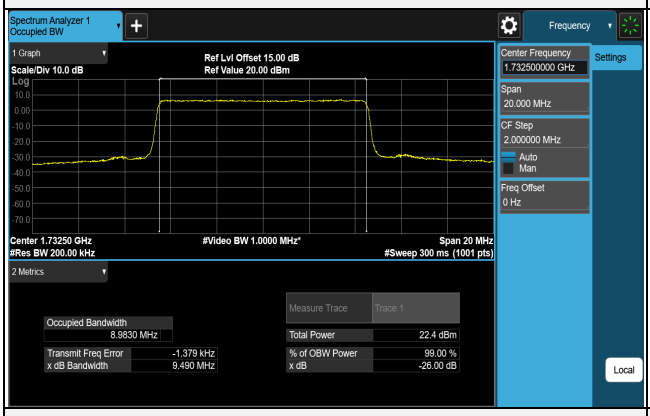
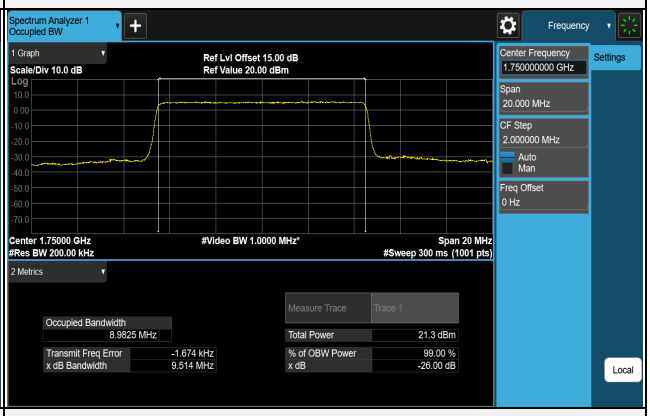
LTE Band 4 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	19975	1712.5	4.4980	4.788
QPSK	20175	1732.5	4.4950	4.793
QPSK	20375	1752.5	4.4945	4.773
16QAM	19975	1712.5	4.4908	4.774
16QAM	20175	1732.5	4.4889	4.768
16QAM	20375	1752.5	4.4906	4.772
64QAM	19975	1712.5	4.4962	4.782
64QAM	20175	1732.5	4.4960	4.778
64QAM	20375	1752.5	4.4923	4.777

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 19975 (1712.5MHz)	QPSK CH 20175 (1732.5MHz)

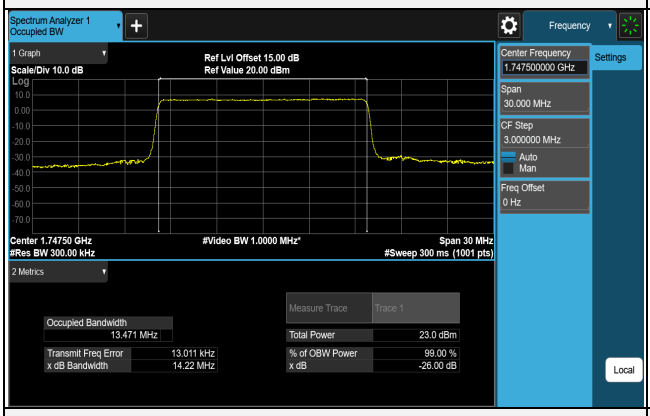
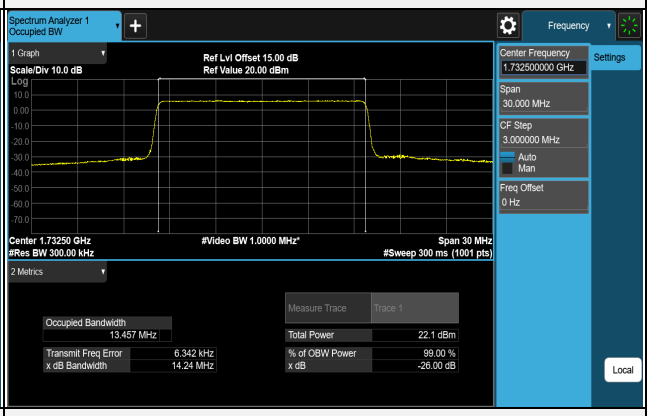
LTE Band 4 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20000	1715	8.9800	9.498
QPSK	20175	1732.5	8.9823	9.508
QPSK	20350	1750	8.9808	9.499
16QAM	20000	1715	8.9720	9.510
16QAM	20175	1732.5	8.9830	9.490
16QAM	20350	1750	8.9811	9.494
64QAM	20000	1715	8.9759	9.511
64QAM	20175	1732.5	8.9805	9.504
64QAM	20350	1750	8.9825	9.514

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 20175 (1732.5MHz)	64QAM CH 20350 (1750MHz)

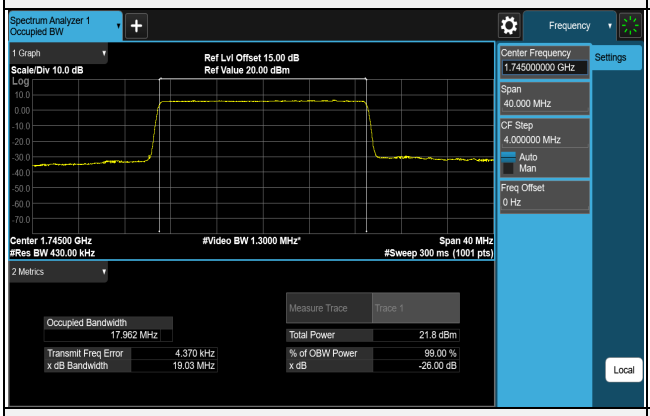
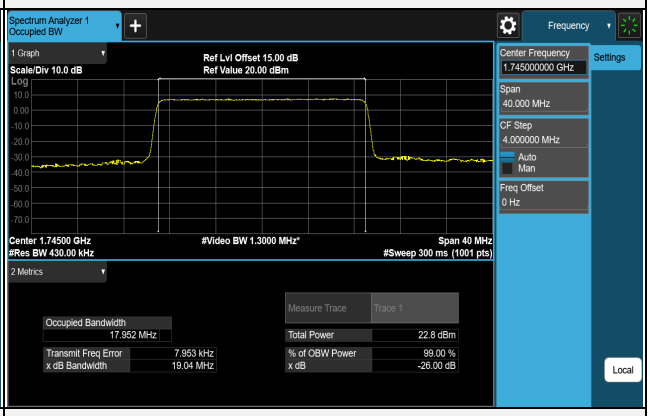
LTE Band 4 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20025	1717.5	13.466	14.23
QPSK	20175	1732.5	13.460	14.23
QPSK	20325	1747.5	13.471	14.23
16QAM	20025	1717.5	13.447	14.23
16QAM	20175	1732.5	13.457	14.24
16QAM	20325	1747.5	13.458	14.24
64QAM	20025	1717.5	13.440	14.23
64QAM	20175	1732.5	13.451	14.23
64QAM	20325	1747.5	13.453	14.23

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20325 (1747.5MHz)	16QAM CH 20175 (1732.5MHz)

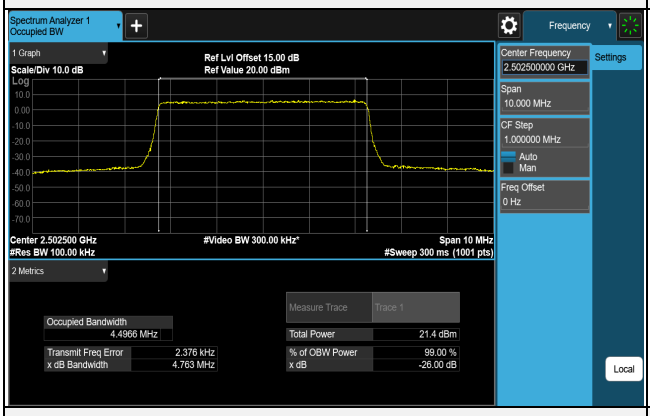
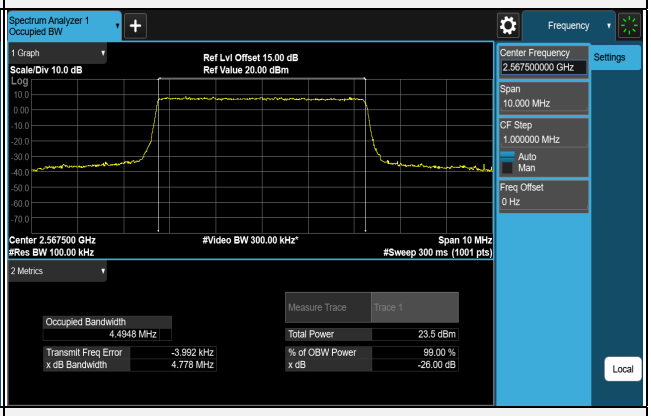
LTE Band 4 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20050	1720	17.946	19.03
QPSK	20175	1732.5	17.959	19.03
QPSK	20300	1745	17.952	19.04
16QAM	20050	1720	17.957	19.02
16QAM	20175	1732.5	17.958	19.04
16QAM	20300	1745	17.962	19.03
64QAM	20050	1720	17.941	19.03
64QAM	20175	1732.5	17.956	19.03
64QAM	20300	1745	17.953	19.03

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 20300 (1745MHz)	QPSK CH 20300 (1745MHz)

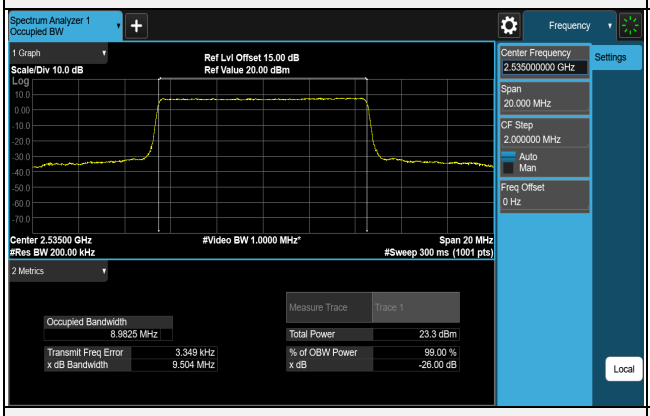
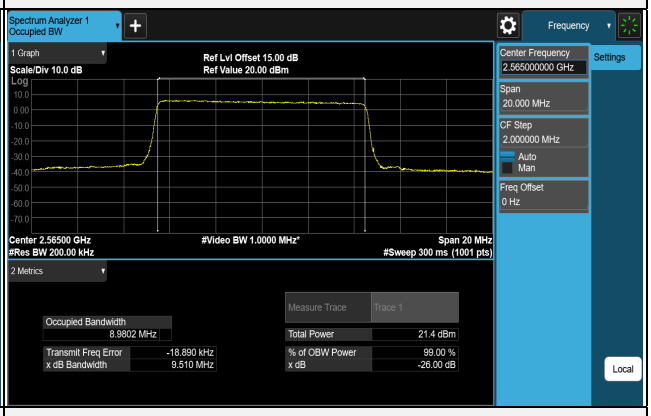
LTE Band 7 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20775	2502.5	4.4871	4.767
QPSK	21100	2535	4.4922	4.771
QPSK	21425	2567.5	4.4948	4.778
16QAM	20775	2502.5	4.4896	4.770
16QAM	21100	2535	4.4884	4.764
16QAM	21425	2567.5	4.4934	4.773
64QAM	20775	2502.5	4.4966	4.763
64QAM	21100	2535	4.4965	4.774
64QAM	21425	2567.5	4.4924	4.770

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 20775 (2502.5MHz)	QPSK CH 21425 (2567.5MHz)

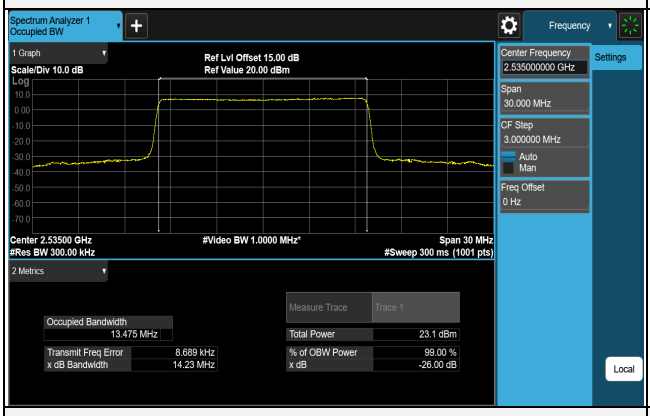
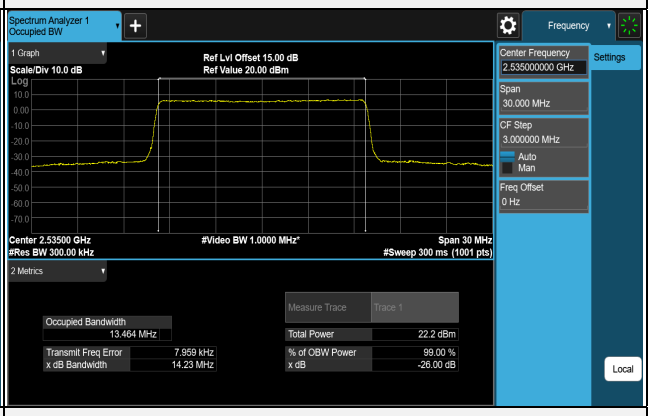
LTE Band 7 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20800	2505	8.9797	9.501
QPSK	21100	2535	8.9825	9.504
QPSK	21400	2565	8.9816	9.495
16QAM	20800	2505	8.9725	9.490
16QAM	21100	2535	8.9812	9.497
16QAM	21400	2565	8.9770	9.487
64QAM	20800	2505	8.9784	9.502
64QAM	21100	2535	8.9825	9.504
64QAM	21400	2565	8.9802	9.510

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 21100 (2535MHz)	64QAM CH 21400 (2565MHz)

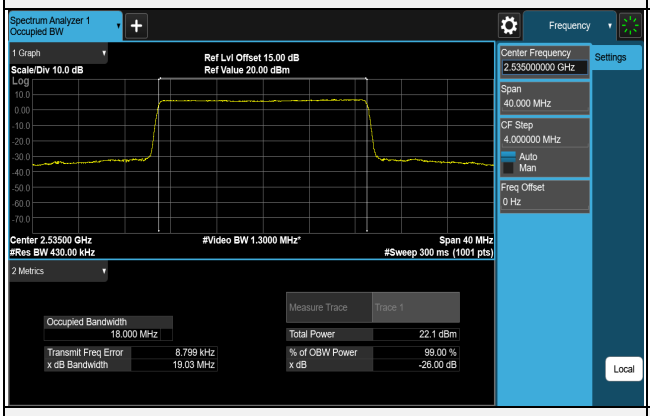
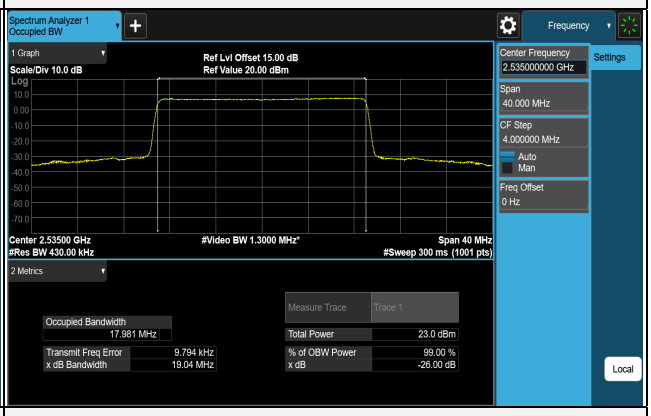
LTE Band 7 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20825	2507.5	13.459	14.22
QPSK	21100	2535	13.475	14.23
QPSK	21375	2562.5	13.466	14.21
16QAM	20825	2507.5	13.442	14.23
16QAM	21100	2535	13.464	14.23
16QAM	21375	2562.5	13.447	14.22
64QAM	20825	2507.5	13.439	14.22
64QAM	21100	2535	13.467	14.23
64QAM	21375	2562.5	13.442	14.20

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 21100 (2535MHz)	16QAM CH 21100 (2535MHz)

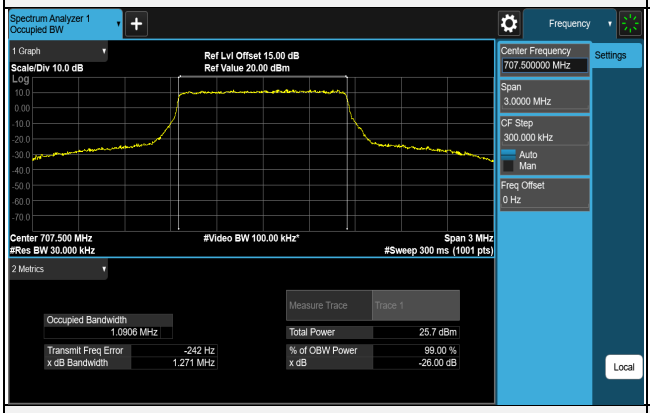
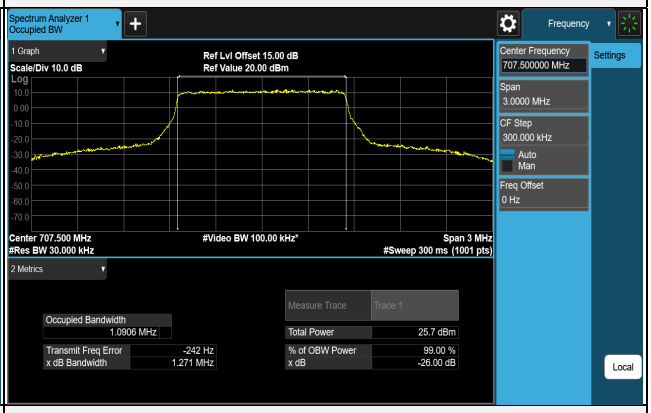
LTE Band 7 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20850	2510	17.902	19.00
QPSK	21100	2535	17.981	19.04
QPSK	21350	2560	17.915	18.98
16QAM	20850	2510	17.911	19.01
16QAM	21100	2535	18.000	19.03
16QAM	21350	2560	17.923	18.98
64QAM	20850	2510	17.910	19.01
64QAM	21100	2535	17.986	19.03
64QAM	21350	2560	17.916	18.99

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 21100 (2535MHz)	QPSK CH 21100 (2535MHz)

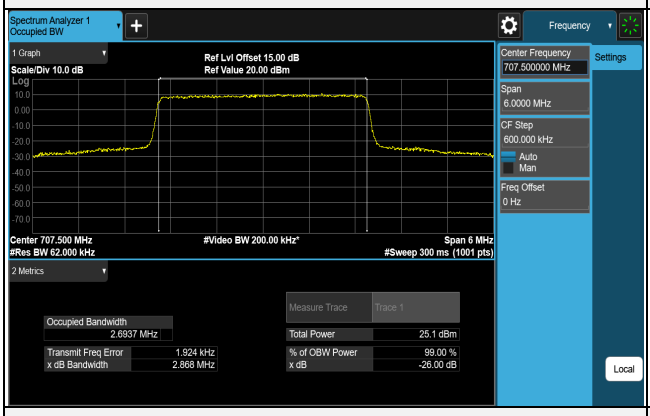
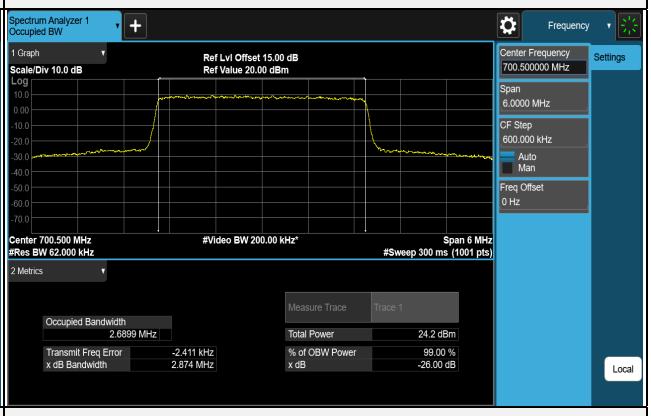
LTE Band 12 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23017	699.7	1.0873	1.251
QPSK	23095	707.5	1.0906	1.271
QPSK	23173	715.3	1.0897	1.256
16QAM	23017	699.7	1.0857	1.251
16QAM	23095	707.5	1.0866	1.263
16QAM	23173	715.3	1.0873	1.256
64QAM	23017	699.7	1.0887	1.250
64QAM	23095	707.5	1.0883	1.250
64QAM	23173	715.3	1.0881	1.251

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 23095 (707.5MHz)	QPSK CH 23095 (707.5MHz)

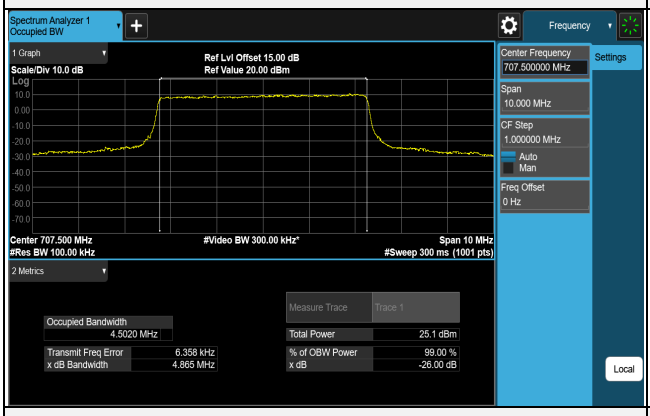
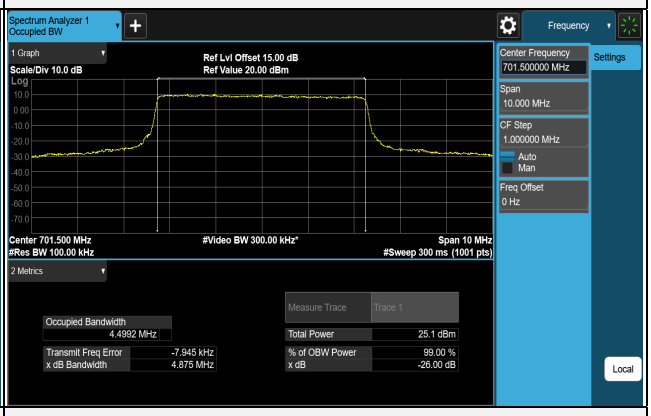
LTE Band 12 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23025	700.5	2.6914	2.866
QPSK	23095	707.5	2.6937	2.868
QPSK	23165	714.5	2.6931	2.869
16QAM	23025	700.5	2.6899	2.874
16QAM	23095	707.5	2.6929	2.868
16QAM	23165	714.5	2.6886	2.871
64QAM	23025	700.5	2.6916	2.861
64QAM	23095	707.5	2.6923	2.860
64QAM	23165	714.5	2.6925	2.861

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 23095 (707.5MHz)	16QAM CH 23025 (700.5MHz)

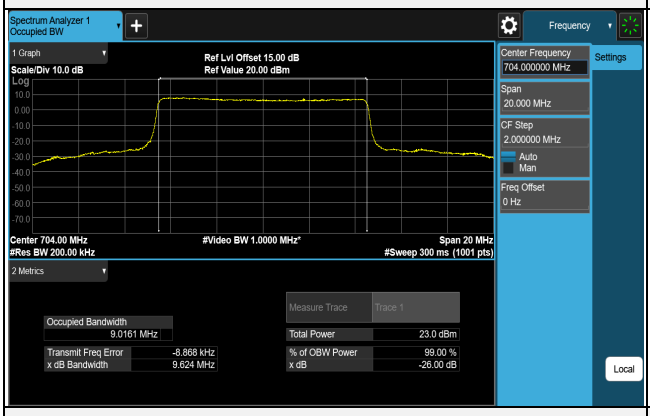
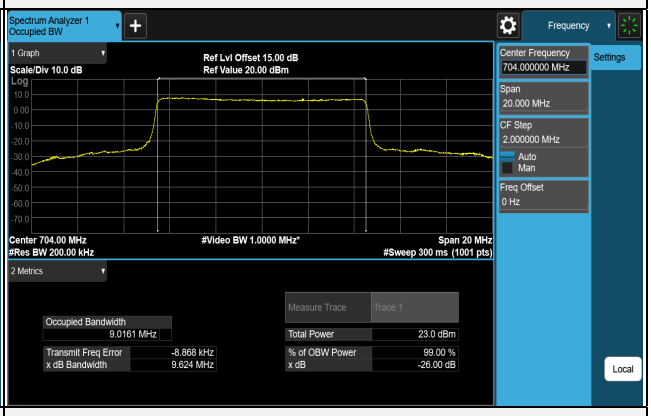
LTE Band 12 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23035	701.5	4.4992	4.875
QPSK	23095	707.5	4.5020	4.865
QPSK	23155	713.5	4.4966	4.833
16QAM	23035	701.5	4.4932	4.870
16QAM	23095	707.5	4.4989	4.851
16QAM	23155	713.5	4.4919	4.840
64QAM	23035	701.5	4.4973	4.832
64QAM	23095	707.5	4.5003	4.857
64QAM	23155	713.5	4.4932	4.838

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 23095 (707.5MHz)	QPSK CH 23035 (701.5MHz)

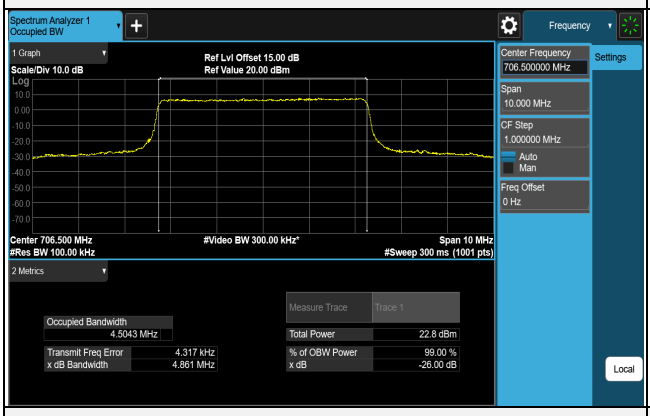
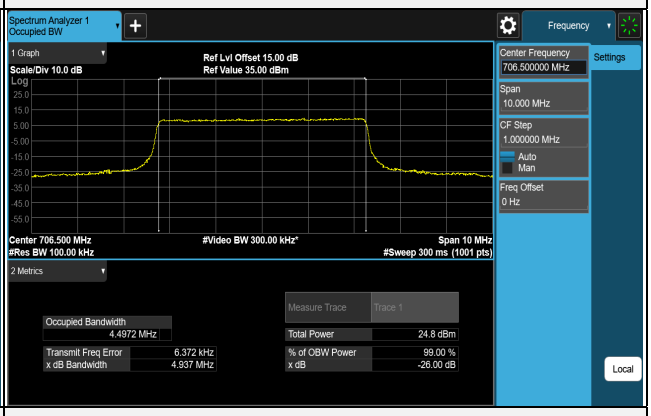
LTE Band 12 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23060	704	9.0139	9.598
QPSK	23095	707.5	8.9916	9.546
QPSK	23130	711	8.9435	9.506
16QAM	23060	704	9.0153	9.549
16QAM	23095	707.5	8.9870	9.538
16QAM	23130	711	8.9372	9.504
64QAM	23060	704	9.0161	9.624
64QAM	23095	707.5	8.9939	9.553
64QAM	23130	711	8.9441	9.519

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 23060 (704MHz)	64QAM CH 23060 (704MHz)

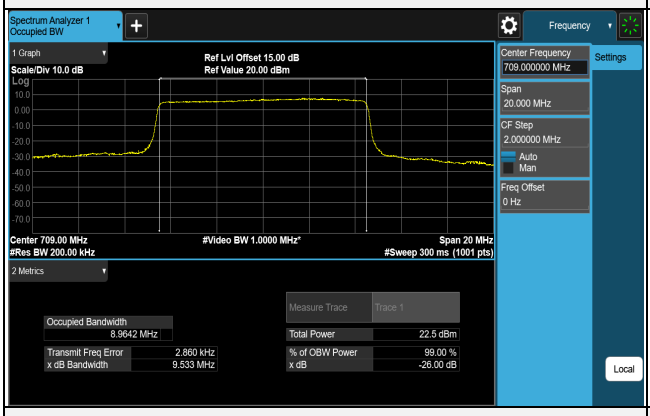
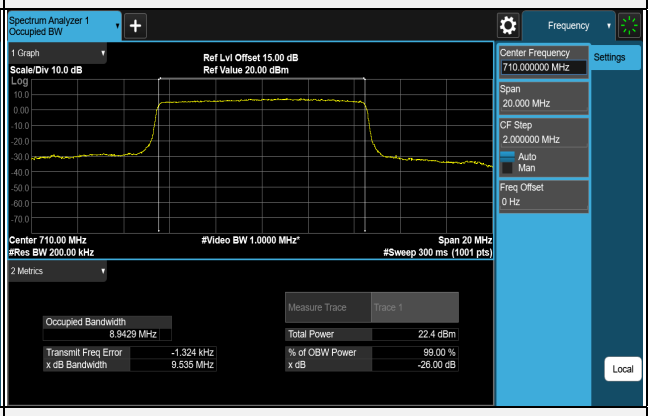
LTE Band 17 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23755	706.5	4.4972	4.937
QPSK	23790	710	4.4918	4.832
QPSK	23825	713.5	4.4957	4.865
16QAM	23755	706.5	4.5016	4.905
16QAM	23790	710	4.4857	4.830
16QAM	23825	713.5	4.4904	4.850
64QAM	23755	706.5	4.5043	4.861
64QAM	23790	710	4.4913	4.839
64QAM	23825	713.5	4.4956	4.875

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 23755 (706.5MHz)	QPSK CH 23755 (706.5MHz)

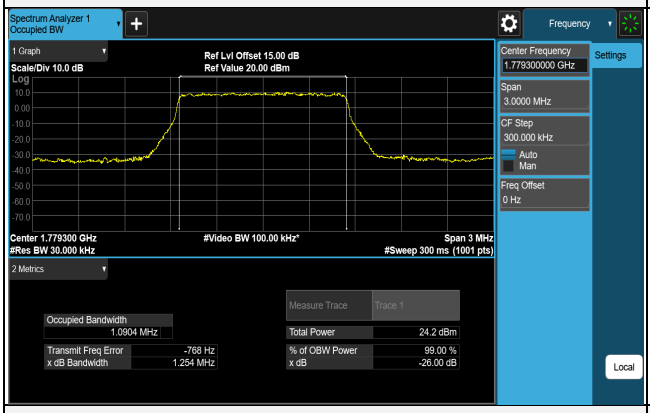
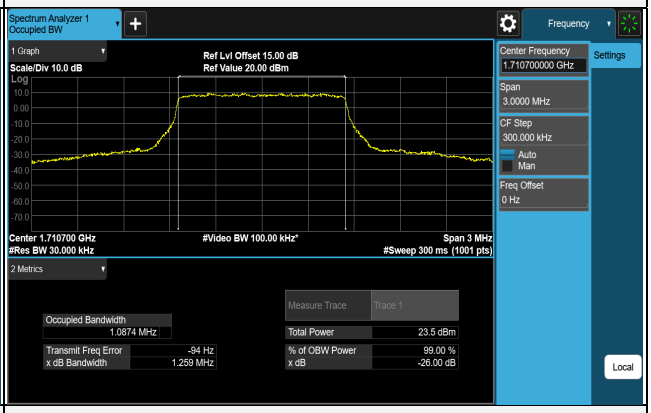
LTE Band 17 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23780	709	8.9630	9.506
QPSK	23790	710	8.9451	9.505
QPSK	23800	711	8.9416	9.493
16QAM	23780	709	8.9569	9.515
16QAM	23790	710	8.9465	9.492
16QAM	23800	711	8.9428	9.507
64QAM	23780	709	8.9642	9.533
64QAM	23790	710	8.9429	9.535
64QAM	23800	711	8.9410	9.529

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 23780 (709MHz)	64QAM CH 23790 (710MHz)

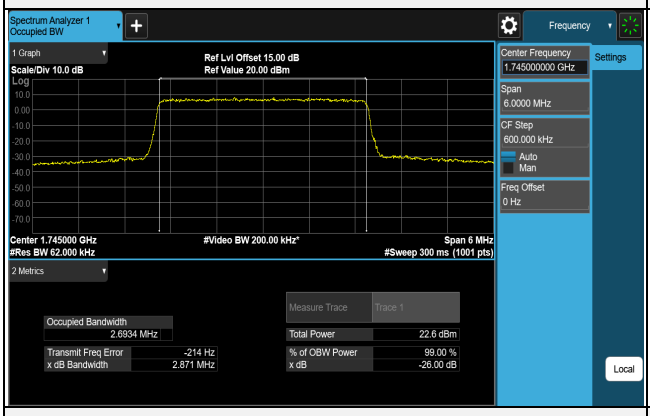
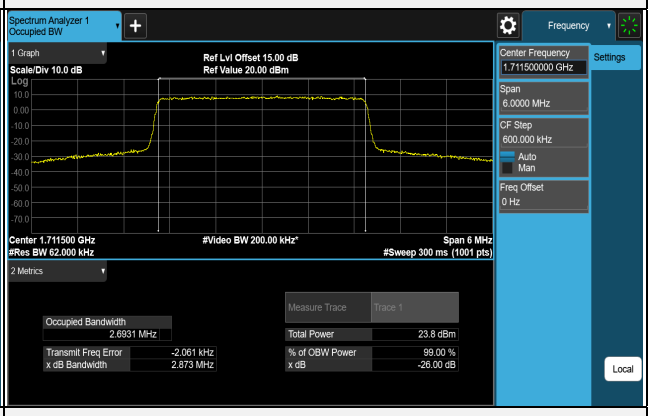
LTE Band 66 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	131979	1710.7	1.0877	1.254
QPSK	132322	1745	1.0900	1.257
QPSK	132665	1779.3	1.0904	1.254
16QAM	131979	1710.7	1.0874	1.259
16QAM	132322	1745	1.0870	1.253
16QAM	132665	1779.3	1.0871	1.254
64QAM	131979	1710.7	1.0883	1.258
64QAM	132322	1745	1.0874	1.253
64QAM	132665	1779.3	1.0880	1.253

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 132665 (1779.3MHz)	16QAM CH 131979 (1710.7MHz)

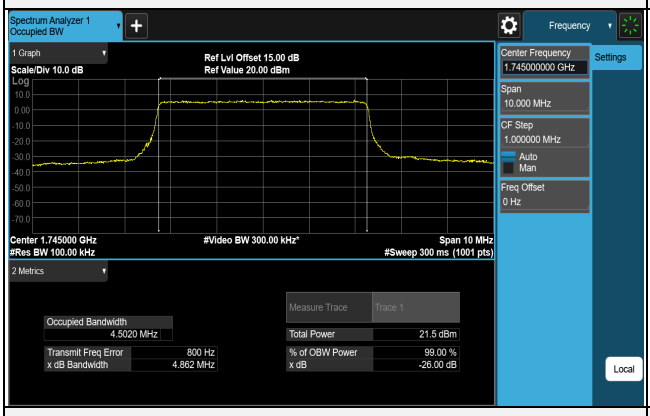
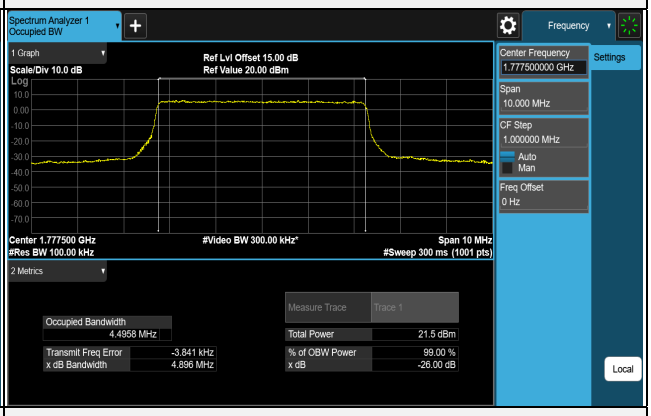
LTE Band 66 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	131987	1711.5	2.6931	2.873
QPSK	132322	1745	2.6897	2.870
QPSK	132657	1778.5	2.6905	2.863
16QAM	131987	1711.5	2.6931	2.860
16QAM	132322	1745	2.6934	2.871
16QAM	132657	1778.5	2.6914	2.869
64QAM	131987	1711.5	2.6899	2.858
64QAM	132322	1745	2.6882	2.861
64QAM	132657	1778.5	2.6901	2.858

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 132322 (1745MHz)	QPSK CH 131987 (1711.5MHz)

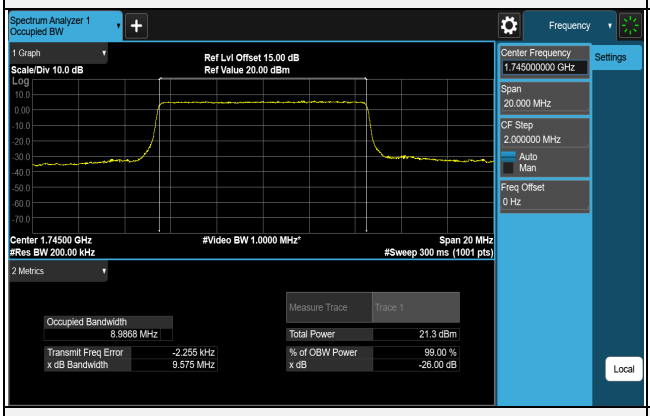
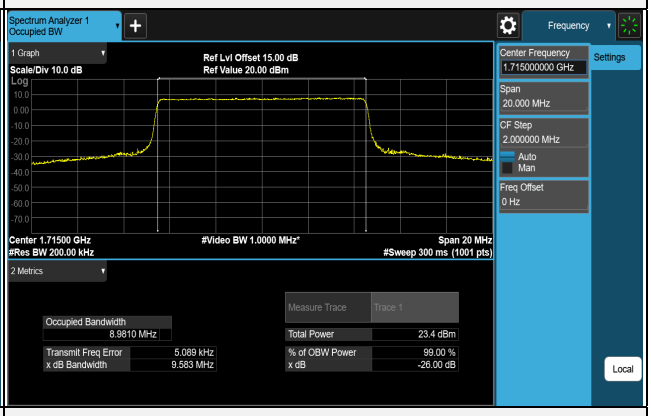
LTE Band 66 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	131997	1712.5	4.4984	4.865
QPSK	132322	1745	4.4958	4.893
QPSK	132647	1777.5	4.4956	4.870
16QAM	131997	1712.5	4.4967	4.859
16QAM	132322	1745	4.4947	4.865
16QAM	132647	1777.5	4.4901	4.858
64QAM	131997	1712.5	4.4980	4.861
64QAM	132322	1745	4.5020	4.862
64QAM	132647	1777.5	4.4958	4.896

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 132322 (1745MHz)	64QAM CH 132647 (1777.5MHz)

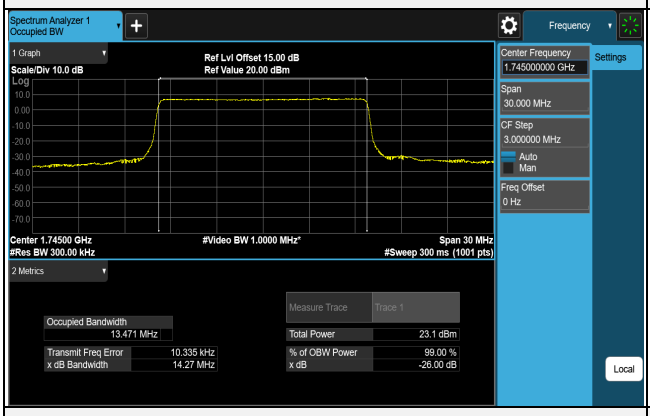
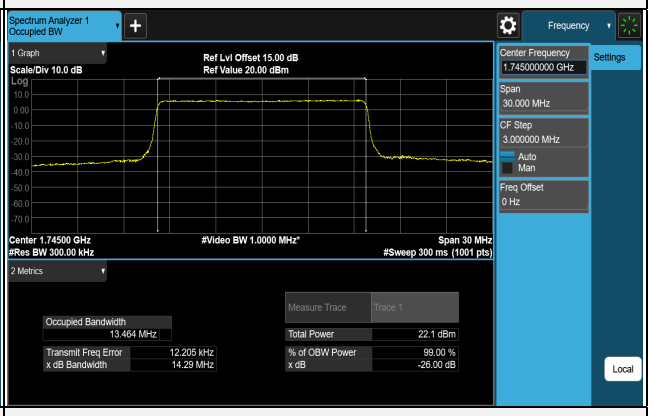
LTE Band 66 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	132022	1715	8.9810	9.583
QPSK	132322	1745	8.9813	9.569
QPSK	132622	1775	8.9757	9.548
16QAM	132022	1715	8.9722	9.563
16QAM	132322	1745	8.9799	9.539
16QAM	132622	1775	8.9757	9.524
64QAM	132022	1715	8.9762	9.575
64QAM	132322	1745	8.9868	9.575
64QAM	132622	1775	8.9822	9.579

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
64QAM CH 132322 (1745MHz)	QPSK CH 132022 (1715MHz)

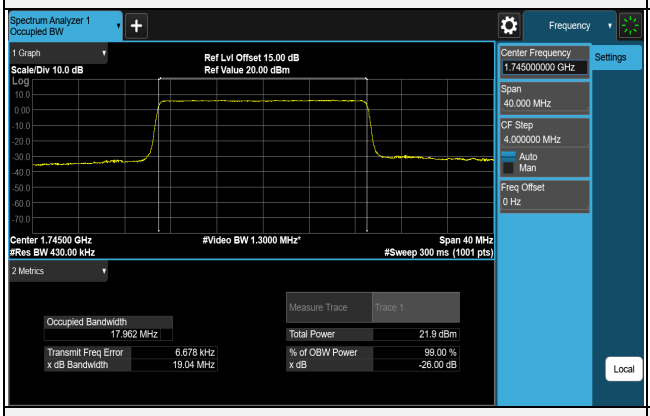
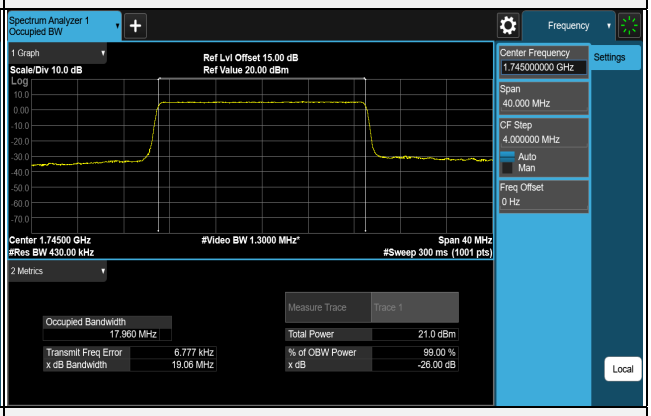
LTE Band 66 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	132047	1717.5	13.470	14.28
QPSK	132322	1745	13.471	14.27
QPSK	132597	1772.5	13.455	14.26
16QAM	132047	1717.5	13.459	14.28
16QAM	132322	1745	13.464	14.29
16QAM	132597	1772.5	13.452	14.28
64QAM	132047	1717.5	13.448	14.27
64QAM	132322	1745	13.462	14.29
64QAM	132597	1772.5	13.450	14.28

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 132322 (1745MHz)	16QAM CH 132322 (1745MHz)

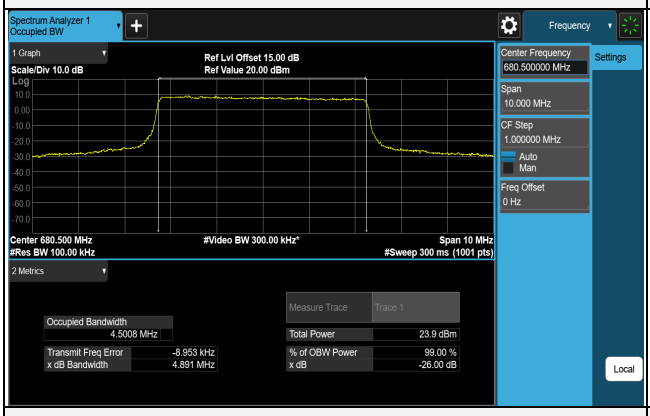
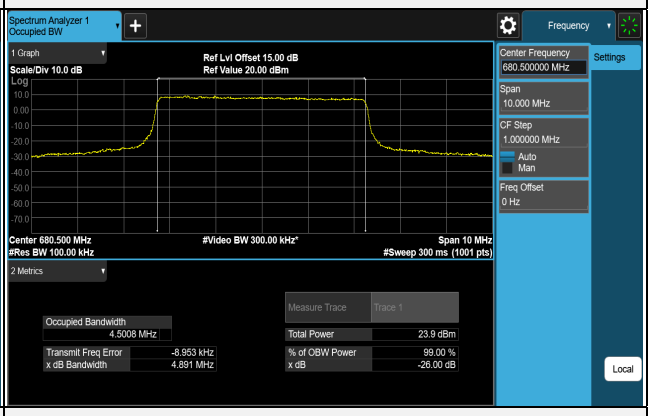
LTE Band 66 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	132072	1720	17.954	19.05
QPSK	132322	1745	17.955	19.04
QPSK	132572	1770	17.941	19.03
16QAM	132072	1720	17.957	19.05
16QAM	132322	1745	17.962	19.05
16QAM	132572	1770	17.948	19.03
64QAM	132072	1720	17.947	19.05
64QAM	132322	1745	17.960	19.06
64QAM	132572	1770	17.945	19.06

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 132322 (1745MHz)	64QAM CH 132322 (1745MHz)

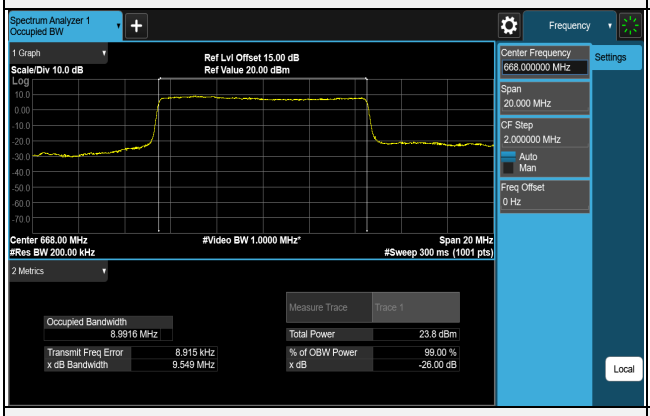
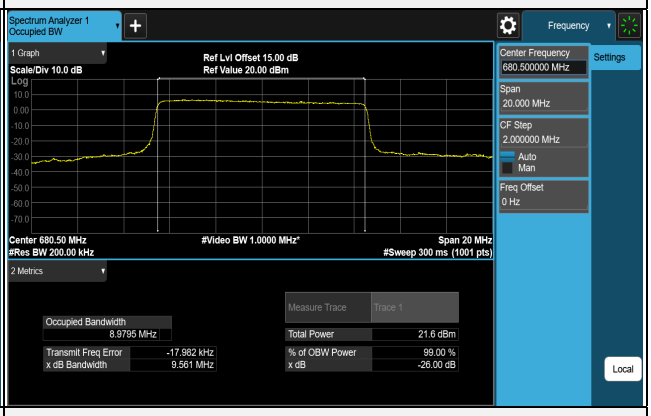
LTE Band 71 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	133147	665.5	4.4784	4.814
QPSK	133297	680.5	4.5008	4.891
QPSK	133447	695.5	4.4965	4.853
16QAM	133147	665.5	4.4793	4.821
16QAM	133297	680.5	4.4978	4.879
16QAM	133447	695.5	4.4937	4.847
64QAM	133147	665.5	4.4823	4.820
64QAM	133297	680.5	4.4994	4.857
64QAM	133447	695.5	4.4954	4.843

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 133297 (680.5MHz)	QPSK CH 133297 (680.5MHz)

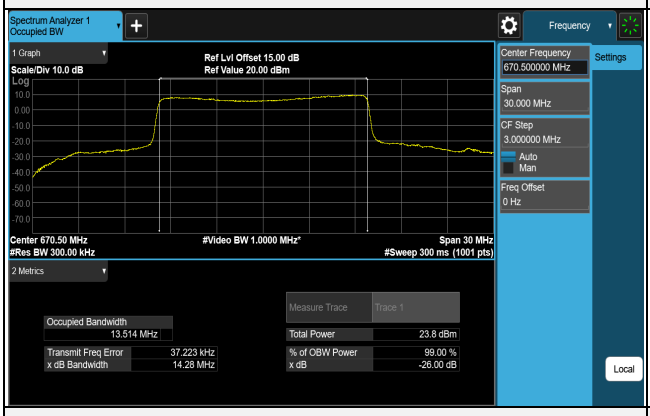
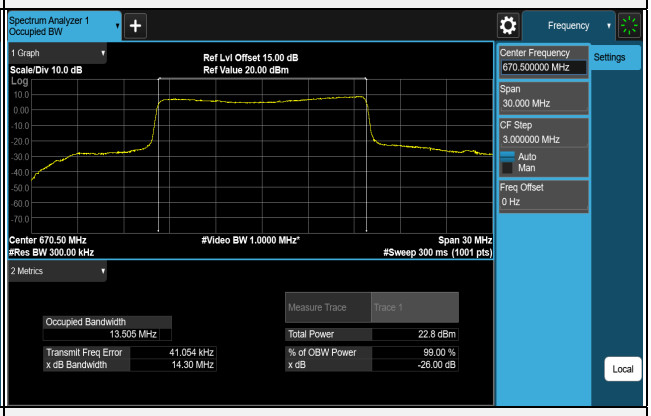
LTE Band 71 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	133172	668	8.9916	9.549
QPSK	133297	680.5	8.9754	9.528
QPSK	133422	693	8.9619	9.546
16QAM	133172	668	8.9912	9.527
16QAM	133297	680.5	8.9744	9.526
16QAM	133422	693	8.9527	9.524
64QAM	133172	668	8.9860	9.558
64QAM	133297	680.5	8.9795	9.561
64QAM	133422	693	8.9612	9.532

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 133172 (668MHz)	64QAM CH 133297 (680.5MHz)

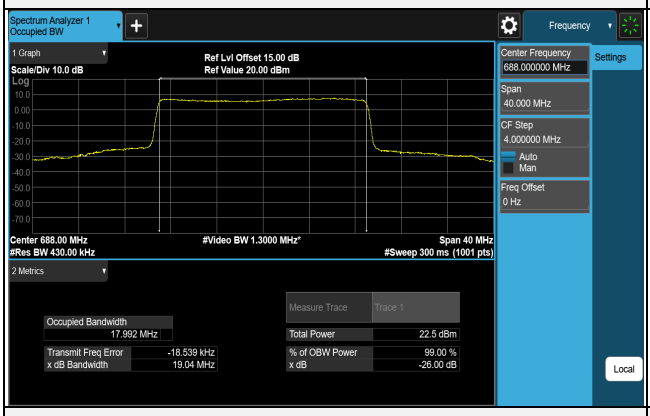
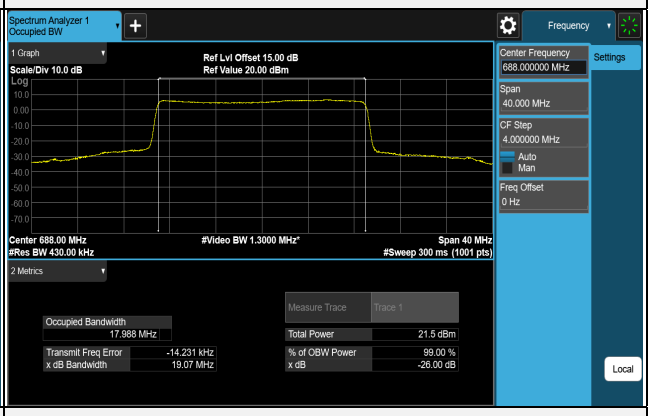
LTE Band 71 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	133197	670.5	13.514	14.28
QPSK	133297	680.5	13.430	14.24
QPSK	133397	690.5	13.447	14.24
16QAM	133197	670.5	13.505	14.30
16QAM	133297	680.5	13.434	14.24
16QAM	133397	690.5	13.438	14.27
64QAM	133197	670.5	13.499	14.26
64QAM	133297	680.5	13.423	14.26
64QAM	133397	690.5	13.432	14.26

pectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 133197 (670.5MHz)	16QAM CH 133197 (670.5MHz)

LTE Band 71 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	133222	673	17.947	19.02
QPSK	133297	680.5	17.905	19.02
QPSK	133372	688	17.987	19.06
16QAM	133222	673	17.960	19.01
16QAM	133297	680.5	17.917	19.02
16QAM	133372	688	17.992	19.04
64QAM	133222	673	17.949	19.02
64QAM	133297	680.5	17.909	19.00
64QAM	133372	688	17.988	19.07

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 133372 (688MHz)	64QAM CH 133372 (688MHz)

4.5 Channel Edge / Out-of-Band Emissions Measurement

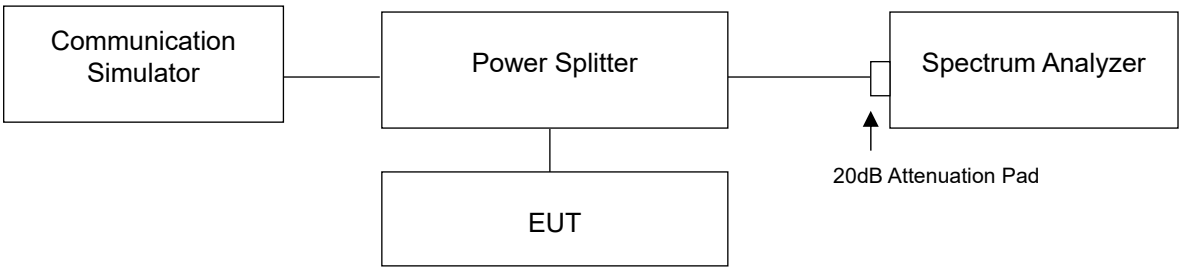
4.5.1 Limits of Band Edge / Out-of-Band Emissions Measurement

For LTE Band 4, LTE Band 66:
According to FCC 27.53(h), for operations in the 1695-1710MHz, 1710-1755MHz, 1755-1780 MHz, 1915-1920MHz, 1995-2000 MHz, 2000-2020MHz, 2110-2155MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P) dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

For LTE Band 7:
According to FCC 27.53(m)(4) regulations, any transmit power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

For LTE Band 12, LTE Band 17, LTE Band 71:
According to FCC 27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

4.5.2 Test Setup

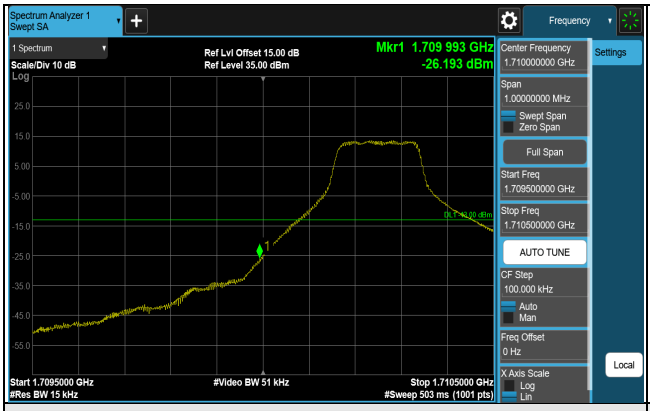


4.5.3 Test Procedures

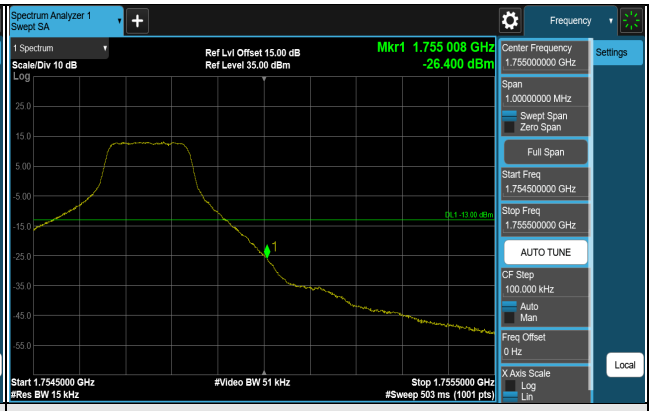
a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 2 channels: low and high operational frequency range.
b. Measurement refer to ANSI C63.26 section 5.7.2 & 5.7.3 and FCC Part 27 section 27.53.
c. Measure 5 MHz and 10 MHz channel bandwidth modes for LTE Band 7, extend the 1% range from 1M to 2M above and below the channel edge, then lower the limit further by 10 log (1000/100) = 10dB (i.e. -10 + -10 = -20dB) to compensate for the integration from 100k to 1M, measure referring to ANSI C63.26 Section 5.7.2 (a)(1).
d. Record the max trace plot into the test report.

4.5.4 Test Results

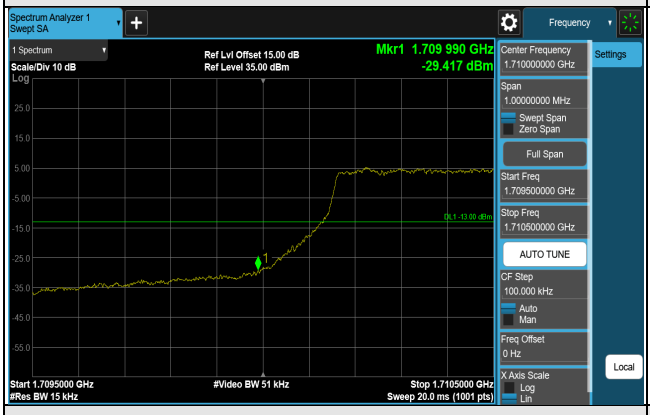
LTE Band 4 (Channel Bandwidth 1.4MHz)



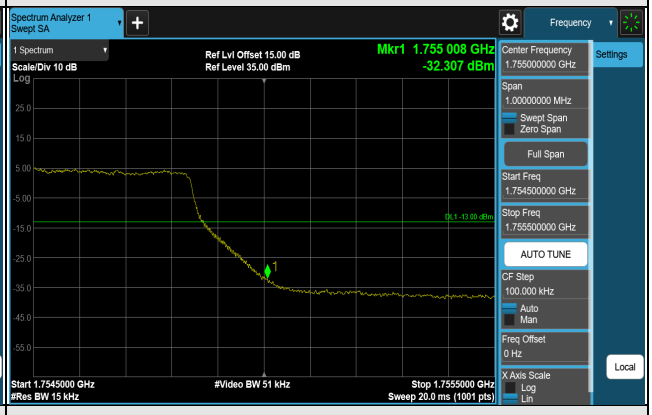
1RB (1710.7MHz)



1RB (1754.3MHz)

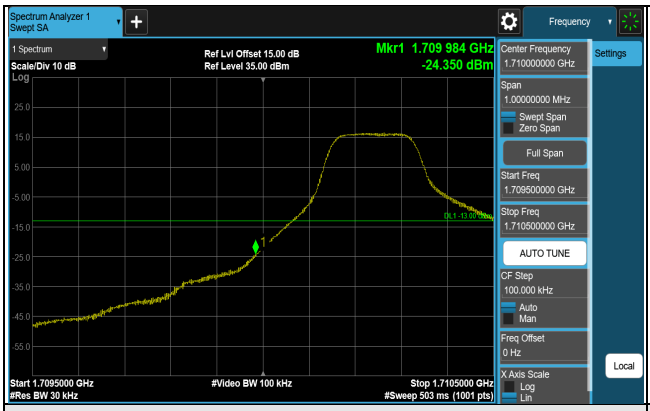


Full (1710.7MHz)

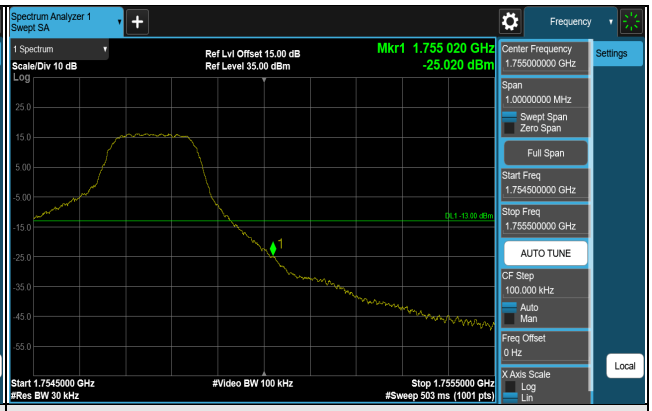


Full (1754.3MHz)

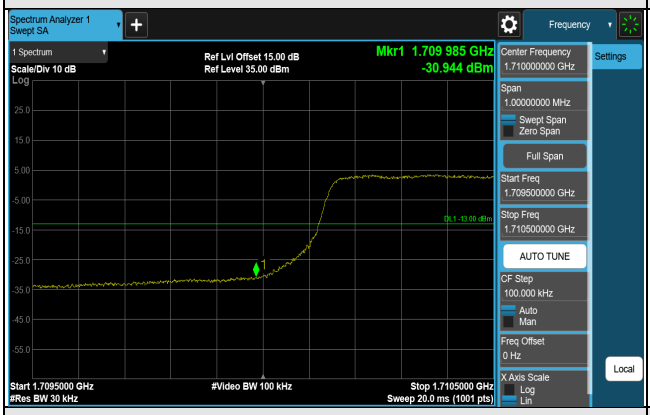
LTE Band 4 (Channel Bandwidth 3MHz)



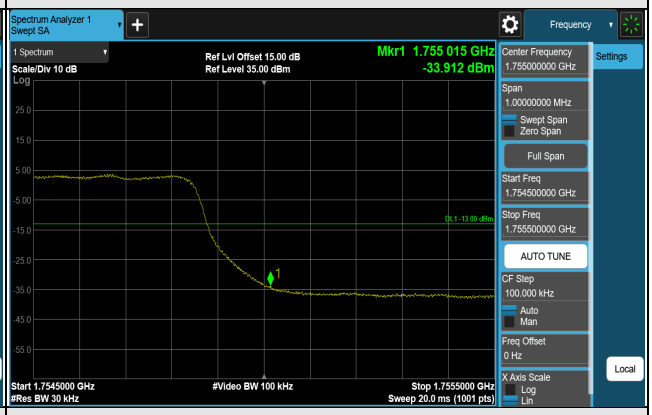
1RB (1711.5MHz)



1RB (1753.5MHz)

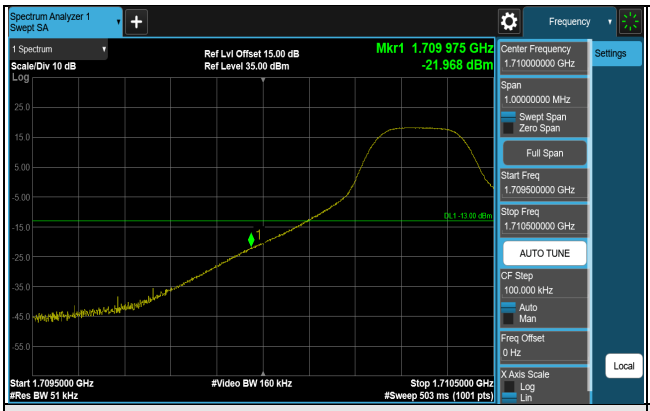


Full (1711.5MHz)

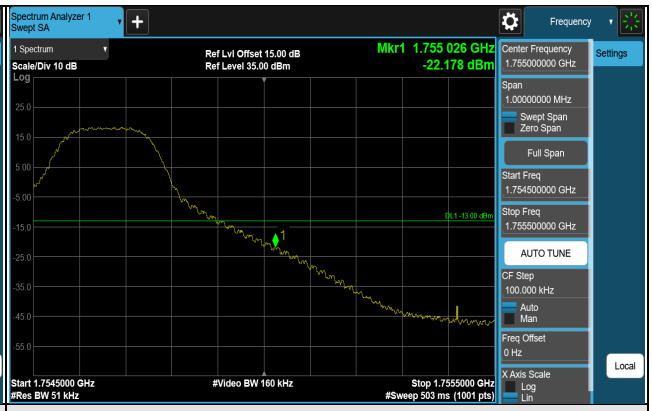


Full (1753.5MHz)

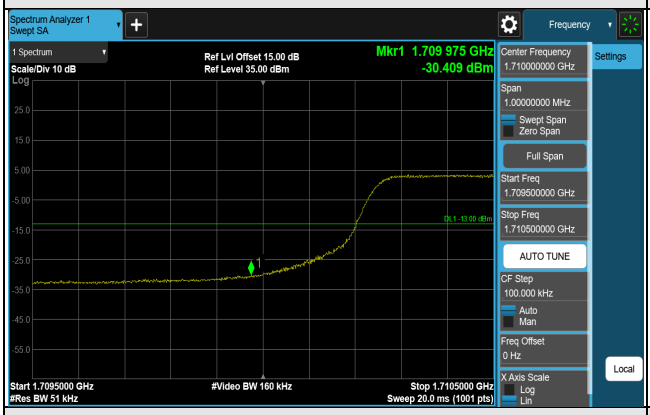
LTE Band 4 (Channel Bandwidth 5MHz)



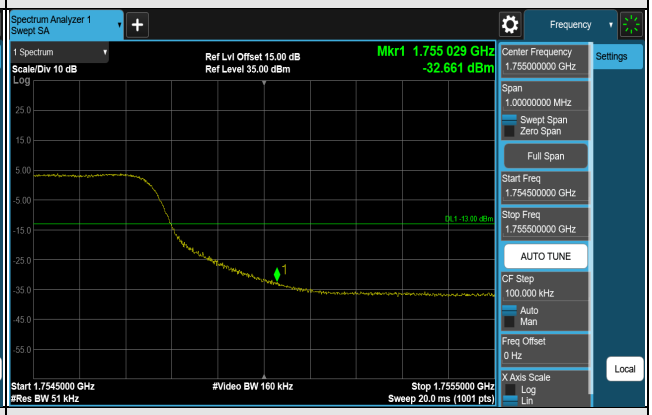
1RB (1712.5MHz)



1RB (1752.5MHz)

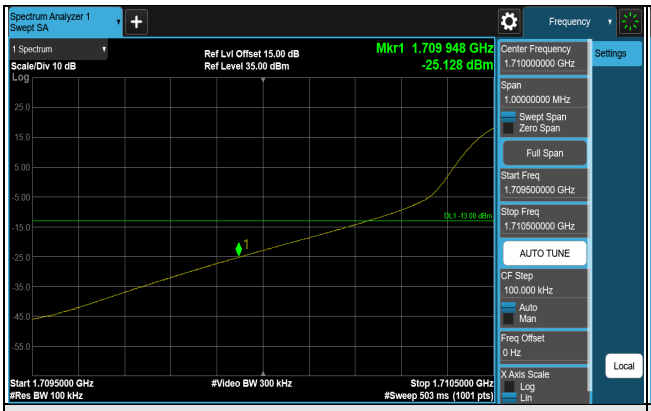


Full (1712.5MHz)

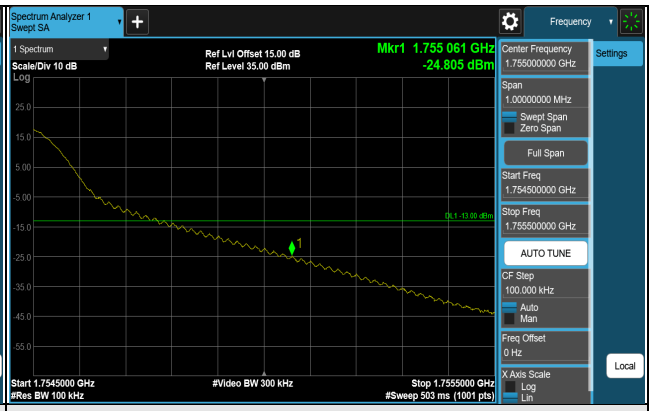


Full (1752.5MHz)

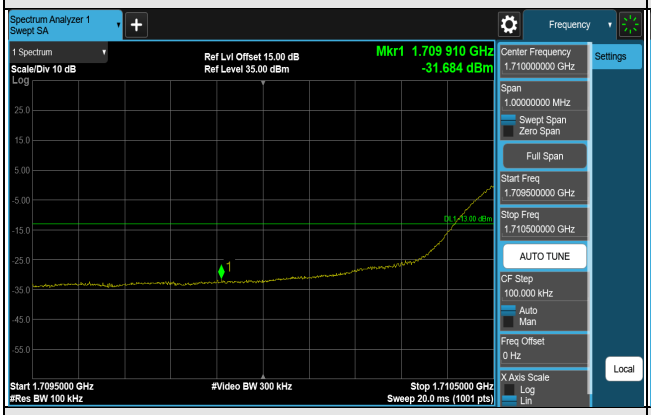
LTE Band 4 (Channel Bandwidth 10MHz)



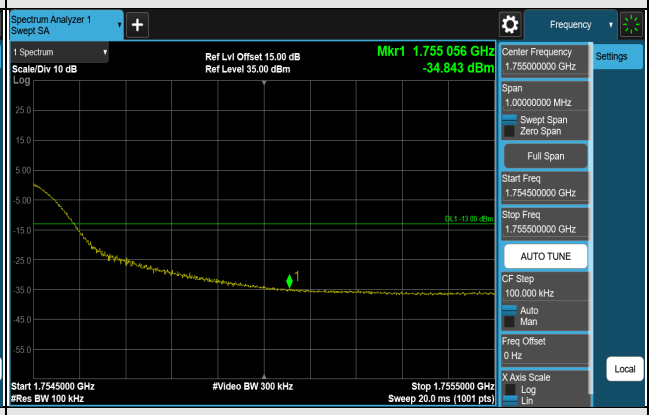
1RB (1715MHz)



1RB (1750MHz)

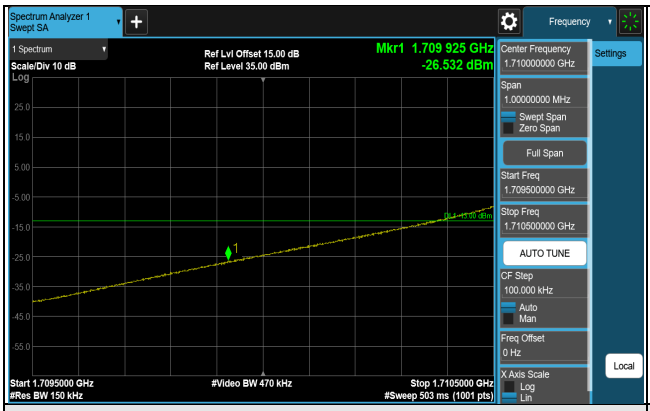


Full (1715MHz)

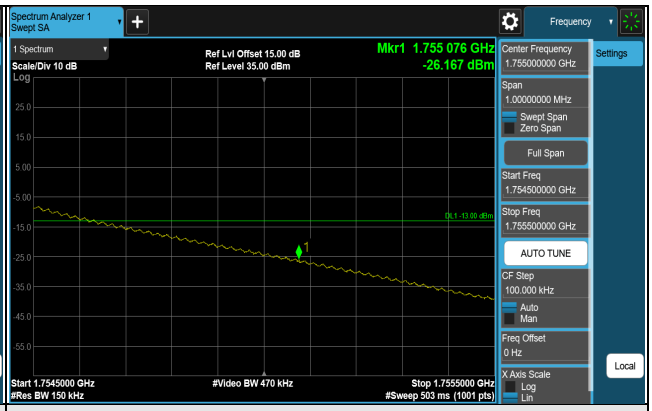


Full (1750MHz)

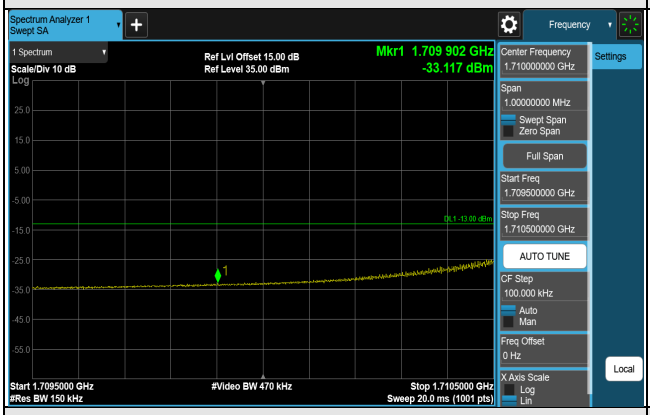
LTE Band 4 (Channel Bandwidth 15MHz)



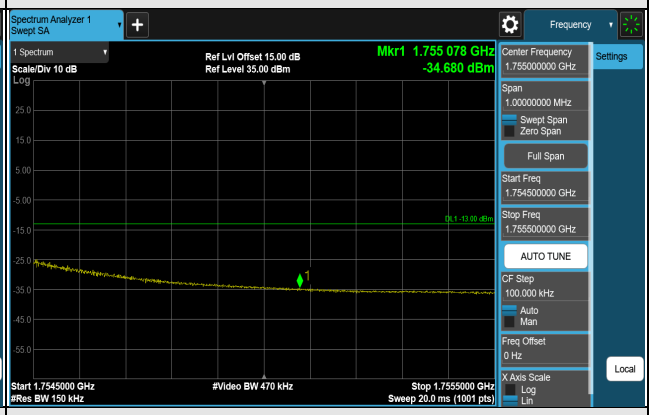
1RB (1717.5MHz)



1RB (1747.5MHz)

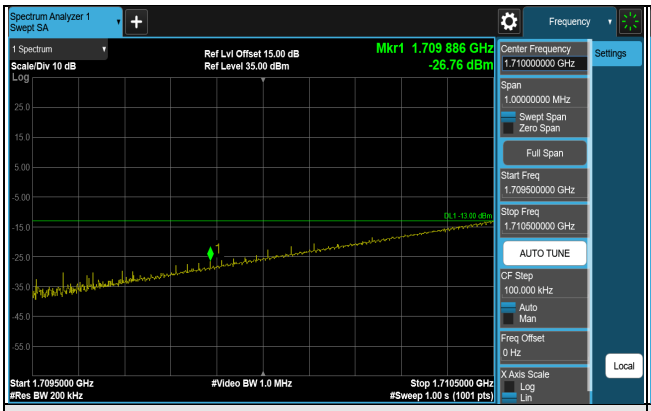


Full (1717.5MHz)

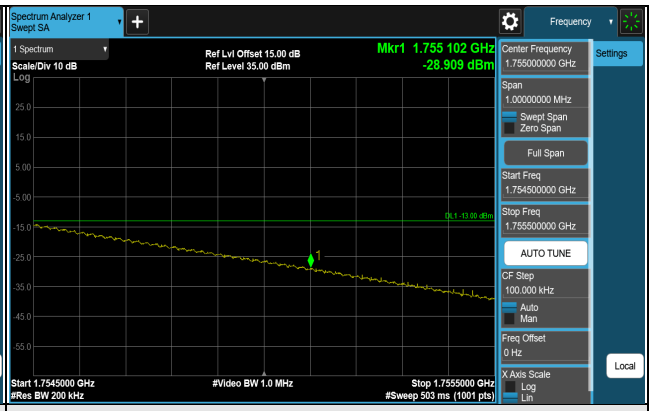


Full (1747.5MHz)

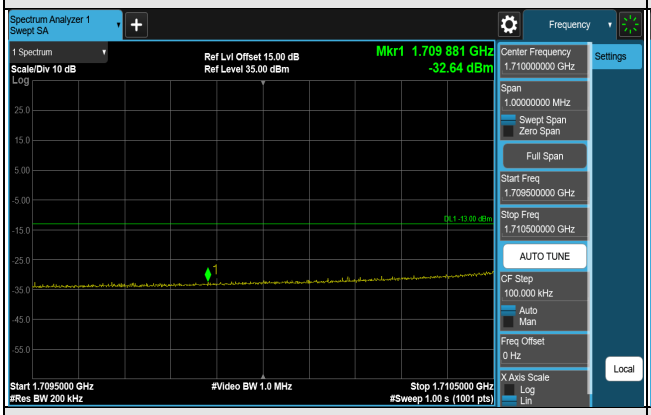
LTE Band 4 (Channel Bandwidth 20MHz)



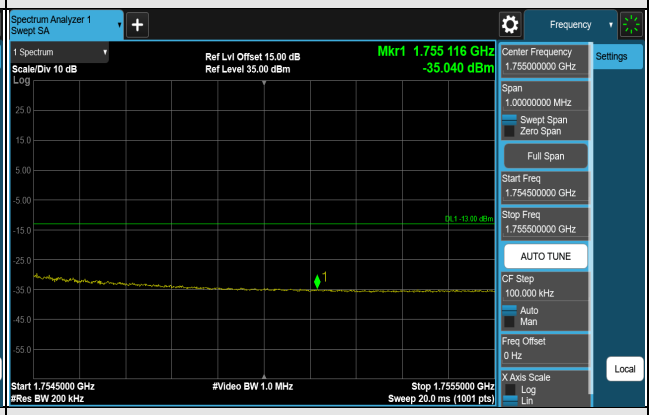
1RB (1720MHz)



1RB (1745MHz)

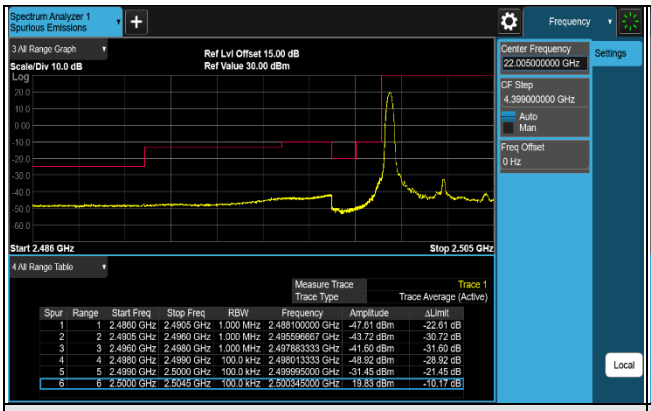


Full (1720MHz)

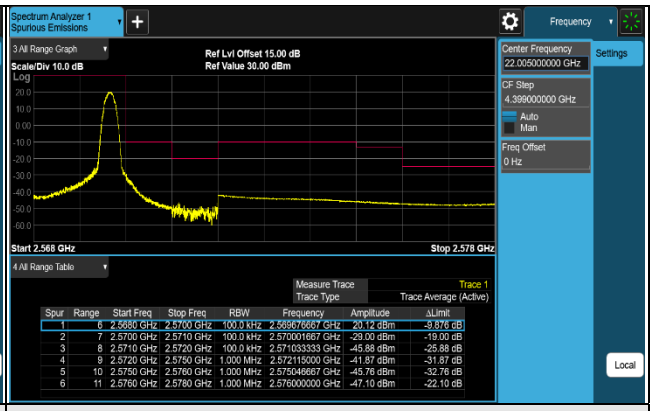


Full (1745MHz)

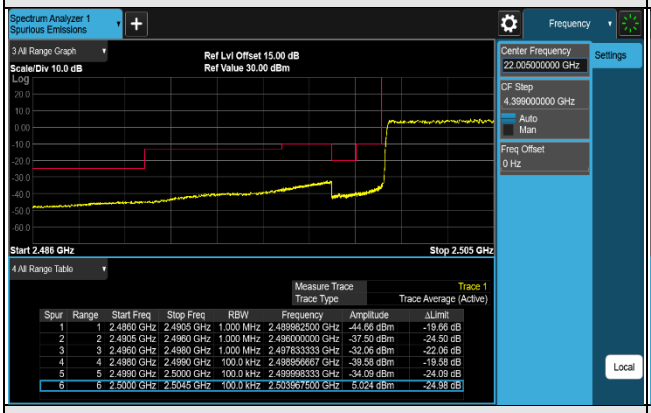
LTE Band 7 (Channel Bandwidth 5MHz)



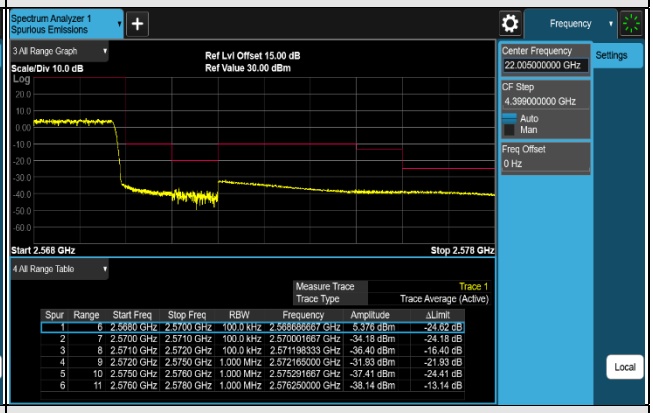
1RB (2502.5MHz)



1RB (2567.5MHz)



Full (2502.5MHz)



Full (2567.5MHz)