

FCC Test Report

(Part 27 – LTE Band 4 / 7 / 12 / 17 / 66 / 71)

Report No.: RFBHKI-WTW-P22030766-2

FCC ID: NKRUMC-STD31LFN

Test Model: UMC-STD31LFN

Received Date: Mar. 18, 2022

Test Date: Apr. 06 ~ Apr. 15, 2022

Issued Date: Jul. 04, 2022

Applicant: Wistron NeWeb Corporation

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number(1):** 788550 / TW0003

Test Location(2): No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

**FCC Registration /
Designation Number(2):** 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFBHKI-WTW-P22030766-2	Original release	Jul. 04, 2022

1 Certificate of Conformity

Product: Cellular module

Brand: WNC

Test Model: UMC-STD31LFN

Sample Status: Engineering sample

Applicant: Wistron NeWeb Corporation

Test Date: Apr. 06 ~ Apr. 18, 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 : Pettie Chen, **Date:** Jul. 04, 2022
Pettie Chen / Senior Specialist

Approved by : Jeremy Lin, **Date:** Jul. 04, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2							
FCC Clause					Test Item	Result	Remarks
WCDMA B4 / LTE B4	LTE B12 / LTE B71	LTE B7	LTE B17	LTE B66			
2.1046 27.50 (d)(4)	2.1046 27.50 (c)	2.1046 27.50 (h)(2)	2.1046 27.50(c)	2.1046 27.50 (d)(4)	Equivalent Isotropically Radiated Power / Equivalent Radiated Power	Pass	Meet the requirement of limit.
2.1047	2.1047	2.1047	2.1047	2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
27.50 (d)(5)	----	----	----	27.50 (d)(5)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.
2.1049	2.1049	2.1049	2.1049	2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	2.1051 27.53 (g)	2.1051 27.53 (m)(4)(6)	2.1051 27.53 (g)	2.1051 27.53 (h)	Band Edge / Out of Band Emissions Measurements	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	2.1051 27.53 (g)	2.1051 27.53 (m)(4)(6)	2.1051 27.53 (g)	2.1051 27.53 (h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (h)	2.1053 27.53 (g)	2.1053 27.53 (m)(4)(6)	2.1053 27.53 (g)	2.1053 27.53 (h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -10.18dB at 62.01MHz.

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) ($\pm$)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038B	MY60180018	Feb. 18, 2022	Feb. 17, 2023
Spectrum Analyzer KEYSIGHT	N9020B	MY60110513	Dec. 24, 2021	Dec. 23, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-1214	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna RF SPIN	DRH18-E	210101A18E	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1049	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC330N	980798	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI	EMC118A45SE	980809	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI	EMC184045SE	980786	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9 000+3000+1000)	201244+ 201232+ 210103	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-N M-(9000+3000+500)	201251+ 201249+ 201248	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM-(5000+3000+2000)	201261+201258+ 201255	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_V7. 6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-515BSN	NA	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208676	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Feb. 16, 2022	Feb. 15, 2023
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 06, 2021	Jul. 05, 2022
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
DC power supply KEYSIGHT	U8002A	MY56330015	NA	NA
Digital Multimeter Fluke	87-III	70360755	Jul. 08, 2021	Jul. 07, 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 9.

3 General Information

3.1 General Description of EUT

Product	Cellular module	
Brand	WNC	
Test Model	UMC-STD31LFN	
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 ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10MHz)	709.0MHz ~ 711.0 MHz
	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)	289.068mW (24.61dBm)	233.884mW (23.69dBm)	184.077mW (22.65dBm)
	LTE Band 4 (Channel Bandwidth 3MHz)	281.838mW (24.50dBm)	227.510mW (23.57dBm)	178.649mW (22.52dBm)
	LTE Band 4 (Channel Bandwidth 5MHz)	290.402mW (24.63dBm)	232.809mW (23.67dBm)	184.077mW (22.65dBm)
	LTE Band 4 (Channel Bandwidth 10MHz)	282.488mW (24.51dBm)	229.615mW (23.61dBm)	181.552mW (22.59dBm)
	LTE Band 4 (Channel Bandwidth 15MHz)	283.792mW (24.53dBm)	227.510mW (23.57dBm)	178.649mW (22.52dBm)
	LTE Band 4 (Channel Bandwidth 20MHz)	281.190mW (24.49dBm)	226.986mW (23.56dBm)	180.302mW (22.56dBm)
	LTE Band 7 (Channel Bandwidth 5MHz)	300.608mW (24.78dBm)	242.103mW (23.84dBm)	191.867mW (22.83dBm)
	LTE Band 7 (Channel Bandwidth 10MHz)	303.389mW (24.82dBm)	243.781mW (23.87dBm)	190.985mW (22.81dBm)
	LTE Band 7 (Channel Bandwidth 15MHz)	304.789mW (24.84dBm)	246.037mW (23.91dBm)	194.089mW (22.88dBm)
	LTE Band 7 (Channel Bandwidth 20MHz)	304.089mW (24.83dBm)	244.906mW (23.89dBm)	191.867mW (22.83dBm)
	LTE Band 66 (Channel Bandwidth 1.4MHz)	278.612mW (24.45dBm)	226.464mW (23.55dBm)	178.649mW (22.52dBm)
	LTE Band 66 (Channel Bandwidth 3MHz)	278.612mW (24.45dBm)	222.331mW (23.47dBm)	175.388mW (22.44dBm)
	LTE Band 66 (Channel Bandwidth 5MHz)	281.838mW (24.50dBm)	225.944mW (23.54dBm)	178.649mW (22.52dBm)
	LTE Band 66 (Channel Bandwidth 10MHz)	279.254mW (24.46dBm)	223.872mW (23.50dBm)	174.582mW (22.42dBm)
	LTE Band 66 (Channel Bandwidth 15MHz)	279.254mW (24.46dBm)	226.986mW (23.56dBm)	176.604mW (22.47dBm)
	LTE Band 66 (Channel Bandwidth 20MHz)	277.332mW (24.43dBm)	224.905mW (23.52dBm)	178.649mW (22.52dBm)
Max. ERP Power		QPSK	16QAM	64QAM
	LTE Band 12 (Channel Bandwidth 1.4MHz)	185.353mW (22.68dBm)	149.279mW (21.74dBm)	117.761mW (20.71dBm)
	LTE Band 12 (Channel Bandwidth 3MHz)	183.654mW (22.64dBm)	149.279mW (21.74dBm)	116.145mW (20.65dBm)
	LTE Band 12 (Channel Bandwidth 5MHz)	180.302mW (22.56dBm)	145.211mW (21.62dBm)	113.763mW (20.56dBm)
	LTE Band 12 (Channel Bandwidth 10MHz)	184.077mW (22.65dBm)	149.279mW (21.74dBm)	115.878mW (20.64dBm)
	LTE Band 17 (Channel Bandwidth: 5MHz)	189.671mW (22.78dBm)	154.170mW (21.88dBm)	122.180mW (20.87dBm)
	LTE Band 17 (Channel Bandwidth: 10MHz)	188.799mW (22.76dBm)	152.405mW (21.83dBm)	119.674mW (20.78dBm)
	LTE Band 71 (Channel Bandwidth 5MHz)	202.768mW (23.07dBm)	162.930mW (22.12dBm)	128.529mW (21.09dBm)
	LTE Band 71 (Channel Bandwidth 10MHz)	207.014mW (23.16dBm)	164.816mW (22.17dBm)	130.918mW (21.17dBm)
	LTE Band 71 (Channel Bandwidth 15MHz)	208.449mW (23.19dBm)	169.044mW (22.28dBm)	131.220mW (21.18dBm)
	LTE Band 71 (Channel Bandwidth 20MHz)	201.372mW (23.04dBm)	162.181mW (22.10dBm)	126.183mW (21.01dBm)

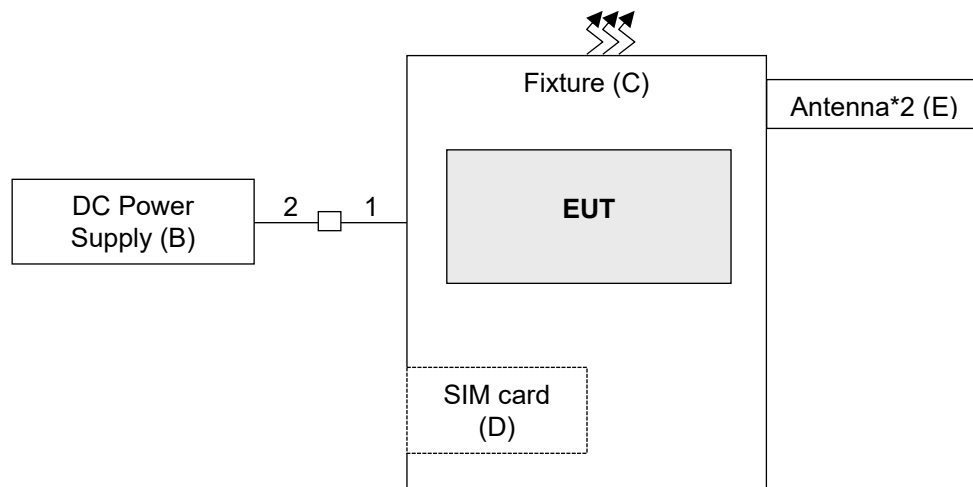
Emission Designator		QPSK	16QAM	64QAM
	LTE Band 4 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W	1M09D7W
	LTE Band 4 (Channel Bandwidth 3MHz)	2M69G7D	2M69D7W	2M69D7W
	LTE Band 4 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W	4M50D7W
	LTE Band 4 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W	8M98D7W
	LTE Band 4 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 4 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
	LTE Band 7 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W	4M50D7W
	LTE Band 7 (Channel Bandwidth 10MHz)	8M98G7D	8M99D7W	8M99D7W
	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	9M01D7W	9M01D7W
	LTE Band 17 (Channel Bandwidth: 5MHz)	4M50G7D	4M50D7W	4M50D7W
	LTE Band 17 (Channel Bandwidth: 10MHz)	9M00G7D	9M00D7W	9M01D7W
	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	4M49D7W	4M50D7W
	LTE Band 66 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W	8M98D7W
	LTE Band 66 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 66 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
	LTE Band 71 (Channel Bandwidth 5MHz)	4M49G7D	4M49D7W	4M50D7W
	LTE Band 71 (Channel Bandwidth 10MHz)	8M99G7D	8M99D7W	9M00D7W
	LTE Band 71 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 71 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
Antenna Type		Refer to Note as below		
Antenna Connector		Refer to Note as below		
Accessory Device		NA		
Cable Supplied		NA		

Note: The antenna information is listed as below.

Type	Connector	Gain (dBi)													
		GSM 850	GSM 1900	WCDMA B2	WCDMA B5	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	1.82	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	MT8820C	6201240432	NA	For LTE
B.	DC Power Supply	TOP WARD	6603A	725906	NA	-
C.	Fixture	NA	NA	NA	NA	Supplied by applicant
D.	SIM Card	R&S	CRT-Z3	NA	NA	Provided by Lab
E.	Antenna*2	NA	NA	NA	NA	Supplied by applicant

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	0.1	N	0	-
2.	DC Power Cable	1	1.0	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	Z-plane
LTE Band 7	Z-plane
LTE Band 12	Z-plane
LTE Band 17	Z-plane
LTE Band 66	Z-plane
LTE Band 71	Z-plane

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	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
-	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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	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
-	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 Below 1GHz	20050 to 20300	20175 (1732.5MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	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:

- For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
- 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	Mode
-	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	Mode
-	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 Below 1GHz	20850 to 21350	21350 (2560.0MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	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	Mode
-	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	Mode
-	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 Below 1GHz	23017 to 23173	23173 (715.3MHz)	1.4MHz	QPSK	1
-	Radiated Emission Above 1GHz	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 Below 1GHz	23780 to 23800	23780 (709.0MHz)	10MHz	QPSK	1
-	Radiated Emission Above 1GHz	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:

- For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
- 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.
- 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	Mode
-	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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Emission Bandwidth	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	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
-	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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	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 Below 1GHz	132072 to 132572	132322 (1745.0MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	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	Mode
-	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	Mode
-	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 Below 1GHz	133222 to 133372	133372 (688.0MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	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	21deg. C, 67%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:

Mobile / Portable station are limited to 1 watts e.i.r.p.

For LTE Band 7:

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

For LTE Band 12, 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:

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

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

where

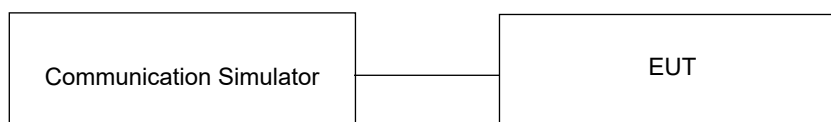
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

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	22.83	22.83	22.79
		1	50	22.92	22.91	22.88
		1	99	22.90	22.87	22.80
		50	0	21.87	21.90	21.82
		50	25	21.92	21.88	21.89
		50	50	21.81	21.91	21.94
		100	0	21.76	21.85	21.83
20M	16QAM	1	0	21.93	21.90	21.82
		1	50	21.99	21.94	21.93
		1	99	21.93	21.97	21.81
		50	0	20.93	20.91	20.92
		50	25	20.96	20.97	20.93
		50	50	20.82	20.97	21.01
		100	0	20.83	20.95	20.92
20M	64QAM	1	0	20.83	20.90	20.82
		1	50	20.99	20.93	20.92
		1	99	20.92	20.89	20.73
		50	0	19.89	19.84	19.87
		50	25	19.87	19.93	19.90
		50	50	19.76	19.95	19.92
		100	0	19.76	19.95	19.88

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	22.80	22.88	22.83
		1	37	22.82	22.89	22.96
		1	74	22.85	22.86	22.89
		36	0	21.86	21.95	21.92
		36	19	21.86	21.89	21.81
		36	39	21.81	21.87	21.97
		75	0	21.81	21.85	21.77
15M	16QAM	1	0	21.80	21.96	21.90
		1	37	21.91	21.99	22.00
		1	74	21.87	21.93	21.95
		36	0	20.96	20.99	20.92
		36	19	20.88	20.93	20.90
		36	39	20.91	20.97	20.97
		75	0	20.85	20.87	20.82
15M	64QAM	1	0	20.78	20.90	20.80
		1	37	20.86	20.89	20.95
		1	74	20.86	20.84	20.88
		36	0	19.90	19.98	19.82
		36	19	19.88	19.86	19.82
		36	39	19.90	19.97	19.92
		75	0	19.77	19.77	19.77

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	22.93	22.94	22.88
		1	24	22.82	22.90	22.82
		1	49	22.90	22.89	22.88
		25	0	21.88	21.93	21.96
		25	12	21.91	21.84	21.85
		25	25	22.09	22.00	21.91
		50	0	21.91	21.92	22.02
10M	16QAM	1	0	21.93	22.04	21.95
		1	24	21.83	21.98	21.83
		1	49	21.93	21.89	21.88
		25	0	20.97	20.94	20.99
		25	12	20.97	20.91	20.85
		25	25	21.11	21.00	20.96
		50	0	20.97	21.02	21.11
10M	64QAM	1	0	20.85	21.02	20.85
		1	24	20.81	20.96	20.82
		1	49	20.86	20.89	20.82
		25	0	19.87	19.88	19.96
		25	12	19.87	19.88	19.82
		25	25	20.04	19.90	19.88
		50	0	19.88	19.97	20.01

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	23.06	22.99	23.06
		1	12	22.90	22.93	22.97
		1	24	22.80	22.87	22.85
		12	0	21.85	21.85	21.86
		12	6	21.88	21.88	21.84
		12	13	21.85	21.92	21.95
		25	0	22.03	21.93	21.94
5M	16QAM	1	0	22.06	22.09	22.10
		1	12	21.98	22.00	21.97
		1	24	21.82	21.94	21.95
		12	0	20.92	20.85	20.90
		12	6	20.94	20.88	20.89
		12	13	20.89	20.95	20.95
		25	0	21.03	21.02	20.99
5M	64QAM	1	0	21.03	21.02	21.08
		1	12	20.93	20.99	20.88
		1	24	20.78	20.86	20.92
		12	0	19.82	19.80	19.84
		12	6	19.92	19.78	19.82
		12	13	19.89	19.90	19.94
		25	0	19.95	20.01	19.99

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	22.83	22.88	22.93
		1	7	22.84	22.93	22.86
		1	14	22.92	22.86	22.89
		8	0	21.88	21.83	21.93
		8	3	22.00	22.01	21.91
		8	7	21.77	21.85	21.94
		15	0	21.92	21.92	21.97
3M	16QAM	1	0	21.84	21.95	21.98
		1	7	21.86	22.00	21.87
		1	14	21.92	21.96	21.94
		8	0	20.91	20.87	21.01
		8	3	21.00	21.01	20.94
		8	7	20.85	20.94	21.00
		15	0	21.01	20.95	21.07
3M	64QAM	1	0	20.76	20.95	20.89
		1	7	20.81	20.91	20.79
		1	14	20.87	20.87	20.87
		8	0	19.81	19.77	19.97
		8	3	19.98	19.95	19.92
		8	7	19.79	19.92	19.91
		15	0	19.93	19.88	20.01

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	22.85	22.85	22.79
		1	2	22.97	22.91	22.97
		1	5	22.87	22.88	22.97
		3	0	22.81	22.89	22.83
		3	1	22.99	22.92	22.94
		3	3	22.88	22.94	23.04
		6	0	21.79	21.87	21.81
1.4M	16QAM	1	0	21.94	21.92	21.88
		1	2	22.01	21.91	22.01
		1	5	21.95	21.95	21.97
		3	0	21.81	21.92	21.84
		3	1	22.02	22.00	21.99
		3	3	21.91	22.03	22.12
		6	0	20.88	20.94	20.85
1.4M	64QAM	1	0	20.94	20.89	20.82
		1	2	20.94	20.87	20.91
		1	5	20.87	20.91	20.87
		3	0	20.80	20.90	20.83
		3	1	20.95	20.97	20.91
		3	3	20.84	21.02	21.08
		6	0	19.88	19.94	19.85

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	22.68	22.63	22.56
		1	50	22.54	22.57	22.64
		1	99	22.58	22.53	22.61
		50	0	21.54	21.51	21.55
		50	25	21.56	21.57	21.55
		50	50	21.49	21.49	21.40
		100	0	21.64	21.60	21.50
20M	16QAM	1	0	21.74	21.70	21.59
		1	50	21.59	21.62	21.68
		1	99	21.59	21.62	21.67
		50	0	20.59	20.55	20.61
		50	25	20.62	20.64	20.65
		50	50	20.52	20.52	20.50
		100	0	20.64	20.60	20.53
20M	64QAM	1	0	20.64	20.68	20.51
		1	50	20.53	20.52	20.59
		1	99	20.58	20.59	20.65
		50	0	19.51	19.55	19.60
		50	25	19.57	19.58	19.58
		50	50	19.44	19.50	19.47
		100	0	19.59	19.58	19.45

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	22.69	22.65	22.56
		1	37	22.48	22.58	22.67
		1	74	22.46	22.51	22.59
		36	0	21.65	21.65	21.55
		36	19	21.53	21.59	21.63
		36	39	21.46	21.53	21.50
		75	0	21.57	21.54	21.47
15M	16QAM	1	0	21.71	21.68	21.60
		1	37	21.49	21.64	21.76
		1	74	21.55	21.51	21.65
		36	0	20.75	20.70	20.61
		36	19	20.60	20.62	20.69
		36	39	20.48	20.56	20.53
		75	0	20.65	20.55	20.56
15M	64QAM	1	0	20.62	20.66	20.55
		1	37	20.46	20.63	20.73
		1	74	20.48	20.48	20.59
		36	0	19.74	19.66	19.61
		36	19	19.58	19.53	19.64
		36	39	19.43	19.46	19.46
		75	0	19.55	19.46	19.52

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	22.62	22.65	22.67
		1	24	22.54	22.56	22.50
		1	49	22.46	22.55	22.51
		25	0	21.69	21.62	21.64
		25	12	21.54	21.59	21.53
		25	25	21.54	21.60	21.64
		50	0	21.50	21.58	21.63
10M	16QAM	1	0	21.62	21.67	21.72
		1	24	21.62	21.66	21.59
		1	49	21.49	21.65	21.57
		25	0	20.76	20.72	20.72
		25	12	20.55	20.60	20.60
		25	25	20.59	20.66	20.71
		50	0	20.59	20.63	20.69
10M	64QAM	1	0	20.55	20.60	20.66
		1	24	20.54	20.58	20.52
		1	49	20.48	20.55	20.54
		25	0	19.73	19.72	19.72
		25	12	19.51	19.59	19.57
		25	25	19.49	19.59	19.64
		50	0	19.58	19.56	19.61

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	22.52	22.61	22.63
		1	12	22.56	22.59	22.61
		1	24	22.47	22.57	22.56
		12	0	21.58	21.64	21.61
		12	6	21.57	21.66	21.74
		12	13	21.69	21.62	21.65
		25	0	21.64	21.56	21.50
5M	16QAM	1	0	21.58	21.64	21.68
		1	12	21.64	21.69	21.69
		1	24	21.52	21.62	21.60
		12	0	20.58	20.72	20.67
		12	6	20.67	20.67	20.83
		12	13	20.76	20.69	20.71
		25	0	20.70	20.57	20.51
5M	64QAM	1	0	20.49	20.62	20.67
		1	12	20.55	20.68	20.61
		1	24	20.48	20.56	20.55
		12	0	19.56	19.63	19.66
		12	6	19.66	19.62	19.76
		12	13	19.72	19.60	19.63
		25	0	19.60	19.54	19.47

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	22.70	22.69	22.67
		1	24	22.74	22.64	22.69
		1	49	22.68	22.70	22.78
		25	0	21.62	21.69	21.76
		25	12	21.58	21.64	21.64
		25	25	21.64	21.58	21.64
		50	0	21.51	21.55	21.47
10M	16QAM	1	0	21.76	21.75	21.69
		1	24	21.82	21.70	21.77
		1	49	21.77	21.74	21.87
		25	0	20.62	20.76	20.76
		25	12	20.66	20.73	20.65
		25	25	20.67	20.64	20.72
		50	0	20.61	20.59	20.53
10M	64QAM	1	0	20.71	20.70	20.62
		1	24	20.73	20.61	20.73
		1	49	20.70	20.64	20.77
		25	0	19.57	19.76	19.72
		25	12	19.62	19.69	19.62
		25	25	19.58	19.59	19.68
		50	0	19.59	19.58	19.53

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	22.61	22.69
		1	12	22.60	22.63	22.66
		1	24	22.65	22.65	22.61
		12	0	21.77	21.67	21.57
		12	6	21.69	21.59	21.67
		12	13	21.68	21.63	21.63
		25	0	21.69	21.70	21.75
5M	16QAM	1	0	21.53	21.69	21.69
		1	12	21.63	21.72	21.71
		1	24	21.75	21.73	21.68
		12	0	20.78	20.75	20.59
		12	6	20.69	20.63	20.70
		12	13	20.76	20.71	20.73
		25	0	20.72	20.70	20.75
5M	64QAM	1	0	20.47	20.63	20.69
		1	12	20.53	20.62	20.64
		1	24	20.65	20.63	20.61
		12	0	19.78	19.75	19.59
		12	6	19.60	19.58	19.62
		12	13	19.73	19.71	19.67
		25	0	19.68	19.69	19.67

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	22.56	22.59	22.53
		1	7	22.61	22.64	22.54
		1	14	22.77	22.75	22.72
		8	0	21.78	21.71	21.70
		8	3	21.73	21.69	21.67
		8	7	21.66	21.73	21.73
		15	0	21.77	21.77	21.80
3M	16QAM	1	0	21.61	21.65	21.54
		1	7	21.70	21.66	21.62
		1	14	21.87	21.75	21.77
		8	0	20.83	20.81	20.80
		8	3	20.74	20.79	20.70
		8	7	20.67	20.80	20.75
		15	0	20.82	20.85	20.87
3M	64QAM	1	0	20.57	20.64	20.52
		1	7	20.68	20.65	20.59
		1	14	20.78	20.68	20.77
		8	0	19.79	19.75	19.75
		8	3	19.68	19.79	19.64
		8	7	19.57	19.78	19.75
		15	0	19.76	19.82	19.83

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	22.77	22.75	22.75
		1	2	22.74	22.76	22.81
		1	5	22.70	22.61	22.54
		3	0	22.55	22.64	22.63
		3	1	22.54	22.60	22.60
		3	3	22.79	22.77	22.78
		6	0	21.79	21.70	21.71
1.4M	16QAM	1	0	21.82	21.81	21.77
		1	2	21.76	21.83	21.81
		1	5	21.75	21.62	21.54
		3	0	21.55	21.66	21.69
		3	1	21.62	21.67	21.63
		3	3	21.86	21.87	21.81
		6	0	20.82	20.78	20.72
1.4M	64QAM	1	0	20.80	20.71	20.71
		1	2	20.74	20.79	20.73
		1	5	20.67	20.62	20.51
		3	0	20.51	20.63	20.59
		3	1	20.52	20.66	20.57
		3	3	20.80	20.84	20.75
		6	0	19.72	19.69	19.67

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	22.76	22.75	22.75
		1	24	22.89	22.88	22.80
		1	49	22.88	22.87	22.77
		25	0	21.81	21.83	21.91
		25	12	21.81	21.89	21.92
		25	25	22.01	21.93	22.03
		50	0	21.82	21.90	21.80
10M	16QAM	1	0	21.79	21.85	21.76
		1	24	21.96	21.92	21.82
		1	49	21.94	21.88	21.84
		25	0	20.91	20.91	20.98
		25	12	20.83	20.89	20.98
		25	25	21.01	20.98	21.10
		50	0	20.84	21.00	20.80
10M	64QAM	1	0	20.78	20.75	20.69
		1	24	20.91	20.87	20.72
		1	49	20.86	20.84	20.75
		25	0	19.91	19.88	19.95
		25	12	19.79	19.86	19.90
		25	25	19.98	19.95	20.00
		50	0	19.74	19.99	19.80

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	22.81	22.79	22.82
		1	12	22.91	22.85	22.77
		1	24	22.87	22.86	22.76
		12	0	21.78	21.86	21.76
		12	6	21.98	21.94	22.01
		12	13	21.84	21.80	21.78
		25	0	21.90	21.85	21.77
5M	16QAM	1	0	21.86	21.86	21.83
		1	12	22.01	21.91	21.87
		1	24	21.93	21.90	21.85
		12	0	20.83	20.95	20.85
		12	6	21.07	21.04	21.01
		12	13	20.84	20.81	20.80
		25	0	20.95	20.88	20.79
5M	64QAM	1	0	20.78	20.85	20.80
		1	12	21.00	20.84	20.78
		1	24	20.92	20.81	20.85
		12	0	19.82	19.89	19.84
		12	6	19.99	20.04	19.95
		12	13	19.79	19.77	19.78
		25	0	19.85	19.82	19.70

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	22.86	22.81	22.74
		1	50	22.80	22.78	22.82
		1	99	22.83	22.79	22.69
		50	0	21.54	21.63	21.62
		50	25	21.58	21.65	21.59
		50	50	21.64	21.73	21.73
		100	0	21.75	21.72	21.69
20M	16QAM	1	0	21.95	21.90	21.80
		1	50	21.86	21.86	21.88
		1	99	21.85	21.88	21.70
		50	0	20.64	20.73	20.69
		50	25	20.64	20.72	20.66
		50	50	20.64	20.74	20.76
		100	0	20.84	20.82	20.77
20M	64QAM	1	0	20.95	20.88	20.76
		1	50	20.83	20.80	20.84
		1	99	20.75	20.80	20.63
		50	0	19.64	19.72	19.62
		50	25	19.58	19.65	19.57
		50	50	19.61	19.71	19.72
		100	0	19.77	19.78	19.73

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	22.85	22.79	22.80
		1	37	22.72	22.81	22.87
		1	74	22.86	22.83	22.89
		36	0	21.63	21.65	21.67
		36	19	21.68	21.69	21.70
		36	39	21.71	21.71	21.74
		75	0	21.69	21.67	21.63
15M	16QAM	1	0	21.90	21.79	21.84
		1	37	21.79	21.90	21.88
		1	74	21.93	21.91	21.99
		36	0	20.68	20.72	20.67
		36	19	20.77	20.71	20.80
		36	39	20.75	20.81	20.79
		75	0	20.74	20.71	20.68
15M	64QAM	1	0	20.90	20.75	20.77
		1	37	20.79	20.80	20.83
		1	74	20.90	20.89	20.89
		36	0	19.65	19.72	19.57
		36	19	19.73	19.71	19.73
		36	39	19.66	19.71	19.71
		75	0	19.69	19.61	19.61

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	22.75	22.75	22.68
		1	24	22.89	22.80	22.85
		1	49	22.75	22.82	22.72
		25	0	21.55	21.65	21.72
		25	12	21.66	21.69	21.73
		25	25	21.67	21.70	21.68
		50	0	21.69	21.76	21.66
10M	16QAM	1	0	21.85	21.77	21.78
		1	24	21.93	21.90	21.85
		1	49	21.75	21.91	21.79
		25	0	20.61	20.67	20.81
		25	12	20.72	20.75	20.77
		25	25	20.76	20.72	20.70
		50	0	20.74	20.86	20.72
10M	64QAM	1	0	20.79	20.73	20.68
		1	24	20.85	20.84	20.85
		1	49	20.65	20.84	20.74
		25	0	19.54	19.61	19.72
		25	12	19.63	19.73	19.71
		25	25	19.67	19.65	19.60
		50	0	19.66	19.77	19.68

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	22.72	22.79	22.70
		1	12	22.84	22.83	22.93
		1	24	22.79	22.81	22.72
		12	0	21.66	21.65	21.59
		12	6	21.57	21.63	21.62
		12	13	21.71	21.71	21.77
		25	0	21.69	21.73	21.64
5M	16QAM	1	0	21.73	21.83	21.73
		1	12	21.92	21.90	21.97
		1	24	21.79	21.89	21.74
		12	0	20.70	20.73	20.63
		12	6	20.60	20.71	20.67
		12	13	20.72	20.73	20.85
		25	0	20.75	20.76	20.66
5M	64QAM	1	0	20.73	20.75	20.72
		1	12	20.90	20.88	20.95
		1	24	20.73	20.80	20.69
		12	0	19.62	19.71	19.54
		12	6	19.50	19.69	19.61
		12	13	19.63	19.67	19.75
		25	0	19.65	19.76	19.66

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	22.75	22.79	22.82
		1	7	22.88	22.81	22.82
		1	14	22.77	22.83	22.81
		8	0	21.74	21.65	21.62
		8	3	21.76	21.69	21.76
		8	7	21.71	21.63	21.70
		15	0	21.72	21.70	21.76
3M	16QAM	1	0	21.81	21.83	21.89
		1	7	21.90	21.90	21.85
		1	14	21.82	21.88	21.83
		8	0	20.81	20.67	20.67
		8	3	20.78	20.79	20.77
		8	7	20.73	20.64	20.74
		15	0	20.72	20.79	20.80
3M	64QAM	1	0	20.71	20.78	20.84
		1	7	20.82	20.87	20.79
		1	14	20.74	20.81	20.81
		8	0	19.71	19.64	19.61
		8	3	19.70	19.73	19.77
		8	7	19.66	19.61	19.70
		15	0	19.65	19.71	19.79

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	22.85	22.75	22.73
		1	2	22.81	22.80	22.88
		1	5	22.73	22.73	22.81
		3	0	22.61	22.69	22.59
		3	1	22.78	22.79	22.69
		3	3	22.83	22.75	22.83
		6	0	21.66	21.64	21.60
1.4M	16QAM	1	0	21.94	21.82	21.82
		1	2	21.88	21.81	21.98
		1	5	21.74	21.82	21.87
		3	0	21.68	21.79	21.60
		3	1	21.80	21.82	21.77
		3	3	21.84	21.81	21.85
		6	0	20.72	20.68	20.70
1.4M	64QAM	1	0	20.92	20.80	20.81
		1	2	20.78	20.75	20.95
		1	5	20.66	20.80	20.85
		3	0	20.65	20.74	20.56
		3	1	20.73	20.78	20.74
		3	3	20.74	20.72	20.81
		6	0	19.69	19.61	19.62

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	23.11	23.16	23.09
		1	50	23.10	23.15	23.13
		1	99	23.17	23.10	23.17
		50	0	22.22	22.16	22.16
		50	25	22.26	22.21	22.28
		50	50	22.11	22.19	22.24
		100	0	22.24	22.23	22.21
20M	16QAM	1	0	22.20	22.23	22.17
		1	50	22.14	22.16	22.14
		1	99	22.21	22.15	22.18
		50	0	21.30	21.25	21.18
		50	25	21.29	21.25	21.33
		50	50	21.19	21.27	21.26
		100	0	21.26	21.24	21.28
20M	64QAM	1	0	21.12	21.14	21.08
		1	50	21.13	21.10	21.05
		1	99	21.11	21.11	21.11
		50	0	20.23	20.23	20.15
		50	25	20.26	20.21	20.24
		50	50	20.10	20.26	20.16
		100	0	20.20	20.21	20.19

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	23.24	23.29	23.32
		1	37	23.13	23.16	23.11
		1	74	23.15	23.20	23.15
		36	0	22.22	22.16	22.24
		36	19	22.18	22.21	22.29
		36	39	22.23	22.19	22.15
		75	0	22.22	22.21	22.11
15M	16QAM	1	0	22.34	22.29	22.41
		1	37	22.20	22.18	22.17
		1	74	22.18	22.29	22.16
		36	0	21.30	21.19	21.28
		36	19	21.25	21.31	21.29
		36	39	21.26	21.28	21.16
		75	0	21.24	21.25	21.15
15M	64QAM	1	0	21.28	21.21	21.31
		1	37	21.16	21.17	21.08
		1	74	21.16	21.29	21.12
		36	0	20.29	20.12	20.19
		36	19	20.19	20.27	20.21
		36	39	20.22	20.22	20.10
		75	0	20.24	20.18	20.05

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	23.20	23.19	23.29
		1	24	23.26	23.21	23.11
		1	49	23.19	23.19	23.13
		25	0	22.18	22.16	22.06
		25	12	22.26	22.20	22.18
		25	25	22.20	22.16	22.08
		50	0	22.11	22.13	22.10
10M	16QAM	1	0	22.20	22.21	22.30
		1	24	22.27	22.22	22.14
		1	49	22.20	22.25	22.17
		25	0	21.21	21.26	21.10
		25	12	21.36	21.26	21.21
		25	25	21.28	21.23	21.15
		50	0	21.15	21.20	21.17
10M	64QAM	1	0	21.20	21.11	21.30
		1	24	21.19	21.21	21.12
		1	49	21.17	21.25	21.16
		25	0	20.18	20.26	20.03
		25	12	20.30	20.23	20.14
		25	25	20.21	20.20	20.15
		50	0	20.14	20.17	20.13

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	23.20	23.15	23.05
		1	12	23.15	23.12	23.19
		1	24	23.11	23.03	23.02
		12	0	22.03	22.10	22.02
		12	6	22.25	22.19	22.26
		12	13	22.13	22.06	22.07
		25	0	22.08	22.13	22.03
5M	16QAM	1	0	22.22	22.23	22.11
		1	12	22.25	22.20	22.21
		1	24	22.12	22.07	22.05
		12	0	21.12	21.20	21.05
		12	6	21.26	21.29	21.27
		12	13	21.15	21.08	21.09
		25	0	21.16	21.23	21.05
5M	64QAM	1	0	21.13	21.22	21.04
		1	12	21.16	21.12	21.20
		1	24	21.04	21.03	20.97
		12	0	20.05	20.18	20.02
		12	6	20.26	20.29	20.18
		12	13	20.06	19.98	20.06
		25	0	20.12	20.14	20.03

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	24.40	24.40	24.36
		1	50	24.49	24.48	24.45
		1	99	24.47	24.44	24.37
		50	0	23.44	23.47	23.39
		50	25	23.49	23.45	23.46
		50	50	23.38	23.48	23.51
		100	0	23.33	23.42	23.40
20M	16QAM	1	0	23.50	23.47	23.39
		1	50	23.56	23.51	23.50
		1	99	23.50	23.54	23.38
		50	0	22.50	22.48	22.49
		50	25	22.53	22.54	22.50
		50	50	22.39	22.54	22.58
		100	0	22.40	22.52	22.49
20M	64QAM	1	0	22.40	22.47	22.39
		1	50	22.56	22.50	22.49
		1	99	22.49	22.46	22.30
		50	0	21.46	21.41	21.44
		50	25	21.44	21.50	21.47
		50	50	21.33	21.52	21.49
		100	0	21.33	21.52	21.45

*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	24.37	24.45	24.40
		1	37	24.39	24.46	24.53
		1	74	24.42	24.43	24.46
		36	0	23.43	23.52	23.49
		36	19	23.43	23.46	23.38
		36	39	23.38	23.44	23.54
		75	0	23.38	23.42	23.34
15M	16QAM	1	0	23.37	23.53	23.47
		1	37	23.48	23.56	23.57
		1	74	23.44	23.50	23.52
		36	0	22.53	22.56	22.49
		36	19	22.45	22.50	22.47
		36	39	22.48	22.54	22.54
		75	0	22.42	22.44	22.39
15M	64QAM	1	0	22.35	22.47	22.37
		1	37	22.43	22.46	22.52
		1	74	22.43	22.41	22.45
		36	0	21.47	21.55	21.39
		36	19	21.45	21.43	21.39
		36	39	21.47	21.54	21.49
		75	0	21.34	21.34	21.34

*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	24.50	24.51	24.45
		1	24	24.39	24.47	24.39
		1	49	24.47	24.46	24.45
		25	0	23.45	23.50	23.53
		25	12	23.48	23.41	23.42
		25	25	23.66	23.57	23.48
		50	0	23.48	23.49	23.59
10M	16QAM	1	0	23.50	23.61	23.52
		1	24	23.40	23.55	23.40
		1	49	23.50	23.46	23.45
		25	0	22.54	22.51	22.56
		25	12	22.54	22.48	22.42
		25	25	22.68	22.57	22.53
		50	0	22.54	22.59	22.68
10M	64QAM	1	0	22.42	22.59	22.42
		1	24	22.38	22.53	22.39
		1	49	22.43	22.46	22.39
		25	0	21.44	21.45	21.53
		25	12	21.44	21.45	21.39
		25	25	21.61	21.47	21.45
		50	0	21.45	21.54	21.58

*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	24.63	24.56	24.63
		1	12	24.47	24.50	24.54
		1	24	24.37	24.44	24.42
		12	0	23.42	23.42	23.43
		12	6	23.45	23.45	23.41
		12	13	23.42	23.49	23.52
		25	0	23.60	23.50	23.51
5M	16QAM	1	0	23.63	23.66	23.67
		1	12	23.55	23.57	23.54
		1	24	23.39	23.51	23.52
		12	0	22.49	22.42	22.47
		12	6	22.51	22.45	22.46
		12	13	22.46	22.52	22.52
		25	0	22.60	22.59	22.56
5M	64QAM	1	0	22.60	22.59	22.65
		1	12	22.50	22.56	22.45
		1	24	22.35	22.43	22.49
		12	0	21.39	21.37	21.41
		12	6	21.49	21.35	21.39
		12	13	21.46	21.47	21.51
		25	0	21.52	21.58	21.56

*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	24.40	24.45	24.50
		1	7	24.41	24.50	24.43
		1	14	24.49	24.43	24.46
		8	0	23.45	23.40	23.50
		8	3	23.57	23.58	23.48
		8	7	23.34	23.42	23.51
		15	0	23.49	23.49	23.54
3M	16QAM	1	0	23.41	23.52	23.55
		1	7	23.43	23.57	23.44
		1	14	23.49	23.53	23.51
		8	0	22.48	22.44	22.58
		8	3	22.57	22.58	22.51
		8	7	22.42	22.51	22.57
		15	0	22.58	22.52	22.64
3M	64QAM	1	0	22.33	22.52	22.46
		1	7	22.38	22.48	22.36
		1	14	22.44	22.44	22.44
		8	0	21.38	21.34	21.54
		8	3	21.55	21.52	21.49
		8	7	21.36	21.49	21.48
		15	0	21.50	21.45	21.58

*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	24.42	24.42	24.36
		1	2	24.54	24.48	24.54
		1	5	24.44	24.45	24.54
		3	0	24.38	24.46	24.40
		3	1	24.56	24.49	24.51
		3	3	24.45	24.51	24.61
		6	0	23.36	23.44	23.38
1.4M	16QAM	1	0	23.51	23.49	23.45
		1	2	23.58	23.48	23.58
		1	5	23.52	23.52	23.54
		3	0	23.38	23.49	23.41
		3	1	23.59	23.57	23.56
		3	3	23.48	23.60	23.69
		6	0	22.45	22.51	22.42
1.4M	64QAM	1	0	22.51	22.46	22.39
		1	2	22.51	22.44	22.48
		1	5	22.44	22.48	22.44
		3	0	22.37	22.47	22.40
		3	1	22.52	22.54	22.48
		3	3	22.41	22.59	22.65
		6	0	21.45	21.51	21.42

*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	24.83	24.78	24.71
		1	50	24.69	24.72	24.79
		1	99	24.73	24.68	24.76
		50	0	23.69	23.66	23.70
		50	25	23.71	23.72	23.70
		50	50	23.64	23.64	23.55
		100	0	23.79	23.75	23.65
20M	16QAM	1	0	23.89	23.85	23.74
		1	50	23.74	23.77	23.83
		1	99	23.74	23.77	23.82
		50	0	22.74	22.70	22.76
		50	25	22.77	22.79	22.80
		50	50	22.67	22.67	22.65
		100	0	22.79	22.75	22.68
20M	64QAM	1	0	22.79	22.83	22.66
		1	50	22.68	22.67	22.74
		1	99	22.73	22.74	22.80
		50	0	21.66	21.70	21.75
		50	25	21.72	21.73	21.73
		50	50	21.59	21.65	21.62
		100	0	21.74	21.73	21.60

*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	24.84	24.80	24.71
		1	37	24.63	24.73	24.82
		1	74	24.61	24.66	24.74
		36	0	23.80	23.80	23.70
		36	19	23.68	23.74	23.78
		36	39	23.61	23.68	23.65
		75	0	23.72	23.69	23.62
15M	16QAM	1	0	23.86	23.83	23.75
		1	37	23.64	23.79	23.91
		1	74	23.70	23.66	23.80
		36	0	22.90	22.85	22.76
		36	19	22.75	22.77	22.84
		36	39	22.63	22.71	22.68
		75	0	22.80	22.70	22.71
15M	64QAM	1	0	22.77	22.81	22.70
		1	37	22.61	22.78	22.88
		1	74	22.63	22.63	22.74
		36	0	21.89	21.81	21.76
		36	19	21.73	21.68	21.79
		36	39	21.58	21.61	21.61
		75	0	21.70	21.61	21.67

*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	24.77	24.80	24.82
		1	24	24.69	24.71	24.65
		1	49	24.61	24.70	24.66
		25	0	23.84	23.77	23.79
		25	12	23.69	23.74	23.68
		25	25	23.69	23.75	23.79
		50	0	23.65	23.73	23.78
10M	16QAM	1	0	23.77	23.82	23.87
		1	24	23.77	23.81	23.74
		1	49	23.64	23.80	23.72
		25	0	22.91	22.87	22.87
		25	12	22.70	22.75	22.75
		25	25	22.74	22.81	22.86
		50	0	22.74	22.78	22.84
10M	64QAM	1	0	22.70	22.75	22.81
		1	24	22.69	22.73	22.67
		1	49	22.63	22.70	22.69
		25	0	21.88	21.87	21.87
		25	12	21.66	21.74	21.72
		25	25	21.64	21.74	21.79
		50	0	21.73	21.71	21.76

*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	24.67	24.76	24.78
		1	12	24.71	24.74	24.76
		1	24	24.62	24.72	24.71
		12	0	23.73	23.79	23.76
		12	6	23.72	23.81	23.89
		12	13	23.84	23.77	23.80
		25	0	23.79	23.71	23.65
5M	16QAM	1	0	23.73	23.79	23.83
		1	12	23.79	23.84	23.84
		1	24	23.67	23.77	23.75
		12	0	22.73	22.87	22.82
		12	6	22.82	22.82	22.98
		12	13	22.91	22.84	22.86
		25	0	22.85	22.72	22.66
5M	64QAM	1	0	22.64	22.77	22.82
		1	12	22.70	22.83	22.76
		1	24	22.63	22.71	22.70
		12	0	21.71	21.78	21.81
		12	6	21.81	21.77	21.91
		12	13	21.87	21.75	21.78
		25	0	21.75	21.69	21.62

*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	22.57	22.56	22.54
		1	24	22.61	22.51	22.56
		1	49	22.55	22.57	22.65
		25	0	21.49	21.56	21.63
		25	12	21.45	21.51	21.51
		25	25	21.51	21.45	21.51
		50	0	21.38	21.42	21.34
10M	16QAM	1	0	21.63	21.62	21.56
		1	24	21.69	21.57	21.64
		1	49	21.64	21.61	21.74
		25	0	20.49	20.63	20.63
		25	12	20.53	20.60	20.52
		25	25	20.54	20.51	20.59
		50	0	20.48	20.46	20.40
10M	64QAM	1	0	20.58	20.57	20.49
		1	24	20.60	20.48	20.60
		1	49	20.57	20.51	20.64
		25	0	19.44	19.63	19.59
		25	12	19.49	19.56	19.49
		25	25	19.45	19.46	19.55
		50	0	19.46	19.45	19.40

*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	22.40	22.48	22.56
		1	12	22.47	22.50	22.53
		1	24	22.52	22.52	22.48
		12	0	21.64	21.54	21.44
		12	6	21.56	21.46	21.54
		12	13	21.55	21.50	21.50
		25	0	21.56	21.57	21.62
5M	16QAM	1	0	21.40	21.56	21.56
		1	12	21.50	21.59	21.58
		1	24	21.62	21.60	21.55
		12	0	20.65	20.62	20.46
		12	6	20.56	20.50	20.57
		12	13	20.63	20.58	20.60
		25	0	20.59	20.57	20.62
5M	64QAM	1	0	20.34	20.50	20.56
		1	12	20.40	20.49	20.51
		1	24	20.52	20.50	20.48
		12	0	19.65	19.62	19.46
		12	6	19.47	19.45	19.49
		12	13	19.60	19.58	19.54
		25	0	19.55	19.56	19.54

*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	22.43	22.46	22.40
		1	7	22.48	22.51	22.41
		1	14	22.64	22.62	22.59
		8	0	21.65	21.58	21.57
		8	3	21.60	21.56	21.54
		8	7	21.53	21.60	21.60
		15	0	21.64	21.64	21.67
3M	16QAM	1	0	21.48	21.52	21.41
		1	7	21.57	21.53	21.49
		1	14	21.74	21.62	21.64
		8	0	20.70	20.68	20.67
		8	3	20.61	20.66	20.57
		8	7	20.54	20.67	20.62
		15	0	20.69	20.72	20.74
3M	64QAM	1	0	20.44	20.51	20.39
		1	7	20.55	20.52	20.46
		1	14	20.65	20.55	20.64
		8	0	19.66	19.62	19.62
		8	3	19.55	19.66	19.51
		8	7	19.44	19.65	19.62
		15	0	19.63	19.69	19.70

*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	22.64	22.62	22.62
		1	2	22.61	22.63	22.68
		1	5	22.57	22.48	22.41
		3	0	22.42	22.51	22.50
		3	1	22.41	22.47	22.47
		3	3	22.66	22.64	22.65
		6	0	21.66	21.57	21.58
1.4M	16QAM	1	0	21.69	21.68	21.64
		1	2	21.63	21.70	21.68
		1	5	21.62	21.49	21.41
		3	0	21.42	21.53	21.56
		3	1	21.49	21.54	21.50
		3	3	21.73	21.74	21.68
		6	0	20.69	20.65	20.59
1.4M	64QAM	1	0	20.67	20.58	20.58
		1	2	20.61	20.66	20.60
		1	5	20.54	20.49	20.38
		3	0	20.38	20.50	20.46
		3	1	20.39	20.53	20.44
		3	3	20.67	20.71	20.62
		6	0	19.59	19.56	19.54

*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	22.63	22.62	22.62
		1	12	22.76	22.75	22.67
		1	24	22.75	22.74	22.64
		12	0	21.68	21.70	21.78
		12	6	21.68	21.76	21.79
		12	13	21.88	21.80	21.90
		25	0	21.69	21.77	21.67
10M	16QAM	1	0	21.66	21.72	21.63
		1	12	21.83	21.79	21.69
		1	24	21.81	21.75	21.71
		12	0	20.78	20.78	20.85
		12	6	20.70	20.76	20.85
		12	13	20.88	20.85	20.97
		25	0	20.71	20.87	20.67
10M	64QAM	1	0	20.65	20.62	20.56
		1	12	20.78	20.74	20.59
		1	24	20.73	20.71	20.62
		12	0	19.78	19.75	19.82
		12	6	19.66	19.73	19.77
		12	13	19.85	19.82	19.87
		25	0	19.61	19.86	19.67

*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	22.68	22.66	22.69
		1	12	22.78	22.72	22.64
		1	24	22.74	22.73	22.63
		12	0	21.65	21.73	21.63
		12	6	21.85	21.81	21.88
		12	13	21.71	21.67	21.65
		25	0	21.77	21.72	21.64
5M	16QAM	1	0	21.73	21.73	21.70
		1	12	21.88	21.78	21.74
		1	24	21.80	21.77	21.72
		12	0	20.70	20.82	20.72
		12	6	20.94	20.91	20.88
		12	13	20.71	20.68	20.67
		25	0	20.82	20.75	20.66
5M	64QAM	1	0	20.65	20.72	20.67
		1	12	20.87	20.71	20.65
		1	24	20.79	20.68	20.72
		12	0	19.69	19.76	19.71
		12	6	19.86	19.91	19.82
		12	13	19.66	19.64	19.65
		25	0	19.72	19.69	19.57

*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	24.43	24.38	24.31
		1	50	24.37	24.35	24.39
		1	99	24.40	24.36	24.26
		50	0	23.11	23.20	23.19
		50	25	23.15	23.22	23.16
		50	50	23.21	23.30	23.30
		100	0	23.32	23.29	23.26
20M	16QAM	1	0	23.52	23.47	23.37
		1	50	23.43	23.43	23.45
		1	99	23.42	23.45	23.27
		50	0	22.21	22.30	22.26
		50	25	22.21	22.29	22.23
		50	50	22.21	22.31	22.33
		100	0	22.41	22.39	22.34
20M	64QAM	1	0	22.52	22.45	22.33
		1	50	22.40	22.37	22.41
		1	99	22.32	22.37	22.20
		50	0	21.21	21.29	21.19
		50	25	21.15	21.22	21.14
		50	50	21.18	21.28	21.29
		100	0	21.34	21.35	21.30

*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	24.42	24.36	24.37
		1	37	24.29	24.38	24.44
		1	74	24.43	24.40	24.46
		36	0	23.20	23.22	23.24
		36	19	23.25	23.26	23.27
		36	39	23.28	23.28	23.31
		75	0	23.26	23.24	23.20
15M	16QAM	1	0	23.47	23.36	23.41
		1	37	23.36	23.47	23.45
		1	74	23.50	23.48	23.56
		36	0	22.25	22.29	22.24
		36	19	22.34	22.28	22.37
		36	39	22.32	22.38	22.36
		75	0	22.31	22.28	22.25
15M	64QAM	1	0	22.47	22.32	22.34
		1	37	22.36	22.37	22.40
		1	74	22.47	22.46	22.46
		36	0	21.22	21.29	21.14
		36	19	21.30	21.28	21.30
		36	39	21.23	21.28	21.28
		75	0	21.26	21.18	21.18

*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	24.32	24.32	24.25
		1	24	24.46	24.37	24.42
		1	49	24.32	24.39	24.29
		25	0	23.12	23.22	23.29
		25	12	23.23	23.26	23.30
		25	25	23.24	23.27	23.25
		50	0	23.26	23.33	23.23
10M	16QAM	1	0	23.42	23.34	23.35
		1	24	23.50	23.47	23.42
		1	49	23.32	23.48	23.36
		25	0	22.18	22.24	22.38
		25	12	22.29	22.32	22.34
		25	25	22.33	22.29	22.27
		50	0	22.31	22.43	22.29
10M	64QAM	1	0	22.36	22.30	22.25
		1	24	22.42	22.41	22.42
		1	49	22.22	22.41	22.31
		25	0	21.11	21.18	21.29
		25	12	21.20	21.30	21.28
		25	25	21.24	21.22	21.17
		50	0	21.23	21.34	21.25

*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	24.29	24.36	24.27
		1	12	24.41	24.40	24.50
		1	24	24.36	24.38	24.29
		12	0	23.23	23.22	23.16
		12	6	23.14	23.20	23.19
		12	13	23.28	23.28	23.34
		25	0	23.26	23.30	23.21
5M	16QAM	1	0	23.30	23.40	23.30
		1	12	23.49	23.47	23.54
		1	24	23.36	23.46	23.31
		12	0	22.27	22.30	22.20
		12	6	22.17	22.28	22.24
		12	13	22.29	22.30	22.42
		25	0	22.32	22.33	22.23
5M	64QAM	1	0	22.30	22.32	22.29
		1	12	22.47	22.45	22.52
		1	24	22.30	22.37	22.26
		12	0	21.19	21.28	21.11
		12	6	21.07	21.26	21.18
		12	13	21.20	21.24	21.32
		25	0	21.22	21.33	21.23

*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	24.32	24.36	24.39
		1	7	24.45	24.38	24.39
		1	14	24.34	24.40	24.38
		8	0	23.31	23.22	23.19
		8	3	23.33	23.26	23.33
		8	7	23.28	23.20	23.27
		15	0	23.29	23.27	23.33
3M	16QAM	1	0	23.38	23.40	23.46
		1	7	23.47	23.47	23.42
		1	14	23.39	23.45	23.40
		8	0	22.38	22.24	22.24
		8	3	22.35	22.36	22.34
		8	7	22.30	22.21	22.31
		15	0	22.29	22.36	22.37
3M	64QAM	1	0	22.28	22.35	22.41
		1	7	22.39	22.44	22.36
		1	14	22.31	22.38	22.38
		8	0	21.28	21.21	21.18
		8	3	21.27	21.30	21.34
		8	7	21.23	21.18	21.27
		15	0	21.22	21.28	21.36

*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	24.42	24.32	24.30
		1	2	24.38	24.37	24.45
		1	5	24.30	24.30	24.38
		3	0	24.18	24.26	24.16
		3	1	24.35	24.36	24.26
		3	3	24.40	24.32	24.40
		6	0	23.23	23.21	23.17
1.4M	16QAM	1	0	23.51	23.39	23.39
		1	2	23.45	23.38	23.55
		1	5	23.31	23.39	23.44
		3	0	23.25	23.36	23.17
		3	1	23.37	23.39	23.34
		3	3	23.41	23.38	23.42
		6	0	22.29	22.25	22.27
1.4M	64QAM	1	0	22.49	22.37	22.38
		1	2	22.35	22.32	22.52
		1	5	22.23	22.37	22.42
		3	0	22.22	22.31	22.13
		3	1	22.30	22.35	22.31
		3	3	22.31	22.29	22.38
		6	0	21.26	21.18	21.19

*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	22.98	23.03	22.96
		1	50	22.97	23.02	23.00
		1	99	23.04	22.97	23.04
		50	0	22.09	22.03	22.03
		50	25	22.13	22.08	22.15
		50	50	21.98	22.06	22.11
		100	0	22.11	22.10	22.08
20M	16QAM	1	0	22.07	22.10	22.04
		1	50	22.01	22.03	22.01
		1	99	22.08	22.02	22.05
		50	0	21.17	21.12	21.05
		50	25	21.16	21.12	21.20
		50	50	21.06	21.14	21.13
		100	0	21.13	21.11	21.15
20M	64QAM	1	0	20.99	21.01	20.95
		1	50	21.00	20.97	20.92
		1	99	20.98	20.98	20.98
		50	0	20.10	20.10	20.02
		50	25	20.13	20.08	20.11
		50	50	19.97	20.13	20.03
		100	0	20.07	20.08	20.06

*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	23.11	23.16	23.19
		1	37	23.00	23.03	22.98
		1	74	23.02	23.07	23.02
		36	0	22.09	22.03	22.11
		36	19	22.05	22.08	22.16
		36	39	22.10	22.06	22.02
		75	0	22.09	22.08	21.98
15M	16QAM	1	0	22.21	22.16	22.28
		1	37	22.07	22.05	22.04
		1	74	22.05	22.16	22.03
		36	0	21.17	21.06	21.15
		36	19	21.12	21.18	21.16
		36	39	21.13	21.15	21.03
		75	0	21.11	21.12	21.02
15M	64QAM	1	0	21.15	21.08	21.18
		1	37	21.03	21.04	20.95
		1	74	21.03	21.16	20.99
		36	0	20.16	19.99	20.06
		36	19	20.06	20.14	20.08
		36	39	20.09	20.09	19.97
		75	0	20.11	20.05	19.92

*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	23.07	23.06	23.16
		1	24	23.13	23.08	22.98
		1	49	23.06	23.06	23.00
		25	0	22.05	22.03	21.93
		25	12	22.13	22.07	22.05
		25	25	22.07	22.03	21.95
		50	0	21.98	22.00	21.97
10M	16QAM	1	0	22.07	22.08	22.17
		1	24	22.14	22.09	22.01
		1	49	22.07	22.12	22.04
		25	0	21.08	21.13	20.97
		25	12	21.23	21.13	21.08
		25	25	21.15	21.10	21.02
		50	0	21.02	21.07	21.04
10M	64QAM	1	0	21.07	20.98	21.17
		1	24	21.06	21.08	20.99
		1	49	21.04	21.12	21.03
		25	0	20.05	20.13	19.90
		25	12	20.17	20.10	20.01
		25	25	20.08	20.07	20.02
		50	0	20.01	20.04	20.00

*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	23.07	23.02	22.92
		1	12	23.02	22.99	23.06
		1	24	22.98	22.90	22.89
		12	0	21.90	21.97	21.89
		12	6	22.12	22.06	22.13
		12	13	22.00	21.93	21.94
		25	0	21.95	22.00	21.90
5M	16QAM	1	0	22.09	22.10	21.98
		1	12	22.12	22.07	22.08
		1	24	21.99	21.94	21.92
		12	0	20.99	21.07	20.92
		12	6	21.13	21.16	21.14
		12	13	21.02	20.95	20.96
		25	0	21.03	21.10	20.92
5M	64QAM	1	0	21.00	21.09	20.91
		1	12	21.03	20.99	21.07
		1	24	20.91	20.90	20.84
		12	0	19.92	20.05	19.89
		12	6	20.13	20.16	20.05
		12	13	19.93	19.85	19.93
		25	0	19.99	20.01	19.90

*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

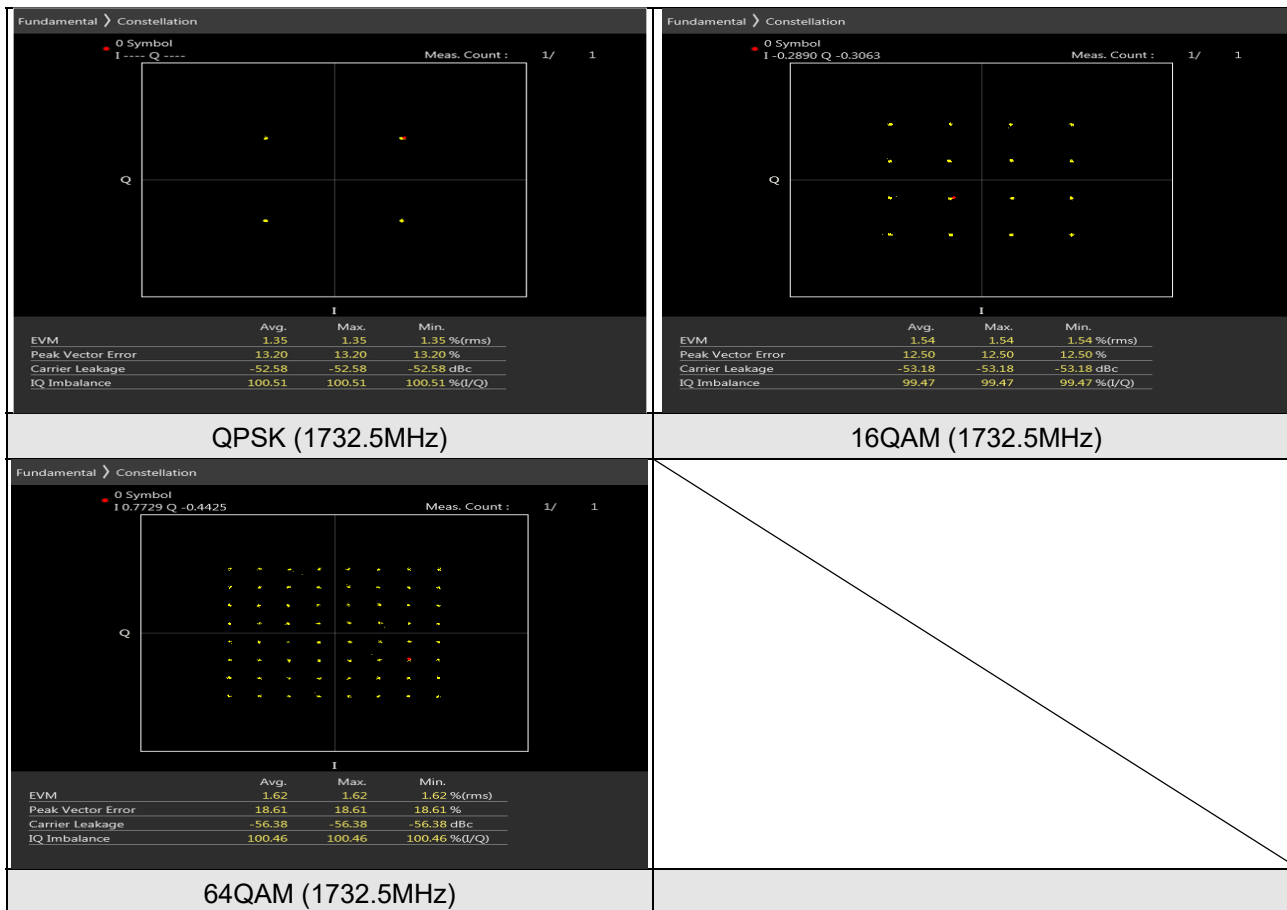
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup

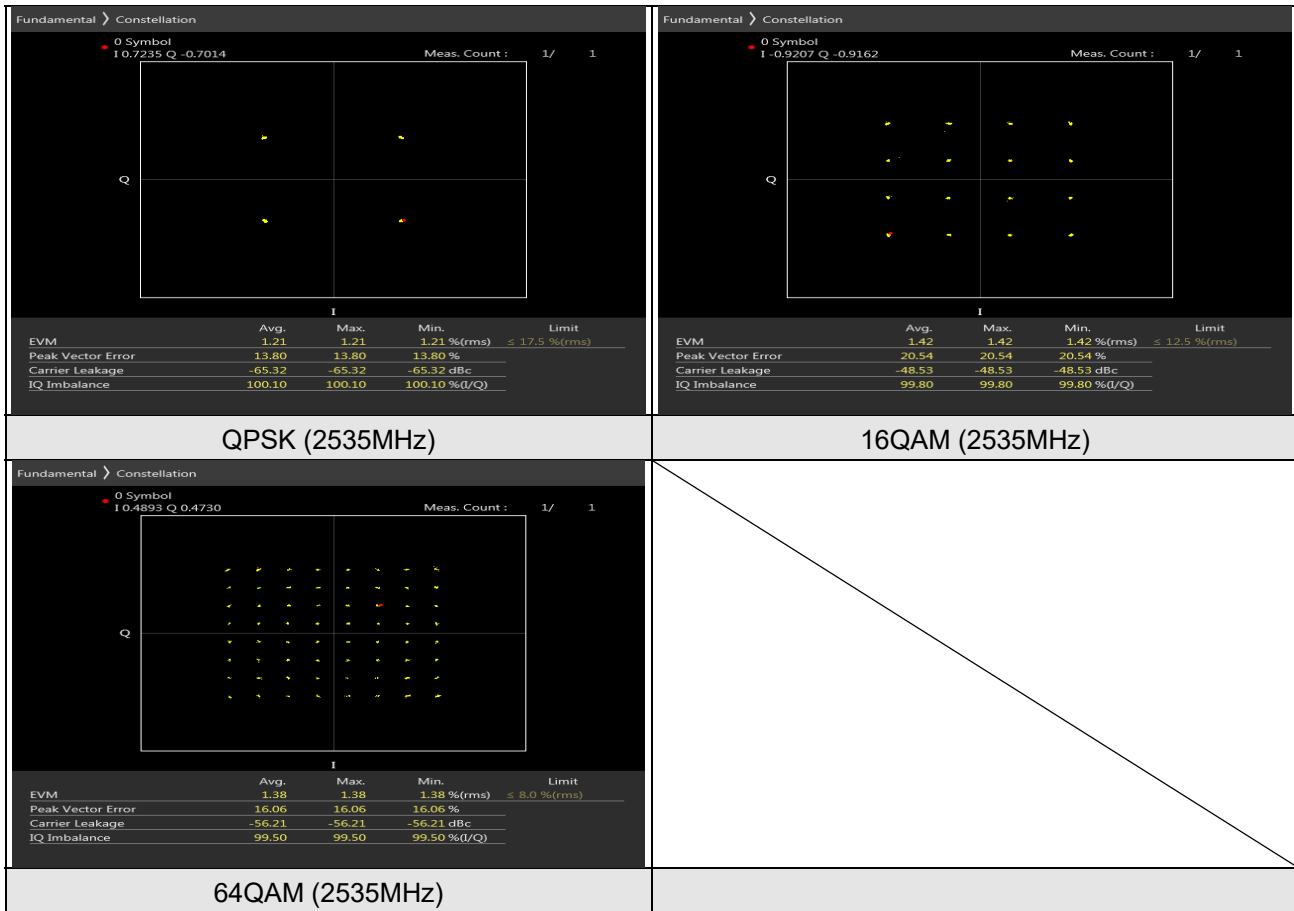


4.2.4 Test Results

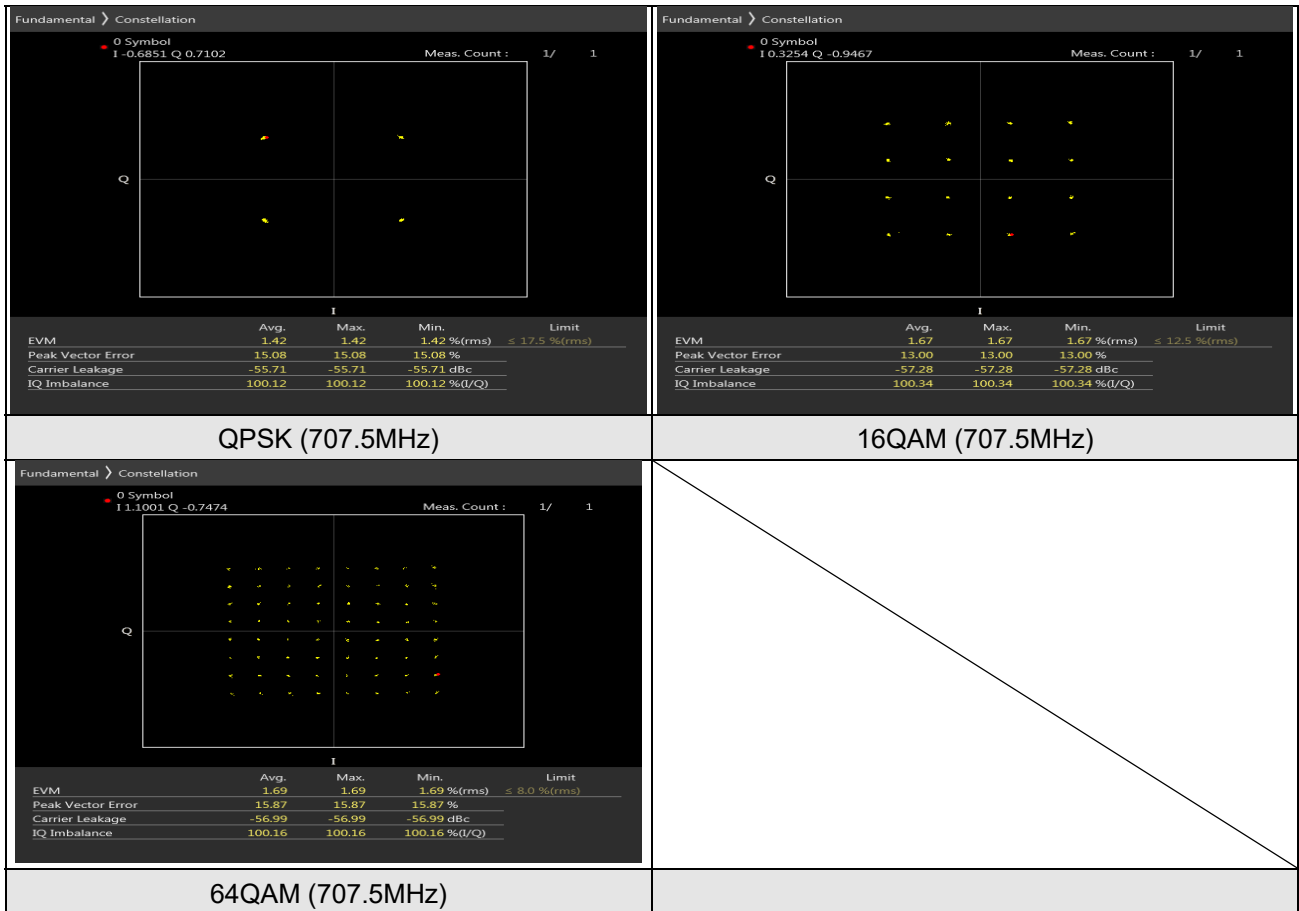
LTE Band 4



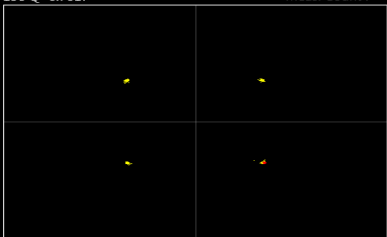
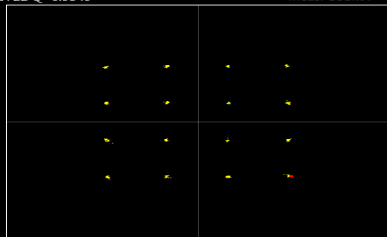
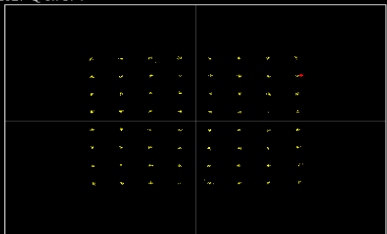
LTE Band 7



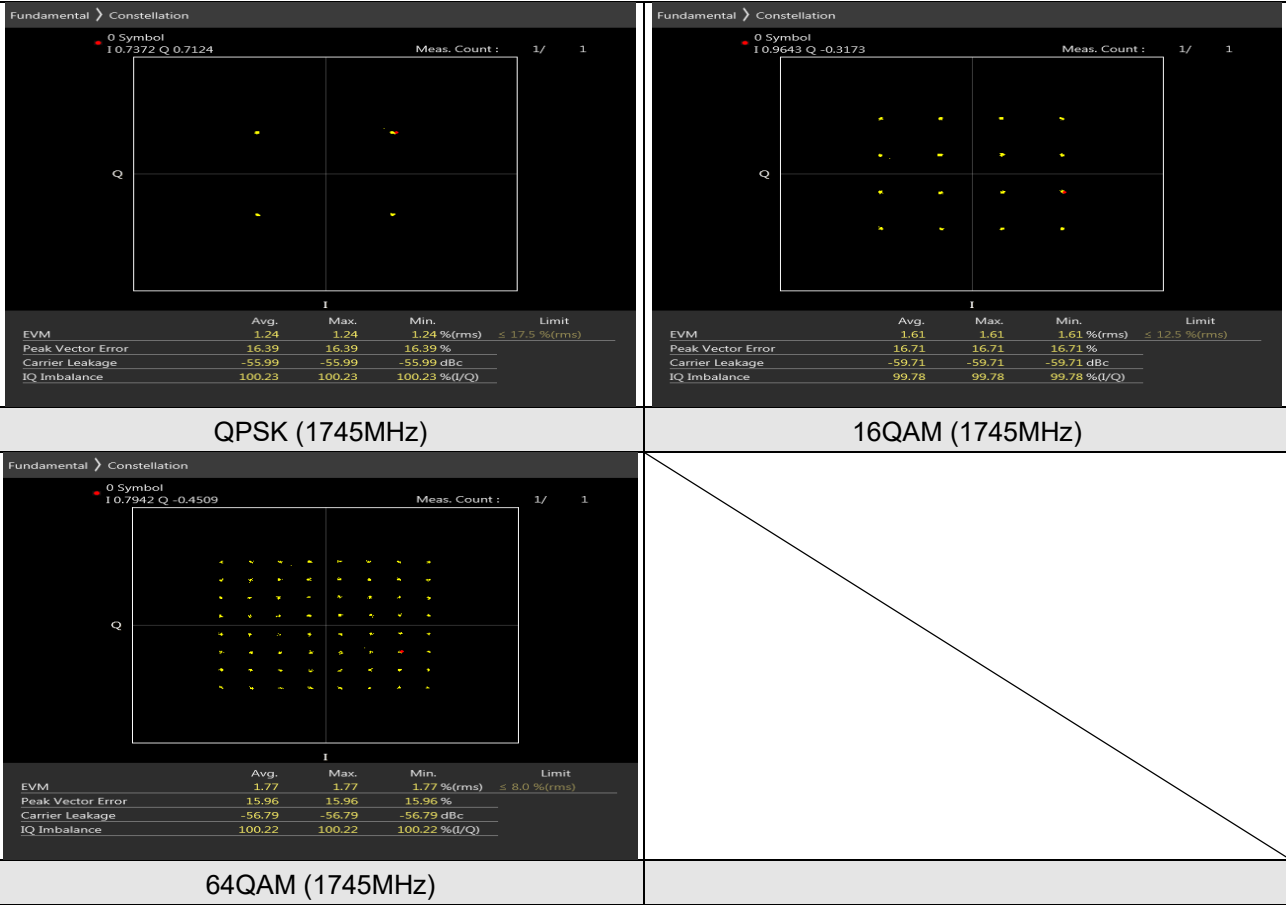
LTE Band 12



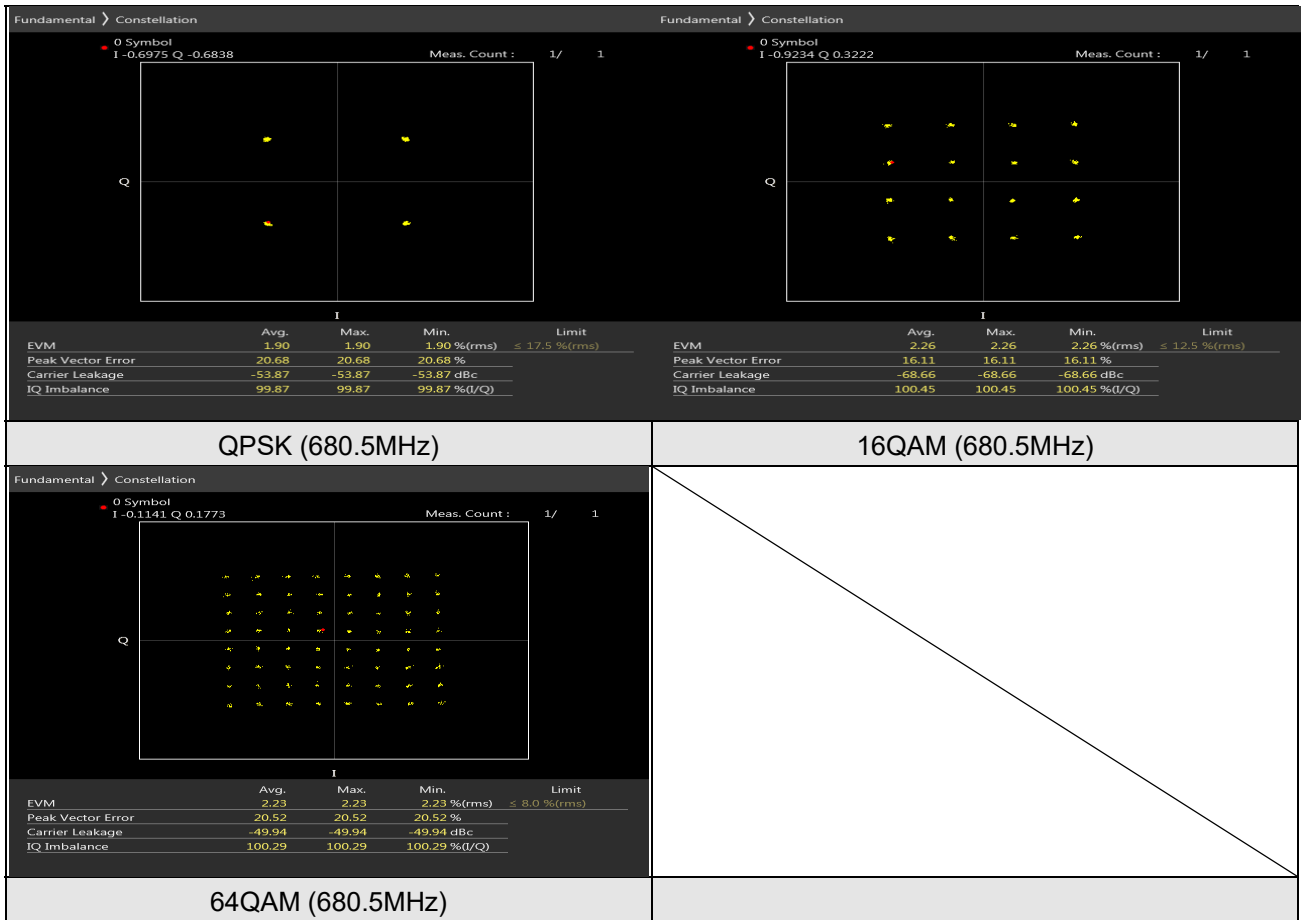
LTE Band 17

Fundamental > Constellation 0 Symbol I 0.7156 Q -0.7017 Meas. Count : 1/ 1  <table><tr><td></td><td>Avg.</td><td>Max.</td><td>Min.</td><td>Limit</td></tr><tr><td>EVM</td><td>1.43</td><td>1.43</td><td>1.43 %(rms)</td><td>≤ 17.5 %(rms)</td></tr><tr><td>Peak Vector Error</td><td>12.25</td><td>12.25</td><td>12.25 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-60.22</td><td>-60.22</td><td>-60.22 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>100.80</td><td>100.80</td><td>100.80 %(I/Q)</td><td></td></tr></table>		Avg.	Max.	Min.	Limit	EVM	1.43	1.43	1.43 %(rms)	≤ 17.5 %(rms)	Peak Vector Error	12.25	12.25	12.25 %		Carrier Leakage	-60.22	-60.22	-60.22 dBc		IQ Imbalance	100.80	100.80	100.80 %(I/Q)		Fundamental > Constellation 0 Symbol I 0.9722 Q -0.9349 Meas. Count : 1/ 1  <table><tr><td></td><td>Avg.</td><td>Max.</td><td>Min.</td><td>Limit</td></tr><tr><td>EVM</td><td>1.80</td><td>1.80</td><td>1.80 %(rms)</td><td>≤ 12.5 %(rms)</td></tr><tr><td>Peak Vector Error</td><td>13.04</td><td>13.04</td><td>13.04 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-65.62</td><td>-65.62</td><td>-65.62 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>99.70</td><td>99.70</td><td>99.70 %(I/Q)</td><td></td></tr></table>		Avg.	Max.	Min.	Limit	EVM	1.80	1.80	1.80 %(rms)	≤ 12.5 %(rms)	Peak Vector Error	13.04	13.04	13.04 %		Carrier Leakage	-65.62	-65.62	-65.62 dBc		IQ Imbalance	99.70	99.70	99.70 %(I/Q)	
	Avg.	Max.	Min.	Limit																																															
EVM	1.43	1.43	1.43 %(rms)	≤ 17.5 %(rms)																																															
Peak Vector Error	12.25	12.25	12.25 %																																																
Carrier Leakage	-60.22	-60.22	-60.22 dBc																																																
IQ Imbalance	100.80	100.80	100.80 %(I/Q)																																																
	Avg.	Max.	Min.	Limit																																															
EVM	1.80	1.80	1.80 %(rms)	≤ 12.5 %(rms)																																															
Peak Vector Error	13.04	13.04	13.04 %																																																
Carrier Leakage	-65.62	-65.62	-65.62 dBc																																																
IQ Imbalance	99.70	99.70	99.70 %(I/Q)																																																
QPSK (710MHz)	16QAM (710MHz)																																																		
Fundamental > Constellation 0 Symbol I 1.1027 Q 0.7874 Meas. Count : 1/ 1  <table><tr><td></td><td>Avg.</td><td>Max.</td><td>Min.</td><td>Limit</td></tr><tr><td>EVM</td><td>1.73</td><td>1.73</td><td>1.73 %(rms)</td><td>≤ 8.0 %(rms)</td></tr><tr><td>Peak Vector Error</td><td>14.66</td><td>14.66</td><td>14.66 %</td><td></td></tr><tr><td>Carrier Leakage</td><td>-61.32</td><td>-61.32</td><td>-61.32 dBc</td><td></td></tr><tr><td>IQ Imbalance</td><td>99.25</td><td>99.25</td><td>99.25 %(I/Q)</td><td></td></tr></table>		Avg.	Max.	Min.	Limit	EVM	1.73	1.73	1.73 %(rms)	≤ 8.0 %(rms)	Peak Vector Error	14.66	14.66	14.66 %		Carrier Leakage	-61.32	-61.32	-61.32 dBc		IQ Imbalance	99.25	99.25	99.25 %(I/Q)																											
	Avg.	Max.	Min.	Limit																																															
EVM	1.73	1.73	1.73 %(rms)	≤ 8.0 %(rms)																																															
Peak Vector Error	14.66	14.66	14.66 %																																																
Carrier Leakage	-61.32	-61.32	-61.32 dBc																																																
IQ Imbalance	99.25	99.25	99.25 %(I/Q)																																																
64QAM (710MHz)																																																			

LTE Band 66



LTE Band 71



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

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

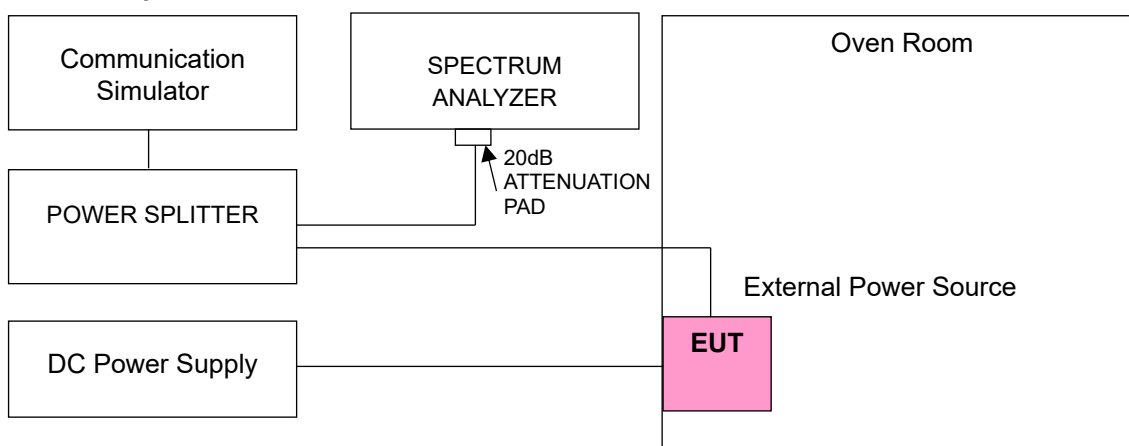
Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Feb. 16, 2022	Feb. 15, 2023
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
Digital Multimeter Fluke	87-III	70360742	Jun. 24, 2021	Jun. 23, 2022
DC Power Supply Topward	6306A	727263	NA	NA

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

4.3.4 Test Setup



4.3.5 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)
3.4	1710.700004	0.002	1754.300004	0.002
4.0	1710.700001	0.001	1754.300003	0.002
4.6	1710.700004	0.002	1754.299997	-0.002

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.699996	-0.002	1754.300003	0.002
-30	1710.699998	-0.001	1754.300002	0.001
-20	1710.699999	-0.001	1754.299999	-0.001
-10	1710.699997	-0.002	1754.300004	0.002
0	1710.700002	0.001	1754.299995	-0.003
10	1710.699999	-0.001	1754.300004	0.002
20	1710.700003	0.002	1754.300003	0.002
30	1710.699996	-0.002	1754.300002	0.001
40	1710.699998	-0.001	1754.299997	-0.002
50	1710.700005	0.003	1754.300002	0.001
60	1710.700003	0.002	1754.300001	0.001
70	1710.699997	-0.002	1754.299995	-0.003
80	1710.699998	-0.001	1754.299998	-0.001
85	1710.700003	0.002	1754.299996	-0.002

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)
3.4	1711.499997	-0.002	1753.499996	-0.002
4.0	1711.499995	-0.003	1753.500004	0.002
4.6	1711.500002	0.001	1753.500005	0.003

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1711.499998	-0.001	1753.499995	-0.003
-30	1711.500001	0.001	1753.499999	-0.001
-20	1711.499999	-0.001	1753.499995	-0.003
-10	1711.499997	-0.002	1753.500003	0.002
0	1711.500001	0.001	1753.499997	-0.002
10	1711.499996	-0.002	1753.499999	-0.001
20	1711.500001	0.001	1753.499997	-0.002
30	1711.500001	0.001	1753.499999	-0.001
40	1711.499998	-0.001	1753.500005	0.003
50	1711.499999	-0.001	1753.499997	-0.002
60	1711.500002	0.001	1753.500002	0.001
70	1711.500003	0.002	1753.499996	-0.002
80	1711.499998	-0.001	1753.500001	0.001
85	1711.499998	-0.001	1753.499999	-0.001

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)
3.4	1712.499995	-0.003	1752.500005	0.003
4.0	1712.499996	-0.002	1752.499999	-0.001
4.6	1712.499996	-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. (°C)	LTE Band 4			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.499996	-0.002	1752.500003	0.002
-30	1712.499995	-0.003	1752.500003	0.002
-20	1712.500003	0.002	1752.500005	0.003
-10	1712.499995	-0.003	1752.499999	-0.001
0	1712.499999	-0.001	1752.500005	0.003
10	1712.500005	0.003	1752.499999	-0.001
20	1712.499997	-0.002	1752.499997	-0.002
30	1712.500005	0.003	1752.499998	-0.001
40	1712.500005	0.003	1752.499999	-0.001
50	1712.500004	0.002	1752.500002	0.001
60	1712.499995	-0.003	1752.499995	-0.003
70	1712.500003	0.002	1752.500004	0.002
80	1712.499999	-0.001	1752.499999	-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)
3.4	1714.999998	-0.001	1749.999998	-0.001
4.0	1714.999995	-0.003	1750.000004	0.002
4.6	1714.999996	-0.002	1750.000004	0.002

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1715.000005	0.003	1750.000002	0.001
-30	1714.999999	-0.001	1750.000001	0.001
-20	1715.000005	0.003	1749.999996	-0.002
-10	1714.999998	-0.001	1749.999997	-0.002
0	1715.000005	0.003	1750.000003	0.002
10	1715.000001	0.001	1749.999999	-0.001
20	1714.999997	-0.002	1749.999996	-0.002
30	1714.999996	-0.002	1749.999999	-0.001
40	1714.999995	-0.003	1750.000005	0.003
50	1715.000001	0.001	1750.000002	0.001
60	1714.999995	-0.003	1749.999998	-0.001
70	1714.999996	-0.002	1749.999996	-0.002
80	1714.999999	-0.001	1749.999996	-0.002
85	1714.999998	-0.001	1750.000002	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)
3.4	1717.500001	0.001	1747.499995	-0.003
4.0	1717.500002	0.001	1747.499997	-0.002
4.6	1717.500004	0.002	1747.500001	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1717.500002	0.001	1747.500005	0.003
-30	1717.499995	-0.003	1747.499997	-0.002
-20	1717.499997	-0.002	1747.500005	0.003
-10	1717.499999	-0.001	1747.500005	0.003
0	1717.499999	-0.001	1747.500002	0.001
10	1717.499996	-0.002	1747.500003	0.002
20	1717.500004	0.002	1747.499996	-0.002
30	1717.500002	0.001	1747.500003	0.002
40	1717.500005	0.003	1747.499997	-0.002
50	1717.499999	-0.001	1747.500003	0.002
60	1717.500005	0.003	1747.500002	0.001
70	1717.499995	-0.003	1747.499998	-0.001
80	1717.499995	-0.003	1747.500005	0.003
85	1717.500002	0.001	1747.500005	0.003

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)
3.4	1719.999995	-0.003	1744.999998	-0.001
4.0	1719.999997	-0.002	1744.999998	-0.001
4.6	1720.000005	0.003	1745.000002	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1720.000004	0.002	1744.999998	-0.001
-30	1720.000004	0.002	1745.000004	0.002
-20	1720.000004	0.002	1744.999999	-0.001
-10	1719.999998	-0.001	1744.999996	-0.002
0	1719.999995	-0.003	1745.000005	0.003
10	1719.999999	-0.001	1745.000002	0.001
20	1719.999998	-0.001	1745.000003	0.002
30	1720.000005	0.003	1744.999996	-0.002
40	1719.999995	-0.003	1745.000001	0.001
50	1720.000001	0.001	1745.000003	0.002
60	1719.999995	-0.003	1744.999998	-0.001
70	1720.000005	0.003	1744.999997	-0.002
80	1719.999995	-0.003	1745.000003	0.002
85	1719.999998	-0.001	1745.000002	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)
3.4	2502.499999	0.000	2567.500001	0.000
4.0	2502.499998	-0.001	2567.499998	-0.001
4.6	2502.499996	-0.002	2567.499996	-0.002

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2502.499995	-0.002	2567.500003	0.001
-30	2502.499996	-0.002	2567.499998	-0.001
-20	2502.500001	0.000	2567.500001	0.000
-10	2502.500002	0.001	2567.500004	0.002
0	2502.500001	0.000	2567.500005	0.002
10	2502.499998	-0.001	2567.500002	0.001
20	2502.499997	-0.001	2567.499996	-0.002
30	2502.500003	0.001	2567.499998	-0.001
40	2502.499995	-0.002	2567.500005	0.002
50	2502.500001	0.000	2567.500003	0.001
60	2502.500001	0.000	2567.499998	-0.001
70	2502.499999	0.000	2567.500001	0.000
80	2502.499998	-0.001	2567.499996	-0.002
85	2502.500001	0.000	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)
3.4	2504.999998	-0.001	2565.000001	0.000
4.0	2505.000004	0.002	2565.000003	0.001
4.6	2504.999997	-0.001	2565.000003	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2505.000003	0.001	2565.000004	0.002
-30	2504.999998	-0.001	2564.999996	-0.002
-20	2504.999999	0.000	2564.999997	-0.001
-10	2505.000001	0.000	2565.000005	0.002
0	2504.999996	-0.002	2564.999995	-0.002
10	2505.000003	0.001	2564.999996	-0.002
20	2504.999997	-0.001	2564.999995	-0.002
30	2504.999999	0.000	2564.999999	0.000
40	2504.999997	-0.001	2565.000005	0.002
50	2505.000004	0.002	2564.999996	-0.002
60	2504.999999	0.000	2564.999995	-0.002
70	2504.999998	-0.001	2565.000005	0.002
80	2504.999995	-0.002	2564.999999	0.000
85	2505.000005	0.002	2564.999998	-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)
3.4	2507.499996	-0.002	2562.499999	0.000
4.0	2507.499997	-0.001	2562.499997	-0.001
4.6	2507.499995	-0.002	2562.500003	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	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	2562.499996	-0.002
-30	2507.500004	0.002	2562.499997	-0.001
-20	2507.500001	0.000	2562.500004	0.002
-10	2507.500004	0.002	2562.500003	0.001
0	2507.499995	-0.002	2562.500002	0.001
10	2507.499996	-0.002	2562.499995	-0.002
20	2507.500003	0.001	2562.500005	0.002
30	2507.499999	0.000	2562.499999	0.000
40	2507.499999	0.000	2562.499995	-0.002
50	2507.500005	0.002	2562.500001	0.000
60	2507.500001	0.000	2562.500005	0.002
70	2507.499996	-0.002	2562.499997	-0.001
80	2507.499995	-0.002	2562.500002	0.001
85	2507.500004	0.002	2562.499996	-0.002

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)
3.4	2510.000003	0.001	2559.999996	-0.002
4.0	2509.999998	-0.001	2560.000001	0.000
4.6	2510.000005	0.002	2559.999997	-0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2509.999997	-0.001	2559.999998	-0.001
-30	2510.000004	0.002	2559.999995	-0.002
-20	2510.000004	0.002	2560.000005	0.002
-10	2510.000001	0.000	2560.000001	0.000
0	2509.999997	-0.001	2560.000005	0.002
10	2509.999999	0.000	2560.000003	0.001
20	2509.999997	-0.001	2560.000001	0.000
30	2510.000005	0.002	2560.000004	0.002
40	2510.000005	0.002	2559.999997	-0.001
50	2509.999998	-0.001	2560.000003	0.001
60	2510.000005	0.002	2559.999995	-0.002
70	2510.000001	0.000	2560.000004	0.002
80	2509.999997	-0.001	2560.000003	0.001
85	2509.999995	-0.002	2560.000004	0.002

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)
3.4	699.699997	-0.004	715.299997	-0.004
4.0	699.699995	-0.007	715.300002	0.003
4.6	699.700004	0.006	715.299999	-0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	699.700001	0.001	715.300002	0.003
-30	699.700001	0.001	715.300004	0.006
-20	699.699997	-0.004	715.299999	-0.001
-10	699.699999	-0.001	715.300004	0.006
0	699.699996	-0.006	715.300005	0.007
10	699.699997	-0.004	715.300004	0.006
20	699.699995	-0.007	715.300005	0.007
30	699.700004	0.006	715.299998	-0.003
40	699.700001	0.001	715.299997	-0.004
50	699.700004	0.006	715.299997	-0.004
60	699.699998	-0.003	715.299997	-0.004
70	699.699997	-0.004	715.300001	0.001
80	699.699998	-0.003	715.299996	-0.006
85	699.699998	-0.003	715.299997	-0.004

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)
3.4	700.499996	-0.006	714.500004	0.006
4.0	700.499997	-0.004	714.499996	-0.006
4.6	700.499998	-0.003	714.500001	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	700.500004	0.006	714.499996	-0.006
-30	700.500004	0.006	714.499998	-0.003
-20	700.499996	-0.006	714.500002	0.003
-10	700.499995	-0.007	714.499998	-0.003
0	700.500005	0.007	714.500003	0.004
10	700.500004	0.006	714.499999	-0.001
20	700.500002	0.003	714.500003	0.004
30	700.499998	-0.003	714.500002	0.003
40	700.500002	0.003	714.500004	0.006
50	700.500002	0.003	714.500004	0.006
60	700.500004	0.006	714.500001	0.001
70	700.499998	-0.003	714.500002	0.003
80	700.499998	-0.003	714.499996	-0.006
85	700.500005	0.007	714.500003	0.004

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)
3.4	701.499996	-0.006	713.499998	-0.003
4.0	701.500003	0.004	713.500003	0.004
4.6	701.499998	-0.003	713.500004	0.006

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	701.499998	-0.003	713.500004	0.006
-30	701.500003	0.004	713.499997	-0.004
-20	701.499997	-0.004	713.500003	0.004
-10	701.499999	-0.001	713.500004	0.006
0	701.499996	-0.006	713.500001	0.001
10	701.500001	0.001	713.500004	0.006
20	701.499999	-0.001	713.499998	-0.003
30	701.500005	0.007	713.499998	-0.003
40	701.500005	0.007	713.499995	-0.007
50	701.500003	0.004	713.500001	0.001
60	701.500001	0.001	713.500002	0.003
70	701.499999	-0.001	713.499995	-0.007
80	701.499996	-0.006	713.499999	-0.001
85	701.500004	0.006	713.500002	0.003

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)
3.4	703.999999	-0.001	710.999999	-0.001
4.0	704.000001	0.001	711.000001	0.001
4.6	704.000004	0.006	710.999999	-0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	703.999998	-0.003	711.000001	0.001
-30	704.000002	0.003	711.000005	0.007
-20	704.000004	0.006	711.000004	0.006
-10	703.999995	-0.007	710.999997	-0.004
0	703.999998	-0.003	711.000003	0.004
10	704.000003	0.004	710.999996	-0.006
20	703.999995	-0.007	710.999998	-0.003
30	704.000003	0.004	710.999998	-0.003
40	703.999995	-0.007	710.999996	-0.006
50	703.999998	-0.003	711.000005	0.007
60	704.000005	0.007	710.999997	-0.004
70	704.000002	0.003	710.999999	-0.001
80	703.999998	-0.003	711.000001	0.001
85	704.000002	0.003	710.999998	-0.003

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)
3.4	706.499996	-0.006	713.500002	0.003
4.0	706.500002	0.003	713.500003	0.004
4.6	706.500005	0.007	713.500004	0.006

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	706.500002	0.003	713.500003	0.004
-30	706.500004	0.006	713.499996	-0.006
-20	706.500002	0.003	713.500002	0.003
-10	706.500002	0.003	713.500005	0.007
0	706.500003	0.004	713.499999	-0.001
10	706.499996	-0.006	713.499997	-0.004
20	706.500005	0.007	713.500003	0.004
30	706.499996	-0.006	713.500002	0.003
40	706.499998	-0.003	713.500005	0.007
50	706.500005	0.007	713.500001	0.001
60	706.499997	-0.004	713.499995	-0.007
70	706.499998	-0.003	713.500002	0.003
80	706.500002	0.003	713.499996	-0.006
85	706.500002	0.003	713.499999	-0.001

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)
3.4	708.999996	-0.006	710.999999	-0.001
4.0	708.999999	-0.001	710.999995	-0.007
4.6	708.999995	-0.007	711.000005	0.007

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	709.000001	0.001	711.000002	0.003
-30	708.999999	-0.001	710.999996	-0.006
-20	708.999996	-0.006	710.999999	-0.001
-10	709.000003	0.004	710.999996	-0.006
0	708.999995	-0.007	710.999997	-0.004
10	708.999999	-0.001	710.999998	-0.003
20	708.999996	-0.006	710.999995	-0.007
30	709.000001	0.001	711.000005	0.007
40	709.000002	0.003	710.999995	-0.007
50	708.999998	-0.003	710.999998	-0.003
60	708.999997	-0.004	711.000005	0.007
70	708.999998	-0.003	711.000001	0.001
80	709.000001	0.001	710.999995	-0.007
85	708.999998	-0.003	711.000004	0.006

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)
3.4	1710.699997	-0.002	1779.300004	0.002
4.0	1710.700001	0.001	1779.300002	0.001
4.6	1710.699996	-0.002	1779.300005	0.003

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.699997	-0.002	1779.300005	0.003
-30	1710.699996	-0.002	1779.300003	0.002
-20	1710.699997	-0.002	1779.299995	-0.003
-10	1710.700002	0.001	1779.299997	-0.002
0	1710.699997	-0.002	1779.300001	0.001
10	1710.700005	0.003	1779.300004	0.002
20	1710.699997	-0.002	1779.299998	-0.001
30	1710.699995	-0.003	1779.299996	-0.002
40	1710.700005	0.003	1779.300001	0.001
50	1710.699999	-0.001	1779.299999	-0.001
60	1710.699995	-0.003	1779.299998	-0.001
70	1710.699999	-0.001	1779.299998	-0.001
80	1710.700005	0.003	1779.300005	0.003
85	1710.700004	0.002	1779.300003	0.002

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)
3.4	1711.499997	-0.002	1778.500005	0.003
4.0	1711.500001	0.001	1778.500003	0.002
4.6	1711.499997	-0.002	1778.500001	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1711.499999	-0.001	1778.499996	-0.002
-30	1711.500005	0.003	1778.500001	0.001
-20	1711.500004	0.002	1778.500003	0.002
-10	1711.500002	0.001	1778.500005	0.003
0	1711.500005	0.003	1778.499998	-0.001
10	1711.500003	0.002	1778.499999	-0.001
20	1711.500001	0.001	1778.499995	-0.003
30	1711.500001	0.001	1778.499998	-0.001
40	1711.499995	-0.003	1778.500005	0.003
50	1711.499996	-0.002	1778.500001	0.001
60	1711.499999	-0.001	1778.500001	0.001
70	1711.499997	-0.002	1778.500005	0.003
80	1711.500002	0.001	1778.500003	0.002
85	1711.500002	0.001	1778.500002	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	1712.500001	0.001	1777.499998	-0.001
4.0	1712.499999	-0.001	1777.500003	0.002
4.6	1712.499999	-0.001	1777.500003	0.002

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.499995	-0.003	1777.499995	-0.003
-30	1712.500001	0.001	1777.500002	0.001
-20	1712.499996	-0.002	1777.499999	-0.001
-10	1712.500002	0.001	1777.500001	0.001
0	1712.500001	0.001	1777.499998	-0.001
10	1712.500001	0.001	1777.500002	0.001
20	1712.500005	0.003	1777.499997	-0.002
30	1712.500001	0.001	1777.499999	-0.001
40	1712.499997	-0.002	1777.500004	0.002
50	1712.499995	-0.003	1777.500003	0.002
60	1712.500001	0.001	1777.499998	-0.001
70	1712.499995	-0.003	1777.499998	-0.001
80	1712.499996	-0.002	1777.499998	-0.001
85	1712.500004	0.002	1777.499999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	1715.000003	0.002	1774.999999	-0.001
4.0	1715.000004	0.002	1775.000005	0.003
4.6	1715.000004	0.002	1775.000004	0.002

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1714.999996	-0.002	1774.999997	-0.002
-30	1715.000001	0.001	1774.999999	-0.001
-20	1714.999999	-0.001	1775.000001	0.001
-10	1715.000005	0.003	1775.000003	0.002
0	1714.999999	-0.001	1774.999996	-0.002
10	1714.999999	-0.001	1774.999999	-0.001
20	1715.000004	0.002	1775.000002	0.001
30	1715.000005	0.003	1775.000002	0.001
40	1714.999996	-0.002	1775.000005	0.003
50	1714.999998	-0.001	1775.000001	0.001
60	1715.000005	0.003	1775.000002	0.001
70	1715.000004	0.002	1774.999995	-0.003
80	1715.000003	0.002	1775.000005	0.003
85	1715.000005	0.003	1774.999997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	1717.500003	0.002	1772.499996	-0.002
4.0	1717.499997	-0.002	1772.499997	-0.002
4.6	1717.499998	-0.001	1772.500001	0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1717.499999	-0.001	1772.499995	-0.003
-30	1717.499996	-0.002	1772.499996	-0.002
-20	1717.500002	0.001	1772.499999	-0.001
-10	1717.499996	-0.002	1772.499995	-0.003
0	1717.499997	-0.002	1772.500002	0.001
10	1717.499996	-0.002	1772.499995	-0.003
20	1717.499996	-0.002	1772.499999	-0.001
30	1717.499995	-0.003	1772.500001	0.001
40	1717.500001	0.001	1772.500004	0.002
50	1717.499997	-0.002	1772.499997	-0.002
60	1717.500002	0.001	1772.499999	-0.001
70	1717.499997	-0.002	1772.499999	-0.001
80	1717.499999	-0.001	1772.499996	-0.002
85	1717.499995	-0.003	1772.500005	0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	1719.999995	-0.003	1770.000001	0.001
4.0	1720.000003	0.002	1770.000002	0.001
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. (°C)	LTE Band 66			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1719.999997	-0.002	1769.999997	-0.002
-30	1720.000003	0.002	1769.999998	-0.001
-20	1719.999997	-0.002	1769.999997	-0.002
-10	1720.000005	0.003	1769.999998	-0.001
0	1719.999995	-0.003	1770.000004	0.002
10	1720.000003	0.002	1770.000005	0.003
20	1719.999999	-0.001	1769.999996	-0.002
30	1719.999999	-0.001	1769.999998	-0.001
40	1720.000004	0.002	1769.999999	-0.001
50	1720.000005	0.003	1769.999997	-0.002
60	1720.000003	0.002	1770.000003	0.002
70	1719.999998	-0.001	1769.999996	-0.002
80	1720.000002	0.001	1769.999996	-0.002
85	1719.999997	-0.002	1770.000005	0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	665.499995	-0.008	695.499996	-0.006
4.0	665.500001	0.002	695.499995	-0.007
4.6	665.499995	-0.008	695.499995	-0.007

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	665.499995	-0.008	695.499997	-0.004
-30	665.500001	0.002	695.499998	-0.003
-20	665.499999	-0.002	695.500002	0.003
-10	665.500001	0.002	695.500002	0.003
0	665.499996	-0.006	695.499996	-0.006
10	665.500005	0.008	695.499996	-0.006
20	665.499999	-0.002	695.499995	-0.007
30	665.499995	-0.008	695.500003	0.004
40	665.499995	-0.008	695.499996	-0.006
50	665.500003	0.005	695.499998	-0.003
60	665.500005	0.008	695.500005	0.007
70	665.499995	-0.008	695.499996	-0.006
80	665.499997	-0.005	695.499995	-0.007
85	665.500001	0.002	695.499996	-0.006

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	667.999999	-0.001	693.000002	0.003
4.0	667.999996	-0.006	693.000002	0.003
4.6	667.999996	-0.006	692.999999	-0.001

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	667.999995	-0.007	693.000002	0.003
-30	667.999999	-0.001	692.999997	-0.004
-20	668.000005	0.007	693.000002	0.003
-10	668.000002	0.003	692.999998	-0.003
0	667.999998	-0.003	693.000002	0.003
10	667.999999	-0.001	692.999995	-0.007
20	667.999998	-0.003	693.000003	0.004
30	667.999997	-0.004	693.000001	0.001
40	667.999997	-0.004	692.999997	-0.004
50	667.999995	-0.007	692.999995	-0.007
60	668.000001	0.001	692.999995	-0.007
70	668.000005	0.007	692.999999	-0.001
80	668.000002	0.003	693.000003	0.004
85	667.999998	-0.003	693.000004	0.006

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	670.499995	-0.007	690.500003	0.004
4.0	670.499998	-0.003	690.500005	0.007
4.6	670.500005	0.007	690.499998	-0.003

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	670.500002	0.003	690.499996	-0.006
-30	670.499996	-0.006	690.500002	0.003
-20	670.499999	-0.001	690.500005	0.007
-10	670.500001	0.001	690.500005	0.007
0	670.499995	-0.007	690.500004	0.006
10	670.500001	0.001	690.499996	-0.006
20	670.500003	0.004	690.500004	0.006
30	670.500003	0.004	690.499999	-0.001
40	670.500005	0.007	690.500003	0.004
50	670.499996	-0.006	690.500003	0.004
60	670.500005	0.007	690.500005	0.007
70	670.500005	0.007	690.500002	0.003
80	670.500004	0.006	690.500005	0.007
85	670.500004	0.006	690.499998	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 71			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.4	673.000004	0.006	688.000002	0.003
4.0	673.000005	0.007	688.000001	0.001
4.6	673.000001	0.001	688.000004	0.006

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

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	673.000001	0.001	687.999995	-0.007
-30	672.999996	-0.006	688.000004	0.006
-20	672.999998	-0.003	687.999996	-0.006
-10	673.000003	0.004	687.999999	-0.001
0	672.999997	-0.004	688.000004	0.006
10	673.000001	0.001	688.000003	0.004
20	673.000002	0.003	688.000001	0.001
30	672.999998	-0.003	687.999998	-0.003
40	673.000002	0.003	687.999997	-0.004
50	673.000003	0.004	688.000001	0.001
60	673.000003	0.004	688.000005	0.007
70	673.000005	0.007	687.999997	-0.004
80	673.000001	0.001	687.999998	-0.003
85	672.999998	-0.003	688.000001	0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Limits of Occupied Bandwidth Measurement

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

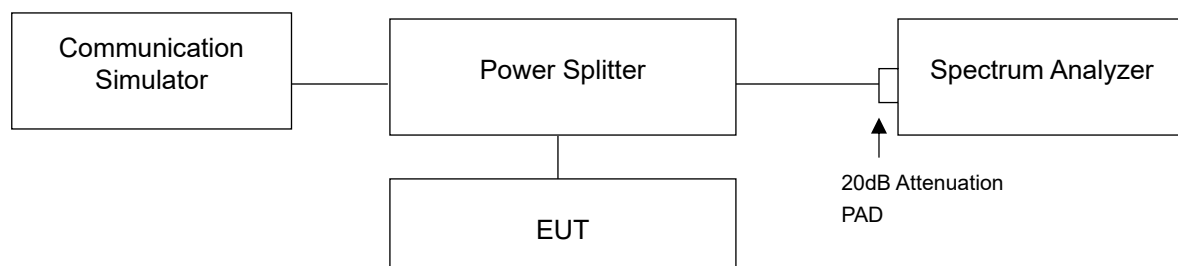
4.4.2 Test Procedure

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

- 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.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- 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.
- 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.
- Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- 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).
- 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.
- 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.
- 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.

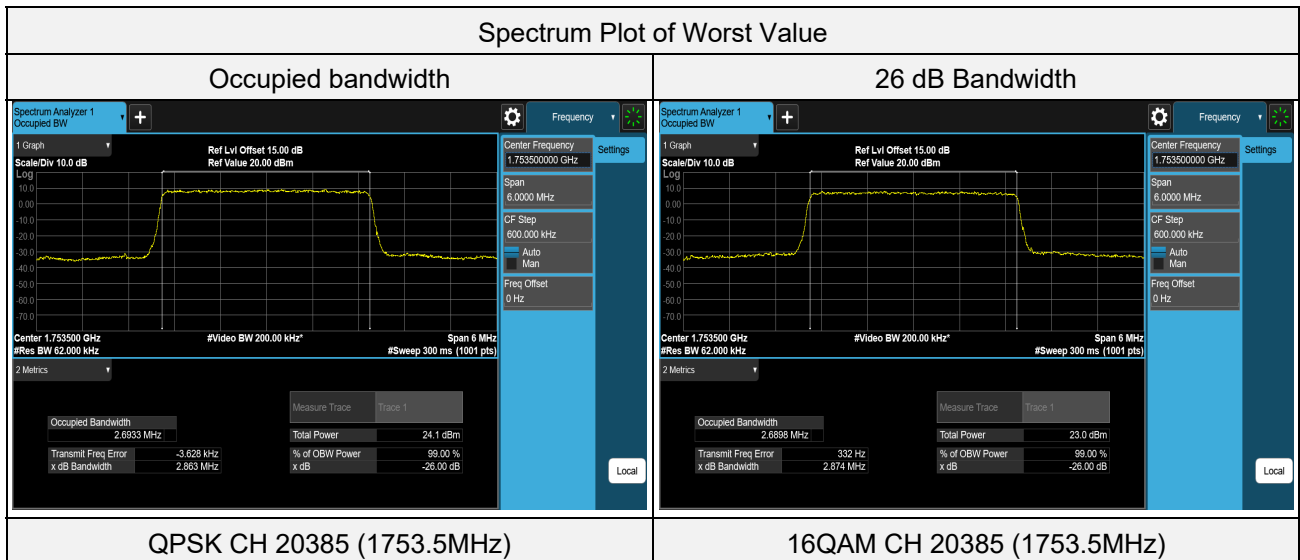
4.4.3 Test Setup



LTE Band 4 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19965	1711.5	2.6901	2.857
QPSK	20175	1732.5	2.6927	2.861
QPSK	20385	1753.5	2.6933	2.863
16QAM	19965	1711.5	2.6875	2.870
16QAM	20175	1732.5	2.6903	2.865
16QAM	20385	1753.5	2.6898	2.874
64QAM	19965	1711.5	2.6900	2.861
64QAM	20175	1732.5	2.6907	2.863
64QAM	20385	1753.5	2.6901	2.860

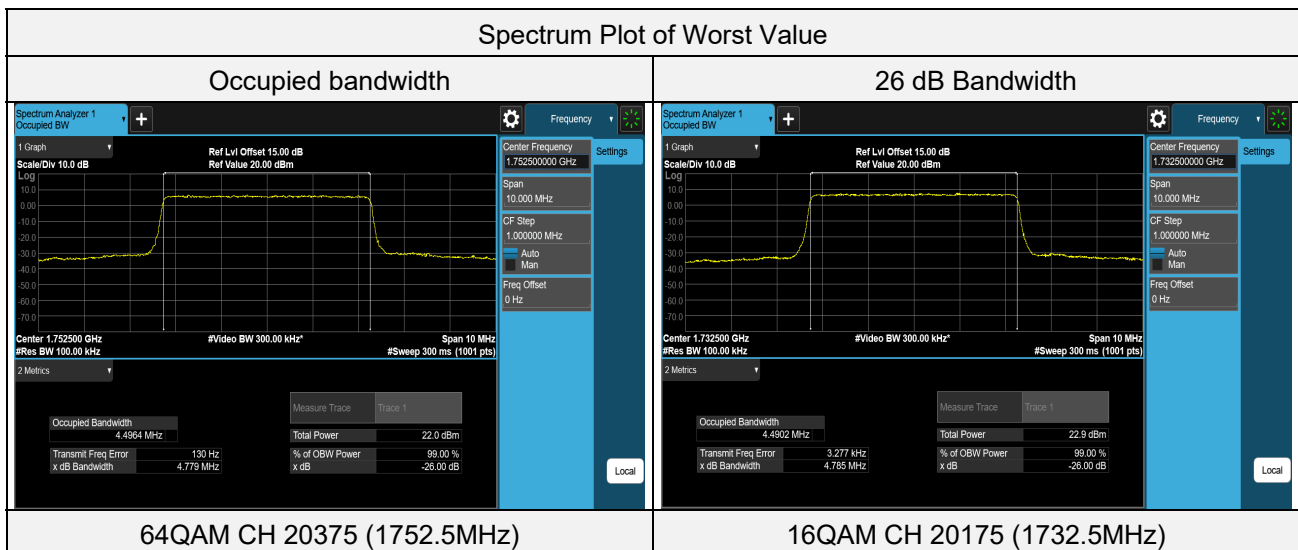
NOTE: For the test plots please refer to the below pages.



LTE Band 4 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19975	1712.5	4.4959	4.784
QPSK	20175	1732.5	4.4929	4.778
QPSK	20375	1752.5	4.4936	4.781
16QAM	19975	1712.5	4.4918	4.772
16QAM	20175	1732.5	4.4902	4.785
16QAM	20375	1752.5	4.4892	4.769
64QAM	19975	1712.5	4.4928	4.778
64QAM	20175	1732.5	4.4926	4.782
64QAM	20375	1752.5	4.4964	4.779

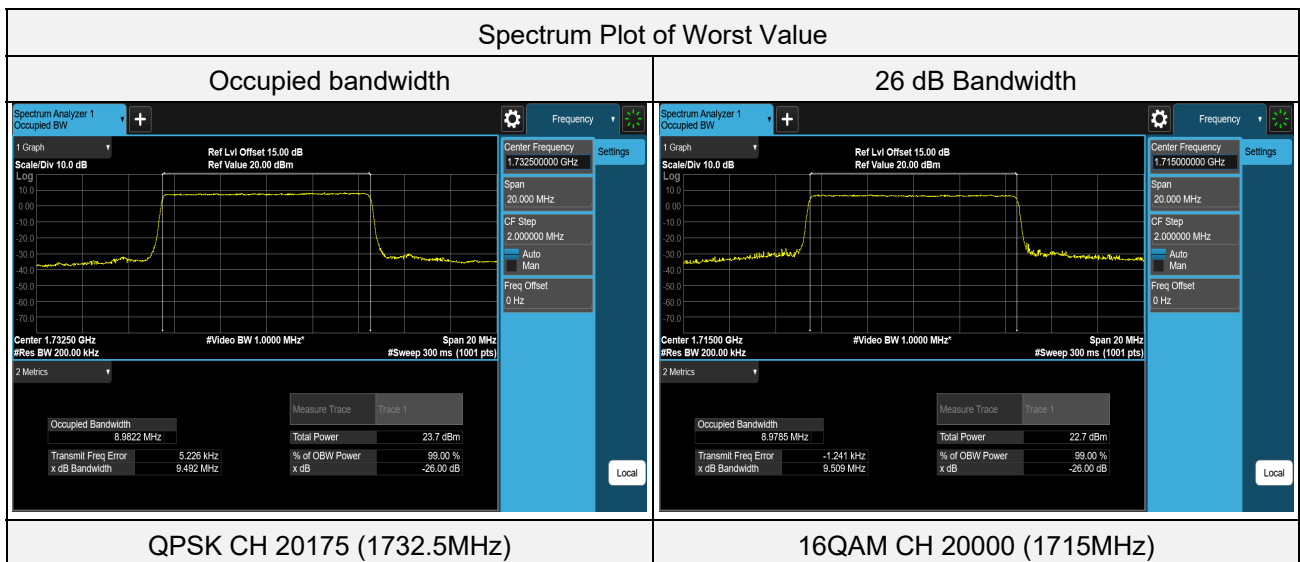
NOTE: For the test plots please refer to the below pages.



LTE Band 4 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20000	1715	8.9800	9.507
QPSK	20175	1732.5	8.9822	9.492
QPSK	20350	1750	8.9753	9.496
16QAM	20000	1715	8.9785	9.509
16QAM	20175	1732.5	8.9776	9.501
16QAM	20350	1750	8.9800	9.501
64QAM	20000	1715	8.9803	9.509
64QAM	20175	1732.5	8.9804	9.505
64QAM	20350	1750	8.9787	9.505

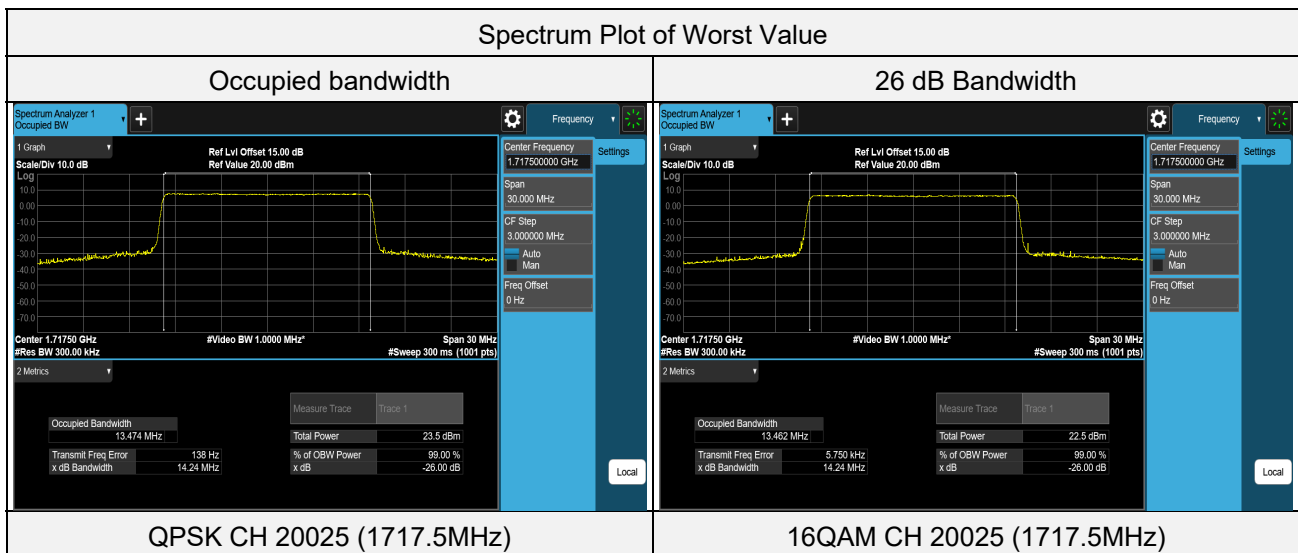
NOTE: For the test plots please refer to the below pages.



LTE Band 4 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20025	1717.5	13.4739	14.236
QPSK	20175	1732.5	13.4685	14.224
QPSK	20325	1747.5	13.4664	14.222
16QAM	20025	1717.5	13.4616	14.244
16QAM	20175	1732.5	13.4558	14.241
16QAM	20325	1747.5	13.4495	14.229
64QAM	20025	1717.5	13.4563	14.229
64QAM	20175	1732.5	13.4495	14.220
64QAM	20325	1747.5	13.4469	14.230

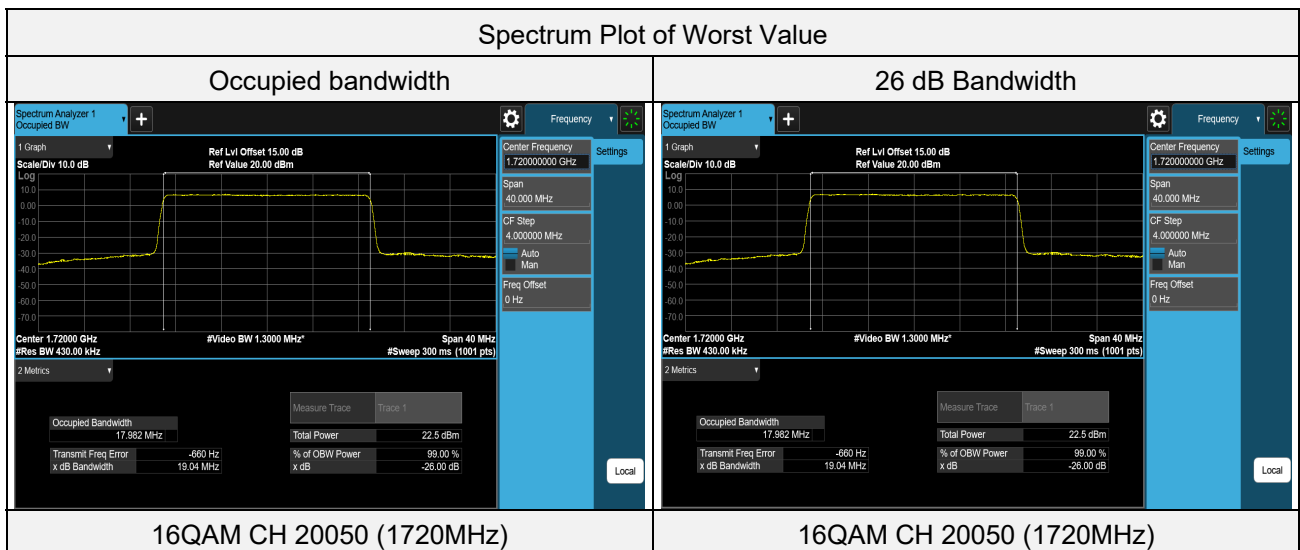
NOTE: For the test plots please refer to the below pages.



LTE Band 4 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20050	1720	17.9608	19.033
QPSK	20175	1732.5	17.9478	19.018
QPSK	20300	1745	17.9382	19.019
16QAM	20050	1720	17.9819	19.036
16QAM	20175	1732.5	17.9664	19.025
16QAM	20300	1745	17.9482	19.035
64QAM	20050	1720	17.9610	19.033
64QAM	20175	1732.5	17.9557	19.020
64QAM	20300	1745	17.9463	19.030

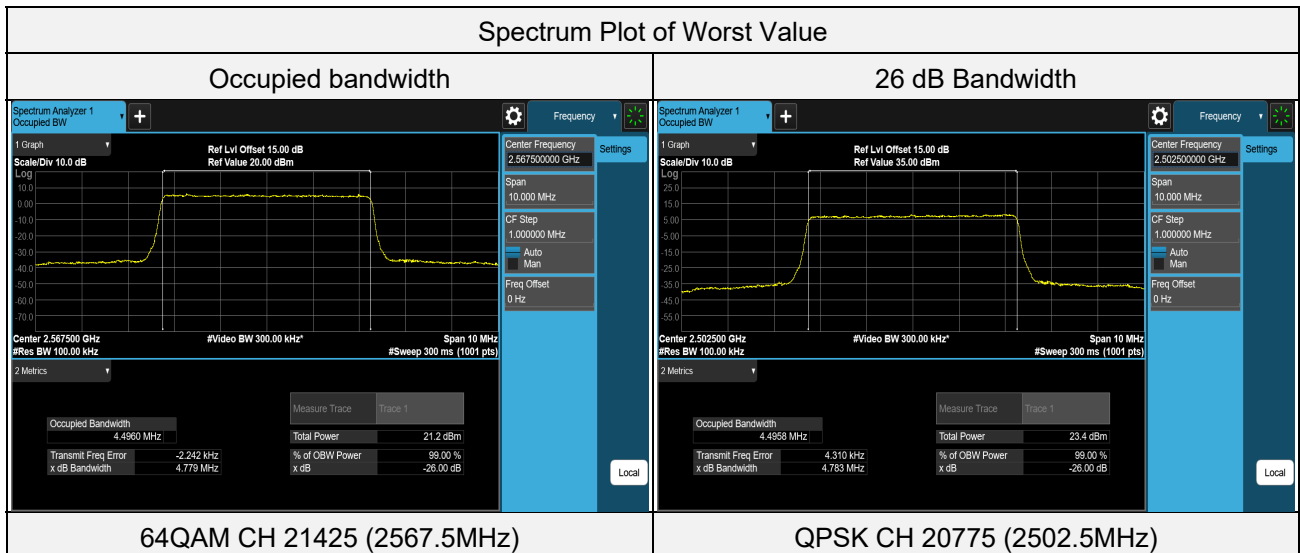
NOTE: For the test plots please refer to the below pages.



LTE Band 7 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20775	2502.5	4.4958	4.783
QPSK	21100	2535	4.4926	4.769
QPSK	21425	2567.5	4.4918	4.775
16QAM	20775	2502.5	4.4901	4.772
16QAM	21100	2535	4.4939	4.770
16QAM	21425	2567.5	4.4917	4.767
64QAM	20775	2502.5	4.4952	4.776
64QAM	21100	2535	4.4920	4.764
64QAM	21425	2567.5	4.4960	4.779

NOTE: For the test plots please refer to the below pages.

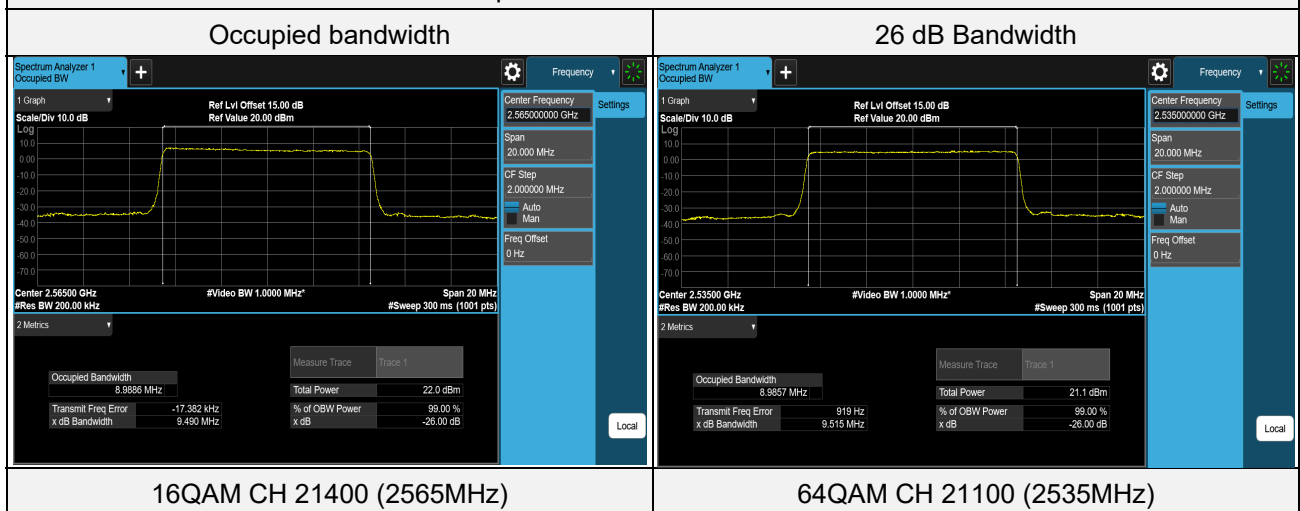


LTE Band 7 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20800	2505	8.9729	9.483
QPSK	21100	2535	8.9845	9.503
QPSK	21400	2565	8.9822	9.500
16QAM	20800	2505	8.9758	9.478
16QAM	21100	2535	8.9847	9.501
16QAM	21400	2565	8.9886	9.490
64QAM	20800	2505	8.9716	9.491
64QAM	21100	2535	8.9857	9.515
64QAM	21400	2565	8.9845	9.509

NOTE: For the test plots please refer to the below pages.

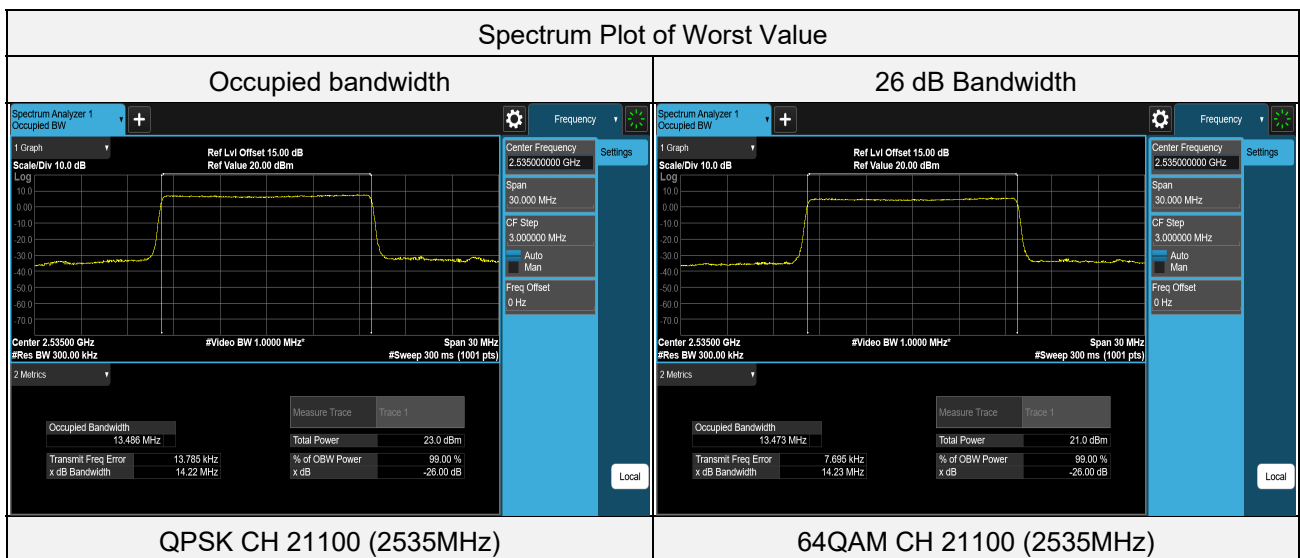
Spectrum Plot of Worst Value



LTE Band 7 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20825	2507.5	13.4468	14.203
QPSK	21100	2535	13.4856	14.225
QPSK	21375	2562.5	13.4709	14.198
16QAM	20825	2507.5	13.4351	14.201
16QAM	21100	2535	13.4760	14.233
16QAM	21375	2562.5	13.4518	14.201
64QAM	20825	2507.5	13.4270	14.194
64QAM	21100	2535	13.4729	14.234
64QAM	21375	2562.5	13.4511	14.200

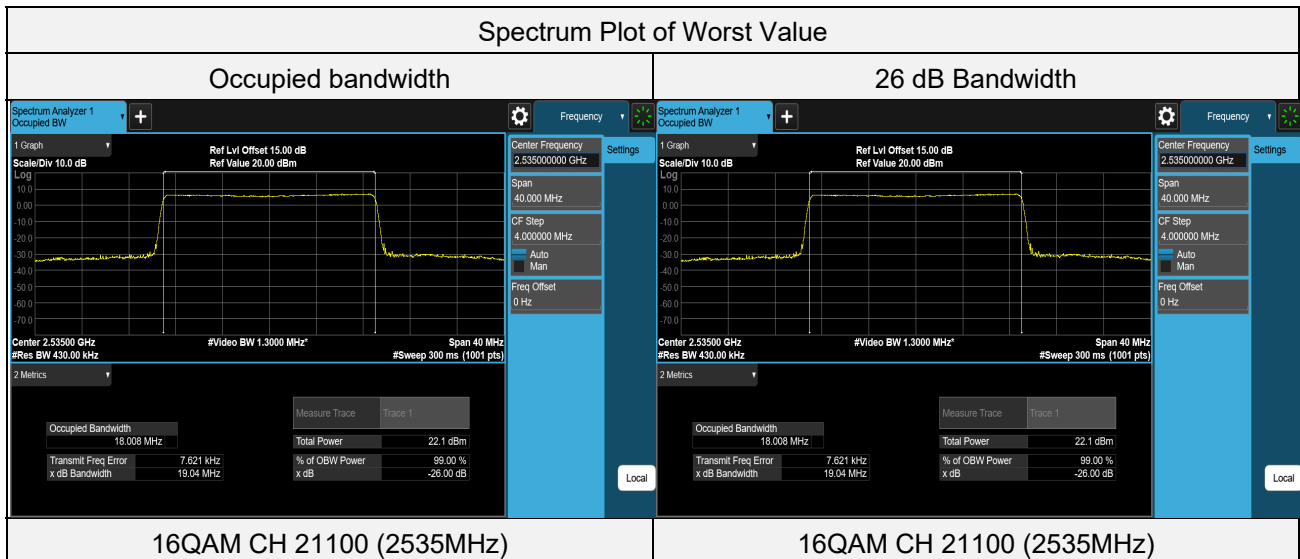
NOTE: For the test plots please refer to the below pages.



LTE Band 7 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20850	2510	17.8697	18.984
QPSK	21100	2535	18.0004	19.033
QPSK	21350	2560	17.8973	18.976
16QAM	20850	2510	17.8944	18.989
16QAM	21100	2535	18.0076	19.038
16QAM	21350	2560	17.9095	18.980
64QAM	20850	2510	17.8807	18.979
64QAM	21100	2535	18.0035	19.033
64QAM	21350	2560	17.9054	18.977

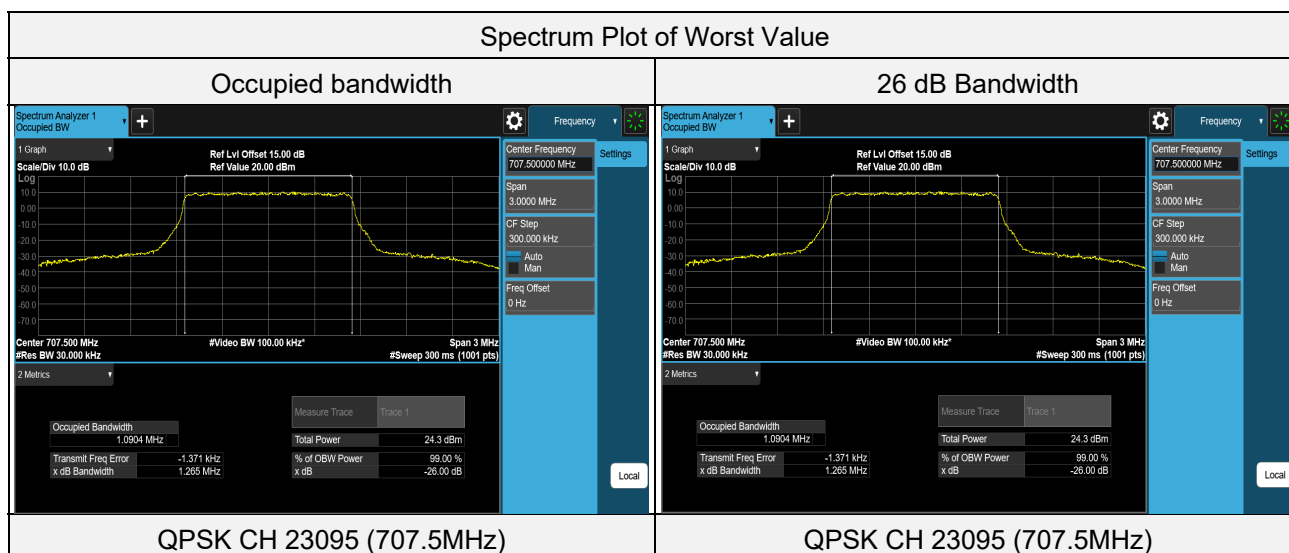
NOTE: For the test plots please refer to the below pages.



LTE Band 12 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23017	699.7	1.0857	1.242
QPSK	23095	707.5	1.0904	1.265
QPSK	23173	715.3	1.0889	1.248
16QAM	23017	699.7	1.0865	1.250
16QAM	23095	707.5	1.0870	1.249
16QAM	23173	715.3	1.0859	1.250
64QAM	23017	699.7	1.0885	1.248
64QAM	23095	707.5	1.0884	1.251
64QAM	23173	715.3	1.0870	1.257

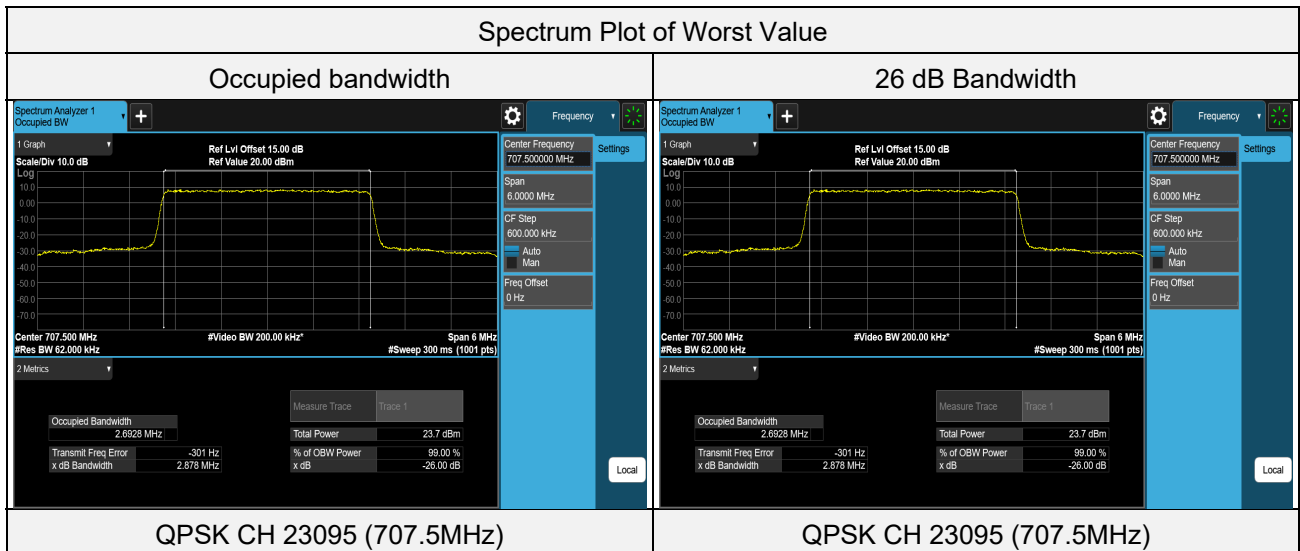
NOTE: For the test plots please refer to the below pages.



LTE Band 12 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23025	700.5	2.6923	2.863
QPSK	23095	707.5	2.6928	2.878
QPSK	23165	714.5	2.6901	2.858
16QAM	23025	700.5	2.6913	2.876
16QAM	23095	707.5	2.6901	2.870
16QAM	23165	714.5	2.6864	2.865
64QAM	23025	700.5	2.6928	2.860
64QAM	23095	707.5	2.6925	2.862
64QAM	23165	714.5	2.6877	2.852

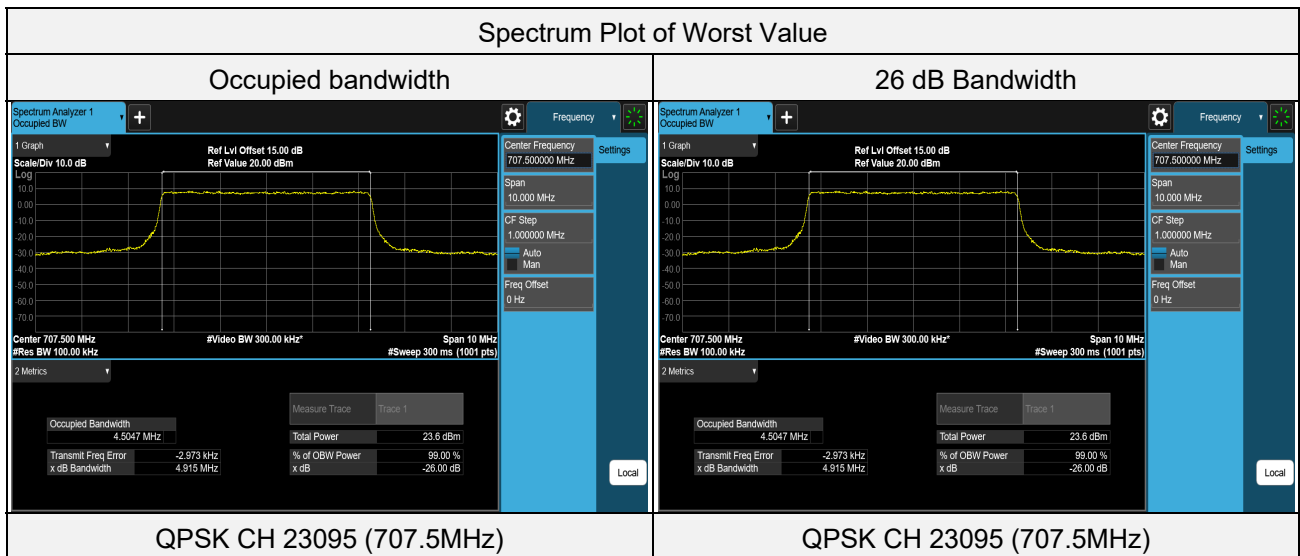
NOTE: For the test plots please refer to the below pages.



LTE Band 12 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23035	701.5	4.4917	4.858
QPSK	23095	707.5	4.5047	4.915
QPSK	23155	713.5	4.4873	4.839
16QAM	23035	701.5	4.4860	4.857
16QAM	23095	707.5	4.5021	4.878
16QAM	23155	713.5	4.4872	4.841
64QAM	23035	701.5	4.4894	4.844
64QAM	23095	707.5	4.5031	4.900
64QAM	23155	713.5	4.4925	4.856

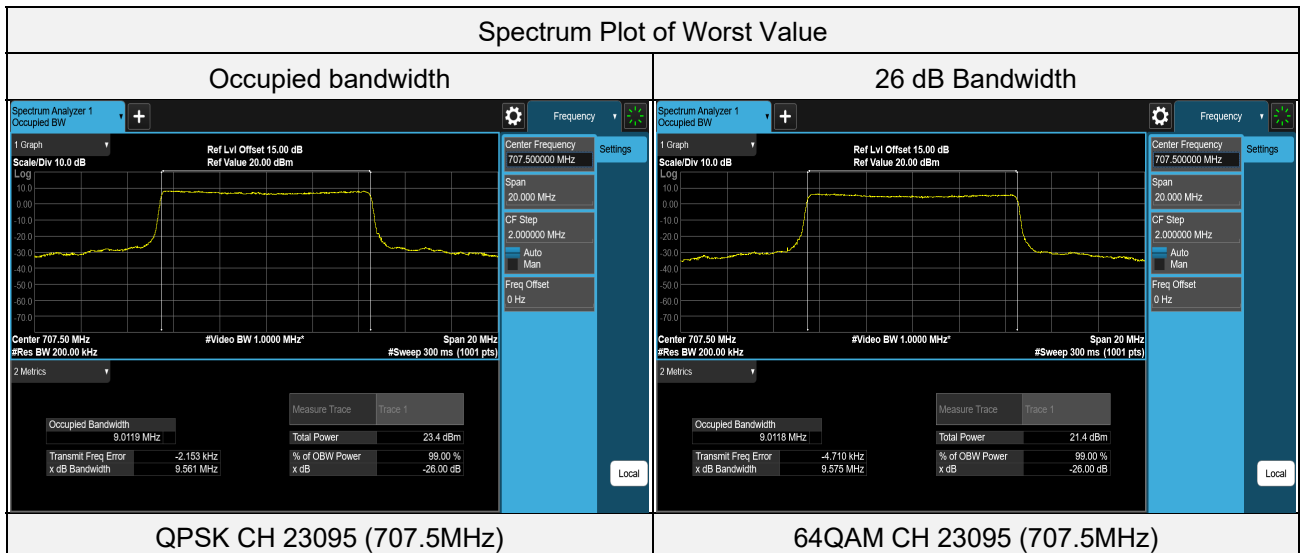
NOTE: For the test plots please refer to the below pages.



LTE Band 12 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23060	704	8.9639	9.513
QPSK	23095	707.5	9.0119	9.561
QPSK	23130	711	8.9768	9.535
16QAM	23060	704	8.9614	9.496
16QAM	23095	707.5	9.0086	9.549
16QAM	23130	711	8.9734	9.518
64QAM	23060	704	8.9666	9.537
64QAM	23095	707.5	9.0118	9.575
64QAM	23130	711	8.9755	9.548

NOTE: For the test plots please refer to the below pages.



Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23755	706.5	4.4978	4.889
QPSK	23790	710	4.5009	4.868
QPSK	23825	713.5	4.4877	4.855
16QAM	23755	706.5	4.5003	4.871
16QAM	23790	710	4.4996	4.863
16QAM	23825	713.5	4.4857	4.834
64QAM	23755	706.5	4.5045	4.881
64QAM	23790	710	4.5015	4.862
64QAM	23825	713.5	4.4846	4.854

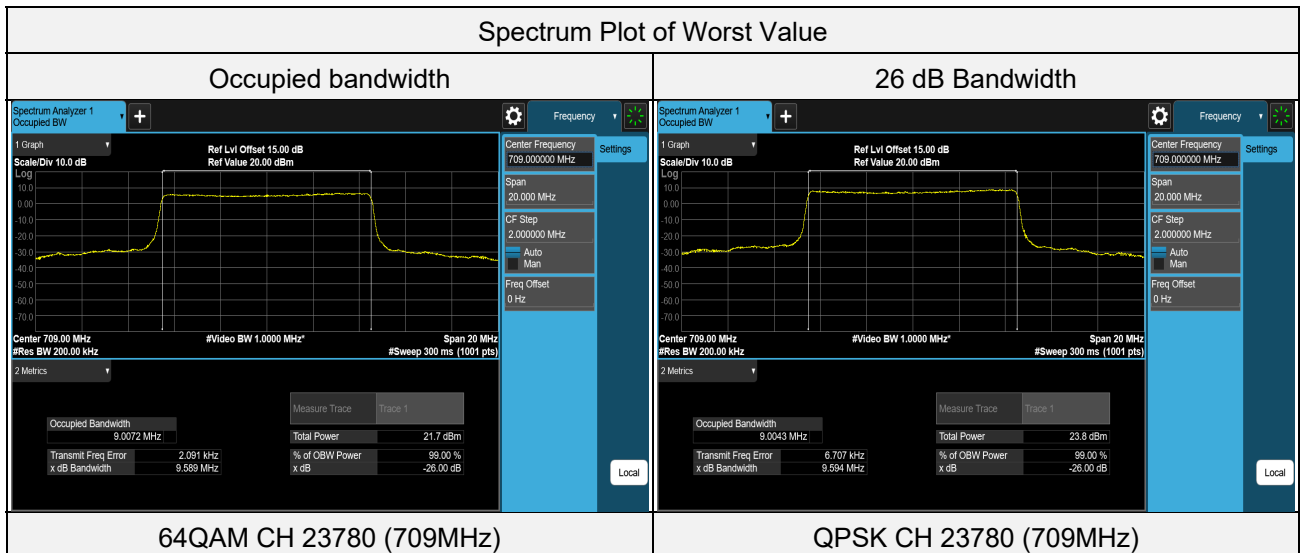
The figure displays two side-by-side spectrum analyzer plots for the 'Worst Value' signal. Both plots show a signal centered at 706.5 MHz with a 10 MHz span. The left plot is for 64QAM CH 23755, and the right plot is for QPSK CH 23755. Both plots show a signal with a 300 kHz video bandwidth and a 300 ms sweep. The left plot shows a signal with a 4.5045 MHz occupied bandwidth, while the right plot shows a signal with a 4.4978 MHz occupied bandwidth. The left plot also shows a 26 dB bandwidth of 4.881 MHz, while the right plot shows a 26 dB bandwidth of 4.889 MHz. The plots are labeled 'Spectrum Plot of Worst Value' at the top.

Signal	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
64QAM CH 23755 (706.5MHz)	4.5045	4.881
QPSK CH 23755 (706.5MHz)	4.4978	4.889

LTE Band 17 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23780	709	9.0043	9.594
QPSK	23790	710	8.9893	9.520
QPSK	23800	711	8.9774	9.541
16QAM	23780	709	9.0002	9.549
16QAM	23790	710	8.9919	9.536
16QAM	23800	711	8.9696	9.521
64QAM	23780	709	9.0072	9.589
64QAM	23790	710	8.9902	9.556
64QAM	23800	711	8.9758	9.533

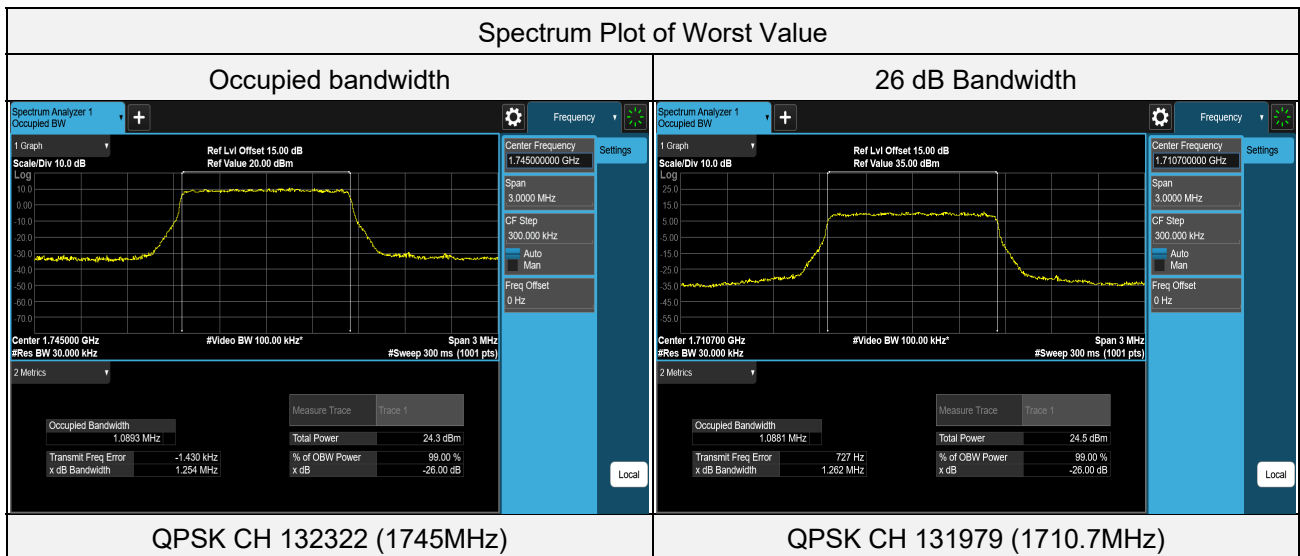
NOTE: For the test plots please refer to the below pages.



LTE Band 66 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	131979	1710.7	1.0881	1.262
QPSK	132322	1745	1.0893	1.254
QPSK	132665	1779.3	1.0889	1.258
16QAM	131979	1710.7	1.0870	1.255
16QAM	132322	1745	1.0870	1.248
16QAM	132665	1779.3	1.0877	1.251
64QAM	131979	1710.7	1.0877	1.252
64QAM	132322	1745	1.0875	1.253
64QAM	132665	1779.3	1.0883	1.254

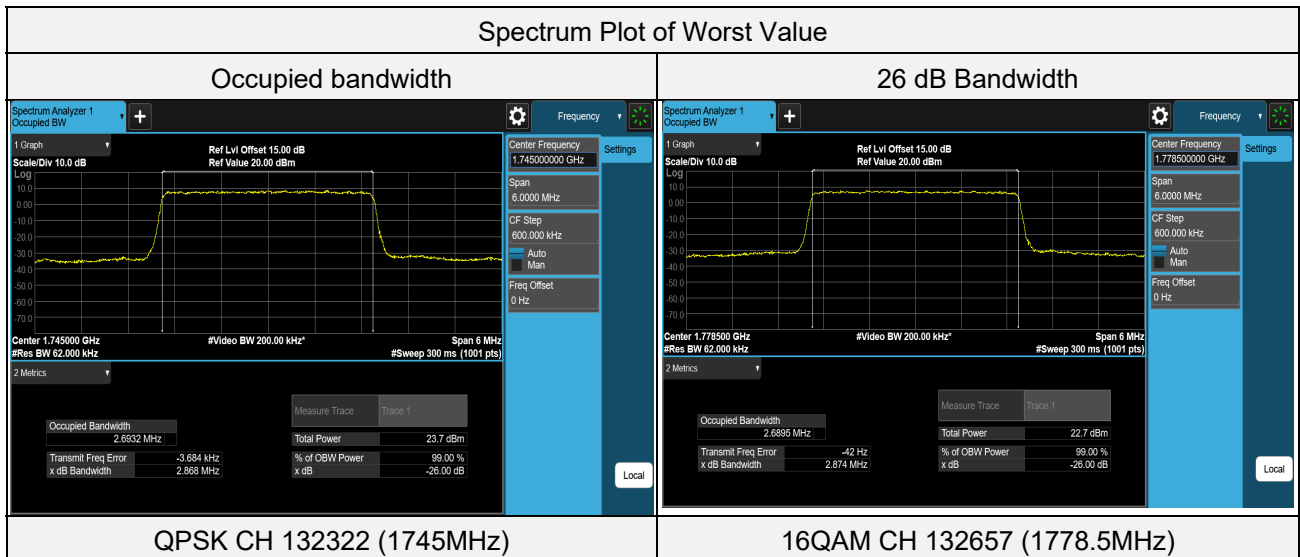
NOTE: For the test plots please refer to the below pages.



LTE Band 66 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	131987	1711.5	2.6918	2.870
QPSK	132322	1745	2.6932	2.868
QPSK	132657	1778.5	2.6886	2.861
16QAM	131987	1711.5	2.6925	2.862
16QAM	132322	1745	2.6919	2.859
16QAM	132657	1778.5	2.6895	2.874
64QAM	131987	1711.5	2.6910	2.863
64QAM	132322	1745	2.6926	2.865
64QAM	132657	1778.5	2.6921	2.860

NOTE: For the test plots please refer to the below pages.



Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	131997	1712.5	4.4971	4.867
QPSK	132322	1745	4.4956	4.861
QPSK	132647	1777.5	4.4966	4.860
16QAM	131997	1712.5	4.4910	4.866
16QAM	132322	1745	4.4916	4.882
16QAM	132647	1777.5	4.4935	4.875
64QAM	131997	1712.5	4.4979	4.868
64QAM	132322	1745	4.4996	4.862
64QAM	132647	1777.5	4.4983	4.873

Spectrum Plot of Worst Value

Occupied bandwidth

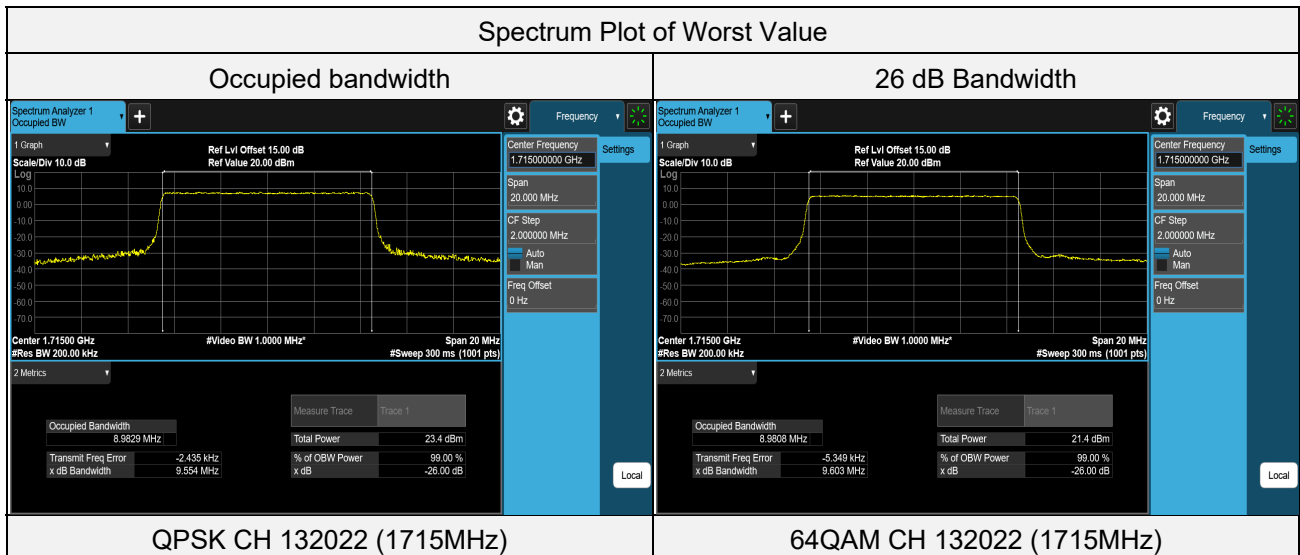
26 dB Bandwidth

Both plots show a signal centered at 1.745 GHz with a span of 10 MHz. The left plot shows a wider bandwidth (approx. 300 kHz) compared to the right plot (approx. 100 kHz).

LTE Band 66 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	132022	1715	8.9829	9.554
QPSK	132322	1745	8.9782	9.570
QPSK	132622	1775	8.9829	9.573
16QAM	132022	1715	8.9797	9.526
16QAM	132322	1745	8.9812	9.523
16QAM	132622	1775	8.9765	9.540
64QAM	132022	1715	8.9808	9.603
64QAM	132322	1745	8.9811	9.561
64QAM	132622	1775	8.9812	9.561

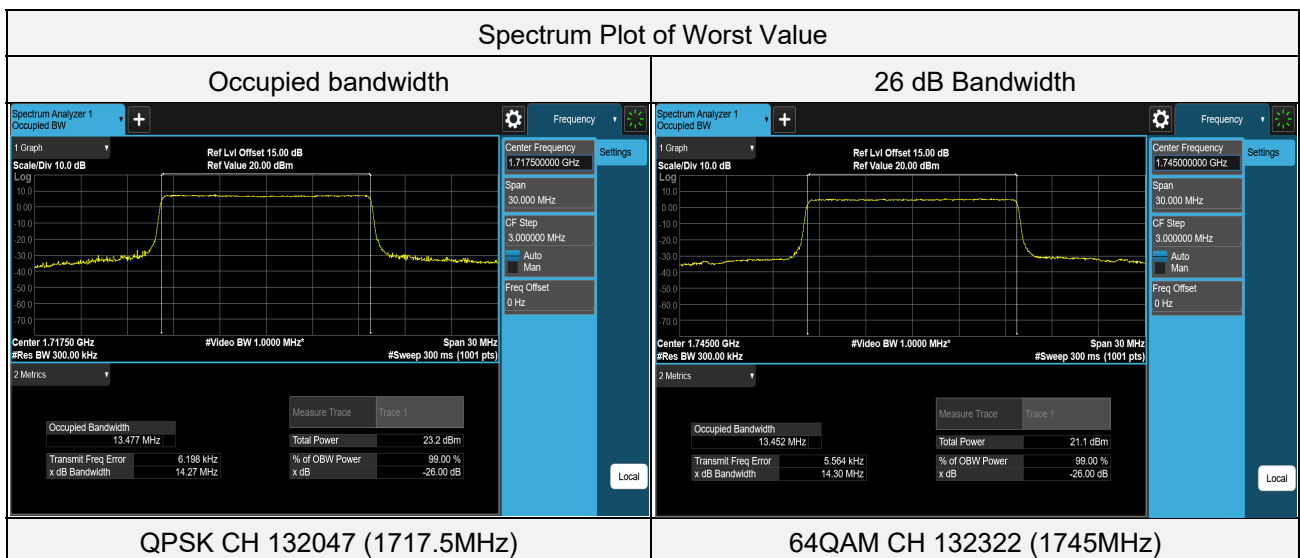
NOTE: For the test plots please refer to the below pages.



LTE Band 66 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	132047	1717.5	13.4772	14.270
QPSK	132322	1745	13.4717	14.256
QPSK	132597	1772.5	13.4603	14.261
16QAM	132047	1717.5	13.4634	14.291
16QAM	132322	1745	13.4495	14.266
16QAM	132597	1772.5	13.4559	14.266
64QAM	132047	1717.5	13.4593	14.288
64QAM	132322	1745	13.4516	14.301
64QAM	132597	1772.5	13.4501	14.279

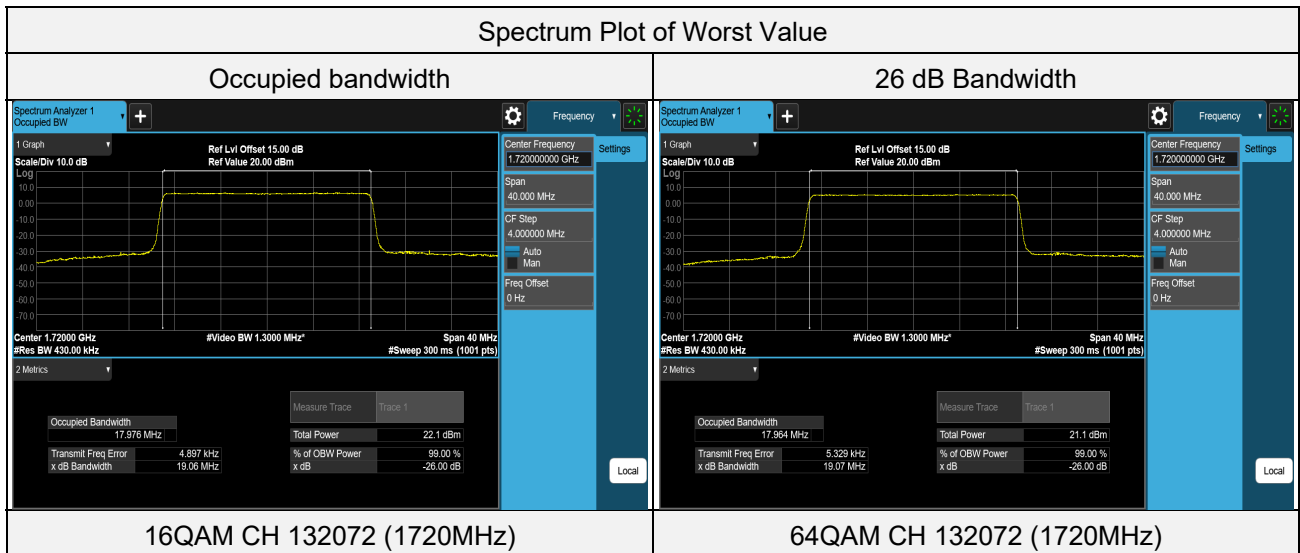
NOTE: For the test plots please refer to the below pages.



LTE Band 66 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	132072	1720	17.9663	19.047
QPSK	132322	1745	17.9457	19.051
QPSK	132572	1770	17.9478	19.046
16QAM	132072	1720	17.9764	19.060
16QAM	132322	1745	17.9499	19.042
16QAM	132572	1770	17.9619	19.036
64QAM	132072	1720	17.9635	19.066
64QAM	132322	1745	17.9504	19.046
64QAM	132572	1770	17.9546	19.058

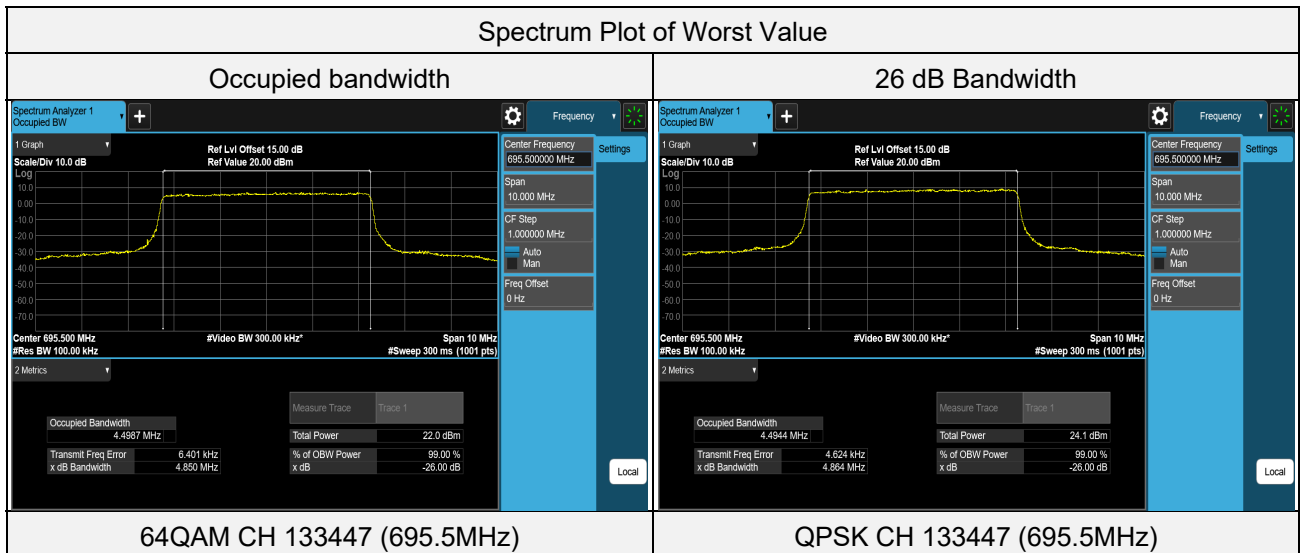
NOTE: For the test plots please refer to the below pages.



LTE Band 71 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	133147	665.5	4.4832	4.825
QPSK	133297	680.5	4.4891	4.857
QPSK	133447	695.5	4.4944	4.864
16QAM	133147	665.5	4.4801	4.834
16QAM	133297	680.5	4.4870	4.836
16QAM	133447	695.5	4.4920	4.859
64QAM	133147	665.5	4.4825	4.803
64QAM	133297	680.5	4.4926	4.852
64QAM	133447	695.5	4.4987	4.850

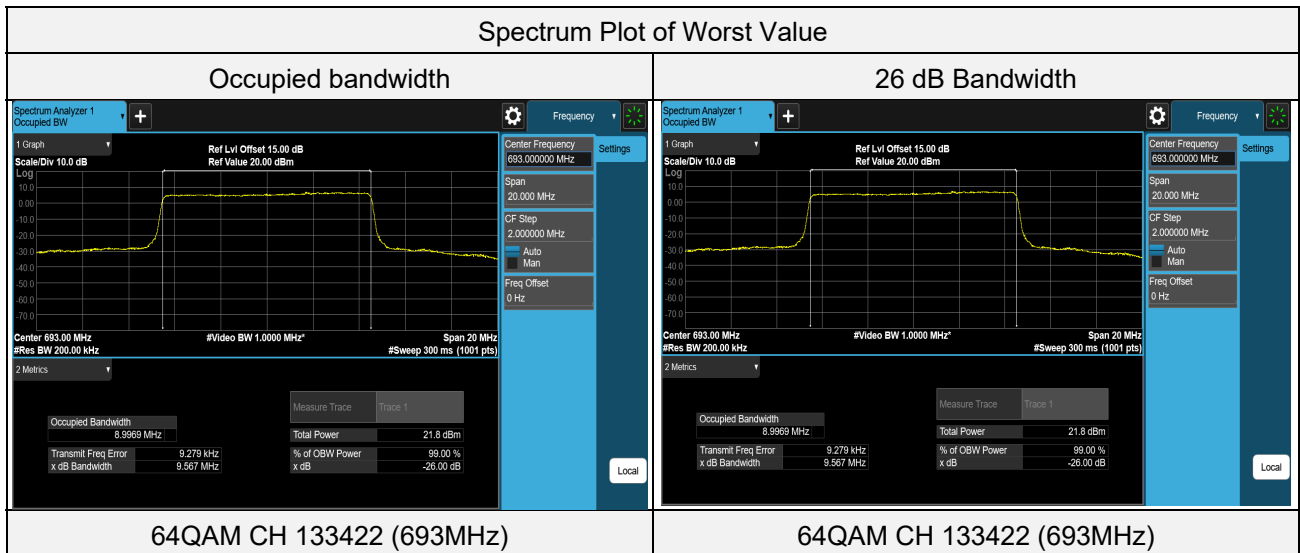
NOTE: For the test plots please refer to the below pages.



LTE Band 71 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	133172	668	8.9225	9.506
QPSK	133297	680.5	8.9446	9.496
QPSK	133422	693	8.9948	9.554
16QAM	133172	668	8.9171	9.499
16QAM	133297	680.5	8.9446	9.505
16QAM	133422	693	8.9945	9.540
64QAM	133172	668	8.9164	9.500
64QAM	133297	680.5	8.9454	9.511
64QAM	133422	693	8.9969	9.567

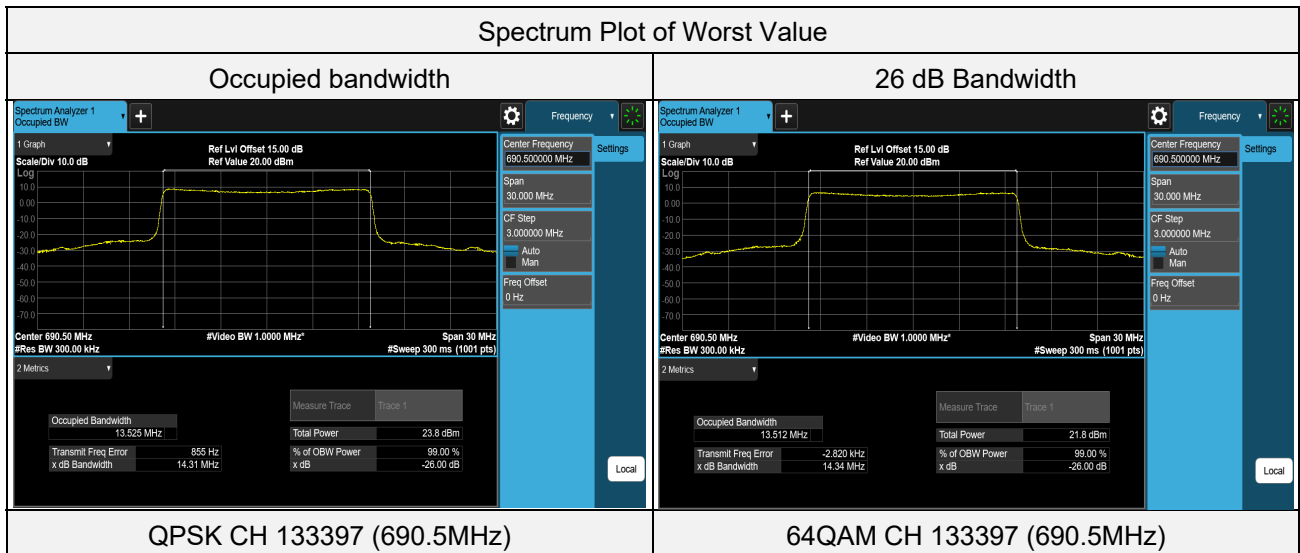
NOTE: For the test plots please refer to the below pages.



LTE Band 71 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	133197	670.5	13.4405	14.245
QPSK	133297	680.5	13.3878	14.203
QPSK	133397	690.5	13.5255	14.310
16QAM	133197	670.5	13.4301	14.250
16QAM	133297	680.5	13.3744	14.218
16QAM	133397	690.5	13.5149	14.311
64QAM	133197	670.5	13.4249	14.257
64QAM	133297	680.5	13.3691	14.203
64QAM	133397	690.5	13.5124	14.345

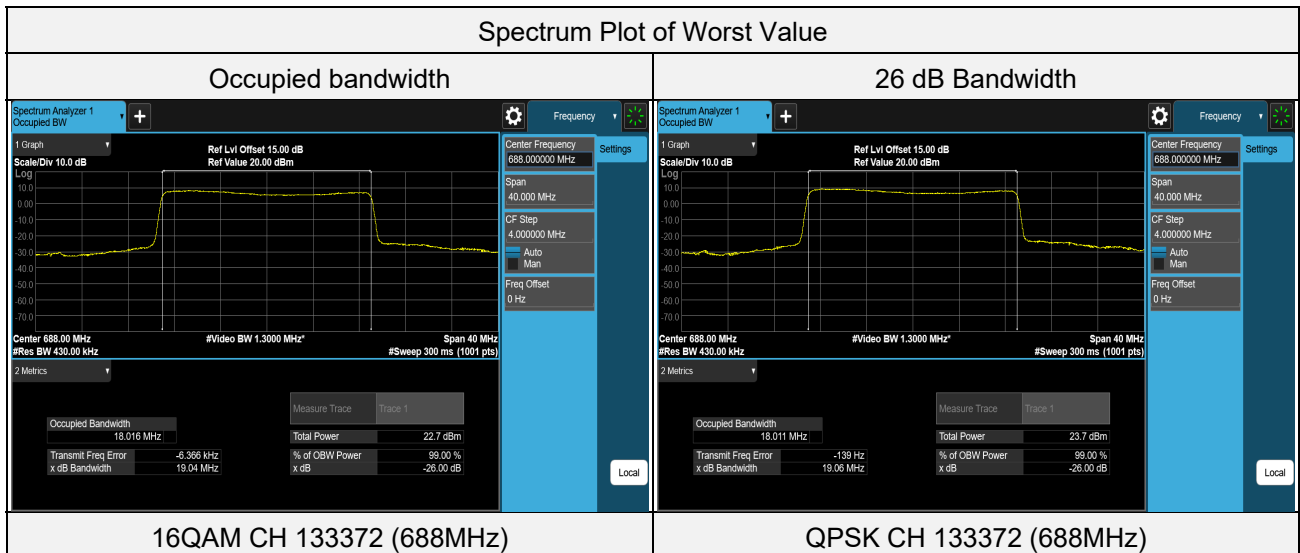
NOTE: For the test plots please refer to the below pages.



LTE Band 71 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	133222	673	17.9336	19.015
QPSK	133297	680.5	17.8617	18.978
QPSK	133372	688	18.0109	19.060
16QAM	133222	673	17.9473	19.010
16QAM	133297	680.5	17.8743	18.969
16QAM	133372	688	18.0156	19.041
64QAM	133222	673	17.9301	19.003
64QAM	133297	680.5	17.8696	18.986
64QAM	133372	688	18.0021	19.048

NOTE: For the test plots please refer to the below pages.



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.

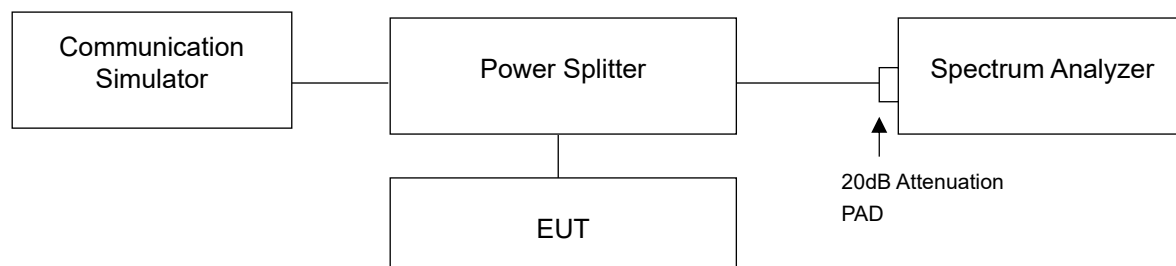
For LTE Band 7:

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

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.

4.5.2 Test Setup



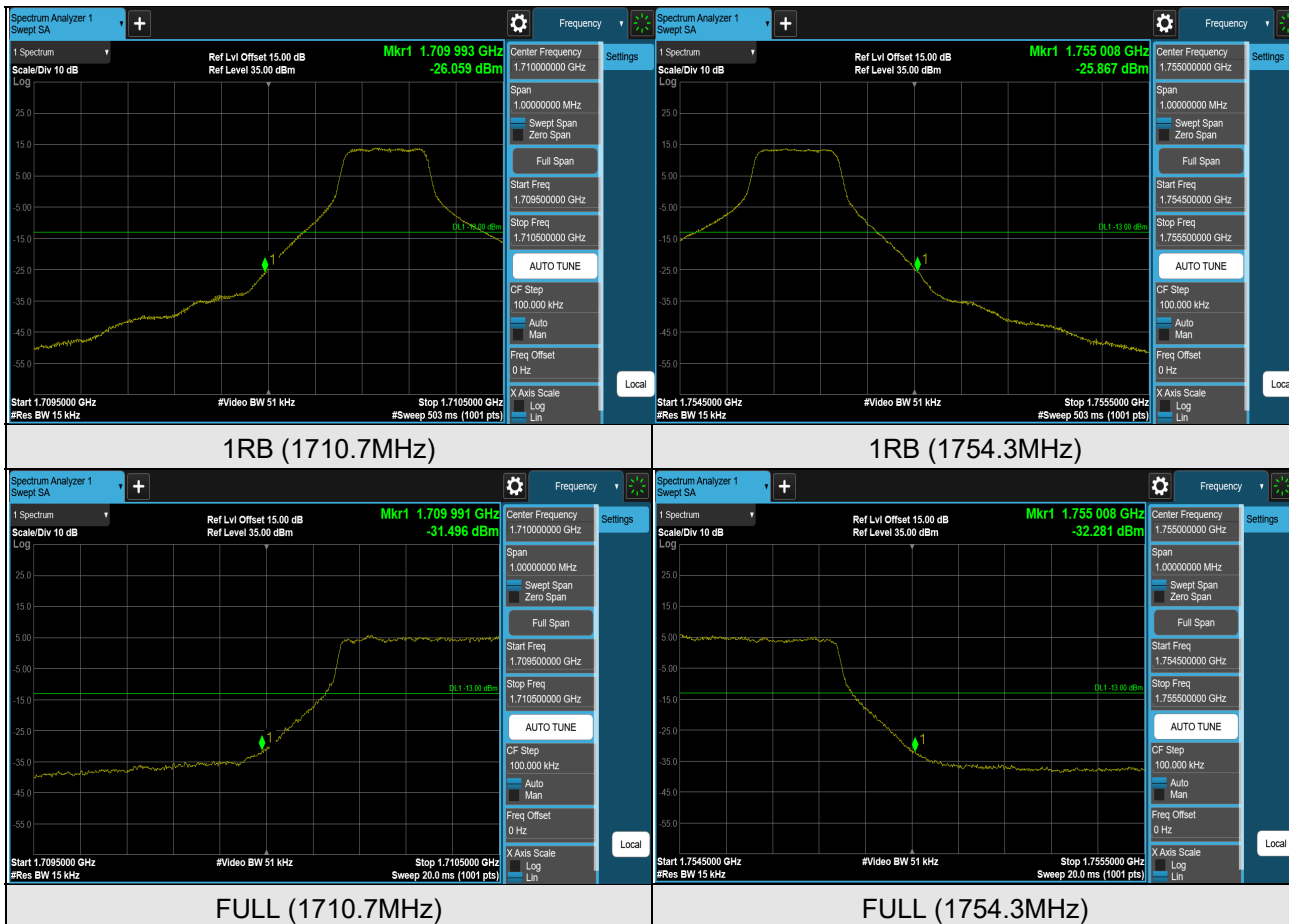
4.5.3 Test Procedures

- 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. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).
- c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- f. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- g. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
- h. Except LTE Band 12 measurement procedure refer 27.53(g).
- i. LTE Band 7 measurement, for 5 MHz and 10 MHz channel BW mode, extend the 1% range from 1M to 2M above and below the channel edge and then reduce the limit further by $10 \log (1000/100) = 10\text{dB}$ (i.e. total $-10 + -10 = -20\text{dB}$) to compensate for the integration from 100k to 1M.
- j. Record the max trace plot into the test report.

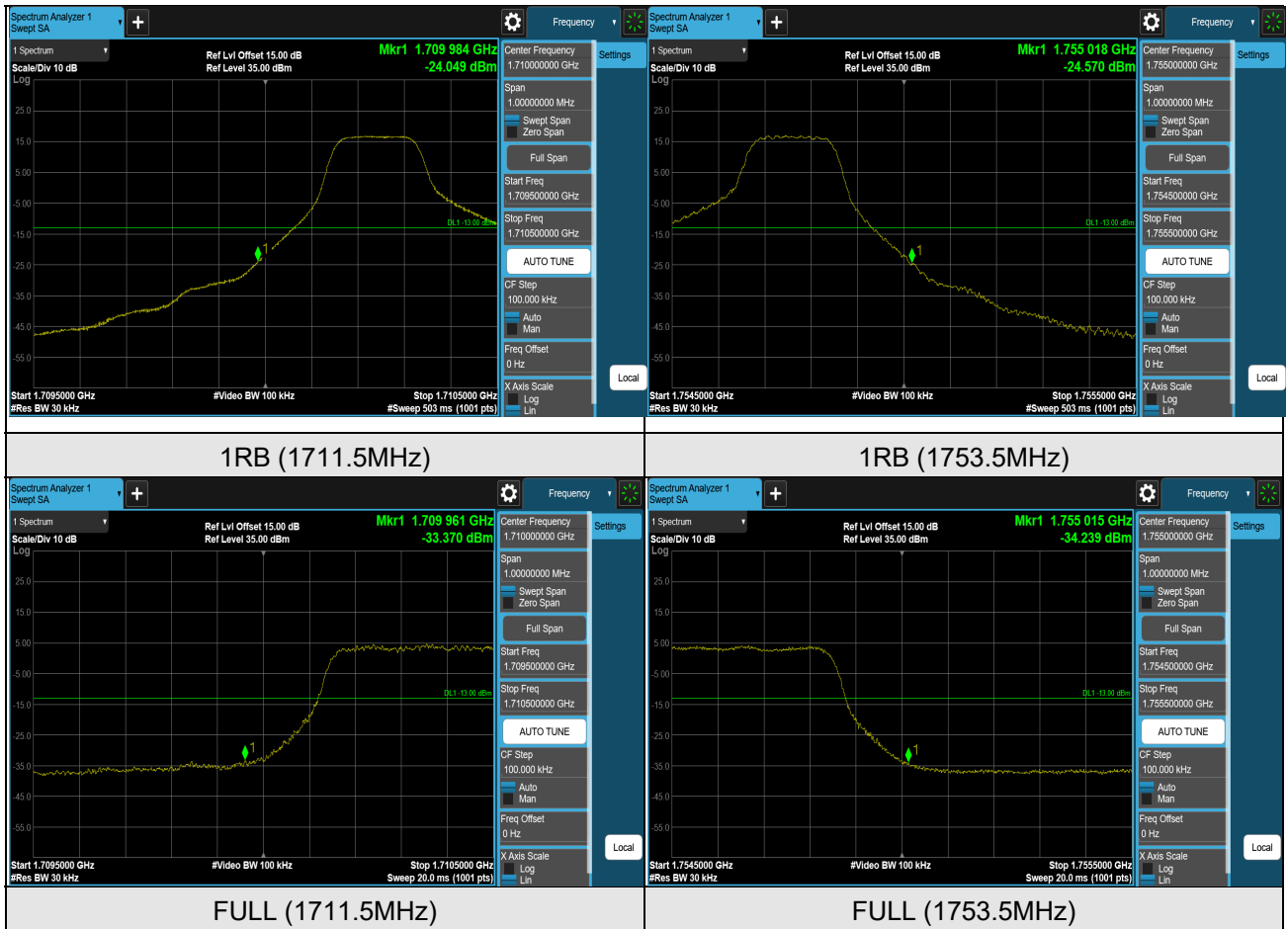
4.5.4 Test Results

Band Edge

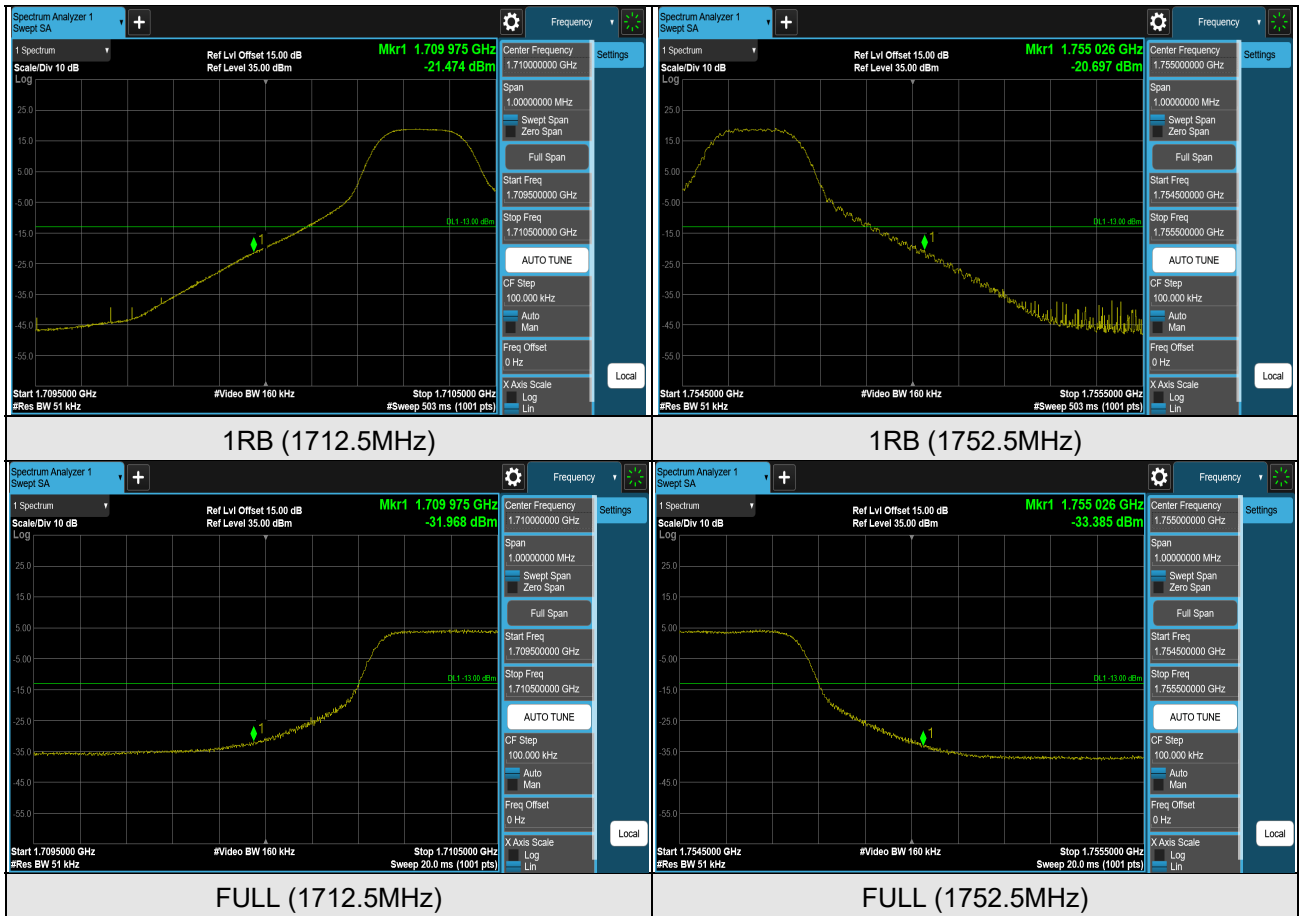
LTE Band 4 (Channel Bandwidth 1.4MHz)



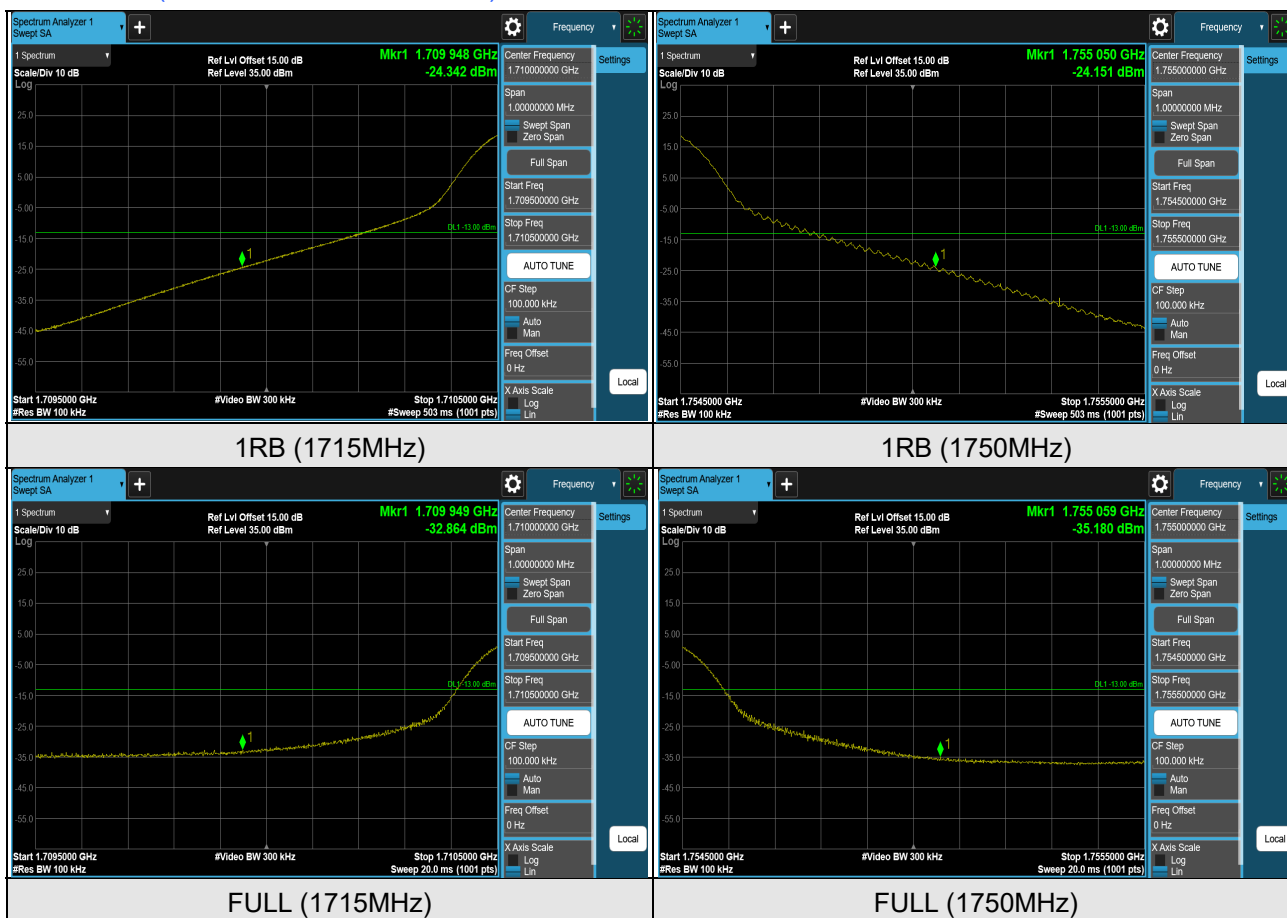
LTE Band 4 (Channel Bandwidth 3MHz)



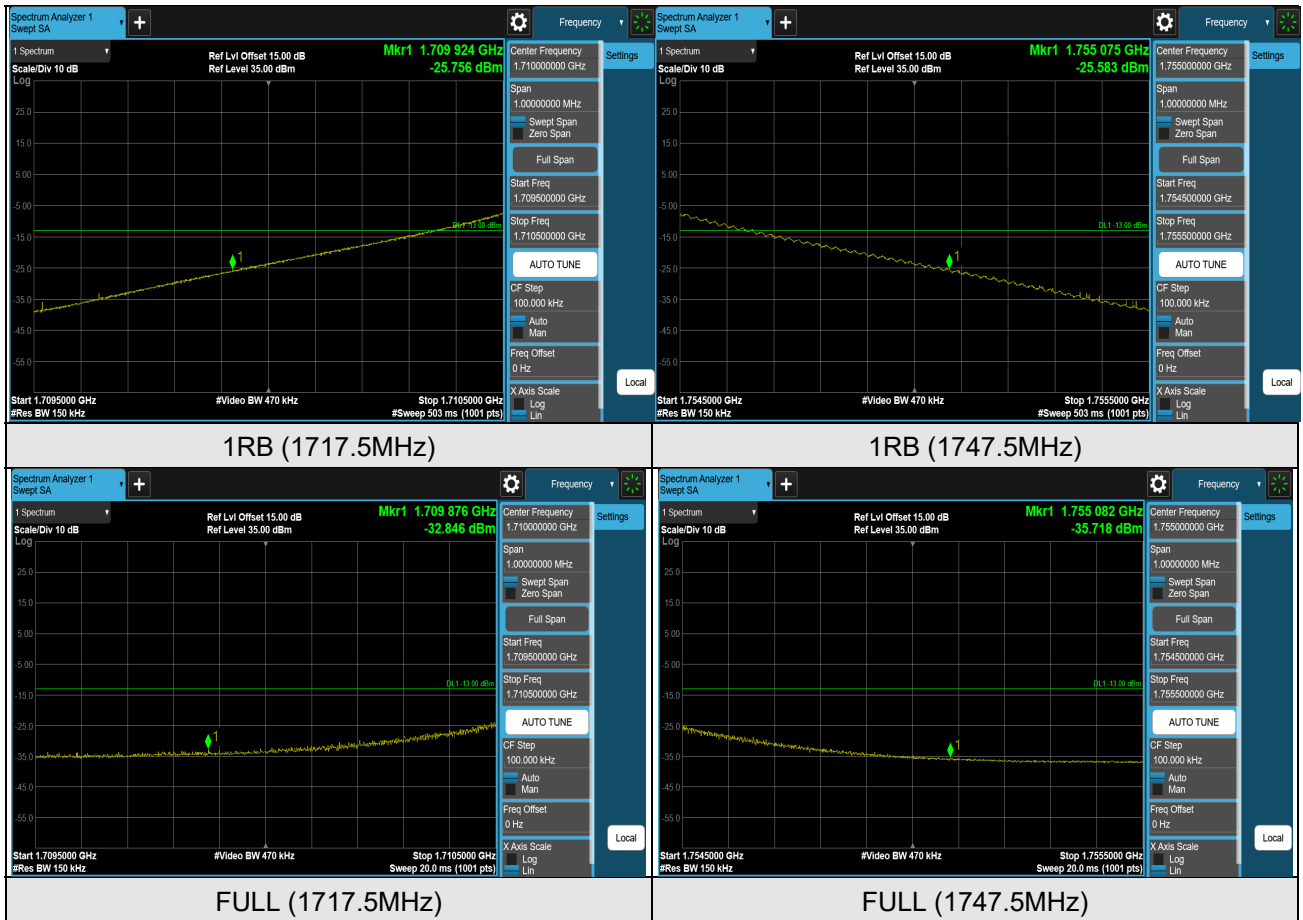
LTE Band 4 (Channel Bandwidth 5MHz)



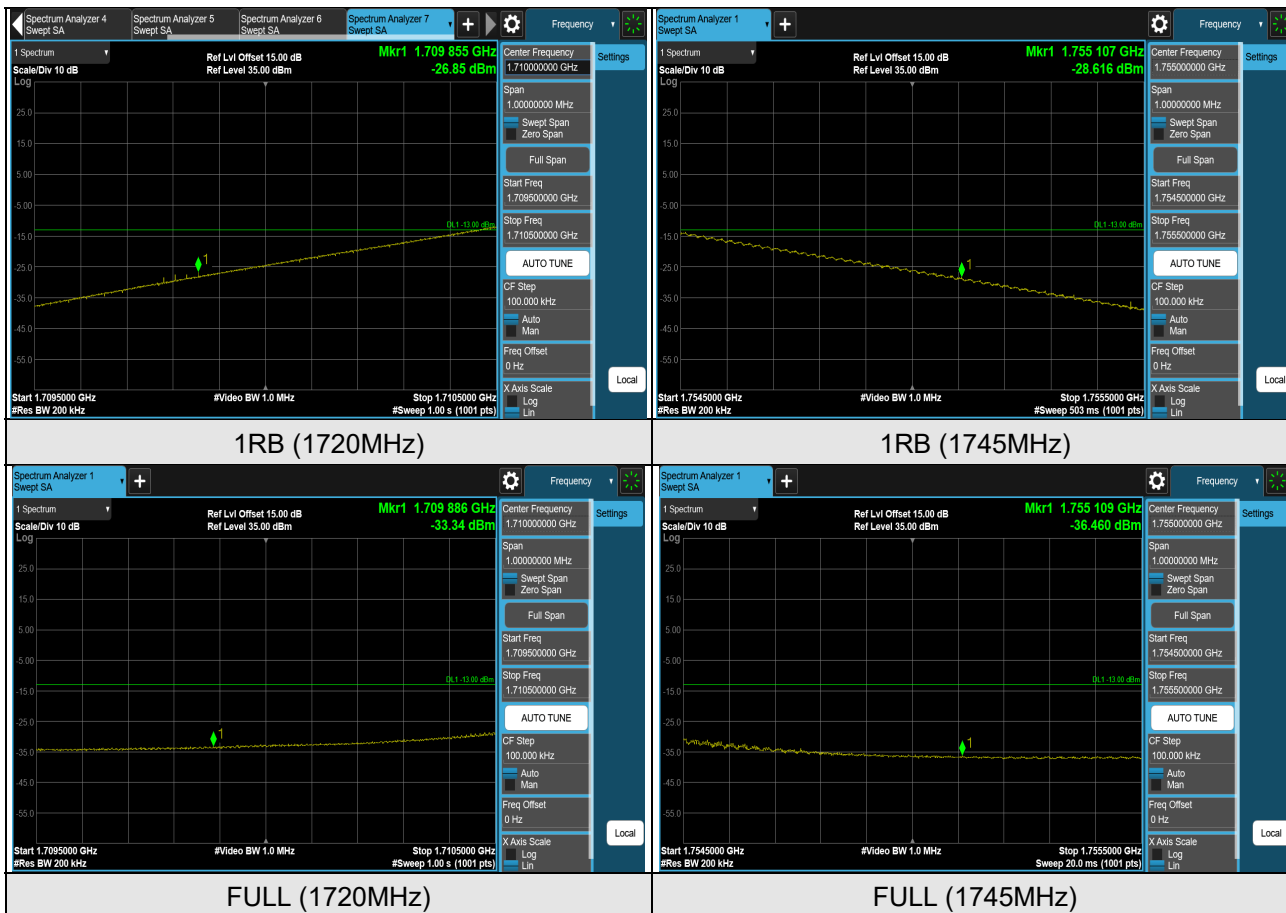
LTE Band 4 (Channel Bandwidth 10MHz)



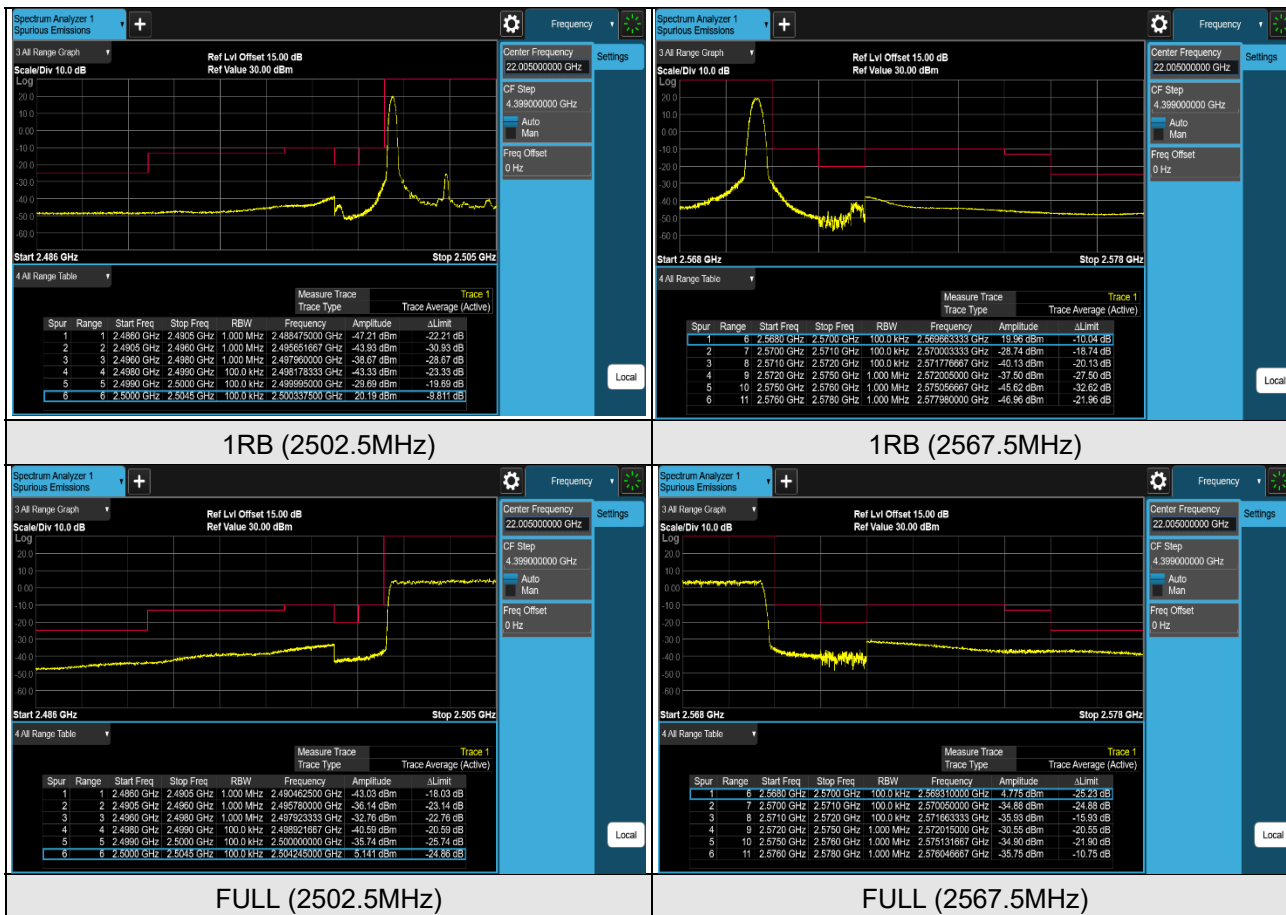
LTE Band 4 (Channel Bandwidth 15MHz)



LTE Band 4 (Channel Bandwidth 20MHz)



LTE Band 7 (Channel Bandwidth 5MHz)



LTE Band 7 (Channel Bandwidth 10MHz)

