

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

Report No.: RFBHKI-WTW-P21120244-2

FCC ID: NKRUMC-MT2731CBN

Test Model: UMC-MT2731CBN

Received Date: Nov. 01, 2021

Test Date: Jan. 17 ~ Feb. 24, 2022

Issued Date: Jun. 09, 2022

Applicant: Wistron NeWeb Corporation

Address: 20 Park Ave. II, Hsinchu Science Park, Hsinchu 308, Taiwan

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, TAIWAN

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



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Release Control Record

Issue No.	Description	Date Issued
RFBHKI-WTW-P21120244-2	Original release	Jun. 09, 2022

1 Certificate of Conformity

Product: Cellular module
Brand: WNC
Test Model: UMC-MT2731CBN
Sample Status: Engineering sample
Applicant: Wistron NeWeb Corporation
Test Date: Jan. 17 ~ Feb. 24, 2022
Standards: FCC Part 27, Subpart C, H, L, M

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

Prepared by : Celine Chou , **Date:** Jun. 09, 2022
Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jun. 09, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

For LTE Band 4, B66

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (d)	Equivalent Isotropically radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	Out of Band Emission Measurements	Pass	Meet the requirement of limit.
27.50 (d)(5)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -28.62dB at 77.53MHz.

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

For LTE Band 7

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (h)(2)	Equivalent Isotropically radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Channel Edge / Out of Band Emission Measurements	Pass	Meet the requirement of limit.
--	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -19.80dB at 83.35MHz.

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

For LTE Band 12, LTE Band 17

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50 (c)	Effective radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (g)	Out of Band Emission Measurements	Pass	Meet the requirement of limit.
--	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53 (g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -26.33dB at 3537.50MHz.

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	2.93 dB
	200MHz ~ 1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 03, 2021	Dec. 02, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 28, 2021	Oct. 27, 2022
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier EMCI	EMC001340	980201	Sep. 15, 2021	Sep. 14, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 330H	980112	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable EMCI	EMC104-SM-SM-800 0	171005	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000 (140807)	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 05, 2021	Oct. 04, 2022
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 02, 2021	Jun. 01, 2022
DC power supply Keysight	U8002A	MY56330015	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6272278310	Jun. 23, 2021	Jun. 22, 2022

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.

3 General Information

3.1 General Description of EUT

Product	Cellular module	
Brand	WNC	
Test Model	UMC-MT2731CBN	
Sample Status	Engineering sample	
Power Supply Rating	4.0Vdc	
Modulation Type	QPSK, 16QAM, 64QAM	
Operating Frequency	LTE Band 4 (Channel Bandwidth 1.4MHz)	1710.7MHz ~ 1754.3MHz
	LTE Band 4 (Channel Bandwidth 3MHz)	1711.5MHz ~ 1753.5MHz
	LTE Band 4 (Channel Bandwidth 5MHz)	1712.5MHz ~ 1752.5MHz
	LTE Band 4 (Channel Bandwidth 10MHz)	1715.0MHz ~ 1750.0MHz
	LTE Band 4 (Channel Bandwidth 15MHz)	1717.5MHz ~ 1747.5MHz
	LTE Band 4 (Channel Bandwidth 20MHz)	1720.0MHz ~ 1745.0MHz
	LTE Band 7 (Channel Bandwidth 5MHz)	2502.5MHz ~ 2567.5MHz
	LTE Band 7 (Channel Bandwidth 10MHz)	2505.0MHz ~ 2565.0MHz
	LTE Band 7 (Channel Bandwidth 15MHz)	2507.5MHz ~ 2562.5MHz
	LTE Band 7 (Channel Bandwidth 20MHz)	2510.0MHz ~ 2560.0MHz
	LTE Band 12 (Channel Bandwidth 1.4MHz)	699.7MHz ~ 715.3MHz
	LTE Band 12 (Channel Bandwidth 3MHz)	700.5MHz ~ 714.5MHz
	LTE Band 12 (Channel Bandwidth 5MHz)	701.5MHz ~ 713.5MHz
	LTE Band 12 (Channel Bandwidth 10MHz)	704.0MHz ~ 711.0MHz
	LTE Band 17 (Channel Bandwidth 5MHz)	706.5MHz ~ 713.5MHz
	LTE Band 17 (Channel Bandwidth 10MHz)	709.0MHz ~ 711.0MHz
	LTE Band 66 (Channel Bandwidth 1.4MHz)	1710.7MHz ~ 1779.3MHz
	LTE Band 66 (Channel Bandwidth 3MHz)	1711.5MHz ~ 1778.5MHz
LTE Band 66 (Channel Bandwidth 5MHz)	1712.5MHz ~ 1777.5MHz	
LTE Band 66 (Channel Bandwidth 10MHz)	1715.0MHz ~ 1775.0MHz	
LTE Band 66 (Channel Bandwidth 15MHz)	1717.5MHz ~ 1772.5MHz	
LTE Band 66 (Channel Bandwidth 20MHz)	1720.0MHz ~ 1770.0MHz	

Max. EIRP Power		QPSK	16QAM	64QAM
	LTE Band 4 (Channel Bandwidth 1.4MHz)	261.818mW (24.18dBm)	212.814mW (23.28dBm)	167.880mW (22.25dBm)
	LTE Band 4 (Channel Bandwidth 3MHz)	271.019mW (24.33dBm)	219.786mW (23.42dBm)	174.181mW (22.41dBm)
	LTE Band 4 (Channel Bandwidth 5MHz)	257.040mW (24.10dBm)	219.280mW (23.41dBm)	167.494mW (22.24dBm)
	LTE Band 4 (Channel Bandwidth 10MHz)	262.422mW (24.19dBm)	220.293mW (23.43dBm)	171.396mW (22.34dBm)
	LTE Band 4 (Channel Bandwidth 15MHz)	277.971mW (24.44dBm)	225.424mW (23.53dBm)	173.780mW (22.40dBm)
	LTE Band 4 (Channel Bandwidth 20MHz)	278.612mW (24.45dBm)	225.944mW (23.54dBm)	174.181mW (22.41dBm)
	LTE Band 7 (Channel Bandwidth 5MHz)	303.389mW (24.82dBm)	245.471mW (23.90dBm)	190.546mW (22.80dBm)
	LTE Band 7 (Channel Bandwidth 10MHz)	306.196mW (24.86dBm)	246.604mW (23.92dBm)	193.197mW (22.86dBm)
	LTE Band 7 (Channel Bandwidth 15MHz)	311.172mW (24.93dBm)	266.073mW (24.25dBm)	194.536mW (22.89dBm)
	LTE Band 7 (Channel Bandwidth 20MHz)	311.889mW (24.94dBm)	251.189mW (24.00dBm)	199.526mW (23.00dBm)
	LTE Band 66 (Channel Bandwidth 1.4MHz)	269.774mW (24.31dBm)	232.809mW (23.67dBm)	171.791mW (22.35dBm)
	LTE Band 66 (Channel Bandwidth 3MHz)	282.488mW (24.51dBm)	240.436mW (23.81dBm)	170.608mW (22.32dBm)
	LTE Band 66 (Channel Bandwidth 5MHz)	274.789mW (24.39dBm)	233.884mW (23.69dBm)	171.791mW (22.35dBm)
	LTE Band 66 (Channel Bandwidth 10MHz)	267.917mW (24.28dBm)	234.423mW (23.70dBm)	181.970mW (22.60dBm)
	LTE Band 66 (Channel Bandwidth 15MHz)	282.488mW (24.51dBm)	237.684mW (23.76dBm)	177.011mW (22.48dBm)
	LTE Band 66 (Channel Bandwidth 20MHz)	283.139mW (24.52dBm)	237.684mW (23.76dBm)	180.717mW (22.57dBm)

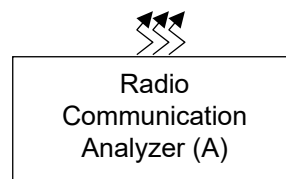
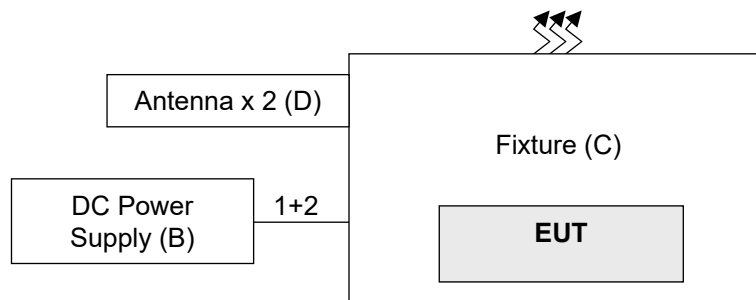
Max. ERP Power		QPSK	16QAM	64QAM
	LTE Band 12 (Channel Bandwidth 1.4MHz)	199.067mW (22.99dBm)	174.985mW (22.43dBm)	128.825mW (21.10dBm)
	LTE Band 12 (Channel Bandwidth 3MHz)	200.447mW (23.02dBm)	177.828mW (22.50dBm)	139.637mW (21.45dBm)
	LTE Band 12 (Channel Bandwidth 5MHz)	198.609mW (22.98dBm)	163.682mW (22.14dBm)	138.038mW (21.40dBm)
	LTE Band 12 (Channel Bandwidth 10MHz)	207.970mW (23.18dBm)	161.808mW (22.09dBm)	137.088mW (21.37dBm)
	LTE Band 17 (Channel Bandwidth 5MHz)	195.434mW (22.91dBm)	172.584mW (22.37dBm)	134.276mW (21.28dBm)
	LTE Band 17 (Channel Bandwidth 10MHz)	208.449mW (23.19dBm)	176.198mW (22.46dBm)	141.254mW (21.50dBm)
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	8M99D7W	8M99D7W
	LTE Band 4 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W
	LTE Band 4 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W
	LTE Band 7 (Channel Bandwidth 5MHz)	4M49G7D	4M49D7W	4M50D7W
	LTE Band 7 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W	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	2M70D7W	2M69D7W
	LTE Band 12 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M50D7W
	LTE Band 12 (Channel Bandwidth 10MHz)	8M99G7D	8M99D7W	8M99D7W
	LTE Band 17 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M51D7W
	LTE Band 17 (Channel Bandwidth 10MHz)	8M98G7D	8M97D7W	8M98D7W
	LTE Band 66 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W	1M09D7W
	LTE Band 66 (Channel Bandwidth 3MHz)	2M69G7D	2M69D7W	2M69D7W
	LTE Band 66 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W	4M50D7W
LTE Band 66 (Channel Bandwidth 10MHz)	8M99G7D	8M99D7W	8M98D7W	
LTE Band 66 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W	13M5D7W	
LTE Band 66 (Channel Bandwidth 20MHz)	18M0G7D	18M0D7W	18M0D7W	
Antenna Type	Refer to note			
Antenna Connector	Refer to note			
Accessory Device	NA			
Cable Supplied	NA			

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

Type	Connector	Gain (dBi)											
		GSM 850	GSM 1900	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B14	LTE B17	LTE B25	LTE B26	LTE B66
Dipole	SMA	1.82	1.80	1.80	1.57	1.82	2.15	2.02	2.02	2.02	1.80	1.82	1.57

* 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



Remote site

3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	NA	-
B.	DC Power Supply	JIN YIH Technology	SP3051	SP30512050388	NA	-
C.	Fixture	NA	NA	NA	NA	Provided by manufacturer
D.	Antenna x 2	WNC	RF21S00802A	NA	NA	Provided by manufacturer

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Power Cable	1	1.8	N	0	-
2.	DC Cable	1	0.12	N	0	-

3.3 Test Mode Applicability and Tested Channel Detail

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

Band	Radiated Emission
LTE Band 4	Z-plane
LTE Band 7	Z-plane
LTE Band 12	Z-plane
LTE Band 17	Z-plane
LTE Band 66	Z-plane

LTE Band 4

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

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

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

Note:

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

LTE Band 7

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

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

Note:

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

LTE Band 12

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

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

Note:

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

LTE Band 17

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

Note:

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

LTE Band 66

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

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

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

Note:

- 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.
- 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	James Yang
Modulation Characteristics	25deg. C, 60%RH	4.0Vdc	James Yang
Frequency Stability	25deg. C, 60%RH	4.0Vdc	James Yang
Occupied Bandwidth	25deg. C, 60%RH	4.0Vdc	James Yang
Band Edge	25deg. C, 60%RH	4.0Vdc	James Yang
Peak To Average Ratio	25deg. C, 60%RH	4.0Vdc	James Yang
Conducted Emission	25deg. C, 60%RH	4.0Vdc	James Yang
Radiated Emission	22deg. C, 64%RH	4.0Vdc	Vincent Chen

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

For LTE Band 4, LTE Band 66:

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

For LTE Band 7:

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

For LTE Band 12, LTE Band 17:

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	22.57	22.50	22.34
		1	50	22.88	22.63	22.37
		1	99	22.30	22.28	21.96
		50	0	21.43	21.52	21.19
		50	25	21.36	21.49	21.16
		50	50	21.33	21.54	21.30
		100	0	21.21	21.48	21.14
20M	16QAM	1	0	21.86	21.79	21.59
		1	50	21.97	21.74	21.61
		1	99	21.80	21.73	21.62
		50	0	20.42	20.42	20.29
		50	25	20.52	20.56	20.53
		50	50	20.62	20.63	20.60
		100	0	20.46	20.56	20.45
20M	64QAM	1	0	20.77	20.76	20.67
		1	50	20.84	20.83	20.78
		1	99	20.35	20.38	20.26
		50	0	19.43	19.55	19.40
		50	25	19.46	19.61	19.39
		50	50	19.41	19.53	19.33
		100	0	19.43	19.57	19.38

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	22.56	22.46	22.31
		1	37	22.87	22.78	22.54
		1	74	22.40	22.42	22.16
		36	0	21.43	21.54	21.23
		36	19	21.54	21.66	21.37
		36	39	21.32	21.53	21.34
		75	0	21.25	21.53	21.24
15M	16QAM	1	0	21.86	21.65	21.60
		1	37	21.96	21.78	21.72
		1	74	21.92	21.84	21.78
		36	0	20.51	20.55	20.49
		36	19	20.47	20.57	20.47
		36	39	20.21	20.43	20.33
		75	0	20.37	20.61	20.60
15M	64QAM	1	0	20.67	20.65	20.61
		1	37	20.83	20.83	20.81
		1	74	20.69	20.77	20.76
		36	0	19.32	19.48	19.54
		36	19	19.38	19.55	19.61
		36	39	19.27	19.54	19.58
		75	0	19.13	19.43	19.57

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	22.58	22.57	22.28
		1	24	22.62	22.50	22.12
		1	49	22.48	22.51	22.12
		25	0	21.33	21.44	20.99
		25	12	21.39	21.56	21.05
		25	25	21.46	21.63	21.10
		50	0	21.29	21.57	20.94
10M	16QAM	1	0	21.56	21.79	21.56
		1	24	21.86	21.84	21.61
		1	49	21.24	21.58	21.36
		25	0	20.14	20.46	20.32
		25	12	20.32	20.63	20.55
		25	25	20.26	20.64	20.50
		50	0	20.21	20.57	20.36
10M	64QAM	1	0	20.68	20.67	20.57
		1	24	20.77	20.59	20.54
		1	49	20.51	20.68	20.46
		25	0	19.31	19.48	19.17
		25	12	19.38	19.57	19.31
		25	25	19.44	19.66	19.32
		50	0	19.26	19.59	19.29

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	22.46	22.51	22.24
		1	12	22.32	22.53	22.14
		1	24	22.05	22.33	22.06
		12	0	21.17	21.43	21.16
		12	6	21.36	21.62	21.26
		12	13	21.10	21.48	21.21
		25	0	21.06	21.54	21.24
5M	16QAM	1	0	21.58	21.73	21.63
		1	12	21.70	21.84	21.77
		1	24	21.56	21.67	21.51
		12	0	20.36	20.46	20.28
		12	6	20.44	20.59	20.43
		12	13	20.28	20.49	20.37
		25	0	20.10	20.43	20.22
5M	64QAM	1	0	20.41	20.66	20.46
		1	12	20.54	20.67	20.58
		1	24	20.42	20.59	20.37
		12	0	19.14	19.68	19.19
		12	6	18.87	19.46	19.01
		12	13	18.93	19.53	19.17
		25	0	18.76	19.47	19.17

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	22.53	22.46	22.28
		1	7	22.75	22.76	22.60
		1	14	22.63	22.59	22.48
		8	0	21.60	21.56	21.54
		8	3	21.40	21.43	21.46
		8	7	21.50	21.50	21.52
		15	0	21.26	21.32	21.42
3M	16QAM	1	0	21.55	21.48	21.56
		1	7	21.73	21.85	21.83
		1	14	21.78	21.71	21.78
		8	0	20.45	20.46	20.80
		8	3	20.62	20.65	21.07
		8	7	20.47	20.54	21.06
		15	0	20.40	20.48	20.91
3M	64QAM	1	0	20.33	20.75	20.37
		1	7	20.35	20.84	20.53
		1	14	20.21	20.81	20.48
		8	0	18.81	19.46	19.11
		8	3	18.96	19.65	19.37
		8	7	18.76	19.57	19.24
		15	0	18.57	19.47	19.14

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	22.54	22.38	22.28
		1	2	22.61	22.49	22.47
		1	5	22.53	22.43	22.41
		3	0	22.51	22.52	22.59
		3	1	22.46	22.57	22.58
		3	3	22.45	22.54	22.57
		6	0	21.38	21.53	21.64
1.4M	16QAM	1	0	21.55	21.57	21.35
		1	2	21.71	21.70	21.58
		1	5	21.53	21.62	21.48
		3	0	21.57	21.65	21.44
		3	1	21.50	21.62	21.35
		3	3	21.61	21.57	21.36
		6	0	20.28	20.46	20.12
1.4M	64QAM	1	0	20.31	20.56	20.29
		1	2	20.68	20.52	20.31
		1	5	20.59	20.66	20.57
		3	0	20.36	20.63	20.32
		3	1	20.35	20.67	20.38
		3	3	20.39	20.63	20.43
		6	0	19.06	19.49	19.19

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	22.79	21.92	21.68
		1	50	22.56	21.84	21.68
		1	99	22.17	21.54	21.45
		50	0	21.58	21.03	20.95
		50	25	21.31	20.85	20.87
		50	50	21.32	20.90	20.97
		100	0	21.34	20.93	21.09
20M	16QAM	1	0	21.85	21.14	20.87
		1	50	21.78	21.18	20.84
		1	99	21.56	20.93	20.57
		50	0	20.61	20.09	19.81
		50	25	20.34	19.83	19.63
		50	50	20.48	20.02	19.82
		100	0	20.37	19.94	19.81
20M	64QAM	1	0	20.85	20.25	20.18
		1	50	20.78	20.24	20.10
		1	99	20.06	19.58	19.34
		50	0	19.55	19.08	18.78
		50	25	19.20	18.83	18.48
		50	50	19.19	18.94	18.62
		100	0	19.15	18.94	18.64

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	22.56	21.83	21.68
		1	37	22.78	22.08	21.89
		1	74	22.31	21.59	21.45
		36	0	21.69	20.95	20.82
		36	19	21.66	20.98	20.95
		36	39	21.57	20.87	20.84
		75	0	21.53	20.90	20.78
15M	16QAM	1	0	21.80	20.97	20.84
		1	37	22.10	21.24	21.06
		1	74	21.61	20.74	20.58
		36	0	20.71	19.96	19.90
		36	19	20.65	19.95	19.96
		36	39	20.66	19.94	19.94
		75	0	20.63	20.02	19.96
15M	64QAM	1	0	20.72	20.21	20.15
		1	37	20.74	20.15	20.07
		1	74	20.39	20.06	19.92
		36	0	19.24	19.01	18.95
		36	19	19.14	19.02	18.95
		36	39	18.96	18.83	18.69
		75	0	18.99	18.96	18.75

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	22.67	21.80	21.63
		1	24	22.71	21.83	21.58
		1	49	22.40	21.63	21.34
		25	0	21.57	20.94	20.66
		25	12	21.63	20.94	20.70
		25	25	21.59	20.86	20.57
		50	0	21.63	20.97	20.70
10M	16QAM	1	0	21.56	21.05	20.86
		1	24	21.77	20.84	20.61
		1	49	21.40	20.96	20.75
		25	0	20.32	19.88	19.73
		25	12	20.28	19.93	19.82
		25	25	20.20	19.86	19.68
		50	0	20.28	19.97	19.71
10M	64QAM	1	0	20.70	20.22	20.08
		1	24	20.71	20.26	20.17
		1	49	20.39	20.01	19.86
		25	0	19.38	19.06	18.85
		25	12	19.32	19.11	18.83
		25	25	19.14	19.01	18.71
		50	0	19.02	18.94	18.54

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	22.51	21.78	21.43
		1	12	22.67	22.17	21.75
		1	24	22.39	21.72	21.35
		12	0	21.48	20.85	20.52
		12	6	21.37	20.84	20.48
		12	13	21.38	20.87	20.49
		25	0	21.40	20.93	20.55
5M	16QAM	1	0	21.62	21.06	20.78
		1	12	21.75	21.38	21.00
		1	24	21.26	20.79	20.40
		12	0	20.36	19.88	19.44
		12	6	20.26	19.87	19.36
		12	13	20.28	19.95	19.47
		25	0	20.18	19.86	19.34
5M	64QAM	1	0	20.61	20.10	19.94
		1	12	20.65	20.36	20.30
		1	24	20.60	20.12	20.10
		12	0	19.33	18.95	18.84
		12	6	19.37	18.97	18.79
		12	13	19.31	18.95	18.78
		25	0	19.24	18.94	18.68

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	22.94	23.02	23.05
		1	24	23.19	23.14	23.31
		1	49	23.00	22.93	23.14
		25	0	22.00	21.97	22.21
		25	12	21.99	22.05	22.23
		25	25	21.84	22.02	22.21
		50	0	21.86	22.07	22.17
10M	16QAM	1	0	22.16	22.04	22.16
		1	24	22.16	22.10	22.22
		1	49	22.03	22.06	22.18
		25	0	21.14	21.26	21.43
		25	12	20.99	21.17	21.38
		25	25	21.06	21.21	21.43
		50	0	21.11	21.23	21.46
10M	64QAM	1	0	21.34	21.35	21.38
		1	24	21.34	21.42	21.50
		1	49	21.12	21.23	21.38
		25	0	20.11	20.21	20.36
		25	12	20.02	20.14	20.29
		25	25	20.08	20.26	20.36
		50	0	19.91	20.17	20.32

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	22.83	23.01	22.86
		1	12	22.81	23.08	23.11
		1	24	22.33	22.66	22.43
		12	0	21.55	21.88	21.63
		12	6	21.63	22.05	21.81
		12	13	21.47	21.93	21.79
		25	0	21.59	22.05	21.86
5M	16QAM	1	0	21.98	21.94	22.04
		1	12	22.02	22.08	22.27
		1	24	21.80	21.97	22.25
		12	0	20.79	21.07	21.35
		12	6	20.76	21.13	21.45
		12	13	20.66	21.07	21.43
		25	0	20.78	21.18	21.46
5M	64QAM	1	0	21.17	21.05	20.88
		1	12	21.47	21.40	21.53
		1	24	21.29	21.24	20.99
		12	0	20.13	20.14	19.86
		12	6	20.18	20.21	19.92
		12	13	20.07	20.17	19.92
		25	0	19.96	20.06	19.78

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	22.83	22.91	22.96
		1	7	22.95	23.06	23.15
		1	14	22.71	22.94	23.01
		8	0	21.85	22.12	22.24
		8	3	21.82	22.16	22.34
		8	7	21.80	22.12	22.25
		15	0	21.68	22.05	22.22
3M	16QAM	1	0	22.16	22.48	22.32
		1	7	22.20	22.52	22.63
		1	14	22.12	22.57	22.56
		8	0	20.62	21.15	21.11
		8	3	20.65	21.17	21.10
		8	7	20.70	21.24	21.20
		15	0	20.50	21.05	20.95
3M	64QAM	1	0	21.18	21.41	21.14
		1	7	21.38	21.33	21.58
		1	14	21.02	21.31	21.09
		8	0	19.83	20.16	19.94
		8	3	19.72	20.13	19.99
		8	7	19.68	20.09	20.01
		15	0	19.57	20.03	19.96

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	22.80	22.81	22.87
		1	2	23.03	23.04	23.12
		1	5	22.85	22.87	22.93
		3	0	22.90	22.95	22.94
		3	1	22.75	22.85	22.74
		3	3	22.64	22.86	22.83
		6	0	21.84	22.15	22.04
1.4M	16QAM	1	0	21.87	21.76	22.06
		1	2	22.26	22.17	22.56
		1	5	21.91	21.87	22.34
		3	0	21.78	21.86	22.40
		3	1	21.89	22.04	22.54
		3	3	21.72	21.88	22.45
		6	0	21.11	21.28	21.77
1.4M	64QAM	1	0	21.04	21.19	21.07
		1	2	21.09	21.02	21.23
		1	5	20.95	21.19	21.01
		3	0	20.84	21.08	20.80
		3	1	20.77	21.12	20.89
		3	3	20.58	21.05	20.75
		6	0	19.55	20.01	19.62

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	22.73	23.11	22.98
		1	24	23.31	23.32	22.75
		1	49	23.00	22.65	22.69
		25	0	21.91	22.16	22.03
		25	12	22.32	21.80	22.18
		25	25	21.98	21.69	21.67
		50	0	21.74	22.05	21.69
10M	16QAM	1	0	22.08	21.74	22.11
		1	24	21.99	22.59	22.13
		1	49	21.88	21.97	22.04
		25	0	21.06	21.14	20.69
		25	12	21.11	20.81	21.22
		25	25	20.84	20.94	21.03
		50	0	20.70	20.90	20.97
10M	64QAM	1	0	21.12	21.08	21.30
		1	24	21.04	21.63	21.29
		1	49	20.92	21.09	20.86
		25	0	20.06	20.00	19.72
		25	12	19.95	19.76	20.23
		25	25	20.09	19.90	19.91
		50	0	20.03	19.72	20.21

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	22.84	23.03	22.62
		1	12	23.04	22.77	22.79
		1	24	22.78	22.95	22.60
		12	0	21.96	21.80	22.19
		12	6	22.10	21.97	21.81
		12	13	21.94	21.76	21.87
		25	0	21.95	21.72	21.70
5M	16QAM	1	0	21.93	21.69	21.88
		1	12	22.29	22.50	22.18
		1	24	21.91	21.84	21.98
		12	0	20.96	20.93	20.93
		12	6	21.04	21.20	21.05
		12	13	20.97	20.95	21.10
		25	0	20.99	20.75	21.16
5M	64QAM	1	0	21.09	21.01	21.30
		1	12	21.34	21.41	21.25
		1	24	21.02	20.89	20.86
		12	0	19.98	20.28	20.09
		12	6	20.03	20.02	20.11
		12	13	19.92	20.10	19.74
		25	0	19.97	19.80	19.81

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	22.63	22.11	22.46
		1	50	22.55	22.95	22.56
		1	99	22.48	22.27	22.45
		50	0	21.67	21.35	21.62
		50	25	21.68	21.42	21.62
		50	50	21.34	21.51	21.33
		100	0	21.62	21.47	21.82
20M	16QAM	1	0	21.68	21.58	21.73
		1	50	21.73	22.19	21.81
		1	99	22.10	21.75	22.09
		50	0	20.07	20.36	20.11
		50	25	20.20	20.69	20.72
		50	50	20.52	20.36	20.71
		100	0	20.33	20.26	20.46
20M	64QAM	1	0	20.51	20.78	20.58
		1	50	20.59	20.87	21.00
		1	99	20.57	20.77	20.84
		50	0	19.62	19.70	19.38
		50	25	19.34	19.43	19.41
		50	50	19.32	19.58	19.78
		100	0	19.36	19.67	19.44

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	22.12	22.29	22.64
		1	37	22.65	22.94	22.74
		1	74	22.35	22.49	22.35
		36	0	21.66	21.79	21.59
		36	19	21.28	21.74	21.69
		36	39	21.39	21.35	21.83
		75	0	21.51	21.25	21.38
15M	16QAM	1	0	21.66	21.69	21.55
		1	37	22.19	21.87	21.81
		1	74	22.03	22.13	21.78
		36	0	20.61	20.37	20.39
		36	19	20.46	20.49	20.39
		36	39	20.58	20.27	20.29
		75	0	20.61	20.69	20.18
15M	64QAM	1	0	20.64	20.56	20.63
		1	50	20.91	20.84	20.72
		1	99	20.59	20.57	20.82
		50	0	19.54	19.74	19.82
		50	25	19.48	19.89	19.65
		50	50	19.82	19.65	19.30
		100	0	19.62	19.59	19.56

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	22.23	22.22	22.44
		1	24	22.49	22.47	22.71
		1	49	22.55	22.34	22.20
		25	0	21.54	21.26	21.80
		25	12	21.30	21.68	21.45
		25	25	21.80	21.33	21.48
		50	0	21.56	21.75	21.84
10M	16QAM	1	0	21.72	21.62	21.67
		1	24	22.13	21.93	22.12
		1	49	21.53	21.91	21.96
		25	0	20.50	20.11	20.11
		25	12	20.43	20.73	20.37
		25	25	20.48	20.36	20.56
		50	0	20.47	20.40	20.49
10M	64QAM	1	0	20.67	20.78	20.40
		1	50	20.73	20.84	21.03
		1	99	20.28	20.83	20.39
		50	0	19.30	19.52	19.29
		50	25	19.63	19.53	19.59
		50	50	19.66	19.30	19.45
		100	0	19.80	19.74	19.75

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	22.37	22.08	22.34
		1	12	22.77	22.82	22.63
		1	24	22.39	22.47	22.49
		12	0	21.53	21.25	21.76
		12	6	21.58	21.61	21.38
		12	13	21.53	21.30	21.63
		25	0	21.54	21.24	21.63
5M	16QAM	1	0	21.68	21.52	21.55
		1	12	21.98	21.79	21.93
		1	24	21.83	22.12	21.71
		12	0	20.35	20.41	20.42
		12	6	20.47	20.62	20.64
		12	13	20.48	20.77	20.69
		25	0	20.47	20.40	20.20
5M	64QAM	1	0	20.48	20.73	20.23
		1	50	20.78	20.61	20.70
		1	99	20.54	20.56	20.38
		50	0	19.52	19.55	19.68
		50	25	19.62	19.46	19.72
		50	50	19.56	19.30	19.82
		100	0	19.50	19.39	19.38

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	22.23	22.40	22.49
		1	7	22.56	22.48	22.94
		1	14	22.54	22.15	22.11
		8	0	21.81	21.35	21.73
		8	3	21.78	21.38	21.73
		8	7	21.32	21.43	21.36
		15	0	21.31	21.31	21.33
3M	16QAM	1	0	21.54	21.69	21.51
		1	7	22.17	21.82	22.24
		1	14	21.79	22.08	21.62
		8	0	20.35	20.51	20.10
		8	3	20.52	20.39	20.18
		8	7	20.19	20.36	20.44
		15	0	20.56	20.34	20.67
3M	64QAM	1	0	20.23	20.75	20.38
		1	50	20.56	20.74	20.62
		1	99	20.38	20.72	20.70
		50	0	19.70	19.29	19.41
		50	25	19.55	19.54	19.51
		50	50	19.53	19.28	19.74
		100	0	19.28	19.50	19.74

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	22.51	22.07	22.50
		1	2	22.57	22.53	22.74
		1	5	22.33	22.66	22.30
		3	0	21.81	21.29	21.57
		3	1	21.40	21.55	21.51
		3	3	21.38	21.52	21.27
		6	0	21.60	21.57	21.52
1.4M	16QAM	1	0	21.69	21.92	21.76
		1	2	21.68	21.84	21.81
		1	5	22.10	21.89	21.75
		3	0	20.29	20.07	20.25
		3	1	20.37	20.38	20.17
		3	3	20.69	20.32	20.47
		6	0	20.37	20.54	20.19
1.4M	64QAM	1	0	20.23	20.63	20.74
		1	50	20.55	20.77	20.53
		1	99	20.48	20.78	20.65
		50	0	19.32	19.80	19.37
		50	25	19.77	19.63	19.81
		50	50	19.65	19.69	19.46
		100	0	19.52	19.39	19.27

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	24.14	24.07	23.91
		1	50	24.45	24.20	23.94
		1	99	23.87	23.85	23.53
		50	0	23.00	23.09	22.76
		50	25	22.93	23.06	22.73
		50	50	22.90	23.11	22.87
		100	0	22.78	23.05	22.71
20M	16QAM	1	0	23.43	23.36	23.16
		1	50	23.54	23.31	23.18
		1	99	23.37	23.30	23.19
		50	0	21.99	21.99	21.86
		50	25	22.09	22.13	22.10
		50	50	22.19	22.20	22.17
		100	0	22.03	22.13	22.02
20M	64QAM	1	0	22.34	22.33	22.24
		1	50	22.41	22.40	22.35
		1	99	21.92	21.95	21.83
		50	0	21.00	21.12	20.97
		50	25	21.03	21.18	20.96
		50	50	20.98	21.10	20.90
		100	0	21.00	21.14	20.95

*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	24.13	24.03	23.88
		1	37	24.44	24.35	24.11
		1	74	23.97	23.99	23.73
		36	0	23.00	23.11	22.80
		36	19	23.11	23.23	22.94
		36	39	22.89	23.10	22.91
		75	0	22.82	23.10	22.81
15M	16QAM	1	0	23.43	23.22	23.17
		1	37	23.53	23.35	23.29
		1	74	23.49	23.41	23.35
		36	0	22.08	22.12	22.06
		36	19	22.04	22.14	22.04
		36	39	21.78	22.00	21.90
		75	0	21.94	22.18	22.17
15M	64QAM	1	0	22.24	22.22	22.18
		1	37	22.40	22.40	22.38
		1	74	22.26	22.34	22.33
		36	0	20.89	21.05	21.11
		36	19	20.95	21.12	21.18
		36	39	20.84	21.11	21.15
		75	0	20.70	21.00	21.14

*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	24.15	24.14	23.85
		1	24	24.19	24.07	23.69
		1	49	24.05	24.08	23.69
		25	0	22.90	23.01	22.56
		25	12	22.96	23.13	22.62
		25	25	23.03	23.20	22.67
		50	0	22.86	23.14	22.51
10M	16QAM	1	0	23.13	23.36	23.13
		1	24	23.43	23.41	23.18
		1	49	22.81	23.15	22.93
		25	0	21.71	22.03	21.89
		25	12	21.89	22.20	22.12
		25	25	21.83	22.21	22.07
		50	0	21.78	22.14	21.93
10M	64QAM	1	0	22.25	22.24	22.14
		1	24	22.34	22.16	22.11
		1	49	22.08	22.25	22.03
		25	0	20.88	21.05	20.74
		25	12	20.95	21.14	20.88
		25	25	21.01	21.23	20.89
		50	0	20.83	21.16	20.86

*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	24.03	24.08	23.81
		1	12	23.89	24.10	23.71
		1	24	23.62	23.90	23.63
		12	0	22.74	23.00	22.73
		12	6	22.93	23.19	22.83
		12	13	22.67	23.05	22.78
		25	0	22.63	23.11	22.81
5M	16QAM	1	0	23.15	23.30	23.20
		1	12	23.27	23.41	23.34
		1	24	23.13	23.24	23.08
		12	0	21.93	22.03	21.85
		12	6	22.01	22.16	22.00
		12	13	21.85	22.06	21.94
		25	0	21.67	22.00	21.79
5M	64QAM	1	0	21.98	22.23	22.03
		1	12	22.11	22.24	22.15
		1	24	21.99	22.16	21.94
		12	0	20.71	21.25	20.76
		12	6	20.44	21.03	20.58
		12	13	20.50	21.10	20.74
		25	0	20.33	21.04	20.74

*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	24.10	24.03	23.85
		1	7	24.32	24.33	24.17
		1	14	24.20	24.16	24.05
		8	0	23.17	23.13	23.11
		8	3	22.97	23.00	23.03
		8	7	23.07	23.07	23.09
		15	0	22.83	22.89	22.99
3M	16QAM	1	0	23.12	23.05	23.13
		1	7	23.30	23.42	23.40
		1	14	23.35	23.28	23.35
		8	0	22.02	22.03	22.37
		8	3	22.19	22.22	22.64
		8	7	22.04	22.11	22.63
		15	0	21.97	22.05	22.48
3M	64QAM	1	0	21.90	22.32	21.94
		1	7	21.92	22.41	22.10
		1	14	21.78	22.38	22.05
		8	0	20.38	21.03	20.68
		8	3	20.53	21.22	20.94
		8	7	20.33	21.14	20.81
		15	0	20.14	21.04	20.71

*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	24.11	23.95	23.85
		1	2	24.18	24.06	24.04
		1	5	24.10	24.00	23.98
		3	0	24.08	24.09	24.16
		3	1	24.03	24.14	24.15
		3	3	24.02	24.11	24.14
		6	0	22.95	23.10	23.21
1.4M	16QAM	1	0	23.12	23.14	22.92
		1	2	23.28	23.27	23.15
		1	5	23.10	23.19	23.05
		3	0	23.14	23.22	23.01
		3	1	23.07	23.19	22.92
		3	3	23.18	23.14	22.93
		6	0	21.85	22.03	21.69
1.4M	64QAM	1	0	21.88	22.13	21.86
		1	2	22.25	22.09	21.88
		1	5	22.16	22.23	22.14
		3	0	21.93	22.20	21.89
		3	1	21.92	22.24	21.95
		3	3	21.96	22.20	22.00
		6	0	20.63	21.06	20.76

*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	24.94	24.07	23.83
		1	50	24.71	23.99	23.83
		1	99	24.32	23.69	23.60
		50	0	23.73	23.18	23.10
		50	25	23.46	23.00	23.02
		50	50	23.47	23.05	23.12
		100	0	23.49	23.08	23.24
20M	16QAM	1	0	24.00	23.29	23.02
		1	50	23.93	23.33	22.99
		1	99	23.71	23.08	22.72
		50	0	22.76	22.24	21.96
		50	25	22.49	21.98	21.78
		50	50	22.63	22.17	21.97
		100	0	22.52	22.09	21.96
20M	64QAM	1	0	23.00	22.40	22.33
		1	50	22.93	22.39	22.25
		1	99	22.21	21.73	21.49
		50	0	21.70	21.23	20.93
		50	25	21.35	20.98	20.63
		50	50	21.34	21.09	20.77
		100	0	21.30	21.09	20.79

*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	24.71	23.98	23.83
		1	37	24.93	24.23	24.04
		1	74	24.46	23.74	23.60
		36	0	23.84	23.10	22.97
		36	19	23.81	23.13	23.10
		36	39	23.72	23.02	22.99
		75	0	23.68	23.05	22.93
15M	16QAM	1	0	23.95	23.12	22.99
		1	37	24.25	23.39	23.21
		1	74	23.76	22.89	22.73
		36	0	22.86	22.11	22.05
		36	19	22.80	22.10	22.11
		36	39	22.81	22.09	22.09
		75	0	22.78	22.17	22.11
15M	64QAM	1	0	22.87	22.36	22.30
		1	37	22.89	22.30	22.22
		1	74	22.54	22.21	22.07
		36	0	21.39	21.16	21.10
		36	19	21.29	21.17	21.10
		36	39	21.11	20.98	20.84
		75	0	21.14	21.11	20.90

*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	24.82	23.95	23.78
		1	24	24.86	23.98	23.73
		1	49	24.55	23.78	23.49
		25	0	23.72	23.09	22.81
		25	12	23.78	23.09	22.85
		25	25	23.74	23.01	22.72
		50	0	23.78	23.12	22.85
10M	16QAM	1	0	23.71	23.20	23.01
		1	24	23.92	22.99	22.76
		1	49	23.55	23.11	22.90
		25	0	22.47	22.03	21.88
		25	12	22.43	22.08	21.97
		25	25	22.35	22.01	21.83
		50	0	22.43	22.12	21.86
10M	64QAM	1	0	22.85	22.37	22.23
		1	24	22.86	22.41	22.32
		1	49	22.54	22.16	22.01
		25	0	21.53	21.21	21.00
		25	12	21.47	21.26	20.98
		25	25	21.29	21.16	20.86
		50	0	21.17	21.09	20.69

*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	24.66	23.93	23.58
		1	12	24.82	24.32	23.90
		1	24	24.54	23.87	23.50
		12	0	23.63	23.00	22.67
		12	6	23.52	22.99	22.63
		12	13	23.53	23.02	22.64
		25	0	23.55	23.08	22.70
5M	16QAM	1	0	23.77	23.21	22.93
		1	12	23.90	23.53	23.15
		1	24	23.41	22.94	22.55
		12	0	22.51	22.03	21.59
		12	6	22.41	22.02	21.51
		12	13	22.43	22.10	21.62
		25	0	22.33	22.01	21.49
5M	64QAM	1	0	22.76	22.25	22.09
		1	12	22.80	22.51	22.45
		1	24	22.75	22.27	22.25
		12	0	21.48	21.10	20.99
		12	6	21.52	21.12	20.94
		12	13	21.46	21.10	20.93
		25	0	21.39	21.09	20.83

*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	22.81	22.89	22.92
		1	24	23.06	23.01	23.18
		1	49	22.87	22.80	23.01
		25	0	21.87	21.84	22.08
		25	12	21.86	21.92	22.10
		25	25	21.71	21.89	22.08
		50	0	21.73	21.94	22.04
10M	16QAM	1	0	22.03	21.91	22.03
		1	24	22.03	21.97	22.09
		1	49	21.90	21.93	22.05
		25	0	21.01	21.13	21.30
		25	12	20.86	21.04	21.25
		25	25	20.93	21.08	21.30
		50	0	20.98	21.10	21.33
10M	64QAM	1	0	21.21	21.22	21.25
		1	24	21.21	21.29	21.37
		1	49	20.99	21.10	21.25
		25	0	19.98	20.08	20.23
		25	12	19.89	20.01	20.16
		25	25	19.95	20.13	20.23
		50	0	19.78	20.04	20.19

*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	22.70	22.88	22.73
		1	12	22.68	22.95	22.98
		1	24	22.20	22.53	22.30
		12	0	21.42	21.75	21.50
		12	6	21.50	21.92	21.68
		12	13	21.34	21.80	21.66
		25	0	21.46	21.92	21.73
5M	16QAM	1	0	21.85	21.81	21.91
		1	12	21.89	21.95	22.14
		1	24	21.67	21.84	22.12
		12	0	20.66	20.94	21.22
		12	6	20.63	21.00	21.32
		12	13	20.53	20.94	21.30
		25	0	20.65	21.05	21.33
5M	64QAM	1	0	21.04	20.92	20.75
		1	12	21.34	21.27	21.40
		1	24	21.16	21.11	20.86
		12	0	20.00	20.01	19.73
		12	6	20.05	20.08	19.79
		12	13	19.94	20.04	19.79
		25	0	19.83	19.93	19.65

*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	22.70	22.78	22.83
		1	7	22.82	22.93	23.02
		1	14	22.58	22.81	22.88
		8	0	21.72	21.99	22.11
		8	3	21.69	22.03	22.21
		8	7	21.67	21.99	22.12
		15	0	21.55	21.92	22.09
3M	16QAM	1	0	22.03	22.35	22.19
		1	7	22.07	22.39	22.50
		1	14	21.99	22.44	22.43
		8	0	20.49	21.02	20.98
		8	3	20.52	21.04	20.97
		8	7	20.57	21.11	21.07
		15	0	20.37	20.92	20.82
3M	64QAM	1	0	21.05	21.28	21.01
		1	7	21.25	21.20	21.45
		1	14	20.89	21.18	20.96
		8	0	19.70	20.03	19.81
		8	3	19.59	20.00	19.86
		8	7	19.55	19.96	19.88
		15	0	19.44	19.90	19.83

*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	22.67	22.68	22.74
		1	2	22.90	22.91	22.99
		1	5	22.72	22.74	22.80
		3	0	22.77	22.82	22.81
		3	1	22.62	22.72	22.61
		3	3	22.51	22.73	22.70
		6	0	21.71	22.02	21.91
1.4M	16QAM	1	0	21.74	21.63	21.93
		1	2	22.13	22.04	22.43
		1	5	21.78	21.74	22.21
		3	0	21.65	21.73	22.27
		3	1	21.76	21.91	22.41
		3	3	21.59	21.75	22.32
		6	0	20.98	21.15	21.64
1.4M	64QAM	1	0	20.91	21.06	20.94
		1	2	20.96	20.89	21.10
		1	5	20.82	21.06	20.88
		3	0	20.71	20.95	20.67
		3	1	20.64	20.99	20.76
		3	3	20.45	20.92	20.62
		6	0	19.42	19.88	19.49

*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	22.60	22.98	22.85
		1	24	23.18	23.19	22.62
		1	49	22.87	22.52	22.56
		25	0	21.78	22.03	21.90
		25	12	22.19	21.67	22.05
		25	25	21.85	21.56	21.54
		50	0	21.61	21.92	21.56
10M	16QAM	1	0	21.95	21.61	21.98
		1	24	21.86	22.46	22.00
		1	49	21.75	21.84	21.91
		25	0	20.93	21.01	20.56
		25	12	20.98	20.68	21.09
		25	25	20.71	20.81	20.90
		50	0	20.57	20.77	20.84
10M	64QAM	1	0	20.99	20.95	21.17
		1	24	20.91	21.50	21.16
		1	49	20.79	20.96	20.73
		25	0	19.93	19.87	19.59
		25	12	19.82	19.63	20.10
		25	25	19.96	19.77	19.78
		50	0	19.90	19.59	20.08

*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	22.71	22.90	22.49
		1	12	22.91	22.64	22.66
		1	24	22.65	22.82	22.47
		12	0	21.83	21.67	22.06
		12	6	21.97	21.84	21.68
		12	13	21.81	21.63	21.74
		25	0	21.82	21.59	21.57
5M	16QAM	1	0	21.80	21.56	21.75
		1	12	22.16	22.37	22.05
		1	24	21.78	21.71	21.85
		12	0	20.83	20.80	20.80
		12	6	20.91	21.07	20.92
		12	13	20.84	20.82	20.97
		25	0	20.86	20.62	21.03
5M	64QAM	1	0	20.96	20.88	21.17
		1	12	21.21	21.28	21.12
		1	24	20.89	20.76	20.73
		12	0	19.85	20.15	19.96
		12	6	19.90	19.89	19.98
		12	13	19.79	19.97	19.61
		25	0	19.84	19.67	19.68

*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	24.20	23.68	24.03
		1	50	24.12	24.52	24.13
		1	99	24.05	23.84	24.02
		50	0	23.24	22.92	23.19
		50	25	23.25	22.99	23.19
		50	50	22.91	23.08	22.90
		100	0	23.19	23.04	23.39
20M	16QAM	1	0	23.25	23.15	23.30
		1	50	23.30	23.76	23.38
		1	99	23.67	23.32	23.66
		50	0	21.64	21.93	21.68
		50	25	21.77	22.26	22.29
		50	50	22.09	21.93	22.28
		100	0	21.90	21.83	22.03
20M	64QAM	1	0	22.08	22.35	22.15
		1	50	22.16	22.44	22.57
		1	99	22.14	22.34	22.41
		50	0	21.19	21.27	20.95
		50	25	20.91	21.00	20.98
		50	50	20.89	21.15	21.35
		100	0	20.93	21.24	21.01

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	23.69	23.86	24.21
		1	37	24.22	24.51	24.31
		1	74	23.92	24.06	23.92
		36	0	23.23	23.36	23.16
		36	19	22.85	23.31	23.26
		36	39	22.96	22.92	23.40
		75	0	23.08	22.82	22.95
15M	16QAM	1	0	23.23	23.26	23.12
		1	37	23.76	23.44	23.38
		1	74	23.60	23.70	23.35
		36	0	22.18	21.94	21.96
		36	19	22.03	22.06	21.96
		36	39	22.15	21.84	21.86
		75	0	22.18	22.26	21.75
15M	64QAM	1	0	22.21	22.13	22.20
		1	50	22.48	22.41	22.29
		1	99	22.16	22.14	22.39
		50	0	21.11	21.31	21.39
		50	25	21.05	21.46	21.22
		50	50	21.39	21.22	20.87
		100	0	21.19	21.16	21.13

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	23.80	23.79	24.01
		1	24	24.06	24.04	24.28
		1	49	24.12	23.91	23.77
		25	0	23.11	22.83	23.37
		25	12	22.87	23.25	23.02
		25	25	23.37	22.90	23.05
		50	0	23.13	23.32	23.41
10M	16QAM	1	0	23.29	23.19	23.24
		1	24	23.70	23.50	23.69
		1	49	23.10	23.48	23.53
		25	0	22.07	21.68	21.68
		25	12	22.00	22.30	21.94
		25	25	22.05	21.93	22.13
		50	0	22.04	21.97	22.06
10M	64QAM	1	0	22.24	22.35	21.97
		1	50	22.30	22.41	22.60
		1	99	21.85	22.40	21.96
		50	0	20.87	21.09	20.86
		50	25	21.20	21.10	21.16
		50	50	21.23	20.87	21.02
		100	0	21.37	21.31	21.32

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	23.94	23.65	23.91
		1	12	24.34	24.39	24.20
		1	24	23.96	24.04	24.06
		12	0	23.10	22.82	23.33
		12	6	23.15	23.18	22.95
		12	13	23.10	22.87	23.20
		25	0	23.11	22.81	23.20
5M	16QAM	1	0	23.25	23.09	23.12
		1	12	23.55	23.36	23.50
		1	24	23.40	23.69	23.28
		12	0	21.92	21.98	21.99
		12	6	22.04	22.19	22.21
		12	13	22.05	22.34	22.26
		25	0	22.04	21.97	21.77
5M	64QAM	1	0	22.05	22.30	21.80
		1	50	22.35	22.18	22.27
		1	99	22.11	22.13	21.95
		50	0	21.09	21.12	21.25
		50	25	21.19	21.03	21.29
		50	50	21.13	20.87	21.39
		100	0	21.07	20.96	20.95

*EIRP = Conducted + antenna gain (1.57dBi)

LTE Band 66						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	23.80	23.97	24.06
		1	7	24.13	24.05	24.51
		1	14	24.11	23.72	23.68
		8	0	23.38	22.92	23.30
		8	3	23.35	22.95	23.30
		8	7	22.89	23.00	22.93
		15	0	22.88	22.88	22.90
3M	16QAM	1	0	23.11	23.26	23.08
		1	7	23.74	23.39	23.81
		1	14	23.36	23.65	23.19
		8	0	21.92	22.08	21.67
		8	3	22.09	21.96	21.75
		8	7	21.76	21.93	22.01
		15	0	22.13	21.91	22.24
3M	64QAM	1	0	21.80	22.32	21.95
		1	50	22.13	22.31	22.19
		1	99	21.95	22.29	22.27
		50	0	21.27	20.86	20.98
		50	25	21.12	21.11	21.08
		50	50	21.10	20.85	21.31
		100	0	20.85	21.07	21.31

*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	24.08	23.64	24.07
		1	2	24.14	24.10	24.31
		1	5	23.90	24.23	23.87
		3	0	23.38	22.86	23.14
		3	1	22.97	23.12	23.08
		3	3	22.95	23.09	22.84
		6	0	23.17	23.14	23.09
1.4M	16QAM	1	0	23.26	23.49	23.33
		1	2	23.25	23.41	23.38
		1	5	23.67	23.46	23.32
		3	0	21.86	21.64	21.82
		3	1	21.94	21.95	21.74
		3	3	22.26	21.89	22.04
		6	0	21.94	22.11	21.76
1.4M	64QAM	1	0	21.80	22.20	22.31
		1	50	22.12	22.34	22.10
		1	99	22.05	22.35	22.22
		50	0	20.89	21.37	20.94
		50	25	21.34	21.20	21.38
		50	50	21.22	21.26	21.03
		100	0	21.09	20.96	20.84

*EIRP = Conducted + antenna gain (1.57dBi)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

4.2.2 Test Procedure

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

4.2.3 Test Setup



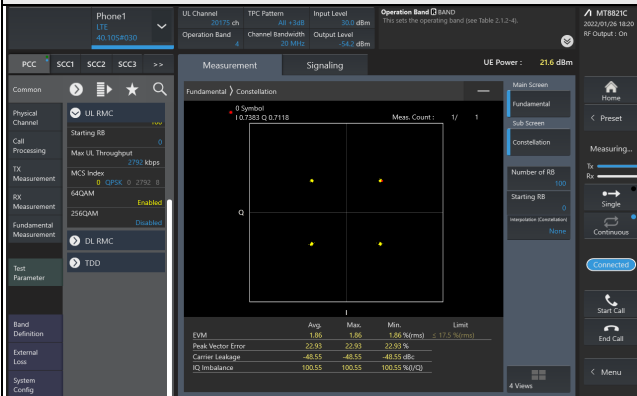
4.2.4 Test Results

LTE Band 4

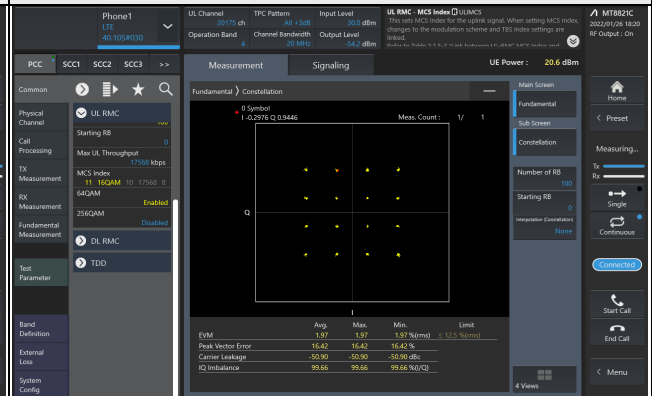
Spectrum Plot of Measurement Value

Channel: 20175 / Frequency (MHz): 1732.5MHz

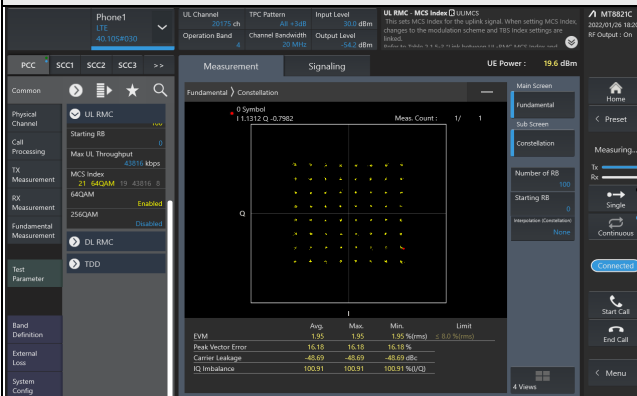
QPSK



16QAM



64QAM



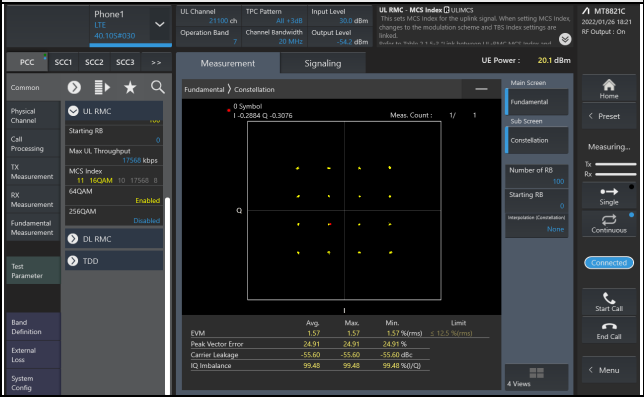
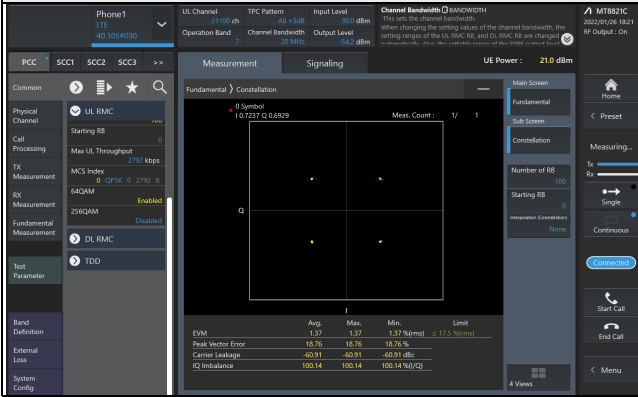
LTE Band 7

Spectrum Plot of Measurement Value

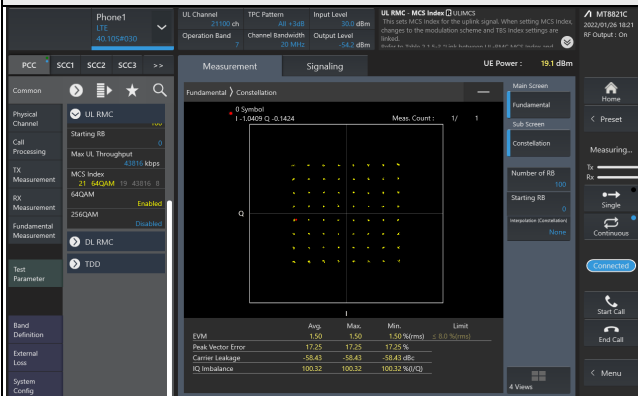
Channel: 21100 / Frequency (MHz): 2535.0MHz

QPSK

16QAM



64QAM

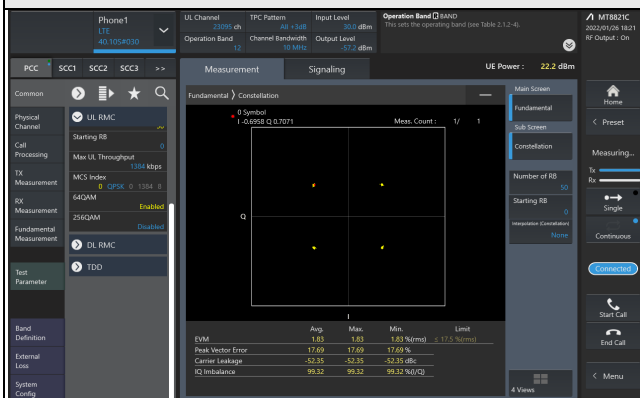


LTE Band 12

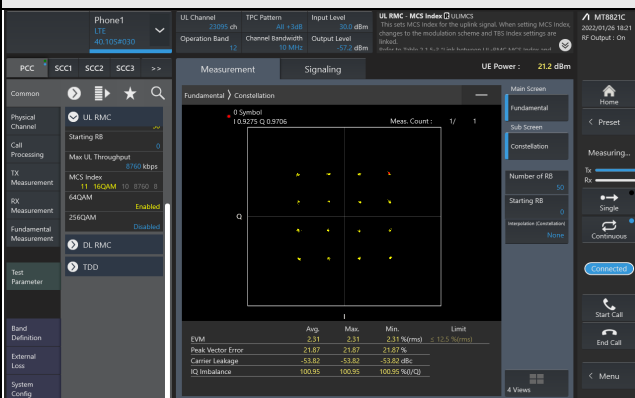
Spectrum Plot of Measurement Value

Channel: 23095 / Frequency (MHz): 707.5MHz

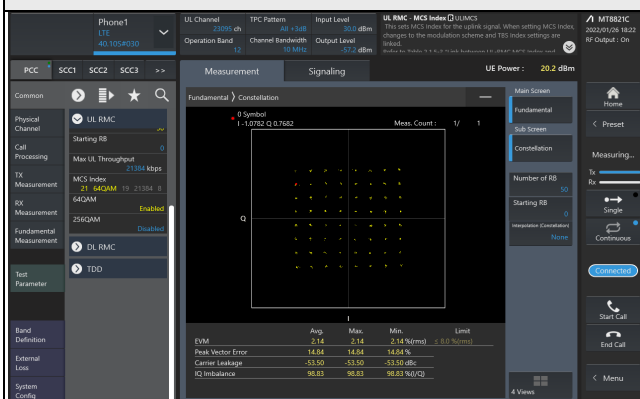
QPSK



16QAM



64QAM

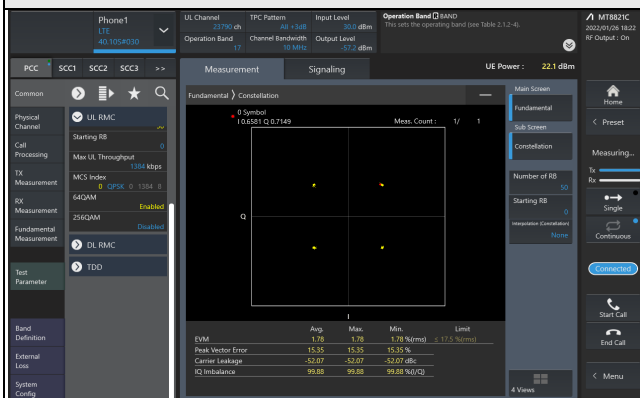


LTE Band 17

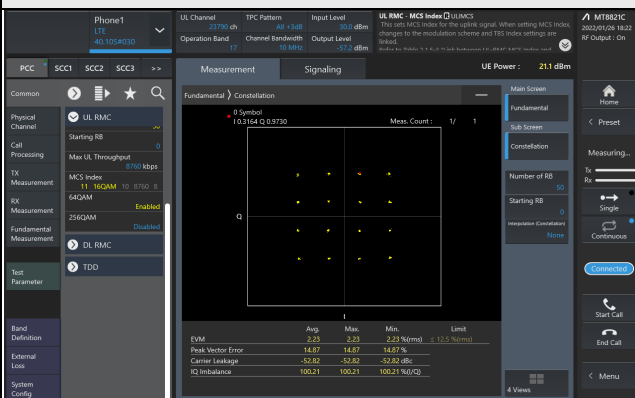
Spectrum Plot of Measurement Value

Channel: 23790 / Frequency (MHz): 710.0MHz

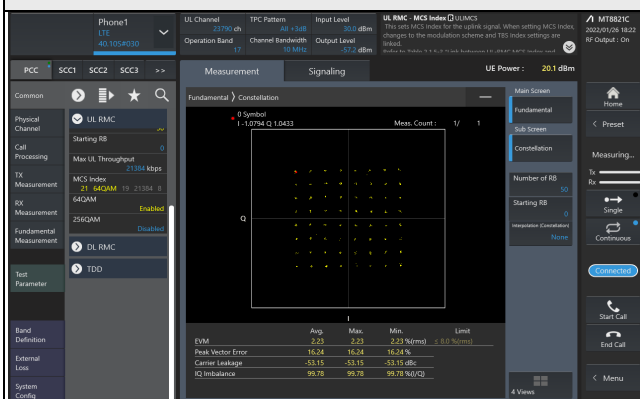
QPSK



16QAM



64QAM



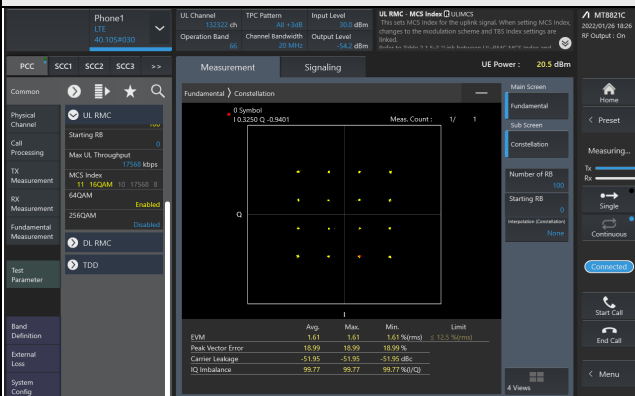
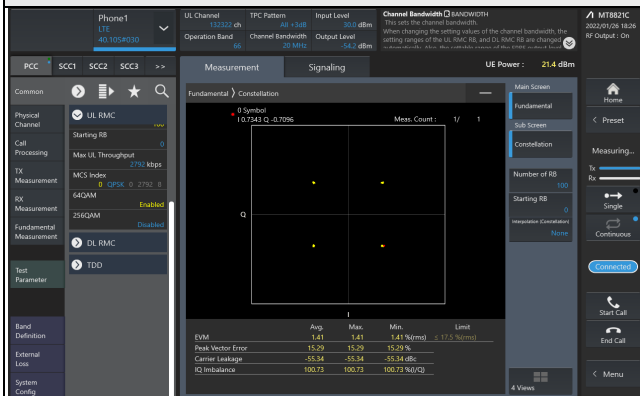
LTE Band 66

Spectrum Plot of Measurement Value

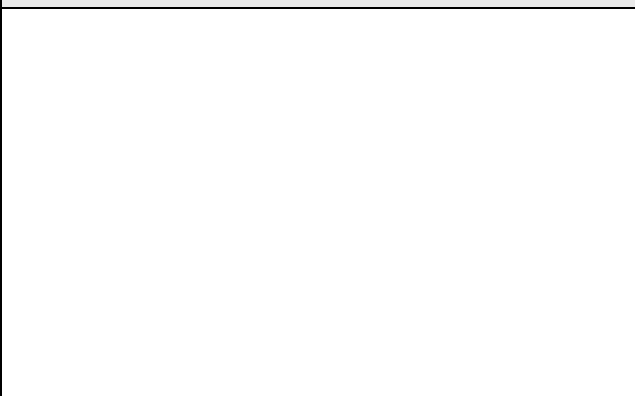
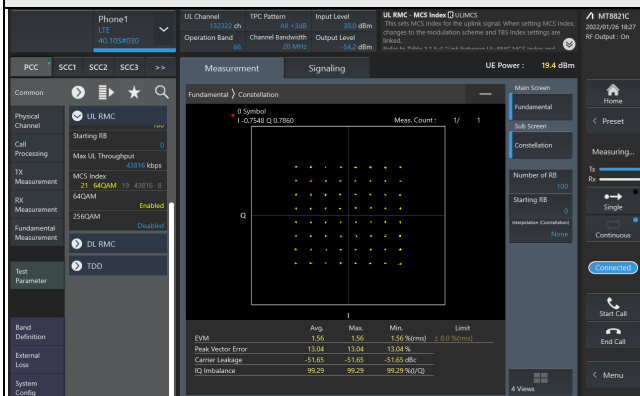
Channel: 132322 / Frequency (MHz): 1745.0MHz

QPSK

16QAM



64QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

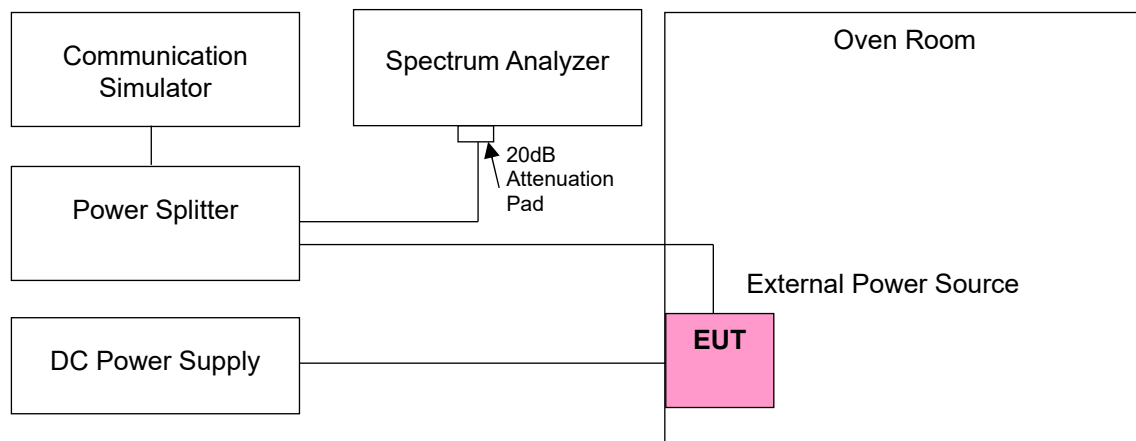
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1710.700004	0.002	1754.300001	0.001
3.4	1710.700001	0.001	1754.300004	0.002
4.6	1710.700004	0.002	1754.300002	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 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.700003	0.002	1754.300004	0.002
-30	1710.700003	0.002	1754.300004	0.002
-20	1710.700001	0.001	1754.300001	0.001
-10	1710.700003	0.002	1754.300003	0.002
0	1710.700002	0.001	1754.300002	0.001
10	1710.700001	0.001	1754.300003	0.002
20	1710.699999	-0.001	1754.299996	-0.002
30	1710.699999	-0.001	1754.299998	-0.001
40	1710.699998	-0.001	1754.299999	-0.001
50	1710.699998	-0.001	1754.299997	-0.002
60	1710.699997	-0.002	1754.299997	-0.002
70	1710.699996	-0.002	1754.299997	-0.002
80	1710.699999	-0.001	1754.299998	-0.001
85	1710.699998	-0.001	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)
4.0	1711.500003	0.002	1753.500001	0.001
3.4	1711.500002	0.001	1753.500003	0.002
4.6	1711.500002	0.001	1753.500003	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 4			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1711.500003	0.002	1753.500004	0.002
-30	1711.500001	0.001	1753.500004	0.002
-20	1711.500001	0.001	1753.500002	0.001
-10	1711.500002	0.001	1753.500003	0.002
0	1711.500004	0.002	1753.500001	0.001
10	1711.500004	0.002	1753.500002	0.001
20	1711.499996	-0.002	1753.499997	-0.002
30	1711.499996	-0.002	1753.499997	-0.002
40	1711.499996	-0.002	1753.499996	-0.002
50	1711.499999	-0.001	1753.499999	-0.001
60	1711.499996	-0.002	1753.499998	-0.001
70	1711.499998	-0.001	1753.499998	-0.001
80	1711.499997	-0.002	1753.499996	-0.002
85	1711.499996	-0.002	1753.499998	-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)
4.0	1712.500002	0.001	1752.500003	0.002
3.4	1712.500003	0.002	1752.500002	0.001
4.6	1712.500001	0.001	1752.500001	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 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.500001	0.001	1752.500001	0.001
-30	1712.500001	0.001	1752.500004	0.002
-20	1712.500004	0.002	1752.500001	0.001
-10	1712.500003	0.002	1752.500001	0.001
0	1712.500004	0.002	1752.500002	0.001
10	1712.500004	0.002	1752.500003	0.002
20	1712.499998	-0.001	1752.499998	-0.001
30	1712.499996	-0.002	1752.499999	-0.001
40	1712.499997	-0.002	1752.499997	-0.002
50	1712.499999	-0.001	1752.499999	-0.001
60	1712.499997	-0.002	1752.499996	-0.002
70	1712.499998	-0.001	1752.499997	-0.002
80	1712.499999	-0.001	1752.499999	-0.001
85	1712.499999	-0.001	1752.499997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1715.000001	0.001	1750.000003	0.002
3.4	1715.000002	0.001	1750.000002	0.001
4.6	1715.000003	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	1715.000001	0.001	1750.000002	0.001
-30	1715.000003	0.002	1750.000004	0.002
-20	1715.000003	0.002	1750.000001	0.001
-10	1715.000002	0.001	1750.000002	0.001
0	1715.000003	0.002	1750.000001	0.001
10	1715.000001	0.001	1750.000001	0.001
20	1714.999996	-0.002	1749.999998	-0.001
30	1714.999996	-0.002	1749.999996	-0.002
40	1714.999996	-0.002	1749.999997	-0.002
50	1714.999998	-0.001	1749.999998	-0.001
60	1714.999996	-0.002	1749.999999	-0.001
70	1714.999997	-0.002	1749.999999	-0.001
80	1714.999998	-0.001	1749.999998	-0.001
85	1714.999998	-0.001	1749.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1717.500002	0.001	1747.500003	0.002
3.4	1717.500004	0.002	1747.500002	0.001
4.6	1717.500001	0.001	1747.500002	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	1747.500003	0.002
-30	1717.500003	0.002	1747.500003	0.002
-20	1717.500004	0.002	1747.500001	0.001
-10	1717.500001	0.001	1747.500003	0.002
0	1717.500003	0.002	1747.500003	0.002
10	1717.500004	0.002	1747.500003	0.002
20	1717.499999	-0.001	1747.499999	-0.001
30	1717.499997	-0.002	1747.499997	-0.002
40	1717.499999	-0.001	1747.499997	-0.002
50	1717.499996	-0.002	1747.499997	-0.002
60	1717.499999	-0.001	1747.499997	-0.002
70	1717.499998	-0.001	1747.499998	-0.001
80	1717.499998	-0.001	1747.499999	-0.001
85	1717.499998	-0.001	1747.499997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1720.000001	0.001	1745.000004	0.002
3.4	1720.000004	0.002	1745.000004	0.002
4.6	1720.000004	0.002	1745.000003	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 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1720.000003	0.002	1745.000001	0.001
-30	1720.000002	0.001	1745.000003	0.002
-20	1720.000002	0.001	1745.000001	0.001
-10	1720.000004	0.002	1745.000004	0.002
0	1720.000003	0.002	1745.000003	0.002
10	1720.000003	0.002	1745.000001	0.001
20	1719.999997	-0.002	1744.999996	-0.002
30	1719.999999	-0.001	1744.999997	-0.002
40	1719.999996	-0.002	1744.999999	-0.001
50	1719.999998	-0.001	1744.999997	-0.002
60	1719.999999	-0.001	1744.999999	-0.001
70	1719.999996	-0.002	1744.999999	-0.001
80	1719.999999	-0.001	1744.999996	-0.002
85	1719.999998	-0.001	1744.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2502.500002	0.001	2567.500004	0.002
3.4	2502.500002	0.001	2567.500003	0.001
4.6	2502.500001	0.000	2567.500004	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	2502.500003	0.001	2567.500004	0.002
-30	2502.500001	0.000	2567.500004	0.002
-20	2502.500002	0.001	2567.500004	0.002
-10	2502.500002	0.001	2567.500002	0.001
0	2502.500004	0.002	2567.500001	0.000
10	2502.500002	0.001	2567.500001	0.000
20	2502.499997	-0.001	2567.499997	-0.001
30	2502.499999	0.000	2567.499996	-0.002
40	2502.499996	-0.002	2567.499999	0.000
50	2502.499999	0.000	2567.499998	-0.001
60	2502.499999	0.000	2567.499999	0.000
70	2502.499996	-0.002	2567.499996	-0.002
80	2502.499999	0.000	2567.499998	-0.001
85	2502.499999	0.000	2567.499999	0.000

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2505.000001	0.000	2565.000002	0.001
3.4	2505.000004	0.002	2565.000002	0.001
4.6	2505.000002	0.001	2565.000001	0.000

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	2505.000004	0.002	2565.000003	0.001
-30	2505.000001	0.000	2565.000002	0.001
-20	2505.000004	0.002	2565.000001	0.000
-10	2505.000004	0.002	2565.000003	0.001
0	2505.000001	0.000	2565.000001	0.000
10	2505.000001	0.000	2565.000002	0.001
20	2504.999996	-0.002	2564.999998	-0.001
30	2504.999998	-0.001	2564.999999	0.000
40	2504.999998	-0.001	2564.999996	-0.002
50	2504.999999	0.000	2564.999998	-0.001
60	2504.999996	-0.002	2564.999998	-0.001
70	2504.999997	-0.001	2564.999996	-0.002
80	2504.999999	0.000	2564.999999	0.000
85	2504.999998	-0.001	2564.999999	0.000

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2507.500001	0.000	2562.500004	0.002
3.4	2507.500001	0.000	2562.500001	0.000
4.6	2507.500002	0.001	2562.500004	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 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2507.500003	0.001	2562.500001	0.000
-30	2507.500002	0.001	2562.500001	0.000
-20	2507.500001	0.000	2562.500004	0.002
-10	2507.500002	0.001	2562.500002	0.001
0	2507.500004	0.002	2562.500001	0.000
10	2507.500004	0.002	2562.500002	0.001
20	2507.499996	-0.002	2562.499999	0.000
30	2507.499997	-0.001	2562.499999	0.000
40	2507.499996	-0.002	2562.499997	-0.001
50	2507.499996	-0.002	2562.499999	0.000
60	2507.499997	-0.001	2562.499998	-0.001
70	2507.499996	-0.002	2562.499996	-0.002
80	2507.499996	-0.002	2562.499996	-0.002
85	2507.499998	-0.001	2562.499997	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	2510.000002	0.001	2560.000001	0.000
3.4	2510.000003	0.001	2560.000004	0.002
4.6	2510.000001	0.000	2560.000004	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 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	2510.000001	0.000	2560.000001	0.000
-30	2510.000003	0.001	2560.000002	0.001
-20	2510.000002	0.001	2560.000001	0.000
-10	2510.000001	0.000	2560.000001	0.000
0	2510.000001	0.000	2560.000004	0.002
10	2510.000001	0.000	2560.000004	0.002
20	2509.999997	-0.001	2559.999996	-0.002
30	2509.999996	-0.002	2559.999997	-0.001
40	2509.999996	-0.002	2559.999997	-0.001
50	2509.999998	-0.001	2559.999996	-0.002
60	2509.999999	0.000	2559.999998	-0.001
70	2509.999997	-0.001	2559.999997	-0.001
80	2509.999996	-0.002	2559.999999	0.000
85	2509.999999	0.000	2559.999998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	699.700004	0.006	715.300002	0.003
3.4	699.700002	0.003	715.300001	0.001
4.6	699.700001	0.001	715.300003	0.004

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	699.700003	0.004	715.300001	0.001
-30	699.700004	0.006	715.300003	0.004
-20	699.700004	0.006	715.300001	0.001
-10	699.700004	0.006	715.300001	0.001
0	699.700004	0.006	715.300003	0.004
10	699.700003	0.004	715.300002	0.003
20	699.699996	-0.006	715.299997	-0.004
30	699.699999	-0.001	715.299996	-0.006
40	699.699997	-0.004	715.299999	-0.001
50	699.699998	-0.003	715.299999	-0.001
60	699.699996	-0.006	715.299997	-0.004
70	699.699997	-0.004	715.299998	-0.003
80	699.699997	-0.004	715.299999	-0.001
85	699.699997	-0.004	715.299998	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	700.500001	0.001	714.500001	0.001
3.4	700.500003	0.004	714.500003	0.004
4.6	700.500003	0.004	714.500003	0.004

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	700.500001	0.001	714.500003	0.004
-30	700.500001	0.001	714.500004	0.006
-20	700.500001	0.001	714.500004	0.006
-10	700.500003	0.004	714.500002	0.003
0	700.500002	0.003	714.500004	0.006
10	700.500001	0.001	714.500003	0.004
20	700.499998	-0.003	714.499998	-0.003
30	700.499997	-0.004	714.499997	-0.004
40	700.499997	-0.004	714.499999	-0.001
50	700.499997	-0.004	714.499996	-0.006
60	700.499996	-0.006	714.499997	-0.004
70	700.499997	-0.004	714.499997	-0.004
80	700.499997	-0.004	714.499998	-0.003
85	700.499998	-0.003	714.499997	-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)
4.0	701.500001	0.001	713.500003	0.004
3.4	701.500001	0.001	713.500003	0.004
4.6	701.500003	0.004	713.500001	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 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	701.500003	0.004	713.500001	0.001
-30	701.500001	0.001	713.500002	0.003
-20	701.500004	0.006	713.500004	0.006
-10	701.500001	0.001	713.500003	0.004
0	701.500004	0.006	713.500001	0.001
10	701.500001	0.001	713.500004	0.006
20	701.499999	-0.001	713.499999	-0.001
30	701.499996	-0.006	713.499998	-0.003
40	701.499996	-0.006	713.499997	-0.004
50	701.499999	-0.001	713.499999	-0.001
60	701.499996	-0.006	713.499998	-0.003
70	701.499996	-0.006	713.499998	-0.003
80	701.499997	-0.004	713.499998	-0.003
85	701.499999	-0.001	713.499997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	704.000004	0.006	711.000003	0.004
3.4	704.000003	0.004	711.000001	0.001
4.6	704.000004	0.006	711.000003	0.004

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	704.000003	0.004	711.000002	0.003
-30	704.000001	0.001	711.000002	0.003
-20	704.000001	0.001	711.000004	0.006
-10	704.000004	0.006	711.000001	0.001
0	704.000003	0.004	711.000002	0.003
10	704.000003	0.004	711.000001	0.001
20	703.999998	-0.003	710.999998	-0.003
30	703.999996	-0.006	710.999999	-0.001
40	703.999997	-0.004	710.999999	-0.001
50	703.999999	-0.001	710.999998	-0.003
60	703.999996	-0.006	710.999997	-0.004
70	703.999998	-0.003	710.999996	-0.006
80	703.999997	-0.004	710.999996	-0.006
85	703.999999	-0.001	710.999997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 17			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	706.500004	0.006	713.500004	0.006
3.4	706.500004	0.006	713.500003	0.004
4.6	706.500003	0.004	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	706.500004	0.006	713.500001	0.001
-30	706.500002	0.003	713.500004	0.006
-20	706.500004	0.006	713.500001	0.001
-10	706.500001	0.001	713.500004	0.006
0	706.500002	0.003	713.500002	0.003
10	706.500004	0.006	713.500001	0.001
20	706.499996	-0.006	713.499997	-0.004
30	706.499996	-0.006	713.499998	-0.003
40	706.499998	-0.003	713.499999	-0.001
50	706.499999	-0.001	713.499996	-0.006
60	706.499998	-0.003	713.499996	-0.006
70	706.499996	-0.006	713.499999	-0.001
80	706.499999	-0.001	713.499999	-0.001
85	706.499998	-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)
4.0	709.000001	0.001	711.000002	0.003
3.4	709.000004	0.006	711.000002	0.003
4.6	709.000004	0.006	711.000003	0.004

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	709.000002	0.003	711.000003	0.004
-20	709.000002	0.003	711.000004	0.006
-10	709.000003	0.004	711.000003	0.004
0	709.000002	0.003	711.000004	0.006
10	709.000001	0.001	711.000004	0.006
20	708.999999	-0.001	710.999997	-0.004
30	708.999999	-0.001	710.999998	-0.003
40	708.999996	-0.006	710.999997	-0.004
50	708.999997	-0.004	710.999997	-0.004
60	708.999998	-0.003	710.999998	-0.003
70	708.999996	-0.006	710.999999	-0.001
80	708.999997	-0.004	710.999996	-0.006
85	708.999999	-0.001	710.999998	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1710.700004	0.002	1779.300004	0.002
3.4	1710.700003	0.002	1779.300001	0.001
4.6	1710.700002	0.001	1779.300003	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: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.700003	0.002	1779.300002	0.001
-30	1710.700004	0.002	1779.300003	0.002
-20	1710.700003	0.002	1779.300002	0.001
-10	1710.700003	0.002	1779.300003	0.002
0	1710.700004	0.002	1779.300003	0.002
10	1710.700004	0.002	1779.300002	0.001
20	1710.699997	-0.002	1779.299996	-0.002
30	1710.699998	-0.001	1779.299999	-0.001
40	1710.699996	-0.002	1779.299999	-0.001
50	1710.699997	-0.002	1779.299998	-0.001
60	1710.699997	-0.002	1779.299997	-0.002
70	1710.699999	-0.001	1779.299996	-0.002
80	1710.699997	-0.002	1779.299998	-0.001
85	1710.699996	-0.002	1779.299997	-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)
4.0	1711.500004	0.002	1778.500002	0.001
3.4	1711.500002	0.001	1778.500002	0.001
4.6	1711.500003	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	1711.500004	0.002	1778.500004	0.002
-30	1711.500003	0.002	1778.500002	0.001
-20	1711.500003	0.002	1778.500003	0.002
-10	1711.500004	0.002	1778.500001	0.001
0	1711.500002	0.001	1778.500003	0.002
10	1711.500003	0.002	1778.500002	0.001
20	1711.499999	-0.001	1778.499996	-0.002
30	1711.499996	-0.002	1778.499999	-0.001
40	1711.499998	-0.001	1778.499996	-0.002
50	1711.499997	-0.002	1778.499997	-0.002
60	1711.499998	-0.001	1778.499998	-0.001
70	1711.499999	-0.001	1778.499997	-0.002
80	1711.499999	-0.001	1778.499999	-0.001
85	1711.499997	-0.002	1778.499997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1712.500003	0.002	1777.500001	0.001
3.4	1712.500001	0.001	1777.500003	0.002
4.6	1712.500001	0.001	1777.500002	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: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.500003	0.002	1777.500002	0.001
-30	1712.500003	0.002	1777.500002	0.001
-20	1712.500002	0.001	1777.500003	0.002
-10	1712.500003	0.002	1777.500001	0.001
0	1712.500003	0.002	1777.500003	0.002
10	1712.500002	0.001	1777.500002	0.001
20	1712.499998	-0.001	1777.499997	-0.002
30	1712.499998	-0.001	1777.499997	-0.002
40	1712.499997	-0.002	1777.499996	-0.002
50	1712.499996	-0.002	1777.499999	-0.001
60	1712.499999	-0.001	1777.499996	-0.002
70	1712.499999	-0.001	1777.499996	-0.002
80	1712.499997	-0.002	1777.499999	-0.001
85	1712.499998	-0.001	1777.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1715.000003	0.002	1775.000002	0.001
3.4	1715.000003	0.002	1775.000004	0.002
4.6	1715.000004	0.002	1775.000001	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: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1715.000002	0.001	1775.000001	0.001
-30	1715.000002	0.001	1775.000002	0.001
-20	1715.000004	0.002	1775.000004	0.002
-10	1715.000003	0.002	1775.000001	0.001
0	1715.000004	0.002	1775.000004	0.002
10	1715.000003	0.002	1775.000002	0.001
20	1714.999998	-0.001	1774.999998	-0.001
30	1714.999999	-0.001	1774.999997	-0.002
40	1714.999996	-0.002	1774.999997	-0.002
50	1714.999998	-0.001	1774.999999	-0.001
60	1714.999997	-0.002	1774.999996	-0.002
70	1714.999996	-0.002	1774.999999	-0.001
80	1714.999998	-0.001	1774.999997	-0.002
85	1714.999997	-0.002	1774.999997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1717.500001	0.001	1772.500001	0.001
3.4	1717.500002	0.001	1772.500004	0.002
4.6	1717.500002	0.001	1772.500003	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: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1717.500002	0.001	1772.500004	0.002
-30	1717.500003	0.002	1772.500001	0.001
-20	1717.500004	0.002	1772.500002	0.001
-10	1717.500001	0.001	1772.500003	0.002
0	1717.500004	0.002	1772.500004	0.002
10	1717.500003	0.002	1772.500003	0.002
20	1717.499997	-0.002	1772.499998	-0.001
30	1717.499999	-0.001	1772.499999	-0.001
40	1717.499998	-0.001	1772.499998	-0.001
50	1717.499999	-0.001	1772.499998	-0.001
60	1717.499999	-0.001	1772.499999	-0.001
70	1717.499999	-0.001	1772.499999	-0.001
80	1717.499999	-0.001	1772.499999	-0.001
85	1717.499999	-0.001	1772.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1720.000001	0.001	1770.000002	0.001
3.4	1720.000001	0.001	1770.000003	0.002
4.6	1720.000001	0.001	1770.000003	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: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1720.000002	0.001	1770.000004	0.002
-30	1720.000001	0.001	1770.000003	0.002
-20	1720.000002	0.001	1770.000002	0.001
-10	1720.000004	0.002	1770.000004	0.002
0	1720.000002	0.001	1770.000003	0.002
10	1720.000003	0.002	1770.000003	0.002
20	1719.999998	-0.001	1769.999998	-0.001
30	1719.999998	-0.001	1769.999996	-0.002
40	1719.999997	-0.002	1769.999998	-0.001
50	1719.999998	-0.001	1769.999999	-0.001
60	1719.999998	-0.001	1769.999996	-0.002
70	1719.999997	-0.002	1769.999996	-0.002
80	1719.999998	-0.001	1769.999996	-0.002
85	1719.999996	-0.002	1769.999996	-0.002

4.4 Emission Bandwidth Measurement

4.4.1 Limits of Emission Bandwidth Measurement

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

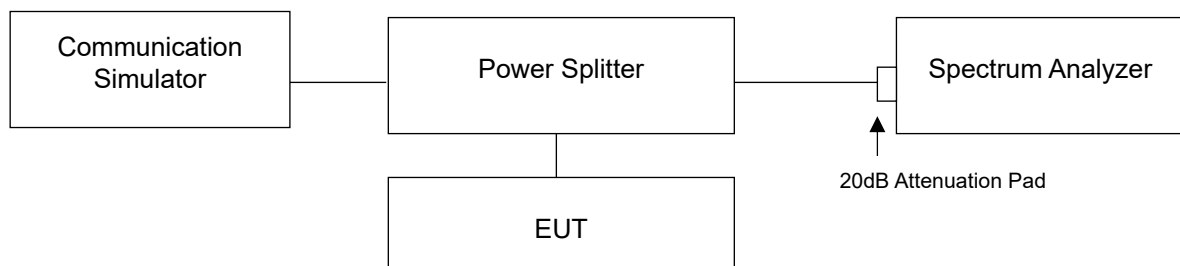
4.4.2 Test Procedure

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

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

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

4.4.3 Test Setup

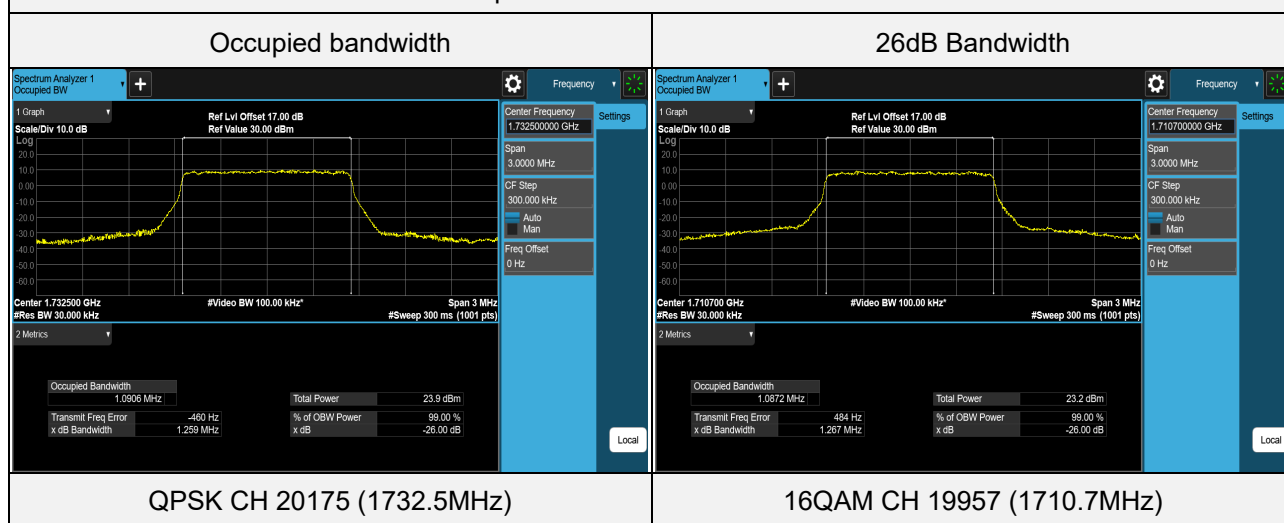


4.4.4 Test Result

LTE Band 4 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	19957	1710.7	1.0873	1.258
QPSK	20175	1732.5	1.0906	1.259
QPSK	20393	1754.3	1.0893	1.256
16QAM	19957	1710.7	1.0872	1.267
16QAM	20175	1732.5	1.0863	1.256
16QAM	20393	1754.3	1.0862	1.253
64QAM	19957	1710.7	1.0880	1.258
64QAM	20175	1732.5	1.0882	1.255
64QAM	20393	1754.3	1.0871	1.252

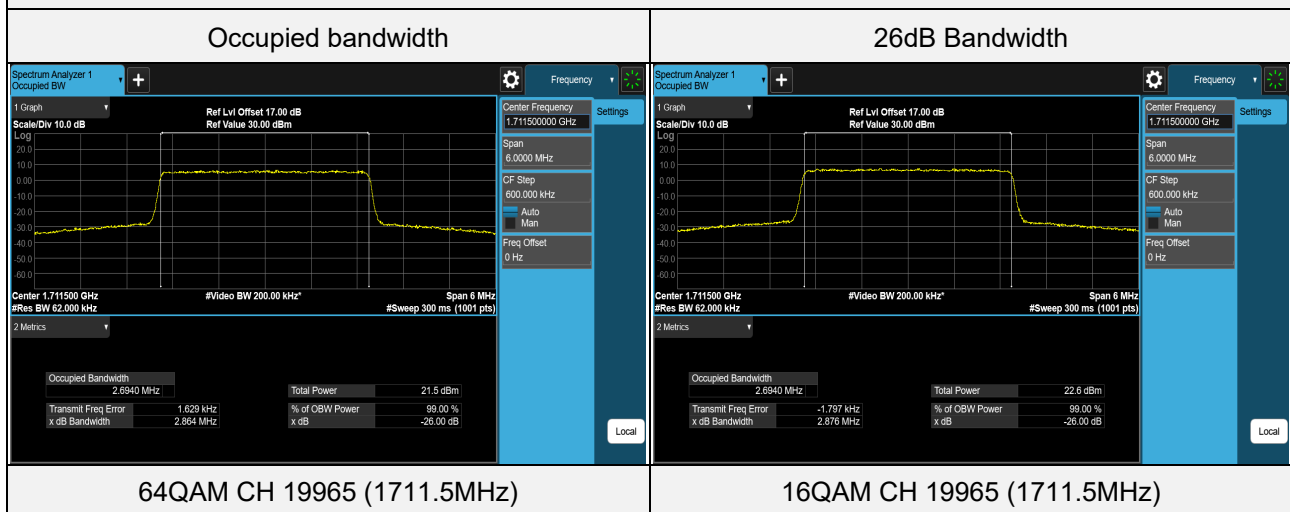
Spectrum Plot of Worst Value



LTE Band 4 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	19965	1711.5	2.6933	2.869
QPSK	20175	1732.5	2.6936	2.865
QPSK	20385	1753.5	2.6915	2.869
16QAM	19965	1711.5	2.6940	2.876
16QAM	20175	1732.5	2.6928	2.867
16QAM	20385	1753.5	2.6905	2.870
64QAM	19965	1711.5	2.6940	2.864
64QAM	20175	1732.5	2.6934	2.864
64QAM	20385	1753.5	2.6920	2.856

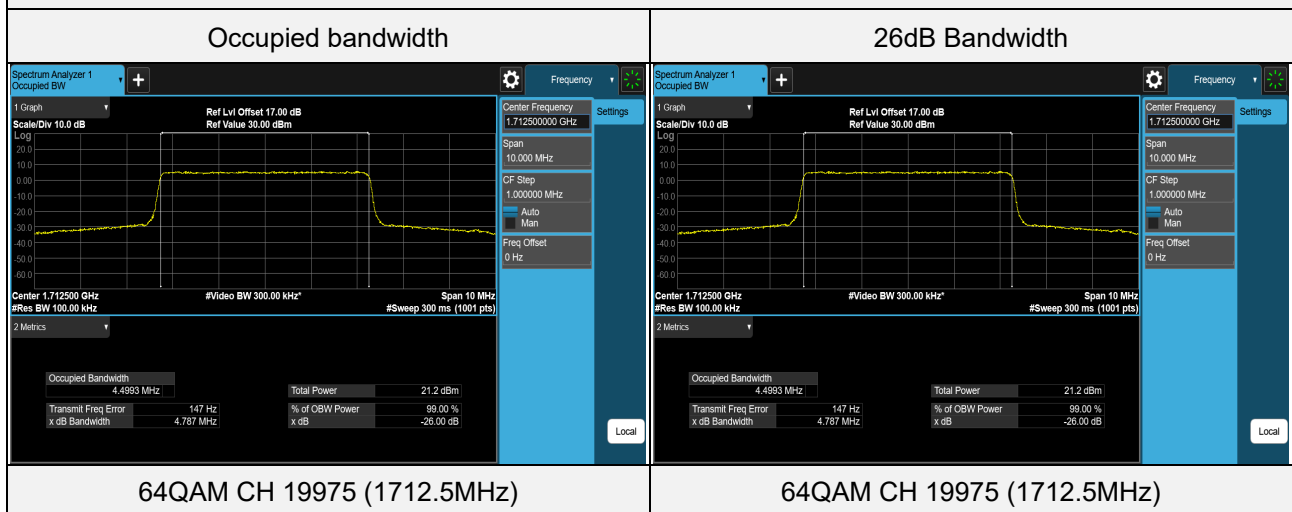
Spectrum Plot of Worst Value



LTE Band 4 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	19975	1712.5	4.4965	4.784
QPSK	20175	1732.5	4.4948	4.778
QPSK	20375	1752.5	4.4927	4.774
16QAM	19975	1712.5	4.4932	4.773
16QAM	20175	1732.5	4.4907	4.769
16QAM	20375	1752.5	4.4922	4.763
64QAM	19975	1712.5	4.4993	4.787
64QAM	20175	1732.5	4.4932	4.783
64QAM	20375	1752.5	4.4930	4.777

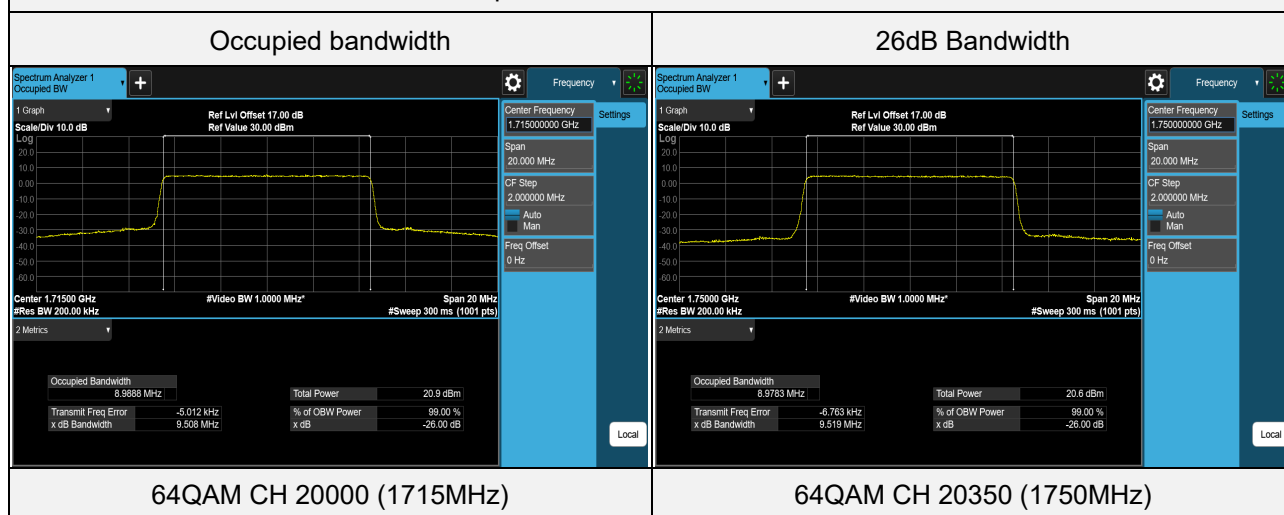
Spectrum Plot of Worst Value



LTE Band 4 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20000	1715	8.9845	9.516
QPSK	20175	1732.5	8.9803	9.499
QPSK	20350	1750	8.9769	9.498
16QAM	20000	1715	8.9858	9.502
16QAM	20175	1732.5	8.9791	9.488
16QAM	20350	1750	8.9745	9.498
64QAM	20000	1715	8.9888	9.508
64QAM	20175	1732.5	8.9783	9.505
64QAM	20350	1750	8.9783	9.519

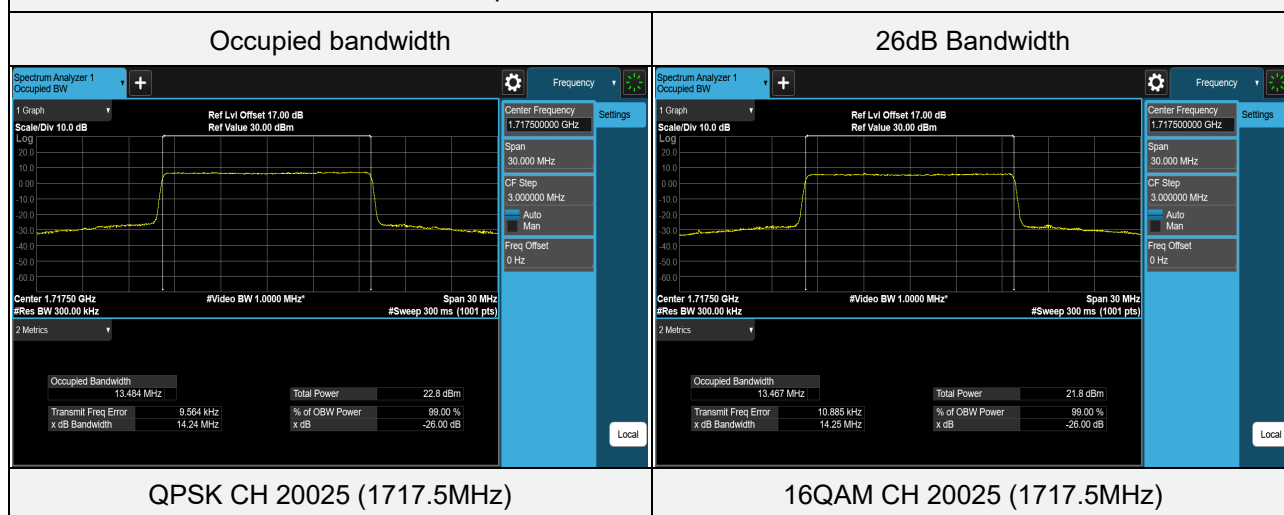
Spectrum Plot of Worst Value



LTE Band 4 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20025	1717.5	13.484	14.24
QPSK	20175	1732.5	13.471	14.23
QPSK	20325	1747.5	13.462	14.22
16QAM	20025	1717.5	13.467	14.25
16QAM	20175	1732.5	13.456	14.23
16QAM	20325	1747.5	13.452	14.22
64QAM	20025	1717.5	13.465	14.25
64QAM	20175	1732.5	13.457	14.22
64QAM	20325	1747.5	13.448	14.23

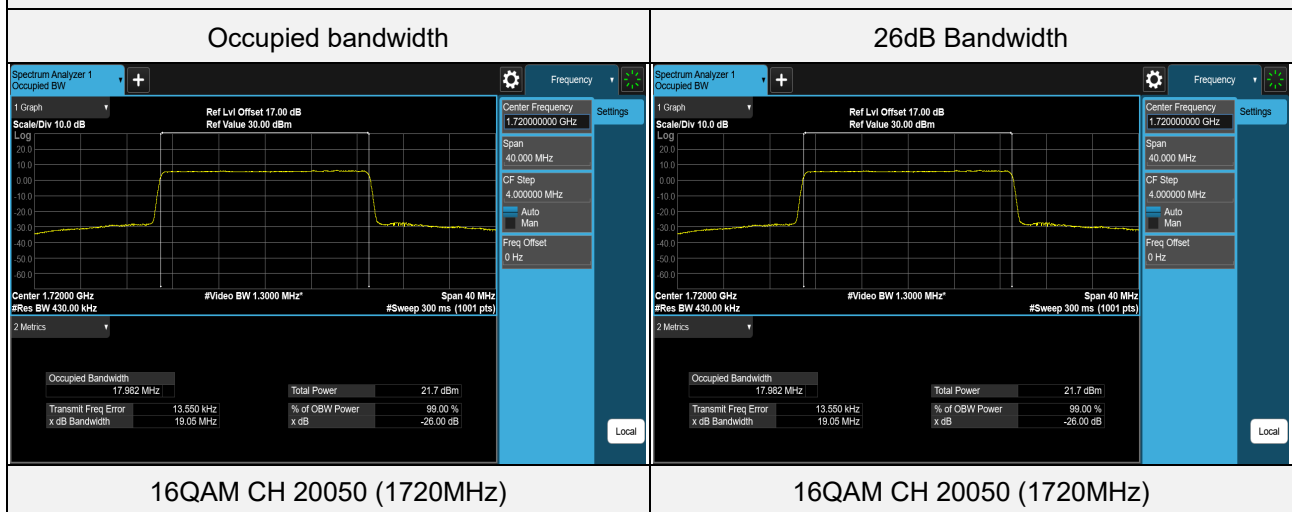
Spectrum Plot of Worst Value



LTE Band 4 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20050	1720	17.970	19.05
QPSK	20175	1732.5	17.948	19.02
QPSK	20300	1745	17.943	19.02
16QAM	20050	1720	17.982	19.05
16QAM	20175	1732.5	17.954	19.02
16QAM	20300	1745	17.951	19.03
64QAM	20050	1720	17.971	19.04
64QAM	20175	1732.5	17.950	19.02
64QAM	20300	1745	17.949	19.03

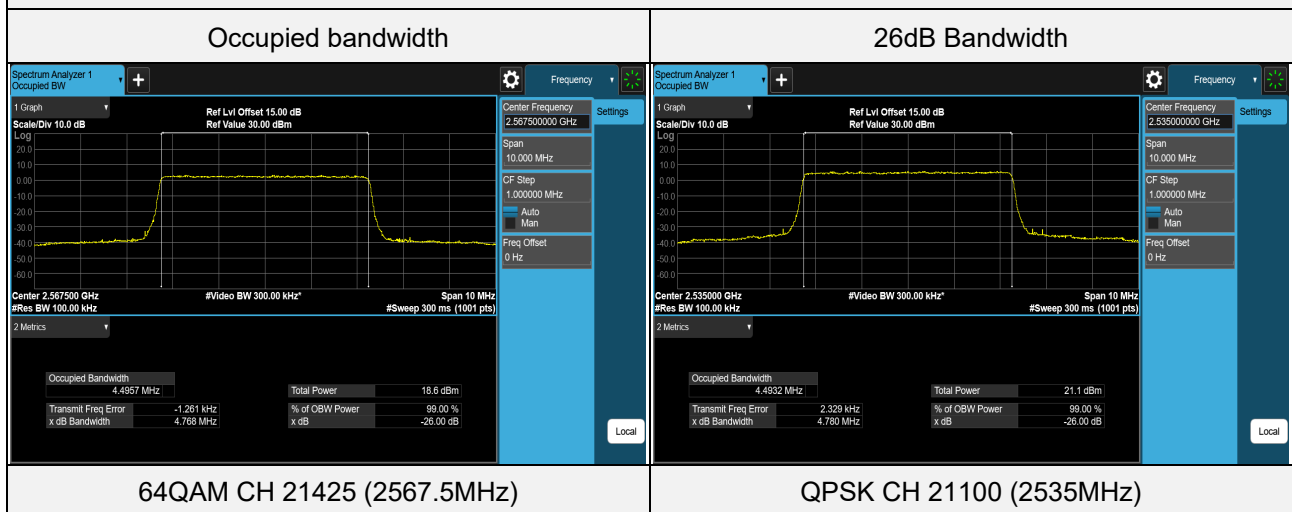
Spectrum Plot of Worst Value



LTE Band 7 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20775	2502.5	4.4882	4.767
QPSK	21100	2535	4.4932	4.780
QPSK	21425	2567.5	4.4916	4.780
16QAM	20775	2502.5	4.4892	4.766
16QAM	21100	2535	4.4939	4.771
16QAM	21425	2567.5	4.4883	4.771
64QAM	20775	2502.5	4.4921	4.772
64QAM	21100	2535	4.4925	4.776
64QAM	21425	2567.5	4.4957	4.768

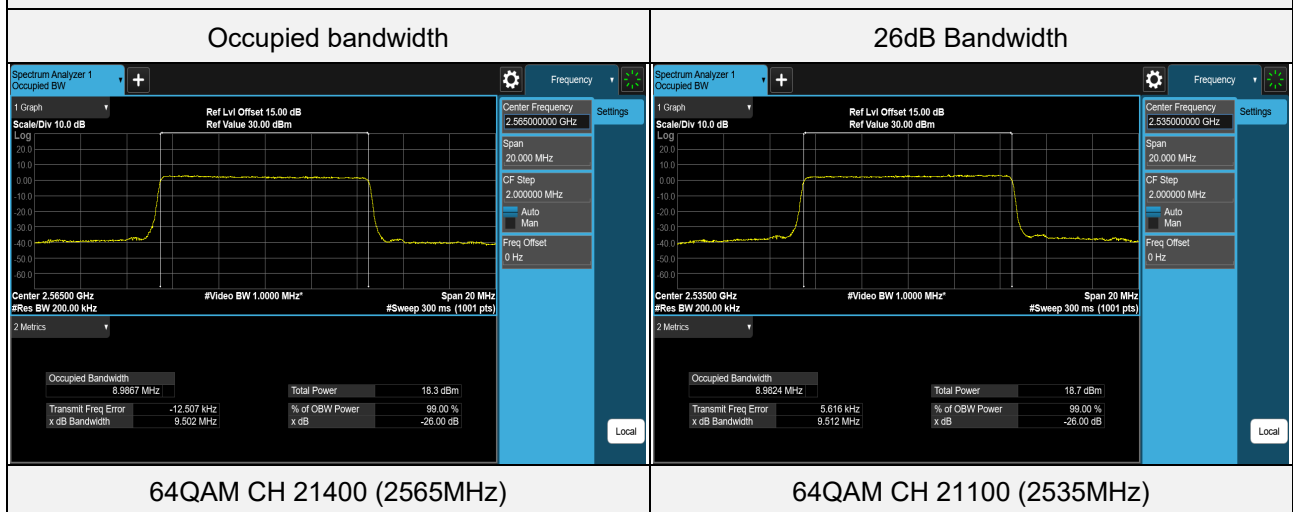
Spectrum Plot of Worst Value



LTE Band 7 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20800	2505	8.9718	9.488
QPSK	21100	2535	8.9834	9.498
QPSK	21400	2565	8.9813	9.492
16QAM	20800	2505	8.9678	9.482
16QAM	21100	2535	8.9783	9.492
16QAM	21400	2565	8.9840	9.488
64QAM	20800	2505	8.9694	9.498
64QAM	21100	2535	8.9824	9.512
64QAM	21400	2565	8.9867	9.502

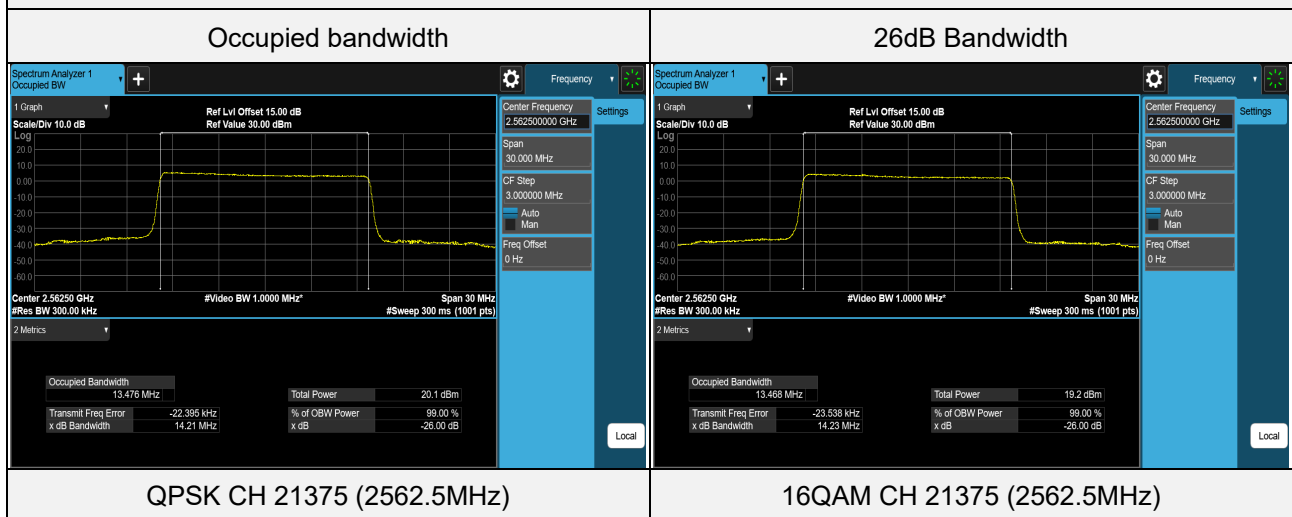
Spectrum Plot of Worst Value



LTE Band 7 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20825	2507.5	13.431	14.21
QPSK	21100	2535	13.475	14.22
QPSK	21375	2562.5	13.476	14.21
16QAM	20825	2507.5	13.427	14.22
16QAM	21100	2535	13.469	14.22
16QAM	21375	2562.5	13.468	14.23
64QAM	20825	2507.5	13.425	14.21
64QAM	21100	2535	13.464	14.23
64QAM	21375	2562.5	13.462	14.21

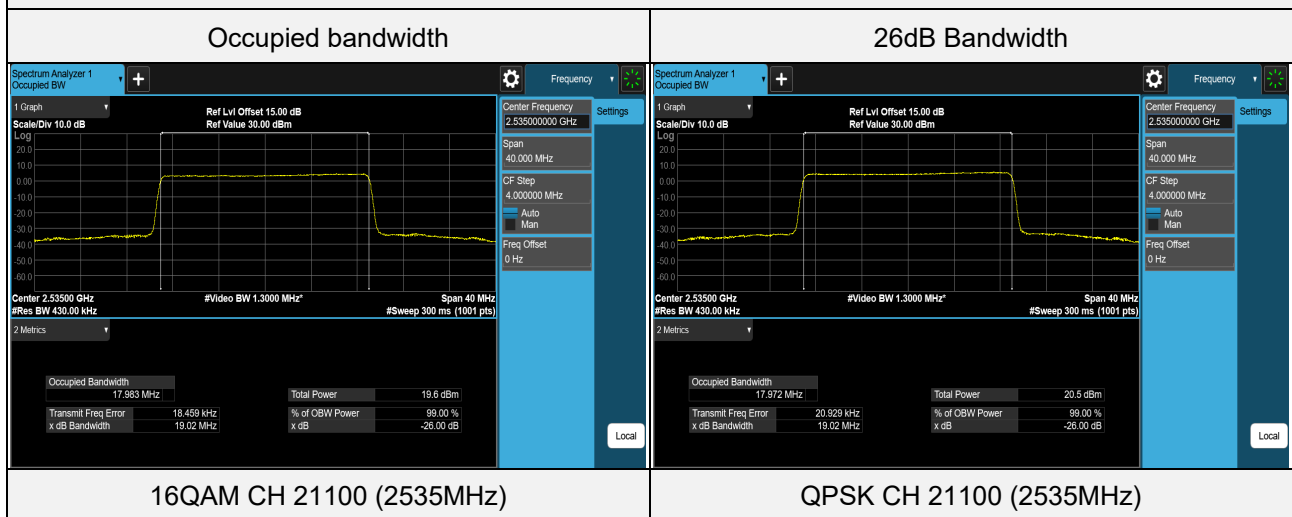
Spectrum Plot of Worst Value



LTE Band 7 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20850	2510	17.870	18.98
QPSK	21100	2535	17.972	19.02
QPSK	21350	2560	17.937	18.99
16QAM	20850	2510	17.896	18.99
16QAM	21100	2535	17.983	19.02
16QAM	21350	2560	17.942	18.99
64QAM	20850	2510	17.883	18.99
64QAM	21100	2535	17.979	19.02
64QAM	21350	2560	17.934	19.00

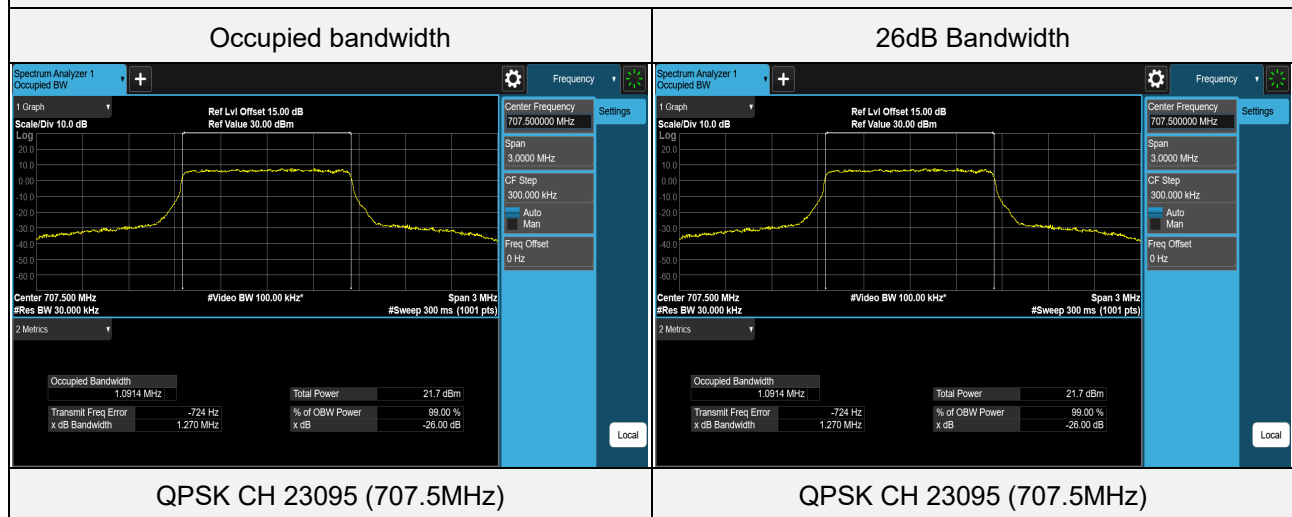
Spectrum Plot of Worst Value



LTE Band 12 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23017	699.7	1.0872	1.252
QPSK	23095	707.5	1.0914	1.270
QPSK	23173	715.3	1.0905	1.263
16QAM	23017	699.7	1.0870	1.254
16QAM	23095	707.5	1.0869	1.261
16QAM	23173	715.3	1.0866	1.246
64QAM	23017	699.7	1.0886	1.248
64QAM	23095	707.5	1.0885	1.244
64QAM	23173	715.3	1.0882	1.250

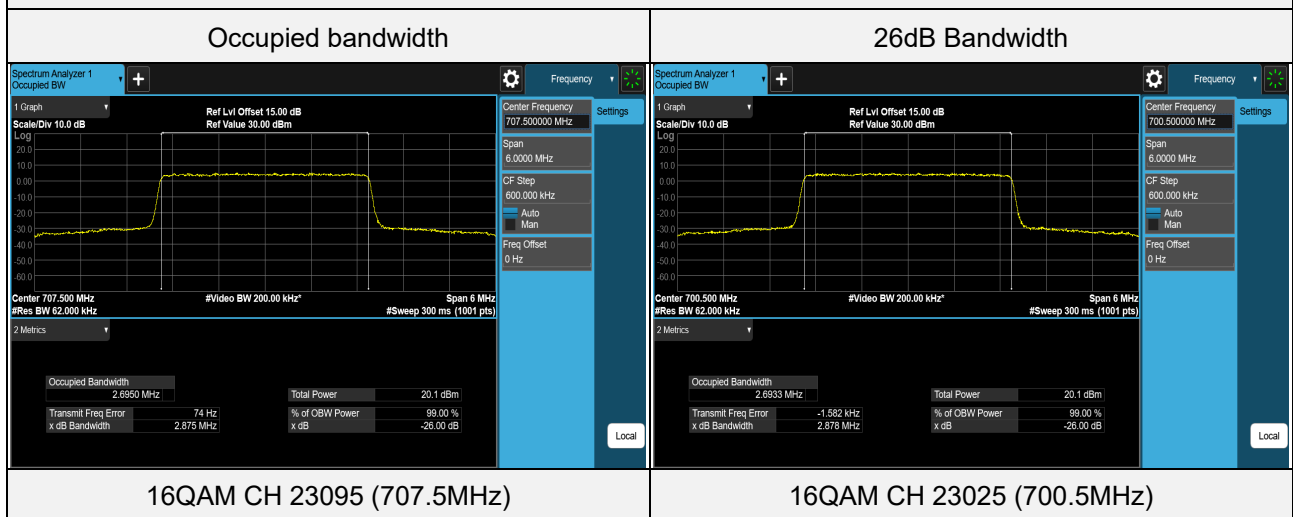
Spectrum Plot of Worst Value



LTE Band 12 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23025	700.5	2.6916	2.875
QPSK	23095	707.5	2.6932	2.870
QPSK	23165	714.5	2.6932	2.870
16QAM	23025	700.5	2.6933	2.878
16QAM	23095	707.5	2.6950	2.875
16QAM	23165	714.5	2.6926	2.867
64QAM	23025	700.5	2.6925	2.861
64QAM	23095	707.5	2.6925	2.859
64QAM	23165	714.5	2.6915	2.860

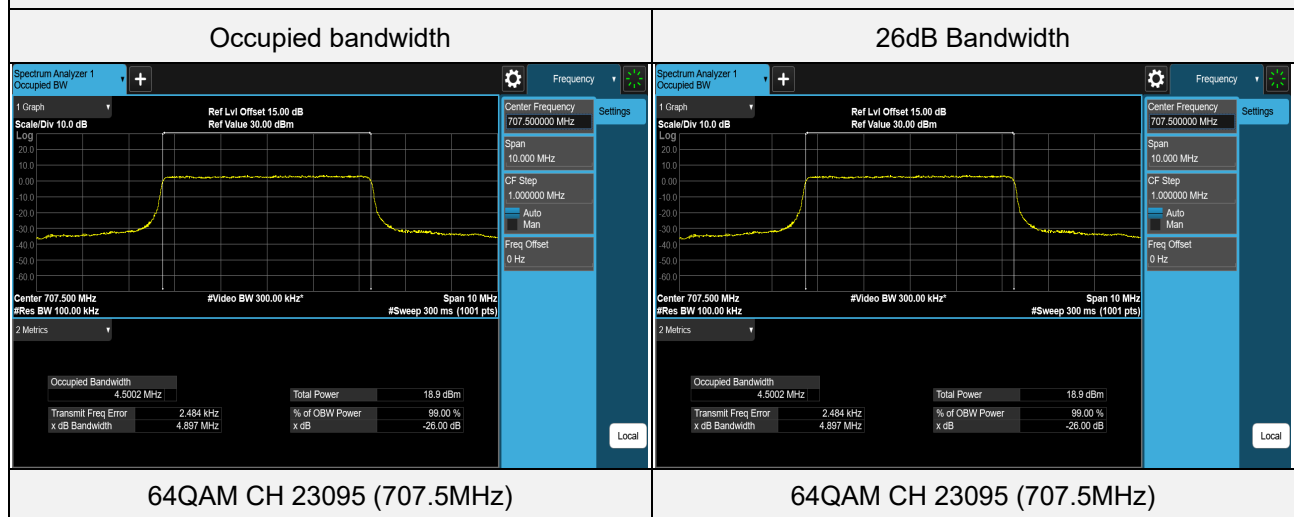
Spectrum Plot of Worst Value



LTE Band 12 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23035	701.5	4.4971	4.896
QPSK	23095	707.5	4.4983	4.881
QPSK	23155	713.5	4.4959	4.884
16QAM	23035	701.5	4.4937	4.864
16QAM	23095	707.5	4.4952	4.865
16QAM	23155	713.5	4.4932	4.870
64QAM	23035	701.5	4.4950	4.892
64QAM	23095	707.5	4.5002	4.897
64QAM	23155	713.5	4.4954	4.881

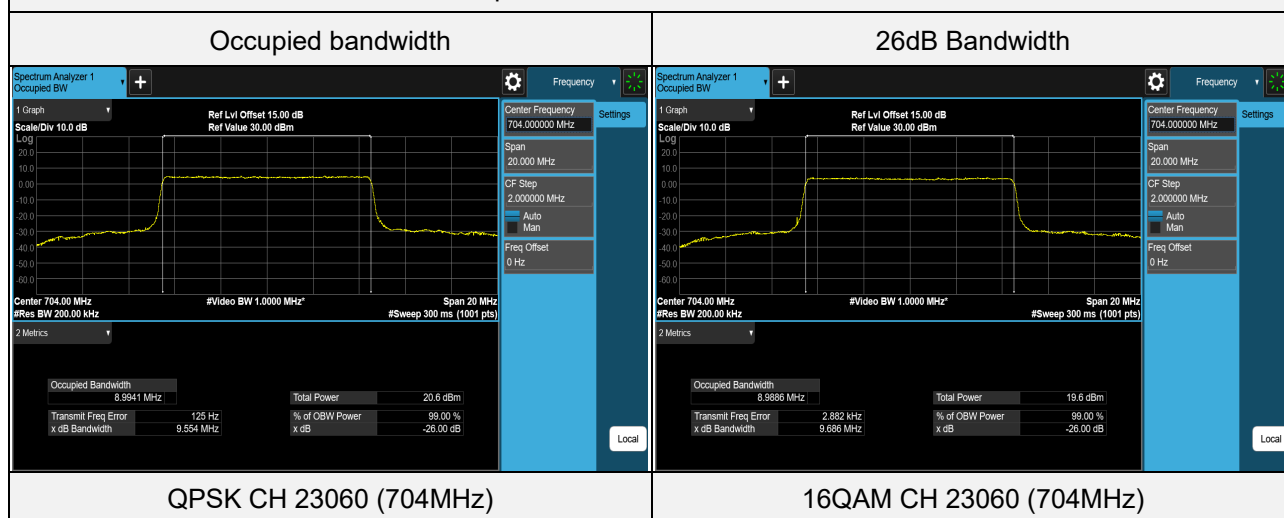
Spectrum Plot of Worst Value



LTE Band 12 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23060	704	8.9941	9.554
QPSK	23095	707.5	8.9925	9.542
QPSK	23130	711	8.9750	9.562
16QAM	23060	704	8.9886	9.686
16QAM	23095	707.5	8.9847	9.548
16QAM	23130	711	8.9720	9.547
64QAM	23060	704	8.9939	9.583
64QAM	23095	707.5	8.9904	9.601
64QAM	23130	711	8.9744	9.560

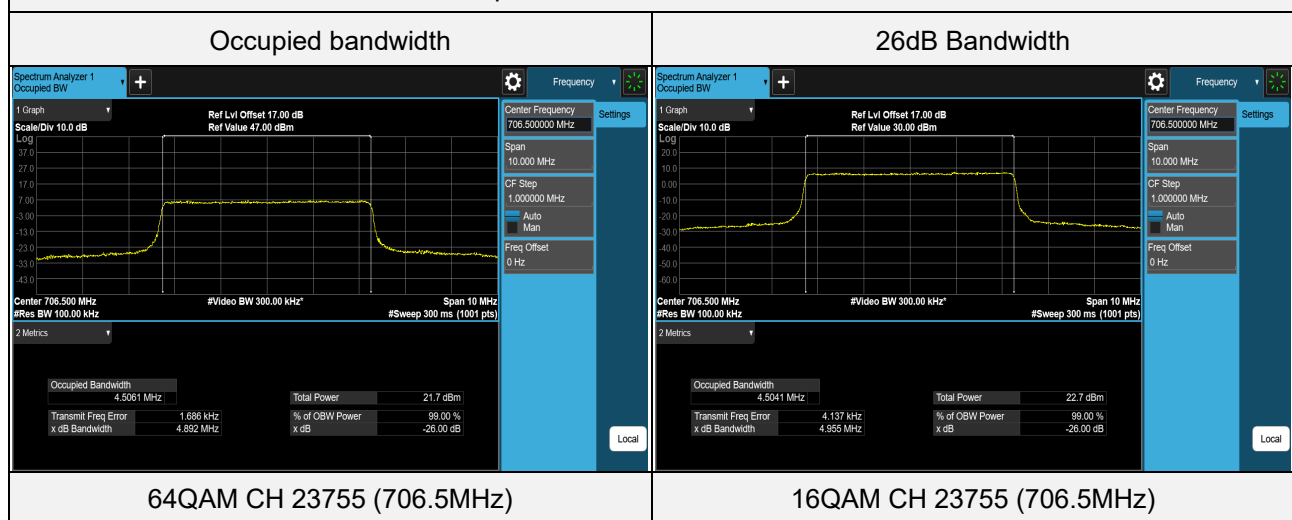
Spectrum Plot of Worst Value



LTE Band 17 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23755	706.5	4.5007	4.920
QPSK	23790	710	4.4939	4.871
QPSK	23825	713.5	4.4929	4.852
16QAM	23755	706.5	4.5041	4.955
16QAM	23790	710	4.4907	4.836
16QAM	23825	713.5	4.4876	4.840
64QAM	23755	706.5	4.5061	4.892
64QAM	23790	710	4.4949	4.855
64QAM	23825	713.5	4.4880	4.840

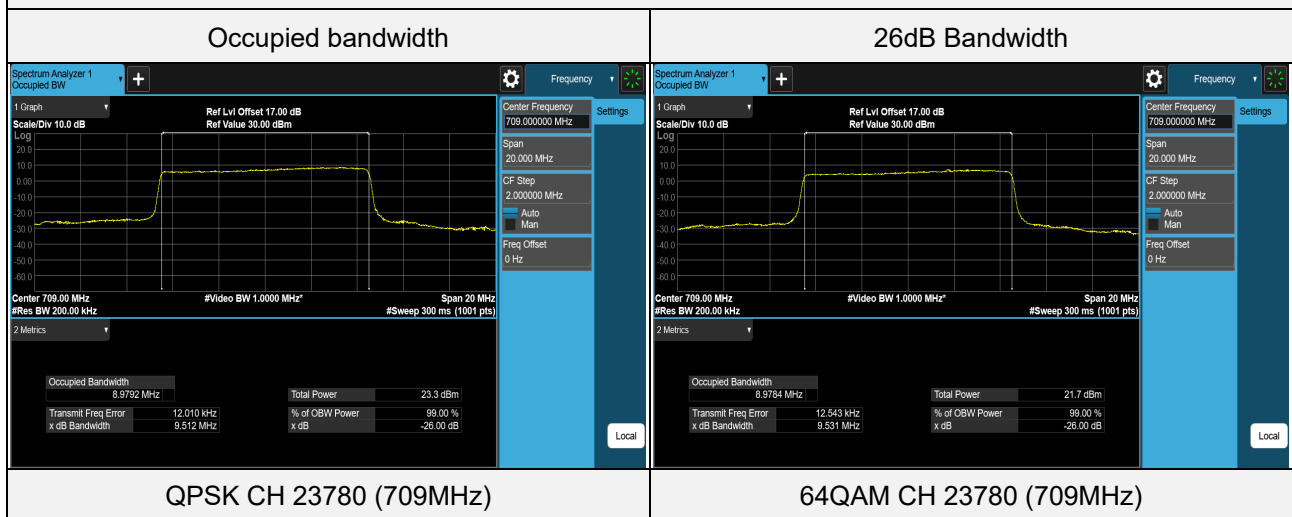
Spectrum Plot of Worst Value



LTE Band 17 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	23780	709	8.9792	9.512
QPSK	23790	710	8.9555	9.503
QPSK	23800	711	8.9422	9.505
16QAM	23780	709	8.9731	9.513
16QAM	23790	710	8.9570	9.522
16QAM	23800	711	8.9403	9.503
64QAM	23780	709	8.9784	9.531
64QAM	23790	710	8.9556	9.517
64QAM	23800	711	8.9422	9.499

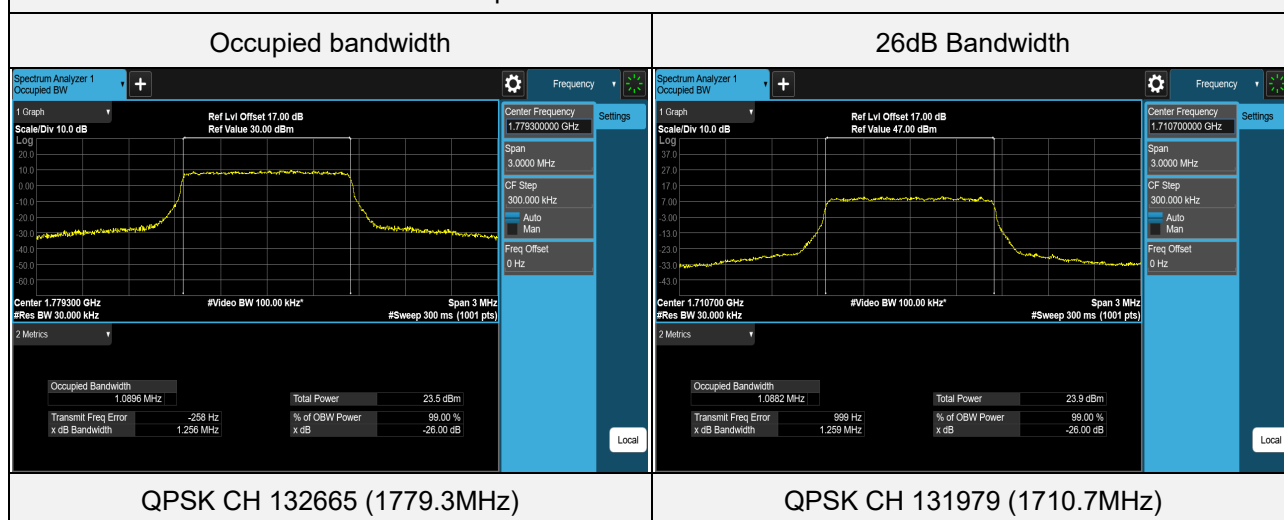
Spectrum Plot of Worst Value



LTE Band 66 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	131979	1710.7	1.0882	1.259
QPSK	132322	1745	1.0891	1.258
QPSK	132665	1779.3	1.0896	1.256
16QAM	131979	1710.7	1.0879	1.258
16QAM	132322	1745	1.0868	1.242
16QAM	132665	1779.3	1.0886	1.254
64QAM	131979	1710.7	1.0870	1.257
64QAM	132322	1745	1.0882	1.254
64QAM	132665	1779.3	1.0875	1.254

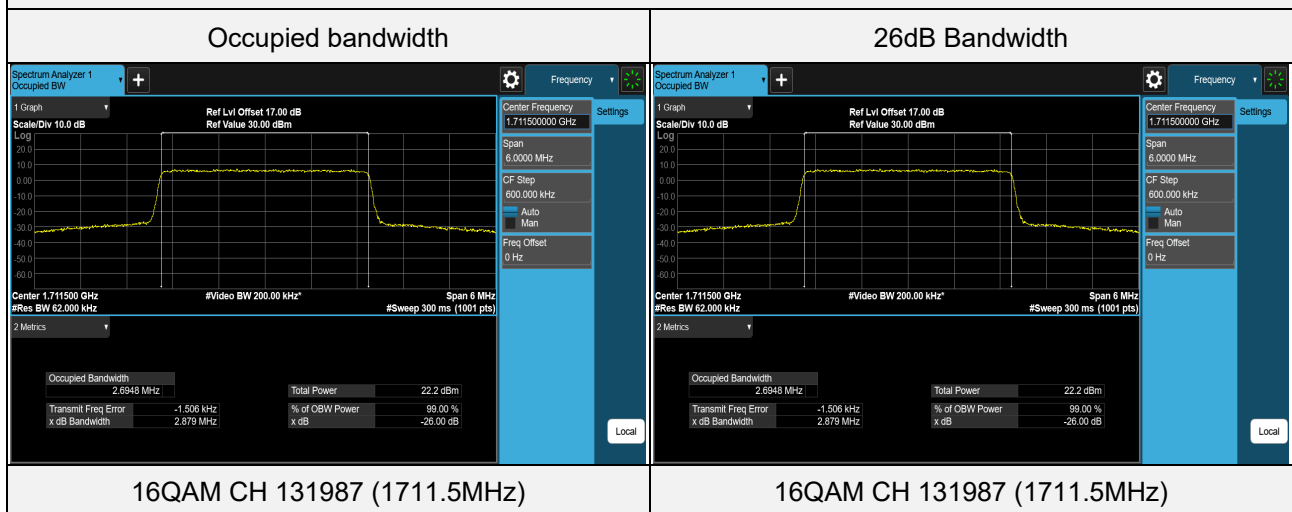
Spectrum Plot of Worst Value



LTE Band 66 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	131987	1711.5	2.6931	2.867
QPSK	132322	1745	2.6911	2.868
QPSK	132657	1778.5	2.6929	2.872
16QAM	131987	1711.5	2.6948	2.879
16QAM	132322	1745	2.6914	2.876
16QAM	132657	1778.5	2.6926	2.876
64QAM	131987	1711.5	2.6933	2.867
64QAM	132322	1745	2.6922	2.862
64QAM	132657	1778.5	2.6912	2.857

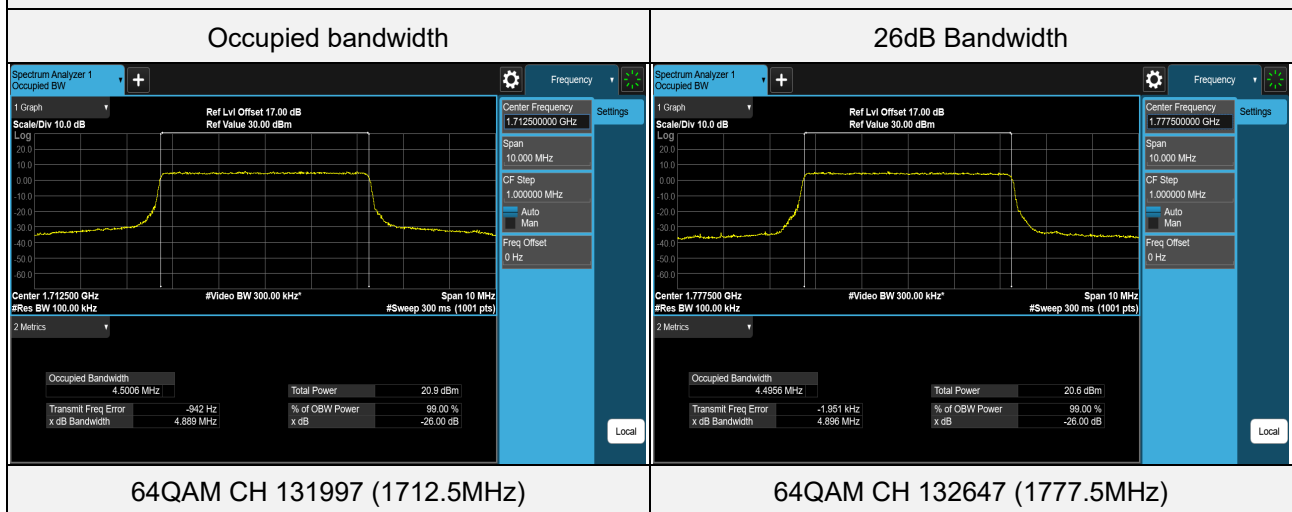
Spectrum Plot of Worst Value



LTE Band 66 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	131997	1712.5	4.4980	4.894
QPSK	132322	1745	4.4965	4.867
QPSK	132647	1777.5	4.4996	4.881
16QAM	131997	1712.5	4.4972	4.870
16QAM	132322	1745	4.4904	4.870
16QAM	132647	1777.5	4.4947	4.892
64QAM	131997	1712.5	4.5006	4.889
64QAM	132322	1745	4.4976	4.879
64QAM	132647	1777.5	4.4956	4.896

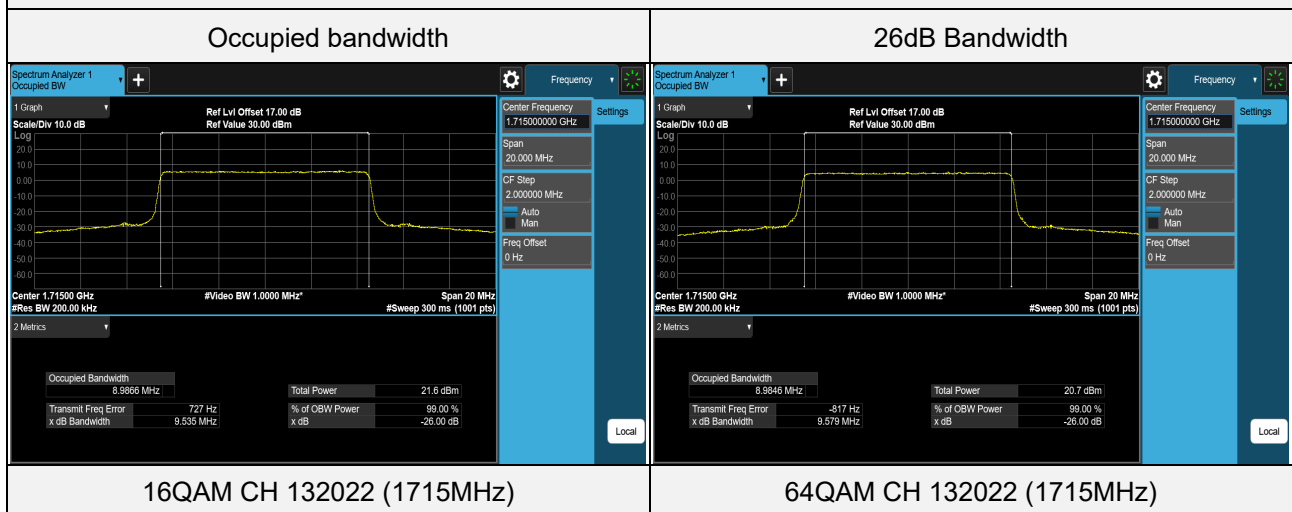
Spectrum Plot of Worst Value



LTE Band 66 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	132022	1715	8.9854	9.558
QPSK	132322	1745	8.9811	9.558
QPSK	132622	1775	8.9813	9.551
16QAM	132022	1715	8.9866	9.535
16QAM	132322	1745	8.9745	9.533
16QAM	132622	1775	8.9766	9.542
64QAM	132022	1715	8.9846	9.579
64QAM	132322	1745	8.9826	9.572
64QAM	132622	1775	8.9794	9.559

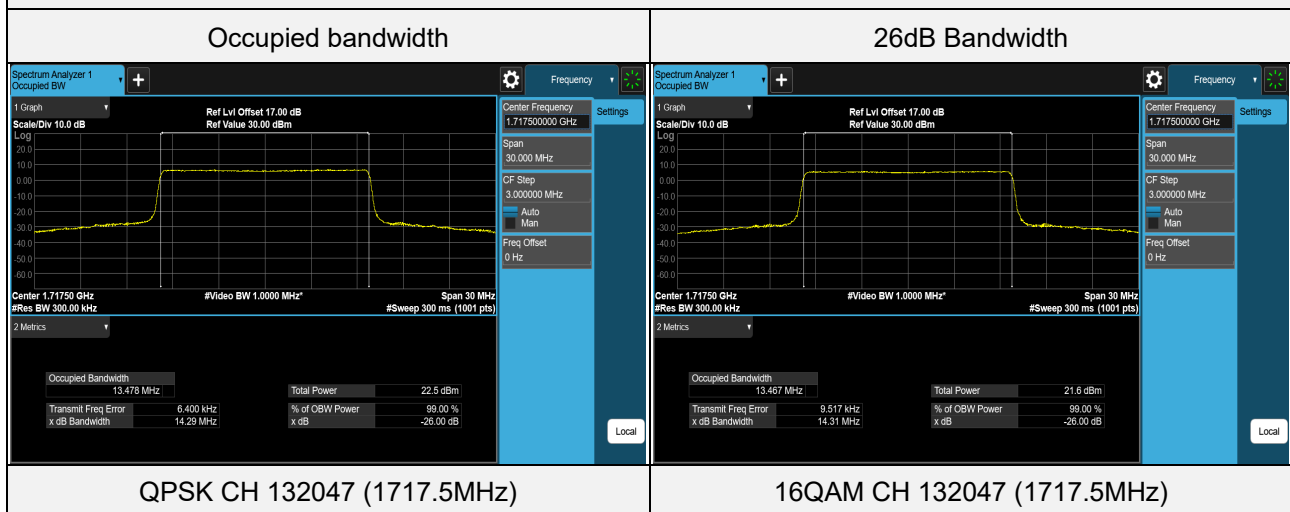
Spectrum Plot of Worst Value



LTE Band 66 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	132047	1717.5	13.478	14.29
QPSK	132322	1745	13.462	14.27
QPSK	132597	1772.5	13.462	14.26
16QAM	132047	1717.5	13.467	14.31
16QAM	132322	1745	13.461	14.26
16QAM	132597	1772.5	13.450	14.26
64QAM	132047	1717.5	13.462	14.29
64QAM	132322	1745	13.455	14.29
64QAM	132597	1772.5	13.450	14.26

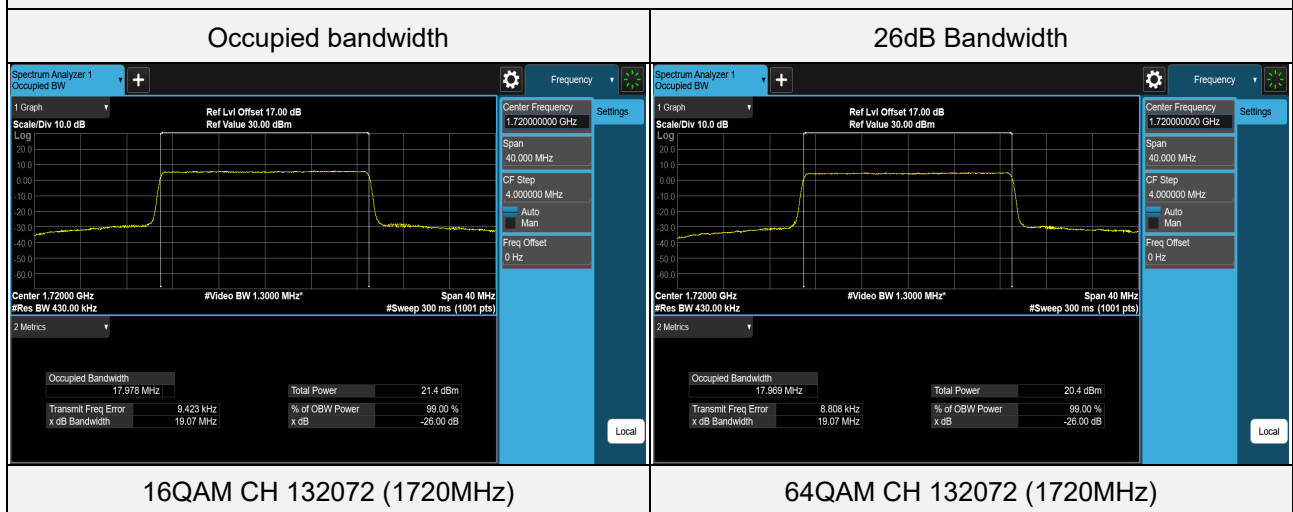
Spectrum Plot of Worst Value



LTE Band 66 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	132072	1720	17.976	19.07
QPSK	132322	1745	17.946	19.05
QPSK	132572	1770	17.945	19.03
16QAM	132072	1720	17.978	19.07
16QAM	132322	1745	17.960	19.03
16QAM	132572	1770	17.951	19.04
64QAM	132072	1720	17.969	19.07
64QAM	132322	1745	17.948	19.03
64QAM	132572	1770	17.954	19.05

Spectrum Plot of Worst Value



4.5 Channel Edge / Out-of-Band Emissions Measurement

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

For LTE Band 4, LTE Band 66:

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

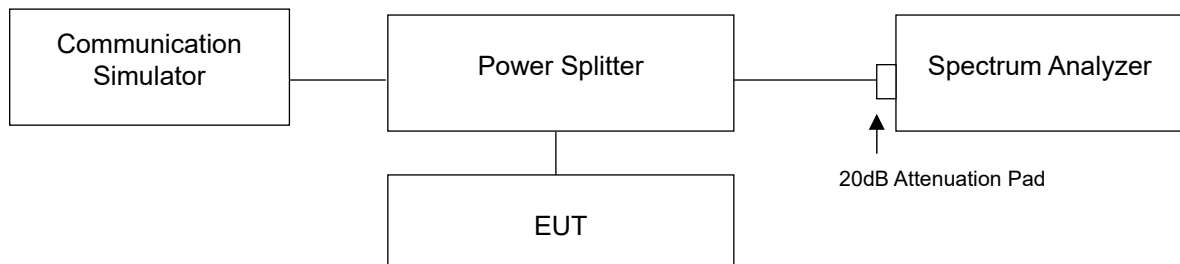
For LTE Band 7:

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

For LTE Band 12, LTE Band 17:

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

4.5.2 Test Setup

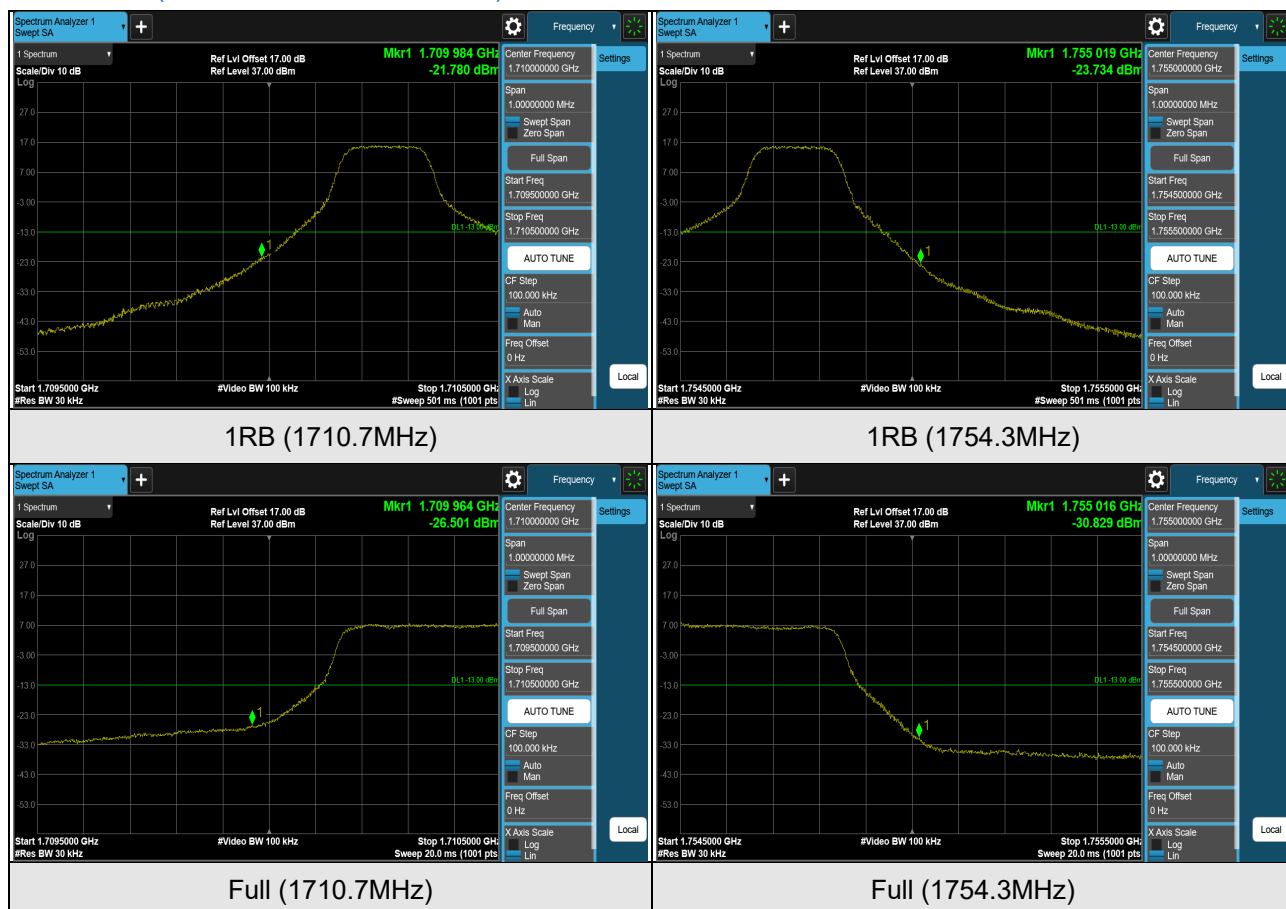


4.5.3 Test Procedures

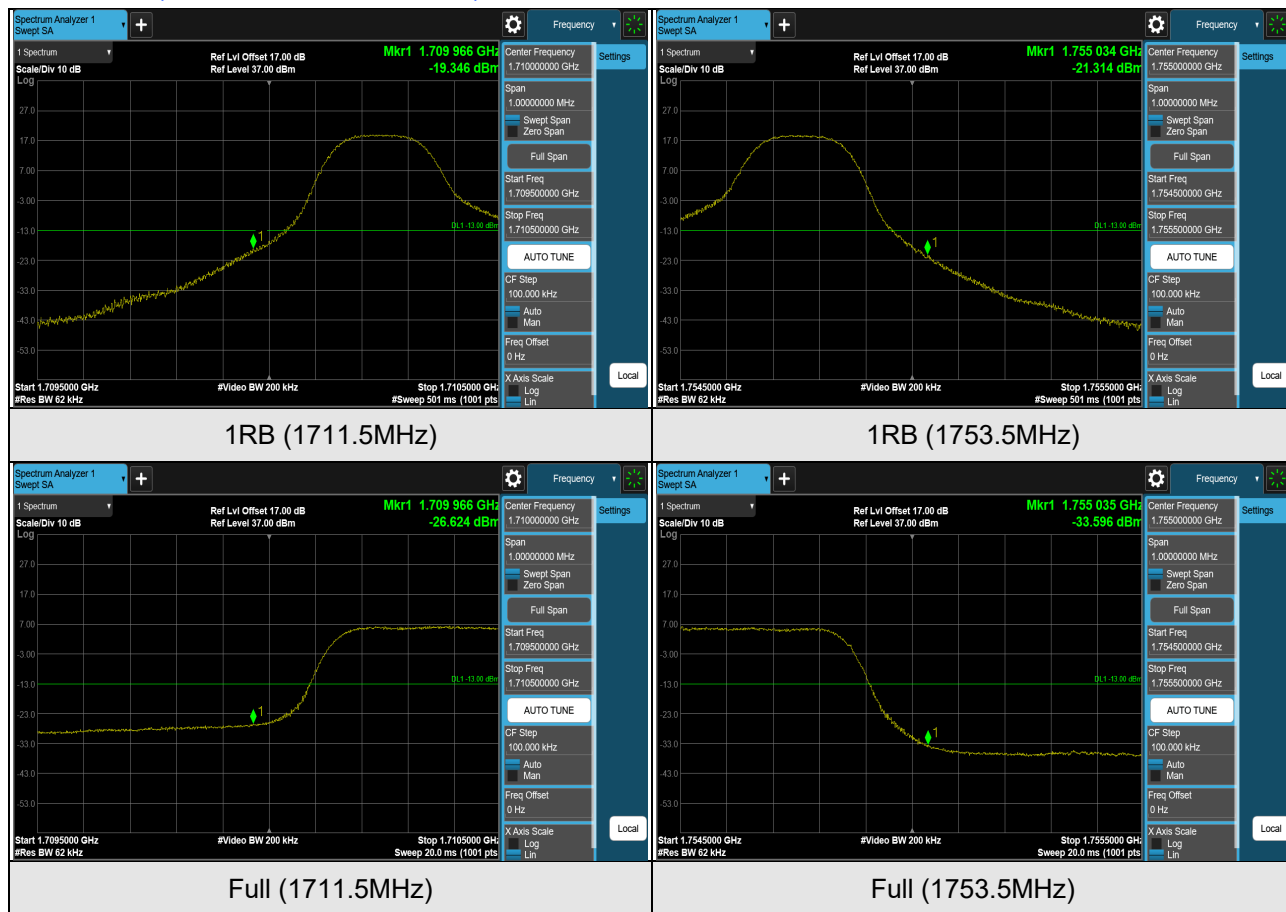
- The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 2 channels: low and high operational frequency range.
- Measurement refer to ANSI C63.26 section 5.7.2 & 5.7.3 and FCC Part 27 section 27.53.
- Measure 5 MHz and 10 MHz channel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

4.5.4 Test Results

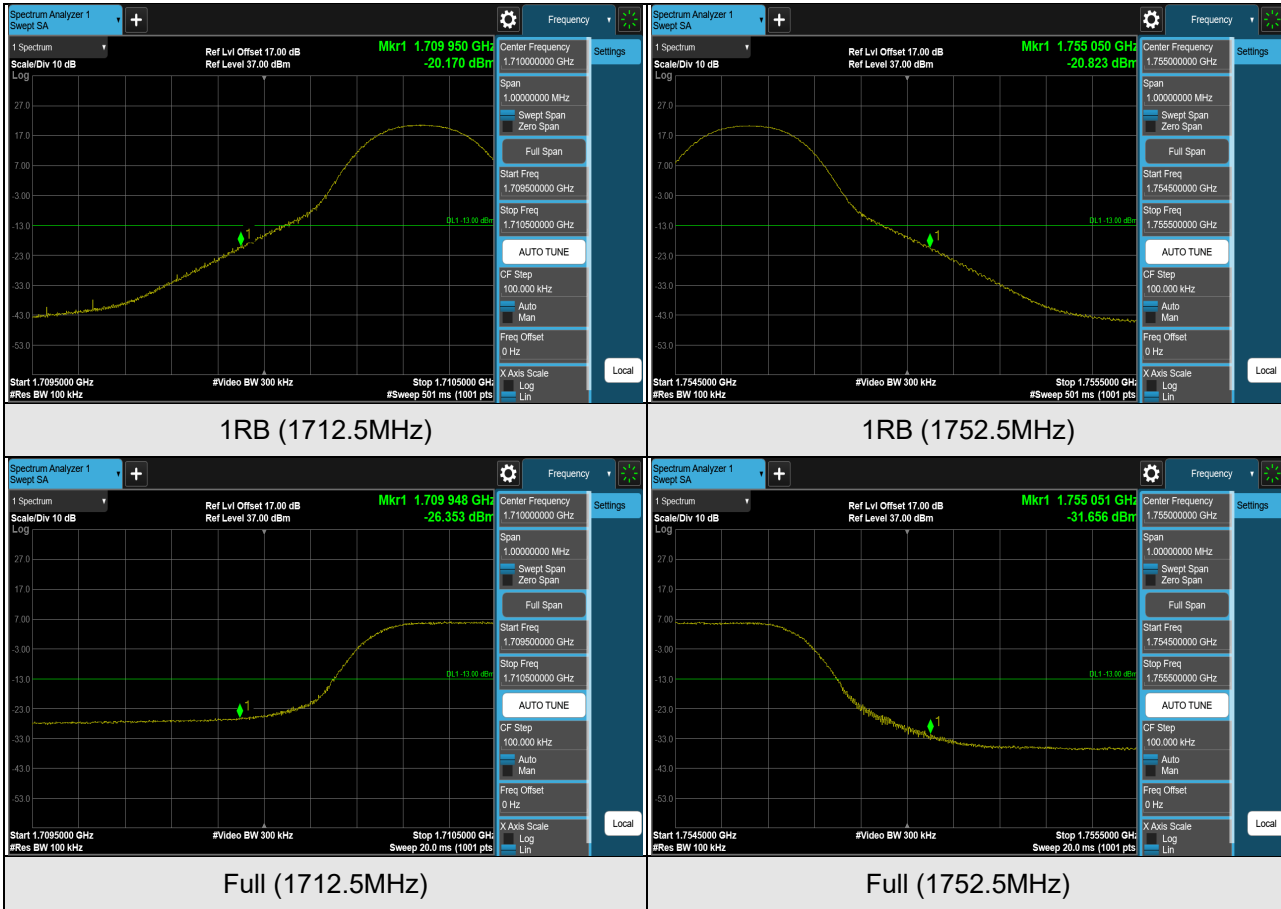
LTE Band 4 (Channel Bandwidth 1.4MHz)



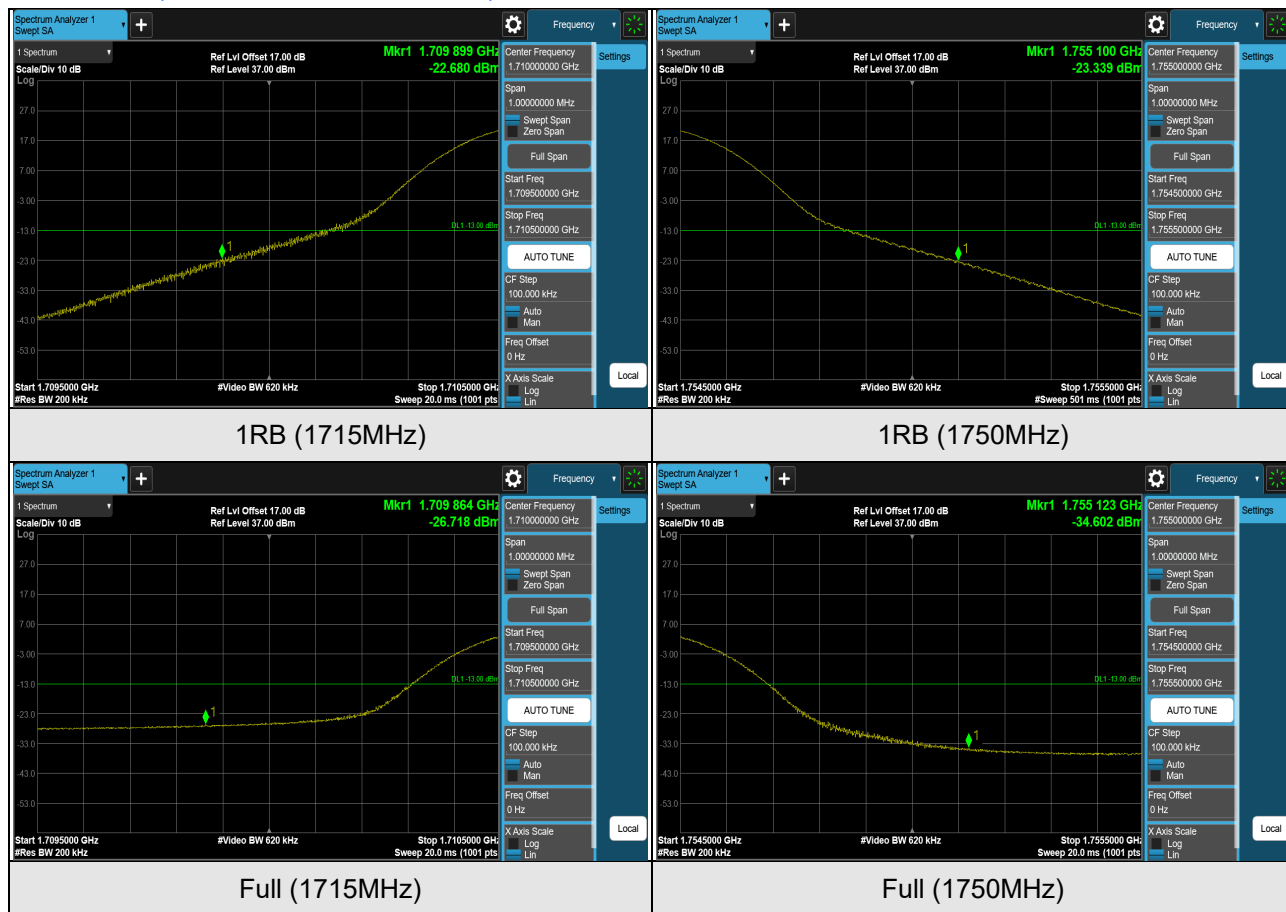
LTE Band 4 (Channel Bandwidth 3MHz)



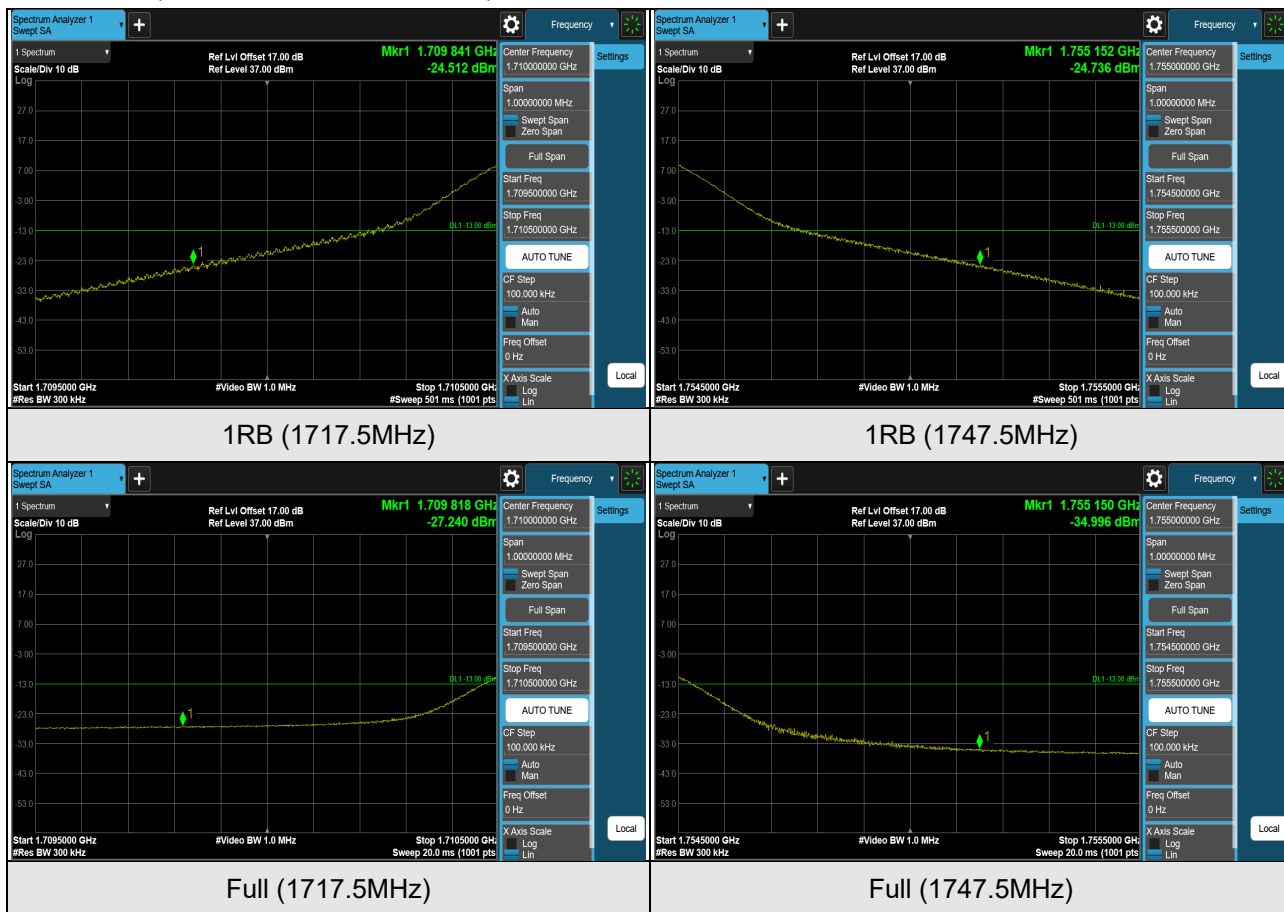
LTE Band 4 (Channel Bandwidth 5MHz)



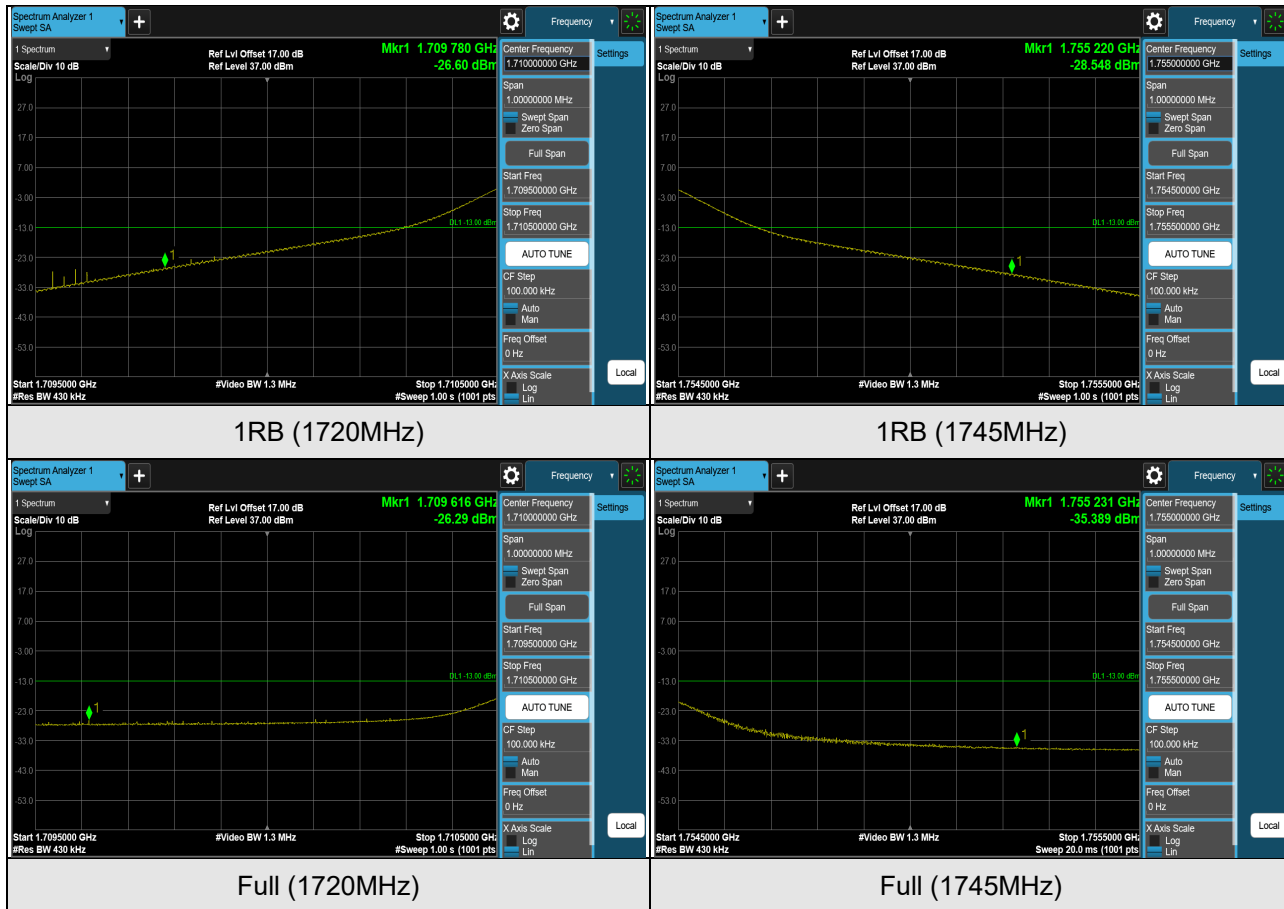
LTE Band 4 (Channel Bandwidth 10MHz)



LTE Band 4 (Channel Bandwidth 15MHz)



LTE Band 4 (Channel Bandwidth 20MHz)



LTE Band 7 (Channel Bandwidth 5MHz)

