FCC Test Report

(Part 27 – WCDMA B4, LTE B4/B7/B12/B13/B38/B41)

Report No.:	RFBFMG-WTW-P22010752-2
FCC ID:	B32E2351
Test Model:	e235-4G-1
Received Date:	Jan. 24, 2022
Test Date:	Mar. 20 ~ Mar. 25, 2022
Issued Date:	Jul. 22, 2022
Applicant:	Verifone, Inc.
Address:	1400 West Stanford Ranch Road Suite 150 Rocklin CA 95765 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location(1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number(1):	788550 / TW0003
Test Location(2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan
FCC Registration / Designation Number(2):	427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBFMG-WTW-P22010752-2	Original release	Jul. 22, 2022

1 Certificate of Conformity

Product:	Point of Sale Terminal
Brand:	Verifone
Test Model:	e235-4G-1
Sample Status:	Engineering sample
Applicant:	Verifone, Inc.
Test Date:	Mar. 20 ~ Mar. 25, 2022
Standards:	FCC Part 27, Subpart C, F, H, M, N

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

Prepared by : Pettie Chen , **Date:** Jul. 22, 2022

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jul. 22, 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2						
FCC Clause				Test Item	Result	Remarks
WCDMA B4 / LTE B4	LTE B12	LTE B13	LTE B7 / LTE B38 / LTE B41			
2.1046 27.50 (d)(4)	2.1046 27.50 (c)	2.1046 27.50 (b)	2.1046 27.50 (h)(2)	Equivalent Isotropically Radiated Power / Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	2.1047	2.1047	2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
27.50 (d)(5)	----	----	----	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.
2.1049	2.1049	2.1049	2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	2.1051 27.53 (g)	2.1051 27.53 (c)	2.1051 27.53 (m)(4)(6)	Band Edge / Out of Band Emissions Measurements	Pass	Meet the requirement of limit.
2.1051 27.53 (h)	2.1051 27.53 (g)	2.1051 27.53 (c)(f)	2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53 (h)	2.1053 27.53 (g)	2.1053 27.53 (c)(f)	2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -3.14dB at 10440.00MHz.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Agilent Technologies	N9038A	MY52260177	Sep. 01, 2021	Aug. 31, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 14, 2021	Nov. 13, 2022
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2021	Nov. 24, 2022
Preamplifier Agilent	310N	187226	Jun. 17, 2021	Jun. 16, 2022
Preamplifier Agilent	83017A	MY39501357	Jun. 17, 2021	Jun. 16, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 05, 2021	Oct. 04, 2022
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 17, 2021	Jun. 16, 2022
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 17, 2021	Jun. 16, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	ADT_Radiated_V7.6.1 5.9.5	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
DC power supply KEYSIGHT	U8002A	MY56330015	NA	NA
Digital Multimeter Fluke	87-III	70360755	Jul. 08, 2021	Jul. 07, 2022
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 26, 2021	Aug. 25, 2022
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Mar. 03, 2022	Mar. 02, 2023
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 06, 2021	Jul. 05, 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 Xindian Chamber 6.

3 General Information

3.1 General Description of EUT

Product	Point of Sale Terminal	
Brand	Verifone	
Test Model	e235-4G-1	
Sample Status	Engineering sample	
Power Supply Rating	5Vdc (From adapter)	
Modulation Type	WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM	
Operating Frequency	WCDMA Band 4	1712.4MHz ~ 1752.6MHz
	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 13 (Channel Bandwidth 5MHz)	779.5MHz ~ 784.5MHz
	LTE Band 13 (Channel Bandwidth 10MHz)	782.0MHz
	LTE Band 38 (Channel Bandwidth 5MHz)	2572.5MHz ~ 2617.5MHz
	LTE Band 38 (Channel Bandwidth 10MHz)	2575.0MHz ~ 2615.0MHz
	LTE Band 38 (Channel Bandwidth 15MHz)	2577.5MHz ~ 2612.5MHz
	LTE Band 38 (Channel Bandwidth 20MHz)	2580.0MHz ~ 2610.0MHz
	LTE Band 41 (Channel Bandwidth 5MHz)	2498.5MHz ~ 2687.5MHz
	LTE Band 41 (Channel Bandwidth 10MHz)	2501.0MHz ~ 2685.0 MHz
	LTE Band 41 (Channel Bandwidth 15MHz)	2503.5MHz ~ 2682.5MHz
	LTE Band 41 (Channel Bandwidth 20MHz)	2506.0MHz ~ 2680.0 MHz

Max. EIRP Power	WCDMA Band 4	353.997mW (25.49dBm)	
		QPSK	16QAM
	LTE Band 4 (Channel Bandwidth 1.4MHz)	359.749mW (25.56dBm)	304.089mW (24.83dBm)
	LTE Band 4 (Channel Bandwidth 3MHz)	362.243mW (25.59dBm)	297.852mW (24.74dBm)
	LTE Band 4 (Channel Bandwidth 5MHz)	359.749mW (25.56dBm)	301.995mW (24.80dBm)
	LTE Band 4 (Channel Bandwidth 10MHz)	356.451mW (25.52dBm)	299.916mW (24.77dBm)
	LTE Band 4 (Channel Bandwidth 15MHz)	362.243mW (25.59dBm)	298.538mW (24.75dBm)
	LTE Band 4 (Channel Bandwidth 20MHz)	364.754mW (25.62dBm)	304.089mW (24.83dBm)
	LTE Band 7 (Channel Bandwidth 5MHz)	413.048mW (26.16dBm)	342.768mW (25.35dBm)
	LTE Band 7 (Channel Bandwidth 10MHz)	419.759mW (26.23dBm)	339.625mW (25.31dBm)
	LTE Band 7 (Channel Bandwidth 15MHz)	414.954mW (26.18dBm)	340.408mW (25.32dBm)
	LTE Band 7 (Channel Bandwidth 20MHz)	420.727mW (26.24dBm)	343.558mW (25.36dBm)
	LTE Band 38 (Channel Bandwidth 5MHz)	412.098mW (26.15dBm)	323.594mW (25.10dBm)
	LTE Band 38 (Channel Bandwidth 10MHz)	406.443mW (26.09dBm)	326.588mW (25.14dBm)
	LTE Band 38 (Channel Bandwidth 15MHz)	406.443mW (26.09dBm)	322.849mW (25.09dBm)
	LTE Band 38 (Channel Bandwidth 20MHz)	414.000mW (26.17dBm)	326.588mW (25.14dBm)
	LTE Band 41 (Channel Bandwidth 5MHz)	494.311mW (26.94dBm)	399.945mW (26.02dBm)
	LTE Band 41 (Channel Bandwidth 10MHz)	495.450mW (26.95dBm)	399.945mW (26.02dBm)
	LTE Band 41 (Channel Bandwidth 15MHz)	494.311mW (26.94dBm)	392.645mW (25.94dBm)
	LTE Band 41 (Channel Bandwidth 20MHz)	503.501mW (27.02dBm)	408.319mW (26.11dBm)
Max. ERP Power		QPSK	16QAM
	LTE Band 12 (Channel Bandwidth 1.4MHz)	120.781mW (20.82dBm)	94.406mW (19.75dBm)
	LTE Band 12 (Channel Bandwidth 3MHz)	117.490mW (20.70dBm)	95.060mW (19.78dBm)
	LTE Band 12 (Channel Bandwidth 5MHz)	115.878mW (20.64dBm)	95.060mW (19.78dBm)
	LTE Band 12 (Channel Bandwidth 10MHz)	118.304mW (20.73dBm)	96.161mW (19.83dBm)
	LTE Band 13 (Channel Bandwidth 5MHz)	154.170mW (21.88dBm)	121.619mW (20.85dBm)
	LTE Band 13 (Channel Bandwidth 10MHz)	154.882mW (21.90dBm)	122.744mW (20.89dBm)

Emission Designator	WCDMA Band 4	4M14F9W	
		QPSK	16QAM
	LTE Band 4 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 4 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 4 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 4 (Channel Bandwidth 10MHz)	8M96G7D	4M57D7W
	LTE Band 4 (Channel Bandwidth 15MHz)	13M4G7D	4M68D7W
	LTE Band 4 (Channel Bandwidth 20MHz)	17M9G7D	4M82D7W
	LTE Band 7 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 7 (Channel Bandwidth 10MHz)	8M96G7D	4M57D7W
	LTE Band 7 (Channel Bandwidth 15MHz)	13M4G7D	4M68D7W
	LTE Band 7 (Channel Bandwidth 20MHz)	17M9G7D	4M82D7W
	LTE Band 12 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 12 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 12 (Channel Bandwidth 5MHz)	4M50G7D	4M50D7W
	LTE Band 12 (Channel Bandwidth 10MHz)	8M97G7D	4M57D7W
	LTE Band 13 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 13 (Channel Bandwidth 10MHz)	8M97G7D	4M58D7W
	LTE Band 38 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 38 (Channel Bandwidth 10MHz)	8M96G7D	4M56D7W
	LTE Band 38 (Channel Bandwidth 15MHz)	13M4G7D	4M68D7W
	LTE Band 38 (Channel Bandwidth 20MHz)	17M9G7D	4M82D7W
	LTE Band 41 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 41 (Channel Bandwidth 10MHz)	8M96G7D	4M57D7W
	LTE Band 41 (Channel Bandwidth 15MHz)	13M4G7D	4M67D7W
	LTE Band 41 (Channel Bandwidth 20MHz)	17M9G7D	4M81D7W
Antenna Type	Refer to Note as below		
Accessory Device	NA		
Cable Supplied	0.93m non-shielded USB cable		

Note:

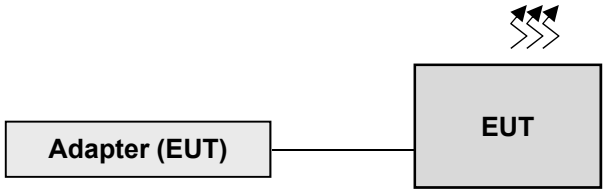
1. The antenna information is listed as below.

Type	Gain (dBi)														
	GSM 850	GSM 1900	WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13	LTE B25	LTE B26	LTE B38	LTE B41
monopole	1.1	2.2	2.2	2.0	1.1	2.2	2.0	1.1	2.5	-0.5	0.6	2.2	1.1	2.7	3.3

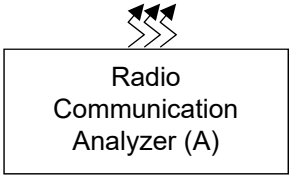
* The above Antenna information refers to the manufacturer's antenna specifications, the laboratory shall not be held responsible.

2. EUT WWAN equipment specification, 16QAM modulation with bandwidth exceeding 10MHz only supports 25RB.

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	MT8820C	6201240432	NA	For LTE
		R&S	CMU200	101095	NA	For WCDMA

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

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

Band	Radiated Emission
WCDMA Band 4	Y-plane
LTE Band 4	Y-plane
LTE Band 7	Z-plane
LTE Band 12	Y-plane
LTE Band 13	X-plane
LTE Band 38	Z-plane
LTE Band 41	X-plane

WCDMA Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	1312 to 1513	1312 (1712.4MHz), 1413 (1732.6MHz), 1513 (1752.6MHz)	WCDMA, HSDPA, HSUPA
-	Modulation Characteristics	1312 to 1513	1413 (1732.6MHz)	WCDMA, HSDPA, HSUPA
-	Frequency Stability	1312 to 1513	1312 (1712.4MHz), 1513 (1752.6MHz)	WCDMA
-	Occupied Bandwidth	1312 to 1513	1312 (1712.4MHz), 1413 (1732.6MHz), 1513 (1752.6MHz)	WCDMA, HSDPA, HSUPA
-	Band Edge	1312 to 1513	1312 (1712.4MHz), 1513 (1752.6MHz)	WCDMA, HSDPA, HSUPA
-	Peak To Average Ratio	1312 to 1513	1312 (1712.4MHz), 1413 (1732.6MHz), 1513 (1752.6MHz)	WCDMA, HSDPA, HSUPA
-	Conducted Emission	1312 to 1513	1312 (1712.4MHz), 1413 (1732.6MHz), 1513 (1752.6MHz)	WCDMA, HSDPA, HSUPA
-	Radiated Emission Below 1GHz	1312 to 1513	1413 (1732.6MHz)	WCDMA
-	Radiated Emission Above 1GHz	1312 to 1513	1312 (1712.4MHz), 1413 (1732.6MHz), 1513 (1752.6MHz)	WCDMA

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

LTE Band 4

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

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

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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission Below 1GHz	20050 to 20300	20175 (1732.5MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	19957 to 20393	19957 (1710.7MHz), 20175 (1732.5MHz), 20393 (1754.3MHz)	1.4MHz	QPSK	1
		19975 to 20375	19975 (1712.5MHz), 20175 (1732.5MHz), 20375 (1752.5MHz)	5MHz	QPSK	1
		20050 to 20300	20050 (1720.0MHz), 20175 (1732.5MHz), 20300 (1745.0MHz)	20MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 7

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

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

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 12

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

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

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission Below 1GHz	23060 to 23130	23130 (711.0MHz)	10MHz	QPSK	1
-	Radiated Emission Above 1GHz	23017 to 23173	23017 (699.7MHz), 23095 (707.5MHz), 23173 (715.3MHz)	1.4MHz	QPSK	1
		23035 to 23155	23035 (701.5MHz), 23095 (707.5MHz), 23155 (713.5MHz)	5MHz	QPSK	1
		23060 to 23130	23060 (704.0MHz), 23095 (707.5MHz), 23130 (711.0MHz)	10MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 13

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		23230	23230 (782.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	23230	23230 (782.0MHz),	10MHz	QPSK / 16QAM	Full
-	Frequency Stability	23205 to 23255	23205 (779.5MHz), 23255 (784.5MHz)	5MHz	QPSK	Full
		23230	23230 (782.0MHz),	10MHz	QPSK	Full
-	Emission Bandwidth	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK / 16QAM	Full
		23230	23230 (782.0MHz)	10MHz	QPSK / 16QAM	Full
-	Band Edge	23205 to 23255	23205 (779.5MHz), 23255 (784.5MHz)	5MHz	QPSK	1 Half Full
		23230	23230 (782.0MHz)	10MHz	QPSK	1 Half Full
-	Peak to Average Ratio	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK / 16QAM	1
		23230	23230 (782.0MHz)	10MHz	QPSK / 16QAM	1
-	Conducted Emission	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230 (782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	23230	23230 (782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	23205 to 23255	23205 (779.5MHz), 23230 (782.0MHz), 23255 (784.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230 (782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 38

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	EIRP	37775 to 38225	37775 (2572.5MHz), 38000 (2595.0MHz), 38225 (2617.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		37800 to 38200	37800 (2575.0MHz), 38000 (2595.0MHz), 38200 (2615.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		37825 to 38175	37825 (2577.5MHz), 38000 (2595.0MHz), 38175 (2612.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
		37850 to 38150	37850 (2580.0MHz), 38000 (2595.0MHz), 38150 (2610.0MHz)	20MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	37850 to 38150	38000 (2595.0MHz)	20MHz	QPSK / 16QAM	Full
-	Frequency Stability	37775 to 38225	37775 (2572.5MHz), 38225 (2617.5MHz)	5MHz	QPSK	Full
		37800 to 38200	37800 (2575.0MHz), 38200 (2615.0MHz)	10MHz	QPSK	Full
		37825 to 38175	37825 (2577.5MHz), 38175 (2612.5MHz)	15MHz	QPSK	Full
		37850 to 38150	37850 (2580.0MHz), 38150 (2610.0MHz)	20MHz	QPSK	Full
-	Emission Bandwidth	37775 to 38225	37775 (2572.5MHz), 38000 (2595.0MHz), 38225 (2617.5MHz)	5MHz	QPSK / 16QAM	Full
		37800 to 38200	37800 (2575.0MHz), 38000 (2595.0MHz), 38200 (2615.0MHz)	10MHz	QPSK / 16QAM	Full
		37825 to 38175	37825 (2577.5MHz), 38000 (2595.0MHz), 38175 (2612.5MHz)	15MHz	QPSK / 16QAM	Full
		37850 to 38150	37850 (2580.0MHz), 38000 (2595.0MHz), 38150 (2610.0MHz)	20MHz	QPSK / 16QAM	Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Out-of-Band Emissions	37775 to 38225	37775 (2572.5MHz), 38225 (2617.5MHz)	5MHz	QPSK	1 Half Full
		37800 to 38200	37800 (2575.0MHz), 38200 (2615.0MHz)	10MHz	QPSK	1 Half Full
		37825 to 38175	37825 (2577.5MHz), 38175 (2612.5MHz)	15MHz	QPSK	1 Half Full
		37850 to 38150	37850 (2580.0MHz), 38150 (2610.0MHz)	20MHz	QPSK	1 Half Full
-	Peak to Average Ratio	37775 to 38225	37775 (2572.5MHz), 38000 (2595.0MHz), 38225 (2617.5MHz)	5MHz	QPSK / 16QAM	1
		37800 to 38200	37800 (2575.0MHz), 38000 (2595.0MHz), 38200 (2615.0MHz)	10MHz	QPSK / 16QAM	1
		37825 to 38175	37825 (2577.5MHz), 38000 (2595.0MHz), 38175 (2612.5MHz)	15MHz	QPSK / 16QAM	1
		37850 to 38150	37850 (2580.0MHz), 38000 (2595.0MHz), 38150 (2610.0MHz)	20MHz	QPSK / 16QAM	1
-	Conducted Emission	37775 to 38225	37775 (2572.5MHz), 38000 (2595.0MHz), 38225 (2617.5MHz)	5MHz	QPSK	1
		37800 to 38200	37800 (2575.0MHz), 38000 (2595.0MHz), 38200 (2615.0MHz)	10MHz	QPSK	1
		37825 to 38175	37825 (2577.5MHz), 38000 (2595.0MHz), 38175 (2612.5MHz)	15MHz	QPSK	1
		37850 to 38150	37850 (2580.0MHz), 38000 (2595.0MHz), 38150 (2610.0MHz)	20MHz	QPSK	1
-	Radiated Emission Below 1GHz	37850 to 38150	38150 (2610.0MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	37775 to 38225	37775 (2572.5MHz), 38000 (2595.0MHz), 38225 (2617.5MHz)	5MHz	QPSK	1
		37850 to 38150	37850 (2580.0MHz), 38000 (2595.0MHz), 38150 (2610.0MHz)	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 Section 6.6.3.1.4, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 41

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	EIRP	39675 to 41565	39675 (2498.5MHz), 40620 (2593.0MHz), 41565 (2687.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		39700 to 41540	39700 (2501.0MHz), 40620 (2593.0MHz), 41540 (2685.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		39725 to 41515	39725 (2503.5MHz), 40620 (2593.0MHz), 41515 (2682.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
		39750 to 41490	39750 (2506.0MHz), 40620 (2593.0MHz), 41490 (2680.0MHz)	20MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	39750 to 41490	40620 (2593.0MHz)	20MHz	QPSK / 16QAM	Full
-	Frequency Stability	39675 to 41565	39675 (2498.5MHz), 41565 (2687.5MHz)	5MHz	QPSK	Full
		39700 to 41540	39700 (2501.0MHz), 41540 (2685.0MHz)	10MHz	QPSK	Full
		39725 to 41515	39725 (2503.5MHz), 41515 (2682.5MHz)	15MHz	QPSK	Full
		39750 to 41490	39750 (2506.0MHz), 41490 (2680.0MHz)	20MHz	QPSK	Full
-	Emission Bandwidth	39675 to 41565	39675 (2498.5MHz), 40620 (2593.0MHz), 41565 (2687.5MHz)	5MHz	QPSK / 16QAM	Full
		39700 to 41540	39700 (2501.0MHz), 40620 (2593.0MHz), 41540 (2685.0MHz)	10MHz	QPSK / 16QAM	Full
		39725 to 41515	39725 (2503.5MHz), 40620 (2593.0MHz), 41515 (2682.5MHz)	15MHz	QPSK / 16QAM	Full
		39750 to 41490	39750 (2506.0MHz), 40620 (2593.0MHz), 41490 (2680.0MHz)	20MHz	QPSK / 16QAM	Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Out-of-Band Emissions	39675 to 41565	39675 (2498.5MHz), 41565 (2687.5MHz)	5MHz	QPSK	1 Half Full
		39700 to 41540	39700 (2501.0MHz), 41540 (2685.0MHz)	10MHz	QPSK	1 Half Full
		39725 to 41515	39725 (2503.5MHz), 41515 (2682.5MHz)	15MHz	QPSK	1 Half Full
		39750 to 41490	39750 (2506.0MHz), 41490 (2680.0MHz)	20MHz	QPSK	1 Half Full
-	Peak to Average Ratio	39675 to 41565	39675 (2498.5MHz), 40620 (2593.0MHz), 41565 (2687.5MHz)	5MHz	QPSK / 16QAM	1
		39700 to 41540	39700 (2501.0MHz), 40620 (2593.0MHz), 41540 (2685.0MHz)	10MHz	QPSK / 16QAM	1
		39725 to 41515	39725 (2503.5MHz), 40620 (2593.0MHz), 41515 (2682.5MHz)	15MHz	QPSK / 16QAM	1
		39750 to 41490	39750 (2506.0MHz), 40620 (2593.0MHz), 41490 (2680.0MHz)	20MHz	QPSK / 16QAM	1
-	Conducted Emission	39675 to 41565	39675 (2498.5MHz), 40620 (2593.0MHz), 41565 (2687.5MHz)	5MHz	QPSK	1
		39700 to 41540	39700 (2501.0MHz), 40620 (2593.0MHz), 41540 (2685.0MHz)	10MHz	QPSK	1
		39725 to 41515	39725 (2503.5MHz), 40620 (2593.0MHz), 41515 (2682.5MHz)	15MHz	QPSK	1
		39750 to 41490	39750 (2506.0MHz), 40620 (2593.0MHz), 41490 (2680.0MHz)	20MHz	QPSK	1
-	Radiated Emission Below 1GHz	39750 to 41490	41490 (2680.0MHz)	20MHz	QPSK	1
-	Radiated Emission Above 1GHz	39675 to 41565	39675 (2498.5MHz), 40620 (2593.0MHz), 41565 (2687.5MHz)	5MHz	QPSK	1
		39750 to 41490	39750 (2506.0MHz), 40620 (2593.0MHz), 41490 (2680.0MHz)	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 Section 6.6.3.1.4, choose the 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM 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	120Vac, 60Hz	Willy Cheng
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Frequency Stability	25deg. C, 60%RH	3.7Vdc	Willy Cheng
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Band Edge	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Peak To Average Ratio	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Radiated Emission	25deg. C, 60%RH	120Vac, 60Hz	Charles Hsiao Karl Lee

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

For WCDMA Band 4, LTE Band 4:
Mobile / Portable station are limited to 1 watts e.i.r.p.

For LTE Band 12:
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.

For LTE Band 13:
Control stations and mobile stations in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.
Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

For LTE Band 7, LTE Band 38, LTE Band 41:
Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

4.1.2 Test Procedures

Conducted Power Measurement:

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

Maximum EIRP / ERP

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

$EIRP = P_{Meas} + G_T$

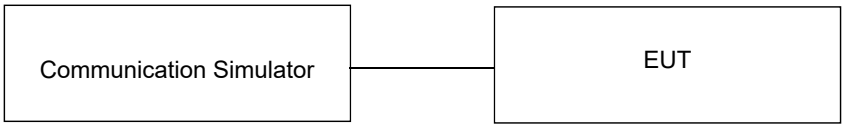
$ERP = P_{Meas} + G_T - 2.15$

where

ERP or EIRP	effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)
P_{Meas}	measured transmitter output power or PSD, in dBm or dBW
G_T	gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA IV		
TX Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	23.46	**23.49**	23.48
HSDPA Subtest-1	22.26	22.42	22.45
HSDPA Subtest-2	22.35	22.50	22.47
HSDPA Subtest-3	21.84	22.00	21.99
HSDPA Subtest-4	21.83	22.00	21.98
DC-HSDPA Subtest-1	22.18	22.35	22.37
DC-HSDPA Subtest-2	22.27	22.43	22.39
DC-HSDPA Subtest-3	21.76	21.93	21.91
DC-HSDPA Subtest-4	21.75	21.93	21.90
HSUPA Subtest-1	22.07	22.03	22.00
HSUPA Subtest-2	20.48	20.49	20.41
HSUPA Subtest-3	21.24	21.37	21.21
HSUPA Subtest-4	20.43	20.47	20.43
HSUPA Subtest-5	22.30	22.40	22.40

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	23.36	23.46	**23.62**
		1	50	23.33	23.41	23.60
		1	99	23.32	23.36	23.41
		50	0	22.24	22.31	22.72
		50	25	22.24	22.33	22.69
		50	50	22.19	22.24	22.59
		100	0	22.18	22.22	22.54
20M	16QAM	1	0	21.99	22.22	22.83
		1	50	21.98	22.12	22.81
		1	99	21.96	22.22	22.79
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

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	23.30	23.39	23.57
		1	37	23.32	23.35	**23.59**
		1	74	23.26	23.30	23.36
		36	0	22.24	22.26	22.69
		36	19	22.19	22.28	22.69
		36	39	22.18	22.18	22.56
		75	0	22.14	22.12	22.52
15M	16QAM	1	0	21.99	22.22	22.75
		1	37	21.88	22.11	22.72
		1	74	21.96	22.18	22.70
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	23.33	23.39	23.51
		1	24	23.26	23.31	**23.52**
		1	49	23.24	23.36	23.37
		25	0	22.24	22.24	22.66
		25	12	22.23	22.28	22.68
		25	25	22.14	22.14	22.49
		50	0	22.16	22.18	22.51
10M	16QAM	1	0	21.91	22.12	22.77
		1	24	21.98	22.02	22.75
		1	49	21.94	22.14	22.77
		25	0	21.51	21.47	21.54
		25	12	21.42	21.41	21.46
		25	25	21.41	21.33	21.41
		50	0	-	-	-

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	23.26	23.44	**23.56**
		1	12	23.23	23.34	23.50
		1	24	23.24	23.35	23.35
		12	0	22.20	22.21	22.65
		12	6	22.15	22.31	22.67
		12	13	22.15	22.19	22.54
		25	0	22.15	22.19	22.48
5M	16QAM	1	0	21.95	22.17	22.80
		1	12	21.98	22.12	22.71
		1	24	21.93	22.14	22.74
		12	0	21.48	21.39	21.47
		12	6	21.39	21.31	21.38
		12	13	21.31	21.24	21.39
		25	0	21.37	21.32	21.38

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	23.33	23.45	**23.59**
		1	7	23.23	23.41	23.57
		1	14	23.25	23.28	23.29
		8	0	22.20	22.25	22.68
		8	3	22.19	22.23	22.59
		8	7	22.13	22.24	22.56
		15	0	22.18	22.14	22.46
3M	16QAM	1	0	21.96	22.18	22.74
		1	7	21.92	22.11	22.71
		1	14	21.89	22.12	22.71
		8	0	21.45	21.40	21.50
		8	3	21.40	21.41	21.38
		8	7	21.37	21.29	21.33
		15	0	21.34	21.31	21.36

LTE Band 4						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	23.27	23.42	23.52
		1	2	23.31	23.36	**23.56**
		1	5	23.23	23.26	23.32
		3	0	23.17	23.21	23.31
		3	1	23.18	23.28	23.33
		3	3	23.14	23.24	23.29
		6	0	22.18	22.20	22.54
1.4M	16QAM	1	0	21.99	22.21	22.83
		1	2	21.92	22.02	22.74
		1	5	21.89	22.12	22.74
		3	0	21.46	21.39	21.51
		3	1	21.41	21.41	21.45
		3	3	21.40	21.24	21.32
		6	0	21.34	21.32	21.38

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	23.38	23.46	**23.74**
		1	50	23.29	23.37	23.73
		1	99	23.14	23.22	23.58
		50	0	22.37	22.45	22.81
		50	25	22.32	22.40	22.76
		50	50	22.28	22.36	22.72
		100	0	22.30	22.38	22.74
20M	16QAM	1	0	22.42	22.50	22.86
		1	50	22.30	22.38	22.74
		1	99	22.27	22.35	22.71
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

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	23.33	23.36	**23.68**
		1	37	23.25	23.35	23.63
		1	74	23.09	23.21	23.54
		36	0	22.36	22.39	22.71
		36	19	22.24	22.38	22.70
		36	39	22.21	22.26	22.67
		75	0	22.22	22.37	22.68
15M	16QAM	1	0	22.42	22.49	22.82
		1	37	22.26	22.30	22.71
		1	74	22.22	22.32	22.69
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

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	23.37	23.36	23.66
		1	24	23.19	23.34	**23.73**
		1	49	23.10	23.16	23.58
		25	0	22.32	22.42	22.72
		25	12	22.30	22.34	22.76
		25	25	22.27	22.35	22.62
		50	0	22.30	22.36	22.64
10M	16QAM	1	0	22.34	22.47	22.81
		1	24	22.24	22.28	22.74
		1	49	22.21	22.27	22.68
		25	0	21.42	21.50	21.86
		25	12	21.34	21.42	21.78
		25	25	21.25	21.33	21.69
		50	0	-	-	-

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	23.31	23.46	**23.66**
		1	12	23.29	23.32	23.64
		1	24	23.12	23.21	23.55
		12	0	22.35	22.39	22.74
		12	6	22.23	22.37	22.75
		12	13	22.22	22.33	22.67
		25	0	22.27	22.34	22.65
5M	16QAM	1	0	22.41	22.46	22.85
		1	12	22.28	22.32	22.72
		1	24	22.18	22.31	22.61
		12	0	21.41	21.41	21.84
		12	6	21.30	21.32	21.74
		12	13	21.19	21.25	21.65
		25	0	21.10	21.24	21.62

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	23.12	**23.38**	23.34
		1	24	23.10	23.34	23.24
		1	49	23.09	23.17	23.16
		25	0	22.49	22.52	22.49
		25	12	22.37	22.41	22.28
		25	25	22.31	22.32	22.29
		50	0	22.34	22.35	22.25
10M	16QAM	1	0	22.48	22.47	22.40
		1	24	22.27	22.35	22.26
		1	49	22.29	22.27	22.27
		25	0	21.47	21.43	21.47
		25	12	21.31	21.26	21.36
		25	25	21.21	21.12	21.22
		50	0	-	-	-

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	23.02	**23.29**	23.27
		1	12	23.07	23.28	23.15
		1	24	23.08	23.07	23.06
		12	0	22.43	22.44	22.47
		12	6	22.35	22.40	22.23
		12	13	22.29	22.25	22.29
		25	0	22.34	22.25	22.15
5M	16QAM	1	0	22.43	22.38	22.38
		1	12	22.19	22.33	22.21
		1	24	22.25	22.26	22.23
		12	0	21.37	21.35	21.38
		12	6	21.24	21.18	21.35
		12	13	21.15	21.04	21.15
		25	0	21.17	21.12	21.14

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	23.08	**23.35**	23.33
		1	7	23.05	23.28	23.19
		1	14	23.09	23.09	23.07
		8	0	22.46	22.42	22.39
		8	3	22.37	22.36	22.21
		8	7	22.31	22.25	22.26
		15	0	22.24	22.33	22.15
3M	16QAM	1	0	22.42	22.43	22.32
		1	7	22.25	22.26	22.22
		1	14	22.29	22.24	22.23
		8	0	21.40	21.33	21.46
		8	3	21.23	21.18	21.27
		8	7	21.11	21.05	21.12
		15	0	21.11	21.03	21.05

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	23.08	23.33	23.29
		1	2	22.90	23.32	23.03
		1	5	23.00	23.03	23.01
		3	0	23.36	**23.47**	23.32
		3	1	23.20	23.31	23.25
		3	3	23.14	23.21	23.26
		6	0	22.27	22.14	22.09
1.4M	16QAM	1	0	22.40	22.35	22.28
		1	2	22.19	22.19	22.12
		1	5	22.09	22.15	22.23
		3	0	22.32	22.38	22.30
		3	1	22.20	22.16	22.26
		3	3	22.09	22.10	22.16
		6	0	21.03	21.04	21.06

LTE Band 13				
BW	MCS Index	RB Size	RB Offset	Low
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	**23.45**
		1	24	23.43
		1	49	23.41
		25	0	22.41
		25	12	22.40
		25	25	22.38
		50	0	22.35
10M	16QAM	1	0	22.44
		1	24	22.41
		1	49	22.38
		25	0	21.56
		25	12	21.47
		25	25	21.44
		50	0	-

LTE Band 13						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	**23.42**	**23.43**	23.33
		1	12	23.41	23.41	23.35
		1	24	23.38	23.40	23.33
		12	0	22.25	22.34	22.33
		12	6	22.38	22.39	22.31
		12	13	22.29	22.35	22.34
		25	0	22.29	22.32	22.29
5M	16QAM	1	0	22.37	22.40	22.38
		1	12	22.25	22.31	22.23
		1	24	22.26	22.33	22.33
		12	0	21.41	21.48	21.39
		12	6	21.41	21.47	21.41
		12	13	21.24	21.34	21.27
		25	0	21.21	21.30	21.20

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37850	38000	38150
		Frequency (MHz)		2580	2595	2610
20M	QPSK	1	0	**23.47**	23.33	23.39
		1	50	23.38	23.32	23.32
		1	99	23.21	23.13	23.17
		50	0	22.47	22.42	22.45
		50	25	22.36	22.32	22.35
		50	50	22.25	22.13	22.17
		100	0	22.28	22.19	22.27
20M	16QAM	1	0	22.44	22.39	22.37
		1	50	22.29	22.27	22.29
		1	99	22.21	22.08	22.16
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37825	38000	38175
		Frequency (MHz)		2577.5	2595	2612.5
15M	QPSK	1	0	**23.39**	23.32	23.33
		1	37	23.38	23.23	23.32
		1	74	23.17	23.09	23.12
		36	0	22.42	22.36	22.39
		36	19	22.36	22.26	22.30
		36	39	22.15	22.03	22.10
		75	0	22.25	22.17	22.27
15M	16QAM	1	0	22.39	22.34	22.34
		1	37	22.25	22.19	22.21
		1	74	22.14	22.00	22.06
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37800	38000	38200
		Frequency (MHz)		2575	2595	2615
10M	QPSK	1	0	**23.39**	23.33	23.33
		1	24	23.36	23.26	23.28
		1	49	23.16	23.09	23.12
		25	0	22.43	22.35	22.36
		25	12	22.32	22.25	22.35
		25	25	22.19	22.04	22.08
		50	0	22.22	22.10	22.21
10M	16QAM	1	0	22.44	22.33	22.37
		1	24	22.25	22.19	22.19
		1	49	22.11	22.08	22.15
		25	0	21.42	21.39	21.41
		25	12	21.26	21.17	21.21
		25	25	21.13	21.12	21.04
		50	0	-	-	-

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37775	38000	38225
		Frequency (MHz)		2572.5	2595	2617.5
5M	QPSK	1	0	**23.45**	23.24	23.29
		1	12	23.32	23.22	23.25
		1	24	23.12	23.08	23.13
		12	0	22.47	22.38	22.39
		12	6	22.34	22.25	22.25
		12	13	22.25	22.13	22.10
		25	0	22.26	22.12	22.23
5M	16QAM	1	0	22.40	22.38	22.29
		1	12	22.21	22.21	22.27
		1	24	22.19	22.06	22.12
		12	0	21.36	21.34	21.39
		12	6	21.18	21.13	21.19
		12	13	21.12	21.10	21.02
		25	0	21.07	20.97	20.98

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39750	40620	41490
		Frequency (MHz)		2506	2593	2680
20M	QPSK	1	0	22.95	23.41	**23.72**
		1	50	22.88	23.34	23.65
		1	99	22.84	23.30	23.61
		50	0	22.07	22.53	22.84
		50	25	22.01	22.47	22.78
		50	50	21.95	22.41	22.72
		100	0	21.98	22.44	22.75
20M	16QAM	1	0	22.04	22.50	22.81
		1	50	22.00	22.46	22.77
		1	99	21.94	22.40	22.71
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39725	40620	41515
		Frequency (MHz)		2503.5	2593	2682.5
15M	QPSK	1	0	22.86	23.41	**23.64**
		1	37	22.78	23.27	23.63
		1	74	22.74	23.29	23.57
		36	0	22.03	22.51	22.78
		36	19	22.00	22.37	22.77
		36	39	21.87	22.40	22.63
		75	0	21.91	22.34	22.75
15M	16QAM	1	0	21.88	22.31	22.64
		1	37	21.88	22.30	22.64
		1	74	21.78	22.28	22.58
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39700	40620	41540
		Frequency (MHz)		2501	2593	2685
10M	QPSK	1	0	22.86	23.40	**23.65**
		1	24	22.84	23.32	23.60
		1	49	22.82	23.27	23.61
		25	0	21.98	22.47	22.79
		25	12	21.91	22.39	22.71
		25	25	21.93	22.40	22.68
		50	0	21.90	22.35	22.69
10M	16QAM	1	0	21.88	22.33	22.72
		1	24	21.85	22.24	22.56
		1	49	21.75	22.26	22.54
		25	0	21.02	21.46	21.75
		25	12	20.96	21.45	21.73
		25	25	20.92	21.37	21.68
		50	0	-	-	-

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39675	40620	41565
		Frequency (MHz)		2498.5	2593	2687.5
5M	QPSK	1	0	22.87	23.33	**23.64**
		1	12	22.80	23.29	23.59
		1	24	22.77	23.24	23.58
		12	0	21.98	22.49	22.75
		12	6	21.93	22.40	22.71
		12	13	21.94	22.36	22.65
		25	0	21.88	22.43	22.65
5M	16QAM	1	0	21.93	22.35	22.72
		1	12	21.84	22.32	22.60
		1	24	21.80	22.23	22.53
		12	0	21.00	21.47	21.77
		12	6	21.00	21.43	21.76
		12	13	21.06	21.48	21.79
		25	0	20.97	21.45	21.75

EIRP / ERP Power (dBm)

Band	WCDMA IV		
TX Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	25.46	**25.49**	25.48
HSDPA Subtest-1	24.26	24.42	24.45
HSDPA Subtest-2	24.35	24.50	24.47
HSDPA Subtest-3	23.84	24.00	23.99
HSDPA Subtest-4	23.83	24.00	23.98
DC-HSDPA Subtest-1	24.18	24.35	24.37
DC-HSDPA Subtest-2	24.27	24.43	24.39
DC-HSDPA Subtest-3	23.76	23.93	23.91
DC-HSDPA Subtest-4	23.75	23.93	23.90
HSUPA Subtest-1	24.07	24.03	24.00
HSUPA Subtest-2	22.48	22.49	22.41
HSUPA Subtest-3	23.24	23.37	23.21
HSUPA Subtest-4	22.43	22.47	22.43
HSUPA Subtest-5	24.30	24.40	24.40

*EIRP = Conducted + antenna gain (2dBi)

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	25.36	25.46	**25.62**
		1	50	25.33	25.41	25.60
		1	99	25.32	25.36	25.41
		50	0	24.24	24.31	24.72
		50	25	24.24	24.33	24.69
		50	50	24.19	24.24	24.59
		100	0	24.18	24.22	24.54
20M	16QAM	1	0	23.99	24.22	**24.83**
		1	50	23.98	24.12	24.81
		1	99	23.96	24.22	24.79
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

*EIRP = Conducted + antenna gain (2dBi)

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	25.30	25.39	25.57
		1	37	25.32	25.35	**25.59**
		1	74	25.26	25.30	25.36
		36	0	24.24	24.26	24.69
		36	19	24.19	24.28	24.69
		36	39	24.18	24.18	24.56
		75	0	24.14	24.12	24.52
15M	16QAM	1	0	23.99	24.22	**24.75**
		1	37	23.88	24.11	24.72
		1	74	23.96	24.18	24.70
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

*EIRP = Conducted + antenna gain (2dBi)

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	25.33	25.39	25.51
		1	24	25.26	25.31	**25.52**
		1	49	25.24	25.36	25.37
		25	0	24.24	24.24	24.66
		25	12	24.23	24.28	24.68
		25	25	24.14	24.14	24.49
		50	0	24.16	24.18	24.51
10M	16QAM	1	0	23.91	24.12	**24.77**
		1	24	23.98	24.02	24.75
		1	49	23.94	24.14	**24.77**
		25	0	23.51	23.47	23.54
		25	12	23.42	23.41	23.46
		25	25	23.41	23.33	23.41
		50	0	-	-	-

*EIRP = Conducted + antenna gain (2dBi)

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	25.26	25.44	**25.56**
		1	12	25.23	25.34	25.50
		1	24	25.24	25.35	25.35
		12	0	24.20	24.21	24.65
		12	6	24.15	24.31	24.67
		12	13	24.15	24.19	24.54
		25	0	24.15	24.19	24.48
5M	16QAM	1	0	23.95	24.17	**24.80**
		1	12	23.98	24.12	24.71
		1	24	23.93	24.14	24.74
		12	0	23.48	23.39	23.47
		12	6	23.39	23.31	23.38
		12	13	23.31	23.24	23.39
		25	0	23.37	23.32	23.38

*EIRP = Conducted + antenna gain (2dBi)

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	25.33	25.45	**25.59**
		1	7	25.23	25.41	25.57
		1	14	25.25	25.28	25.29
		8	0	24.20	24.25	24.68
		8	3	24.19	24.23	24.59
		8	7	24.13	24.24	24.56
		15	0	24.18	24.14	24.46
3M	16QAM	1	0	23.96	24.18	**24.74**
		1	7	23.92	24.11	24.71
		1	14	23.89	24.12	24.71
		8	0	23.45	23.40	23.50
		8	3	23.40	23.41	23.38
		8	7	23.37	23.29	23.33
		15	0	23.34	23.31	23.36

*EIRP = Conducted + antenna gain (2dBi)

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	25.27	25.42	25.52
		1	2	25.31	25.36	**25.56**
		1	5	25.23	25.26	25.32
		3	0	25.17	25.21	25.31
		3	1	25.18	25.28	25.33
		3	3	25.14	25.24	25.29
		6	0	24.18	24.20	24.54
1.4M	16QAM	1	0	23.99	24.21	**24.83**
		1	2	23.92	24.02	24.74
		1	5	23.89	24.12	24.74
		3	0	23.46	23.39	23.51
		3	1	23.41	23.41	23.45
		3	3	23.40	23.24	23.32
		6	0	23.34	23.32	23.38

*EIRP = Conducted + antenna gain (2dBi)

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	25.88	25.96	**26.24**
		1	50	25.79	25.87	26.23
		1	99	25.64	25.72	26.08
		50	0	24.87	24.95	25.31
		50	25	24.82	24.90	25.26
		50	50	24.78	24.86	25.22
		100	0	24.80	24.88	25.24
20M	16QAM	1	0	24.92	25.00	**25.36**
		1	50	24.80	24.88	25.24
		1	99	24.77	24.85	25.21
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

*EIRP = Conducted + antenna gain (2.5dBi)

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	25.83	25.86	**26.18**
		1	37	25.75	25.85	26.13
		1	74	25.59	25.71	26.04
		36	0	24.86	24.89	25.21
		36	19	24.74	24.88	25.20
		36	39	24.71	24.76	25.17
		75	0	24.72	24.87	25.18
15M	16QAM	1	0	24.92	24.99	**25.32**
		1	37	24.76	24.80	25.21
		1	74	24.72	24.82	25.19
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

*EIRP = Conducted + antenna gain (2.5dBi)

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	25.87	25.86	26.16
		1	24	25.69	25.84	**26.23**
		1	49	25.60	25.66	26.08
		25	0	24.82	24.92	25.22
		25	12	24.80	24.84	25.26
		25	25	24.77	24.85	25.12
		50	0	24.80	24.86	25.14
10M	16QAM	1	0	24.84	24.97	**25.31**
		1	24	24.74	24.78	25.24
		1	49	24.71	24.77	25.18
		25	0	23.92	24.00	24.36
		25	12	23.84	23.92	24.28
		25	25	23.75	23.83	24.19
		50	0	-	-	-

*EIRP = Conducted + antenna gain (2.5dBi)

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	25.81	25.96	**26.16**
		1	12	25.79	25.82	26.14
		1	24	25.62	25.71	26.05
		12	0	24.85	24.89	25.24
		12	6	24.73	24.87	25.25
		12	13	24.72	24.83	25.17
		25	0	24.77	24.84	25.15
5M	16QAM	1	0	24.91	24.96	**25.35**
		1	12	24.78	24.82	25.22
		1	24	24.68	24.81	25.11
		12	0	23.91	23.91	24.34
		12	6	23.80	23.82	24.24
		12	13	23.69	23.75	24.15
		25	0	23.60	23.74	24.12

*EIRP = Conducted + antenna gain (2.5dBi)

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	20.47	**20.73**	20.69
		1	24	20.45	20.69	20.59
		1	49	20.44	20.52	20.51
		25	0	19.84	19.87	19.84
		25	12	19.72	19.76	19.63
		25	25	19.66	19.67	19.64
		50	0	19.69	19.70	19.60
10M	16QAM	1	0	**19.83**	19.82	19.75
		1	24	19.62	19.70	19.61
		1	49	19.64	19.62	19.62
		25	0	18.82	18.78	18.82
		25	12	18.66	18.61	18.71
		25	25	18.56	18.47	18.57
		50	0	-	-	-

*ERP = Conducted + antenna gain (-0.5dBi) -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	20.37	**20.64**	20.62
		1	12	20.42	20.63	20.50
		1	24	20.43	20.42	20.41
		12	0	19.78	19.79	19.82
		12	6	19.70	19.75	19.58
		12	13	19.64	19.60	19.64
		25	0	19.69	19.60	19.50
5M	16QAM	1	0	**19.78**	19.73	19.73
		1	12	19.54	19.68	19.56
		1	24	19.60	19.61	19.58
		12	0	18.72	18.70	18.73
		12	6	18.59	18.53	18.70
		12	13	18.50	18.39	18.50
		25	0	18.52	18.47	18.49

*ERP = Conducted + antenna gain (-0.5dBi) -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	20.43	**20.70**	20.68
		1	7	20.40	20.63	20.54
		1	14	20.44	20.44	20.42
		8	0	19.81	19.77	19.74
		8	3	19.72	19.71	19.56
		8	7	19.66	19.60	19.61
		15	0	19.59	19.68	19.50
3M	16QAM	1	0	19.77	**19.78**	19.67
		1	7	19.60	19.61	19.57
		1	14	19.64	19.59	19.58
		8	0	18.75	18.68	18.81
		8	3	18.58	18.53	18.62
		8	7	18.46	18.40	18.47
		15	0	18.46	18.38	18.40

*ERP = Conducted + antenna gain (-0.5dBi) -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	20.43	20.68	20.64
		1	2	20.25	20.67	20.38
		1	5	20.35	20.38	20.36
		3	0	20.71	**20.82**	20.67
		3	1	20.55	20.66	20.60
		3	3	20.49	20.56	20.61
		6	0	19.62	19.49	19.44
1.4M	16QAM	1	0	**19.75**	19.70	19.63
		1	2	19.54	19.54	19.47
		1	5	19.44	19.50	19.58
		3	0	19.67	19.73	19.65
		3	1	19.55	19.51	19.61
		3	3	19.44	19.45	19.51
		6	0	18.38	18.39	18.41

*ERP = Conducted + antenna gain (-0.5dBi) -2.15

LTE Band 13				
BW	MCS Index	RB Size	RB Offset	Low
		Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	**21.90**
		1	24	21.88
		1	49	21.86
		25	0	20.86
		25	12	20.85
		25	25	20.83
		50	0	20.80
10M	16QAM	1	0	**20.89**
		1	24	20.86
		1	49	20.83
		25	0	20.01
		25	12	19.92
		25	25	19.89
		50	0	-

*ERP = Conducted + antenna gain (0.6dBi) -2.15

LTE Band 13						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	21.87	**21.88**	21.78
		1	12	21.86	21.86	21.80
		1	24	21.83	21.85	21.78
		12	0	20.70	20.79	20.78
		12	6	20.83	20.84	20.76
		12	13	20.74	20.80	20.79
		25	0	20.74	20.77	20.74
5M	16QAM	1	0	20.82	**20.85**	20.83
		1	12	20.70	20.76	20.68
		1	24	20.71	20.78	20.78
		12	0	19.86	19.93	19.84
		12	6	19.86	19.92	19.86
		12	13	19.69	19.79	19.72
		25	0	19.66	19.75	19.65

*ERP = Conducted + antenna gain (0.6dBi)-2.15

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37850	38000	38150
		Frequency (MHz)		2580	2595	2610
20M	QPSK	1	0	**26.17**	26.03	26.09
		1	50	26.08	26.02	26.02
		1	99	25.91	25.83	25.87
		50	0	25.17	25.12	25.15
		50	25	25.06	25.02	25.05
		50	50	24.95	24.83	24.87
		100	0	24.98	24.89	24.97
20M	16QAM	1	0	**25.14**	25.09	25.07
		1	50	24.99	24.97	24.99
		1	99	24.91	24.78	24.86
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

*EIRP = Conducted + antenna gain (2.7dBi)

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37825	38000	38175
		Frequency (MHz)		2577.5	2595	2612.5
15M	QPSK	1	0	**26.09**	26.02	26.03
		1	37	26.08	25.93	26.02
		1	74	25.87	25.79	25.82
		36	0	25.12	25.06	25.09
		36	19	25.06	24.96	25.00
		36	39	24.85	24.73	24.80
		75	0	24.95	24.87	24.97
15M	16QAM	1	0	**25.09**	25.04	25.04
		1	37	24.95	24.89	24.91
		1	74	24.84	24.70	24.76
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

*EIRP = Conducted + antenna gain (2.7dBi)

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37800	38000	38200
		Frequency (MHz)		2575	2595	2615
10M	QPSK	1	0	**26.09**	26.03	26.03
		1	24	26.06	25.96	25.98
		1	49	25.86	25.79	25.82
		25	0	25.13	25.05	25.06
		25	12	25.02	24.95	25.05
		25	25	24.89	24.74	24.78
		50	0	24.92	24.80	24.91
10M	16QAM	1	0	**25.14**	25.03	25.07
		1	24	24.95	24.89	24.89
		1	49	24.81	24.78	24.85
		25	0	24.12	24.09	24.11
		25	12	23.96	23.87	23.91
		25	25	23.83	23.82	23.74
		50	0	-	-	-

*EIRP = Conducted + antenna gain (2.7dBi)

LTE Band 38						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		37775	38000	38225
		Frequency (MHz)		2572.5	2595	2617.5
5M	QPSK	1	0	**26.15**	25.94	25.99
		1	12	26.02	25.92	25.95
		1	24	25.82	25.78	25.83
		12	0	25.17	25.08	25.09
		12	6	25.04	24.95	24.95
		12	13	24.95	24.83	24.80
		25	0	24.96	24.82	24.93
5M	16QAM	1	0	**25.10**	25.08	24.99
		1	12	24.91	24.91	24.97
		1	24	24.89	24.76	24.82
		12	0	24.06	24.04	24.09
		12	6	23.88	23.83	23.89
		12	13	23.82	23.80	23.72
		25	0	23.77	23.67	23.68

*EIRP = Conducted + antenna gain (2.7dBi)

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39750	40620	41490
		Frequency (MHz)		2506	2593	2680
20M	QPSK	1	0	26.25	26.71	**27.02**
		1	50	26.18	26.64	26.95
		1	99	26.14	26.60	26.91
		50	0	25.37	25.83	26.14
		50	25	25.31	25.77	26.08
		50	50	25.25	25.71	26.02
		100	0	25.28	25.74	26.05
20M	16QAM	1	0	25.34	25.80	**26.11**
		1	50	25.30	25.76	26.07
		1	99	25.24	25.70	26.01
		50	0	-	-	-
		50	25	-	-	-
		50	50	-	-	-
		100	0	-	-	-

*EIRP = Conducted + antenna gain (3.3dBi)

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39725	40620	41515
		Frequency (MHz)		2503.5	2593	2682.5
15M	QPSK	1	0	26.16	26.71	**26.94**
		1	37	26.08	26.57	26.93
		1	74	26.04	26.59	26.87
		36	0	25.33	25.81	26.08
		36	19	25.30	25.67	26.07
		36	39	25.17	25.70	25.93
		75	0	25.21	25.64	26.05
15M	16QAM	1	0	25.18	25.61	**25.94**
		1	37	25.18	25.60	**25.94**
		1	74	25.08	25.58	25.88
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

*EIRP = Conducted + antenna gain (3.3dBi)

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39700	40620	41540
		Frequency (MHz)		2501	2593	2685
10M	QPSK	1	0	26.16	26.70	**26.95**
		1	24	26.14	26.62	26.90
		1	49	26.12	26.57	26.91
		25	0	25.28	25.77	26.09
		25	12	25.21	25.69	26.01
		25	25	25.23	25.70	25.98
		50	0	25.20	25.65	25.99
10M	16QAM	1	0	25.18	25.63	**26.02**
		1	24	25.15	25.54	25.86
		1	49	25.05	25.56	25.84
		25	0	24.32	24.76	25.05
		25	12	24.26	24.75	25.03
		25	25	24.22	24.67	24.98
		50	0	-	-	-

*EIRP = Conducted + antenna gain (3.3dBi)

LTE Band 41						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		39675	40620	41565
		Frequency (MHz)		2498.5	2593	2687.5
5M	QPSK	1	0	26.17	26.63	**26.94**
		1	12	26.10	26.59	26.89
		1	24	26.07	26.54	26.88
		12	0	25.28	25.79	26.05
		12	6	25.23	25.70	26.01
		12	13	25.24	25.66	25.95
		25	0	25.18	25.73	25.95
5M	16QAM	1	0	25.23	25.65	**26.02**
		1	12	25.14	25.62	25.90
		1	24	25.10	25.53	25.83
		12	0	24.30	24.77	25.07
		12	6	24.30	24.73	25.06
		12	13	24.36	24.78	25.09
		25	0	24.27	24.75	25.05

*EIRP = Conducted + antenna gain (3.3dBi)

4.2 Modulation Characteristics Measurement

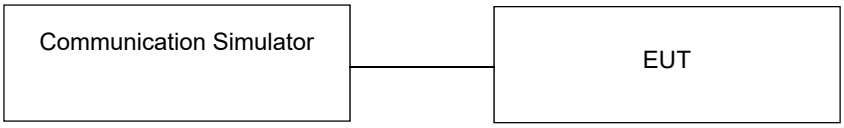
4.2.1 Limits of Modulation Characteristics

N/A

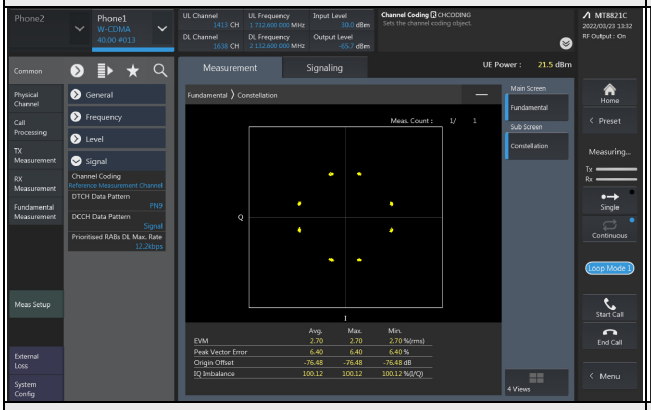
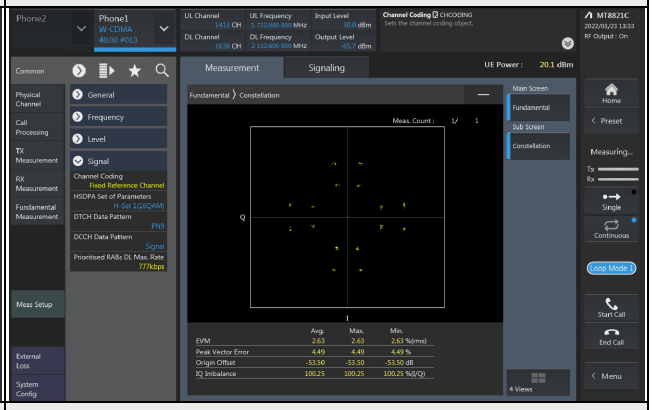
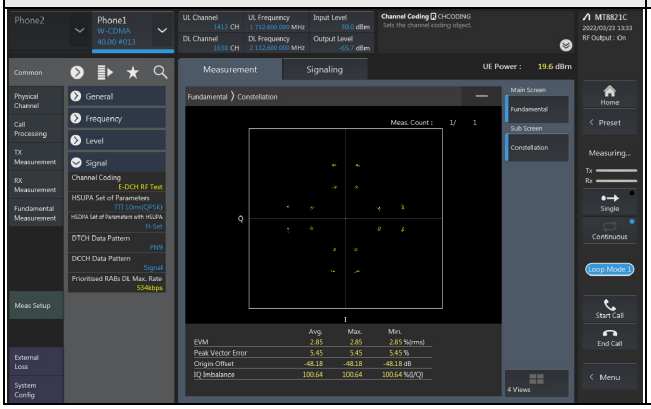
4.2.2 Test Procedure

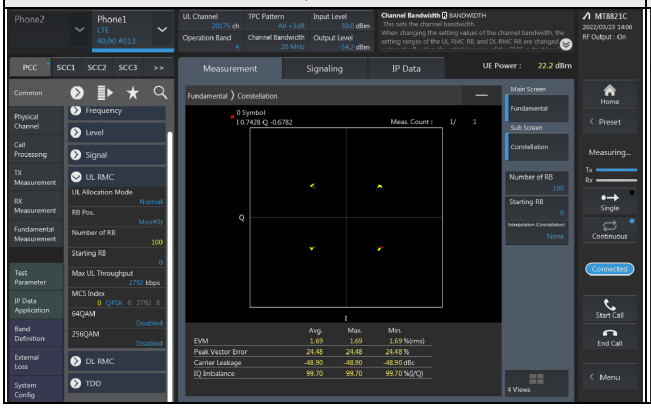
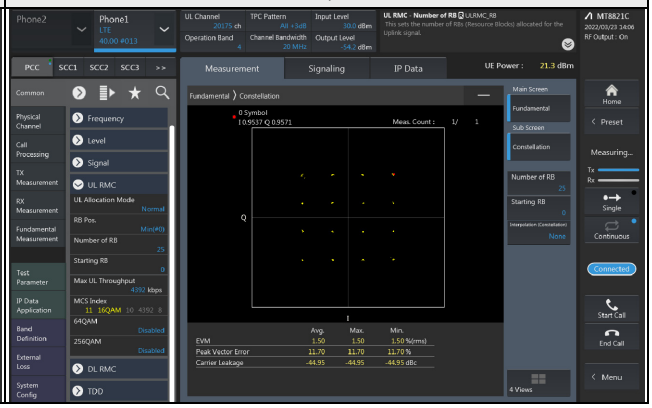
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

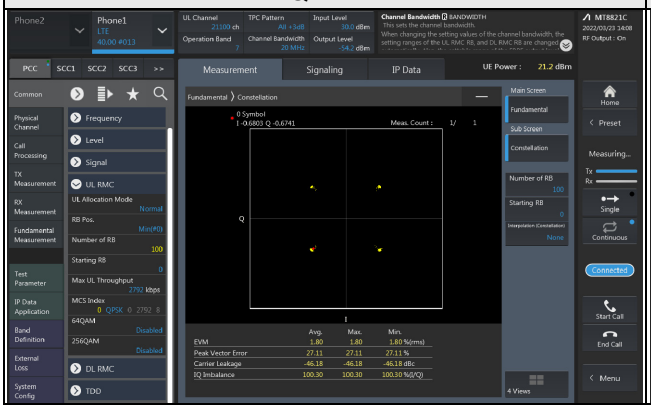
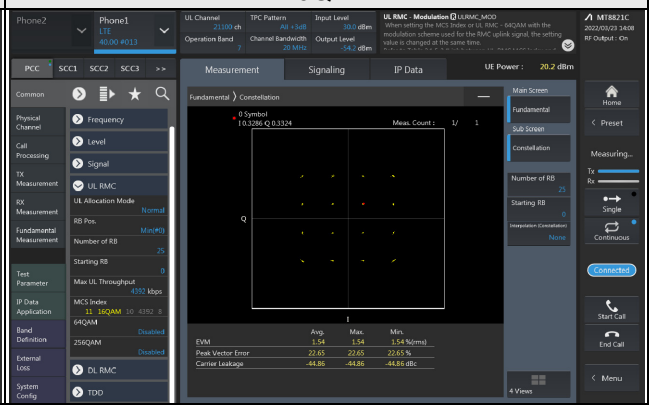
4.2.3 Test Setup

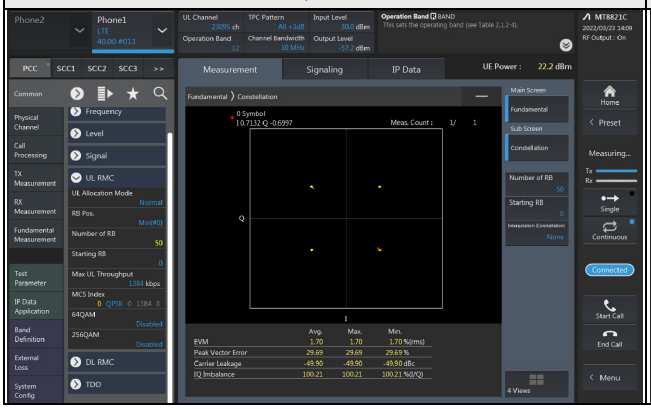
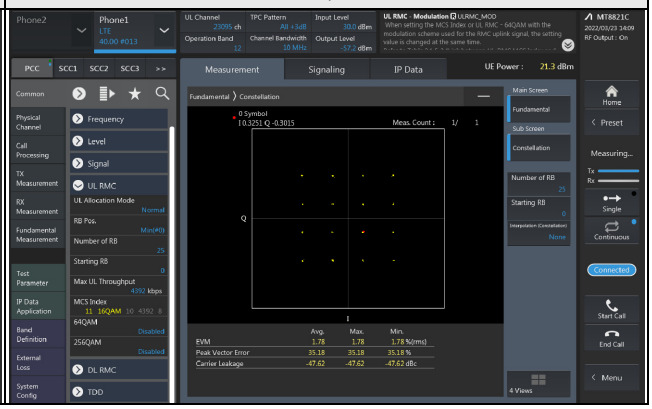


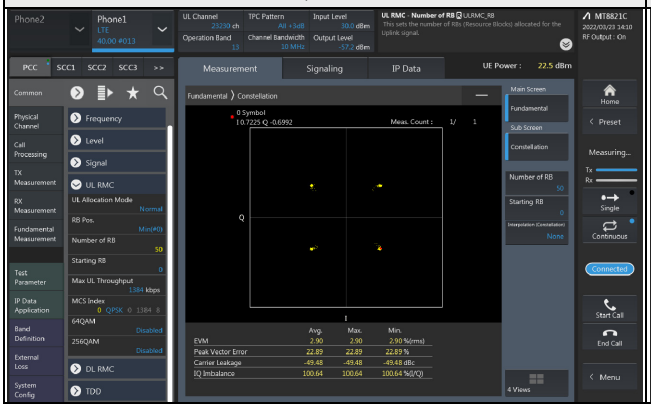
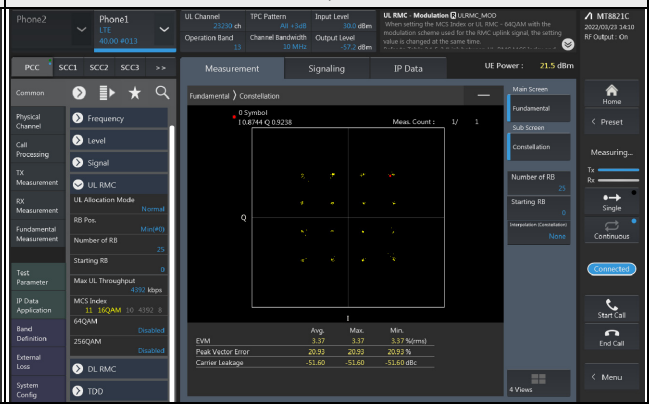
4.2.4 Test Results

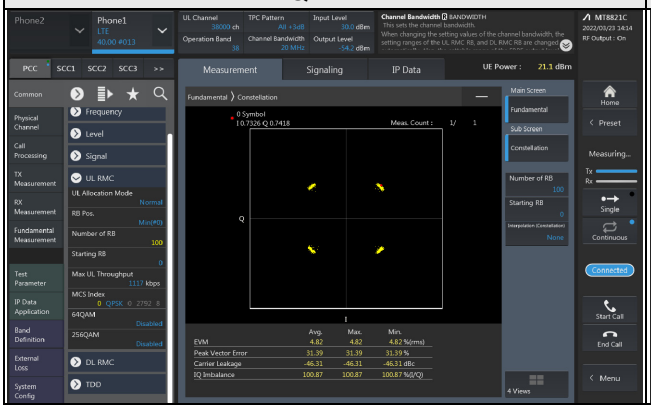
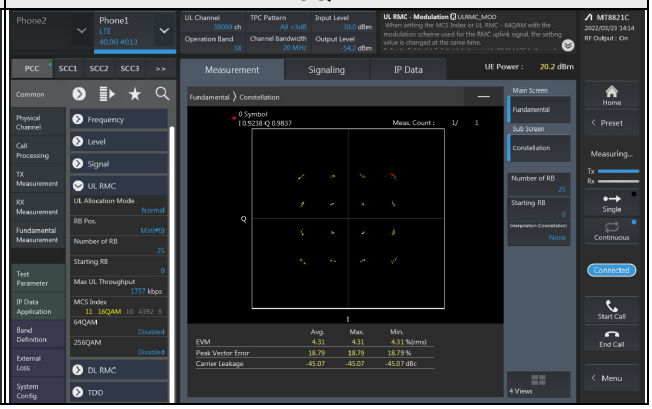
WCDMA Band 4	
Spectrum Plot of Measurement Value	
Channel: 1413 / Frequency (MHz): 1732.6MHz	
WCDMA	HSDPA
	
HSUPA	
	

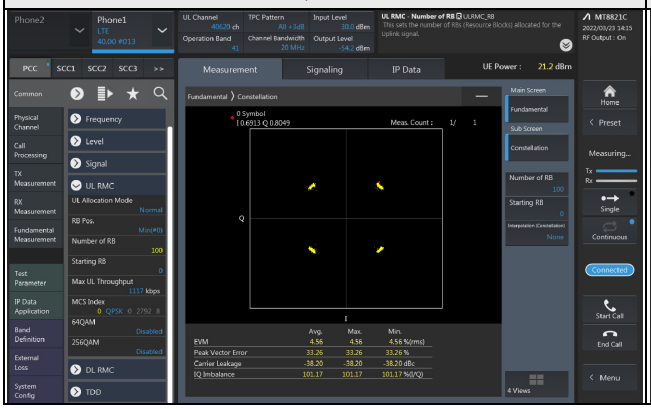
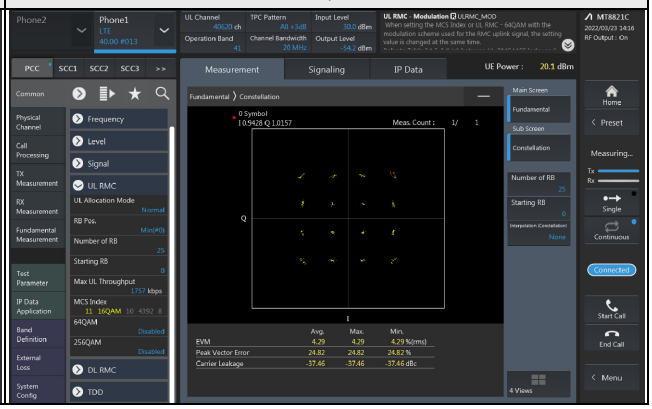
LTE Band 4	
Spectrum Plot of Measurement Value	
Channel: 20175 / Frequency (MHz): 1732.5MHz	
QPSK	16QAM
	

LTE Band 7	
Spectrum Plot of Measurement Value	
Channel: 21100 / Frequency (MHz): 2535.0MHz	
QPSK	16QAM
	

LTE Band 12	
Spectrum Plot of Measurement Value	
Channel: 23095 / Frequency (MHz): 707.5MHz	
QPSK	16QAM
	

LTE Band 13	
Spectrum Plot of Measurement Value	
Channel: 23230 / Frequency (MHz): 782.0MHz	
QPSK	16QAM
	

LTE Band 38	
Spectrum Plot of Measurement Value	
Channel: 38000 / Frequency (MHz): 2595.0MHz	
QPSK	16QAM
	

LTE Band 41	
Spectrum Plot of Measurement Value	
Channel: 40620 / Frequency (MHz): 2593.0MHz	
QPSK	16QAM
	

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.

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

4.3.2 Test Procedure

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

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

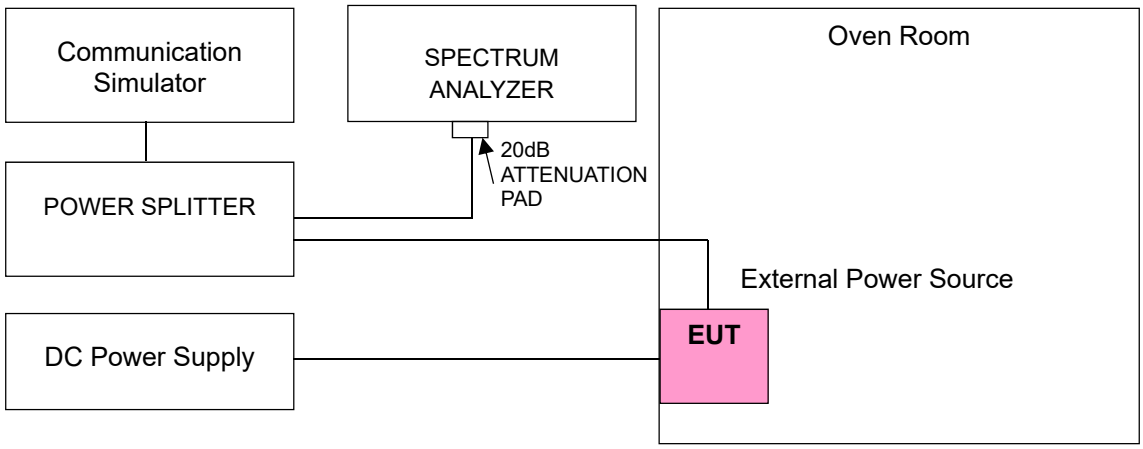
Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Instruments

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

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

4.3.4 Test Setup



4.3.5 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	WCDMA Band 4			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	1712.400001	0.001	1752.600003	0.002
3.7	1712.400003	0.002	1752.600004	0.002
4.255	1712.400003	0.002	1752.600002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA Band 4			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.400002	0.001	1752.600004	0.002
-20	1712.400004	0.002	1752.600002	0.001
-10	1712.400002	0.001	1752.600003	0.002
0	1712.400003	0.002	1752.600003	0.002
10	1712.399996	-0.002	1752.599997	-0.002
20	1712.399999	-0.001	1752.599997	-0.002
30	1712.399999	-0.001	1752.599998	-0.001
40	1712.399996	-0.002	1752.599997	-0.002
50	1712.399996	-0.002	1752.599997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	1710.700004	0.002	1754.300001	0.001
3.7	1710.700004	0.002	1754.300001	0.001
4.255	1710.700003	0.002	1754.300004	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1710.700001	0.001	1754.300001	0.001
-20	1710.700002	0.001	1754.300002	0.001
-10	1710.700004	0.002	1754.300003	0.002
0	1710.700003	0.002	1754.300004	0.002
10	1710.699999	-0.001	1754.299999	-0.001
20	1710.699997	-0.002	1754.299998	-0.001
30	1710.699997	-0.002	1754.299998	-0.001
40	1710.699999	-0.001	1754.299997	-0.002
50	1710.699996	-0.002	1754.299997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	1711.500004	0.002	1753.500001	0.001
3.7	1711.500004	0.002	1753.500003	0.002
4.255	1711.500002	0.001	1753.500003	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1711.500004	0.002	1753.500001	0.001
-20	1711.500002	0.001	1753.500002	0.001
-10	1711.500004	0.002	1753.500004	0.002
0	1711.500001	0.001	1753.500001	0.001
10	1711.499997	-0.002	1753.499999	-0.001
20	1711.499999	-0.001	1753.499999	-0.001
30	1711.499999	-0.001	1753.499998	-0.001
40	1711.499999	-0.001	1753.499999	-0.001
50	1711.499996	-0.002	1753.499997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	1712.500001	0.001	1752.500004	0.002
3.7	1712.500001	0.001	1752.500002	0.001
4.255	1712.500004	0.002	1752.500003	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.500002	0.001	1752.500003	0.002
-20	1712.500002	0.001	1752.500003	0.002
-10	1712.500001	0.001	1752.500003	0.002
0	1712.500003	0.002	1752.500003	0.002
10	1712.499998	-0.001	1752.499998	-0.001
20	1712.499997	-0.002	1752.499998	-0.001
30	1712.499997	-0.002	1752.499999	-0.001
40	1712.499996	-0.002	1752.499998	-0.001
50	1712.499997	-0.002	1752.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	1715.000001	0.001	1750.000001	0.001
3.7	1715.000002	0.001	1750.000002	0.001
4.255	1715.000003	0.002	1750.000002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1715.000001	0.001	1750.000003	0.002
-20	1715.000004	0.002	1750.000004	0.002
-10	1715.000003	0.002	1750.000003	0.002
0	1715.000003	0.002	1750.000002	0.001
10	1714.999996	-0.002	1749.999996	-0.002
20	1714.999998	-0.001	1749.999996	-0.002
30	1714.999996	-0.002	1749.999999	-0.001
40	1714.999997	-0.002	1749.999997	-0.002
50	1714.999998	-0.001	1749.999996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 4			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	1717.500002	0.001	1747.500003	0.002
3.7	1717.500003	0.002	1747.500002	0.001
4.255	1717.500003	0.002	1747.500002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1717.500001	0.001	1747.500004	0.002
-20	1717.500002	0.001	1747.500002	0.001
-10	1717.500003	0.002	1747.500001	0.001
0	1717.500001	0.001	1747.500004	0.002
10	1717.499996	-0.002	1747.499996	-0.002
20	1717.499999	-0.001	1747.499999	-0.001
30	1717.499998	-0.001	1747.499996	-0.002
40	1717.499999	-0.001	1747.499998	-0.001
50	1717.499996	-0.002	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)
3.145	1720.000003	0.002	1745.000002	0.001
3.7	1720.000002	0.001	1745.000004	0.002
4.255	1720.000004	0.002	1745.000002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000003	0.002	1745.000001	0.001
-20	1720.000001	0.001	1745.000003	0.002
-10	1720.000001	0.001	1745.000001	0.001
0	1720.000004	0.002	1745.000003	0.002
10	1719.999999	-0.001	1744.999998	-0.001
20	1719.999997	-0.002	1744.999996	-0.002
30	1719.999999	-0.001	1744.999996	-0.002
40	1719.999996	-0.002	1744.999998	-0.001
50	1719.999997	-0.002	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)
3.145	2502.500002	0.001	2567.500002	0.001
3.7	2502.500003	0.001	2567.500001	0.000
4.255	2502.500002	0.001	2567.500003	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2502.500004	0.002	2567.500004	0.002
-20	2502.500003	0.001	2567.500001	0.000
-10	2502.500001	0.000	2567.500001	0.000
0	2502.500001	0.000	2567.500003	0.001
10	2502.499997	-0.001	2567.499998	-0.001
20	2502.499999	0.000	2567.499997	-0.001
30	2502.499997	-0.001	2567.499997	-0.001
40	2502.499996	-0.002	2567.499997	-0.001
50	2502.499997	-0.001	2567.499997	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2505.000003	0.001	2565.000003	0.001
3.7	2505.000002	0.001	2565.000002	0.001
4.255	2505.000001	0.000	2565.000002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2505.000004	0.002	2565.000001	0.000
-20	2505.000002	0.001	2565.000002	0.001
-10	2505.000003	0.001	2565.000002	0.001
0	2505.000002	0.001	2565.000004	0.002
10	2504.999998	-0.001	2564.999999	0.000
20	2504.999999	0.000	2564.999998	-0.001
30	2504.999997	-0.001	2564.999998	-0.001
40	2504.999996	-0.002	2564.999997	-0.001
50	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)
3.145	2507.500001	0.000	2562.500001	0.000
3.7	2507.500003	0.001	2562.500002	0.001
4.255	2507.500001	0.000	2562.500002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2507.500003	0.001	2562.500004	0.002
-20	2507.500002	0.001	2562.500003	0.001
-10	2507.500002	0.001	2562.500003	0.001
0	2507.500004	0.002	2562.500004	0.002
10	2507.499998	-0.001	2562.499999	0.000
20	2507.499999	0.000	2562.499996	-0.002
30	2507.499997	-0.001	2562.499999	0.000
40	2507.499996	-0.002	2562.499997	-0.001
50	2507.499998	-0.001	2562.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2510.000004	0.002	2560.000004	0.002
3.7	2510.000004	0.002	2560.000002	0.001
4.255	2510.000002	0.001	2560.000001	0.000

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 7			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2510.000002	0.001	2560.000003	0.001
-20	2510.000002	0.001	2560.000001	0.000
-10	2510.000001	0.000	2560.000004	0.002
0	2510.000003	0.001	2560.000002	0.001
10	2509.999996	-0.002	2559.999997	-0.001
20	2509.999999	0.000	2559.999997	-0.001
30	2509.999996	-0.002	2559.999999	0.000
40	2509.999997	-0.001	2559.999998	-0.001
50	2509.999997	-0.001	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)
3.145	699.700003	0.004	715.300001	0.001
3.7	699.700004	0.006	715.300003	0.004
4.255	699.700004	0.006	715.300003	0.004

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	699.700004	0.006	715.300002	0.003
-20	699.700003	0.004	715.300001	0.001
-10	699.700004	0.006	715.300001	0.001
0	699.700003	0.004	715.300002	0.003
10	699.699998	-0.003	715.299996	-0.006
20	699.699997	-0.004	715.299996	-0.006
30	699.699998	-0.003	715.299997	-0.004
40	699.699998	-0.003	715.299996	-0.006
50	699.699999	-0.001	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)
3.145	700.500004	0.006	714.500002	0.003
3.7	700.500004	0.006	714.500004	0.006
4.255	700.500001	0.001	714.500002	0.003

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	700.500004	0.006	714.500002	0.003
-20	700.500003	0.004	714.500004	0.006
-10	700.500002	0.003	714.500002	0.003
0	700.500001	0.001	714.500001	0.001
10	700.499998	-0.003	714.499998	-0.003
20	700.499998	-0.003	714.499997	-0.004
30	700.499999	-0.001	714.499996	-0.006
40	700.499998	-0.003	714.499998	-0.003
50	700.499999	-0.001	714.499998	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	701.500001	0.001	713.500002	0.003
3.7	701.500001	0.001	713.500001	0.001
4.255	701.500003	0.004	713.500004	0.006

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	701.500004	0.006	713.500001	0.001
-20	701.500003	0.004	713.500002	0.003
-10	701.500003	0.004	713.500002	0.003
0	701.500001	0.001	713.500002	0.003
10	701.499997	-0.004	713.499999	-0.001
20	701.499996	-0.006	713.499996	-0.006
30	701.499996	-0.006	713.499999	-0.001
40	701.499999	-0.001	713.499996	-0.006
50	701.499999	-0.001	713.499999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 12			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	704.000004	0.006	711.000003	0.004
3.7	704.000004	0.006	711.000003	0.004
4.255	704.000004	0.006	711.000004	0.006

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	704.000003	0.004	711.000004	0.006
-20	704.000001	0.001	711.000002	0.003
-10	704.000004	0.006	711.000003	0.004
0	704.000001	0.001	711.000004	0.006
10	703.999996	-0.006	710.999997	-0.004
20	703.999996	-0.006	710.999997	-0.004
30	703.999998	-0.003	710.999998	-0.003
40	703.999997	-0.004	710.999996	-0.006
50	703.999998	-0.003	710.999998	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 13			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	779.500003	0.004	784.500001	0.001
3.7	779.500004	0.005	784.500003	0.004
4.255	779.500003	0.004	784.500004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	779.500001	0.001	784.500004	0.005
-20	779.500001	0.001	784.500001	0.001
-10	779.500003	0.004	784.500004	0.005
0	779.500004	0.005	784.500003	0.004
10	779.499997	-0.004	784.499999	-0.001
20	779.499999	-0.001	784.499999	-0.001
30	779.499999	-0.001	784.499996	-0.005
40	779.499996	-0.005	784.499996	-0.005
50	779.499998	-0.003	784.499997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 13	
	Channel Bandwidth 10MHz	
	Frequency (MHz)	Frequency Error (ppm)
3.145	782.000004	0.005
3.7	782.000004	0.005
4.255	782.000004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13	
	Channel Bandwidth 10MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	782.000004	0.005
-20	782.000002	0.003
-10	782.000004	0.005
0	782.000001	0.001
10	781.999997	-0.004
20	781.999996	-0.005
30	781.999999	-0.001
40	781.999997	-0.004
50	781.999997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 38			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2572.500004	0.002	2617.500002	0.001
3.7	2572.500004	0.002	2617.500003	0.001
4.255	2572.500002	0.001	2617.500003	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 38			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2572.500002	0.001	2617.500004	0.002
-20	2572.500002	0.001	2617.500004	0.002
-10	2572.500003	0.001	2617.500004	0.002
0	2572.500001	0.000	2617.500001	0.000
10	2572.499996	-0.002	2617.499998	-0.001
20	2572.499996	-0.002	2617.499998	-0.001
30	2572.499996	-0.002	2617.499998	-0.001
40	2572.499996	-0.002	2617.499998	-0.001
50	2572.499999	0.000	2617.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 38			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2575.000002	0.001	2615.000003	0.001
3.7	2575.000002	0.001	2615.000003	0.001
4.255	2575.000002	0.001	2615.000001	0.000

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 38			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2575.000001	0.000	2615.000002	0.001
-20	2575.000002	0.001	2615.000002	0.001
-10	2575.000001	0.000	2615.000003	0.001
0	2575.000003	0.001	2615.000004	0.002
10	2574.999999	0.000	2614.999997	-0.001
20	2574.999996	-0.002	2614.999999	0.000
30	2574.999996	-0.002	2614.999996	-0.002
40	2574.999997	-0.001	2614.999996	-0.002
50	2574.999998	-0.001	2614.999996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 38			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2577.500004	0.002	2612.500003	0.001
3.7	2577.500001	0.000	2612.500003	0.001
4.255	2577.500002	0.001	2612.500003	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 38			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2577.500001	0.000	2612.500004	0.002
-20	2577.500002	0.001	2612.500003	0.001
-10	2577.500002	0.001	2612.500001	0.000
0	2577.500004	0.002	2612.500003	0.001
10	2577.499999	0.000	2612.499998	-0.001
20	2577.499998	-0.001	2612.499997	-0.001
30	2577.499996	-0.002	2612.499997	-0.001
40	2577.499999	0.000	2612.499998	-0.001
50	2577.499997	-0.001	2612.499997	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 38			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2580.000004	0.002	2610.000004	0.002
3.7	2580.000002	0.001	2610.000004	0.002
4.255	2580.000004	0.002	2610.000000	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 38			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2580.000001	0.000	2610.000002	0.001
-20	2580.000001	0.000	2610.000001	0.000
-10	2580.000003	0.001	2610.000004	0.002
0	2580.000004	0.002	2610.000002	0.001
10	2579.999998	-0.001	2609.999998	-0.001
20	2579.999998	-0.001	2609.999998	-0.001
30	2579.999998	-0.001	2609.999998	-0.001
40	2579.999996	-0.002	2609.999999	0.000
50	2579.999998	-0.001	2609.999998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 41			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2498.500001	0.000	2687.500003	0.001
3.7	2498.500002	0.001	2687.500004	0.001
4.255	2498.500001	0.000	2687.500003	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2498.500001	0.000	2687.500004	0.001
-20	2498.500003	0.001	2687.500003	0.001
-10	2498.500001	0.000	2687.500003	0.001
0	2498.500001	0.000	2687.500001	0.000
10	2498.499996	-0.002	2687.499997	-0.001
20	2498.499999	0.000	2687.499999	0.000
30	2498.499998	-0.001	2687.499996	-0.001
40	2498.499999	0.000	2687.499996	-0.001
50	2498.499996	-0.002	2687.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 41			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2501.000001	0.000	2685.000003	0.001
3.7	2501.000004	0.002	2685.000003	0.001
4.255	2501.000003	0.001	2685.000001	0.000

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2501.000002	0.001	2685.000001	0.000
-20	2501.000002	0.001	2685.000002	0.001
-10	2501.000004	0.002	2685.000002	0.001
0	2501.000004	0.002	2685.000003	0.001
10	2500.999996	-0.002	2684.999997	-0.001
20	2500.999998	-0.001	2684.999997	-0.001
30	2500.999996	-0.002	2684.999998	-0.001
40	2500.999997	-0.001	2684.999999	0.000
50	2500.999998	-0.001	2684.999997	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 41			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2503.500001	0.000	2682.500002	0.001
3.7	2503.500002	0.001	2682.500004	0.001
4.255	2503.500004	0.002	2682.500003	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2503.500003	0.001	2682.500001	0.000
-20	2503.500001	0.000	2682.500003	0.001
-10	2503.500001	0.000	2682.500002	0.001
0	2503.500004	0.002	2682.500003	0.001
10	2503.499999	0.000	2682.499997	-0.001
20	2503.499998	-0.001	2682.499996	-0.001
30	2503.499997	-0.001	2682.499997	-0.001
40	2503.499999	0.000	2682.499996	-0.001
50	2503.499998	-0.001	2682.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 41			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	2506.000002	0.001	2680.000001	0.000
3.7	2506.000002	0.001	2680.000004	0.001
4.255	2506.000004	0.002	2680.000002	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 41			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2506.000001	0.000	2680.000004	0.001
-20	2506.000003	0.001	2680.000003	0.001
-10	2506.000001	0.000	2680.000003	0.001
0	2506.000001	0.000	2680.000002	0.001
10	2505.999997	-0.001	2679.999998	-0.001
20	2505.999999	0.000	2679.999999	0.000
30	2505.999997	-0.001	2679.999998	-0.001
40	2505.999999	0.000	2679.999997	-0.001
50	2505.999996	-0.002	2679.999998	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Limits of Occupied Bandwidth Measurement

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

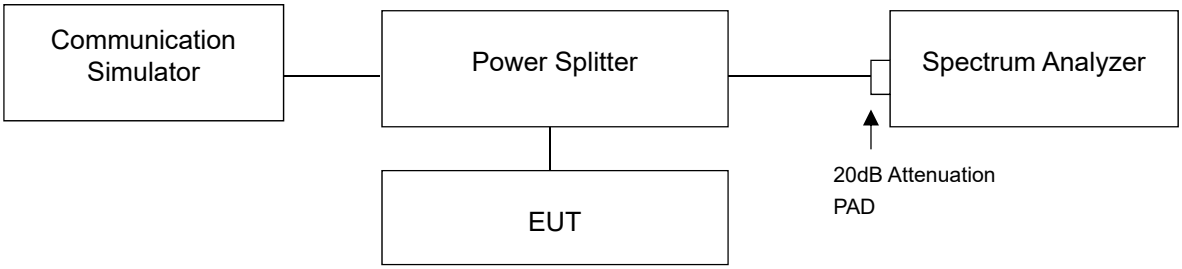
4.4.2 Test Procedure

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

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

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

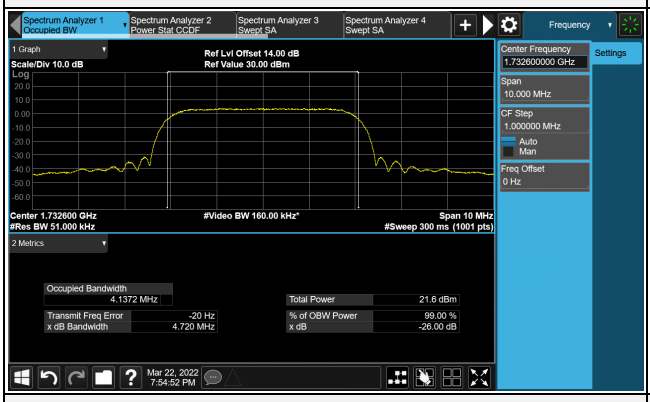
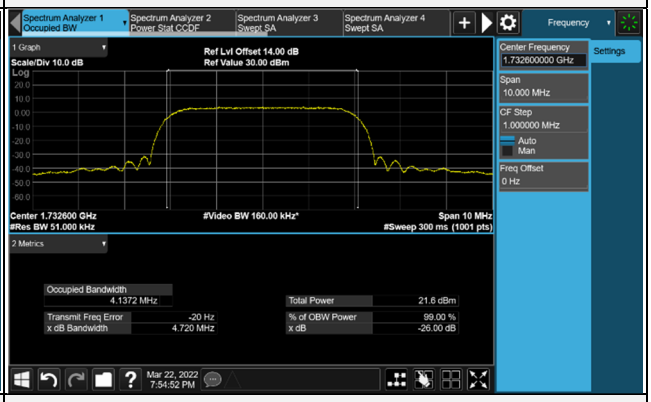
4.4.3 Test Setup



4.4.4 Test Result

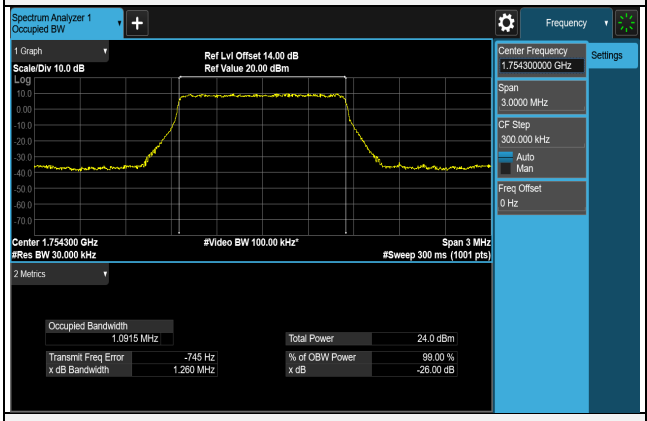
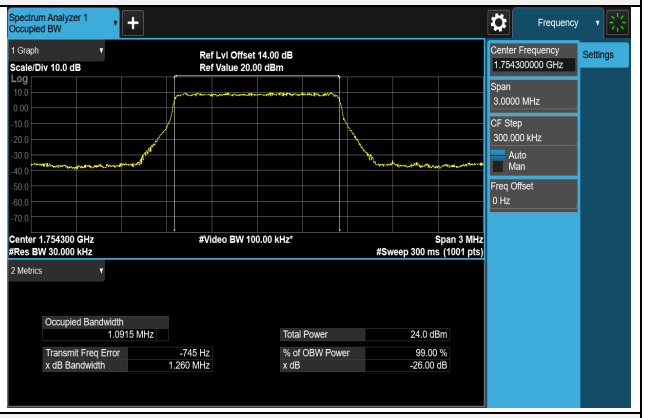
WCDMA Band 4

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	1312	1712.4	4.1327	4.703
WCDMA	1413	1732.6	4.1310	4.698
WCDMA	1513	1752.6	4.1342	4.706
HSDPA	1312	1712.4	4.1337	4.707
HSDPA	1413	1732.6	4.1372	4.720
HSDPA	1513	1752.6	4.1352	4.713
HSUPA	1312	1712.4	4.1351	4.717
HSUPA	1413	1732.6	4.1340	4.716
HSUPA	1513	1752.6	4.1366	4.718

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
HSDPA CH 1413 (1732.6MHz)	HSDPA CH 1413 (1732.6MHz)

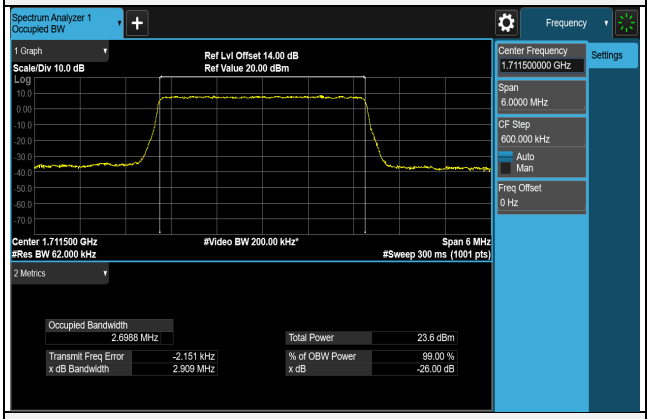
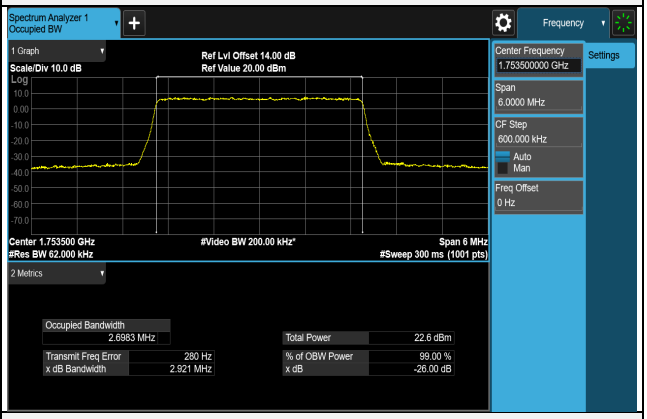
LTE Band 4 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19957	1710.7	1.0873	1.249
QPSK	20175	1732.5	1.0913	1.257
QPSK	20393	1754.3	1.0915	1.260
16QAM	19957	1710.7	1.0894	1.245
16QAM	20175	1732.5	1.0884	1.252
16QAM	20393	1754.3	1.0874	1.251

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20393 (1754.3MHz)	QPSK CH 20393 (1754.3MHz)

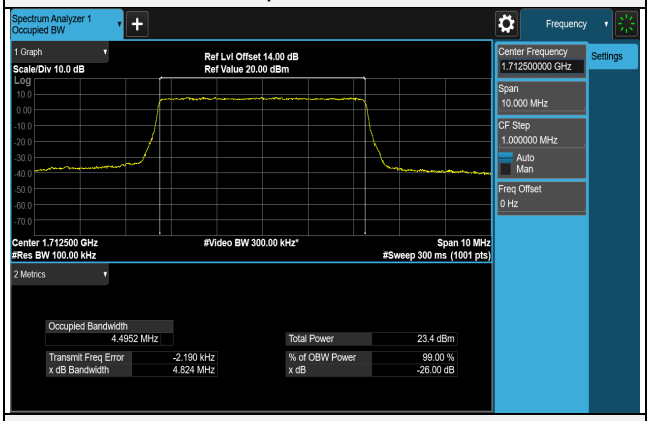
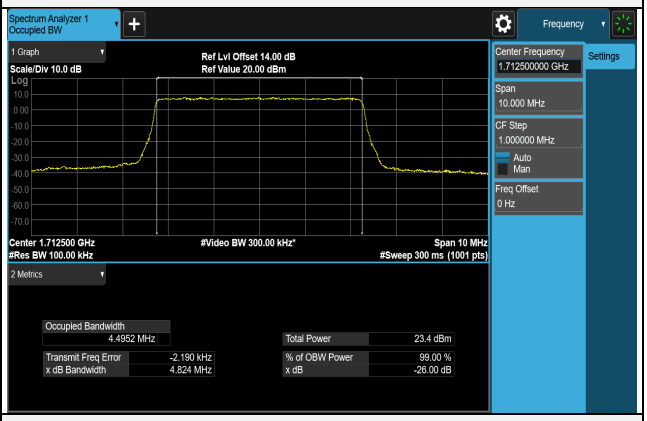
LTE Band 4 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19965	1711.5	2.6988	2.909
QPSK	20175	1732.5	2.6963	2.916
QPSK	20385	1753.5	2.6827	2.873
16QAM	19965	1711.5	2.6978	2.916
16QAM	20175	1732.5	2.6971	2.918
16QAM	20385	1753.5	2.6983	2.921

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 19965 (1711.5MHz)	16QAM CH 20385 (1753.5MHz)

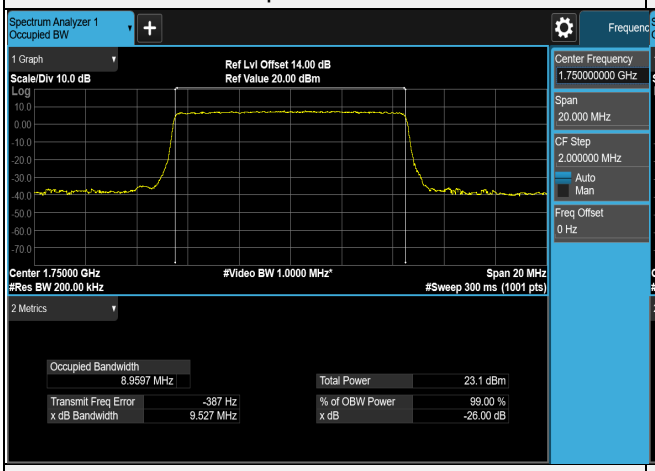
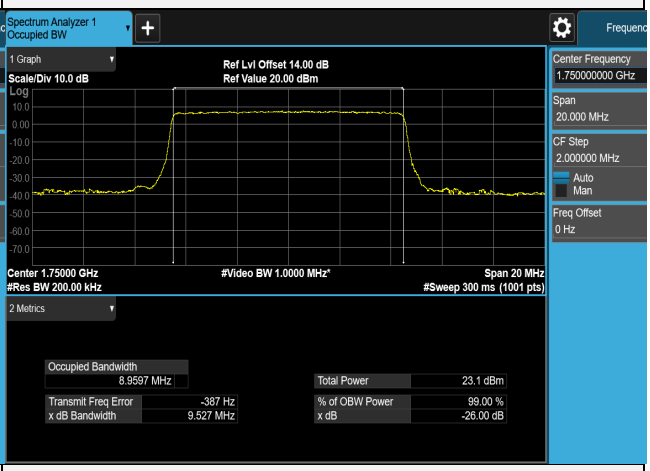
LTE Band 4 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19975	1712.5	4.4952	4.824
QPSK	20175	1732.5	4.4924	4.813
QPSK	20375	1752.5	4.4916	4.817
16QAM	19975	1712.5	4.4924	4.820
16QAM	20175	1732.5	4.4876	4.817
16QAM	20375	1752.5	4.4879	4.820

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

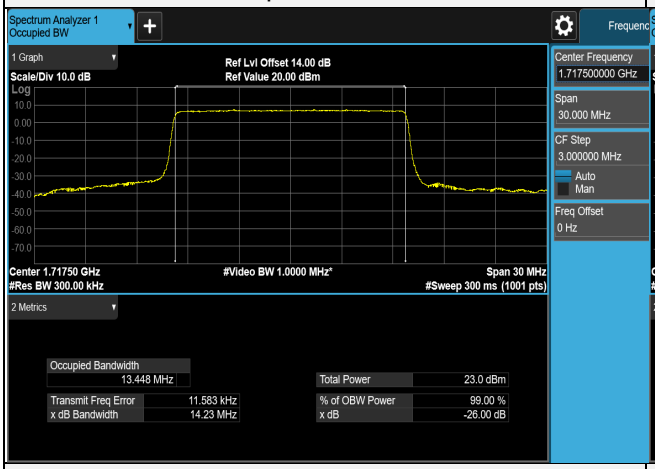
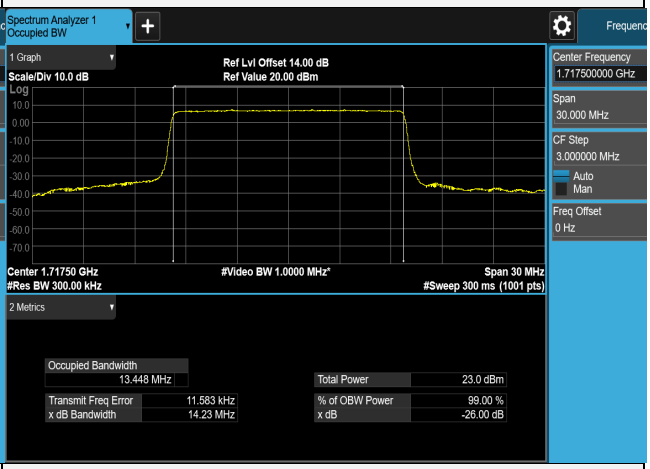
LTE Band 4 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20000	1715	8.9576	9.508
QPSK	20175	1732.5	8.9480	9.493
QPSK	20350	1750	8.9597	9.527
16QAM	20000	1715	4.5717	5.133
16QAM	20175	1732.5	4.5711	5.085
16QAM	20350	1750	4.5691	5.090

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20350 (1750MHz)	QPSK CH 20350 (1750MHz)

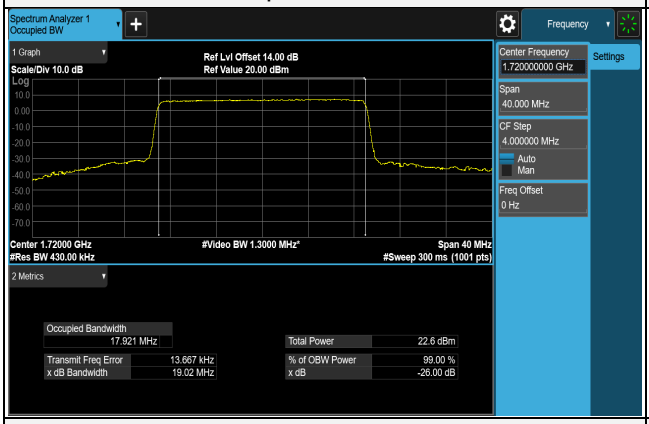
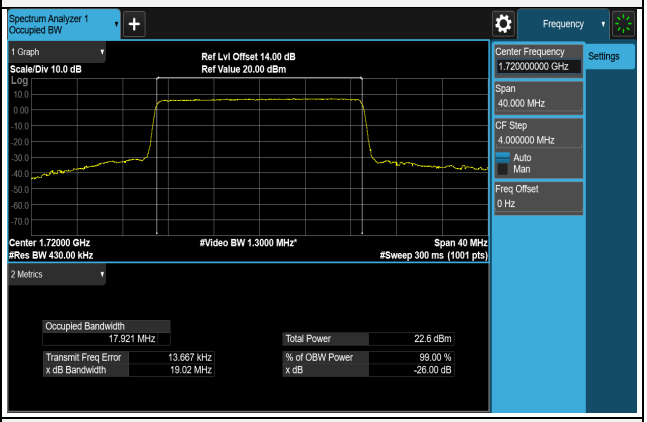
LTE Band 4 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20025	1717.5	13.4480	14.229
QPSK	20175	1732.5	13.4131	14.203
QPSK	20325	1747.5	13.4444	14.220
16QAM	20025	1717.5	4.6740	5.362
16QAM	20175	1732.5	4.6736	5.312
16QAM	20325	1747.5	4.6754	5.374

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20025 (1717.5MHz)	QPSK CH 20025 (1717.5MHz)

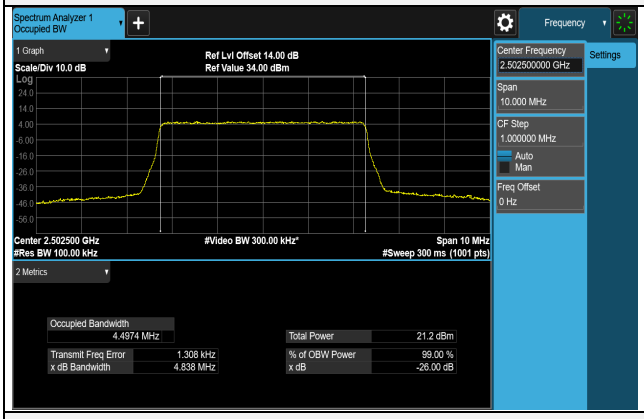
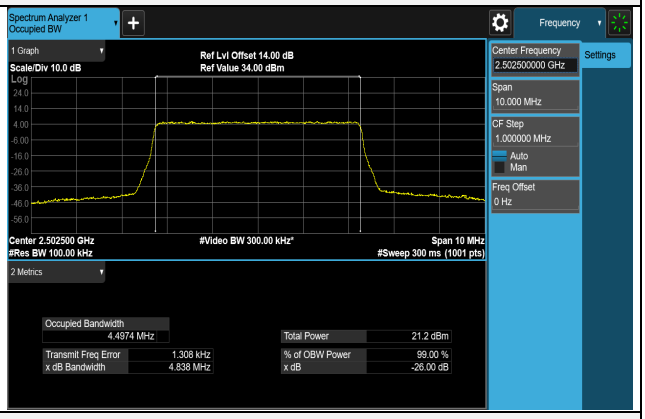
LTE Band 4 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20050	1720	17.9206	19.023
QPSK	20175	1732.5	17.8584	18.992
QPSK	20300	1745	17.8951	19.016
16QAM	20050	1720	4.8134	5.589
16QAM	20175	1732.5	4.8169	5.591
16QAM	20300	1745	4.8127	5.587

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 20050 (1720MHz)	QPSK CH 20050 (1720MHz)

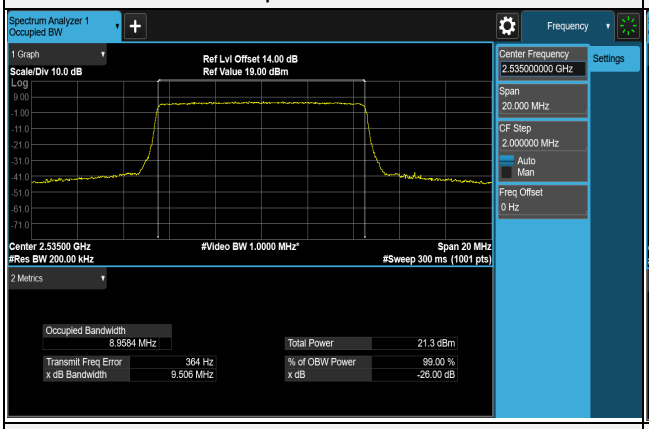
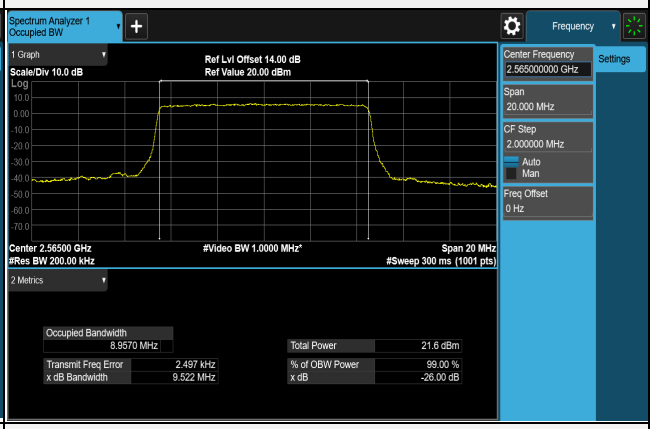
LTE Band 7 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20775	2502.5	4.4974	4.838
QPSK	21100	2535	4.4899	4.826
QPSK	21425	2567.5	4.4922	4.826
16QAM	20775	2502.5	4.4914	4.826
16QAM	21100	2535	4.4901	4.821
16QAM	21425	2567.5	4.4871	4.815

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

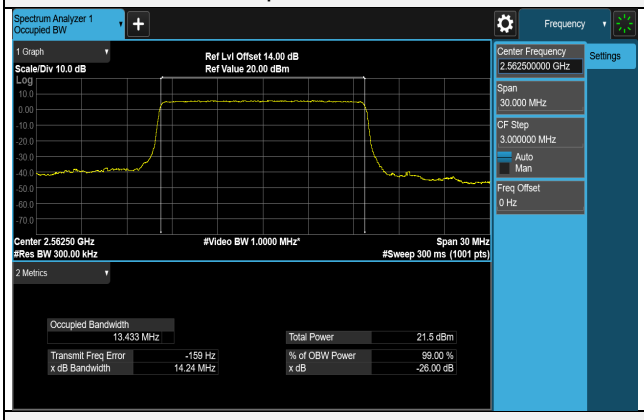
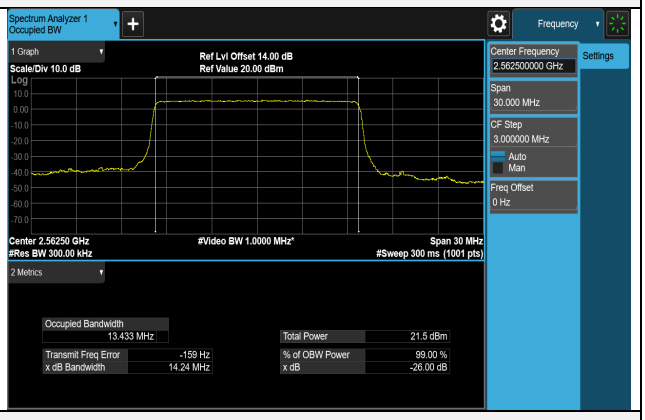
LTE Band 7 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20800	2505	8.9522	9.506
QPSK	21100	2535	8.9584	9.506
QPSK	21400	2565	8.9570	9.522
16QAM	20800	2505	4.5656	5.066
16QAM	21100	2535	4.5718	5.101
16QAM	21400	2565	4.5652	5.101

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

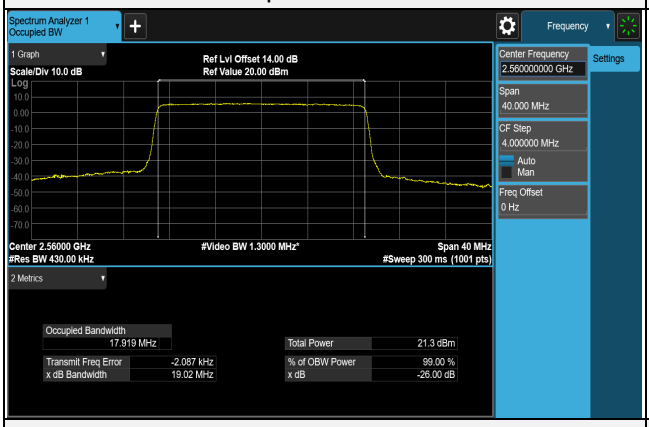
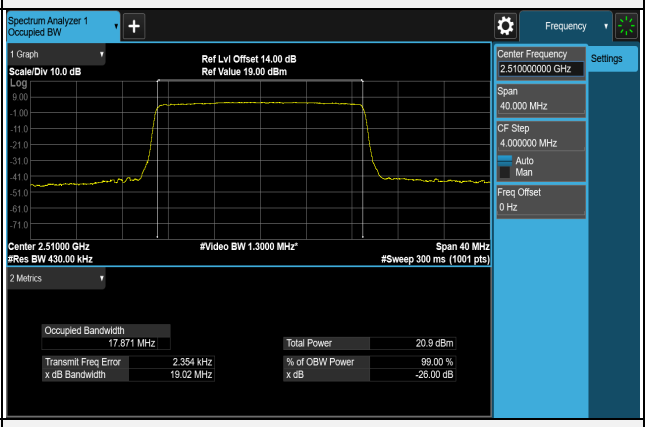
LTE Band 7 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20825	2507.5	13.4261	14.210
QPSK	21100	2535	13.4320	14.225
QPSK	21375	2562.5	13.4335	14.235
16QAM	20825	2507.5	4.6670	5.283
16QAM	21100	2535	4.6767	5.275
16QAM	21375	2562.5	4.6696	5.349

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 21375 (2562.5MHz)	QPSK CH 21375 (2562.5MHz)

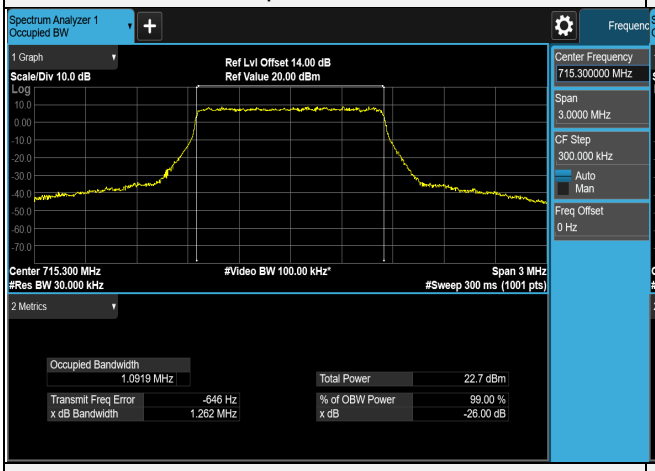
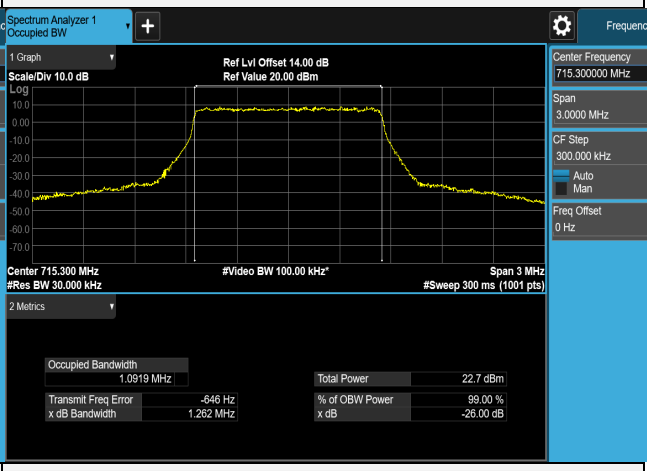
LTE Band 7 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20850	2510	17.8714	19.020
QPSK	21100	2535	17.9124	19.017
QPSK	21350	2560	17.9186	19.018
16QAM	20850	2510	4.8147	5.597
16QAM	21100	2535	4.8174	5.561
16QAM	21350	2560	4.8137	5.579

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 21350 (2560MHz)	QPSK CH 20850 (2510MHz)

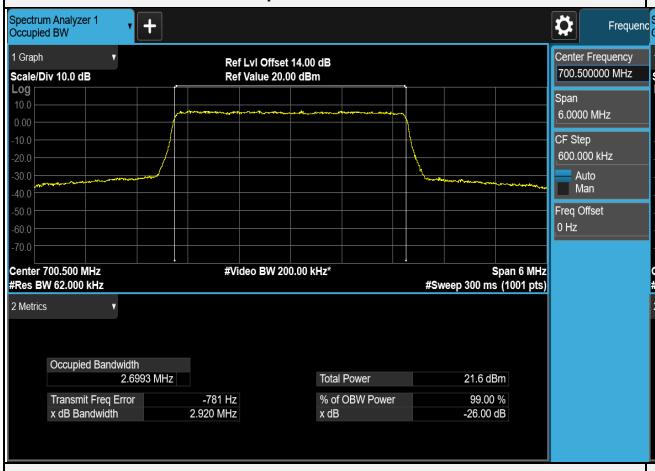
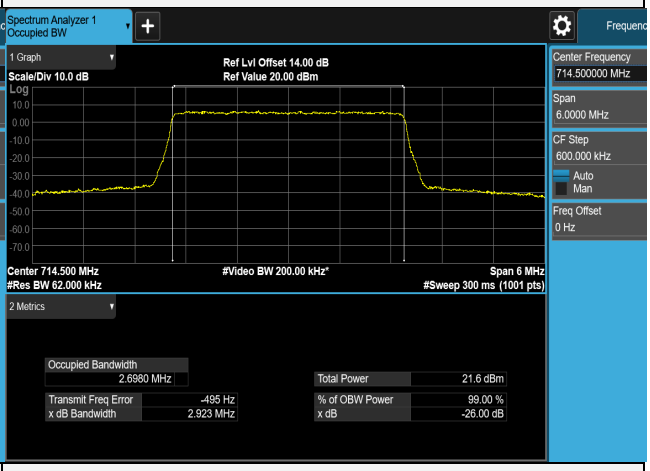
LTE Band 12 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23017	699.7	1.0880	1.256
QPSK	23095	707.5	1.0918	1.259
QPSK	23173	715.3	1.0919	1.262
16QAM	23017	699.7	1.0885	1.249
16QAM	23095	707.5	1.0873	1.247
16QAM	23173	715.3	1.0869	1.244

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 23173 (715.3MHz)	QPSK CH 23173 (715.3MHz)

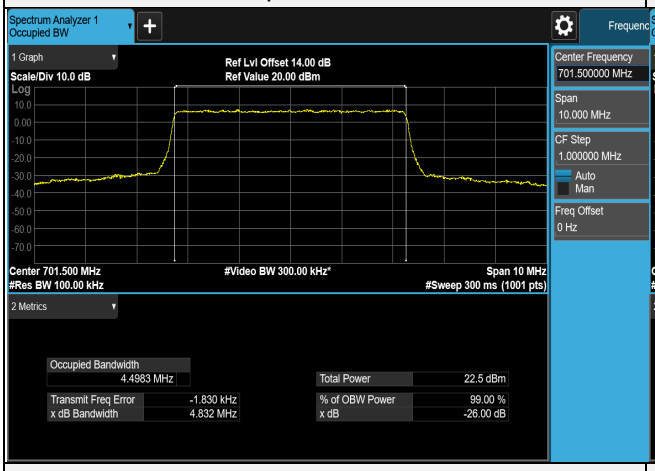
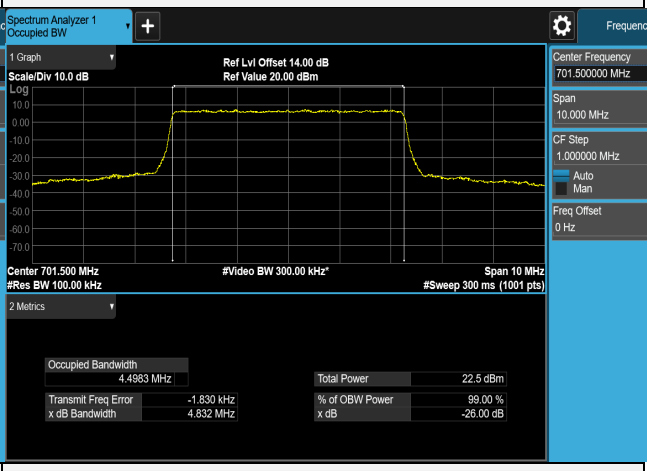
LTE Band 12 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23025	700.5	2.6992	2.914
QPSK	23095	707.5	2.6957	2.916
QPSK	23165	714.5	2.6957	2.913
16QAM	23025	700.5	2.6993	2.920
16QAM	23095	707.5	2.6976	2.922
16QAM	23165	714.5	2.6980	2.923

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
16QAM CH 23025 (700.5MHz)	16QAM CH 23165 (714.5MHz)

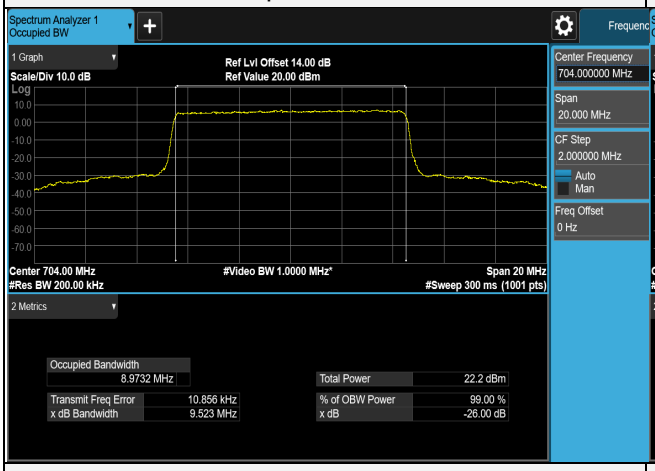
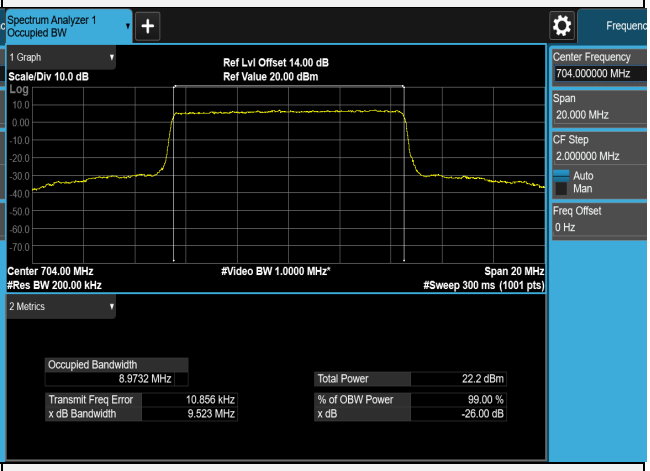
LTE Band 12 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23035	701.5	4.4983	4.832
QPSK	23095	707.5	4.4546	4.710
QPSK	23155	713.5	4.4917	4.824
16QAM	23035	701.5	4.4977	4.812
16QAM	23095	707.5	4.4919	4.823
16QAM	23155	713.5	4.4844	4.807

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

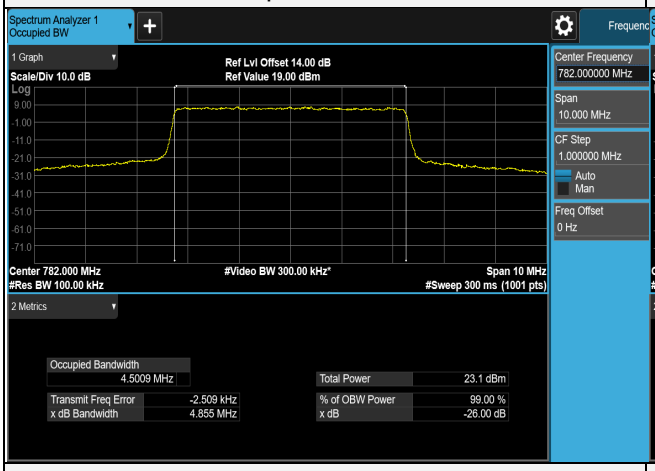
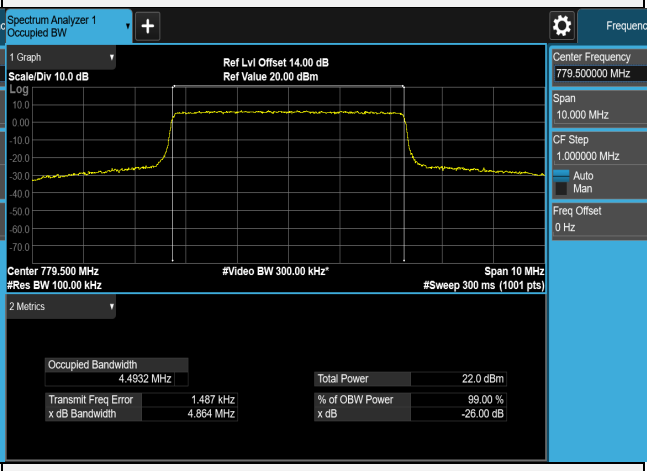
LTE Band 12 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23060	704	8.9732	9.523
QPSK	23095	707.5	8.9533	9.496
QPSK	23130	711	8.9467	9.512
16QAM	23060	704	4.5630	5.061
16QAM	23095	707.5	4.5649	5.085
16QAM	23130	711	4.5656	5.061

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

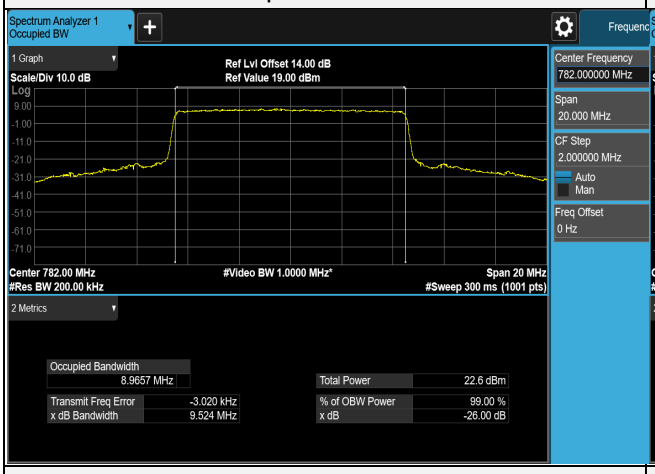
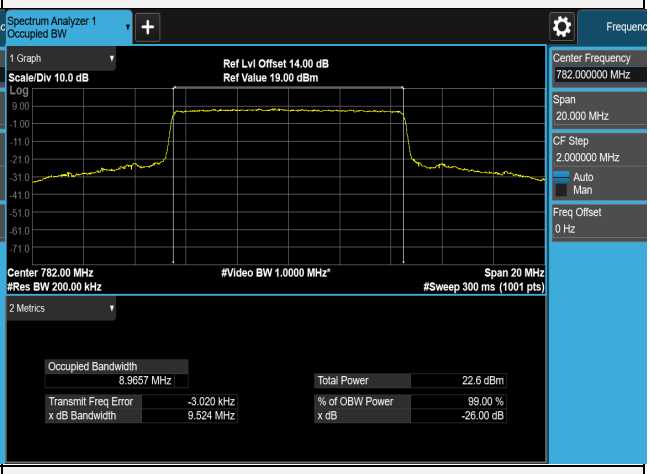
LTE Band 13 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23205	779.5	4.4879	4.832
QPSK	23230	782	4.5009	4.855
QPSK	23255	784.5	4.4938	4.806
16QAM	23205	779.5	4.4932	4.864
16QAM	23230	782	4.4892	4.826
16QAM	23255	784.5	4.4949	4.828

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 23230 (782MHz)	16QAM CH 23205 (779.5MHz)

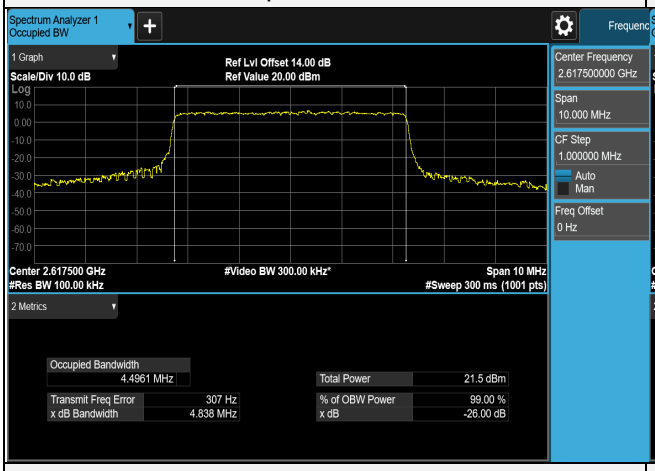
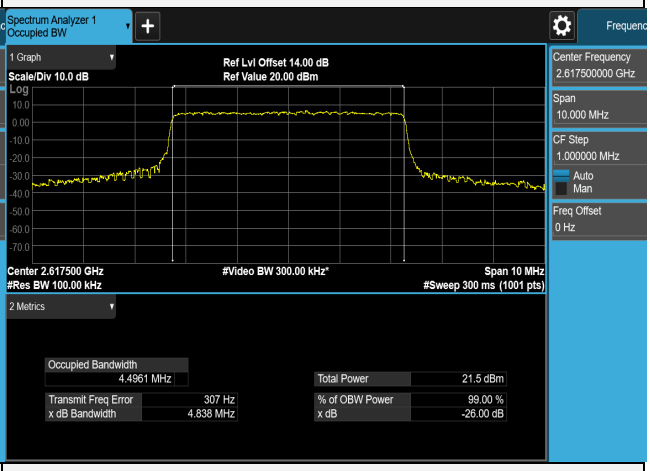
LTE Band 13 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	23230	782	8.9657	9.524
16QAM	23230	782	4.5763	5.201

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 23230 (782MHz)	QPSK CH 23230 (782MHz)

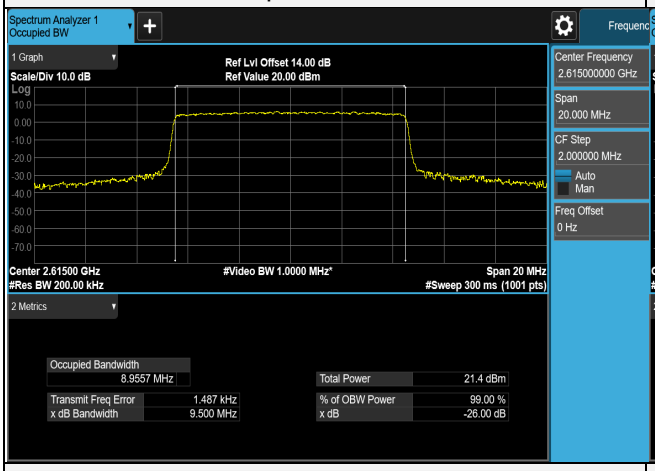
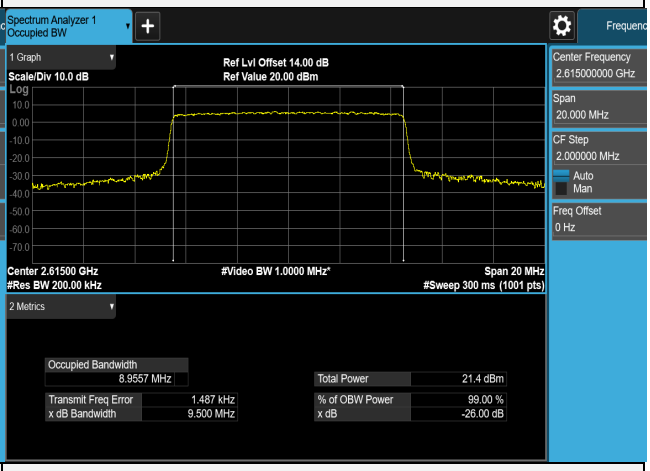
LTE Band 38 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	37775	2572.5	4.4909	4.815
QPSK	38000	2595	4.4904	4.817
QPSK	38225	2617.5	4.4961	4.838
16QAM	37775	2572.5	4.4845	4.813
16QAM	38000	2595	4.4841	4.791
16QAM	38225	2617.5	4.4878	4.813

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 38225 (2617.5MHz)	QPSK CH 38225 (2617.5MHz)

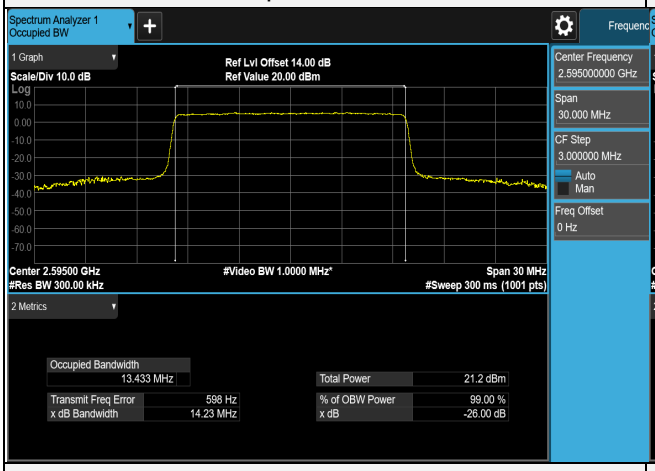
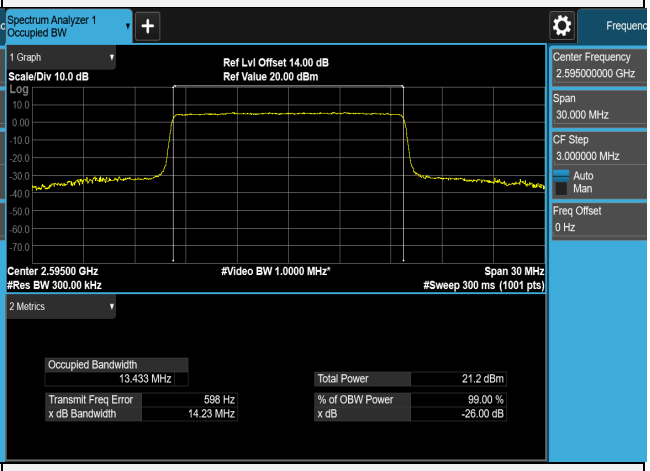
LTE Band 38 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	37800	2575	8.9548	9.476
QPSK	38000	2595	8.9475	9.495
QPSK	38200	2615	8.9557	9.500
16QAM	37800	2575	4.5608	5.069
16QAM	38000	2595	4.5580	5.085
16QAM	38200	2615	4.5555	5.069

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 38200 (2615MHz)	QPSK CH 38200 (2615MHz)

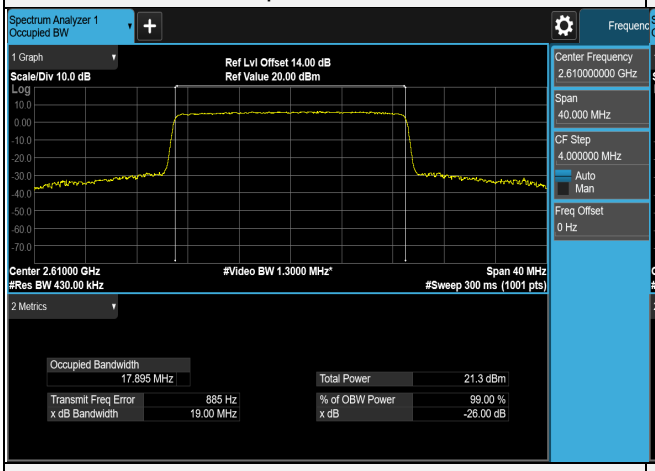
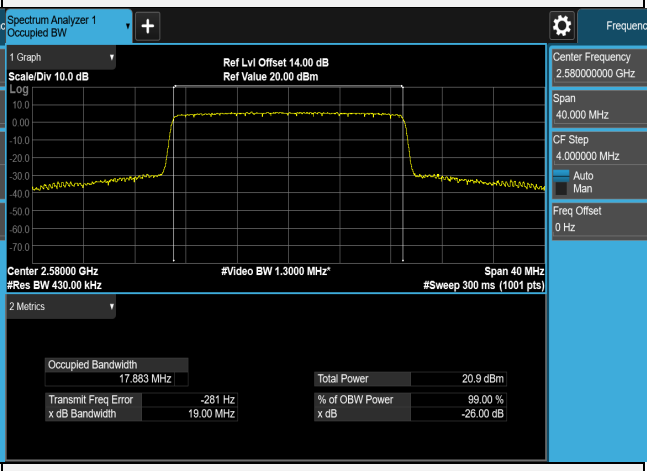
LTE Band 38 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	37825	2577.5	13.4284	14.216
QPSK	38000	2595	13.4330	14.234
QPSK	38175	2612.5	13.4143	14.226
16QAM	37825	2577.5	4.6743	5.380
16QAM	38000	2595	4.6742	5.350
16QAM	38175	2612.5	4.6760	5.308

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 38000 (2595MHz)	QPSK CH 38000 (2595MHz)

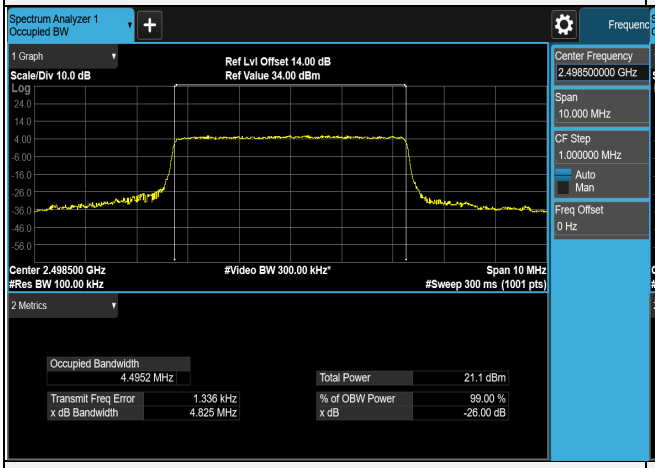
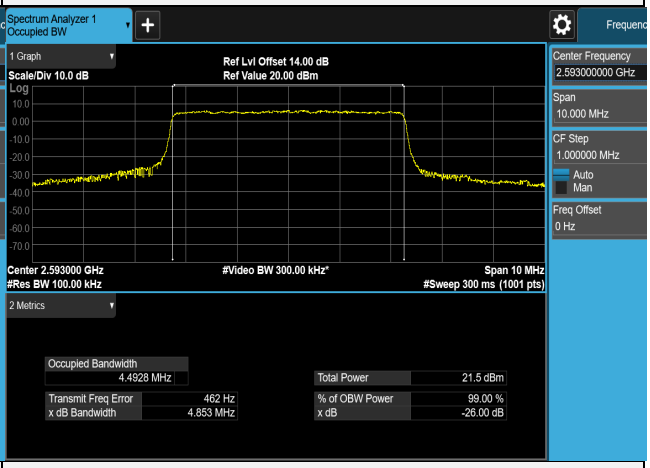
LTE Band 38 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	37850	2580	17.8830	19.002
QPSK	38000	2595	17.8838	18.995
QPSK	38150	2610	17.8948	19.000
16QAM	37850	2580	4.8132	5.565
16QAM	38000	2595	4.8167	5.560
16QAM	38150	2610	4.8067	5.567

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 38150 (2610MHz)	QPSK CH 37850 (2580MHz)

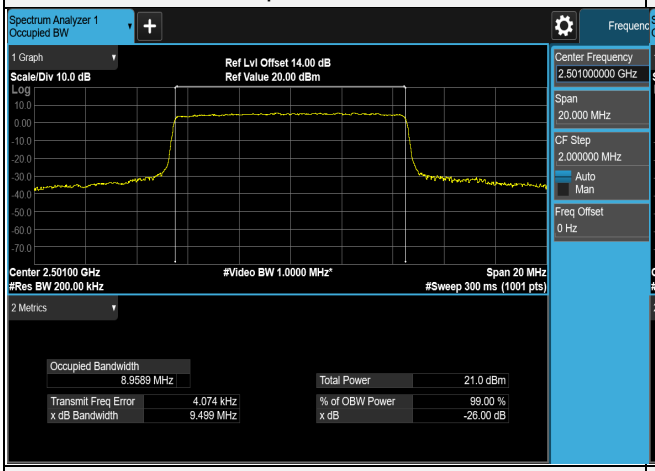
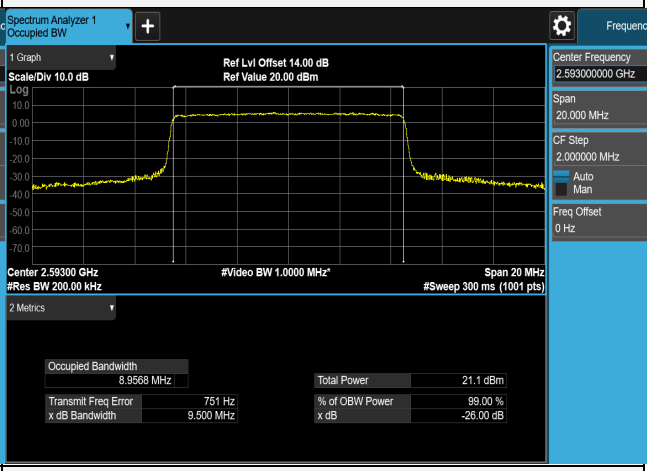
LTE Band 41 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	39675	2498.5	4.4952	4.825
QPSK	40620	2593	4.4928	4.853
QPSK	41565	2687.5	4.4952	4.829
16QAM	39675	2498.5	4.4849	4.796
16QAM	40620	2593	4.4886	4.794
16QAM	41565	2687.5	4.4908	4.818

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 39675 (2498.5MHz)	QPSK CH 40620 (2593MHz)

LTE Band 41 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	39700	2501	8.9589	9.499
QPSK	40620	2593	8.9568	9.500
QPSK	41540	2685	8.9538	9.499
16QAM	39700	2501	4.5669	5.036
16QAM	40620	2593	4.5653	5.015
16QAM	41540	2685	4.5692	5.067

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 39700 (2501MHz)	QPSK CH 40620 (2593MHz)