FCC Test Report
(Part 27)

Report No.:	RFBEKK-WTW-P20080111-3
FCC ID:	2AARN-DLWPH-8M
Test Model:	DLWPH-8M
Series Model:	DLWPH-8M-RW
Received Date:	Aug. 06, 2020
Test Date:	Sep. 02, 2020 ~ Oct. 20, 2020
Issued Date:	Oct. 21, 2020
Applicant:	PHIHONG TECHNOLOGY CO. LTD.
Address:	No.568, Fu Xing 3rd Rd., Guishan, Tao Yuan Hsien, 333 Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBEKK-WTW-P20080111-3	Original Release	Oct. 21, 2020

1 Certificate of Conformity

Product:	EV charging system module 4G with WI-FI
Brand:	Phihong Technology Co., Ltd.
Test Model:	DLWPH-8M
Series Model:	DLWPH-8M-RW
Sample Status:	Engineering Sample
Applicant:	PHIHONG TECHNOLOGY CO. LTD.
Test Date:	Sep. 02, 2020 ~ Oct. 20, 2020
Standards:	FCC Part 27, Subpart C, F, H, L, 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 : Lena Wang , **Date:** Oct. 21, 2020

Lena Wang / Specialist

Approved by : , **Date:** Oct. 21, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2						
FCC Clause				Test Item	Result	Remarks
WCDMA B4 / LTE B4	LTE B12/ LTE B71	LTE B13	LTE B66			
2.1046 27.50 (d)(4)	2.1046 27.50 (c)	2.1046 27.50 (b)	2.1046 27.50 (d)(4)	Equivalent Isotropically Radiated Power / Equivalent Radiated Power	Pass	Meet the requirement of limit.
2.1047	2.1047	2.1047	2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.
27.50 (d)(5)	----	----	27.50 (d)(5)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	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.
27.53(h)	27.53(g)	27.53(c)	27.53(h)	Band Edge 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(h)	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(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -7.50 dB at 1569.00 MHz.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 02, 2020	Jul. 01, 2021
MXG Vector signal generator Agilent	N5182B	MY53050162	Jan. 14, 2020	Jan. 13, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Nov. 08, 2019	Nov. 07, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 07, 2019	Nov. 06, 2020
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna EMCI	EM-6879	269	Sep. 18, 2019	Sep. 17, 2020
			Sep. 17, 2020	Sep. 16, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 08, 2020	Jun. 07, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 18, 2020	Feb. 17, 2021
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 08, 2020	Jun. 07, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 06, 2020	Jun. 05, 2021
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Jul. 01, 2019	Jun. 30, 2021

Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 13, 2020	Feb. 12, 2021
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 18, 2019	Sep. 17, 2020
			Sep. 09, 2020	Sep. 08, 2021
DC Power Supply Topward	33010D	807748	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

Product	EV charging system module 4G with WI-FI			
Brand	Phihong Technology Co., Ltd.			
Test Model	DLWPH-8M			
Series Model	DLWPH-8M-RW			
Model Difference	Refer to Note as below			
Status of EUT	Engineering Sample			
Power Supply Rating	10Vdc~35Vdc (for DC power supply)			
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	
		Channel Bandwidth 3MHz	1711.5MHz ~ 1753.5MHz	
		Channel Bandwidth 5MHz	1712.5MHz ~ 1752.5MHz	
		Channel Bandwidth 10MHz	1715.0MHz ~ 1750.0MHz	
		Channel Bandwidth 15MHz	1717.5MHz ~ 1747.5MHz	
		Channel Bandwidth 20MHz	1720.0MHz ~ 1745.0MHz	
	LTE Band 12	Channel Bandwidth 1.4MHz	699.7MHz ~ 715.3MHz	
		Channel Bandwidth 3MHz	700.5MHz ~ 714.5MHz	
		Channel Bandwidth 5MHz	701.5MHz ~ 713.5MHz	
		Channel Bandwidth 10MHz	704.0MHz ~ 711.0MHz	
	LTE Band 13	Channel Bandwidth 5MHz	779.5MHz ~ 784.5MHz	
		Channel Bandwidth 10MHz	782.0MHz	
	LTE Band 66	Channel Bandwidth 1.4MHz	1710.7MHz ~ 1779.3MHz	
		Channel Bandwidth 3MHz	1711.5MHz ~ 1778.5MHz	
		Channel Bandwidth 5MHz	1712.5MHz ~ 1777.5MHz	
		Channel Bandwidth 10MHz	1715.0MHz ~ 1775.0MHz	
		Channel Bandwidth 15MHz	1717.5MHz ~ 1772.5MHz	
		Channel Bandwidth 20MHz	1720.0MHz ~ 1770.0MHz	
	LTE Band 71	Channel Bandwidth 5MHz	665.5MHz ~ 695.5MHz	
		Channel Bandwidth 10MHz	668.0MHz ~ 693.0MHz	
		Channel Bandwidth 15MHz	670.5MHz ~ 690.5MHz	
		Channel Bandwidth 20MHz	673.0MHz ~ 688.0MHz	
Max. EIRP Power	WCDMA Band 4		320.627mW (25.06dBm)	
			QPSK	16QAM
	LTE Band 4	Channel Bandwidth 1.4MHz	319.890mW (25.05dBm)	262.422mW (24.19dBm)
		Channel Bandwidth 3MHz	344.350mW (25.37dBm)	263.027mW (24.20dBm)
		Channel Bandwidth 5MHz	331.894mW (25.21dBm)	277.332mW (24.43dBm)
		Channel Bandwidth 10MHz	311.889mW (24.94dBm)	244.906mW (23.89dBm)

		Channel Bandwidth 15MHz	342.768mW (25.35dBm)	269.774mW (24.31dBm)
		Channel Bandwidth 20MHz	336.512mW (25.27dBm)	280.543mW (24.48dBm)
Max. EIRP Power	LTE Band 66		QPSK	16QAM
		Channel Bandwidth 1.4MHz	322.107mW (25.08dBm)	250.035mW (23.98dBm)
		Channel Bandwidth 3MHz	319.890mW (25.05dBm)	250.611mW (23.99dBm)
		Channel Bandwidth 5MHz	322.107mW (25.08dBm)	251.189mW (24.00dBm)
		Channel Bandwidth 10MHz	324.304mW (25.11dBm)	248.313mW (23.95dBm)
		Channel Bandwidth 15MHz	319.154mW (25.04dBm)	250.611mW (23.99dBm)
		Channel Bandwidth 20MHz	312.608mW (24.95dBm)	255.270mW (24.07dBm)
Max. ERP Power			QPSK	16QAM
	LTE Band 12	Channel Bandwidth 1.4MHz	128.825mW (21.10dBm)	103.514mW (20.15dBm)
		Channel Bandwidth 3MHz	127.938mW (21.07dBm)	101.158mW (20.05dBm)
		Channel Bandwidth 5MHz	125.026mW (20.97dBm)	113.763mW (20.56dBm)
		Channel Bandwidth 10MHz	125.603mW (20.99dBm)	109.396mW (20.39dBm)
	LTE Band 13	Channel Bandwidth 5MHz	73.114mW (18.64dBm)	59.979mW (17.78dBm)
		Channel Bandwidth 10MHz	80.168mW (19.04dBm)	58.345mW (17.66dBm)
	LTE Band 71	Channel Bandwidth 5MHz	84.918mW (19.29dBm)	66.834mW (18.25dBm)
		Channel Bandwidth 10MHz	83.946mW (19.24dBm)	62.806mW (17.98dBm)
		Channel Bandwidth 15MHz	84.918mW (19.29dBm)	62.661mW (17.97dBm)
		Channel Bandwidth 20MHz	84.333mW (19.26dBm)	62.951mW (17.99dBm)
Emission Designator	WCDMA Band 4		4M14F9W	
			QPSK	16QAM
	LTE Band 4	Channel Bandwidth 1.4MHz	1M09G7D	1M09D7W
		Channel Bandwidth 3MHz	2M70G7D	2M70D7W
		Channel Bandwidth 5MHz	4M49G7D	4M49D7W
		Channel Bandwidth 10MHz	8M95G7D	8M95D7W
		Channel Bandwidth 15MHz	13M4G7D	13M4D7W
		Channel Bandwidth 20MHz	17M9G7D	17M9D7W
	LTE Band 12	Channel Bandwidth 1.4MHz	1M09G7D	1M09D7W
		Channel Bandwidth 3MHz	2M70G7D	2M70D7W
		Channel Bandwidth 5MHz	4M49G7D	4M49D7W
		Channel Bandwidth 10MHz	8M96G7D	8M97D7W
	LTE Band 13	Channel Bandwidth 5MHz	4M49G7D	4M49D7W
		Channel Bandwidth 10MHz	8M95G7D	8M95D7W
	LTE Band 66	Channel Bandwidth 1.4MHz	1M09G7D	1M09D7W
		Channel Bandwidth 3MHz	2M70G7D	2M70D7W
		Channel Bandwidth 5MHz	4M49G7D	4M49D7W
		Channel Bandwidth 10MHz	8M95G7D	8M95D7W
		Channel Bandwidth 15MHz	13M4G7D	13M4D7W

		Channel Bandwidth 20MHz	17M9G7D	17M9D7W
	LTE Band 71	Channel Bandwidth 5MHz	4M49G7D	4M49D7W
		Channel Bandwidth 10MHz	8M96G7D	8M96D7W
		Channel Bandwidth 15MHz	13M5G7D	13M5D7W
		Channel Bandwidth 20MHz	17M9G7D	17M9D7W
Antenna Type	Refer to Note as below			
Antenna Connector	Refer to Note as below			
Accessory Device	NA			
Cable Supplied	NA			

Note:

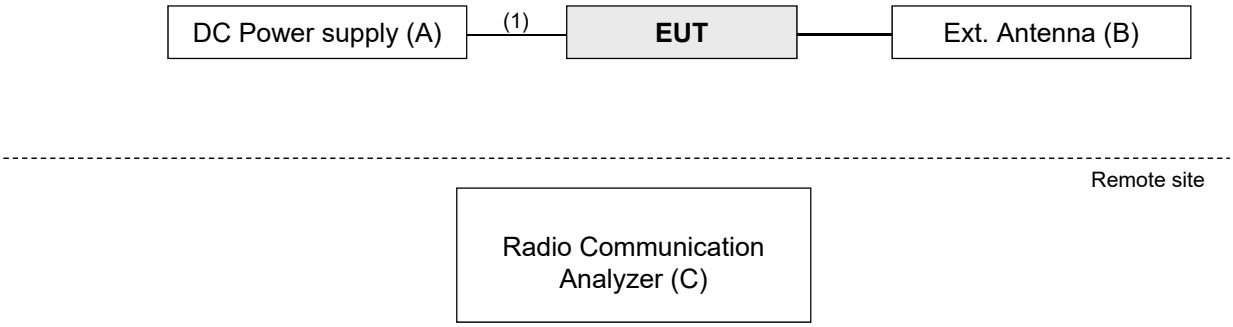
1. All models are listed as below.

Brand	Model	Difference of WLAN Antenna type
Phihong Technology Co., Ltd.	DLWPH-8M	internal antenna
	DLWPH-8M-RW	external antenna

2. The following antennas were provided to the EUT.

Brand	Model	Antenna Gain(dBi)				Antenna Type	Connector Type
		WCDMA Band 4 / LTE Band 4 / 66	LTE Band 12	LTE Band 13	LTE Band 71		
Gortec	DR0727-4201BSM	1.70	-1.09	-3.11	-2.45	PCB	SMA Male

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	DC Power Supply	Topward	33010D	807748	NA	-
B.	Ext. Antenna	Gortec	DR0727-4201BSM	NA	NA	Provided by client
C.	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	NA	-

Note:

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

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

3.3 Test Mode Applicability and Tested Channel Detail

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

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	1513(1752.6MHz)	WCDMA
-	Radiated Emission Above 1GHz	1312 to 1513	1312(1712.4MHz), 1413(1732.6MHz), 1513(1752.6MHz)	WCDMA

Note:

1. This device was tested under all modulations. The worst case of conducted output power was found in WCDMA modulation. Therefore, only EIRP, modulation characteristics, occupied bandwidth, band edge, conducted Emission and peak to average ratio items had been tested under WCDMA, HSDPA and HSUPA mode, the other items were performed under WCDMA mode only.
2. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel 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 RB / 2 RB Offset
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK / 16QAM	1 RB / 7 RB Offset
		19975 to 20375	19975(1712.5MHz), 20175(1732.5MHz), 20375(1752.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000(1715.0MHz), 20175(1732.5MHz), 20350(1750.0MHz)	10MHz	QPSK / 16QAM	1 RB / 24 RB Offset
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	QPSK / 16QAM	1 RB / 37 RB Offset
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20050 to 20300	20175(1732.5MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957(1710.7MHz), 20393(1754.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		19965 to 20385	19965(1711.5MHz), 20385(1753.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		19975 to 20375	19975(1712.5MHz), 20375(1752.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		20000 to 20350	20000(1715.0MHz), 20350(1750.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
		20025 to 20325	20025(1717.5MHz), 20325(1747.5MHz)	15MHz	QPSK	75 RB / 0 RB Offset
		20050 to 20300	20050(1720.0MHz), 20300(1745.0MHz)	20MHz	QPSK	100 RB / 0 RB Offset
-	Emission Bandwidth	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK / 16QAM	6 RB / 0RB Offset
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK / 16QAM	15 RB / 0RB Offset
		19975 to 20375	19975(1712.5MHz), 20175(1732.5MHz), 20375(1752.5MHz)	5MHz	QPSK / 16QAM	25RB / 0RB Offset
		20000 to 20350	20000(1715.0MHz), 20175(1732.5MHz), 20350(1750.0MHz)	10MHz	QPSK / 16QAM	50RB / 0RB Offset
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	19957 to 20393	19957(1710.7MHz), 20393(1754.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		19965 to 20385	19965(1711.5MHz), 20385(1753.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		19975 to 20375	19975(1712.5MHz), 20375(1752.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		20000 to 20350	20000(1715.0MHz), 20350(1750.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		20025 to 20325	20025(1717.5MHz), 20325(1747.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		20050 to 20300	20050(1720.0MHz), 20300(1745.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
-	Peak To Average Ratio	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 2 RB Offset
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK / 16QAM	1 RB / 7 RB Offset
		19975 to 20375	19975(1712.5MHz), 20175(1732.5MHz), 20375(1752.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000(1715.0MHz), 20175(1732.5MHz), 20350(1750.0MHz)	10MHz	QPSK / 16QAM	1 RB / 24 RB Offset
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	QPSK / 16QAM	1 RB / 37 RB Offset
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK	1 RB / 2 RB Offset
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK	1 RB / 7 RB Offset
		19975 to 20375	19975(1712.5MHz), 20175(1732.5MHz), 20375(1752.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000(1715.0MHz), 20175(1732.5MHz), 20350(1750.0MHz)	10MHz	QPSK	1 RB / 24 RB Offset
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	QPSK	1 RB / 37 RB Offset
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Radiated Emission Below 1GHz	19957 to 20393	19957(1710.7MHz),	1.4MHz	QPSK	1 RB / 2 RB Offset
-	Radiated Emission Above 1GHz	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK	1 RB / 2 RB Offset
		19975 to 20375	19975(1712.5MHz), 20175(1732.5MHz), 20375(1752.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel 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 conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only EIRP, 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 QPSK mode only.

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	3 RB / 1 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK / 16QAM	1 RB / 7 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK / 16QAM	1 RB / 12 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5 MHz), 23130(711.0 MHz)	10MHz	QPSK / 16QAM	1 RB / 24 RB Offset
-	Modulation Characteristics	23060 to 23130	23095(707.5MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	23017 to 23173	23017(699.7MHz), 23173(715.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23165(714.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23155(713.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23130(711.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
-	Emission Bandwidth	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK / 16QAM	6 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK / 16QAM	15 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
-	Band Edge	23017 to 23173	23017(699.7MHz), 23173(715.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23165(714.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23155(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23130(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK / 16QAM	3 RB / 1 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK / 16QAM	1 RB / 7 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK / 16QAM	1 RB / 12 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK / 16QAM	1 RB / 24 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK	3 RB / 1 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK	1 RB / 7 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK	1 RB / 24 RB Offset
-	Radiated Emission Below 1GHz	23035 to 23155	23155(713.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
-	Radiated Emission Above 1GHz	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK	3 RB / 1 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK	1 RB / 24 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the 1.4MHz & highest channel bandwidth for final test.
3. The conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only ERP, 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 QPSK mode only.

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 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	23230	23230(782.0MHz),	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	23205 to 23255	23205(779.5MHz), 23255(784.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		23230	23230(782.0MHz),	10MHz	QPSK	50 RB / 0 RB Offset
-	Emission Bandwidth	23205 to 23255	23205(779.5MHz), 23230(782.0MHz), 23255(784.5MHz)	5MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
-	Band Edge	23205 to 23255	23205(779.5MHz), 23255(784.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
-	Peak to Average Ratio	23205 to 23255	23205(779.5MHz), 23230(782.0MHz), 23255(784.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23230	23230(782.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	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	23205 to 23255	23255(784.5MHz)	5MHz	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 (above 1GHz) channel 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 conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only ERP, 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 QPSK mode only.

LTE Band 66

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK / 16QAM	3 RB / 3 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK / 16QAM	1 RB / 14 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK / 16QAM	1 RB / 12 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK / 16QAM	1 RB / 24 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK / 16QAM	1 RB / 37 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	132072 to 132572	132322 (1745.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
-	Frequency Stability	131979 to 132665	131979 (1710.7MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132657 (1778.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132647 (1777.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132622 (1775.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132597 (1772.5MHz)	15MHz	QPSK	75 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	100 RB / 0 RB Offset
-	Emission Bandwidth	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK / 16QAM	6 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK / 16QAM	15 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	131979 to 132665	131979 (1710.7MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132657 (1778.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132647 (1777.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132622 (1775.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132597 (1772.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
-	Peak to Average Ratio	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	3 RB / 3 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK	1 RB / 14 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK	1 RB / 24 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK	1 RB / 37 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset
-	Conducted Emission	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	3 RB / 3 RB Offset
		131987 to 132657	131987 (1711.5MHz), 132322 (1745.0MHz), 132657 (1778.5MHz)	3MHz	QPSK	1 RB / 14 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
		132022 to 132622	132022 (1715.0MHz), 132322 (1745.0MHz), 132622 (1775.0MHz)	10MHz	QPSK	1 RB / 24 RB Offset
		132047 to 132597	132047 (1717.5MHz), 132322 (1745.0MHz), 132597 (1772.5MHz)	15MHz	QPSK	1 RB / 37 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	131979 to 132665	132665 (1779.3MHz)	1.4MHz	QPSK	3 RB / 3 RB Offset
-	Radiated Emission Above 1GHz	131979 to 132665	131979 (1710.7MHz), 132322 (1745.0MHz), 132665 (1779.3MHz)	1.4MHz	QPSK	3 RB / 3 RB Offset
		131997 to 132647	131997 (1712.5MHz), 132322 (1745.0MHz), 132647 (1777.5MHz)	5MHz	QPSK	1 RB / 12 RB Offset
		132072 to 132572	132072 (1720.0MHz), 132322 (1745.0MHz), 132572 (1770.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

Note:
1. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel 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 conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only EIRP, 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 QPSK mode only.

LTE Band 71

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10 MHz	QPSK / 16QAM	1 RB / 24 RB Offset
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20 MHz	QPSK / 16QAM	1 RB / 99 RB Offset
-	Modulation Characteristics	133222 to 133372	133297 (680.5MHz)	20 MHz	QPSK / 16QAM	100 RB / 0 RB Offset
-	Frequency Stability	133147 to 133447	133147 (665.5MHz), 133447 (695.5MHz)	5 MHz	QPSK	25 RB / 0 RB Offset
		133172 to 133422	133172 (668.0MHz), 133422 (693.0MHz)	10 MHz	QPSK	50 RB / 0 RB Offset
		133197 to 133397	133197 (670.5MHz), 133397 (690.5MHz)	15 MHz	QPSK	75 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133372 (688.0MHz)	20 MHz	QPSK	100 RB / 0 RB Offset
-	Emission Bandwidth	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5 MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10 MHz	QPSK / 16QAM	50 RB / 0 RB Offset
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15 MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20 MHz	QPSK / 16QAM	100 RB / 0 RB Offset
-	Band Edge	133147 to 133447	133147 (665.5MHz), 133447 (695.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		133172 to 133422	133172 (668.0MHz), 133422 (693.0MHz)	10 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		133197 to 133397	133197 (670.5MHz), 133397 (690.5MHz)	15 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133372 (688.0MHz)	20 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset
-	Peak to Average Ratio	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10 MHz	QPSK / 16QAM	1 RB / 24 RB Offset
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20 MHz	QPSK / 16QAM	1 RB / 99 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset
		133172 to 133422	133172 (668.0MHz), 133297 (680.5MHz), 133422 (693.0MHz)	10 MHz	QPSK	1 RB / 24 RB Offset
		133197 to 133397	133197 (670.5MHz), 133297 (680.5MHz), 133397 (690.5MHz)	15 MHz	QPSK	1 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20 MHz	QPSK	1 RB / 99 RB Offset
-	Radiated Emission Below 1GHz	133147 to 133447	133447 (695.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission Above 1GHz	133147 to 133447	133147 (665.5MHz), 133297 (680.5MHz), 133447 (695.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset
		133222 to 133372	133222 (673.0MHz), 133297 (680.5MHz), 133372 (688.0MHz)	20 MHz	QPSK	1 RB / 99 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission (above 1GHz) channel 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 conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only ERP, 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 QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP / ERP	25deg. C, 70%RH	120Vac, 60Hz	Tank Wu
Modulation characteristics	24deg. C, 64%RH	120Vac, 60Hz	Tank Wu
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	Tank Wu
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	Tank Wu
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	Tank Wu
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	Tank Wu
Conducted Emission	24deg. C, 64%RH	120Vac, 60Hz	Tank Wu
Radiated Emission	22deg. C, 68%RH 23deg. C, 67%RH	120Vac, 60Hz	Noah Chang, Greg Lin, Titan Hsu

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 63.26-2015

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

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

WCDMA, LTE Band 4, LTE Band 66:
Mobile / Portable station are limited to 1 watts e.i.r.p.

LTE Band 12, LTE Band 13, LTE Band 71:
Control and mobile stations in the 698-746 MHz, 746-757 MHz, 787-788 MHz and 805-806 MHz band are limited to 30 watts ERP.
Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink, 746-757 MHz,787-788 MHz and 805-806 MHzband are limited to 3 watts ERP.

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.

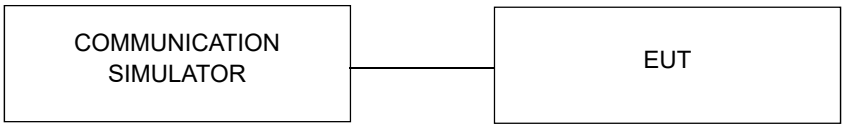
Maximum EIRP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is
given in Equation as follows:
ERP or EIRP = P_{Meas} + G_T
where
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas}, e.g., dBm or dBW)
P_{Meas} measured transmitter output power or PSD, in dBm or dBW
G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

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

Conducted Power Measurement:



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

4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA IV		
Channel	1312	1413	1513
Frequency	1712.4	1732.6	1752.6
RMC 12.2K	23.14	23.32	**23.36**
HSDPA Subtest-1	22.52	22.55	22.56
HSDPA Subtest-2	22.52	22.54	22.58
HSDPA Subtest-3	22.51	22.55	22.53
HSDPA Subtest-4	22.48	22.55	22.53
HSUPA Subtest-1	21.70	21.78	21.74
HSUPA Subtest-2	21.69	21.75	21.75
HSUPA Subtest-3	21.70	21.76	21.75
HSUPA Subtest-4	21.71	21.77	21.76
HSUPA Subtest-5	21.69	21.70	21.71

LTE Band 4						
BW	MCS Index	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	23.14	23.23	23.09
		1	2	23.23	**23.35**	23.21
		1	5	23.18	23.31	23.21
		3	0	23.12	23.28	23.20
		3	1	23.28	23.33	23.25
		3	3	23.23	23.31	23.28
		6	0	22.27	22.30	22.28
	16QAM	1	0	22.38	22.40	22.26
		1	2	**22.49**	22.33	22.34
		1	5	22.32	22.34	22.37
		3	0	22.06	22.34	22.17
		3	1	21.84	22.29	22.38
		3	3	22.11	22.44	22.48
		6	0	20.98	21.37	21.47

LTE Band 4						
BW	MCS Index	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	23.27	23.51	23.55
		1	7	23.23	**23.67**	23.30
		1	14	23.26	23.30	23.29
		8	0	22.28	22.37	22.37
		8	3	22.31	22.41	22.34
		8	7	22.34	22.40	22.33
		15	0	22.37	22.37	22.30
	16QAM	1	0	22.05	21.90	22.27
		1	7	22.13	21.97	22.25
		1	14	22.28	22.08	**22.50**
		8	0	21.31	21.47	21.16
		8	3	21.52	21.61	21.16
		8	7	21.18	21.59	21.06
		15	0	21.45	21.47	21.22

LTE Band 4						
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	23.29	**23.51**	23.10
		1	12	23.40	23.38	23.23
		1	24	23.16	23.08	23.25
		12	0	22.35	22.35	22.48
		12	6	22.40	22.38	22.47
		12	13	22.41	22.40	22.43
		25	0	22.32	22.38	22.41
	16QAM	1	0	22.68	22.20	22.12
		1	12	**22.73**	21.95	21.91
		1	24	22.70	22.32	22.28
		12	0	21.29	21.15	21.23
		12	6	21.25	21.19	21.15
		12	13	21.27	21.12	21.17
		25	0	21.27	21.23	21.19

LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	23.05	23.00	23.19
		1	24	23.06	**23.24**	23.19
		1	49	22.77	23.10	23.11
		25	0	22.38	22.31	22.33
		25	12	22.31	22.42	22.29
		25	25	22.25	22.40	22.23
		50	0	22.39	22.34	22.27
	16QAM	1	0	22.05	21.81	21.82
		1	24	22.05	21.88	**22.19**
		1	49	21.78	21.74	21.76
		25	0	21.37	21.27	21.30
		25	12	21.31	21.28	21.27
		25	25	21.23	21.37	21.22
		50	0	21.17	21.17	21.19

LTE Band 4						
BW	MCS Index	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	23.44	23.50	23.13
		1	37	23.39	**23.65**	23.46
		1	74	23.27	23.27	23.22
		36	0	22.57	22.36	22.43
		36	19	22.36	22.40	22.27
		36	39	22.26	22.43	22.32
		75	0	22.45	22.45	22.19
	16QAM	1	0	**22.61**	22.49	22.52
		1	37	22.50	22.46	22.44
		1	74	22.34	22.32	22.41
		36	0	21.42	21.40	21.37
		36	19	21.32	21.35	21.32
		36	39	21.20	21.27	21.28
		75	0	21.37	21.33	21.34

LTE Band 4						
BW	MCS Index	Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	**23.57**	23.20	23.20
		1	50	23.52	23.52	23.37
		1	99	22.95	23.13	23.07
		50	0	22.50	22.37	22.54
		50	25	22.35	22.37	22.39
		50	50	22.33	22.43	22.29
		100	0	22.42	22.45	22.41
	16QAM	1	0	22.37	22.54	22.33
		1	50	**22.78**	22.34	22.25
		1	99	22.04	22.22	22.17
		50	0	21.44	21.40	21.62
		50	25	21.29	21.31	21.48
		50	50	21.26	21.36	21.36
		100	0	21.39	21.40	21.29

LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	23.86	24.06	24.07
		1	2	24.14	24.21	24.17
		1	5	23.94	24.05	24.19
		3	0	24.02	24.06	24.16
		3	1	24.05	24.22	**24.34**
		3	3	24.26	24.22	24.26
		6	0	23.18	23.24	23.24
	16QAM	1	0	22.67	22.80	22.71
		1	2	22.82	22.81	22.77
		1	5	22.59	22.82	22.79
		3	0	22.81	22.95	23.21
		3	1	23.02	23.02	**23.39**
		3	3	23.02	22.93	23.34
		6	0	21.98	21.97	22.08

LTE Band 12						
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	24.00	24.04	24.23
		1	7	**24.31**	24.09	24.04
		1	14	24.12	23.93	**24.31**
		8	0	23.15	23.18	23.29
		8	3	23.30	23.19	23.37
		8	7	23.20	23.23	23.33
		15	0	23.12	23.25	23.31
	16QAM	1	0	**23.29**	22.94	23.12
		1	7	23.17	23.26	23.15
		1	14	23.17	23.05	23.14
		8	0	22.21	21.94	22.22
		8	3	22.26	21.96	22.23
		8	7	22.05	22.19	22.29
		15	0	22.15	22.20	22.32

LTE Band 12						
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	23.85	24.00	24.16
		1	12	24.19	**24.21**	24.15
		1	24	23.87	24.02	24.16
		12	0	23.10	23.13	23.10
		12	6	23.01	23.24	23.29
		12	13	23.05	23.21	23.35
		25	0	23.06	23.16	23.22
	16QAM	1	0	23.21	23.59	23.26
		1	12	23.16	**23.80**	23.33
		1	24	23.37	23.23	23.25
		12	0	22.16	22.20	22.07
		12	6	22.07	22.03	22.15
		12	13	22.11	22.12	22.34
		25	0	22.20	22.13	22.33

LTE Band 12						
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	23.71	23.83	23.86
		1	24	23.83	24.10	**24.23**
		1	49	23.90	23.99	24.10
		25	0	22.94	23.13	23.20
		25	12	23.01	23.19	23.18
		25	25	23.15	23.15	23.28
		50	0	23.05	23.20	23.26
	16QAM	1	0	23.18	23.12	23.21
		1	24	22.87	23.23	**23.63**
		1	49	23.33	23.35	23.20
		25	0	22.00	22.11	22.15
		25	12	22.05	22.27	22.15
		25	25	22.11	22.32	22.14
		50	0	22.05	22.20	22.15

LTE Band 13						
BW	MCS Index	Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	**23.90**	23.82	23.70
		1	12	23.78	23.67	23.85
		1	24	23.65	23.78	23.64
		12	0	22.92	22.87	22.98
		12	6	23.03	22.91	23.17
		12	13	22.87	22.99	23.04
		25	0	23.08	22.96	22.95
	16QAM	1	0	**23.04**	22.61	22.59
		1	12	22.71	22.36	22.67
		1	24	22.93	22.66	22.50
		12	0	22.04	21.77	21.96
		12	6	21.86	21.78	21.83
		12	13	21.81	21.89	22.02
		25	0	22.17	21.81	21.87

LTE Band 13					
BW	MCS Index	Channel		23230	
		Frequency (MHz)		782	
10M	QPSK	1	0	**24.30**	
		1	24	24.05	
		1	49	24.05	
		25	0	23.02	
		25	12	23.01	
		25	25	22.90	
		50	0	23.01	
	16QAM	1	0	**22.92**	
		1	24	22.80	
		1	49	22.84	
		25	0	21.96	
		25	12	21.75	
		25	25	22.09	
		50	0	22.05	

LTE Band 66						
BW	MCS Index	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	23.13	**23.38**	23.15
		1	2	23.21	23.34	23.12
		1	5	23.19	23.33	23.19
		3	0	23.18	23.33	23.21
		3	1	23.14	23.30	23.19
		3	3	23.15	**23.38**	23.20
		6	0	22.28	22.17	22.12
	16QAM	1	0	22.04	22.13	22.11
		1	2	22.19	22.15	**22.28**
		1	5	22.19	22.14	22.19
		3	0	22.16	22.17	22.26
		3	1	22.10	22.20	22.02
		3	3	22.12	22.11	22.20
		6	0	21.22	21.20	21.25

LTE Band 66						
BW	MCS Index	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	23.10	**23.35**	23.10
		1	7	23.18	23.32	23.11
		1	14	23.17	**23.35**	23.13
		8	0	22.10	22.18	22.10
		8	3	22.14	22.15	22.14
		8	7	22.25	22.20	22.16
		15	0	22.29	22.14	22.15
	16QAM	1	0	**22.29**	22.18	**22.29**
		1	7	22.14	22.21	22.20
		1	14	22.28	22.22	22.12
		8	0	21.12	21.20	21.20
		8	3	21.30	21.29	21.20
		8	7	21.18	21.11	21.14
		15	0	21.14	21.18	21.14

LTE Band 66						
BW	MCS Index	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	23.15	23.32	23.16
		1	12	23.22	**23.38**	23.14
		1	24	23.16	23.32	23.19
		12	0	22.16	22.11	22.09
		12	6	22.18	22.20	22.15
		12	13	22.12	22.11	22.14
		25	0	22.20	22.12	22.30
	16QAM	1	0	22.21	**22.30**	22.26
		1	12	22.15	22.13	22.16
		1	24	22.12	22.19	22.25
		12	0	21.19	21.17	21.18
		12	6	21.19	21.14	21.14
		12	13	21.10	21.19	21.26
		25	0	21.30	21.30	21.25

LTE Band 66						
BW	MCS Index	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	23.11	23.30	23.12
		1	24	23.22	**23.41**	23.10
		1	49	23.20	23.31	23.19
		25	0	22.01	22.08	22.19
		25	12	22.15	22.17	22.21
		25	25	22.23	22.30	22.23
		50	0	22.27	22.14	22.24
	16QAM	1	0	22.00	22.13	22.04
		1	24	22.19	**22.25**	22.23
		1	49	22.11	22.20	22.24
		25	0	21.18	21.12	21.21
		25	12	21.13	21.17	21.28
		25	25	21.20	21.15	21.11
		50	0	21.24	21.26	21.22

LTE Band 66						
BW	MCS Index	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	23.11	23.33	23.12
		1	37	23.20	**23.34**	23.21
		1	74	23.10	23.31	23.21
		36	0	22.00	22.01	22.08
		36	19	22.13	22.11	22.30
		36	39	22.16	22.19	22.16
		75	0	22.15	22.20	22.29
	16QAM	1	0	22.22	**22.29**	22.27
		1	37	22.24	22.22	22.11
		1	74	22.19	22.11	22.14
		36	0	21.19	21.33	21.07
		36	19	21.25	21.26	21.15
		36	39	21.27	21.28	21.29
		75	0	21.24	21.18	21.24

LTE Band 66						
BW	MCS Index	Channel		132072	132322	132575
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	23.12	**23.25**	23.22
		1	50	23.16	23.18	23.14
		1	99	23.13	23.17	23.13
		50	0	22.17	22.54	22.19
		50	25	22.07	22.12	22.05
		50	50	22.16	22.13	22.18
		100	0	22.10	22.14	22.11
	16QAM	1	0	22.20	**22.37**	22.22
		1	50	22.14	22.19	22.05
		1	99	22.14	22.17	22.13
		50	0	21.33	21.31	21.11
		50	25	21.11	21.18	21.10
		50	50	21.29	21.23	21.15
		100	0	21.28	21.26	21.10

LTE Band 71						
BW	MCS Index	Channel		133147	133297	133447
		Frequency (MHz)		665.5	680.5	695.5
5M	QPSK	1	0	23.83	23.85	**23.89**
		1	12	23.81	23.78	23.83
		1	24	23.77	23.81	**23.89**
		12	0	22.77	22.70	22.75
		12	6	22.84	22.88	22.74
		12	13	22.74	22.86	22.76
		25	0	22.72	22.86	22.81
	16QAM	1	0	22.53	22.46	**22.85**
		1	12	22.41	22.56	22.45
		1	24	22.57	22.43	22.41
		12	0	21.83	21.73	21.90
		12	6	21.83	21.77	21.89
		12	13	21.89	21.77	21.84
		25	0	21.70	21.77	21.73

LTE Band 71						
BW	MCS Index	Channel		133172	133297	133422
		Frequency (MHz)		668	680.5	693
10M	QPSK	1	0	23.83	23.82	23.76
		1	24	**23.84**	23.78	23.76
		1	49	23.70	**23.84**	23.76
		25	0	22.80	22.87	22.72
		25	12	22.87	22.86	22.79
		25	25	22.86	22.79	22.70
		50	0	22.76	22.79	22.81
	16QAM	1	0	**22.58**	22.54	22.51
		1	24	22.45	22.55	22.47
		1	49	22.53	22.56	22.57
		25	0	21.77	21.75	21.87
		25	12	21.82	21.75	21.78
		25	25	21.87	21.86	21.86
		50	0	21.85	21.73	21.78

LTE Band 71						
BW	MCS Index	Channel		133197	133297	133397
		Frequency (MHz)		670.5	680.5	690.5
15M	QPSK	1	0	23.79	23.72	**23.89**
		1	37	23.83	23.73	23.72
		1	74	23.75	23.87	23.74
		36	0	22.70	22.76	22.82
		36	19	22.79	22.77	22.71
		36	39	22.83	22.82	22.79
		75	0	22.78	22.77	22.84
	16QAM	1	0	22.41	22.51	22.45
		1	37	22.40	22.50	**22.57**
		1	74	22.43	22.45	22.54
		36	0	21.89	21.84	21.90
		36	19	21.88	21.84	21.73
		36	39	21.89	21.83	21.74
		75	0	21.71	21.77	21.85

LTE Band 71						
BW	MCS Index	Channel		133222	133297	133372
		Frequency (MHz)		673	680.5	688
20M	QPSK	1	0	23.73	23.82	23.84
		1	50	23.74	23.75	23.73
		1	99	**23.86**	23.77	23.70
		50	0	22.75	22.90	22.73
		50	25	22.74	22.70	22.83
		50	50	22.81	22.80	22.70
		100	0	22.70	22.75	22.87
	16QAM	1	0	22.50	22.54	**22.59**
		1	50	22.47	22.48	22.49
		1	99	22.48	22.57	22.43
		50	0	21.72	21.78	21.75
		50	25	21.82	21.77	21.90
		50	50	21.86	21.84	21.78
		100	0	21.83	21.80	21.72

EIRP Power(dBm)

Band	WCDMA IV		
Channel	1312	1413	1513
Frequency	1712.4	1732.6	1752.6
RMC 12.2K	24.84	25.02	**25.06**
HSDPA Subtest-1	24.22	24.25	24.26
HSDPA Subtest-2	24.22	24.24	24.28
HSDPA Subtest-3	24.21	24.25	24.23
HSDPA Subtest-4	24.18	24.25	24.23
HSUPA Subtest-1	23.40	23.48	23.44
HSUPA Subtest-2	23.39	23.45	23.45
HSUPA Subtest-3	23.40	23.46	23.45
HSUPA Subtest-4	23.41	23.47	23.46
HSUPA Subtest-5	23.39	23.40	23.41

*EIRP = Conducted + antenna gain (1.70dBi)

LTE Band 4						
BW	MCS Index	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	24.84	24.93	24.79
		1	2	24.93	**25.05**	24.91
		1	5	24.88	25.01	24.91
		3	0	24.82	24.98	24.90
		3	1	24.98	25.03	24.95
		3	3	24.93	25.01	24.98
		6	0	23.97	24.00	23.98
	16QAM	1	0	24.08	24.10	23.96
		1	2	**24.19**	24.03	24.04
		1	5	24.02	24.04	24.07
		3	0	23.76	24.04	23.87
		3	1	23.54	23.99	24.08
		3	3	23.81	24.14	24.18
		6	0	22.68	23.07	23.17

LTE Band 4						
BW	MCS Index	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	24.97	25.21	25.25
		1	7	24.93	**25.37**	25.00
		1	14	24.96	25.00	24.99
		8	0	23.98	24.07	24.07
		8	3	24.01	24.11	24.04
		8	7	24.04	24.10	24.03
		15	0	24.07	24.07	24.00
	16QAM	1	0	23.75	23.60	23.97
		1	7	23.83	23.67	23.95
		1	14	23.98	23.78	**24.20**
		8	0	23.01	23.17	22.86
		8	3	23.22	23.31	22.86
		8	7	22.88	23.29	22.76
		15	0	23.15	23.17	22.92

*EIRP = Conducted + antenna gain (1.70dBi)

LTE Band 4						
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	24.99	**25.21**	24.80
		1	12	25.10	25.08	24.93
		1	24	24.86	24.78	24.95
		12	0	24.05	24.05	24.18
		12	6	24.10	24.08	24.17
		12	13	24.11	24.10	24.13
		25	0	24.02	24.08	24.11
	16QAM	1	0	24.38	23.90	23.82
		1	12	**24.43**	23.65	23.61
		1	24	24.40	24.02	23.98
		12	0	22.99	22.85	22.93
		12	6	22.95	22.89	22.85
		12	13	22.97	22.82	22.87
		25	0	22.97	22.93	22.89

LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	24.75	24.70	24.89
		1	24	24.76	**24.94**	24.89
		1	49	24.47	24.80	24.81
		25	0	24.08	24.01	24.03
		25	12	24.01	24.12	23.99
		25	25	23.95	24.10	23.93
		50	0	24.09	24.04	23.97
	16QAM	1	0	23.75	23.51	23.52
		1	24	23.75	23.58	**23.89**
		1	49	23.48	23.44	23.46
		25	0	23.07	22.97	23.00
		25	12	23.01	22.98	22.97
		25	25	22.93	23.07	22.92
		50	0	22.87	22.87	22.89

*EIRP = Conducted + antenna gain (1.70dBi)

LTE Band 4						
BW	MCS Index	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	25.14	25.20	24.83
		1	37	25.09	**25.35**	25.16
		1	74	24.97	24.97	24.92
		36	0	24.27	24.06	24.13
		36	19	24.06	24.10	23.97
		36	39	23.96	24.13	24.02
		75	0	24.15	24.15	23.89
	16QAM	1	0	**24.31**	24.19	24.22
		1	37	24.20	24.16	24.14
		1	74	24.04	24.02	24.11
		36	0	23.12	23.10	23.07
		36	19	23.02	23.05	23.02
		36	39	22.90	22.97	22.98
		75	0	23.07	23.03	23.04

LTE Band 4						
BW	MCS Index	Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	**25.27**	24.90	24.90
		1	50	25.22	25.22	25.07
		1	99	24.65	24.83	24.77
		50	0	24.20	24.07	24.24
		50	25	24.05	24.07	24.09
		50	50	24.03	24.13	23.99
		100	0	24.12	24.15	24.11
	16QAM	1	0	24.07	24.24	24.03
		1	50	**24.48**	24.04	23.95
		1	99	23.74	23.92	23.87
		50	0	23.14	23.10	23.32
		50	25	22.99	23.01	23.18
		50	50	22.96	23.06	23.06
		100	0	23.09	23.10	22.99

*EIRP = Conducted + antenna gain (1.70dBi)

LTE Band 66						
BW	MCS Index	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	24.83	**25.08**	24.85
		1	2	24.91	25.04	24.82
		1	5	24.89	25.03	24.89
		3	0	24.88	25.03	24.91
		3	1	24.84	25.00	24.89
		3	3	24.85	**25.08**	24.90
		6	0	23.98	23.87	23.82
	16QAM	1	0	23.74	23.83	23.81
		1	2	23.89	23.85	**23.98**
		1	5	23.89	23.84	23.89
		3	0	23.86	23.87	23.96
		3	1	23.80	23.90	23.72
		3	3	23.82	23.81	23.90
		6	0	22.92	22.90	22.95

LTE Band 66						
BW	MCS Index	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	24.80	**25.05**	24.80
		1	7	24.88	25.02	24.81
		1	14	24.87	**25.05**	24.83
		8	0	23.80	23.88	23.80
		8	3	23.84	23.85	23.84
		8	7	23.95	23.90	23.86
		15	0	23.99	23.84	23.85
	16QAM	1	0	**23.99**	23.88	**23.99**
		1	7	23.84	23.91	23.90
		1	14	23.98	23.92	23.82
		8	0	22.82	22.90	22.90
		8	3	23.00	22.99	22.90
		8	7	22.88	22.81	22.84
		15	0	22.84	22.88	22.84

*EIRP = Conducted + antenna gain (1.70dBi)

LTE Band 66						
BW	MCS Index	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	24.85	25.02	24.86
		1	12	24.92	**25.08**	24.84
		1	24	24.86	25.02	24.89
		12	0	23.86	23.81	23.79
		12	6	23.88	23.90	23.85
		12	13	23.82	23.81	23.84
		25	0	23.90	23.82	24.00
	16QAM	1	0	23.91	**24.00**	23.96
		1	12	23.85	23.83	23.86
		1	24	23.82	23.89	23.95
		12	0	22.89	22.87	22.88
		12	6	22.89	22.84	22.84
		12	13	22.80	22.89	22.96
		25	0	23.00	23.00	22.95

LTE Band 66						
BW	MCS Index	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	24.81	25.00	24.82
		1	24	24.92	**25.11**	24.80
		1	49	24.90	25.01	24.89
		25	0	23.71	23.78	23.89
		25	12	23.85	23.87	23.91
		25	25	23.93	24.00	23.93
		50	0	23.97	23.84	23.94
	16QAM	1	0	23.70	23.83	23.74
		1	24	23.89	**23.95**	23.93
		1	49	23.81	23.90	23.94
		25	0	22.88	22.82	22.91
		25	12	22.83	22.87	22.98
		25	25	22.90	22.85	22.81
		50	0	22.94	22.96	22.92

*EIRP = Conducted + antenna gain (1.70dBi)

LTE Band 66						
BW	MCS Index	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	24.81	25.03	24.82
		1	37	24.90	**25.04**	24.91
		1	74	24.80	25.01	24.91
		36	0	23.70	23.71	23.78
		36	19	23.83	23.81	24.00
		36	39	23.86	23.89	23.86
		75	0	23.85	23.90	23.99
	16QAM	1	0	23.92	**23.99**	23.97
		1	37	23.94	23.92	23.81
		1	74	23.89	23.81	23.84
		36	0	22.89	23.03	22.77
		36	19	22.95	22.96	22.85
		36	39	22.97	22.98	22.99
		75	0	22.94	22.88	22.94

LTE Band 66						
BW	MCS Index	Channel		132072	132322	132575
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	24.82	**24.95**	24.92
		1	50	24.86	24.88	24.84
		1	99	24.83	24.87	24.83
		50	0	23.87	24.24	23.89
		50	25	23.77	23.82	23.75
		50	50	23.86	23.83	23.88
		100	0	23.80	23.84	23.81
	16QAM	1	0	23.90	**24.07**	23.92
		1	50	23.84	23.89	23.75
		1	99	23.84	23.87	23.83
		50	0	23.03	23.01	22.81
		50	25	22.81	22.88	22.80
		50	50	22.99	22.93	22.85
		100	0	22.98	22.96	22.80

*EIRP = Conducted + antenna gain (1.70dBi)

ERP Power (dBm)

LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	20.62	20.82	20.83
		1	2	20.90	20.97	20.93
		1	5	20.70	20.81	20.95
		3	0	20.78	20.82	20.92
		3	1	20.81	20.98	**21.10**
		3	3	21.02	20.98	21.02
		6	0	19.94	20.00	20.00
	16QAM	1	0	19.43	19.56	19.47
		1	2	19.58	19.57	19.53
		1	5	19.35	19.58	19.55
		3	0	19.57	19.71	19.97
		3	1	19.78	19.78	**20.15**
		3	3	19.78	19.69	20.10
		6	0	18.74	18.73	18.84

LTE Band 12						
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	20.76	20.80	20.99
		1	7	**21.07**	20.85	20.80
		1	14	20.88	20.69	**21.07**
		8	0	19.91	19.94	20.05
		8	3	20.06	19.95	20.13
		8	7	19.96	19.99	20.09
		15	0	19.88	20.01	20.07
	16QAM	1	0	**20.05**	19.70	19.88
		1	7	19.93	20.02	19.91
		1	14	19.93	19.81	19.90
		8	0	18.97	18.70	18.98
		8	3	19.02	18.72	18.99
		8	7	18.81	18.95	19.05
		15	0	18.91	18.96	19.08

*ERP = Conducted + antenna gain (-1.09dBi)-2.15

LTE Band 12						
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	20.61	20.76	20.92
		1	12	20.95	**20.97**	20.91
		1	24	20.63	20.78	20.92
		12	0	19.86	19.89	19.86
		12	6	19.77	20.00	20.05
		12	13	19.81	19.97	20.11
		25	0	19.82	19.92	19.98
	16QAM	1	0	19.97	20.35	20.02
		1	12	19.92	**20.56**	20.09
		1	24	20.13	19.99	20.01
		12	0	18.92	18.96	18.83
		12	6	18.83	18.79	18.91
		12	13	18.87	18.88	19.10
		25	0	18.96	18.89	19.09

LTE Band 12						
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	20.47	20.59	20.62
		1	24	20.59	20.86	**20.99**
		1	49	20.66	20.75	20.86
		25	0	19.70	19.89	19.96
		25	12	19.77	19.95	19.94
		25	25	19.91	19.91	20.04
		50	0	19.81	19.96	20.02
	16QAM	1	0	19.94	19.88	19.97
		1	24	19.63	19.99	**20.39**
		1	49	20.09	20.11	19.96
		25	0	18.76	18.87	18.91
		25	12	18.81	19.03	18.91
		25	25	18.87	19.08	18.90
		50	0	18.81	18.96	18.91

*ERP = Conducted + antenna gain (-1.09dBi)-2.15

LTE Band 13						
BW	MCS Index	Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	**18.64**	18.56	18.44
		1	12	18.52	18.41	18.59
		1	24	18.39	18.52	18.38
		12	0	17.66	17.61	17.72
		12	6	17.77	17.65	17.91
		12	13	17.61	17.73	17.78
		25	0	17.82	17.70	17.69
	16QAM	1	0	**17.78**	17.35	17.33
		1	12	17.45	17.10	17.41
		1	24	17.67	17.40	17.24
		12	0	16.78	16.51	16.70
		12	6	16.60	16.52	16.57
		12	13	16.55	16.63	16.76
		25	0	16.91	16.55	16.61

LTE Band 13				
BW	MCS Index	Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	**19.04**
		1	24	18.79
		1	49	18.79
		25	0	17.76
		25	12	17.75
		25	25	17.64
		50	0	17.75
	16QAM	1	0	**17.66**
		1	24	17.54
		1	49	17.58
		25	0	16.70
		25	12	16.49
		25	25	16.83
		50	0	16.79

*ERP = Conducted + antenna gain (-3.11dBi)-2.15

LTE Band 71						
BW	MCS Index	Channel		133147	133297	133447
		Frequency (MHz)		665.5	680.5	695.5
5M	QPSK	1	0	19.23	19.25	**19.29**
		1	12	19.21	19.18	19.23
		1	24	19.17	19.21	**19.29**
		12	0	18.17	18.10	18.15
		12	6	18.24	18.28	18.14
		12	13	18.14	18.26	18.16
		25	0	18.12	18.26	18.21
	16QAM	1	0	17.93	17.86	**18.25**
		1	12	17.81	17.96	17.85
		1	24	17.97	17.83	17.81
		12	0	17.23	17.13	17.30
		12	6	17.23	17.17	17.29
		12	13	17.29	17.17	17.24
		25	0	17.10	17.17	17.13

LTE Band 71						
BW	MCS Index	Channel		133172	133297	133422
		Frequency (MHz)		668	680.5	693
10M	QPSK	1	0	19.23	19.22	19.16
		1	24	**19.24**	19.18	19.16
		1	49	19.10	**19.24**	19.16
		25	0	18.20	18.27	18.12
		25	12	18.27	18.26	18.19
		25	25	18.26	18.19	18.10
		50	0	18.16	18.19	18.21
	16QAM	1	0	**17.98**	17.94	17.91
		1	24	17.85	17.95	17.87
		1	49	17.93	17.96	17.97
		25	0	17.17	17.15	17.27
		25	12	17.22	17.15	17.18
		25	25	17.27	17.26	17.26
		50	0	17.25	17.13	17.18

*ERP = Conducted + antenna gain (-2.45dBi)-2.15

LTE Band 71						
BW	MCS Index	Channel		133197	133297	133397
		Frequency (MHz)		670.5	680.5	690.5
15M	QPSK	1	0	19.19	19.12	**19.29**
		1	37	19.23	19.13	19.12
		1	74	19.15	19.27	19.14
		36	0	18.10	18.16	18.22
		36	19	18.19	18.17	18.11
		36	39	18.23	18.22	18.19
		75	0	18.18	18.17	18.24
	16QAM	1	0	17.81	17.91	17.85
		1	37	17.80	17.90	**17.97**
		1	74	17.83	17.85	17.94
		36	0	17.29	17.24	17.30
		36	19	17.28	17.24	17.13
		36	39	17.29	17.23	17.14
		75	0	17.11	17.17	17.25

LTE Band 71						
BW	MCS Index	Channel		133222	133297	133372
		Frequency (MHz)		673	680.5	688
20M	QPSK	1	0	19.13	19.22	19.24
		1	50	19.14	19.15	19.13
		1	99	**19.26**	19.17	19.10
		50	0	18.15	18.30	18.13
		50	25	18.14	18.10	18.23
		50	50	18.21	18.20	18.10
		100	0	18.10	18.15	18.27
	16QAM	1	0	17.90	17.94	**17.99**
		1	50	17.87	17.88	17.89
		1	99	17.88	17.97	17.83
		50	0	17.12	17.18	17.15
		50	25	17.22	17.17	17.30
		50	50	17.26	17.24	17.18
		100	0	17.23	17.20	17.12

*ERP = Conducted + antenna gain (-2.45dBi)-2.15

4.2 Modulation Characteristics Measurement

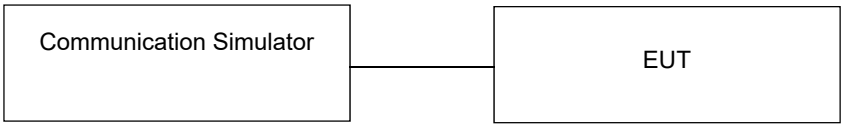
4.2.1 Limits of Modulation Characteristics

N/A

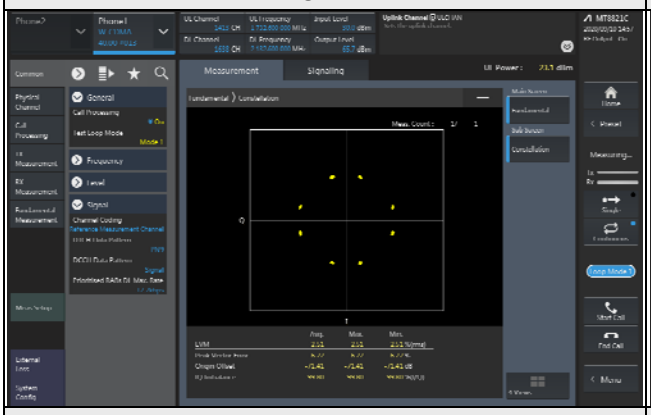
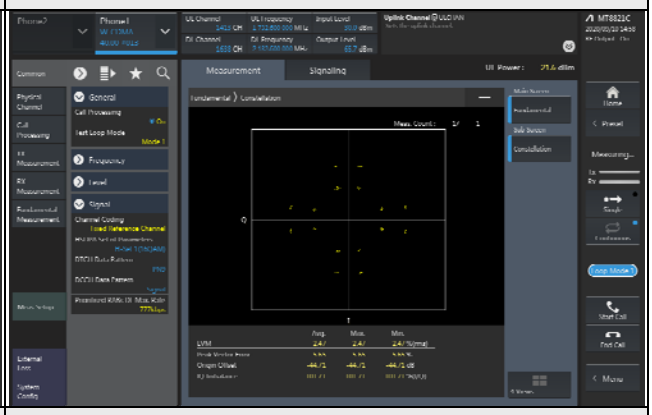
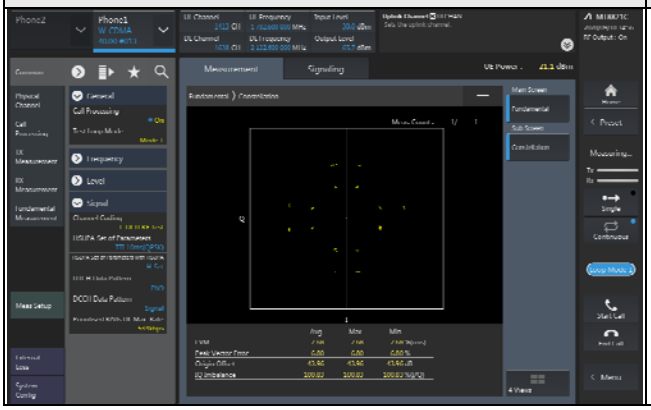
4.2.2 Test Procedure

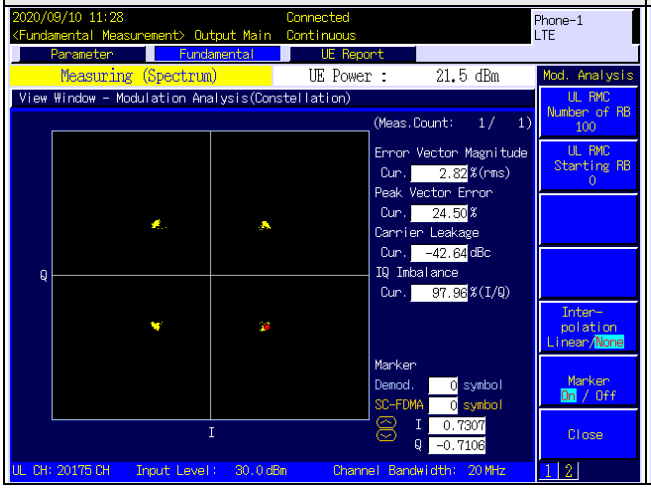
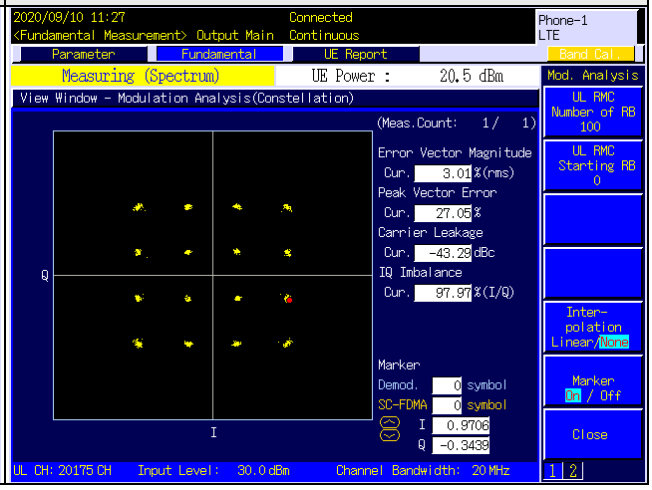
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

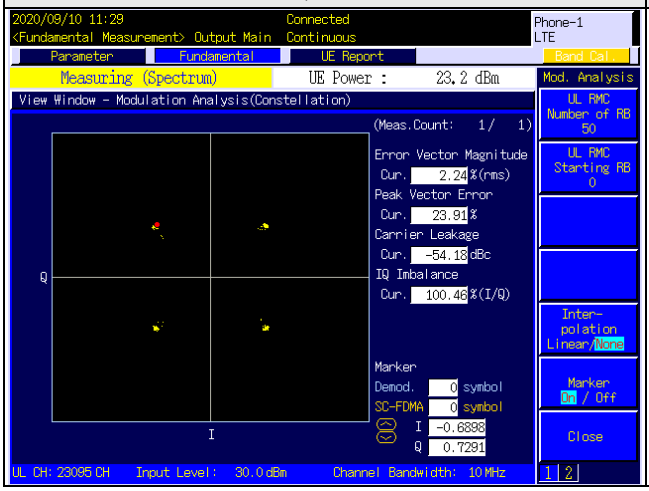
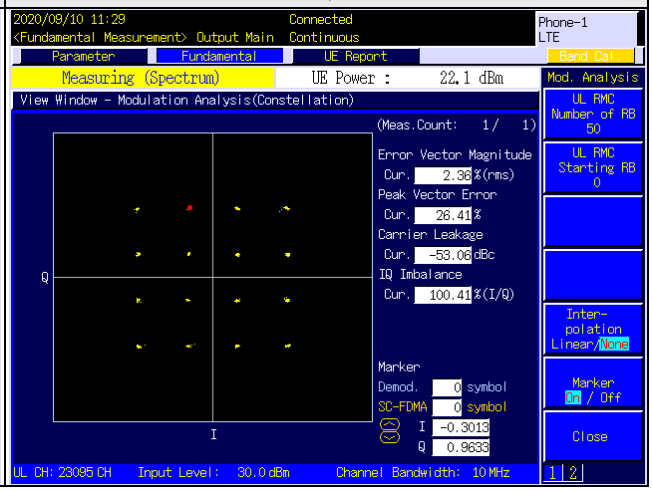
4.2.3 Test Setup

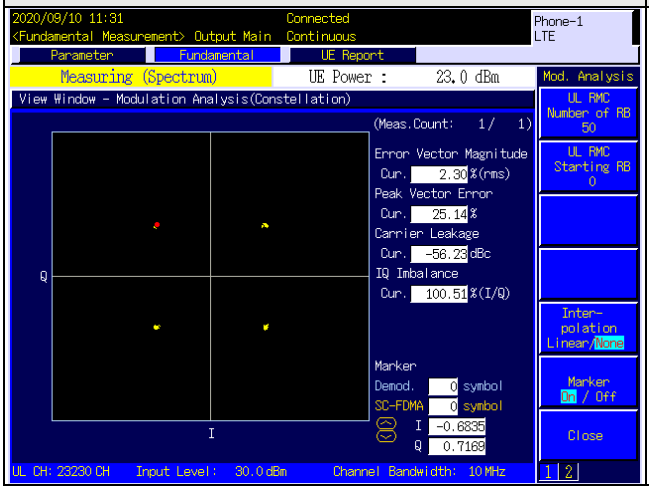
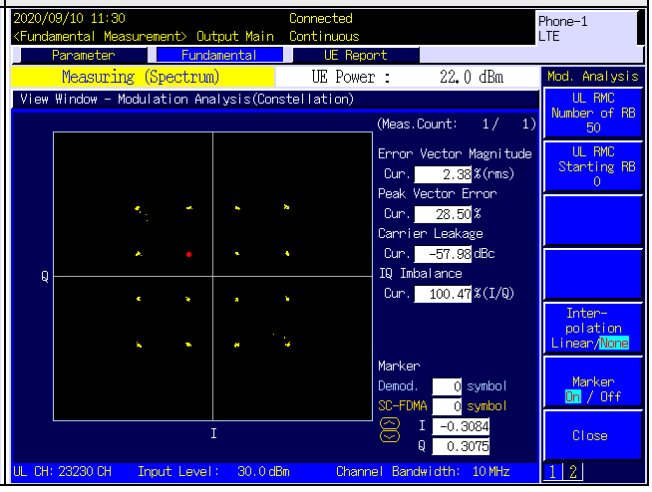


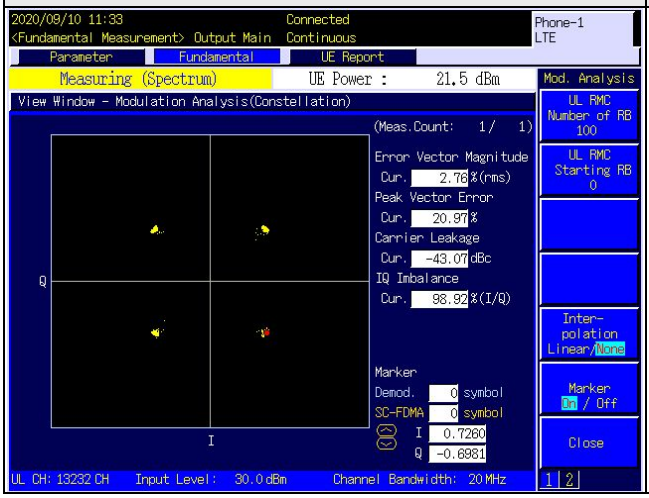
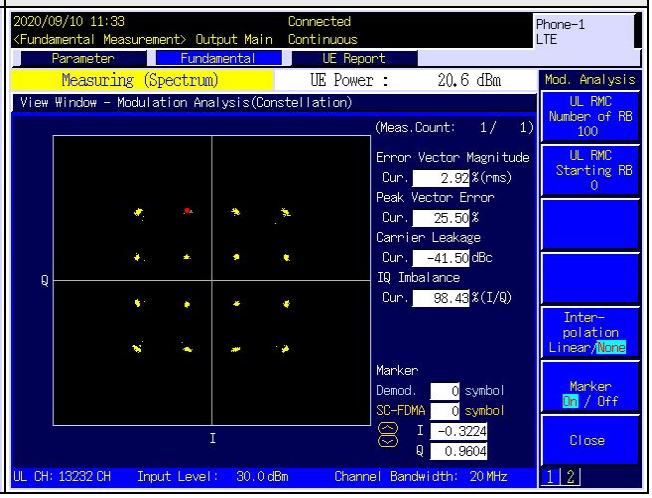
4.2.4 Test Results

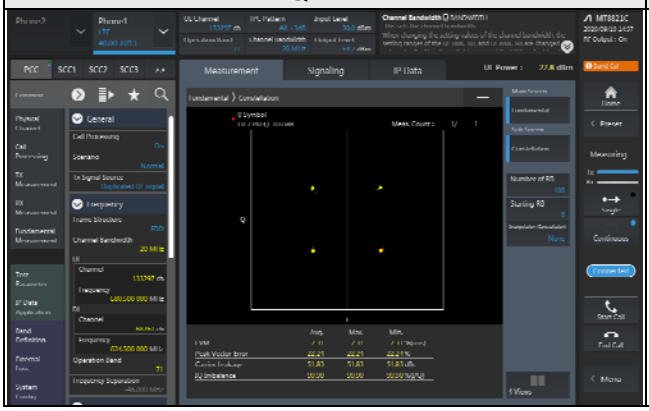
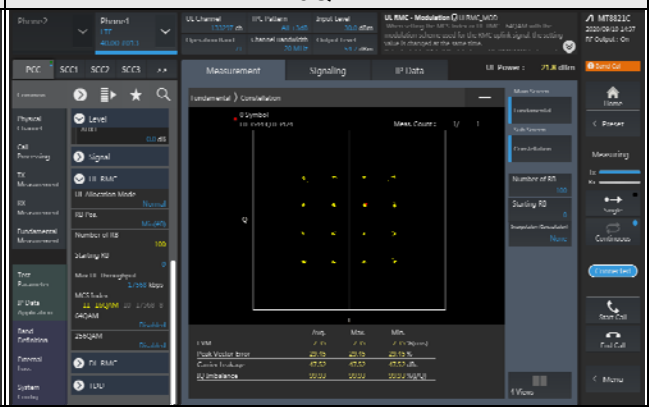
WCDMA Band 4	
Spectrum Plot of Measurement Value	
Channel: 1413 / Frequency (MHz): 1732.6MHz	
WCDMA	HSDPA
	
HSUPA	
	

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

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

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

LTE Band 66	
Spectrum Plot of Measurement Value	
Channel: 132322 / Frequency (MHz): 1745.0 MHz	
QPSK	16QAM
	

LTE Band 71	
Spectrum Plot of Measurement Value	
Channel: 133297 / Frequency (MHz): 680.5 MHz	
QPSK	16QAM
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

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

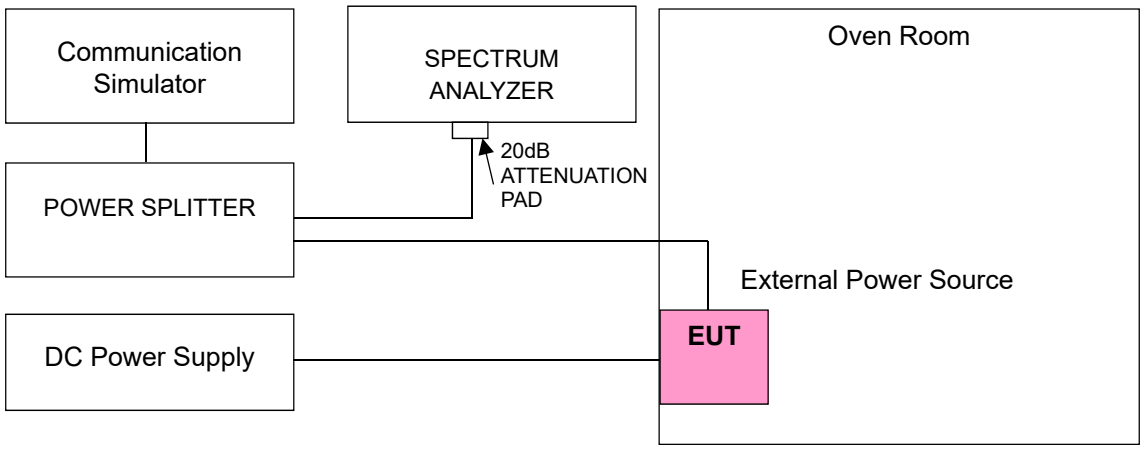
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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 Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA Band 4			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1712.400003	0.002	1752.600002	0.001
10	1712.400003	0.002	1752.600002	0.001
35	1712.400002	0.001	1752.600003	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA Band 4			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.400001	0.001	1752.600001	0.001
-30	1712.400001	0.001	1752.600001	0.001
-20	1712.400002	0.001	1752.600001	0.001
-10	1712.400002	0.001	1752.600001	0.001
0	1712.400003	0.002	1752.600004	0.002
10	1712.400002	0.001	1752.600004	0.002
20	1712.399997	-0.002	1752.599999	-0.001
30	1712.399997	-0.002	1752.599997	-0.002
40	1712.399996	-0.002	1752.599997	-0.002
50	1712.399997	-0.002	1752.599996	-0.002
60	1712.399999	-0.001	1752.599997	-0.002
70	1712.399999	-0.001	1752.599997	-0.002
80	1712.399998	-0.001	1752.599997	-0.002
85	1712.399998	-0.001	1752.599997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1710.700003	0.002	1754.300002	0.001
10	1710.700004	0.002	1754.300001	0.001
35	1710.700004	0.002	1754.300003	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.700001	0.001	1754.300002	0.001
-30	1710.700001	0.001	1754.300002	0.001
-20	1710.700002	0.001	1754.300004	0.002
-10	1710.700001	0.001	1754.300001	0.001
0	1710.700002	0.001	1754.300002	0.001
10	1710.700003	0.002	1754.300004	0.002
20	1710.699998	-0.001	1754.299999	-0.001
30	1710.699999	-0.001	1754.299999	-0.001
40	1710.699998	-0.001	1754.299996	-0.002
50	1710.699998	-0.001	1754.299999	-0.001
60	1710.699998	-0.001	1754.299998	-0.001
70	1710.699997	-0.002	1754.299997	-0.002
80	1710.699998	-0.001	1754.299999	-0.001
85	1710.699999	-0.001	1754.299997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1711.500001	0.001	1753.500002	0.001
10	1711.500001	0.001	1753.500004	0.002
35	1711.500004	0.002	1753.500002	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1711.500003	0.001	1753.500002	0.001
-30	1711.500004	0.002	1753.500001	0.001
-20	1711.500004	0.002	1753.500004	0.002
-10	1711.500002	0.001	1753.500001	0.001
0	1711.500003	0.002	1753.500003	0.002
10	1711.500002	0.001	1753.500003	0.002
20	1711.499998	-0.001	1753.499997	-0.002
30	1711.499997	-0.002	1753.499998	-0.001
40	1711.499997	-0.002	1753.499997	-0.002
50	1711.499997	-0.002	1753.499997	-0.002
60	1711.499998	-0.001	1753.499998	-0.001
70	1711.499999	-0.001	1753.499997	-0.002
80	1711.499997	-0.002	1753.499998	-0.001
85	1711.499996	-0.002	1753.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1712.500003	0.002	1752.500002	0.001
10	1712.500001	0.001	1752.500001	0.001
35	1712.500003	0.002	1752.500003	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.500002	0.001	1752.500001	0.001
-30	1712.500004	0.002	1752.500002	0.001
-20	1712.500001	0.001	1752.500001	0.001
-10	1712.500002	0.001	1752.500003	0.002
0	1712.500004	0.002	1752.500004	0.002
10	1712.500001	0.001	1752.500002	0.001
20	1712.499996	-0.002	1752.499997	-0.002
30	1712.499999	-0.001	1752.499996	-0.002
40	1712.499996	-0.002	1752.499999	-0.001
50	1712.499997	-0.002	1752.499998	-0.001
60	1712.499997	-0.002	1752.499996	-0.002
70	1712.499997	-0.002	1752.499998	-0.001
80	1712.499998	-0.001	1752.499998	-0.001
85	1712.499999	-0.001	1752.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1715.000001	0.001	1750.000004	0.002
10	1715.000003	0.002	1750.000004	0.002
35	1715.000001	0.001	1750.000003	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1715.000002	0.001	1750.000002	0.001
-30	1715.000003	0.002	1750.000003	0.002
-20	1715.000004	0.002	1750.000002	0.001
-10	1715.000004	0.002	1750.000003	0.002
0	1715.000003	0.002	1750.000001	0.001
10	1715.000002	0.001	1750.000003	0.002
20	1714.999999	-0.001	1749.999997	-0.002
30	1714.999998	-0.001	1749.999996	-0.002
40	1714.999998	-0.001	1749.999998	-0.001
50	1714.999999	-0.001	1749.999999	-0.001
60	1714.999997	-0.002	1749.999996	-0.002
70	1714.999997	-0.002	1749.999997	-0.002
80	1714.999998	-0.001	1749.999998	-0.001
85	1714.999998	-0.001	1749.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1717.500004	0.002	1747.500003	0.002
10	1717.500002	0.001	1747.500003	0.002
35	1717.500002	0.001	1747.500003	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1717.500002	0.001	1747.500001	0.001
-30	1717.500002	0.001	1747.500004	0.002
-20	1717.500003	0.002	1747.500003	0.002
-10	1717.500001	0.001	1747.500003	0.002
0	1717.500003	0.002	1747.500003	0.002
10	1717.500002	0.001	1747.500003	0.002
20	1717.499998	-0.001	1747.499998	-0.001
30	1717.499998	-0.001	1747.499999	-0.001
40	1717.499998	-0.001	1747.499998	-0.001
50	1717.499997	-0.002	1747.499998	-0.001
60	1717.499996	-0.002	1747.499997	-0.002
70	1717.499999	-0.001	1747.499998	-0.001
80	1717.499997	-0.002	1747.499997	-0.002
85	1717.499998	-0.001	1747.499996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1720.000001	0.001	1745.000003	0.002
10	1720.000001	0.001	1745.000003	0.002
35	1720.000003	0.002	1745.000003	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1720.000004	0.002	1745.000004	0.002
-30	1720.000002	0.001	1745.000002	0.001
-20	1720.000001	0.001	1745.000003	0.002
-10	1720.000004	0.002	1745.000003	0.001
0	1720.000004	0.002	1745.000004	0.002
10	1720.000004	0.002	1745.000002	0.001
20	1719.999997	-0.002	1744.999999	-0.001
30	1719.999998	-0.001	1744.999996	-0.002
40	1719.999998	-0.001	1744.999996	-0.002
50	1719.999997	-0.002	1744.999998	-0.001
60	1719.999998	-0.001	1744.999996	-0.002
70	1719.999997	-0.002	1744.999998	-0.001
80	1719.999998	-0.001	1744.999996	-0.002
85	1719.999997	-0.002	1744.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	699.700002	0.003	715.300004	0.005
10	699.700003	0.005	715.300003	0.003
35	699.700003	0.004	715.300003	0.004

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	699.700004	0.006	715.300001	0.002
-30	699.700003	0.005	715.300001	0.002
-20	699.700002	0.002	715.300001	0.002
-10	699.700002	0.003	715.300003	0.004
0	699.700002	0.003	715.300003	0.004
10	699.700002	0.003	715.300002	0.003
20	699.699997	-0.005	715.299997	-0.004
30	699.699996	-0.006	715.299997	-0.004
40	699.699997	-0.004	715.299999	-0.002
50	699.699997	-0.005	715.299998	-0.003
60	699.699998	-0.003	715.299998	-0.002
70	699.699998	-0.003	715.299998	-0.002
80	699.699997	-0.005	715.299997	-0.004
85	699.699999	-0.002	715.299999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	700.500002	0.002	714.500004	0.005
10	700.500002	0.003	714.500003	0.005
35	700.500001	0.002	714.500002	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	700.500003	0.004	714.500003	0.003
-30	700.500001	0.001	714.500002	0.003
-20	700.500003	0.005	714.500004	0.005
-10	700.500001	0.002	714.500001	0.002
0	700.500003	0.004	714.500001	0.002
10	700.500004	0.005	714.500004	0.005
20	700.499999	-0.002	714.499998	-0.003
30	700.499997	-0.005	714.499997	-0.005
40	700.499998	-0.003	714.499997	-0.004
50	700.499997	-0.004	714.499996	-0.005
60	700.499998	-0.002	714.499998	-0.003
70	700.499997	-0.005	714.499999	-0.002
80	700.499997	-0.004	714.499997	-0.004
85	700.499998	-0.003	714.499999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	701.500004	0.005	713.500002	0.002
10	701.500003	0.005	713.500003	0.005
35	701.500004	0.005	713.500004	0.005

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	701.500003	0.005	713.500002	0.002
-30	701.500002	0.002	713.500002	0.003
-20	701.500003	0.004	713.500004	0.005
-10	701.500003	0.004	713.500003	0.005
0	701.500002	0.003	713.500003	0.005
10	701.500003	0.004	713.500002	0.003
20	701.499999	-0.002	713.499996	-0.005
30	701.499999	-0.002	713.499997	-0.004
40	701.499998	-0.003	713.499998	-0.003
50	701.499999	-0.002	713.499997	-0.005
60	701.499998	-0.004	713.499999	-0.002
70	701.499998	-0.003	713.499997	-0.004
80	701.499997	-0.005	713.499998	-0.003
85	701.499998	-0.003	713.499996	-0.006

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	704.000003	0.005	711.000001	0.001
10	704.000001	0.002	711.000003	0.004
35	704.000002	0.002	711.000002	0.003

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	704.000004	0.006	711.000003	0.004
-30	704.000003	0.004	711.000002	0.003
-20	704.000001	0.002	711.000003	0.004
-10	704.000003	0.005	711.000004	0.005
0	704.000003	0.004	711.000004	0.005
10	704.000002	0.003	711.000002	0.002
20	703.999999	-0.002	710.999997	-0.004
30	703.999998	-0.003	710.999999	-0.002
40	703.999999	-0.002	710.999998	-0.003
50	703.999999	-0.002	710.999997	-0.005
60	703.999998	-0.003	710.999999	-0.002
70	703.999999	-0.002	710.999999	-0.002
80	703.999997	-0.004	710.999999	-0.002
85	703.999998	-0.003	710.999998	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	779.500001	0.001	784.500002	0.002
10	779.500001	0.002	784.500003	0.004
35	779.500001	0.001	784.500003	0.004

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	779.500002	0.002	784.500003	0.003
-30	779.500002	0.003	784.500002	0.003
-20	779.500003	0.003	784.500001	0.001
-10	779.500001	0.002	784.500002	0.002
0	779.500003	0.004	784.500003	0.004
10	779.500002	0.003	784.500001	0.001
20	779.499996	-0.005	784.499998	-0.003
30	779.499998	-0.003	784.499999	-0.001
40	779.499999	-0.002	784.499997	-0.004
50	779.499999	-0.001	784.499997	-0.004
60	779.499997	-0.003	784.499997	-0.004
70	779.499998	-0.003	784.499997	-0.004
80	779.499996	-0.005	784.499999	-0.002
85	779.499996	-0.005	784.499998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
12	782.000004	0.005
10	782.000002	0.003
35	782.000002	0.003

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-40	782.000003	0.003
-30	782.000004	0.005
-20	782.000003	0.004
-10	782.000003	0.003
0	782.000004	0.004
10	782.000003	0.004
20	781.999997	-0.004
30	781.999996	-0.005
40	781.999999	-0.002
50	781.999998	-0.002
60	781.999998	-0.003
70	781.999997	-0.004
80	781.999997	-0.004
85	781.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1710.700003	0.002	1779.300002	0.001
10	1710.700002	0.001	1779.300004	0.002
35	1710.700002	0.001	1779.300002	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1710.700003	0.002	1779.300003	0.002
-30	1710.700001	0.001	1779.300002	0.001
-20	1710.700003	0.002	1779.300003	0.002
-10	1710.700003	0.002	1779.300003	0.001
0	1710.700003	0.002	1779.300004	0.002
10	1710.700001	0.001	1779.300002	0.001
20	1710.699998	-0.001	1779.299996	-0.002
30	1710.699997	-0.002	1779.299997	-0.002
40	1710.699997	-0.002	1779.299999	-0.001
50	1710.699998	-0.001	1779.299998	-0.001
60	1710.699996	-0.002	1779.299997	-0.002
70	1710.699998	-0.001	1779.299996	-0.002
80	1710.699996	-0.002	1779.299998	-0.001
85	1710.699998	-0.001	1779.299997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1711.500002	0.001	1778.500003	0.002
10	1711.500003	0.002	1778.500004	0.002
35	1711.500004	0.002	1778.500002	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1711.500002	0.001	1778.500004	0.002
-30	1711.500003	0.002	1778.500002	0.001
-20	1711.500003	0.002	1778.500002	0.001
-10	1711.500003	0.002	1778.500002	0.001
0	1711.500003	0.001	1778.500002	0.001
10	1711.500003	0.002	1778.500004	0.002
20	1711.499998	-0.001	1778.499999	-0.001
30	1711.499998	-0.001	1778.499999	-0.001
40	1711.499998	-0.001	1778.499998	-0.001
50	1711.499996	-0.002	1778.499998	-0.001
60	1711.499999	-0.001	1778.499997	-0.002
70	1711.499999	-0.001	1778.499997	-0.002
80	1711.499996	-0.002	1778.499997	-0.002
85	1711.499997	-0.002	1778.499996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1712.500003	0.002	1777.500001	0.001
10	1712.500002	0.001	1777.500001	0.001
35	1712.500001	0.001	1777.500003	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1712.500003	0.002	1777.500004	0.002
-30	1712.500003	0.002	1777.500004	0.002
-20	1712.500002	0.001	1777.500002	0.001
-10	1712.500003	0.002	1777.500003	0.002
0	1712.500003	0.001	1777.500001	0.001
10	1712.500001	0.001	1777.500001	0.001
20	1712.499998	-0.001	1777.499998	-0.001
30	1712.499998	-0.001	1777.499998	-0.001
40	1712.499997	-0.002	1777.499996	-0.002
50	1712.499998	-0.001	1777.499998	-0.001
60	1712.499999	-0.001	1777.499999	-0.001
70	1712.499996	-0.002	1777.499999	-0.001
80	1712.499996	-0.002	1777.499997	-0.002
85	1712.499999	-0.001	1777.499999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1715.000004	0.002	1775.000002	0.001
10	1715.000001	0.001	1775.000003	0.002
35	1715.000003	0.002	1775.000004	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1715.000002	0.001	1775.000003	0.001
-30	1715.000001	0.001	1775.000002	0.001
-20	1715.000002	0.001	1775.000003	0.002
-10	1715.000004	0.002	1775.000003	0.001
0	1715.000002	0.001	1775.000003	0.002
10	1715.000003	0.002	1775.000002	0.001
20	1714.999998	-0.001	1774.999998	-0.001
30	1714.999998	-0.001	1774.999998	-0.001
40	1714.999998	-0.001	1774.999999	-0.001
50	1714.999998	-0.001	1774.999997	-0.002
60	1714.999998	-0.001	1774.999997	-0.001
70	1714.999999	-0.001	1774.999997	-0.002
80	1714.999998	-0.001	1774.999998	-0.001
85	1714.999996	-0.002	1774.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1717.500002	0.001	1772.500003	0.001
10	1717.500002	0.001	1772.500001	0.001
35	1717.500002	0.001	1772.500001	0.001

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1717.500003	0.002	1772.500004	0.002
-30	1717.500004	0.002	1772.500003	0.002
-20	1717.500003	0.002	1772.500002	0.001
-10	1717.500002	0.001	1772.500001	0.001
0	1717.500003	0.001	1772.500001	0.001
10	1717.500002	0.001	1772.500004	0.002
20	1717.499999	-0.001	1772.499999	-0.001
30	1717.499998	-0.001	1772.499997	-0.002
40	1717.499998	-0.001	1772.499997	-0.001
50	1717.499998	-0.001	1772.499998	-0.001
60	1717.499997	-0.002	1772.499997	-0.002
70	1717.499996	-0.002	1772.499996	-0.002
80	1717.499997	-0.002	1772.499997	-0.002
85	1717.499999	-0.001	1772.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	1720.000003	0.001	1770.000002	0.001
10	1720.000001	0.001	1770.000001	0.001
35	1720.000001	0.001	1770.000003	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1720.000003	0.002	1770.000002	0.001
-30	1720.000002	0.001	1770.000001	0.001
-20	1720.000004	0.002	1770.000003	0.002
-10	1720.000003	0.001	1770.000003	0.002
0	1720.000004	0.002	1770.000004	0.002
10	1720.000002	0.001	1770.000001	0.001
20	1719.999996	-0.002	1769.999997	-0.002
30	1719.999996	-0.002	1769.999996	-0.002
40	1719.999998	-0.001	1769.999997	-0.002
50	1719.999997	-0.002	1769.999999	-0.001
60	1719.999998	-0.001	1769.999998	-0.001
70	1719.999999	-0.001	1769.999997	-0.002
80	1719.999996	-0.002	1769.999999	-0.001
85	1719.999998	-0.001	1769.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	665.500003	0.004	695.500001	0.001
10	665.500002	0.002	695.500002	0.003
35	665.500002	0.003	695.500002	0.002

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	665.500003	0.005	695.500003	0.004
-30	665.500002	0.003	695.500003	0.005
-20	665.500003	0.005	695.500002	0.003
-10	665.500003	0.005	695.500001	0.002
0	665.500002	0.003	695.500002	0.003
10	665.500002	0.003	695.500001	0.002
20	665.499998	-0.003	695.499997	-0.005
30	665.499997	-0.005	695.499999	-0.002
40	665.499996	-0.005	695.499998	-0.003
50	665.499999	-0.002	695.499997	-0.004
60	665.499998	-0.004	695.499998	-0.003
70	665.499997	-0.005	695.499998	-0.003
80	665.499997	-0.005	695.499999	-0.002
85	665.499996	-0.006	695.499999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	668.000003	0.004	693.000004	0.006
10	668.000004	0.006	693.000002	0.002
35	668.000001	0.002	693.000003	0.005

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	668.000002	0.002	693.000004	0.005
-30	668.000003	0.004	693.000002	0.003
-20	668.000003	0.004	693.000004	0.006
-10	668.000003	0.004	693.000004	0.006
0	668.000004	0.005	693.000003	0.005
10	668.000002	0.003	693.000003	0.004
20	667.999998	-0.003	692.999997	-0.005
30	667.999997	-0.005	692.999996	-0.005
40	667.999998	-0.003	692.999999	-0.001
50	667.999999	-0.002	692.999998	-0.002
60	667.999997	-0.005	692.999997	-0.005
70	667.999997	-0.005	692.999999	-0.002
80	667.999997	-0.005	692.999996	-0.006
85	667.999997	-0.005	692.999997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	670.500002	0.003	690.500002	0.002
10	670.500001	0.002	690.500003	0.005
35	670.500001	0.001	690.500002	0.003

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	670.500003	0.004	690.500002	0.003
-30	670.500003	0.004	690.500003	0.005
-20	670.500002	0.002	690.500003	0.004
-10	670.500004	0.006	690.500001	0.002
0	670.500002	0.003	690.500002	0.003
10	670.500002	0.003	690.500002	0.003
20	670.499997	-0.005	690.499999	-0.002
30	670.499997	-0.005	690.499996	-0.006
40	670.499998	-0.004	690.499997	-0.004
50	670.499997	-0.004	690.499997	-0.005
60	670.499997	-0.005	690.499999	-0.002
70	670.499996	-0.006	690.499998	-0.003
80	670.499997	-0.005	690.499997	-0.005
85	670.499999	-0.001	690.499999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
12	673.000003	0.004	688.000002	0.003
10	673.000001	0.002	688.000003	0.005
35	673.000002	0.002	688.000003	0.005

Note: The applicant defined the normal working voltage is from 10Vdc to 35Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 71			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	673.000003	0.005	688.000002	0.002
-30	673.000002	0.003	688.000003	0.004
-20	673.000001	0.002	688.000002	0.003
-10	673.000003	0.004	688.000002	0.003
0	673.000003	0.004	688.000002	0.002
10	673.000004	0.006	688.000002	0.003
20	672.999999	-0.002	687.999998	-0.003
30	672.999999	-0.002	687.999997	-0.005
40	672.999996	-0.005	687.999997	-0.005
50	672.999997	-0.005	687.999996	-0.006
60	672.999997	-0.005	687.999998	-0.002
70	672.999996	-0.006	687.999998	-0.002
80	672.999999	-0.002	687.999996	-0.006
85	672.999997	-0.005	687.999997	-0.005

4.4 Occupied Bandwidth Measurement

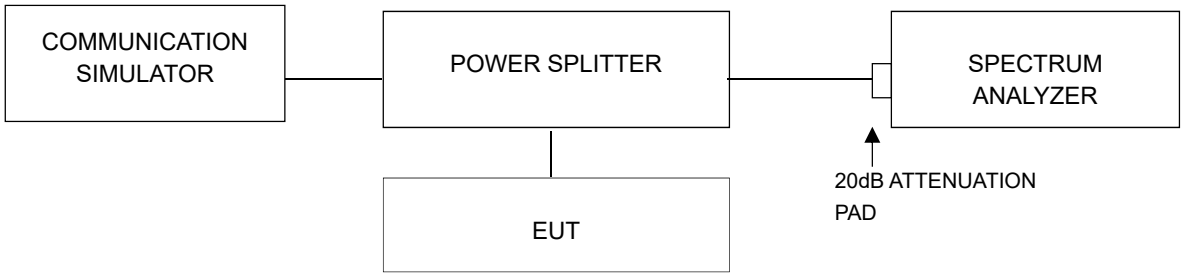
4.4.1 Limits of Occupied Bandwidth Measurement

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

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz and VBW = 160kHz for WCDMA; with RBW = 30kHz and VBW = 100kHz (Channel Bandwidth: 1.4MHz), RBW = 62kHz and VBW = 200kHz (Channel Bandwidth: 3MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 5MHz), RBW = 200kHz and VBW = 1MHz (Channel Bandwidth: 10MHz), RBW = 300kHz and VBW = 1MHz (Channel Bandwidth: 15MHz) and RBW = 430kHz and VBW = 1.3MHz (Channel Bandwidth: 20MHz). The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.4.3 Test Setup



4.4.4 Test Result

Occupied Bandwidth

WCDMA Band 4

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
1312	1712.4	4.14	4.14	4.14
1413	1732.6	4.13	4.13	4.14
1513	1752.6	4.14	4.14	4.14

Spectrum Plot of Worst Value

WCDMA

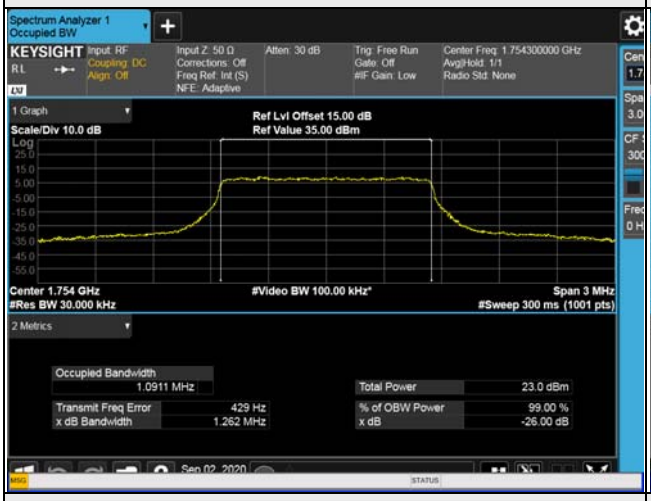
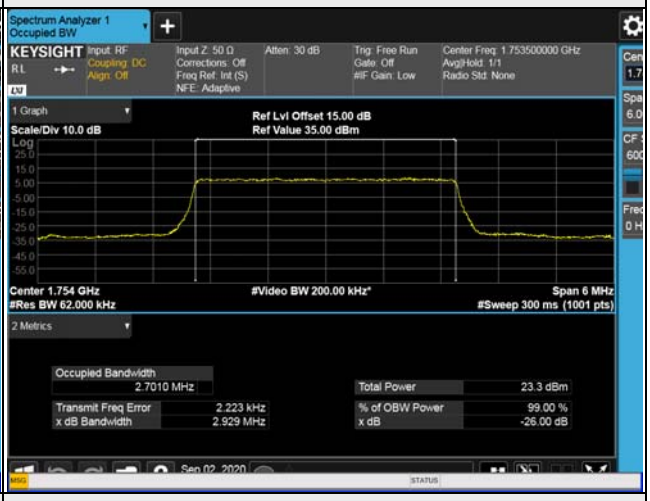
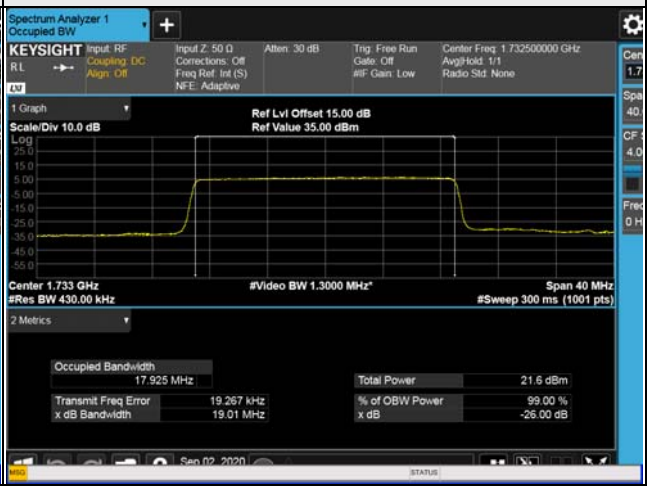
HSDPA

HSUPA

LTE Band 4

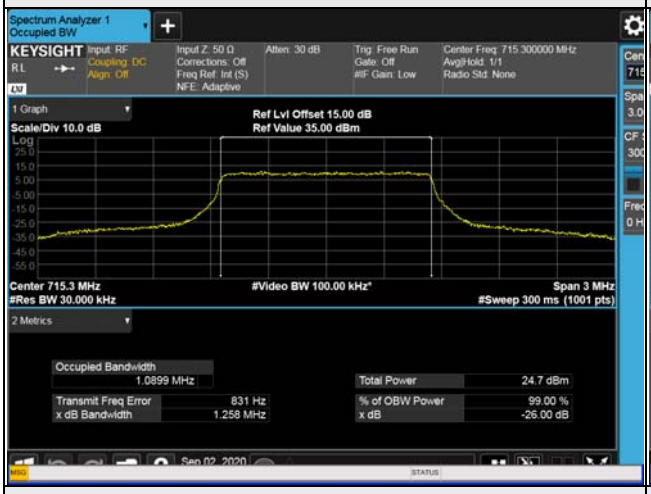
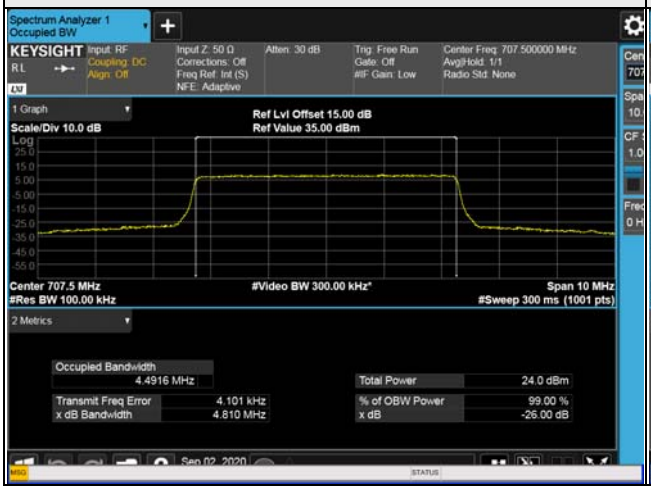
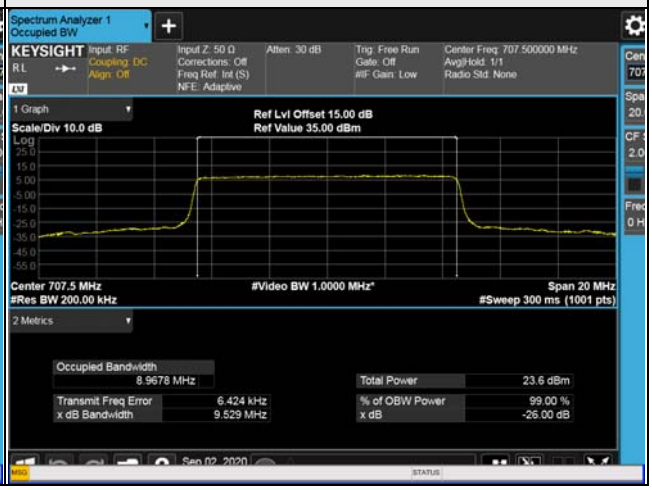
LTE Band 4, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
19957	1710.7	1.09	1.09
20175	1732.5	1.09	1.09
20393	1754.3	1.09	1.09
LTE Band 4, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
19965	1711.5	2.70	2.70
20175	1732.5	2.70	2.70
20385	1753.5	2.70	2.70
LTE Band 4, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
19975	1712.5	4.49	4.49
20175	1732.5	4.49	4.49
20375	1752.5	4.49	4.49
LTE Band 4, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20000	1715.0	8.95	8.95
20175	1732.5	8.95	8.95
20350	1750.0	8.95	8.95
LTE Band 4, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20025	1717.5	13.43	13.41
20175	1732.5	13.44	13.43
20325	1747.5	13.42	13.40

LTE Band 4, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20050	1720.0	17.88	17.91
20175	1732.5	17.91	17.93
20300	1745.0	17.85	17.87

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / QPSK
	
5MHz / 16QAM	10MHz / QPSK
	
15MHz / QPSK	20MHz / 16QAM
	

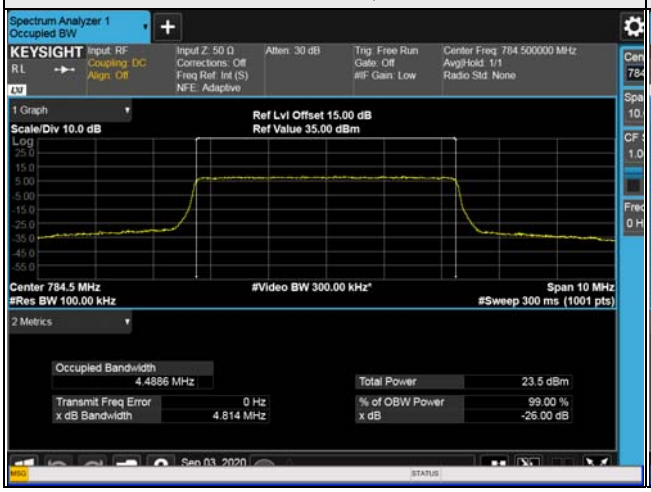
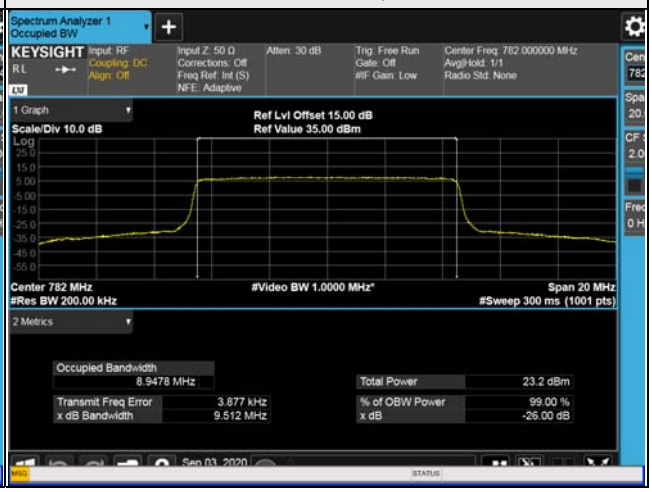
LTE Band 12

LTE Band 12, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23017	699.7	1.09	1.09
23095	707.5	1.09	1.09
23173	715.3	1.09	1.09
LTE Band 12, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23025	700.5	2.70	2.69
23095	707.5	2.70	2.70
23165	714.5	2.70	2.70
LTE Band 12, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23035	701.5	4.49	4.49
23095	707.5	4.49	4.49
23155	713.5	4.49	4.49
LTE Band 12, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23060	704.0	8.96	8.96
23095	707.5	8.96	8.97
23130	711.0	8.94	8.94

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / QPSK
	
5MHz / 16QAM	10MHz / 16QAM
	

LTE Band 13

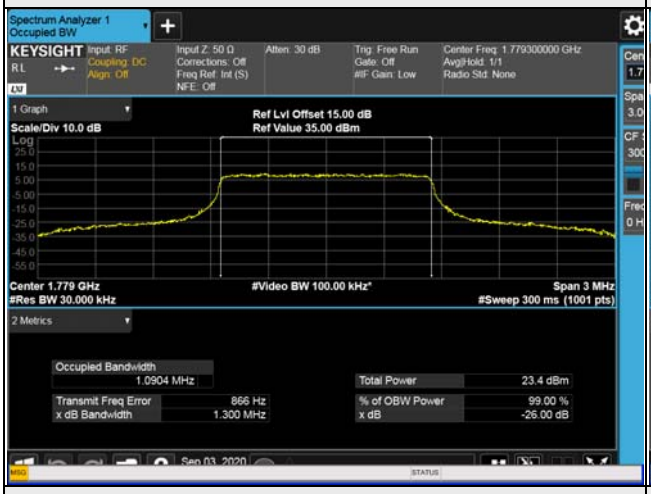
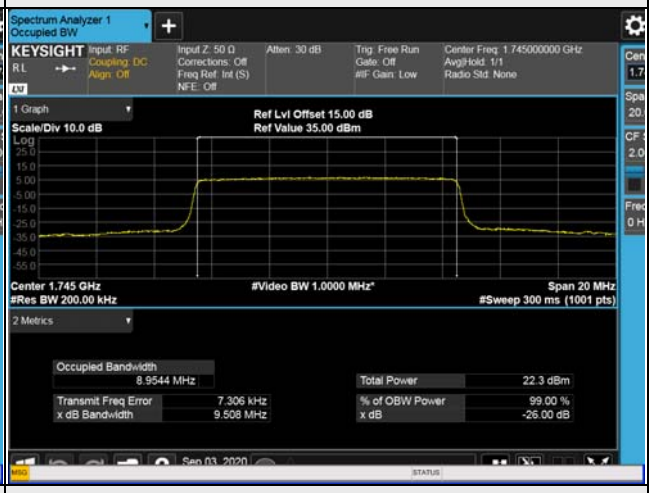
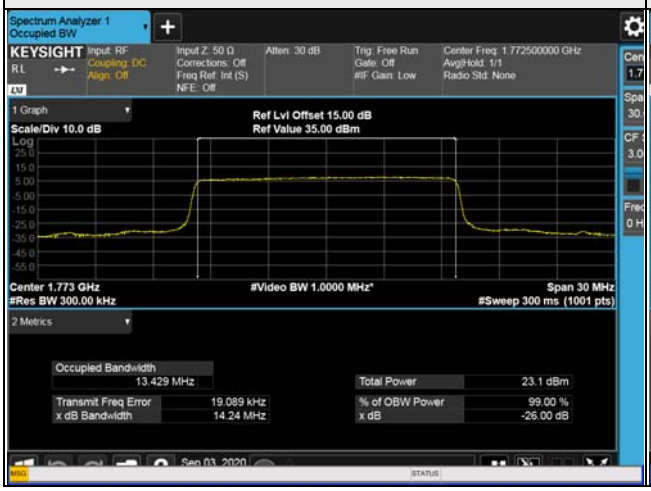
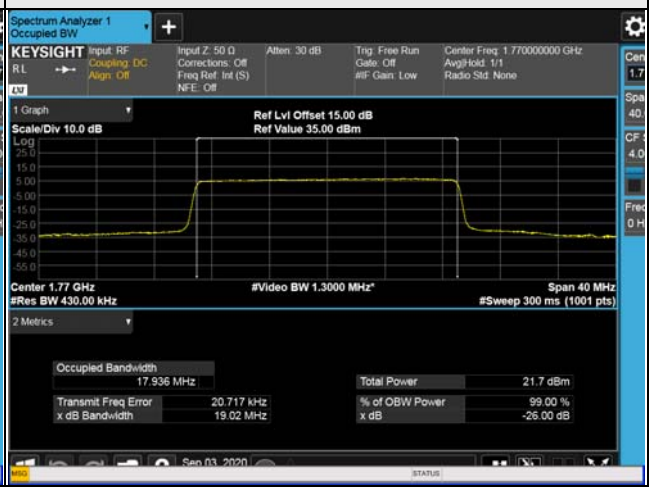
LTE Band 13, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23205	779.5	4.49	4.49
23230	782.0	4.49	4.49
23255	784.5	4.49	4.49
LTE Band 13, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23230	782.0	8.95	8.95

Spectrum Plot of Worst Value	
5MHz / 16QAM	10MHz / 16QAM
	

LTE Band 66

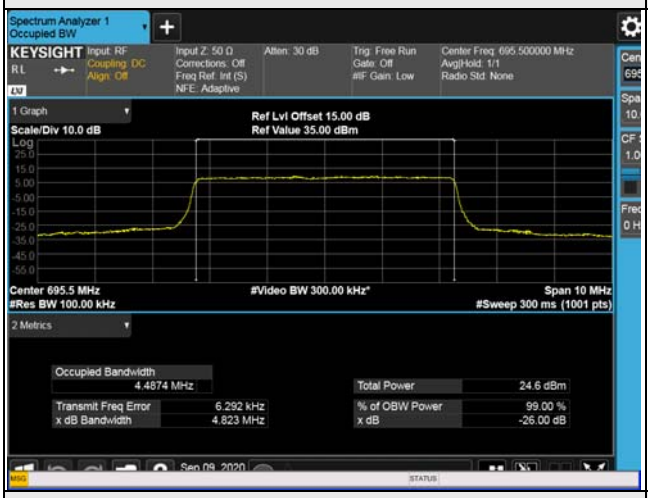
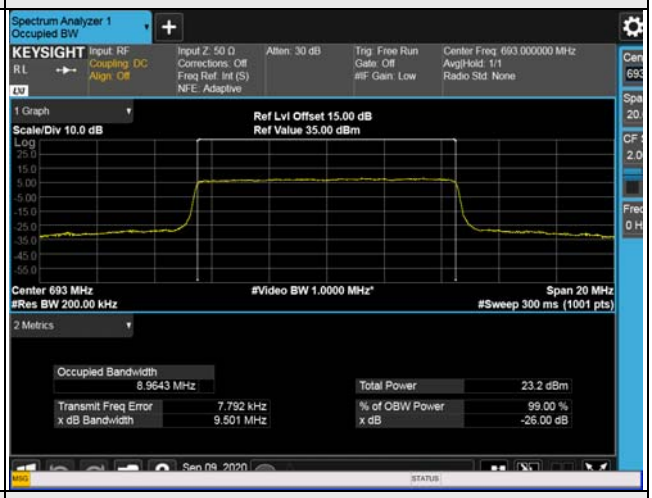
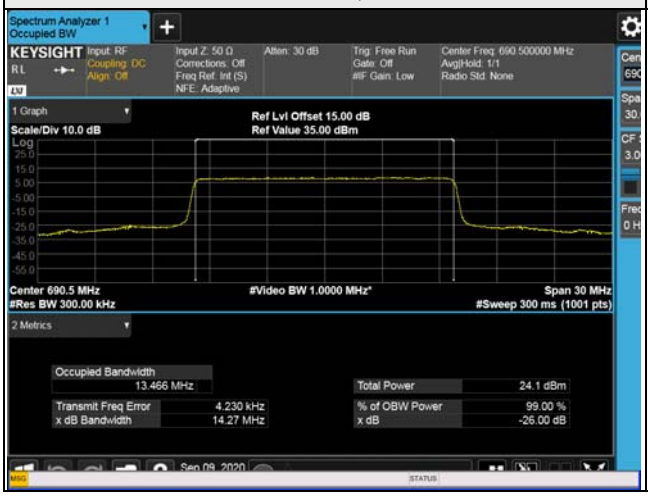
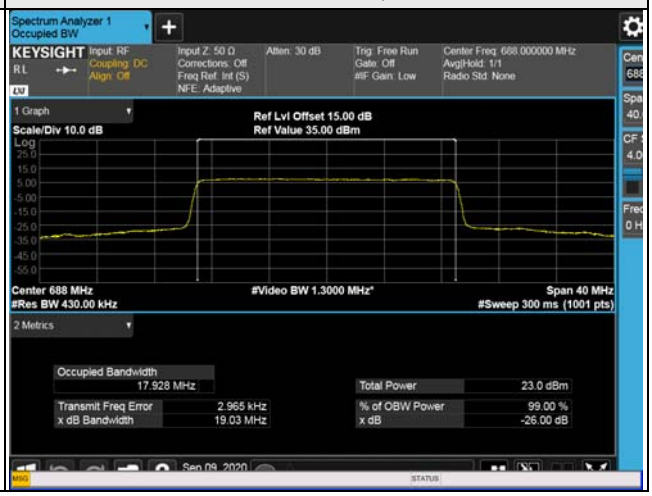
LTE Band 66, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
131979	1710.7	1.09	1.09
132322	1745.0	1.09	1.09
132665	1779.3	1.09	1.09
LTE Band 66, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
131987	1711.5	2.70	2.70
132322	1745.0	2.70	2.70
132657	1778.5	2.70	2.70
LTE Band 66, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
131997	1712.5	4.49	4.49
132322	1745.0	4.49	4.49
132647	1777.5	4.49	4.49
LTE Band 66, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
132022	1715.0	8.94	8.95
132322	1745.0	8.95	8.95
132622	1775.0	8.94	8.95
LTE Band 66, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
132047	1717.5	13.43	13.41
132322	1745.0	13.42	13.40
132597	1772.5	13.43	13.42

LTE Band 66, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
132072	1720.0	17.88	17.90
132322	1745.0	17.85	17.87
132572	1770.0	17.91	17.94

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / QPSK
	
5MHz / 16QAM	10MHz / 16QAM
	
15MHz / QPSK	20MHz / 16QAM
	

LTE Band 71

LTE Band 71, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
133147	665.5	4.48	4.49
133297	680.5	4.48	4.48
133447	695.5	4.49	4.49
LTE Band 71, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
133172	668	8.94	8.94
133297	680.5	8.93	8.93
133422	693	8.96	8.96
LTE Band 71, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
133197	670.5	13.45	13.43
133297	680.5	13.40	13.39
133397	690.5	13.47	13.45
LTE Band 71, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
133222	673	17.88	17.90
133297	680.5	17.83	17.85
133372	688	17.86	17.93

Spectrum Plot of Worst Value	
5MHz / QPSK	10MHz / 16QAM
	
15MHz / QPSK	20MHz / 16QAM
	

26dB Bandwidth

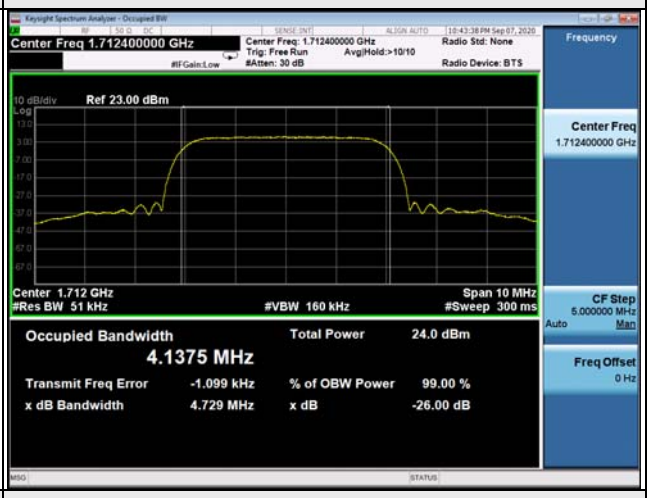
WCDMA Band 4

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
1312	1712.4	4.72	4.73	4.73
1413	1732.6	4.70	4.70	4.70
1513	1752.6	4.72	4.72	4.72

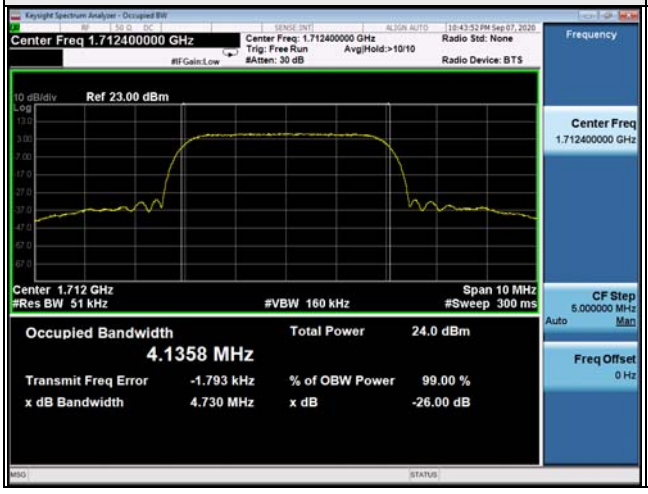
Spectrum Plot of Worst Value

WCDMA

HSDPA



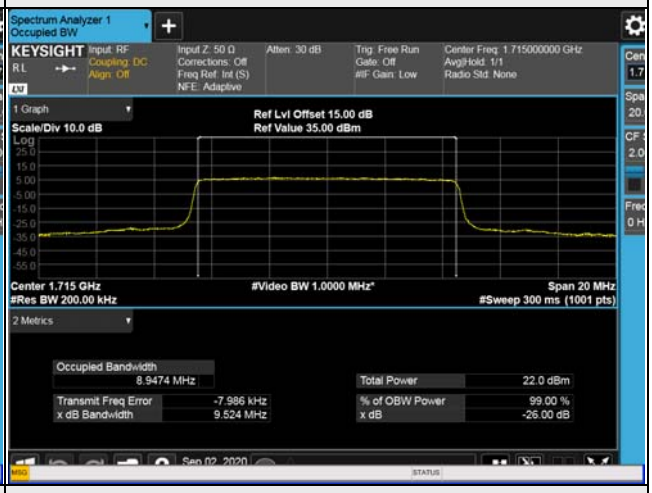
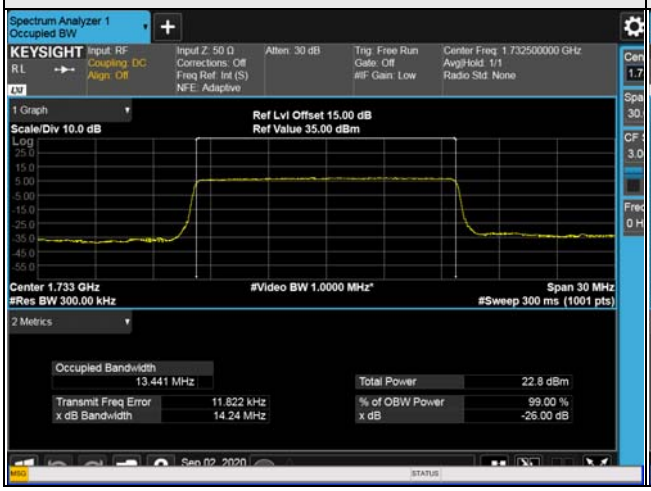
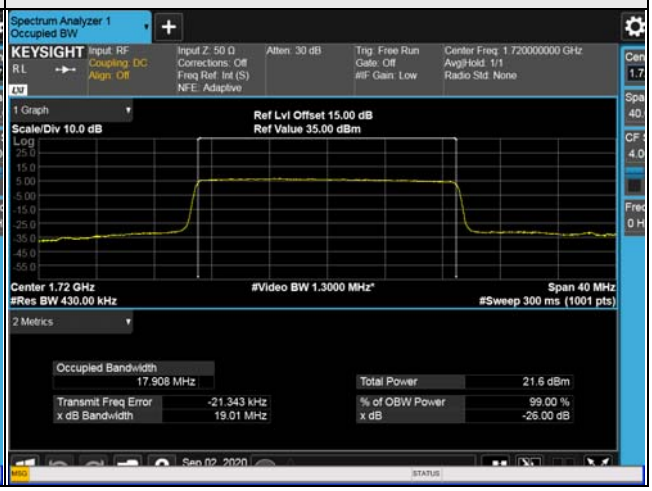
HSUPA



LTE Band 4

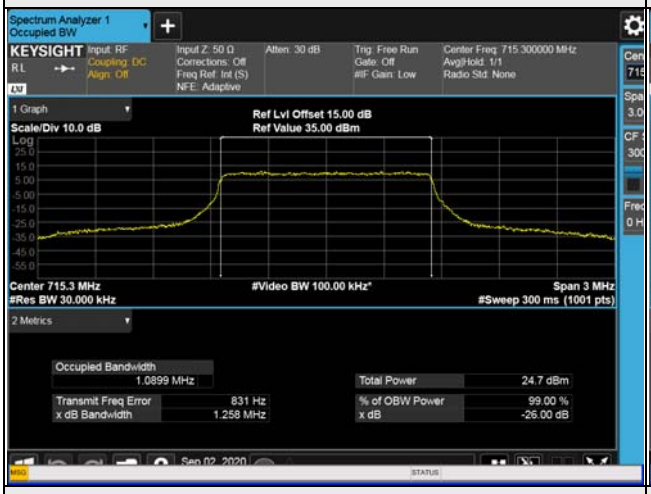
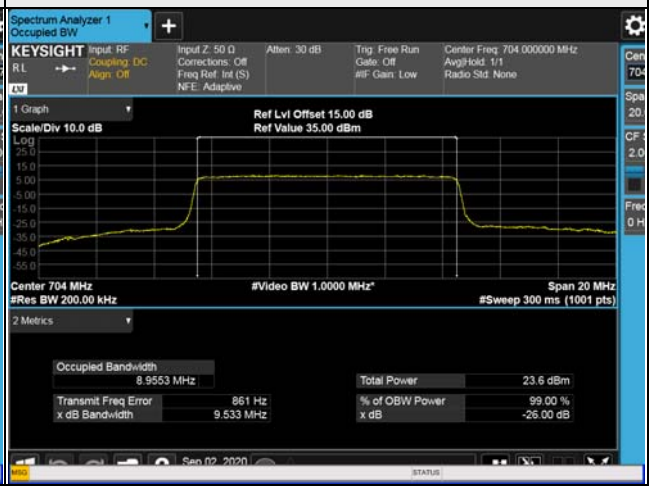
LTE Band 4, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
19957	1710.7	1.26	1.26
20175	1732.5	1.25	1.27
20393	1754.3	1.26	1.26
LTE Band 4, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
19965	1711.5	2.92	2.93
20175	1732.5	2.93	2.94
20385	1753.5	2.93	2.93
LTE Band 4, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
19975	1712.5	4.84	4.83
20175	1732.5	4.82	4.84
20375	1752.5	4.83	4.82
LTE Band 4, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20000	1715.0	9.51	9.52
20175	1732.5	9.51	9.50
20350	1750.0	9.51	9.52
LTE Band 4, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20025	1717.5	14.23	14.22
20175	1732.5	14.24	14.23
20325	1747.5	14.21	14.23

LTE Band 4, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20050	1720.0	19.00	19.01
20175	1732.5	19.01	19.01
20300	1745.0	18.98	18.97

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / 16QAM
	
5MHz / 16QAM	10MHz / 16QAM
	
15MHz / QPSK	20MHz / 16QAM
	

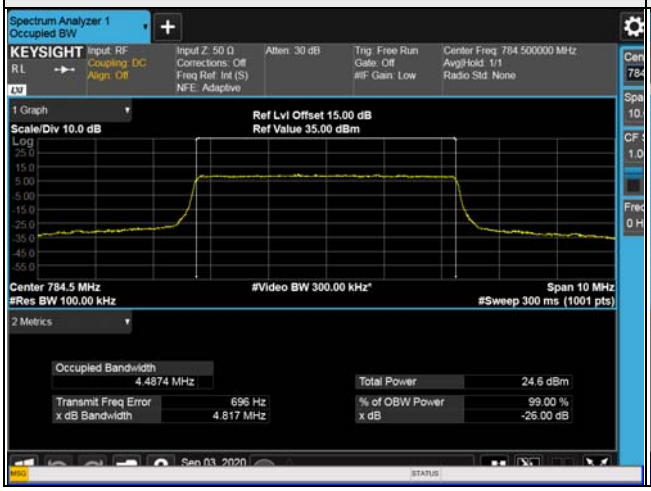
LTE Band 12

LTE Band 12, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23017	699.7	1.24	1.25
23095	707.5	1.25	1.25
23173	715.3	1.26	1.26
LTE Band 12, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23025	700.5	2.91	2.92
23095	707.5	2.92	2.92
23165	714.5	2.94	2.92
LTE Band 12, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23035	701.5	4.80	4.80
23095	707.5	4.83	4.81
23155	713.5	4.80	4.82
LTE Band 12, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23060	704.0	9.52	9.53
23095	707.5	9.52	9.53
23130	711.0	9.50	9.49

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / QPSK
	
5MHz / QPSK	10MHz / 16QAM
	

LTE Band 13

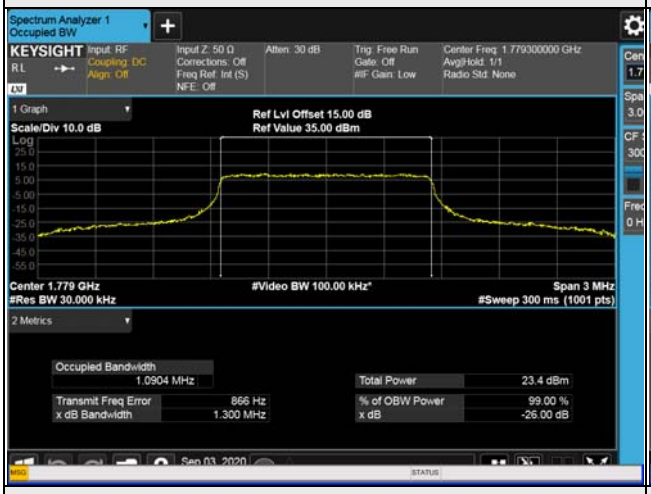
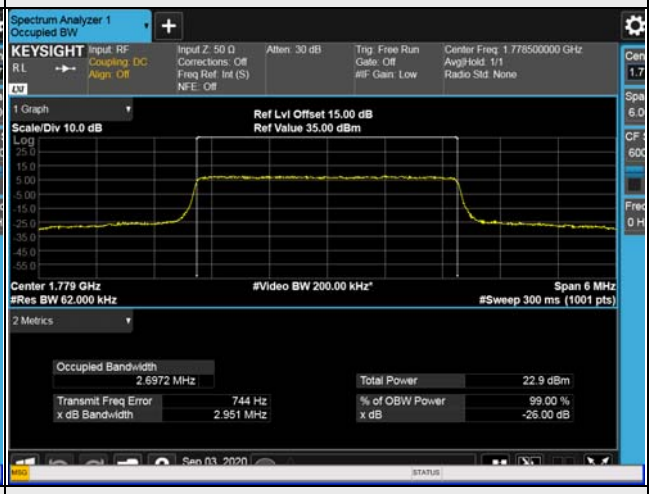
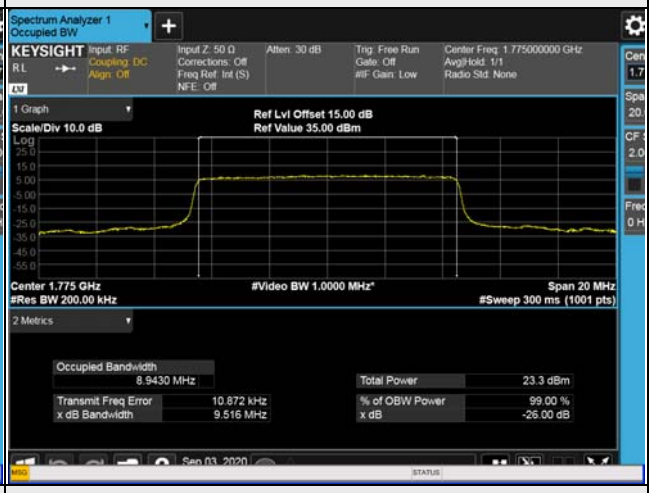
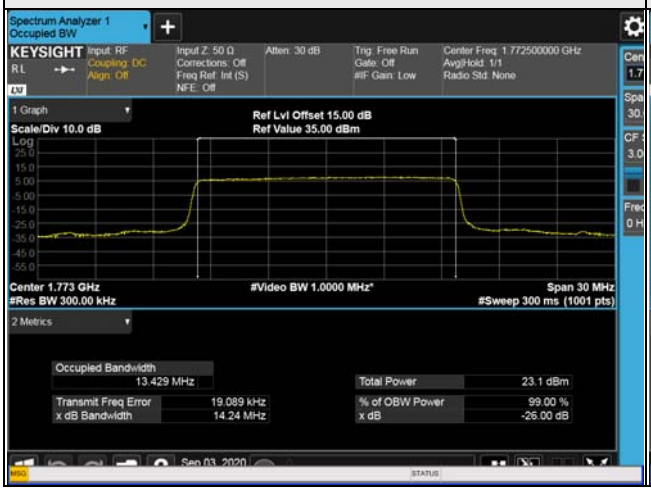
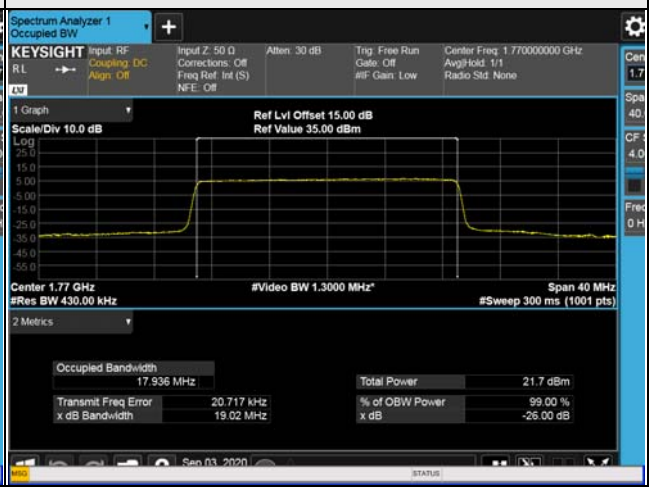
LTE Band 13, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23205	779.5	4.81	4.81
23230	782.0	4.81	4.81
23255	784.5	4.82	4.81
LTE Band 13, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23230	782.0	9.49	9.51

Spectrum Plot of Worst Value	
5MHz / QPSK	10MHz / 16QAM
	

LTE Band 66

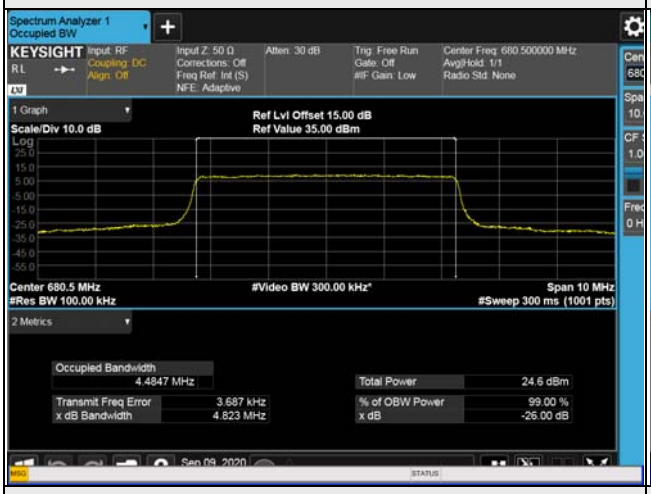
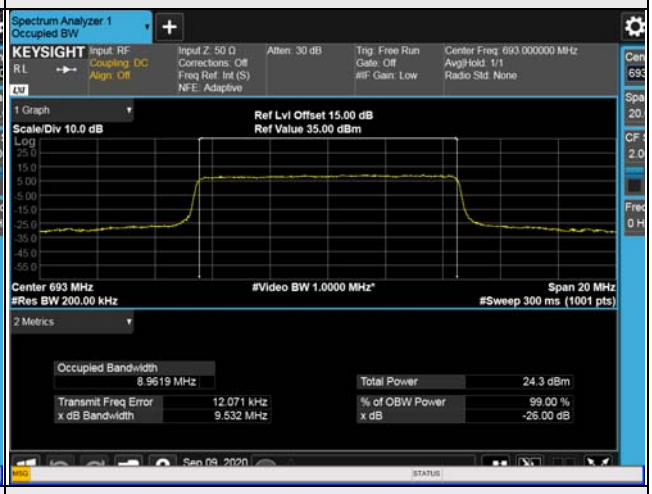
LTE Band 66, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
131979	1710.7	1.26	1.27
132322	1745.0	1.27	1.26
132665	1779.3	1.28	1.30
LTE Band 66, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
131987	1711.5	2.93	2.93
132322	1745.0	2.92	2.93
132657	1778.5	2.94	2.95
LTE Band 66, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
131997	1712.5	4.83	4.82
132322	1745.0	4.81	4.82
132647	1777.5	4.82	4.84
LTE Band 66, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
132022	1715.0	9.51	9.51
132322	1745.0	9.51	9.51
132622	1775.0	9.52	9.50
LTE Band 66, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
132047	1717.5	14.23	14.21
132322	1745.0	14.23	14.22
132597	1772.5	14.24	14.23

LTE Band 66, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
132072	1720.0	19.00	19.01
132322	1745.0	18.98	18.99
132572	1770.0	19.02	19.02

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / 16QAM
	
5MHz / 16QAM	10MHz / QPSK
	
15MHz / QPSK	20MHz / 16QAM
	

LTE Band 71

LTE Band 71, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
133147	665.5	4.81	4.81
133297	680.5	4.82	4.81
133447	695.5	4.82	4.81
LTE Band 71, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
133172	668	9.51	9.51
133297	680.5	9.49	9.50
133422	693	9.53	9.50
LTE Band 71, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
133197	670.5	14.24	14.24
133297	680.5	14.21	14.22
133397	690.5	14.27	14.24
LTE Band 71, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
133222	673	19.02	19.03
133297	680.5	18.97	18.96
133372	688	18.98	19.03

Spectrum Plot of Worst Value	
5MHz / QPSK	10MHz / QPSK
	
15MHz / QPSK	20MHz / 16QAM