

FCC Test Report (Part 27)

Report No.: RF200428C03-2

FCC ID: PZWBHTM80QWG

Test Model: BHT-M80-QWG

Received Date: Apr. 28, 2020

Test Date: May 05 ~ Jul. 10, 2020 (Test Mode A)
Oct. 21, 2020 (Test Mode B, C)

Issued Date: Oct. 28, 2020

Applicant: DENSO WAVE INCORPORATED

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FCC Registration / 788550 / TW0003

Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RF200428C03-2	Original release	Oct. 28, 2020

1 Certificate of Conformity

Product: 2D Code Handy Terminal

Brand: DENSO

Test Model: BHT-M80-QWG

Sample Status: Engineering sample

Applicant: DENSO WAVE INCORPORATED

Test Date: May 05 ~ Jul. 10, 2020 (Test Mode A)
Oct. 21, 2020 (Test Mode B, C)

Standards: FCC Part 27, Subpart C, F, H, L, M

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

Prepared by : Pettie Chen, **Date:** Oct. 28, 2020
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Oct. 28, 2020
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2						Test Item	Result	Remarks
FCC Clause								
LTE B4	LTE B12	LTE B13	LTE B17	LTE B7				
2.1046 27.50 (d)(4)	2.1046 27.50 (c)	2.1046 27.50 (b)	2.1046 27.50 (c)	2.1046 27.50 (h)(2)	Equivalent Isotropically Radiated Power / Equivalent Radiated Power	Pass	Meet the requirement of limit.	
2.1047	2.1047	2.1047	2.1047	2.1047	Modulation Characteristics	Pass	Meet the requirement of limit.	
27.50 (d)(5)	----	----	----	----	Peak To Average Ratio	Pass	Meet the requirement of limit.	
2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	Pass	Meet the requirement of limit.	
2.1049	2.1049	2.1049	2.1049	2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.	
2.1051 27.53(h)	2.1051 27.53(g)	2.1051 27.53(c)	2.1051 27.53(g)	2.1051 27.53 (m)(4)(6)	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(g)	2.1051 27.53 (m)(4)(6)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.	
2.1053 27.53(h)	2.1053 27.53(g)	2.1053 27.53(c)(f)	2.1053 27.53(g)	2.1053 27.53 (m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -1.4dB at 1564.00MHz.	

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (\pm)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101582	Mar. 31, 2020	Mar. 30, 2021
MXG Vector signal generator Agilent	N5182B	MY53050162	Jan. 14, 2020	Jan. 13, 2021
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Feb. 13, 2020	Feb. 12, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Nov. 08, 2019	Nov. 07, 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 TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
			Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jul. 11, 2019	Jul. 10, 2020
			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)	Jul. 11, 2019	Jul. 10, 2020
			Jan. 18, 2020	Jan. 17, 2021
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 30, 2019	Jul. 29, 2020
			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
Standard Temperature And Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 12, 2019	Dec. 11, 2020
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 27, 2019	Jun. 26, 2020
			Jun. 23, 2020	Jun. 22, 2021
DC power supply Keysight	U8002A	MY56330015	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.

3 General Information

3.1 General Description of EUT

Product	2D Code Handy Terminal		
Brand	DENSO		
Test Model	BHT-M80-QWG		
Status of EUT	Engineering Sample		
Power Supply Rating	3.85Vdc (Battery) 5.0Vdc / 9.0Vdc / 12.0Vdc (from adapter)		
Modulation Type	QPSK, 16QAM		
Operating Frequency	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 7	Channel Bandwidth 5MHz	2502.5MHz ~ 2567.5MHz
		Channel Bandwidth 10MHz	2505.0MHz ~ 2565.0MHz
		Channel Bandwidth 15MHz	2507.5MHz ~ 2562.5MHz
		Channel Bandwidth 20MHz	2510.0MHz ~ 2560.0MHz
	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 17	Channel Bandwidth 5MHz	706.5MHz ~ 713.5MHz
		Channel Bandwidth 10MHz	709.0MHz ~ 711.0MHz

Max. EIRP Power			QPSK	16QAM
	Max. EIRP Power	LTE Band 4	Channel Bandwidth 1.4MHz	144.544mW (21.6dBm)
Channel Bandwidth 3MHz			134.896mW (21.3dBm)	109.648mW (20.4dBm)
Channel Bandwidth 5MHz			144.544mW (21.6dBm)	114.815mW (20.6dBm)
Channel Bandwidth 10MHz			138.038mW (21.4dBm)	112.202mW (20.5dBm)
Channel Bandwidth 15MHz			141.254mW (21.5dBm)	112.202mW (20.5dBm)
Channel Bandwidth 20MHz			134.896mW (21.3dBm)	109.648mW (20.4dBm)
LTE Band 7		Channel Bandwidth 5MHz	169.824mW (22.3dBm)	131.826mW (21.2dBm)
		Channel Bandwidth 10MHz	165.959mW (22.2dBm)	134.896mW (21.3dBm)
		Channel Bandwidth 15MHz	158.489mW (22.0dBm)	128.825mW (21.1dBm)
		Channel Bandwidth 20MHz	177.828mW (22.5dBm)	134.896mW (21.3dBm)
Max. ERP Power			QPSK	16QAM
	LTE Band 12	Channel Bandwidth 1.4MHz	91.201mW (19.6dBm)	70.795mW (18.5dBm)
		Channel Bandwidth 3MHz	97.724mW (19.9dBm)	81.283mW (19.1dBm)
		Channel Bandwidth 5MHz	87.096mW (19.4dBm)	67.608mW (18.3dBm)
		Channel Bandwidth 10MHz	95.499mW (19.8dBm)	74.131mW (18.7dBm)
	LTE Band 13	Channel Bandwidth 5MHz	112.202mW (20.5dBm)	91.201mW (19.6dBm)
		Channel Bandwidth 10MHz	112.202mW (20.5dBm)	85.114mW (19.3dBm)
	LTE Band 17	Channel Bandwidth 5MHz	87.096mW (19.4dBm)	69.183mW (18.4dBm)
		Channel Bandwidth 10MHz	93.325mW (19.7dBm)	75.858mW (18.8dBm)

Emission Designator		QPSK		16QAM	
			Channel Bandwidth		
LTE Band 4		1.4MHz	1M09G7D	1M09D7W	
		3MHz	2M71G7D	2M70D7W	
		5MHz	4M50G7D	4M50D7W	
		10MHz	8M98G7D	8M98D7W	
		15MHz	13M5G7D	13M5D7W	
		20MHz	17M9G7D	18M0D7W	
LTE Band 7		5MHz	4M49G7D	4M50D7W	
		10MHz	8M97G7D	8M98D7W	
		15MHz	13M5G7D	13M5D7W	
		20MHz	17M9G7D	18M0D7W	
LTE Band 12		1.4MHz	1M09G7D	1M09D7W	
		3MHz	2M70G7D	2M70D7W	
		5MHz	4M49G7D	4M49D7W	
		10MHz	8M97G7D	8M97D7W	
LTE Band 13		5MHz	4M49G7D	4M50D7W	
		10MHz	8M94G7D	8M95D7W	
LTE Band 17		5MHz	4M50G7D	4M50D7W	
		10MHz	8M97G7D	8M97D7W	
Antenna Type	Refer to note				
Antenna Connector	Refer to note				
Accessory Device	Refer to note				
Cable Supplied	Refer to note				

Note:

- The EUT contains following accessory devices.

Battery 1	
Brand	DENSO
Model	BT1
Rating	3.85Vdc, 4020mAh, 15.47Wh

Battery 2	
Brand	DENSO
Model	BT1S
Rating	3.85Vdc, 2900mAh, 11.16Wh

Adapter	
Brand	CHANNEL WELL TECHNOLOGY
Model	2ACP0183C
Input Power	100-240Vac~0.5A , 50/60Hz
Output Power	5.0Vdc / 3.0A, 15.0W 9.0Vdc / 2.0A, 18.0W 12.0Vdc / 1.5A, 18.0W
Data Cable	1.45 m shielded USB cable without core

Cradle 1: QC3.0 charge single Cradle (Option)	
Brand	DENSO
Model	CU-M80UQ
Adapter	
Brand	CHANNEL WELL TECHNOLOGY
Model	2ACP0183C
Input Power	100-240Vac, 50/60Hz, 0.5A
Output Power	5.0Vdc / 3.0A, 15.0W 9.0Vdc / 2.0A, 18.0W 12.0Vdc / 1.5A, 18.0W
Data Cable	1.45 m shielded USB cable without core

Cradle 2: USB Cradle with spare battery charge (Option)	
Brand	DENSO
Model	CU-M80U
Adapter	
Brand	Sunny
Model	SYS1548-5012-T3
Input Power	100-240Vac, 1.5A MAX, 50-60Hz
Output Power	+12.0Vdc, 4.16A
Power cable	DC: 1.16m cable with one core AC: 1.71m non-shielded cable without core
Data Cable	1.45 m shielded USB cable without core

2. The EUT uses the following antennas.

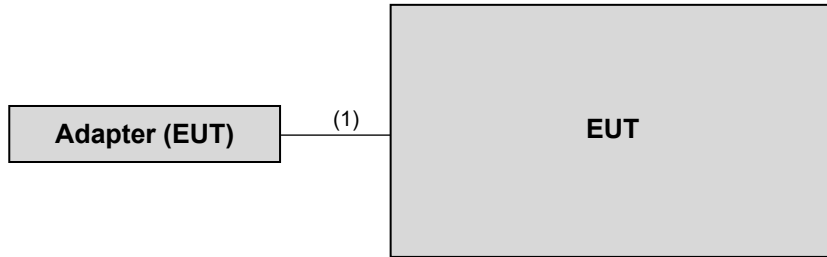
Ant. Type	PIFA		
Ant. Connector	Spring		
LTE Band 4			
Frequency (MHz)	1710	1732	1755
Peak Gain (dBi)	1.23	1.15	1.10
LTE Band 7			
Frequency (MHz)	2500	2535	2570
Peak Gain (dBi)	2.51	2.19	2.40
LTE Band 12			
Frequency (MHz)	698	707	716
Peak Gain (dBi)	-1.23	-0.94	-0.69
LTE Band 13			
Frequency (MHz)	777	782	787
Peak Gain (dBi)	0.31	0.58	0.40
LTE Band 17			
Frequency (MHz)	704	710	716
Peak Gain (dBi)	-0.84	-0.73	-0.69

* The max. gain was chosen for final tests.

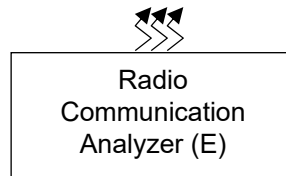
* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Configuration of System under Test

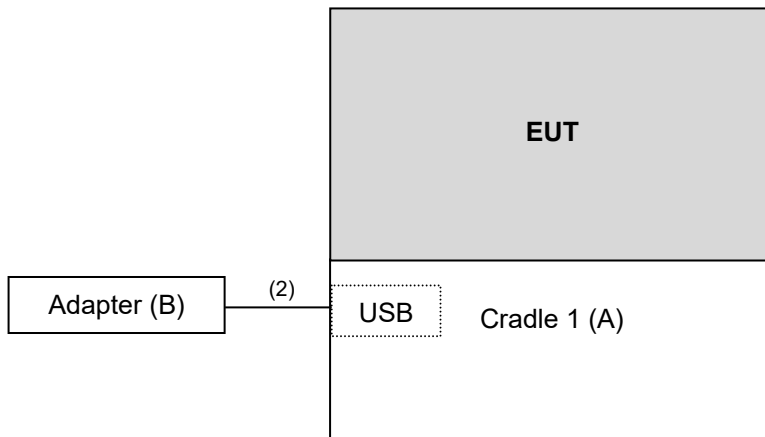
Mode A



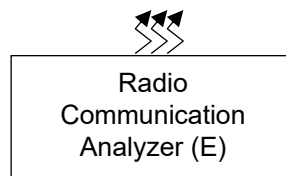
Remote site



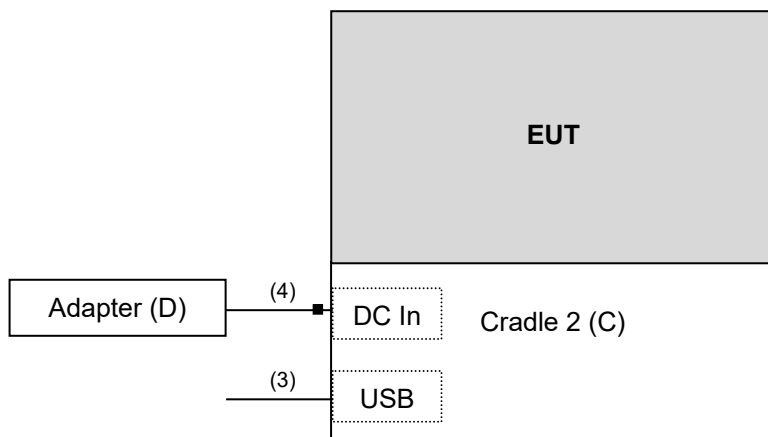
Mode B



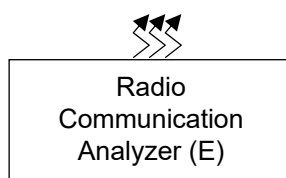
Remote site



Mode C



Remote site



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Cradle 1	DENSO	CU-M80UQ	NA	NA	Provided by manufacturer
B.	Adapter	CWT	2ACP0183C	NA	NA	Provided by manufacturer
C.	Cradle 2	DENSO	CU-M80U	NA	NA	Provided by manufacturer
D.	Adapter	Sunny	SYS1548-5012-T3	NA	NA	Provided by manufacturer
E.	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	NA	-

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	1.45	Y	0	Accessory of EUT
2.	USB cable	1	1.45	Y	0	Provided by manufacturer
3.	USB cable	1	1.45	Y	0	Provided by manufacturer
4.	Power cable	1	1.16	-	1	Provided by manufacturer

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 X-plane (For LTE Band 4, 7) and Y-plane (For LTE Band 12, 13, 17). Following channel(s) was (were) selected for the final test as listed below.

Test results are presented in the report as below.

Test Mode	Test Condition
A	EUT with adapter
B	EUT with Cradle 1
C	EUT with Cradle 2

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	EIRP	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 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 / 0 RB Offset
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050(1720.0MHz), 20175(1732.5MHz), 20300(1745.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Modulation Characteristics	20050 to 20300	20175(1732.5MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
A	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

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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	Conducted Emission	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965(1711.5MHz), 20175(1732.5MHz), 20385(1753.5MHz)	3MHz	QPSK	1 RB / 0 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 / 0 RB Offset
		20025 to 20325	20025(1717.5MHz), 20175(1732.5MHz), 20325(1747.5MHz)	15MHz	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
A	Radiated Emission Below 1GHz	20050 to 20300	20175(1732.5MHz)	20MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Above 1GHz	19957 to 20393	19957(1710.7MHz), 20175(1732.5MHz), 20393(1754.3MHz)	1.4MHz	QPSK	1 RB / 0 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 above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test. For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.
2. 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 7

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
A	EIRP	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Modulation Characteristics	20850 to 21350	21100 (2535.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
A	Frequency Stability	20775 to 21425	20775 (2502.5MHz), 21425 (2567.5MHz)	5 MHz	QPSK	25 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21400 (2565.0MHz)	10 MHz	QPSK	50 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21375 (2562.5MHz)	15 MHz	QPSK	75 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK	100 RB / 0 RB Offset
A	Emission Bandwidth	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	QPSK / 16QAM	50 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK / 16QAM	100 RB / 0 RB Offset
A	Emission Mask	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK	1 RB / 0 RB Offset 1 RB / 99 RB Offset 100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
A	Peak to Average Ratio	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Conducted Emission	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset
		20800 to 21400	20800 (2505.0MHz), 21100 (2535.0MHz), 21400 (2565.0MHz)	10 MHz	QPSK	1 RB / 0 RB Offset
		20825 to 21375	20825 (2507.5MHz), 21100 (2535.0MHz), 21375 (2562.5MHz)	15 MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK	1 RB / 0 RB Offset
A, B, C	Radiated Emission Below 1GHz	20775 to 21425	21100 (2535.0MHz)	5 MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Above 1GHz	20775 to 21425	20775 (2502.5MHz), 21100 (2535.0MHz), 21425 (2567.5MHz)	5 MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	20850 (2510.0MHz), 21100 (2535.0MHz), 21350 (2560.0MHz)	20 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. 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. For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.
2. 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
A	ERP	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5 MHz), 23130(711.0 MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Modulation Characteristics	23060 to 23130	23095(707.5MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
A	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
A	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
A	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

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
A	Peak to Average Ratio	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Conducted Emission	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025(700.5MHz), 23095(707.5MHz), 23165(714.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Below 1GHz	23035 to 23155	23155(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Above 1GHz	23017 to 23173	23017(699.7MHz), 23095(707.5MHz), 23173(715.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035(701.5MHz), 23095(707.5MHz), 23155(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060(704.0MHz), 23095(707.5MHz), 23130(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset

Note:

1. 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. For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.
2. 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
A	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
A	Modulation Characteristics	23230	23230(782.0MHz),	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
A	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
A	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
A	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
A	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
A	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
A	Radiated Emission Below 1GHz	23230	23230(782.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
A	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 above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the 5MHz & highest channel bandwidth for final test. For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.
2. 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 17

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
A	ERP	23755 to 23825	23755(706.5MHz), 23790(710.0MHz), 23825(713.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23790(710.0MHz), 23800(711.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Modulation Characteristics	23780 to 23800	23790(710.0MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
A	Frequency Stability	23755 to 23825	23755(706.5MHz), 23825(713.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23800(711.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
A	Emission Bandwidth	23755 to 23825	23755(706.5MHz), 23790(710.0MHz), 23825(713.5MHz)	5MHz	QPSK / 16QAM	25 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23790(710.0MHz), 23800(711.0MHz)	10MHz	QPSK / 16QAM	50 RB / 0 RB Offset
A	Band Edge	23755 to 23825	23755(706.5MHz), 23825(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23800(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
A	Peak to Average Ratio	23755 to 23825	23755(706.5MHz), 23790(710.0MHz), 23825(713.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23790(710.0MHz), 23800(711.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Conducted Emission	23755 to 23825	23755(706.5MHz), 23790(710.0MHz), 23825(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23790(710.0MHz), 23800(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Below 1GHz	23780 to 23800	23800(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Above 1GHz	23755 to 23825	23755(706.5MHz), 23790(710.0MHz), 23825(713.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780(709.0MHz), 23790(710.0MHz), 23800(711.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset

Note:

1. 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. For radiated emissions below 1 GHz, select the worst radiated emission (above 1GHz) channel for final testing.
2. 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	22deg. C, 66%RH	120Vac, 60Hz	Han Wu
Modulation characteristics	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Frequency Stability	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Conducted Emission	24deg. C, 64%RH	120Vac, 60Hz	James Yang
Radiated Emission	22deg. C, 66%RH 22deg. C, 68%RH	120Vac, 60Hz	Han Wu Greg Lin

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

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

LTE Band 4:

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

LTE Band 12, LTE Band 13, LTE Band 17:

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 MHz band are limited to 3 watts ERP.

LTE Band 7:

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

4.1.2 Test Procedures

EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW is 5MHz, 10MHz, 15MHz, 20MHz for LTE Mode, and VBW $\geq 3 \times$ RBW.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15\text{dBi}$.

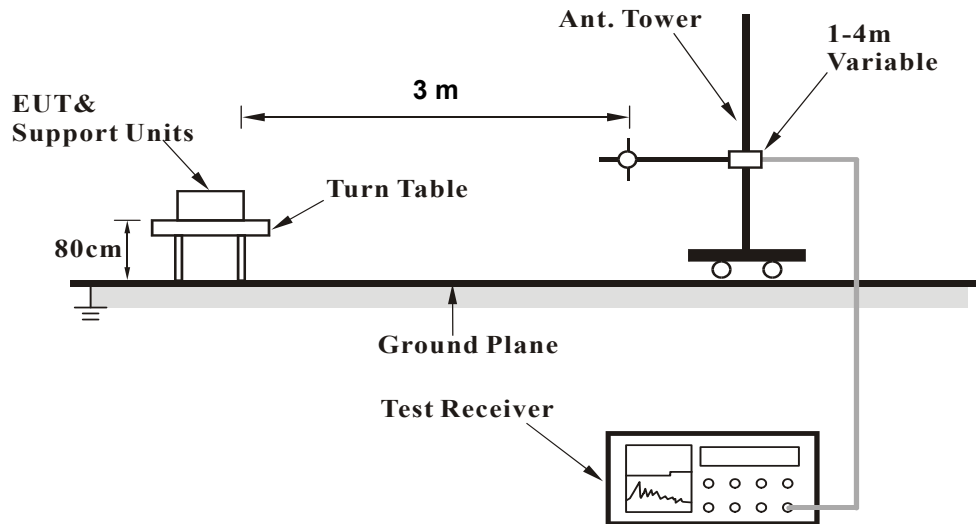
Conducted Power Measurement:

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

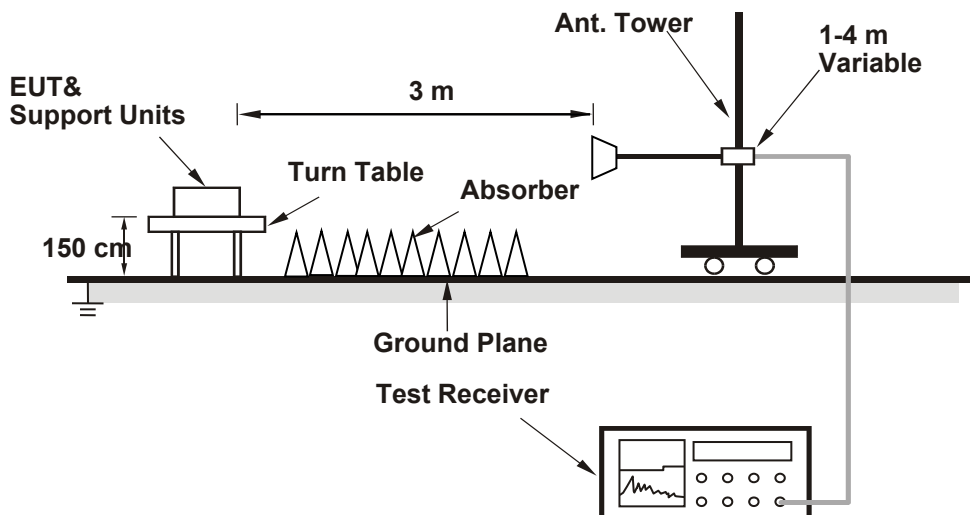
4.1.3 Test Setup

EIRP/ERP Measurement:

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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)

LTE Band 4						
BW	MCS Index	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	23.27	23.30	23.26
		1	2	23.36	23.34	23.35
		1	5	23.28	23.23	23.17
		3	0	23.38	23.27	23.21
		3	1	23.34	23.26	23.36
		3	3	23.29	23.14	23.22
		6	0	22.27	22.22	22.33
	16QAM	1	0	22.46	22.38	22.41
		1	2	22.40	22.37	22.32
		1	5	22.28	22.29	22.34
		3	0	22.34	22.29	22.26
		3	1	22.31	22.24	22.36
		3	3	22.33	22.23	22.28
		6	0	21.36	21.27	21.21

LTE Band 4						
BW	MCS Index	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	23.29	23.23	23.39
		1	7	23.37	23.15	23.22
		1	14	23.33	23.21	23.22
		8	0	22.32	22.26	22.32
		8	3	22.25	22.31	22.26
		8	7	22.28	22.23	22.34
		15	0	22.24	22.23	22.31
	16QAM	1	0	22.27	22.35	22.29
		1	7	22.36	22.32	22.29
		1	14	22.31	22.25	22.36
		8	0	21.33	21.38	21.35
		8	3	21.41	21.34	21.39
		8	7	21.36	21.34	21.22
		15	0	21.38	21.23	21.25

LTE Band 4						
BW	MCS Index	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	23.29	23.30	23.11
		1	12	23.30	23.20	23.05
		1	24	23.14	23.29	23.14
		12	0	22.36	22.43	22.14
		12	6	22.32	22.33	22.30
		12	13	22.37	22.20	22.08
		25	0	22.30	22.27	22.21
	16QAM	1	0	22.31	22.39	22.35
		1	12	22.35	22.29	22.31
		1	24	22.36	22.18	22.26
		12	0	21.35	21.34	21.32
		12	6	21.35	21.29	21.33
		12	13	21.29	21.26	21.30
		25	0	21.35	21.26	21.34

LTE Band 4						
BW	MCS Index	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	23.41	23.32	23.33
		1	24	23.34	23.20	23.16
		1	49	23.32	23.25	23.16
		25	0	22.25	22.32	22.35
		25	12	22.28	22.31	22.25
		25	25	22.34	22.30	22.17
		50	0	22.25	22.19	22.27
	16QAM	1	0	22.33	22.34	22.30
		1	24	22.32	22.27	22.29
		1	49	22.31	22.28	22.32
		25	0	21.34	21.31	21.32
		25	12	21.37	21.31	21.26
		25	25	21.28	21.31	21.26
		50	0	21.29	21.24	21.20

LTE Band 4						
BW	MCS Index	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	23.42	23.39	23.37
		1	37	23.40	23.30	23.35
		1	74	23.37	23.35	23.26
		36	0	22.45	22.34	22.42
		36	19	22.42	22.41	22.38
		36	39	22.31	22.27	22.29
		75	0	22.37	22.29	22.33
	16QAM	1	0	22.43	22.42	22.43
		1	37	22.45	22.35	22.45
		1	74	22.36	22.37	22.36
		36	0	21.41	21.37	21.45
		36	19	21.40	21.38	21.43
		36	39	21.38	21.29	21.31
		75	0	21.35	21.32	21.37

LTE Band 4						
BW	MCS Index	Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	23.45	23.41	23.42
		1	50	23.41	23.37	23.38
		1	99	23.39	23.35	23.36
		50	0	22.47	22.43	22.44
		50	25	22.45	22.41	22.42
		50	50	22.41	22.37	22.38
		100	0	22.43	22.39	22.40
	16QAM	1	0	22.49	22.47	22.48
		1	50	22.49	22.45	22.46
		1	99	22.45	22.41	22.42
		50	0	21.50	21.46	21.47
		50	25	21.47	21.43	21.44
		50	50	21.41	21.37	21.38
		100	0	21.43	21.39	21.40

LTE Band 7						
BW	MCS Index	Channel		20775	21100	21425
		Frequency (MHz)		2502.5	2535	2567.5
5M	QPSK	1	0	23.45	23.70	23.51
		1	12	23.56	23.68	23.52
		1	24	23.41	23.61	23.48
		12	0	22.56	22.62	22.62
		12	6	22.62	22.58	22.54
		12	13	22.59	22.69	22.56
		25	0	22.59	22.68	22.55
	16QAM	1	0	22.73	22.77	22.76
		1	12	22.72	22.74	22.78
		1	24	22.56	22.84	22.65
		12	0	21.81	21.79	21.73
		12	6	21.66	21.70	21.70
		12	13	21.63	21.72	21.69
		25	0	21.65	21.78	21.71

LTE Band 7						
BW	MCS Index	Channel		20800	21100	21400
		Frequency (MHz)		2505	2535	2565
10M	QPSK	1	0	23.50	23.65	23.66
		1	24	23.52	23.58	23.52
		1	49	23.38	23.66	23.62
		25	0	22.62	22.66	22.64
		25	12	22.64	22.76	22.72
		25	25	22.62	22.65	22.58
		50	0	22.50	22.65	22.68
	16QAM	1	0	22.72	22.76	22.79
		1	24	22.76	22.80	22.84
		1	49	22.59	22.78	22.70
		25	0	21.70	21.89	21.69
		25	12	21.75	21.73	21.81
		25	25	21.61	21.80	21.70
		50	0	21.63	21.65	21.76

LTE Band 7						
BW	MCS Index	Channel		20825	21100	21375
		Frequency (MHz)		2507.5	2535	2562.5
15M	QPSK	1	0	23.62	23.69	23.74
		1	37	23.55	23.70	23.66
		1	74	23.55	23.71	23.63
		36	0	22.72	22.75	22.77
		36	19	22.69	22.76	22.68
		36	39	22.62	22.70	22.71
		75	0	22.57	22.73	22.65
	16QAM	1	0	22.81	22.88	22.83
		1	37	22.77	22.86	22.87
		1	74	22.72	22.80	22.74
		36	0	21.78	21.86	21.89
		36	19	21.80	21.81	21.77
		36	39	21.69	21.77	21.82
		75	0	21.78	21.85	21.80

LTE Band 7						
BW	MCS Index	Channel		20850	21100	21350
		Frequency (MHz)		2510	2535	2560
20M	QPSK	1	0	23.68	23.78	23.74
		1	50	23.65	23.75	23.71
		1	99	23.62	23.72	23.68
		50	0	22.73	22.83	22.79
		50	25	22.71	22.81	22.77
		50	50	22.68	22.78	22.74
		100	0	22.67	22.77	22.73
	16QAM	1	0	22.83	22.93	22.89
		1	50	22.81	22.91	22.87
		1	99	22.78	22.88	22.84
		50	0	21.83	21.93	21.89
		50	25	21.81	21.91	21.87
		50	50	21.77	21.87	21.83
		100	0	21.79	21.89	21.85

LTE Band 12						
BW	MCS Index	Channel		23017	23095	23173
		Frequency (MHz)		699.7	707.5	715.3
1.4M	QPSK	1	0	23.38	23.37	23.29
		1	2	23.38	23.29	23.22
		1	5	23.25	23.25	23.23
		3	0	23.30	23.38	23.39
		3	1	23.29	23.29	23.43
		3	3	23.26	23.20	23.28
		6	0	22.29	22.21	22.26
	16QAM	1	0	22.31	22.33	22.37
		1	2	22.27	22.31	22.37
		1	5	22.23	22.27	22.34
		3	0	22.43	22.35	22.35
		3	1	22.28	22.21	22.41
		3	3	22.35	22.19	22.41
		6	0	21.17	21.30	21.32

LTE Band 12						
BW	MCS Index	Channel		23025	23095	23165
		Frequency (MHz)		700.5	707.5	714.5
3M	QPSK	1	0	23.32	23.39	23.40
		1	7	23.30	23.18	23.28
		1	14	23.31	23.26	23.34
		8	0	22.26	22.30	22.48
		8	3	22.28	22.34	22.33
		8	7	22.30	22.36	22.38
		15	0	22.27	22.24	22.32
	16QAM	1	0	22.30	22.33	22.33
		1	7	22.27	22.20	22.34
		1	14	22.21	22.29	22.26
		8	0	21.32	21.32	21.48
		8	3	21.34	21.43	21.34
		8	7	21.22	21.28	21.29
		15	0	21.26	21.34	21.34

LTE Band 12						
BW	MCS Index	Channel		23035	23095	23155
		Frequency (MHz)		701.5	707.5	713.5
5M	QPSK	1	0	23.42	23.36	23.42
		1	12	23.35	23.39	23.43
		1	24	23.35	23.28	23.37
		12	0	22.35	22.45	22.46
		12	6	22.36	22.36	22.45
		12	13	22.31	22.39	22.35
		25	0	22.36	22.35	22.37
	16QAM	1	0	22.36	22.42	22.43
		1	12	22.39	22.39	22.36
		1	24	22.35	22.27	22.30
		12	0	21.44	21.45	21.43
		12	6	21.37	21.42	21.45
		12	13	21.31	21.33	21.38
		25	0	21.38	21.35	21.45

LTE Band 12						
BW	MCS Index	Channel		23060	23095	23130
		Frequency (MHz)		704	707.5	711
10M	QPSK	1	0	23.42	23.44	23.47
		1	24	23.39	23.41	23.44
		1	49	23.36	23.38	23.41
		25	0	22.44	22.46	22.49
		25	12	22.41	22.43	22.46
		25	25	22.37	22.39	22.42
		50	0	22.39	22.41	22.44
	16QAM	1	0	22.44	22.46	22.49
		1	24	22.40	22.42	22.45
		1	49	22.35	22.37	22.40
		25	0	21.45	21.47	21.50
		25	12	21.42	21.44	21.47
		25	25	21.39	21.41	21.44
		50	0	21.41	21.43	21.46

LTE Band 13						
BW	MCS Index	Channel		23205	23230	23255
		Frequency (MHz)		779.5	782	784.5
5M	QPSK	1	0	23.21	23.34	23.22
		1	12	23.14	23.20	23.13
		1	24	23.01	23.08	23.05
		12	0	22.24	22.30	22.12
		12	6	22.32	22.42	22.23
		12	13	22.24	22.32	22.21
		25	0	22.15	22.36	22.17
	16QAM	1	0	22.13	22.26	22.15
		1	12	22.32	22.41	22.23
		1	24	22.14	22.23	22.28
		12	0	21.25	21.38	21.29
		12	6	21.23	21.33	21.26
		12	13	21.11	21.39	21.29
		25	0	21.12	21.27	21.26

LTE Band 13				
BW	MCS Index	Channel		23230
		Frequency (MHz)		782
10M	QPSK	1	0	23.37
		1	24	23.34
		1	49	23.31
		25	0	22.45
		25	12	22.42
		25	25	22.36
		50	0	22.41
	16QAM	1	0	22.46
		1	24	22.43
		1	49	22.40
		25	0	21.47
		25	12	21.44
		25	25	21.41
		50	0	21.42

LTE Band 17						
BW	MCS Index	Channel		23755	23790	23825
		Frequency (MHz)		706.5	710	713.5
5M	QPSK	1	0	23.22	23.33	23.24
		1	12	23.25	23.30	23.22
		1	24	23.27	23.33	23.31
		12	0	22.26	22.32	22.35
		12	6	22.32	22.35	22.08
		12	13	22.19	22.28	22.26
		25	0	22.34	22.34	22.32
	16QAM	1	0	22.33	22.40	22.28
		1	12	22.23	22.33	22.30
		1	24	22.19	22.24	22.27
		12	0	21.29	21.36	21.19
		12	6	21.23	21.26	21.32
		12	13	21.18	21.28	21.27
		25	0	21.23	21.33	21.31

LTE Band 17						
BW	MCS Index	Channel		23780	23790	23800
		Frequency (MHz)		709	710	711
10M	QPSK	1	0	23.43	23.48	23.46
		1	24	23.41	23.46	23.44
		1	49	23.38	23.43	23.41
		25	0	22.43	22.48	22.46
		25	12	22.40	22.45	22.43
		25	25	22.36	22.41	22.39
		50	0	22.39	22.44	22.42
	16QAM	1	0	22.43	22.48	22.46
		1	24	22.40	22.45	22.43
		1	49	22.36	22.41	22.39
		25	0	21.41	21.46	21.44
		25	12	21.37	21.42	21.40
		25	25	21.34	21.39	21.37
		50	0	21.39	21.44	21.42

EIRP/ERP Power(dBm)

Modulation Type: QPSK

LTE Band 4

Channel Bandwidth: 1.4MHz

MODE		TX channel 19957, 20175, 20393					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1710.70	-17.6	20.4	0.7	21.1	30.0	-8.9
2	1732.50	-17.4	21.0	0.6	21.6	30.0	-8.4
3	1754.30	-18.4	20.4	0.5	20.9	30.0	-9.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1710.70	-18.6	19.2	0.7	19.9	30.0	-10.1
2	1732.50	-19.4	18.9	0.6	19.5	30.0	-10.5
3	1754.30	-19.4	19.5	0.5	20.0	30.0	-10.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 3MHz

MODE		TX channel 19965, 20175, 20385					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1711.50	-17.5	20.5	0.7	21.2	30.0	-8.8
2	1732.50	-17.7	20.7	0.6	21.3	30.0	-8.7
3	1753.50	-18.0	20.8	0.5	21.3	30.0	-8.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1711.50	-18.7	19.1	0.7	19.8	30.0	-10.2
2	1732.50	-19.7	18.6	0.6	19.2	30.0	-10.8
3	1753.50	-19.9	19.0	0.5	19.5	30.0	-10.5

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 5MHz

MODE		TX channel 19975, 20175, 20375					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1712.50	-17.2	20.9	0.7	21.6	30.0	-8.4
2	1732.50	-17.8	20.6	0.6	21.2	30.0	-8.8
3	1752.50	-17.8	21.0	0.5	21.5	30.0	-8.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1712.50	-19.0	18.9	0.7	19.6	30.0	-10.4
2	1732.50	-19.5	18.8	0.6	19.4	30.0	-10.6
3	1752.50	-19.8	19.0	0.5	19.5	30.0	-10.5

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 20000, 20175, 20350					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1715.00	-17.5	20.6	0.7	21.3	30.0	-8.7
2	1732.50	-17.7	20.7	0.6	21.3	30.0	-8.7
3	1750.00	-17.9	20.9	0.5	21.4	30.0	-8.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1715.00	-18.7	19.2	0.7	19.9	30.0	-10.1
2	1732.50	-19.2	19.1	0.6	19.7	30.0	-10.3
3	1750.00	-19.4	19.4	0.5	19.9	30.0	-10.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 15MHz

MODE		TX channel 20025, 20175, 20325					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1717.50	-17.3	20.8	0.7	21.5	30.0	-8.5
2	1732.50	-18.2	20.2	0.6	20.8	30.0	-9.2
3	1747.50	-18.4	20.3	0.5	20.8	30.0	-9.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1717.50	-19.0	19.0	0.7	19.7	30.0	-10.3
2	1732.50	-19.4	18.9	0.6	19.5	30.0	-10.5
3	1747.50	-19.4	19.3	0.5	19.8	30.0	-10.2

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 20MHz

MODE		TX channel 20050, 20175, 20300					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1720.00	-17.8	20.4	0.7	21.1	30.0	-8.9
2	1732.50	-17.7	20.7	0.6	21.3	30.0	-8.7
3	1745.00	-18.1	20.6	0.5	21.1	30.0	-8.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1720.00	-19.3	18.7	0.7	19.4	30.0	-10.6
2	1732.50	-19.3	19.0	0.6	19.6	30.0	-10.4
3	1745.00	-19.3	19.4	0.5	19.9	30.0	-10.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 7

Channel Bandwidth: 5MHz

MODE		TX channel 20775, 21100, 21425					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2502.50	-19.4	22.1	0.2	22.3	33.0	-10.7
2	2535.00	-20.1	21.6	0.2	21.8	33.0	-11.2
3	2567.50	-20.3	21.7	0.2	21.9	33.0	-11.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2502.50	-22.4	21.1	0.2	21.3	33.0	-11.7
2	2535.00	-22.7	20.9	0.2	21.1	33.0	-11.9
3	2567.50	-23.2	20.5	0.2	20.7	33.0	-12.3

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 2080, 21100, 21400					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2505.00	-19.9	21.6	0.2	21.8	33.0	-11.2
2	2535.00	-20.3	21.4	0.2	21.6	33.0	-11.4
3	2565.00	-20.0	22.0	0.2	22.2	33.0	-10.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2505.00	-22.4	21.1	0.2	21.3	33.0	-11.7
2	2535.00	-22.5	21.1	0.2	21.3	33.0	-11.7
3	2565.00	-23.3	20.4	0.2	20.6	33.0	-12.4

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 15MHz

MODE		TX channel 20825, 21100, 21375					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2507.50	-20.0	21.5	0.2	21.7	33.0	-11.3
2	2535.00	-19.9	21.8	0.2	22.0	33.0	-11.0
3	2562.50	-20.4	21.6	0.2	21.8	33.0	-11.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2507.50	-22.4	21.1	0.2	21.3	33.0	-11.7
2	2535.00	-22.5	21.1	0.2	21.3	33.0	-11.7
3	2562.50	-23.3	20.4	0.2	20.6	33.0	-12.4

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 20MHz

MODE		TX channel 20850, 21100, 21350					
Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-19.2	22.3	0.2	22.5	33.0	-10.5
2	2535.00	-20.0	21.7	0.2	21.9	33.0	-11.1
3	2560.00	-20.1	21.8	0.2	22.0	33.0	-11.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-22.8	20.7	0.2	20.9	33.0	-12.1
2	2535.00	-22.9	20.7	0.2	20.9	33.0	-12.1
3	2560.00	-22.7	21.0	0.2	21.2	33.0	-11.8

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12

Channel Bandwidth: 1.4MHz

MODE		TX channel 23017, 23095, 23173					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	699.70	-8.4	16.1	3.5	19.6	34.8	-15.2
2	707.50	-9.1	15.6	3.5	19.1	34.8	-15.7
3	715.30	-9.3	15.7	3.5	19.2	34.8	-15.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	699.70	-13.3	14.2	3.5	17.7	34.8	-17.1
2	707.50	-13.6	14.2	3.5	17.7	34.8	-17.1
3	715.30	-13.5	14.1	3.5	17.6	34.8	-17.2

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 3MHz

MODE		TX channel 23025, 23095, 23165					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	700.50	-8.1	16.4	3.5	19.9	34.8	-14.9
2	707.50	-9.1	15.6	3.5	19.1	34.8	-15.7
3	714.50	-8.7	16.3	3.5	19.8	34.8	-15.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	700.50	-13.4	14.2	3.5	17.7	34.8	-17.1
2	707.50	-13.9	13.9	3.5	17.4	34.8	-17.4
3	714.50	-14.0	13.6	3.5	17.1	34.8	-17.7

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 5MHz

MODE		TX channel 23035, 23095, 23155					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-8.6	16.0	3.4	19.4	34.8	-15.4
2	707.50	-8.9	15.8	3.5	19.3	34.8	-15.5
3	713.50	-9.5	15.5	3.5	19.0	34.8	-15.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-13.1	14.6	3.4	18.0	34.8	-16.8
2	707.50	-13.6	14.1	3.5	17.6	34.8	-17.2
3	713.50	-13.6	14.1	3.5	17.6	34.8	-17.2

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 23060, 23095, 23130					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-8.8	15.9	3.5	19.4	34.8	-15.4
2	707.50	-8.9	15.8	3.5	19.3	34.8	-15.5
3	711.00	-8.7	16.3	3.5	19.8	34.8	-15.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-13.6	14.0	3.5	17.5	34.8	-17.3
2	707.50	-13.9	13.9	3.5	17.4	34.8	-17.4
3	711.00	-13.2	14.4	3.5	17.9	34.8	-16.9

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13

Channel Bandwidth: 5MHz

MODE		TX channel 23205, 23230, 23255					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	779.50	-9.6	16.4	4.0	20.4	34.8	-14.4
2	782.00	-10.1	15.9	4.0	19.9	34.8	-14.9
3	784.50	-9.6	16.5	4.0	20.5	34.8	-14.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	779.50	-16.4	11.7	4.0	15.7	34.8	-19.1
2	782.00	-15.6	12.3	4.0	16.3	34.8	-18.5
3	784.50	-16.0	11.9	4.0	15.9	34.8	-18.9

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 23230					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-9.5	16.5	4.0	20.5	34.8	-14.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-16.2	11.7	4.0	15.7	34.8	-19.1

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 17

Channel Bandwidth: 5MHz

MODE		TX channel 23755, 23790, 23825					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	706.50	-8.9	15.9	3.5	19.4	34.8	-15.4
2	710.00	-9.0	15.9	3.5	19.4	34.8	-15.4
3	713.50	-9.3	15.7	3.5	19.2	34.8	-15.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	706.50	-15.9	11.7	3.5	15.2	34.8	-19.6
2	710.00	-16.4	11.2	3.5	14.7	34.8	-20.1
3	713.50	-16.4	11.3	3.5	14.8	34.8	-20.0

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 23780, 23790, 23800					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	709.00	-8.6	16.2	3.5	19.7	34.8	-15.1
2	710.00	-8.9	16.0	3.5	19.5	34.8	-15.3
3	711.00	-9.6	15.4	3.5	18.9	34.8	-15.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	709.00	-16.2	11.4	3.5	14.9	34.8	-19.9
2	710.00	-16.2	11.4	3.5	14.9	34.8	-19.9
3	711.00	-16.2	11.4	3.5	14.9	34.8	-19.9

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: 16QAM

LTE Band 4

Channel Bandwidth: 1.4MHz

MODE		TX channel 19957, 20175, 20393					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1710.70	-18.7	19.3	0.7	20.0	30.0	-10.0
2	1732.50	-18.3	20.1	0.6	20.7	30.0	-9.3
3	1754.30	-19.3	19.5	0.5	20.0	30.0	-10.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1710.70	-19.5	18.3	0.7	19.0	30.0	-11.0
2	1732.50	-20.6	17.7	0.6	18.3	30.0	-11.7
3	1754.30	-20.3	18.6	0.5	19.1	30.0	-10.9

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 3MHz

MODE		TX channel 19965, 20175, 20385					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1711.50	-18.3	19.7	0.7	20.4	30.0	-9.6
2	1732.50	-18.7	19.7	0.6	20.3	30.0	-9.7
3	1753.50	-18.9	19.9	0.5	20.4	30.0	-9.6
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1711.50	-19.9	17.9	0.7	18.6	30.0	-11.4
2	1732.50	-20.6	17.7	0.6	18.3	30.0	-11.7
3	1753.50	-20.9	18.0	0.5	18.5	30.0	-11.5

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 5MHz

MODE		TX channel 19975, 20175, 20375					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1712.50	-18.2	19.9	0.7	20.6	30.0	-9.4
2	1732.50	-18.8	19.6	0.6	20.2	30.0	-9.8
3	1752.50	-18.7	20.1	0.5	20.6	30.0	-9.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1712.50	-19.9	18.0	0.7	18.7	30.0	-11.3
2	1732.50	-20.5	17.8	0.6	18.4	30.0	-11.6
3	1752.50	-20.6	18.2	0.5	18.7	30.0	-11.3

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 20000, 20175, 20350					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1715.00	-18.3	19.8	0.7	20.5	30.0	-9.5
2	1732.50	-18.5	19.9	0.6	20.5	30.0	-9.5
3	1750.00	-19.0	19.8	0.5	20.3	30.0	-9.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1715.00	-19.9	18.0	0.7	18.7	30.0	-11.3
2	1732.50	-20.2	18.1	0.6	18.7	30.0	-11.3
3	1750.00	-20.3	18.5	0.5	19.0	30.0	-11.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 15MHz

MODE		TX channel 20025, 20175, 20325					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1717.50	-18.3	19.8	0.7	20.5	30.0	-9.5
2	1732.50	-19.2	19.2	0.6	19.8	30.0	-10.2
3	1747.50	-19.6	19.1	0.5	19.6	30.0	-10.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1717.50	-20.2	17.8	0.7	18.5	30.0	-11.5
2	1732.50	-20.6	17.7	0.6	18.3	30.0	-11.7
3	1747.50	-20.2	18.5	0.5	19.0	30.0	-11.0

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 20MHz

MODE		TX channel 20050, 20175, 20300					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1720.00	-19.0	19.2	0.7	19.9	30.0	-10.1
2	1732.50	-18.6	19.8	0.6	20.4	30.0	-9.6
3	1745.00	-19.0	19.7	0.5	20.2	30.0	-9.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	1720.00	-20.2	17.8	0.7	18.5	30.0	-11.5
2	1732.50	-20.5	17.8	0.6	18.4	30.0	-11.6
3	1745.00	-20.4	18.3	0.5	18.8	30.0	-11.2

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 7

Channel Bandwidth: 5MHz

MODE		TX channel 20775, 21100, 21425					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2502.50	-20.5	21.0	0.2	21.2	33.0	-11.8
2	2535.00	-21.1	20.6	0.2	20.8	33.0	-12.2
3	2567.50	-21.2	20.8	0.2	21.0	33.0	-12.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2502.50	-23.7	19.8	0.2	20.0	33.0	-13.0
2	2535.00	-23.8	19.8	0.2	20.0	33.0	-13.0
3	2567.50	-24.0	19.7	0.2	19.9	33.0	-13.1

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 2080, 21100, 21400					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2505.00	-20.4	21.1	0.2	21.3	33.0	-11.7
2	2535.00	-21.3	20.4	0.2	20.6	33.0	-12.4
3	2565.00	-21.1	20.9	0.2	21.1	33.0	-11.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2505.00	-23.6	19.9	0.2	20.1	33.0	-12.9
2	2535.00	-23.7	19.9	0.2	20.1	33.0	-12.9
3	2565.00	-23.7	20.0	0.2	20.2	33.0	-12.8

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 15MHz

MODE		TX channel 20825, 21100, 21375					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2507.50	-21.0	20.5	0.2	20.7	33.0	-12.3
2	2535.00	-21.1	20.6	0.2	20.8	33.0	-12.2
3	2562.50	-21.1	20.9	0.2	21.1	33.0	-11.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2507.50	-23.6	19.9	0.2	20.1	33.0	-12.9
2	2535.00	-23.5	20.1	0.2	20.3	33.0	-12.7
3	2562.50	-24.1	19.6	0.2	19.8	33.0	-13.2

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 20MHz

MODE		TX channel 20850, 21100, 21350					
Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-20.7	20.8	0.2	21.0	33.0	-12.0
2	2535.00	-20.6	21.1	0.2	21.3	33.0	-11.7
3	2560.00	-21.6	20.3	0.2	20.5	33.0	-12.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	2510.00	-23.4	20.1	0.2	20.3	33.0	-12.7
2	2535.00	-24.1	19.5	0.2	19.7	33.0	-13.3
3	2560.00	-24.1	19.6	0.2	19.8	33.0	-13.2

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 12

Channel Bandwidth: 1.4MHz

MODE		TX channel 23017, 23095, 23173					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	699.70	-9.5	15.0	3.5	18.5	34.8	-16.3
2	707.50	-10.4	14.4	3.5	17.9	34.8	-16.9
3	715.30	-10.1	14.9	3.5	18.4	34.8	-16.4
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	699.70	-14.3	13.2	3.5	16.7	34.8	-18.1
2	707.50	-14.4	13.3	3.5	16.8	34.8	-18.0
3	715.30	-14.7	12.9	3.5	16.4	34.8	-18.4

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 3MHz

MODE		TX channel 23025, 23095, 23165					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	700.50	-8.9	15.6	3.5	19.1	34.8	-15.7
2	707.50	-10.4	14.4	3.5	17.9	34.8	-16.9
3	714.50	-9.7	15.3	3.5	18.8	34.8	-16.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	700.50	-14.2	13.4	3.5	16.9	34.8	-17.9
2	707.50	-15.1	12.7	3.5	16.2	34.8	-18.6
3	714.50	-14.9	12.7	3.5	16.2	34.8	-18.6

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 5MHz

MODE		TX channel 23035, 23095, 23155					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-9.7	14.9	3.4	18.3	34.8	-16.5
2	707.50	-9.9	14.8	3.5	18.3	34.8	-16.5
3	713.50	-10.6	14.4	3.5	17.9	34.8	-16.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	701.50	-14.1	13.6	3.4	17.0	34.8	-17.8
2	707.50	-14.4	13.3	3.5	16.8	34.8	-18.0
3	713.50	-14.9	12.9	3.5	16.4	34.8	-18.4

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 23060, 23095, 23130					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-9.8	14.9	3.5	18.4	34.8	-16.4
2	707.50	-10.1	14.7	3.5	18.2	34.8	-16.6
3	711.00	-9.8	15.2	3.5	18.7	34.8	-16.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	704.00	-14.4	13.2	3.5	16.7	34.8	-18.1
2	707.50	-14.9	12.9	3.5	16.4	34.8	-18.4
3	711.00	-14.1	13.5	3.5	17.0	34.8	-17.8

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13

Channel Bandwidth: 5MHz

MODE		TX channel 23205, 23230, 23255					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	779.50	-10.4	15.6	4.0	19.6	34.8	-15.2
2	782.00	-11.1	14.9	4.0	18.9	34.8	-15.9
3	784.50	-10.8	15.3	4.0	19.3	34.8	-15.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	779.50	-17.2	10.9	4.0	14.9	34.8	-19.9
2	782.00	-16.8	11.1	4.0	15.1	34.8	-19.7
3	784.50	-17.2	10.7	4.0	14.7	34.8	-20.1

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 23230					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-10.7	15.3	4.0	19.3	34.8	-15.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	782.00	-17.4	10.5	4.0	14.5	34.8	-20.3

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 17

Channel Bandwidth: 5MHz

MODE		TX channel 23755, 23790, 23825					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	706.50	-10.1	14.7	3.5	18.2	34.8	-16.6
2	710.00	-10.0	14.9	3.5	18.4	34.8	-16.4
3	713.50	-10.2	14.8	3.5	18.3	34.8	-16.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	706.50	-17.1	10.5	3.5	14.0	34.8	-20.8
2	710.00	-17.6	10.0	3.5	13.5	34.8	-21.3
3	713.50	-17.4	10.4	3.5	13.9	34.8	-20.9

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Channel Bandwidth: 10MHz

MODE		TX channel 23780, 23790, 23800					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	709.00	-9.4	15.3	3.5	18.8	34.8	-16.0
2	710.00	-10.0	14.9	3.5	18.4	34.8	-16.4
3	711.00	-10.7	14.3	3.5	17.8	34.8	-17.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	709.00	-17.4	10.2	3.5	13.7	34.8	-21.1
2	710.00	-17.3	10.3	3.5	13.8	34.8	-21.0
3	711.00	-17.2	10.4	3.5	13.9	34.8	-20.9

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

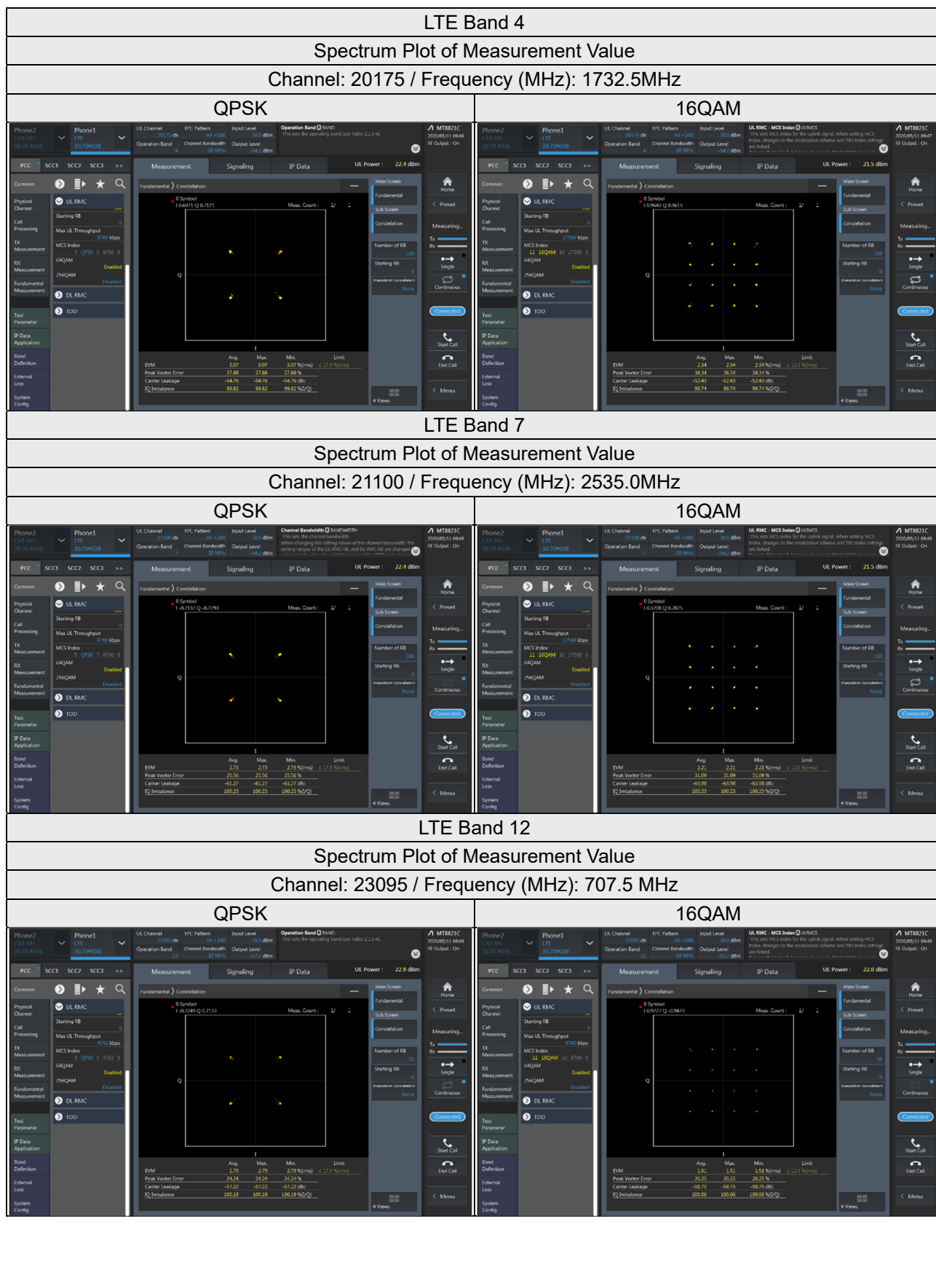
4.2.2 Test Procedure

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

4.2.3 Test Setup



4.2.4 Test Results

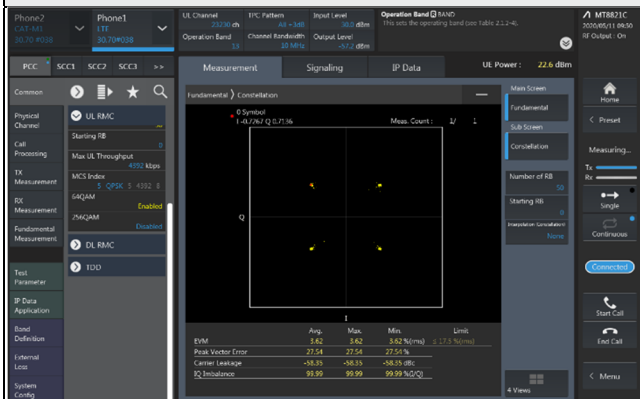


LTE Band 13

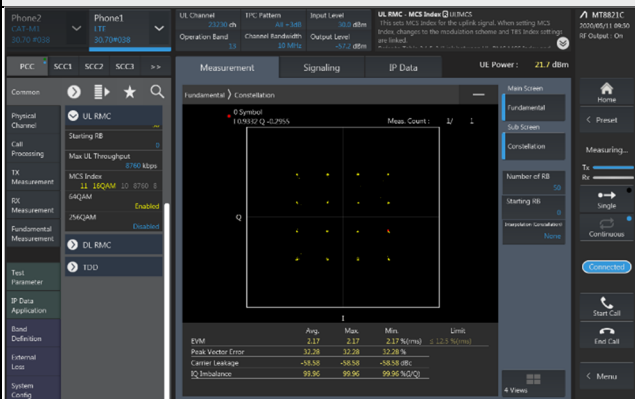
Spectrum Plot of Measurement Value

Channel: 23230 / Frequency (MHz): 782.0MHz

QPSK



16QAM

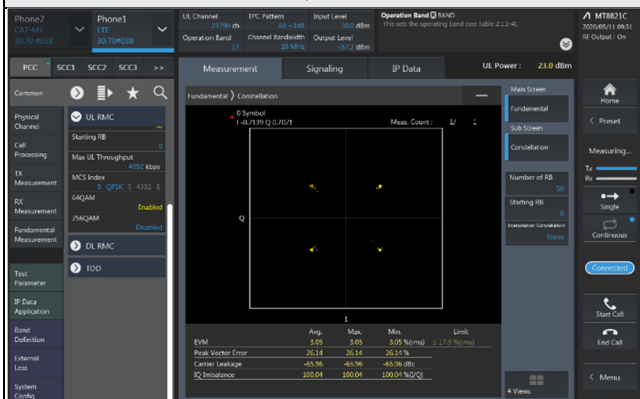


LTE Band 17

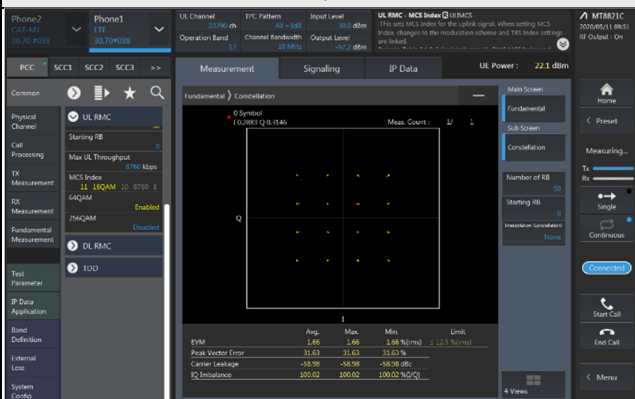
Spectrum Plot of Measurement Value

Channel: 23790 / Frequency (MHz): 710.0MHz

QPSK



16QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

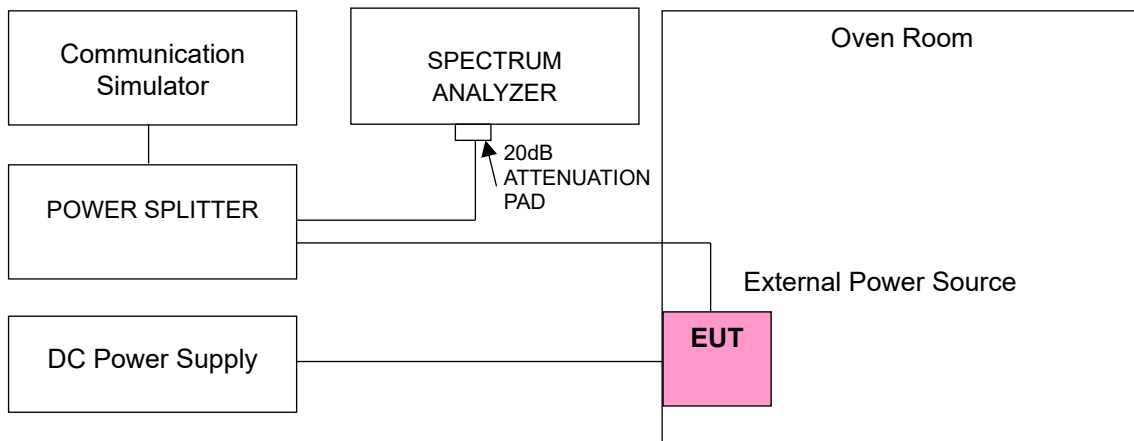
According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary 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 $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

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)
3.85	1710.700002	0.001	1754.300003	0.002
3.27	1710.700002	0.001	1754.300001	0.001
4.42	1710.700002	0.001	1754.300003	0.002

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1710.700003	0.002	1754.300002	0.001
-20	1710.700003	0.002	1754.300003	0.002
-10	1710.700002	0.001	1754.300003	0.002
0	1710.700002	0.001	1754.300002	0.001
10	1710.700002	0.001	1754.300002	0.001
20	1710.699997	-0.002	1754.299997	-0.002
30	1710.699999	-0.001	1754.299999	-0.001
40	1710.699998	-0.001	1754.299997	-0.002
50	1710.699999	-0.001	1754.299998	-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)
3.85	1711.500002	0.001	1753.500004	0.002
3.27	1711.500002	0.001	1753.500003	0.002
4.42	1711.500002	0.001	1753.500001	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1711.500004	0.002	1753.500001	0.001
-20	1711.500001	0.001	1753.500003	0.001
-10	1711.500002	0.001	1753.500002	0.001
0	1711.500003	0.002	1753.500004	0.002
10	1711.500004	0.002	1753.500003	0.002
20	1711.499997	-0.002	1753.499997	-0.002
30	1711.499997	-0.002	1753.499998	-0.001
40	1711.499999	-0.001	1753.499998	-0.001
50	1711.499996	-0.002	1753.499996	-0.002

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)
3.85	1712.500003	0.002	1752.500001	0.001
3.27	1712.500003	0.002	1752.500003	0.001
4.42	1712.500001	0.001	1752.500004	0.002

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.500001	0.001	1752.500002	0.001
-20	1712.500002	0.001	1752.500002	0.001
-10	1712.500004	0.002	1752.500004	0.002
0	1712.500001	0.001	1752.500003	0.002
10	1712.500003	0.002	1752.500002	0.001
20	1712.499997	-0.002	1752.499996	-0.002
30	1712.499997	-0.002	1752.499999	-0.001
40	1712.499996	-0.002	1752.499999	-0.001
50	1712.499997	-0.002	1752.499997	-0.002

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)
3.85	1715.000001	0.001	1750.000002	0.001
3.27	1715.000002	0.001	1750.000004	0.002
4.42	1715.000001	0.001	1750.000003	0.002

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1715.000001	0.001	1750.000003	0.001
-20	1715.000001	0.001	1750.000003	0.002
-10	1715.000004	0.002	1750.000002	0.001
0	1715.000003	0.002	1750.000002	0.001
10	1715.000003	0.002	1750.000002	0.001
20	1714.999998	-0.001	1749.999998	-0.001
30	1714.999998	-0.001	1749.999998	-0.001
40	1714.999999	-0.001	1749.999997	-0.002
50	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)
3.85	1717.500003	0.002	1747.500004	0.002
3.27	1717.500003	0.002	1747.500004	0.002
4.42	1717.500002	0.001	1747.500002	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1717.500004	0.002	1747.500004	0.002
-20	1717.500002	0.001	1747.500002	0.001
-10	1717.500003	0.002	1747.500001	0.001
0	1717.500002	0.001	1747.500001	0.001
10	1717.500001	0.001	1747.500003	0.002
20	1717.499997	-0.002	1747.499999	-0.001
30	1717.499997	-0.002	1747.499999	-0.001
40	1717.499998	-0.001	1747.499996	-0.002
50	1717.499997	-0.002	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)
3.85	1720.000001	0.001	1745.000003	0.002
3.27	1720.000003	0.001	1745.000002	0.001
4.42	1720.000003	0.002	1745.000001	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000001	0.001	1745.000003	0.002
-20	1720.000003	0.001	1745.000004	0.002
-10	1720.000003	0.002	1745.000002	0.001
0	1720.000003	0.002	1745.000003	0.002
10	1720.000002	0.001	1745.000004	0.002
20	1719.999997	-0.002	1744.999999	-0.001
30	1719.999998	-0.001	1744.999997	-0.002
40	1719.999999	-0.001	1744.999998	-0.001
50	1719.999998	-0.001	1744.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	2502.500001	0.001	2567.500002	0.001
3.27	2502.500004	0.001	2567.500004	0.002
4.42	2502.500003	0.001	2567.500001	0.000

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2502.500002	0.001	2567.500001	0.001
-20	2502.500004	0.002	2567.500002	0.001
-10	2502.500001	0.000	2567.500003	0.001
0	2502.500003	0.001	2567.500003	0.001
10	2502.500003	0.001	2567.500002	0.001
20	2502.499999	-0.001	2567.499998	-0.001
30	2502.499998	-0.001	2567.499998	-0.001
40	2502.499998	-0.001	2567.499999	0.000
50	2502.499998	-0.001	2567.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	2505.000003	0.001	2565.000003	0.001
3.27	2505.000004	0.001	2565.000004	0.002
4.42	2505.000002	0.001	2565.000004	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2505.000001	0.000	2565.000003	0.001
-20	2505.000002	0.001	2565.000003	0.001
-10	2505.000003	0.001	2565.000003	0.001
0	2505.000002	0.001	2565.000003	0.001
10	2505.000004	0.002	2565.000002	0.001
20	2504.999999	0.000	2564.999997	-0.001
30	2504.999996	-0.002	2564.999998	-0.001
40	2504.999998	-0.001	2564.999996	-0.001
50	2504.999998	-0.001	2564.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	2507.500002	0.001	2562.500003	0.001
3.27	2507.500002	0.001	2562.500003	0.001
4.42	2507.500001	0.001	2562.500003	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2507.500003	0.001	2562.500004	0.002
-20	2507.500004	0.001	2562.500002	0.001
-10	2507.500002	0.001	2562.500002	0.001
0	2507.500002	0.001	2562.500003	0.001
10	2507.500004	0.002	2562.500003	0.001
20	2507.499998	-0.001	2562.499997	-0.001
30	2507.499997	-0.001	2562.499997	-0.001
40	2507.499998	-0.001	2562.499998	-0.001
50	2507.499997	-0.001	2562.499996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	2510.000003	0.001	2560.000003	0.001
3.27	2510.000002	0.001	2560.000002	0.001
4.42	2510.000002	0.001	2560.000002	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2510.000004	0.002	2560.000002	0.001
-20	2510.000004	0.001	2560.000001	0.001
-10	2510.000004	0.001	2560.000003	0.001
0	2510.000004	0.002	2560.000001	0.000
10	2510.000004	0.001	2560.000001	0.001
20	2509.999998	-0.001	2559.999999	0.000
30	2509.999996	-0.001	2559.999997	-0.001
40	2509.999996	-0.001	2559.999999	-0.001
50	2509.999998	-0.001	2559.999997	-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)
3.85	699.700002	0.002	715.300004	0.006
3.27	699.700004	0.005	715.300004	0.005
4.42	699.700002	0.003	715.300001	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	699.700004	0.005	715.300004	0.005
-20	699.700002	0.003	715.300002	0.003
-10	699.700001	0.002	715.300002	0.002
0	699.700004	0.005	715.300003	0.004
10	699.700002	0.002	715.300002	0.003
20	699.699998	-0.003	715.299996	-0.006
30	699.699999	-0.002	715.299997	-0.004
40	699.699997	-0.004	715.299996	-0.005
50	699.699997	-0.005	715.299998	-0.003

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)
3.85	700.500001	0.001	714.500001	0.002
3.27	700.500003	0.005	714.500001	0.002
4.42	700.500004	0.005	714.500002	0.003

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	700.500003	0.004	714.500001	0.002
-20	700.500004	0.006	714.500002	0.003
-10	700.500002	0.003	714.500001	0.002
0	700.500003	0.005	714.500002	0.003
10	700.500003	0.004	714.500004	0.005
20	700.499998	-0.003	714.499998	-0.003
30	700.499997	-0.004	714.499996	-0.006
40	700.499999	-0.002	714.499998	-0.002
50	700.499997	-0.004	714.499997	-0.004

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)
3.85	701.500001	0.002	713.500001	0.002
3.27	701.500003	0.005	713.500002	0.003
4.42	701.500003	0.004	713.500003	0.004

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	701.500003	0.005	713.500001	0.002
-20	701.500002	0.002	713.500001	0.002
-10	701.500003	0.004	713.500003	0.004
0	701.500003	0.004	713.500003	0.004
10	701.500001	0.002	713.500002	0.003
20	701.499999	-0.002	713.499996	-0.005
30	701.499999	-0.002	713.499999	-0.001
40	701.499999	-0.002	713.499997	-0.004
50	701.499996	-0.005	713.499997	-0.004

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)
3.85	704.000001	0.002	711.000003	0.004
3.27	704.000002	0.003	711.000004	0.005
4.42	704.000004	0.005	711.000004	0.005

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	704.000003	0.005	711.000001	0.001
-20	704.000004	0.005	711.000003	0.004
-10	704.000003	0.005	711.000003	0.004
0	704.000004	0.005	711.000003	0.004
10	704.000003	0.004	711.000003	0.005
20	703.999996	-0.005	710.999999	-0.002
30	703.999997	-0.005	710.999998	-0.003
40	703.999997	-0.005	710.999998	-0.003
50	703.999998	-0.003	710.999998	-0.003

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)
3.85	779.500002	0.002	784.500002	0.003
3.27	779.500002	0.002	784.500002	0.002
4.42	779.500001	0.002	784.500003	0.003

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	779.500004	0.005	784.500003	0.004
-20	779.500003	0.003	784.500001	0.002
-10	779.500003	0.004	784.500003	0.004
0	779.500004	0.005	784.500003	0.004
10	779.500001	0.002	784.500002	0.003
20	779.499997	-0.004	784.499998	-0.003
30	779.499999	-0.001	784.499997	-0.004
40	779.499998	-0.002	784.499997	-0.004
50	779.499997	-0.003	784.499999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
3.85	782.000002	0.002
3.27	782.000003	0.004
4.42	782.000004	0.004

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	782.000001	0.001
-20	782.000002	0.002
-10	782.000002	0.002
0	782.000004	0.005
10	782.000003	0.004
20	781.999997	-0.004
30	781.999997	-0.004
40	781.999998	-0.003
50	781.999996	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	706.500003	0.005	713.500001	0.002
3.27	706.500003	0.004	713.500003	0.004
4.42	706.500003	0.004	713.500001	0.001

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	706.500001	0.001	713.500003	0.005
-20	706.500003	0.004	713.500002	0.003
-10	706.500001	0.001	713.500003	0.004
0	706.500002	0.003	713.500004	0.005
10	706.500003	0.005	713.500002	0.003
20	706.499997	-0.004	713.499997	-0.004
30	706.499997	-0.005	713.499998	-0.004
40	706.499998	-0.003	713.499996	-0.006
50	706.499997	-0.004	713.499997	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	709.000001	0.002	711.000002	0.003
3.27	709.000002	0.003	711.000003	0.004
4.42	709.000003	0.004	711.000003	0.005

Note: The applicant defined the normal working voltage is from 3.27Vdc to 4.42Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	709.000003	0.004	711.000002	0.002
-20	709.000003	0.004	711.000002	0.002
-10	709.000001	0.002	711.000002	0.003
0	709.000002	0.002	711.000004	0.006
10	709.000004	0.006	711.000002	0.002
20	708.999998	-0.003	710.999999	-0.002
30	708.999999	-0.002	710.999999	-0.002
40	708.999999	-0.002	710.999999	-0.002
50	708.999996	-0.005	710.999999	-0.002

4.4 Occupied Bandwidth Measurement

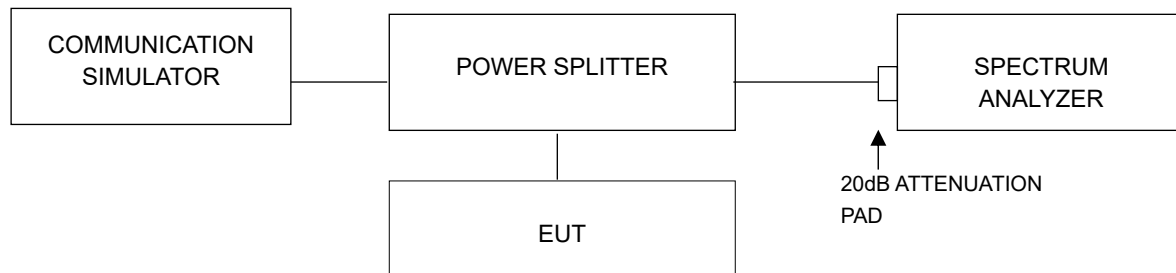
4.4.1 Limits of Occupied Bandwidth Measurement

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 = 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

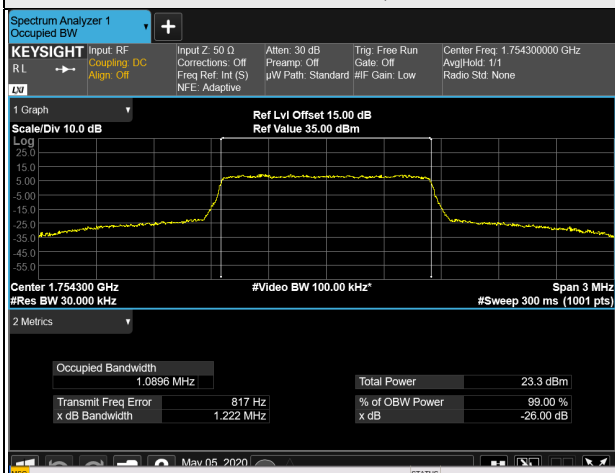
LTE Band 4

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	2.71	2.70
LTE Band 4, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
19975	1712.5	4.49	4.50
20175	1732.5	4.49	4.49
20375	1752.5	4.50	4.50
LTE Band 4, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20000	1715.0	8.97	8.98
20175	1732.5	8.97	8.97
20350	1750.0	8.98	8.98
LTE Band 4, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20025	1717.5	13.46	13.46
20175	1732.5	13.45	13.44
20325	1747.5	13.46	13.45

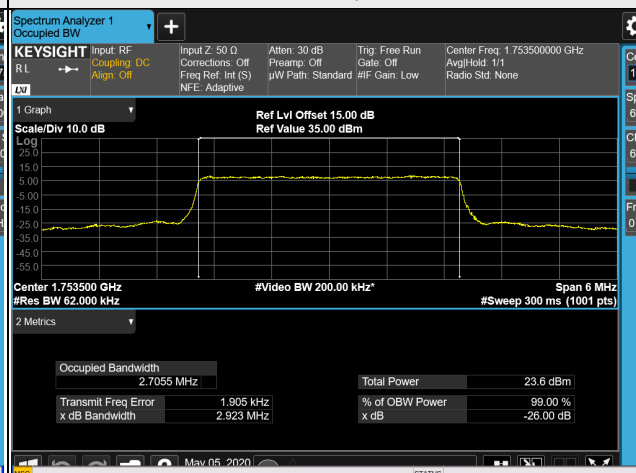
LTE Band 4, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20050	1720.0	17.94	17.96
20175	1732.5	17.91	17.93
20300	1745.0	17.93	17.95

Spectrum Plot of Worst Value

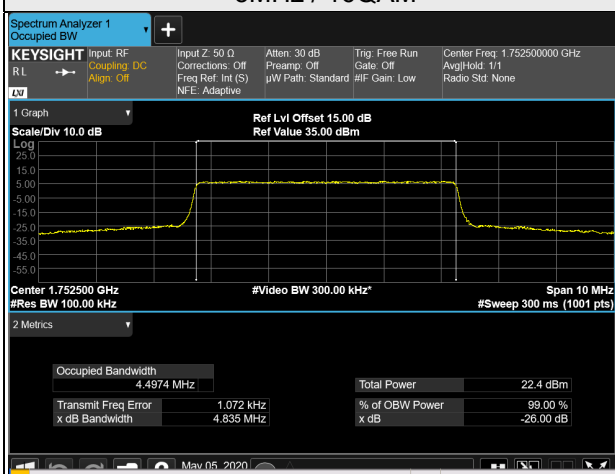
1.4MHz / 16QAM



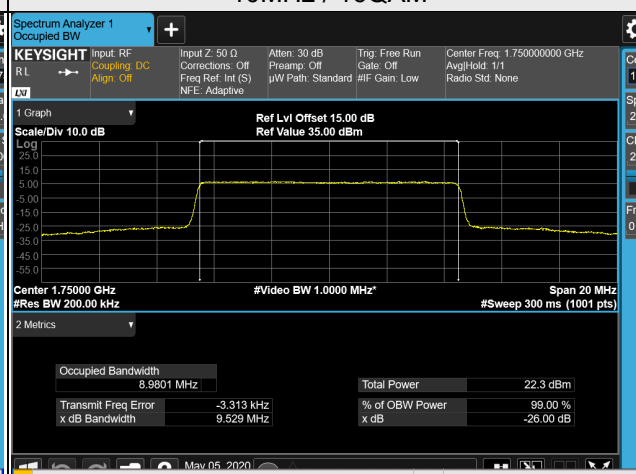
3MHz / QPSK



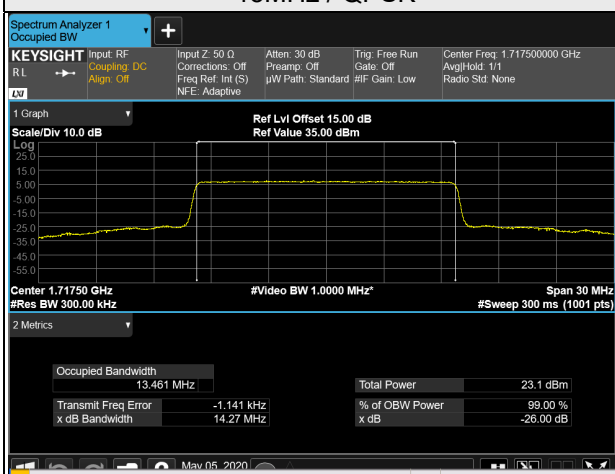
5MHz / 16QAM



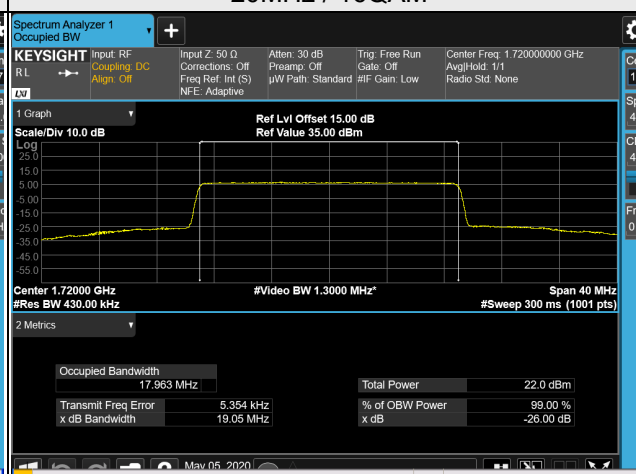
10MHz / 16QAM



15MHz / QPSK



20MHz / 16QAM

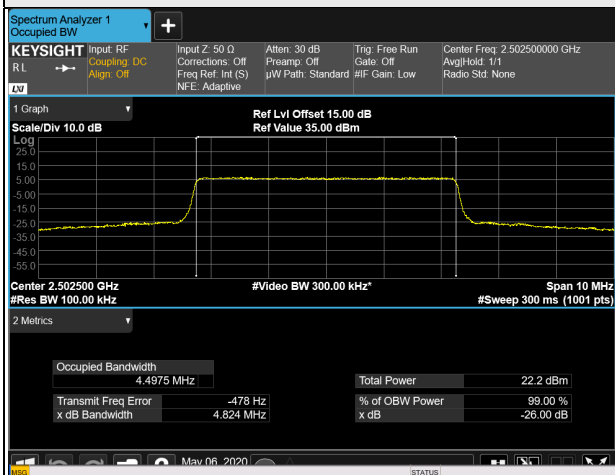


LTE Band 7

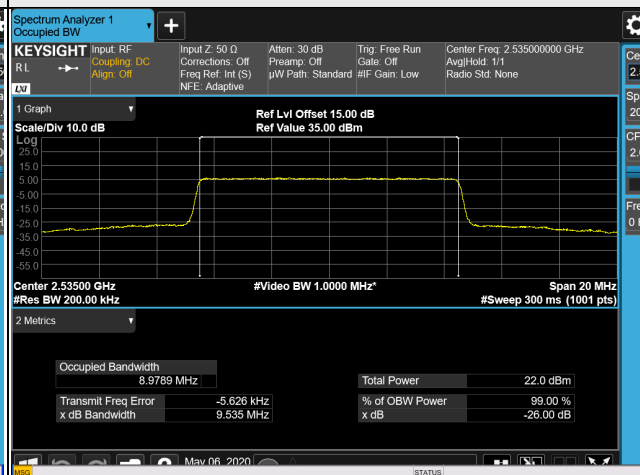
LTE Band 7, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20775	2502.5	4.49	4.50
21100	2535.0	4.49	4.50
21425	2567.5	4.49	4.49
LTE Band 7, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20800	2505.0	8.97	8.98
21100	2535.0	8.97	8.98
21400	2565.0	8.97	8.98
LTE Band 7, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20825	2507.5	13.45	13.44
21100	2535.0	13.45	13.45
21375	2562.5	13.46	13.45
LTE Band 7, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
20850	2510.0	17.91	17.93
21100	2535.0	17.92	17.95
21350	2560.0	17.92	17.95

Spectrum Plot of Worst Value

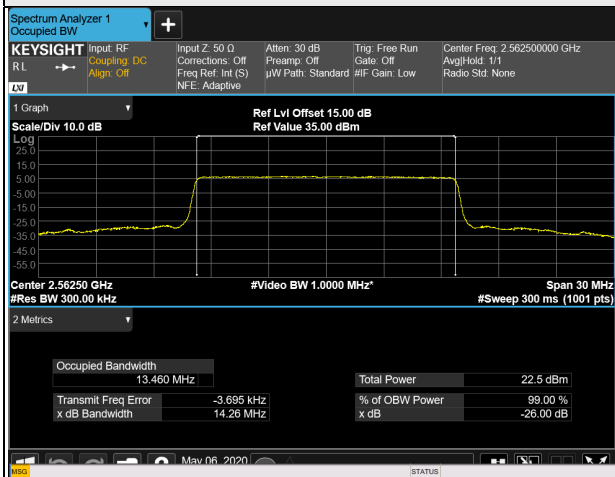
5MHz / 16QAM



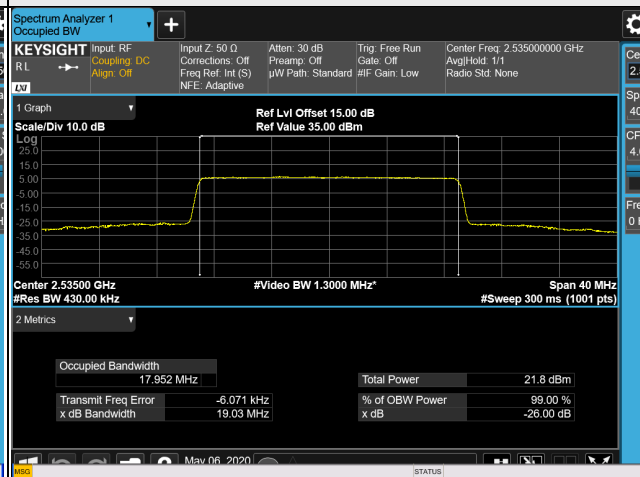
10MHz / 16QAM



15MHz / QPSK



20MHz / 16QAM

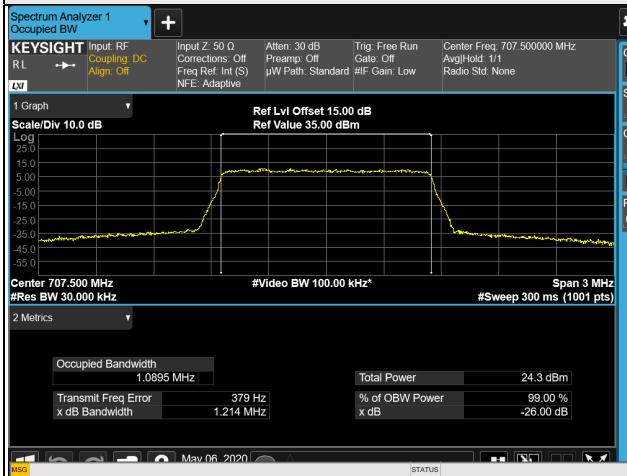


LTE Band 12

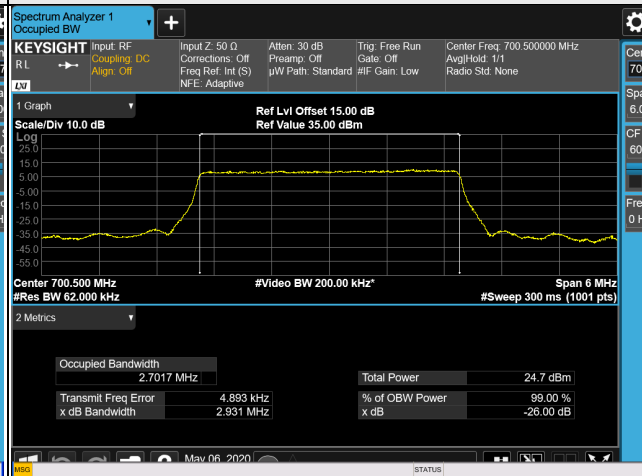
LTE Band 12, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23017	699.7	1.09	1.09
23095	707.5	1.09	1.09
23173	715.3	1.09	1.09
LTE Band 12, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23025	700.5	2.70	2.70
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	8.94	8.95
23095	707.5	8.95	8.95
23130	711.0	8.97	8.97

Spectrum Plot of Worst Value

1.4MHz / 16QAM



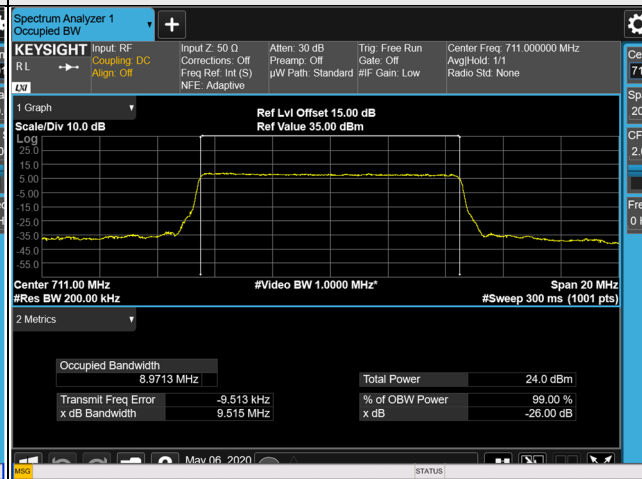
3MHz / QPSK



5MHz / 16QAM



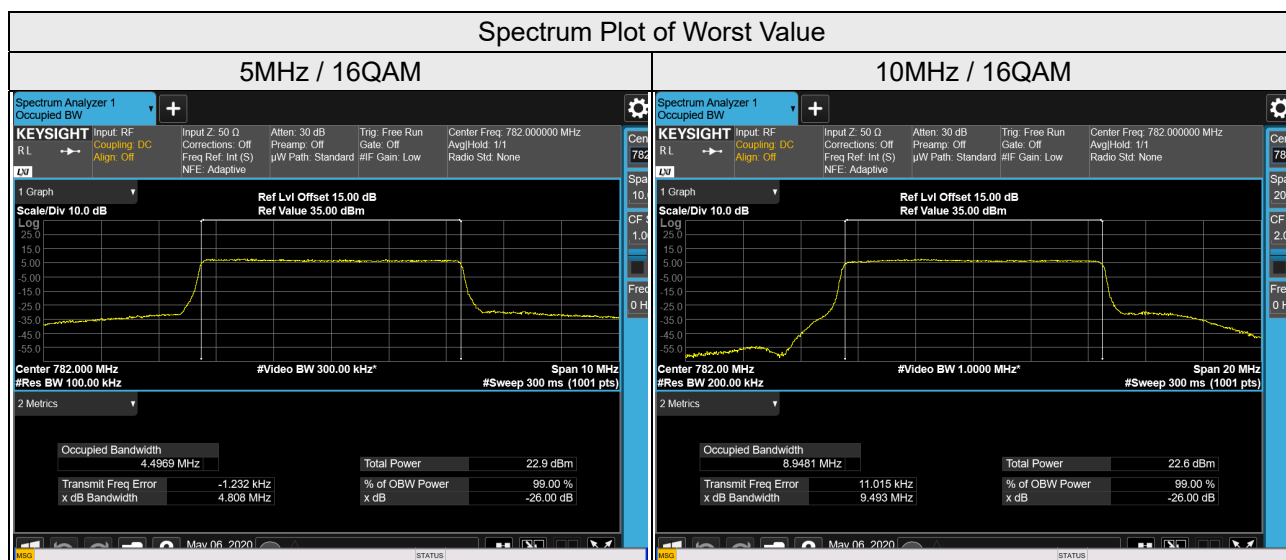
10MHz / QPSK



LTE Band 13

LTE Band 13, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23205	779.5	4.48	4.48
23230	782.0	4.49	4.50
23255	784.5	4.49	4.49

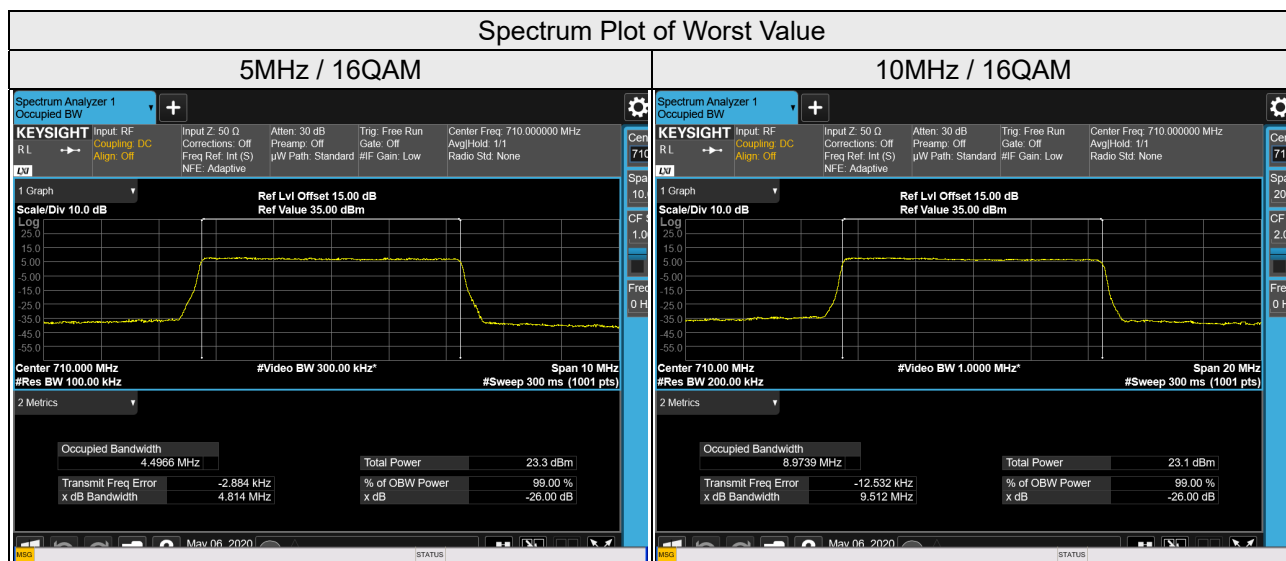
LTE Band 13, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23230	782.0	8.94	8.95



LTE Band 17

LTE Band 17, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23755	706.5	4.49	4.49
23790	710.0	4.50	4.50
23825	713.5	4.49	4.49

LTE Band 17, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23780	709.0	8.97	8.97
23790	710.0	8.97	8.97
23800	711.0	8.97	8.97



26dB Bandwidth

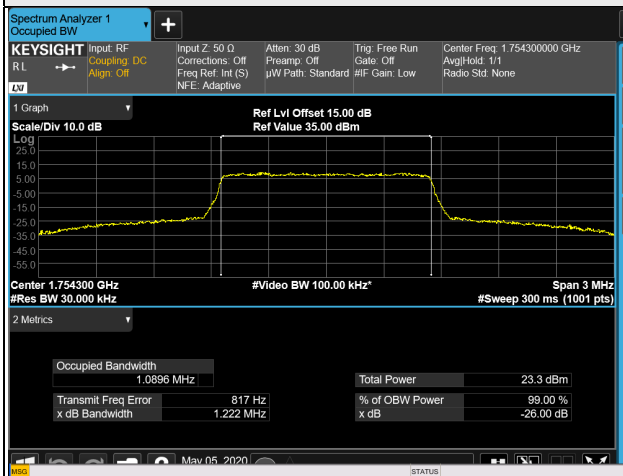
LTE Band 4

LTE Band 4, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
19957	1710.7	1.22	1.22
20175	1732.5	1.22	1.22
20393	1754.3	1.22	1.22
LTE Band 4, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
19965	1711.5	2.93	2.94
20175	1732.5	2.93	2.93
20385	1753.5	2.92	2.93
LTE Band 4, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
19975	1712.5	4.83	4.82
20175	1732.5	4.82	4.82
20375	1752.5	4.83	4.84
LTE Band 4, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20000	1715.0	9.54	9.53
20175	1732.5	9.54	9.52
20350	1750.0	9.52	9.53
LTE Band 4, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20025	1717.5	14.27	14.25
20175	1732.5	14.25	14.26
20325	1747.5	14.24	14.26

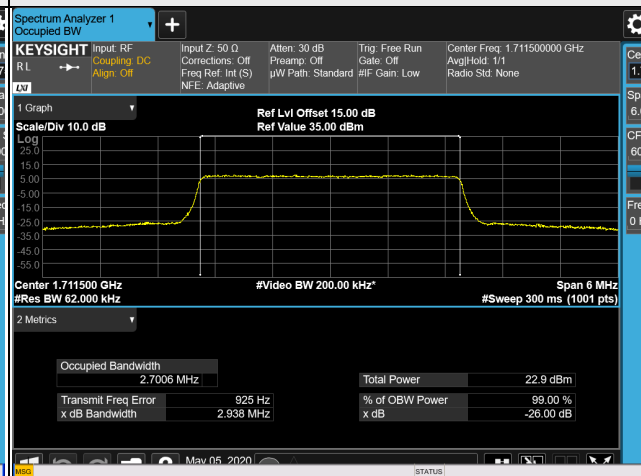
LTE Band 4, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20050	1720.0	19.05	19.05
20175	1732.5	19.04	19.02
20300	1745.0	19.05	19.06

Spectrum Plot of Worst Value

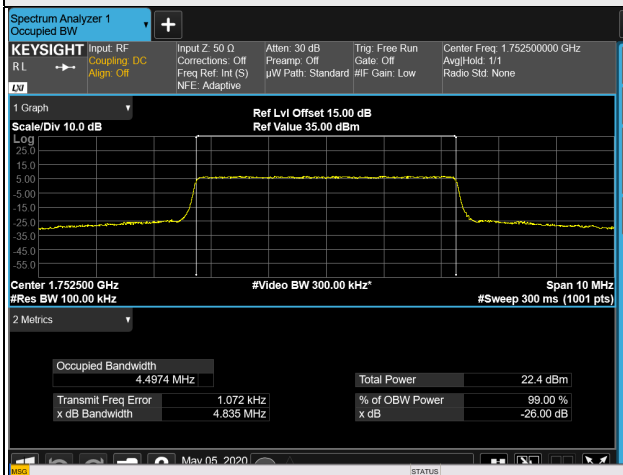
1.4MHz / 16QAM



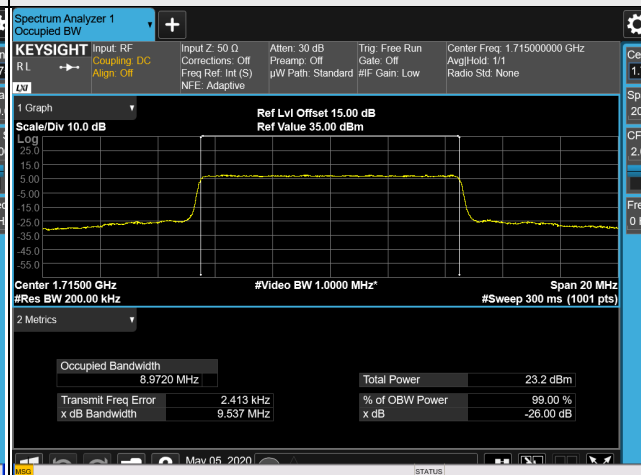
3MHz / 16QAM



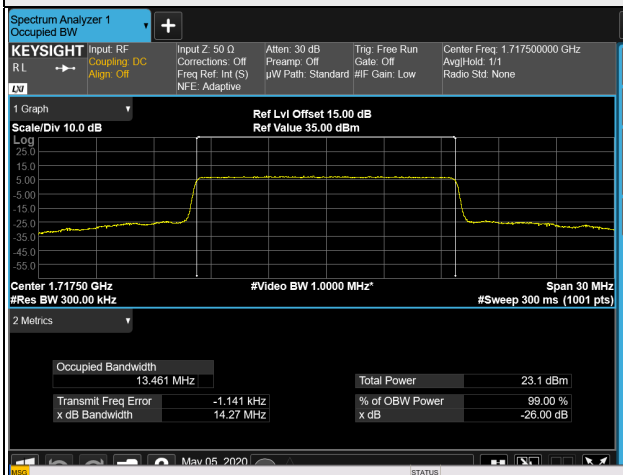
5MHz / 16QAM



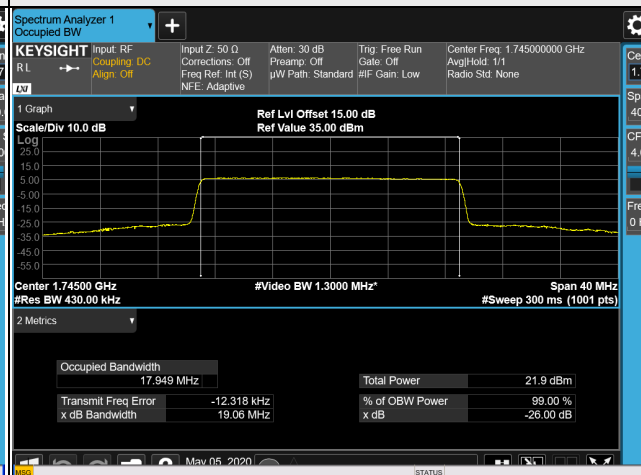
10MHz / QPSK



15MHz / QPSK



20MHz / 16QAM

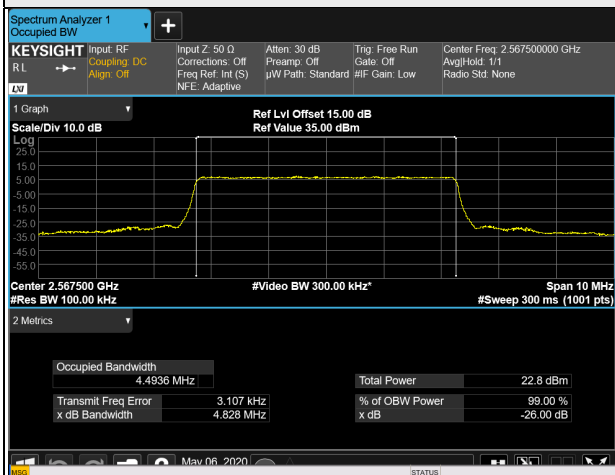


LTE Band 7

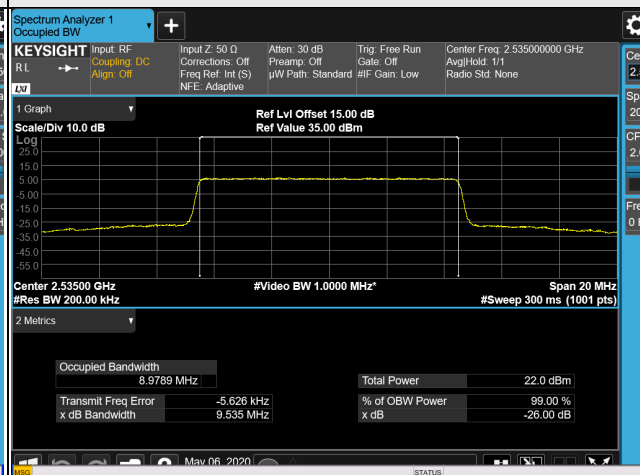
LTE Band 7, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20775	2502.5	4.83	4.82
21100	2535.0	4.82	4.83
21425	2567.5	4.83	4.81
LTE Band 7, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20800	2505.0	9.52	9.52
21100	2535.0	9.52	9.54
21400	2565.0	9.53	9.53
LTE Band 7, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20825	2507.5	14.26	14.25
21100	2535.0	14.25	14.24
21375	2562.5	14.26	14.26
LTE Band 7, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
20850	2510.0	19.02	19.02
21100	2535.0	19.04	19.03
21350	2560.0	19.03	19.04

Spectrum Plot of Worst Value

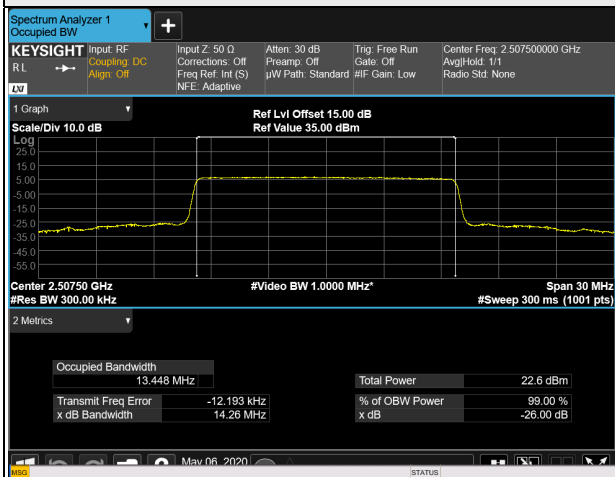
5MHz / QPSK



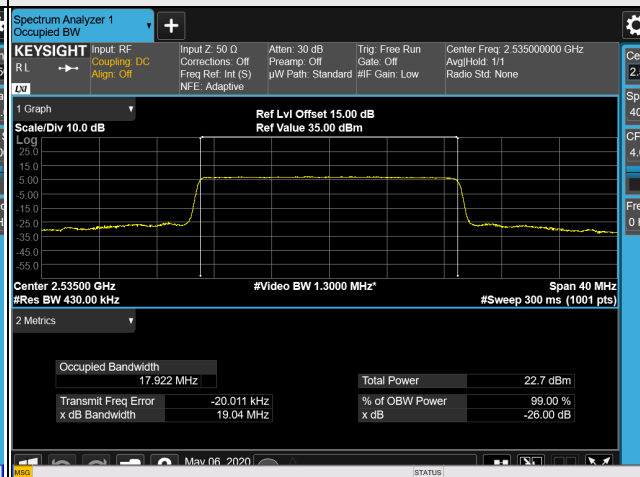
10MHz / 16QAM



15MHz / QPSK



20MHz / QPSK

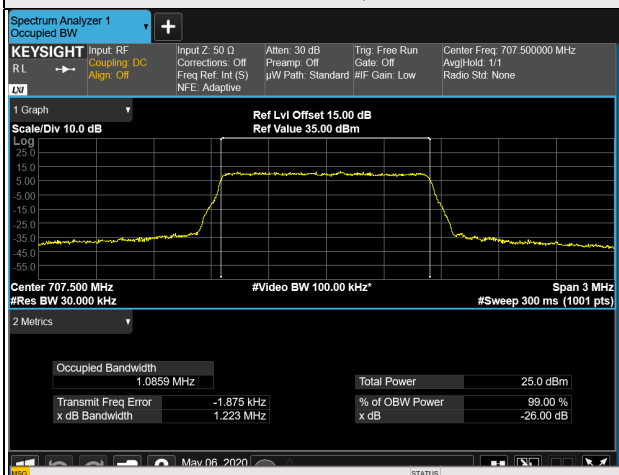


LTE Band 12

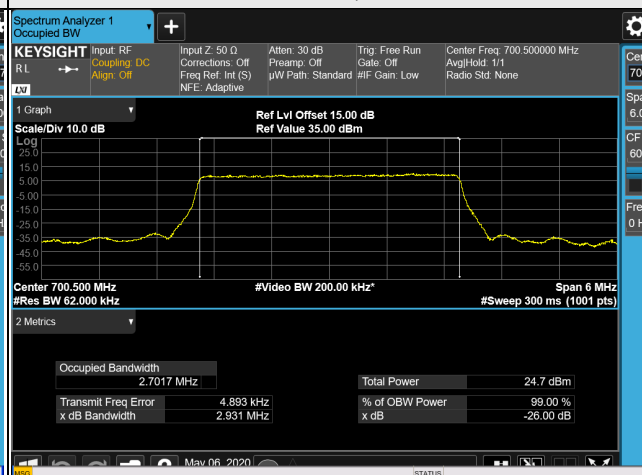
LTE Band 12, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23017	699.7	1.21	1.22
23095	707.5	1.22	1.21
23173	715.3	1.22	1.21
LTE Band 12, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23025	700.5	2.93	2.92
23095	707.5	2.93	2.92
23165	714.5	2.93	2.92
LTE Band 12, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23035	701.5	4.82	4.80
23095	707.5	4.80	4.80
23155	713.5	4.80	4.80
LTE Band 12, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23060	704.0	9.49	9.49
23095	707.5	9.51	9.49
23130	711.0	9.52	9.51

Spectrum Plot of Worst Value

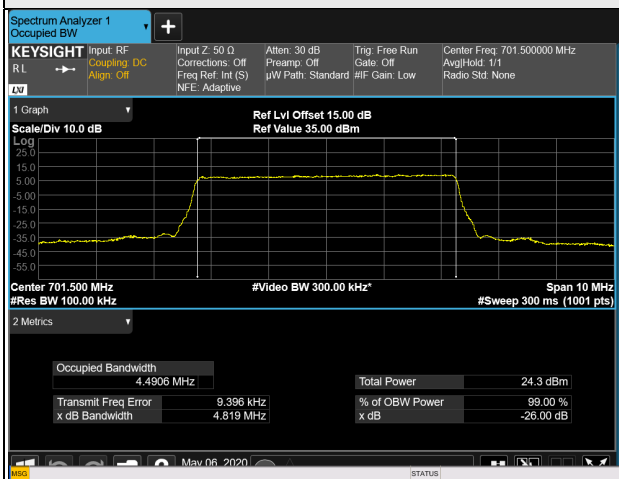
1.4MHz / QPSK



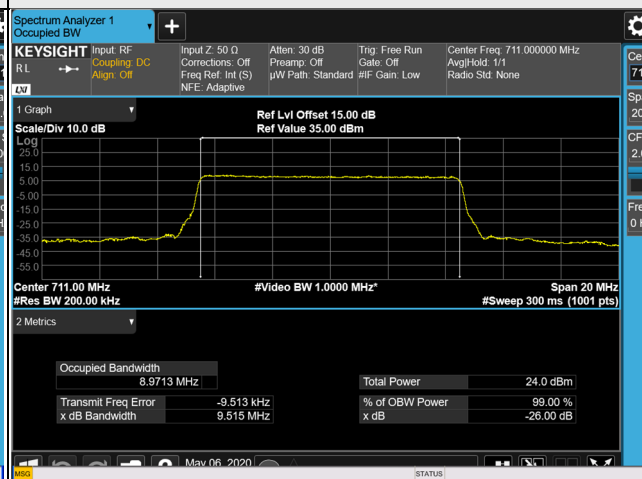
3MHz / QPSK



5MHz / QPSK



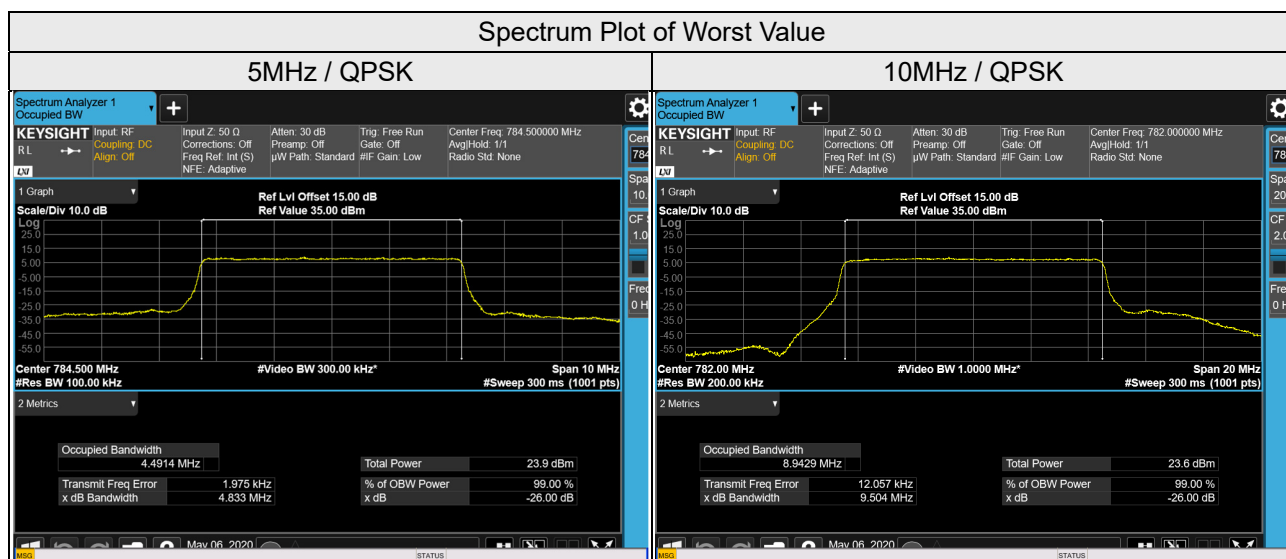
10MHz / QPSK



LTE Band 13

LTE Band 13, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23205	779.5	4.80	4.79
23230	782.0	4.82	4.81
23255	784.5	4.83	4.81

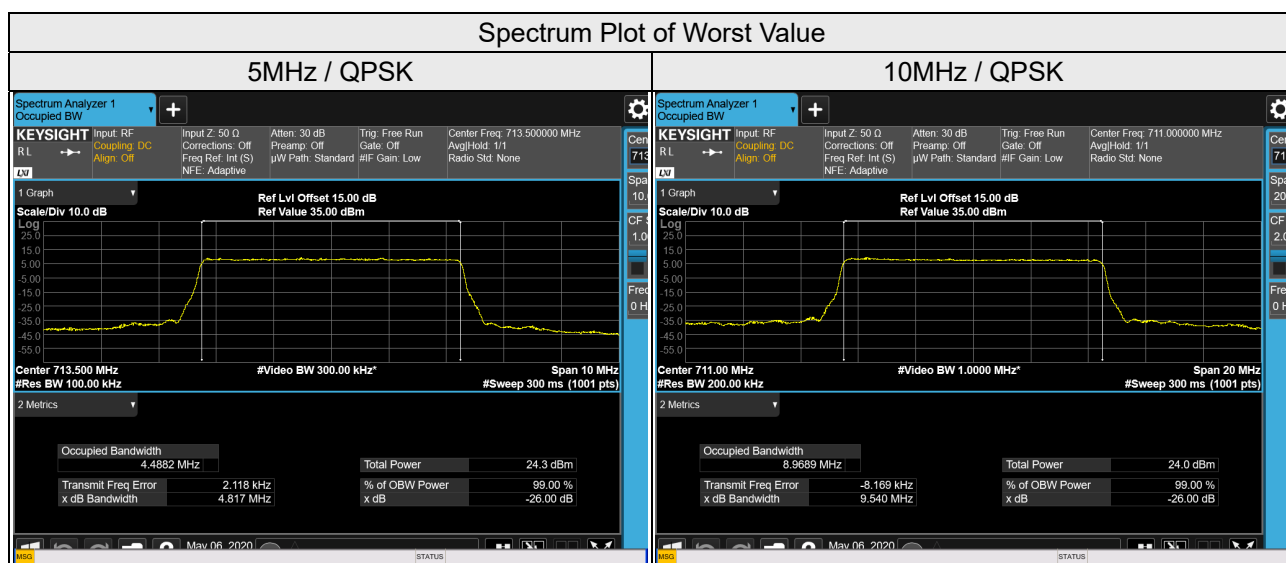
LTE Band 13, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23230	782.0	9.50	9.49



LTE Band 17

LTE Band 17, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23755	706.5	4.80	4.81
23790	710.0	4.81	4.81
23825	713.5	4.82	4.81

LTE Band 17, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
23780	709.0	9.51	9.51
23790	710.0	9.52	9.51
23800	711.0	9.54	9.51



4.5 Channel Edge Measurement

4.5.1 Limits of Band Edge Measurement

For LTE Band 4

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

For LTE Band 7

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

For LTE Band 12

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

For LTE Band 13

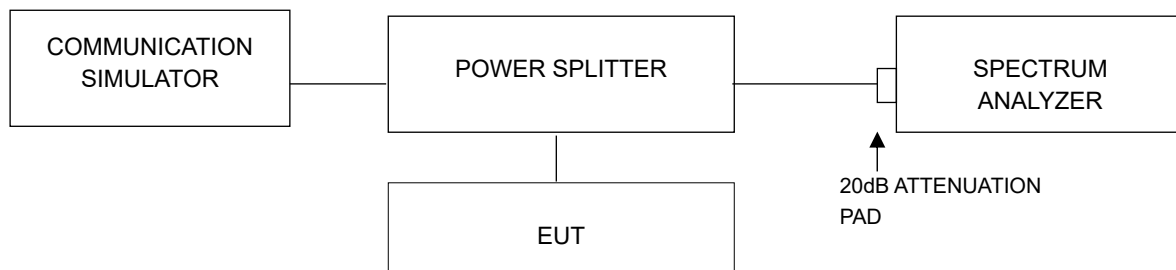
According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

According to 27.53(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations

For LTE Band 17

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

4.5.2 Test Setup

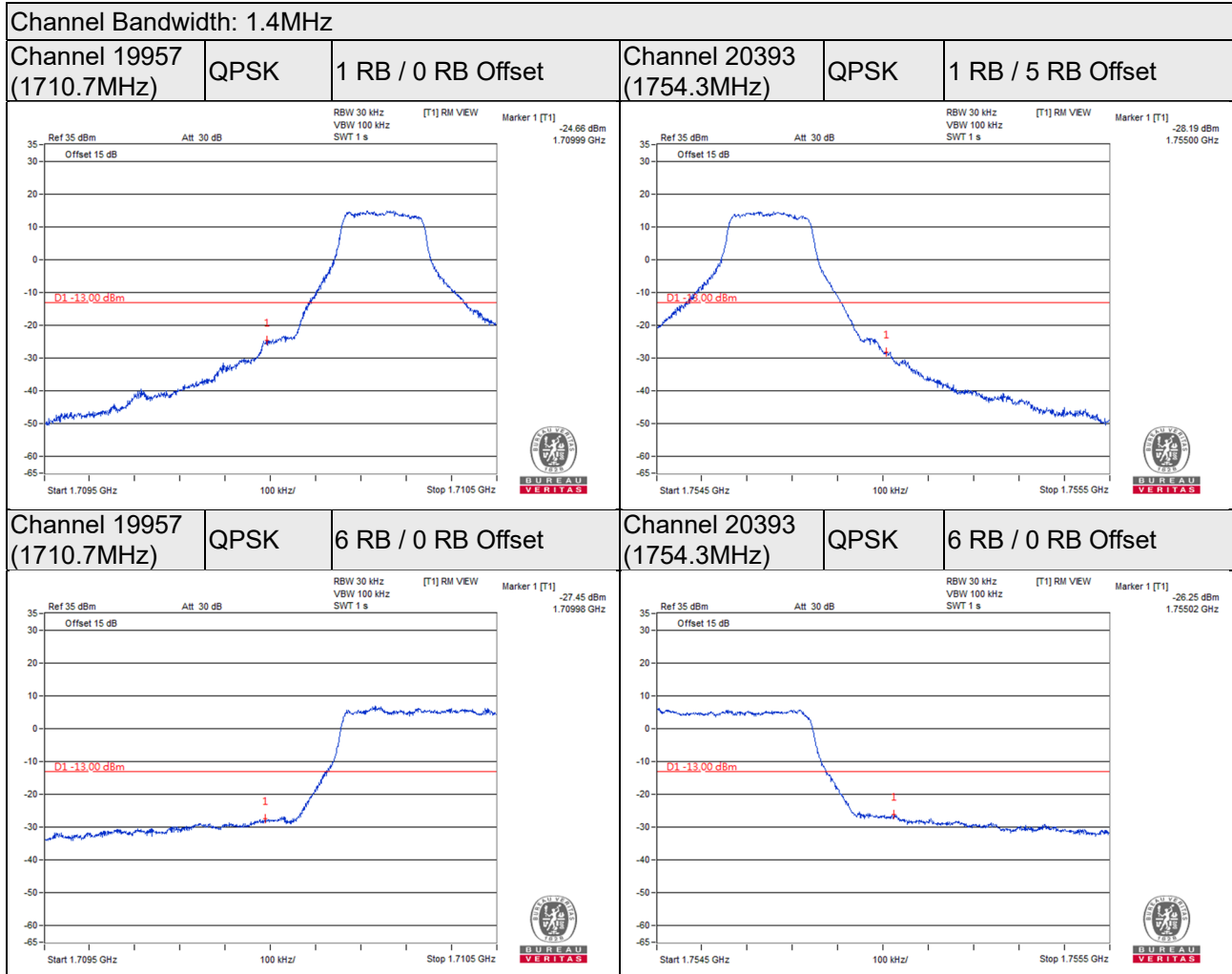


4.5.3 Test Procedures

- a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 2 channels: low and high operational frequency range. Emission mask measurements were done at 3 channels: low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 1.4MHz / 3MHz).
- c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- f. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
- g. LTE Band 7 operations in the 5 MHz channel BW mode, extend the 1% range from 1M to 2M above and below the channel edge and then reduce the limit further by $10 \log(1000/100) = 10\text{dB}$ (i.e. total $-10 + -10 = -20\text{dB}$) to compensate for the integration from 100k to 1M.
- h. Record the max trace plot into the test report.

4.5.4 Test Results

LTE Band 4



Channel Bandwidth: 3MHz

**Channel 19965
(1711.5MHz)**

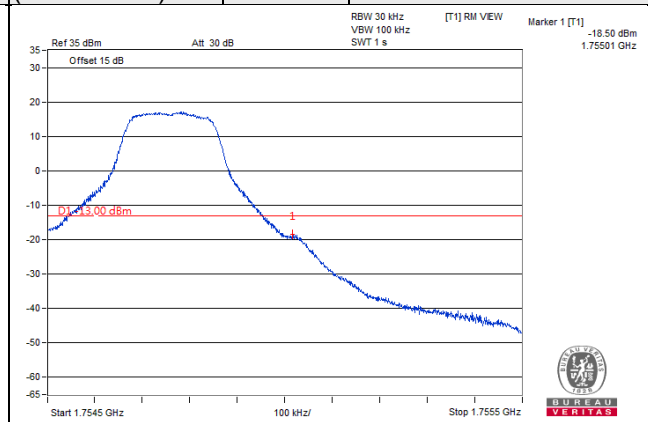
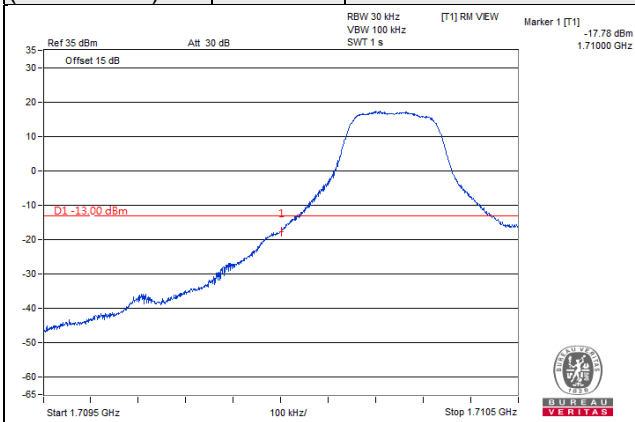
QPSK

1 RB / 0 RB Offset

**Channel 20385
(1753.5MHz)**

QPSK

1 RB / 14 RB Offset



**Channel 19965
(1711.5MHz)**

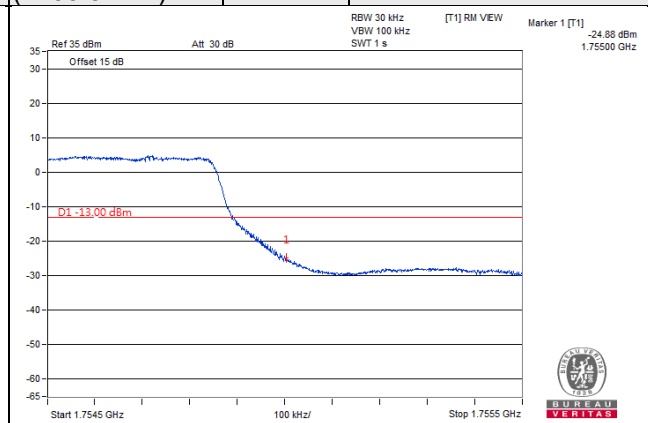
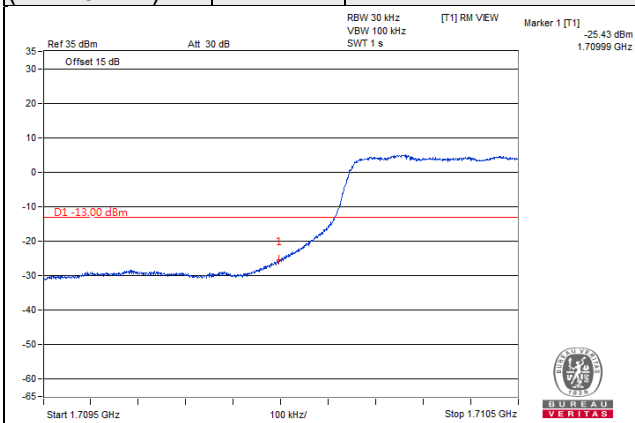
QPSK

15 RB / 0 RB Offset

**Channel 20385
(1753.5MHz)**

QPSK

15 RB / 0 RB Offset





BUREAU VERITAS

Channel Bandwidth: 5MHz

Channel 19975
(1712.5MHz)

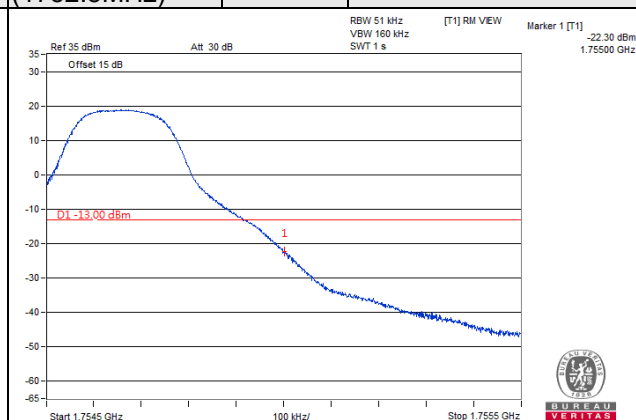
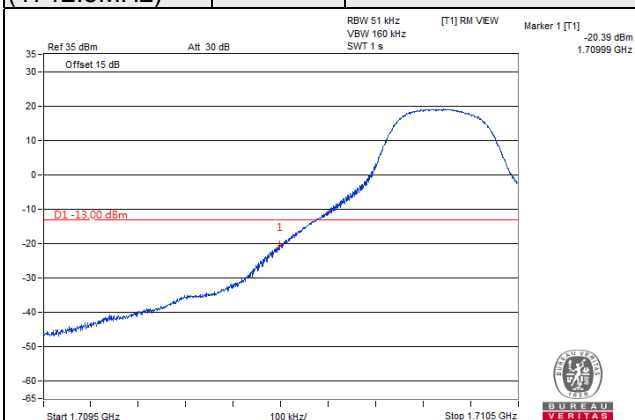
QPSK

1 RB / 0 RB Offset

Channel 20375
(1752.5MHz)

QPSK

1 RB / 24 RB Offset



Channel 19975
(1712.5MHz)

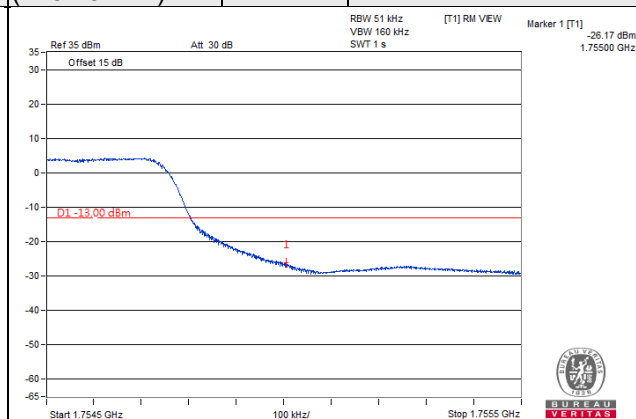
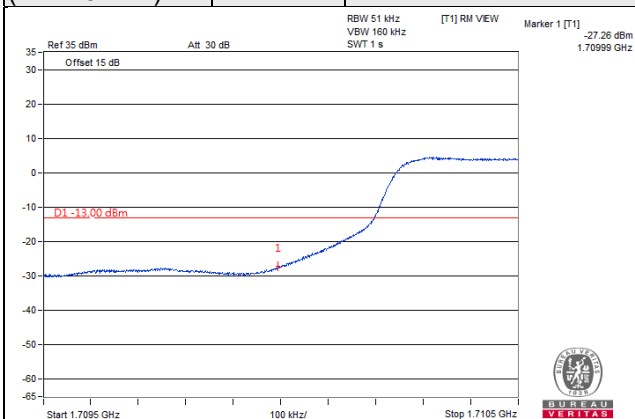
QPSK

25 RB / 0 RB Offset

Channel 20375
(1752.5MHz)

QPSK

25 RB / 0 RB Offset





BUREAU VERITAS

Channel Bandwidth: 10MHz

Channel 20000
(1715.0MHz)

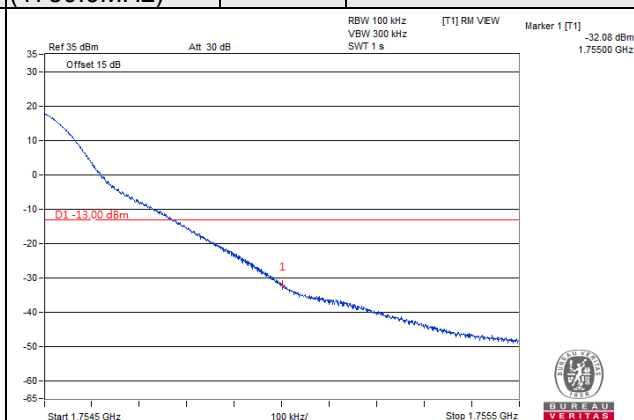
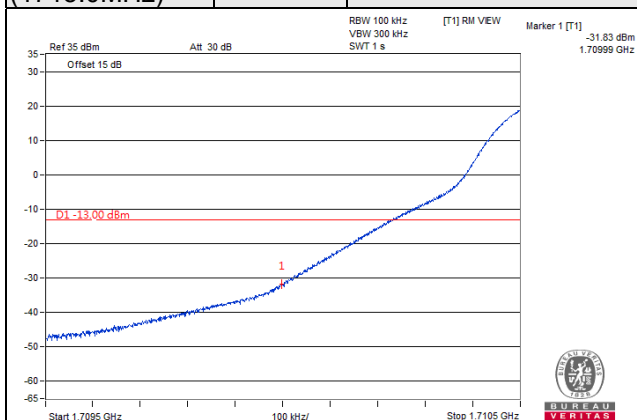
QPSK

1 RB / 0 RB Offset

Channel 20350
(1750.0MHz)

QPSK

1 RB / 49 RB Offset



Channel 20000
(1715.0MHz)

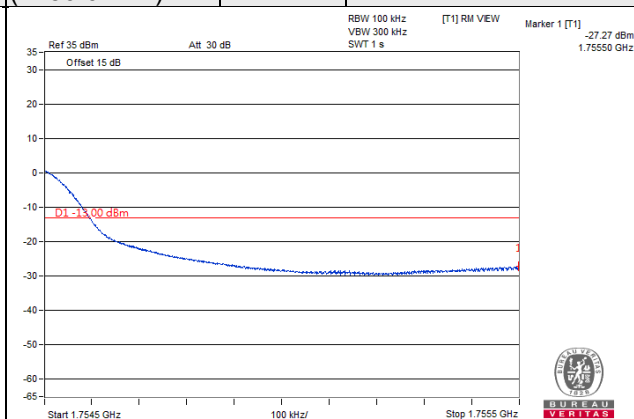
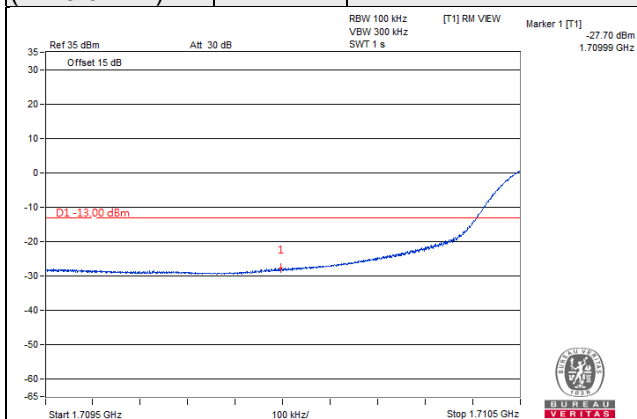
QPSK

50 RB / 0 RB Offset

Channel 20350
(1750.0MHz)

QPSK

50 RB / 0 RB Offset



Channel Bandwidth: 15MHz

Channel 20025
(1717.5MHz)

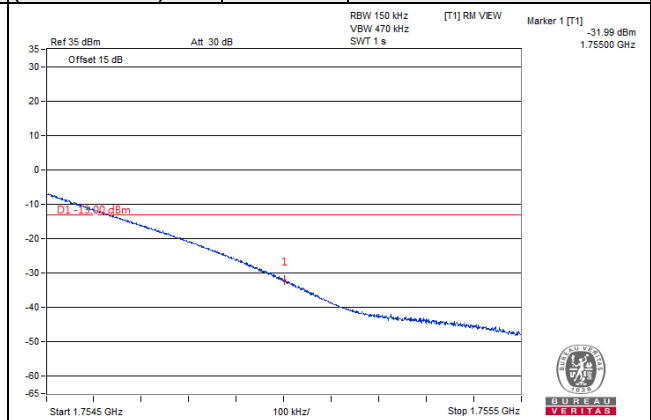
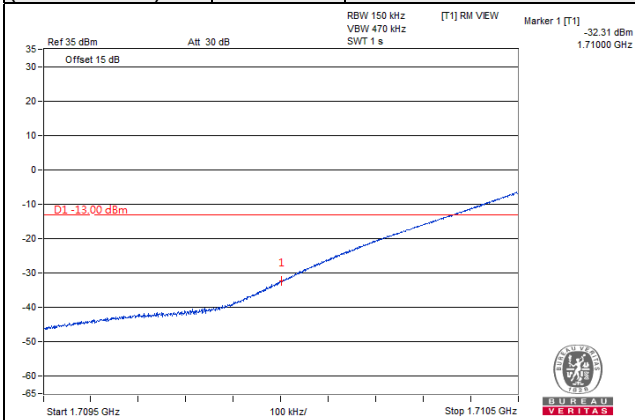
QPSK

1 RB / 0 RB Offset

Channel 20325
(1747.5MHz)

QPSK

1 RB / 74 RB Offset



Channel 20025
(1717.5MHz)

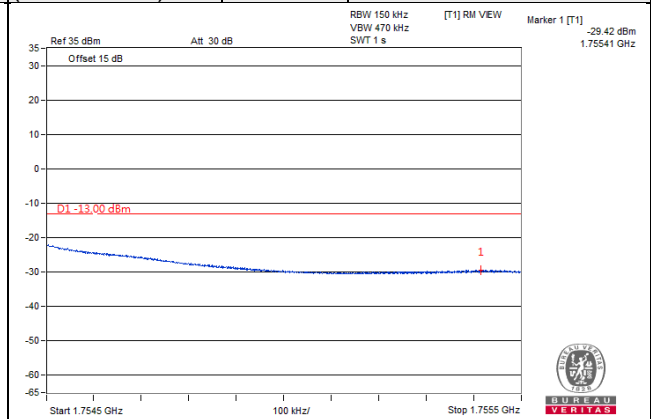
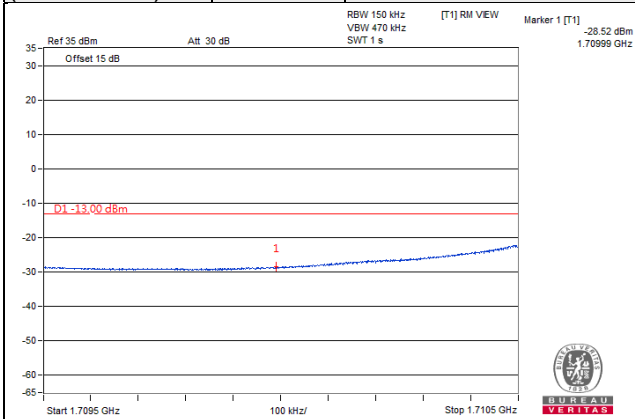
QPSK

75 RB / 0 RB Offset

Channel 20325
(1747.5MHz)

QPSK

75 RB / 0 RB Offset



Channel Bandwidth: 20MHz

Channel 20050
(1720.0MHz)

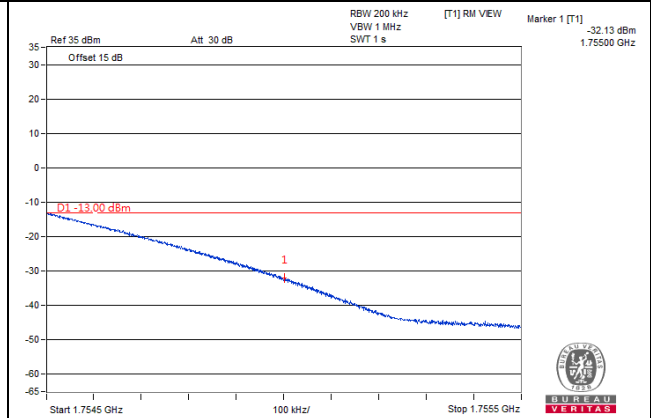
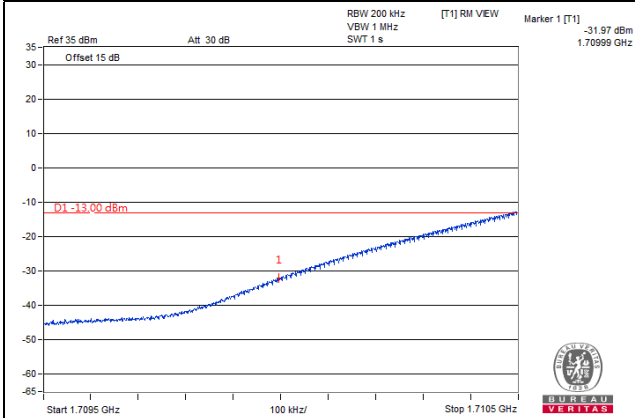
QPSK

1 RB / 0 RB Offset

Channel 20300
(1745.0MHz)

QPSK

1 RB / 99 RB Offset



Channel 20050
(1720.0MHz)

QPSK

100 RB / 0 RB Offset

Channel 20300
(1745.0MHz)

QPSK

100 RB / 0 RB Offset

