



RF TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-MF920V
Product LTE Ufi
Model MF920V
Report No. RXA1706-0182RF03
Issue Date July 26, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR47 Part 27C (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Jiang peng Lan

Performed by: Jiangpeng Lan

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50(d)(4) /27.50(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h) /27.53(m)	PASS
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051 /27.53(h) /27.53(m)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) /27.53(m)	PASS
Date of Testing: June 14, 2017~July 7, 2017			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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2 General Description of Equipment under Test

Client Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

General information

EUT Description			
Model:	MF920V		
IMEI	861376030696365		
Hardware Version:	dmsA		
Software Version:	WEB_LAMF920V1AV1.0.0B01		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	WCDMA Band IV; LTE Band 4; LTE Band 7;		
HSDPA UE Category:	24		
HSUPA UE Category:	6		
LTE Category	4		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV: 25.24 dBm LTE Band 4: 21.95 dBm LTE Band 7: 22.72 dBm		
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.5V Maximum: 4.35V		
Extreme Temperature:	Lowest: -10°C Highest: +55°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	WCDMA Band IV	1710 ~ 1755	2110 ~ 2155
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
EUT Accessory			
Battery	Manufacturer: ZhongShan Tianmao Battery Co., Ltd Model: Li3820T43P3h715345 Power Rating: DC 3.8V, 2000mAh, Li-ion		
Adapter	Manufacturer: Shenzhen Dokocom Energy Technology Co Ltd Model: STC-A51A-Z Input power: 100-240 Vac 50-60Hz 250mA Output power: 5 Vdc 1000mA		
USB	98cm Cable, Shielded		
Note: 1. The information of the EUT is declared by the manufacturer.			

2.1 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC CFR47 Part 2 (2017)

FCC CFR47 Part 27C (2017)

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v02r02

3 Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, vertical polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated. Subsequently, only the worst case emissions are reported.

The following testing in WCDMA/LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for WCDMA Band IV:

	Test items	Modes/Modulation
Conducted Test cases	RF power output	RMC/HSDPA/HSUPA/DC-HSDPA
	Effective Isotropic Radiated power	RMC
	Occupied Bandwidth	RMC
	Band Edge Compliance	RMC
	Peak-to-Average Power Ratio	RMC
	Frequency Stability	RMC
	Spurious Emissions at Antenna Terminals	RMC
Radiated Test cases	Radiates Spurious Emission	RMC

Test modes are chosen to be reported as the worst case configuration below for LTE Band 4/7:

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	LTE 4	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
Occupied Bandwidth	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	LTE 4	O	O	O	O	O	O	O	O	O	-	O	O	-	O
	LTE 7	-	-	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	LTE 4	O	O	O	O	O	O	O	O	-	-	O	O	O	O
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	LTE 4	O	O	O	O	O	O	O	O	-	-	O	-	O	-
	LTE 7	-	-	O	O	O	O	O	O	-	-	O	-	O	-
Spurious Emissions at Antenna Terminals	LTE 4	O	O	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 7	-	-	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 4	O	O	O	O	O	O	O	-	O	-	-	O	O	O
	LTE 7	-	-	O	O	O	O	O	-	O	-	-	O	O	O
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.														

4 Test Information

4.1 RF Power Output

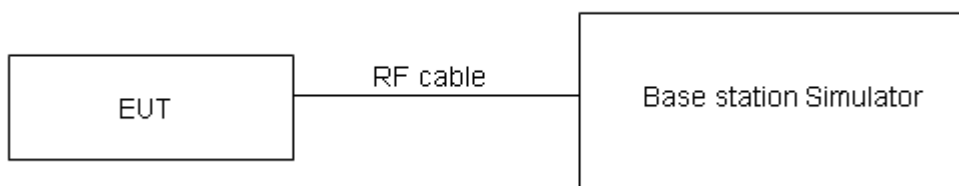
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=0.4$ dB.

Test Results

WCDMA Band IV		Conducted Power(dBm)		
		Channel 1312	Channel 1413	Channel 1513
		1712.4 (MHz)	1732.6 (MHz)	1752.6(MHz)
RMC	12.2k	23.01	23.24	23.33
	64k	22.87	23.18	23.20
	144k	22.86	23.08	23.19
	384k	22.85	23.07	23.18
HSDPA	Sub - Test 1	22.84	23.08	23.17
	Sub - Test 2	22.85	23.07	23.19
	Sub - Test 3	22.45	22.65	22.77
	Sub - Test 4	22.44	22.67	22.76
HSUPA	Sub - Test 1	22.93	23.16	23.25
	Sub - Test 2	21.09	21.32	21.41
	Sub - Test 3	21.91	22.14	22.23
	Sub - Test 4	21.10	21.33	21.42
	Sub - Test 5	22.89	23.12	23.21
DC-HSDPA	Sub - Test 1	22.88	23.11	23.20
	Sub - Test 2	22.86	23.10	23.19
	Sub - Test 3	22.35	22.59	22.68
	Sub - Test 4	22.34	22.58	22.67
Note: 1) The maximum RF Output Power numbers are marks in bold. 2) The following testing in RMC based on the maximum RF Output Power.				

LTE TDD Band 4				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	22.21	22.15	22.33
		1	2	22.33	22.17	22.12
		1	5	22.22	21.96	22.12
		3	0	21.98	22.02	22.22
		3	2	21.98	22.00	22.03
		3	3	21.94	21.90	22.01
		6	0	20.97	21.18	21.09
	16QAM	1	0	21.02	21.00	21.18
		1	2	21.06	20.80	21.25
		1	5	21.02	21.13	21.09
		3	0	20.98	20.88	21.20
		3	2	20.94	21.04	20.98
		3	3	21.07	20.81	20.90
		6	0	20.14	20.09	20.11
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	22.23	22.19	22.36
		1	7	22.36	22.22	22.16
		1	14	22.25	22.01	22.16
		8	0	21.08	21.14	21.35
		8	4	21.10	21.10	21.15
		8	7	21.04	21.01	21.11
		15	0	21.00	21.22	21.12
	16QAM	1	0	21.05	21.02	21.21
		1	7	21.09	20.85	21.29
		1	14	21.04	21.17	21.12
		8	0	20.09	20.01	20.32
		8	4	20.05	20.17	20.10
		8	7	20.17	19.93	20.03
		15	0	20.17	20.13	20.14
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.20	22.17	22.32
		1	13	22.34	22.18	22.13
		1	24	22.22	21.96	22.12
		12	0	21.05	21.09	21.31
		12	6	21.08	21.06	21.10
		12	13	21.02	20.99	21.07
		25	0	20.98	21.21	21.10



	16QAM	1	0	21.02	20.98	21.18
		1	13	21.06	20.83	21.26
		1	24	21.01	21.15	21.08
		12	0	20.07	19.97	20.29
		12	6	20.02	20.12	20.06
		12	13	20.14	19.88	19.99
		25	0	20.15	20.09	20.09
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.22	22.18	22.35
		1	25	22.37	22.23	22.17
		1	49	22.24	22.00	22.15
		25	0	21.08	21.14	21.35
		25	13	21.11	21.11	21.14
		25	25	21.04	21.03	21.12
		50	0	21.06	21.23	21.14
	16QAM	1	0	21.04	21.01	21.20
		1	25	21.09	20.87	21.29
		1	49	21.04	21.17	21.11
		25	0	20.10	20.02	20.33
		25	13	20.04	20.16	20.09
		25	25	20.17	19.93	20.03
		50	0	20.18	20.14	20.13
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	22.21	22.14	22.33
		1	38	22.35	22.22	22.14
		1	74	22.21	21.95	22.11
		36	0	21.06	21.10	21.32
		36	18	21.08	21.06	21.10
		36	39	21.01	21.00	21.08
		75	0	21.04	21.19	21.09
	16QAM	1	0	20.99	20.99	21.18
		1	38	21.07	20.84	21.27
		1	74	21.01	21.13	21.08
		36	0	20.07	20.00	20.30
		36	18	20.01	20.11	20.05
		36	39	20.15	19.89	20.00
		75	0	20.15	20.09	20.09
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	22.18	22.10	22.30
		1	50	22.34	22.18	22.12



		1	99	22.19	21.94	22.08
		50	0	21.03	21.05	21.28
		50	25	21.06	21.02	21.07
		50	50	20.98	20.95	21.04
		100	0	21.01	21.14	21.05
	16QAM	1	0	20.97	20.95	21.13
		1	50	21.03	20.82	21.23
		1	99	20.99	21.10	21.06
		50	0	20.04	19.96	20.27
		50	25	19.98	20.09	20.02
		50	50	20.12	19.84	19.96
		100	0	20.13	20.05	20.06

Note:

1) The following testing in worst case based on the maximum RF Output Power.

LTE FDD Band 7				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20775/2502.5	21100/2535	21425/2567.5
5MHz	QPSK	1	0	22.31	22.30	22.16
		1	13	22.45	22.42	22.26
		1	24	22.25	22.28	22.06
		12	0	21.18	21.42	21.50
		12	6	21.30	21.34	21.16
		12	13	21.13	21.29	21.01
		25	0	21.03	21.28	21.30
	16QAM	1	0	20.96	21.07	21.02
		1	13	21.26	21.27	21.21
		1	24	20.98	20.92	20.84
		12	0	19.98	20.16	20.09
		12	6	20.11	20.29	19.97
		12	13	20.16	20.38	20.07
		25	0	20.13	20.27	20.08
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	22.33	22.31	22.19
		1	25	22.48	22.47	22.30
		1	49	22.27	22.32	22.09
		25	0	21.21	21.47	21.54
		25	13	21.33	21.39	21.20
		25	25	21.15	21.33	21.06
		50	0	21.11	21.30	21.34
	16QAM	1	0	20.98	21.10	21.04



		1	25	21.29	21.31	21.24
		1	49	21.01	20.94	20.87
		25	0	20.01	20.21	20.13
		25	13	20.13	20.33	20.00
		25	25	20.19	20.43	20.11
		50	0	20.16	20.32	20.12
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	22.32	22.27	22.17
		1	38	22.46	22.46	22.27
		1	74	22.24	22.27	22.05
		36	0	21.19	21.43	21.51
		36	18	21.30	21.34	21.16
		36	39	21.12	21.30	21.02
		75	0	21.09	21.26	21.29
	16QAM	1	0	20.93	21.08	21.02
		1	38	21.27	21.28	21.22
		1	74	20.98	20.90	20.84
		36	0	19.98	20.19	20.10
		36	18	20.10	20.28	19.96
		36	39	20.17	20.39	20.08
		75	0	20.13	20.27	20.08
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	22.29	22.23	22.14
		1	50	22.45	22.42	22.25
		1	99	22.22	22.26	22.02
		50	0	21.16	21.38	21.47
		50	25	21.28	21.30	21.13
		50	50	21.09	21.25	20.98
		100	0	21.06	21.21	21.25
	16QAM	1	0	20.91	21.04	20.97
		1	50	21.23	21.26	21.18
		1	99	20.96	20.87	20.82
		50	0	19.95	20.15	20.07
		50	25	20.07	20.26	19.93
		50	50	20.14	20.34	20.04
		100	0	20.11	20.23	20.05

4.2 Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

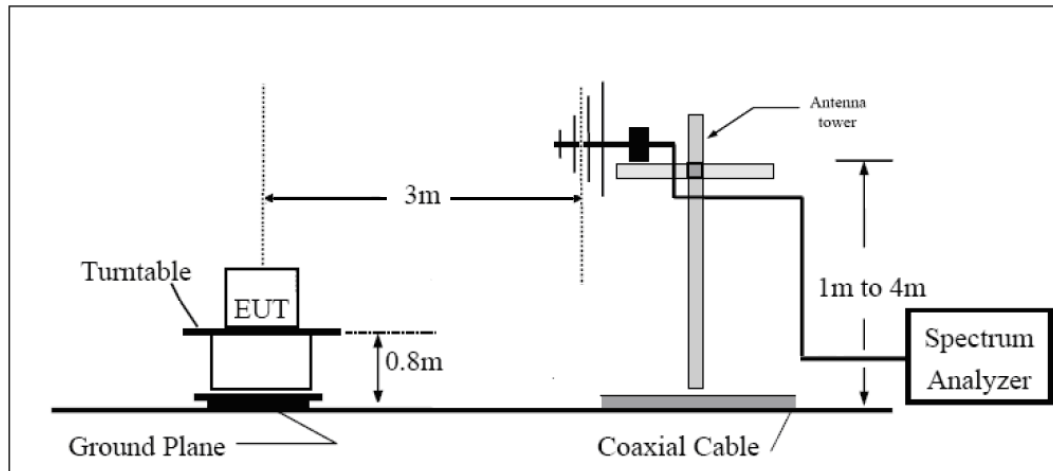
1. The testing follows ANSI C63.26 (2015) Section 5.5.2.3.
2. Above 30MHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAG) should be recorded after test.
7. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAG} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

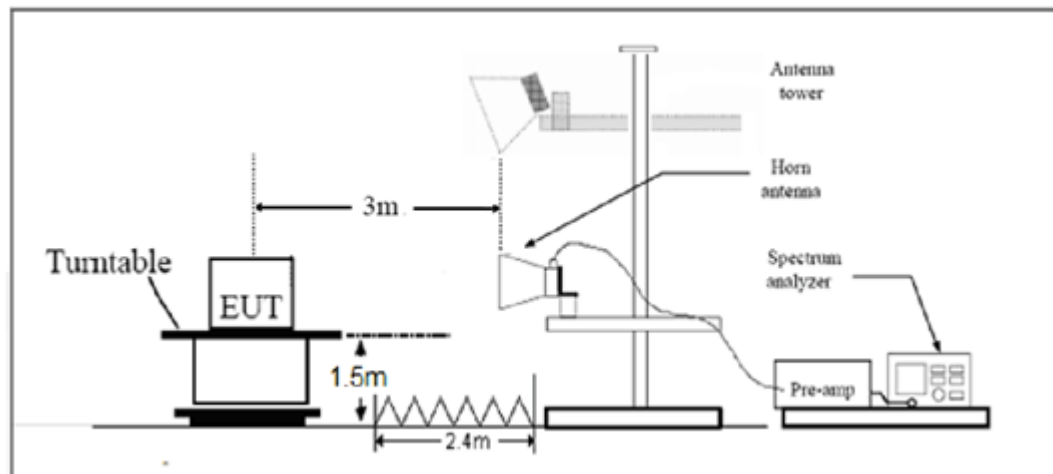
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

Limits

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Rule Part 27.50(h) (2) specifies that “Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.”

Part 27.50(d)(4)Limit (EIRP)	$\leq 1 \text{ W}$ (30 dBm)
Part 27.50(h)(2) Limit (EIRP)	$\leq 2 \text{ W}$ (33 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 1.19 \text{ dB}$

Test Results

WCDMA Band IV							
Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
1712.4	H	-23.45	-45.44	0.00	1.82	23.81	Pass
1732.6	H	-23.06	-45.38	0.00	1.96	24.28	Pass
1752.6	H	-22.07	-45.38	0.00	1.93	25.24	Pass
1712.4	V	-32.82	-45.54	0.00	1.82	14.54	Pass
1732.6	V	-31.28	-45.46	0.00	1.96	16.14	Pass
1752.6	V	-30.67	-45.49	0.00	1.93	16.75	Pass

LTE Band 4								
Bandwidth	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
1.4MHz (QPSK)	1710.7	H	-35.55	-54.30	0.00	1.44	20.19	Pass
	1732.5	H	-35.17	-54.32	0.00	1.57	20.71	Pass
	1754.3	H	-34.09	-54.10	0.00	1.72	21.73	Pass
	1710.7	V	-34.87	-54.35	0.00	1.44	20.92	Pass
	1732.5	V	-34.63	-54.41	0.00	1.57	21.35	Pass
	1754.3	V	-34.77	-54.52	0.00	1.72	21.47	Pass
1.4MHz (16QAM)	1710.7	H	-35.86	-54.30	0.00	1.44	19.88	Pass
	1732.5	H	-35.48	-54.32	0.00	1.57	20.40	Pass
	1754.3	H	-34.40	-54.10	0.00	1.72	21.42	Pass
	1710.7	V	-35.17	-54.35	0.00	1.44	20.62	Pass
	1732.5	V	-34.94	-54.41	0.00	1.57	21.04	Pass
	1754.3	V	-35.09	-54.52	0.00	1.72	21.15	Pass
3MHz (QPSK)	1711.5	H	-35.34	-54.33	0.00	1.44	20.43	Pass
	1732.5	H	-35.38	-54.32	0.00	1.57	20.50	Pass
	1753.5	H	-34.25	-54.11	0.00	1.72	21.58	Pass
	1711.5	V	-34.85	-54.35	0.00	1.44	20.94	Pass
	1732.5	V	-35.01	-54.41	0.00	1.57	20.97	Pass
	1753.5	V	-34.75	-54.48	0.00	1.72	21.45	Pass
3MHz (16QAM)	1711.5	H	-35.64	-54.33	0.00	1.44	20.13	Pass
	1732.5	H	-35.68	-54.32	0.00	1.57	20.20	Pass
	1753.5	H	-34.58	-54.11	0.00	1.72	21.25	Pass
	1711.5	V	-35.16	-54.35	0.00	1.44	20.63	Pass
	1732.5	V	-35.32	-54.41	0.00	1.57	20.66	Pass
	1753.5	V	-35.05	-54.48	0.00	1.72	21.15	Pass
5MHz (QPSK)	1712.5	H	-35.65	-54.34	0.00	1.44	20.13	Pass
	1732.5	H	-35.41	-54.32	0.00	1.57	20.47	Pass
	1752.5	H	-34.56	-54.13	0.00	1.72	21.28	Pass
	1712.5	V	-34.77	-54.38	0.00	1.44	21.05	Pass
	1732.5	V	-34.49	-54.41	0.00	1.57	21.49	Pass



	1752.5	V	-34.78	-54.47	0.00	1.72	21.41	Pass
5MHz (16QAM)	1712.5	H	-35.96	-54.34	0.00	1.44	19.82	Pass
	1732.5	H	-35.73	-54.32	0.00	1.57	20.15	Pass
	1752.5	H	-34.89	-54.13	0.00	1.72	20.95	Pass
	1712.5	V	-35.07	-54.38	0.00	1.44	20.75	Pass
	1732.5	V	-34.83	-54.41	0.00	1.57	21.15	Pass
	1752.5	V	-35.08	-54.47	0.00	1.72	21.11	Pass
10MHz (QPSK)	1715	H	-35.46	-54.33	0.00	1.44	20.31	Pass
	1732.5	H	-35.76	-54.32	0.00	1.57	20.12	Pass
	1750	H	-34.05	-54.12	0.00	1.66	21.73	Pass
	1715	V	-34.58	-54.32	0.00	1.44	21.18	Pass
	1732.5	V	-34.68	-54.41	0.00	1.57	21.30	Pass
	1750	V	-34.23	-54.52	0.00	1.66	21.95	Pass
10MHz (16QAM)	1715	H	-35.76	-54.33	0.00	1.44	20.01	Pass
	1732.5	H	-36.06	-54.32	0.00	1.57	19.82	Pass
	1750	H	-34.36	-54.12	0.00	1.66	21.42	Pass
	1715	V	-34.88	-54.32	0.00	1.44	20.88	Pass
	1732.5	V	-34.98	-54.41	0.00	1.57	21.00	Pass
	1750	V	-34.54	-54.52	0.00	1.66	21.64	Pass
15MHz (QPSK)	1717.5	H	-35.55	-54.35	0.00	1.49	20.28	Pass
	1732.5	H	-35.73	-54.32	0.00	1.57	20.15	Pass
	1747.5	H	-34.67	-54.17	0.00	1.66	21.16	Pass
	1717.5	V	-34.68	-54.39	0.00	1.49	21.20	Pass
	1732.5	V	-34.51	-54.41	0.00	1.57	21.47	Pass
	1747.5	V	-34.40	-54.51	0.00	1.66	21.77	Pass
15MHz (16QAM)	1717.5	H	-35.86	-54.35	0.00	1.49	19.97	Pass
	1732.5	H	-36.01	-54.32	0.00	1.57	19.87	Pass
	1747.5	H	-34.98	-54.17	0.00	1.66	20.85	Pass
	1717.5	V	-34.97	-54.39	0.00	1.49	20.91	Pass
	1732.5	V	-34.83	-54.41	0.00	1.57	21.15	Pass
	1747.5	V	-34.72	-54.51	0.00	1.66	21.45	Pass
20MHz (QPSK)	1720	H	-35.68	-54.37	0.00	1.49	20.18	Pass
	1732.5	H	-36.10	-54.32	0.00	1.57	19.78	Pass
	1745	H	-35.26	-54.23	0.00	1.63	20.60	Pass
	1720	V	-34.65	-54.44	0.00	1.49	21.28	Pass
	1732.5	V	-34.74	-54.41	0.00	1.57	21.24	Pass
	1745	V	-34.88	-54.59	0.00	1.63	21.34	Pass
20MHz (16QAM)	1720	H	-36.01	-54.37	0.00	1.49	19.85	Pass
	1732.5	H	-36.41	-54.32	0.00	1.57	19.47	Pass
	1745	H	-35.56	-54.23	0.00	1.63	20.30	Pass
	1720	V	-34.95	-54.44	0.00	1.49	20.98	Pass
	1732.5	V	-35.05	-54.41	0.00	1.57	20.93	Pass
	1745	V	-35.19	-54.59	0.00	1.63	21.03	Pass

LTE Band 7								
Band width	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	Conclusion
5MHz (QPSK)	2502.5	H	-40.13	-59.64	0.00	1.81	21.32	Pass
	2535	H	-39.99	-59.72	0.00	1.81	21.54	Pass
	2567.5	H	-39.44	-59.98	0.00	1.83	22.37	Pass
	2502.5	V	-39.50	-59.31	0.00	1.81	21.62	Pass
	2535	V	-39.68	-59.11	0.00	1.81	21.24	Pass
	2567.5	V	-39.74	-59.59	0.00	1.83	21.68	Pass
5MHz (16QAM)	2502.5	H	-40.44	-59.64	0.00	1.81	21.01	Pass
	2535	H	-40.31	-59.72	0.00	1.81	21.22	Pass
	2567.5	H	-39.76	-59.98	0.00	1.83	22.05	Pass
	2502.5	V	-39.82	-59.31	0.00	1.81	21.30	Pass
	2535	V	-39.97	-59.11	0.00	1.81	20.95	Pass
	2567.5	V	-40.07	-59.59	0.00	1.83	21.35	Pass
10MHz (QPSK)	2505	H	-38.78	-59.61	0.00	1.82	22.65	Pass
	2535	H	-39.00	-59.72	0.00	1.81	22.53	Pass
	2565	H	-39.52	-60.02	0.00	1.81	22.31	Pass
	2505	V	-39.27	-59.33	0.00	1.82	21.88	Pass
	2535	V	-39.68	-59.11	0.00	1.81	21.24	Pass
	2565	V	-39.65	-59.59	0.00	1.81	21.75	Pass
10MHz (16QAM)	2505	H	-39.18	-59.61	0.00	1.82	22.25	Pass
	2535	H	-39.30	-59.72	0.00	1.81	22.23	Pass
	2565	H	-39.83	-60.02	0.00	1.81	22.00	Pass
	2505	V	-39.58	-59.33	0.00	1.82	21.57	Pass
	2535	V	-39.97	-59.11	0.00	1.81	20.95	Pass
	2565	V	-39.98	-59.59	0.00	1.81	21.42	Pass
15MHz (QPSK)	2507.5	H	-38.82	-59.71	0.00	1.80	22.69	Pass
	2535	H	-39.18	-59.72	0.00	1.81	22.35	Pass
	2562.5	H	-39.27	-60.08	0.00	1.82	22.63	Pass
	2507.5	V	-39.15	-59.29	0.00	1.80	21.94	Pass
	2535	V	-40.25	-59.72	0.00	1.81	21.28	Pass
	2562.5	V	-39.55	-59.46	0.00	1.82	21.73	Pass
15MHz (16QAM)	2507.5	H	-39.16	-59.71	0.00	1.80	22.35	Pass
	2535	H	-39.48	-59.72	0.00	1.81	22.05	Pass
	2562.5	H	-39.57	-60.08	0.00	1.82	22.33	Pass
	2507.5	V	-39.47	-59.29	0.00	1.80	21.62	Pass
	2535	V	-40.56	-59.72	0.00	1.81	20.97	Pass
	2562.5	V	-39.86	-59.46	0.00	1.82	21.42	Pass
20MHz (QPSK)	2510	H	-38.57	-59.52	0.00	1.77	22.72	Pass
	2535	H	-39.02	-59.72	0.00	1.81	22.51	Pass
	2560	H	-39.37	-60.01	0.00	1.82	22.46	Pass



	2510	V	-38.94	-59.09	0.00	1.77	21.92	Pass
	2535	V	-40.23	-59.72	0.00	1.81	21.30	Pass
	2560	V	-39.86	-59.52	0.00	1.82	21.48	Pass
20MHz (16QAM)	2510	H	-38.89	-59.52	0.00	1.77	22.40	Pass
	2535	H	-39.32	-59.72	0.00	1.81	22.21	Pass
	2560	H	-39.68	-60.01	0.00	1.82	22.15	Pass
	2510	V	-39.24	-59.09	0.00	1.77	21.62	Pass
	2535	V	-40.53	-59.72	0.00	1.81	21.00	Pass
	2560	V	-40.19	-59.52	0.00	1.82	21.15	Pass

Note: 1. EIRP= E.R.P+2.15

4.3 Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.

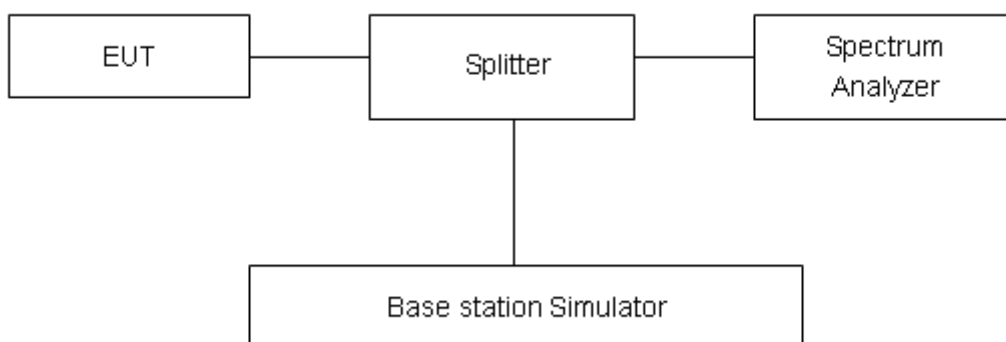
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/7 (1.4MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7 (3MHz/5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 4/7 (10MHz/15MHz/20MHz).

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=624\text{Hz}$.

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
WCDMA Band IV (RMC)	1312	2112.4	4.1419	4.731
	1413	2132.6	4.1279	4.713
	1513	2152.6	4.1485	4.753

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1264	1.366
			20175	1732.5	1.1248	1.357
			20393	1754.3	1.1371	1.354
		3	19965	1711.5	2.7486	3.035
			20175	1732.5	2.7418	3.078
			20385	1753.5	2.7443	3.072
		5	19975	1712.5	4.5172	5.022
			20175	1732.5	4.5338	5.037
			20375	1752.5	4.5082	5.023
		10	20000	1715	9.0216	10.060
			20175	1732.5	9.3970	10.200
			20350	1750	9.0533	10.130
		15	20025	1717.5	13.4200	14.650
			20175	1732.5	13.4720	14.740
			20325	1747.5	13.4500	14.820
		20	20050	1720	17.8810	19.240
			20175	1732.5	17.8820	19.250
			20300	1745	17.8890	19.430
	16QAM	1.4	19957	1710.7	1.1250	1.339
			20175	1732.5	1.1283	1.347
			20393	1754.3	1.1253	1.340
		3	19965	1711.5	2.7362	3.061
			20175	1732.5	2.7605	3.078
			20385	1753.5	2.7392	3.078
		5	19975	1712.5	4.5386	5.037
			20175	1732.5	4.5118	5.038
			20375	1752.5	4.5356	5.032
		10	20000	1715	9.0196	10.050

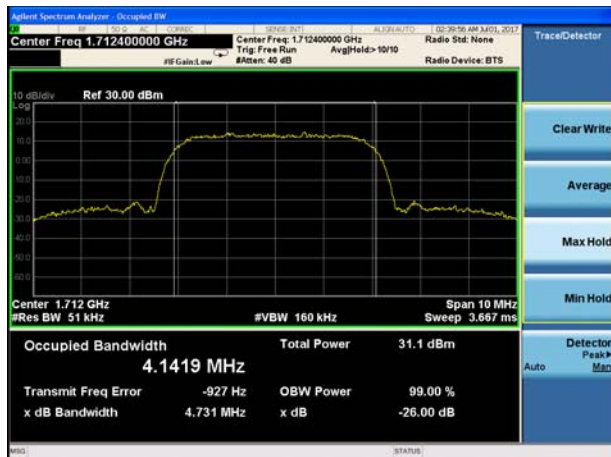


			20175	1732.5	9.0427	10.000
			20350	1750	9.0206	10.020
		15	20025	1717.5	13.478	14.690
			20175	1732.5	13.444	14.670
			20325	1747.5	13.479	14.790
		20	20050	1720	17.891	19.390
			20175	1732.5	17.893	19.330
			20300	1745	17.861	19.270

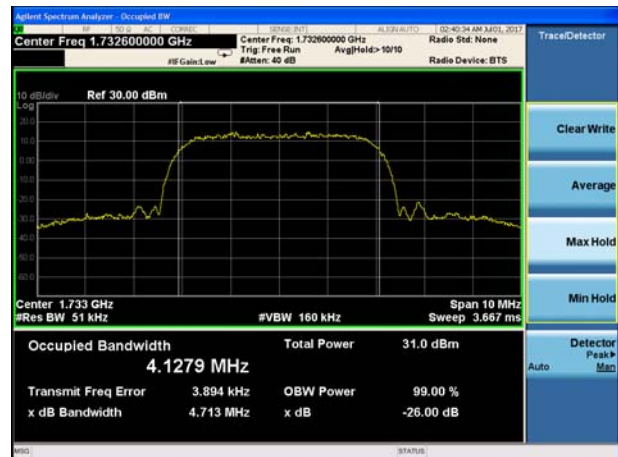
LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.5106	5.025
			21100	2535	4.5120	5.026
			21425	2567.5	4.5321	5.021
		10	20800	2505	9.0179	10.090
			21100	2535	9.0362	10.170
			21400	2565	9.0349	10.090
		15	20825	2507.5	13.4400	14.770
			21100	2535	13.4880	14.830
			21375	2562.5	13.4670	14.780
		20	20850	2510	17.8610	19.300
			21100	2535	17.8800	19.260
			21350	2560	17.8940	19.430
	16QAM	5	20775	2502.5	2.7370	3.068
			21100	2535	2.7377	3.048
			21425	2567.5	2.7504	3.062
		10	20800	2505	4.5274	5.008
			21100	2535	4.5084	5.039
			21400	2565	4.5039	5.034
		15	20825	2507.5	9.0031	10.040
			21100	2535	9.0068	10.020
			21375	2562.5	9.0295	9.985
		20	20850	2510	13.4520	14.750
			21100	2535	13.4250	14.690
			21350	2560	13.4480	14.680



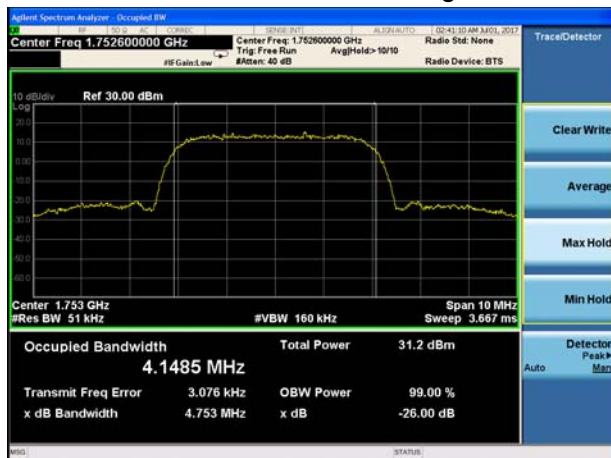
WCDMA Band IV CH-Low



WCDMA Band IV CH Middle

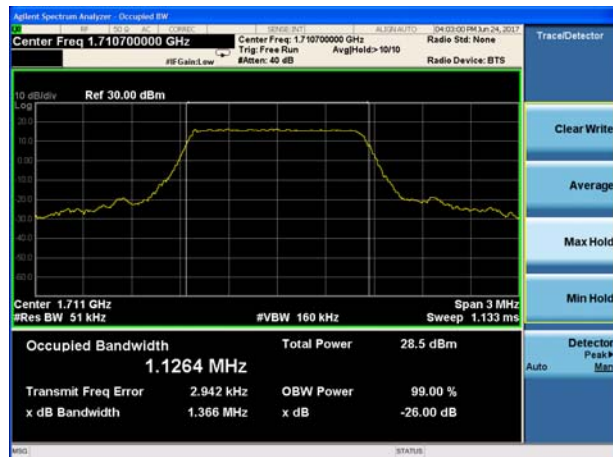


WCDMA Band IV CH High

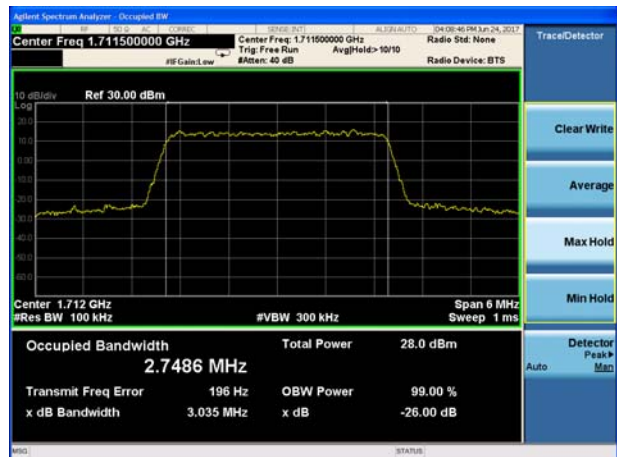




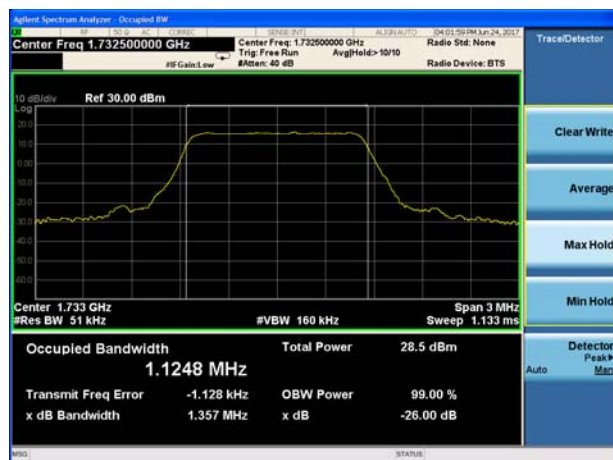
LTE Band 4 QPSK 1.4MHz CH-Low



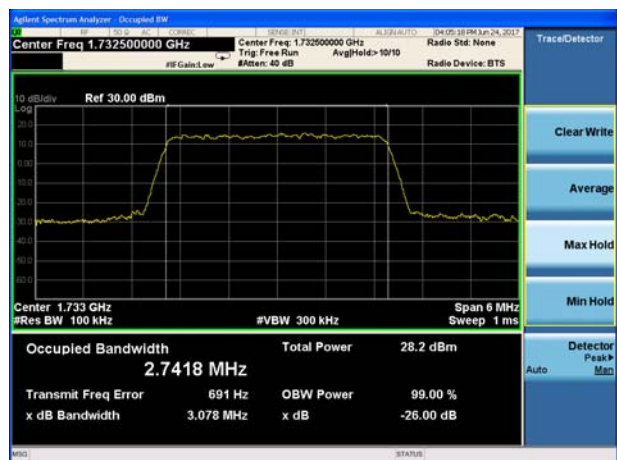
LTE Band 4 QPSK 3MHz CH-Low



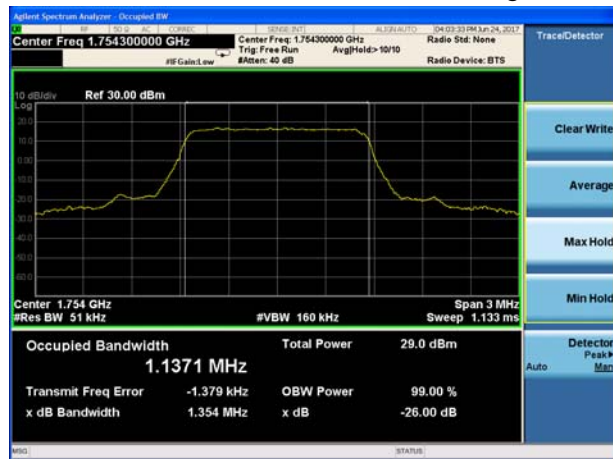
LTE Band 4 QPSK 1.4MHz CH-Middle



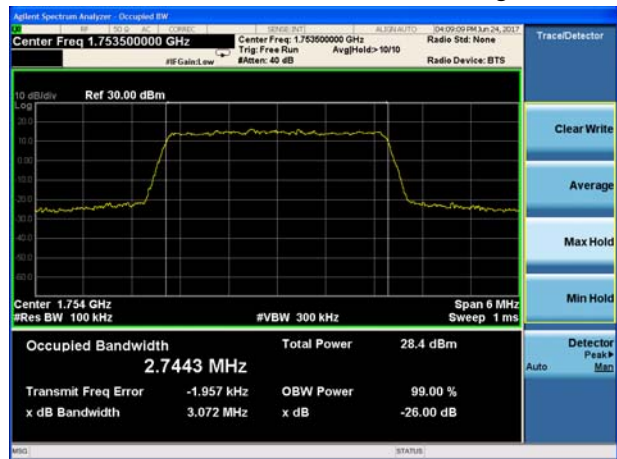
LTE Band 4 QPSK 3MHz CH-Middle



LTE Band 4 QPSK 1.4MHz CH-High



LTE Band 4 QPSK 3MHz CH-High

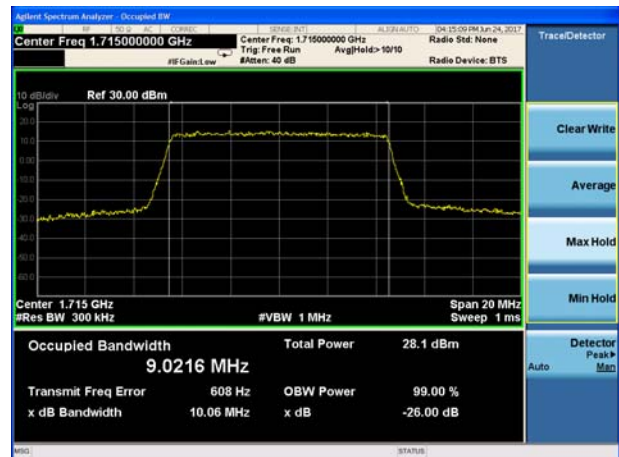




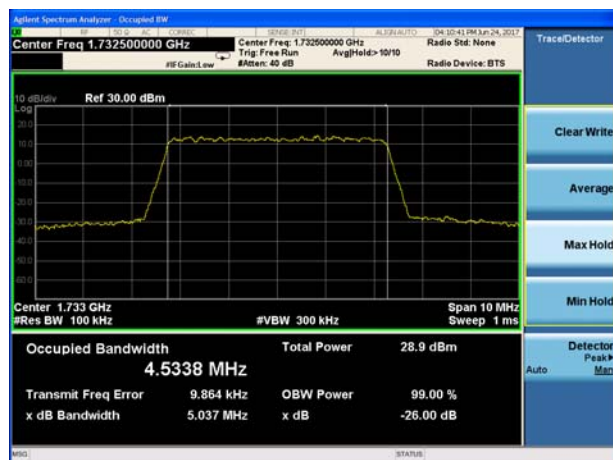
LTE Band 4 QPSK 5MHz CH-Low



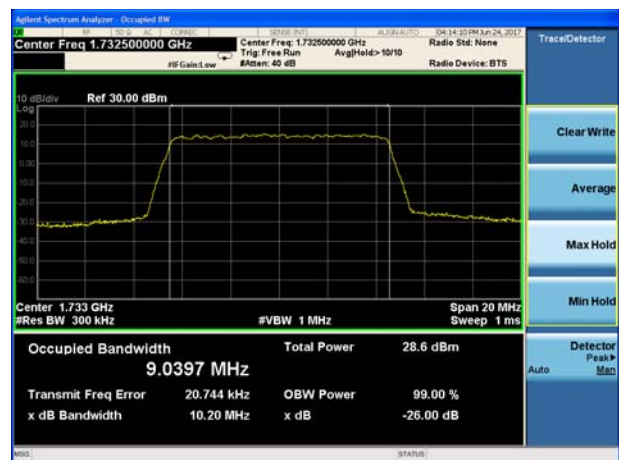
LTE Band 4 QPSK 10MHz CH-Low



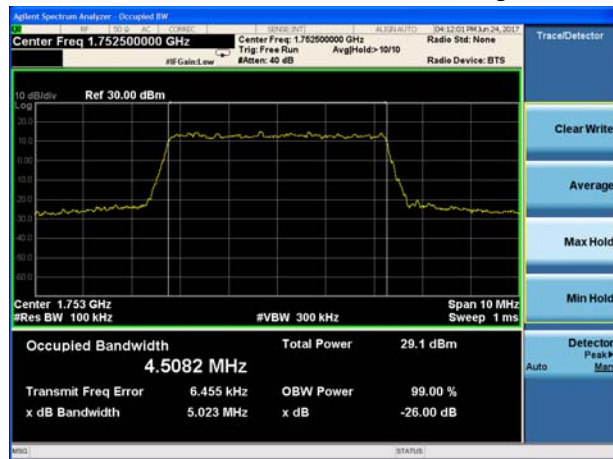
LTE Band 4 QPSK 5MHz CH-Middle



LTE Band 4 QPSK 10MHz CH-Middle



LTE Band 4 QPSK 5MHz CH-High

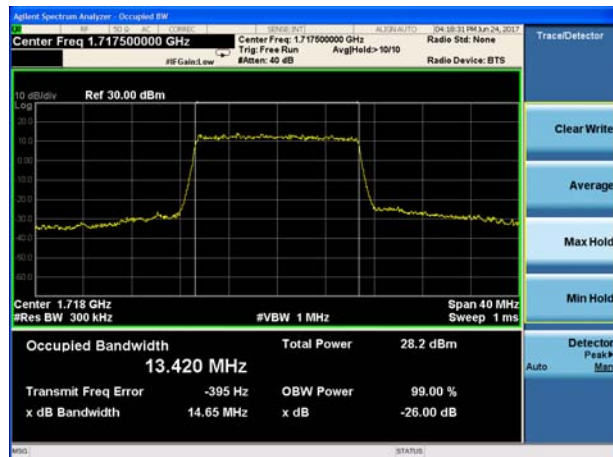


LTE Band 4 QPSK 10MHz CH-High

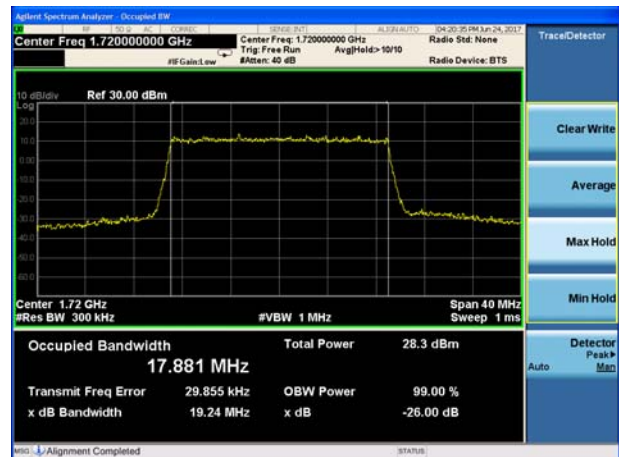




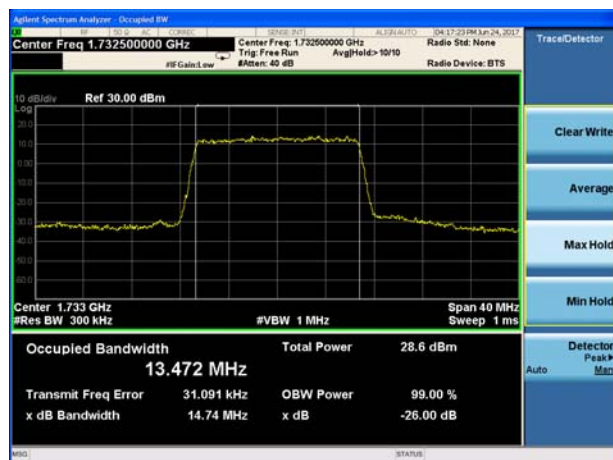
LTE Band 4 QPSK 15MHz CH-Low



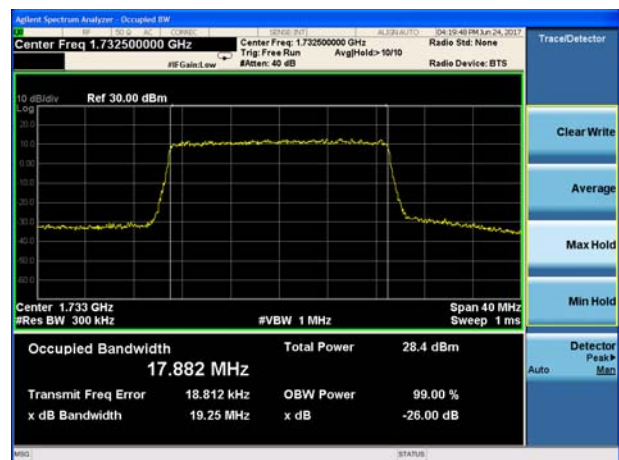
LTE Band 4 QPSK 20MHz CH-Low



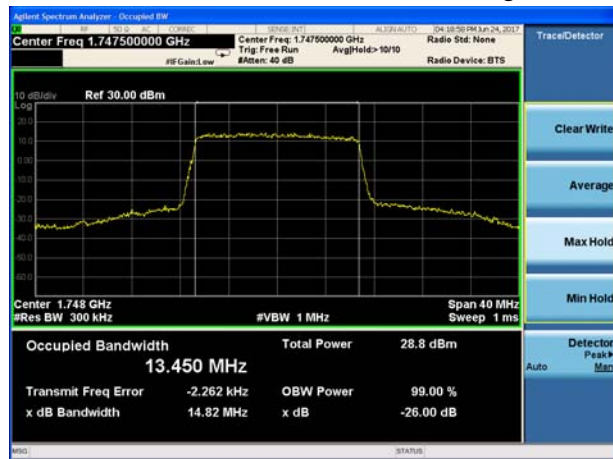
LTE Band 4 QPSK 15MHz CH-Middle



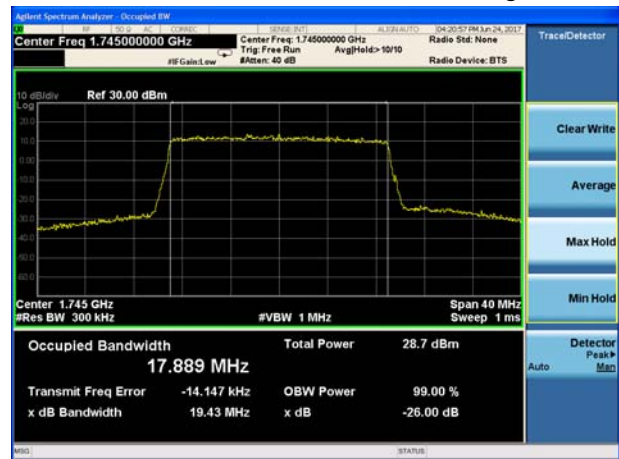
LTE Band 4 QPSK 20MHz CH-Middle



LTE Band 4 QPSK 15MHz CH-High

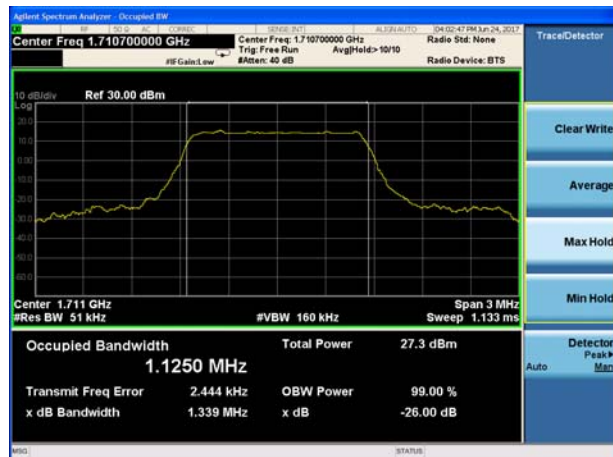


LTE Band 4 QPSK 20MHz CH-High

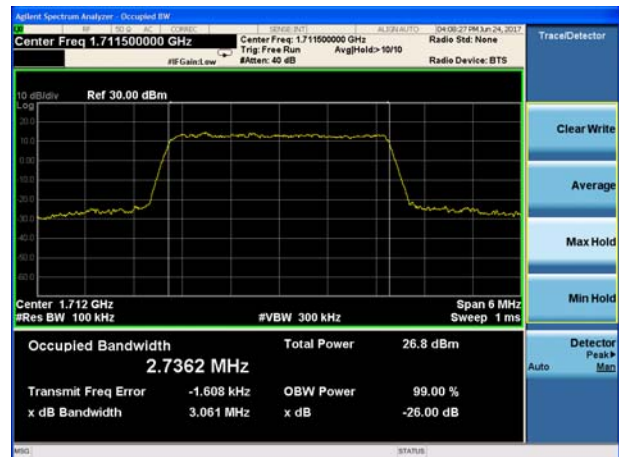




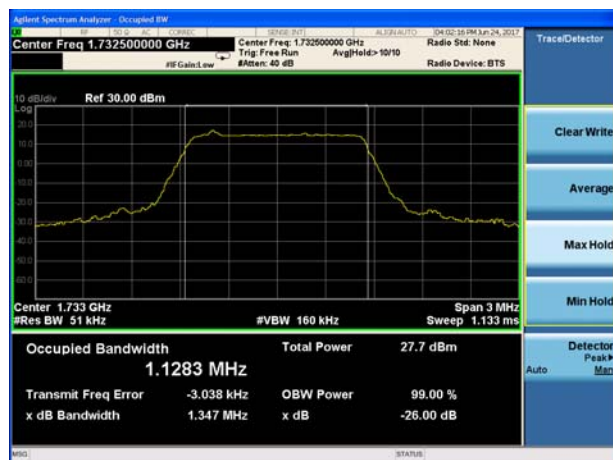
LTE Band 4 16QAM 1.4MHz CH-Low



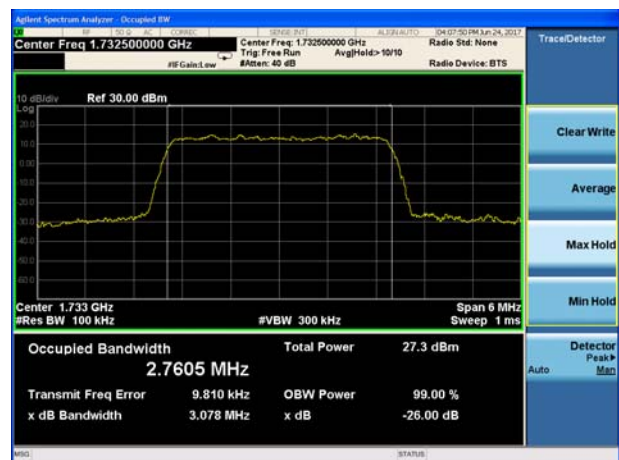
LTE Band 4 16QAM 3MHz CH-Low



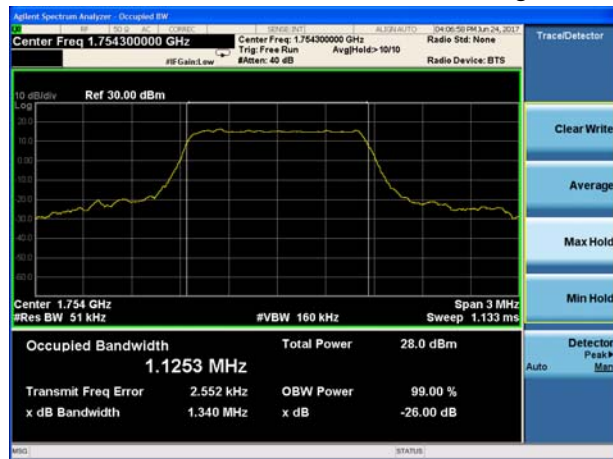
LTE Band 4 16QAM 1.4MHz CH-Middle



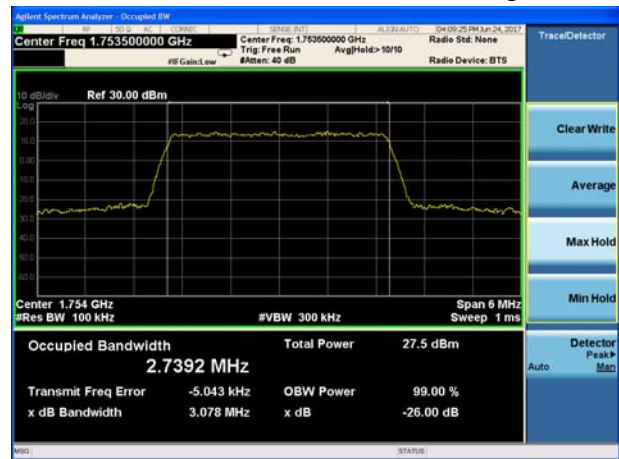
LTE Band 4 16QAM 3MHz CH-Middle



LTE Band 4 16QAM 1.4MHz CH-High



LTE Band 4 16QAM 3MHz CH-High

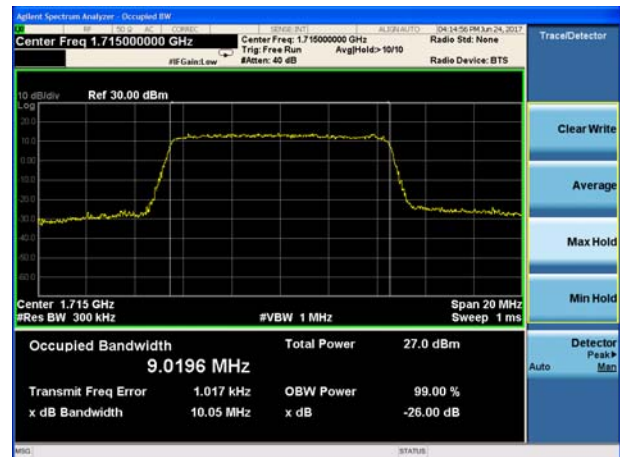




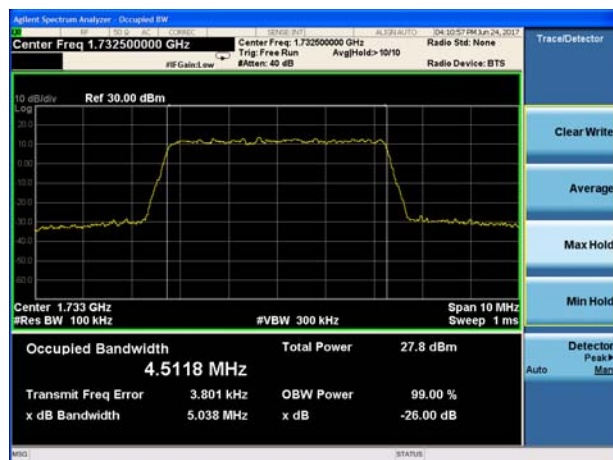
LTE Band 4 16QAM 5MHz CH-Low



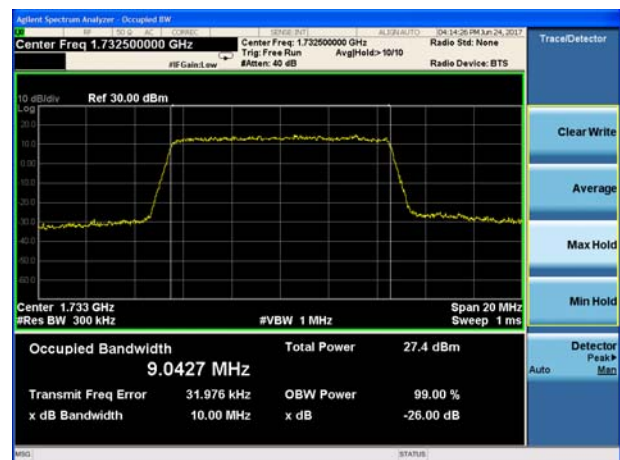
LTE Band 4 16QAM 10MHz CH-Low



LTE Band 4 16QAM 5MHz CH-Middle



LTE Band 4 16QAM 10MHz CH-Middle



LTE Band 4 16QAM 5MHz CH-High

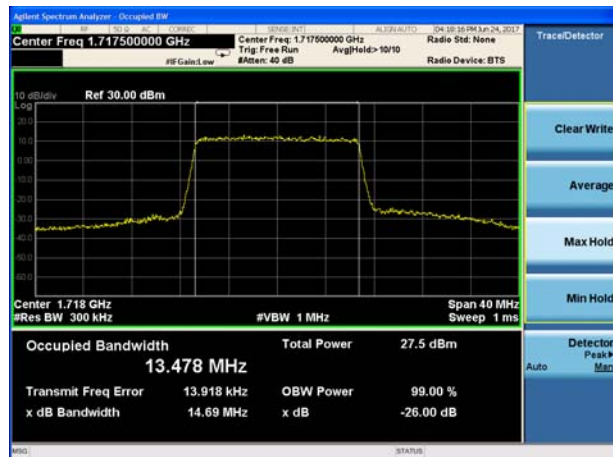


LTE Band 4 16QAM 10MHz CH-High

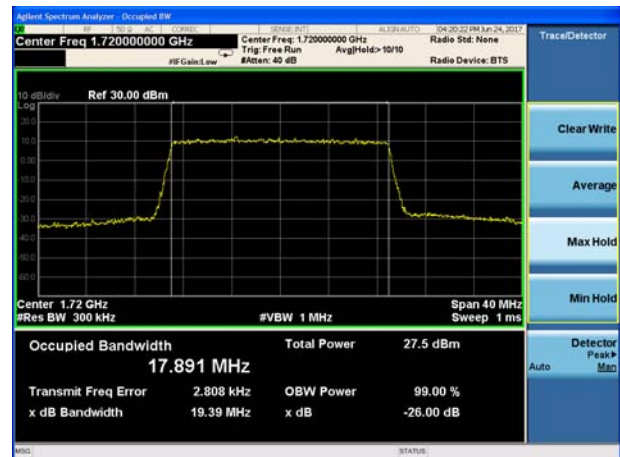




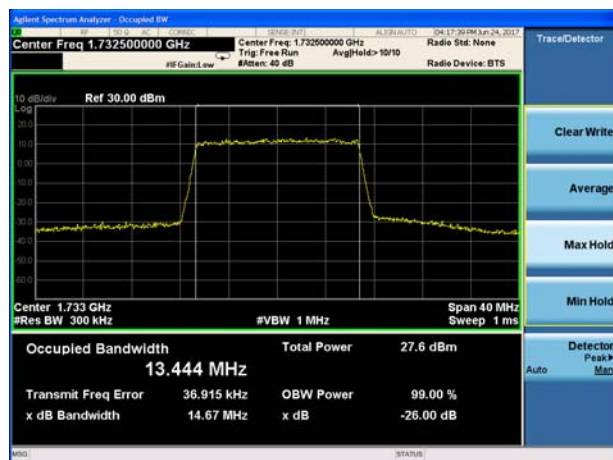
LTE Band 4 16QAM 15MHz CH-Low



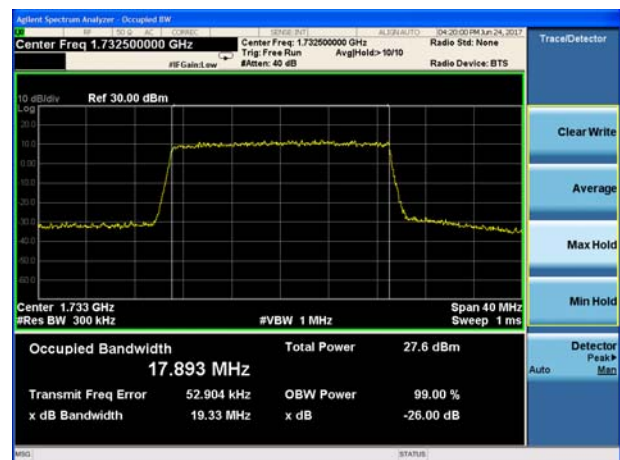
LTE Band 4 16QAM 20MHz CH-Low



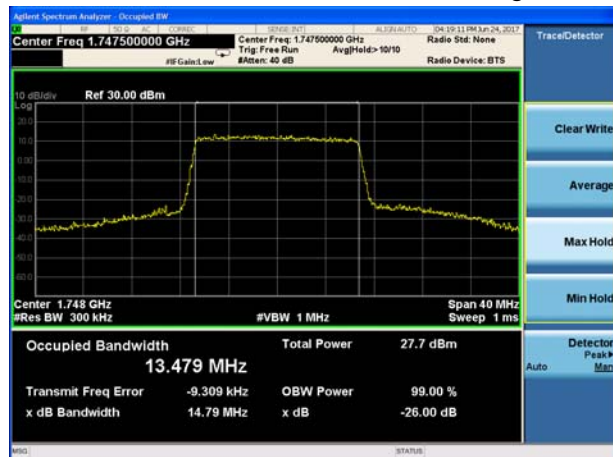
LTE Band 4 16QAM 15MHz CH-Middle



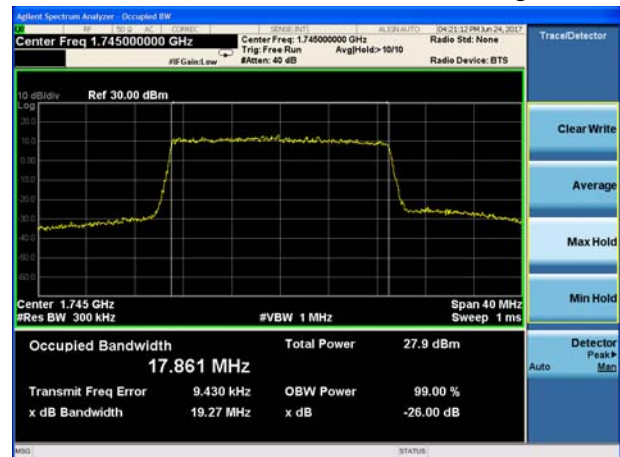
LTE Band 4 16QAM 20MHz CH-Middle



LTE Band 4 16QAM 15MHz CH-High



LTE Band 4 16QAM 20MHz CH-High



4.4 Band Edge Compliance

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

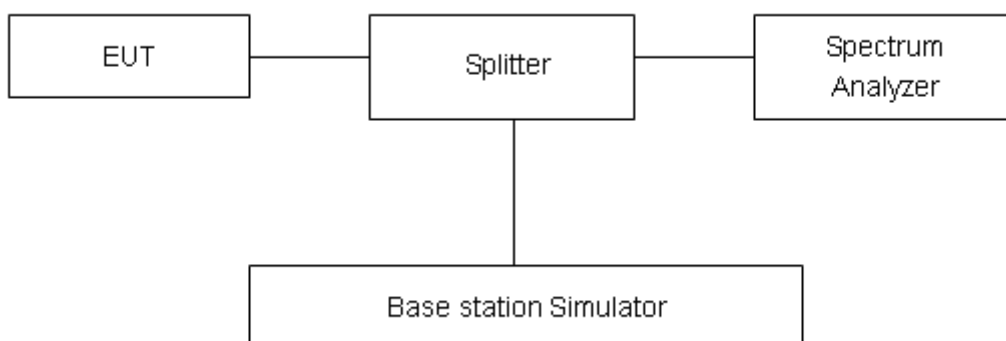
Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured.

The testing follows KDB 971168 v02r02 Section 6.0

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. RBW is set to 51 kHz, VBW is set to 160 kHz for WCDMA Band IV.
RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 4/7 (1.4MHz).
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4/7 (3MHz).
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 4/7 (5MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 4/7 (10MHz).
RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 4/7 (15MHz).
RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 4/7 (20MHz) on spectrum analyzer.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(h)/ specifies that “ 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 $43 + 10 \log_{10} (P)$ dB”

Part 27.53(m) (4)/ specifies that “for BRS and EBS stations. For mobile digital stations, the attenuation 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 as defined in paragraph (m)(4) of this section. 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. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Example:

The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10 \log(P)] \text{ (dB)}$$

$$= [30 + 10 \log (P)] \text{ (dBm)} - [43 + 10 \log(P)] \text{ (dB)} = -13 \text{ dBm}.$$

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684\text{dB}$.

Test Result

All the test traces in the plots shows the test results clearly.

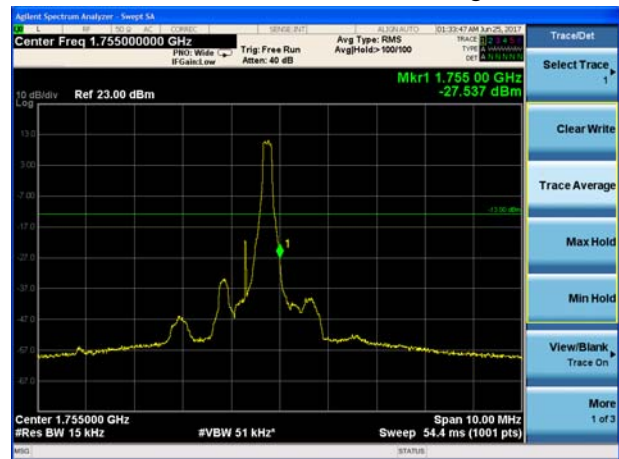




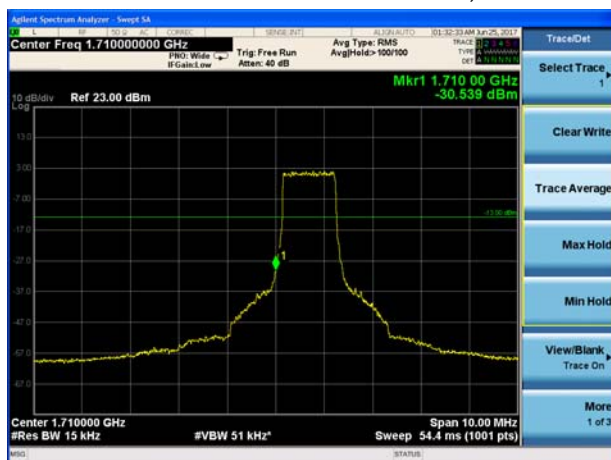
LTE Band 4 QPSK 1.4MHz CH-Low, 1 RB



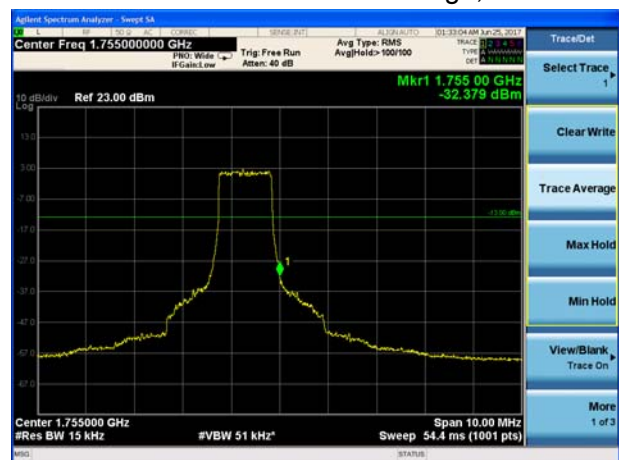
LTE Band 4 QPSK 1.4MHz CH-High, 1 RB



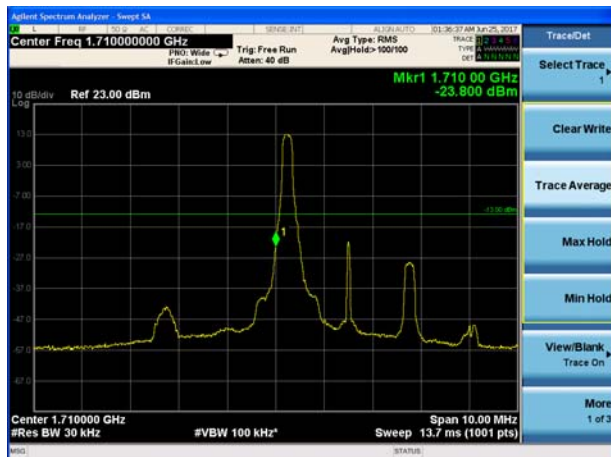
LTE Band 4 QPSK 1.4MHz CH-Low, 100%RB



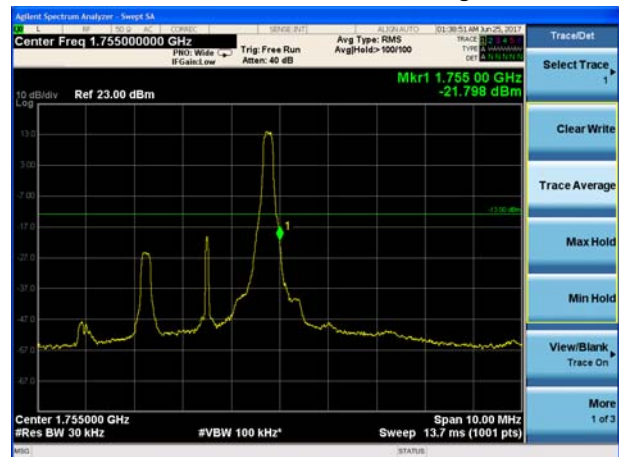
LTE Band 4 QPSK 1.4MHz CH-High, 100%RB



LTE Band 4 QPSK 3MHz CH-Low, 1 RB



LTE Band 4 QPSK 3MHz CH-High, 1 RB





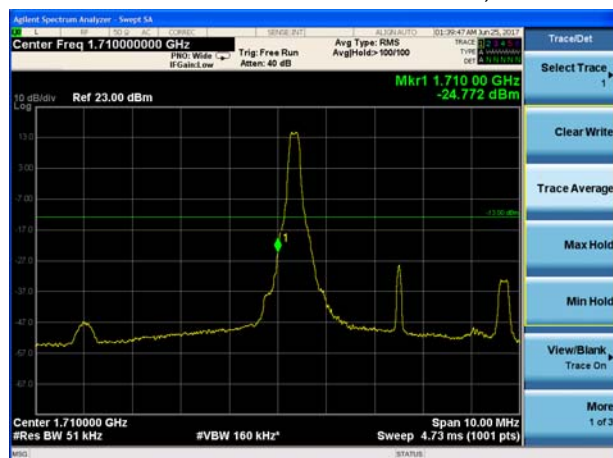
LTE Band 4 QPSK 3MHz CH-Low, 100%RB



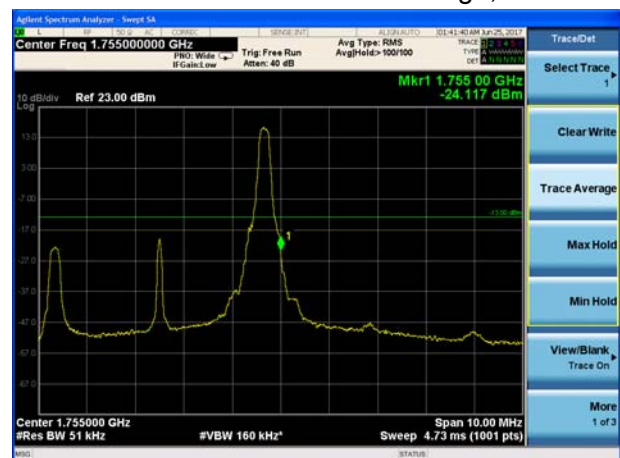
LTE Band 4 QPSK 3MHz CH-High, 100%RB



LTE Band 4 QPSK 5MHz CH-Low, 1 RB



LTE Band 4 QPSK 5MHz CH-High, 1 RB



LTE Band 4 QPSK 5MHz CH-Low, 100%RB

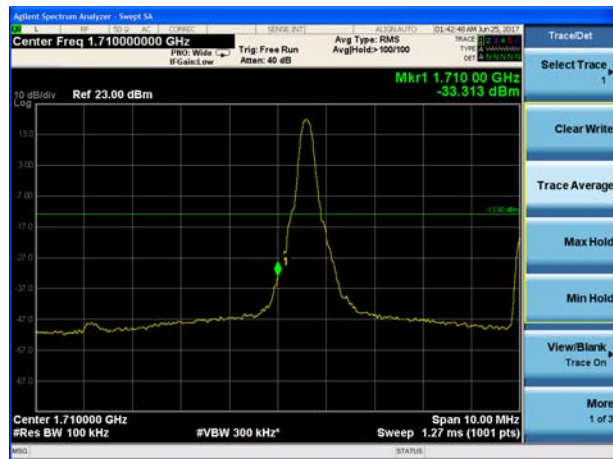


LTE Band 4 QPSK 5MHz CH-High, 100%RB

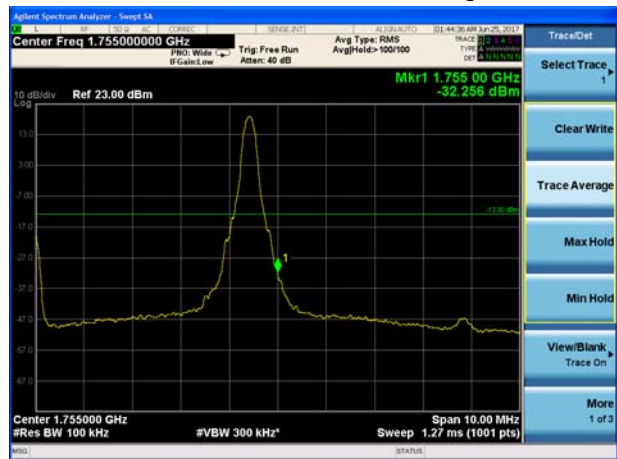




LTE Band 4 QPSK 10MHz CH-Low, 1 RB



LTE Band 4 QPSK 10MHz CH-High, 1 RB



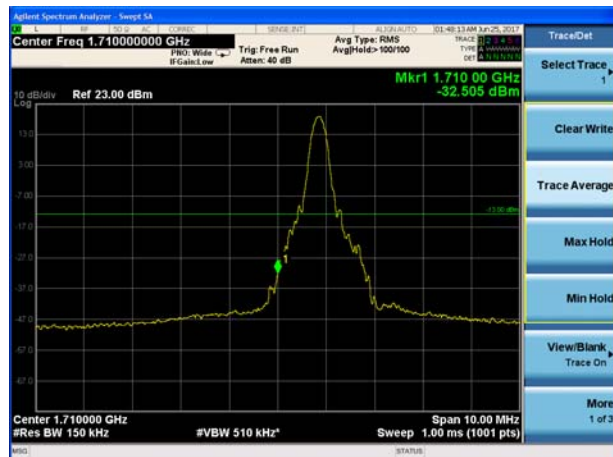
LTE Band 4 QPSK 10MHz CH-Low, 100%RB



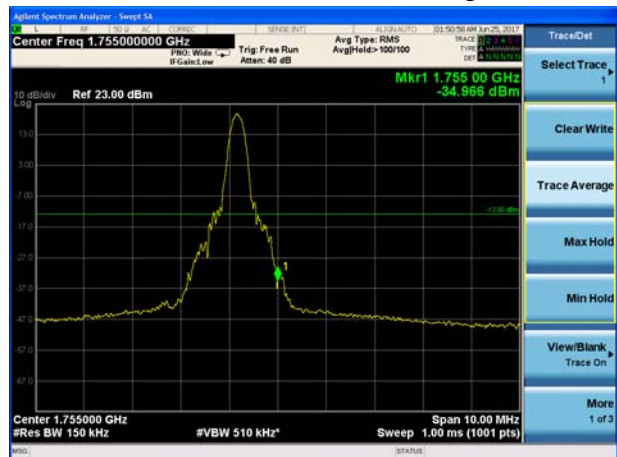
LTE Band 4 QPSK 10MHz CH-High, 100%RB



LTE Band 4 QPSK 15MHz CH-Low, 1 RB



LTE Band 4 QPSK 15MHz CH-High, 1 RB





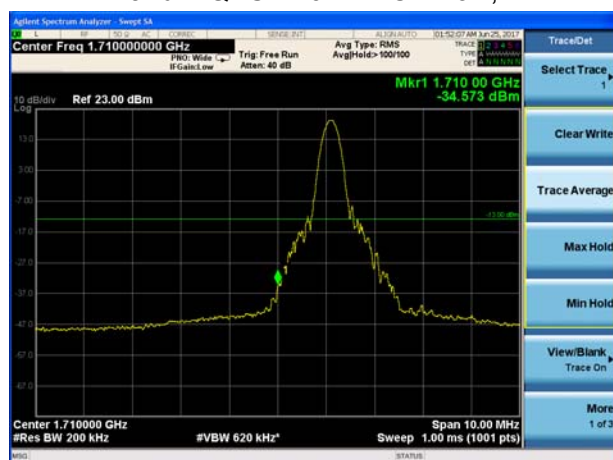
LTE Band 4 QPSK 15MHz CH-Low, 100%RB



LTE Band 4 QPSK 15MHz CH-High, 100%RB



LTE Band 4 QPSK 20MHz CH-Low, 1 RB



LTE Band 4 QPSK 20MHz CH-High, 1 RB



LTE Band 4 QPSK 20MHz CH-Low, 100%RB



LTE Band 4 QPSK 20MHz CH-High, 100%RB





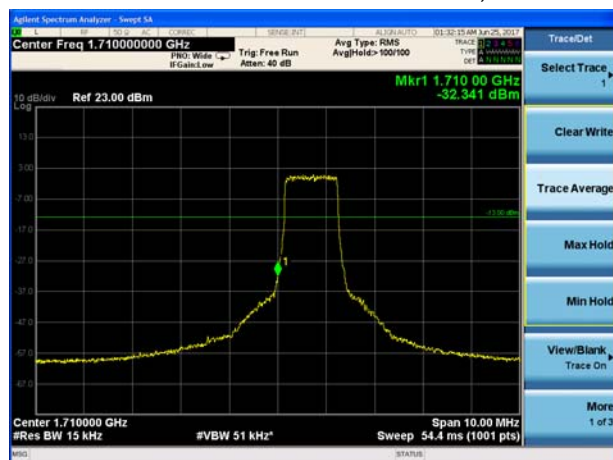
LTE Band 4 16QAM 1.4MHz CH-Low, 1 RB



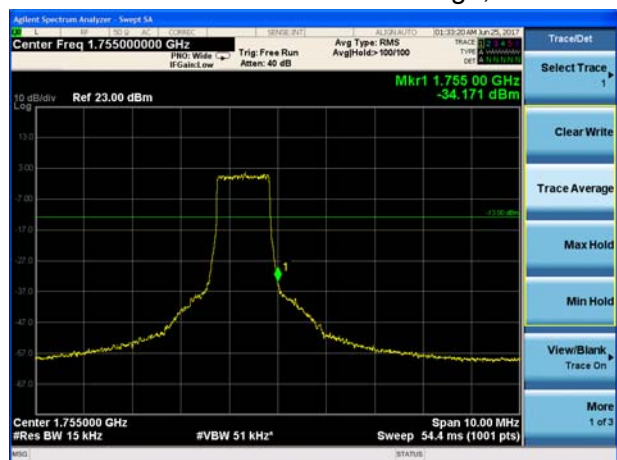
LTE Band 4 16QAM 1.4MHz CH-High, 1 RB



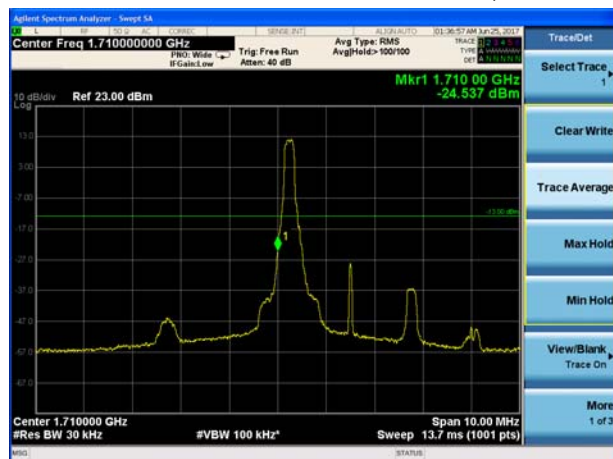
LTE Band 4 16QAM 1.4MHz CH-Low, 100%RB



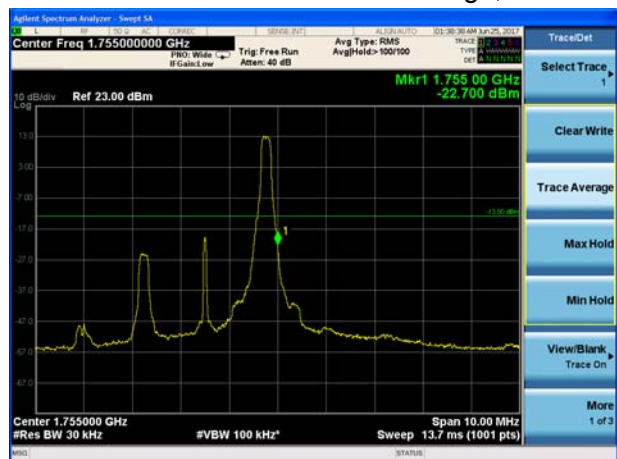
LTE Band 4 16QAM 1.4MHz CH-High, 100%RB



LTE Band 4 16QAM 3MHz CH-Low, 1 RB



LTE Band 4 16QAM 3MHz CH-High, 1 RB





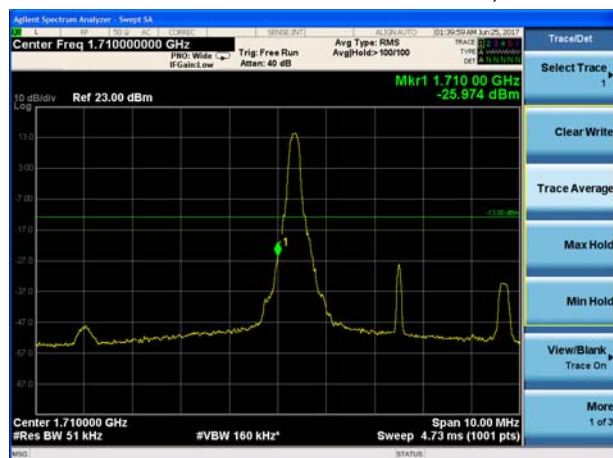
LTE Band 4 16QAM 3MHz CH-Low, 100%RB



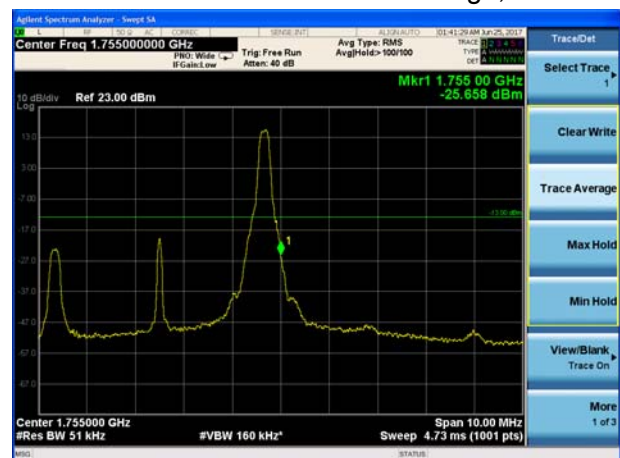
LTE Band 4 16QAM 3MHz CH-High, 100%RB



LTE Band 4 16QAM 5MHz CH-Low, 1 RB



LTE Band 4 16QAM 5MHz CH-High, 1 RB



LTE Band 4 16QAM 5MHz CH-Low, 100%RB

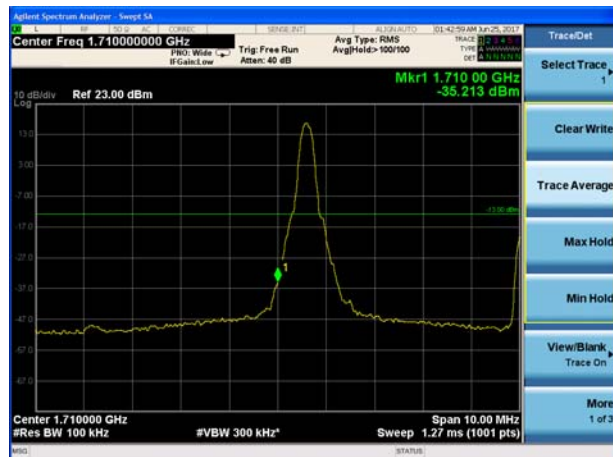


LTE Band 4 16QAM 5MHz CH-High, 100%RB

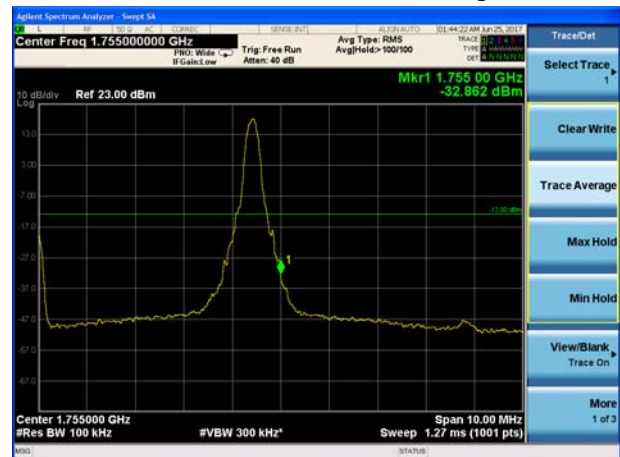




LTE Band 4 16QAM 10MHz CH-Low, 1 RB



LTE Band 4 16QAM 10MHz CH-High, 1 RB



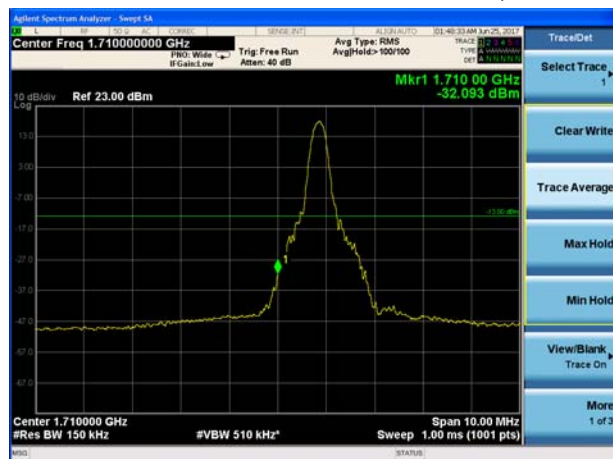
LTE Band 4 16QAM 10MHz CH-Low, 100%RB



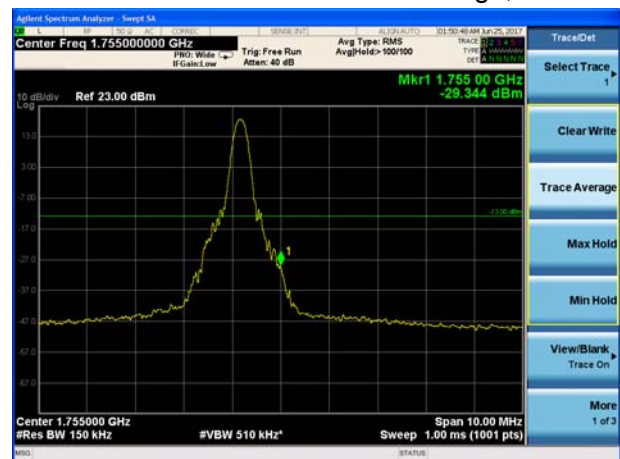
LTE Band 4 16QAM 10MHz CH-High, 100%RB



LTE Band 4 16QAM 15MHz CH-Low, 1 RB



LTE Band 4 16QAM 15MHz CH-High, 1 RB



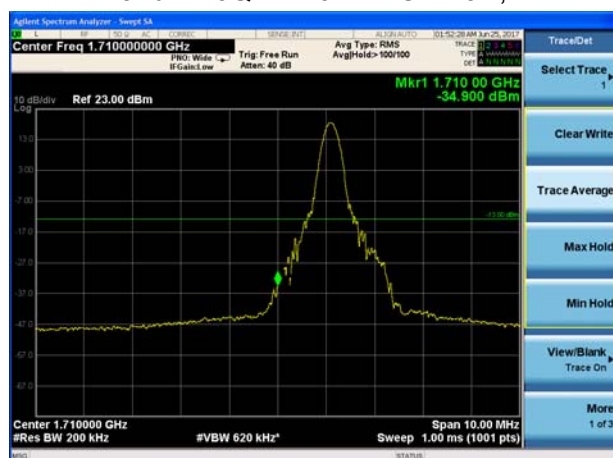
LTE Band 4 16QAM 15MHz CH-Low, 100%RB



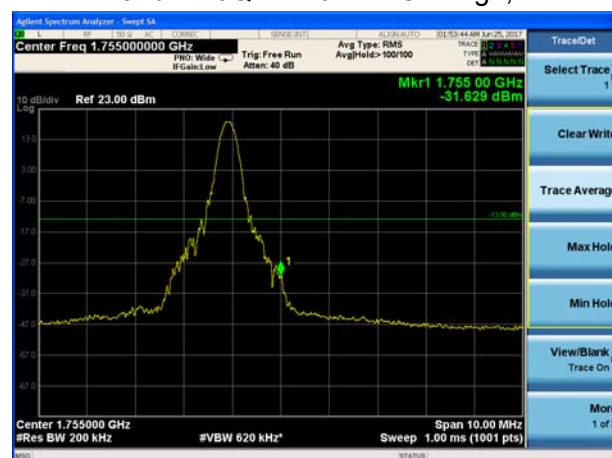
LTE Band 4 16QAM 15MHz CH-High, 100%RB



LTE Band 4 16QAM 20MHz CH-Low, 1 RB



LTE Band 4 16QAM 20MHz CH-High, 1 RB



LTE Band 4 16QAM 20MHz CH-Low, 100%RB

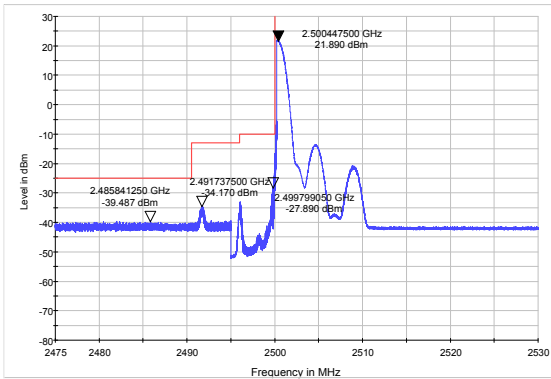


LTE Band 4 16QAM 20MHz CH-High, 100%RB

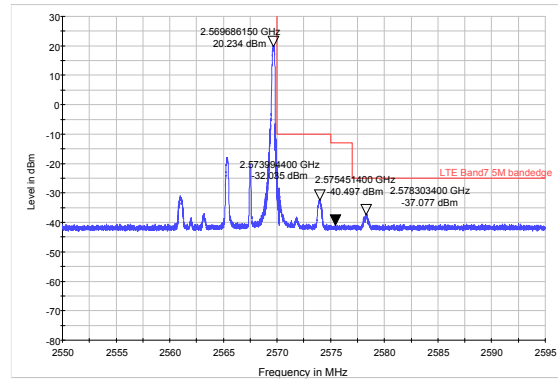




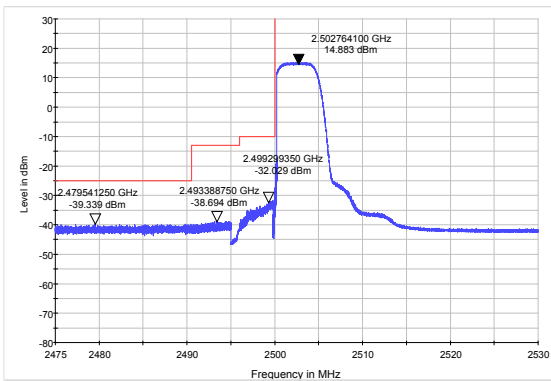
LTE Band 7 QPSK 5MHz CH-Low, 1 RB



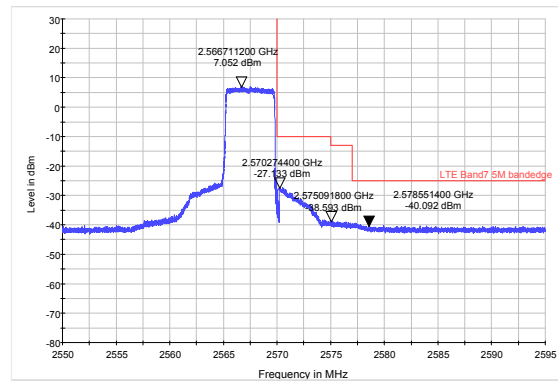
LTE Band 7 QPSK 5MHz CH-High, 1 RB



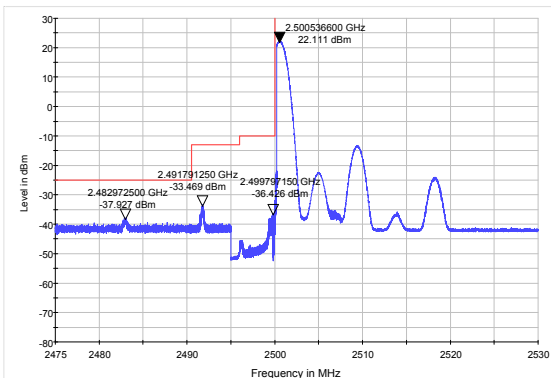
LTE Band 7 QPSK 5MHz CH-Low, 100%RB



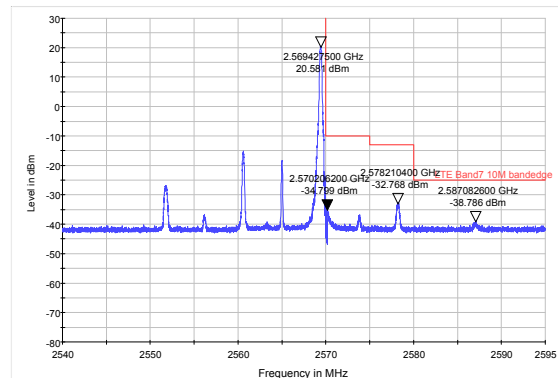
LTE Band 7 QPSK 5MHz CH-High, 100%RB



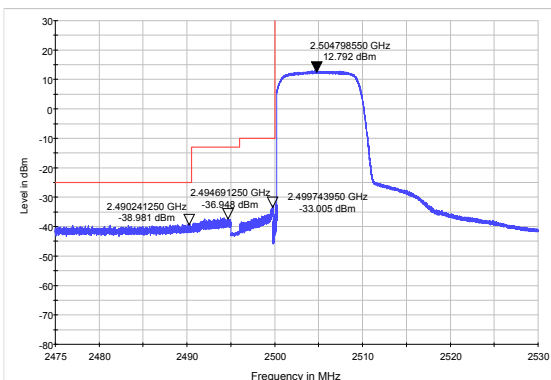
LTE Band 7 QPSK 10MHz CH-Low, 1 RB



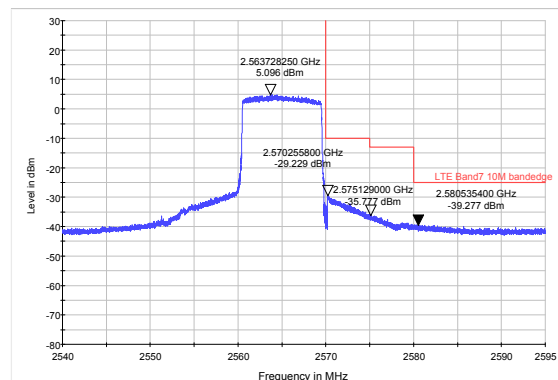
LTE Band 7 QPSK 10MHz CH-High, 1 RB



LTE Band 7 QPSK 10MHz CH-Low, 100%RB

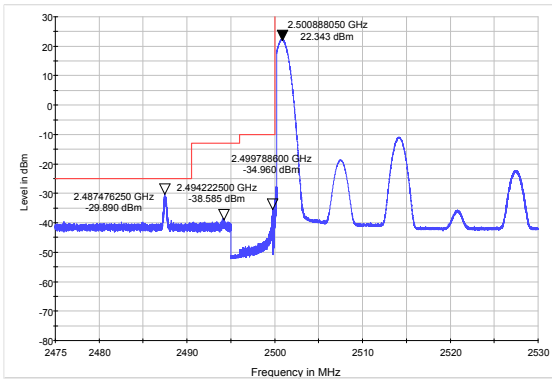


LTE Band 7 QPSK 10MHz CH-High, 100%RB

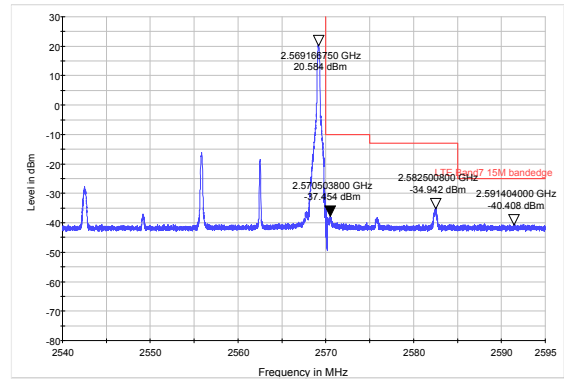




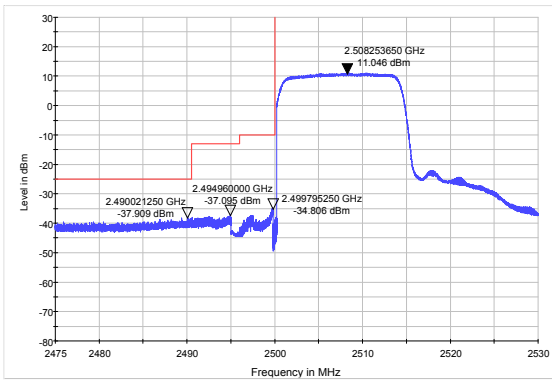
LTE Band 7 QPSK 15MHz CH-Low, 1 RB



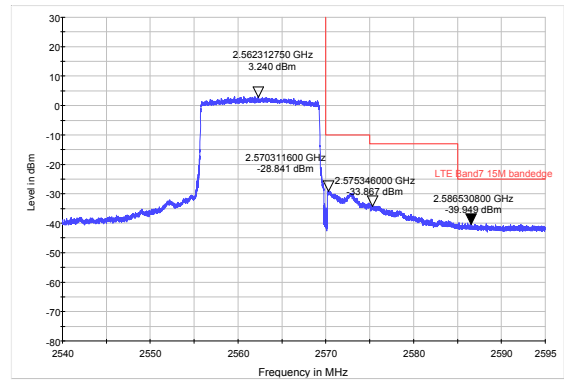
LTE Band 7 QPSK 15MHz CH-High, 1 RB



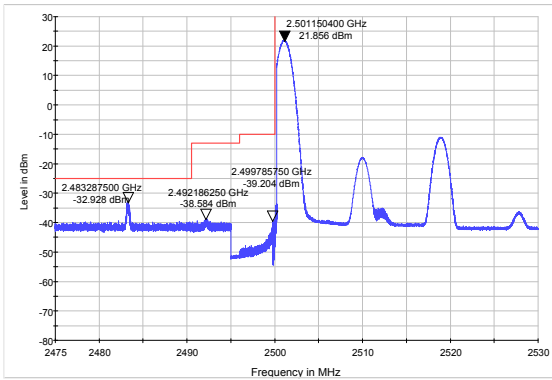
LTE Band 7 QPSK 15MHz CH-Low, 100%RB



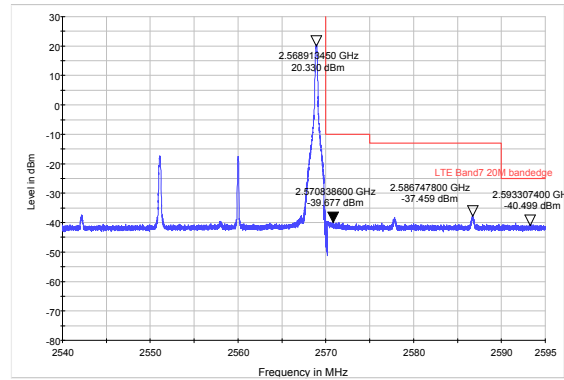
LTE Band 7 QPSK 15MHz CH-High, 100%RB



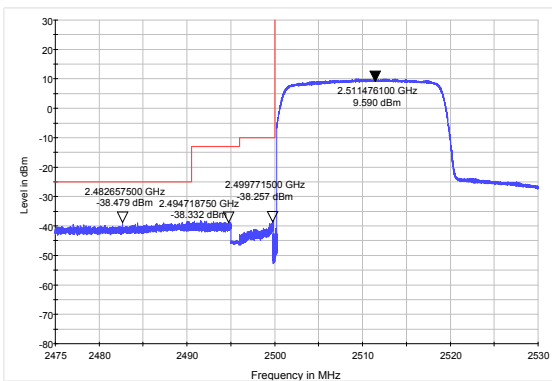
LTE Band 7 QPSK 20MHz CH-Low, 1 RB



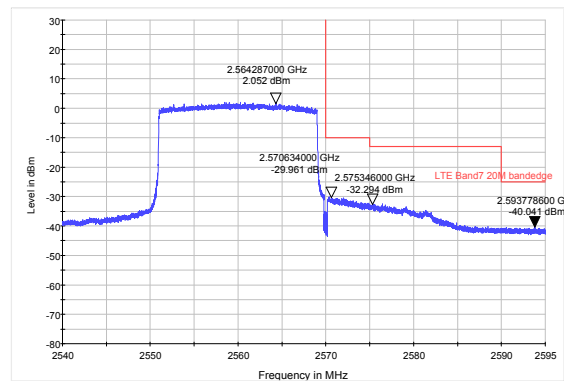
LTE Band 7 QPSK 20MHz CH-High, 1 RB



LTE Band 7 QPSK 20MHz CH-Low, 100%RB

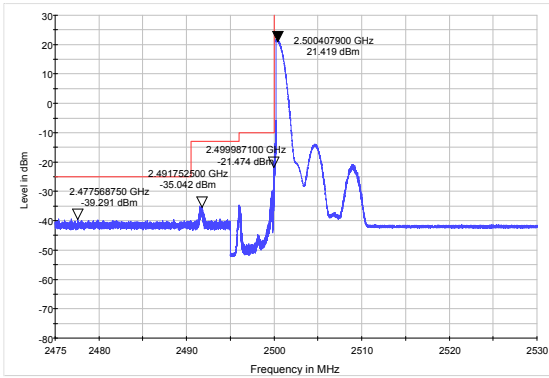


LTE Band 7 QPSK 20MHz CH-High, 100%RB

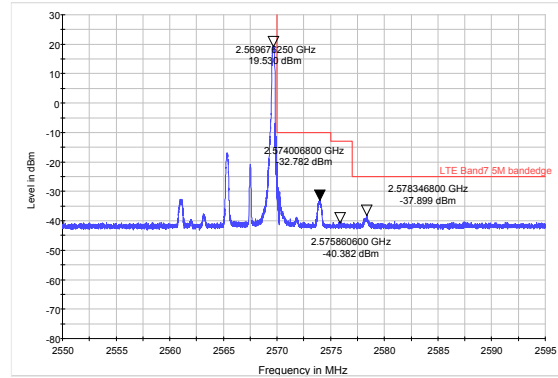




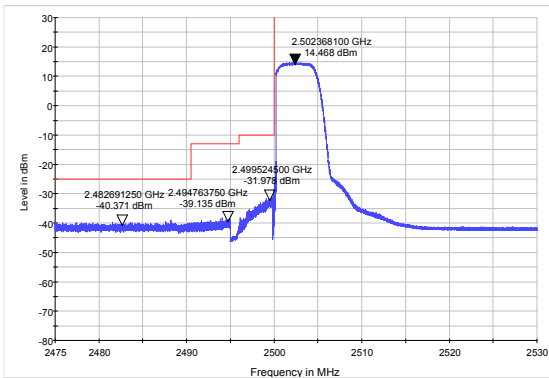
LTE Band 7 16QAM 5MHz CH-Low, 1 RB



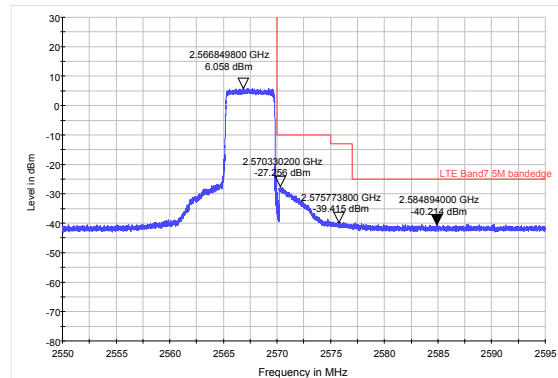
LTE Band 7 16QAM 5MHz CH-High, 1 RB



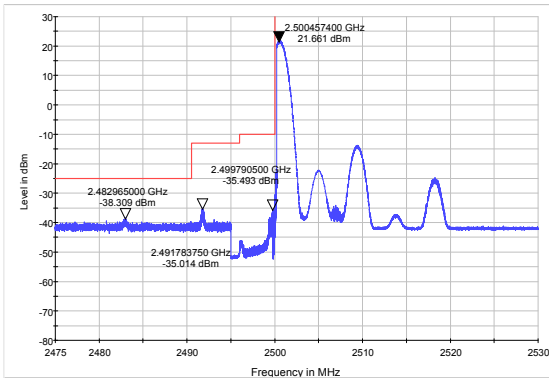
LTE Band 7 16QAM 5MHz CH-Low, 100%RB



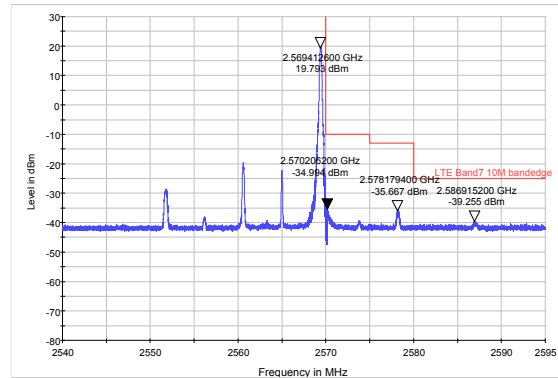
LTE Band 7 16QAM 5MHz CH-High, 100%RB



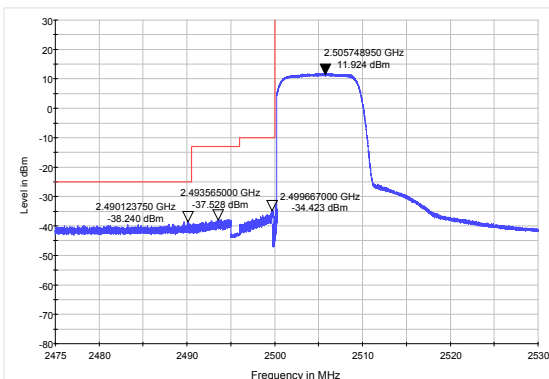
LTE Band 7 16QAM 10MHz CH-Low, 1 RB



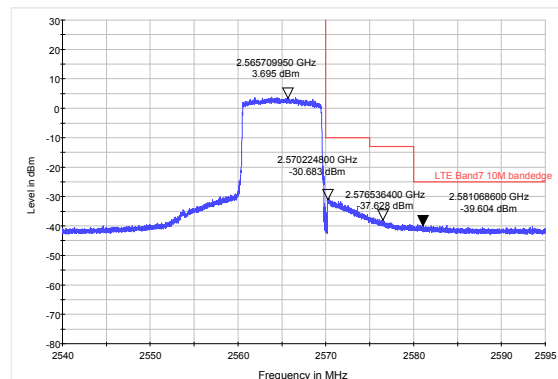
LTE Band 7 16QAM 10MHz CH-High, 1 RB



LTE Band 7 16QAM 10MHz CH-Low, 100%RB

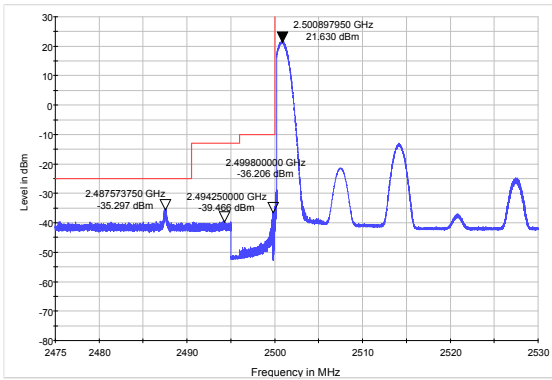


LTE Band 7 16QAM 10MHz CH-High, 100%RB

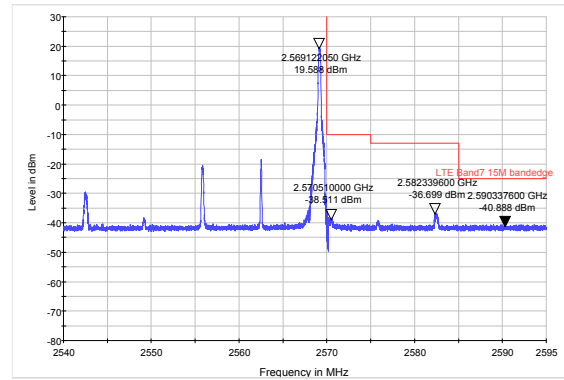




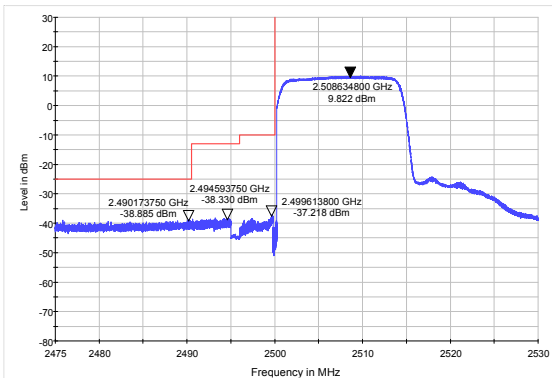
LTE Band 7 16QAM 15MHz CH-Low, 1 RB



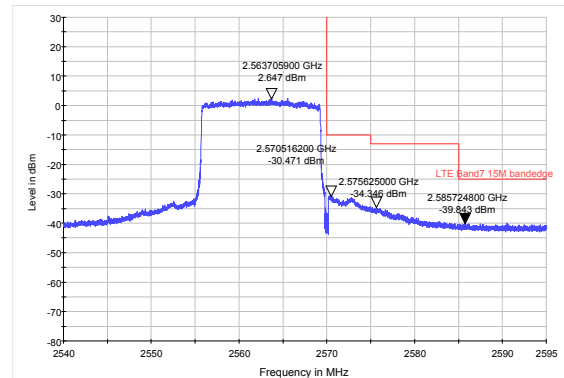
LTE Band 7 16QAM 15MHz CH-High, 1 RB



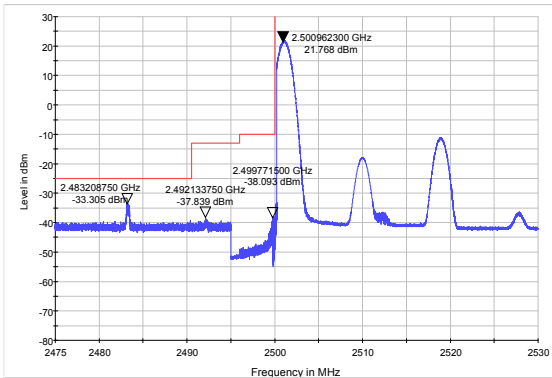
LTE Band 7 16QAM 15MHz CH-Low, 100%RB



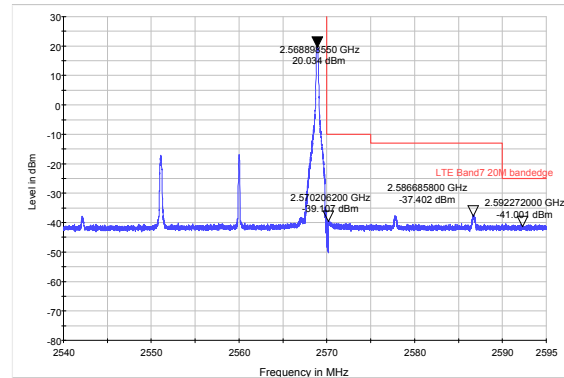
LTE Band 7 16QAM 15MHz CH-High, 100%RB



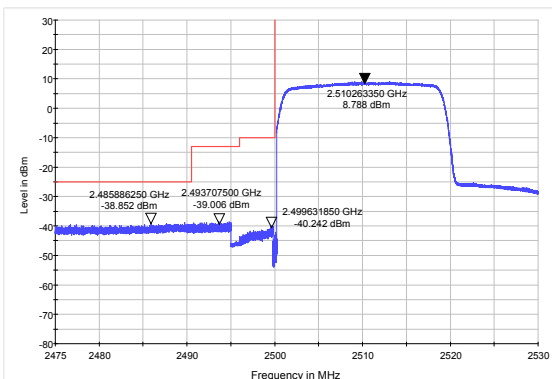
LTE Band 7 16QAM 20MHz CH-Low, 1 RB



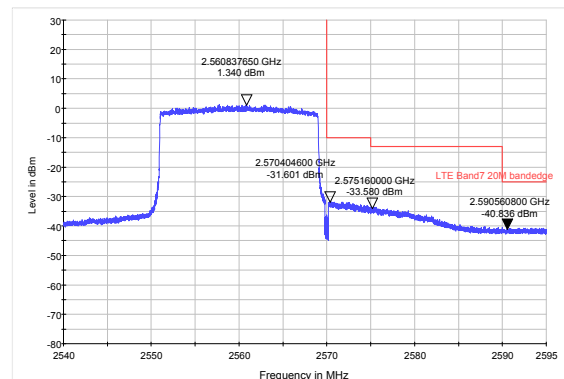
LTE Band 7 16QAM 20MHz CH-High, 1 RB



LTE Band 7 16QAM 20MHz CH-Low, 100%RB



LTE Band 7 16QAM 20MHz CH-High, 100%RB



4.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

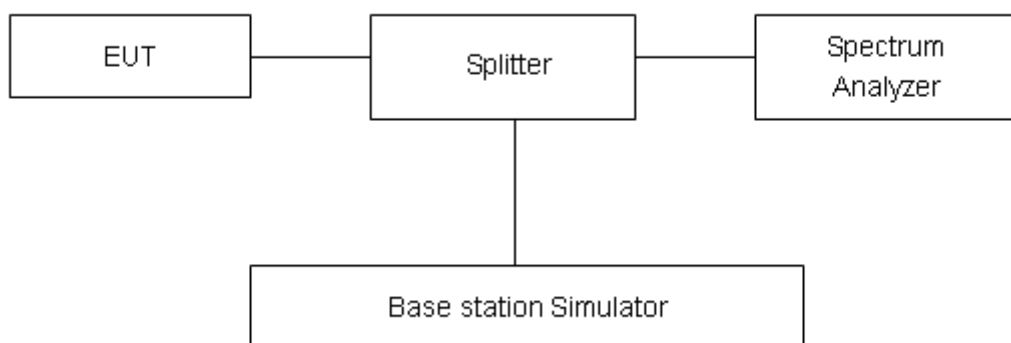
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPK. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.

Test Results

WCDMA Band IV	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
RMC	1312	1712.4	25.59	23.01	2.58	≤13	PASS
	1413	1732.6	26.00	23.24	2.76	≤13	PASS
	1513	1752.6	25.88	23.33	2.55	≤13	PASS

LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	25.75	20.97	4.78	≤13	PASS
		20175	1732.5	26.19	21.18	5.01	≤13	PASS
		20393	1754.3	25.96	21.09	4.87	≤13	PASS
	3	19965	1711.5	25.93	21.00	4.93	≤13	PASS
		20175	1732.5	26.31	21.22	5.09	≤13	PASS
		20385	1753.5	26.08	21.12	4.96	≤13	PASS
	5	19975	1712.5	25.93	20.98	4.95	≤13	PASS
		20175	1732.5	26.32	21.21	5.11	≤13	PASS
		20375	1752.5	26.02	21.10	4.92	≤13	PASS
	10	20000	1715	26.01	21.06	4.95	≤13	PASS
		20175	1732.5	26.30	21.23	5.07	≤13	PASS
		20350	1750	26.02	21.14	4.88	≤13	PASS
	15	20025	1717.5	26.17	21.04	5.13	≤13	PASS
		20175	1732.5	26.41	21.19	5.22	≤13	PASS
		20325	1747.5	26.07	21.09	4.98	≤13	PASS
	20	20050	1720	26.03	21.01	5.02	≤13	PASS
		20175	1732.5	26.16	21.14	5.02	≤13	PASS
		20300	1745	25.94	21.05	4.89	≤13	PASS
16QAM	1.4	19957	1710.7	25.76	20.14	5.62	≤13	PASS
		20175	1732.5	25.94	20.09	5.85	≤13	PASS
		20393	1754.3	25.79	20.11	5.68	≤13	PASS
	3	19965	1711.5	25.93	20.17	5.76	≤13	PASS
		20175	1732.5	26.05	20.13	5.92	≤13	PASS
		20385	1753.5	25.93	20.14	5.79	≤13	PASS
	5	19975	1712.5	25.85	20.15	5.70	≤13	PASS
		20175	1732.5	25.97	20.09	5.88	≤13	PASS
		20375	1752.5	25.76	20.09	5.67	≤13	PASS
	10	20000	1715	25.89	20.18	5.71	≤13	PASS
		20175	1732.5	26.04	20.14	5.90	≤13	PASS
		20350	1750	25.79	20.13	5.66	≤13	PASS



	15	20025	1717.5	25.97	20.15	5.82	≤13	PASS
		20175	1732.5	26.03	20.09	5.94	≤13	PASS
		20325	1747.5	25.80	20.09	5.71	≤13	PASS
	20	20050	1720	25.98	20.13	5.85	≤13	PASS
		20175	1732.5	25.89	20.05	5.84	≤13	PASS
		20300	1745	25.78	20.06	5.72	≤13	PASS

LTE Band 7								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	20775	2502.5	25.84	21.03	4.81	≤13	PASS
		21100	2535	26.34	21.28	5.06	≤13	PASS
		21425	2567.5	26.28	21.30	4.98	≤13	PASS
	10	20800	2505	25.86	21.11	4.75	≤13	PASS
		21100	2535	26.27	21.30	4.97	≤13	PASS
		21400	2565	26.23	21.34	4.89	≤13	PASS
	15	20825	2507.5	25.96	21.09	4.87	≤13	PASS
		21100	2535	26.30	21.26	5.04	≤13	PASS
		21375	2562.5	26.21	21.29	4.92	≤13	PASS
	20	20850	2510	25.90	21.06	4.84	≤13	PASS
		21100	2535	26.19	21.21	4.98	≤13	PASS
		21350	2560	26.19	21.25	4.94	≤13	PASS
16QAM	5	20775	2502.5	25.73	20.13	5.60	≤13	PASS
		21100	2535	26.12	20.27	5.85	≤13	PASS
		21425	2567.5	25.89	20.08	5.81	≤13	PASS
	10	20800	2505	25.75	20.16	5.59	≤13	PASS
		21100	2535	26.11	20.32	5.79	≤13	PASS
		21400	2565	25.89	20.12	5.77	≤13	PASS
	15	20825	2507.5	25.74	20.13	5.61	≤13	PASS
		21100	2535	26.07	20.27	5.80	≤13	PASS
		21375	2562.5	25.79	20.08	5.71	≤13	PASS
	20	20850	2510	25.79	20.11	5.68	≤13	PASS
		21100	2535	26.04	20.23	5.81	≤13	PASS
		21350	2560	25.84	20.05	5.79	≤13	PASS

4.6 Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size.

(1)With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.

(2)Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

2. Frequency Stability (Voltage Variation)

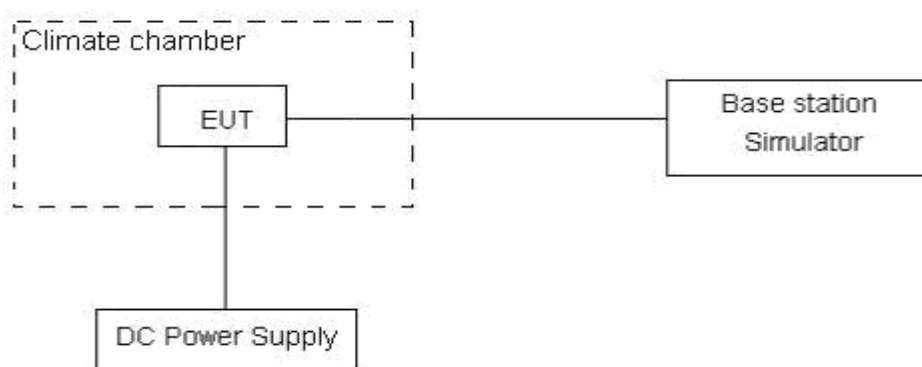
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.5 V and 4.2 V, with a nominal voltage of 3.7V.

Test setup



Limits

No specific frequency stability requirements in part 27.54

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3, U=0.01\text{ppm}$.

Test Result
WCDMA Band IV

Test status	WCDMA Band IV Channel 1413 RMC
	Test Results (ppm)
-30°C/Normal Voltage	-0.000956
-20°C/Normal Voltage	-0.000793
-10°C/Normal Voltage	0.000174
0°C/Normal Voltage	-0.000550
10°C/Normal Voltage	-0.000151
20°C/Normal Voltage	-0.000141
30°C/Normal Voltage	-0.000924
40°C/Normal Voltage	-0.000927
50°C/Normal Voltage	-0.000684
20°C/Min Voltage	0.000084
20°C/Max Voltage	0.000521

Bandwidth	Test status	LTE Band 4 Channel 20175 Test Results (ppm)	
		QPSK	16QAM
1.4MHz	-30°C/Normal Voltage	0.00195	-0.00067
	-20°C/Normal Voltage	-0.00091	-0.00099
	-10°C/Normal Voltage	-0.00159	0.00165
	0°C/Normal Voltage	0.00063	-0.00252
	10°C/Normal Voltage	0.00185	-0.00024
	20°C/Normal Voltage	-0.00083	-0.00139
	30°C/Normal Voltage	-0.00216	0.00038
	40°C/Normal Voltage	0.00121	0.00119
	50°C/Normal Voltage	0.00086	-0.00006
	20°C/Min Voltage	0.00297	0.00176
	20°C/Max Voltage	-0.00042	0.00126
3MHz	-30°C/Normal Voltage	-0.00050	-0.00127
	-20°C/Normal Voltage	0.00060	0.00121
	-10°C/Normal Voltage	0.00069	-0.00025
	0°C/Normal Voltage	-0.00059	-0.00114
	10°C/Normal Voltage	-0.00083	-0.00416
	20°C/Normal Voltage	-0.00055	-0.00215
	30°C/Normal Voltage	0.00088	-0.00231
	40°C/Normal Voltage	0.00247	-0.00327
	50°C/Normal Voltage	-0.00201	0.00046



	20°C/Min Voltage	0.00213	-0.00119
	20°C/Max Voltage	0.00100	-0.00184
5MHz	-30°C/Normal Voltage	-0.00357	-0.00240
	-20°C/Normal Voltage	0.00223	-0.00245
	-10°C/Normal Voltage	0.00111	-0.00054
	0°C/Normal Voltage	-0.00032	-0.00184
	10°C/Normal Voltage	0.00006	0.00068
	20°C/Normal Voltage	-0.00102	-0.00170
	30°C/Normal Voltage	-0.00079	0.00027
	40°C/Normal Voltage	-0.00382	-0.00079
	50°C/Normal Voltage	-0.00230	0.00098
	20°C/Min Voltage	-0.00107	-0.00184
	20°C/Max Voltage	0.00004	0.00291
10MHz	-30°C/Normal Voltage	-0.00065	0.00055
	-20°C/Normal Voltage	0.00027	0.00002
	-10°C/Normal Voltage	-0.00044	0.00083
	0°C/Normal Voltage	-0.00069	-0.00034
	10°C/Normal Voltage	-0.00251	0.00102
	20°C/Normal Voltage	-0.00044	0.00155
	30°C/Normal Voltage	0.00189	-0.00050
	40°C/Normal Voltage	0.00031	-0.00081
	50°C/Normal Voltage	0.00042	-0.00019
	20°C/Min Voltage	-0.00062	0.00211
	20°C/Max Voltage	-0.00117	0.00063
15MHz	-30°C/Normal Voltage	0.00091	0.00012
	-20°C/Normal Voltage	-0.00068	0.00028
	-10°C/Normal Voltage	-0.00274	-0.00094
	0°C/Normal Voltage	-0.00178	-0.00081
	10°C/Normal Voltage	-0.00035	-0.00204
	20°C/Normal Voltage	0.00039	-0.00031
	30°C/Normal Voltage	0.00107	0.00077
	40°C/Normal Voltage	-0.00320	-0.00063
	50°C/Normal Voltage	0.00076	-0.00070
	20°C/Min Voltage	0.00025	-0.00240
	20°C/Max Voltage	0.00145	-0.00196
20MHz	-30°C/Normal Voltage	-0.00117	0.00108
	-20°C/Normal Voltage	0.00166	0.00071
	-10°C/Normal Voltage	0.00057	0.00067
	0°C/Normal Voltage	0.00089	0.00312
	10°C/Normal Voltage	-0.00257	0.00196



	20°C/Normal Voltage	-0.00195	-0.00080
	30°C/Normal Voltage	0.00102	-0.00121
	40°C/Normal Voltage	0.00243	0.00110
	50°C/Normal Voltage	-0.00086	0.00261
	20°C/Min Voltage	-0.00251	-0.00096
	20°C/Max Voltage	-0.00107	-0.00192

Bandwidth	Test status	LTE Band 7 Channel 21100 Test Results (ppm)	
		QPSK	16QAM
5MHz	-30°C/Normal Voltage	-0.00095	0.00243
	-20°C/Normal Voltage	-0.00085	-0.00474
	-10°C/Normal Voltage	-0.00234	0.00321
	0°C/Normal Voltage	-0.00049	0.00399
	10°C/Normal Voltage	-0.00153	0.00124
	20°C/Normal Voltage	-0.00351	-0.00423
	30°C/Normal Voltage	-0.00311	0.00020
	40°C/Normal Voltage	-0.00028	-0.00057
	50°C/Normal Voltage	0.00078	0.00277
	20°C/Min Voltage	-0.00198	-0.00116
	20°C/Max Voltage	-0.00123	-0.00144
10MHz	-30°C/Normal Voltage	-0.00204	-0.00402
	-20°C/Normal Voltage	-0.00179	-0.00169
	-10°C/Normal Voltage	-0.00088	-0.00292
	0°C/Normal Voltage	-0.00348	-0.00261
	10°C/Normal Voltage	-0.00047	-0.00321
	20°C/Normal Voltage	-0.00105	-0.00350
	30°C/Normal Voltage	-0.00290	-0.00045
	40°C/Normal Voltage	-0.00010	-0.00319
	50°C/Normal Voltage	0.00041	-0.00060
	20°C/Min Voltage	0.00033	-0.00148
	20°C/Max Voltage	-0.00072	-0.00313
15MHz	-30°C/Normal Voltage	-0.00043	-0.00212
	-20°C/Normal Voltage	-0.00253	0.00251
	-10°C/Normal Voltage	-0.00099	0.00204
	0°C/Normal Voltage	-0.00122	0.00195
	10°C/Normal Voltage	-0.00262	0.00170
	20°C/Normal Voltage	0.00362	-0.00029
	30°C/Normal Voltage	-0.00248	0.00245
	40°C/Normal Voltage	-0.00064	0.00021
	50°C/Normal Voltage	-0.00183	0.00008



	20°C/Min Voltage	-0.00135	0.00095
	20°C/Max Voltage	-0.00344	0.00116
20MHz	-30°C/Normal Voltage	-0.00221	-0.00201
	-20°C/Normal Voltage	-0.00099	-0.00093
	-10°C/Normal Voltage	-0.00239	0.00195
	0°C/Normal Voltage	-0.00065	-0.00170
	10°C/Normal Voltage	-0.00076	-0.00133
	20°C/Normal Voltage	-0.00227	0.00068
	30°C/Normal Voltage	-0.00081	-0.00168
	40°C/Normal Voltage	-0.00205	-0.00148
	50°C/Normal Voltage	0.00041	0.00086
	20°C/Min Voltage	-0.00252	-0.00184
	20°C/Max Voltage	-0.00037	-0.00260