



中国认可  
国际互认  
检测  
TESTING  
CNAS L2264

# RF TEST REPORT

**Applicant** ZTE CORPORATION  
**FCC ID** SRQ-ZTEBLADEA520  
**Product** LTE/WCDMA/GSM (GPRS)  
Multi-Mode Digital Mobile Phone  
**Brand** ZTE  
**Model** ZTE BLADE A520; BLADE A520  
**Report No.** RXA1612-0277RF03R1  
**Issue Date** January 18, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2016)/ FCC CFR47 Part 27C (2016)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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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: December 12, 2016 ~ December 25, 2016			
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 CNAS or 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.

### **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

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

### General information

EUT Description			
Model:	ZTE BLADE A520; BLADE A520		
Product IMEI:	862974030021581		
Hardware Version:	u3gA		
Software Version:	ZTE_BLADE_A520V1.0.0B01		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	WCDMA Band IV ; LTE Band 4/7		
HSDPA UE Category:	24		
HSUPA UE Category:	7		
Maximum E.I.R.P./ E.R.P.	WCDMA Band IV: 23.41 dBm LTE Band 4: 20.79 dBm LTE Band 7: 22.78 dBm		
Rated Power Supply Voltage:	3.7V		
Extreme Voltage:	Minimum: 3.5V    Maximum: 4.2V		
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	Model: Li3824T44P4h716043		
Adapter	Manufacturer: AOHAI Model: STC-A51A-Z		
Earphone	Manufacturer: FDC Model: DEM-53		
USB Cable	70cm		
Note: 1. The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.			



## 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 (2016)**

**FCC CFR47 Part 27C (2016)**

**ANSI/TIA-603-D (2010)**

**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	WCDMA Band IV	RMC/HSDPA/HSUPA /DC-HSDPA/HSPA+
	Effective Isotropic Radiated power	WCDMA Band IV	RMC
	Occupied Bandwidth	WCDMA Band IV	RMC
	Band Edge Compliance	WCDMA Band IV	RMC
	Peak-to-Average Power Ratio	WCDMA Band IV	RMC
	Frequency Stability	WCDMA Band IV	RMC
	Spurious Emissions at Antenna Terminals	WCDMA Band IV	RMC
Radiated Test cases	Radiates Spurious Emission	WCDMA Band IV	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

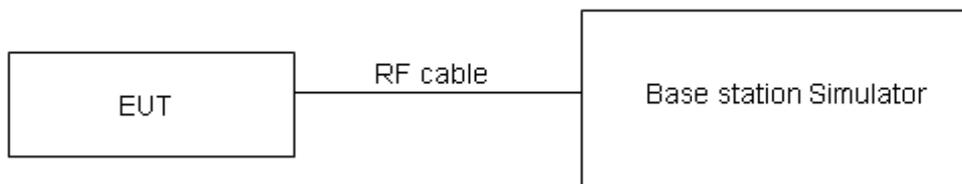
#### Ambient condition

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		AV Conducted Power(dBm)		
		Channel 1312	Channel 1413	Channel 1513
		1712.4 (MHz)	1732.6 (MHz)	1752.6(MHz)
<b>RMC</b>		<b>23.47</b>	<b>23.45</b>	<b>23.32</b>
<b>HSDPA</b>	Sub - Test 1	23.30	23.29	23.16
	Sub - Test 2	23.31	23.28	23.18
	Sub - Test 3	22.91	22.86	22.76
	Sub - Test 4	22.90	22.88	22.75
<b>HSUPA</b>	Sub - Test 1	23.31	23.30	23.24
	Sub - Test 2	21.55	21.53	21.40
	Sub - Test 3	22.37	22.35	22.22
	Sub - Test 4	21.56	21.54	21.41
	Sub - Test 5	23.35	23.33	23.20
<b>DC-HSDPA</b>	Sub - Test 1	23.34	23.32	23.19
	Sub - Test 2	23.32	23.31	23.18
	Sub - Test 3	22.81	22.80	22.67
	Sub - Test 4	22.80	22.79	22.66
<b>HSPA+</b>	16QAM	23.17	23.14	23.03
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 FDD 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	21.62	21.62	21.64
		1	2	21.51	21.44	21.46
		1	5	21.48	21.43	21.40
		3	0	21.54	21.54	21.54
		3	2	21.45	21.50	21.44
		3	3	21.46	21.49	21.41
		6	0	20.51	20.60	20.51
	16QAM	1	0	21.46	21.45	21.48
		1	2	21.44	21.35	21.38
		1	5	21.36	21.31	21.28
		3	0	21.43	21.41	21.44
		3	2	21.26	21.26	21.22
		3	3	21.24	21.32	21.18
		6	0	20.31	20.37	20.28
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	21.64	<b>21.66</b>	21.67
		1	7	21.54	21.49	21.50
		1	14	21.51	21.48	21.44
		8	0	20.64	20.66	20.67
		8	4	20.57	20.60	20.56
		8	7	20.56	20.60	20.51
		15	0	20.54	20.64	20.54
	16QAM	1	0	21.49	21.47	21.51
		1	7	21.47	21.40	21.42
		1	14	21.38	21.35	21.31
		8	0	20.54	20.54	20.56
		8	4	20.37	20.39	20.34
		8	7	20.34	20.44	20.31
		15	0	20.34	20.41	20.31
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	21.61	21.64	21.63
		1	13	21.52	21.45	21.47
		1	24	21.48	21.43	21.40
		12	0	20.61	20.61	20.63
		12	6	20.55	20.56	20.51
		12	13	20.54	20.58	20.47
		25	0	20.52	20.63	20.52



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20000/1715	20175/1732.5	20350/1750
	16QAM	1	0	21.46	21.43	21.48
		1	13	21.44	21.38	21.39
		1	24	21.35	21.33	21.27
		12	0	20.52	20.50	20.53
		12	6	20.34	20.34	20.30
		12	13	20.31	20.39	20.27
		25	0	20.32	20.37	20.26
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
10MHz	QPSK	1	0	21.63	21.65	21.66
		1	25	21.55	21.50	21.51
		1	49	21.50	21.47	21.43
		25	0	20.64	20.66	20.67
		25	13	20.58	20.61	20.55
		25	25	20.56	20.62	20.52
		50	0	20.60	20.65	20.56
	16QAM	1	0	21.48	21.46	21.50
		1	25	21.47	21.42	21.42
		1	49	21.38	21.35	21.30
		25	0	20.55	20.55	20.57
		25	13	20.36	20.38	20.33
		25	25	20.34	20.44	20.31
		50	0	20.35	20.42	20.30
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
15MHz	QPSK	1	0	21.62	21.61	21.64
		1	38	21.53	21.49	21.48
		1	74	21.47	21.42	21.39
		36	0	20.62	20.62	20.64
		36	18	20.55	20.56	20.51
		36	39	20.53	20.59	20.48
		75	0	20.58	20.61	20.51
	16QAM	1	0	21.43	21.44	21.48
		1	38	21.45	21.39	21.40
		1	74	21.35	21.31	21.27
		36	0	20.52	20.53	20.54
		36	18	20.33	20.33	20.29
		36	39	20.32	20.40	20.28
		75	0	20.32	20.37	20.26
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	21.59	21.57	21.61
		1	50	21.42	21.45	21.46



		1	99	21.45	21.41	21.36
		50	0	20.59	20.57	20.60
		50	25	20.53	20.52	20.48
		50	50	20.50	20.54	20.44
		100	0	20.55	20.56	20.47
	16QAM	1	0	21.41	21.40	21.43
		1	50	21.41	21.37	21.36
		1	99	21.33	21.28	21.25
		50	0	20.49	20.49	20.41
		50	25	20.30	20.31	20.26
		50	50	20.29	20.35	20.24
		100	0	20.30	20.33	20.23

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

LTE FDD Band 7				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20775/2502.5	21100/2535	21425/2567.5
5MHz	QPSK	1	0	20.62	20.57	20.70
		1	13	20.54	20.51	20.67
		1	24	20.56	20.73	20.65
		12	0	19.60	19.59	19.72
		12	6	19.53	19.63	19.69
		12	13	19.61	19.69	19.66
		25	0	19.49	19.62	19.69
	16QAM	1	0	20.52	20.40	20.60
		1	13	20.43	20.38	20.55
		1	24	20.40	20.61	20.48
		12	0	19.45	19.40	19.55
		12	6	19.38	19.45	19.53
		12	13	19.41	19.51	19.48
		25	0	19.35	19.40	19.49
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	20.64	20.58	20.73
		1	25	20.57	20.56	20.71
		1	49	20.58	20.77	20.68
		25	0	19.63	19.64	19.76
		25	13	19.56	19.68	19.73
		25	25	19.63	19.73	19.71
		50	0	19.57	19.64	19.73



Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20825/2507.5	21100/2535	21375/2562.5
	16QAM	1	0	20.54	20.43	20.62
		1	25	20.46	20.42	20.58
		1	49	20.43	20.63	20.51
		25	0	19.48	19.45	19.59
		25	13	19.40	19.49	19.56
		25	25	19.44	19.56	19.52
		50	0	19.38	19.45	19.53
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				20850/2510	21100/2535	21350/2560
15MHz	QPSK	1	0	20.63	20.54	20.71
		1	38	20.55	20.55	20.68
		1	74	20.55	20.72	20.64
		36	0	19.61	19.60	19.73
		36	18	19.53	19.63	19.69
		36	39	19.60	19.70	19.67
		75	0	19.55	19.60	19.68
	16QAM	1	0	20.49	20.41	20.60
		1	38	20.44	20.39	20.56
		1	74	20.40	20.59	20.48
		36	0	19.45	19.43	19.56
		36	18	19.37	19.44	19.52
		36	39	19.42	19.52	19.49
		75	0	19.35	19.40	19.49
20MHz	QPSK	1	0	20.60	20.50	20.68
		1	50	20.54	20.51	20.66
		1	99	20.53	20.71	20.61
		50	0	19.58	19.55	19.69
		50	25	19.51	19.59	19.66
		50	50	19.57	19.62	19.63
		100	0	19.52	19.55	19.64
	16QAM	1	0	20.47	20.37	20.49
		1	50	20.40	20.37	20.47
		1	99	20.38	20.49	20.46
		50	0	19.42	19.39	19.48
		50	25	19.34	19.42	19.49
		50	50	19.39	19.47	19.45
		100	0	19.33	19.36	19.46

## 4.2 Effective Isotropic Radiated Power

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Methods of Measurement

The measurement procedures in TIA- 603-D are used.

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antennatower.
3. UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.

$$10. ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$$

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$$E_t = R_t + AF$$

$$E_s = R_s + AF$$

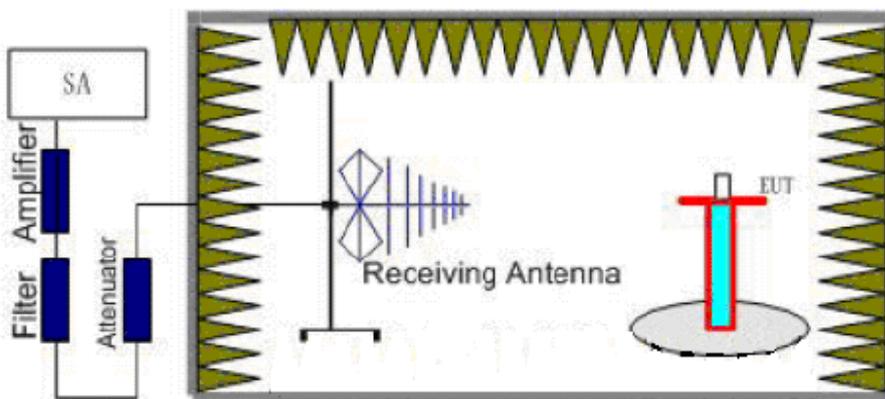
AF (dB/m) : Receive antenna factor

$R_t$  : The highest received signal in spectrum analyzer for EUT.

$R_s$  : The highest received signal in spectrum analyzer for substitution antenna.

$$EIRP = E.R.P + 2.15$$

### Test Setup



**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	-24.40	-45.44	0.00	1.13	22.17	Pass
1732.6	H	-24.40	-45.38	0.00	1.24	22.22	Pass
1752.6	H	-24.52	-45.38	0.00	1.35	22.21	Pass
1712.4	V	-23.45	-45.54	0.00	1.13	23.22	Pass
1732.6	V	-23.36	-45.46	0.00	1.24	23.34	Pass
1752.6	V	-23.43	-45.49	0.00	1.35	23.41	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	-36.18	-54.30	0.00	1.44	19.56	Pass
	1732.5	H	-36.21	-54.32	0.00	1.57	19.67	Pass
	1754.3	H	-36.22	-54.10	0.00	1.72	19.60	Pass
	1710.7	V	-36.01	-54.35	0.00	1.44	19.78	Pass
	1732.5	V	-35.78	-54.41	0.00	1.57	20.20	Pass
	1754.3	V	-35.80	-54.52	0.00	1.72	20.44	Pass
1.4MHz (16QAM)	1710.7	H	-36.62	-54.30	0.00	1.44	19.12	Pass
	1732.5	H	-36.60	-54.32	0.00	1.57	19.28	Pass
	1754.3	H	-36.60	-54.10	0.00	1.72	19.22	Pass
	1710.7	V	-36.34	-54.35	0.00	1.44	19.45	Pass
	1732.5	V	-36.09	-54.41	0.00	1.57	19.89	Pass
	1754.3	V	-35.89	-54.52	0.00	1.72	20.35	Pass
3MHz (QPSK)	1711.5	H	-36.19	-54.33	0.00	1.44	19.58	Pass
	1732.5	H	-36.21	-54.32	0.00	1.57	19.67	Pass
	1753.5	H	-36.23	-54.11	0.00	1.72	19.60	Pass
	1711.5	V	-36.01	-54.35	0.00	1.44	19.78	Pass
	1732.5	V	-35.81	-54.41	0.00	1.57	20.17	Pass
	1753.5	V	-35.74	-54.48	0.00	1.72	20.46	Pass
3MHz (16QAM)	1711.5	H	-36.71	-54.33	0.00	1.44	19.06	Pass
	1732.5	H	-36.68	-54.32	0.00	1.57	19.20	Pass
	1753.5	H	-36.69	-54.11	0.00	1.72	19.14	Pass
	1711.5	V	-36.42	-54.35	0.00	1.44	19.37	Pass
	1732.5	V	-36.20	-54.41	0.00	1.57	19.78	Pass
	1753.5	V	-35.91	-54.48	0.00	1.72	20.29	Pass
5MHz (QPSK)	1712.5	H	-36.16	-54.34	0.00	1.44	19.62	Pass
	1732.5	H	-36.14	-54.32	0.00	1.57	19.74	Pass
	1752.5	H	-36.10	-54.13	0.00	1.72	19.74	Pass
	1712.5	V	-36.01	-54.38	0.00	1.44	19.81	Pass
	1732.5	V	-35.79	-54.41	0.00	1.57	20.19	Pass



	1752.5	V	-35.66	-54.47	0.00	1.72	20.53	Pass
<b>5MHz (16QAM)</b>	1712.5	H	-36.66	-54.34	0.00	1.44	19.12	Pass
	1732.5	H	-36.59	-54.32	0.00	1.57	19.29	Pass
	1752.5	H	-36.54	-54.13	0.00	1.72	19.30	Pass
	1712.5	V	-36.40	-54.38	0.00	1.44	19.42	Pass
	1732.5	V	-36.16	-54.41	0.00	1.57	19.82	Pass
	1752.5	V	-35.81	-54.47	0.00	1.72	20.38	Pass
	<b>10MHz (QPSK)</b>	1715	H	-36.13	-54.33	0.00	1.44	19.64
1732.5		H	-35.97	-54.32	0.00	1.57	19.91	Pass
1750		H	-35.89	-54.12	0.00	1.66	19.89	Pass
1715		V	-35.93	-54.32	0.00	1.44	19.83	Pass
1732.5		V	-35.66	-54.41	0.00	1.57	20.32	Pass
1750		V	-35.57	-54.52	0.00	1.66	20.61	Pass
<b>10MHz (16QAM)</b>	1715	H	-36.59	-54.33	0.00	1.44	19.18	Pass
	1732.5	H	-36.38	-54.32	0.00	1.57	19.50	Pass
	1750	H	-36.29	-54.12	0.00	1.66	19.49	Pass
	1715	V	-36.28	-54.32	0.00	1.44	19.48	Pass
	1732.5	V	-35.99	-54.41	0.00	1.57	19.99	Pass
	1750	V	-35.68	-54.52	0.00	1.66	20.50	Pass
<b>15MHz (QPSK)</b>	1717.5	H	-36.30	-54.35	0.00	1.49	19.53	Pass
	1732.5	H	-35.94	-54.32	0.00	1.57	19.94	Pass
	1747.5	H	-35.92	-54.17	0.00	1.66	19.91	Pass
	1717.5	V	-36.16	-54.39	0.00	1.49	19.72	Pass
	1732.5	V	-35.68	-54.41	0.00	1.57	20.30	Pass
	1747.5	V	-35.63	-54.51	0.00	1.66	20.54	Pass
<b>15MHz (16QAM)</b>	1717.5	H	-36.88	-54.35	0.00	1.49	18.95	Pass
	1732.5	H	-36.47	-54.32	0.00	1.57	19.41	Pass
	1747.5	H	-36.44	-54.17	0.00	1.66	19.39	Pass
	1717.5	V	-36.63	-54.39	0.00	1.49	19.25	Pass
	1732.5	V	-36.13	-54.41	0.00	1.57	19.85	Pass
	1747.5	V	-35.86	-54.51	0.00	1.66	20.31	Pass
<b>20MHz (QPSK)</b>	1720	H	-36.60	-54.37	0.00	1.49	19.26	Pass
	1732.5	H	-36.14	-54.32	0.00	1.57	19.74	Pass
	1745	H	-36.06	-54.23	0.00	1.63	19.80	Pass
	1720	V	-36.01	-54.44	0.00	1.49	19.92	Pass
	1732.5	V	-35.47	-54.41	0.00	1.57	20.51	Pass
	1745	V	-35.43	-54.59	0.00	1.63	20.79	Pass
<b>20MHz (16QAM)</b>	1720	H	-37.15	-54.37	0.00	1.49	18.71	Pass
	1732.5	H	-36.64	-54.32	0.00	1.57	19.24	Pass
	1745	H	-36.55	-54.23	0.00	1.63	19.31	Pass
	1720	V	-36.45	-54.44	0.00	1.49	19.48	Pass
	1732.5	V	-35.89	-54.41	0.00	1.57	20.09	Pass
	1745	V	-35.63	-54.59	0.00	1.63	20.59	Pass



LTE Band 7								
Band width	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	Conclusion
5MHz (QPSK)	2502.5	H	-42.30	-59.64	0.00	1.81	19.15	Pass
	2535	H	-41.33	-59.72	0.00	1.81	20.20	Pass
	2567.5	H	-40.25	-59.98	0.00	1.83	21.56	Pass
	2502.5	V	-43.34	-59.31	0.00	1.81	17.78	Pass
	2535	V	-40.54	-59.11	0.00	1.81	20.38	Pass
	2567.5	V	-38.97	-59.59	0.00	1.83	22.45	Pass
5MHz (16QAM)	2502.5	H	-42.73	-59.64	0.00	1.81	18.72	Pass
	2535	H	-41.71	-59.72	0.00	1.81	19.82	Pass
	2567.5	H	-40.62	-59.98	0.00	1.83	21.19	Pass
	2502.5	V	-43.66	-59.31	0.00	1.81	17.46	Pass
	2535	V	-40.84	-59.11	0.00	1.81	20.08	Pass
	2567.5	V	-39.05	-59.59	0.00	1.83	22.37	Pass
10MHz (QPSK)	2505	H	-42.19	-59.61	0.00	1.82	19.24	Pass
	2535	H	-41.26	-59.72	0.00	1.81	20.27	Pass
	2565	H	-39.84	-60.02	0.00	1.81	21.99	Pass
	2505	V	-43.48	-59.33	0.00	1.82	17.67	Pass
	2535	V	-40.53	-59.11	0.00	1.81	20.39	Pass
	2565	V	-38.62	-59.59	0.00	1.81	22.78	Pass
10MHz (16QAM)	2505	H	-42.70	-59.61	0.00	1.82	18.73	Pass
	2535	H	-41.72	-59.72	0.00	1.81	19.81	Pass
	2565	H	-40.29	-60.02	0.00	1.81	21.54	Pass
	2505	V	-43.88	-59.33	0.00	1.82	17.27	Pass
	2535	V	-40.91	-59.11	0.00	1.81	20.01	Pass
	2565	V	-38.78	-59.59	0.00	1.81	22.62	Pass
15MHz (QPSK)	2507.5	H	-42.27	-59.71	0.00	1.80	19.24	Pass
	2535	H	-41.17	-59.72	0.00	1.81	20.36	Pass
	2562.5	H	-40.52	-60.08	0.00	1.82	21.38	Pass
	2507.5	V	-43.36	-59.29	0.00	1.80	17.73	Pass
	2535	V	-41.20	-59.72	0.00	1.81	20.33	Pass
	2562.5	V	-39.10	-59.46	0.00	1.82	22.18	Pass
15MHz (16QAM)	2507.5	H	-42.70	-59.71	0.00	1.80	18.81	Pass
	2535	H	-41.55	-59.72	0.00	1.81	19.98	Pass
	2562.5	H	-40.89	-60.08	0.00	1.82	21.01	Pass
	2507.5	V	-43.68	-59.29	0.00	1.80	17.41	Pass
	2535	V	-41.50	-59.72	0.00	1.81	20.03	Pass
	2562.5	V	-39.18	-59.46	0.00	1.82	22.10	Pass
20MHz (QPSK)	2510	H	-41.58	-59.52	0.00	1.77	19.71	Pass
	2535	H	-41.09	-59.72	0.00	1.81	20.44	Pass
	2560	H	-40.61	-60.01	0.00	1.82	21.22	Pass



	2510	V	-43.00	-59.09	0.00	1.77	17.86	Pass
	2535	V	-41.23	-59.72	0.00	1.81	20.30	Pass
	2560	V	-39.49	-59.52	0.00	1.82	21.85	Pass
<b>20MHz (16QAM)</b>	2510	H	-42.14	-59.52	0.00	1.77	19.15	Pass
	2535	H	-41.60	-59.72	0.00	1.81	19.93	Pass
	2560	H	-41.11	-60.01	0.00	1.82	20.72	Pass
	2510	V	-43.45	-59.09	0.00	1.77	17.41	Pass
	2535	V	-41.66	-59.72	0.00	1.81	19.87	Pass
	2560	V	-39.70	-59.52	0.00	1.82	21.64	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 (1.4MHz).

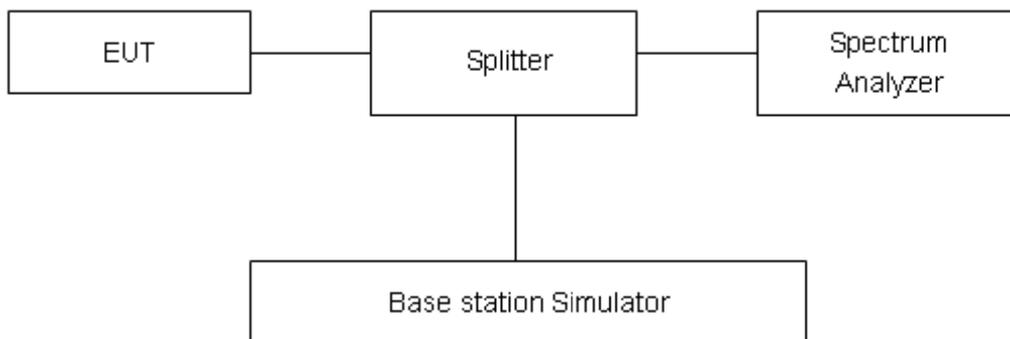
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4 (3MHz).

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 4/7 (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	1712.4	4.2094	4.853
	1413	1732.6	4.2092	4.884
	1513	1752.6	4.1945	4.829

LTE Band 4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	19957	1710.7	1.1312	1.330
			20175	1732.5	1.1228	1.328
			20393	1754.3	1.1261	1.325
		3	19965	1711.5	2.7439	3.039
			20175	1732.5	2.7329	3.034
			20385	1753.5	2.7387	3.057
		5	19975	1712.5	4.5477	5.073
			20175	1732.5	4.5270	5.082
			20375	1752.5	4.5270	5.060
		10	20000	1715	9.0340	10.120
			20175	1732.5	9.0560	10.140
			20350	1750	9.0803	10.150
		15	20025	1717.5	13.4770	14.920
			20175	1732.5	13.5240	14.890
			20325	1747.5	13.5150	14.920
		20	20050	1720	17.9190	19.390
			20175	1732.5	17.9220	19.390
			20300	1745	17.9330	19.540
	16QAM	1.4	19957	1710.7	1.1194	1.308
			20175	1732.5	1.1299	1.320
			20393	1754.3	1.1192	1.306
		3	19965	1711.5	2.7348	3.042
			20175	1732.5	2.7335	3.058
			20385	1753.5	2.7473	3.070
5		19975	1712.5	4.5264	5.076	
		20175	1732.5	4.5403	5.131	
		20375	1752.5	4.5334	5.090	
10		20000	1715	9.0579	10.110	
	20175	1732.5	9.0659	10.030		

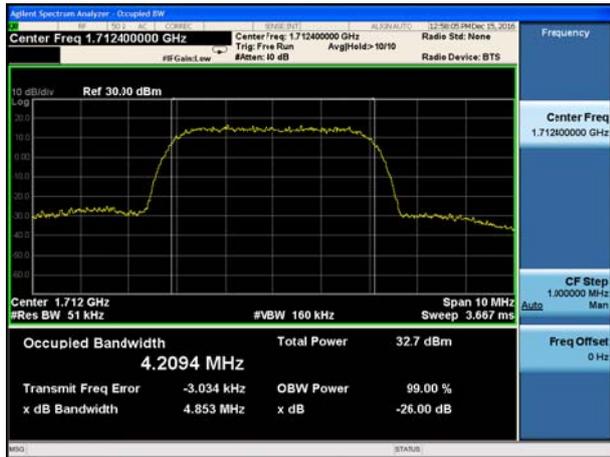


		15	20350	1750	9.0589	10.110
			20025	1717.5	13.5130	14.890
			20175	1732.5	13.5270	14.910
			20325	1747.5	13.5050	14.900
		20	20050	1720	17.9610	19.450
			20175	1732.5	17.9710	19.410
			20300	1745	17.9240	19.430

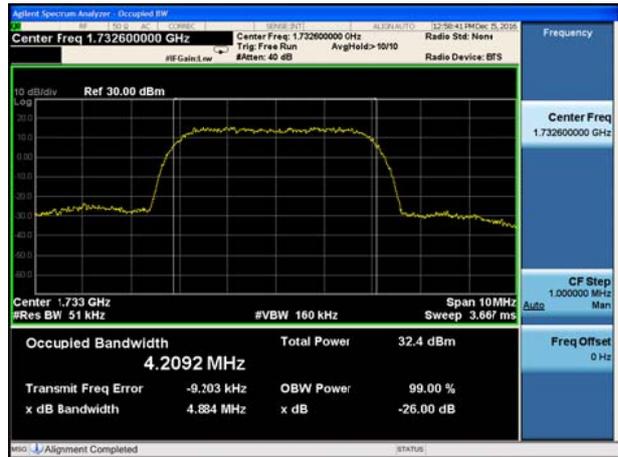
LTE Band 7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	20775	2502.5	4.5337	5.091
			21100	2535	4.5468	5.093
			21425	2567.5	4.5397	5.080
		10	20800	2505	9.0394	10.070
			21100	2535	9.0684	10.170
			21400	2565	9.0633	10.170
		15	20825	2507.5	13.5340	14.940
			21100	2535	13.5060	14.990
			21375	2562.5	13.5090	14.920
		20	20850	2510	17.9420	19.400
			21100	2535	17.9210	19.420
			21350	2560	17.8790	19.540
	16QAM	5	20775	2502.5	4.5498	5.076
			21100	2535	4.5197	5.059
			21425	2567.5	4.5189	5.063
		10	20800	2505	9.0675	10.030
			21100	2535	9.0534	10.050
			21400	2565	9.0543	10.080
		15	20825	2507.5	13.5310	14.830
			21100	2535	13.5140	14.810
			21375	2562.5	13.5060	14.860
		20	20850	2510	17.9710	19.600
			21100	2535	17.9620	19.480
			21350	2560	17.9440	19.510



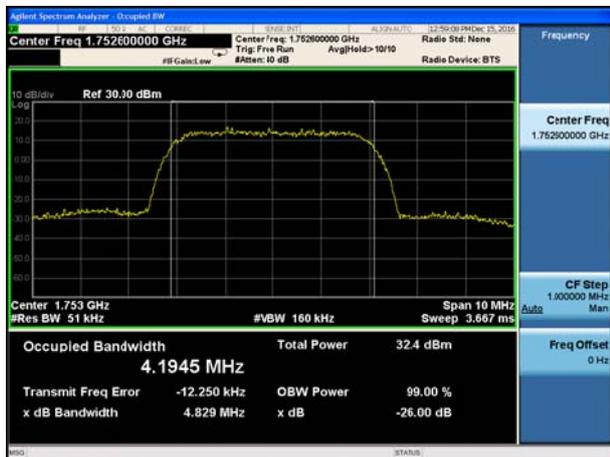
### WCDMA Band IV CH1312 Occupied Bandwidth



### WCDMA Band IV CH1413 Occupied Bandwidth

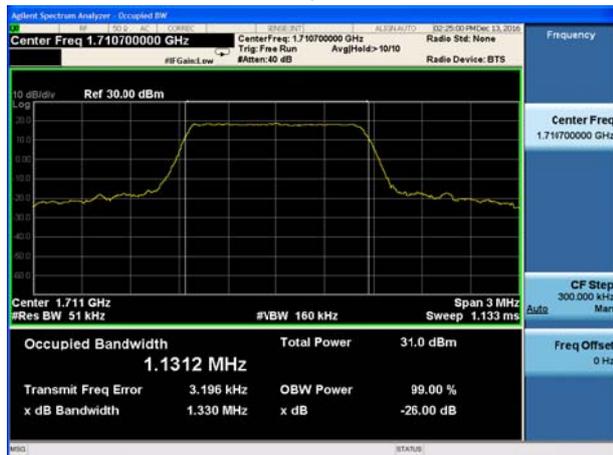


### WCDMA Band IV CH1513 Occupied Bandwidth

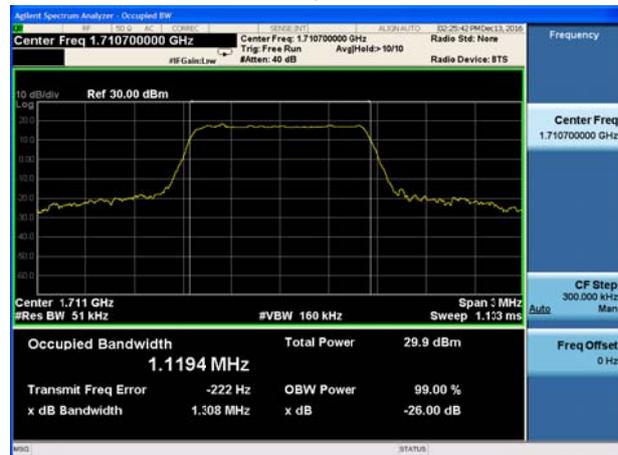




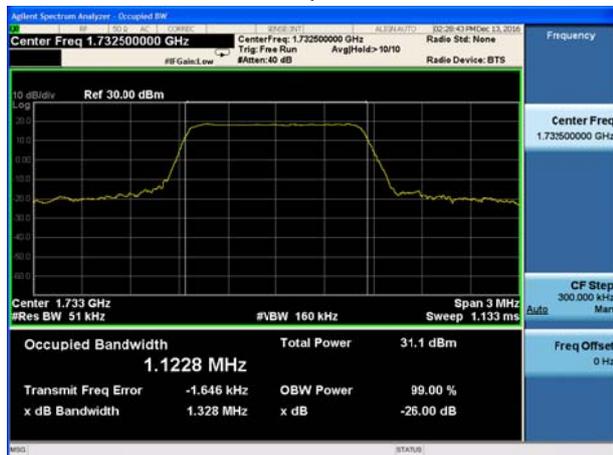
LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH19957 Occupied Bandwidth



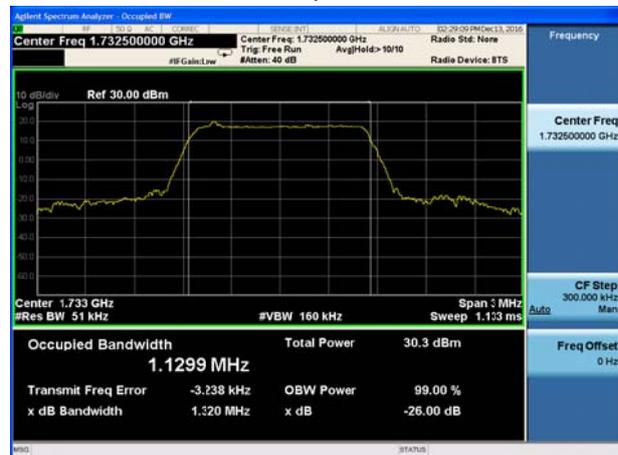
LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH19957 Occupied Bandwidth



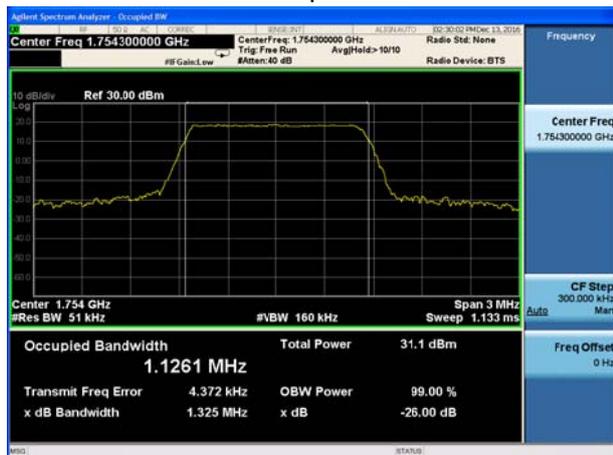
LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH20175 Occupied Bandwidth



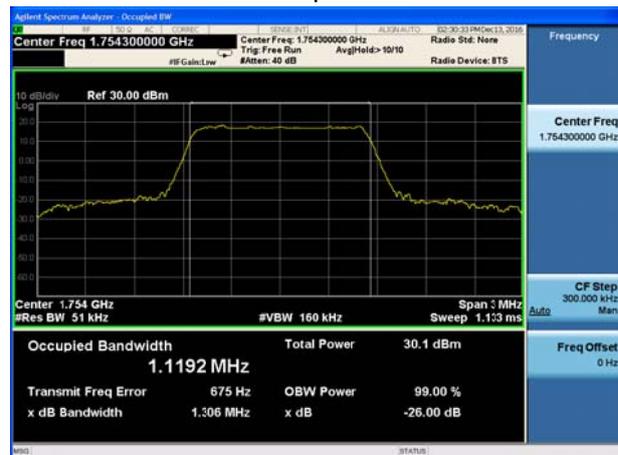
LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH20175 Occupied Bandwidth



LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH20393 Occupied Bandwidth

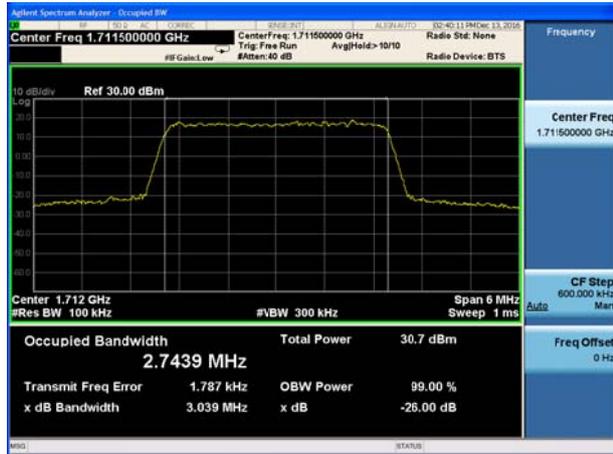


LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH20393 Occupied Bandwidth

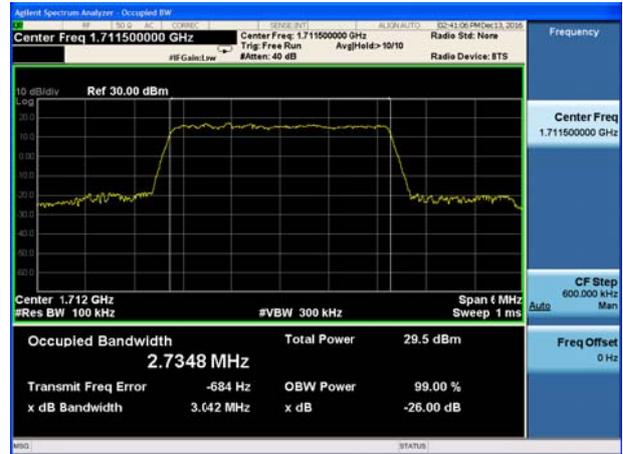




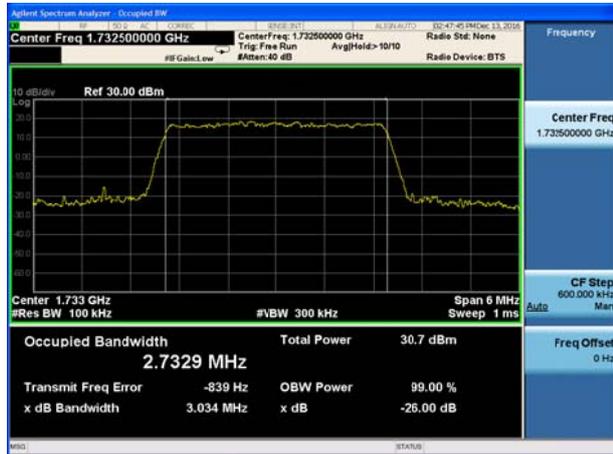
LTE Band 4 QPSK Bandwidth = 3MHz CH19965 Occupied Bandwidth



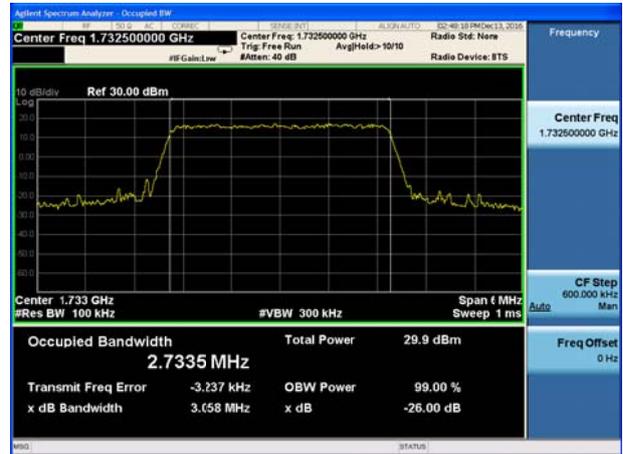
LTE Band 4 16QAM Bandwidth = 3MHz CH19965 Occupied Bandwidth



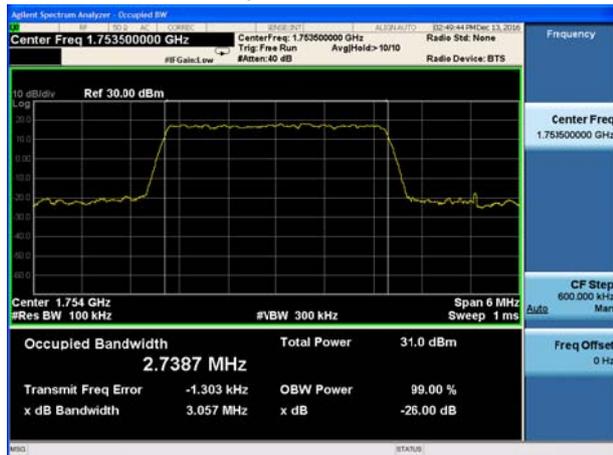
LTE Band 4 QPSK Bandwidth = 3MHz CH20175 Occupied Bandwidth



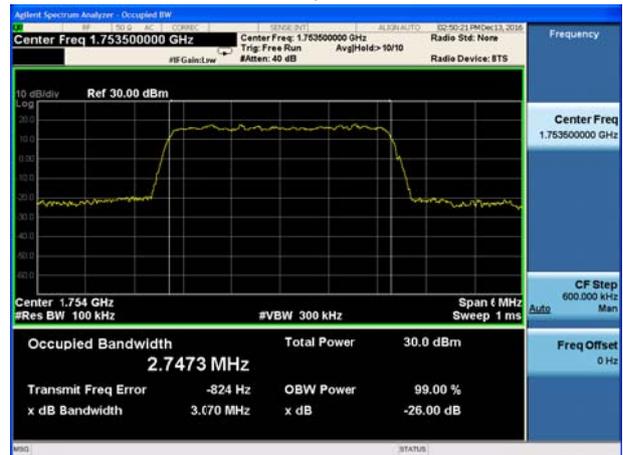
LTE Band 4 16QAM Bandwidth = 3MHz CH20175 Occupied Bandwidth



LTE Band 4 QPSK Bandwidth = 3MHz CH20385 Occupied Bandwidth

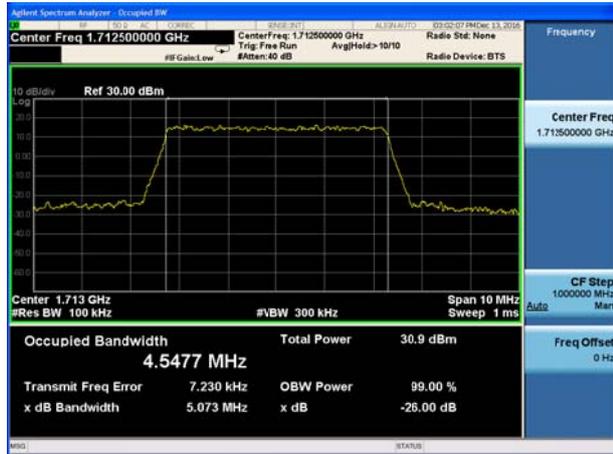


LTE Band 4 16QAM Bandwidth = 3MHz CH20385 Occupied Bandwidth

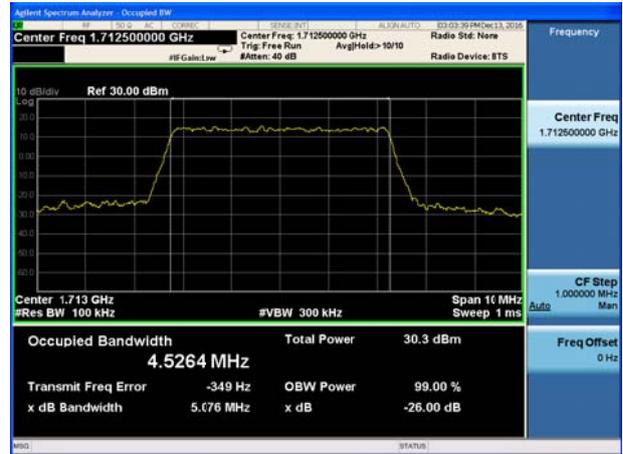




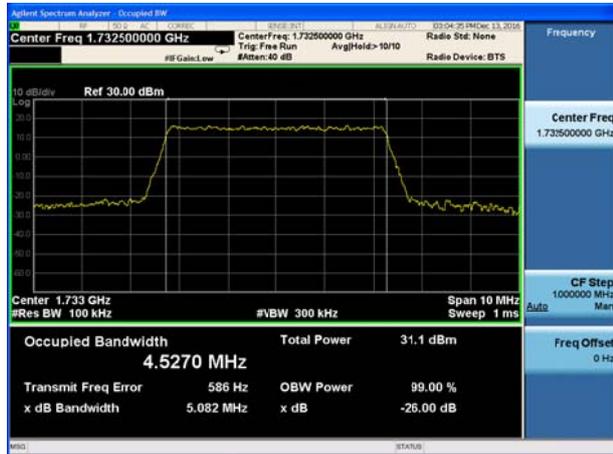
LTE Band 4 QPSK Bandwidth = 5MHz CH19975 Occupied Bandwidth



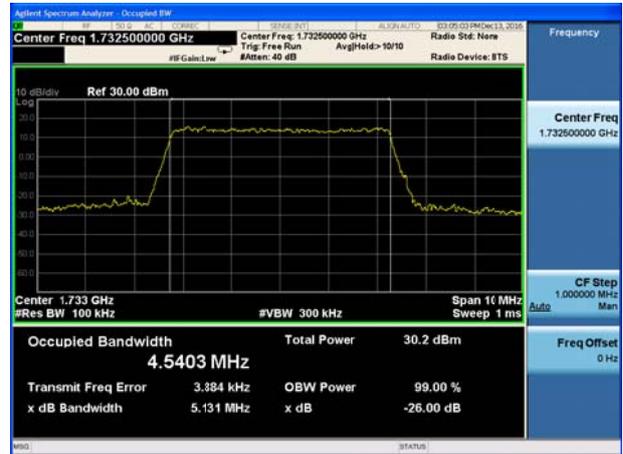
LTE Band 4 16QAM Bandwidth = 5MHz CH19975 Occupied Bandwidth



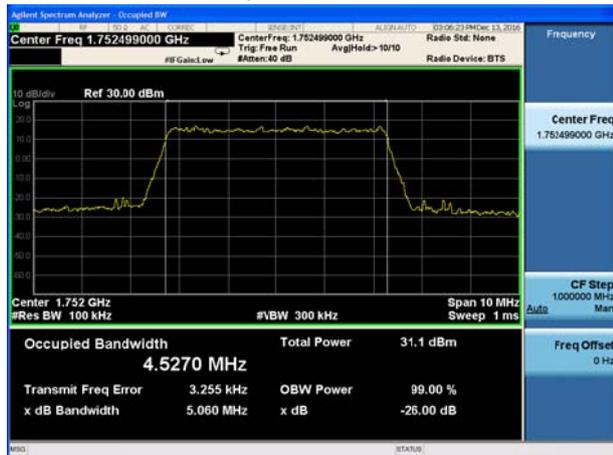
LTE Band 4 QPSK Bandwidth = 5MHz CH20175 Occupied Bandwidth



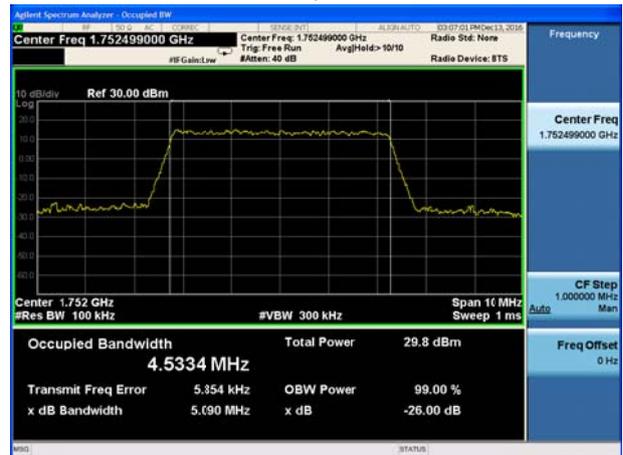
LTE Band 4 16QAM Bandwidth = 5MHz CH20175 Occupied Bandwidth



LTE Band 4 QPSK Bandwidth = 5MHz CH20375 Occupied Bandwidth

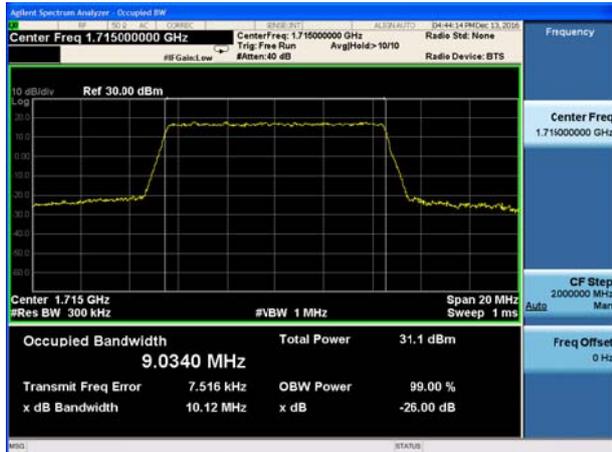


LTE Band 4 16QAM Bandwidth = 5MHz CH20375 Occupied Bandwidth

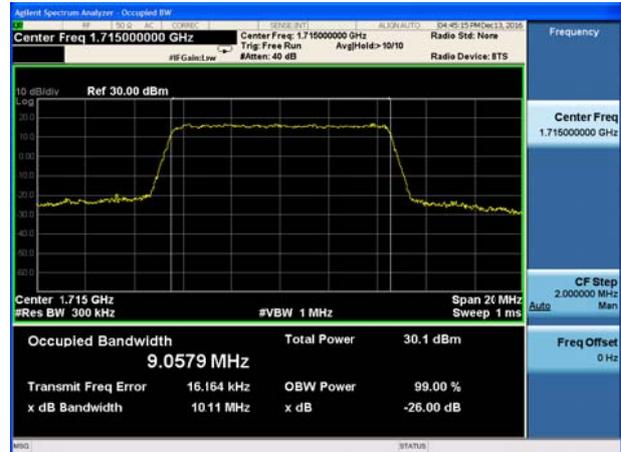




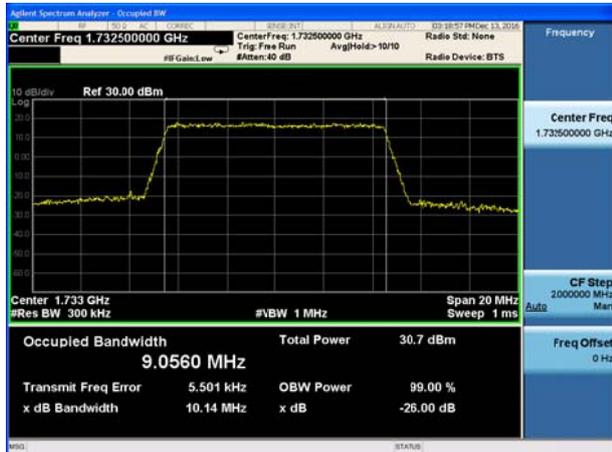
LTE Band 4 QPSK Bandwidth = 10MHz  
CH20000 Occupied Bandwidth



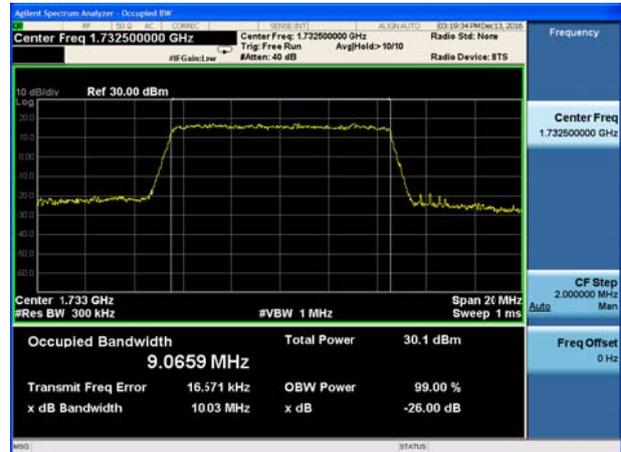
LTE Band 4 16QAM Bandwidth = 10MHz  
CH20000 Occupied Bandwidth



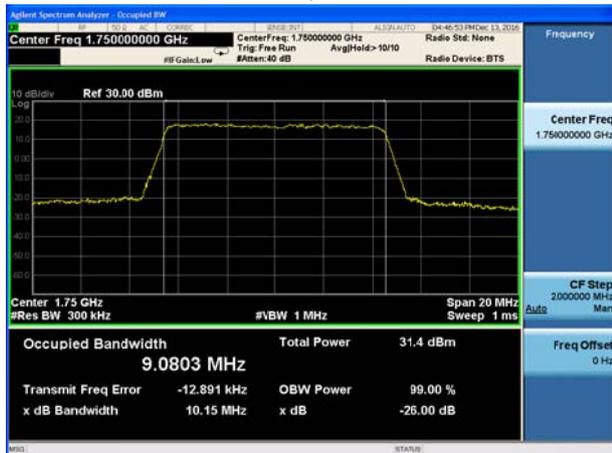
LTE Band 4 QPSK Bandwidth = 10MHz  
CH20175 Occupied Bandwidth



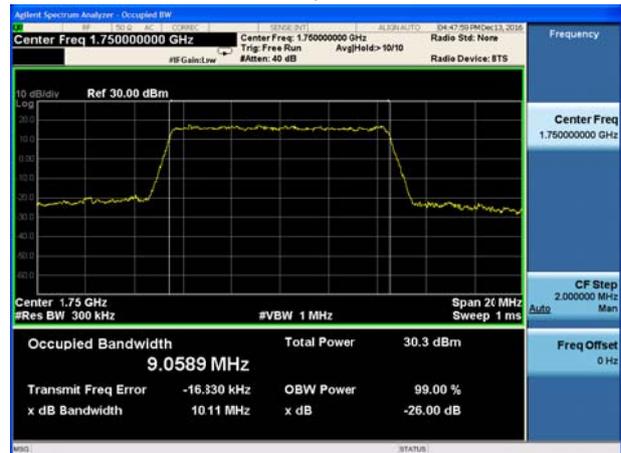
LTE Band 4 16QAM Bandwidth = 10MHz  
CH20175 Occupied Bandwidth



LTE Band 4 QPSK Bandwidth = 10MHz  
CH20350 Occupied Bandwidth

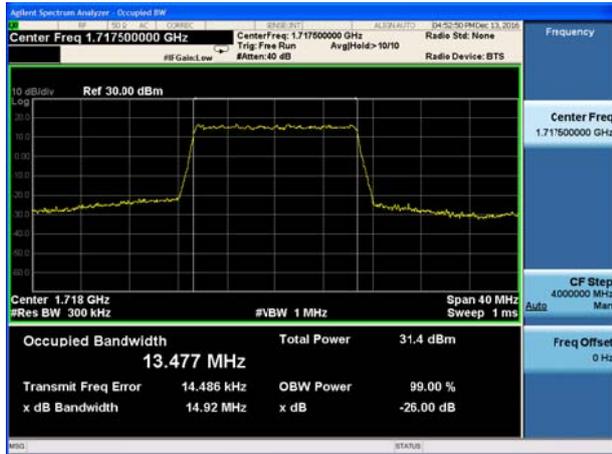


LTE Band 4 16QAM Bandwidth = 10MHz  
CH20350 Occupied Bandwidth

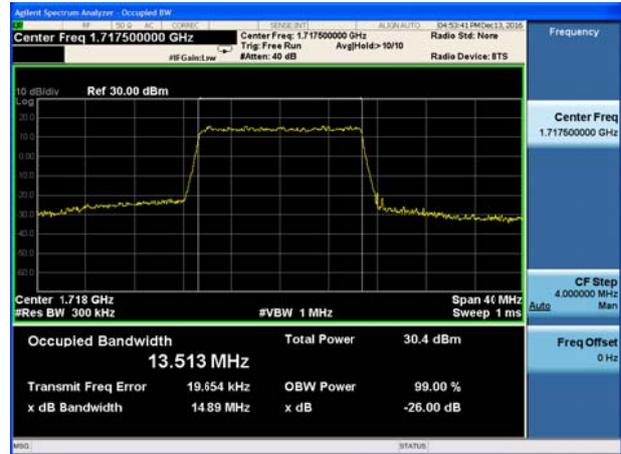




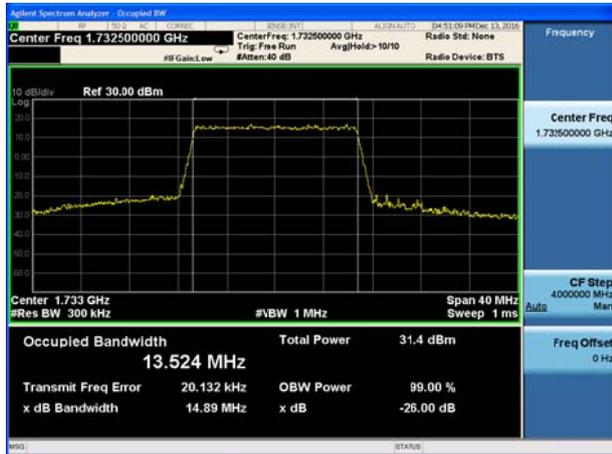
LTE Band 4 QPSK Bandwidth = 15MHz  
CH20025 Occupied Bandwidth



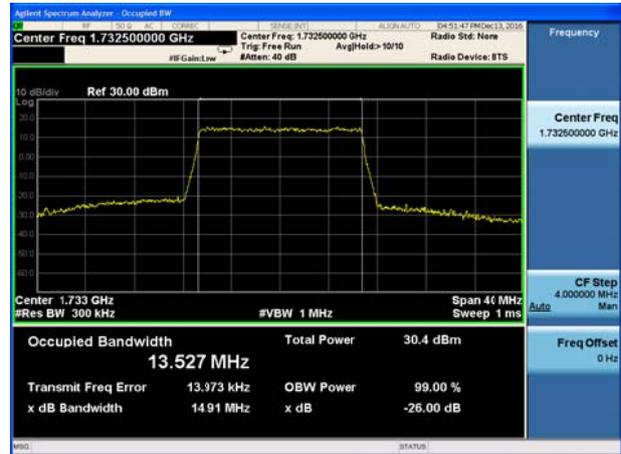
LTE Band 4 16QAM Bandwidth = 15MHz  
CH20025 Occupied Bandwidth



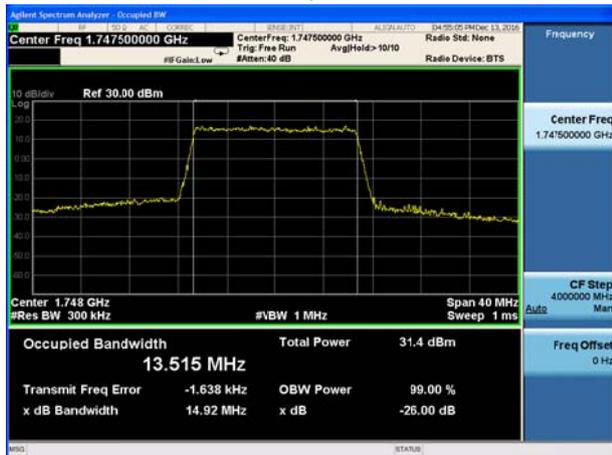
LTE Band 4 QPSK Bandwidth = 15MHz  
CH20175 Occupied Bandwidth



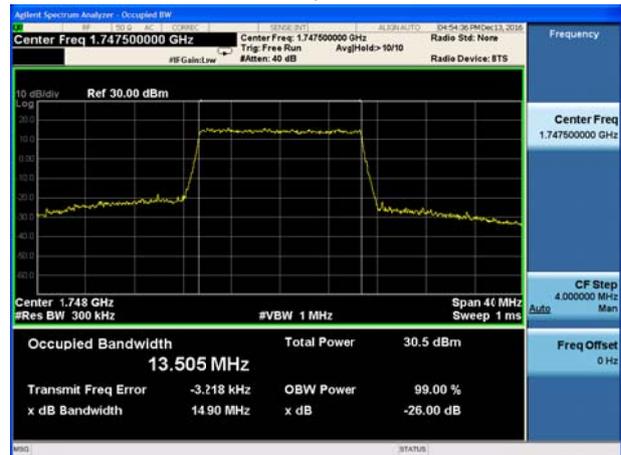
LTE Band 4 16QAM Bandwidth = 15MHz  
CH20175 Occupied Bandwidth



LTE Band 4 QPSK Bandwidth = 15MHz  
CH20325 Occupied Bandwidth

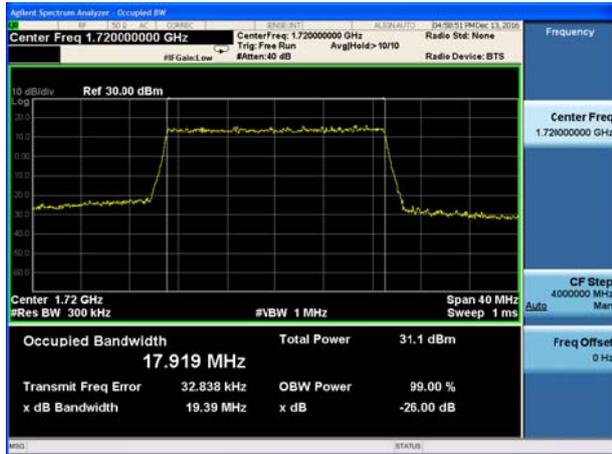


LTE Band 4 16QAM Bandwidth = 15MHz  
CH20325 Occupied Bandwidth

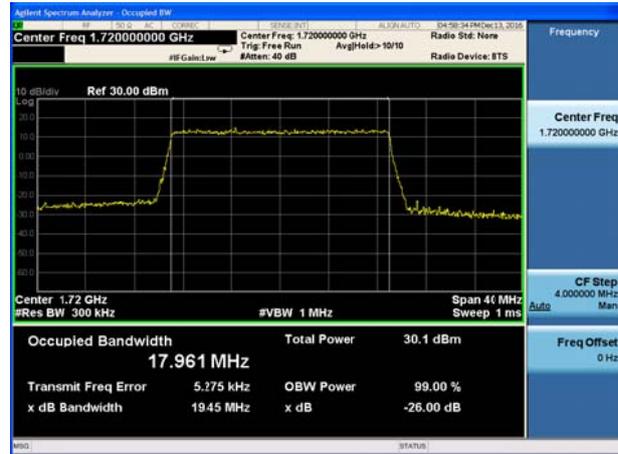




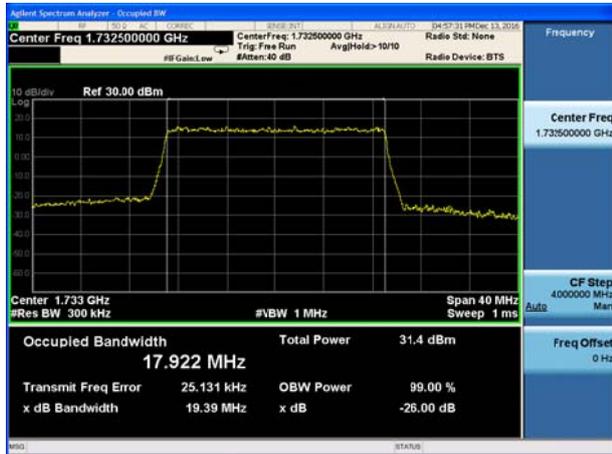
LTE Band 4 QPSK Bandwidth = 20MHz  
CH20050 Occupied Bandwidth



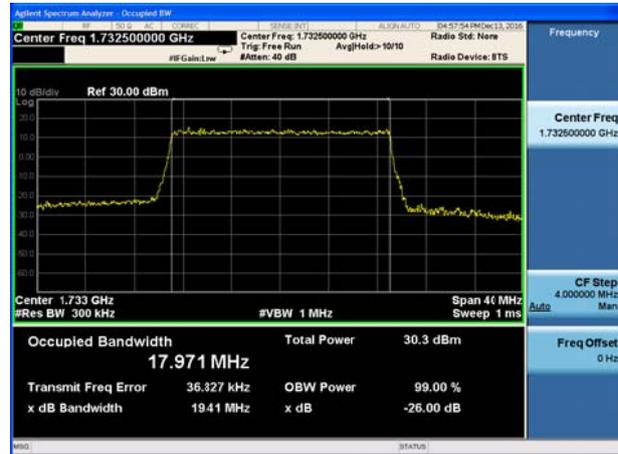
LTE Band 4 16QAM Bandwidth = 20MHz  
CH20050 Occupied Bandwidth



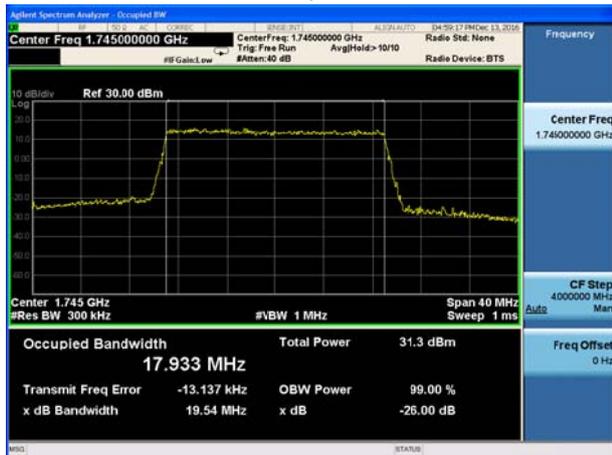
LTE Band 4 QPSK Bandwidth = 20MHz  
CH20175 Occupied Bandwidth



LTE Band 4 16QAM Bandwidth = 20MHz  
CH20175 Occupied Bandwidth



LTE Band 4 QPSK Bandwidth = 20MHz  
CH20300 Occupied Bandwidth

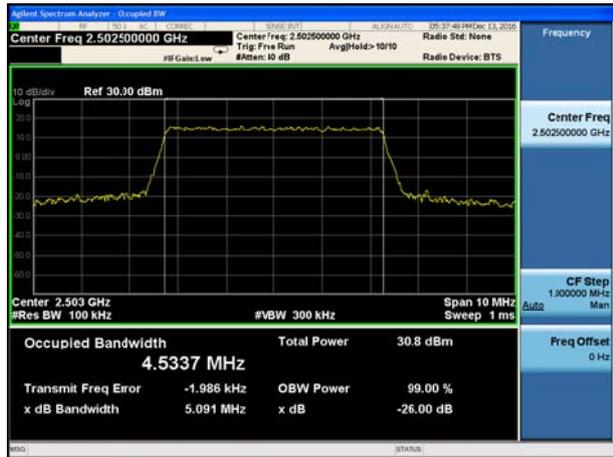


LTE Band 4 16QAM Bandwidth = 20MHz  
CH20300 Occupied Bandwidth

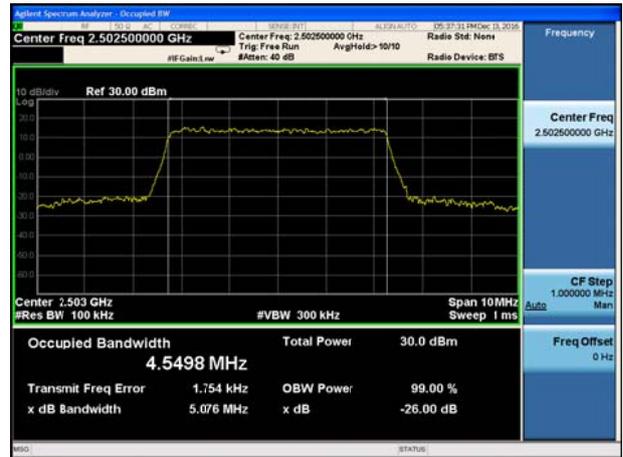




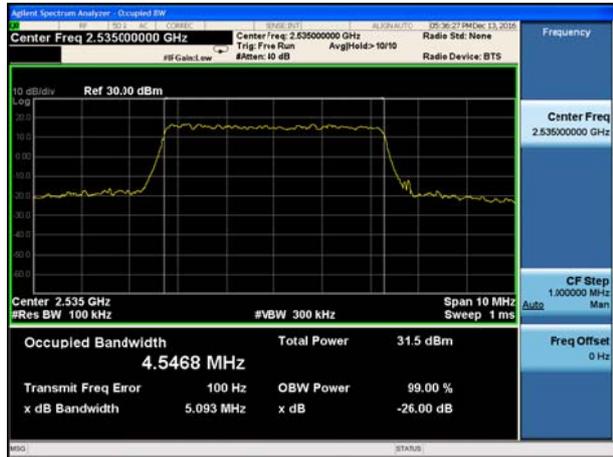
### LTE Band 7 QPSK Bandwidth = 5MHz CH20775 Occupied Bandwidth



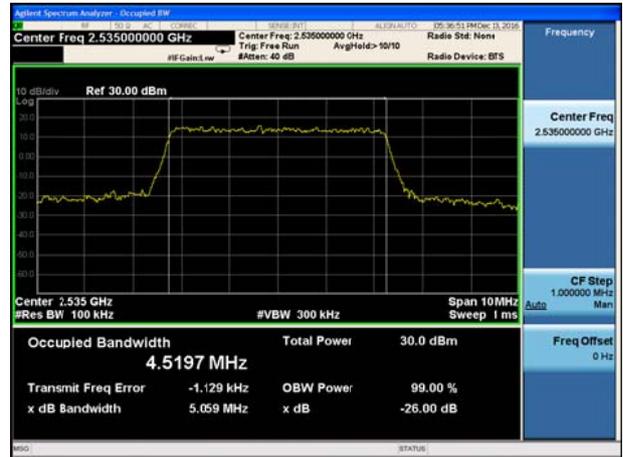
### LTE Band 7 16QAM Bandwidth = 5MHz CH20775 Occupied Bandwidth



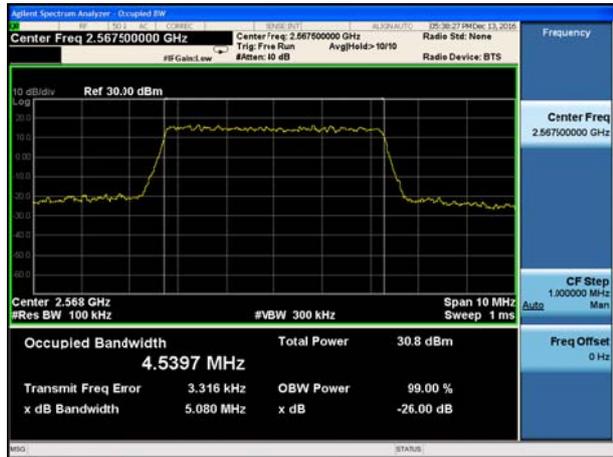
### LTE Band 7 QPSK Bandwidth = 5MHz CH21100 Occupied Bandwidth



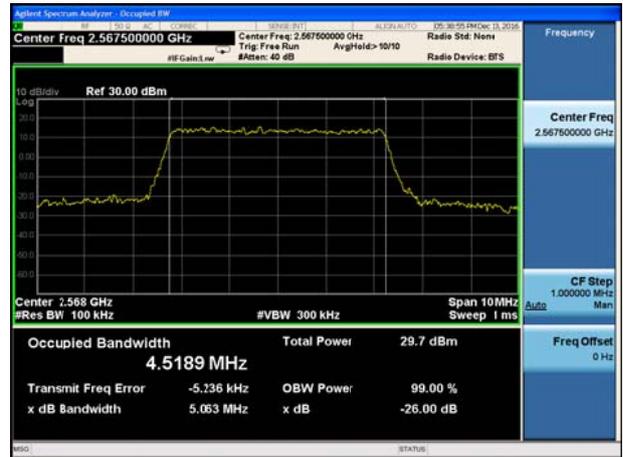
### LTE Band 7 16QAM Bandwidth = 5MHz CH21100 Occupied Bandwidth



### LTE Band 7 QPSK Bandwidth = 5MHz CH21425 Occupied Bandwidth

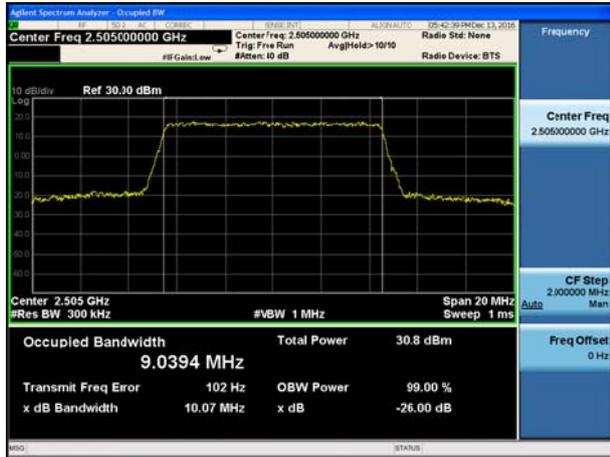


### LTE Band 7 16QAM Bandwidth = 5MHz CH21425 Occupied Bandwidth

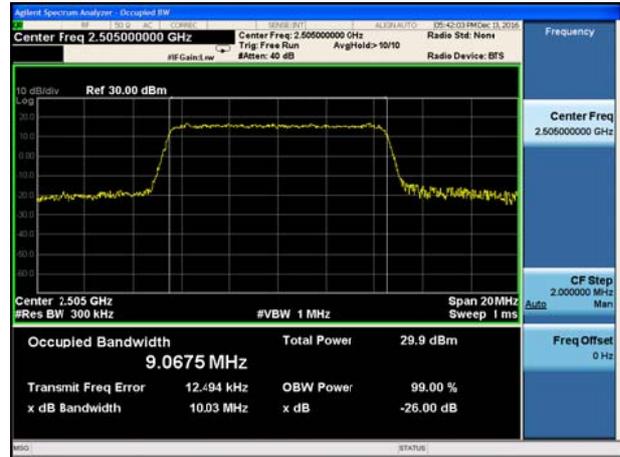




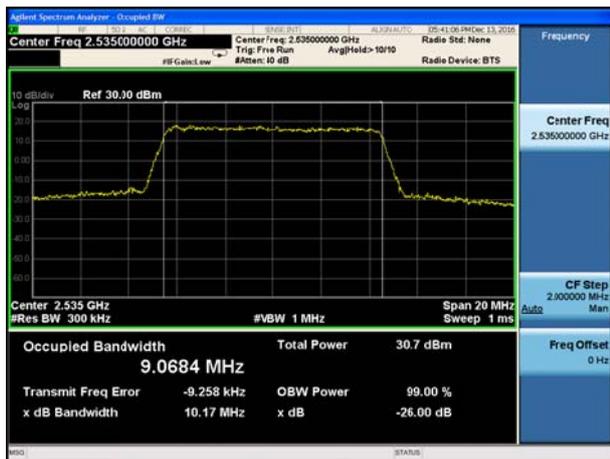
LTE Band 7 QPSK Bandwidth = 10MHz  
CH20800 Occupied Bandwidth



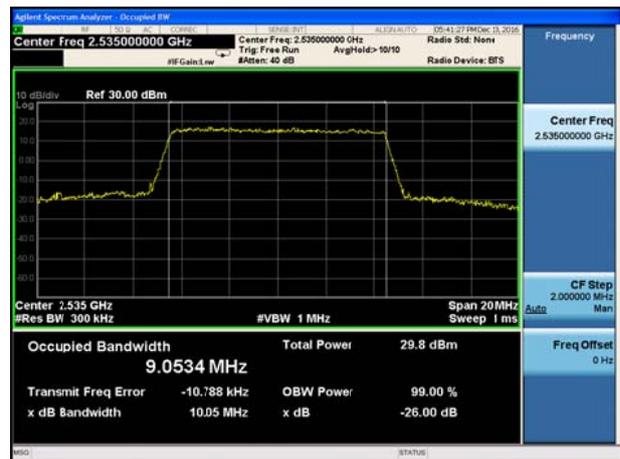
LTE Band 7 16QAM Bandwidth = 10MHz  
CH20800 Occupied Bandwidth



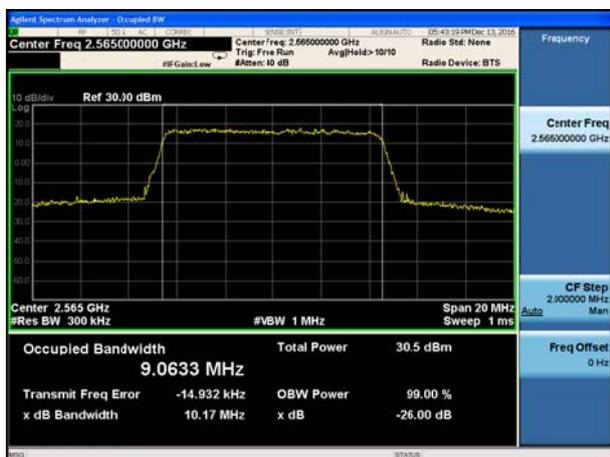
LTE Band 7 QPSK Bandwidth = 10MHz  
CH21100 Occupied Bandwidth



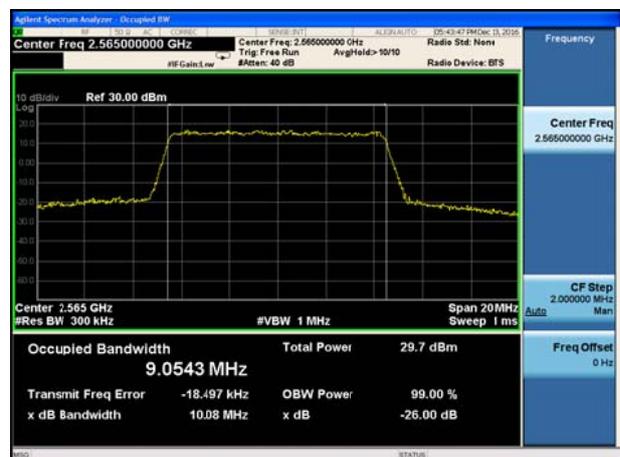
LTE Band 7 16QAM Bandwidth = 10MHz  
CH21100 Occupied Bandwidth



LTE Band 7 QPSK Bandwidth = 10MHz  
CH21400 Occupied Bandwidth

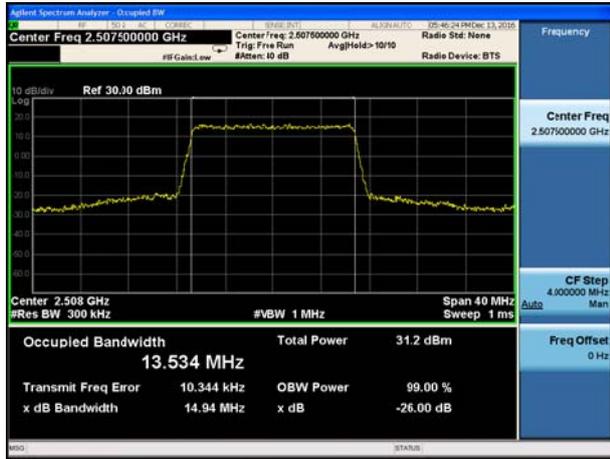


LTE Band 7 16QAM Bandwidth = 10MHz  
CH21400 Occupied Bandwidth

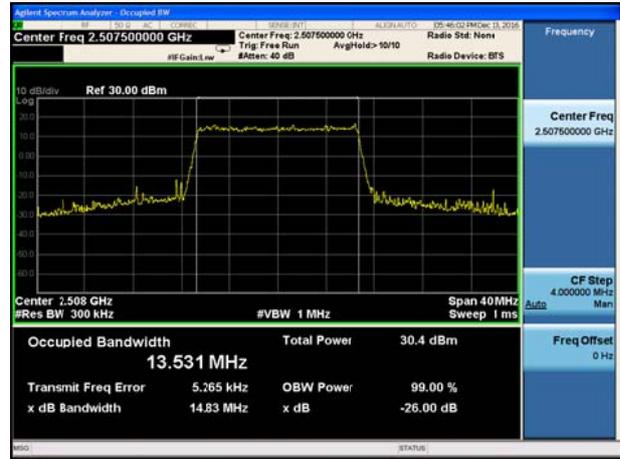




LTE Band 7 QPSK Bandwidth = 15MHz  
CH20825 Occupied Bandwidth



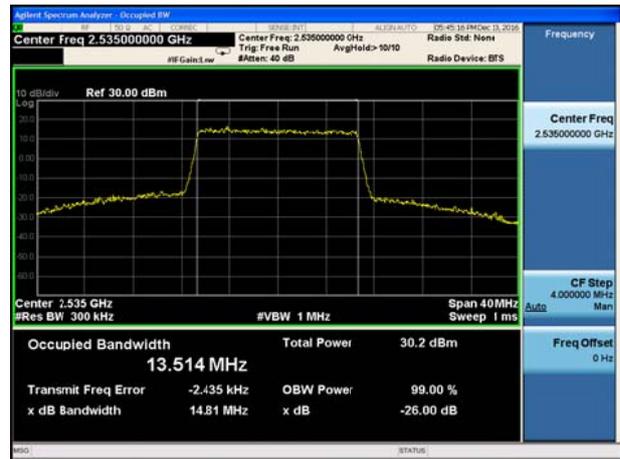
LTE Band 7 16QAM Bandwidth = 15MHz  
CH20825 Occupied Bandwidth



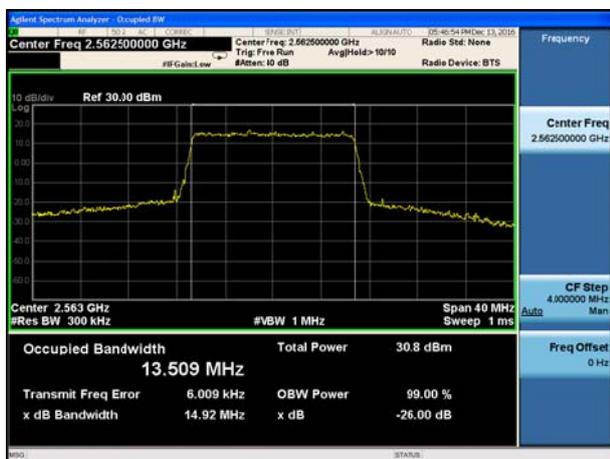
LTE Band 7 QPSK Bandwidth = 15MHz  
CH21100 Occupied Bandwidth



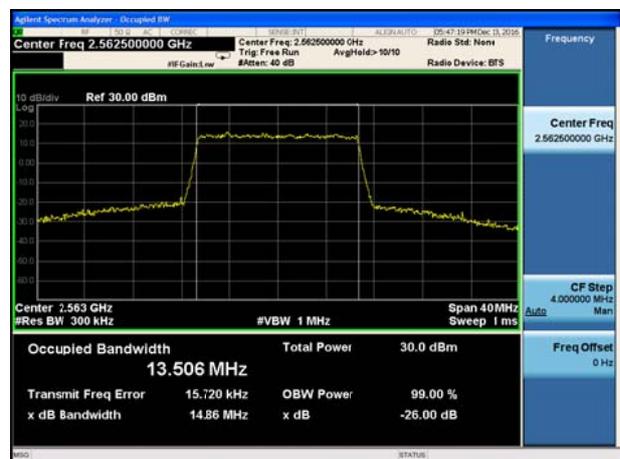
LTE Band 7 16QAM Bandwidth = 15MHz  
CH21100 Occupied Bandwidth



LTE Band 7 QPSK Bandwidth = 15MHz  
CH21375 Occupied Bandwidth



LTE Band 7 16QAM Bandwidth = 15MHz  
CH21375 Occupied Bandwidth

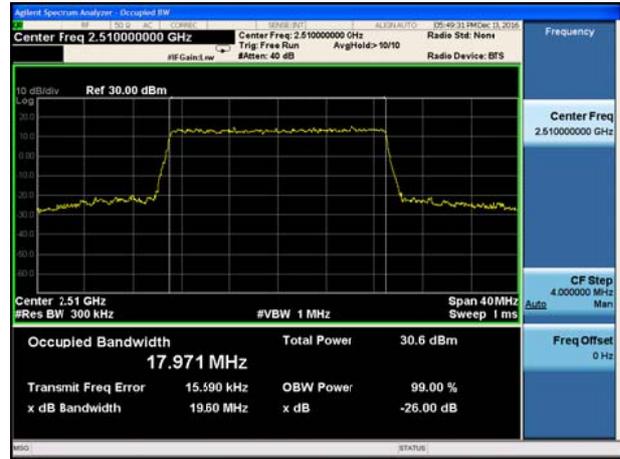




LTE Band 7 QPSK Bandwidth = 20MHz  
CH20850 Occupied Bandwidth



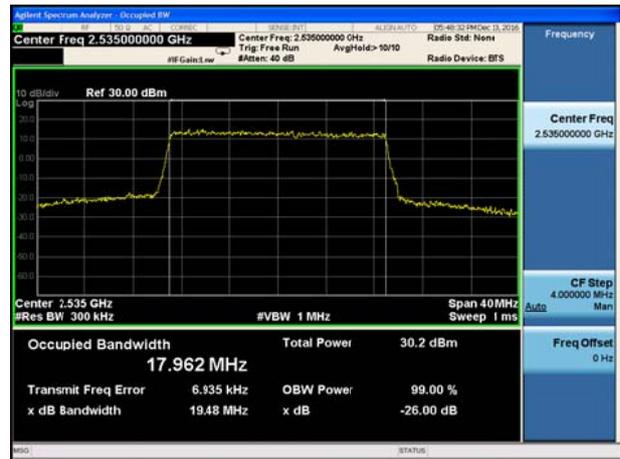
LTE Band 7 16QAM Bandwidth = 20MHz  
CH20850 Occupied Bandwidth



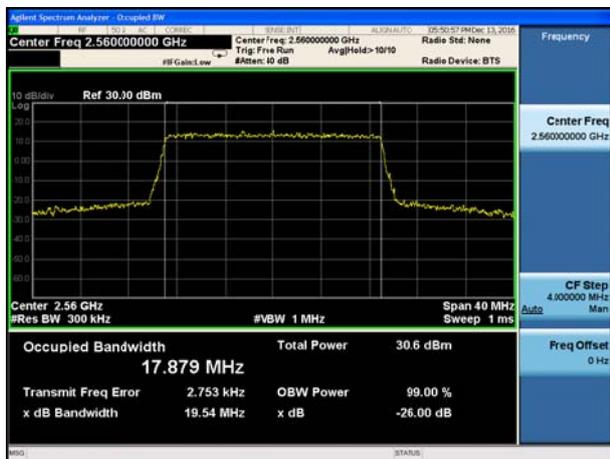
LTE Band 7 QPSK Bandwidth = 20MHz  
CH21100 Occupied Bandwidth



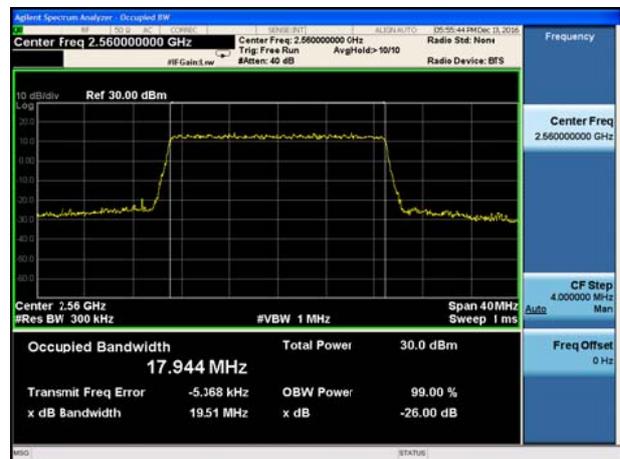
LTE Band 7 16QAM Bandwidth = 20MHz  
CH21100 Occupied Bandwidth



LTE Band 7 QPSK Bandwidth = 20MHz  
CH21350 Occupied Bandwidth



LTE Band 7 16QAM Bandwidth = 20MHz  
CH21350 Occupied Bandwidth



### 4.4 Band Edge Compliance

#### Ambient condition

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

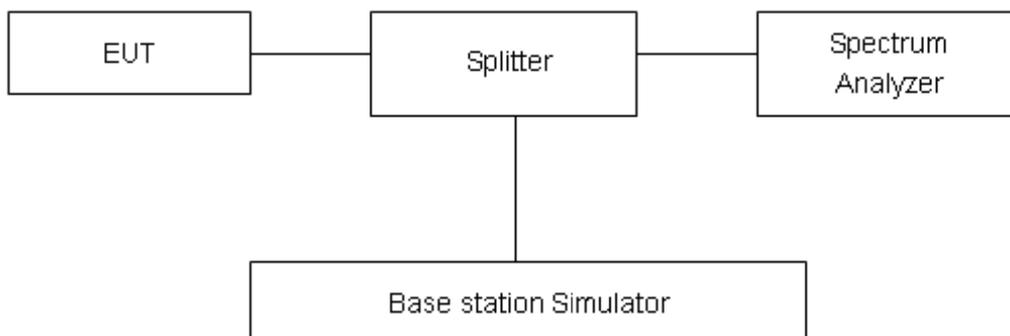
#### Method of Measurement

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. For LTE Band 41 Set RBW  $\geq$  1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.  
 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 (1.4MHz).  
 RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 4 (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)-  $[43 + 10 \log (P)]$  (dB)  
=  $[30 + 10 \log (P)]$  (dBm) -  $[43 + 10 \log (P)]$  (dB) = -13dBm.

## Measurement Uncertainty

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



### Test Result

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

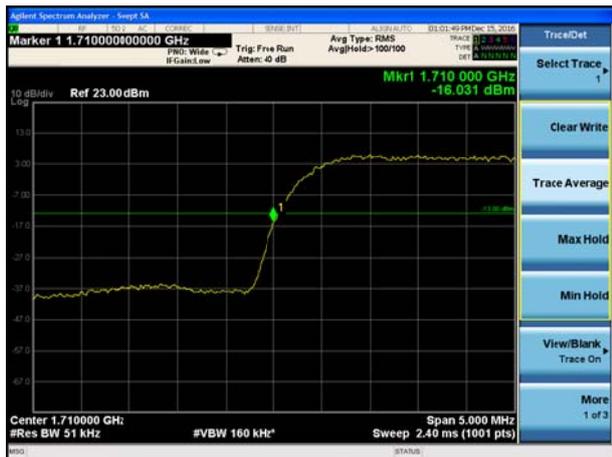
#### WCDMA Band IV CH1312



#### WCDMA Band IV CH1513



#### WCDMA Band IV (HSUPA) CH1312



#### WCDMA Band IV (HSUPA) CH1513



#### WCDMA Band IV (HSDPA) CH1312

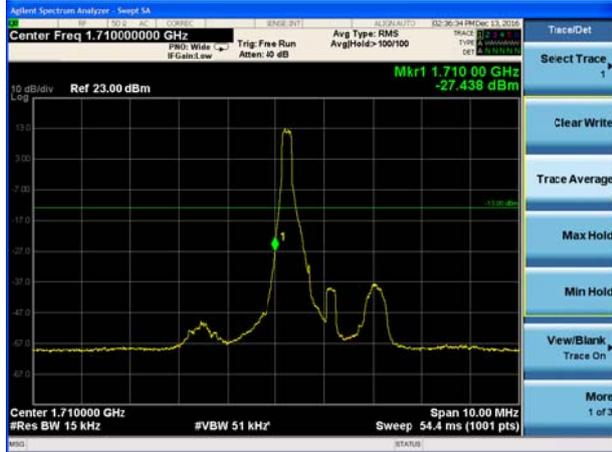


#### WCDMA Band IV (HSDPA) CH1513

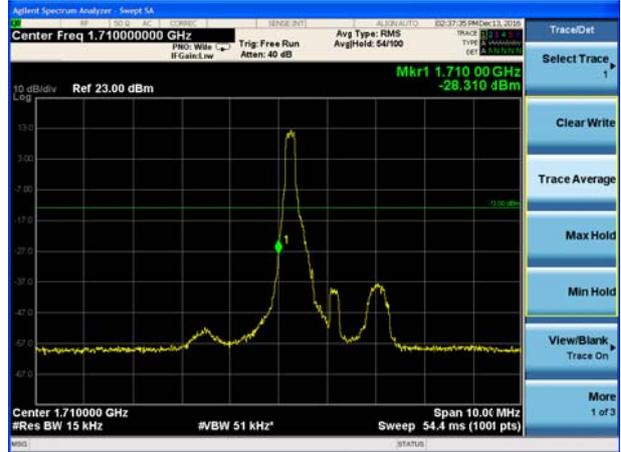




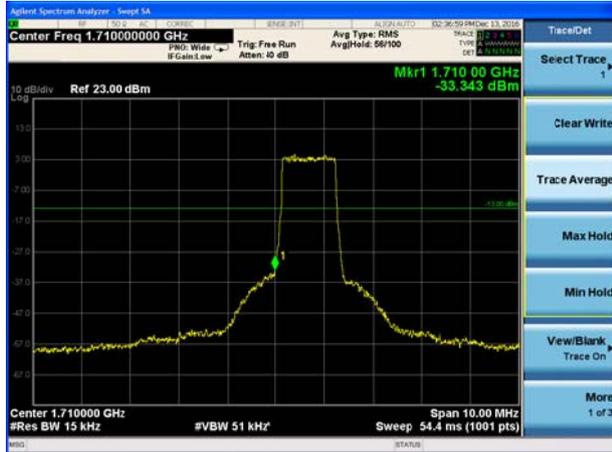
LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH19957, RB 1



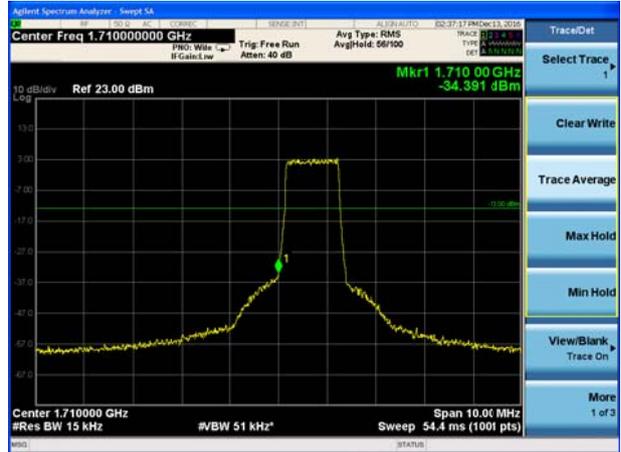
LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH19957, RB 6



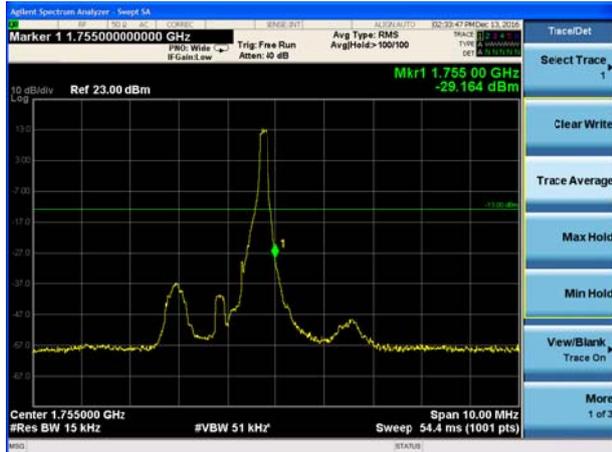
LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH19957, RB 1



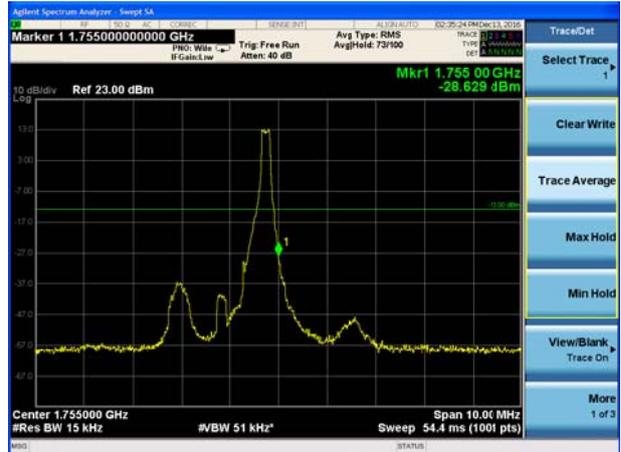
LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH19957, RB 6



LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH20393, RB 1

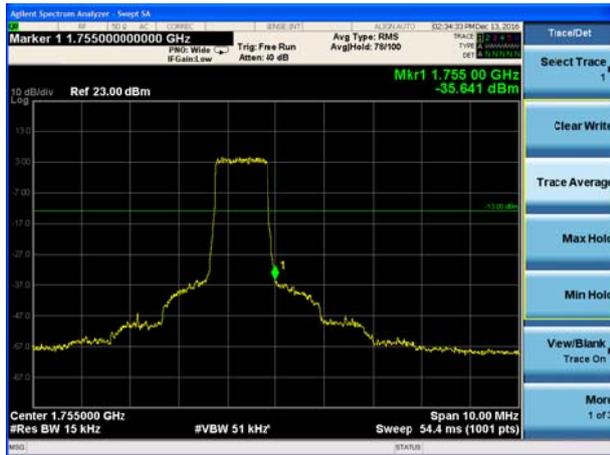


LTE Band 4 QPSK Bandwidth = 1.4MHz  
CH20393, RB 6

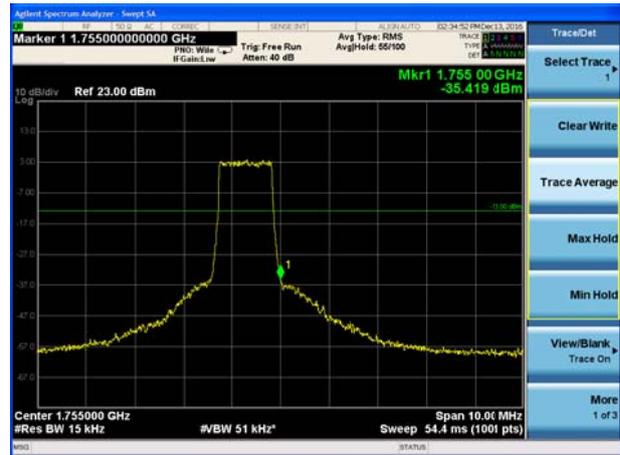




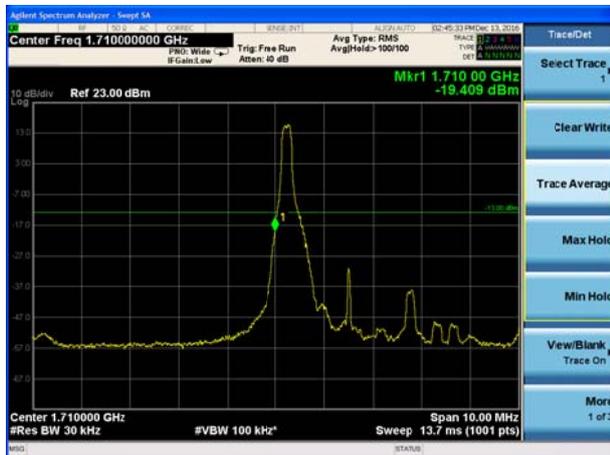
LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH20393, RB 1



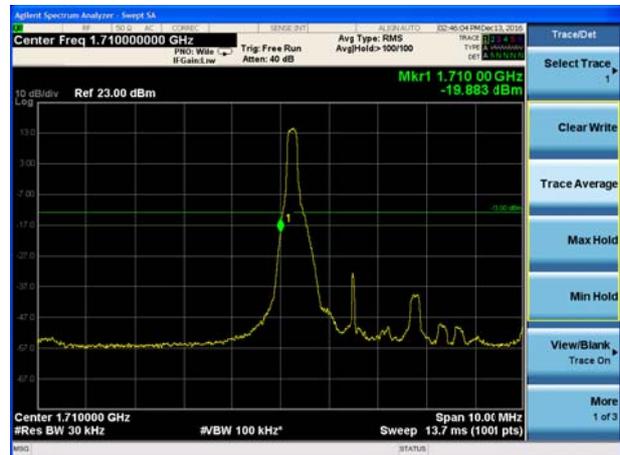
LTE Band 4 16QAM Bandwidth = 1.4MHz  
CH20393, RB 6



LTE Band 4 QPSK Bandwidth = 3MHz CH19965,  
RB 1



LTE Band 4 QPSK Bandwidth = 3MHz CH19965,  
RB 15



LTE Band 4 16QAM Bandwidth = 3MHz  
CH19965, RB 1

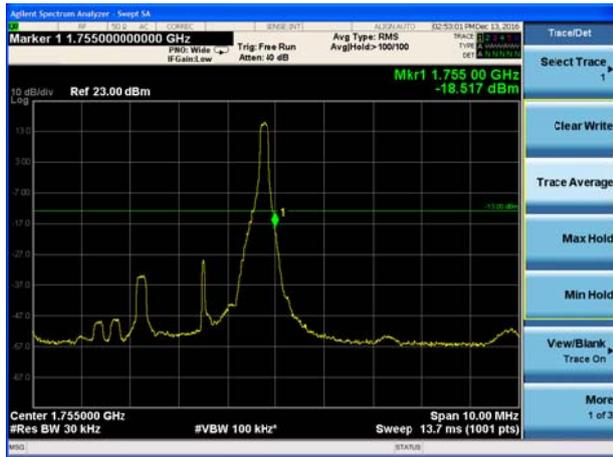


LTE Band 4 16QAM Bandwidth = 3MHz  
CH19965, RB 15

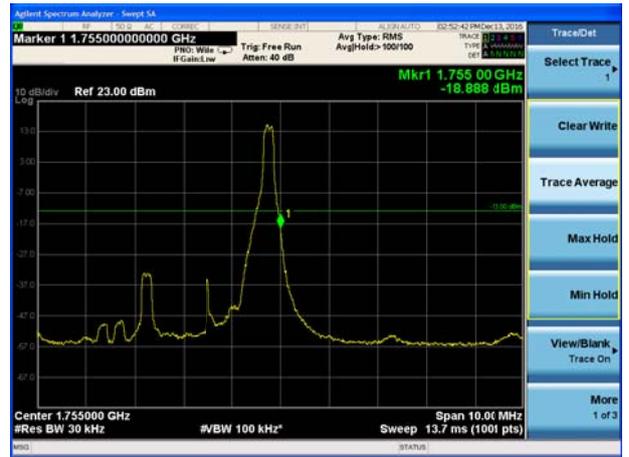




LTE Band 4 QPSK Bandwidth = 3MHz CH20385, RB 1



LTE Band 4 QPSK Bandwidth = 3MHz CH20385, RB 15



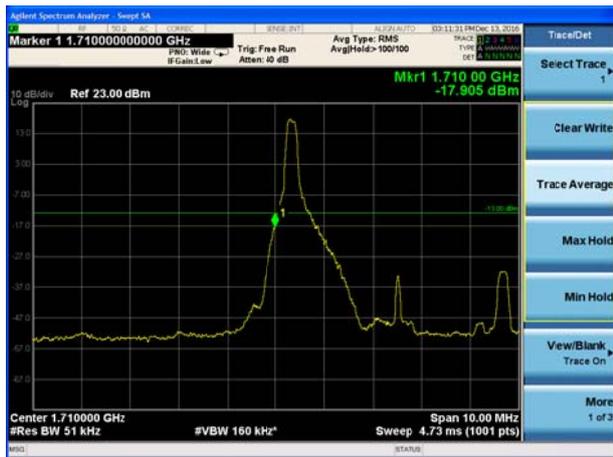
LTE Band 4 16QAM Bandwidth = 3MHz CH20385, RB 1



LTE Band 4 16QAM Bandwidth = 3MHz CH20385, RB 15



LTE Band 4 QPSK Bandwidth = 5MHz CH19975, RB 1



LTE Band 4 QPSK Bandwidth = 5MHz CH19975, RB 25





LTE Band 4 16QAM Bandwidth = 5MHz  
CH19975, RB 1



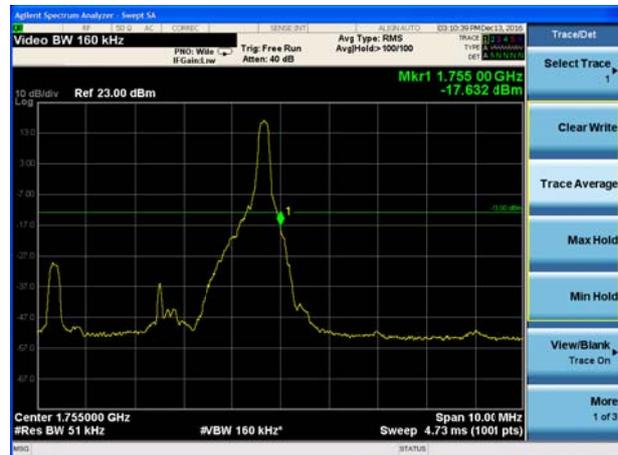
LTE Band 4 16QAM Bandwidth = 5MHz  
CH19975, RB 25



LTE Band 4 QPSK Bandwidth = 5MHz CH20375,  
RB 1



LTE Band 4 QPSK Bandwidth = 5MHz CH20375,  
RB 25



LTE Band 4 16QAM Bandwidth = 5MHz  
CH20375, RB 1



LTE Band 4 16QAM Bandwidth = 5MHz  
CH20375, RB 25

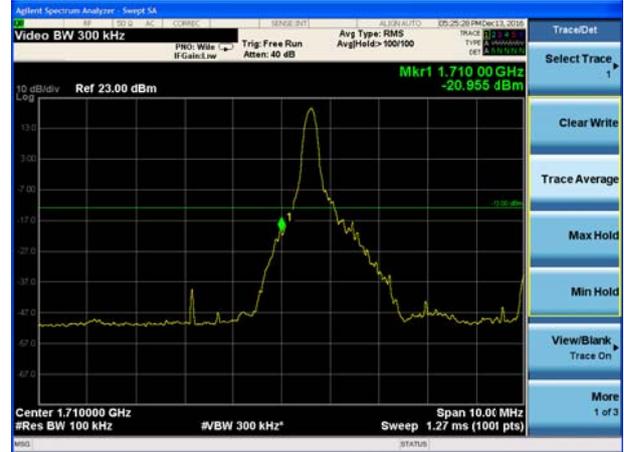




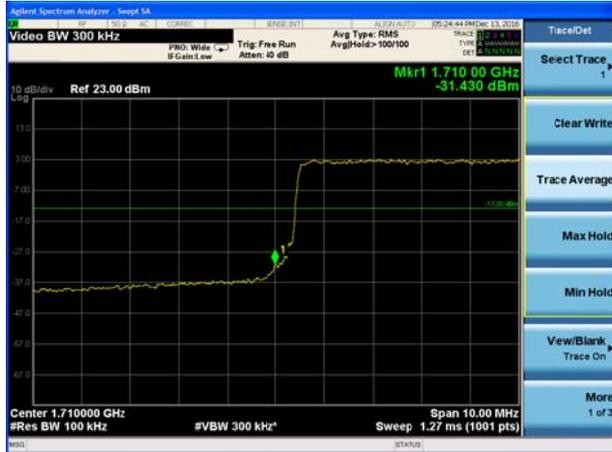
LTE Band 4 QPSK Bandwidth = 10MHz  
CH20000, RB 1



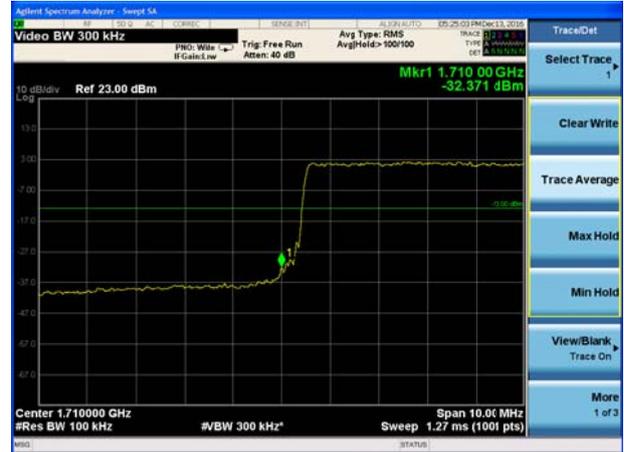
LTE Band 4 QPSK Bandwidth = 10MHz  
CH20000, RB 50



LTE Band 4 16QAM Bandwidth = 10MHz  
CH20000, RB 1



LTE Band 4 16QAM Bandwidth = 10MHz  
CH20000, RB 50



LTE Band 4 QPSK Bandwidth = 10MHz  
CH20350, RB 1



LTE Band 4 QPSK Bandwidth = 10MHz  
CH20350, RB 50

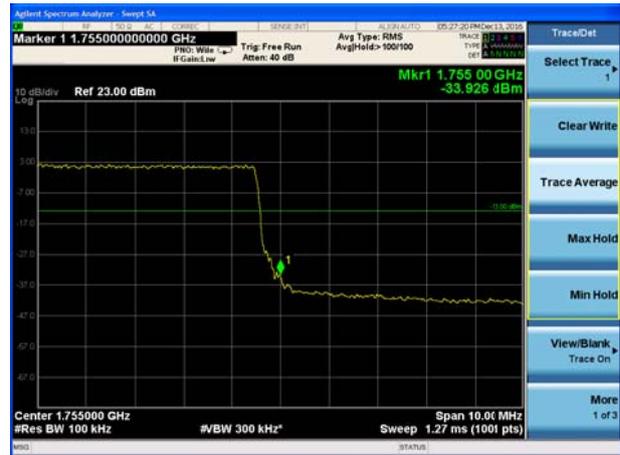




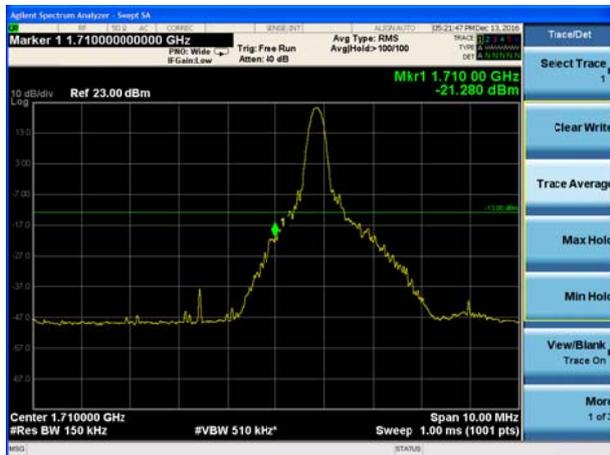
LTE Band 4 16QAM Bandwidth = 10MHz  
CH20350, RB 1



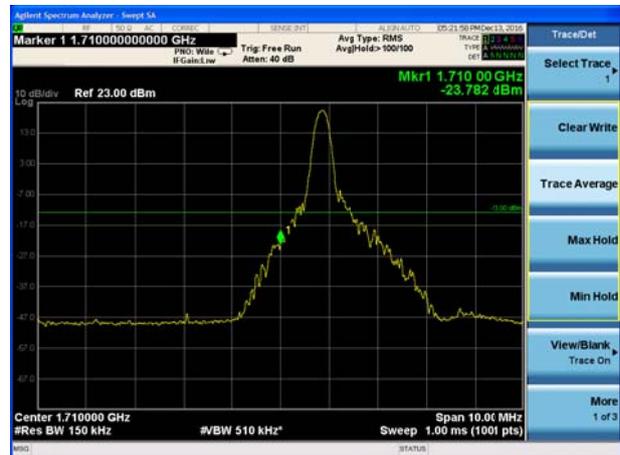
LTE Band 4 16QAM Bandwidth = 10MHz  
CH20350, RB 50



LTE Band 4 QPSK Bandwidth = 15MHz  
CH20025, RB 1



LTE Band 4 QPSK Bandwidth = 15MHz  
CH20025, RB 75



LTE Band 4 16QAM Bandwidth = 15MHz  
CH20025, RB 1

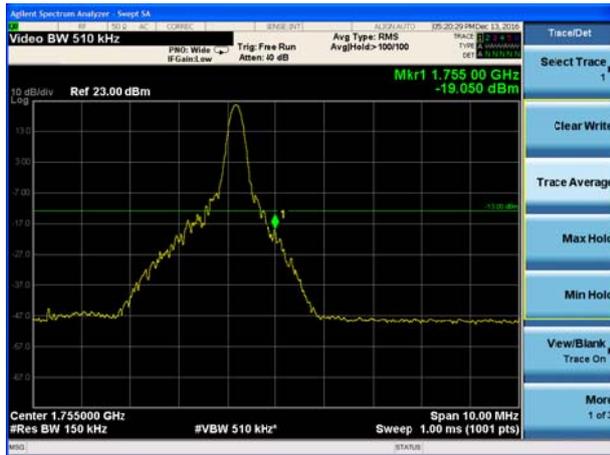


LTE Band 4 16QAM Bandwidth = 15MHz  
CH20025, RB 75





LTE Band 4 QPSK Bandwidth = 15MHz  
CH20325, RB 1



LTE Band 4 QPSK Bandwidth = 15MHz  
CH20325, RB 75



LTE Band 4 16QAM Bandwidth = 15MHz  
CH20325, RB 1



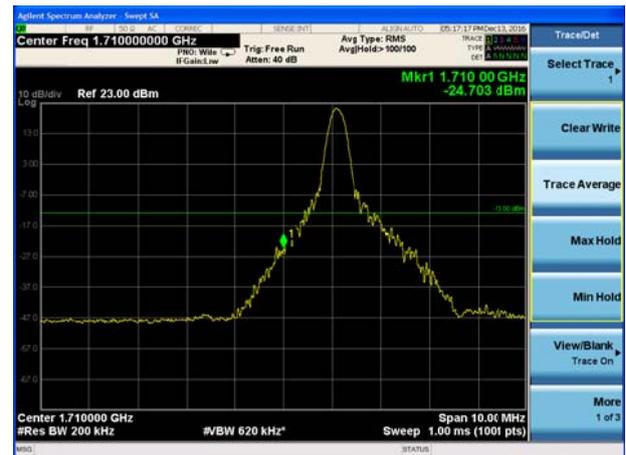
LTE Band 4 16QAM Bandwidth = 15MHz  
CH20325, RB 75



LTE Band 4 QPSK Bandwidth = 20MHz  
CH20050, RB 1



LTE Band 4 QPSK Bandwidth = 20MHz  
CH20050, RB 100

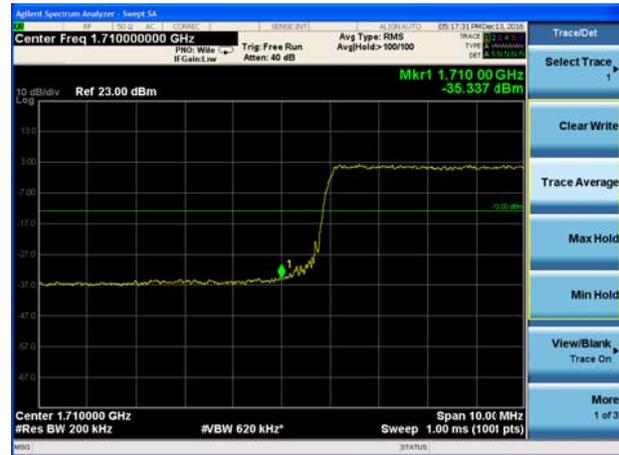




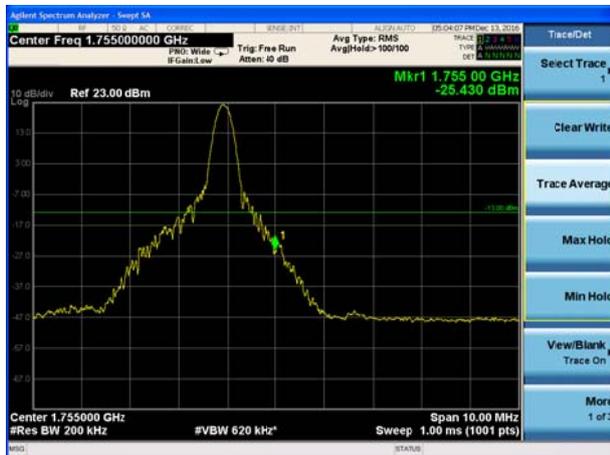
LTE Band 4 16QAM Bandwidth = 20MHz  
CH20050, RB 1



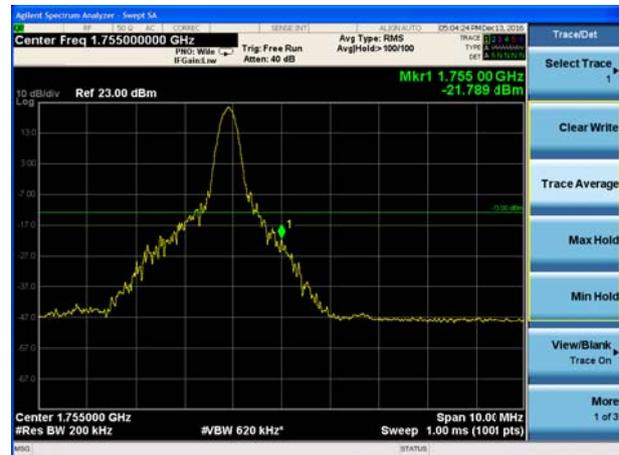
LTE Band 4 16QAM Bandwidth = 20MHz  
CH20050, RB 100



LTE Band 4 QPSK Bandwidth = 20MHz  
CH20300, RB 1



LTE Band 4 QPSK Bandwidth = 20MHz  
CH20300, RB 100



LTE Band 4 16QAM Bandwidth = 20MHz  
CH20300, RB 1

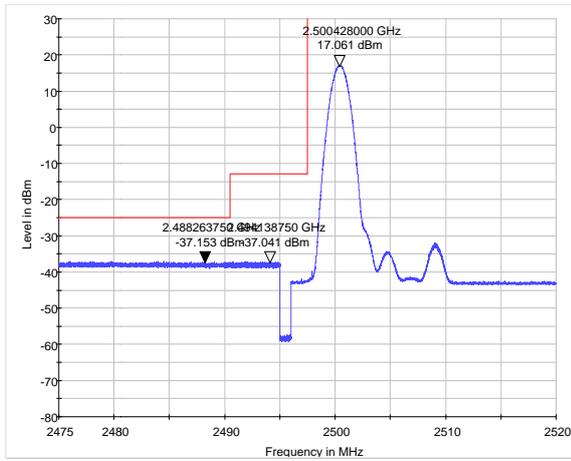


LTE Band 4 16QAM Bandwidth = 20MHz  
CH20300, RB 100

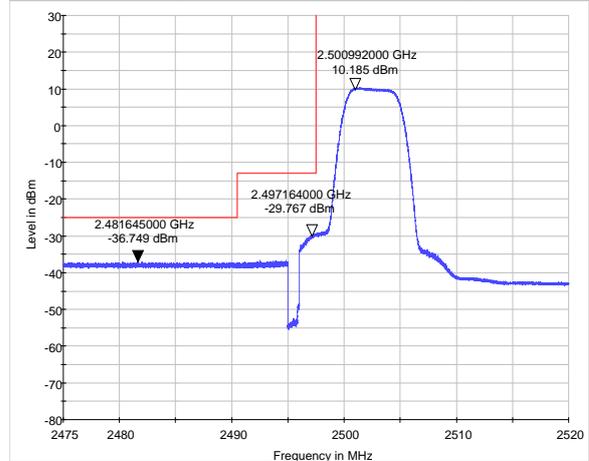




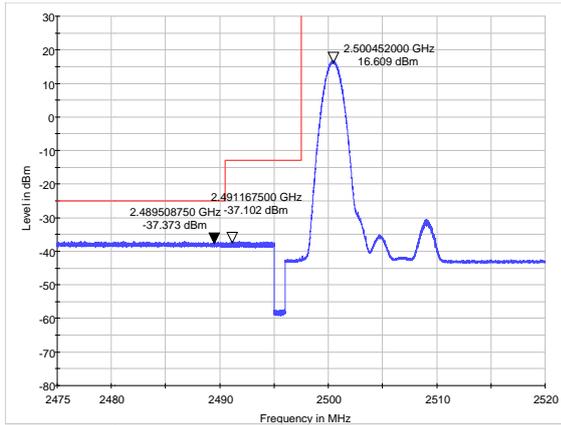
LTE Band 7 QPSK Bandwidth = 5MHz CH20775, RB 1



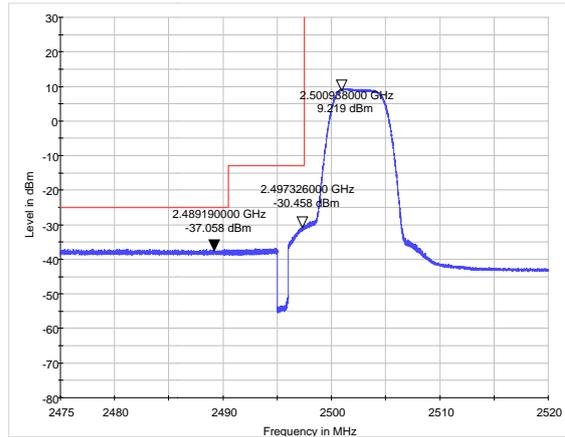
LTE Band 7 QPSK Bandwidth = 5MHz CH20775, RB 25



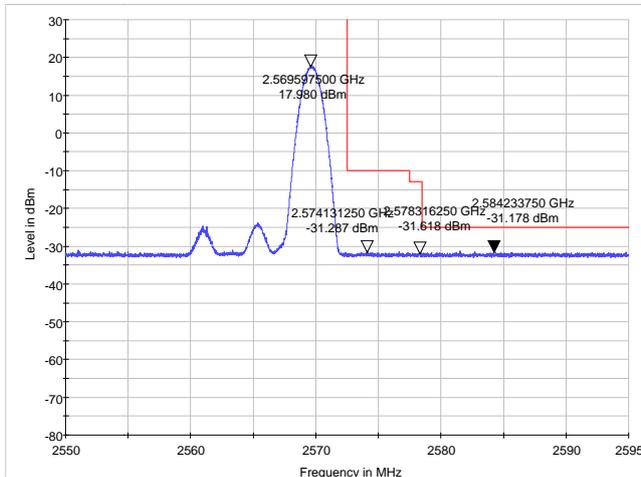
LTE Band 7 16QAM Bandwidth = 5MHz CH20775, RB 1



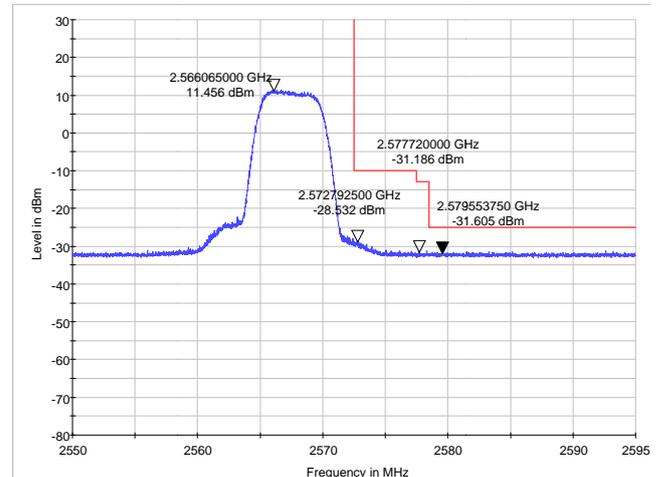
LTE Band 7 16QAM Bandwidth = 5MHz CH20775, RB 25



LTE Band 7 QPSK Bandwidth = 5MHz CH21425, RB 1

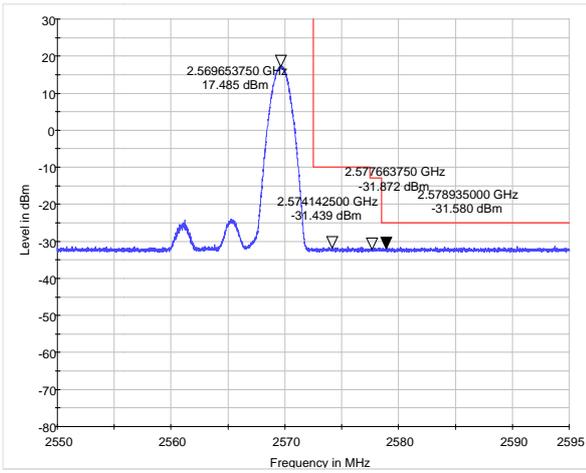


LTE Band 7 QPSK Bandwidth = 5MHz CH21425, RB 25

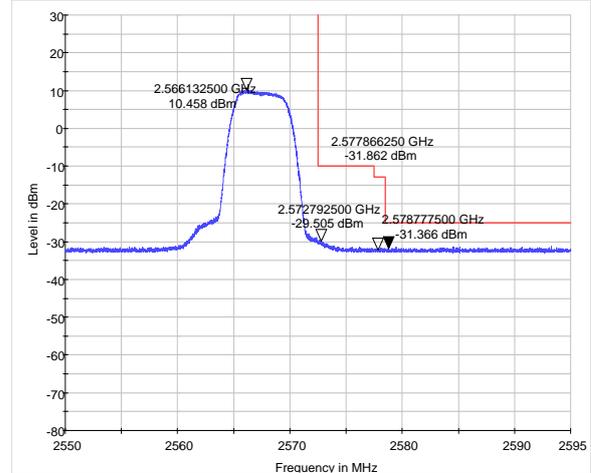




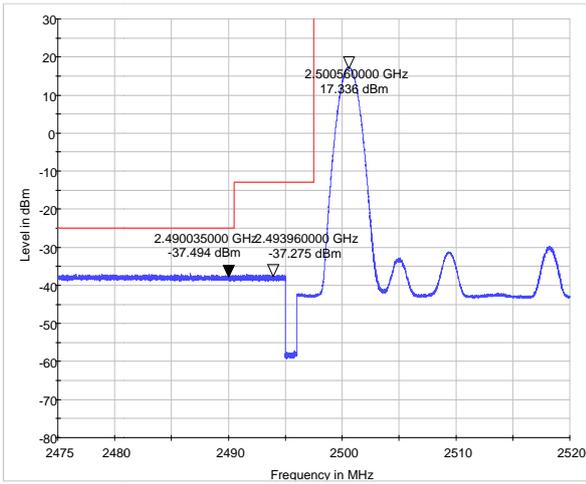
LTE Band 7 16QAM Bandwidth = 5MHz CH21425, RB 1



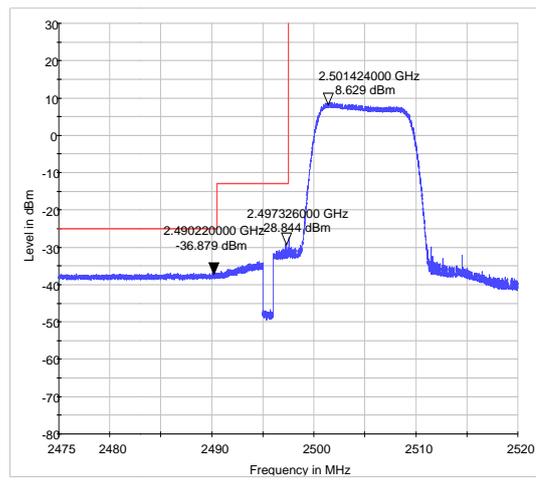
LTE Band 7 16QAM Bandwidth = 5MHz CH21425, RB 25



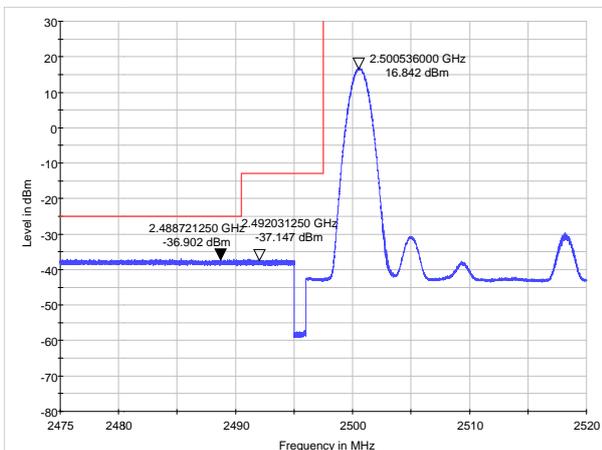
LTE Band 7 QPSK Bandwidth = 10MHz CH20800, RB 1



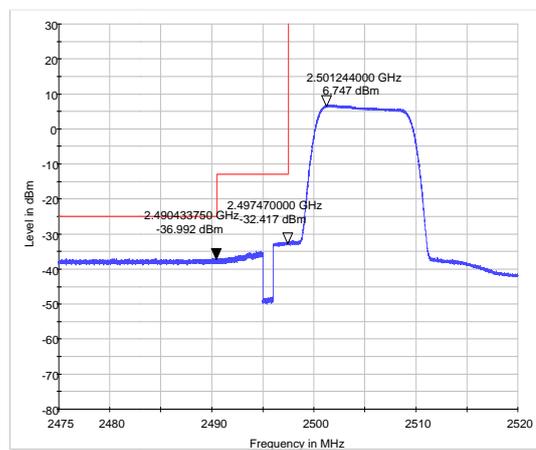
LTE Band 7 QPSK Bandwidth = 10MHz CH20800, RB 50



LTE Band 7 16QAM Bandwidth = 10MHz CH20800, RB 1

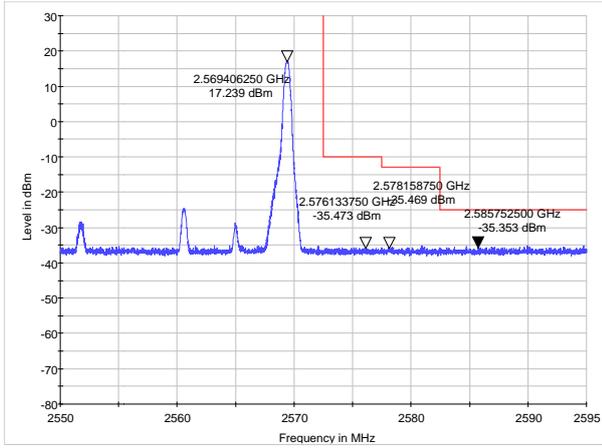


LTE Band 7 16QAM Bandwidth = 10MHz CH20800, RB 50

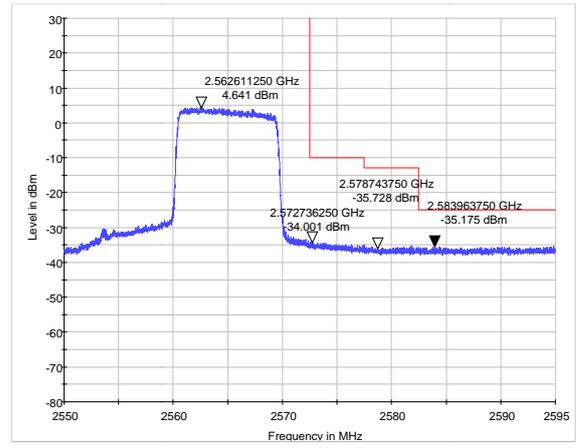




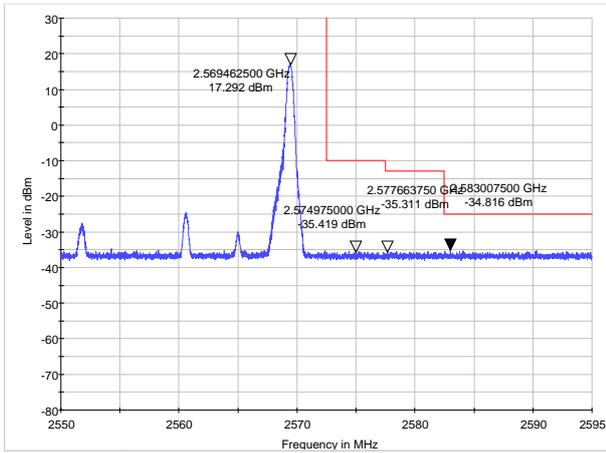
LTE Band 7 QPSK Bandwidth = 10MHz CH21400, RB 1



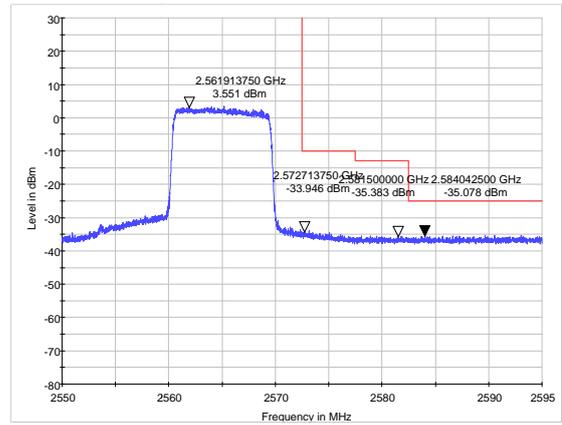
LTE Band 7 QPSK Bandwidth = 10MHz CH21400, RB 50



LTE Band 7 16QAM Bandwidth = 10MHz CH21400, RB 1



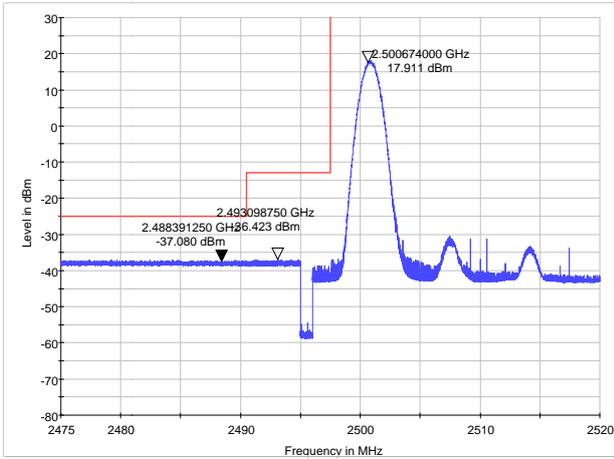
LTE Band 7 16QAM Bandwidth = 10MHz CH21400, RB 50





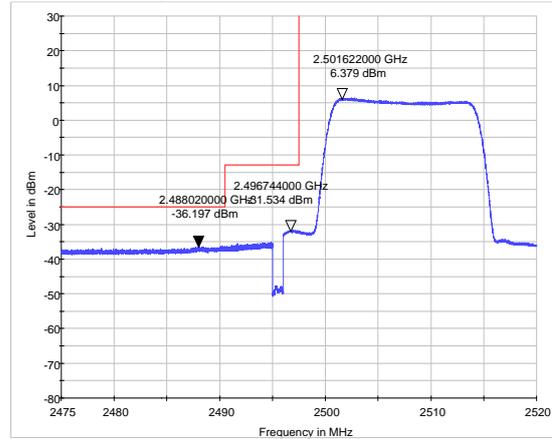
LTE Band 7 QPSK Bandwidth = 15MHz CH20825, RB

1



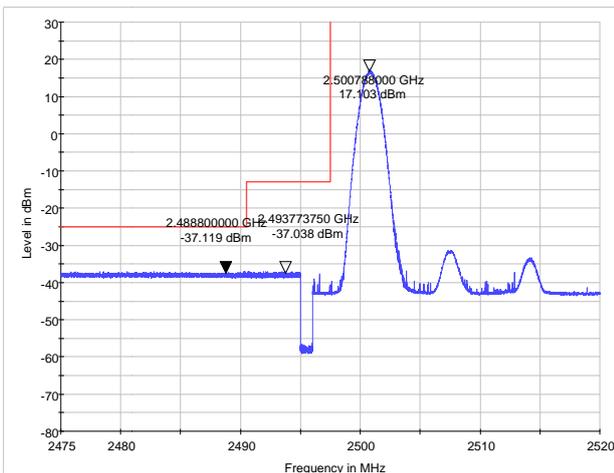
LTE Band 7 QPSK Bandwidth = 15MHz CH20825, RB

75



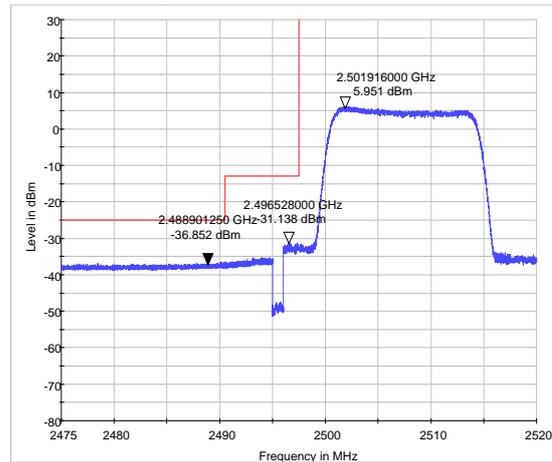
LTE Band 7 16QAM Bandwidth = 15MHz CH20825, RB

1



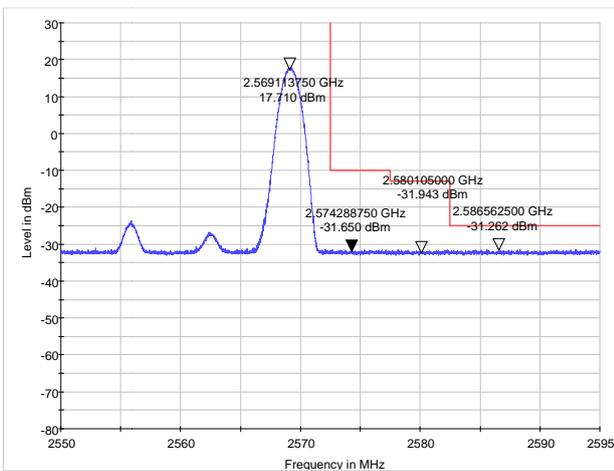
LTE Band 7 16QAM Bandwidth = 15MHz CH20825, RB

75



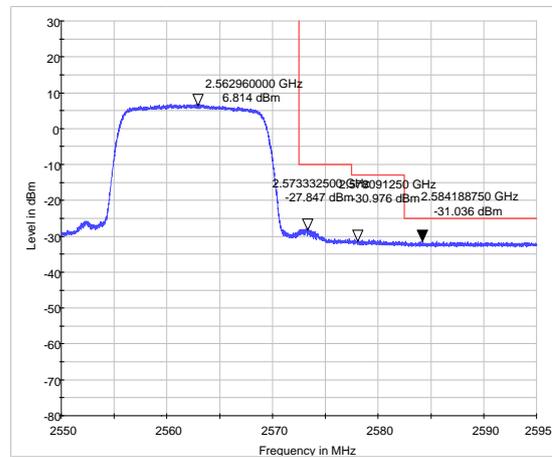
LTE Band 7 QPSK Bandwidth = 15MHz CH21375, RB

1



LTE Band 7 QPSK Bandwidth = 15MHz CH21375, RB

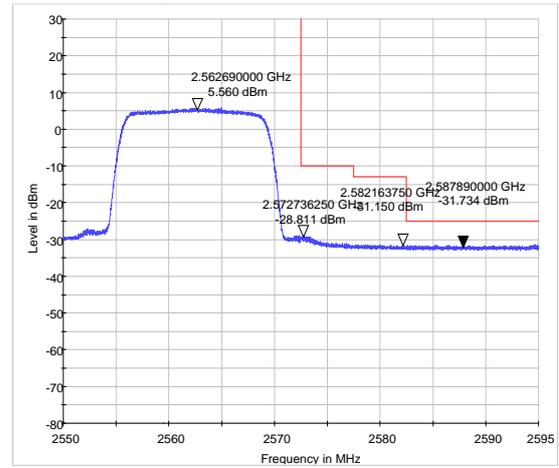
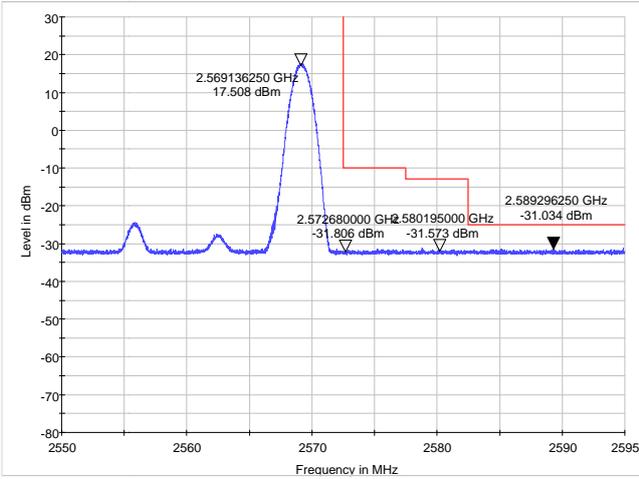
75





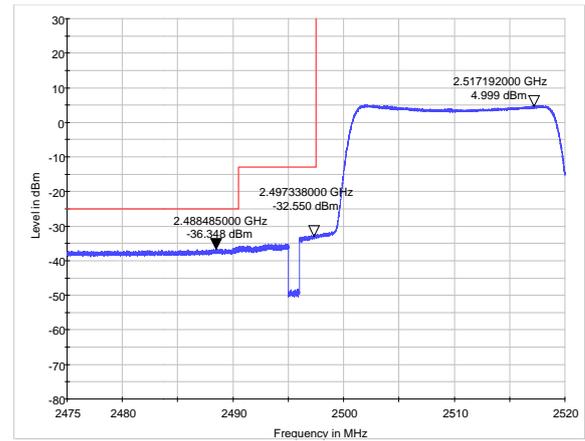
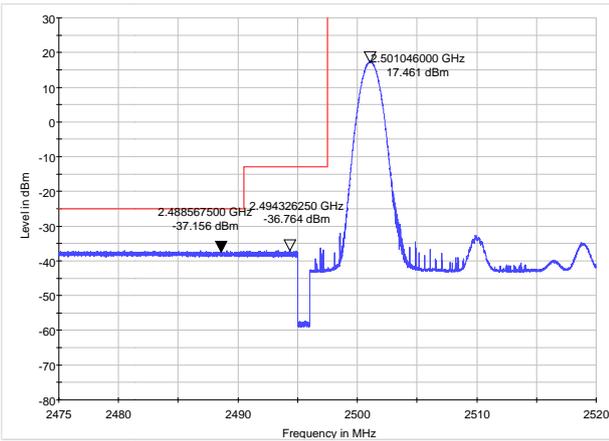
LTE Band 7 16QAM Bandwidth = 15MHz CH21375, RB 1

LTE Band 7 16QAM Bandwidth = 15MHz CH21375, RB 75



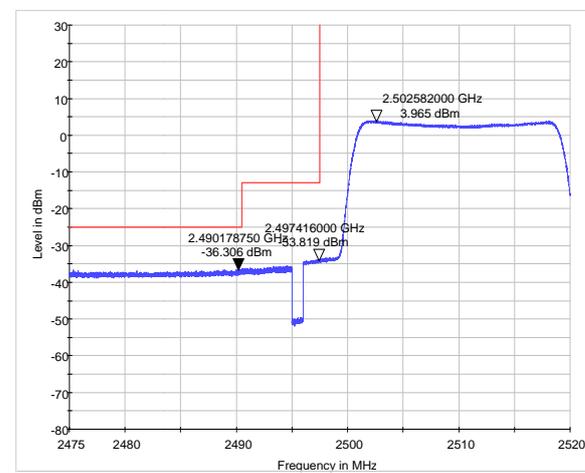
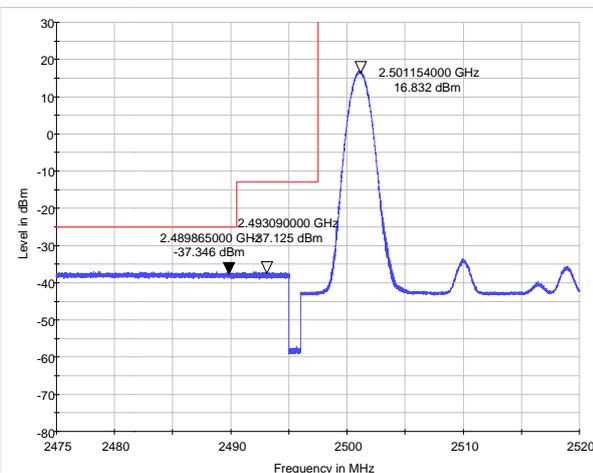
LTE Band 7 QPSK Bandwidth = 20MHz CH20850, RB 1

LTE Band 7 QPSK Bandwidth = 20MHz CH20850, RB 100



LTE Band 7 16QAM Bandwidth = 20MHz CH20850, RB 1

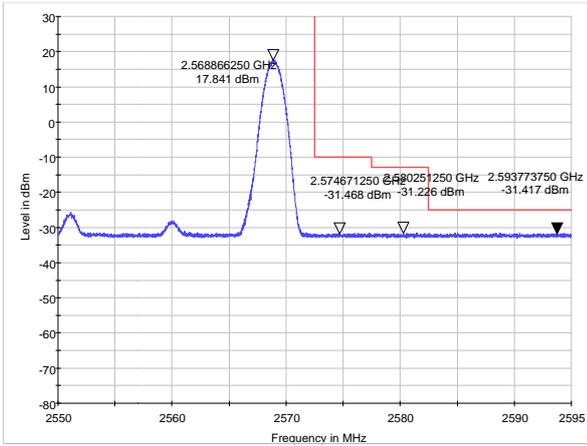
LTE Band 7 16QAM Bandwidth = 20MHz CH20850, RB 100





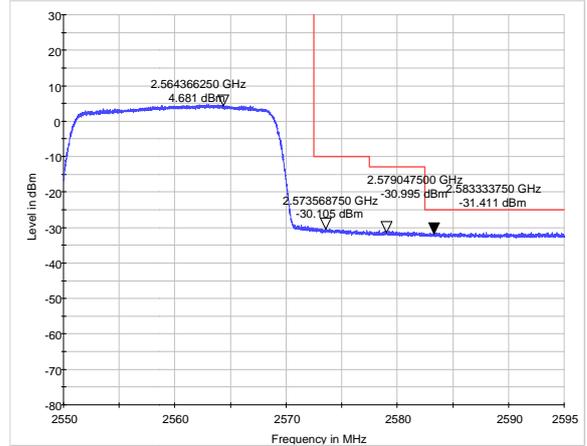
LTE Band 7 QPSK Bandwidth = 20MHz CH21350, RB

1



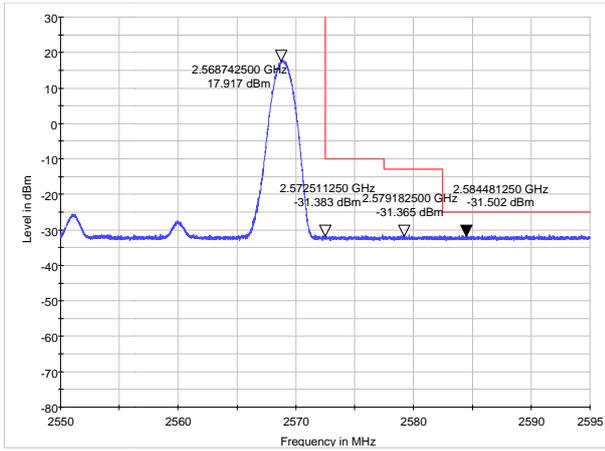
LTE Band 7 QPSK Bandwidth = 20MHz CH21350,

RB 100



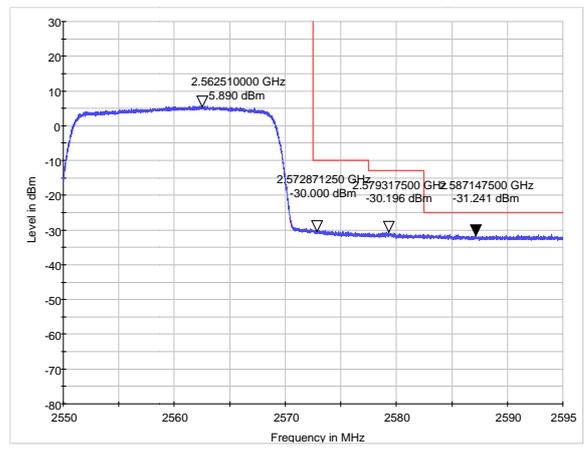
LTE Band 7 16QAM Bandwidth = 20MHz CH21350,

RB 1



LTE Band 7 16QAM Bandwidth = 20MHz

CH21350, RB 100



### 4.5 Peak-to-Average Power Ratio (PAPR)

#### Ambient condition

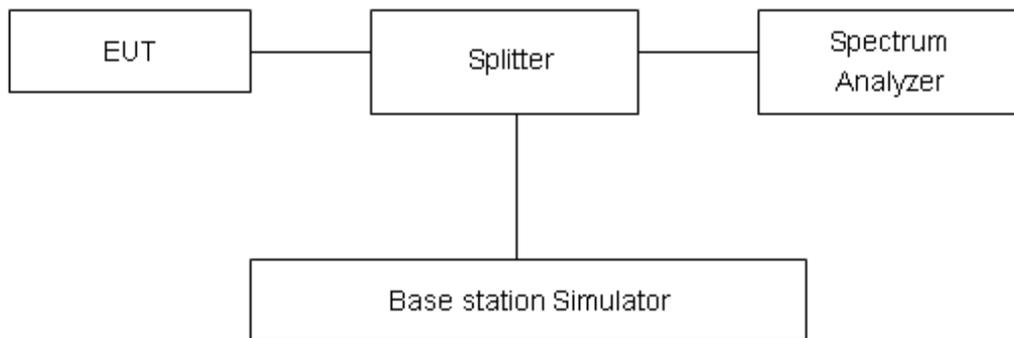
Temperature	Relative humidity
21°C ~25°C	40%~60%

#### 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:

$$PAPR (dB) = PPk (dBm) - PAvg (dBm).$$

#### Test Setup



#### Limits

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.in Part27.50(d).

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for thenormal 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)	Conclusion
RMC	1312	1712.4	26.08	23.31	2.77	PASS
	1413	1732.6	26.21	23.28	2.93	PASS
	1513	1752.6	26.08	23.17	2.91	PASS
HSUPA	1312	1712.4	26.08	23.30	2.78	PASS
	1413	1732.6	26.21	23.29	2.92	PASS
	1513	1752.6	26.08	23.16	2.92	PASS
HSDPA	1312	1712.4	26.17	23.39	2.78	PASS
	1413	1732.6	26.30	23.37	2.93	PASS
	1513	1752.6	26.16	23.24	2.92	PASS

LTE Band 4							
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Conclusion
QPSK	1.4	19957	1710.7	26.83	21.46	5.37	PASS
		20175	1732.5	27.08	21.49	5.59	PASS
		20393	1754.3	26.99	21.41	5.58	PASS
	3	19965	1711.5	26.06	20.54	5.52	PASS
		20175	1732.5	26.39	20.64	5.75	PASS
		20385	1753.5	26.54	20.54	6.00	PASS
	5	19975	1712.5	26.39	20.52	5.87	PASS
		20175	1732.5	26.38	20.63	5.75	PASS
		20375	1752.5	26.19	20.52	5.67	PASS
	10	20000	1715	26.23	20.60	5.63	PASS
		20175	1732.5	26.41	20.65	5.76	PASS
		20350	1750	26.15	20.56	5.59	PASS
	15	20025	1717.5	26.89	20.58	6.31	PASS
		20175	1732.5	26.60	20.61	5.99	PASS
		20325	1747.5	26.37	20.51	5.86	PASS
20	20050	1720	26.26	20.55	5.71	PASS	
	20175	1732.5	28.02	20.56	7.46	PASS	
	20300	1745	28.18	20.47	7.71	PASS	
16QAM	1.4	19957	1710.7	26.15	20.31	5.84	PASS
		20175	1732.5	26.57	20.37	6.20	PASS
		20393	1754.3	26.53	20.28	6.25	PASS
	3	19965	1711.5	26.60	20.34	6.26	PASS



		20175	1732.5	26.84	20.41	6.43	PASS
		20385	1753.5	26.69	20.31	6.38	PASS
	5	19975	1712.5	26.58	20.32	6.26	PASS
		20175	1732.5	26.64	20.37	6.27	PASS
		20375	1752.5	26.51	20.26	6.25	PASS
	10	20000	1715	26.70	20.35	6.35	PASS
		20175	1732.5	26.76	20.42	6.34	PASS
		20350	1750	26.59	20.30	6.29	PASS
	15	20025	1717.5	26.88	20.32	6.56	PASS
		20175	1732.5	26.80	20.37	6.43	PASS
		20325	1747.5	26.60	20.26	6.34	PASS
	20	20050	1720	26.96	20.30	6.66	PASS
		20175	1732.5	26.36	20.33	6.03	PASS
		20300	1745	26.60	20.23	6.37	PASS



LTE Band 7							
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Conclusion
QPSK	5	20775	2502.5	24.89	19.49	5.40	PASS
		21100	2535	24.90	19.62	5.28	PASS
		21425	2567.5	25.19	19.69	5.50	PASS
	10	20800	2505	24.97	19.57	5.40	PASS
		21100	2535	25.38	19.64	5.74	PASS
		21400	2565	25.11	19.73	5.38	PASS
	15	20825	2507.5	25.21	19.55	5.66	PASS
		21100	2535	24.99	19.60	5.39	PASS
		21375	2562.5	25.61	19.68	5.93	PASS
	20	20850	2510	25.05	19.52	5.53	PASS
		21100	2535	24.84	19.55	5.29	PASS
		21350	2560	25.32	19.64	5.68	PASS
16QAM	5	20775	2502.5	25.39	19.35	6.04	PASS
		21100	2535	25.32	19.40	5.92	PASS
		21425	2567.5	25.62	19.49	6.13	PASS
	10	20800	2505	25.52	19.38	6.14	PASS
		21100	2535	25.39	19.45	5.94	PASS
		21400	2565	26.74	19.53	7.21	PASS
	15	20825	2507.5	25.43	19.35	6.08	PASS
		21100	2535	25.33	19.40	5.93	PASS
		21375	2562.5	25.60	19.49	6.11	PASS
	20	20850	2510	25.59	19.33	6.26	PASS
		21100	2535	25.36	19.36	6.00	PASS
		21350	2560	25.63	19.46	6.17	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 +55°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 +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

#### 2. Frequency Stability (Voltage Variation)

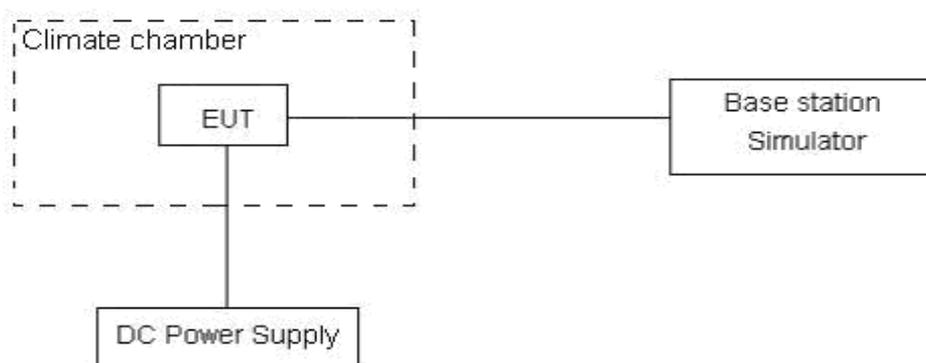
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 4.20 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)	Conclusion
55°C/3.7 V	-0.000278	PASS
50°C/3.7 V	-0.001252	PASS
40°C/3.7 V	0.000084	PASS
30°C/3.7 V	0.000184	PASS
20°C/3.7 V	-0.001125	PASS
10°C/3.7 V	0.000045	PASS
0°C/3.7 V	0.000345	PASS
-10°C/3.7 V	-0.000165	PASS
-20°C/3.7 V	0.000113	PASS
-30°C/3.7 V	0.000042	PASS
20°C/4.20V	-0.000014	PASS
20°C/3.5V	0.000089	PASS

Bandwidth	Test status	LTE Band 4 Channel 20175 Test Results (ppm)		
		QPSK	16QAM	Conclusion
1.4MHz	50°C/3.7 V	0.00033	0.00236	PASS
	40°C/3.7 V	0.00343	0.00110	PASS
	30°C/3.7 V	-0.00184	-0.00277	PASS
	20°C/3.7 V	0.00221	0.00007	PASS
	10°C/3.7 V	0.00290	0.00066	PASS
	0°C/3.7 V	0.00859	-0.00142	PASS
	-10°C/3.7 V	0.00370	0.00400	PASS
	-20°C/3.7 V	-0.00115	0.00453	PASS
	-30°C/3.7 V	0.00645	0.02352	PASS
	20°C/4.20V	0.00314	0.02815	PASS
20°C/3.5V	-0.00236	0.02827	PASS	
3MHz	50°C/3.7 V	-0.00433	0.00340	PASS
	40°C/3.7 V	-0.00301	0.00087	PASS
	30°C/3.7 V	0.00176	0.00028	PASS
	20°C/3.7 V	-0.00180	0.00198	PASS
	10°C/3.7 V	-0.00702	-0.00030	PASS
	0°C/3.7 V	-0.00232	-0.00018	PASS
	-10°C/3.7 V	0.00212	0.00477	PASS
	-20°C/3.7 V	-0.00211	0.00402	PASS



	-30°C/3.7 V	0.00147	0.00300	PASS
	20°C/4.20V	0.00115	0.00323	PASS
	20°C/3.5V	0.00156	0.00392	PASS
5MHz	50°C/3.7 V	0.00066	-0.00310	PASS
	40°C/3.7 V	0.00689	-0.00721	PASS
	30°C/3.7 V	-0.00043	-0.00488	PASS
	20°C/3.7 V	-0.00040	-0.00583	PASS
	10°C/3.7 V	-0.00129	-0.00577	PASS
	0°C/3.7 V	0.00272	-0.00208	PASS
	-10°C/3.7 V	0.00205	-0.00294	PASS
	-20°C/3.7 V	0.00141	-0.00344	PASS
	-30°C/3.7 V	0.00210	-0.00180	PASS
	20°C/4.20V	-0.00056	0.00472	PASS
	20°C/3.5V	-0.00247	0.00050	PASS
	10MHz	50°C/3.7 V	-0.00205	0.00451
40°C/3.7 V		0.00027	0.00474	PASS
30°C/3.7 V		-0.00112	0.00320	PASS
20°C/3.7 V		-0.00120	0.00173	PASS
10°C/3.7 V		-0.00329	0.00241	PASS
0°C/3.7 V		-0.00279	0.00248	PASS
-10°C/3.7 V		-0.00101	0.00875	PASS
-20°C/3.7 V		0.00127	-0.00152	PASS
-30°C/3.7 V		-0.00074	0.00480	PASS
20°C/4.20V		-0.00229	0.00439	PASS
20°C/3.5V		-0.00253	0.00331	PASS
15MHz		50°C/3.7 V	0.00766	0.00289
	40°C/3.7 V	0.00363	0.00661	PASS
	30°C/3.7 V	0.00075	0.00712	PASS
	20°C/3.7 V	0.00133	0.00673	PASS
	10°C/3.7 V	0.00116	0.00263	PASS
	0°C/3.7 V	-0.00176	-0.00116	PASS
	-10°C/3.7 V	0.00291	0.00178	PASS
	-20°C/3.7 V	0.00218	0.00062	PASS
	-30°C/3.7 V	-0.00105	-0.00362	PASS
	20°C/4.20V	0.00109	0.00182	PASS
	20°C/3.5V	0.00135	-0.00026	PASS
	20MHz	50°C/3.7 V	-0.00184	-0.00122
40°C/3.7 V		0.00306	0.00187	PASS
30°C/3.7 V		0.00229	0.00065	PASS
20°C/3.7 V		-0.00110	-0.00380	PASS



	10°C/3.7 V	0.00115	0.00191	PASS
	0°C/3.7 V	0.00142	-0.00027	PASS
	-10°C/3.7 V	0.00382	0.00694	PASS
	-20°C/3.7 V	0.00078	0.00748	PASS
	-30°C/3.7 V	0.00139	0.00706	PASS
	20°C/4.20V	0.00121	0.00276	PASS
	20°C/3.5V	0.00805	0.00303	PASS

Bandwidth	Test status	LTE Band 7 Channel 21100 Test Results (ppm)		
		QPSK	16QAM	Conclusion
5MHz	50°C/3.7 V	0.00136	0.00239	PASS
	40°C/3.7 V	-0.00250	0.00033	PASS
	30°C/3.7 V	-0.00349	0.00041	PASS
	20°C/3.7 V	-0.00189	0.00226	PASS
	10°C/3.7 V	-0.00398	0.00084	PASS
	0°C/3.7 V	0.00011	0.00283	PASS
	-10°C/3.7 V	-0.00298	-0.00025	PASS
	-20°C/3.7 V	-0.00374	0.00096	PASS
	-30°C/3.7 V	-0.00209	0.00210	PASS
	20°C/4.20V	-0.00426	0.00105	PASS
	20°C/3.5V	-0.00230	0.00202	PASS
10MHz	50°C/3.7 V	-0.00159	0.00240	PASS
	40°C/3.7 V	-0.00246	0.00037	PASS
	30°C/3.7 V	-0.00543	0.00142	PASS
	20°C/3.7 V	-0.00289	0.00085	PASS
	10°C/3.7 V	-0.00353	0.00022	PASS
	0°C/3.7 V	-0.00112	-0.00009	PASS
	-10°C/3.7 V	-0.00176	-0.00039	PASS
	-20°C/3.7 V	-0.00133	0.00733	PASS
	-30°C/3.7 V	-0.00083	0.00765	PASS
	20°C/4.20V	-0.00111	0.00812	PASS
	20°C/3.5V	0.00905	0.00768	PASS
15MHz	50°C/3.7 V	0.01023	0.00829	PASS
	40°C/3.7 V	0.01043	0.00624	PASS
	30°C/3.7 V	0.01293	0.00914	PASS
	20°C/3.7 V	0.01009	0.00873	PASS
	10°C/3.7 V	0.00939	-0.00264	PASS