TEST REPORT

Dt&C

DT&C Co., Ltd.

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2008-0234(1)

2. Customer

- Name (FCC) : Point Mobile Co., LTD. / Name (IC) : POINTMOBILE CO.,LTD
- Address (FCC) : B-9F, Kabul Great Valley 32 Digital-ro 9-gil, Geumcheon-gu Seoul South Korea 153-709
  Address (IC) : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu Seoul Korea (Republic Of)

3. Use of Report : FCC & IC Original Grant

4. Product Name / Model Name : Mobile Computer / PM451
   FCC ID : V2X-PM451 / IC : 10664A-PM451

5. Test Method Used : KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015
   Test Specification : §2, §22, §24, §27
   RSS-130 Issue 2, 132 Issue 3, 133 Issue 6, 139 Issue 3, 199 Issue 3

6. Date of Test : 2020.05.11 ~ 2020.07.15

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : Refer to appended test report.

9. Test Result : Refer to the attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by Name : JaeHyeok Bang (Signature)	Reviewed by Name : JaeJin Lee (Signature)

2020 . 08 . 13 .

DT&C Co., Ltd.

Not abided by KS Q ISO / IEC 17025 and KOLAS accreditation.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

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Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2008-0234	Aug. 05, 2020	Initial issue	JaeHyeok Bang	JaeJin Lee
DRTFCC2008-0234(1)	Aug. 13, 2020	FCC Classification Change	JaeHyeok Bang	JaeJin Lee

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1. GENERAL INFORMATION

Applicant Name(FCC)	:	Point Mobile Co., LTD.
Applicant Name(IC)	:	POINTMOBILE CO.,LTD
Address(FCC)	:	B-9F, Kabul Great Valley 32 Digital-ro 9-gil, Geumcheon-gu Seoul South Korea 153-709
Address(IC)	:	B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu Seoul Korea (Republic Of)
FCC ID	:	V2X-PM451
IC	:	10664A-PM451
FCC Classification	:	PCS Licensed Transmitter held to face (PCF)
EUT Type	:	Mobile Computer
Model Name	:	PM451
Add Model Name	:	XG4
Hardware Version	:	MP
Software Version	:	45.00XXX
Serial Number	:	Radiated(2010510307), Conducted(2010510294)
Supplying power	:	DC 3.7 V
Antenna Information	:	PIFA Antenna

Mode	TX Frequency (MHz)	Emission Designator	Modulation	ERP(FCC&IC)		EIRP	
				Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 12, 17	704 ~ 711	8M96G7D	QPSK	20.91	0.123	-	-
LTE Band 12, 17	704 ~ 711	8M95W7D	16QAM	19.62	0.092	-	-
LTE Band 12, 17	701.5 ~ 713.5	4M49G7D	QPSK	21.64	0.146	-	-
LTE Band 12, 17	701.5 ~ 713.5	4M49W7D	16QAM	20.05	0.101	-	-
LTE Band 12	700.5 ~ 714.5	2M69G7D	QPSK	21.40	0.138	-	-
LTE Band 12	700.5 ~ 714.5	2M70W7D	16QAM	20.34	0.108	-	-
LTE Band 12	699.7 ~ 715.3	1M09G7D	QPSK	21.60	0.145	-	-
LTE Band 12	699.7 ~ 715.3	1M09W7D	16QAM	20.35	0.108	-	-
LTE Band 13	782 ~ 782	8M92G7D	QPSK	20.99	0.126	-	-
LTE Band 13	782 ~ 782	8M93W7D	16QAM	19.33	0.086	-	-
LTE Band 13	779.5 ~ 784.5	4M49G7D	QPSK	21.56	0.143	-	-
LTE Band 13	779.5 ~ 784.5	4M48W7D	16QAM	19.94	0.099	-	-

Mode	TX Frequency (MHz)	Emission Designator	Modulation	ERP(For the FCC)		EIRP(For the IC)	
				Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 26	831.5 ~ 841.5	13M4G7D	QPSK	22.33	0.171	24.48	0.281
LTE Band 26	831.5 ~ 841.5	13M4W7D	16QAM	20.87	0.122	23.02	0.200
LTE Band 5, 26	829 ~ 844	8M94G7D	QPSK	22.22	0.167	24.37	0.274
LTE Band 5, 26	829 ~ 844	8M92W7D	16QAM	20.91	0.123	23.06	0.202
LTE Band 5, 26	826.5 ~ 846.5	4M49G7D	QPSK	22.08	0.161	24.23	0.265
LTE Band 5, 26	826.5 ~ 846.5	4M49W7D	16QAM	20.41	0.110	22.56	0.180
LTE Band 5, 26	825.5 ~ 847.5	2M69G7D	QPSK	21.94	0.156	24.09	0.256
LTE Band 5, 26	825.5 ~ 847.5	2M69W7D	16QAM	20.47	0.111	22.62	0.183
LTE Band 5, 26	824.7 ~ 848.3	1M09G7D	QPSK	22.17	0.165	24.32	0.270
LTE Band 5, 26	824.7 ~ 848.3	1M09W7D	16QAM	20.49	0.112	22.64	0.184

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP(FCC & IC)	
				Max power(dBm)	Max power(W)
LTE Band 4	1 720 ~ 1 745	17M9G7D	QPSK	28.89	0.774
LTE Band 4	1 720 ~ 1 745	17M9W7D	16QAM	27.57	0.571
LTE Band 4	1 717.5 ~ 1 747.5	13M4G7D	QPSK	28.61	0.726
LTE Band 4	1 717.5 ~ 1 747.5	13M4W7D	16QAM	27.37	0.546
LTE Band 4	1 715 ~ 1 750	8M95G7D	QPSK	28.83	0.764
LTE Band 4	1 715 ~ 1 750	8M95W7D	16QAM	27.38	0.547
LTE Band 4	1 712.5 ~ 1752.5	4M49G7D	QPSK	28.88	0.773
LTE Band 4	1 712.5 ~ 1 752.5	4M49W7D	16QAM	27.39	0.548
LTE Band 4	1 711.5 ~ 1 753.5	2M69G7D	QPSK	28.44	0.698
LTE Band 4	1 711.5 ~ 1 753.5	2M69W7D	16QAM	27.06	0.508
LTE Band 4	1 710.7 ~ 1 754.3	1M09G7D	QPSK	28.42	0.695
LTE Band 4	1 710.7 ~ 1 754.3	1M09W7D	16QAM	27.34	0.542
LTE Band 2, 25	1 860 ~ 1 905	17M8G7D	QPSK	28.94	0.783
LTE Band 2, 25	1 860 ~ 1 905	17M9W7D	16QAM	27.63	0.579
LTE Band 2, 25	1 857.5 ~ 1 907.5	13M4G7D	QPSK	28.73	0.746
LTE Band 2, 25	1 857.5 ~ 1 907.5	13M4W7D	16QAM	27.39	0.548
LTE Band 2, 25	1 855 ~ 1 910	8M96G7D	QPSK	29.27	0.845
LTE Band 2, 25	1 855 ~ 1 910	8M93W7D	16QAM	27.96	0.625
LTE Band 2, 25	1 852.5 ~ 1 912.5	4M49G7D	QPSK	29.14	0.820
LTE Band 2, 25	1 852.5 ~ 1 912.5	4M49W7D	16QAM	27.53	0.566
LTE Band 2, 25	1 851.5 ~ 1 913.5	2M69G7D	QPSK	28.89	0.774
LTE Band 2, 25	1 851.5 ~ 1 913.5	2M70W7D	16QAM	27.18	0.522
LTE Band 2, 25	1 850.7 ~ 1 914.3	1M09G7D	QPSK	28.26	0.670
LTE Band 2, 25	1 850.7 ~ 1 914.3	1M09W7D	16QAM	27.27	0.533
LTE Band 41	2 506 ~ 2 680	17M9G7D	QPSK	21.01	0.126
LTE Band 41	2 506 ~ 2 680	17M8W7D	16QAM	19.39	0.087
LTE Band 41	2 503.5 ~ 2 682.5	13M3G7D	QPSK	20.77	0.119
LTE Band 41	2 503.5 ~ 2 682.5	13M4W7D	16QAM	19.08	0.081
LTE Band 41	2 501 ~ 2 685	8M85G7D	QPSK	20.88	0.122
LTE Band 41	2 501 ~ 2 685	8M78W7D	16QAM	19.53	0.090
LTE Band 41	2 498.5 ~ 2 687.5	4M51G7D	QPSK	20.11	0.103
LTE Band 41	2 498.5 ~ 2 687.5	4M45W7D	16QAM	18.71	0.074

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP(FCC & IC)	
				Max power(dBm)	Max power(W)
LTE Band 7	2 510 ~ 2 560	17M8G7D	QPSK	23.78	0.239
LTE Band 7	2 510 ~ 2 560	17M9W7D	16QAM	22.51	0.178
LTE Band 7	2 507.5 ~ 2 562.5	13M4G7D	QPSK	24.17	0.261
LTE Band 7	2 507.5 ~ 2 562.5	13M4W7D	16QAM	22.61	0.182
LTE Band 7	2 505 ~ 2 565	8M94G7D	QPSK	24.19	0.262
LTE Band 7	2 505 ~ 2 565	8M92W7D	16QAM	22.82	0.191
LTE Band 7	2 502.5 ~ 2 567.5	4M50G7D	QPSK	23.87	0.244
LTE Band 7	2 502.5 ~ 2 567.5	4M49W7D	16QAM	22.88	0.194

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2. INTRODUCTION

2.1 EUT DESCRIPTION

The Equipment Under Test (EUT) supports GSM/WCDMA/LTE Phone with Bluetooth, WLAN, NFC.

2.2. EUT CAPABILITIES

This EUT contains the following capabilities:
850/1900 GPRS/EDGE, 850/1700/1900 WCDMA/HSUPA, Multi-band LTE, 802.11b/g/n/ac WLAN(2.4GHz)
802.11a/n/ac WLAN(5GHz), Bluetooth(BDR, EDR, LE), NFC.

2.3. TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+22 ℃ ~ +25 ℃
▪ Relative Humidity	42 % ~ 46 %

2.4 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014. All measurement uncertainty values are shown with a coverage factor of *k* = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated Disturbance (Below 1 GHz)	4.86 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.02 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Above 18 GHz)	5.30 dB (The confidence level is about 95 %, k = 2)

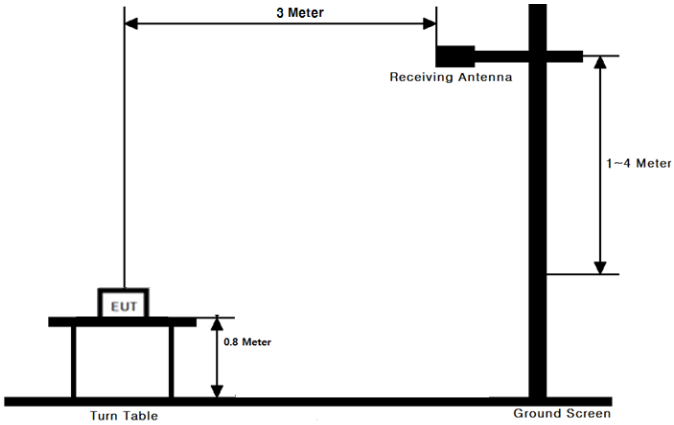
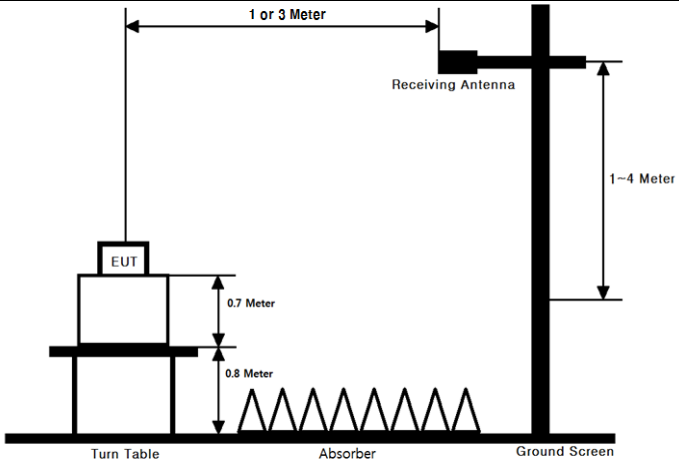
2.6. TEST FACILITY

DT&C Co., Ltd.		
The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site complies with the requirements of § 2.948 according to ANSI 63.4-2014. **- FCC & IC MRA Accredited Test Firm No. : KR0034** **- ISED #: 5740A**		
www.dtnc.net		
Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

3. DESCRIPTION OF TESTS

3.1 ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 1.5-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.17**
- **KDB971168 D01v03 - Section 5.2.2**
- **ANSI C63.26-2015 – Section 5.2.4.4.1**

Test setting

1. Set span to 2 x to 3 x the OBW.
2. Set RBW = 1 % to 5 % of the OBW.
3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   1) Set = auto-couple, or
   2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (rms).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.

10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

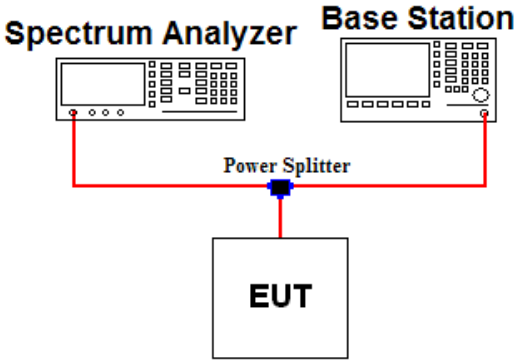
The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal [dBm] + Substitute Antenna gain [dBd for ERP , dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference
Between the gain of the horn antenna and an isotropic antenna are taken into consideration.

3.2 PEAK TO AVERAGE RATIO

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 5.7.2**
- **ANSI C63.26-2015 – Section 5.2.3.4**

A peak to average ratio measurement is performed at the conducted port of the EUT.
The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The present of time the signal spends at or above the level defines the probability for that particular power level.

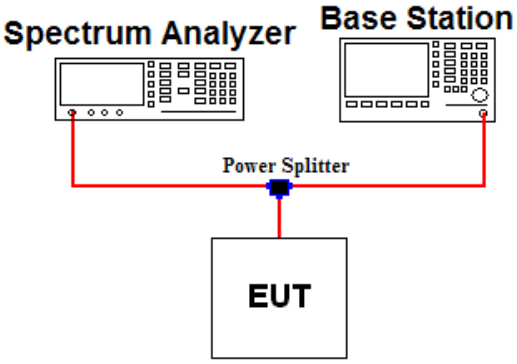
Test setting

The spectrum Analyzer`s CCDF measurement function is enabled.

1. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Set the measurement interval as follows:
   1) For continuous transmissions, set to the greater of [10 × (number of points in sweep) × (transmission symbol period)] or 1 ms.
   2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
   3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
4. Record the maximum PAPR level associated with a probability of 0.1 %.
5. The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.

3.3 OCCUPIED BANDWIDTH.

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 4.3**
- **ANSI C63.26-2015 – Section 5.4.4**

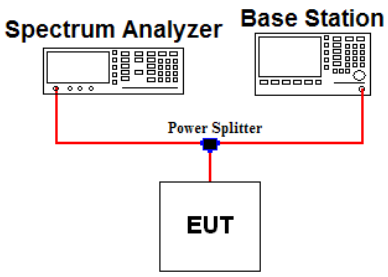
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

Test setting

1. The signal analyzer`s automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 % ~ 5 % of the expected OBW & VBW ≥ 3 X RBW
3. Detector = Peak
4. Trance mode = Max hold
5. Sweep = Auto couple
6. The trace was allowed to stabilize
7. If necessary, step 2 ~ 6 were repeated after changing the RBW such that it would be within 1 % ~ 5 % of the 99 % occupied bandwidth observed in step 6.

3.4 BAND EDGE EMISSIONS AT ANTENNA TERMINAL

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 6**
- **ANSI C63.26-2015 – Section 5.7**

All out of band emissions are measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its lowest and highest channel with all bandwidths, modulations and RB configurations.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

Test setting

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1 % of the emission bandwidth
4. VBW ≥ 3 X RBW
5. Detector = RMS & Trace mode = Max hold
6. Sweep time = Auto couple or 1 s for band edge
7. Number of sweep point ≥ 2 X span / RBW
8. The trace was allowed to stabilize

Note 1: Per Part 22.917(b)(1) / 24.238(b) / 27.53(h) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Note 2: Per Part 27(g) for operations in the 600 MHz band and the 698-746 MHz band, compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

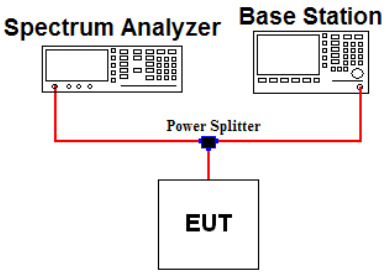
Note 3: Per Part 27.53(c.4) for all frequencies between 763 MHz - 775 MHz and 793 MHz - 805 MHz, the FCC limit is 65 + 10 log10(P[Watts]) = -35 dBm in a 6.25 kHz bandwidth.

Note 4: For part 27.53(m)(4) 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)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2 490.5 MHz and 2 496 MHz and 55 + 10 log (P) dB at or below 2 490.5 MHz.

Note 5: Per part 27.53(m)(6) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 MHz band is 2 495 MHz - 2 496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 6**
- **ANSI C63.26-2015 – Section 5.7**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its low, middle, high channel with all bandwidths, modulations and RB configurations. The spectrum is scanned from 9 kHz up to a frequency including its 10th harmonic.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

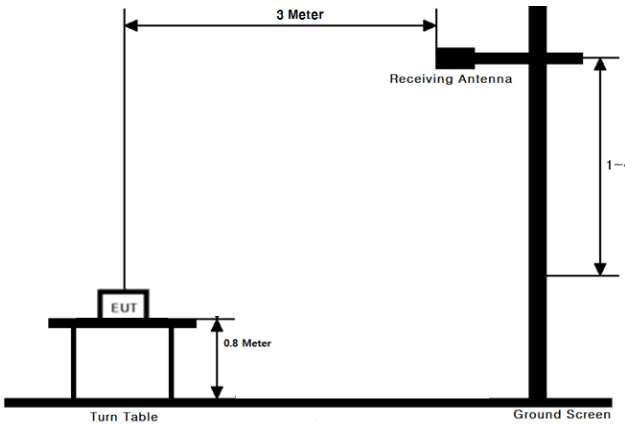
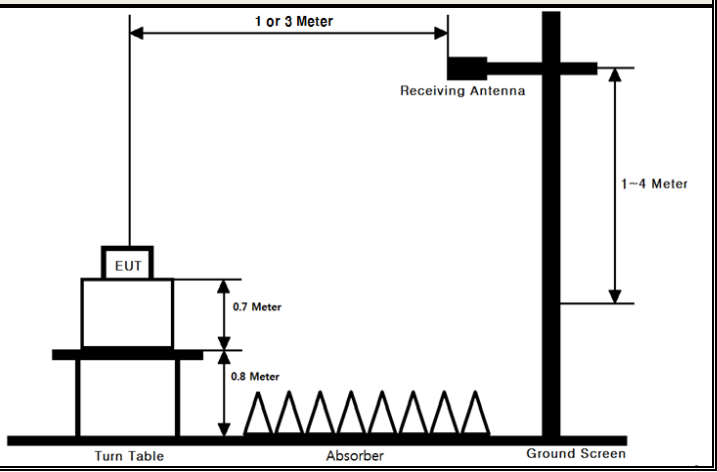
Test setting

1. RBW = 100 kHz(Below 1 GHz) or 1 MHz(Above 1 GHz) & VBW ≥ 3 X RBW (Refer to Note 1)
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

Note 1: Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1MHz or greater for frequencies greater than 1GHz.

3.6 UNDESIRABLE EMISSIONS

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 1.5 meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.12**
- **KDB971168 D01v03 - Section 5.8**
- **ANSI C63.26-2015 – Section 5.5**

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

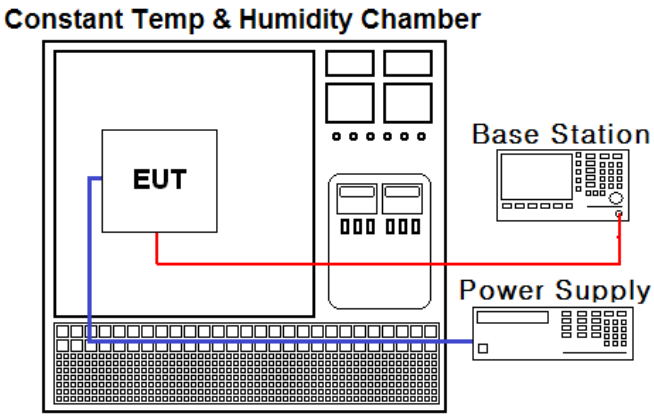
For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

3.7 FREQUENCY STABILITY

Test Set-up



Test Procedure

- **ANSI/TIA-603-E-2016**
- **KDB971168 D01v03 - Section 9**

The frequency stability of the transmitter is measured by:

a.) **Temperature:**
The temperature is varied from -30 °C to +50 °C using an environmental chamber.

b.) **Primary Supply Voltage:**
The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block for Part 24, 27. The frequency stability of the transmitter shall be maintained within ±0.000 25 % (±2.5 ppm) of the center frequency for Part 22.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature.
(20 °C to provide a reference)

2. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C.
A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	19/06/26 20/06/24	20/06/26 21/06/24	MY50200834
Spectrum Analyzer	Agilent Technologies	N9030A	19/12/16	20/12/16	MY53310140
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/26	MY48010133
DC power supply	Agilent Technologies	66332A	19/06/25 20/06/24	20/06/25 21/06/24	MY43001172
Multimeter	FLUKE	17B+	19/12/16	20/12/16	36390701WS
Power Splitter	Anritus	K241B	19/12/16	20/12/16	016681
I/O Adapter	Anritus	MN8110B	NA	NA	6201468128
Temp & Humi	SJ Science	SJ-TH-S50	19/06/25 20/06/23	20/06/25 21/06/23	U5542113
Radio Communication Analyzer	Anritus	MT8820C	19/06/26 20/06/24	20/06/26 21/06/24	6201127429
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-2
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-1
Signal Generator	Rohde Schwarz	SMBV100A	19/12/16	20/12/16	255571
Signal Generator	ANRITSU	MG3695C	19/12/16	20/12/16	173501
Loop Antenna	ETS-Lindgren	6502	19/09/18	21/09/18	00226186
Bilog Antenna	Schwarzbeck	VULB 9160	19/04/23	21/04/23	9160-3362
Dipole Antenna	A.H.Systems Inc.	FCC-4	19/03/26	21/03/26	710A
Dipole Antenna	Schwarzbeck	UHA9105	20/04/10	22/04/10	2262
HORN ANT	ETS	3117	20/04/24	22/04/24	00140394
HORN ANT	ETS	3117	20/03/26	22/03/26	00152145
HORN ANT	A.H.Systems	SAS-574	19/04/23	21/04/23	154
HORN ANT	A.H.Systems	SAS-574	19/07/03	21/07/03	155
Amplifier	EMPOWER	BBS3Q7ELU	19/06/24 20/06/24	20/06/24 21/06/24	1020
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	19/06/27 20/06/24	20/06/27 21/06/24	163
PreAmplifier	H.P	8447D	19/12/16	20/12/16	2944A07774
PreAmplifier	Agilent	8449B	19/06/27 20/06/24	20/06/27 21/06/24	3008A02108
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	19/06/24 20/06/24	20/06/24 21/06/24	7
High-pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	19/06/24 20/06/24	20/06/24 21/06/24	3
High-pass filter	Wainwright	WHNX8.5/26.5G-6SS	19/06/24 20/06/24	20/06/24 21/06/24	1
Cable	DTNC	Cable	20/01/13	21/01/13	M-01
Cable	DTNC	Cable	20/01/13	21/01/13	M-02
Cable	Junkosha	MWX315	20/01/13	21/01/13	M-05
Cable	Junkosha	MWX221	20/01/13	21/01/13	M-06
Cable	DTNC	Cable	20/01/13	21/01/13	RF-84

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.
Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	-	Conducted Output Power	N/A	Conducted	C Note2
2.1049	RSS-GEN[6.7]	Occupied Bandwidth	N/A		C
24.232(d) 27.50(d.5)	RSS-130 [4.6] RSS-132 [5.4] RSS-133 [6.4] RSS-139 [6.5] RSS-199 [4.4]	Peak to Average Ratio	< 13 dB		C
2.1051 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Band Edge / Conducted Spurious Emissions	> 43 + 10log$_{10}$ (P) dB at Band edge and for all out-of-band emissions		C
27.53(m)	RSS-199 [4.5]	Band Edge / Conducted Spurious Emissions	> 40 + 10log10 (P) dB at channel edge and 5 MHz from the channel edge > 43 + 10log10 (P) dB at 5 MHz and X MHz from the channel edge > 55 + 10log10 (P) dB at all frequencies more than X MHz from the channel edge		C
2.1055 22.355 24.235 27.54	RSS-130 [4.5] RSS-132 [5.3] RSS-133 [6.3] RSS-139 [6.4] RSS-199 [4.3]	Frequency Stability	< 2.5 ppm (Part 22) or Fundamental emissions must stay within Authorized frequency block (Part 24, 27)		C
27.50(b.10) 27.50(c.10)	RSS-130 [4.6]	Radiated Output Power (B12, 13)	< 3 Watts max. ERP (FCC & IC)	Radiated	C
22.913(a.5)	RSS-132 [5.4]	Radiated Output Power (B26, B5)	< 7 Watts max. ERP (FCC) < 11.5 Watts max. EIRP (IC)		C
27.50(d.4)	RSS-139 [6.5]	Radiated Output Power (B4)	< 1 Watts max. EIRP (FCC & IC)		C
24.232(c) 27.50(h.2)	RSS-133 [6.4] RSS-199 [4.4]	Radiated Output Power (B2, 7, 41)	< 2 Watts max. EIRP (FCC & IC)		C
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Undesirable Emissions	> 43 + 10log$_{10}$ (P) dB for all out-of-band emissions		C
27.53(m)	RSS-199 [4.5]	Undesirable Emissions (B7, 41)	> 55 + 10log$_{10}$ (P) dB for all out-of-band emissions		C
27.53(f)	RSS-130 [4.7.2]	Undesirable Emissions in 1559 ~ 1610 MHz	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions of less than 700 Hz bandwidth)		C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable
Note 2: Refer to RF Exposure Report (Test Report SAR)

6. SAMPLE CALCULATION

A. Emission Designator

LTE Band 12, 17(QPSK)

Emission Designator = **8M96G7D**
LTE OBW = 8.961 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 12, 17(16QAM)

Emission Designator = **8M95W7D**
LTE OBW = 8.951 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 13(QPSK)

Emission Designator = **8M92G7D**
LTE OBW = 8.920 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 13(16QAM)

Emission Designator **= 8M93W7D**
LTE OBW = 8.932 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5, 26(QPSK)

Emission Designator =**13M4G7D**
LTE OBW = 13.426 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5, 26(16QAM)

Emission Designator = **13M4W7D**
LTE OBW = 13.389 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 4(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.861 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 4(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.899 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2, 25(QPSK)

Emission Designator = **17M8G7D**
LTE OBW = 17.831 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2, 25(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.879 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 41(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.940 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 41(16QAM)

Emission Designator = **17M8W7D**
LTE OBW = 17.783 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 7(QPSK)

Emission Designator = **17M8G7D**
LTE OBW = 17.838 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 7(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.884 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

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B. For substitution method

1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1 GHz respectively above ground.
2) The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3) During the test, the turn table is rotated until the maximum signal is found.
4) Record the field strength meter's level. (ex. Spectrum reading level is -8.5 dBm)
5) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
6) Increase the signal generator output till the field strength meter's level is equal to the item (4). (ex. Signal generator level is -18.04 dBm)
7) The gain of the cable and amplifier between the signal generator and terminals of substituted antenna is 46.92 dB at test frequency.
8) Record the level at substituted antenna terminal. (ex. 28.88dBm)
9) The result is calculated as below;

EIRP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBi)
ERP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBd)
Where, TX Antenna Gain (dBd) = TX Antenna Gain (dBi) - 2.15 dB

7. TEST DATA

7.1 OCCUPIED BANDWIDTH

- Plots of the EUT's Occupied Bandwidth are shown in Clause 8.1

7.2 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.2

7.3 BAND EDEG EMISSIONS (Conducted)

- Plots of the EUT's Band Edge Emissions are shown in Clause 8.3

7.4 SPURIOUS AND HARMONICS EMISSIONS (Conducted)

- Plots of the EUT's Spurious Emissions are shown in Clause 8.4

7.6 ERP & EIRP

- Test Notes

1) This is device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the below table.

7.6.1 LTE Band 12, 17

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	704	QPSK	1/49	H	21.56	-0.65	20.91	0.123
		16QAM	1/49	H	20.27	-0.65	19.62	0.092
	711	QPSK	1/49	H	21.28	-0.63	20.65	0.116
		16QAM	1/49	H	19.82	-0.63	19.19	0.083
5	701.5	QPSK	1/24	H	21.20	-0.66	20.54	0.113
		16QAM	1/24	H	19.87	-0.66	19.21	0.083
	707.5	QPSK	1/12	H	21.20	-0.64	20.56	0.114
		16QAM	1/12	H	20.69	-0.64	20.05	0.101
	713.5	QPSK	1/24	H	22.26	-0.62	21.64	0.146
		16QAM	1/24	H	20.59	-0.62	19.97	0.099

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7.6.2 LTE Band 12

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
3	700.5	QPSK	1/14	H	20.51	-0.66	19.85	0.097
		16QAM	1/14	H	19.24	-0.66	18.58	0.072
	707.5	QPSK	1/7	H	21.47	-0.64	20.83	0.121
		16QAM	1/7	H	20.02	-0.64	19.38	0.087
	714.5	QPSK	1/14	H	22.02	-0.62	21.40	0.138
		16QAM	1/14	H	20.96	-0.62	20.34	0.108
1.4	699.7	QPSK	1/0	H	20.20	-0.66	19.54	0.090
		16QAM	1/0	H	19.14	-0.66	18.48	0.070
	707.5	QPSK	1/2	H	21.44	-0.64	20.80	0.120
		16QAM	1/2	H	20.13	-0.64	19.49	0.089
	715.3	QPSK	1/5	H	22.22	-0.62	21.60	0.145
		16QAM	1/5	H	20.97	-0.62	20.35	0.108

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7.6.3 LTE Band 13

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	782	QPSK	1/0	H	21.44	-0.45	20.99	0.126
		16QAM	1/0	H	19.78	-0.45	19.33	0.086
5	779.5	QPSK	1/12	H	22.01	-0.45	21.56	0.143
		16QAM	1/12	H	20.01	-0.45	19.56	0.090
	784.5	QPSK	1/12	H	21.60	-0.44	21.16	0.131
		16QAM	1/12	H	20.38	-0.44	19.94	0.099

7.6.4 LTE Band 26

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
15	831.5	QPSK	1/0	H	23.02	-0.69	22.33	0.171
		16QAM	1/0	H	21.42	-0.69	20.73	0.118
	841.5	QPSK	1/0	H	23.02	-0.79	22.23	0.167
		16QAM	1/0	H	21.66	-0.79	20.87	0.122

7.6.5 LTE Band 5, 26

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	829	QPSK	1/25	H	22.89	-0.67	22.22	0.167
		16QAM	1/25	H	21.31	-0.67	20.64	0.116
	836.5	QPSK	1/0	H	22.83	-0.74	22.09	0.162
		16QAM	1/0	H	21.65	-0.74	20.91	0.123
	844	QPSK	1/0	H	22.97	-0.81	22.16	0.164
		16QAM	1/0	H	21.58	-0.81	20.77	0.119
5	826.5	QPSK	1/12	H	22.47	-0.65	21.82	0.152
		16QAM	1/12	H	20.56	-0.65	19.91	0.098
	836.5	QPSK	1/12	H	22.82	-0.74	22.08	0.161
		16QAM	1/12	H	21.15	-0.74	20.41	0.110
	846.5	QPSK	1/12	H	22.63	-0.83	21.80	0.151
		16QAM	1/12	H	20.84	-0.83	20.01	0.100
3	825.5	QPSK	1/7	H	22.31	-0.64	21.67	0.147
		16QAM	1/7	H	20.80	-0.64	20.16	0.104
	836.5	QPSK	1/7	H	22.68	-0.74	21.94	0.156
		16QAM	1/7	H	21.21	-0.74	20.47	0.111
	847.5	QPSK	1/7	H	22.66	-0.84	21.82	0.152
		16QAM	1/7	H	20.92	-0.84	20.08	0.102
1.4	824.7	QPSK	1/0	H	22.16	-0.63	21.53	0.142
		16QAM	1/0	H	20.65	-0.63	20.02	0.100
	836.5	QPSK	1/2	H	22.91	-0.74	22.17	0.165
		16QAM	1/2	H	21.23	-0.74	20.49	0.112
	848.3	QPSK	1/2	H	22.46	-0.85	21.61	0.145
		16QAM	1/2	H	20.73	-0.85	19.88	0.097

7.6.6 LTE Band 4

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 720	QPSK	1/50	V	20.18	5.28	25.46	0.352
		16QAM	1/50	V	18.89	5.28	24.17	0.261
	1 732.5	QPSK	1/50	V	22.39	5.33	27.72	0.592
		16QAM	1/50	V	20.83	5.33	26.16	0.413
	1 745	QPSK	1/0	V	23.51	5.38	28.89	0.774
		16QAM	1/0	V	22.19	5.38	27.57	0.571
15	1 717.5	QPSK	1/74	V	20.18	5.27	25.45	0.351
		16QAM	1/74	V	18.48	5.27	23.75	0.237
	1 732.5	QPSK	1/36	V	22.31	5.33	27.64	0.581
		16QAM	1/36	V	21.06	5.33	26.39	0.436
	1 747.5	QPSK	1/0	V	23.22	5.39	28.61	0.726
		16QAM	1/0	V	21.98	5.39	27.37	0.546
10	1 715	QPSK	1/25	V	19.78	5.26	25.04	0.319
		16QAM	1/25	V	19.17	5.26	24.43	0.277
	1 732.5	QPSK	1/25	V	22.49	5.33	27.82	0.605
		16QAM	1/25	V	21.05	5.33	26.38	0.435
	1 750	QPSK	1/0	V	23.43	5.40	28.83	0.764
		16QAM	1/0	V	21.98	5.40	27.38	0.547
5	1 712.5	QPSK	1/0	V	19.81	5.25	25.06	0.321
		16QAM	1/0	V	19.10	5.25	24.35	0.272
	1 732.5	QPSK	1/12	V	22.46	5.33	27.79	0.601
		16QAM	1/12	V	20.85	5.33	26.18	0.415
	1 752.5	QPSK	1/0	V	23.50	5.38	28.88	0.773
		16QAM	1/0	V	22.01	5.38	27.39	0.548
3	1 711.5	QPSK	1/7	V	20.06	5.25	25.31	0.340
		16QAM	1/7	V	18.79	5.25	24.04	0.254
	1 732.5	QPSK	1/7	V	22.43	5.33	27.76	0.597
		16QAM	1/7	V	20.64	5.33	25.97	0.395
	1 753.5	QPSK	1/14	V	23.07	5.37	28.44	0.698
		16QAM	1/14	V	21.69	5.37	27.06	0.508
1.4	1 710.7	QPSK	1/2	V	20.04	5.24	25.28	0.337
		16QAM	1/2	V	18.83	5.24	24.07	0.255
	1 732.5	QPSK	1/5	V	22.17	5.33	27.50	0.562
		16QAM	1/5	V	20.98	5.33	26.31	0.428
	1 754.3	QPSK	1/2	V	23.06	5.36	28.42	0.695
		16QAM	1/2	V	21.98	5.36	27.34	0.542

7.6.7 LTE Band 2, 25

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 860	QPSK	1/50	V	22.93	4.80	27.73	0.593
		16QAM	1/50	V	20.15	4.80	24.95	0.313
	1 882.5	QPSK	1/50	V	24.11	4.58	28.69	0.740
		16QAM	1/50	V	22.77	4.58	27.35	0.543
	1 905	QPSK	1/0	V	24.52	4.42	28.94	0.783
		16QAM	1/0	V	23.21	4.42	27.63	0.579
15	1 857.5	QPSK	1/36	V	22.56	4.83	27.39	0.548
		16QAM	1/36	V	20.85	4.83	25.68	0.370
	1 882.5	QPSK	1/36	V	24.15	4.58	28.73	0.746
		16QAM	1/36	V	22.26	4.58	26.84	0.483
	1 907.5	QPSK	1/36	V	23.63	4.43	28.06	0.640
		16QAM	1/36	V	22.96	4.43	27.39	0.548
10	1 855	QPSK	1/49	V	22.52	4.85	27.37	0.546
		16QAM	1/49	V	21.01	4.85	25.86	0.385
	1 882.5	QPSK	1/25	V	23.81	4.58	28.39	0.690
		16QAM	1/25	V	22.39	4.58	26.97	0.498
	1 910	QPSK	1/25	V	24.83	4.44	29.27	0.845
		16QAM	1/25	V	23.52	4.44	27.96	0.625
5	1 852.5	QPSK	1/0	V	22.02	4.88	26.90	0.490
		16QAM	1/0	V	20.40	4.88	25.28	0.337
	1 882.5	QPSK	1/12	V	23.87	4.58	28.45	0.700
		16QAM	1/12	V	22.25	4.58	26.83	0.482
	1 912.5	QPSK	1/12	V	24.69	4.45	29.14	0.820
		16QAM	1/12	V	23.08	4.45	27.53	0.566
3	1 851.5	QPSK	1/0	V	21.55	4.89	26.44	0.441
		16QAM	1/0	V	20.04	4.89	24.93	0.311
	1 882.5	QPSK	1/14	V	23.84	4.58	28.42	0.695
		16QAM	1/14	V	22.40	4.58	26.98	0.499
	1 913.5	QPSK	1/7	V	24.44	4.45	28.89	0.774
		16QAM	1/7	V	22.73	4.45	27.18	0.522
1.4	1 850.7	QPSK	1/0	V	21.69	4.89	26.58	0.455
		16QAM	1/0	V	19.97	4.89	24.86	0.306
	1 882.5	QPSK	1/2	V	23.68	4.58	28.26	0.670
		16QAM	1/2	V	22.26	4.58	26.84	0.483
	1 914.3	QPSK	1/0	V	23.26	4.46	27.72	0.592
		16QAM	1/0	V	22.81	4.46	27.27	0.533

7.6.8 LTE Band 41

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 506	QPSK	1/50	V	13.46	5.92	19.38	0.087
		16QAM	1/50	V	12.13	5.92	18.05	0.064
	2 593	QPSK	1/50	V	12.90	6.19	19.09	0.081
		16QAM	1/50	V	11.87	6.19	18.06	0.064
	2 680	QPSK	1/50	V	14.67	6.34	21.01	0.126
		16QAM	1/50	V	13.05	6.34	19.39	0.087
15	2 503.5	QPSK	1/36	V	13.15	5.91	19.06	0.081
		16QAM	1/36	V	11.78	5.91	17.69	0.059
	2 593	QPSK	1/36	V	13.01	6.19	19.20	0.083
		16QAM	1/36	V	11.56	6.19	17.75	0.060
	2 682.5	QPSK	1/36	V	14.44	6.33	20.77	0.119
		16QAM	1/36	V	12.75	6.33	19.08	0.081
10	2 501	QPSK	1/25	V	12.68	5.90	18.58	0.072
		16QAM	1/25	V	11.32	5.90	17.22	0.053
	2 593	QPSK	1/25	V	13.08	6.19	19.27	0.085
		16QAM	1/25	V	11.38	6.19	17.57	0.057
	2 685	QPSK	1/25	V	14.56	6.32	20.88	0.122
		16QAM	1/25	V	13.21	6.32	19.53	0.090
5	2 498.5	QPSK	1/12	V	13.91	5.89	19.80	0.095
		16QAM	1/12	V	12.24	5.89	18.13	0.065
	2 593	QPSK	1/12	V	13.34	6.19	19.53	0.090
		16QAM	1/12	V	11.92	6.19	18.11	0.065
	2 687.5	QPSK	1/12	V	13.80	6.31	20.11	0.103
		16QAM	1/12	V	12.40	6.31	18.71	0.074

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7.6.9 LTE Band 7

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2 510	QPSK	1/0	V	17.84	5.94	23.78	0.239
		16QAM	1/0	V	16.57	5.94	22.51	0.178
	2 535	QPSK	1/0	V	16.94	6.04	22.98	0.199
		16QAM	1/0	V	15.26	6.04	21.30	0.135
	2 560	QPSK	1/50	V	16.73	6.12	22.85	0.193
		16QAM	1/50	V	15.64	6.12	21.76	0.150
15	2 507.5	QPSK	1/0	V	18.24	5.93	24.17	0.261
		16QAM	1/0	V	16.68	5.93	22.61	0.182
	2 535	QPSK	1/0	V	16.85	6.04	22.89	0.195
		16QAM	1/0	V	15.79	6.04	21.83	0.152
	2 562.5	QPSK	1/0	V	17.36	6.13	23.49	0.223
		16QAM	1/0	V	15.91	6.13	22.04	0.160
10	2 505	QPSK	1/25	V	18.27	5.92	24.19	0.262
		16QAM	1/25	V	16.90	5.92	22.82	0.191
	2 535	QPSK	1/25	V	16.91	6.04	22.95	0.197
		16QAM	1/25	V	15.69	6.04	21.73	0.149
	2 565	QPSK	1/0	V	16.81	6.13	22.94	0.197
		16QAM	1/0	V	15.41	6.13	21.54	0.143
5	2 502.5	QPSK	1/12	V	17.96	5.91	23.87	0.244
		16QAM	1/12	V	16.97	5.91	22.88	0.194
	2 535	QPSK	1/0	V	16.69	6.04	22.73	0.187
		16QAM	1/0	V	15.30	6.04	21.34	0.136
	2 567.5	QPSK	1/12	V	16.78	6.14	22.92	0.196
		16QAM	1/12	V	15.28	6.14	21.42	0.139

7.7 UNDESIRABLE EMISSIONS (Radiated)

- Test Notes

1) This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported.
2) The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter.
   No other spurious and harmonic emissions were reported greater than listed emissions.
3) Limit Calculation for Band 2/4/12/13/25/26 = 43 + 10 log10 (P[Watts])
4) Limit Calculation for Band 7/41 = 55 + 10 $\log_{10}$ (P[Watts])
5) Limit Calculation for 1 559 MHz ~ 1 610 MHz in Band 13 = −70 dBW/MHz (equivalent isotropically radiated power for wideband signals)

7.7.1 LTE Band 12, 17

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	704	1/49	QPSK	1 416.74	H	-45.94	2.52	-43.42	64.33	33.91
				2 125.17	V	-44.67	3.15	-41.52	62.43	
			16QAM	1 416.83	H	-47.72	2.52	-45.20	64.82	32.62
				2 125.18	V	-48.53	3.15	-45.38	65.00	
	711	1/49	QPSK	1 430.93	H	-48.62	2.57	-46.05	66.70	33.65
				2 146.36	V	-45.10	3.24	-41.86	62.51	
			16QAM	1 430.63	H	-50.14	2.57	-47.57	66.76	32.19
				2 146.19	V	-46.09	3.23	-42.86	62.05	
5	713.5	1/24	QPSK	1 431.31	H	-45.26	2.58	-42.68	64.32	34.64
				2 146.99	V	-48.53	3.24	-45.29	66.93	
			16QAM	1 431.50	H	-46.38	2.58	-43.80	63.77	32.97
				2 147.01	V	-50.25	3.24	-47.01	66.98	

7.7.2 LTE Band 13

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	782	1/0	QPSK	2 332.76	H	-54.13	3.62	-50.51	71.50	33.99
			16QAM	2 340.50	H	-54.56	3.63	-50.93	70.26	32.33
5	779.5	1/12	QPSK	2 338.53	H	-52.54	3.63	-48.91	70.47	34.56
			16QAM	2 337.99	H	-54.40	3.63	-50.77	70.33	32.56

UNDESIRABLE EMISSIONS IN 1 559 MHz ~ 1 610 MHz (LTE Band 13)

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result	Margin	Limit (dBm/MHz)
								(dBm)	(dB)	
10	782	1/25	QPSK	1 564.19	H	-52.45	6.41	-46.04	6.04	-40.00
		1/25	16QAM	1 564.14	H	-54.16	6.41	-47.75	7.75	
5	779.5	1/24	QPSK	1 563.34	H	-53.03	6.41	-46.62	6.61	
		1/24	16QAM	1 563.19	H	-55.22	6.41	-48.81	8.80	

7.7.3 LTE Band 26

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
15	831.5	1/0	QPSK	1 654.18	H	-58.17	4.06	-54.11	76.44	35.33
				2 460.78	V	-53.33	3.51	-49.82	72.15	
			16QAM	1 649.49	H	-55.62	4.15	-51.47	72.20	33.73
				2 454.02	V	-52.80	3.47	-49.33	70.06	
	841.5	1/0	QPSK	1 669.76	H	-55.09	3.72	-51.37	73.60	35.23
				2 497.20	V	-53.13	3.73	-49.40	71.63	
			16QAM	1 669.41	H	-56.37	3.72	-52.65	73.52	33.87
				2 502.69	V	-53.61	3.76	-49.85	70.72	

7.7.4 LTE Band 4

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1 720	1/50	QPSK	3 425.85	V	-55.40	7.75	-47.65	73.11	38.46
				5 160.40	H	-48.04	10.32	-37.72	63.18	
				6 892.38	H	-51.48	11.30	-40.18	65.64	
				8 600.71	V	-46.32	13.20	-33.12	58.58	
			16QAM	3 439.18	V	-54.64	7.78	-46.86	71.03	37.17
				5 160.18	H	-49.36	10.32	-39.04	63.21	
				6 874.24	H	-51.24	11.30	-39.94	64.11	
				8 600.19	V	-46.54	13.20	-33.34	57.51	
	1 732.5	1/50	QPSK	3 464.89	V	-55.51	7.83	-47.68	75.40	40.72
				5 197.69	H	-50.18	10.40	-39.78	67.50	
				6 952.26	H	-51.56	11.40	-40.16	67.88	
				8 662.89	V	-47.91	13.20	-34.71	62.43	
			16QAM	3 462.33	V	-55.30	7.82	-47.48	73.64	39.16
				5 197.58	H	-52.10	10.40	-41.70	67.86	
				6 948.99	H	-51.07	11.40	-39.67	65.83	
				8 662.50	V	-47.93	13.20	-34.73	60.89	
	1 745	1/0	QPSK	3 466.64	V	-55.34	7.83	-47.51	76.40	41.89
				5 208.27	H	-46.38	10.38	-36.00	64.89	
				6 942.03	H	-50.37	11.38	-38.99	67.88	
				8 680.28	V	-46.77	13.20	-33.57	62.46	
			16QAM	3 472.19	V	-55.08	7.84	-47.24	74.81	40.57
				5 208.07	H	-46.80	10.38	-36.42	63.99	
				6 945.23	H	-51.30	11.39	-39.91	67.48	
				8 680.50	V	-47.74	13.20	-34.54	62.11	

7.7.5 LTE Band 2, 25

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1 860	1/50	QPSK	3 736.85	V	-54.71	8.37	-46.34	74.07	40.73
				5 580.02	H	-50.15	10.68	-39.47	67.20	
				7 447.76	H	-49.73	12.00	-37.73	65.46	
				9 321.21	H	-49.43	13.20	-36.23	63.96	
			16QAM	3 695.65	V	-54.49	8.30	-46.19	71.14	37.95
				5 580.48	H	-50.22	10.68	-39.54	64.49	
				7 432.41	H	-50.30	12.00	-38.30	63.25	
				9 319.79	H	-49.70	13.20	-36.50	61.45	
	1 882.5	1/50	QPSK	3 783.42	V	-54.73	8.47	-46.26	74.95	41.69
				5 648.02	H	-46.40	10.70	-35.70	64.39	
				7 517.49	H	-50.27	12.13	-38.14	66.83	
				9 414.56	H	-49.66	13.20	-36.46	65.15	
			16QAM	3 765.58	V	-55.12	8.43	-46.69	74.04	40.35
				5 647.69	H	-46.65	10.70	-35.95	63.30	
				7 510.82	H	-50.36	12.12	-38.24	65.59	
				9 416.72	H	-49.19	13.20	-35.99	63.34	
	1 905	1/0	QPSK	3 806.97	V	-54.68	8.50	-46.18	75.12	41.94
				5 701.81	H	-53.39	10.60	-42.79	71.73	
				7 555.13	H	-51.25	12.20	-39.05	67.99	
				9 485.99	H	-49.96	13.27	-36.69	65.63	
			16QAM	3 783.08	V	-54.60	8.47	-46.13	73.76	40.63
				5 675.41	H	-52.44	10.65	-41.79	69.42	
				7 564.11	H	-50.09	12.20	-37.89	65.52	
				9 457.97	H	-49.95	13.22	-36.73	64.36	
10	1 910	1/25	QPSK	3 829.70	V	-55.13	8.50	-46.63	75.90	42.27
				5 730.33	H	-45.22	10.60	-34.62	63.89	
				7 641.12	H	-49.89	12.20	-37.69	66.96	
				9 550.59	H	-44.75	13.30	-31.45	60.72	
			16QAM	3 807.53	V	-55.25	8.50	-46.75	74.71	40.96
				5 730.39	H	-45.68	10.60	-35.08	63.04	
				7 650.42	H	-50.89	12.20	-38.69	66.65	
				9 550.55	H	-46.21	13.30	-32.91	60.87	

7.7.6 LTE Band 41

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 506	1/99	QPSK	5 029.66	H	-55.50	10.26	-45.24	64.62	44.38
				7 544.89	V	-52.32	12.19	-40.13	59.51	
				10 059.61	V	-41.10	13.10	-28.00	47.38	
			16QAM	5 029.95	H	-55.21	10.26	-44.95	63.00	43.05
				7 544.71	V	-52.47	12.19	-40.28	58.33	
				10 059.51	V	-42.90	13.10	-29.80	47.85	
	2 593	1/99	QPSK	5 203.77	H	-53.61	10.39	-43.22	62.31	44.09
				7 805.82	V	-52.46	12.30	-40.16	59.25	
				10 407.75	V	-40.04	13.02	-27.02	46.11	
			16QAM	5 203.91	H	-54.28	10.39	-43.89	61.95	43.06
				7 805.58	V	-52.70	12.30	-40.40	58.46	
				10 407.59	V	-42.79	13.02	-29.77	47.83	
	2 680	1/99	QPSK	5 377.99	H	-50.14	10.44	-39.70	60.71	46.01
				8 066.68	V	-48.17	12.60	-35.57	56.58	
				10 755.67	V	-39.35	13.10	-26.25	47.26	
			16QAM	5 377.88	H	-52.08	10.44	-41.64	61.03	44.39
				8 066.51	V	-49.64	12.60	-37.04	56.43	
				10 755.43	V	-39.53	13.10	-26.43	45.82	

7.7.7 LTE Band 7

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2 510	1/0	QPSK	5 002.32	H	-50.68	10.20	-40.48	64.26	48.78
				7 489.39	V	-50.26	12.08	-38.18	61.96	
				10 004.48	V	-45.49	13.10	-32.39	56.17	
				12 499.48	H	-42.53	13.10	-29.43	53.21	
			16QAM	5 002.28	H	-50.32	10.20	-40.12	62.63	47.51
				7 523.47	V	-50.25	12.15	-38.10	60.61	
				10 004.30	V	-46.78	13.10	-33.68	56.19	
				12 517.59	H	-42.27	13.10	-29.17	51.68	
	2 535	1/0	QPSK	5 051.98	H	-52.97	10.30	-42.67	65.65	47.98
				7 571.54	V	-50.76	12.20	-38.56	61.54	
				10 104.31	V	-49.15	13.09	-36.06	59.04	
				12 607.69	H	-44.13	13.18	-30.95	53.93	
			16QAM	5 052.18	H	-52.78	10.30	-42.48	63.78	46.30
				7 553.78	V	-50.53	12.20	-38.33	59.63	
				10 104.04	V	-41.48	13.09	-28.39	49.69	
				12 603.00	H	-43.52	13.19	-30.33	51.63	
	2 560	1/50	QPSK	5 120.10	H	-49.00	10.30	-38.70	61.55	47.85
				7 682.51	V	-50.31	12.20	-38.11	60.96	
				10 240.49	V	-44.60	13.00	-31.60	54.45	
				12 793.16	H	-42.60	13.10	-29.50	52.35	
			16QAM	5 120.04	H	-50.09	10.30	-39.79	61.55	46.76
				7 680.52	V	-50.81	12.20	-38.61	60.37	
				10 240.25	V	-46.08	13.00	-33.08	54.84	
				12 810.87	H	-42.95	13.10	-29.85	51.61	
10	2 505	1/25	QPSK	5 010.27	H	-50.82	10.22	-40.60	64.79	49.19
				7 524.01	V	-50.07	12.15	-37.92	62.11	
				10 020.35	V	-46.98	13.10	-33.88	58.07	
				12 530.82	H	-43.47	13.10	-30.37	54.56	
			16QAM	5 010.09	H	-50.48	10.22	-40.26	63.08	47.82
				7 515.40	V	-49.52	12.13	-37.39	60.21	
				10 020.47	V	-47.87	13.10	-34.77	57.59	
				12 518.93	H	-43.13	13.10	-30.03	52.85	

7.8 FREQUENCY STABILITY

- Test Notes

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.8.1 LTE Band 12, 17

OPERATING FREQUENCY : 707.5 MHz
REFERENCE VOLTAGE : 3.70 VDC
LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	707,499,994	-6	-0.008 5	-0.000 000 848
100 %		-30	707,499,991	-9	-0.012 7	-0.000 001 272
100 %		-20	707,500,011	+11	+0.015 5	+0.000 001 555
100 %		-10	707,499,997	-3	-0.004 2	-0.000 000 424
100 %		0	707,500,007	+7	+0.009 9	+0.000 000 989
100 %		+10	707,499,999	-1	-0.001 4	-0.000 000 141
100 %		+20	707,499,994	-6	-0.008 5	-0.000 000 848
100 %		+30	707,499,995	-5	-0.007 1	-0.000 000 707
100 %		+40	707,499,991	-9	-0.012 7	-0.000 001 272
100 %		+50	707,500,004	+4	+0.005 7	+0.000 000 565
115 %	4.26	+20	707,500,009	+9	+0.012 7	+0.000 001 272
BATT.ENDPOINT	3.30	+20	707,499,992	-8	-0.011 3	-0.000 001 131

7.8.2 LTE Band 13

OPERATING FREQUENCY : 782 MHz
REFERENCE VOLTAGE : 3.70 VDC
LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	782,000,013	+13	+0.016 6	+0.000 001 662
100 %		-30	781,999,999	-1	-0.001 3	-0.000 000 128
100 %		-20	781,999,993	-7	-0.009 0	-0.000 000 895
100 %		-10	782,000,005	+5	+0.006 4	+0.000 000 639
100 %		0	782,000,001	+1	+0.001 3	+0.000 000 128
100 %		+10	781,999,993	-7	-0.009 0	-0.000 000 895
100 %		+20	782,000,013	+13	+0.016 6	+0.000 001 662
100 %		+30	781,999,997	-3	-0.003 8	-0.000 000 384
100 %		+40	781,999,988	-12	-0.015 3	-0.000 001 535
100 %		+50	782,000,005	+5	+0.006 4	+0.000 000 639
115 %	4.26	+20	781,999,998	-2	-0.002 6	-0.000 000 256
BATT.ENDPOINT	3.30	+20	782,000,008	+8	+0.010 2	+0.000 001 023

7.8.3 LTE Band 5, 26

OPERATING FREQUENCY : 836.5 MHz
REFERENCE VOLTAGE : 3.70 VDC
DEVIATION LIMIT(FCC&IC) : ± 0.000 25 % or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	836,499,989	-11	-0.013 2	-0.000 001 315
100 %		-30	836,500,005	+5	+0.006 0	+0.000 000 598
100 %		-20	836,499,997	-3	-0.003 6	-0.000 000 359
100 %		-10	836,500,007	+7	+0.008 4	+0.000 000 837
100 %		0	836,500,012	+12	+0.014 3	+0.000 001 435
100 %		+10	836,499,999	-1	-0.001 2	-0.000 000 120
100 %		+20	836,499,989	-11	-0.013 2	-0.000 001 315
100 %		+30	836,499,995	-5	-0.006 0	-0.000 000 598
100 %		+40	836,500,005	+5	+0.006 0	+0.000 000 598
100 %		+50	836,500,008	+8	+0.009 6	+0.000 000 956
115 %	4.26	+20	836,499,997	-3	-0.003 6	-0.000 000 359
BATT.ENDPOINT	3.30	+20	836,500,005	+5	+0.006 0	+0.000 000 598

7.8.4 LTE Band 4

OPERATING FREQUENCY : 1 732.5 MHz
REFERENCE VOLTAGE 3.70 VDC
LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	1,732,500,010	+10	+0.005 8	+0.000 000 577
100 %		-30	1,732,499,994	-6	-0.003 5	-0.000 000 346
100 %		-20	1,732,500,006	+6	+0.003 5	+0.000 000 346
100 %		-10	1,732,499,989	-11	-0.006 3	-0.000 000 635
100 %		0	1,732,499,993	-7	-0.004 0	-0.000 000 404
100 %		+10	1,732,500,002	+2	+0.001 2	+0.000 000 115
100 %		+20	1,732,500,010	+10	+0.005 8	+0.000 000 577
100 %		+30	1,732,500,005	+5	+0.002 9	+0.000 000 289
100 %		+40	1,732,499,994	-6	-0.003 5	-0.000 000 346
100 %		+50	1,732,499,999	-1	-0.000 6	-0.000 000 058
115 %	4.26	+20	1,732,500,008	+8	+0.004 6	+0.000 000 462
BATT.ENDPOINT	3.30	+20	1,732,499,994	-6	-0.003 5	-0.000 000 346

7.8.5 LTE Band 2, 25

OPERATING FREQUENCY : 1 882.5 MHz
REFERENCE VOLTAGE 3.70 VDC
LIMIT(FCC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
LIMIT(IC) : ± 0.000 25 % or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	1,882,499,997	-3	-0.001 6	-0.000 000 159
100 %		-30	1,882,500,007	+7	+0.003 7	+0.000 000 372
100 %		-20	1,882,500,011	+11	+0.005 8	+0.000 000 584
100 %		-10	1,882,499,991	-9	-0.004 8	-0.000 000 478
100 %		0	1,882,499,999	-1	-0.000 5	-0.000 000 053
100 %		+10	1,882,500,006	+6	+0.003 2	+0.000 000 319
100 %		+20	1,882,499,997	-3	-0.001 6	-0.000 000 159
100 %		+30	1,882,500,007	+7	+0.003 7	+0.000 000 372
100 %		+40	1,882,499,998	-2	-0.001 1	-0.000 000 106
100 %		+50	1,882,499,991	-9	-0.004 8	-0.000 000 478
115 %	4.26	+20	1,882,500,008	+8	+0.004 2	+0.000 000 425
BATT.ENDPOINT	3.30	+20	1,882,499,999	-1	-0.000 5	-0.000 000 053

7.8.6 LTE Band 41

OPERATING FREQUENCY : 2 593 MHz
REFERENCE VOLTAGE : 3.70 VDC
LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	2,593,000,010	+10	+0.003 9	+0.000 000 386
100 %		-30	2,592,999,997	-3	-0.001 2	-0.000 000 116
100 %		-20	2,593,000,005	+5	+0.001 9	+0.000 000 193
100 %		-10	2,593,000,010	+10	+0.003 9	+0.000 000 386
100 %		0	2,593,000,007	+7	+0.002 7	+0.000 000 270
100 %		+10	2,592,999,994	-6	-0.002 3	-0.000 000 231
100 %		+20	2,593,000,010	+10	+0.003 9	+0.000 000 386
100 %		+30	2,592,999,993	-7	-0.002 7	-0.000 000 270
100 %		+40	2,593,000,008	+8	+0.003 1	+0.000 000 309
100 %		+50	2,593,000,001	+1	+0.000 4	+0.000 000 039
115 %	4.43	+20	2,592,999,994	-6	-0.002 3	-0.000 000 231
BATT.ENDPOINT	3.30	+20	2,592,999,998	-2	-0.000 8	-0.000 000 077

7.8.7 LTE Band 7

OPERATING FREQUENCY : 2 535 MHz
REFERENCE VOLTAGE : 3.70 VDC
LIMIT(FCC&IC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.70	+20(Ref)	2,535,000,007	+7	+0.002 8	+0.000 000 276
100 %		-30	2,534,999,991	-9	-0.003 6	-0.000 000 355
100 %		-20	2,534,999,999	-1	-0.000 4	-0.000 000 039
100 %		-10	2,534,999,989	-11	-0.004 3	-0.000 000 434
100 %		0	2,535,000,003	+3	+0.001 2	+0.000 000 118
100 %		+10	2,534,999,997	-3	-0.001 2	-0.000 000 118
100 %		+20	2,535,000,007	+7	+0.002 8	+0.000 000 276
100 %		+30	2,535,000,005	+5	+0.002 0	+0.000 000 197
100 %		+40	2,534,999,999	-1	-0.000 4	-0.000 000 039
100 %		+50	2,535,000,009	+9	+0.003 6	+0.000 000 355
115 %	4.43	+20	2,535,000,011	+11	+0.004 3	+0.000 000 434
BATT.ENDPOINT	3.30	+20	2,534,999,997	-3	-0.001 2	-0.000 000 118

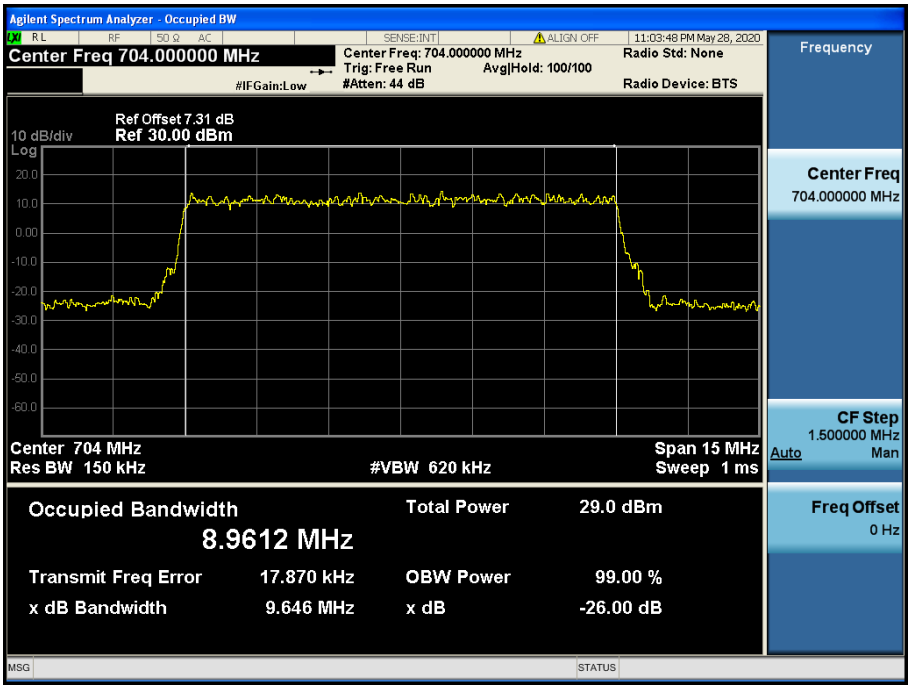
8. TEST PLOTS

- Test Notes:

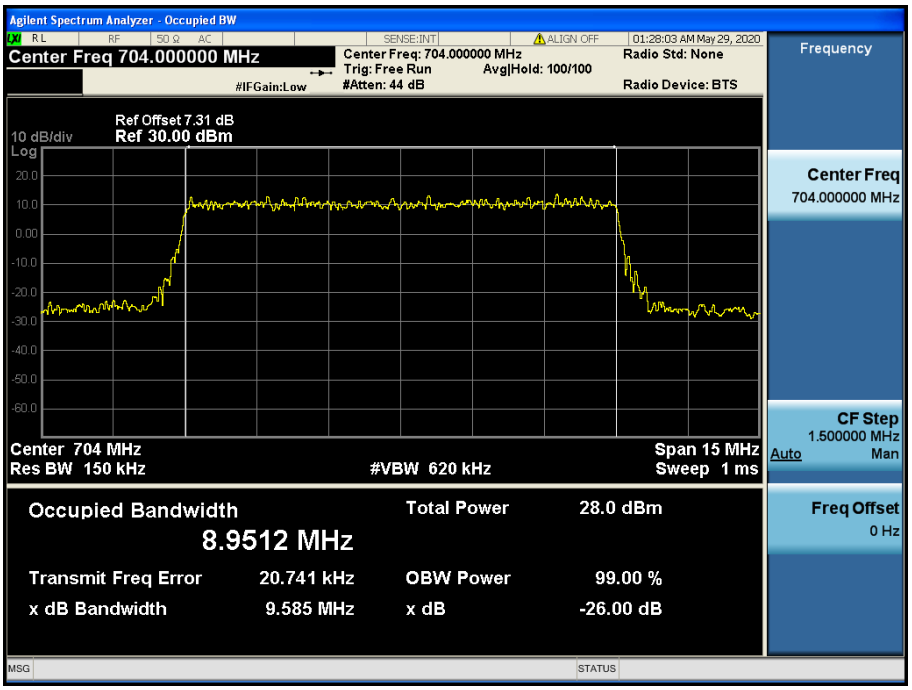
All bandwidths, RB configurations, and modulations were investigated.
The worst case test results are reported.

8.1 OCCUPIED BANDWIDTH

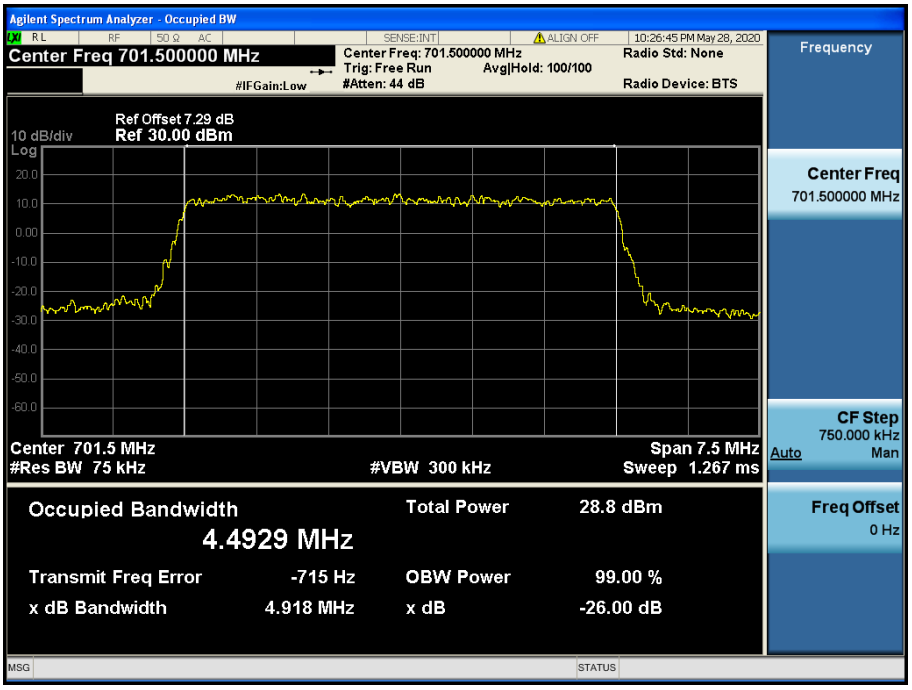
8.1.1 LTE Band 12, 17



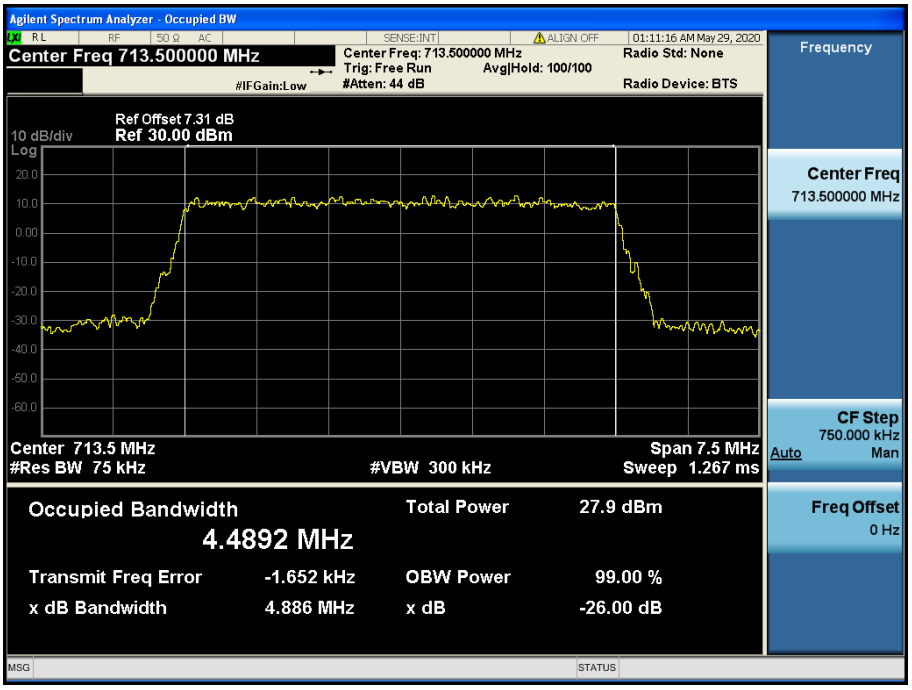
LTE Band 12 / 10 MHz / QPSK - RB Size 50



LTE Band 12 / 10 MHz / 16QAM - RB Size 50

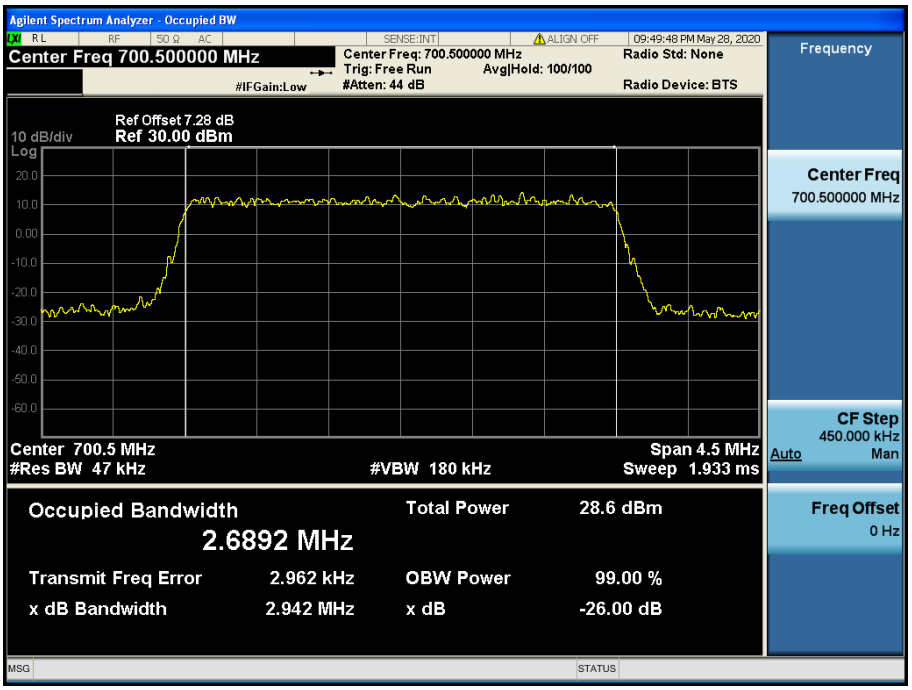


LTE Band 12 / 5 MHz / QPSK - RB Size 25

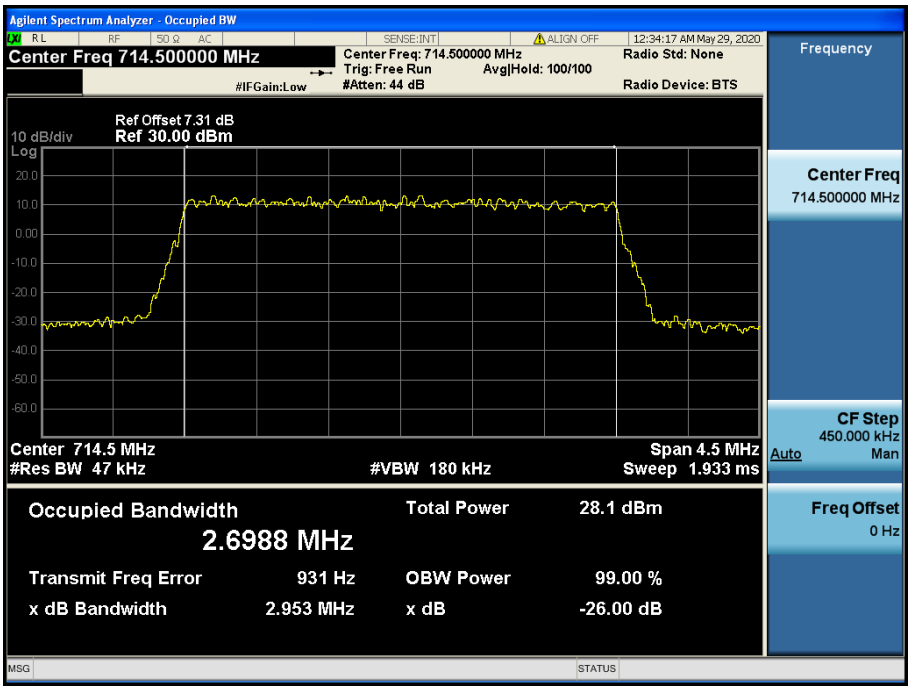


LTE Band 12 / 5 MHz / 16QAM - RB Size 25

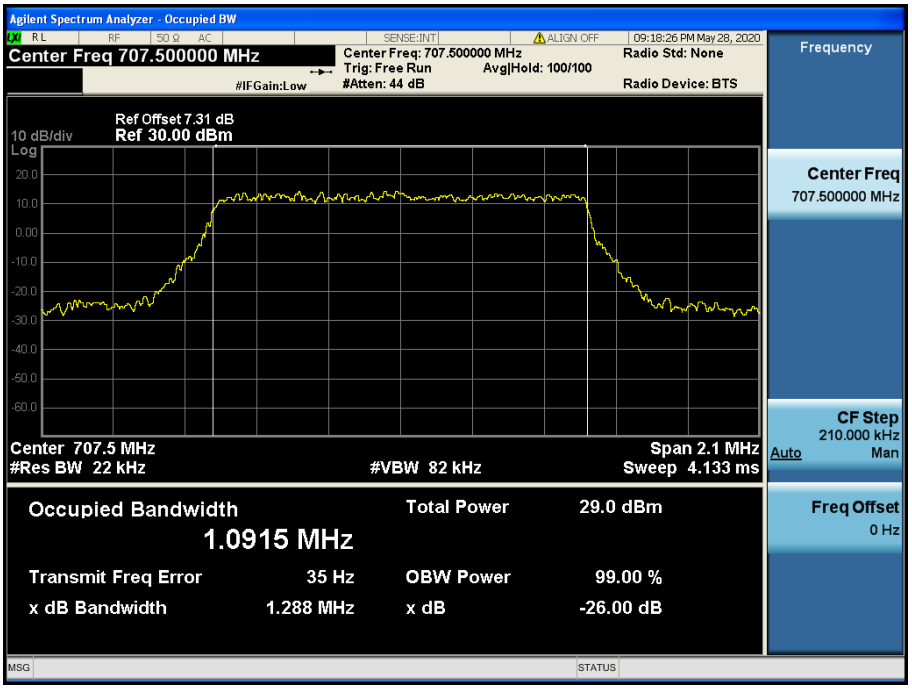
8.1.2 LTE Band 12



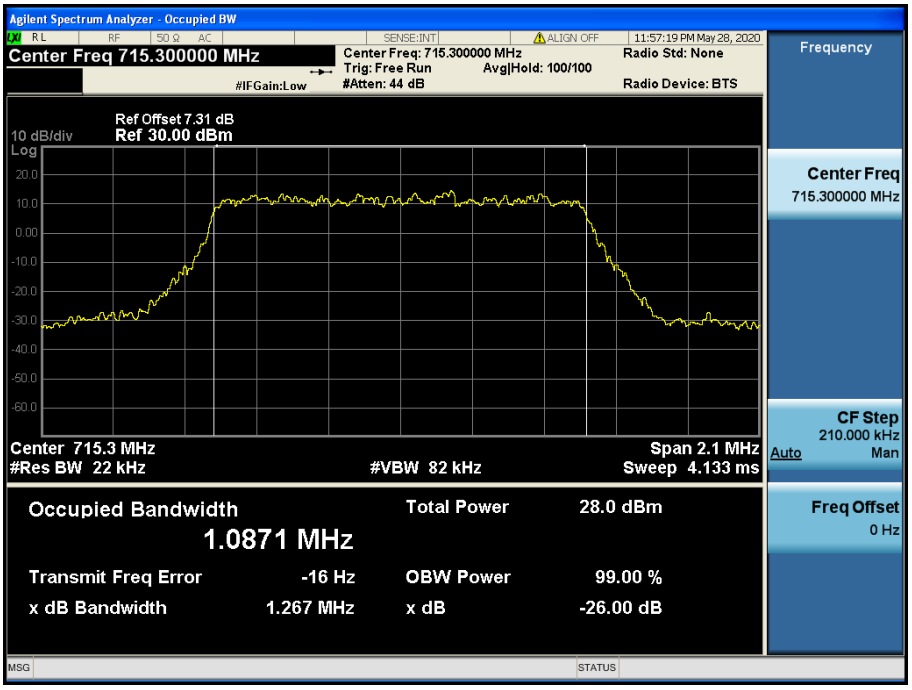
LTE Band 12 / 3 MHz / QPSK - RB Size 15



LTE Band 12 / 3 MHz / 16QAM - RB Size 15

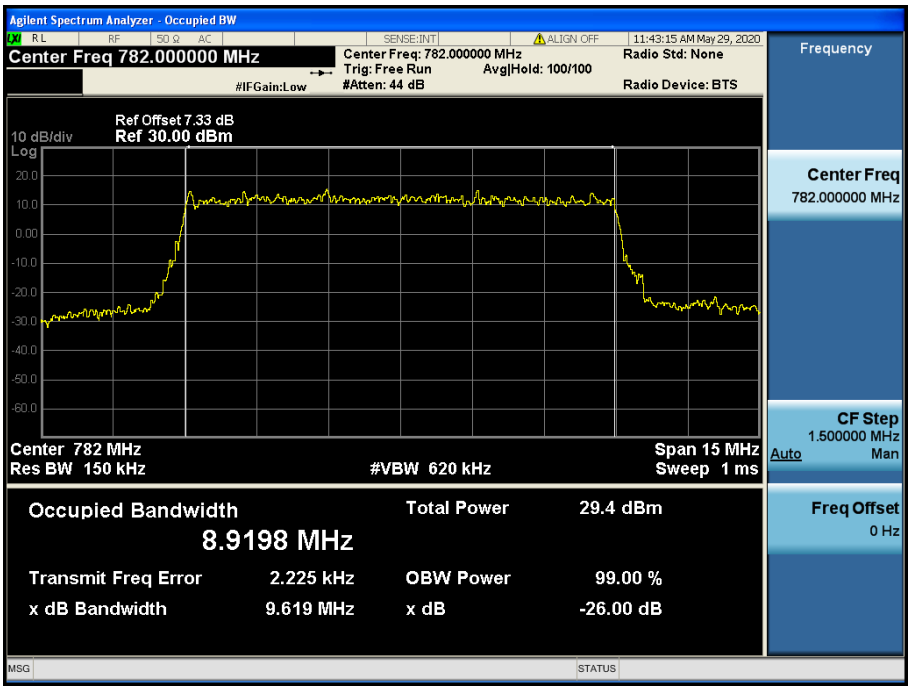


LTE Band 12 / 1.4 MHz / QPSK - RB Size 6

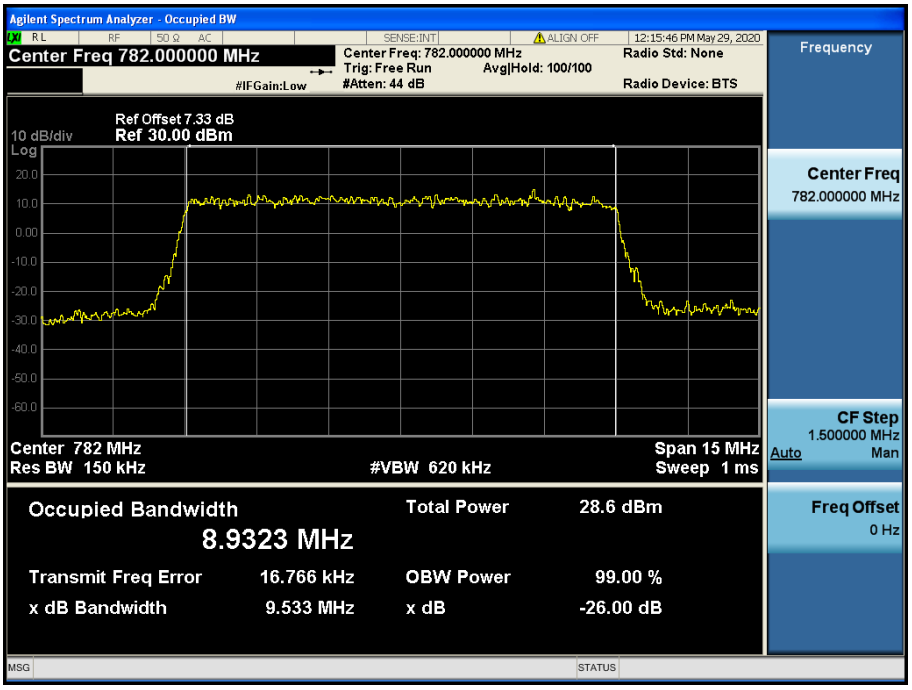


LTE Band 12 / 1.4 MHz / 16QAM - RB Size 6

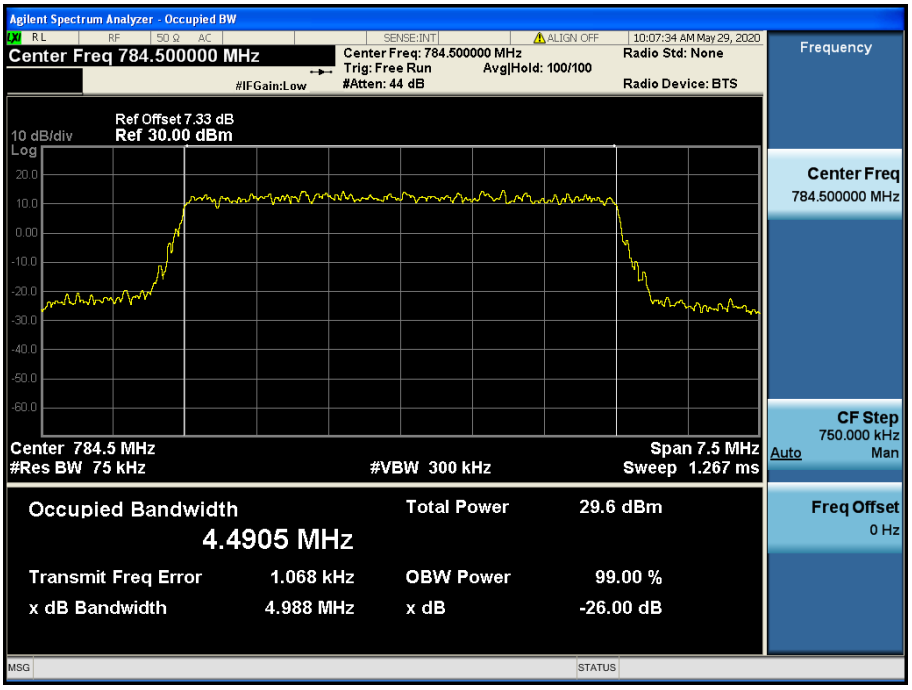
8.1.3 LTE Band 13



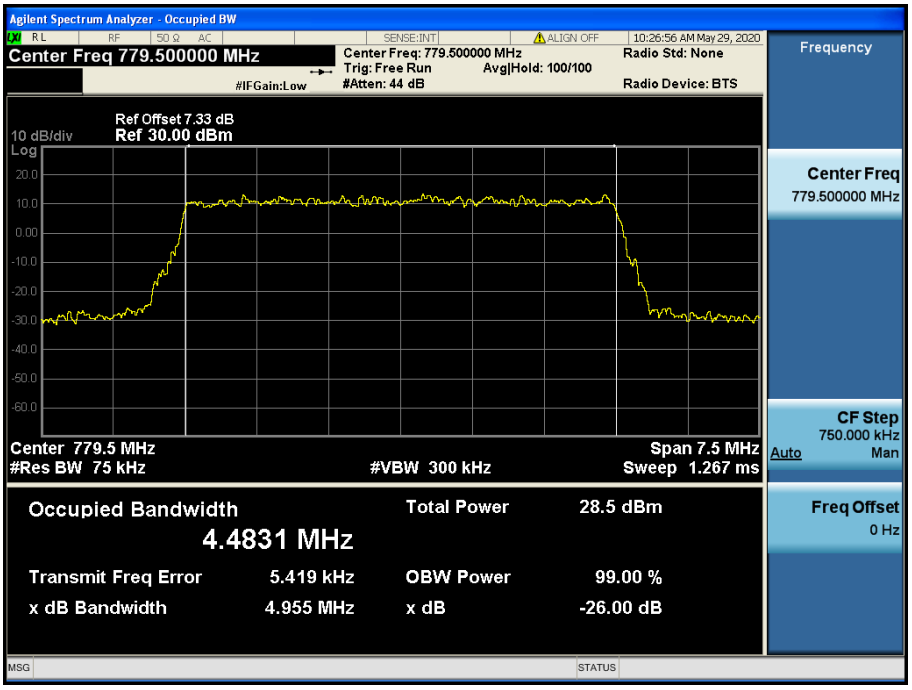
LTE Band 13 / 10 MHz / QPSK - RB Size 50



LTE Band 13 / 10 MHz / 16QAM - RB Size 50

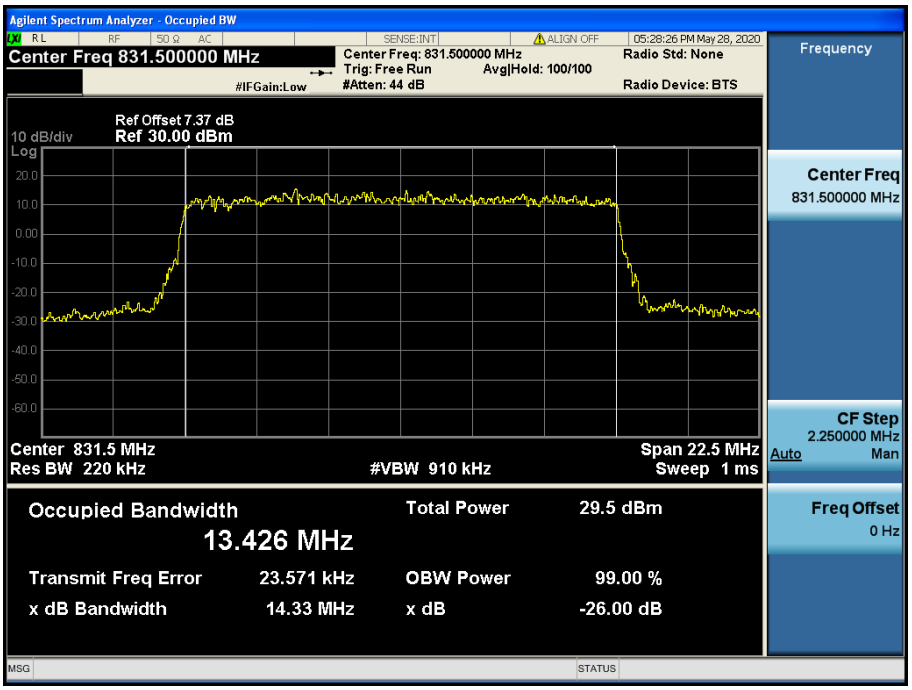


LTE Band 13 / 5 MHz / QPSK - RB Size 25

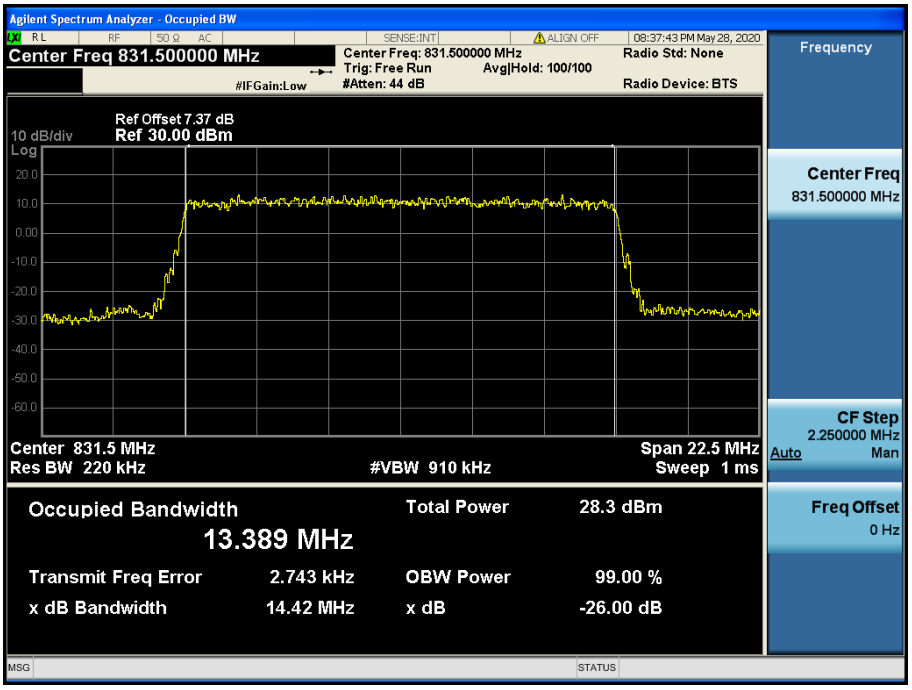


LTE Band 13 / 5 MHz / 16QAM - RB Size 25

8.1.4 LTE Band 26

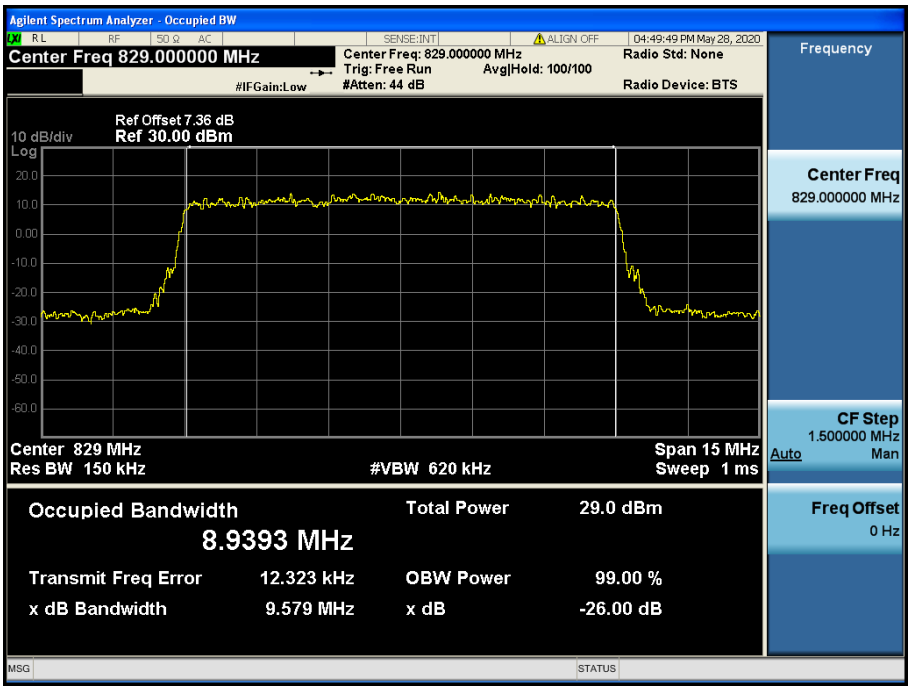


LTE Band 26 / 15 MHz / QPSK - RB Size 75

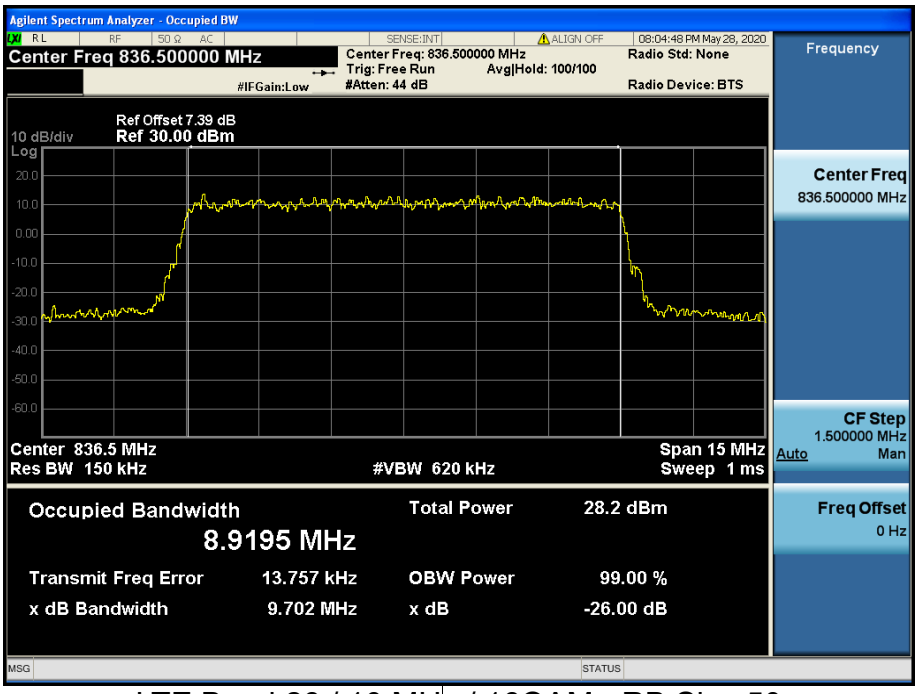


LTE Band 26 / 15 MHz / 16QAM - RB Size 75

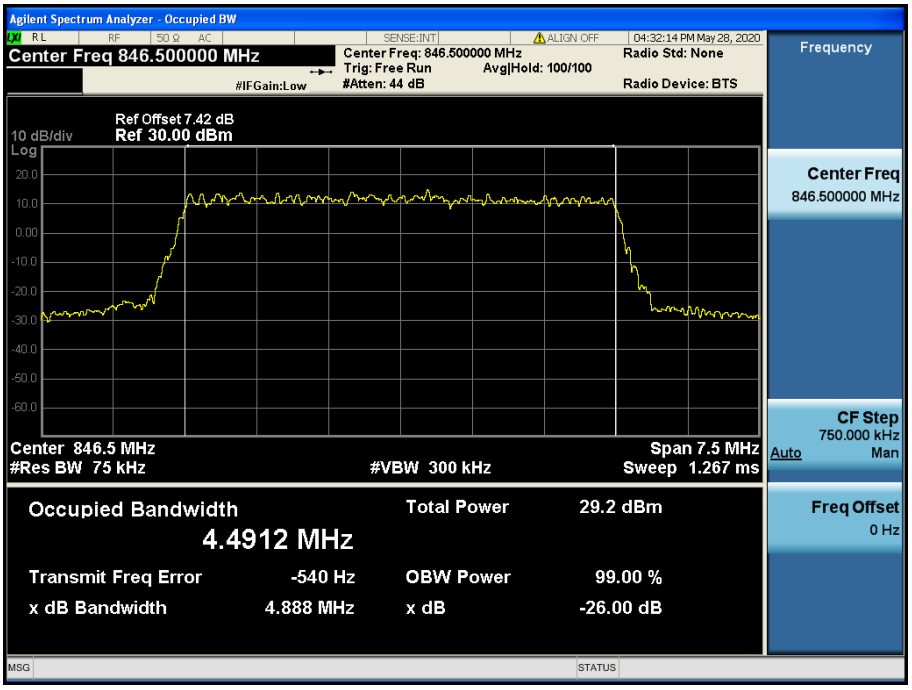
8.1.5 LTE Band 5, 26



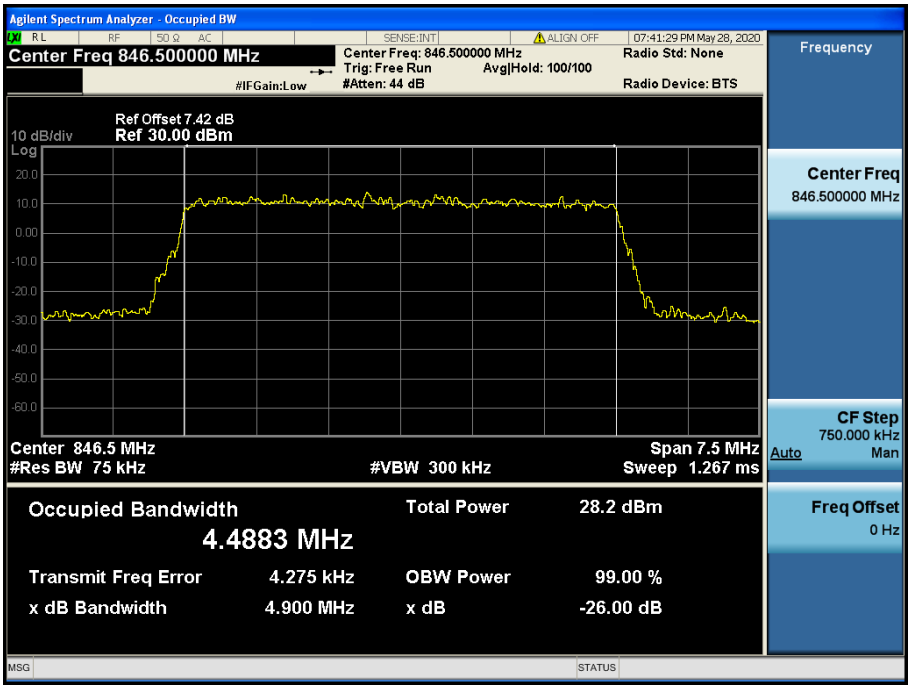
LTE Band 26 / 10 MHz / QPSK - RB Size 50



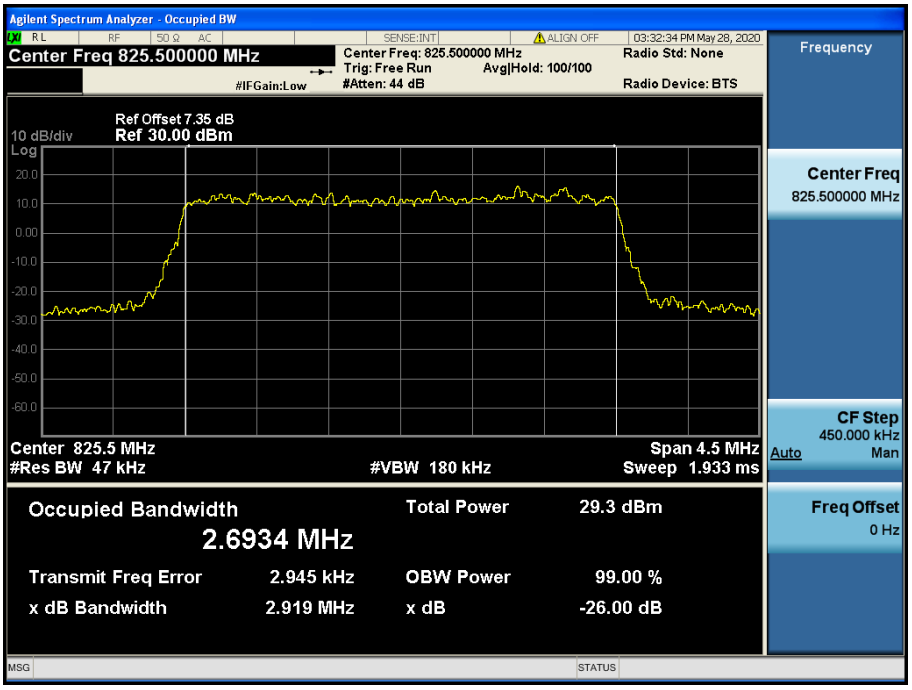
LTE Band 26 / 10 MHz / 16QAM - RB Size 50



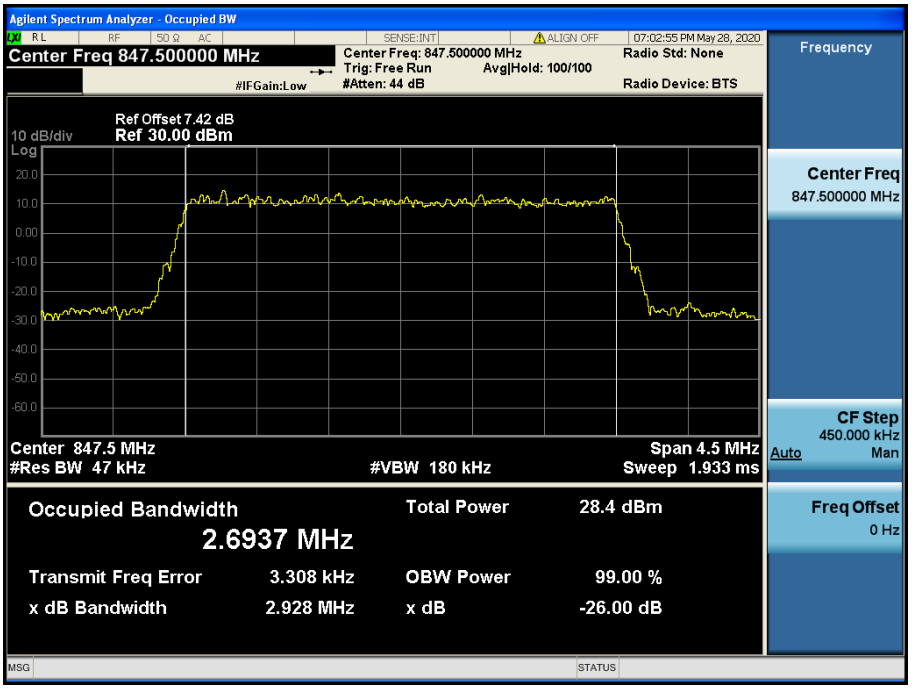
LTE Band 26 / 5 MHz / QPSK - RB Size 25



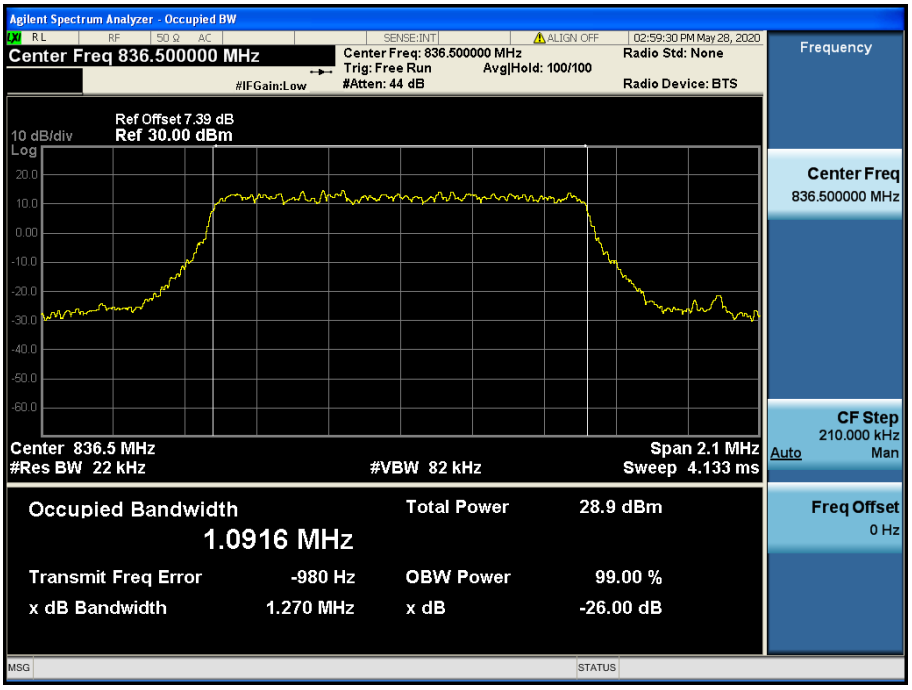
LTE Band 26 / 5 MHz / 16QAM - RB Size 25



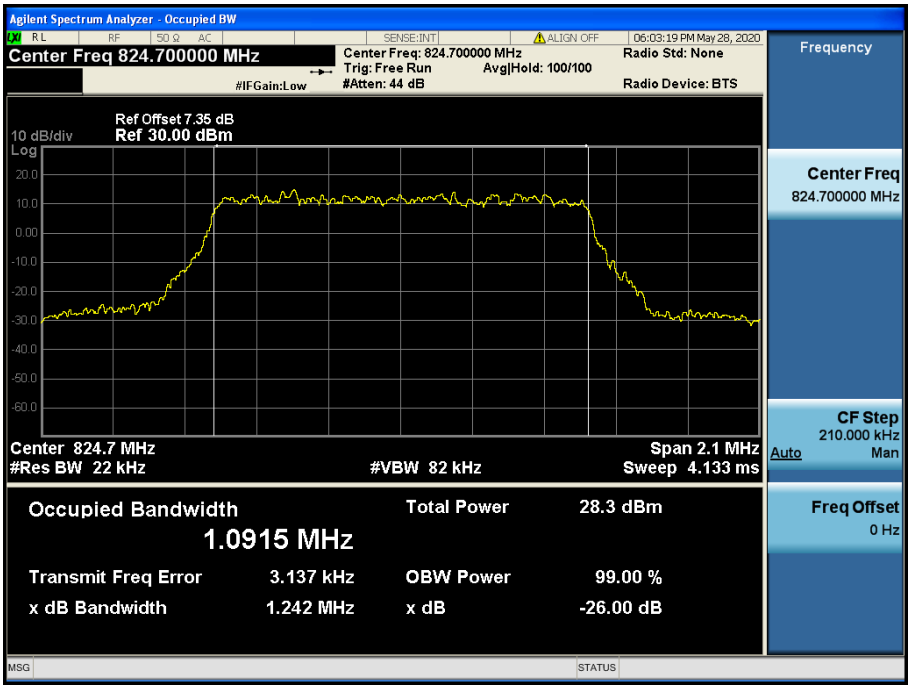
LTE Band 26 / 3 MHz / QPSK - RB Size 15



LTE Band 26 / 3 MHz / 16QAM - RB Size 15

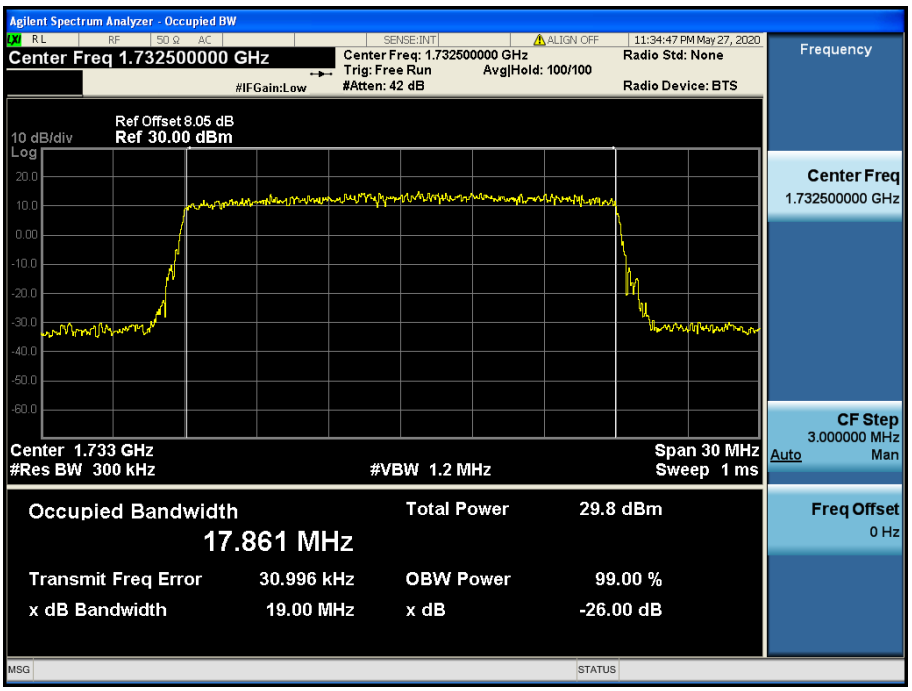


LTE Band 26 / 1.4 MHz / QPSK - RB Size 6

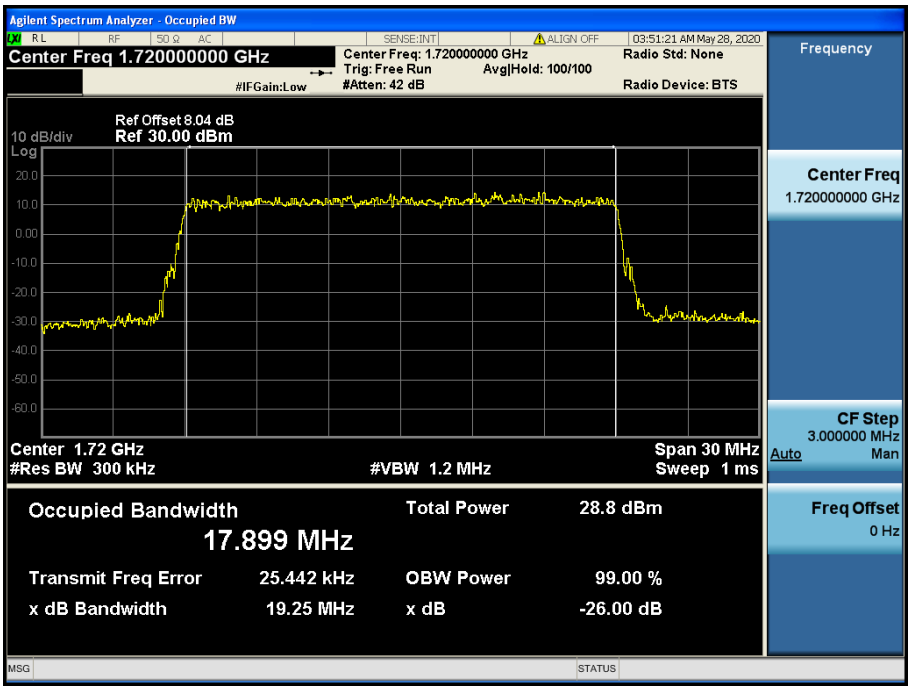


LTE Band 26 / 1.4 MHz / 16QAM - RB Size 6

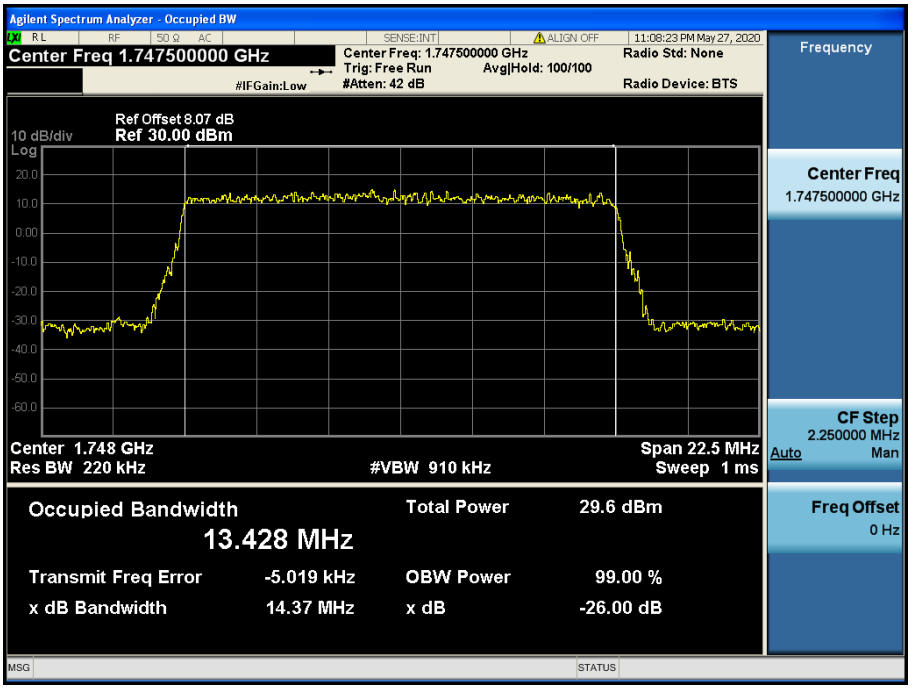
8.1.6 LTE Band 4



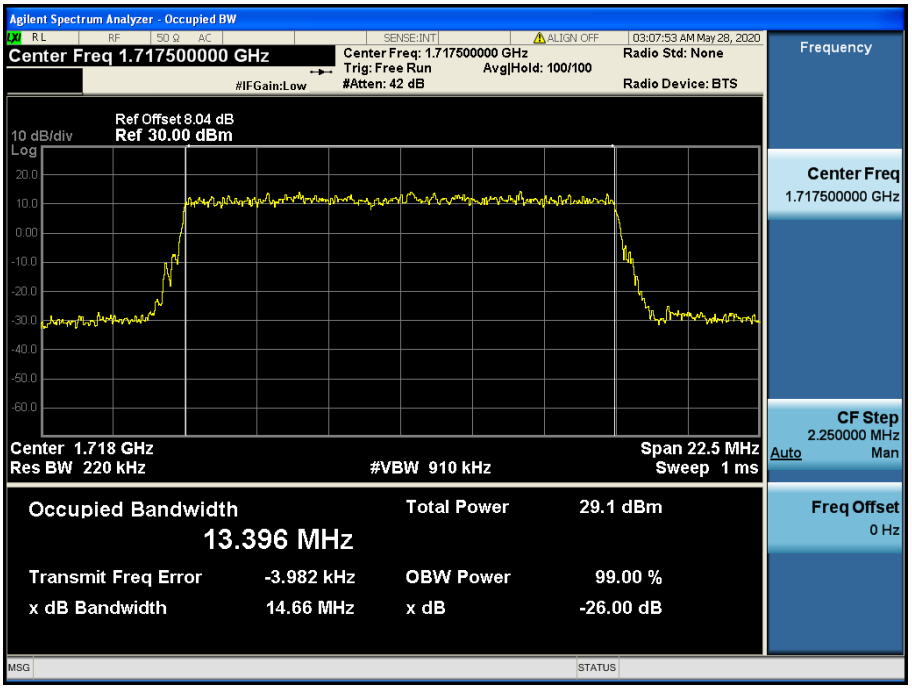
LTE Band 4 / 20 MHz / QPSK - RB Size 100



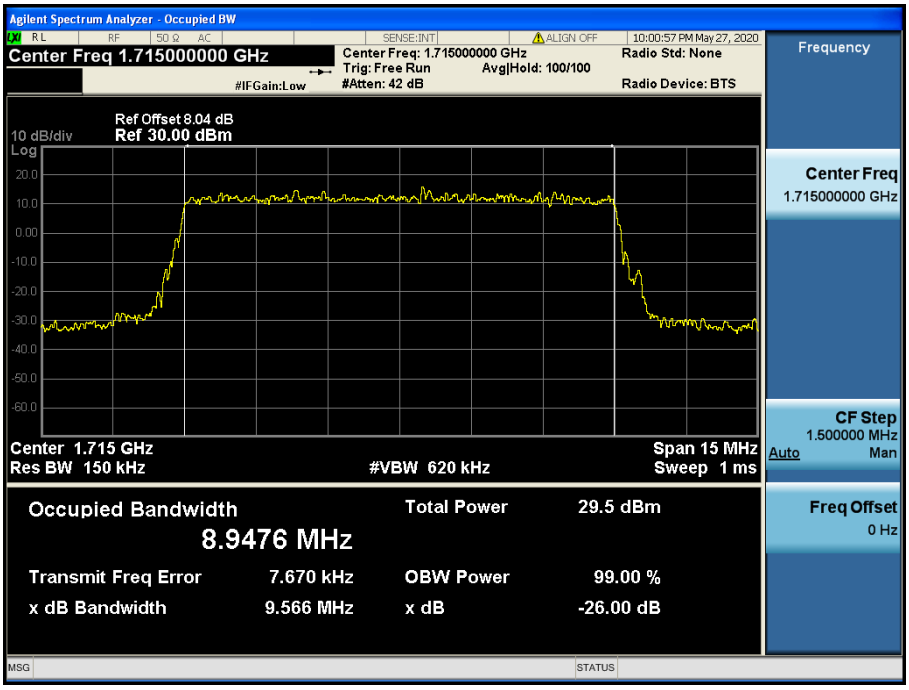
LTE Band 4 / 20 MHz / 16QAM - RB Size 100



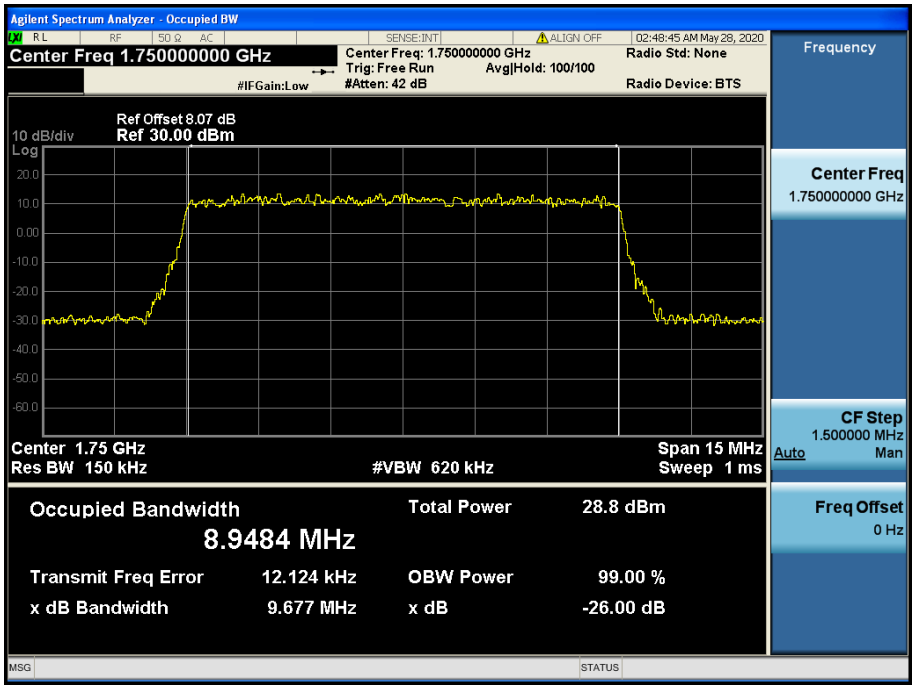
LTE Band 4 / 15 MHz / QPSK - RB Size 75



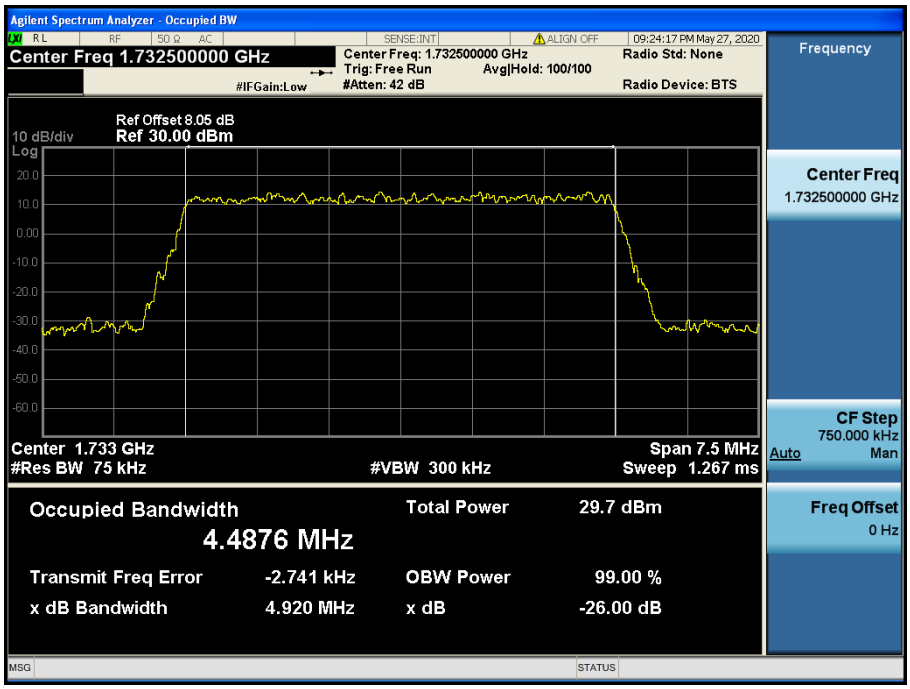
LTE Band 4 / 15 MHz / 16QAM - RB Size 75



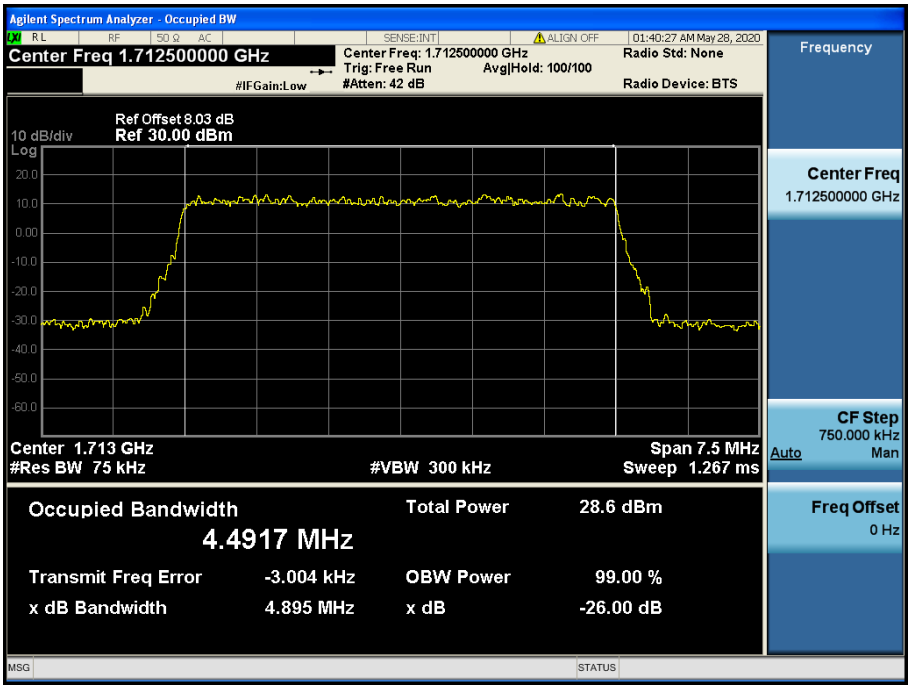
LTE Band 4 / 10 MHz / QPSK - RB Size 50



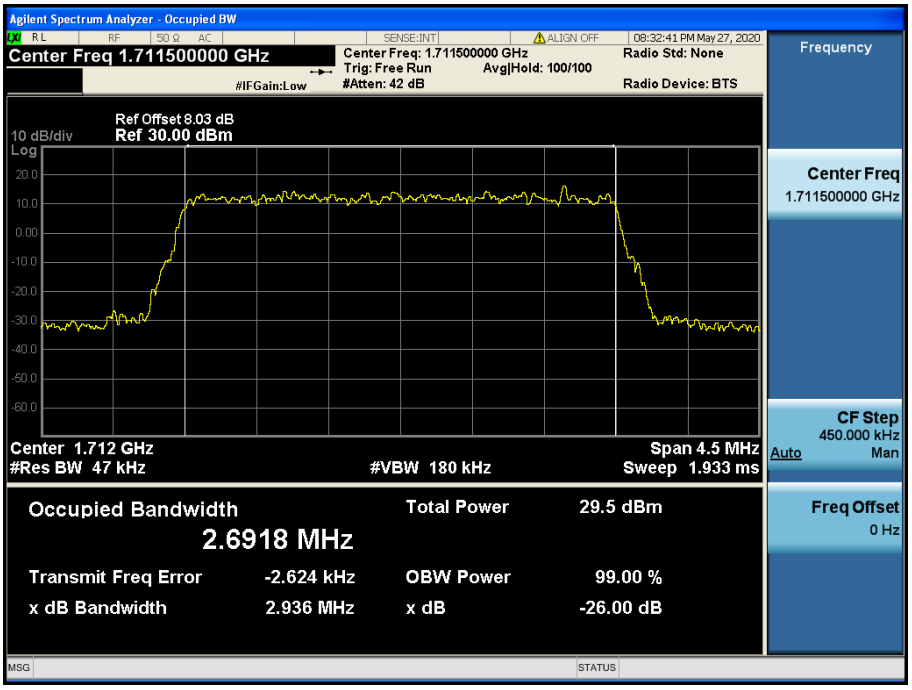
LTE Band 4 / 10 MHz / 16QAM - RB Size 50



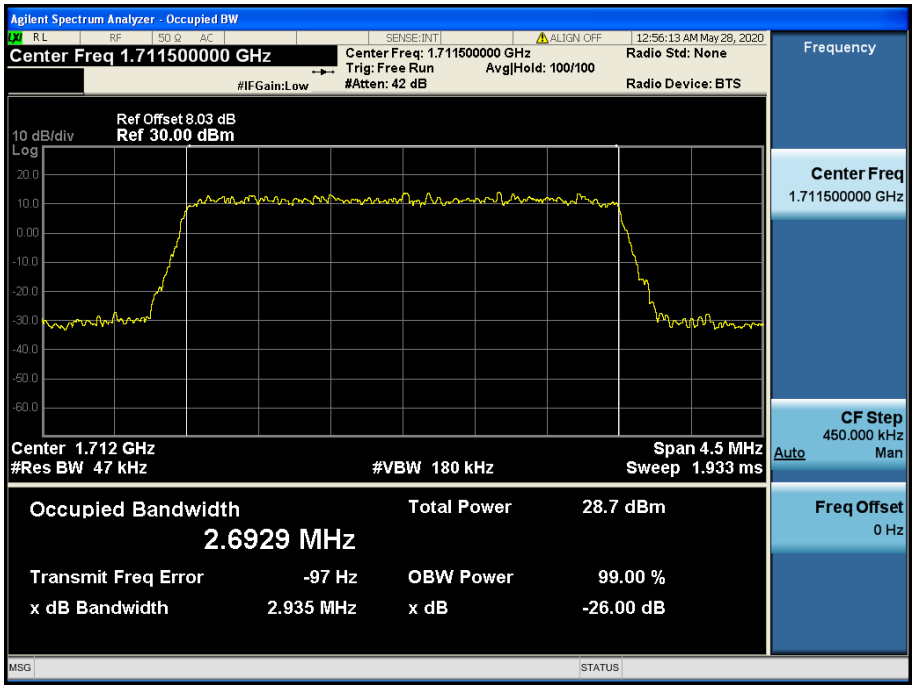
LTE Band 4 / 5 MHz / QPSK - RB Size 25



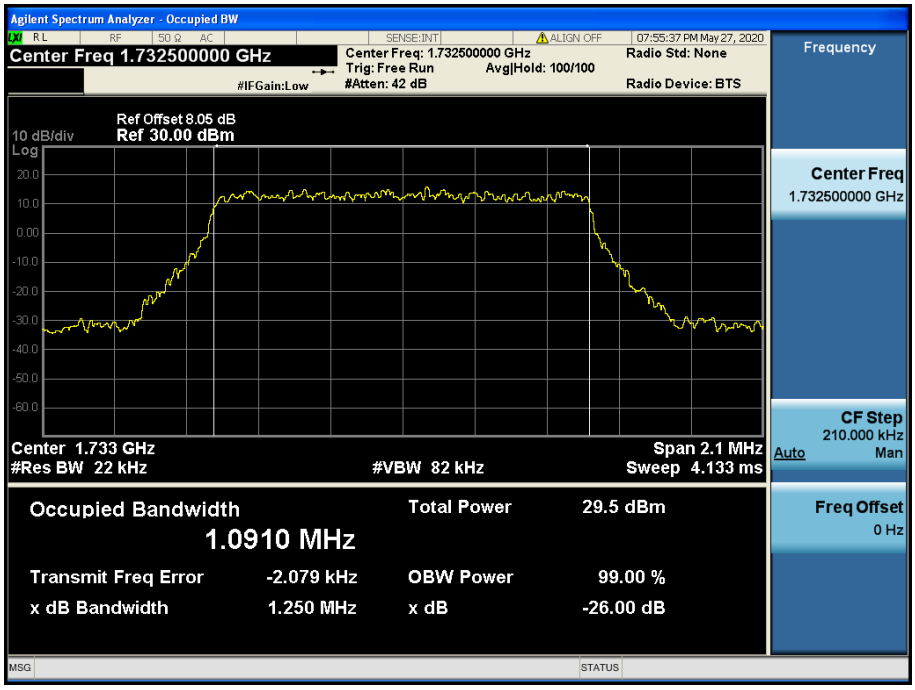
LTE Band 4 / 5 MHz / 16QAM - RB Size 25



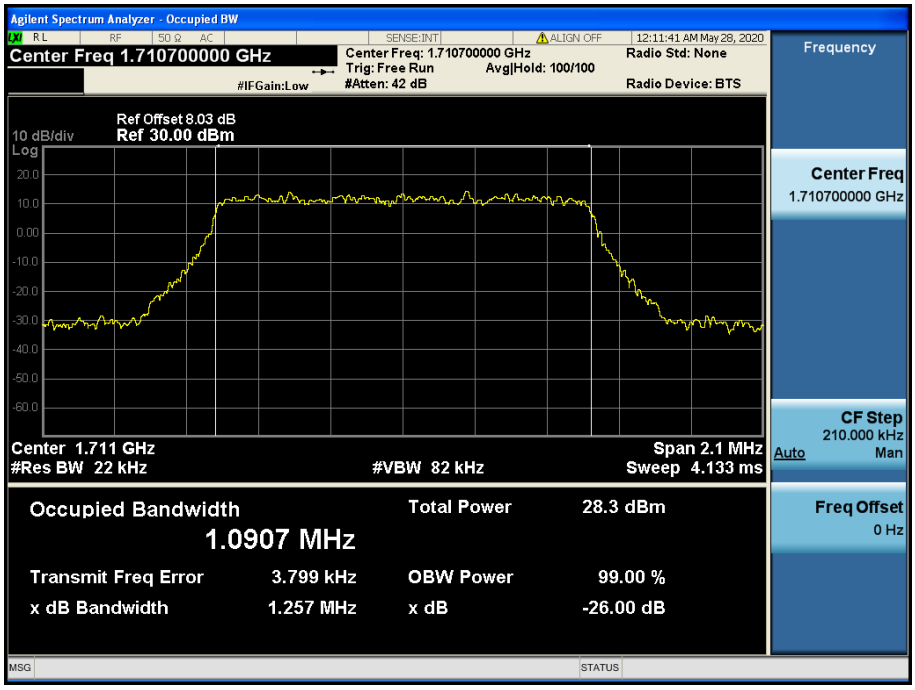
LTE Band 4 / 3 MHz / QPSK - RB Size 15



LTE Band 4 / 3 MHz / 16QAM - RB Size 15

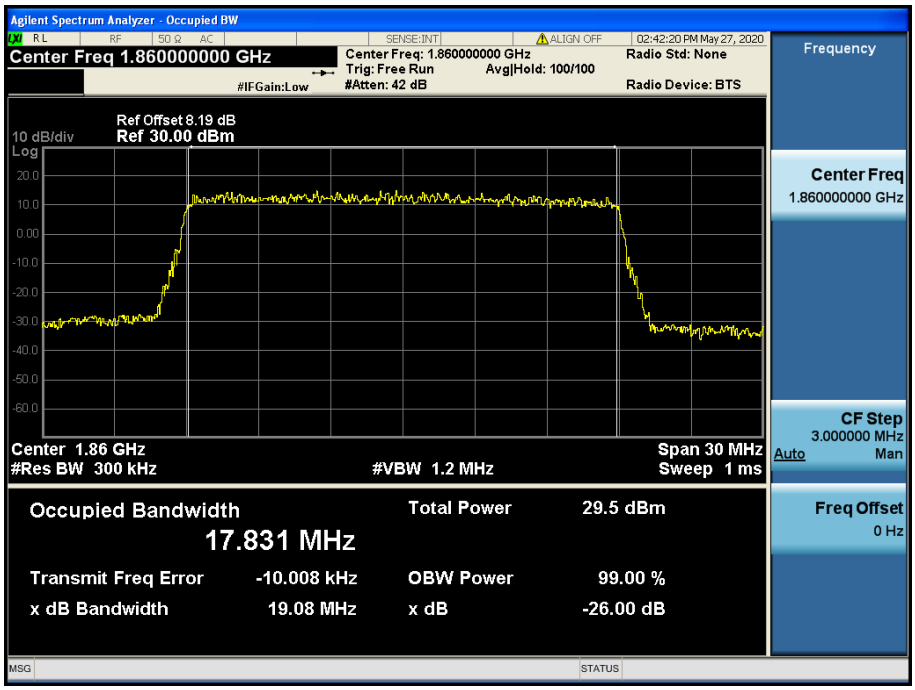


LTE Band 4 / 1.4 MHz / QPSK - RB Size 6

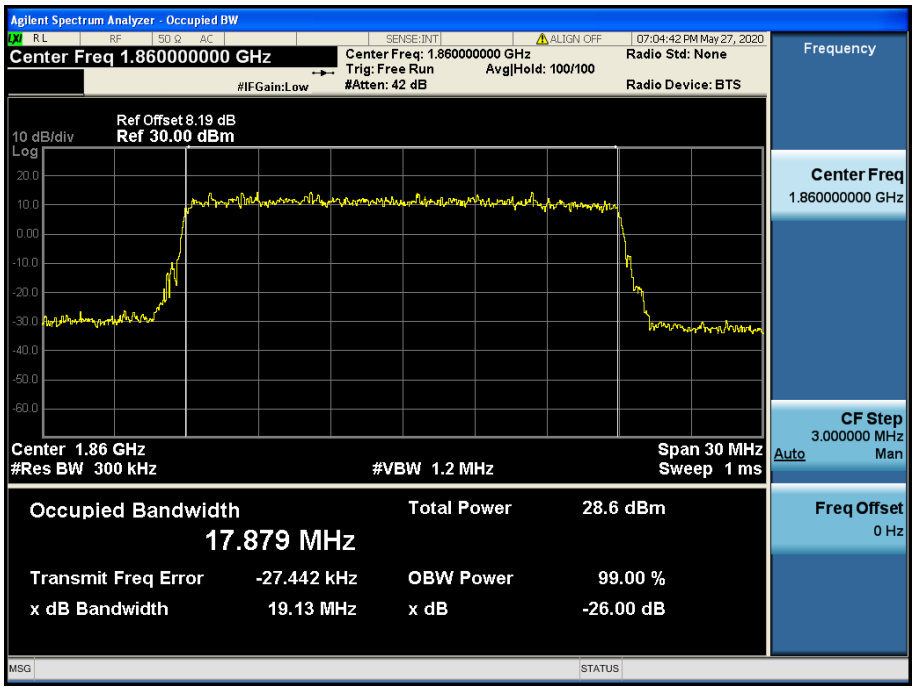


LTE Band 4 / 1.4 MHz / 16QAM - RB Size 6

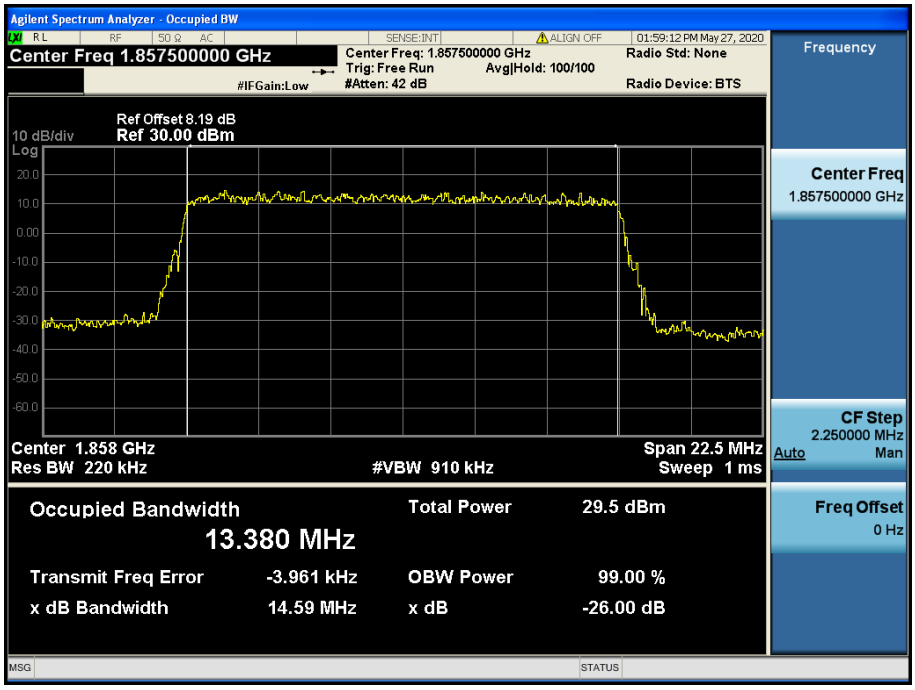
8.1.7 LTE Band 2, 25



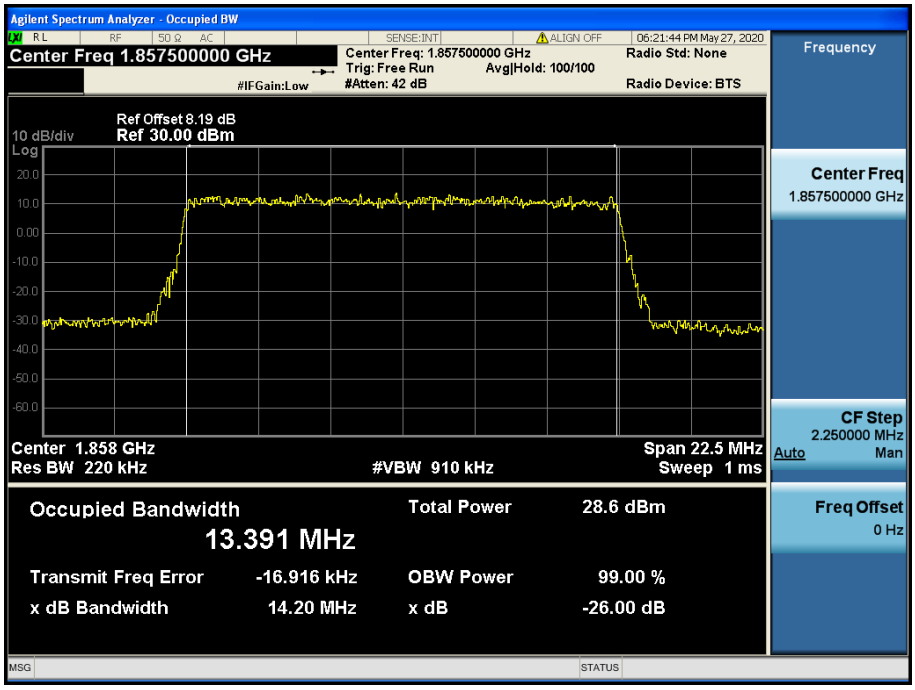
LTE Band 25 / 20 MHz / QPSK - RB Size 100



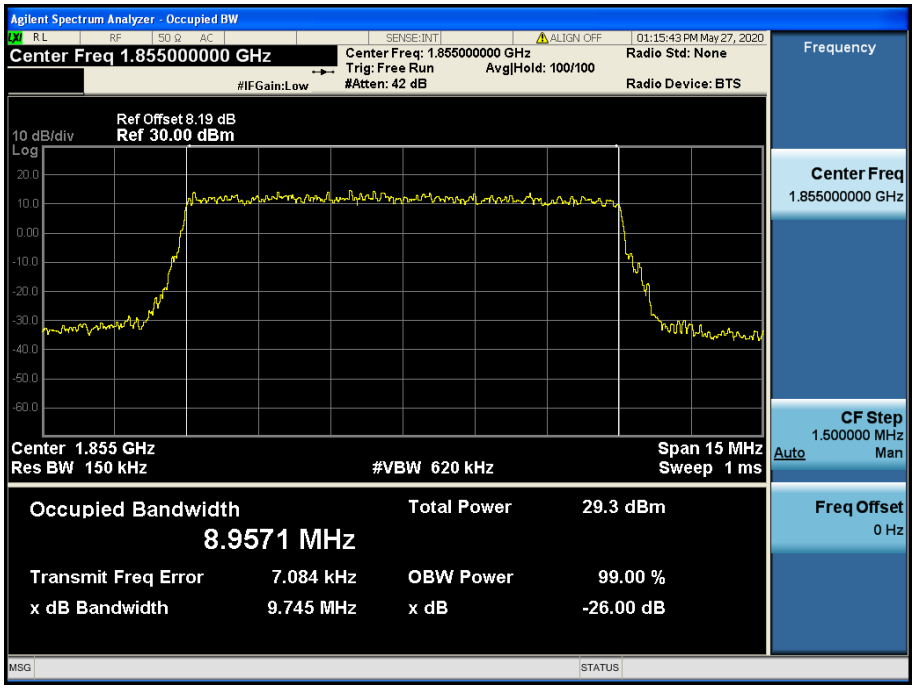
LTE Band 25 / 20 MHz / 16QAM - RB Size 100



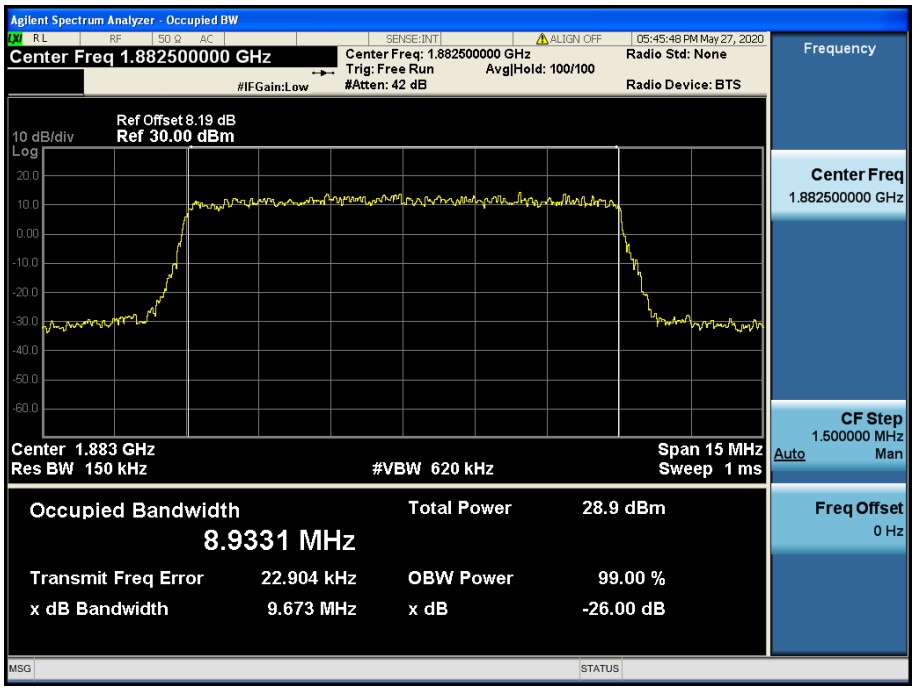
LTE Band 25 / 15 MHz / QPSK - RB Size 75



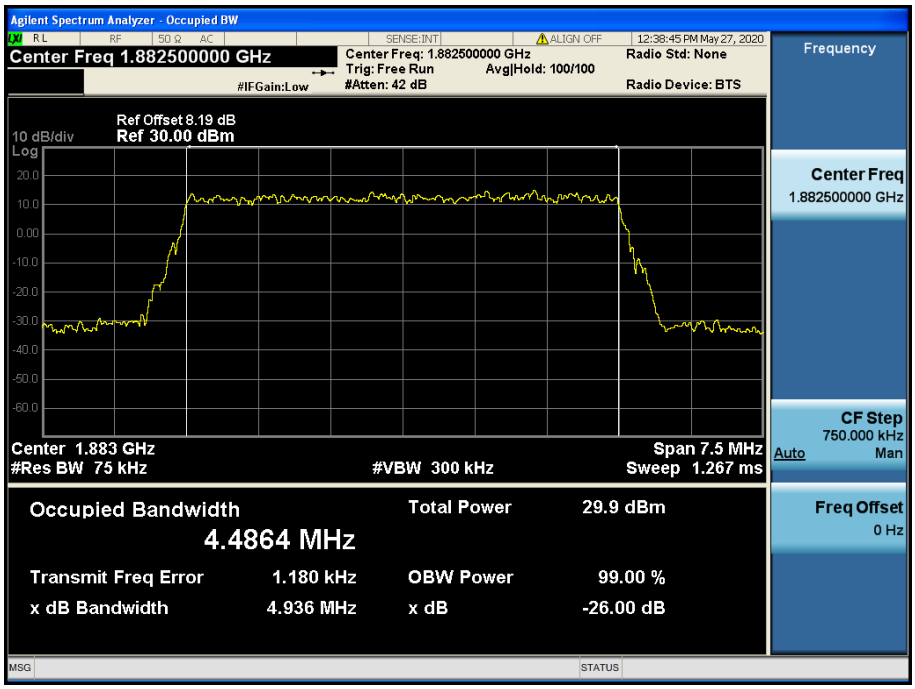
LTE Band 25 / 15 MHz / 16QAM - RB Size 75



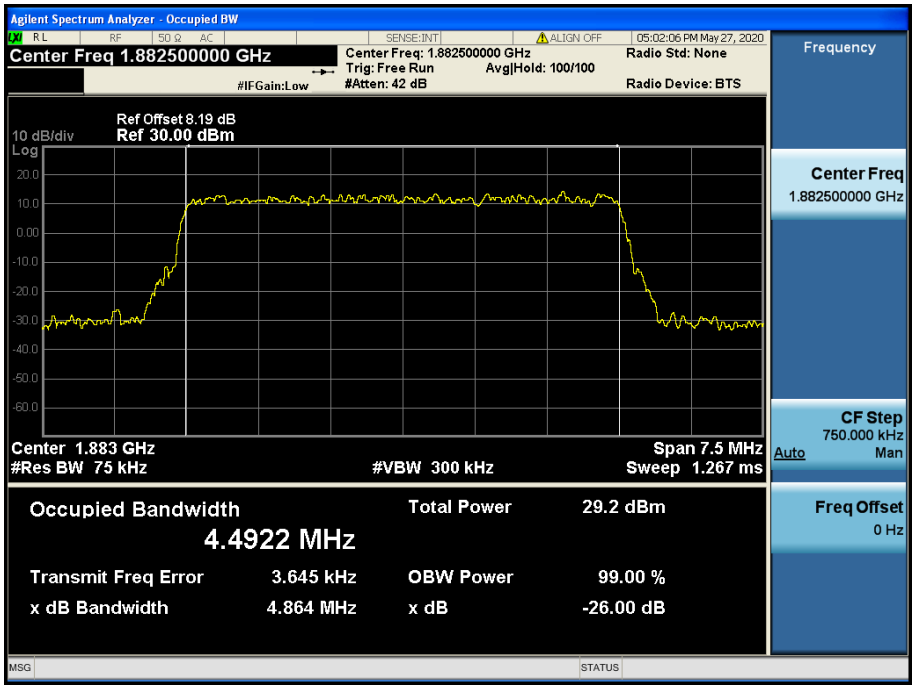
LTE Band 25 / 10 MHz / QPSK - RB Size 50



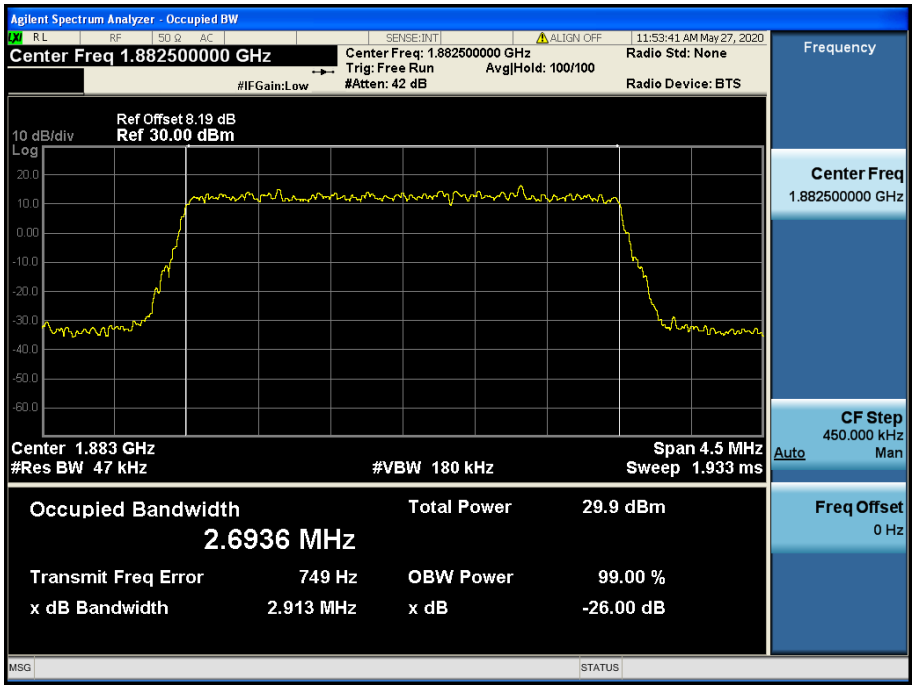
LTE Band 25 / 10 MHz / 16QAM - RB Size 50



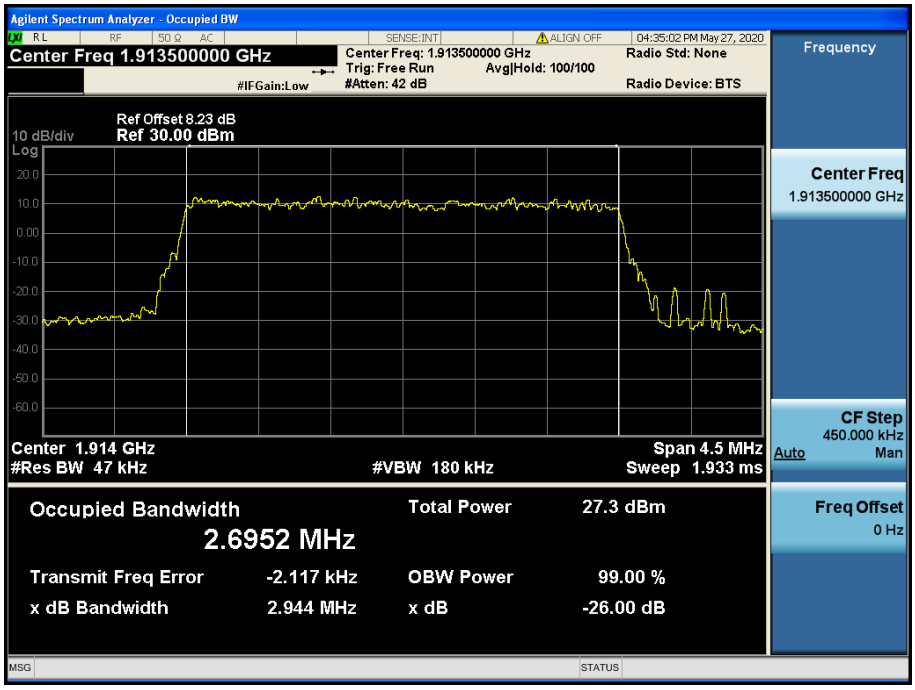
LTE Band 25 / 5 MHz / QPSK - RB Size 25



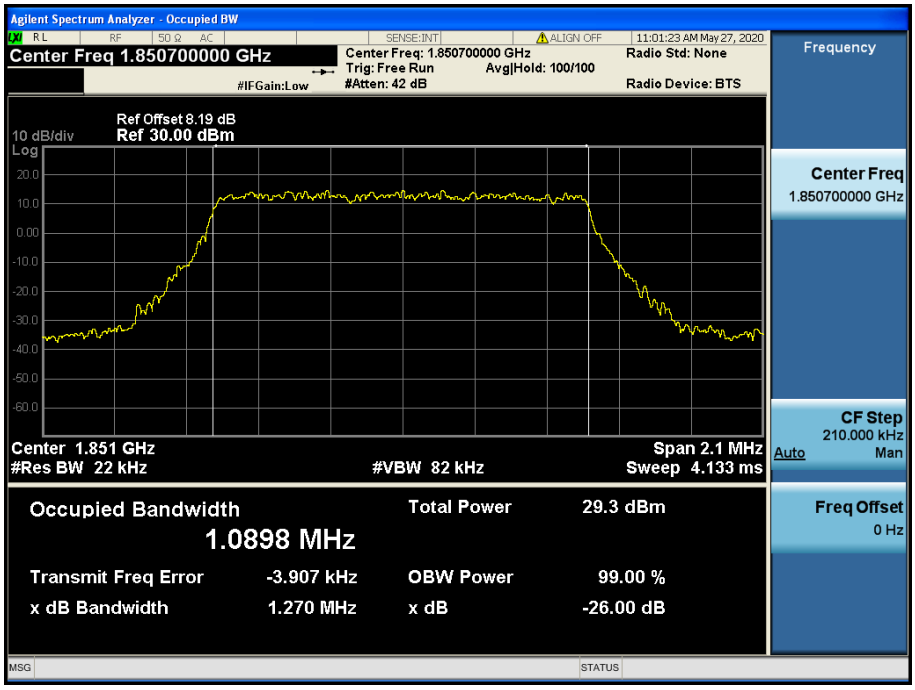
LTE Band 25 / 5 MHz / 16QAM - RB Size 25



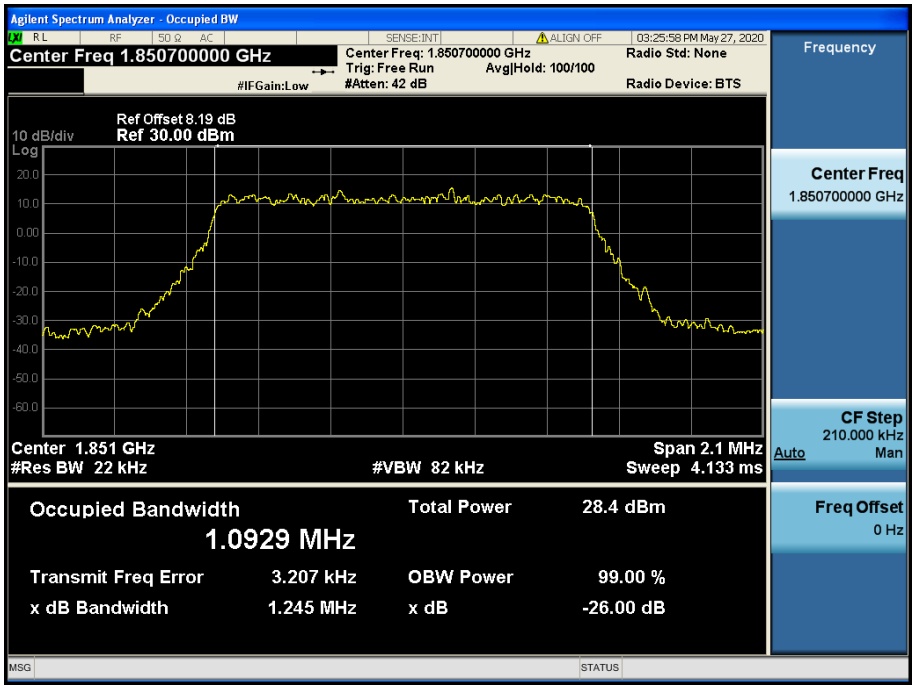
LTE Band 25 / 3 MHz / QPSK - RB Size 15



LTE Band 25 / 3 MHz / 16QAM - RB Size 15

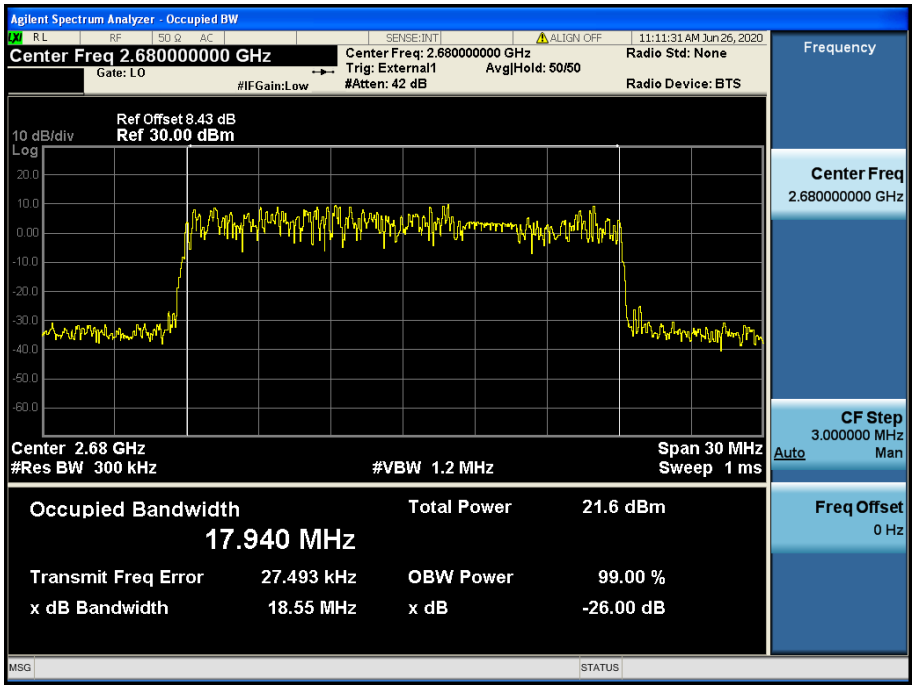


LTE Band 25 / 1.4 MHz / QPSK - RB Size 6

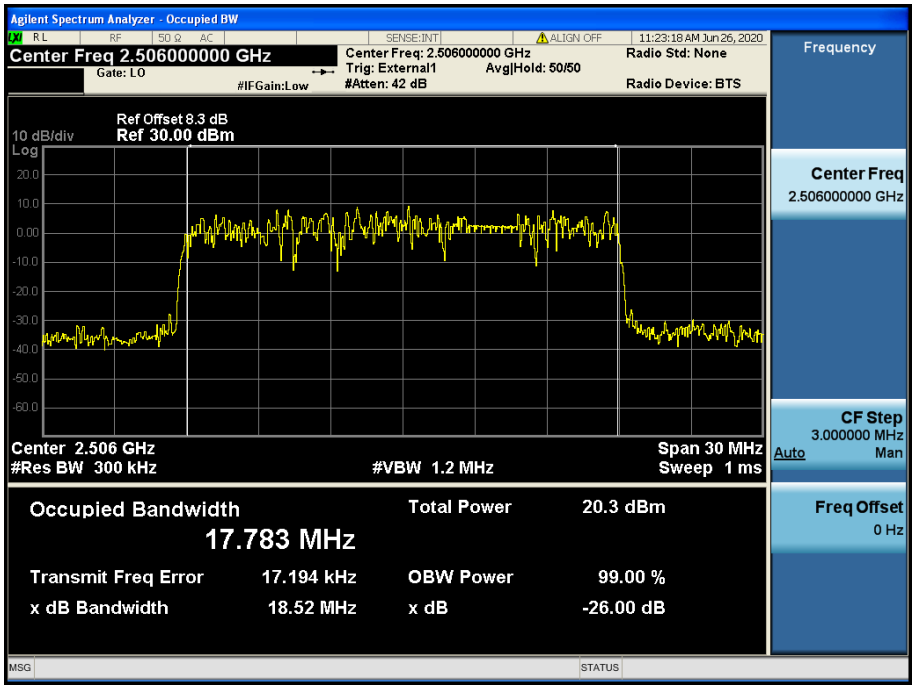


LTE Band 25 / 1.4 MHz / 16QAM - RB Size 6

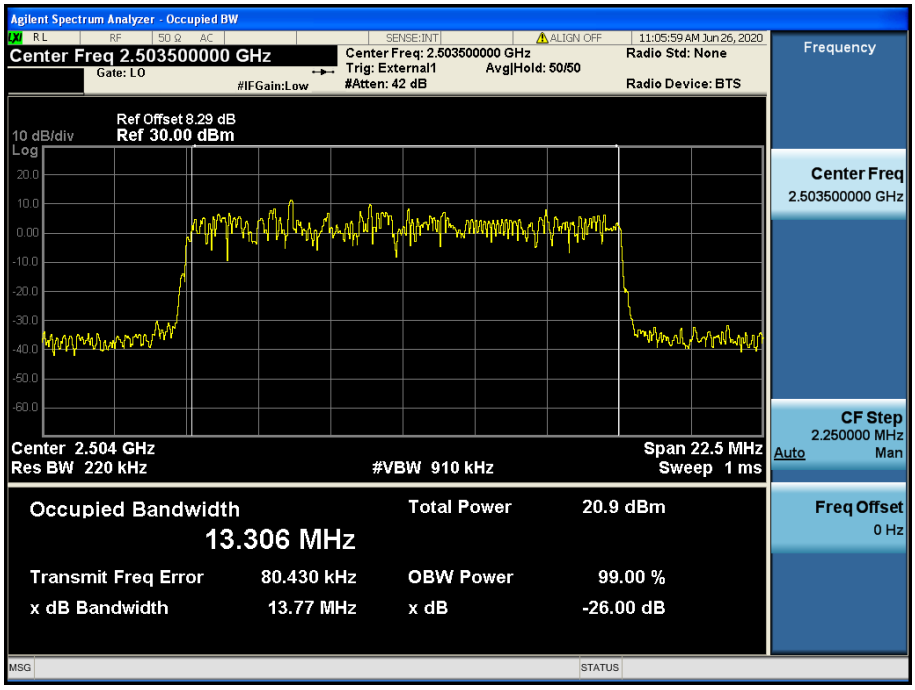
8.1.8 LTE Band 41



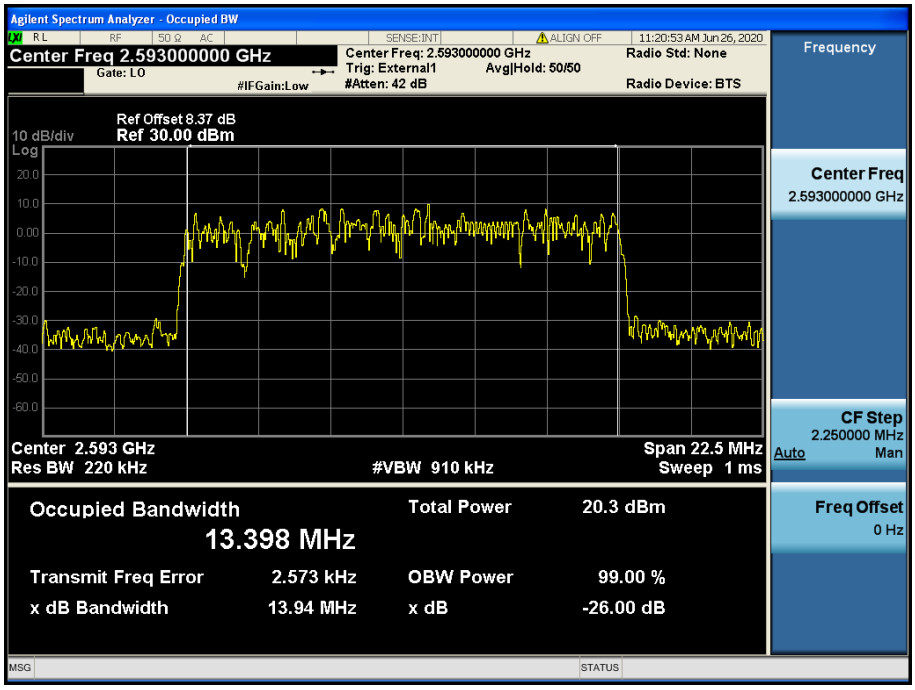
LTE Band 41 / 20 MHz / QPSK - RB Size 100



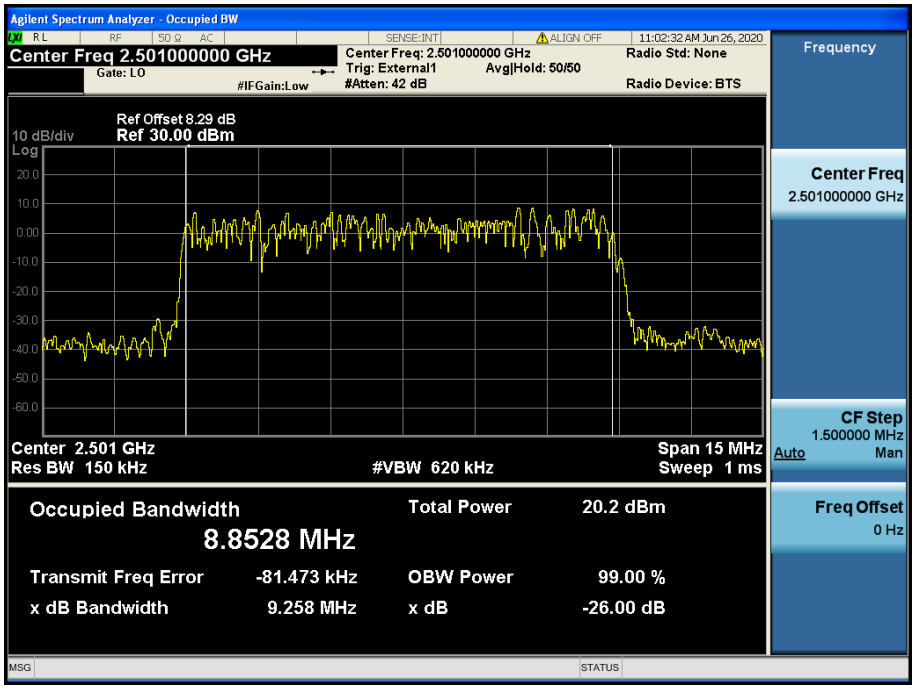
LTE Band 41 / 20 MHz / 16QAM - RB Size 100



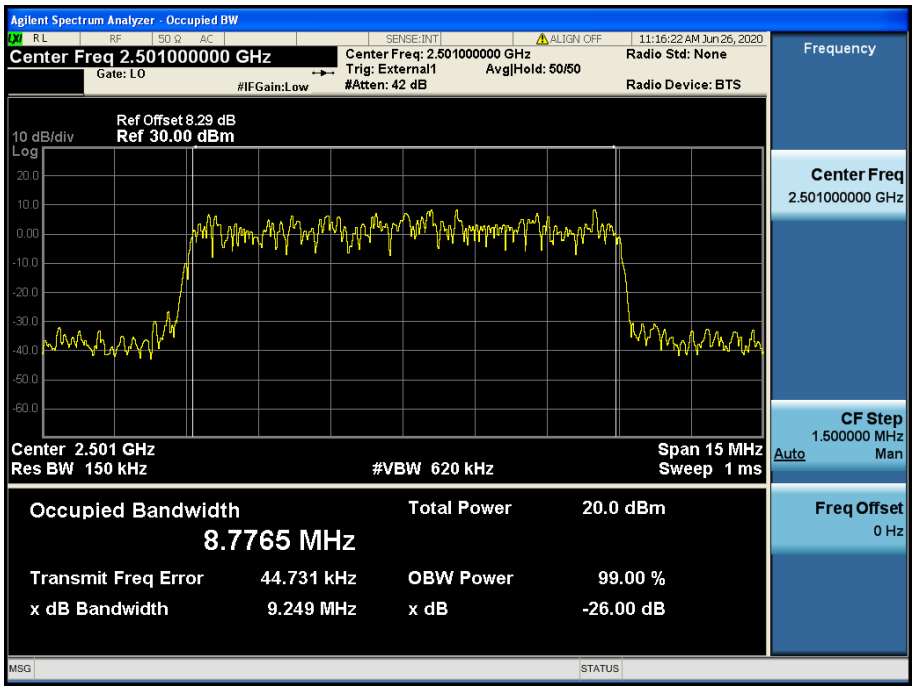
LTE Band 41 / 15 MHz / QPSK - RB Size 75



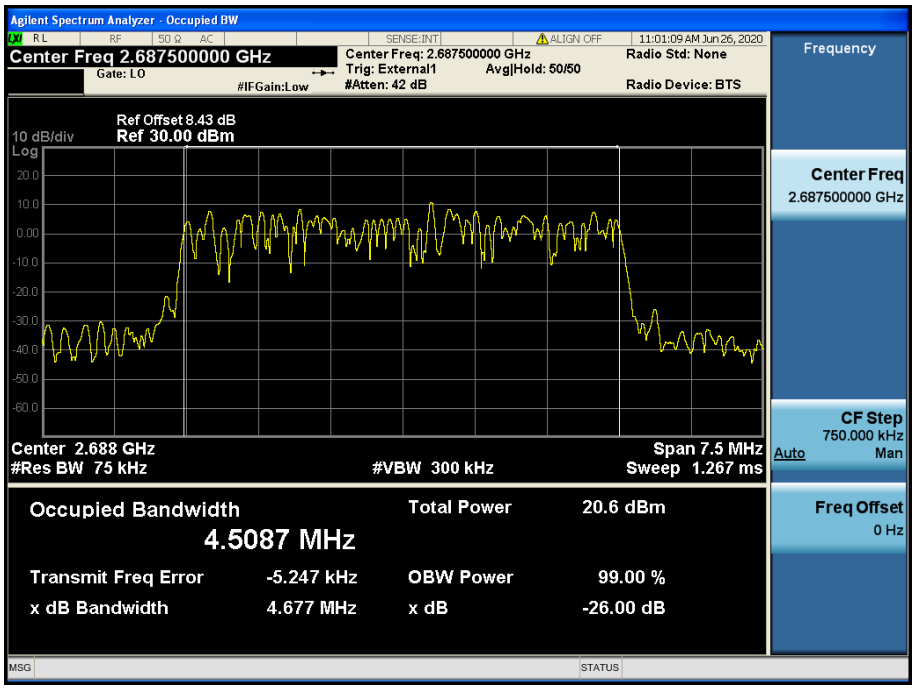
LTE Band 41 / 15 MHz / 16QAM - RB Size 75



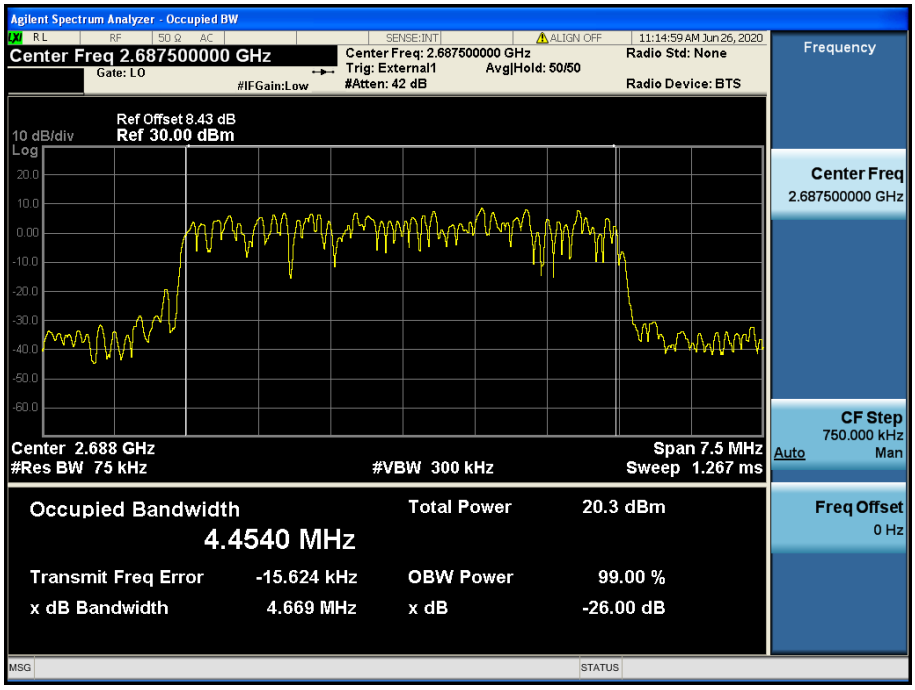
LTE Band 41 / 10 MHz / QPSK - RB Size 50



LTE Band 41 / 10 MHz / 16QAM - RB Size 50

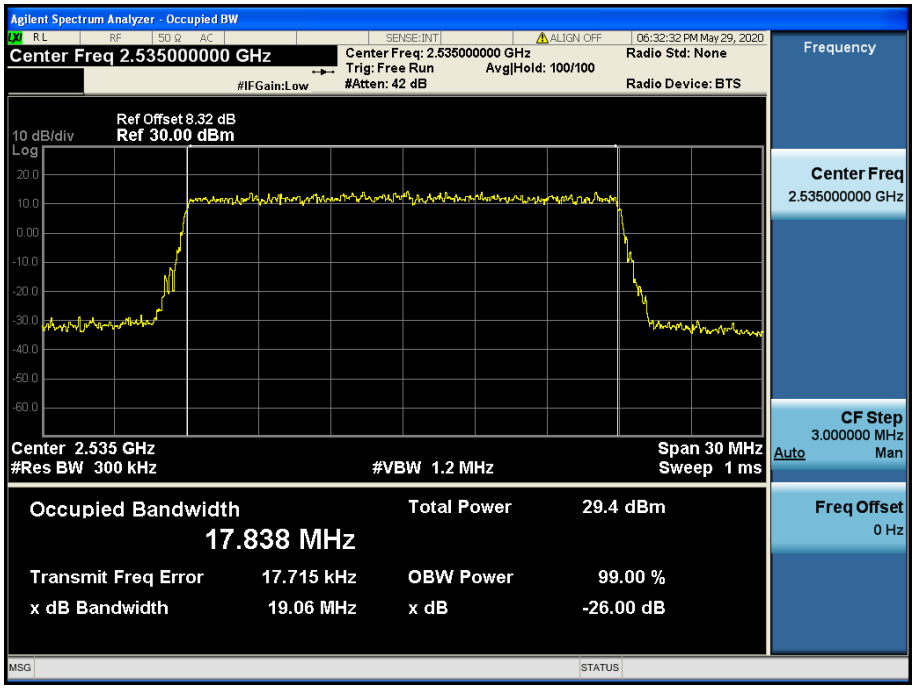


LTE Band 41 / 5 MHz / QPSK - RB Size 25

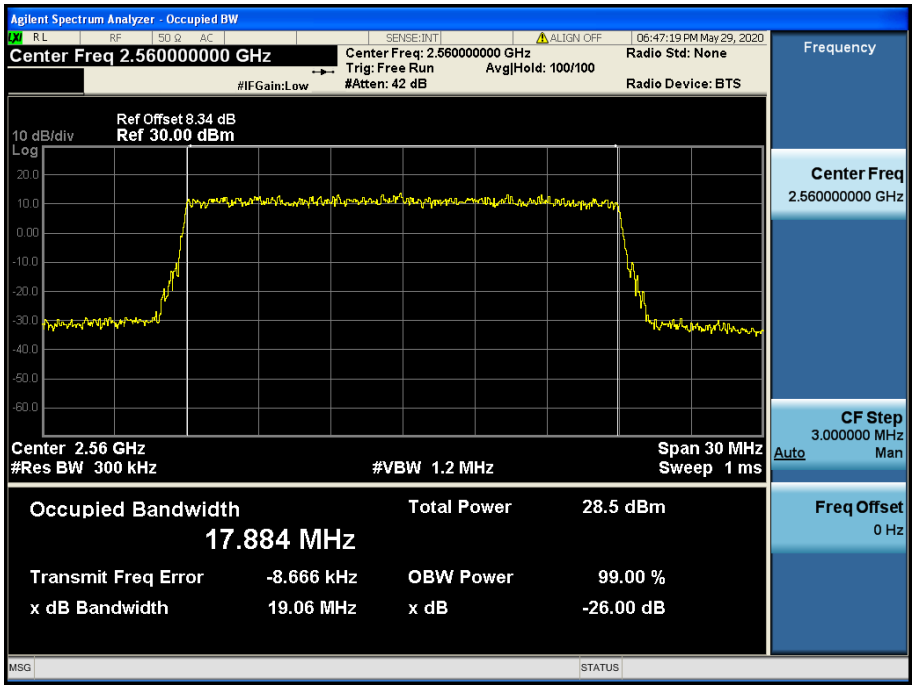


LTE Band 41 / 5 MHz / 16QAM - RB Size 25

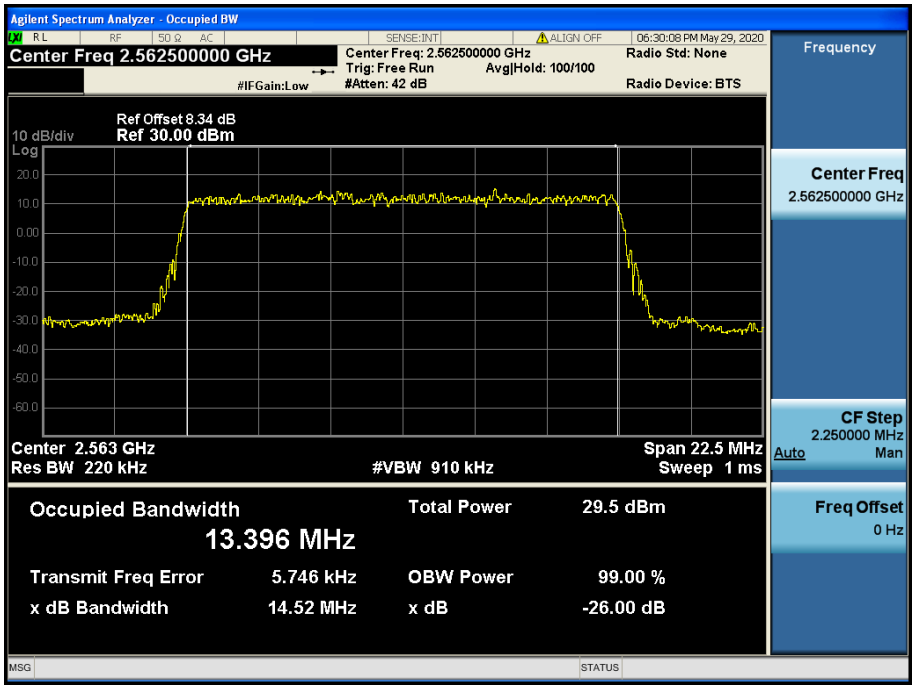
8.1.9 LTE Band 7



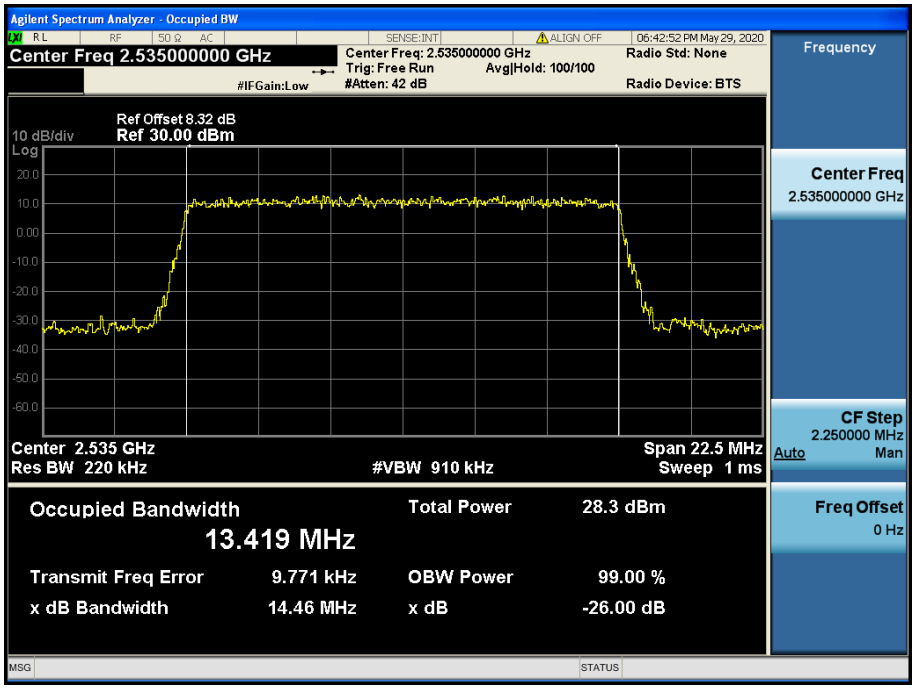
LTE Band 7 / 20 MHz / QPSK - RB Size 100



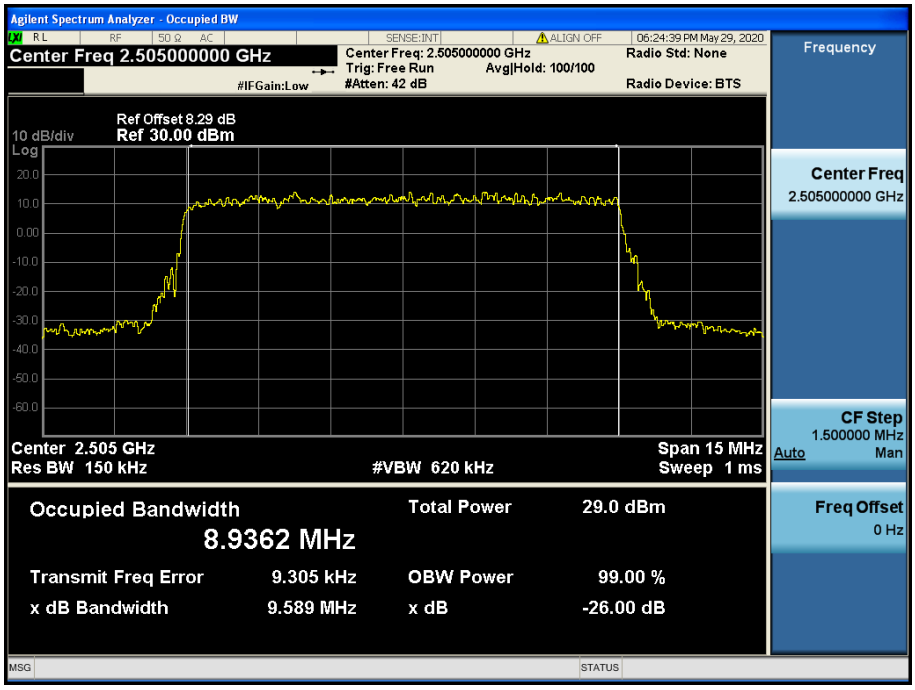
LTE Band 7 / 20 MHz / 16QAM - RB Size 100



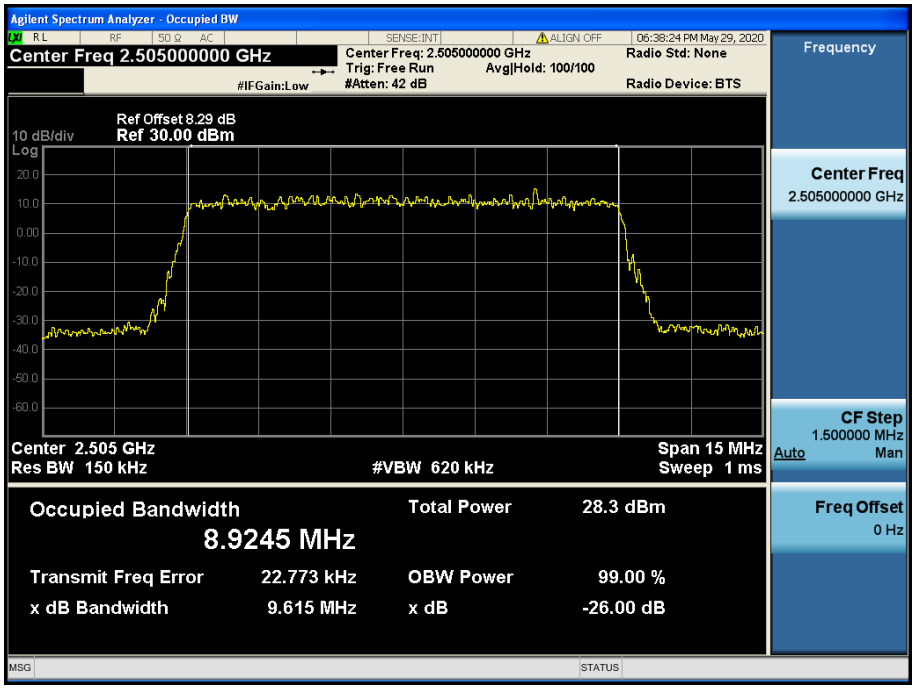
LTE Band 7 / 15 MHz / QPSK - RB Size 75



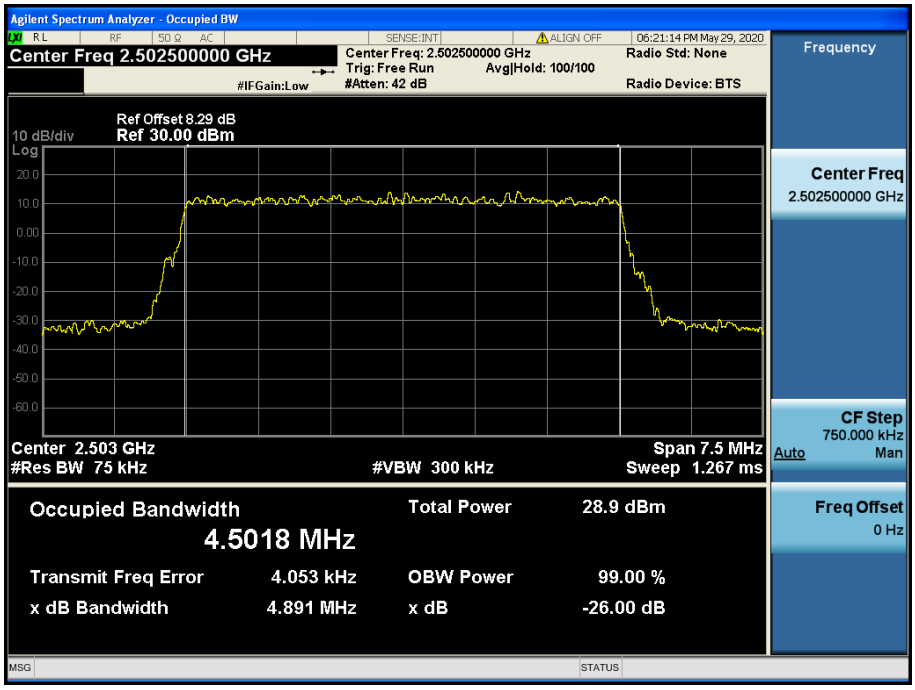
LTE Band 7 / 15 MHz / 16QAM - RB Size 75



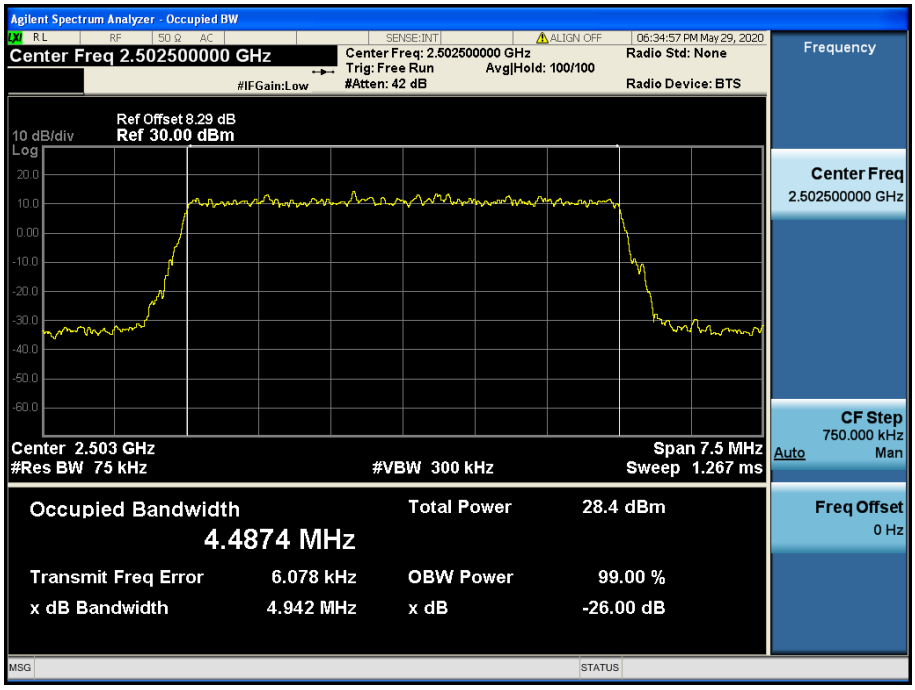
LTE Band 7 / 10 MHz / QPSK - RB Size 50



LTE Band 7 / 10 MHz / 16QAM - RB Size 50



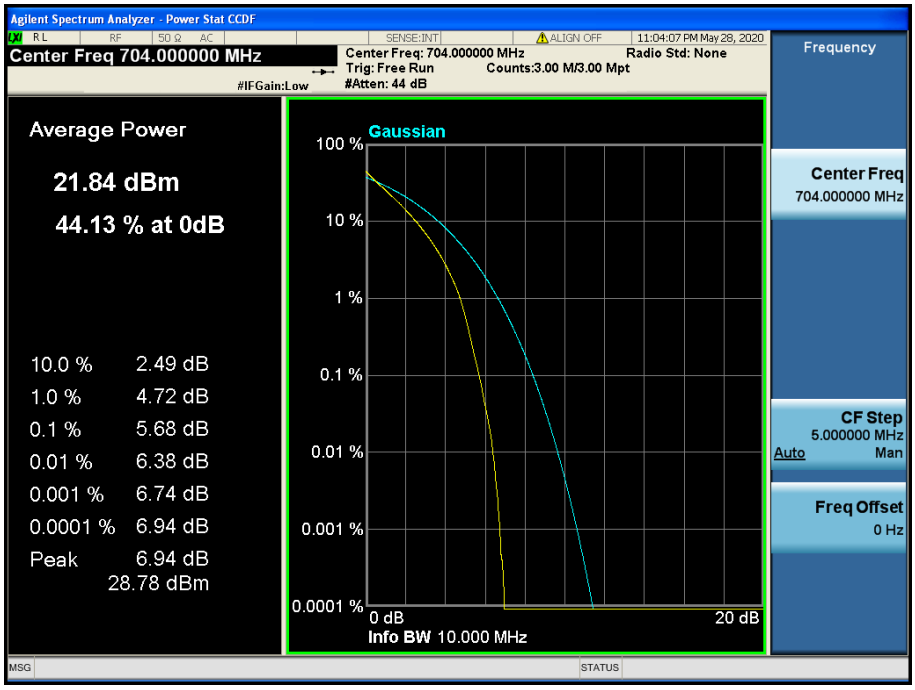
LTE Band 7 / 5 MHz / QPSK - RB Size 25



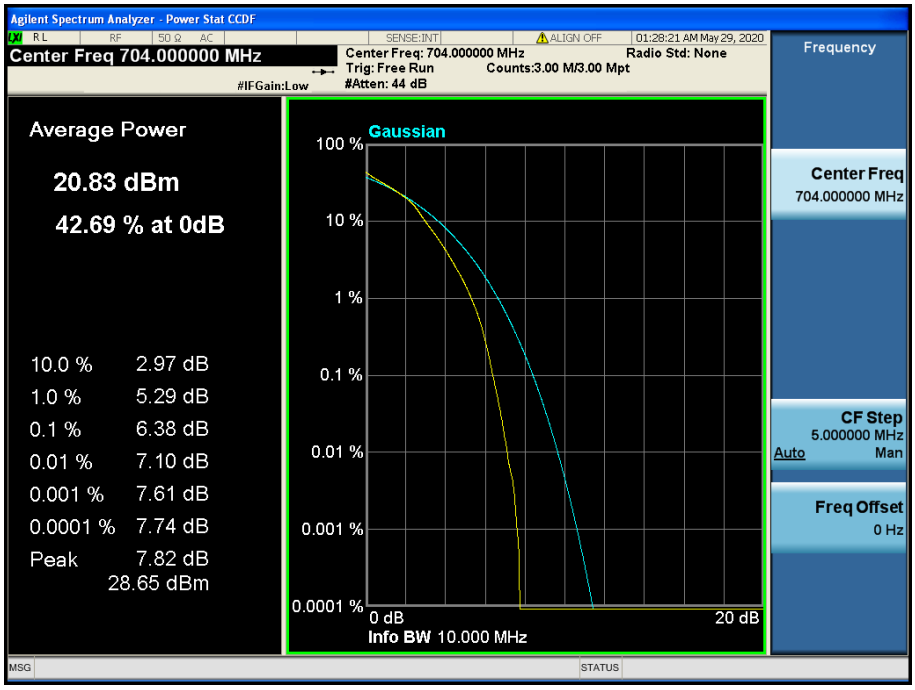
LTE Band 7 / 5 MHz / 16QAM - RB Size 25

8.2 PEAK TO AVERAGE RATIO

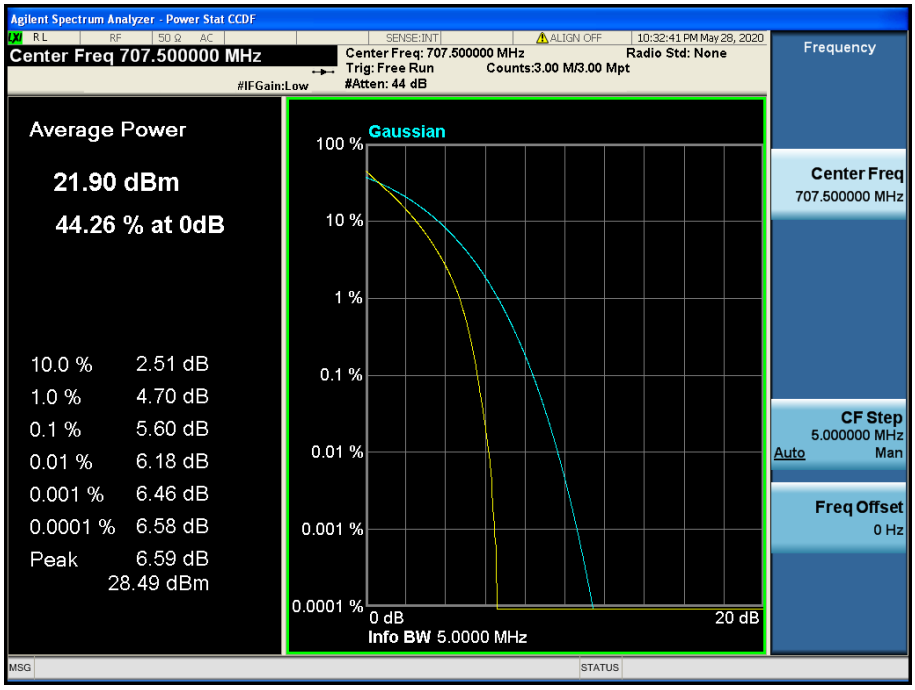
8.2.1 LTE Band 12, 17



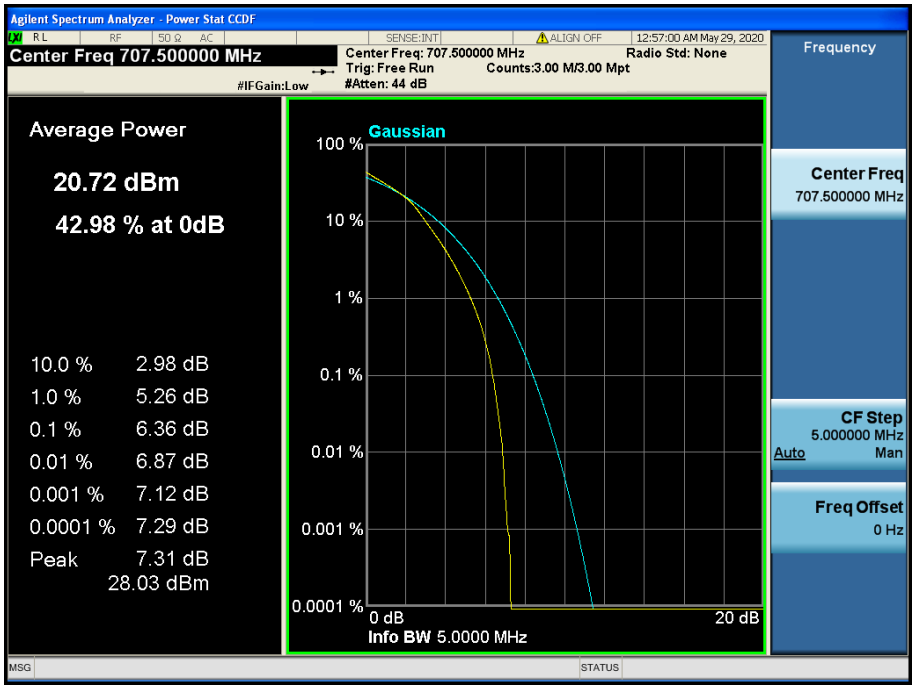
LTE Band 12 / 10 MHz / QPSK - RB Size 50



LTE Band 12 / 10 MHz / 16QAM - RB Size 50

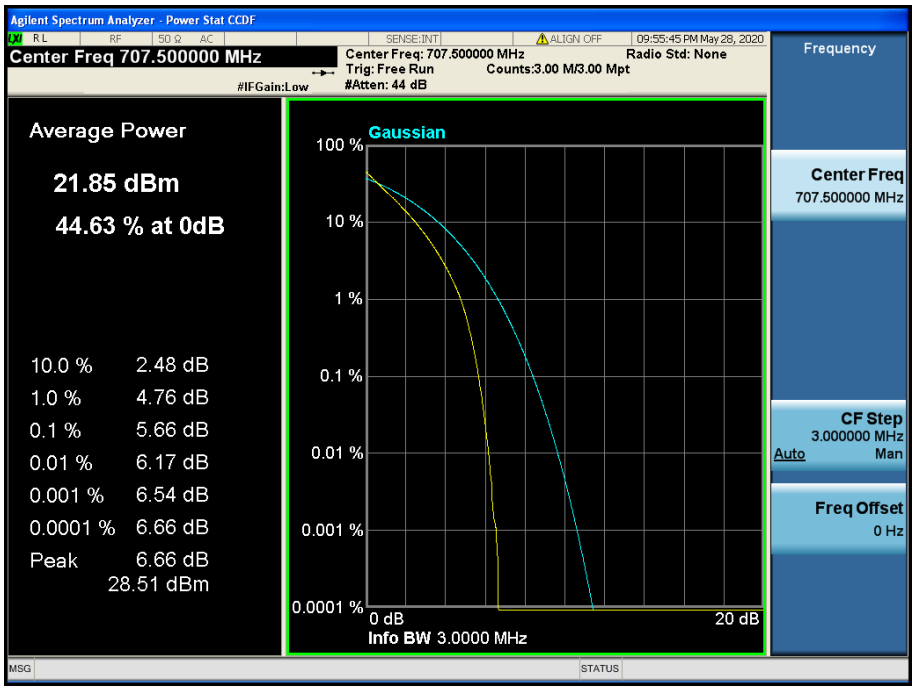


LTE Band 12 / 5 MHz / QPSK - RB Size 25

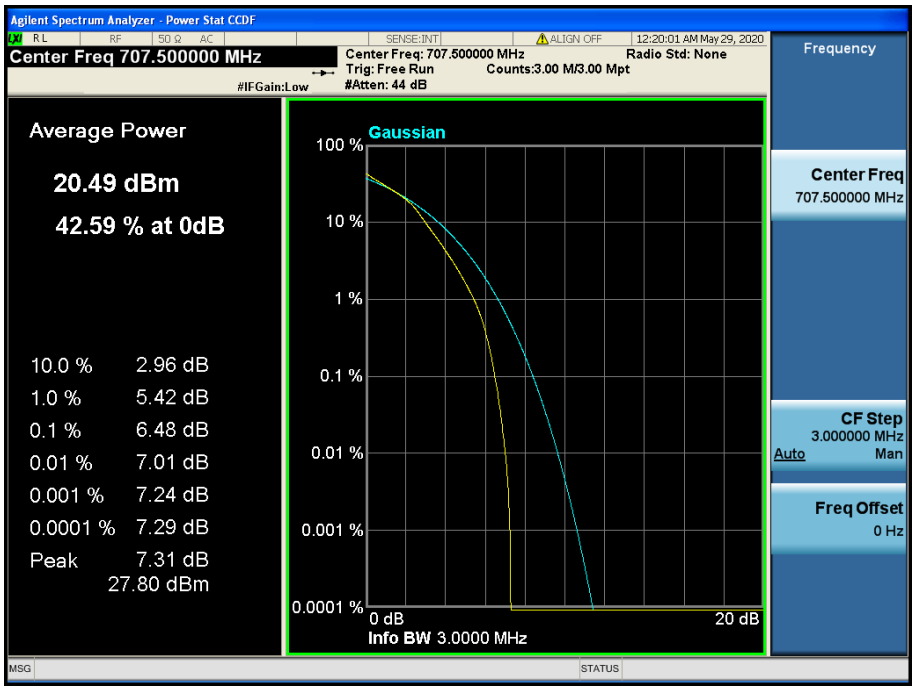


LTE Band 12 / 5 MHz / 16QAM - RB Size 25

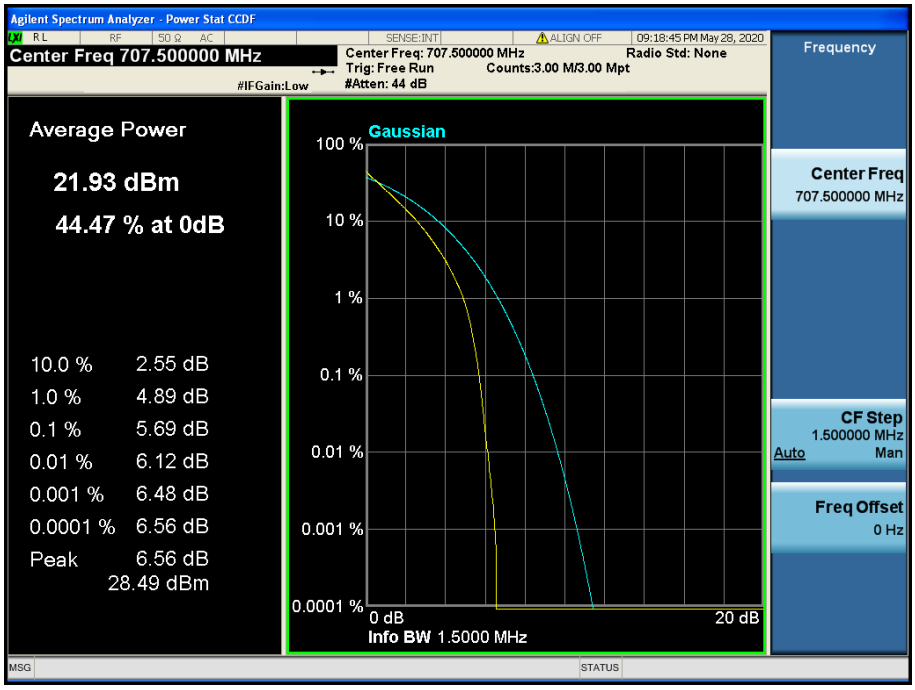
8.2.2 LTE Band 12



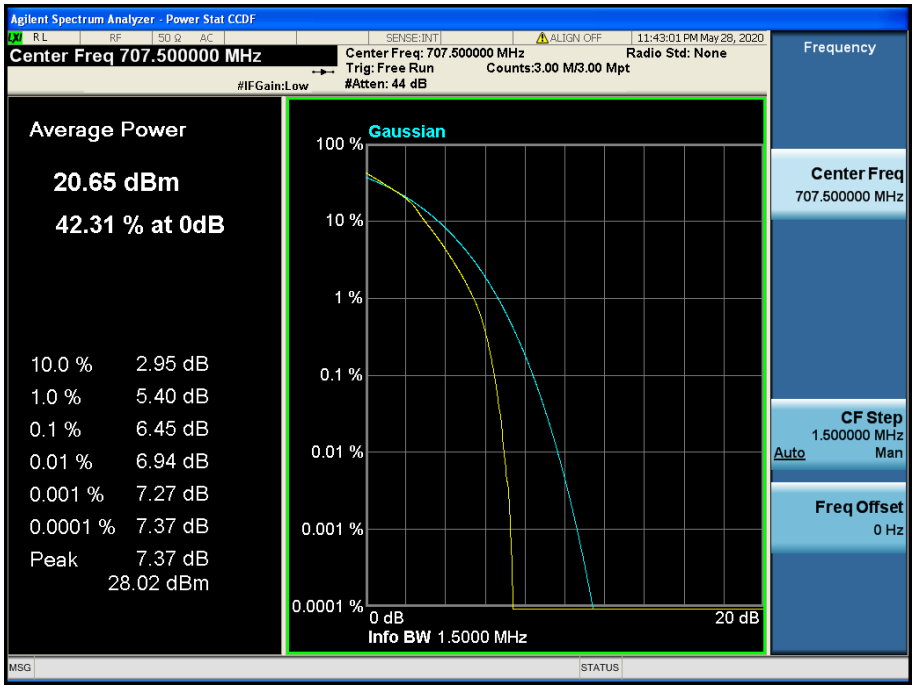
LTE Band 12 / 3 MHz / QPSK - RB Size 15



LTE Band 12 / 3 MHz / 16QAM - RB Size 15

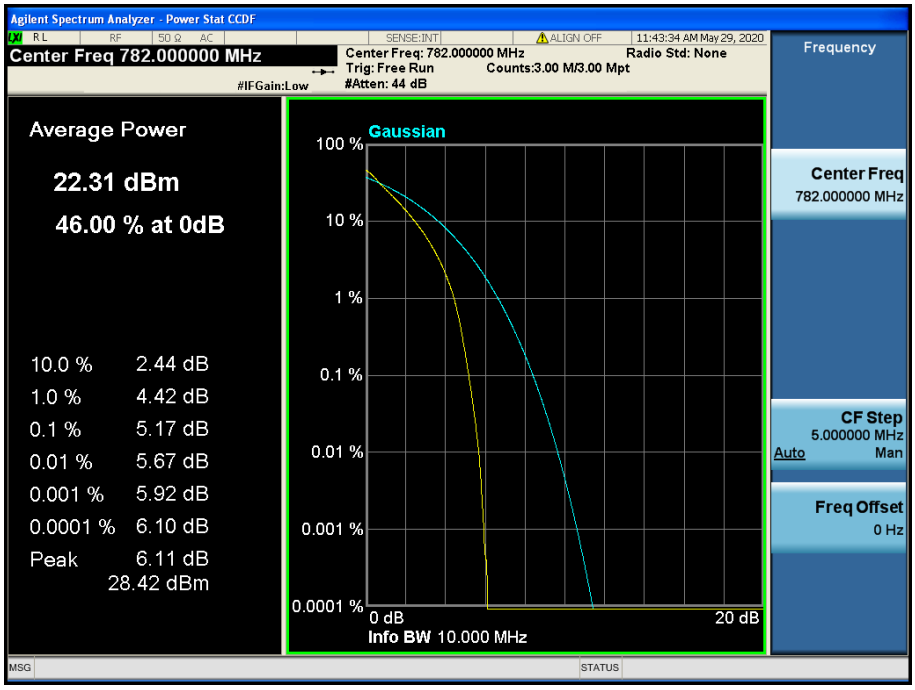


LTE Band 12 / 1.4 MHz / QPSK - RB Size 6

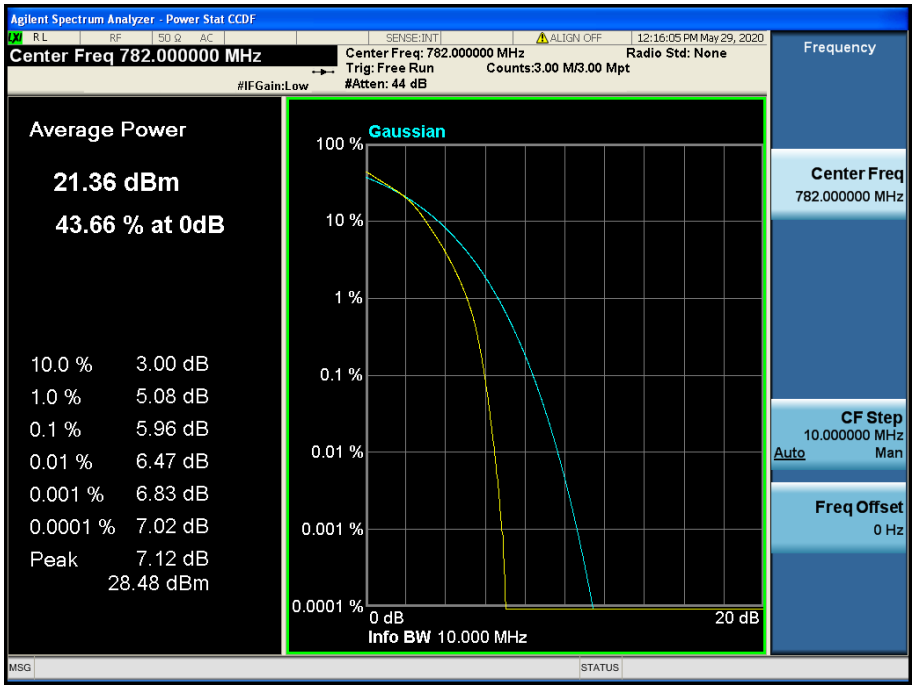


LTE Band 12 / 1.4 MHz / 16QAM - RB Size 6

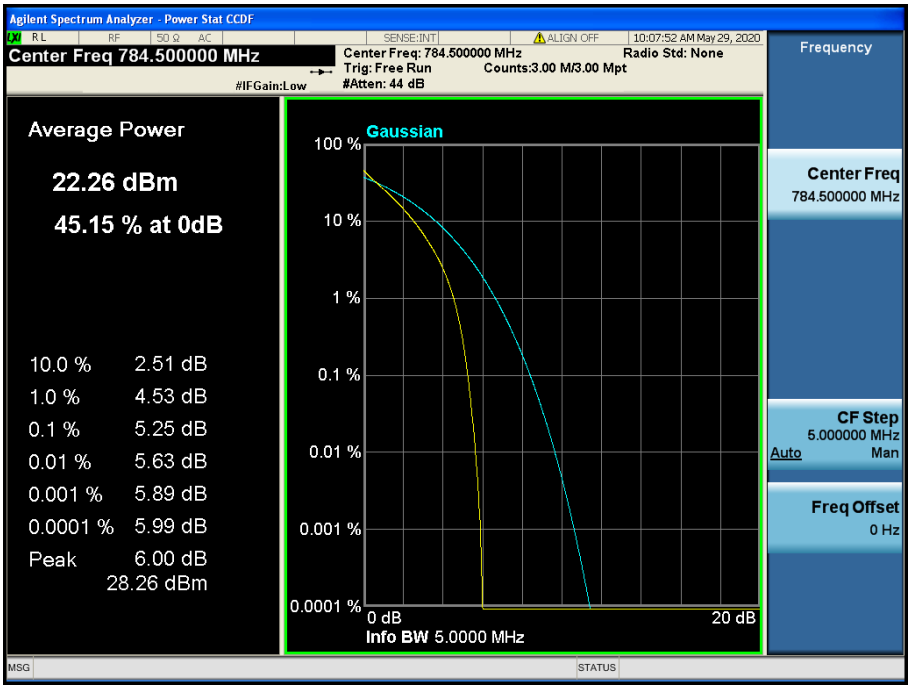
8.2.3 LTE Band 13



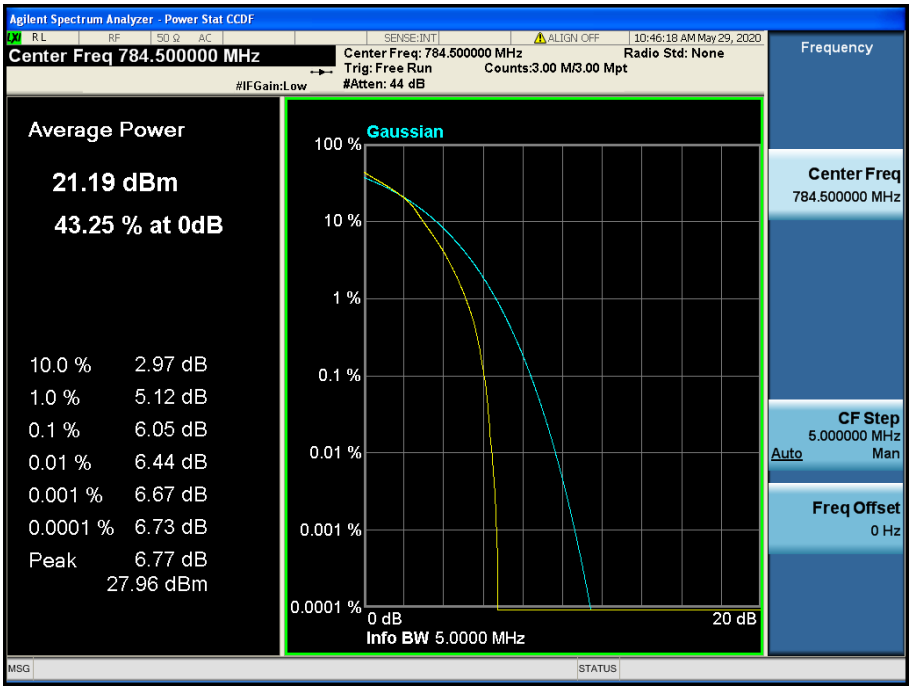
LTE Band 13 / 10 MHz / QPSK - RB Size 50



LTE Band 13 / 10 MHz / 16QAM - RB Size 50

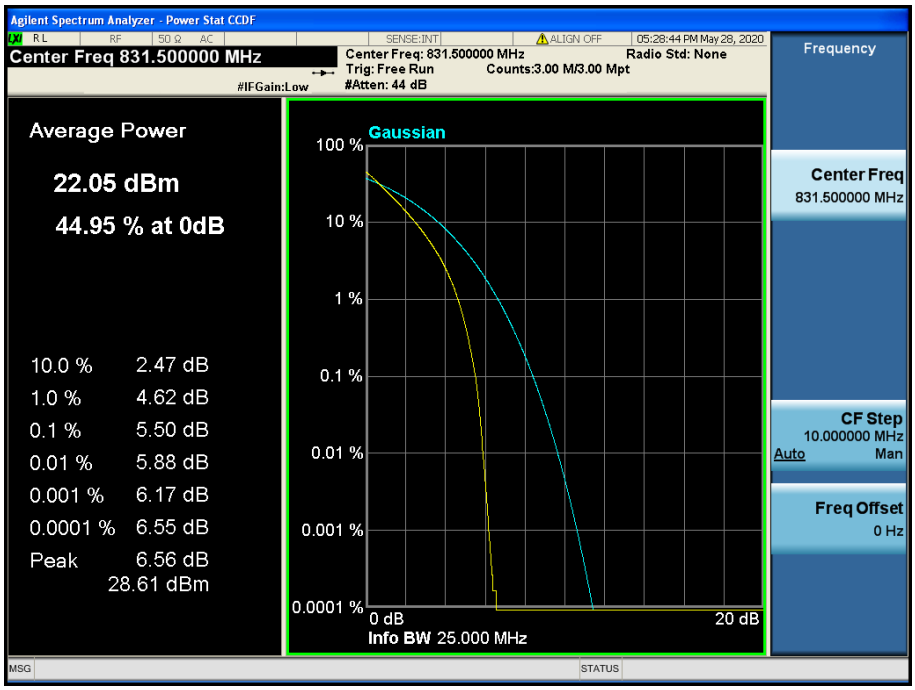


LTE Band 13 / 5 MHz / QPSK - RB Size 25

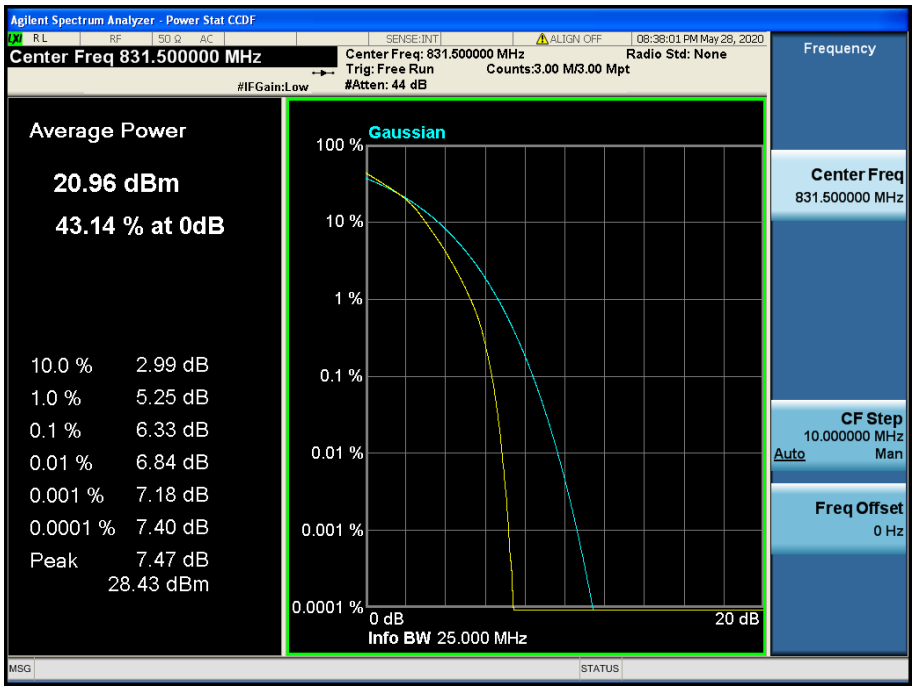


LTE Band 13 / 5 MHz / 16QAM - RB Size 25

8.2.4 LTE Band 26

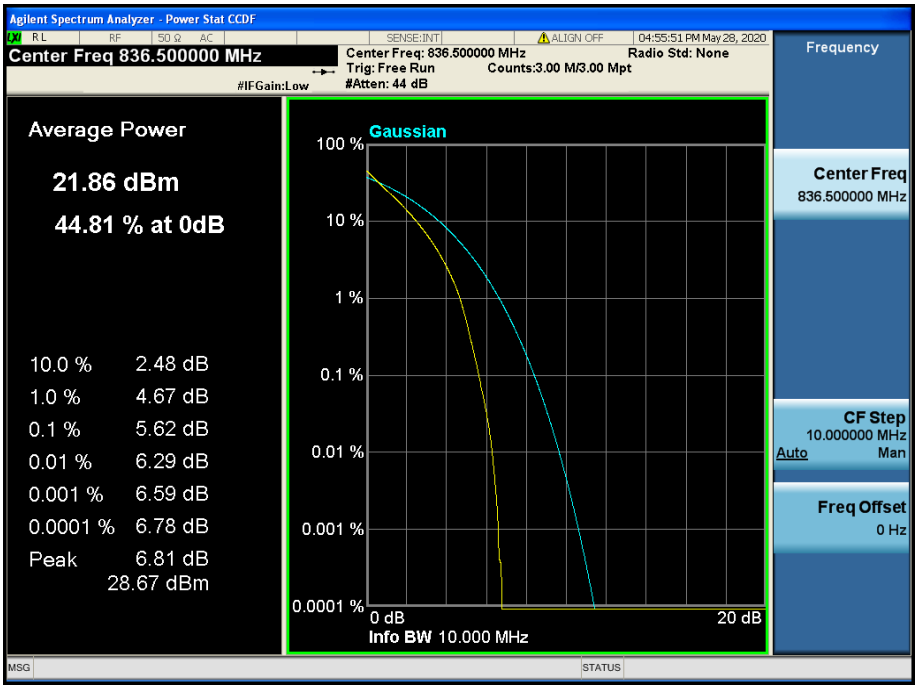


LTE Band 26 / 15 MHz / QPSK - RB Size 75

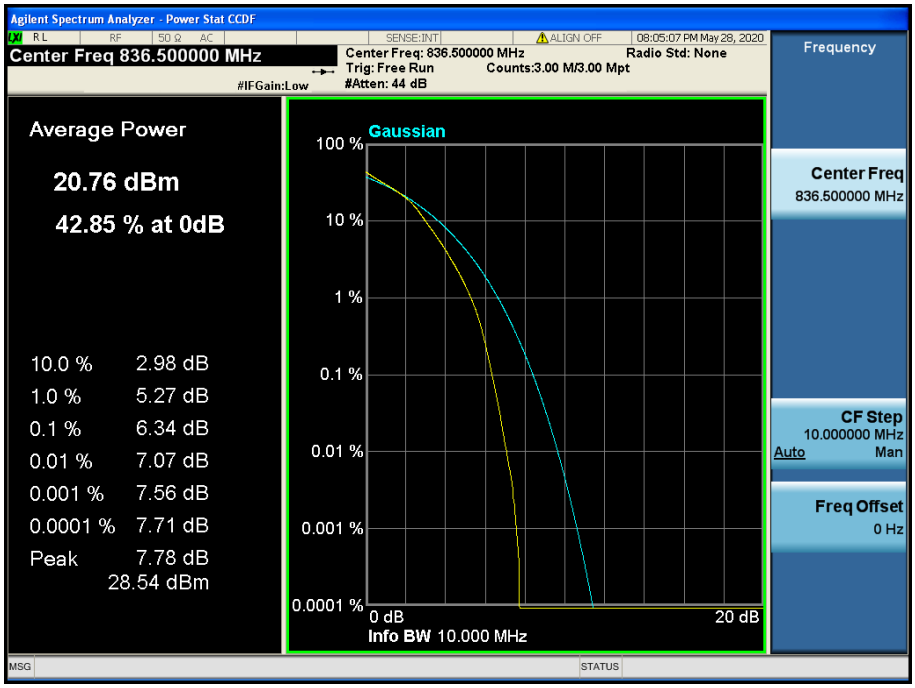


LTE Band 26 / 15 MHz / 16QAM - RB Size 75

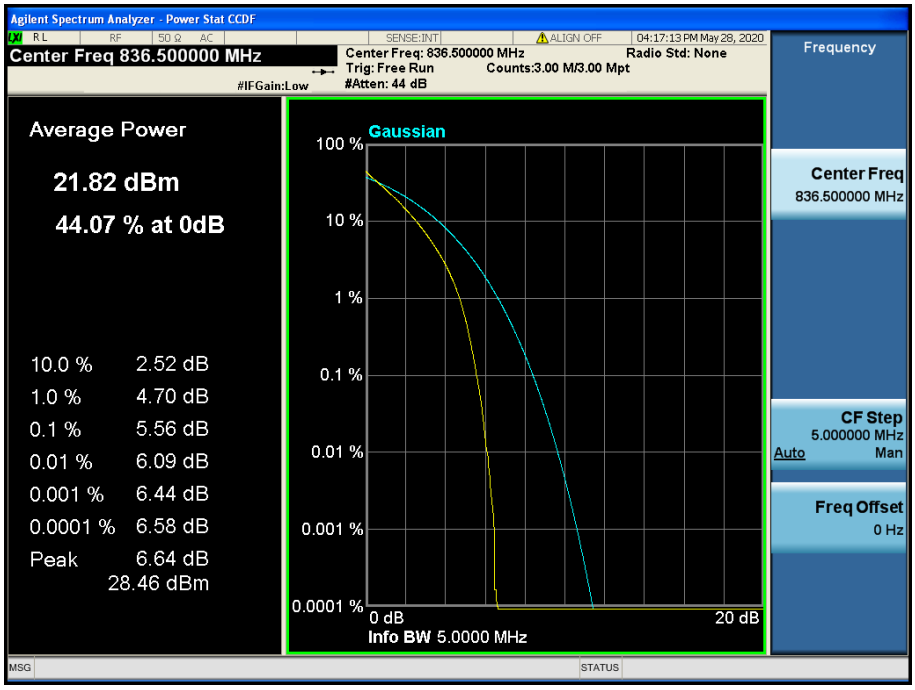
8.2.5 LTE Band 5, 26



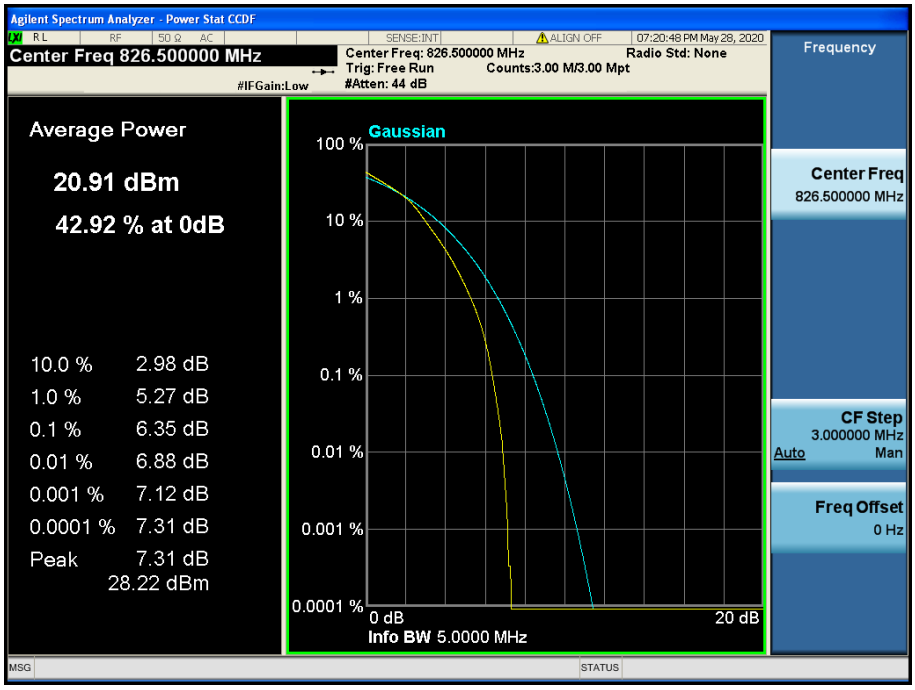
LTE Band 26 / 10 MHz / QPSK - RB Size 50



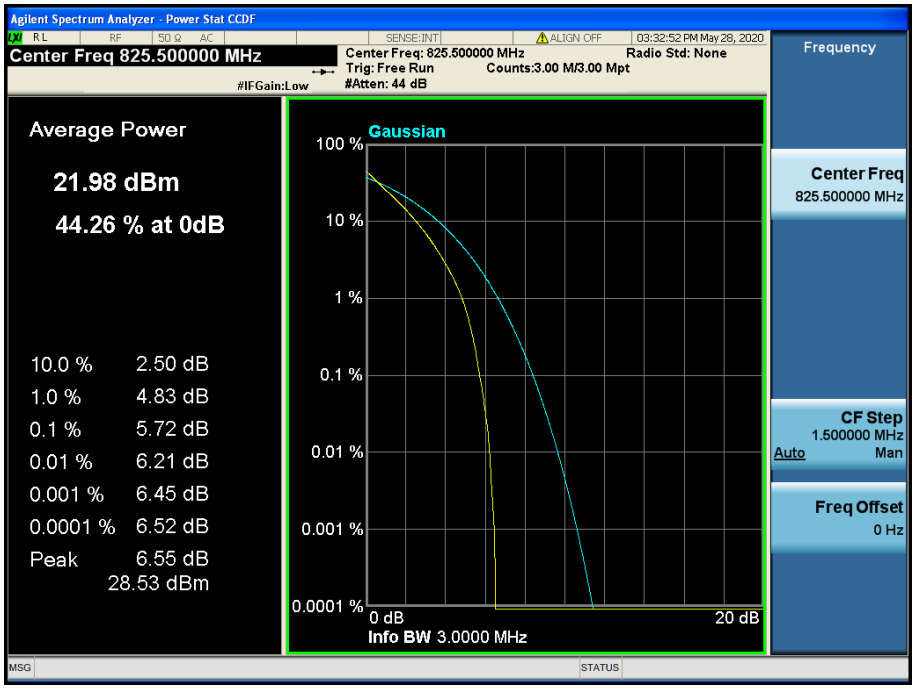
LTE Band 26 / 10 MHz / 16QAM - RB Size 50



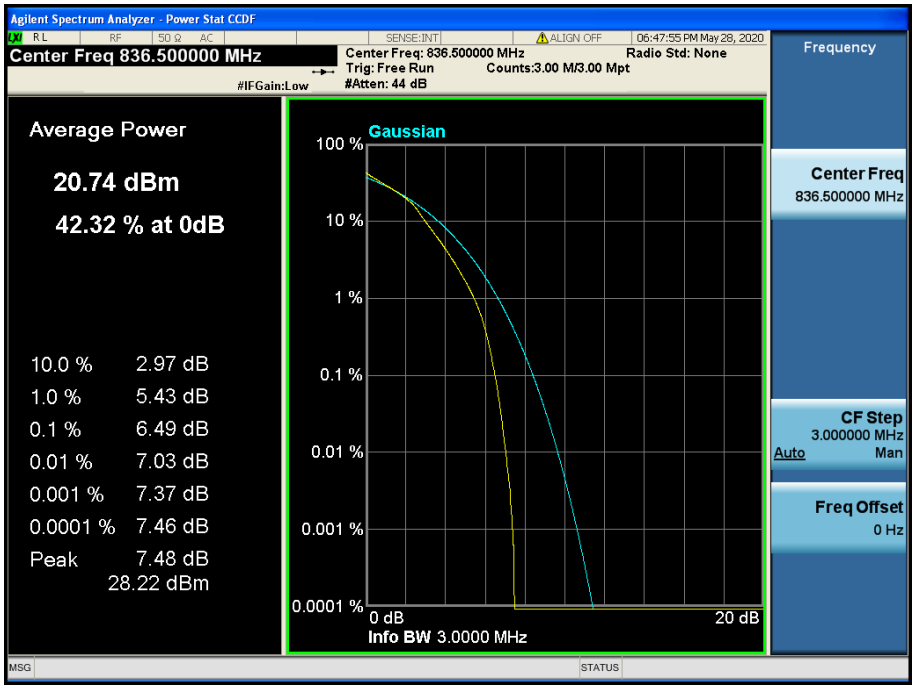
LTE Band 26 / 5 MHz / QPSK - RB Size 25



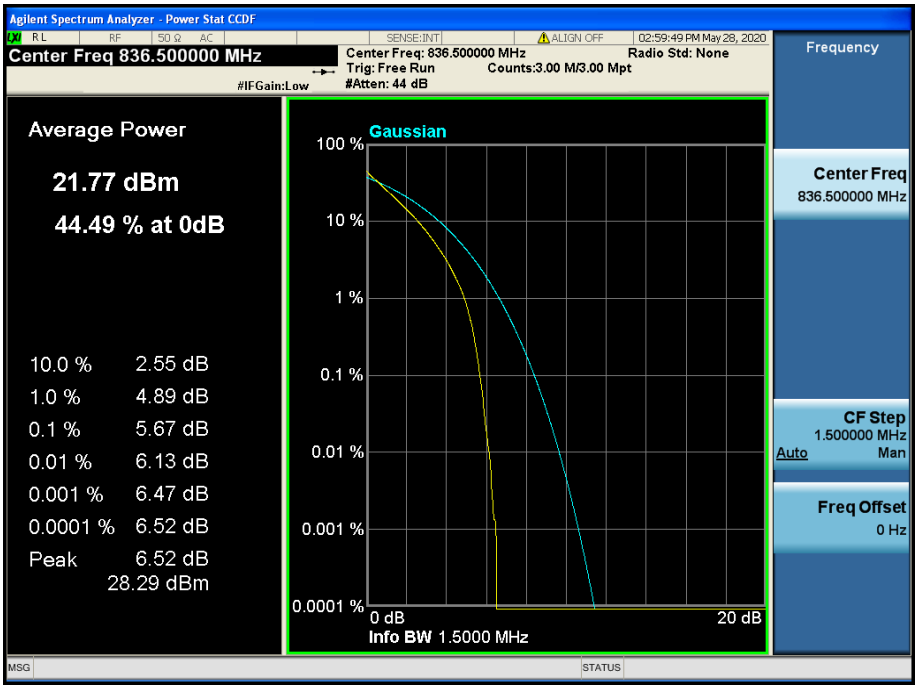
LTE Band 26 / 5 MHz / 16QAM - RB Size 25



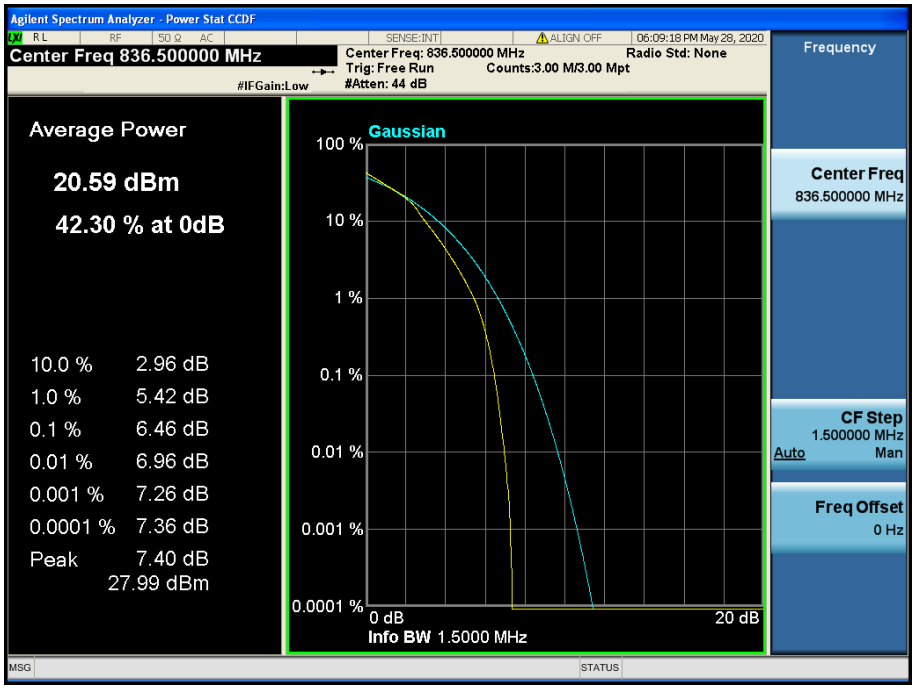
LTE Band 26 / 3 MHz / QPSK - RB Size 15



LTE Band 26 / 3 MHz / 16QAM - RB Size 15

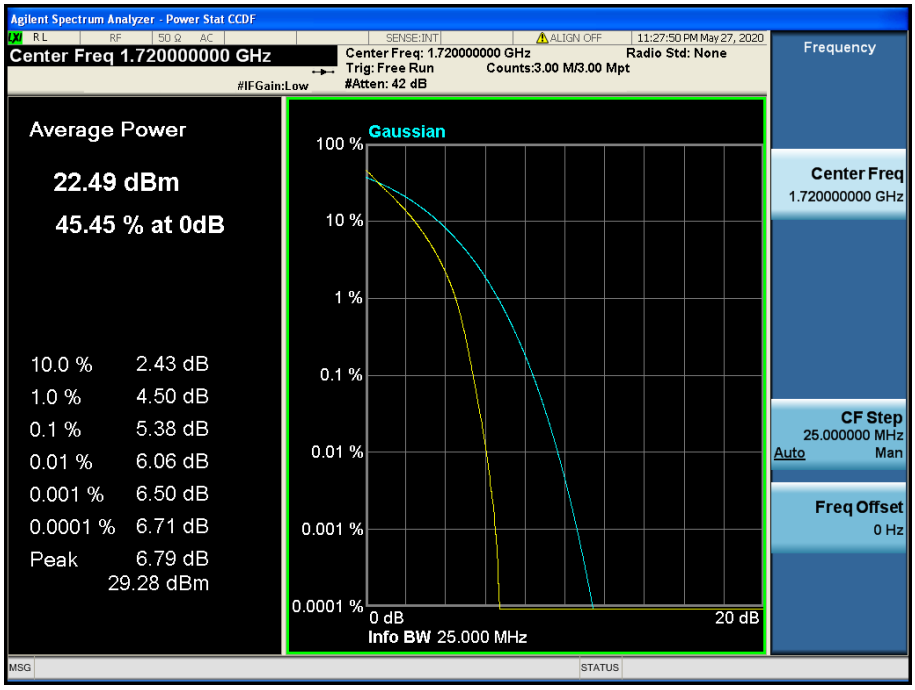


LTE Band 26 / 1.4 MHz / QPSK - RB Size 6

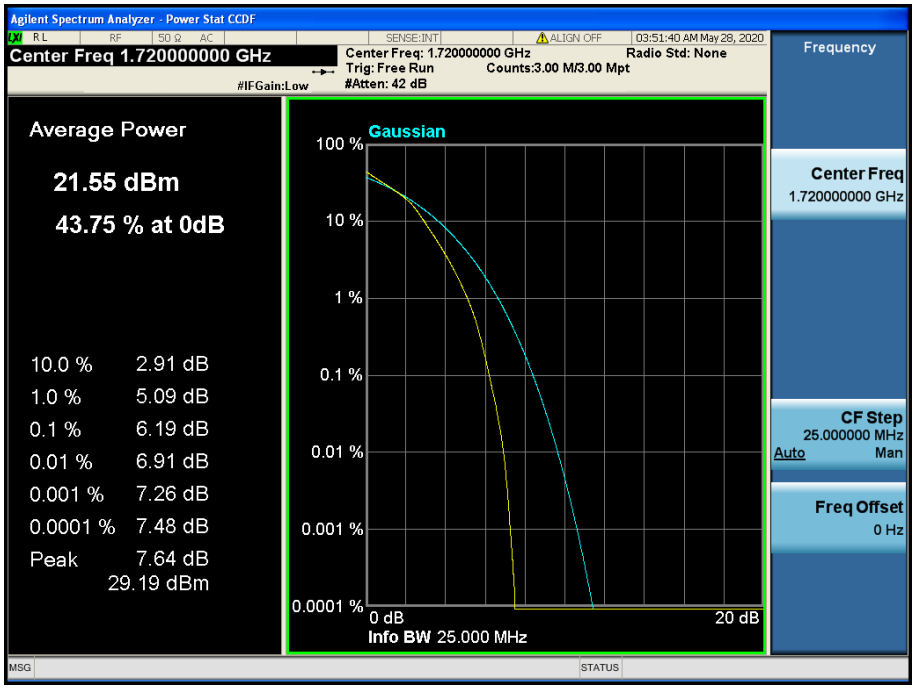


LTE Band 26 / 1.4 MHz / 16QAM - RB Size 6

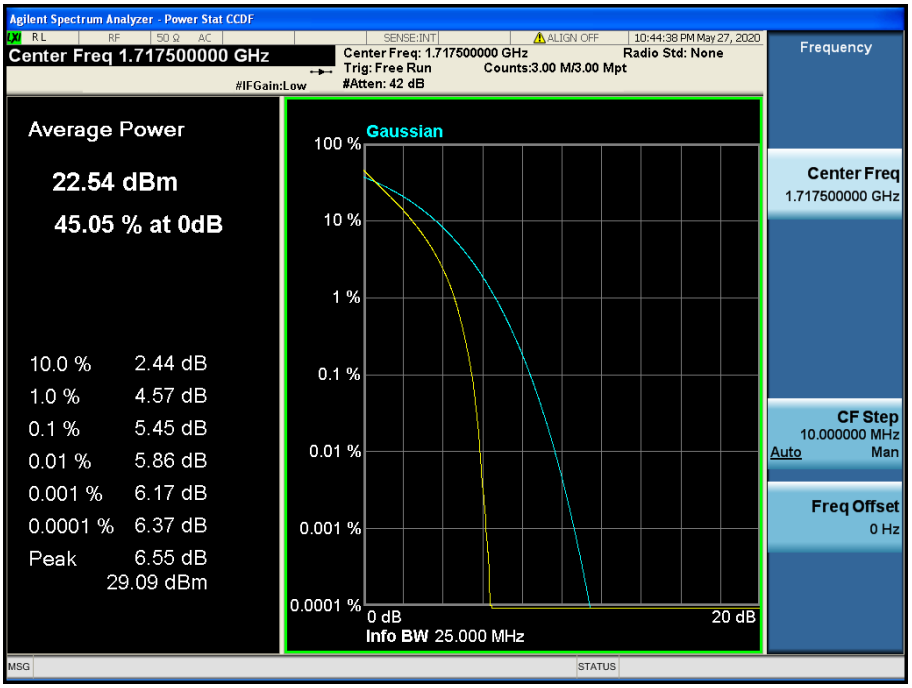
8.2.6 LTE Band 4



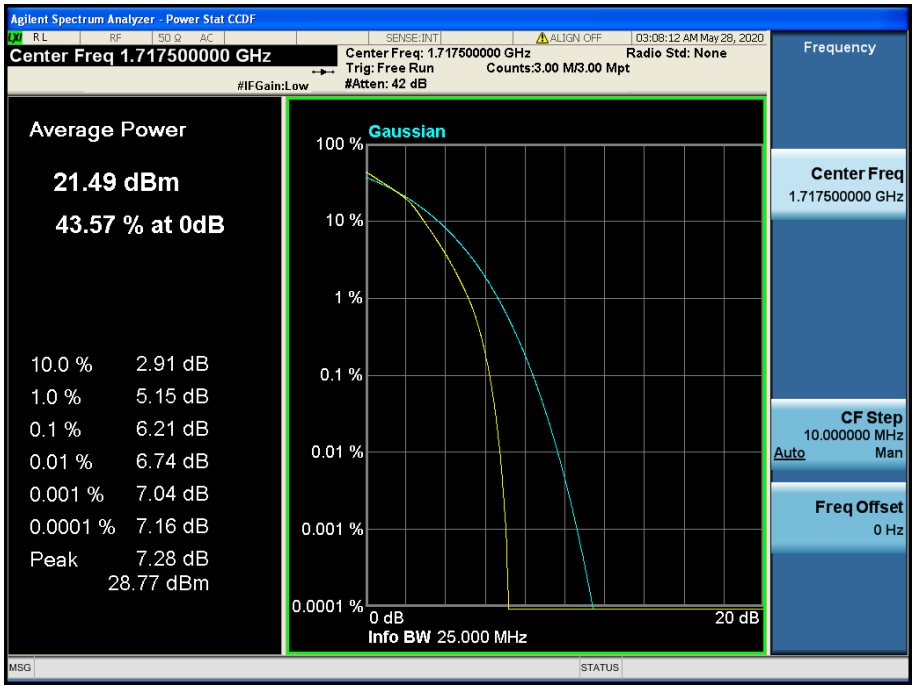
LTE Band 4 / 20 MHz / QPSK - RB Size 100



LTE Band 4 / 20 MHz / 16QAM - RB Size 100



LTE Band 4 / 15 MHz / QPSK - RB Size 75



LTE Band 4 / 15 MHz / 16QAM - RB Size 75