

TEST REPORT



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 : DRTFCC2009-0291

2. Customer

• Name : LG Electronics USA, Inc.

• Address : 111 Sylvan Avenue, North Building Englewood Cliffs, NJ 07632

3. Use of Report : FCC Original Grant

4. Product Name / Model Name : Mobile Phone / OA2007

FCC ID : ZNFOA2007

5. FCC Regulation(s): Part 2, 22, 27

Test Method Used : KDB971168 D01v03r01, ANSI/TIA-603-E-2016, ANSI C63.26-2015

6. Date of Test : 2020.08.03 ~ 2020.09.09

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	Reviewed by
	Name : JungWoo Kim 	Name : GeunKi Son  (Signature)

2020 . 09 . 17 .

DT&C Co., Ltd.

Unconnected with KS Q ISO / IEC 17025 and KOLAS accreditation

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

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2009-0291	Sep. 17, 2020	Initial issue	JungWoo Kim	GeunKi Son

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1. GENERAL INFORMATION

Applicant Name : LG Electronics USA, Inc.
Address : 111 Sylvan Avenue, North Building Englewood Cliffs, NJ 07632
FCC ID : ZNFOA2007
FCC Classification : PCS Licensed Transmitter held to ear (PCE)
EUT Type : Mobile Phone
Model Name : OA2007
Add Model Name : NA
Supplying power : DC 3.87 V
Antenna Information : PIFA Antenna

Mode	TX Frequency (MHz)	Emission Designator	Modulation	ERP	
				Max power (dBm)	Max power (W)
LTE Band 12	704.0 ~ 711.0	8M94G7D	QPSK	18.64	0.073
LTE Band 12	704.0 ~ 711.0	8M93W7D	16QAM	17.71	0.059
LTE Band 12	704.0 ~ 711.0	8M93W7D	64QAM	16.55	0.045
LTE Band 12	701.5 ~ 713.5	4M47G7D	QPSK	18.46	0.070
LTE Band 12	701.5 ~ 713.5	4M47W7D	16QAM	17.54	0.057
LTE Band 12	701.5 ~ 713.5	4M46W7D	64QAM	16.53	0.045
LTE Band 12	700.5 ~ 714.5	2M68G7D	QPSK	18.45	0.070
LTE Band 12	700.5 ~ 714.5	2M69W7D	16QAM	17.68	0.059
LTE Band 12	700.5 ~ 714.5	2M68W7D	64QAM	16.47	0.044
LTE Band 12	699.7 ~ 715.3	1M08G7D	QPSK	18.19	0.066
LTE Band 12	699.7 ~ 715.3	1M08W7D	16QAM	17.37	0.055
LTE Band 12	699.7 ~ 715.3	1M08W7D	64QAM	16.34	0.043
LTE Band 13	782.0 ~ 782.0	8M93G7D	QPSK	19.15	0.082
LTE Band 13	782.0 ~ 782.0	8M91W7D	16QAM	18.31	0.068
LTE Band 13	782.0 ~ 782.0	8M90W7D	64QAM	17.42	0.055
LTE Band 13	779.5 ~ 784.5	4M47G7D	QPSK	18.41	0.069
LTE Band 13	779.5 ~ 784.5	4M47W7D	16QAM	17.52	0.056
LTE Band 13	779.5 ~ 784.5	4M49W7D	64QAM	16.73	0.047
LTE Band 5	829.0 ~ 844.0	8M93G7D	QPSK	20.69	0.117
LTE Band 5	829.0 ~ 844.0	8M93W7D	16QAM	19.79	0.095
LTE Band 5	829.0 ~ 844.0	8M93W7D	64QAM	18.58	0.072
LTE Band 5	826.5 ~ 846.5	4M47G7D	QPSK	19.05	0.080
LTE Band 5	826.5 ~ 846.5	4M47W7D	16QAM	18.24	0.067
LTE Band 5	826.5 ~ 846.5	4M48W7D	64QAM	16.74	0.047
LTE Band 5	825.5 ~ 847.5	2M68G7D	QPSK	19.05	0.080
LTE Band 5	825.5 ~ 847.5	2M68W7D	16QAM	18.10	0.065
LTE Band 5	825.5 ~ 847.5	2M68W7D	64QAM	16.66	0.046
LTE Band 5	824.7 ~ 848.3	1M08G7D	QPSK	19.01	0.080
LTE Band 5	824.7 ~ 848.3	1M08W7D	16QAM	18.32	0.068
LTE Band 5	824.7 ~ 848.3	1M08W7D	64QAM	16.48	0.044

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max power(dBm)	Max power(W)
LTE Band 4	1 720.0 ~ 1 745.0	17M9G7D	QPSK	22.25	0.168
LTE Band 4	1 720.0 ~ 1 745.0	17M8W7D	16QAM	20.98	0.125
LTE Band 4	1 720.0 ~ 1 745.0	17M9W7D	64QAM	19.73	0.094
LTE Band 4	1 717.5 ~ 1 747.5	13M4G7D	QPSK	21.00	0.126
LTE Band 4	1 717.5 ~ 1 747.5	13M4W7D	16QAM	20.06	0.101
LTE Band 4	1 717.5 ~ 1 747.5	13M4W7D	64QAM	19.13	0.082
LTE Band 4	1 715.0 ~ 1 750.0	8M94G7D	QPSK	20.87	0.122
LTE Band 4	1 715.0 ~ 1 750.0	8M93W7D	16QAM	19.75	0.094
LTE Band 4	1 715.0 ~ 1 750.0	8M93W7D	64QAM	18.88	0.077
LTE Band 4	1 712.5 ~ 1 752.5	4M48G7D	QPSK	20.91	0.123
LTE Band 4	1 712.5 ~ 1 752.5	4M48W7D	16QAM	19.79	0.095
LTE Band 4	1 712.5 ~ 1 752.5	4M47W7D	64QAM	19.66	0.092
LTE Band 4	1 711.5 ~ 1 753.5	2M68G7D	QPSK	20.90	0.123
LTE Band 4	1 711.5 ~ 1 753.5	2M69W7D	16QAM	19.88	0.097
LTE Band 4	1 711.5 ~ 1 753.5	2M68W7D	64QAM	19.05	0.080
LTE Band 4	1 710.7 ~ 1 754.3	1M08G7D	QPSK	20.90	0.123
LTE Band 4	1 710.7 ~ 1 754.3	1M08W7D	16QAM	20.06	0.101
LTE Band 4	1 710.7 ~ 1 754.3	1M08W7D	64QAM	18.93	0.078
LTE Band 41	2 506.0 ~ 2 680.0	17M7G7D	QPSK	22.32	0.171
LTE Band 41	2 506.0 ~ 2 680.0	17M6W7D	16QAM	21.45	0.140
LTE Band 41	2 506.0 ~ 2 680.0	17M8W7D	64QAM	20.48	0.112
LTE Band 41	2 503.5 ~ 2 682.5	13M2G7D	QPSK	22.16	0.164
LTE Band 41	2 503.5 ~ 2 682.5	13M3W7D	16QAM	21.24	0.133
LTE Band 41	2 503.5 ~ 2 682.5	13M3W7D	64QAM	20.00	0.100
LTE Band 41	2 501.0 ~ 2 685.0	8M95G7D	QPSK	21.86	0.153
LTE Band 41	2 501.0 ~ 2 685.0	8M91W7D	16QAM	20.86	0.122
LTE Band 41	2 501.0 ~ 2 685.0	8M83W7D	64QAM	20.05	0.101
LTE Band 41	2 498.5 ~ 2 687.5	4M43G7D	QPSK	21.68	0.147
LTE Band 41	2 498.5 ~ 2 687.5	4M48W7D	16QAM	20.50	0.112
LTE Band 41	2 498.5 ~ 2 687.5	4M45W7D	64QAM	19.30	0.085

2. INTRODUCTION

2.1 EUT DESCRIPTION

This EUT contains the following capabilities:

GSM 850/1900, WCDMA/HSUPA 850, Multi-band LTE, 802.11b/g/n/ac WLAN(2.4 GHz)
802.11a/n/ac WLAN(5 GHz), Bluetooth(BDR, EDR, LE),NFC,WCP and Dual Display.

2.2 TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+21 °C ~ +26 °C
▪ Relative Humidity	39 % ~ 46 %

2.3 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.

2.4 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)	4.9 dB (The confidence level is about 95 %, $k = 2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.1 dB (The confidence level is about 95 %, $k = 2$)
Radiated Disturbance (Above 18 GHz)	5.3 dB (The confidence level is about 95 %, $k = 2$)

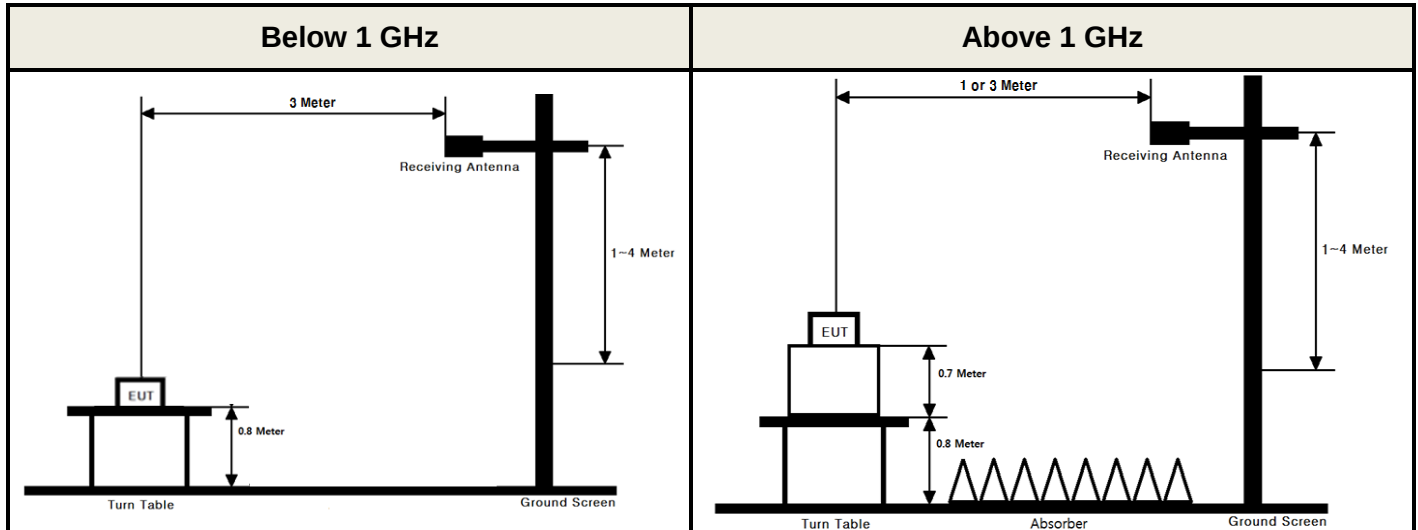
2.5 TEST FACILITY

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 comply with the requirements of § 2.948 according to ANSI 63.4-2014.		
- FCC & IC MRA Designation 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



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8 m or 1.5 m 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 2.2.17
- 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 $\geq$ 3 x RBW.
4. Set number of points in sweep $\geq$ 2 x span / RBW.
5. Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set $\geq$ [10 x (number of points in sweep) x (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.

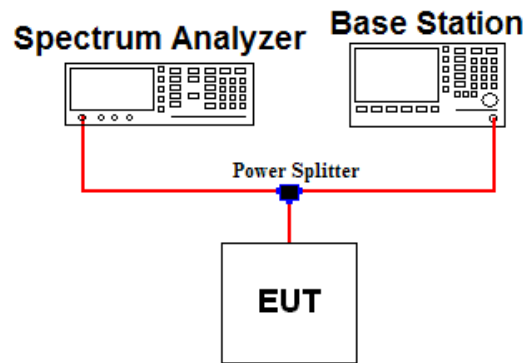
The ERP / EIRP is calculated using the following formula:

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.

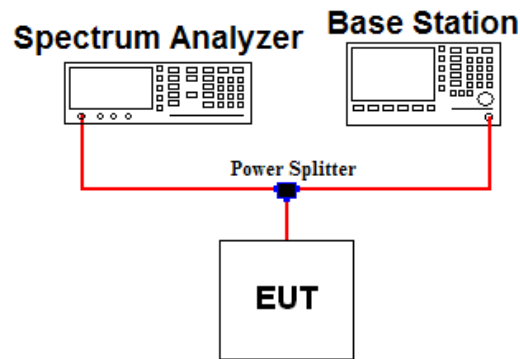
Test setting

The spectrum Analyzer's CCDF measurement function is enabled.

1. Set resolution/measurement bandwidth $\geq$ 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 $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ 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

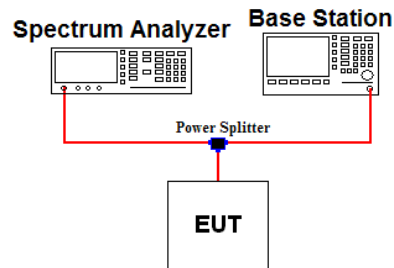
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

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. $RBW = 1 \% \sim 5 \%$ of the expected OBW & $VBW \geq 3 \times RBW$
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 $\geq 3 \times$ RBW
5. Detector = RMS & Trace mode = Max hold
6. Sweep time = Auto couple or 1 s for band edge
7. Number of sweep point $\geq 2 \times$ 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 MHz - 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.

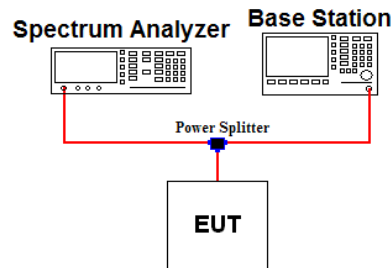
Note 3: Per Part 27.53(c.4) for all frequencies between 763 - 775 MHz and 793 - 805 MHz, the FCC limit is $65 + 10 \log(P[\text{Watts}]) - 35\text{dBm}$ in a 6.25kHz bandwidth.

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 than $43 + 10 \log(P)$ 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.

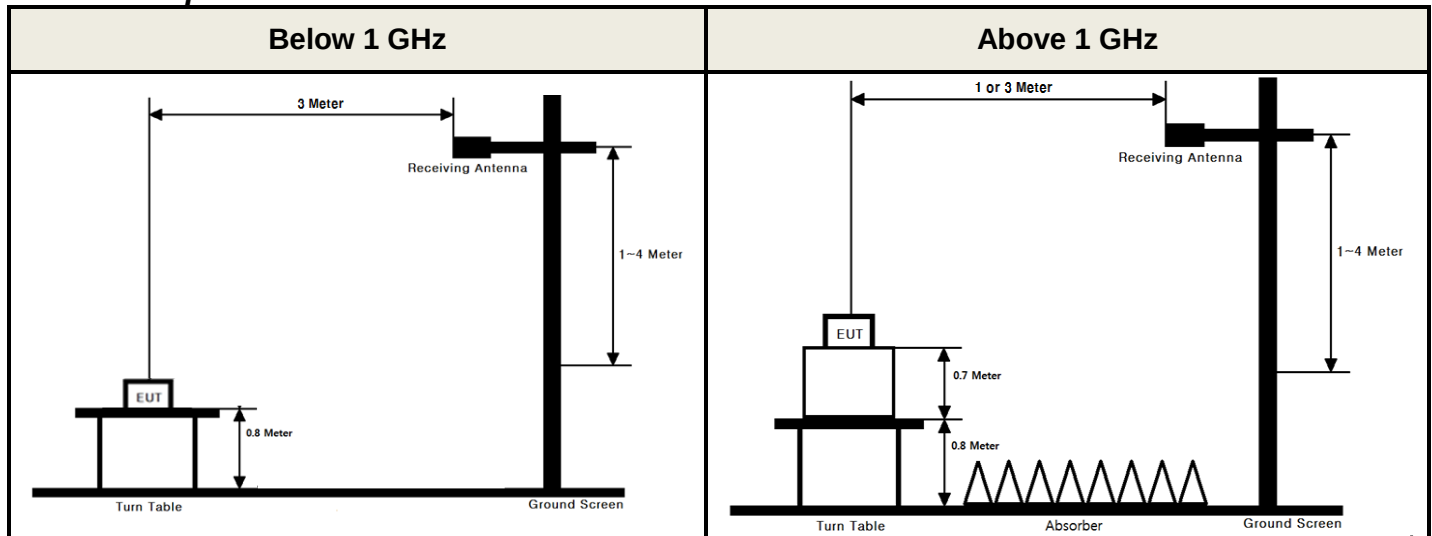
Test setting

1. RBW = 100 kHz (Below 1 GHz) or 1 MHz (Above 1 GHz) & VBW $\geq 3 \times$ RBW (Refer to Note 1)
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point $\geq 2 \times$ 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 1 MHz or greater for frequencies greater than 1 GHz.

3.6 UNDESIRABLE EMISSIONS

Test Set-up



These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8 m or 1.5 m 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 $\geq 3 \times$ RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point $\geq 2 \times$ 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.

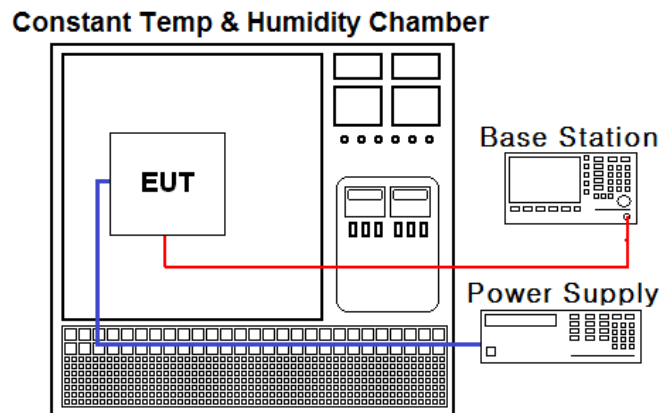
For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

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 $\pm 0.00025\%$ (± 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	20/06/24	21/06/24	US47360812
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY48011700
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY50410357
Spectrum Analyzer	Agilent Technologies	N9030A	19/12/16	20/12/16	MY53310140
DC Power Supply	Agilent Technologies	66332A	20/06/24	21/06/24	US37473422
Power Divider	Weinschel	WA1574	20/06/24	21/06/24	WA1574-4
Multimeter	FLUKE	17B+	19/12/16	20/12/16	36390701WS
Temp & Humi	SJ Science	SJ-TH-S50	20/06/23	21/06/23	U5542113
Radio Communication Analyzer	Anritus	MT8820C	19/12/16	20/12/16	6201274516
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	21/04/24	00140394
HORN ANT	ETS	3117	20/03/26	21/03/26	00152145
HORN ANT	A.H.Systems	SAS-574	20/06/24	21/06/24	154
HORN ANT	A.H.Systems	SAS-574	20/06/24	21/06/24	155
Amplifier	EMPOWER	BBS3Q7ELU	20/06/24	21/06/24	1020
PreAmplifier	H.P	8447D	19/12/16	20/12/16	2944A07774
PreAmplifier	RFBAY.Inc	MPA-40-40	19/12/16	20/12/16	21151801
PreAmplifier	Agilent	8449B	20/06/24	21/06/24	3008A02108
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	20/06/24	21/06/24	163
PreAmplifier	tsj	MLA-1840-J02-45	20/06/24	21/06/24	16966-10728
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	20/06/24	21/06/24	7
High-pass filter	Wainwright	WHKX10-2838-3300-18000-60SS	20/06/24	21/06/24	2
Cable	DTNC	Cable	20/01/16	21/01/16	M-01
Cable	DTNC	Cable	20/01/16	21/01/16	M-02
Cable	Junkosha	MWX315	20/01/16	21/01/16	M-05
Cable	Junkosha	MWX221	20/01/16	21/01/16	M-06
Cable	DTNC	Cable	20/01/16	21/01/16	RF-09

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)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	Conducted Output Power	N/A	Conducted	C Note2
2.1049	Occupied Bandwidth	N/A		C
27.50(d.5)	Peak to Average Ratio	< 13 dB		C
2.1051 22.917(a) 27.53(c.2) 27.53(g) 27.53(h)	Band Edge / Conducted Spurious Emissions	> 43 + 10log ₁₀ (P) dB at Band edge and for all out-of-band emissions		C
27.53(c.4)	Undesirable emissions in 763 ~ 775MHz & 793 ~ 805MHz	>65 + 10 log (P) dB in a 6.25 kHz band segment frequencies between 763-775 MHz and 793-805 MHz		C
27.53(m)	Band Edge / Conducted Spurious Emissions	> 40 + 10log ₁₀ (P) dB at channel edge and 5 MHz from the channel edge > 43 + 10log ₁₀ (P) dB at 5 MHz and X MHz from the channel edge > 55 + 10log ₁₀ (P) dB at all frequencies more than X MHz from the channel edge		C
2.1055 22.355 27.54	Frequency Stability	< 2.5 ppm (Part 22) Fundamental emissions must stay within Authorized frequency block (Part 24, 27)		C
27.50(b.10) 27.50(c.10)	Radiated Output Power (B12, 13)	< 3 Watts max. ERP	Radiated	C
22.913(a.5)	Radiated Output Power (B5)	< 7 Watts max. ERP		C
27.50(d.4)	Radiated Output Power (B4)	< 1 Watts max. EIRP		C
27.50(h.2)	Radiated Output Power (B41)	< 2 Watts max. EIRP		C
2.1053 22.917(a) 27.53(c.2) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10log ₁₀ (P) dB for all out-of-band emissions		C
27.53(m)	Undesirable Emissions(B41)	> 55 + 10log ₁₀ (P) dB for all out-of-band emissions		C
27.53(f)	Undesirable Emissions in 1 559 MHz ~ 1 610 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)

Note 3: This device supports wireless charging & Can use Dual Screen.

So per KDB648474 D03v01r04, the radiated test items were performed all not charging, charging and Dual Screen conditions. For wireless charging condition, the handset is placed on the representative charging pad under normal conditions and in a simulated call configuration. And the worst case data was reported.

6. SAMPLE CALCULATION

A. Emission Designator

LTE Band 12(QPSK)

Emission Designator = **8M94G7D**
LTE OBW = 8.944 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 12(64QAM)

Emission Designator = **8M93W7D**
LTE OBW = 8.934 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 13(QPSK)

Emission Designator = **8M93G7D**
LTE OBW = 8.929 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 13(64QAM)

Emission Designator = **8M90W7D**
LTE OBW = 8.901 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(QPSK)

Emission Designator = **8M93G7D**
LTE OBW = 8.932 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(64QAM)

Emission Designator = **8M94W7D**
LTE OBW = 8.935 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 12(16QAM)

Emission Designator = **8M93W7D**
LTE OBW = 8.929 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 13(16QAM)

Emission Designator = **8M91W7D**
LTE OBW = 8.908 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(16QAM)

Emission Designator = **8M93W7D**
LTE OBW = 8.934 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 4(QPSK)Emission Designator = **17M9G7D**

LTE OBW = 17.901 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 4(16QAM)Emission Designator = **17M8W7D**

LTE OBW = 17.824 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 4(64QAM)Emission Designator = **17M9W7D**

LTE OBW = 17.895 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 41(QPSK)Emission Designator = **17M7G7D**

LTE OBW = 17.736 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 41(16QAM)Emission Designator = **17M6W7D**

LTE OBW = 17.624 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 41(64QAM)Emission Designator = **17M8W7D**

LTE OBW = 17.758 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

B. For substitution method

- 1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1 GHz 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. 28.88 dBm)
- 9) The result is calculated as below;

$$\text{EIRP(dBm)} = \text{LEVLE@ANTENNA TERMINAL} + \text{TX Antenna Gain (dBi)}$$

$$\text{ERP(dBm)} = \text{LEVLE@ANTENNA TERMINAL} + \text{TX Antenna Gain (dBd)}$$

$$\text{Where, TX Antenna Gain (dBd)} = \text{TX Antenna Gain (dBi)} - 2.15 \text{ dB}$$

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 EDGE 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

7.5 ERP & EIRP

- Test Notes

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

7.5.1 LTE Band 12

- Measurement data: Without wireless charging pad

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)	Note
10	704	QPSK	1/25	H	19.08	-0.65	18.43	0.070	-
		16QAM	1/25	H	18.28	-0.65	17.63	0.058	-
		64QAM	1/25	H	17.20	-0.65	16.55	0.045	-
	711	QPSK	1/0	H	19.10	-0.63	18.47	0.070	-
			1/0	H	18.33	-0.63	17.70	0.059	With Dual Display (180°)
		16QAM	1/0	H	17.98	-0.63	17.35	0.054	-
			1/0	H	17.39	-0.63	16.76	0.047	With Dual Display (180°)
		64QAM	1/0	H	16.83	-0.63	16.20	0.042	-
			1/0	H	16.02	-0.63	15.39	0.035	With Dual Display (180°)
			1/0	H	16.02	-0.63	15.39	0.035	With Dual Display (180°)
5	701.5	QPSK	1/24	H	19.12	-0.66	18.46	0.070	-
		16QAM	1/24	H	18.20	-0.66	17.54	0.057	-
		64QAM	1/24	H	17.19	-0.66	16.53	0.045	-
	707.5	QPSK	1/0	H	18.95	-0.64	18.31	0.068	-
		16QAM	1/0	H	17.75	-0.64	17.11	0.051	-
		64QAM	1/0	H	16.74	-0.64	16.10	0.041	-
	713.5	QPSK	1/24	H	18.63	-0.62	18.01	0.063	-
		16QAM	1/24	H	17.78	-0.62	17.16	0.052	-
		64QAM	1/24	H	16.80	-0.62	16.18	0.041	-
3	700.5	QPSK	1/14	H	19.11	-0.66	18.45	0.070	-
		16QAM	1/14	H	18.34	-0.66	17.68	0.059	-
		64QAM	1/14	H	17.13	-0.66	16.47	0.044	-
	707.5	QPSK	1/0	H	19.08	-0.64	18.44	0.070	-
		16QAM	1/0	H	18.15	-0.64	17.51	0.056	-
		64QAM	1/0	H	16.93	-0.64	16.29	0.043	-
	714.5	QPSK	1/14	H	19.04	-0.62	18.42	0.070	-
		16QAM	1/14	H	17.92	-0.62	17.30	0.054	-
		64QAM	1/14	H	16.79	-0.62	16.17	0.041	-
1.4	699.7	QPSK	1/2	H	18.85	-0.66	18.19	0.066	-
		16QAM	1/2	H	18.03	-0.66	17.37	0.055	-
		64QAM	1/2	H	16.96	-0.66	16.30	0.043	-
	707.5	QPSK	1/2	H	18.79	-0.64	18.15	0.065	-
		16QAM	1/2	H	17.85	-0.64	17.21	0.053	-
		64QAM	1/2	H	16.98	-0.64	16.34	0.043	-
	715.3	QPSK	1/5	H	18.78	-0.62	18.16	0.065	-
		16QAM	1/5	H	17.82	-0.62	17.20	0.052	-
		64QAM	1/5	H	16.94	-0.62	16.32	0.043	-

- Measurement data: With wireless charging pad

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)	Note
10	711	QPSK	1/0	H	19.27	-0.63	18.64	0.073	-
				H	18.53	-0.63	17.90	0.062	With Dual Display (180°)
		16QAM	1/0	H	18.34	-0.63	17.71	0.059	-
				H	17.65	-0.63	17.02	0.050	With Dual Display (180°)
		64QAM	1/0	H	17.08	-0.63	16.45	0.044	-
				H	16.38	-0.63	15.75	0.038	With Dual Display (180°)

7.5.2 LTE Band 13

- Measurement data: Without wireless charging pad

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)	Note
10	782.0	QPSK	1/0	H	19.51	-0.45	19.06	0.081	-
			1/0	H	19.60	-0.45	19.15	0.082	With Dual Display (180°)
		16QAM	1/0	H	18.02	-0.45	17.57	0.057	-
			1/0	H	18.76	-0.45	18.31	0.068	With Dual Display (180°)
		64QAM	1/0	H	17.05	-0.45	16.60	0.046	-
			1/0	H	17.87	-0.45	17.42	0.055	With Dual Display (180°)
5	779.5	QPSK	1/0	H	18.86	-0.45	18.41	0.069	-
		16QAM	1/0	H	17.82	-0.45	17.37	0.055	-
		64QAM	1/0	H	17.18	-0.45	16.73	0.047	-
	784.5	QPSK	1/0	H	18.75	-0.44	18.31	0.068	-
		16QAM	1/0	H	17.96	-0.44	17.52	0.056	-
		64QAM	1/0	H	16.75	-0.44	16.31	0.043	-

- Measurement data: With wireless charging pad

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)	Note
10	782	QPSK	1/0	H	17.35	-0.45	16.90	0.049	-
			1/0	H	18.00	-0.45	17.55	0.057	With Dual Display (180°)
		16QAM	1/0	H	16.55	-0.45	16.10	0.041	-
			1/0	H	17.12	-0.45	16.67	0.046	With Dual Display (180°)
		64QAM	1/0	H	15.48	-0.45	15.03	0.032	-
			1/0	H	16.15	-0.45	15.70	0.037	With Dual Display (180°)

7.5.3 LTE Band 5

- Measurement data: Without wireless charging pad

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)	Note
10	829	QPSK	1/49	V	18.40	-0.67	17.73	0.059	-
		16QAM	1/49	V	17.26	-0.67	16.59	0.046	-
		64QAM	1/49	V	16.11	-0.67	15.44	0.035	-
	836.5	QPSK	1/25	V	19.17	-0.74	18.43	0.070	-
		16QAM	1/25	V	18.17	-0.74	17.43	0.055	-
		64QAM	1/25	V	17.11	-0.74	16.37	0.043	-
	844	QPSK	1/0	V	19.93	-0.81	19.12	0.082	-
			1/0	V	20.08	-0.81	19.27	0.085	With Dual Display (180°)
		16QAM	1/0	V	18.95	-0.81	18.14	0.065	-
			1/0	V	19.21	-0.81	18.40	0.069	With Dual Display (180°)
		64QAM	1/0	V	17.89	-0.81	17.08	0.051	-
			1/0	V	18.13	-0.81	17.32	0.054	With Dual Display (180°)
5	826.5	QPSK	1/24	V	18.50	-0.65	17.85	0.061	-
		16QAM	1/24	V	17.59	-0.65	16.94	0.049	-
		64QAM	1/24	V	16.23	-0.65	15.58	0.036	-
	836.5	QPSK	1/0	V	19.17	-0.74	18.43	0.070	-
		16QAM	1/0	V	18.13	-0.74	17.39	0.055	-
		64QAM	1/0	V	17.29	-0.74	16.55	0.045	-
	846.5	QPSK	1/12	V	19.88	-0.83	19.05	0.080	-
		16QAM	1/12	V	19.07	-0.83	18.24	0.067	-
		64QAM	1/12	V	17.57	-0.83	16.74	0.047	-
3	825.5	QPSK	1/14	V	18.21	-0.64	17.57	0.057	-
		16QAM	1/14	V	17.36	-0.64	16.72	0.047	-
		64QAM	1/14	V	16.27	-0.64	15.63	0.037	-
	836.5	QPSK	1/14	V	19.07	-0.74	18.33	0.068	-
		16QAM	1/14	V	18.15	-0.74	17.41	0.055	-
		64QAM	1/14	V	16.94	-0.74	16.20	0.042	-
	847.5	QPSK	1/0	V	19.89	-0.84	19.05	0.080	-
		16QAM	1/0	V	18.94	-0.84	18.10	0.065	-
		64QAM	1/0	V	17.50	-0.84	16.66	0.046	-
1.4	824.7	QPSK	1/2	V	18.07	-0.63	17.44	0.055	-
		16QAM	1/2	V	17.10	-0.63	16.47	0.044	-
		64QAM	1/2	V	15.90	-0.63	15.27	0.034	-
	836.5	QPSK	1/2	V	18.97	-0.74	18.23	0.067	-
		16QAM	1/2	V	18.16	-0.74	17.42	0.055	-
		64QAM	1/2	V	16.96	-0.74	16.22	0.042	-
	848.3	QPSK	1/2	V	19.86	-0.85	19.01	0.080	-
		16QAM	1/2	V	19.17	-0.85	18.32	0.068	-
		64QAM	1/2	V	17.33	-0.85	16.48	0.044	-

- Measurement data: With wireless charging pad

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)	Note
10	844	QPSK	1/0	H	20.46	-0.81	19.65	0.092	-
			1/0	H	21.50	-0.81	20.69	0.117	With Dual Display (180°)
		16QAM	1/0	H	19.64	-0.81	18.83	0.076	-
			1/0	H	20.60	-0.81	19.79	0.095	With Dual Display (180°)
		64QAM	1/0	H	18.41	-0.81	17.60	0.058	-
			1/0	H	19.39	-0.81	18.58	0.072	With Dual Display (180°)

7.5.4 LTE Band 4

- Measurement data: Without wireless charging pad

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)	Note
20	1 720	QPSK	1/50	H	14.81	5.28	20.09	0.102	-
		16QAM	1/50	H	13.84	5.28	19.12	0.082	-
		64QAM	1/50	H	12.45	5.28	17.73	0.059	-
	1 732.5	QPSK	1/0	H	15.51	5.33	20.84	0.121	-
		16QAM	1/0	H	14.34	5.33	19.67	0.093	-
		64QAM	1/0	H	13.37	5.33	18.70	0.074	-
	1 745	QPSK	1/99	H	15.70	5.38	21.08	0.128	-
			1/99	H	16.87	5.38	22.25	0.168	With Dual Display (180°)
		16QAM	1/99	H	14.80	5.38	20.18	0.104	-
			1/99	H	15.60	5.38	20.98	0.125	With Dual Display (180°)
		64QAM	1/99	H	13.84	5.38	19.22	0.084	-
			1/99	H	14.35	5.38	19.73	0.094	With Dual Display (180°)
15	1 717.5	QPSK	1/36	H	14.12	5.27	19.39	0.087	-
		16QAM	1/36	H	13.24	5.27	18.51	0.071	-
		64QAM	1/36	H	12.48	5.27	17.75	0.060	-
	1 732.5	QPSK	1/0	H	15.62	5.33	20.95	0.124	-
		16QAM	1/0	H	14.29	5.33	19.62	0.092	-
		64QAM	1/0	H	13.36	5.33	18.69	0.074	-
	1 747.5	QPSK	1/74	H	15.61	5.39	21.00	0.126	-
		16QAM	1/74	H	14.67	5.39	20.06	0.101	-
		64QAM	1/74	H	13.74	5.39	19.13	0.082	-
10	1 715	QPSK	1/25	H	15.31	5.26	20.57	0.114	-
		16QAM	1/25	H	14.00	5.26	19.26	0.084	-
		64QAM	1/25	H	12.84	5.26	18.10	0.065	-
	1 732.5	QPSK	1/0	H	15.54	5.33	20.87	0.122	-
		16QAM	1/0	H	14.42	5.33	19.75	0.094	-
		64QAM	1/0	H	13.55	5.33	18.88	0.077	-
	1 750	QPSK	1/25	H	15.42	5.40	20.82	0.121	-
		16QAM	1/25	H	14.17	5.40	19.57	0.091	-
		64QAM	1/25	H	13.10	5.40	18.50	0.071	-

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)	Note
5	1 712.5	QPSK	1/12	H	14.86	5.25	20.11	0.103	-
		16QAM	1/12	H	13.91	5.25	19.16	0.082	-
		64QAM	1/12	H	12.80	5.25	18.05	0.064	-
	1 732.5	QPSK	1/0	H	15.58	5.33	20.91	0.123	-
		16QAM	1/0	H	14.41	5.33	19.74	0.094	-
		64QAM	1/0	H	13.35	5.33	18.68	0.074	-
	1 752.5	QPSK	1/0	H	15.38	5.38	20.76	0.119	-
		16QAM	1/0	H	14.41	5.38	19.79	0.095	-
		64QAM	1/0	H	14.28	5.38	19.66	0.092	-
3	1 711.5	QPSK	1/0	H	15.04	5.25	20.29	0.107	-
		16QAM	1/0	H	14.17	5.25	19.42	0.087	-
		64QAM	1/0	H	12.94	5.25	18.19	0.066	-
	1 732.5	QPSK	1/0	H	15.57	5.33	20.90	0.123	-
		16QAM	1/0	H	14.40	5.33	19.73	0.094	-
		64QAM	1/0	H	13.22	5.33	18.55	0.072	-
	1 753.5	QPSK	1/7	H	15.30	5.37	20.67	0.117	-
		16QAM	1/7	H	14.51	5.37	19.88	0.097	-
		64QAM	1/7	H	13.68	5.37	19.05	0.080	-
1.4	1 710.7	QPSK	1/0	H	14.67	5.24	19.91	0.098	-
		16QAM	1/0	H	13.57	5.24	18.81	0.076	-
		64QAM	1/0	H	12.65	5.24	17.89	0.062	-
	1 732.5	QPSK	1/0	H	15.10	5.33	20.43	0.110	-
		16QAM	1/0	H	14.20	5.33	19.53	0.090	-
		64QAM	1/0	H	13.23	5.33	18.56	0.072	-
	1 754.3	QPSK	1/0	H	15.54	5.36	20.90	0.123	-
		16QAM	1/0	H	14.70	5.36	20.06	0.101	-
		64QAM	1/0	H	13.57	5.36	18.93	0.078	-

- Measurement data: With wireless charging pad

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)	Note
20	1 745	QPSK	1/99	H	14.02	5.38	19.40	0.087	-
			1/99	H	15.19	5.38	20.57	0.114	With Dual Display (180°)
		16QAM	1/99	H	13.07	5.38	18.45	0.070	-
			1/99	H	14.24	5.38	19.62	0.092	With Dual Display (180°)
		64QAM	1/99	H	12.08	5.38	17.46	0.056	-
			1/99	H	13.00	5.38	18.38	0.069	With Dual Display (180°)

7.5.5 LTE Band 41

- Measurement data: Without wireless charging pad

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)	Note
20	2 506	QPSK	1/50	H	15.54	5.92	21.46	0.140	-
		16QAM	1/50	H	14.73	5.92	20.65	0.116	-
		64QAM	1/50	H	12.72	5.92	18.64	0.073	-
	2 593	QPSK	1/0	H	16.08	6.19	22.27	0.169	-
			1/0	H	14.79	6.19	20.98	0.125	With Dual Display (180°)
		16QAM	1/0	H	14.96	6.19	21.15	0.130	-
			1/0	H	13.59	6.19	19.78	0.095	With Dual Display (180°)
		64QAM	1/0	H	14.29	6.19	20.48	0.112	-
			1/0	H	12.63	6.19	18.82	0.076	With Dual Display (180°)
			1/0	H	12.63	6.19	18.82	0.076	With Dual Display (180°)
	2 680	QPSK	1/99	H	15.79	6.34	22.13	0.163	-
		16QAM	1/99	H	14.66	6.34	21.00	0.126	-
		64QAM	1/99	H	13.74	6.34	20.08	0.102	-
15	2 503.5	QPSK	1/0	H	15.51	5.91	21.42	0.139	-
		16QAM	1/0	H	14.70	5.91	20.61	0.115	-
		64QAM	1/0	H	13.64	5.91	19.55	0.090	-
	2 593	QPSK	1/0	H	15.97	6.19	22.16	0.164	-
		16QAM	1/0	H	15.05	6.19	21.24	0.133	-
		64QAM	1/0	H	13.81	6.19	20.00	0.100	-
	2 682.5	QPSK	1/36	H	15.54	6.33	21.87	0.154	-
		16QAM	1/36	H	14.45	6.33	20.78	0.120	-
		64QAM	1/36	H	13.47	6.33	19.80	0.095	-
10	2 501	QPSK	1/25	H	15.12	5.90	21.02	0.126	-
		16QAM	1/25	H	14.03	5.90	19.93	0.098	-
		64QAM	1/25	H	12.99	5.90	18.89	0.077	-
	2 593	QPSK	1/0	H	15.67	6.19	21.86	0.153	-
		16QAM	1/0	H	14.67	6.19	20.86	0.122	-
		64QAM	1/0	H	13.86	6.19	20.05	0.101	-
	2 685	QPSK	1/0	H	15.48	6.32	21.80	0.151	-
		16QAM	1/0	H	14.37	6.32	20.69	0.117	-
		64QAM	1/0	H	13.42	6.32	19.74	0.094	-
5	2 498.5	QPSK	1/12	H	15.79	5.89	21.68	0.147	-
		16QAM	1/12	H	14.61	5.89	20.50	0.112	-
		64QAM	1/12	H	13.41	5.89	19.30	0.085	-
	2 593	QPSK	1/0	H	15.27	6.19	21.46	0.140	-
		16QAM	1/0	H	14.03	6.19	20.22	0.105	-
		64QAM	1/0	H	12.93	6.19	19.12	0.082	-
	2 687.5	QPSK	1/0	H	14.85	6.31	21.16	0.131	-
		16QAM	1/0	H	13.64	6.31	19.95	0.099	-
		64QAM	1/0	H	12.56	6.31	18.87	0.077	-

- Measurement data: With wireless charging pad

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)	Note
20	2 593	QPSK	1/0	H	15.50	6.19	21.69	0.148	-
			1/0	H	16.13	6.19	22.32	0.171	With Dual Display (180°)
		16QAM	1/0	H	14.36	6.19	20.55	0.113	-
			1/0	H	15.26	6.19	21.45	0.140	With Dual Display (180°)
		64QAM	1/0	H	13.23	6.19	19.42	0.087	-
			1/0	H	14.17	6.19	20.36	0.109	With Dual Display (180°)

7.6 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 4/5/12/13 = $43 + 10\log_{10}(P[\text{Watts}])$
- 4) Limit Calculation for Band 41 = $55 + 10\log_{10}(P[\text{Watts}])$
- 5) Limit Calculation for 1 559 MHz ~ 1 610 MHz in Band 13 = -70 dBW/MHz (equivalent isotropically radiated power for wideband signals)

7.6.1 LTE Band 12

- Measurement data: Without wireless charging pad

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)	Note
								(dBm)	(dBc)		
10	704	1/25	QPSK	1 397.56	V	-57.80	2.40	-55.40	73.83	31.43	-
				2 114.30	V	-53.18	3.11	-50.07	68.50		-
			16QAM	1 395.54	V	-58.09	2.36	-55.73	73.36	30.63	-
				2 120.45	V	-53.07	3.13	-49.94	67.57		-
			64QAM	1 398.31	V	-58.49	2.42	-56.07	72.62	29.55	-
				2 123.73	V	-52.65	3.14	-49.51	66.06		-
	711	1/0	QPSK	1 423.06	V	-57.21	2.54	-54.67	73.14	31.47	-
				2 125.35	V	-52.79	3.15	-49.64	68.11		-
				1 412.86	V	-56.06	2.50	-53.56	71.26	30.70	With Dual Display (180°)
				2 119.81	V	-52.11	3.13	-48.98	66.68		
			16QAM	1 404.86	V	-57.63	2.47	-55.16	72.51	30.35	-
				2 121.66	V	-52.73	3.14	-49.59	66.94		-
			64QAM	1 407.09	V	-57.76	2.48	-55.28	71.48	29.20	-
				2 121.76	V	-52.84	3.14	-49.70	65.90		-

- Measurement data: With wireless charging pad

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)	Note
								(dBm)	(dBc)		
10	711	1/0	QPSK	1 424.83	V	-57.12	2.55	-54.57	73.21	31.64	-
				2 121.64	V	-53.15	3.14	-50.01	68.65		-
				1 396.24	V	-57.69	2.37	-55.32	73.22	30.90	With Dual Display (180°)
				2 120.02	V	-48.67	3.13	-45.54	63.44		

7.6.2 LTE Band 13

Measurement data: Without wireless charging pad

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)	Note
								(dBm)	(dBc)		
10	782	1/0	QPSK	2 332.60	V	-50.24	3.62	-46.62	65.68	32.06	-
				2 332.41	V	-47.06	3.61	-43.45	62.60	32.15	With Dual Display (180°)
			16QAM	2 332.36	V	-50.30	3.61	-46.69	64.26	30.57	-
			64QAM	2 332.83	V	-51.44	3.62	-47.82	64.42	29.60	-

- Measurement data: With wireless charging pad

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)	Note
								(dBm)	(dBc)		
10	782	1/0	QPSK	2 337.40	V	-52.84	3.62	-49.22	66.12	29.90	-
				2 332.64	V	-44.20	3.62	-40.58	58.13	30.55	With Dual Display (180°)

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

- Measurement data: Without wireless charging pad

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)	Note
								(dBm/MHz)	(dB)		
10	782	1/25	QPSK	1 568.21	V	-58.96	6.45	-52.51	12.51	-40.00	-
				1 564.37	V	-55.96	6.41	-49.55	9.55	-40.00	With Dual Display (180°)
			16QAM	1 575.50	V	-58.16	6.50	-51.66	11.66	-40.00	-
			64QAM	1 565.28	V	-58.65	6.42	-52.23	12.23	-40.00	-
5	779.5	1/24	QPSK	1 575.46	V	-58.11	6.50	-51.61	11.61	-40.00	-
			16QAM	1 571.16	V	-58.50	6.47	-52.03	12.03	-40.00	-
			64QAM	1 578.96	V	-58.37	6.53	-51.84	11.84	-40.00	-
	784.5	1/24	QPSK	1 574.17	V	-58.10	6.49	-51.61	11.61	-40.00	-
			16QAM	1 568.32	V	-58.19	6.45	-51.74	11.74	-40.00	-
			64QAM	1 573.10	V	-58.15	6.48	-51.67	11.67	-40.00	-

- Measurement data: With wireless charging pad

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)	Note
								(dBm/MHz)	(dB)		
10	782	1/25	QPSK	1 559.39	V	-58.24	6.38	-51.86	11.86	-40.00	-
				1 563.84	V	-56.16	6.41	-49.75	9.75	-40.00	With Dual Display (180°)

7.6.3 LTE Band 5

- Measurement data: Without wireless charging pad

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)	Note
								(dBm)	(dBc)		
10	829	1/49	QPSK	1 667.08	V	-57.57	3.77	-53.80	71.53	30.73	-
				2 490.95	H	-54.96	3.70	-51.26	68.99		-
			16QAM	1 660.54	V	-57.95	3.92	-54.03	70.62	29.59	-
				2 511.82	H	-54.67	3.80	-50.87	67.46		-
			64QAM	1 680.43	V	-57.75	3.48	-54.27	69.71	28.44	-
				2 513.28	H	-54.94	3.80	-51.14	66.58		-
	836.5	1/25	QPSK	1 669.95	V	-57.80	3.71	-54.09	72.52	31.43	-
				2 505.09	H	-53.80	3.77	-50.03	68.46		-
			16QAM	1 671.62	V	-57.64	3.67	-53.97	71.40	30.43	-
				2 501.41	H	-54.82	3.76	-51.06	68.49		-
			64QAM	1 665.97	V	-57.98	3.80	-54.18	70.55	29.37	-
				2 500.11	H	-54.60	3.75	-50.85	67.22		-
	844	1/0	QPSK	1 686.30	V	-56.47	3.35	-53.12	72.24	32.12	-
				2 506.42	H	-54.54	3.78	-50.76	69.88		-
				1679.10	V	-52.61	3.51	-49.10	68.37	32.27	With Dual Display (180°)
				2518.90	H	-50.66	3.83	-46.83	66.10		-
			16QAM	1 686.75	V	-57.41	3.34	-54.07	72.21	31.14	-
				2 520.46	H	-54.50	3.83	-50.67	68.81		-
			64QAM	1 686.88	V	-56.88	3.34	-53.54	70.62	30.08	-
				2 523.48	H	-54.76	3.84	-50.92	68.00		-

- Measurement data: With wireless charging pad

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)	Note
								(dBm)	(dBc)		
10	844	1/0	QPSK	1 679.20	H	-54.27	3.51	-50.76	70.41	32.65	-
				2 517.64	V	-53.19	3.82	-49.37	69.02		-
				1678.88	H	-47.85	3.51	-44.34	65.03	33.69	With Dual Display (180°)
				2518.97	V	-45.55	3.83	-41.72	62.41		-

7.6.4 LTE Band 4

- Measurement data: Without wireless charging pad

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)	Note
								(dBm)	(dBc)		
20	1 720	1/50	QPSK	3 426.88	V	-53.85	7.75	-46.10	66.19	33.09	-
				5 160.22	V	-52.29	10.32	-41.97	62.06		-
			16QAM	3 441.86	V	-53.86	7.78	-46.08	65.20	32.12	-
				5 160.20	V	-51.37	10.32	-41.05	60.17		-
			64QAM	3 432.60	V	-55.00	7.77	-47.23	64.96	30.73	-
				5 160.00	V	-49.68	10.32	-39.36	57.09		-
	1 732.5	1/0	QPSK	3 451.91	V	-55.10	7.80	-47.30	68.14	33.84	-
				5 170.73	V	-50.66	10.34	-40.32	61.16		-
			16QAM	3 447.08	V	-53.63	7.79	-45.84	65.51	32.67	-
				5 170.84	V	-50.50	10.34	-40.16	59.83		-
			64QAM	3457.96	V	-55.53	7.82	-47.71	66.41	31.70	-
				5170.62	V	-52.86	10.34	-42.52	61.22		-
	1 745	1/99	QPSK	3 518.17	V	-55.28	7.97	-47.31	68.39	34.08	-
				5 261.97	V	-49.86	10.32	-39.54	60.62		-
				3 507.21	V	-54.98	7.93	-47.05	69.30	35.25	With Dual Display (180°)
				5 261.92	V	-53.55	10.32	-43.23	65.48		-
			16QAM	3 503.20	V	-55.40	7.91	-47.49	67.67	33.18	-
				5 261.66	V	-48.28	10.32	-37.96	58.14		-
			64QAM	3 507.97	V	-55.00	7.93	-47.07	66.29	32.22	-
				5 261.56	V	-48.28	10.32	-37.96	57.18		-

- Measurement data: With wireless charging pad

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)	Note
								(dBm)	(dBc)		
20	1 745	1/99	QPSK	3 507.59	V	-53.74	7.93	-45.81	65.21	32.40	-
				5 261.67	V	-52.51	10.32	-42.19	61.59		-
				3 507.68	V	-52.72	7.93	-44.79	65.36	33.57	With Dual Display (180°)
				5 261.78	V	-52.22	10.32	-41.90	62.47		-

7.6.5 LTE Band 41

- Measurement data: Without wireless charging pad

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)	Note
								(dBm)	(dBc)		
20	2 506	1/50	QPSK	5 026.68	H	-54.03	10.25	-43.78	65.24	46.46	-
				7 534.81	V	-50.59	12.17	-38.42	59.88		-
			16QAM	5 016.36	H	-53.96	10.23	-43.73	64.38	45.65	-
				7 518.07	V	-50.67	12.14	-38.53	59.18		-
			64QAM	5 031.07	H	-53.88	10.26	-43.62	62.26	43.64	-
				7 518.10	V	-50.44	12.14	-38.30	56.94		-
	2 593	1/0	QPSK	5 186.36	H	-53.40	10.37	-43.03	65.30	47.27	-
				7 752.26	V	-50.57	12.30	-38.27	60.54		-
				5 168.31	H	-52.59	10.34	-42.25	63.23	45.98	With Dual Display (180°)
				7 752.22	V	-50.28	12.30	-37.98	58.96		-
			16QAM	5 166.82	H	-53.23	10.33	-42.90	64.05	46.15	-
				7 747.27	V	-50.39	12.29	-38.10	59.25		-
			64QAM	5 143.93	H	-53.86	10.30	-43.56	64.04	45.48	-
				7 752.01	V	-50.47	12.30	-38.17	58.65		-
	2 680	1/99	QPSK	5 362.37	H	-53.79	10.48	-43.31	65.44	47.13	-
				8 079.87	V	-51.13	12.60	-38.53	60.66		-
			16QAM	5 361.86	H	-54.01	10.48	-43.53	64.53	46.00	-
				8 066.58	V	-51.29	12.60	-38.69	59.69		-
			64QAM	5 364.14	H	-53.57	10.47	-43.10	63.18	45.08	-
				8 059.45	V	-50.00	12.60	-37.40	57.48		-

- Measurement data: With wireless charging pad

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)	Note
								(dBm)	(dBc)		
20	2 593	1/0	QPSK	5 191.58	V	-53.70	10.38	-43.32	65.01	46.69	-
				7 750.39	V	-50.48	12.30	-38.18	59.87		-
				5 168.14	V	-53.67	10.34	-43.33	65.65	47.32	With Dual Display (180°)
				7 752.18	V	-50.58	12.30	-38.28	60.60		-

7.7 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.

7.7.1 LTE Band 12

OPERATING FREQUENCY : 707.5 MHz
REFERENCE VOLTAGE : 3.87 VDC
LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.87	+20(Ref)	707,500,009	+9	+0.012 7	+0.000 001 272
100 %		-30	707,500,007	+7	+0.009 9	+0.000 000 989
100 %		-20	707,500,004	+4	+0.005 7	+0.000 000 565
100 %		-10	707,500,013	+13	+0.018 4	+0.000 001 837
100 %		0	707,499,990	-10	-0.014 1	-0.000 001 413
100 %		+10	707,499,997	-3	-0.004 2	-0.000 000 424
100 %		+20	707,500,009	+9	+0.012 7	+0.000 001 272
100 %		+30	707,500,001	+1	+0.001 4	+0.000 000 141
100 %		+40	707,499,999	-1	-0.001 4	-0.000 000 141
100 %		+50	707,500,009	+9	+0.012 7	+0.000 001 272
115 %	4.45	+20	707,500,007	+7	+0.009 9	+0.000 000 989
BATT.ENDPOINT	3.00	+20	707,500,004	+4	+0.005 7	+0.000 000 565

7.7.2 LTE Band 13

OPERATING FREQUENCY : 782.0 MHz
 REFERENCE VOLTAGE : 3.87 VDC
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.87	+20(Ref)	782,000,005	+5	+0.006 4	+0.000 000 639
100 %		-30	782,000,010	+10	+0.012 8	+0.000 001 279
100 %		-20	782,000,007	+7	+0.009 0	+0.000 000 895
100 %		-10	782,000,008	+8	+0.010 2	+0.000 001 023
100 %		0	782,000,009	+9	+0.011 5	+0.000 001 151
100 %		+10	782,000,001	+1	+0.001 3	+0.000 000 128
100 %		+20	782,000,005	+5	+0.006 4	+0.000 000 639
100 %		+30	781,999,997	-3	-0.003 8	-0.000 000 384
100 %		+40	781,999,999	-1	-0.001 3	-0.000 000 128
100 %		+50	781,999,992	-8	-0.010 2	-0.000 001 023
115 %	4.45	+20	782,000,007	+7	+0.009 0	+0.000 000 895
BATT.ENDPOINT	3.00	+20	782,000,003	+3	+0.003 8	+0.000 000 384

7.7.3 LTE Band 5

OPERATING FREQUENCY : 836.5 MHz
 REFERENCE VOLTAGE : 3.87 VDC
 DEVIATION LIMIT : $\pm 0.00025\%$ or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.87	+20(Ref)	836,500,004	+4	+0.004 8	+0.000 000 478
100 %		-30	836,500,001	+1	+0.001 2	+0.000 000 120
100 %		-20	836,500,007	+7	+0.008 4	+0.000 000 837
100 %		-10	836,499,988	-12	-0.014 3	-0.000 001 435
100 %		0	836,500,007	+7	+0.008 4	+0.000 000 837
100 %		+10	836,500,003	+3	+0.003 6	+0.000 000 359
100 %		+20	836,500,004	+4	+0.004 8	+0.000 000 478
100 %		+30	836,499,995	-5	-0.006 0	-0.000 000 598
100 %		+40	836,499,997	-3	-0.003 6	-0.000 000 359
100 %		+50	836,500,007	+7	+0.008 4	+0.000 000 837
115 %	4.45	+20	836,500,010	+10	+0.012 0	+0.000 001 195
BATT.ENDPOINT	3.00	+20	836,499,995	-5	-0.006 0	-0.000 000 598

7.7.4 LTE Band 4

OPERATING FREQUENCY : 1 732.5 MHz
 REFERENCE VOLTAGE : 3.87 VDC
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.87	+20(Ref)	1,732,500,007	+7	+0.004 0	+0.000 000 404
100 %		-30	1,732,500,006	+6	+0.003 5	+0.000 000 346
100 %		-20	1,732,500,001	+1	+0.000 6	+0.000 000 058
100 %		-10	1,732,499,999	-1	-0.000 6	-0.000 000 058
100 %		0	1,732,500,004	+4	+0.002 3	+0.000 000 231
100 %		+10	1,732,499,997	-3	-0.001 7	-0.000 000 173
100 %		+20	1,732,500,007	+7	+0.004 0	+0.000 000 404
100 %		+30	1,732,500,007	+7	+0.004 0	+0.000 000 404
100 %		+40	1,732,500,003	+3	+0.001 7	+0.000 000 173
100 %		+50	1,732,499,990	-10	-0.005 8	-0.000 000 577
115 %	4.45	+20	1,732,500,004	+4	+0.002 3	+0.000 000 231
BATT.ENDPOINT	3.00	+20	1,732,500,003	+3	+0.001 7	+0.000 000 173

7.7.5 LTE Band 41

OPERATING FREQUENCY : 2 593.0 MHz
 REFERENCE VOLTAGE : 3.87 VDC
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100 %	3.87	+20(Ref)	836,500,004	4	+0.004 8	+0.000 000 478
100 %		-30	836,500,001	1	+0.001 2	+0.000 000 120
100 %		-20	836,500,007	7	+0.008 4	+0.000 000 837
100 %		-10	836,499,988	-12	-0.014 3	-0.000 001 435
100 %		0	836,500,007	7	+0.008 4	+0.000 000 837
100 %		+10	836,500,003	3	+0.003 6	+0.000 000 359
100 %		+20	836,500,004	4	+0.004 8	+0.000 000 478
100 %		+30	836,499,995	-5	-0.006 0	-0.000 000 598
100 %		+40	836,499,997	-3	-0.003 6	-0.000 000 359
100 %		+50	836,500,007	7	+0.008 4	+0.000 000 837
115 %	4.45	+20	836,500,010	10	+0.012 0	+0.000 001 195
BATT.ENDPOINT	3.00	+20	836,499,995	-5	-0.006 0	-0.000 000 598

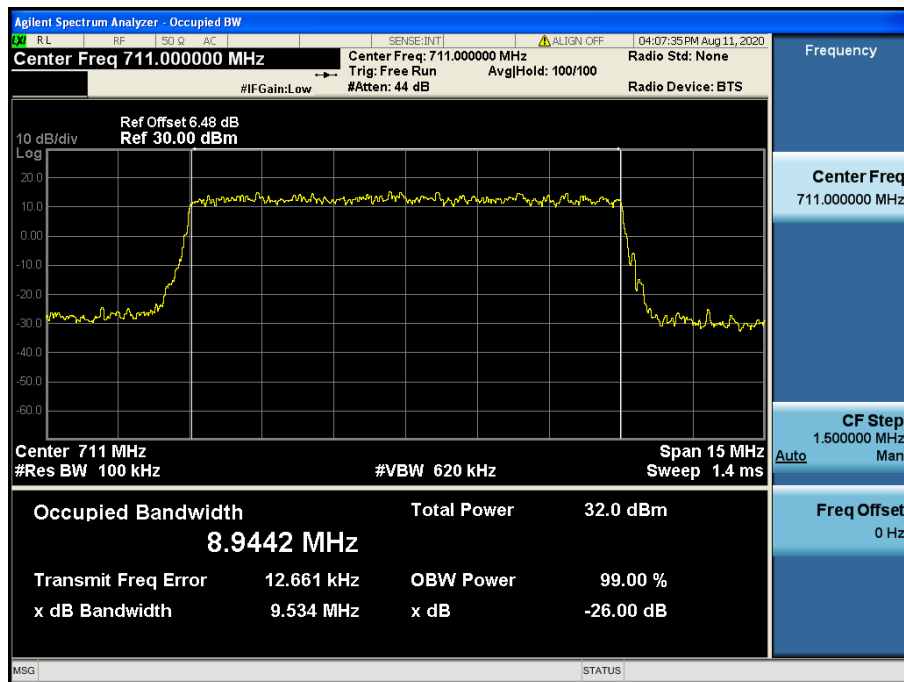
8. TEST PLOTS

- Test Notes:

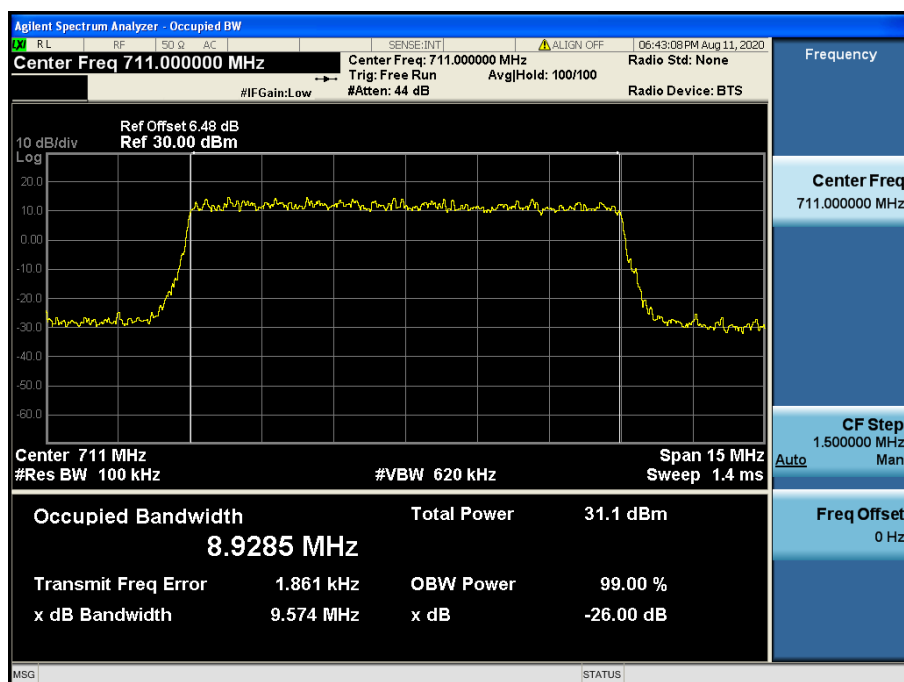
All bandwidths, RB configurations, and modulations were investigated.
The worst case test results are reported.

8.1 OCCUPIED BANDWIDTH

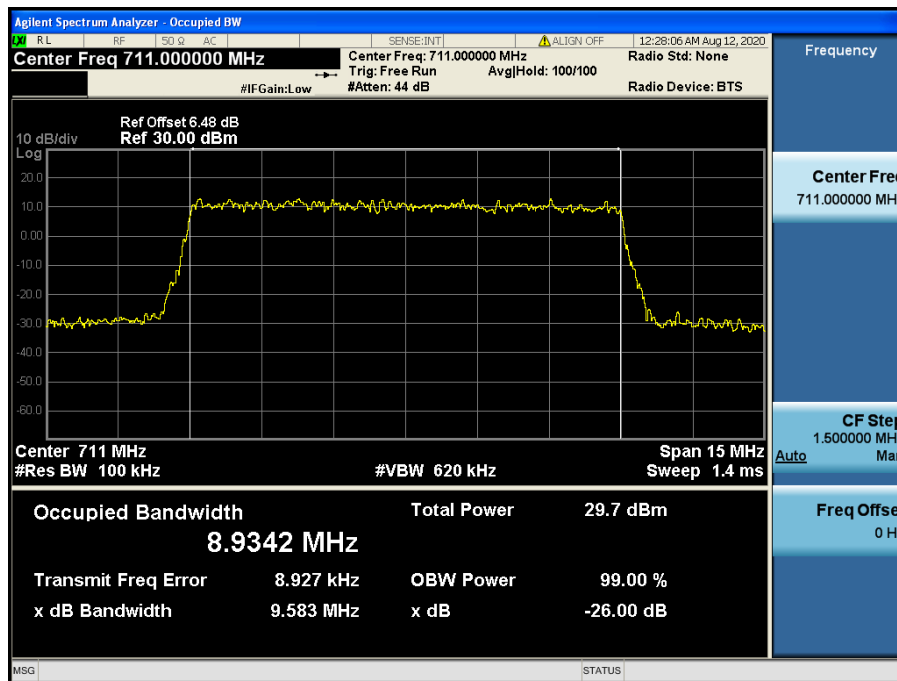
8.1.1 LTE Band 12



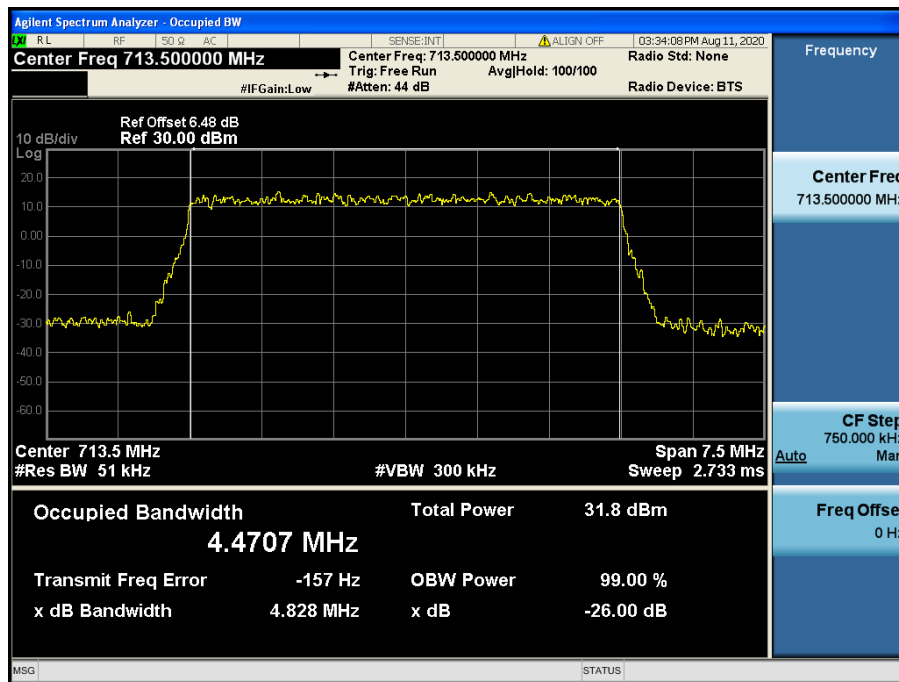
LTE Band 12 / 10 MHz / QPSK - RB Size 50



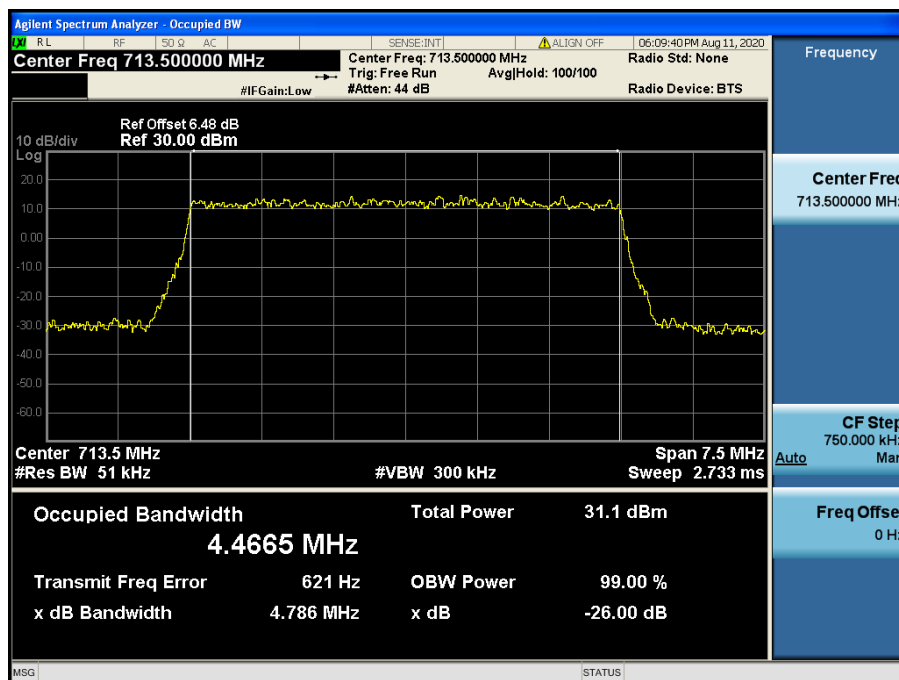
LTE Band 12 / 10 MHz / 16QAM - RB Size 50



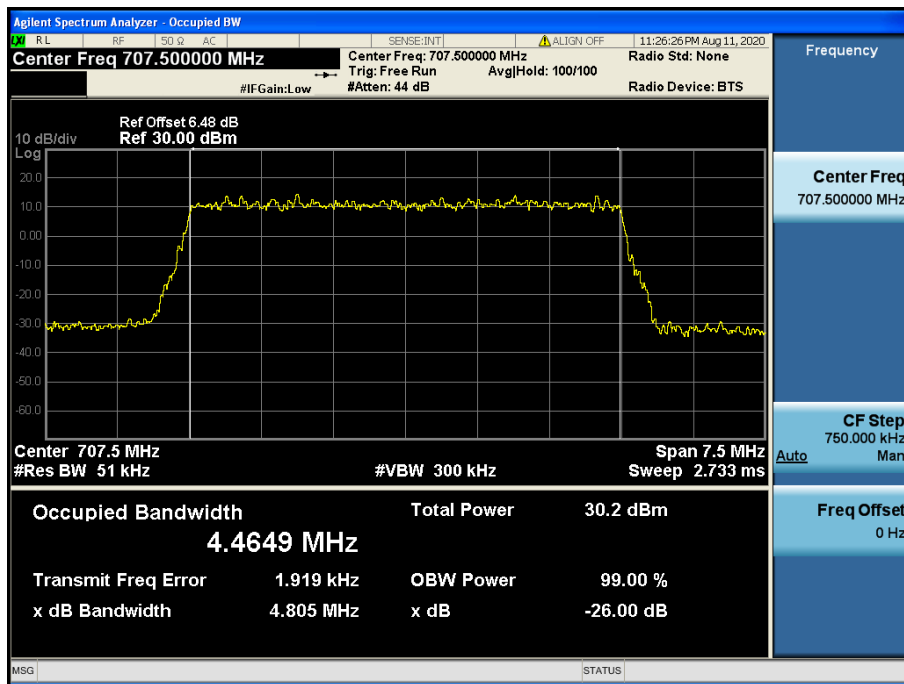
LTE Band 12 / 10 MHz / 64QAM- RB Size 50



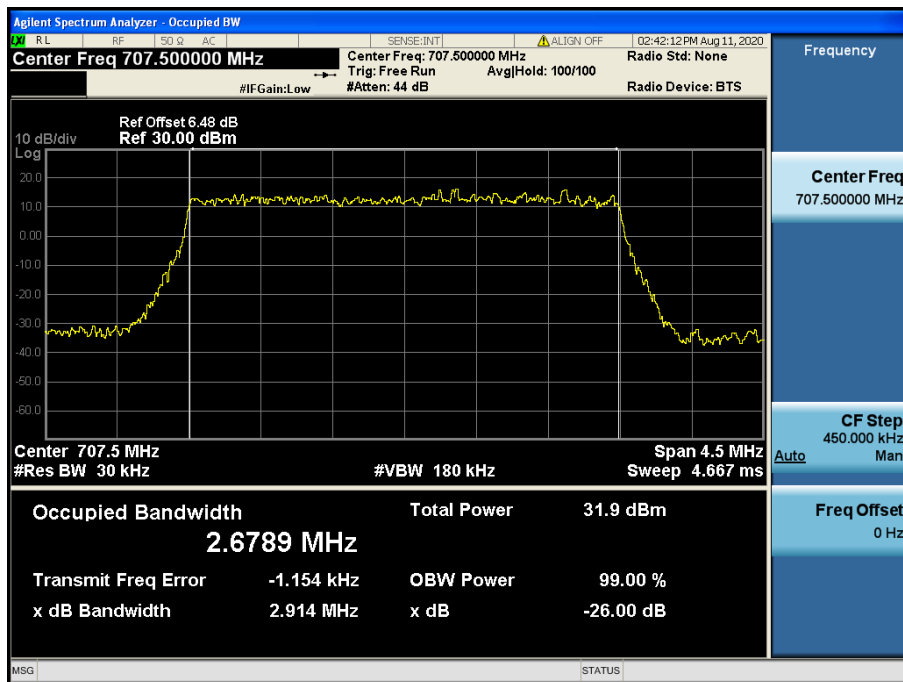
LTE Band 12 / 5 MHz / QPSK - RB Size 25



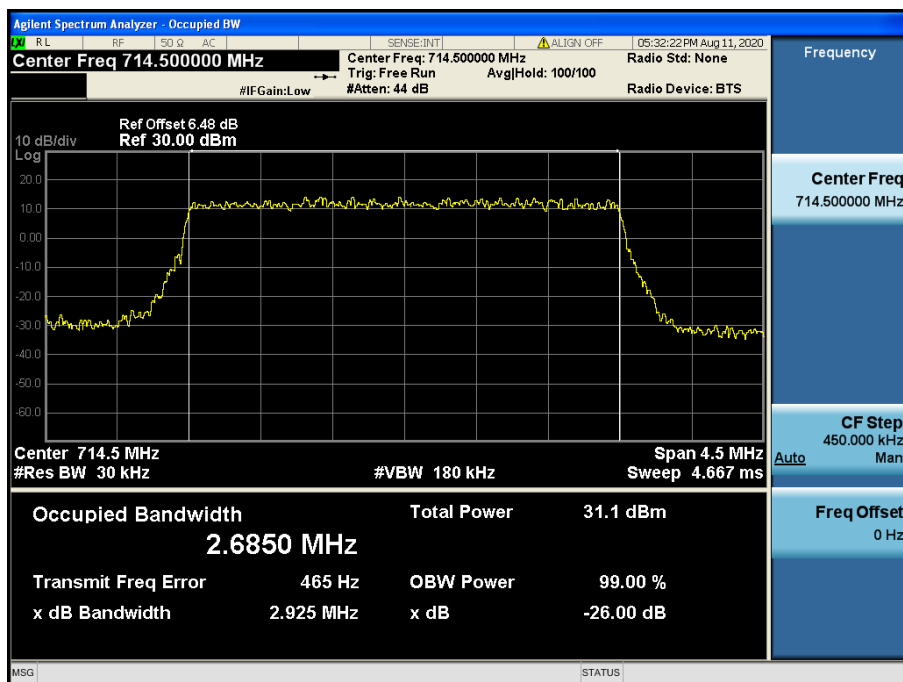
LTE Band 12 / 5 MHz / 16QAM - RB Size 25



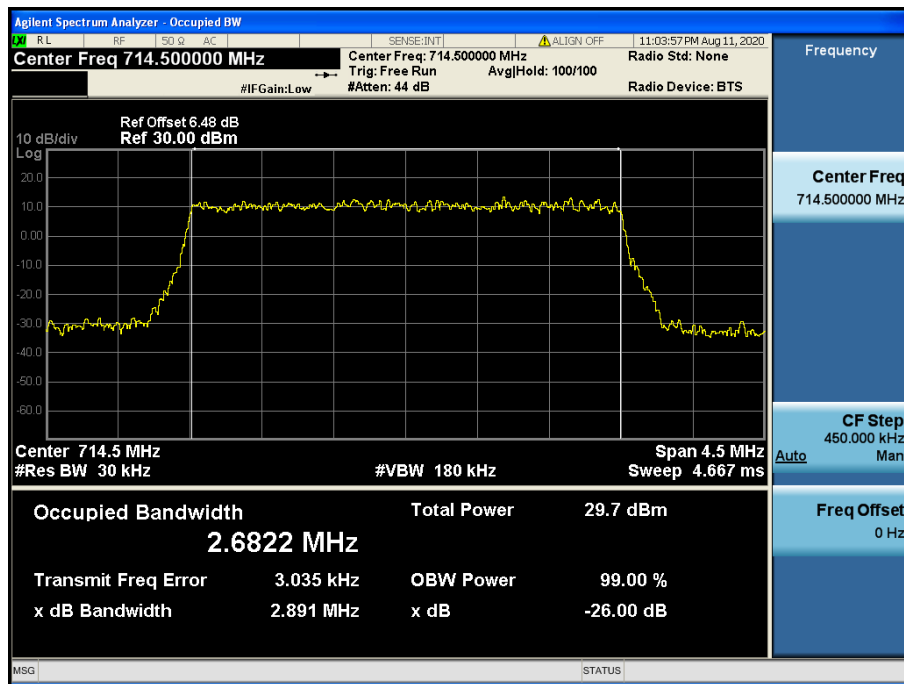
LTE Band 12 / 5 MHz / 64QAM - RB Size 25



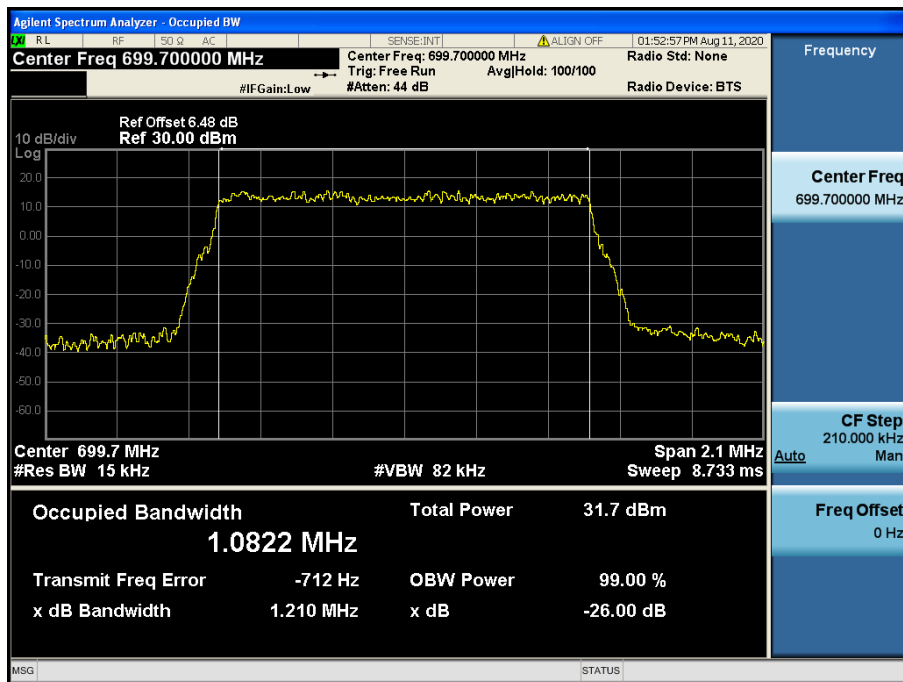
LTE Band 12 / 3 MHz / QPSK - RB Size 15



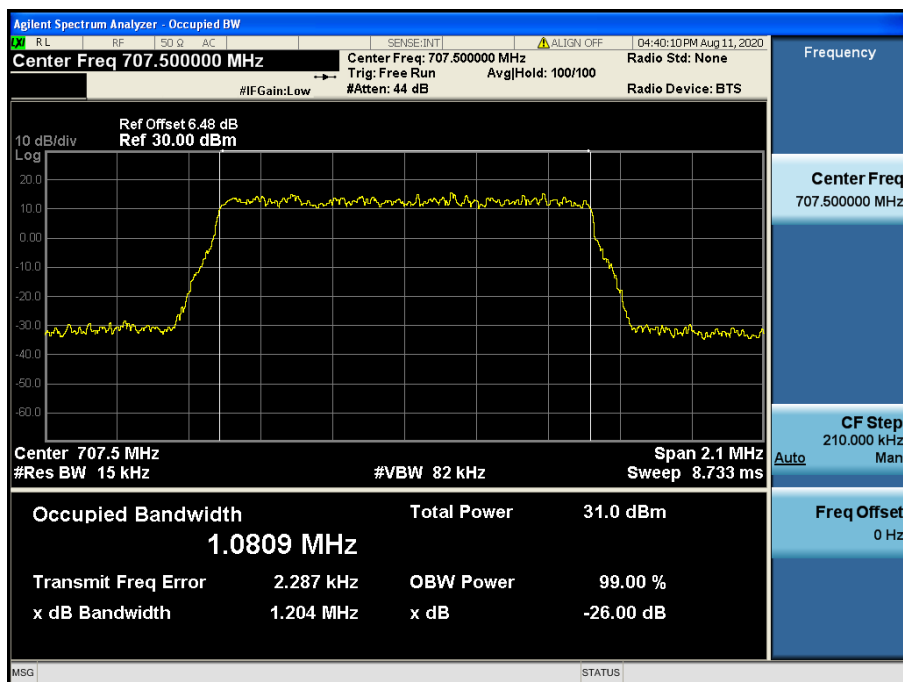
LTE Band 12 / 3 MHz / 16QAM - RB Size 15



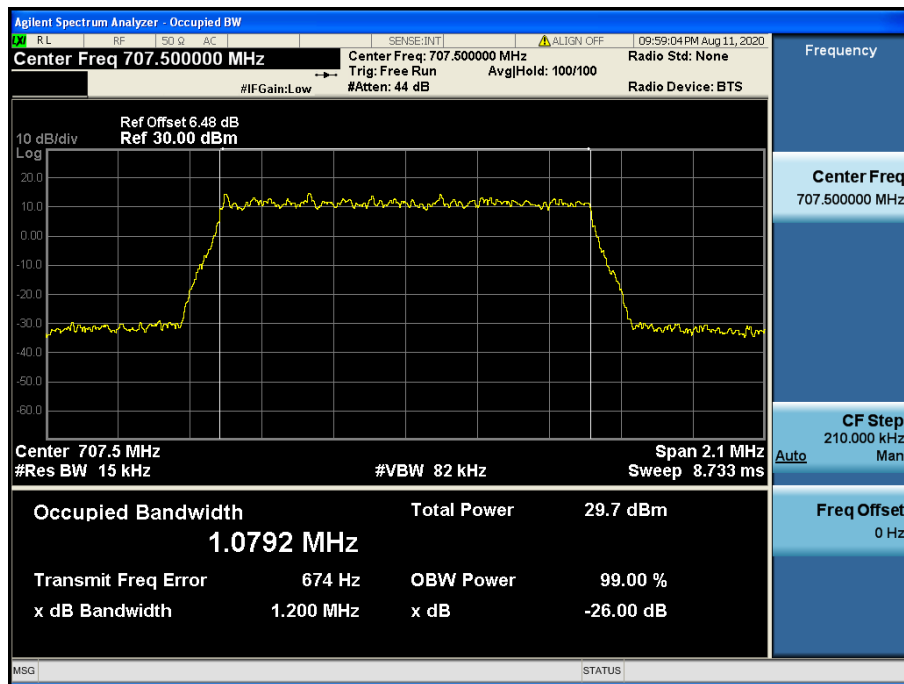
LTE Band 12 / 3 MHz / 64QAM - RB Size 15



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

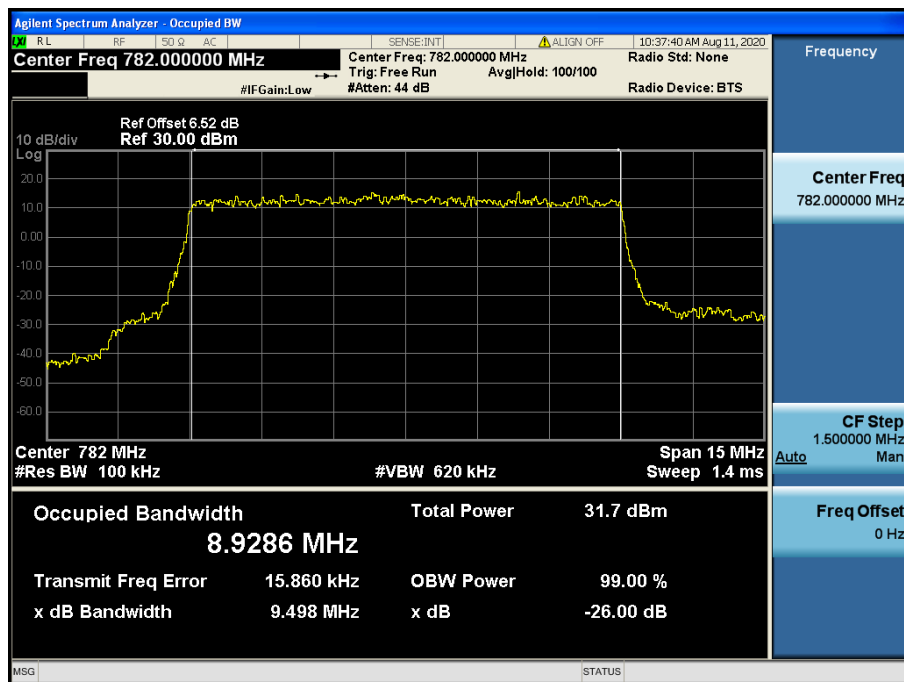


LTE Band 12 / 1.4 MHz / 16QAM - RB Size 6

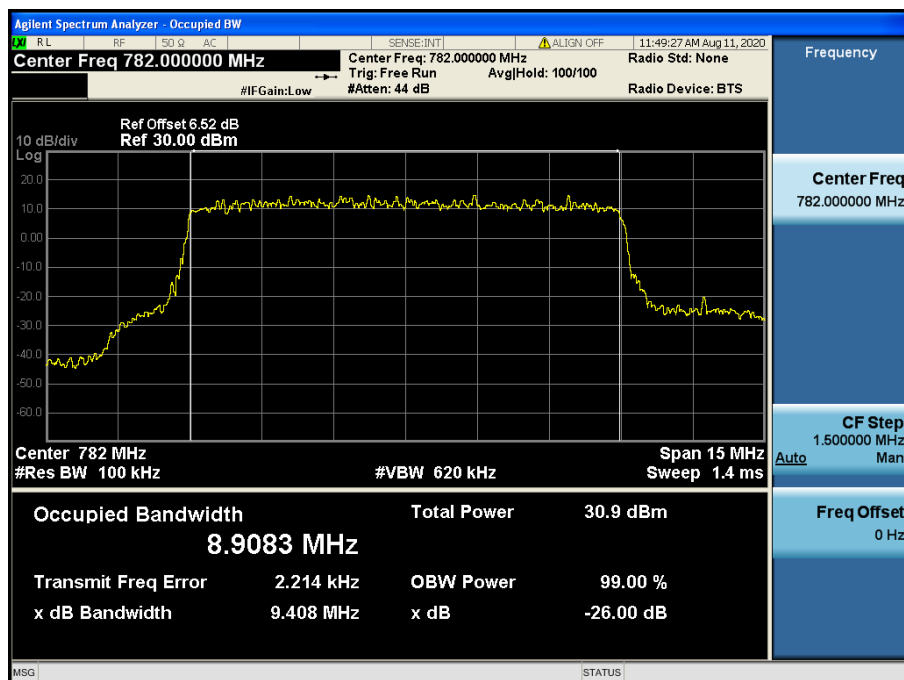


LTE Band 12 / 1.4 MHz / 64QAM - RB Size 6

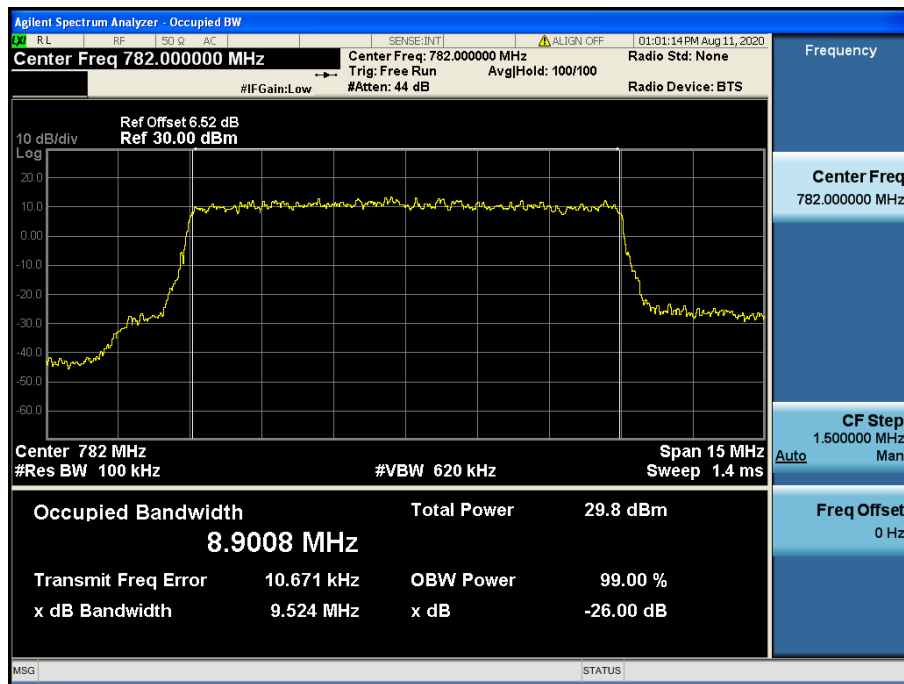
8.1.2 LTE Band 13



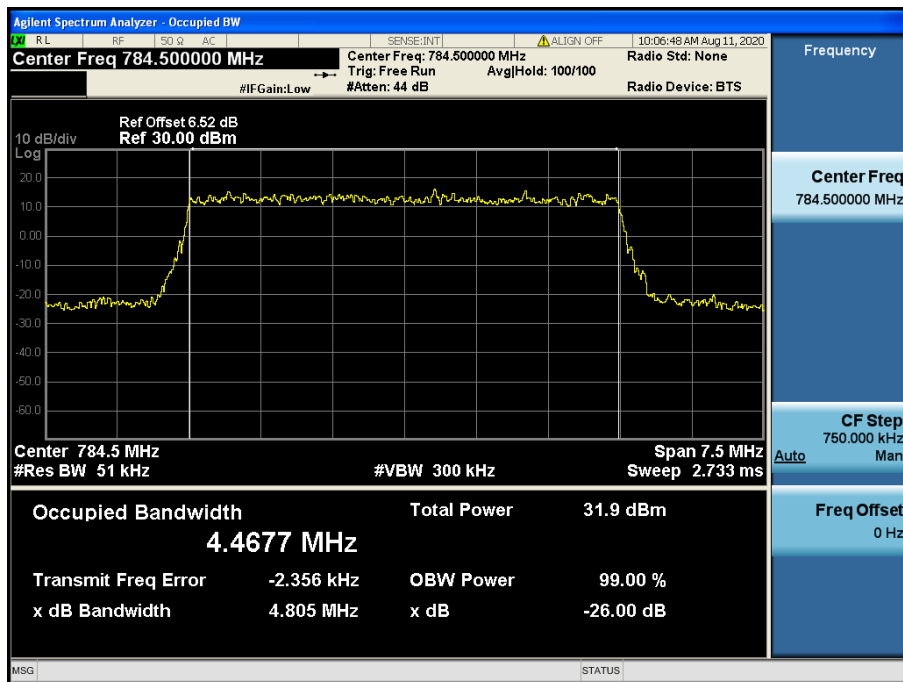
LTE Band 13 / 10 MHz / QPSK - RB Size 50



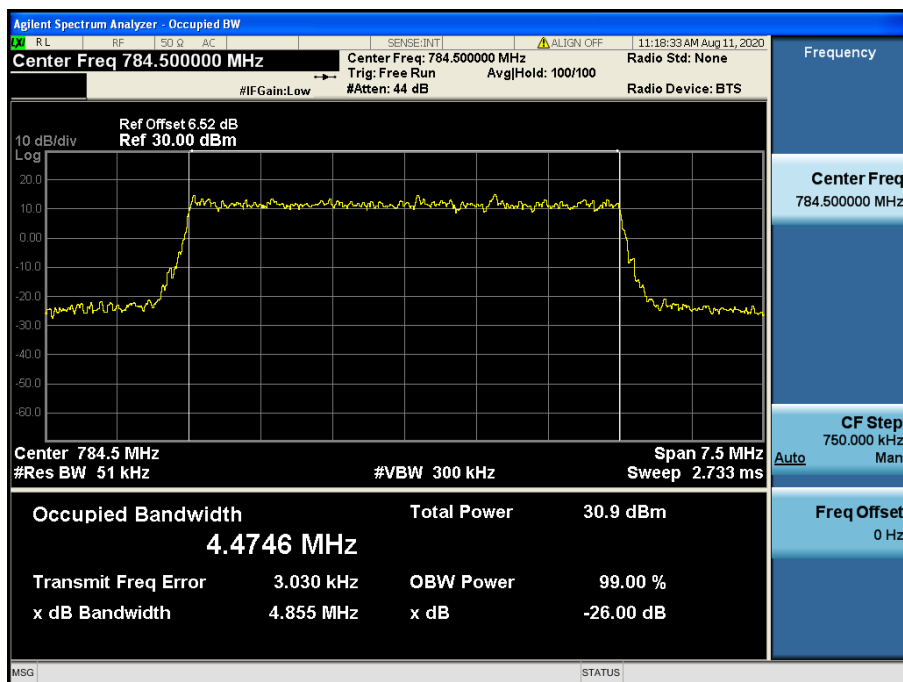
LTE Band 13 / 10 MHz / 16QAM - RB Size 50



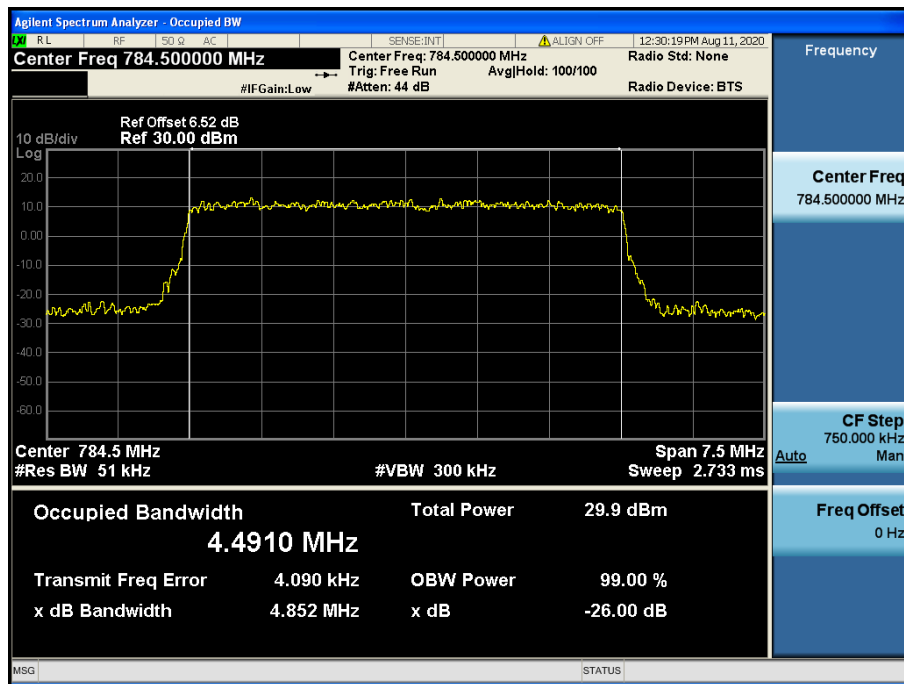
LTE Band 13 / 10 MHz / 64QAM - RB Size 50



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

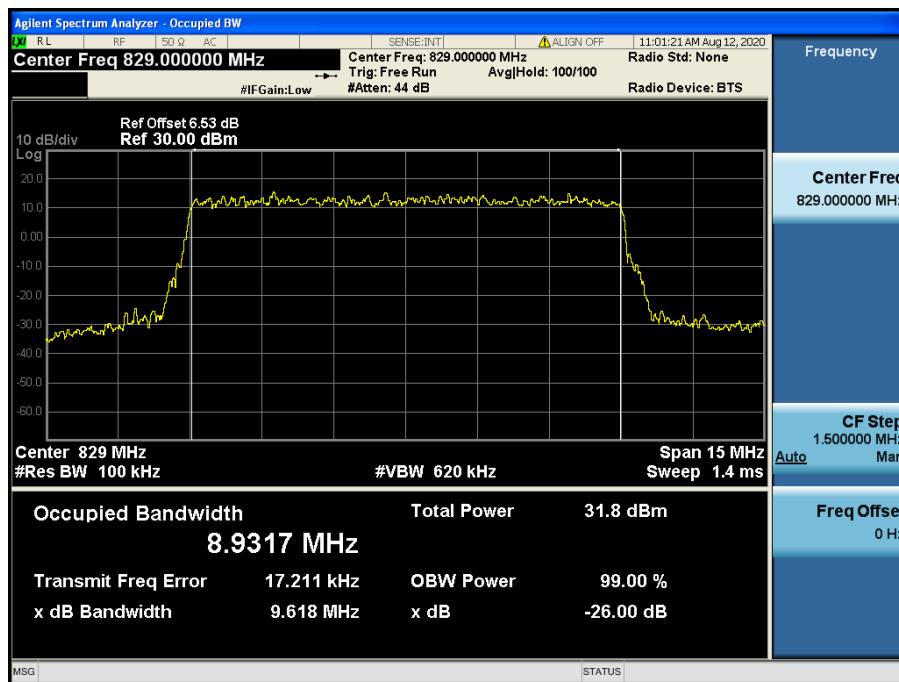


LTE Band 13 / 5 MHz / 16QAM - RB Size 25

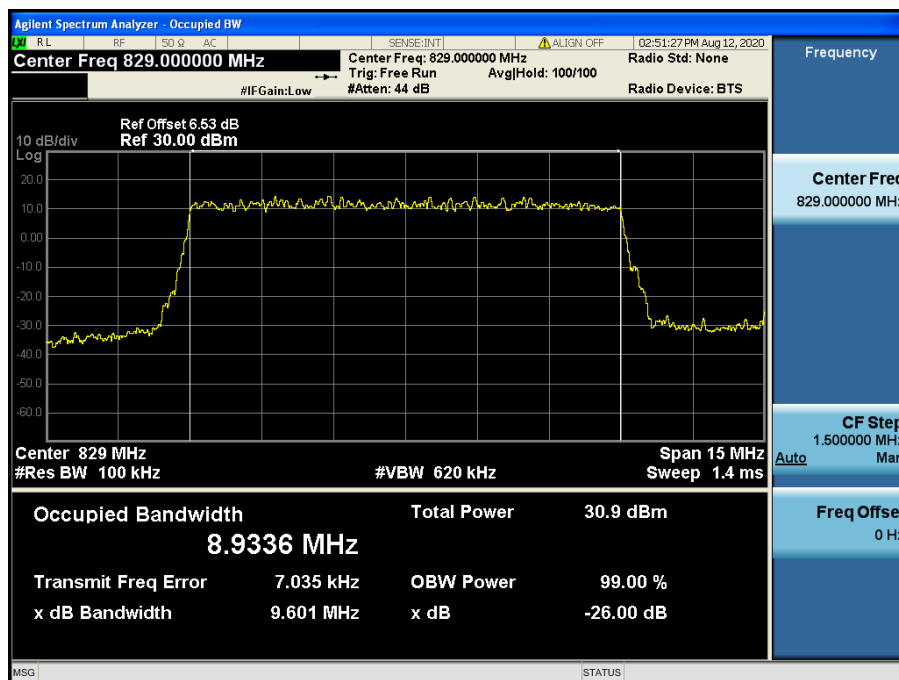


LTE Band 13 / 5 MHz / 64QAM - RB Size 25

8.1.3 LTE Band 5

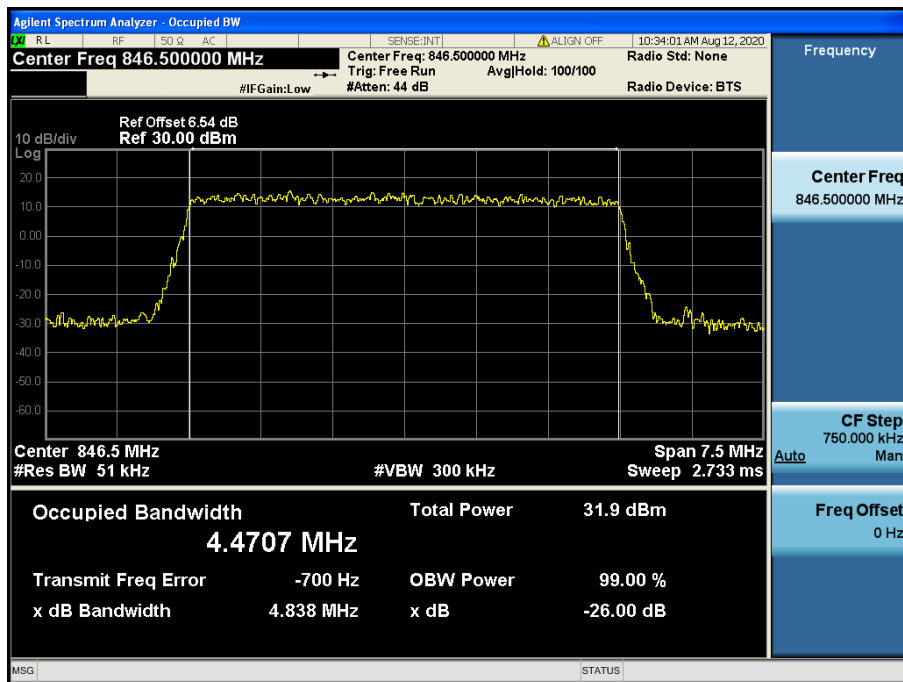


LTE Band 5 / 10 MHz / QPSK - RB Size 50

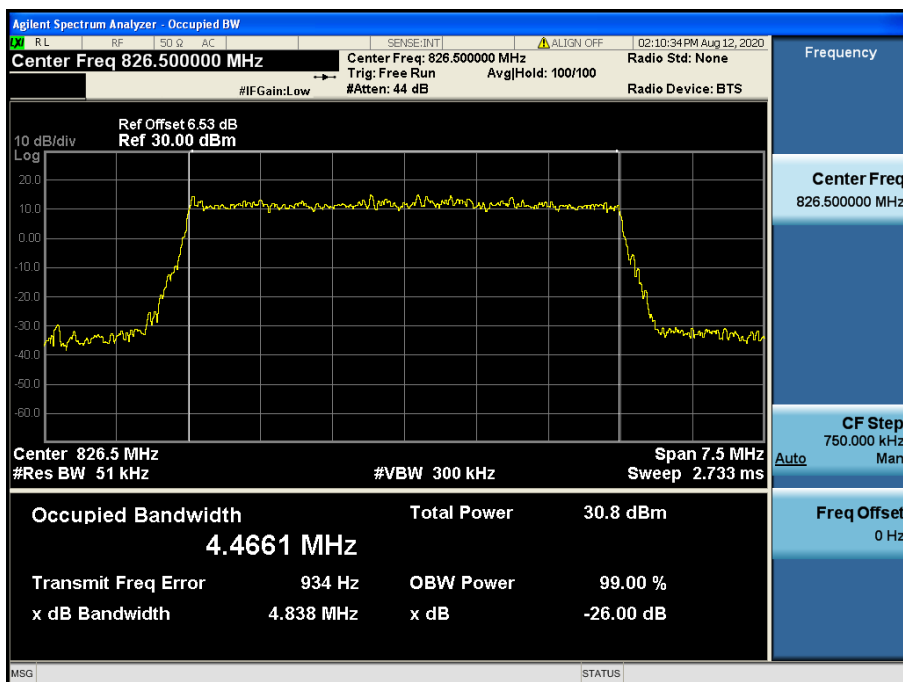


LTE Band 5 / 10 MHz / 16QAM - RB Size 50

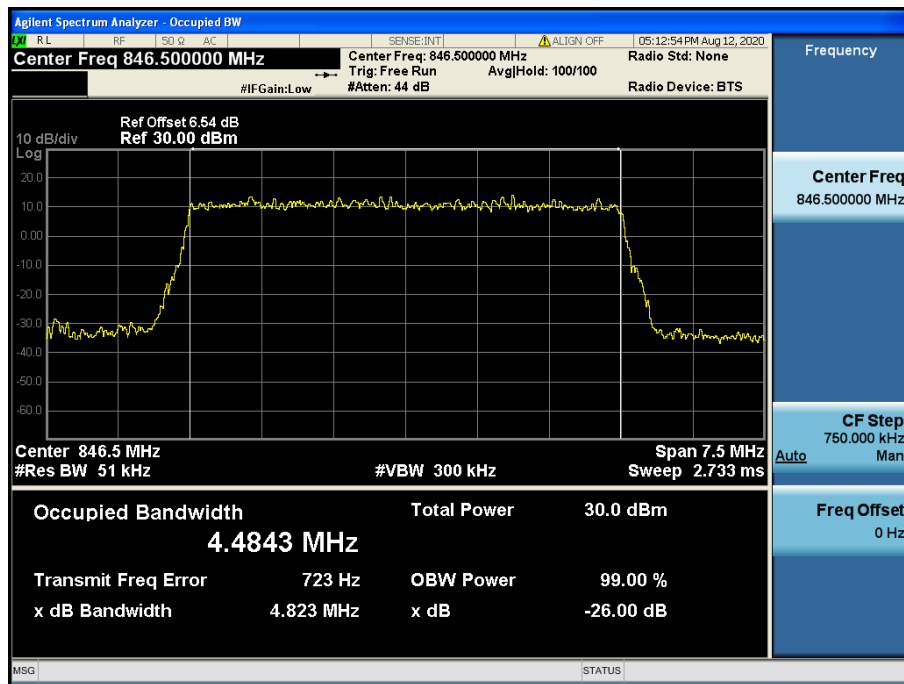




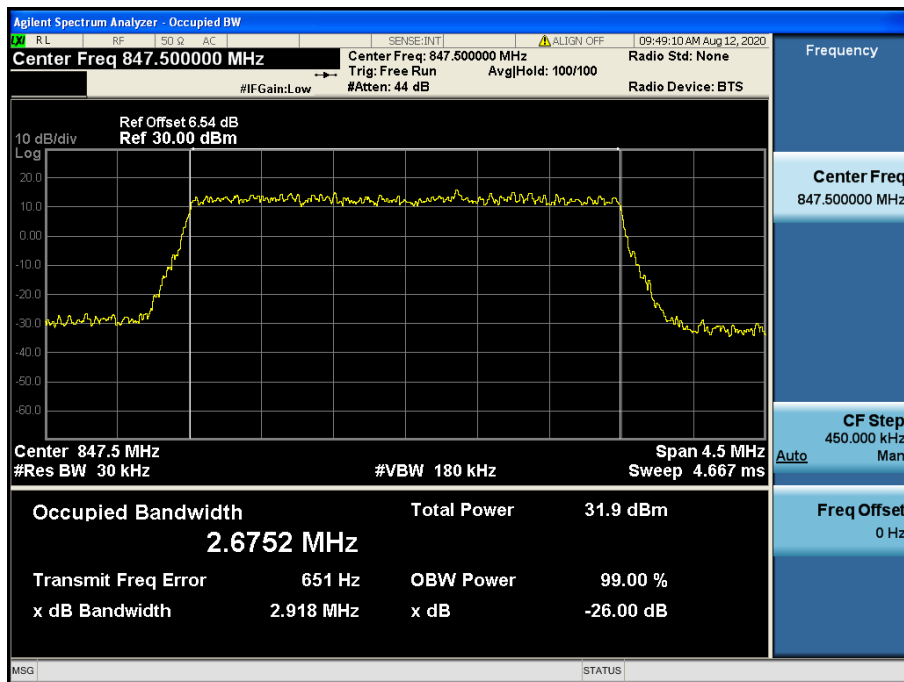
LTE Band 5 / 5 MHz / QPSK - RB Size 25



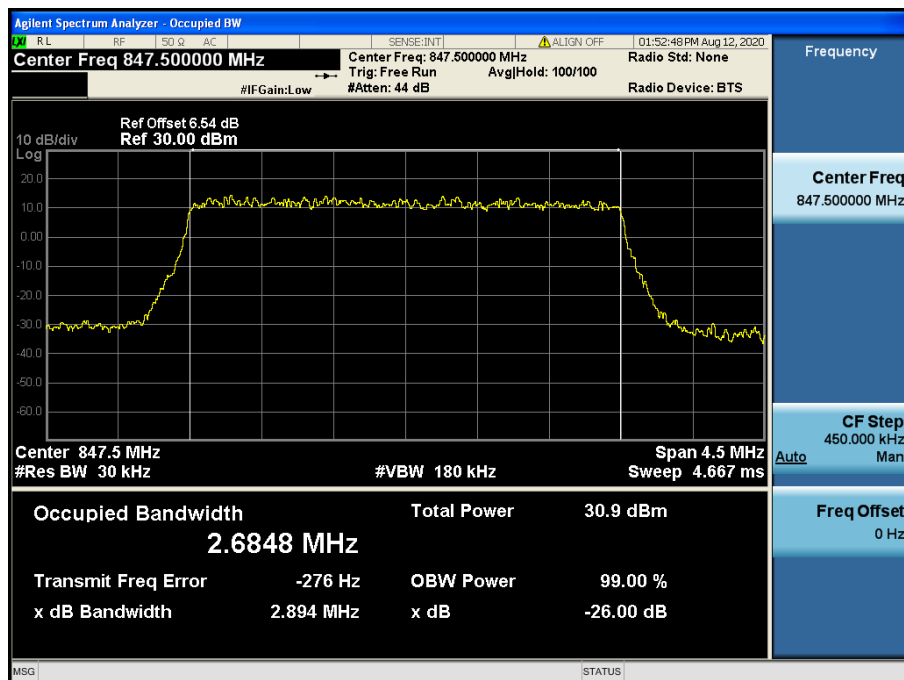
LTE Band 5 / 5 MHz / 16QAM - RB Size 25



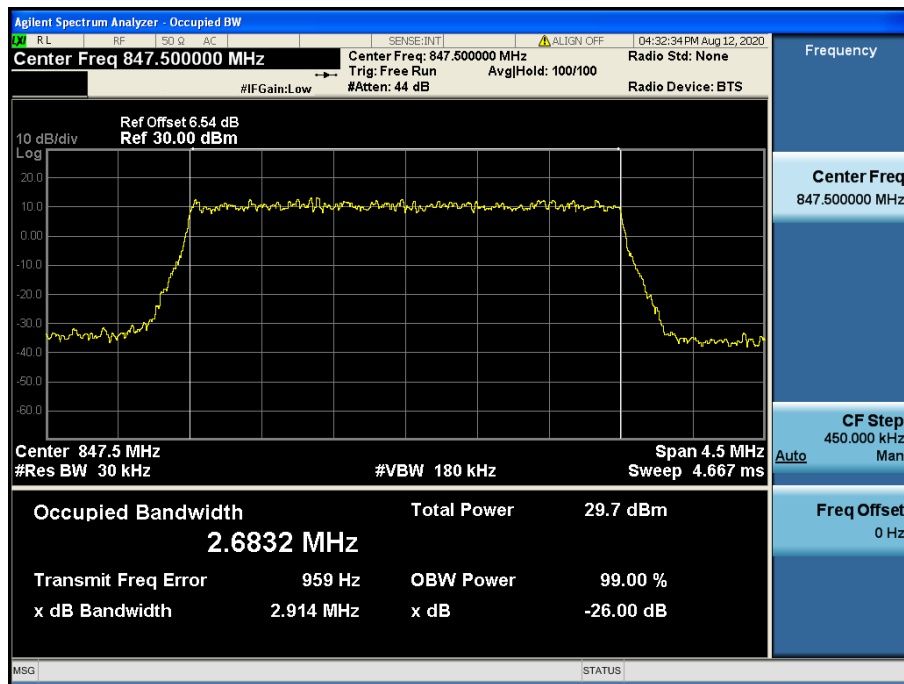
LTE Band 5 / 5 MHz / 64QAM - RB Size 25



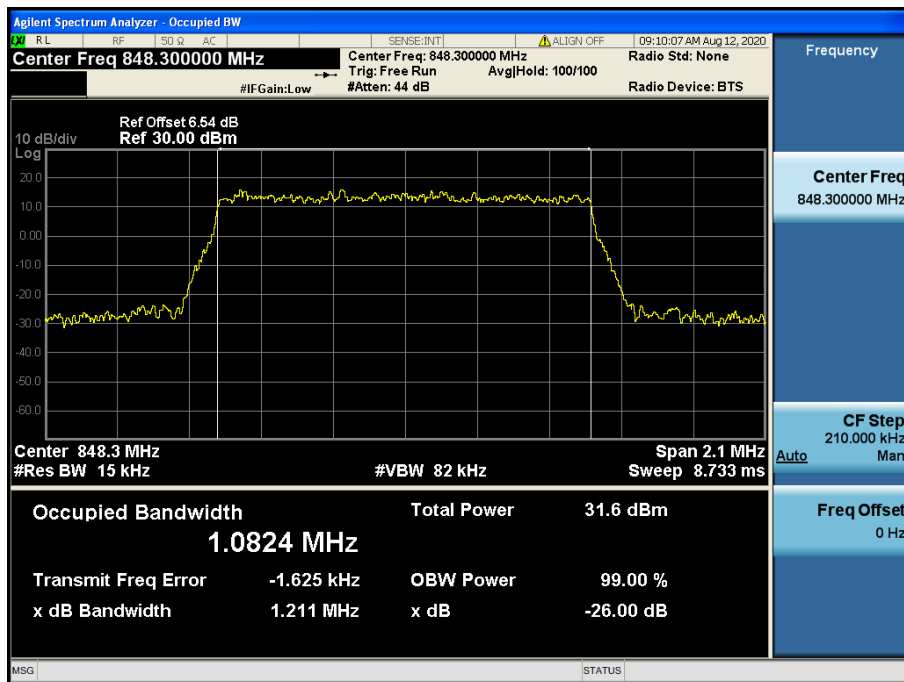
LTE Band 5 / 3 MHz / QPSK - RB Size 15



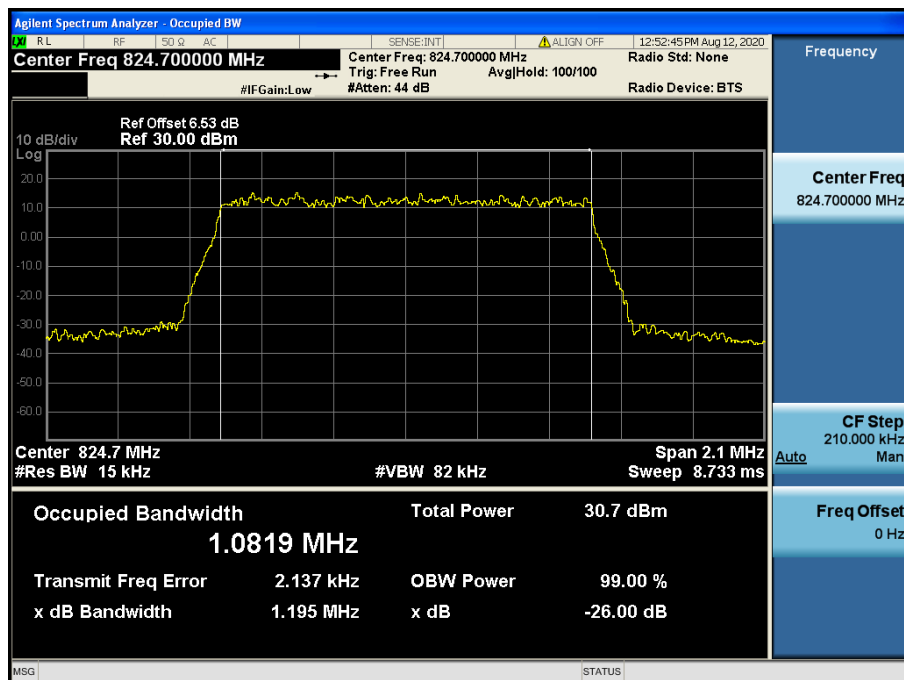
LTE Band 5 / 3 MHz / 16QAM - RB Size 15



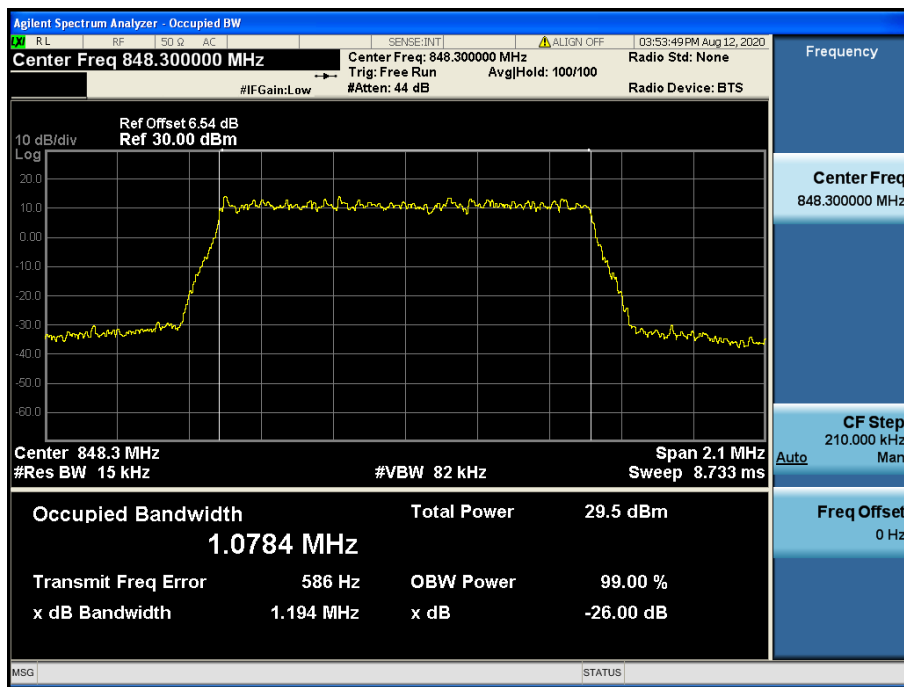
LTE Band 5 / 3 MHz / 64QAM - RB Size 15



LTE Band 5 / 1.4 MHz / QPSK - RB Size 6

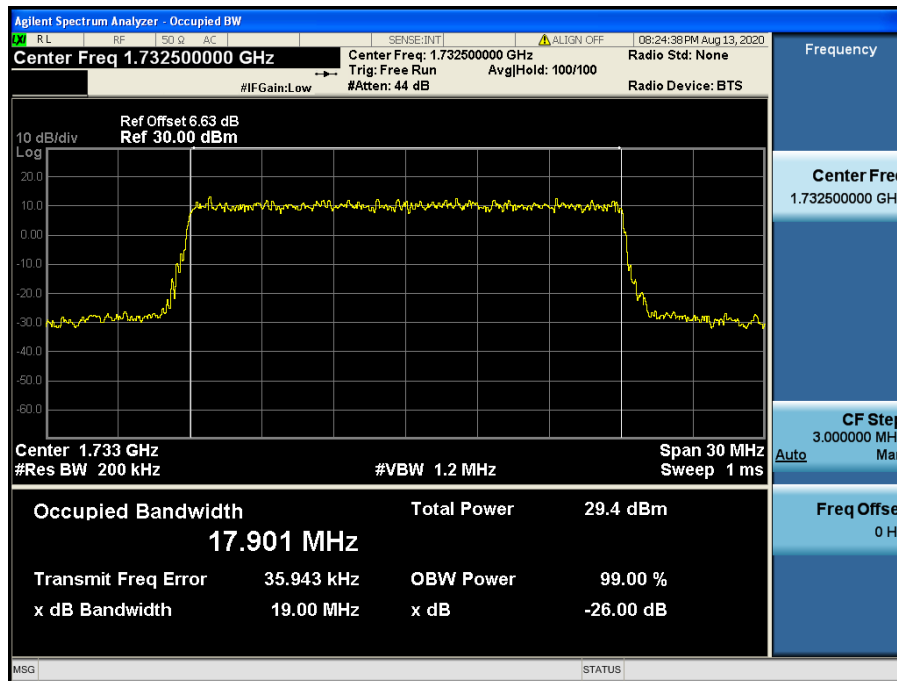


LTE Band 5 / 1.4 MHz / 16QAM - RB Size 6

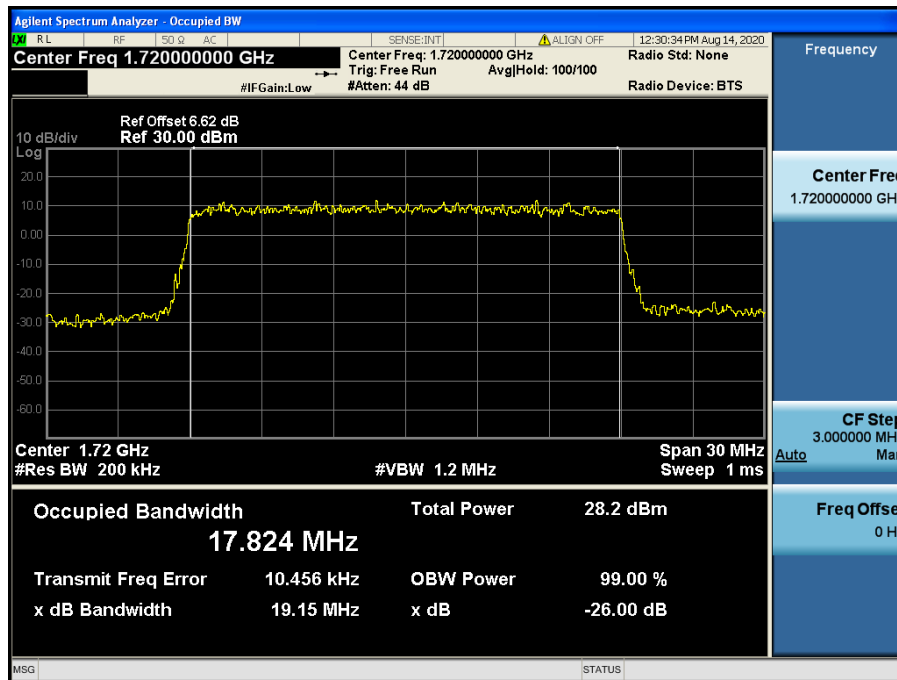


LTE Band 5 / 1.4 MHz / 64QAM - RB Size 6

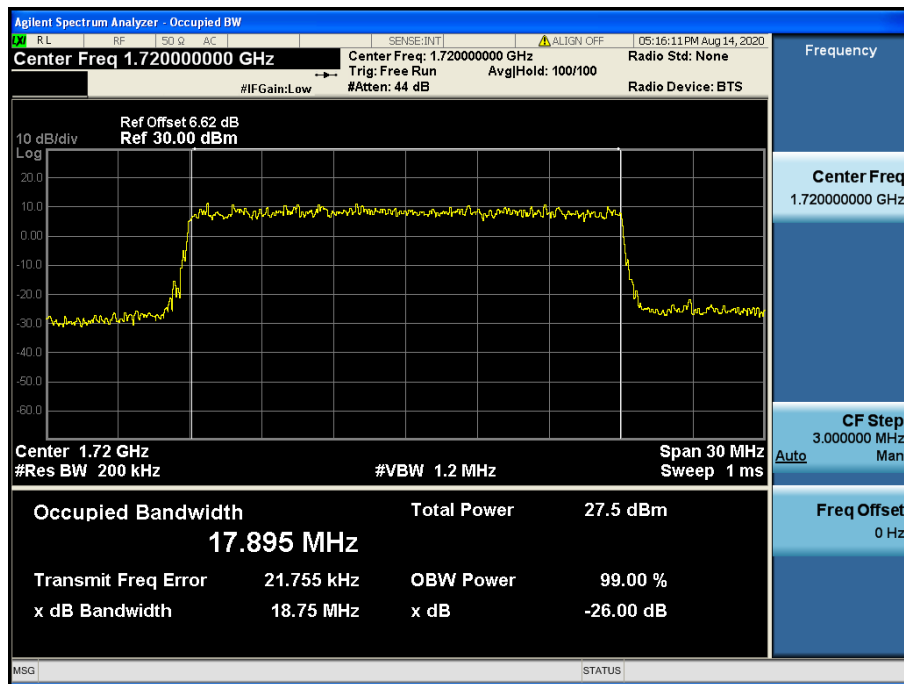
8.1.4 LTE Band 4



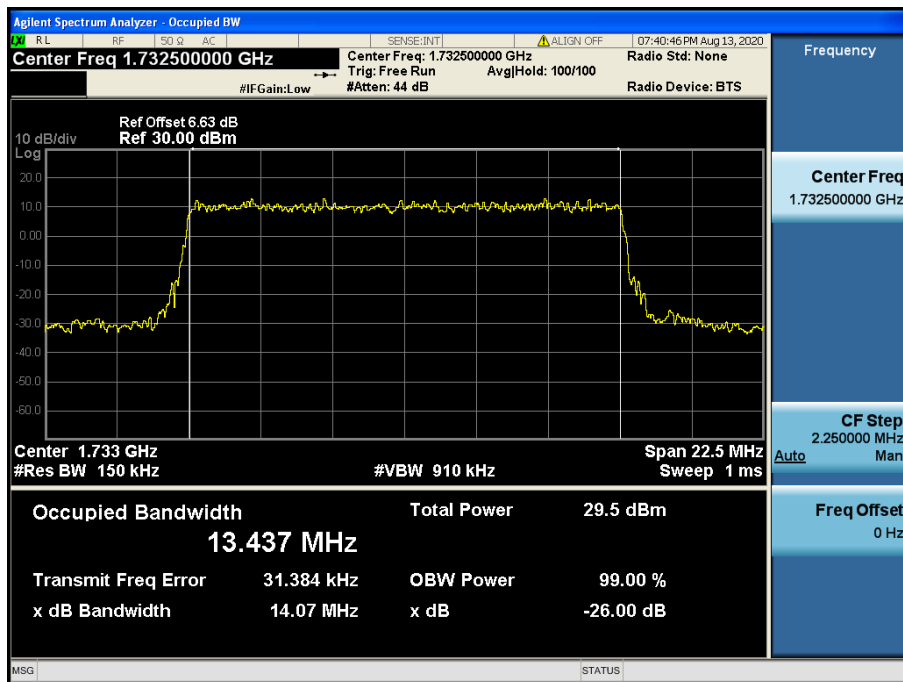
LTE Band 4 / 20 MHz / QPSK - RB Size 100



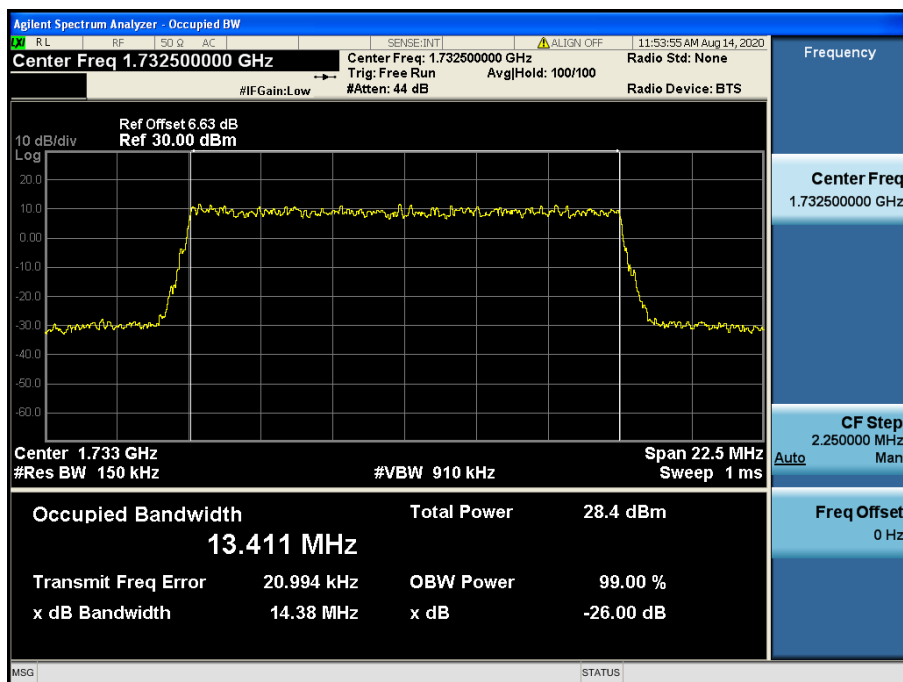
LTE Band 4 / 20 MHz / 16QAM - RB Size 100



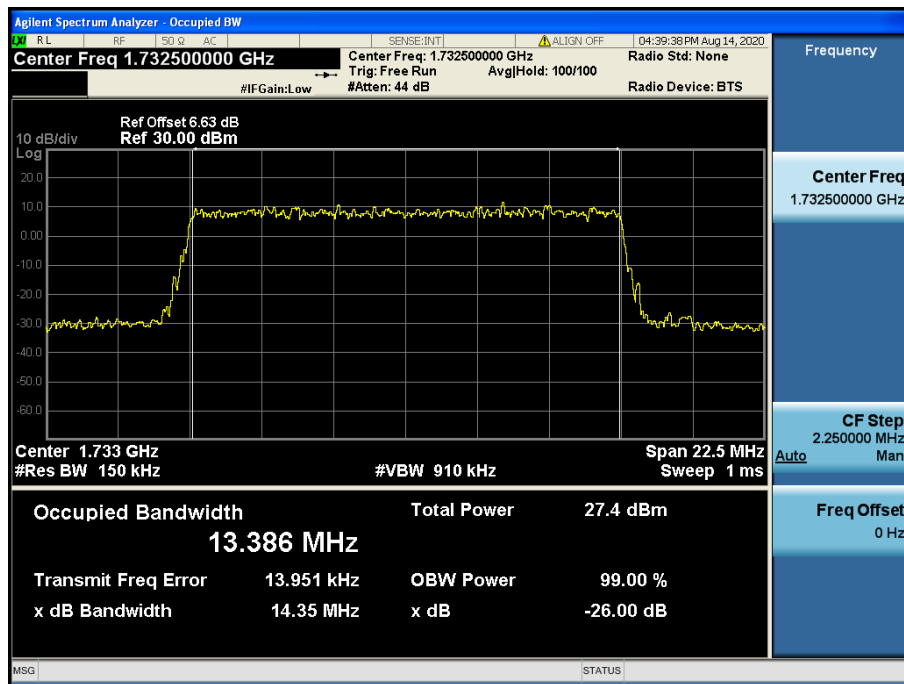
LTE Band 4 / 20 MHz / 64QAM - RB Size 100



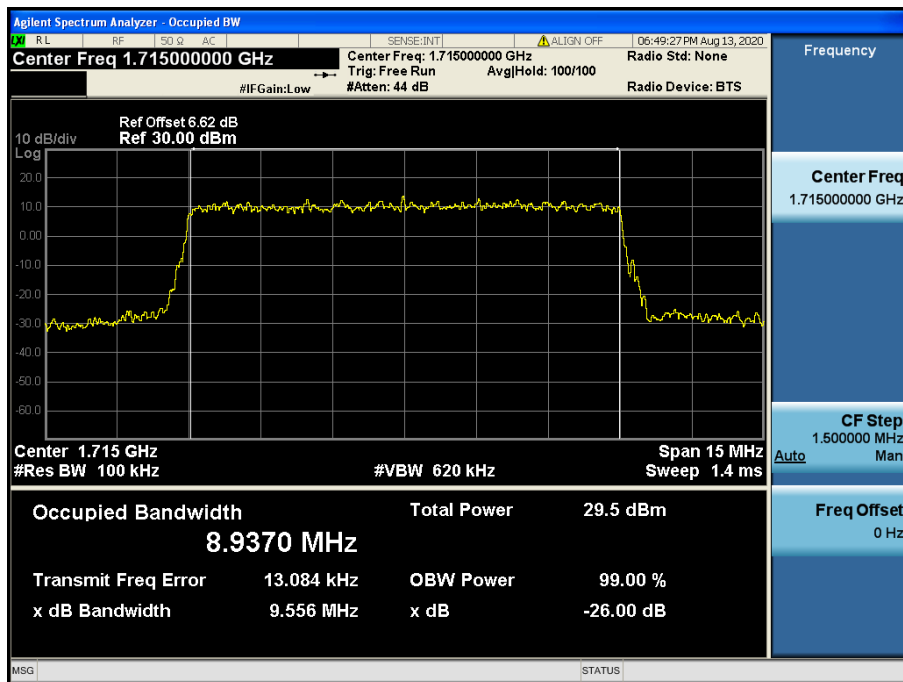
LTE Band 4 / 15 MHz / QPSK - RB Size 75



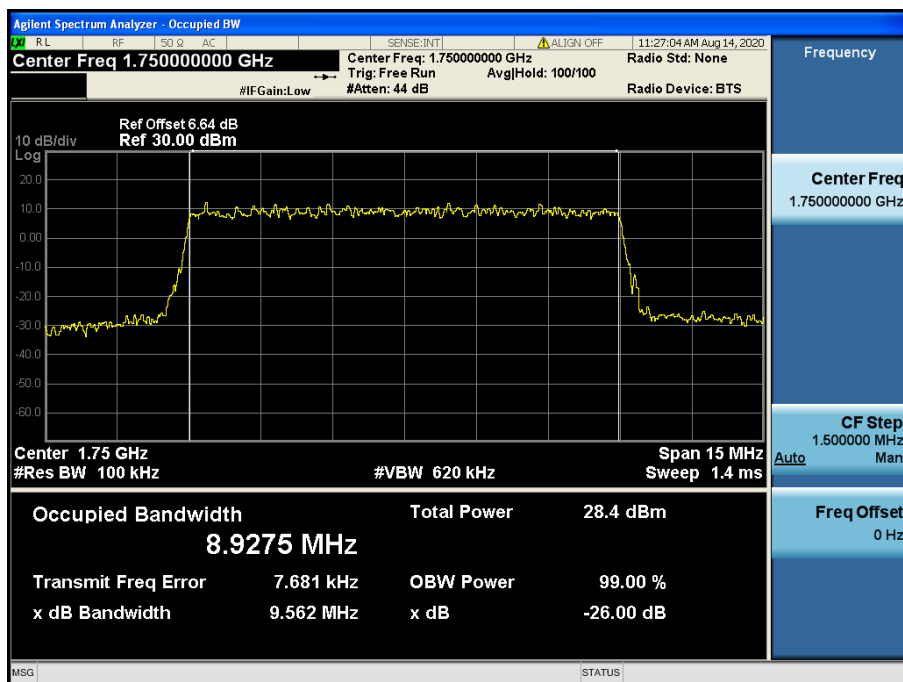
LTE Band 4 / 15 MHz / 16QAM - RB Size 75



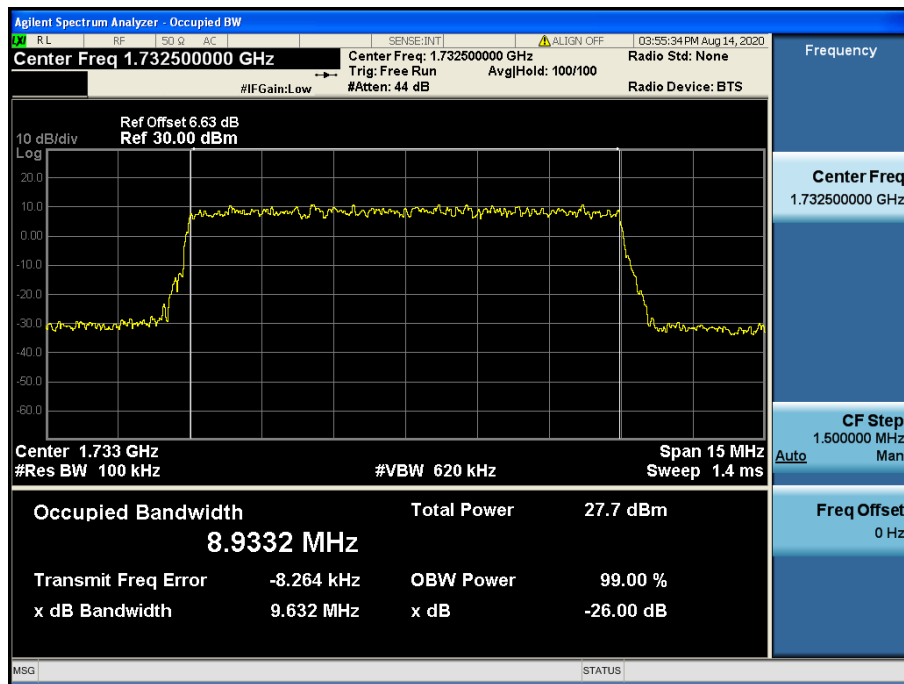
LTE Band 4 / 15 MHz / 64QAM - RB Size 75



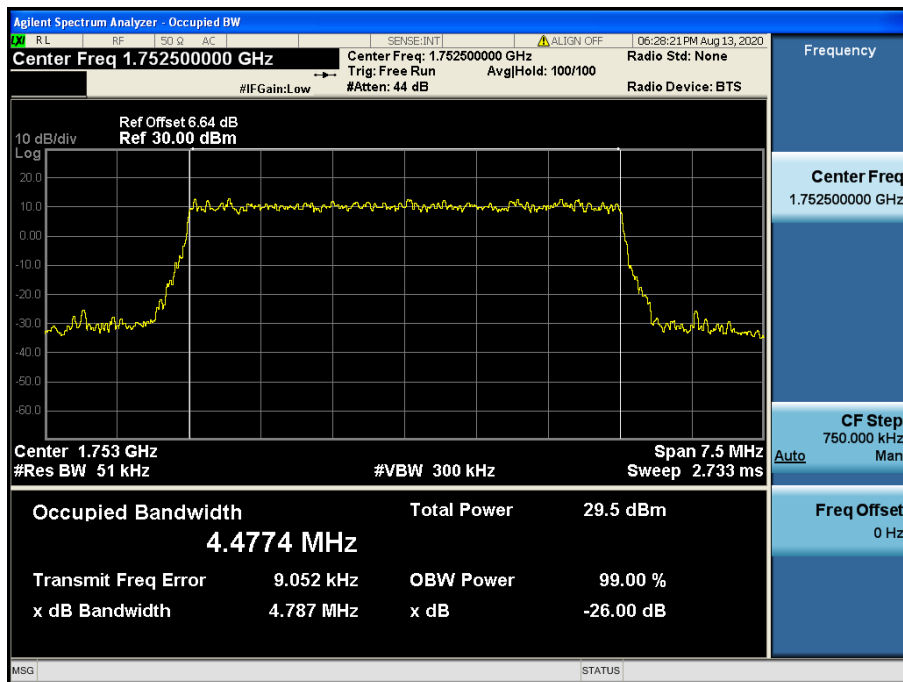
LTE Band 4 / 10 MHz / QPSK - RB Size 50



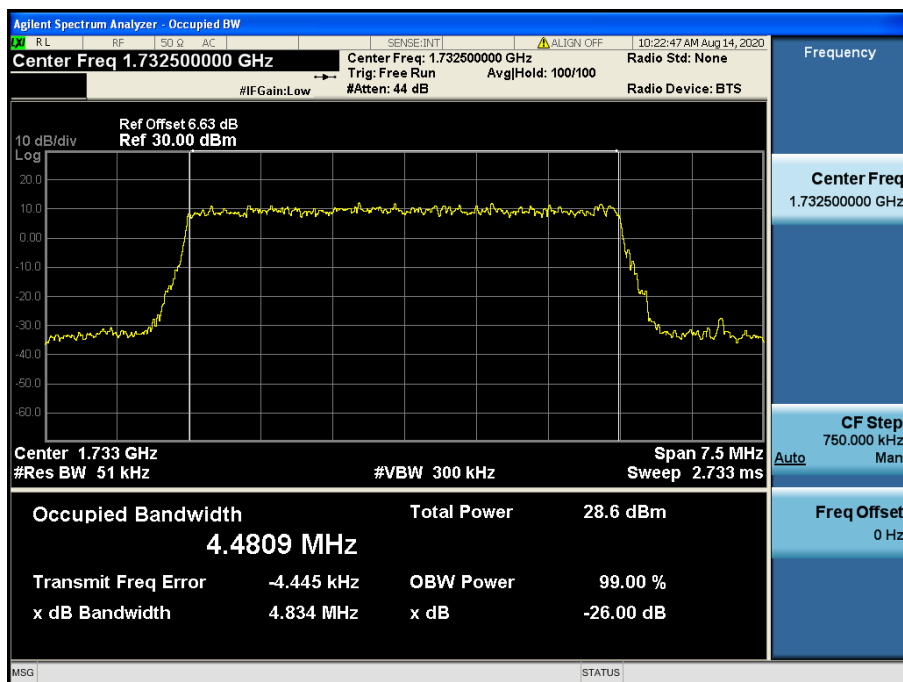
LTE Band 4 / 10 MHz / 16QAM - RB Size 50



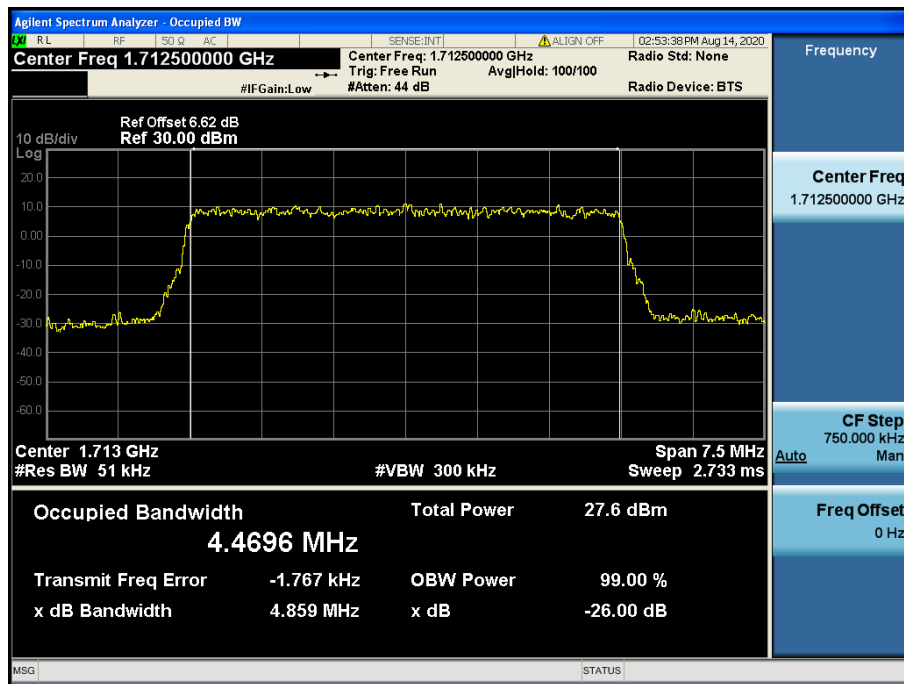
LTE Band 4 / 10 MHz / 64QAM - RB Size 50



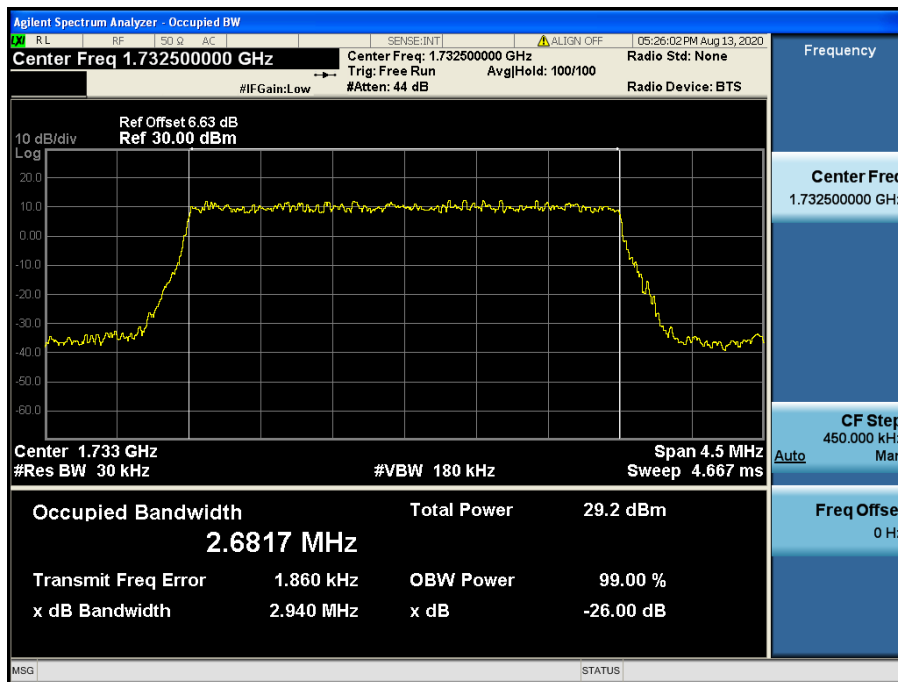
LTE Band 4 / 5 MHz / QPSK - RB Size 25



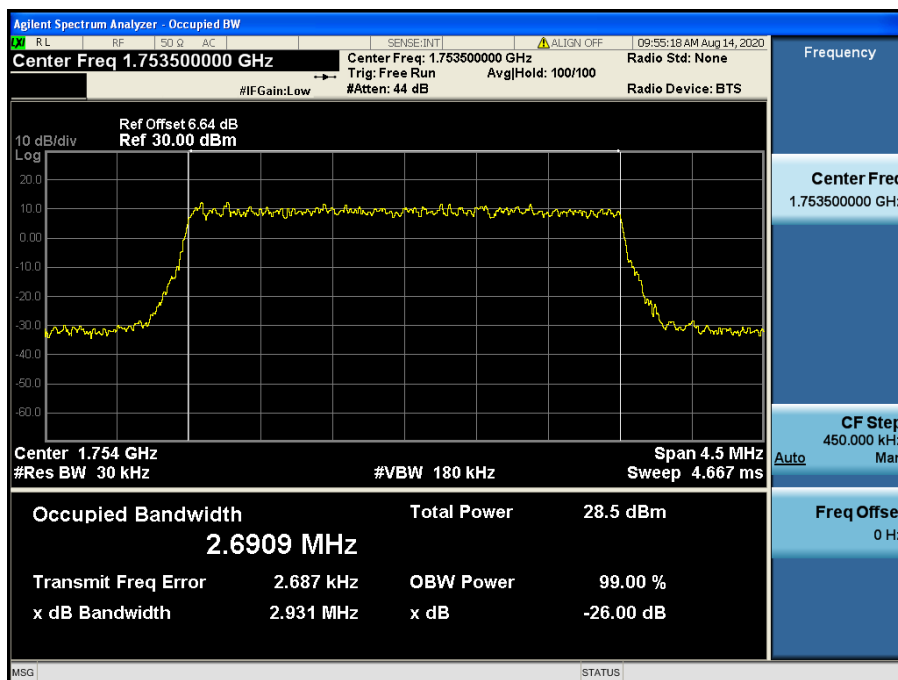
LTE Band 4 / 5 MHz / 16QAM - RB Size 25



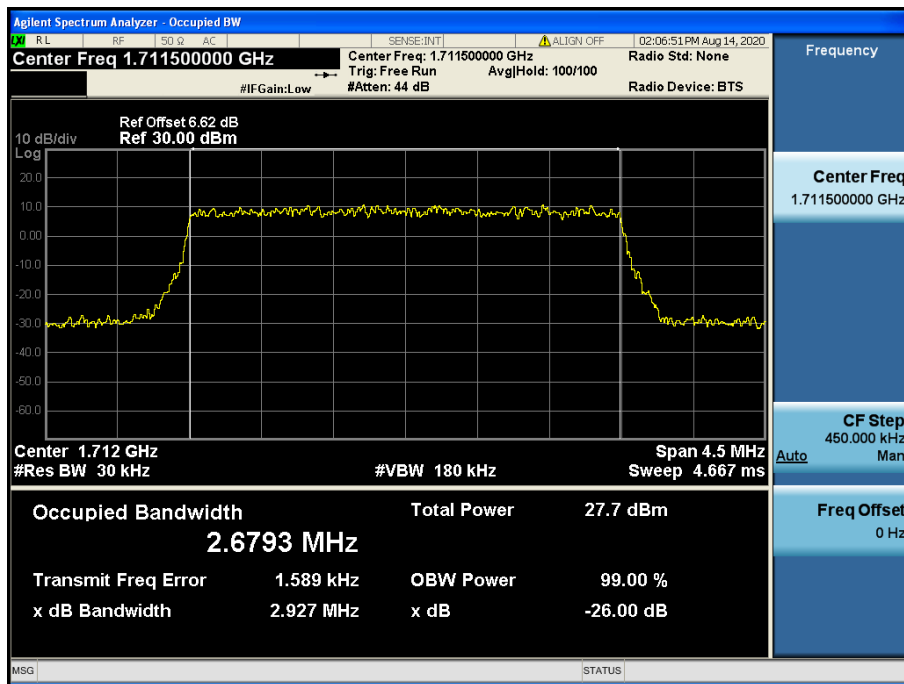
LTE Band 4 / 5 MHz / 64QAM - RB Size 25



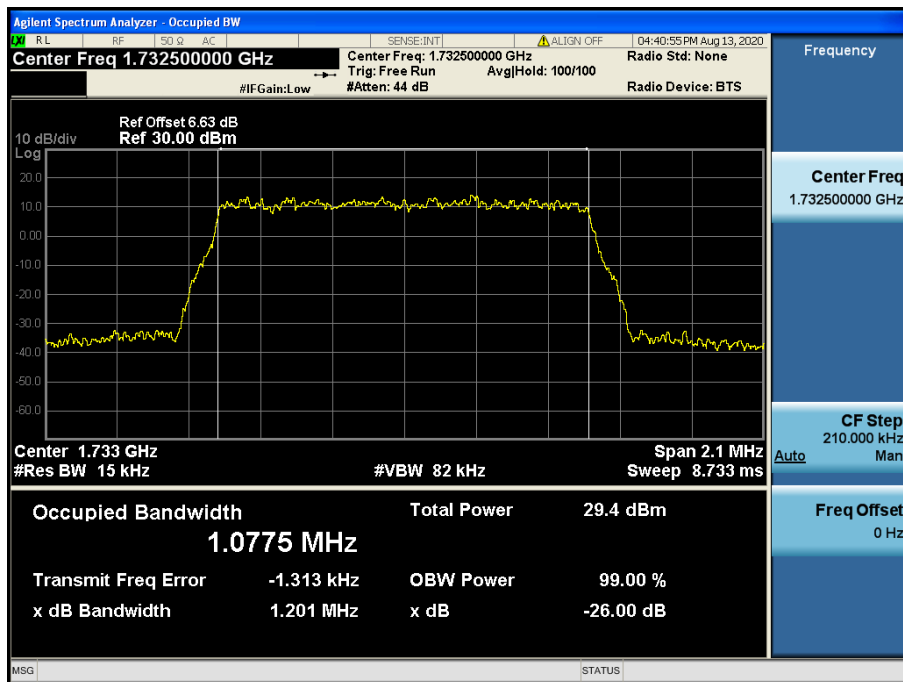
LTE Band 4 / 3 MHz / QPSK - RB Size 15



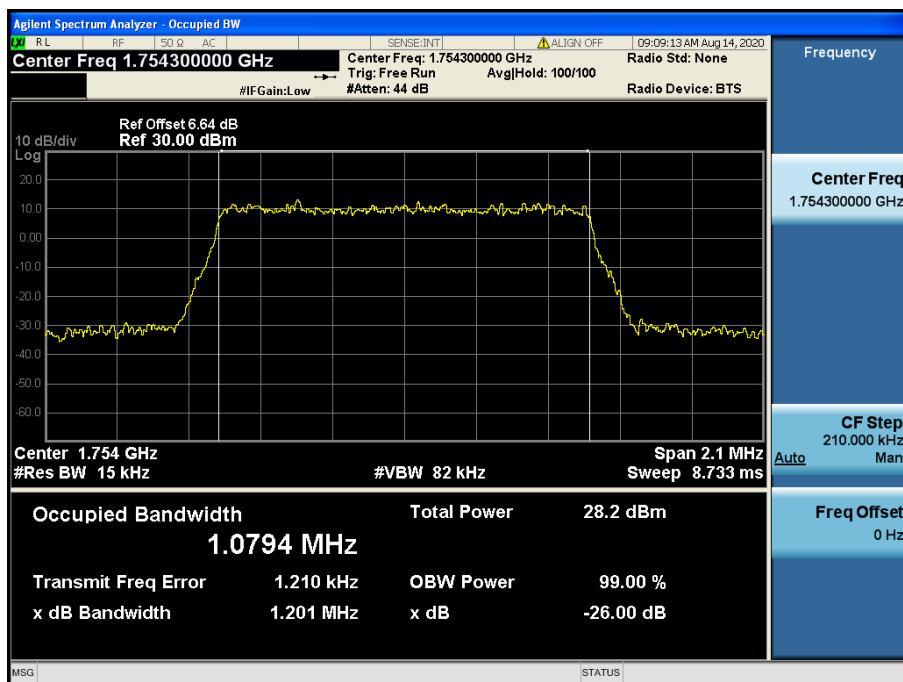
LTE Band 4 / 3 MHz / 16QAM - RB Size 15



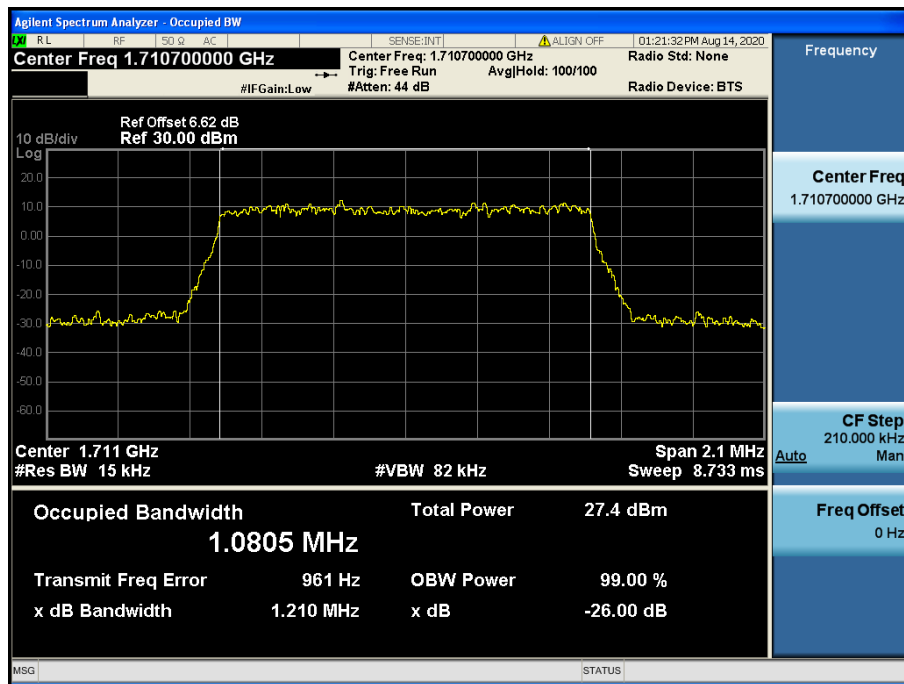
LTE Band 4 / 3 MHz / 64QAM - RB Size 15



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

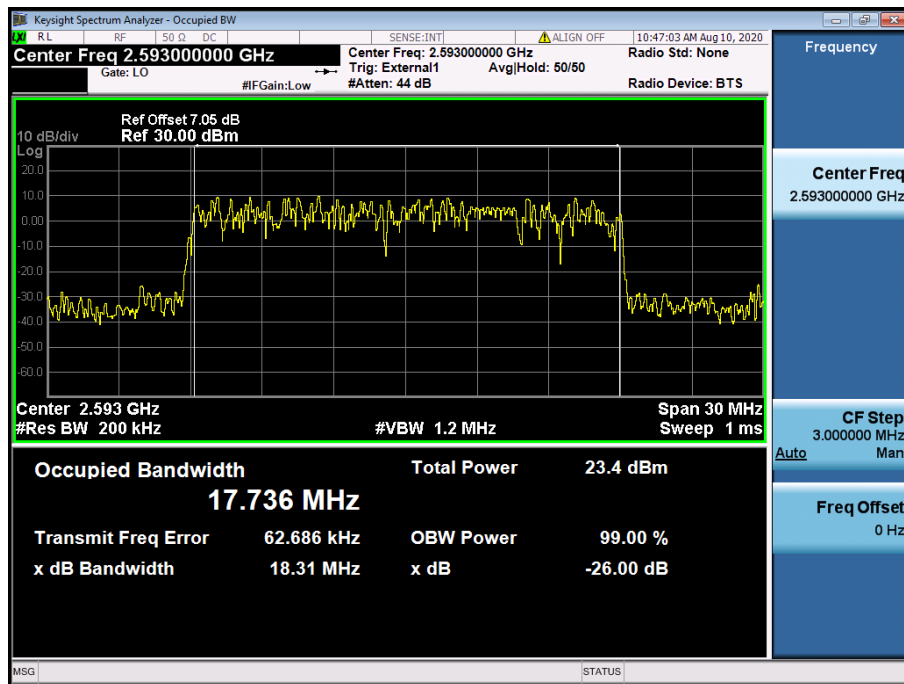


LTE Band 4 / 1.4 MHz / 16QAM - RB Size 6

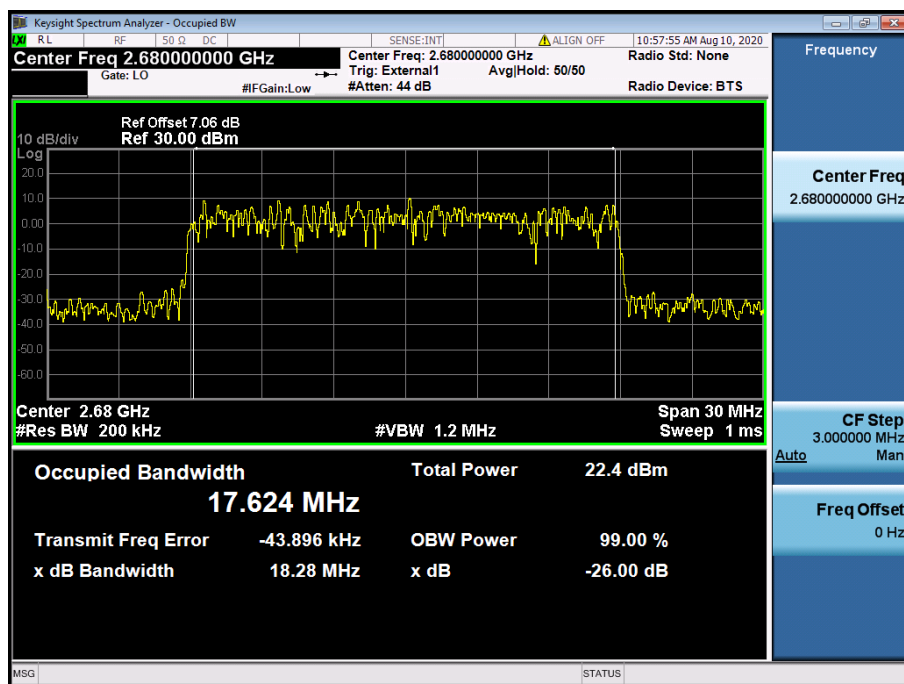


LTE Band 4 / 1.4 MHz / 64QAM - RB Size 6

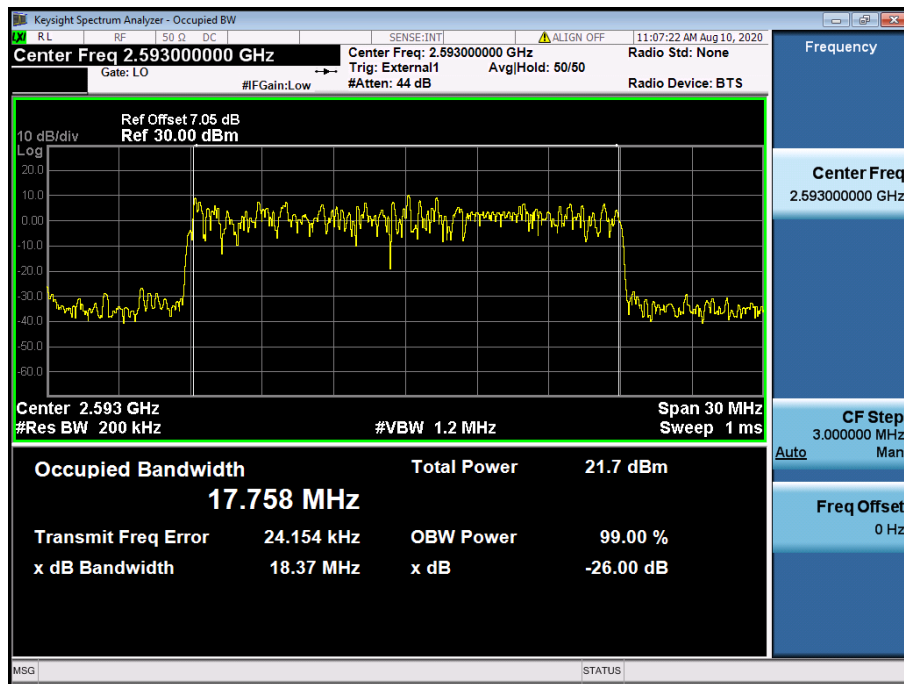
8.1.5 LTE Band 41



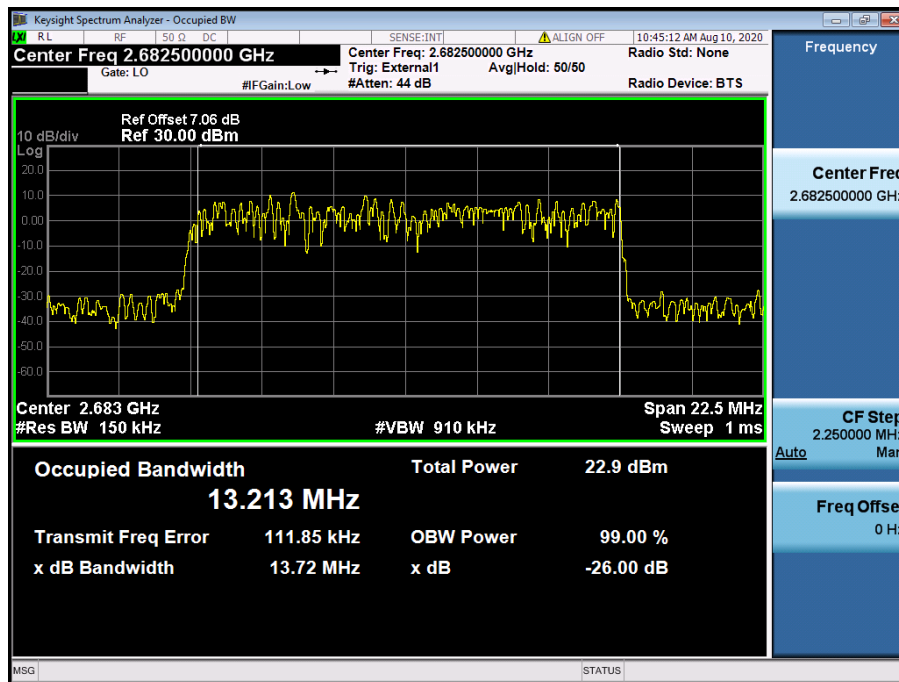
LTE Band 41 / 20 MHz / QPSK - RB Size 100



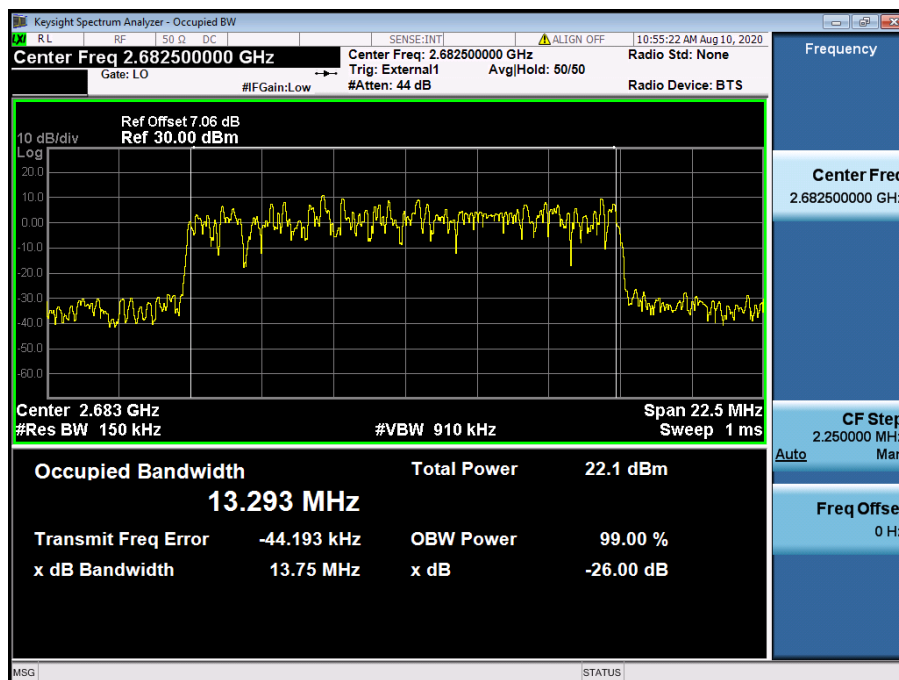
LTE Band 41 / 20 MHz / 16QAM - RB Size 100



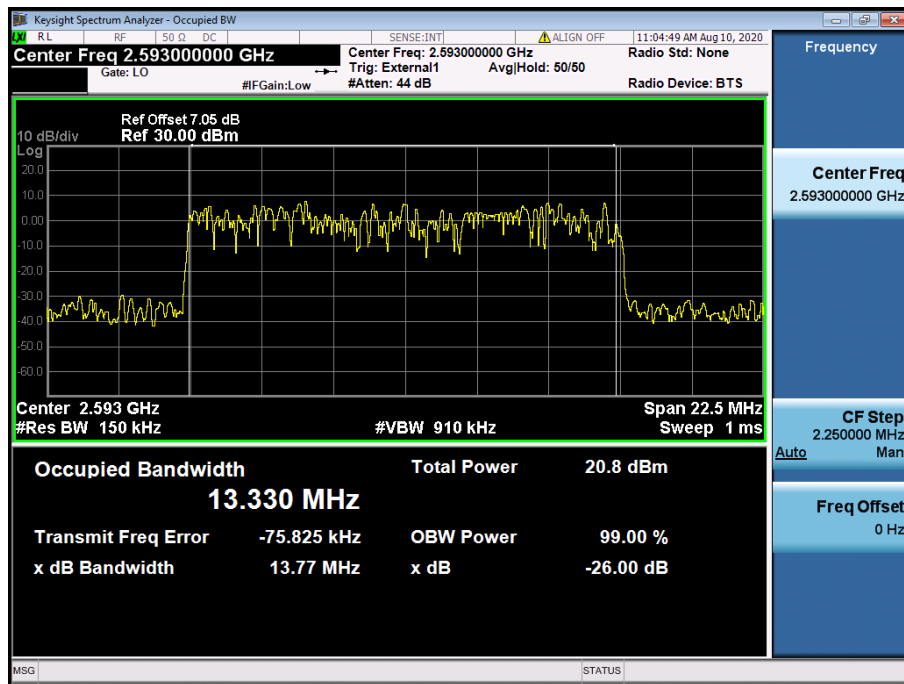
LTE Band 41 / 20 MHz / 64QAM - RB Size 100



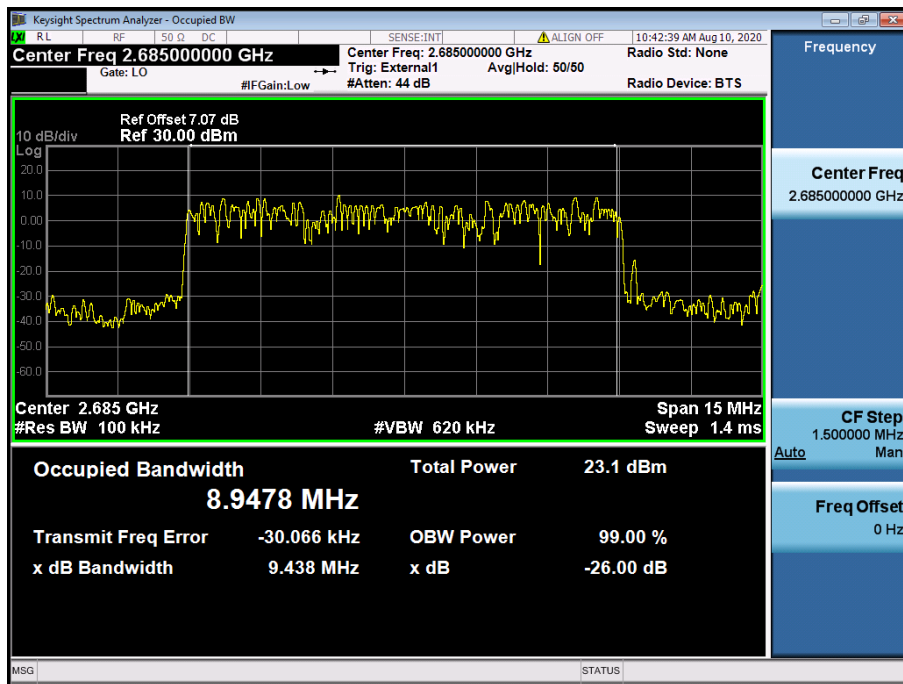
LTE Band 41 / 15 MHz / QPSK - RB Size 75



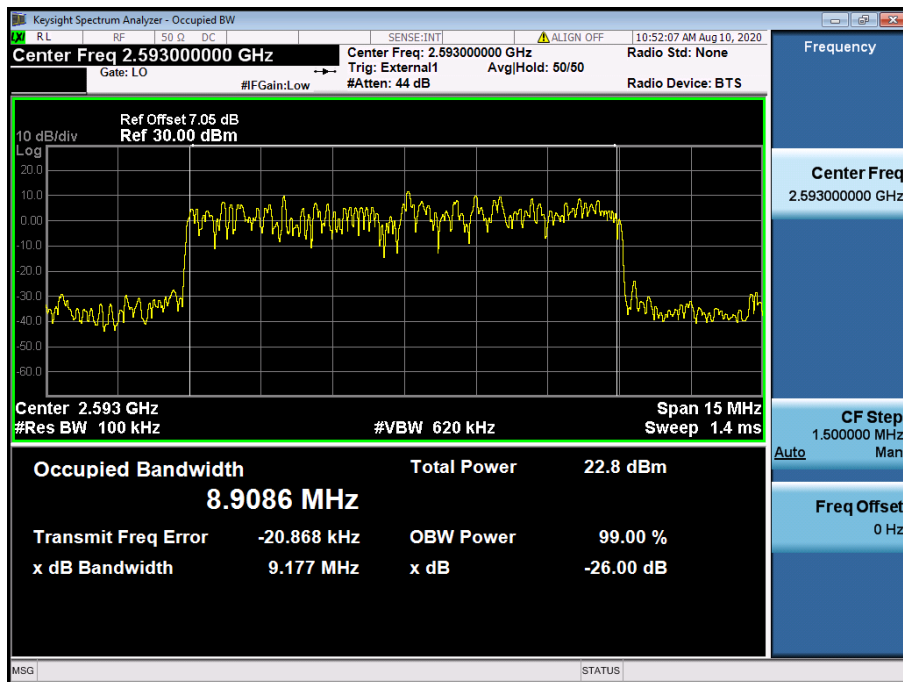
LTE Band 41 / 15 MHz / 16QAM - RB Size 75



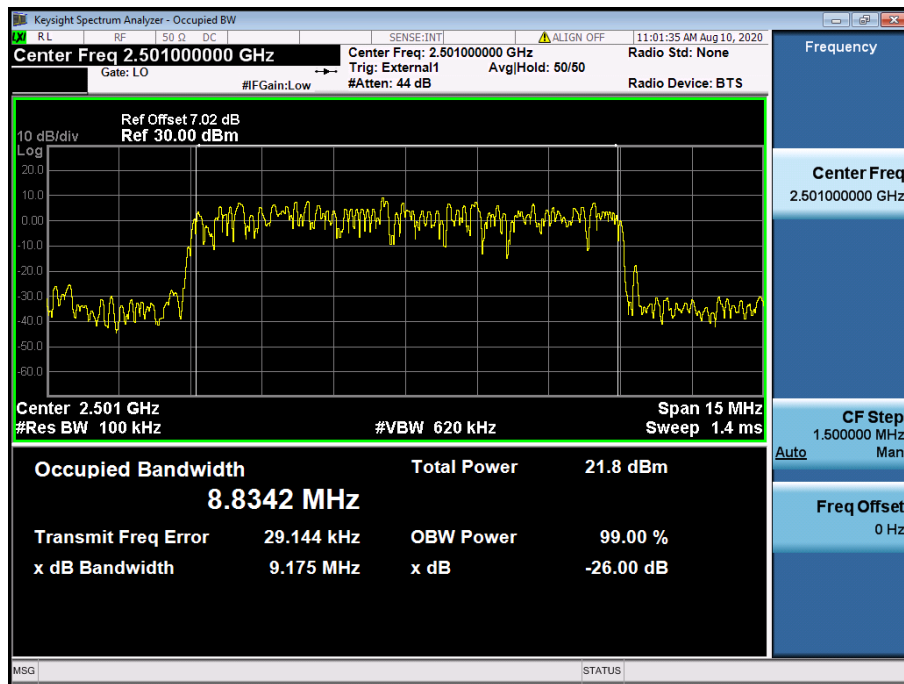
LTE Band 41 / 15 MHz / 64QAM - RB Size 75



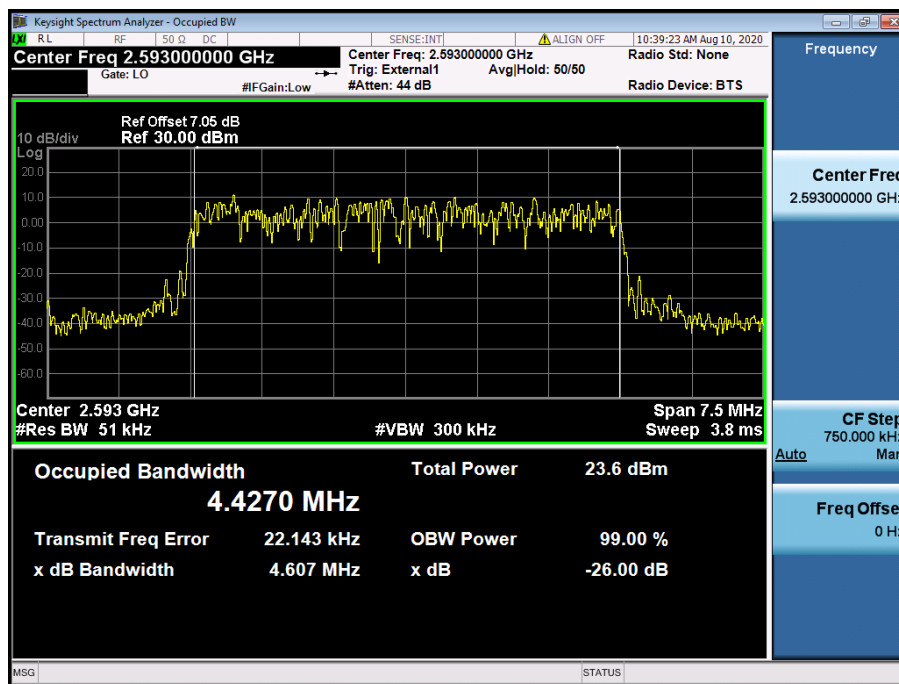
LTE Band 41 / 10 MHz / QPSK - RB Size 50



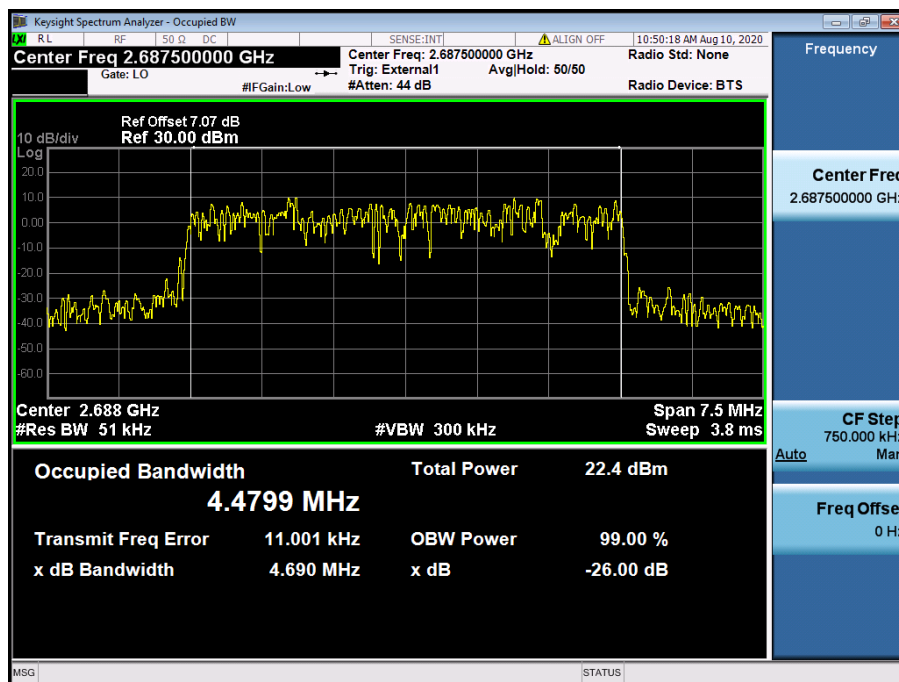
LTE Band 41 / 10 MHz / 16QAM - RB Size 50



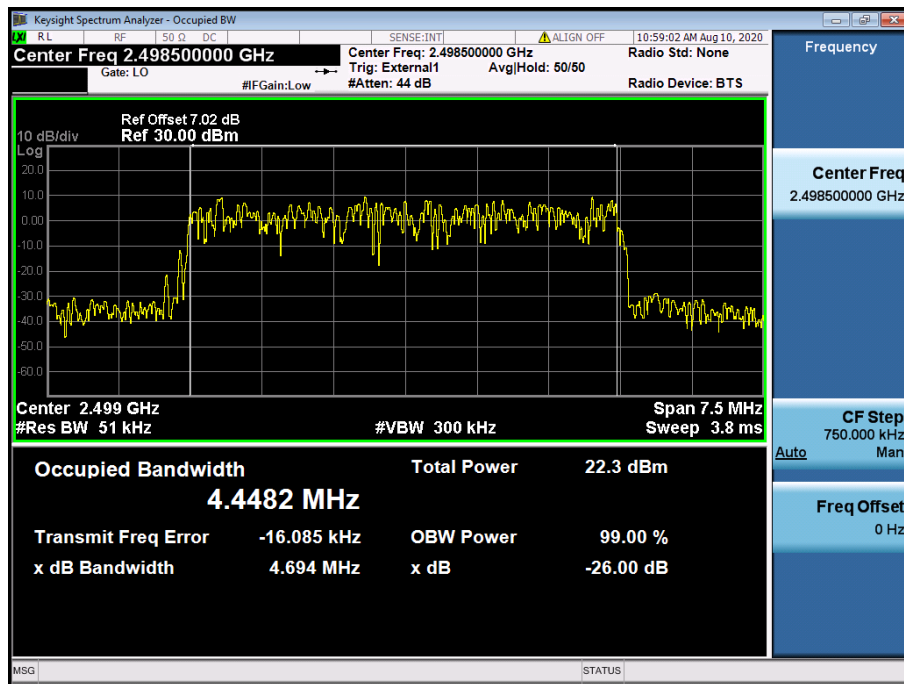
LTE Band 41 / 10 MHz / 64QAM - RB Size 50



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



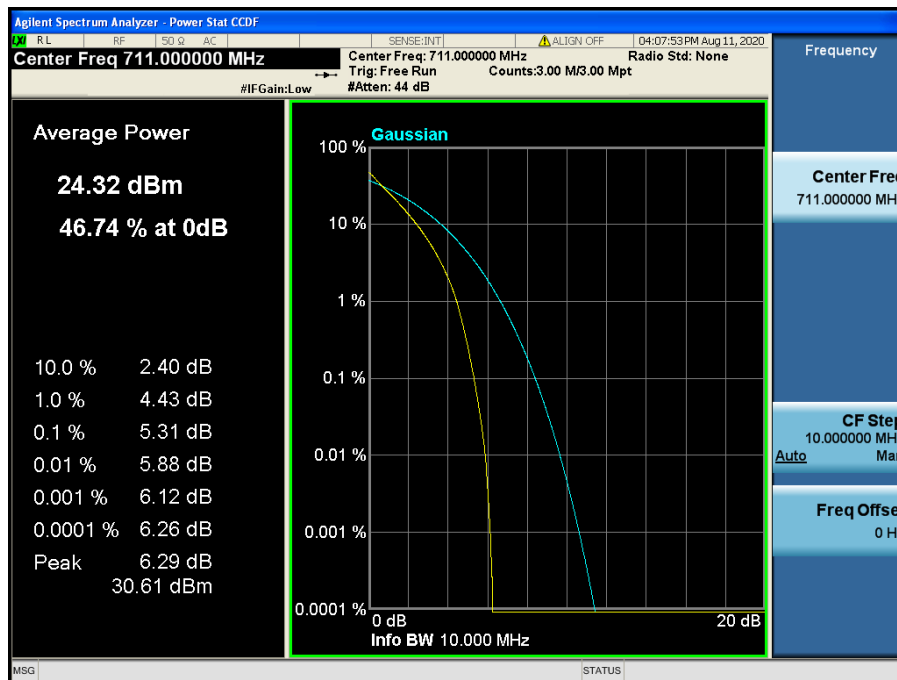
LTE Band 41 / 5 MHz / 16QAM - RB Size 25



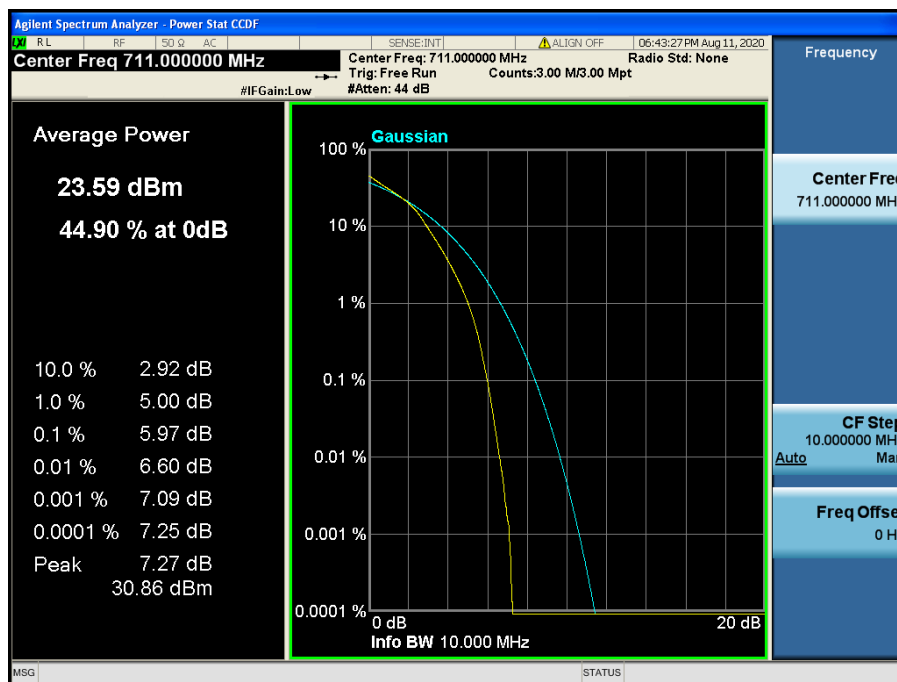
LTE Band 41 / 5 MHz / 64QAM - RB Size 25

8.2 PEAK TO AVERAGE RATIO

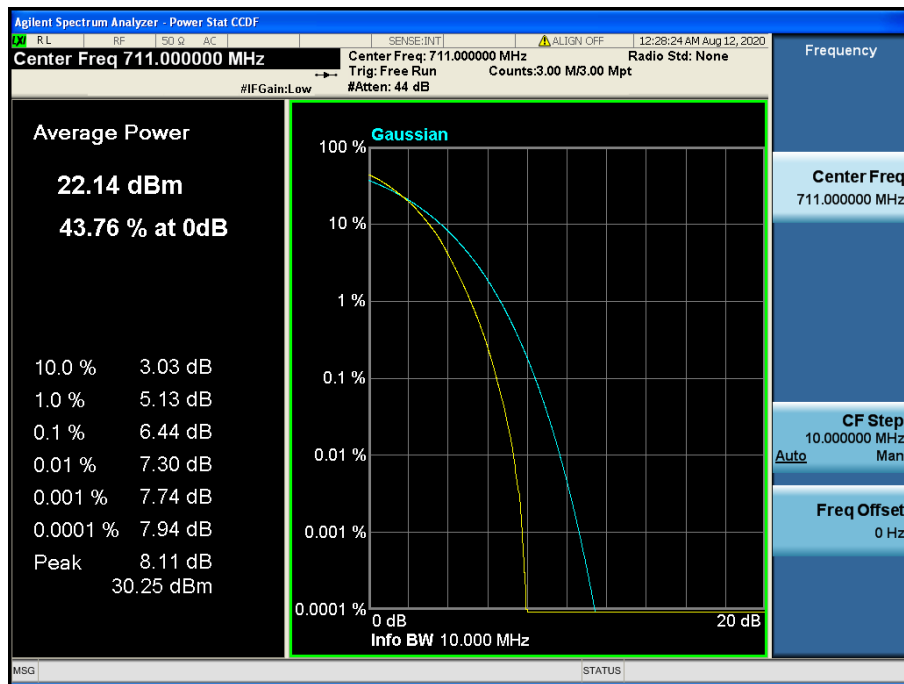
8.2.1 LTE Band 12



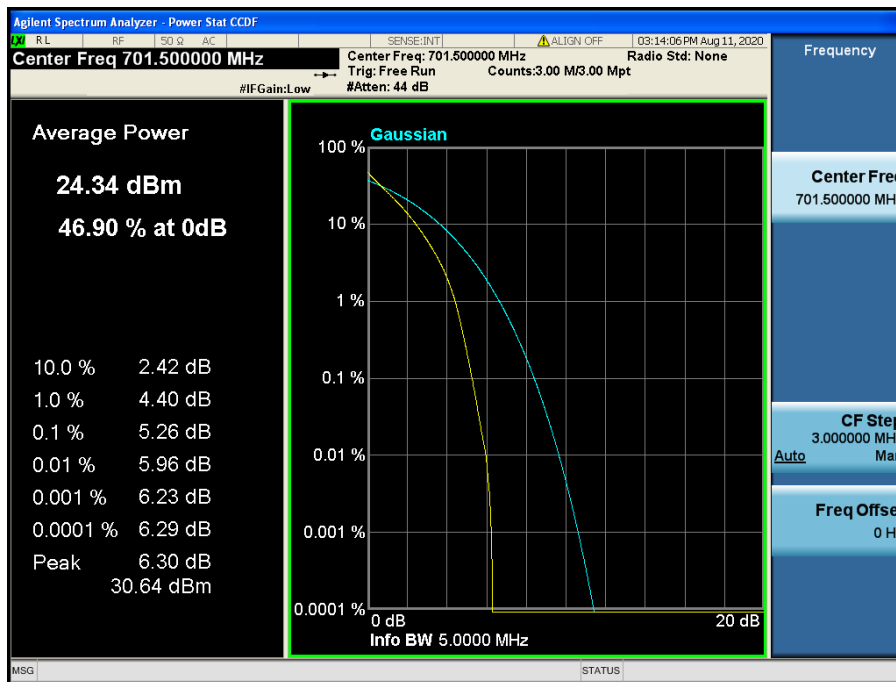
LTE Band 12 / 10 MHz / QPSK - RB Size 50



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



LTE Band 12 / 10 MHz / 64QAM - RB Size 50



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



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



LTE Band 12 / 5 MHz / 64QAM - RB Size 25