RF TEST REPORT

Test item	:	Multi Band GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
Model No.	:	LG-D855V, LGD855V, D855V, LG-D855v, LGD855v, D855v
Order No.	:	DTNC1411-04837
Date of receipt	:	2014-11-05
Test duration	:	2014-11-06 ~ 2014-11-17
Date of issue	:	2014-11-20
Use of report	:	FCC Original Grant

Applicant : LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Test laboratory : DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935

Test specification	:	FCC Part 22
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

Tested by:

Engineer
Jaejin Lee

Reviewed by:

Technical Manager
Geunki Son

Test Report Version

Test Report No.	Date	Description
DRTFCC1411-1468	Nov. 20, 2014	Initial issue

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1. GENERAL INFORMATION

Applicant Name: LG Electronics Mobile Comm U.S.A., Inc.

Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632

FCC ID	:	ZNFD855V
FCC Classification	:	PCS Licensed Transmitter Held to Ear (PCE)
EUT Type	:	Multi Band GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
Model Name	:	LG-D855V
Add Model Name	:	LGD855V, D855V, LG-D855v, LGD855v, D855v ※ 6 models are same mechanical, electrical and functional. ※ The only difference is the model name, which are changed for marketing purpose.
Supplying power	:	DC 3.8 V
Antenna Type	:	Internal Antenna - Type: Built-In type

Mode	Tx Frequency (MHz)	Emission Designator	Modulation	ERP/EIRP	
				Max power(dBm)	Max power(W)
LTE Band 5	829 ~ 844	8M94G7D	QPSK	18.96	0.079
LTE Band 5	829 ~ 844	8M97W7D	16QAM	17.51	0.056
LTE Band 5	826.5 ~ 846.5	4M48G7D	QPSK	18.80	0.076
LTE Band 5	826.5 ~ 846.5	4M49W7D	16QAM	17.86	0.061
LTE Band 5	825.5 ~ 847.5	2M70G7D	QPSK	18.82	0.076
LTE Band 5	825.5 ~ 847.5	2M70W7D	16QAM	17.64	0.058
LTE Band 5	824.7 ~ 848.3	1M08G7D	QPSK	18.79	0.076
LTE Band 5	824.7 ~ 848.3	1M09W7D	16QAM	17.69	0.059

2. INTRODUCTION

2.1 EUT DESCRIPTION

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

2.2. Support equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Wireless Charger	WCP-310	-	LG	BEJWCP300
-	-	-	-	-

Note: The above equipments were supported by manufacturer.

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. TEST FACILITY

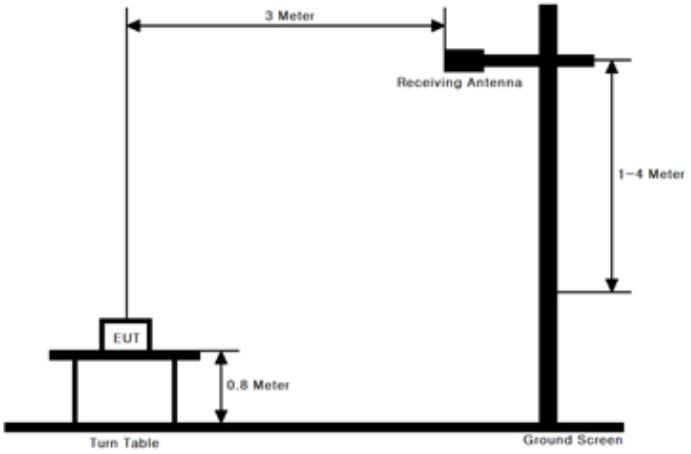
The 3&10m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935. The site is constructed in conformance with the requirements.

- 3&10m test site registration Number: 678747

3. DESCRIPTION OF TESTS

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

Test Set-up



Test Procedure

- **ANSI/TIA-603-C-2004 - Section 2.2.17**
- **KDB971168 v02r02 - Section 5.2.1**

These measurements were performed at 3 &10 m test site. The equipment under test is placed on a non-conductive table 0.8-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna.

Test setting

1. Set span to at least 1.5 times the OBW.
2. Set RBW = 1-5 % of the OBW, not to exceed 1 MHz.
3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.
5. Sweep time = auto couple.
6. Detector = RMS (power averaging).
7. If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98 %), then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), 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.
   Ensure that the sweep time is less than or equal to the transmission burst duration.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band 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 receive 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.

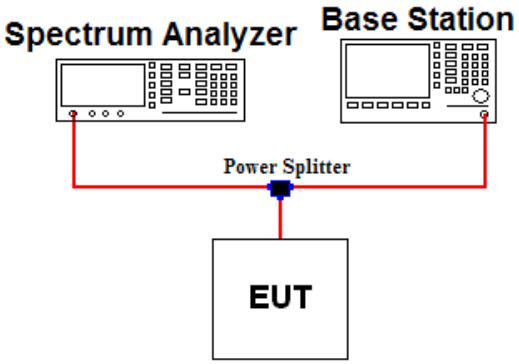
The ERP/EIRP is calculated using the following formula:

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 v02r02 - Section 5.7.1**

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.

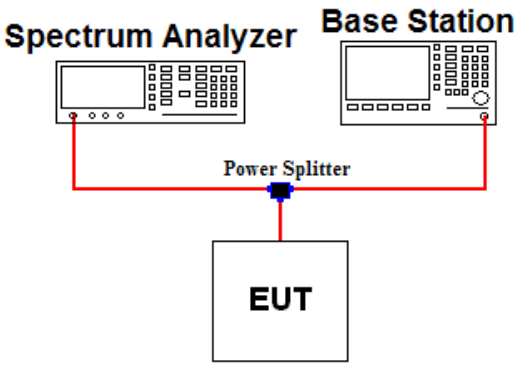
Test setting

The spectrum Analyzer`s CCDF measurement function is enabled.

1. Set resolution/measurement bandwidth ≥ signal`s occupied 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 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 and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1 %

3.3 OCCUPIED BANDWIDTH.

Test set-up



Test Procedure

- **KDB971168 v02r02-Section 4.2**

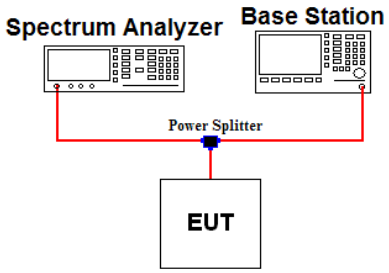
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

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 (Conducted)

Test set-up



Test Procedure

- **KDB971168 v02r02 - Section 6.0**

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 or requirements on note 2 in case of band 7 and 41.

Test setting

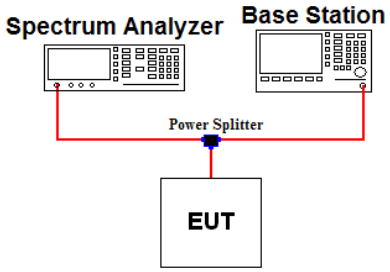
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1 % of the emission bandwidth or 2 % of the emission bandwidth (refer to note 2)
4. VBW ≥ 3 X RBW
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: 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: 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 MHz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 MHz and X MHz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz 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 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. For mobile digital stations, 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 2495-2496 MHz, in which case a resolution bandwidth of **at least one percent** may be employed.

3.5 SPURIOUS AND HARMONIC EMISSIONS (Conducted)

Test set-up



Test Procedure

- **KDB971168 v02r02- Section 6.0**

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 30 MHz 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 or 55 + 10 log(P) in case of band 7 and 41.

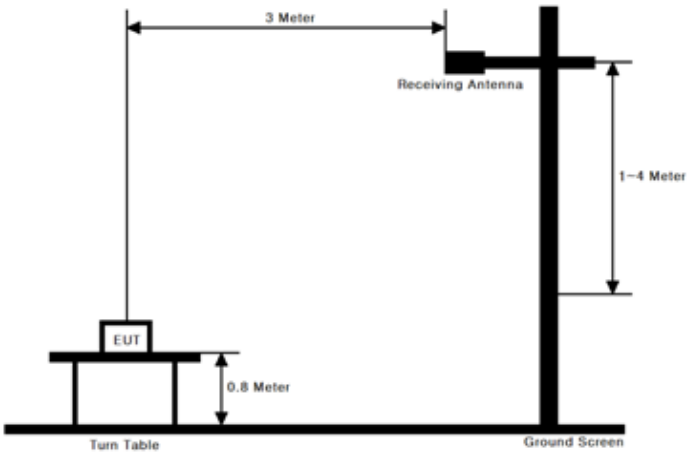
Test setting

1. RBW = 100 KHz or 1 MHz & 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 Part 22 and 1 MHz or greater for Part 24, 27.

3.6 UNDESIRABLE EMISSIONS (Radiated)

Test Set-up



Test Procedure

- **ANSI/TIA-603-C-2004 - Section 2.2.12**
- **KDB971168 v02r02 - Section 5.8**

These measurements were performed at 3 & 10m test site. The equipment under test is placed on a non-conductive table 0.8-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna.

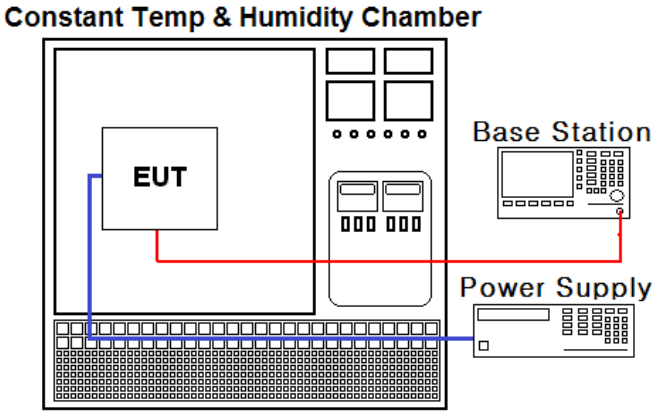
Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = Peak & 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-C-2004**
- **KDB971168 v02r02 - Section 9.0**

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. 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.
   (25 °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
Multimeter	Fluke	17B	14/05/12	15/05/12	26030065WS
DC Power Supply	H.P	66332A	14/02/04	15/02/04	GB37470200
Power Splitter	Anritsu	K241B	14/02/28	15/02/28	1301181
Thermohygrometer	BODYCOM	BJ5478	14/03/03	15/03/03	1209
Temp &Humi Test Chamber	SJ Science	SJ-TH-S50	14/10/21	15/10/21	SJ-TH-S50-130930
MXA Signal Analyzer	Agilent	N9020A	14/09/15	15/09/15	MY50200867
Vector Signal Generator	Rohde Schwarz	SMBV100A	14/01/08	15/01/08	255571
Signal Generator	Rohde Schwarz	SMF100A	14/07/01	15/07/01	102341
RadioCommunication Analyzer	Anritsu	MT8820C	14/09/10	15/09/10	6200978101
Spectrum Analyzer	Agilent	N9020A	14/03/28	15/03/28	MY50510026
LOOP Antenna	Schwarzbeck	FMZB1513	14/04/29	16/04/29	1513-128
Dipole Antenna	Schwarzbeck	VHA9103	13/10/24	15/10/24	2116
Dipole Antenna	Schwarzbeck	VHA9103	14/04/01	16/04/01	2117
Dipole Antenna	Schwarzbeck	UHA9105	13/10/24	15/10/24	2261
Dipole Antenna	Schwarzbeck	UHA9105	14/04/01	16/04/01	2262
Bilog Antenna	Schwarzbeck	VULB9160	14/07/31	16/07/31	9160-3362
HORN ANT	ETS	3115	14/02/26	16/02/26	6419
HORN ANT	ETS	3117	14/05/12	16/05/12	00140394
Amplifier (22dB)	H.P	8447E	14/01/07	15/01/07	2945A02865
Amplifier (30dB)	Agilent	8449B	14/02/27	15/02/27	3008A00370
Amplifier	EMPOWER	BBS3Q7ELU	14/09/12	15/09/12	1020
High-pass filter	Wainwright	WHKX1.0	14/09/11	15/09/11	9

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 Note 2
2.1049	Occupied Bandwidth	N/A		C
24.232(d)	Peak to Average Ratio	< 13 dB		C
2.1051 22.917(a)	Band Edge / conducted Spurious Emissions	< 43 + 10log$_{10}$ (P) dB at Band edge and for all out-of-band emissions		C
2.1055 22.355	Frequency Stability	< 2.5 ppm (Part 22) Fundamental emissions must stay within Authorized frequency block (Part 24, 27)		C
22.913(a.2)	Effective radiated power	< 7 Watts max. ERP	Radiated	C Note 3
2.1053 22.917(a)	Undesirable Emissions	< 43 + 10log$_{10}$ (P) dB at Band edge and for all out-of-band emissions		C Note 3

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: There is no normal battery cover and there is only one kind of wireless charging battery cover for this handset. So per KDB 648474 D03 v01r02, the spurious emissions were tested with the wireless charging battery cover and with both not charging and charging conditions.
Also ERP,EIRP tests were repeated with the wireless charging condition at the worst case configuration of the not charging condition. For wireless charging condition, the handset is placed on the representative charging pad under normal conditions and in a simulated call configuration.

The sample was tested according to the following specification:
ANSI/TIA/EIA-603-C-2004 and KDB 971168 D01 v02r02, KDB 648474 D03 v01r02

6. SAMPLE CALCULATION

A. Emission Designator

LTE Band (QPSK)

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

LTE Band (16QAM)

Emission Designator = **8M97W7D**
LTE OBW = 8.968 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

7. TEST DATA

7.1 OCCUPIED BANDWIDTH

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

7.2 PEAKTOAVERAGERATIO

- 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

7.5 EQUIVALENT ISOTROPIC RADIATED POWER

7.5.1 LTE Band 5 / Without Wireless Charging

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Offset/ Size	Battery cover	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
10	829	QPSK	25/1	Standard	Z	H	16.62	1.19	17.81	0.060
		16QAM	49/1	Standard	Z	H	15.97	1.19	17.16	0.052
	836.5	QPSK	0/1	Standard	Z	H	16.94	1.19	18.13	0.065
		16QAM	25/1	Standard	Z	H	15.98	1.19	17.17	0.052
	844	QPSK	0/1	Standard	Z	H	17.77	1.19	18.96	0.079
		16QAM	0/1	Standard	Z	H	16.32	1.19	17.51	0.056
5	826.5	QPSK	12/1	Standard	Z	H	16.66	1.19	17.85	0.061
		16QAM	0/1	Standard	Z	H	15.22	1.19	16.41	0.044
	836.5	QPSK	0/1	Standard	Z	H	17.61	1.19	18.80	0.076
		16QAM	24/1	Standard	Z	H	16.58	1.19	17.77	0.060
	846.5	QPSK	12/1	Standard	Z	H	17.47	1.19	18.66	0.073
		16QAM	12/1	Standard	Z	H	16.67	1.19	17.86	0.061
3	825.5	QPSK	0/1	Standard	Z	H	16.12	1.19	17.31	0.054
		16QAM	0/1	Standard	Z	H	14.75	1.19	15.94	0.039
	836.5	QPSK	0/1	Standard	Z	H	17.63	1.19	18.82	0.076
		16QAM	0/1	Standard	Z	H	16.42	1.19	17.61	0.058
	847.5	QPSK	14/1	Standard	Z	H	17.52	1.19	18.71	0.074
		16QAM	14/1	Standard	Z	H	16.45	1.19	17.64	0.058
1.4	824.7	QPSK	0/1	Standard	Z	H	16.35	1.19	17.54	0.057
		16QAM	3/1	Standard	Z	H	15.17	1.19	16.36	0.043
	836.5	QPSK	0/1	Standard	Z	H	17.60	1.19	18.79	0.076
		16QAM	5/1	Standard	Z	H	16.50	1.19	17.69	0.059
	848.3	QPSK	0/1	Standard	Z	H	17.25	1.19	18.44	0.070
		16QAM	3/1	Standard	Z	H	16.22	1.19	17.41	0.055

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.5.2 LTE Band 5 / With Wireless Charging

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Offset/ Size	Battery cover	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
10	844	QPSK	0/1	Standard	X	H	14.03	1.19	15.22	0.033
5	836.5	QPSK	0/1	Standard	X	H	13.70	1.19	14.89	0.031
3	836.5	QPSK	0/1	Standard	X	H	14.03	1.19	15.22	0.033
1.4	836.5	QPSK	0/1	Standard	X	H	13.52	1.19	14.71	0.030

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.6 UNDESIRABLE EMISSIONS (Radiated)

7.6.1 LTE Band 5 / Without Wireless Charging

B.W (MHz)	Test Freq. (MHz)	RB Offset/ Size	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
10	829 (W)	25/1	QPSK	1658.23	Z	V	-60.60	6.51	-54.09	71.90	30.81
				2487.22	Y	H	-50.86	7.55	-43.31	61.12	
				6632.61	Y	H	-44.69	9.54	-35.15	52.96	
	836.5 (W)	0/1	QPSK	1664.63	Z	V	-58.68	6.52	-52.16	70.29	31.13
				2496.97	Y	H	-54.22	7.57	-46.65	64.78	
				6658.33	Y	H	-44.54	9.55	-34.99	53.12	
	844 (W)	0/1	QPSK	1679.44	Z	V	-58.01	6.54	-51.47	70.43	31.96
				2519.32	Y	H	-51.47	7.58	-43.89	62.85	
				6718.19	Y	H	-46.35	9.57	-36.78	55.74	
5	826.5 (W)	12/1	QPSK	1653.39	Z	V	-62.01	6.51	-55.50	73.35	30.85
				2480.09	Y	H	-48.76	7.54	-41.22	59.07	
				6613.27	Y	H	-45.77	9.54	-36.23	54.08	
	836.5 (W)	0/1	QPSK	1669.19	Z	V	-57.27	6.53	-50.74	69.54	31.80
				2503.55	Y	H	-55.57	7.57	-48.00	66.80	
				6675.97	Y	H	-47.10	9.56	-37.54	56.34	
	846.5 (W)	12/1	QPSK	1693.55	Z	V	-60.42	6.55	-53.87	72.53	31.66
				2540.05	Y	H	-54.90	7.58	-47.32	65.98	
				6773.66	Y	H	-47.73	9.58	-38.15	56.81	
3	825.5 (W)	0/1	QPSK	1648.98	Z	V	-60.69	6.50	-54.19	71.50	30.31
				2473.28	Y	H	-49.70	7.53	-42.17	59.48	
				6595.50	Y	H	-46.75	9.53	-37.22	54.53	
	836.5 (W)	0/1	QPSK	1670.78	Z	V	-58.15	6.53	-51.62	70.44	31.82
				2506.19	Y	H	-55.18	7.57	-47.61	66.43	
				6683.39	Y	H	-44.45	9.56	-34.89	53.71	
	847.5 (W)	14/1	QPSK	1697.56	Z	V	-59.09	6.56	-52.53	71.24	31.71
				2546.29	Y	H	-57.78	7.59	-50.19	68.90	
				6790.10	Y	H	-45.09	9.59	-35.50	54.21	
1.4	824.7 (W)	0/1	QPSK	1648.97	Z	V	-59.46	6.50	-52.96	70.50	30.54
				2473.30	Y	H	-49.37	7.53	-41.84	59.38	
				6595.49	Y	H	-46.08	9.53	-36.55	54.09	
	836.5 (W)	0/1	QPSK	1672.60	Z	V	-59.76	6.53	-53.23	72.02	31.79
				2508.58	Y	H	-58.24	7.57	-50.67	69.46	
				6689.99	Y	H	-46.32	9.56	-36.76	55.55	
	848.3 (W)	0/1	QPSK	1697.63	Z	V	-57.99	6.56	-51.43	69.87	31.44
				2544.15	Y	H	-57.69	7.59	-50.10	68.54	
				6784.24	Y	H	-45.35	9.59	-35.76	54.20	

Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])
Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.
Note 3: 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 above table.

7.6.2 LTE Band 5 / Without Wireless Charging

B.W (MHz)	Test Freq. (MHz)	RB Offset/ Size	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
10	844 (W)	0/1	QPSK	1679.42	X	H	-62.38	6.54	-55.84	71.06	28.22
				2519.30	X	H	-54.52	7.58	-46.94	62.16	
				6718.34	X	H	-48.11	9.57	-38.54	53.76	
5	836.5 (W)	0/1	QPSK	1669.23	X	H	-62.36	6.53	-55.83	70.72	27.89
				2503.62	X	H	-57.06	7.57	-49.49	64.38	
				6676.10	X	H	-49.40	9.56	-39.84	54.73	
3	836.5 (W)	0/1	QPSK	1670.92	X	H	-62.48	6.53	-55.95	71.17	28.22
				2506.22	X	H	-57.52	7.57	-49.95	65.17	
				6683.45	X	H	-47.99	9.56	-38.43	53.65	
1.4	836.5 (W)	0/1	QPSK	1672.52	X	H	-65.29	6.53	-58.76	73.47	27.71
				2508.64	X	H	-60.97	7.57	-53.40	68.11	
				6690.03	X	H	-49.87	9.56	-40.31	55.02	

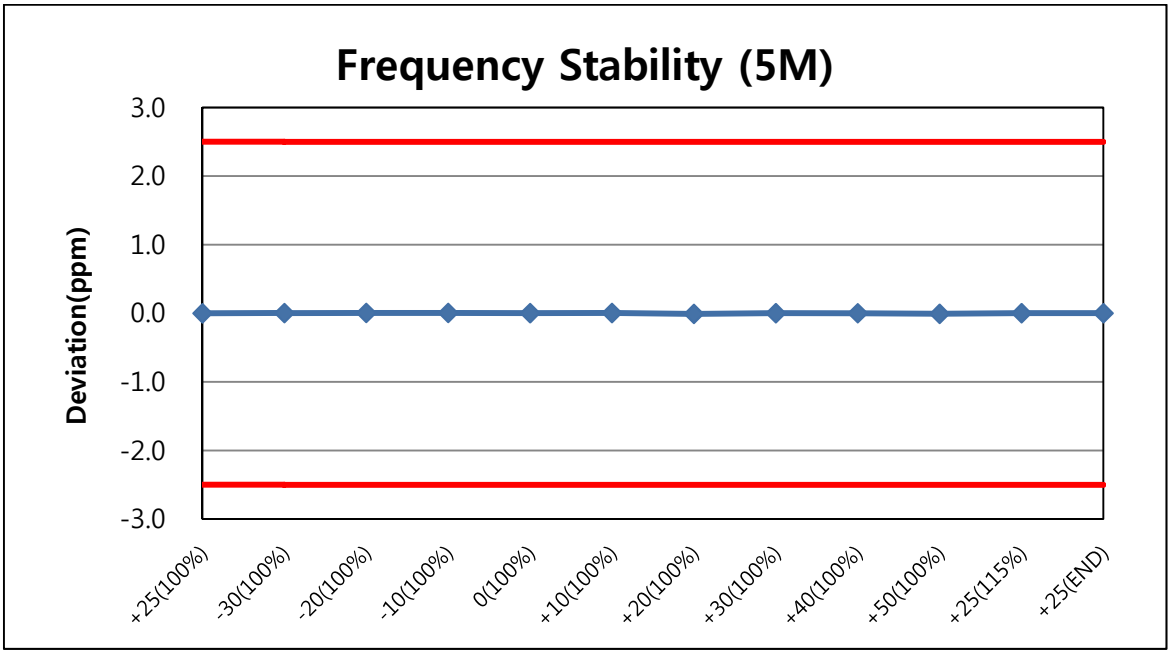
Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])
Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.
Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.7 FREQUENCY STABILITY

7.7.1 LTE Band 5

OPERATING FREQUENCY : 836,500,003 Hz
CHANNEL : 20525
REFERENCE VOLTAGE : 3.8 VDC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	3.8	+25(Ref)	836,500,003	3	0.0	0
100%		-30	836,500,005	5	0.0029	0.00000029
100%		-20	836,500,007	7	0.0054	0.00000054
100%		-10	836,500,007	7	0.0055	0.00000055
100%		0	836,500,005	5	0.0026	0.00000026
100%		10	836,500,007	7	0.0048	0.00000048
100%		20	836,499,995	-5	-0.0085	-0.00000085
100%		30	836,500,004	4	0.0018	0.00000018
100%		40	836,500,004	4	0.0014	0.00000014
100%		50	836,499,996	-4	-0.0075	-0.00000075
115%	4.37	25	836,500,004	4	0.0017	0.00000017
BATT.ENDPOINT	3.10	25	836,500,004	4	0.0017	0.00000017

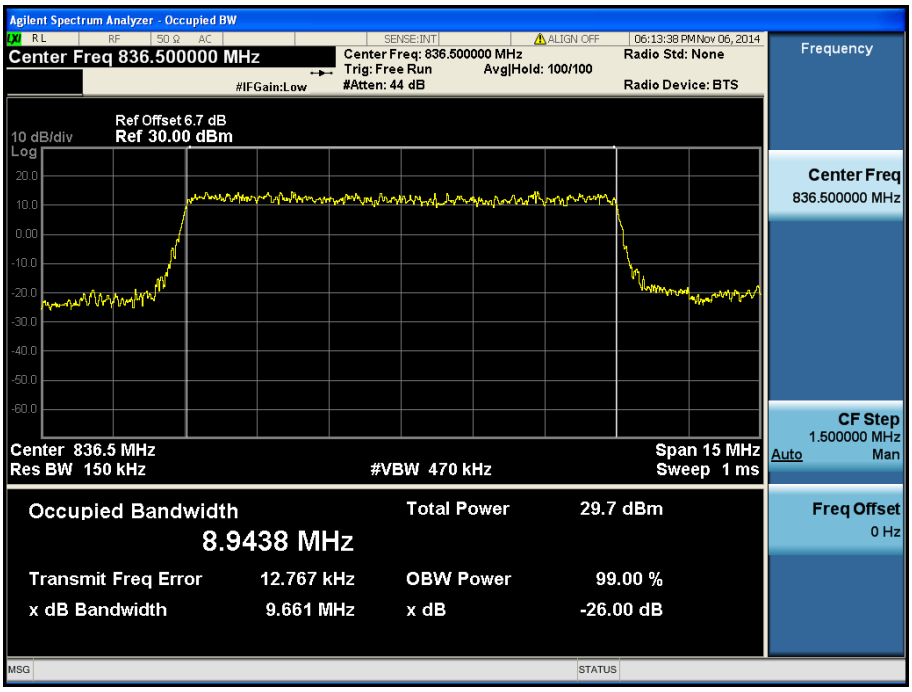


8. TEST PLOTS

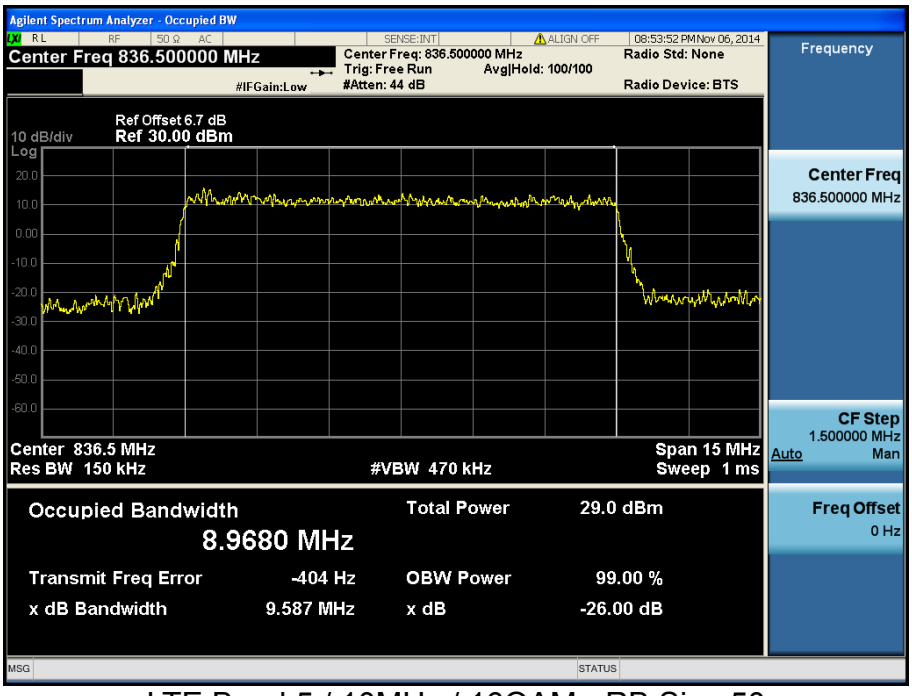
Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.

8.1 OCCUPIED BANDWIDTH

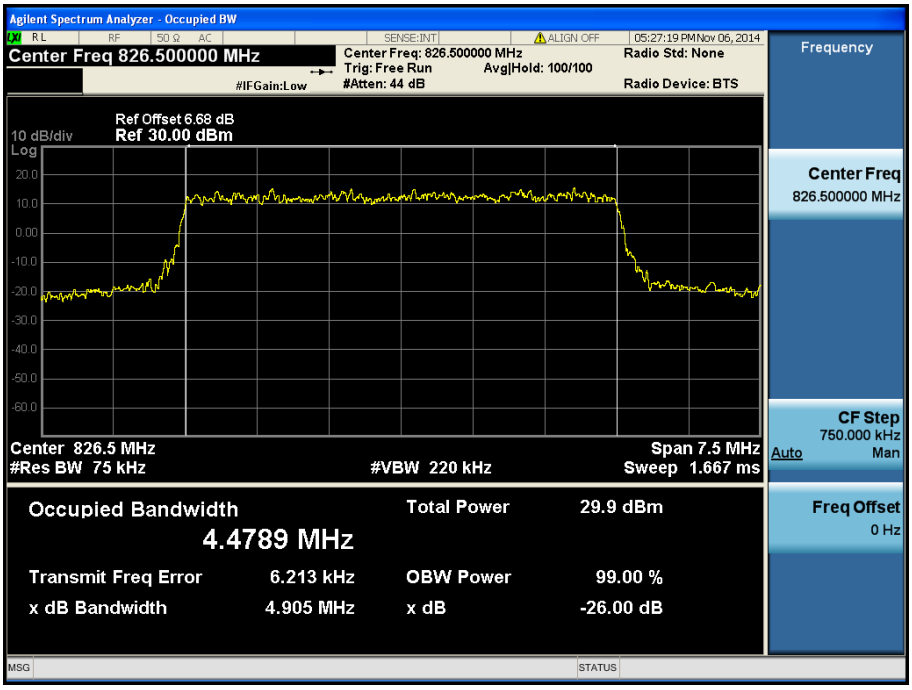
8.1.1 LTE Band 5



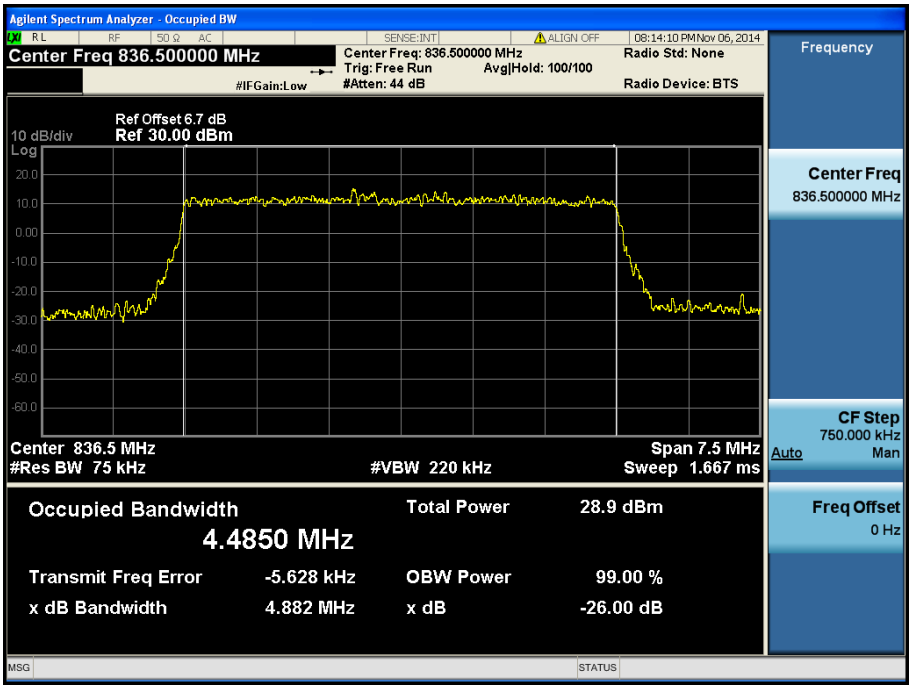
LTE Band 5 / 10MHz / QPSK - RB Size 50



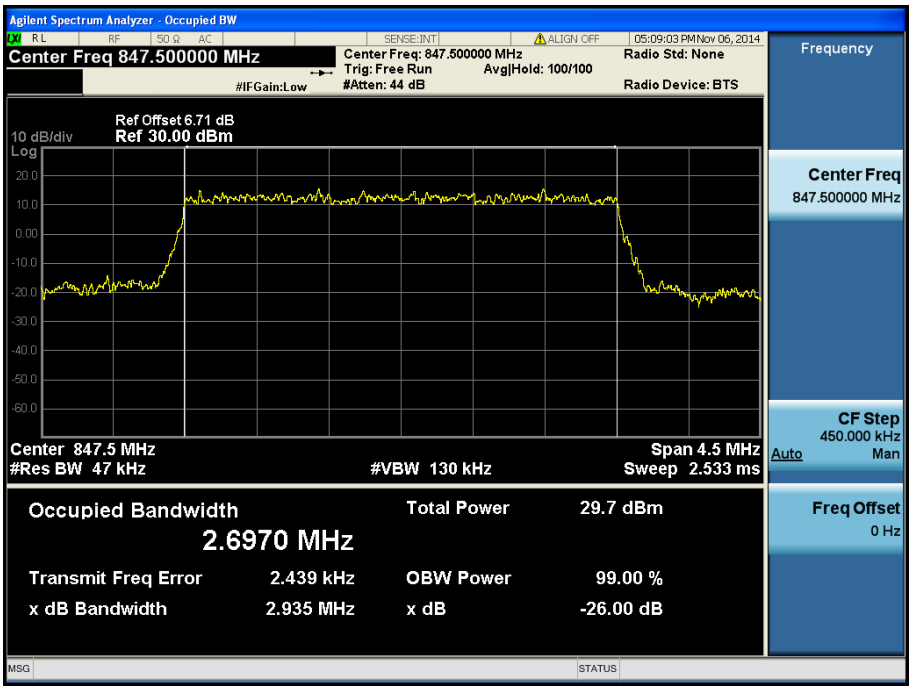
LTE Band 5 / 10MHz / 16QAM - RB Size 50



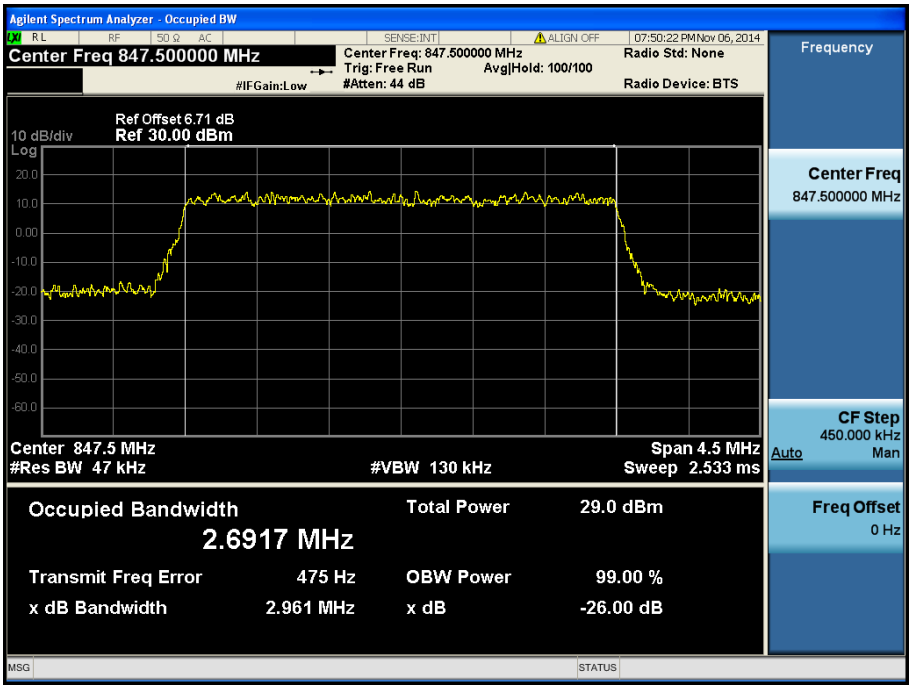
LTE Band 5 / 5MHz / QPSK - RB Size 25



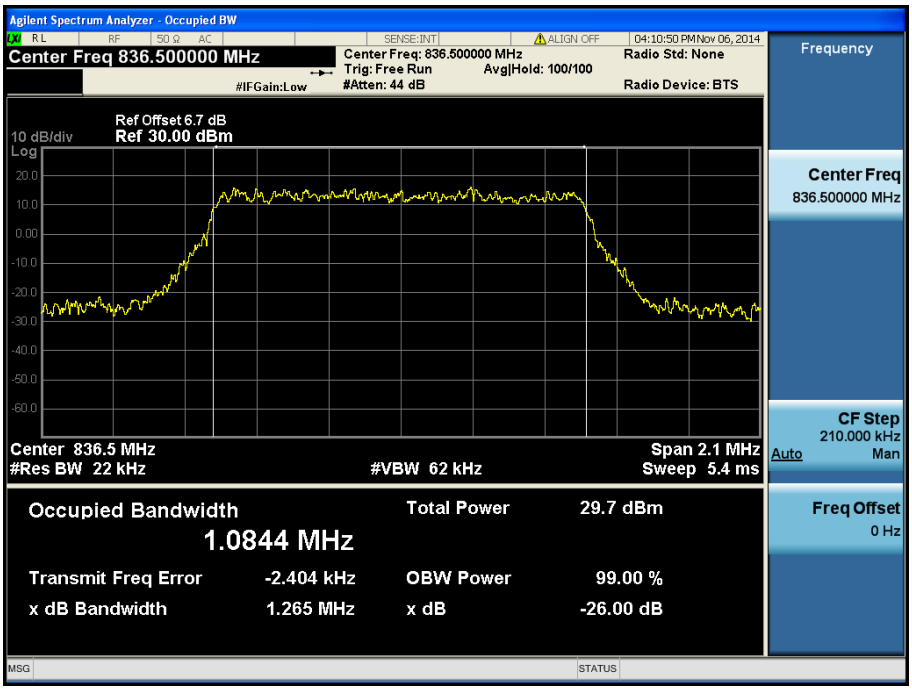
LTE Band 5 / 5MHz / 16QAM - RB Size 25



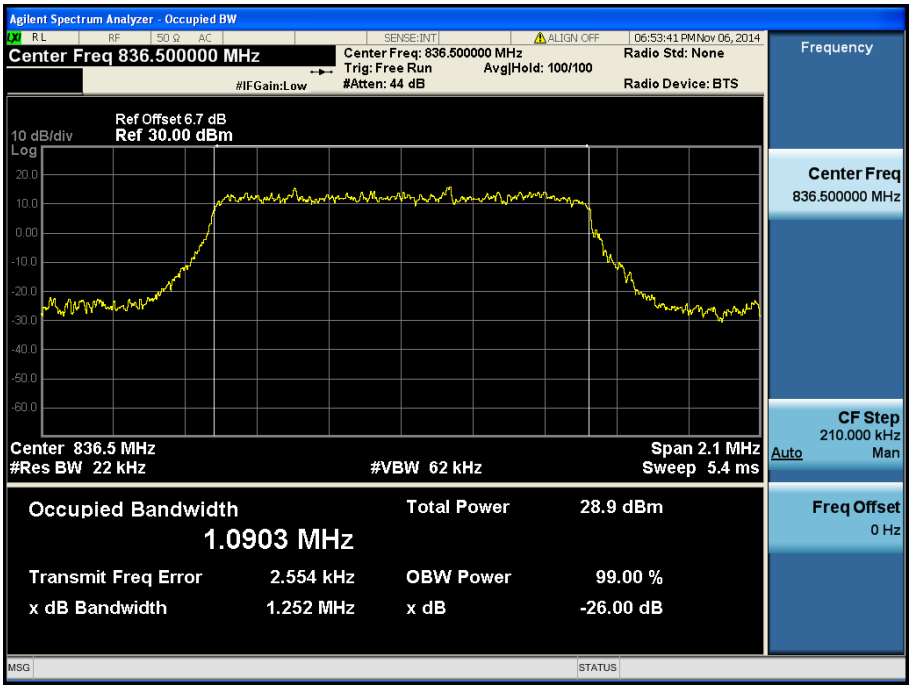
LTE Band 5 / 3MHz / QPSK - RB Size 15



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



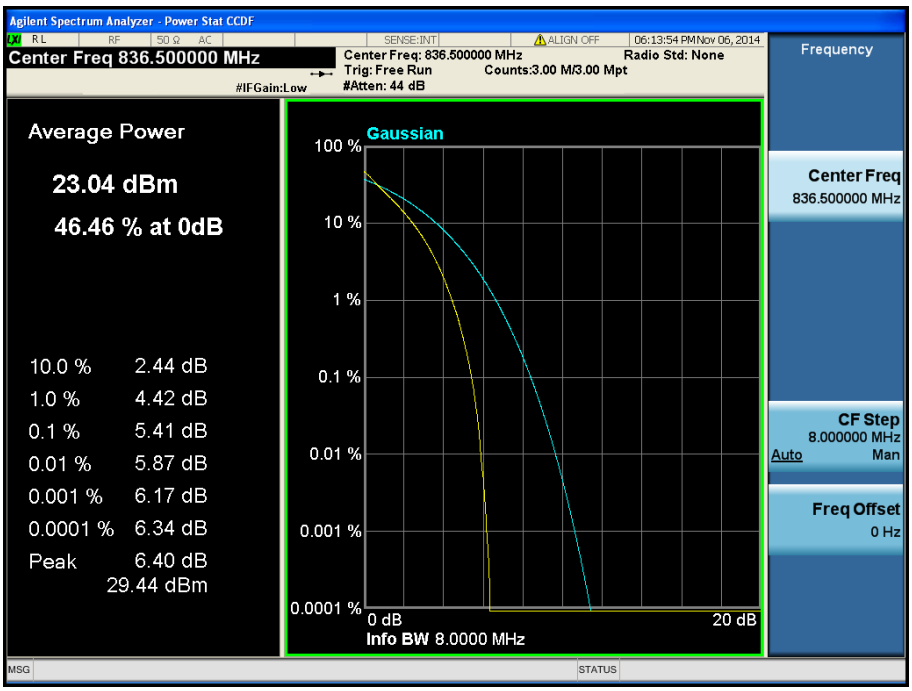
LTE Band 5 / 1.4MHz / QPSK - RB Size 6



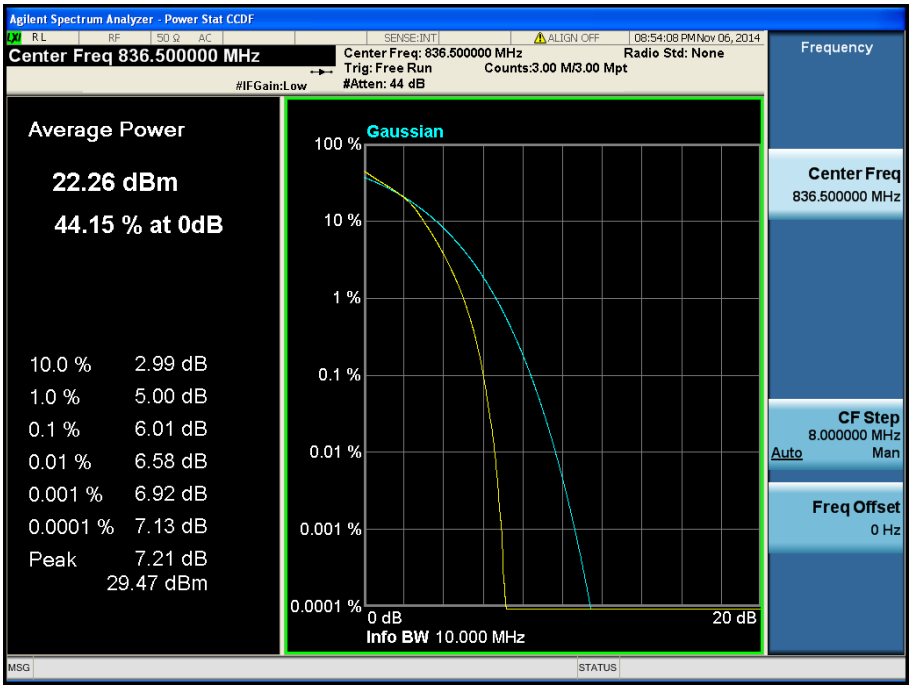
LTE Band 5 / 1.4MHz / 16QAM - RB Size 6

8.2 PEAK TO AVERAGE RATIO

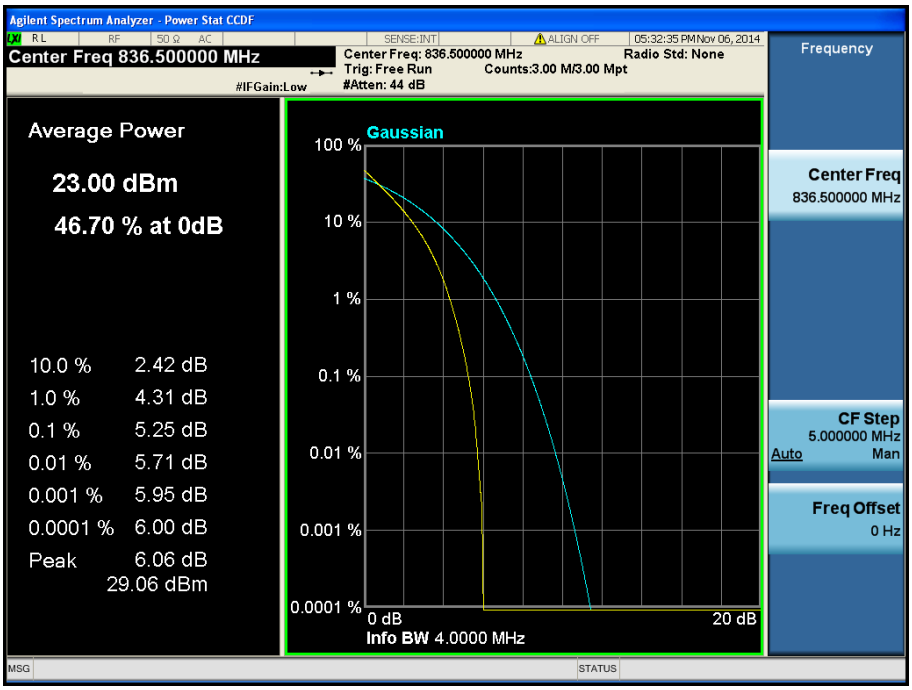
8.2.1 LTE Band 5



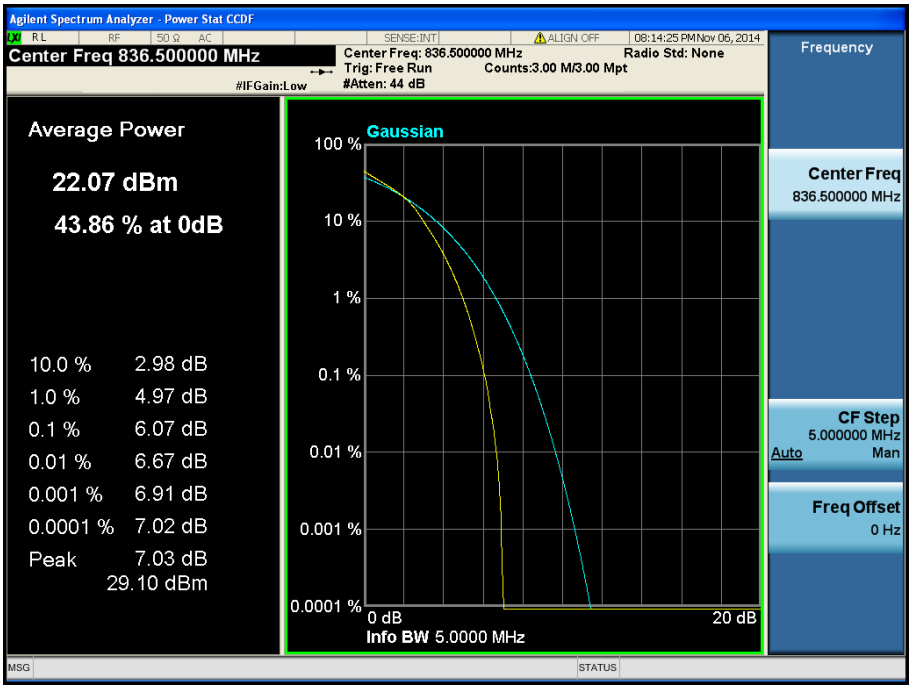
LTE Band 5 / 10MHz / QPSK - RB Size 50



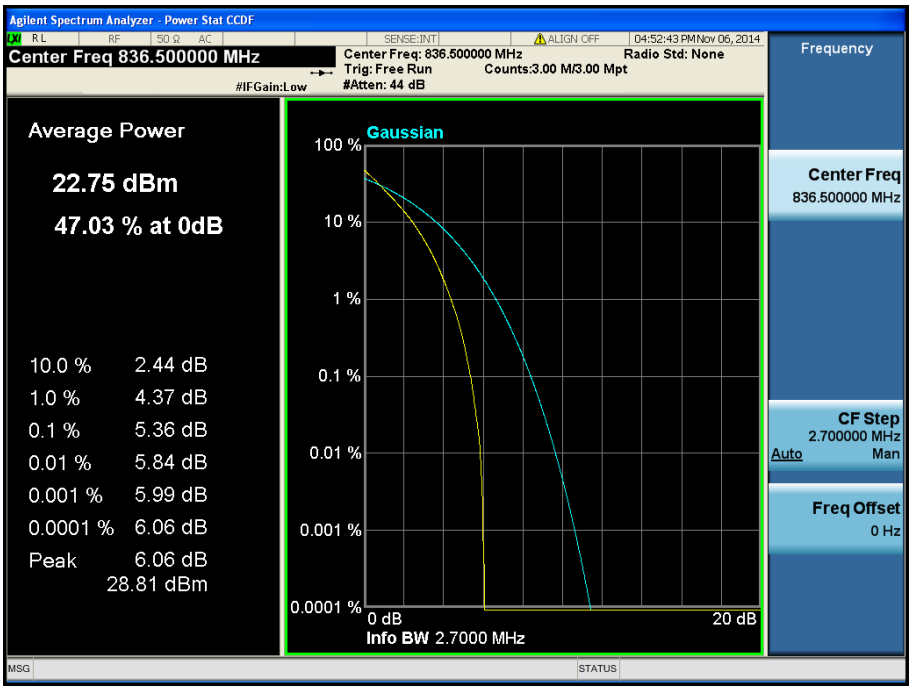
LTE Band 5 / 10MHz / 16QAM - RB Size 50



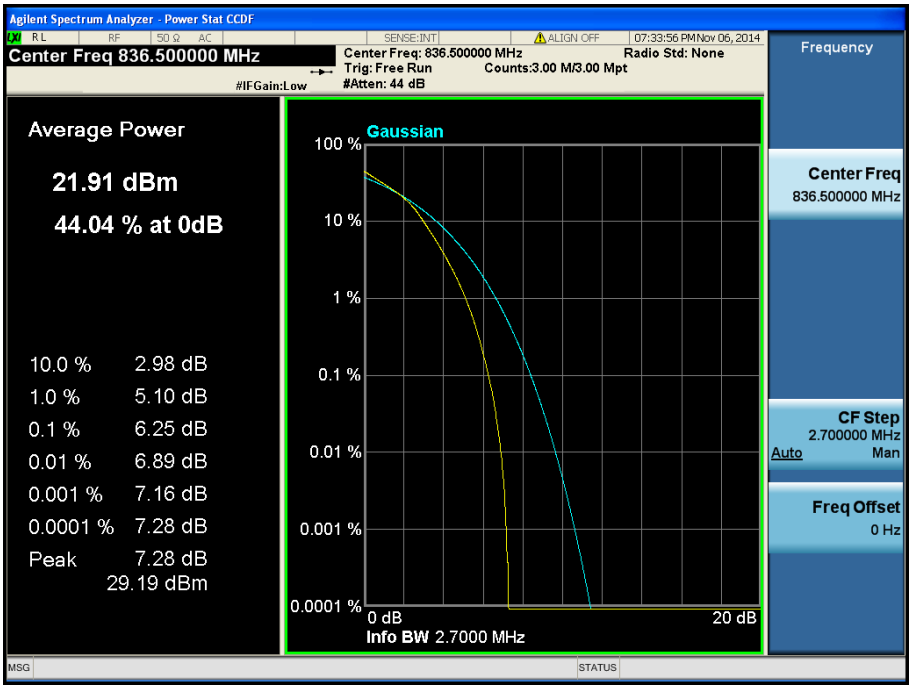
LTE Band 5 / 5MHz / QPSK - RB Size 25



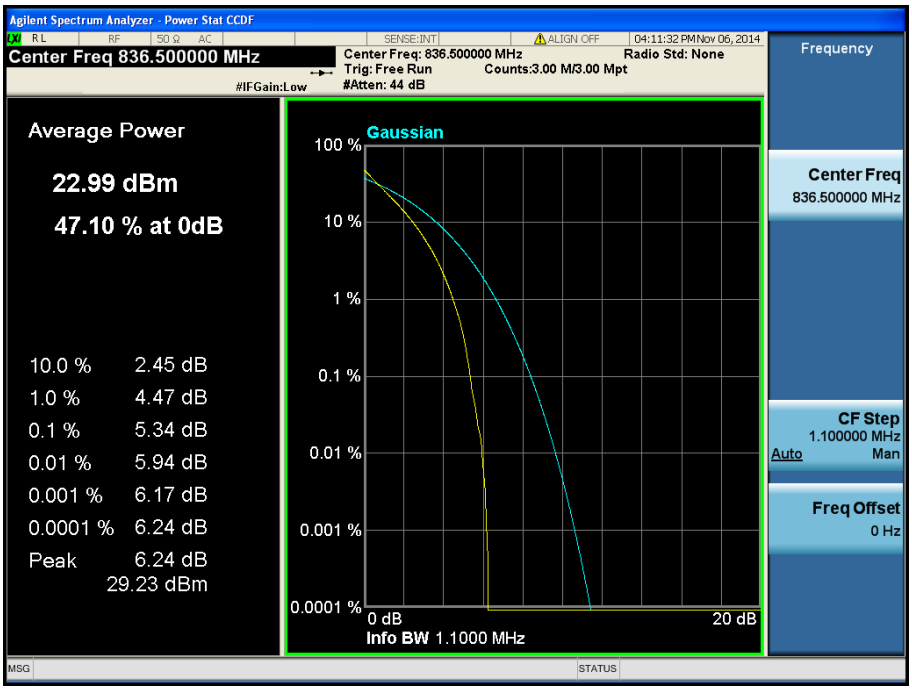
LTE Band 5 / 5MHz / 16QAM - RB Size 25



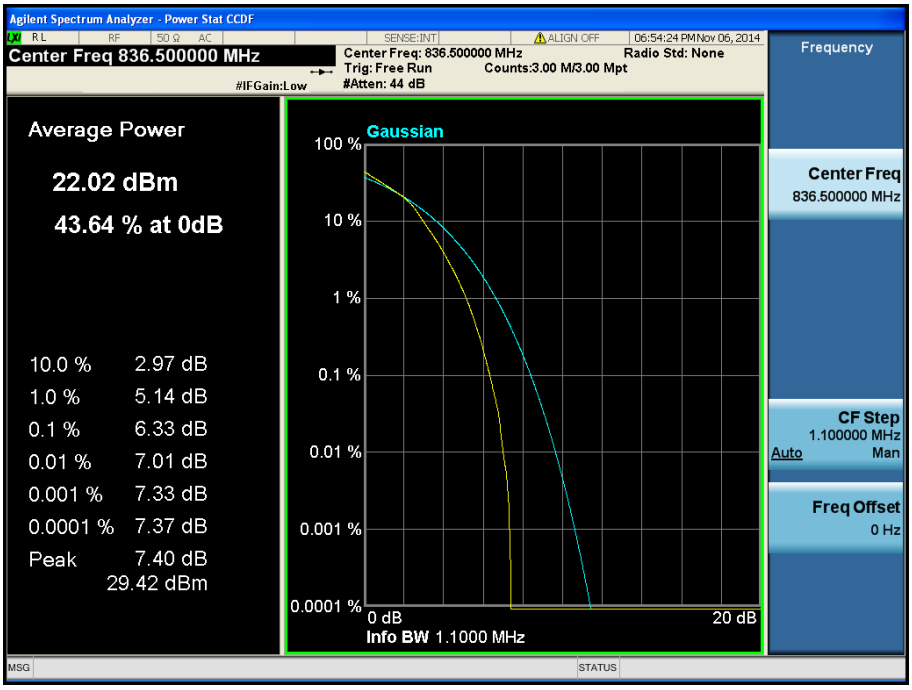
LTE Band 5 / 3MHz / QPSK - RB Size 15



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



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



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

8.3 BAND EDEG EMISSIONS(Conducted)

8.3.1 LTE Band 5

- Lower Band Edge

LTE Band 5 / 10MHz / QPSK - RB Offset/Size (0/25)

- Lower Extended Band Edge

LTE Band 5 / 10MHz / QPSK - RB Offset/Size (0/25)

- Upper Band Edge

LTE Band 5 / 10MHz / QPSK - RB Offset/Size (25/25)

- Upper Extended Band Edge

LTE Band 5 / 10MHz / QPSK - RB Offset/Size (0/50)

- Lower Band Edge

LTE Band 5 / 5MHz / 16QAM Offset/Size (0/1)

- Lower Extended Band Edge

LTE Band 5 / 5MHz / QPSK Offset/Size (0/25)

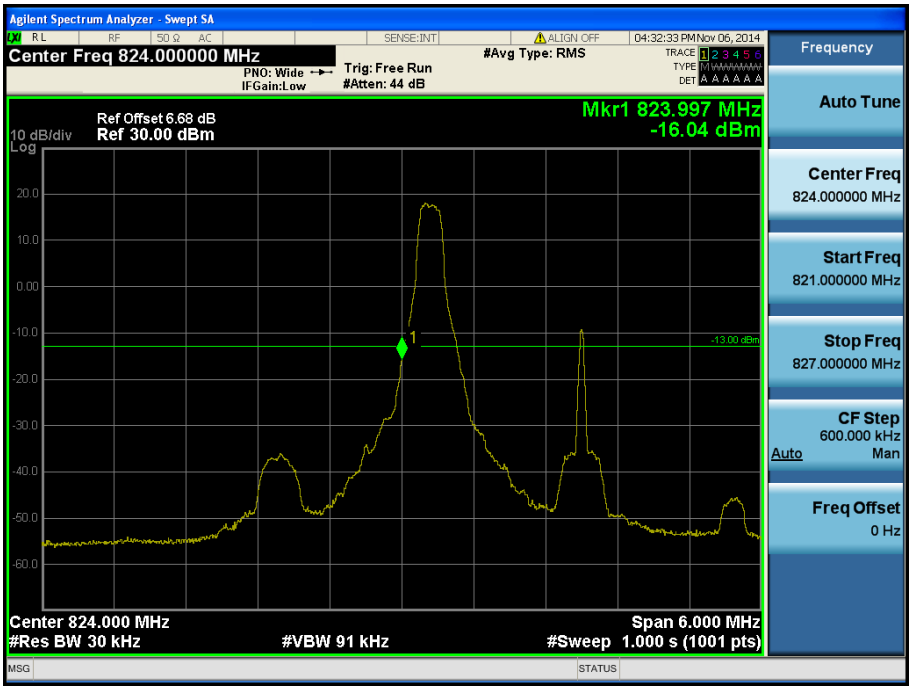
- Upper Band Edge

LTE Band 5 / 5MHz / 16QAM - RB Offset/Size (24/1)

- Upper Extended Band Edge

LTE Band 5 / 5MHz / QPSK - RB Offset/Size (0/25)

- Lower Band Edge

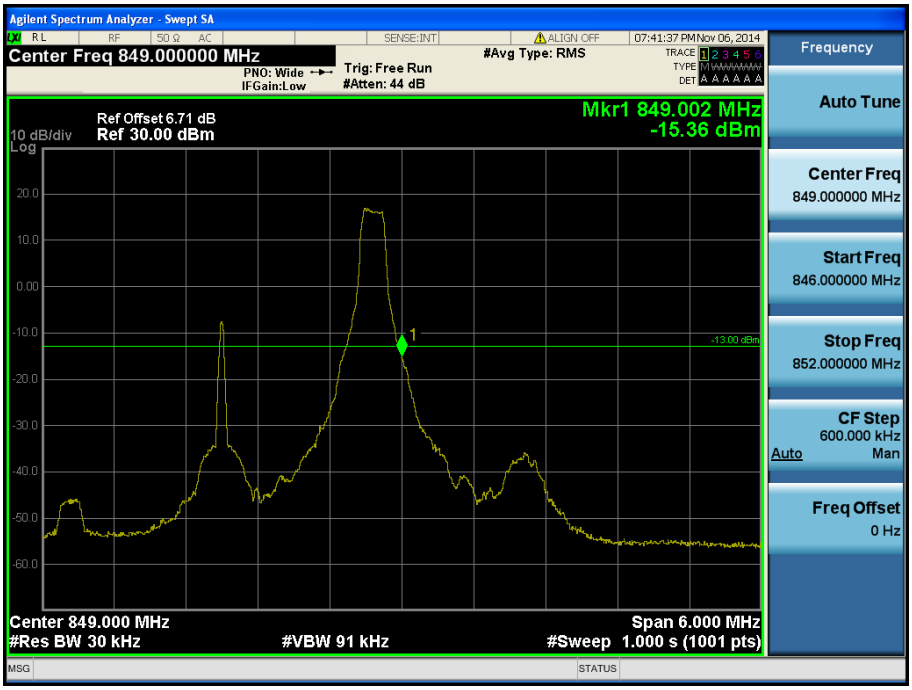


LTE Band 5 / 3MHz / QPSK - RB Offset/Size (0/1)

- Lower Extended Band Edge

LTE Band 5 / 3MHz / QPSK - RB Offset/Size (0/15)

- Upper Band Edge

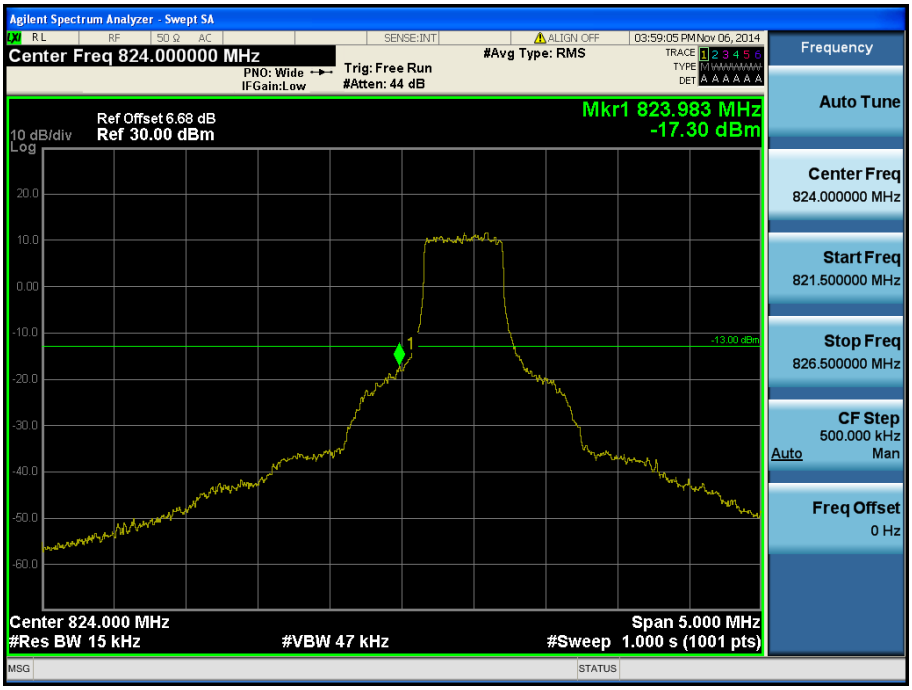


LTE Band 5 / 3MHz / 16QAM - RB Offset/Size (14/1)

- Upper Extended Band Edge

LTE Band 5 / 3MHz / QPSK - RB Offset/Size (0/15)

- Lower Band Edge

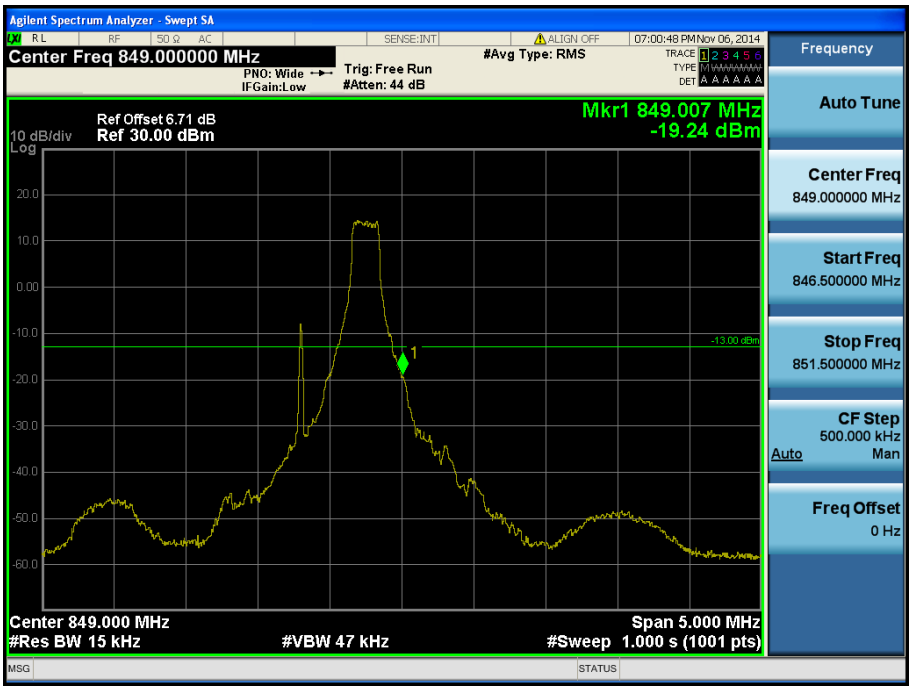


LTE Band 5 / 1.4MHz / QPSK - RB Offset/Size (0/3)

- Lower Extended Band Edge

LTE Band 5 / 1.4MHz / 16QAM - RB Offset/Size (0/6)

- Upper Band Edge



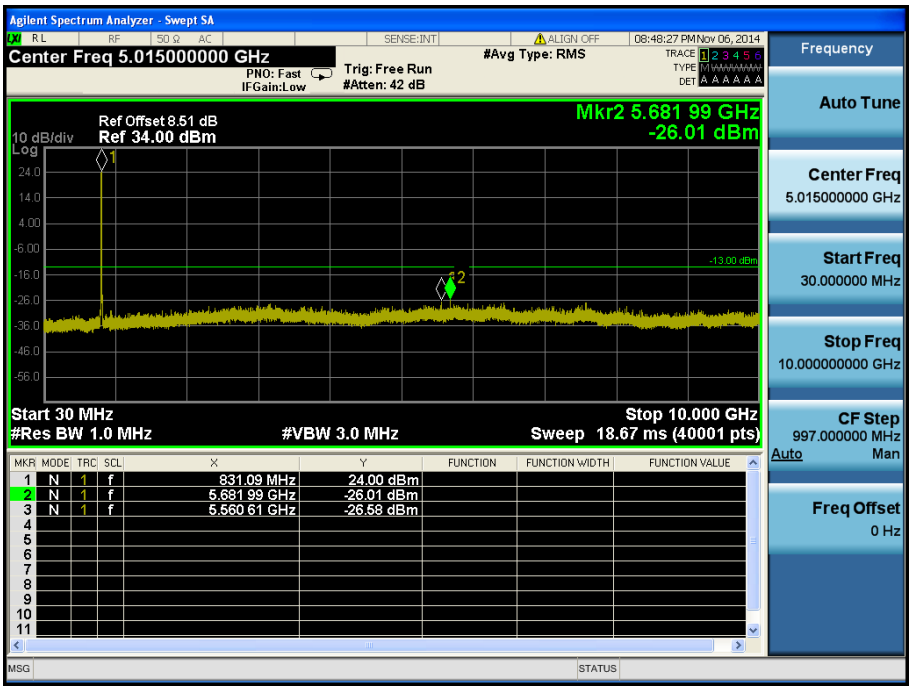
LTE Band 5 / 1.4MHz / 16QAM - RB Offset/Size (5/1)

- Upper Extended Band Edge

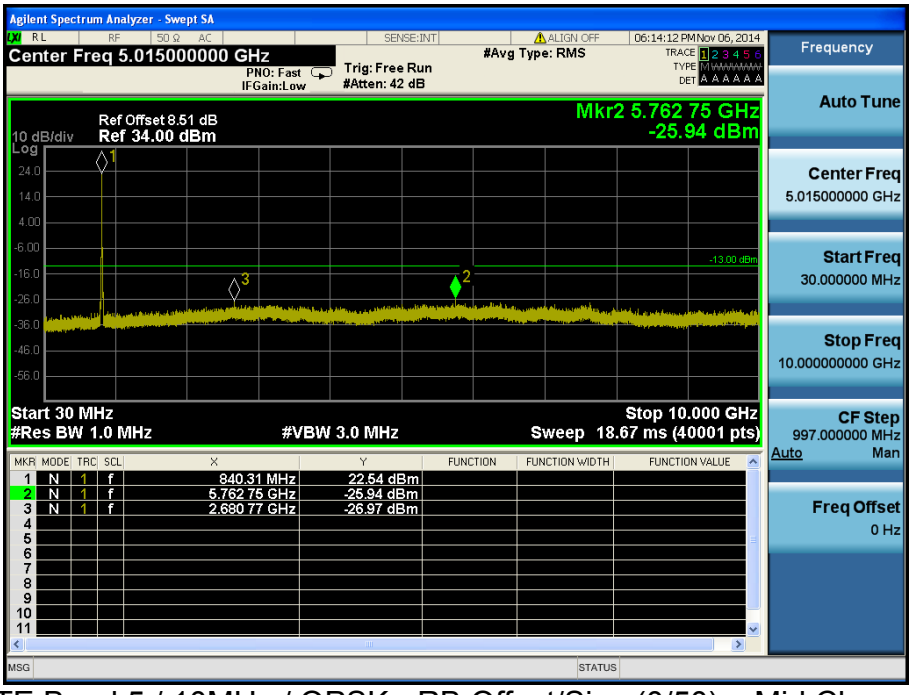
LTE Band 5 / 1.4MHz / QPSK - RB Offset/Size (0/6)

8.4 SPURIOUS AND HARMONICS EMISSIONS (Conducted)

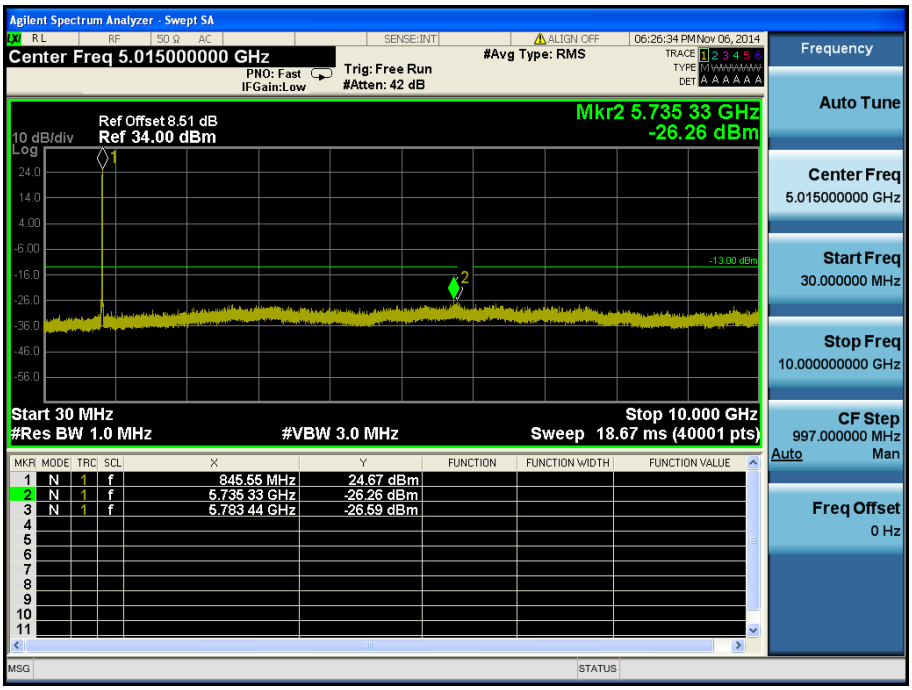
8.4.1 LTE Band 5



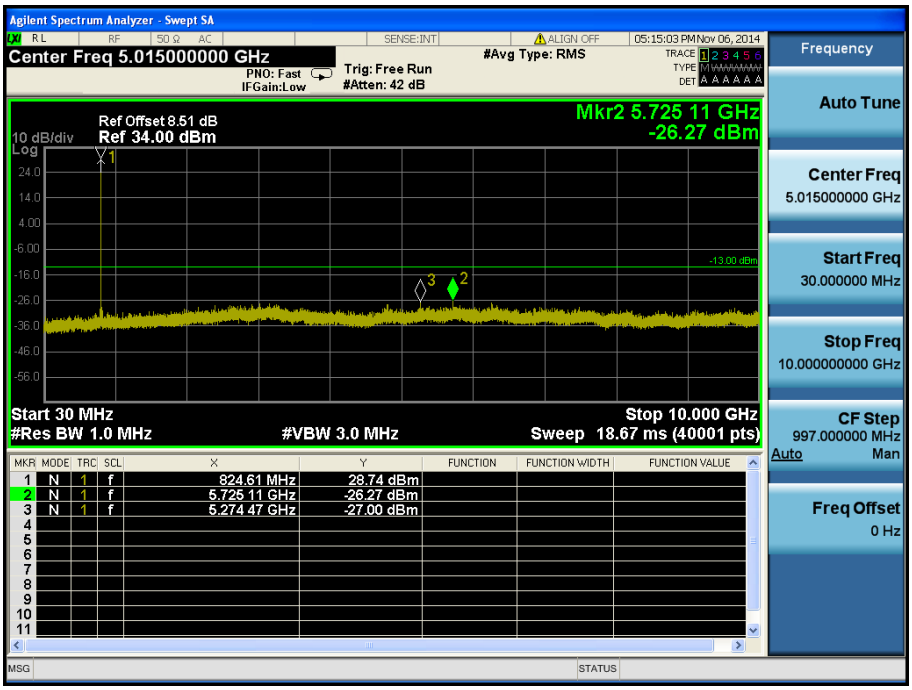
LTE Band 5 / 10MHz / 16QAM - RB Offset/Size (25/25) – Low Channel



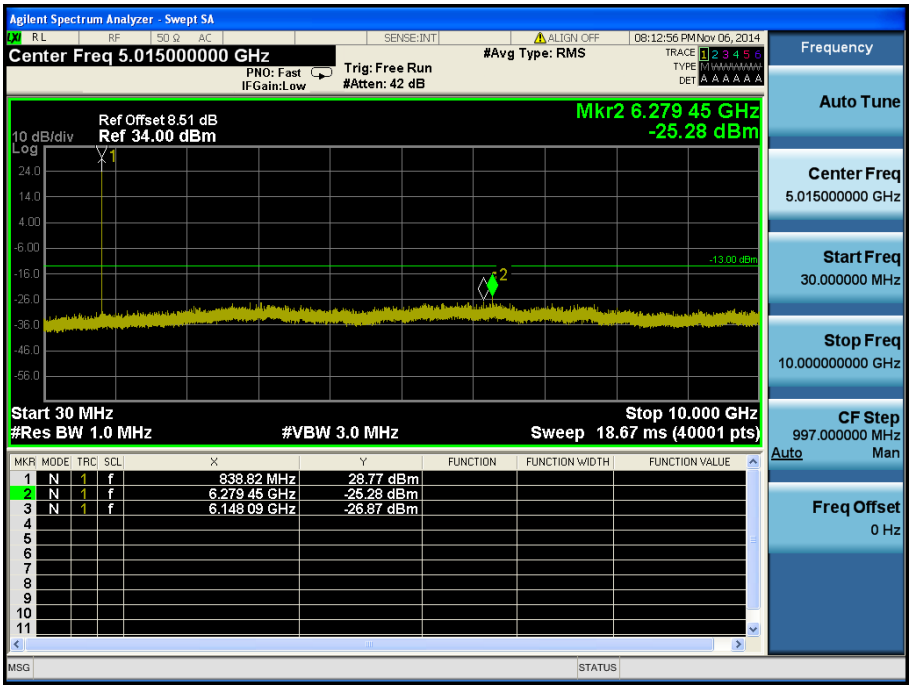
LTE Band 5 / 10MHz / QPSK - RB Offset/Size (0/50) – Mid Channel



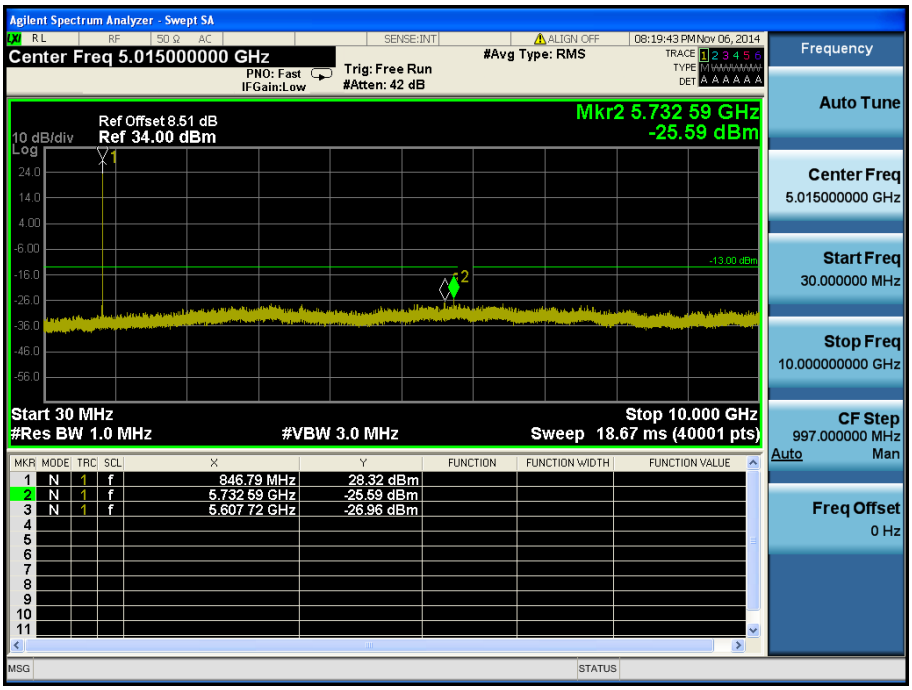
LTE Band 5 / 10MHz / QPSK - RB Offset/Size (12/25) – High Channel



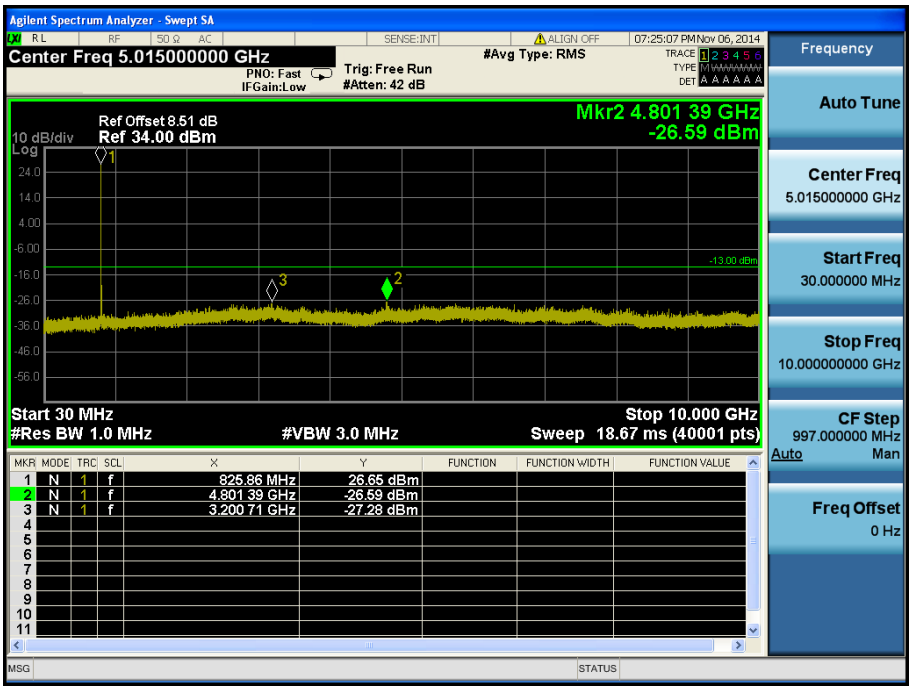
LTE Band 5 / 5MHz / QPSK - RB Offset/Size (0/1) – Low Channel



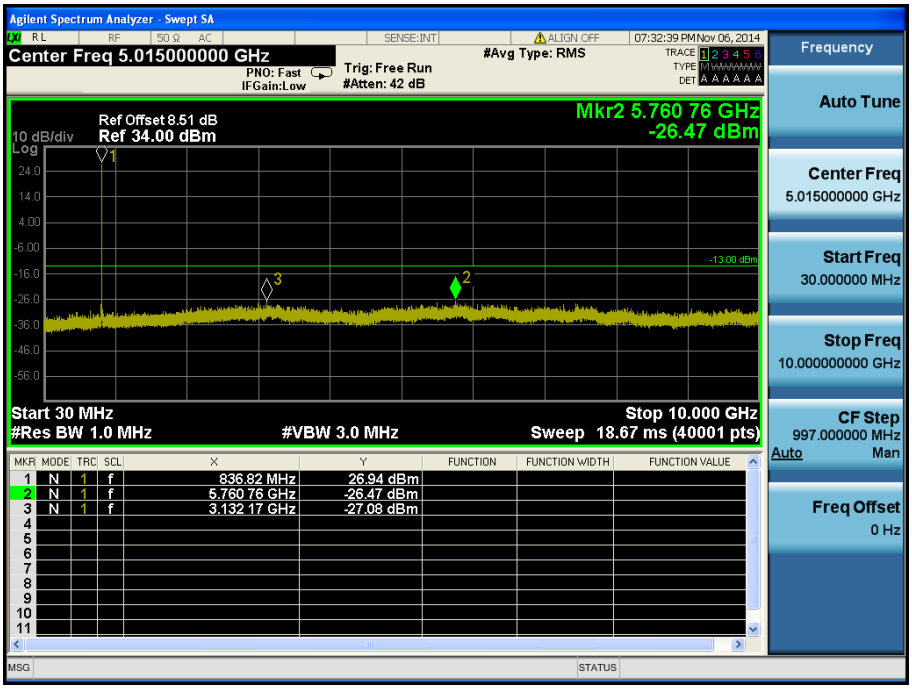
LTE Band 5 / 5MHz / 16QAM - RB Offset/Size (24/1) – Mid Channel



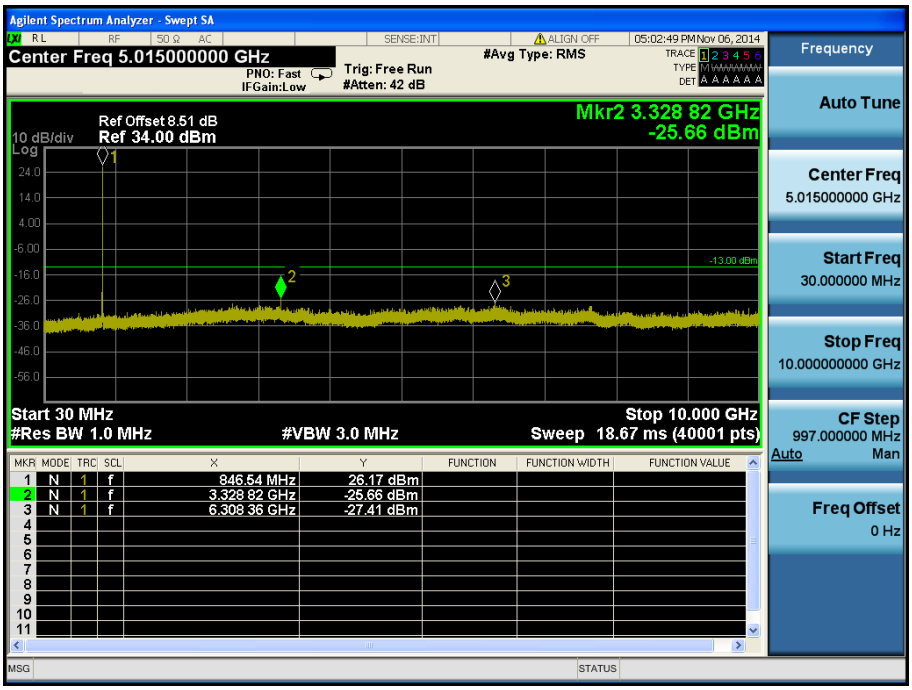
LTE Band 5 / 5MHz / 16QAM - RB Offset/Size (12/1) – High Channel



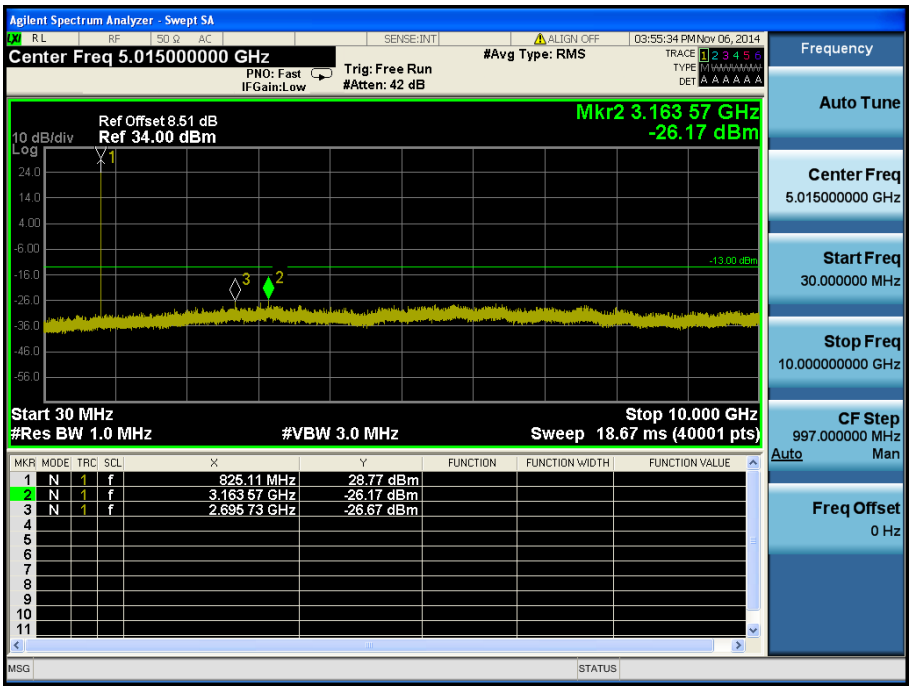
LTE Band 5 / 3MHz / 16QAM - RB Offset/Size (3/8) – Low Channel



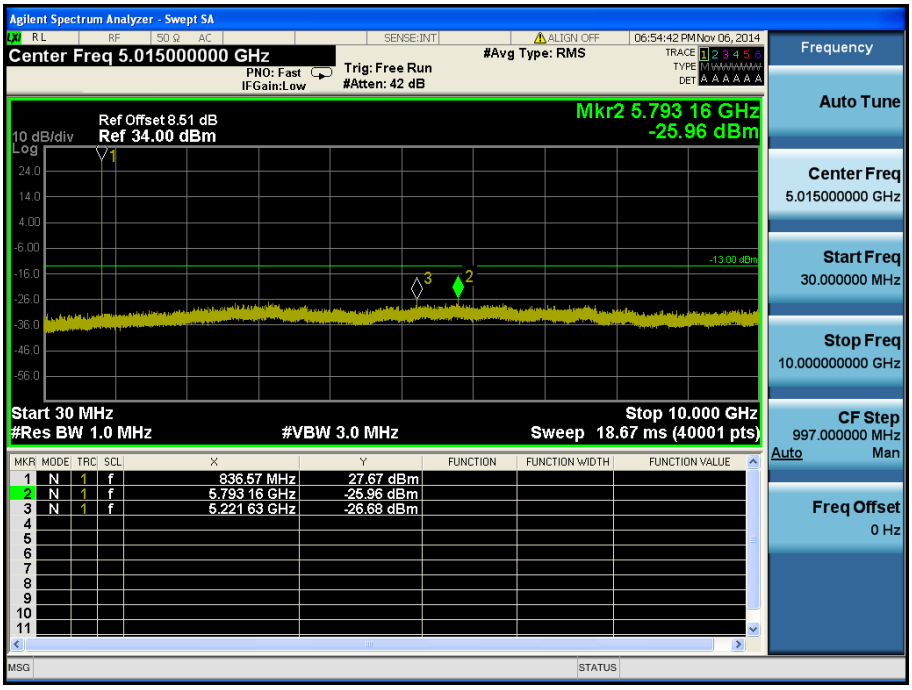
LTE Band 5 / 3MHz / 16QAM - RB Offset/Size (3/8) – Mid Channel



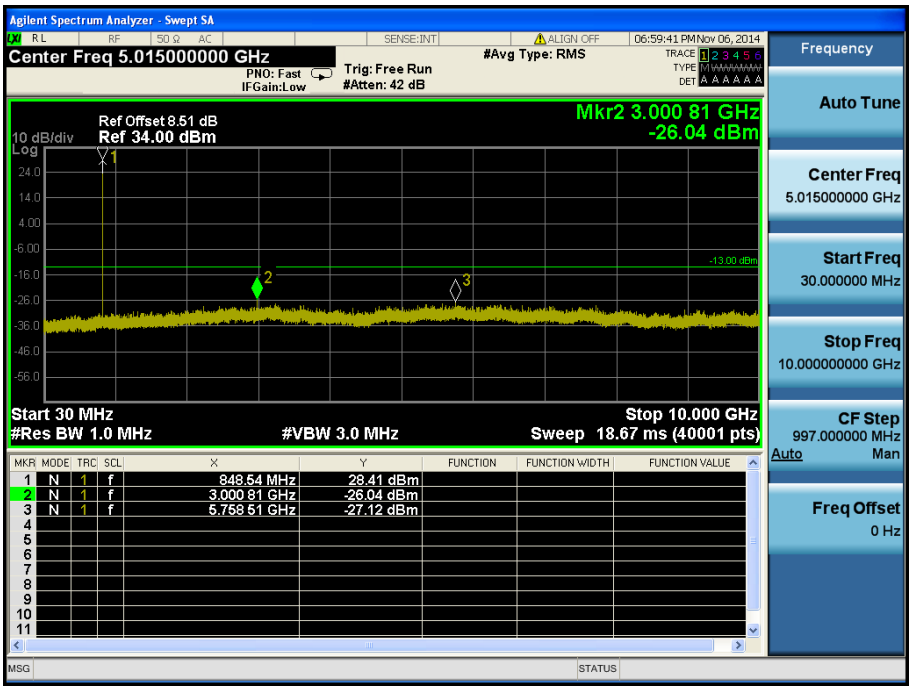
LTE Band 5 / 3MHz / QPSK - RB Offset/Size (0/8) – High Channel



LTE Band 5 / 1.4MHz / QPSK - RB Offset/Size (3/1) – Low Channel



LTE Band 5 / 1.4MHz / 16QAM - RB Offset/Size (0/6) – Mid Channel



LTE Band 5 / 1.4MHz / 16QAM - RB Offset/Size (3/1) – High Channel