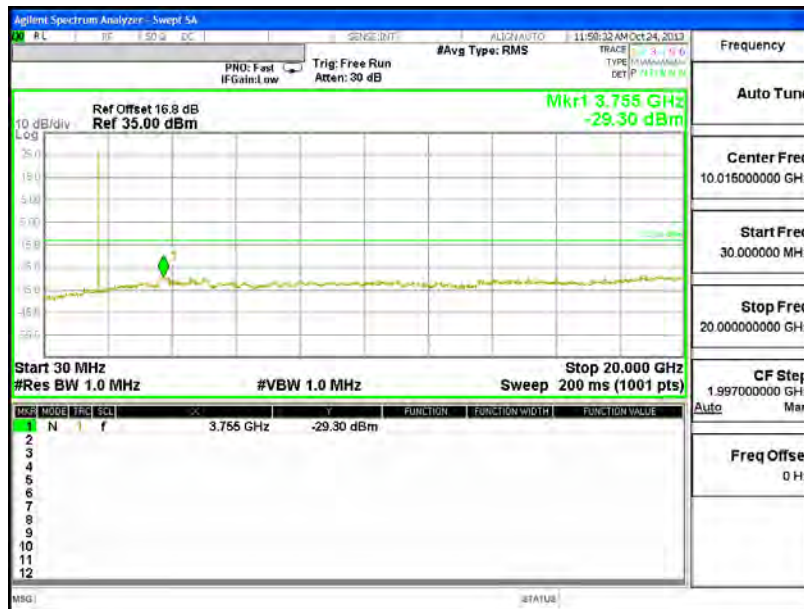
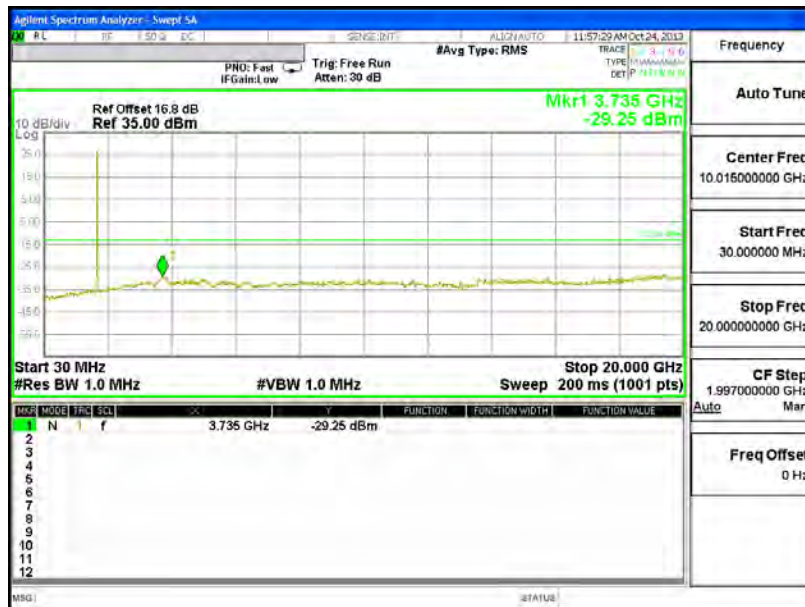


HIGH, RB1-0, 30 TO 20000 MHz

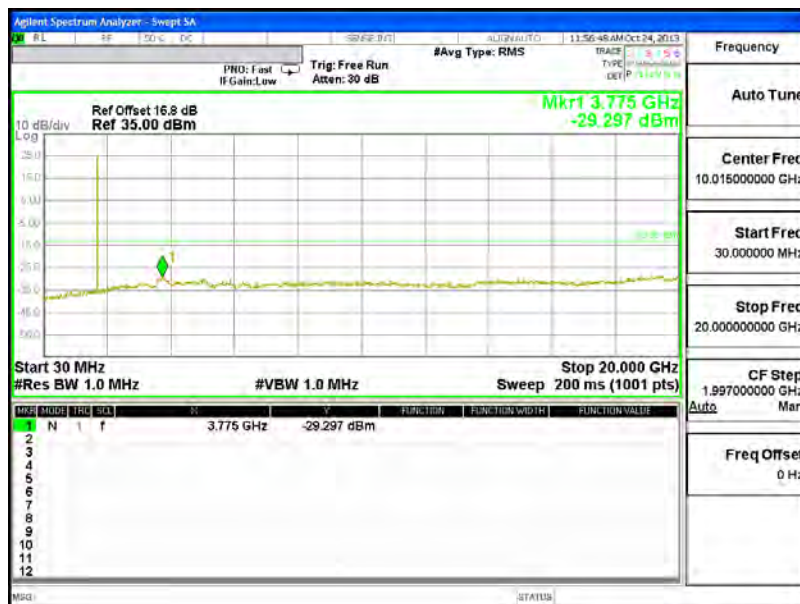


Band 4 (3MHz BANDWIDTH)**LTE 16QAM**

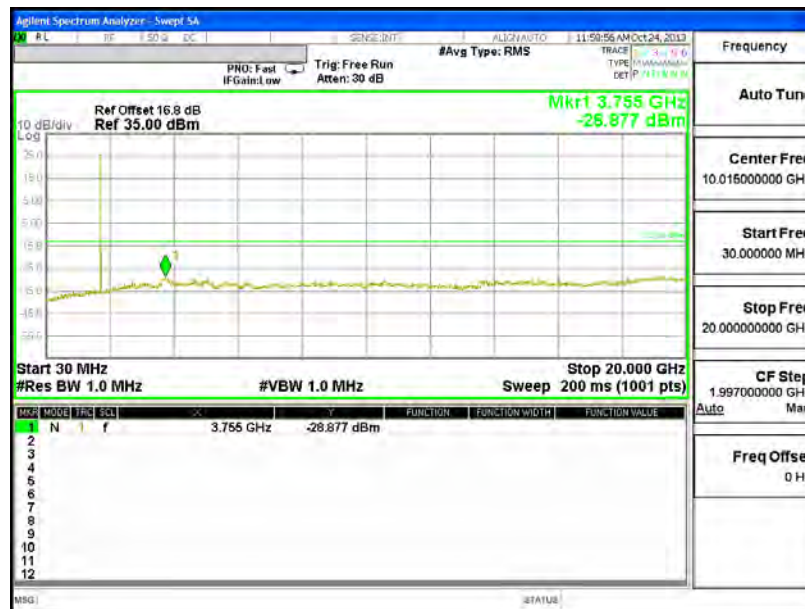
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

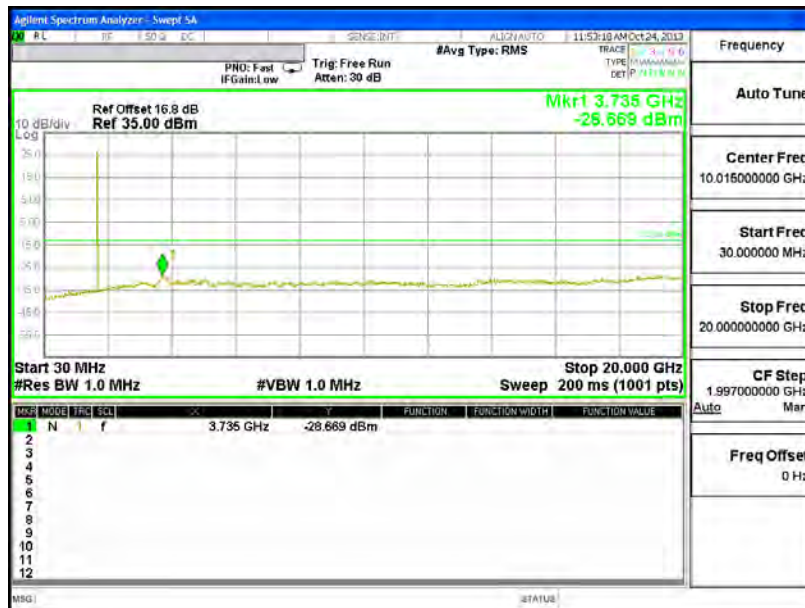


HIGH, RB1-0, 30 TO 20000 MHz

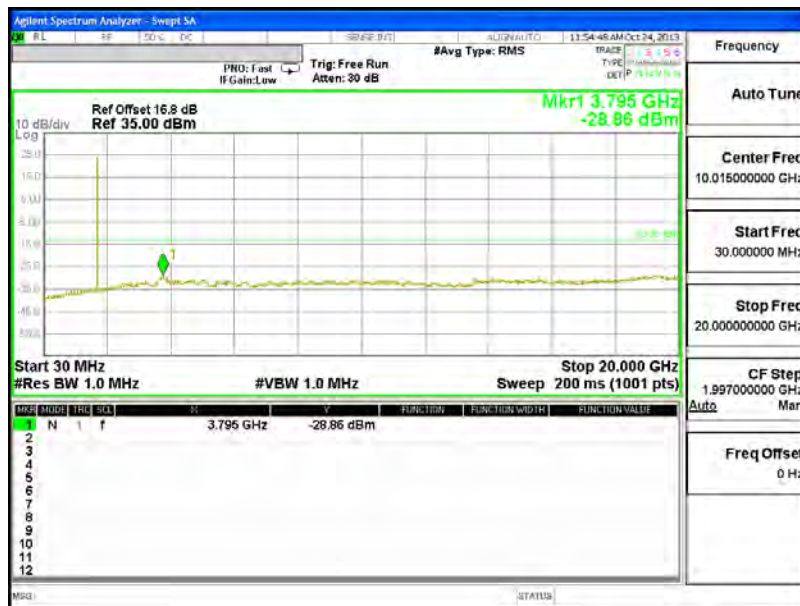


Band 4 (5MHz BANDWIDTH)**LTE QPSK**

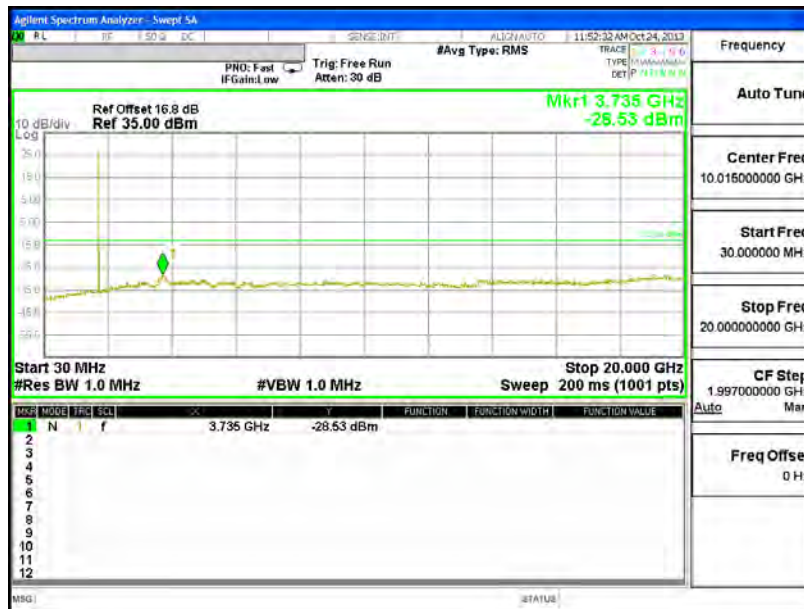
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

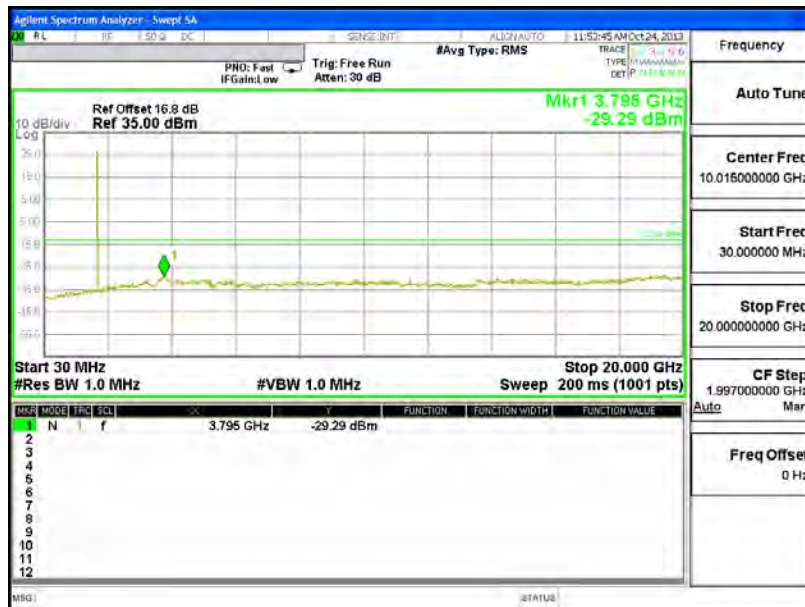


HIGH, RB1-0, 30 TO 20000 MHz

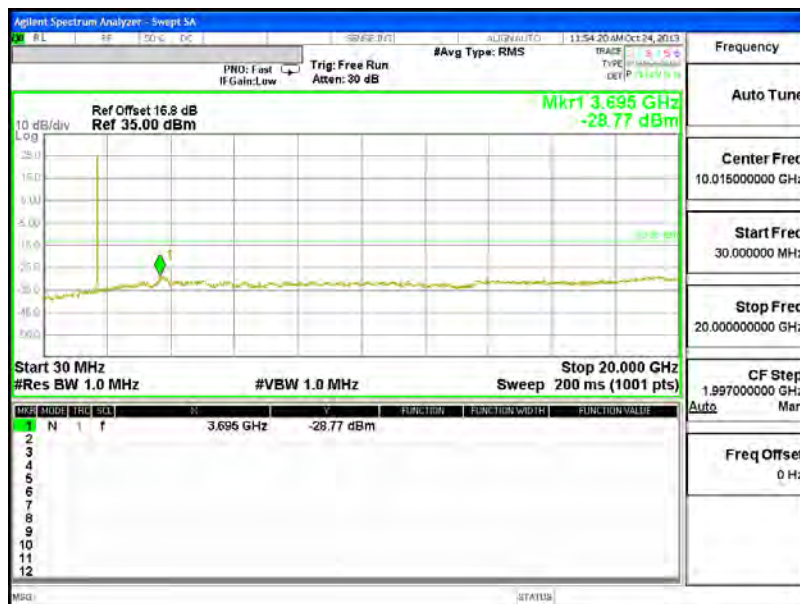


Band 4 (5MHz BANDWIDTH)**LTE 16QAM**

LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

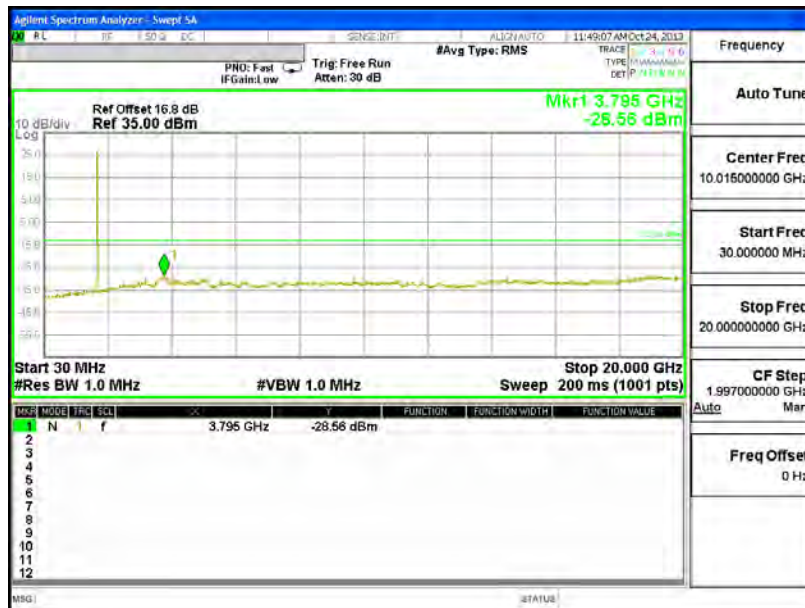


HIGH, RB1-0, 30 TO 20000 MHz

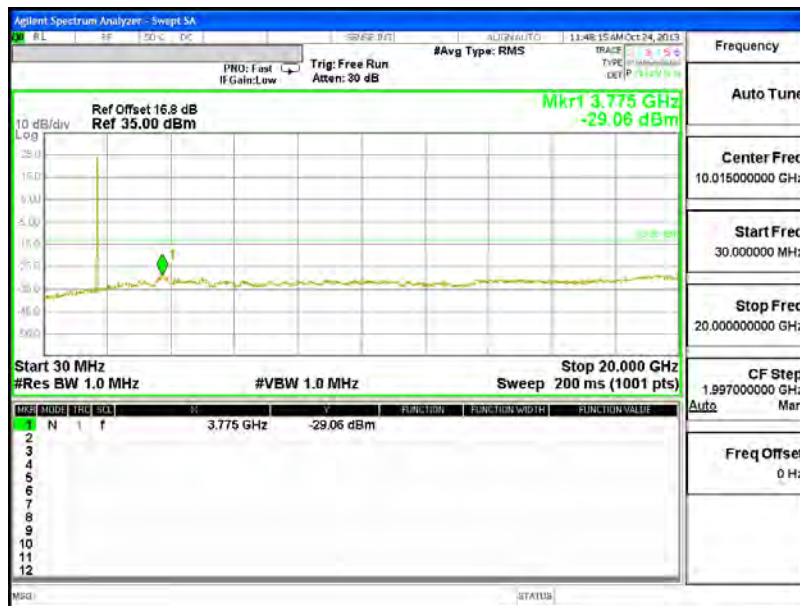


Band 4 (10MHz BANDWIDTH)**LTE QPSK**

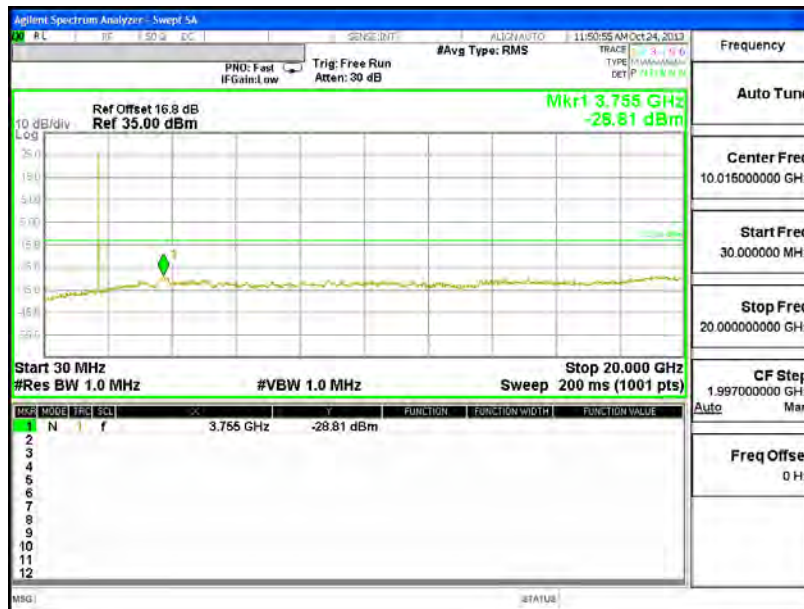
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

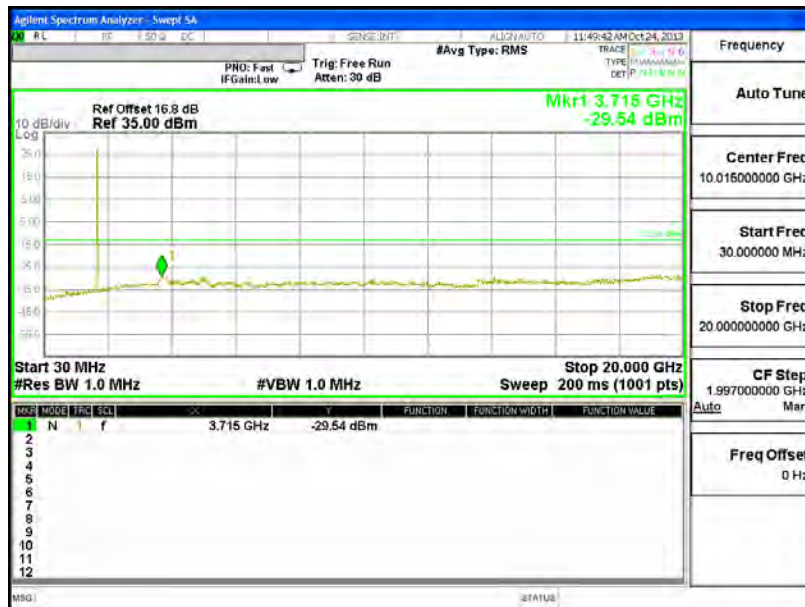


HIGH, RB1-0, 30 TO 20000 MHz

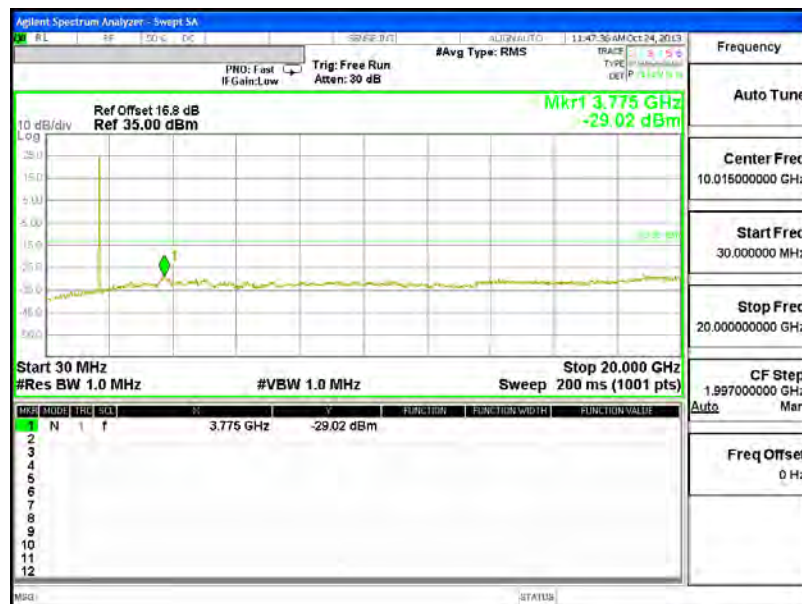


Band 4 (10MHz BANDWIDTH)**LTE 16QAM**

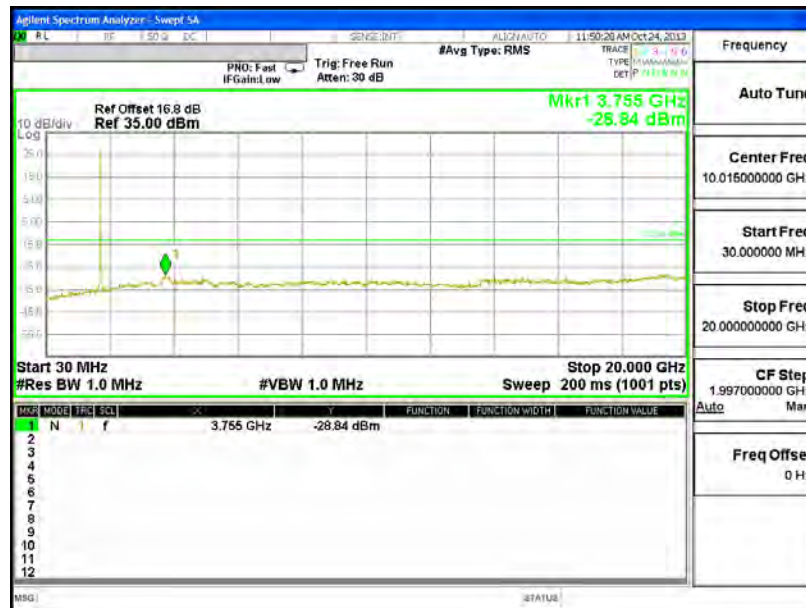
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

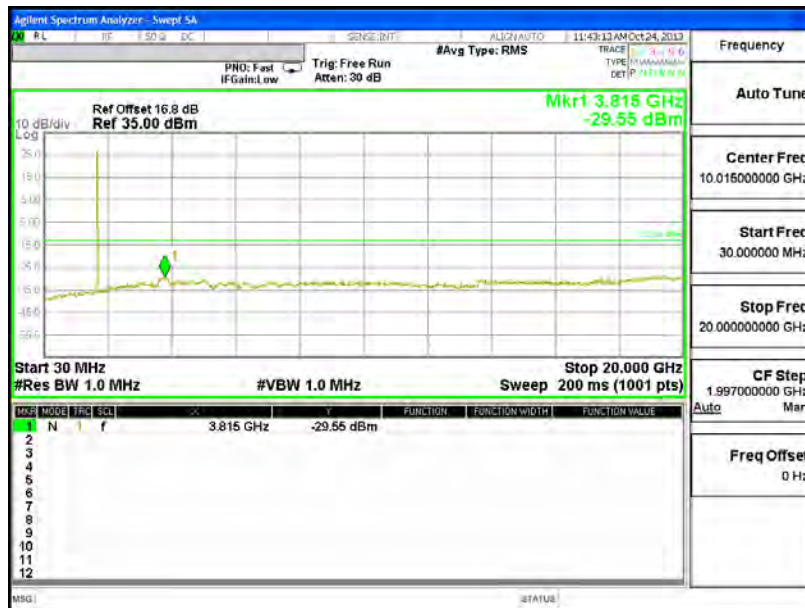


HIGH, RB1-0, 30 TO 20000 MHz

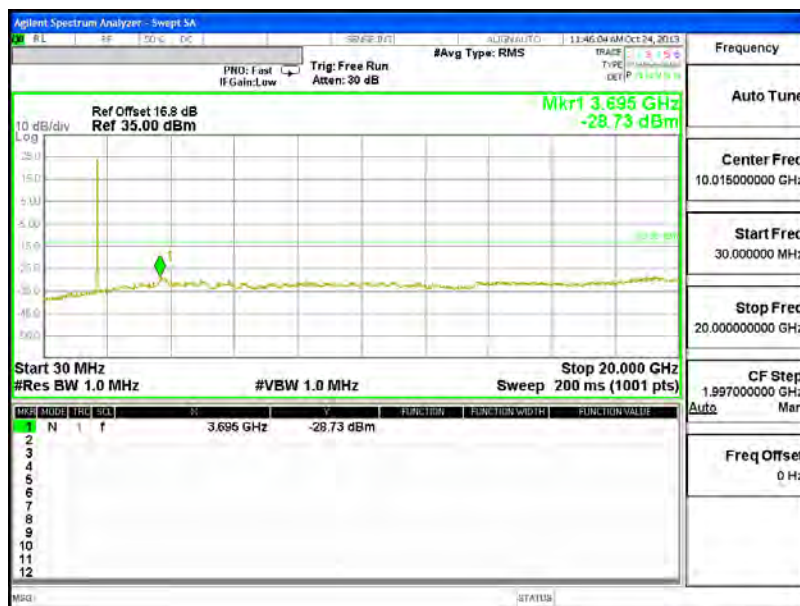


Band 4 (15MHz BANDWIDTH)**LTE QPSK**

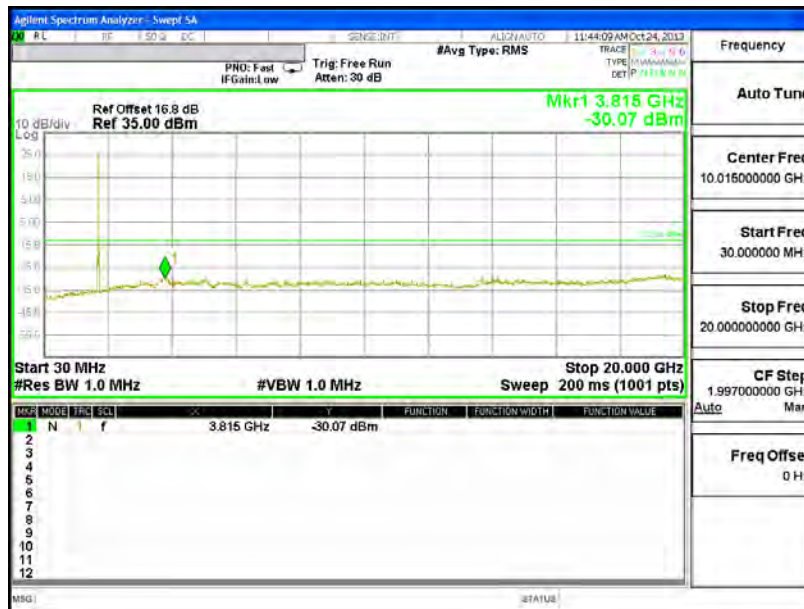
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

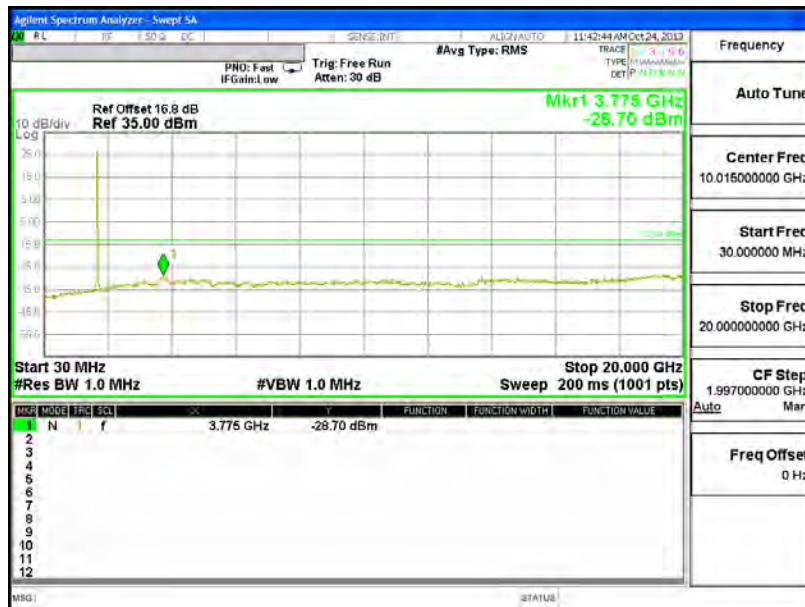


HIGH, RB1-0, 30 TO 20000 MHz

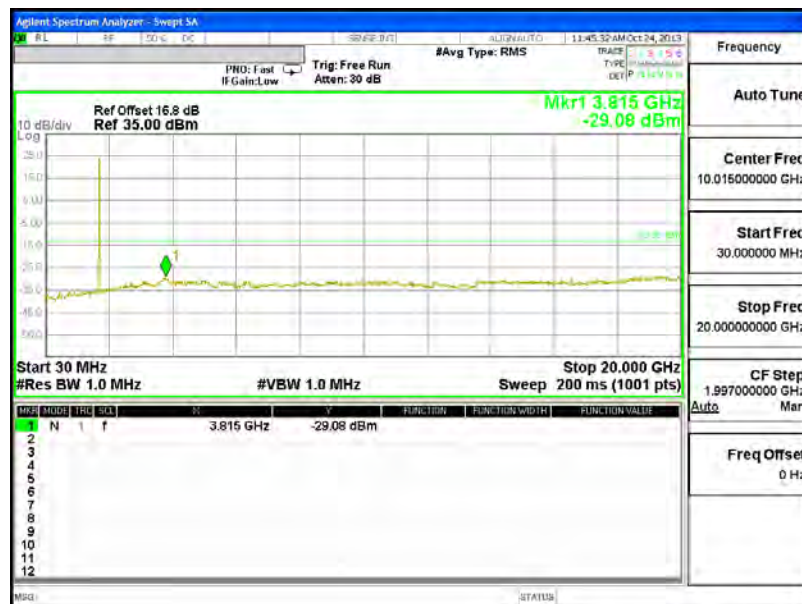


Band 4 (15MHz BANDWIDTH)**LTE 16QAM**

LOW, RB1-0, 30 TO 20000 MHz



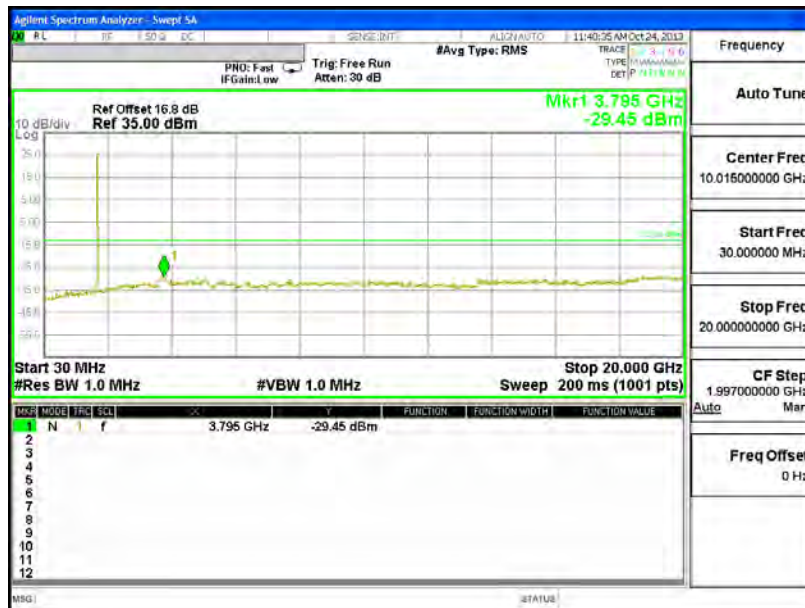
MID, RB1-0, 30 TO 20000 MHz



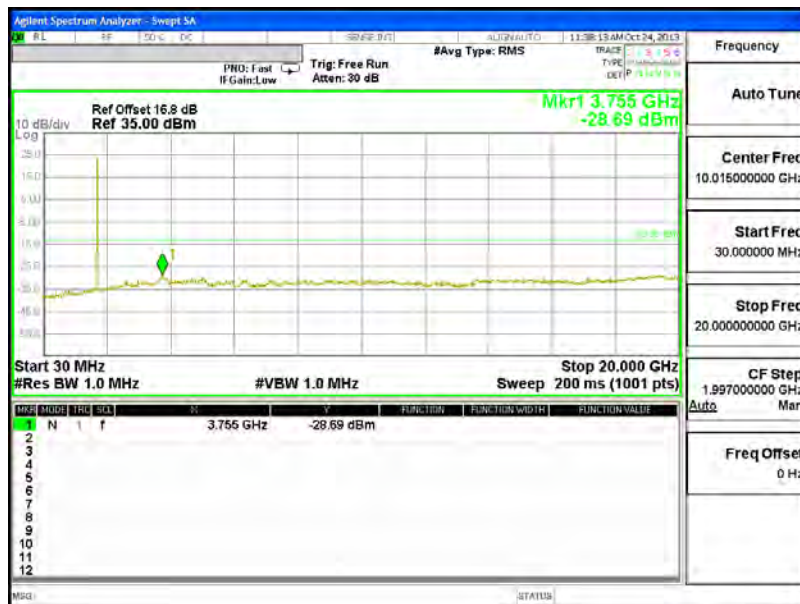


Band 4 (20MHz BANDWIDTH)**LTE QPSK**

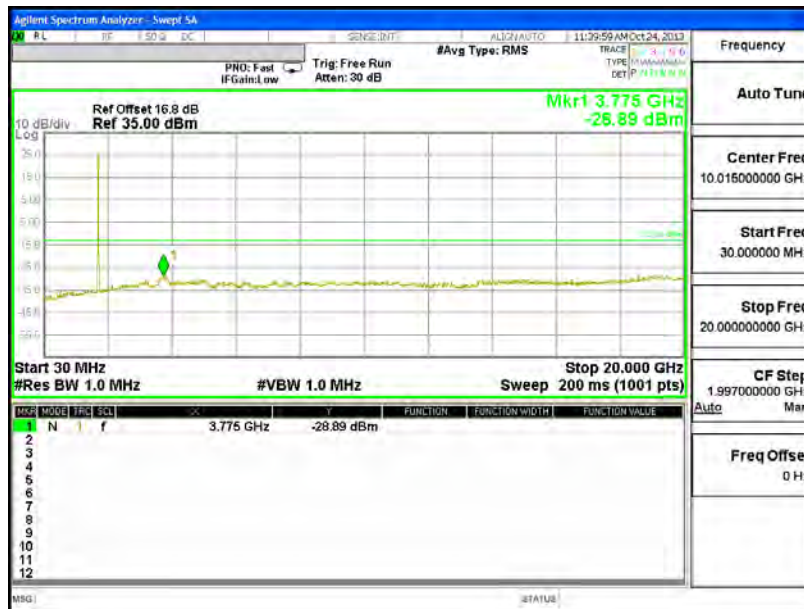
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz

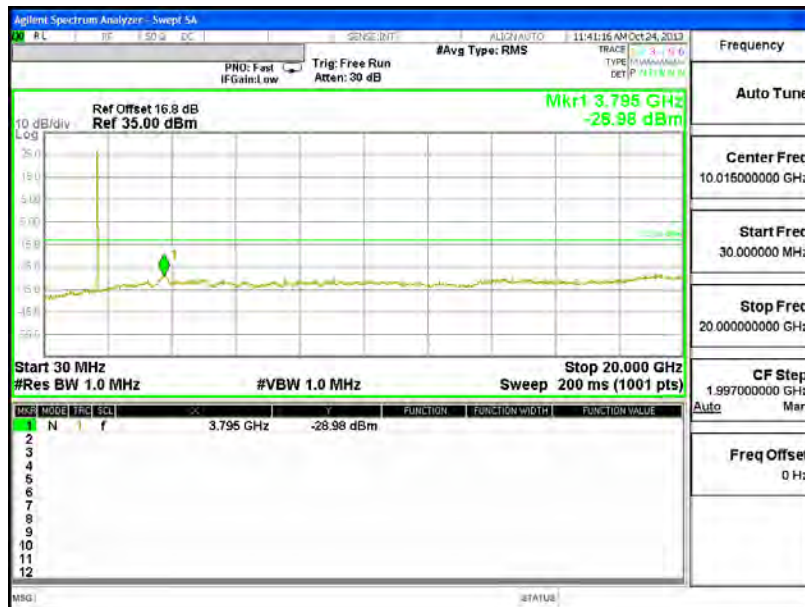


HIGH, RB1-0, 30 TO 20000 MHz

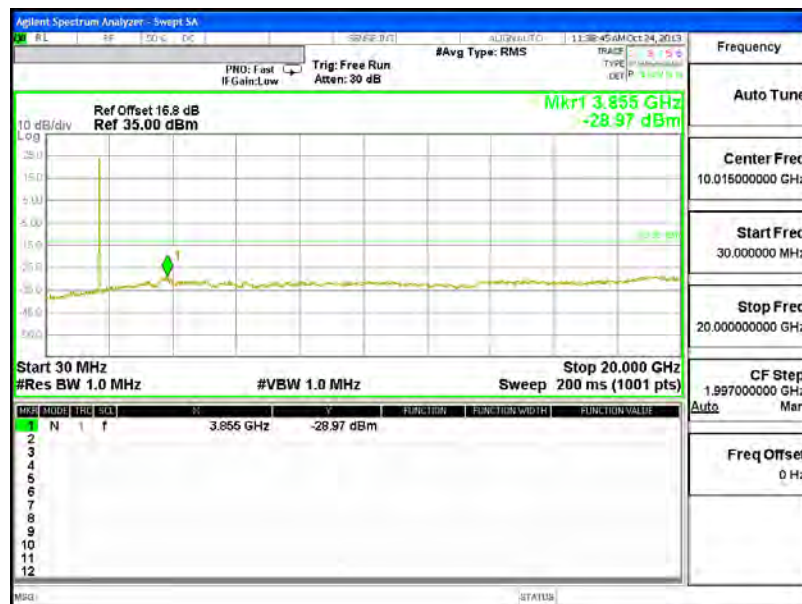


Band 4 (20MHz BANDWIDTH)**LTE 16QAM**

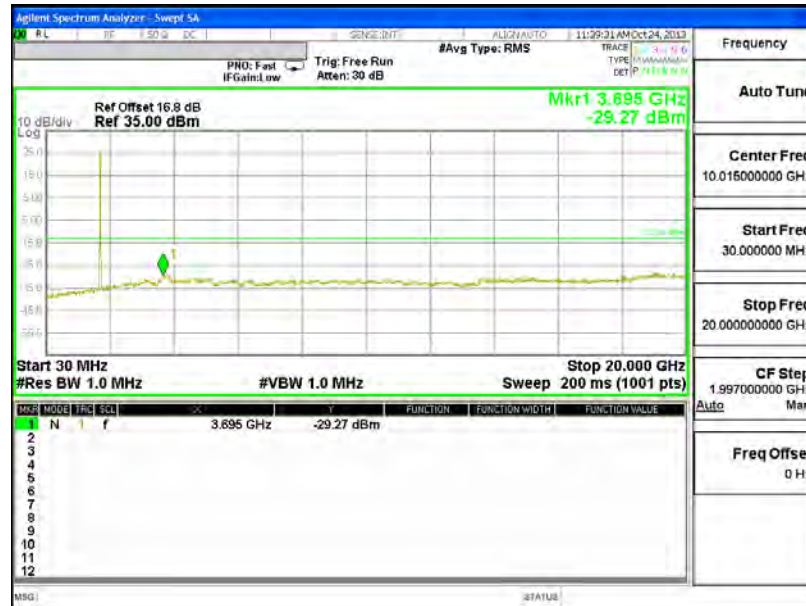
LOW, RB1-0, 30 TO 20000 MHz



MID, RB1-0, 30 TO 20000 MHz



HIGH, RB1-0, 30 TO 20000 MHz

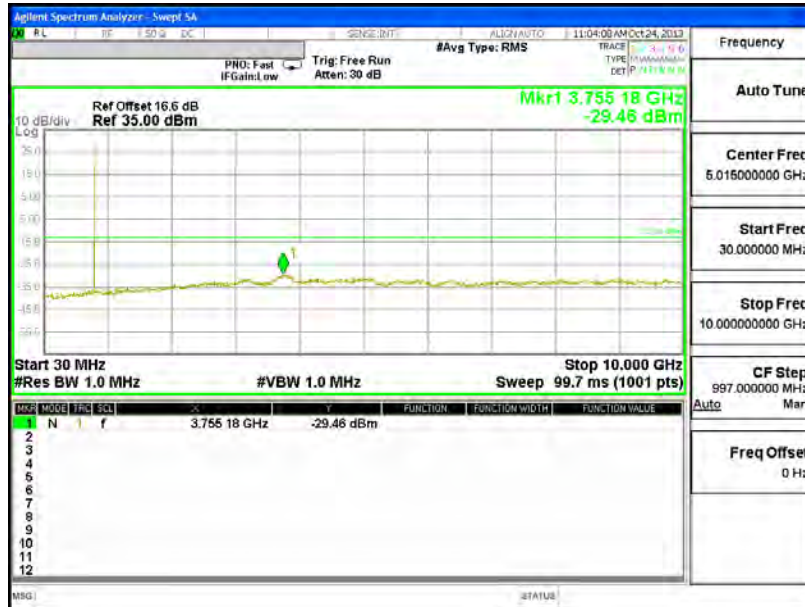


8.3.3. LTE BAND 5

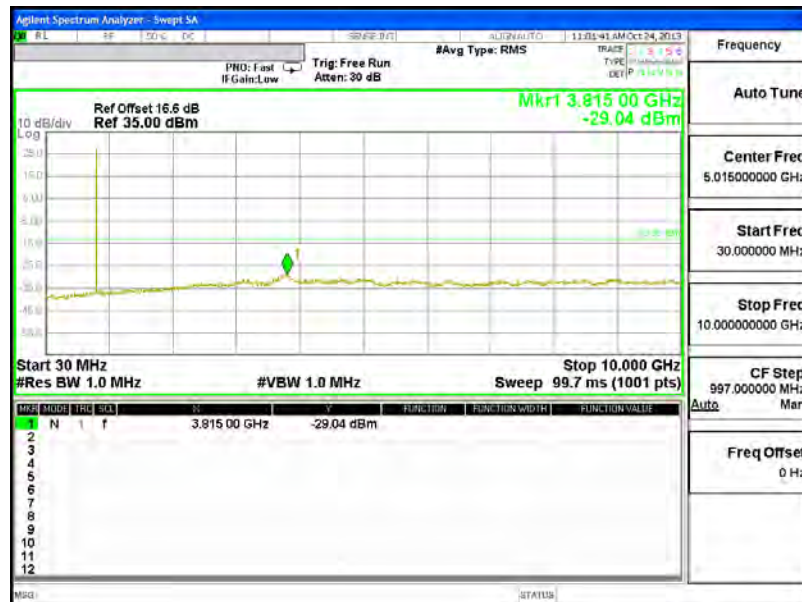
Band 5 (1.4 MHz BANDWIDTH)

LTE QPSK

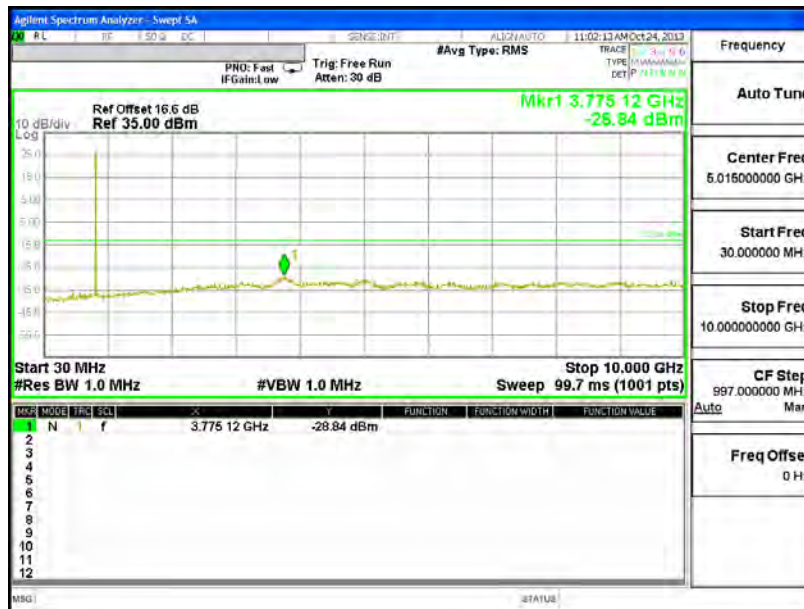
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

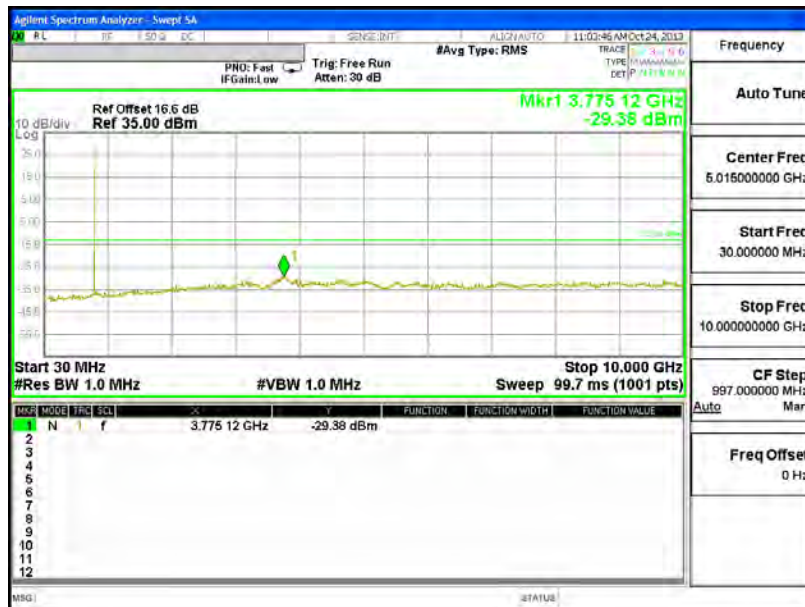


HIGH, RB1-0, 30 TO 10000 MHz

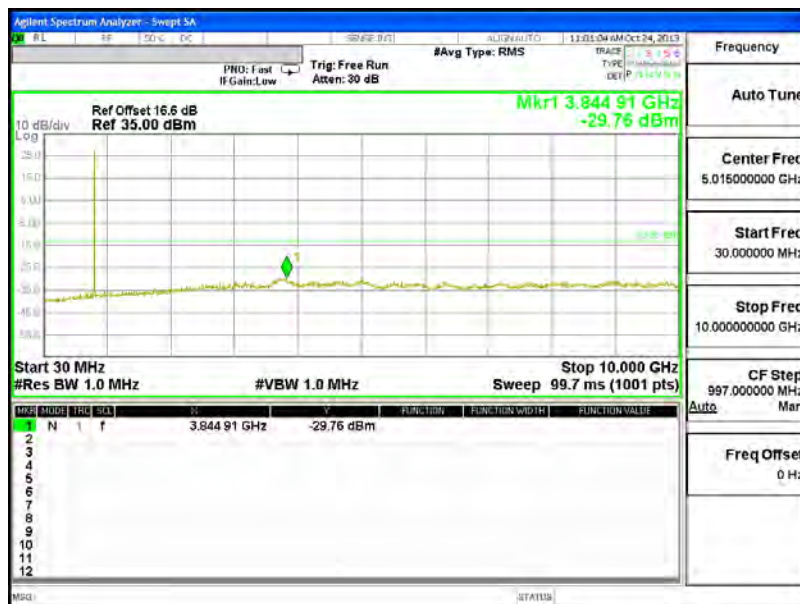


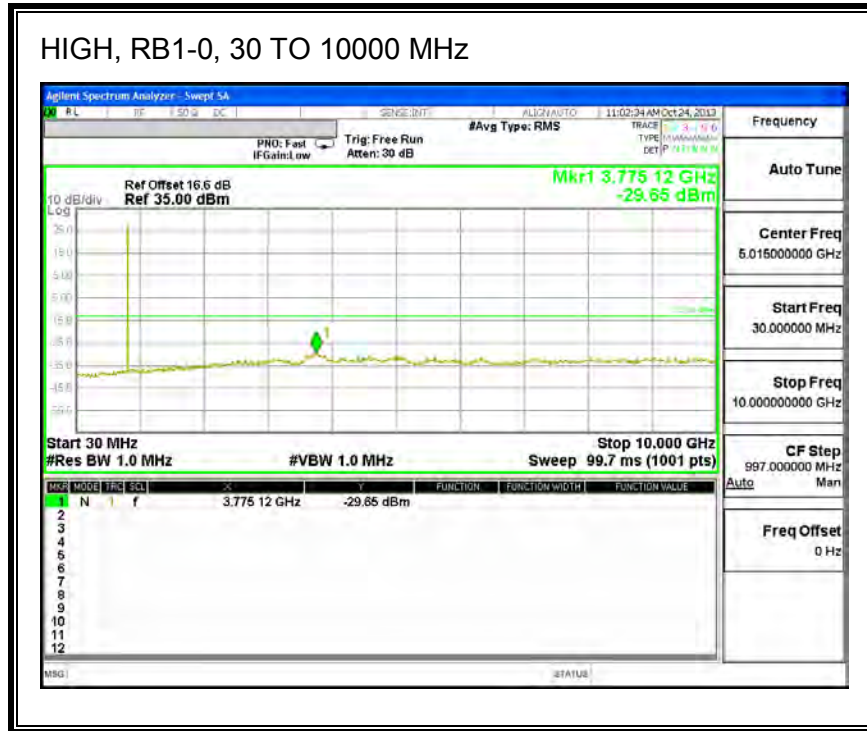
Band 5 (1.4 MHz BANDWIDTH)**LTE 16QAM**

LOW, RB1-0, 30 TO 10000 MHz



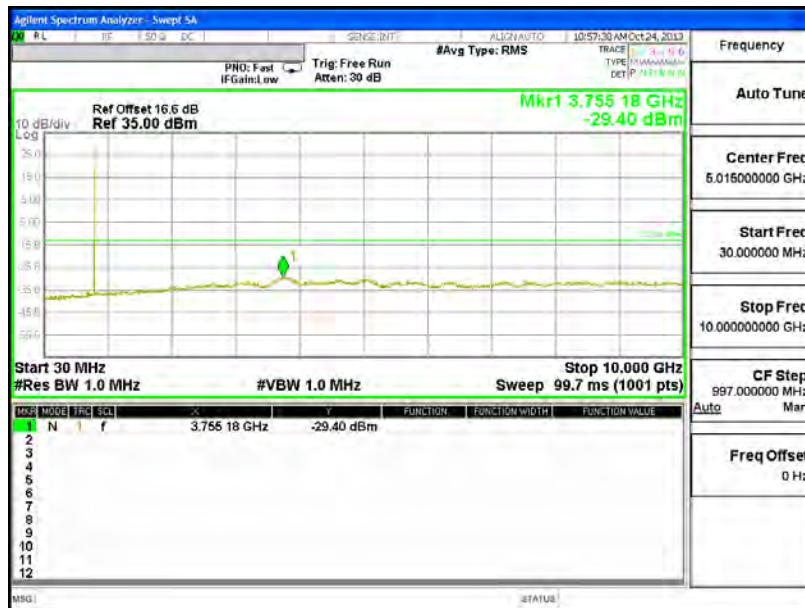
MID, RB1-0, 30 TO 10000 MHz



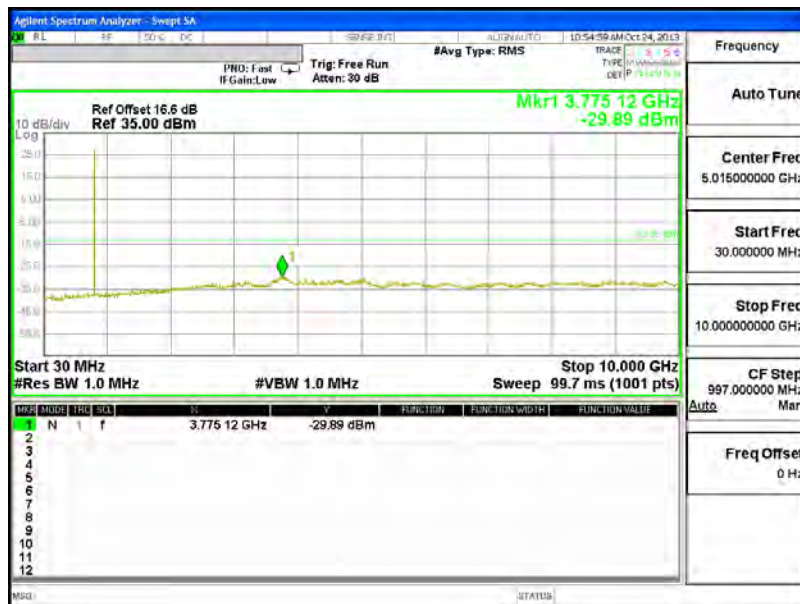


Band 5 (3MHz BANDWIDTH)**LTE QPSK**

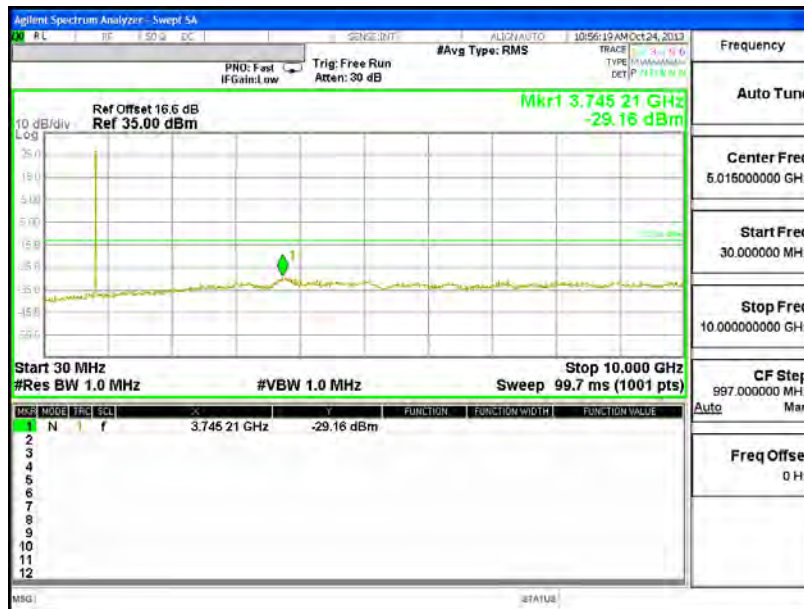
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

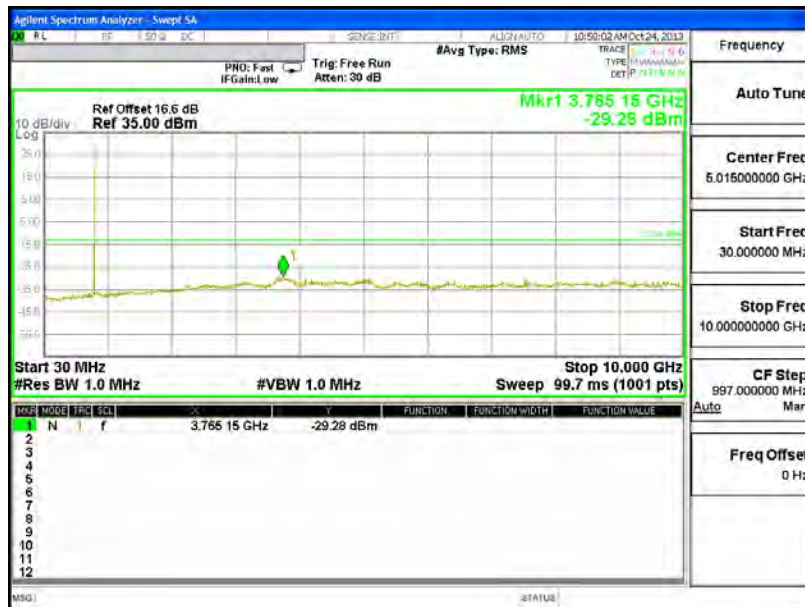


HIGH, RB1-0, 30 TO 10000 MHz

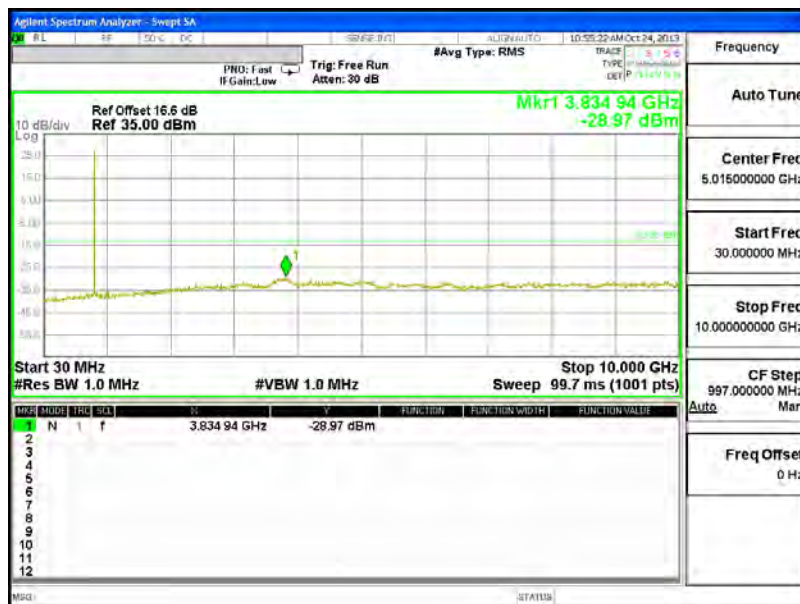


Band 5 (3MHz BANDWIDTH)**LTE 16QAM**

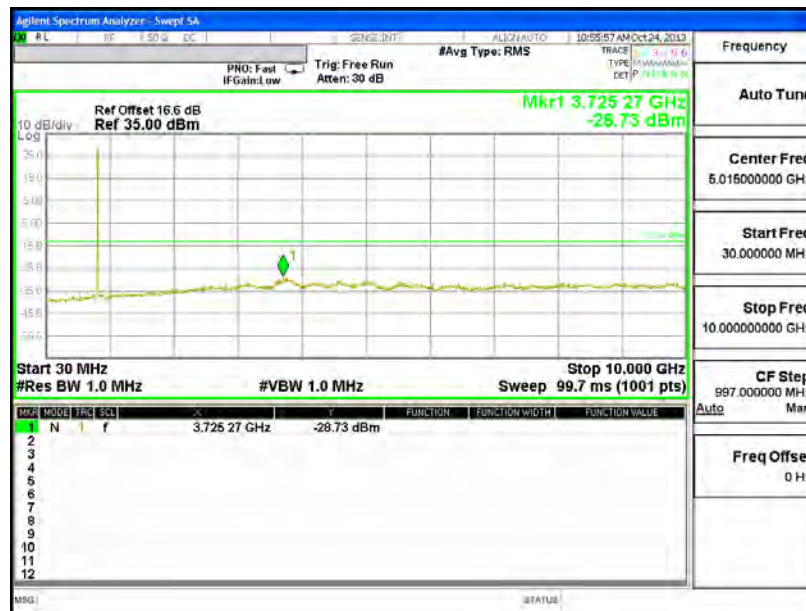
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

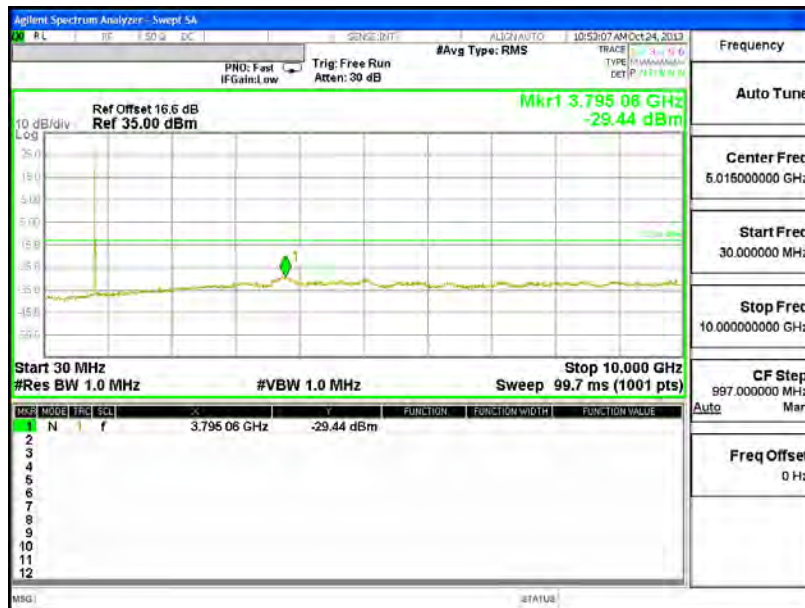


HIGH, RB1-0, 30 TO 10000 MHz

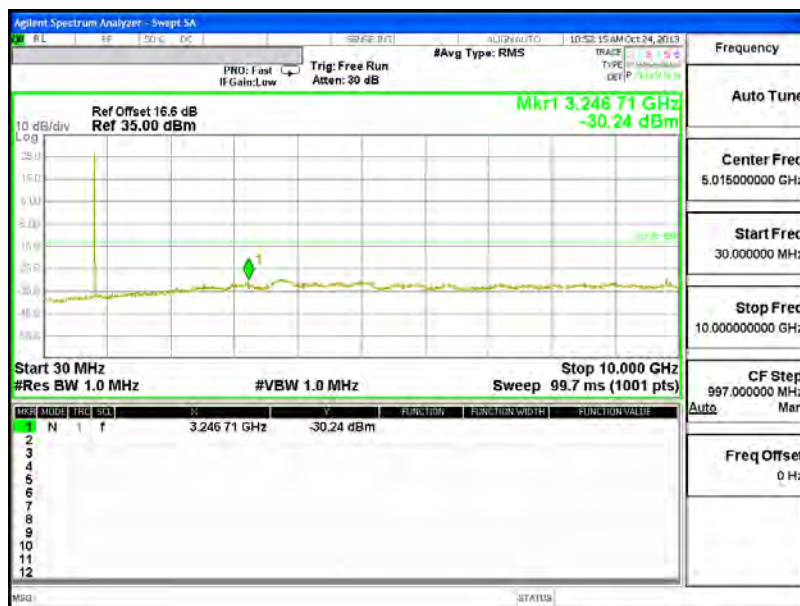


Band 5 (5MHz BANDWIDTH)**LTE QPSK**

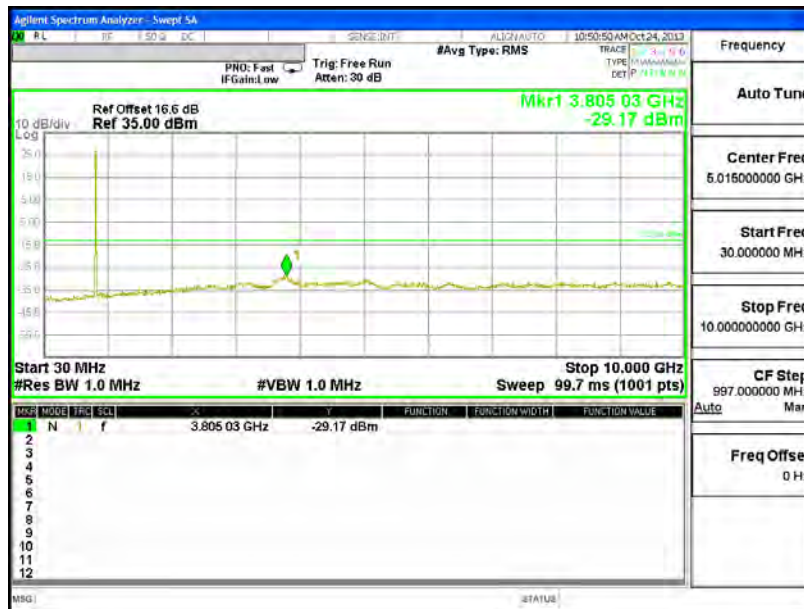
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

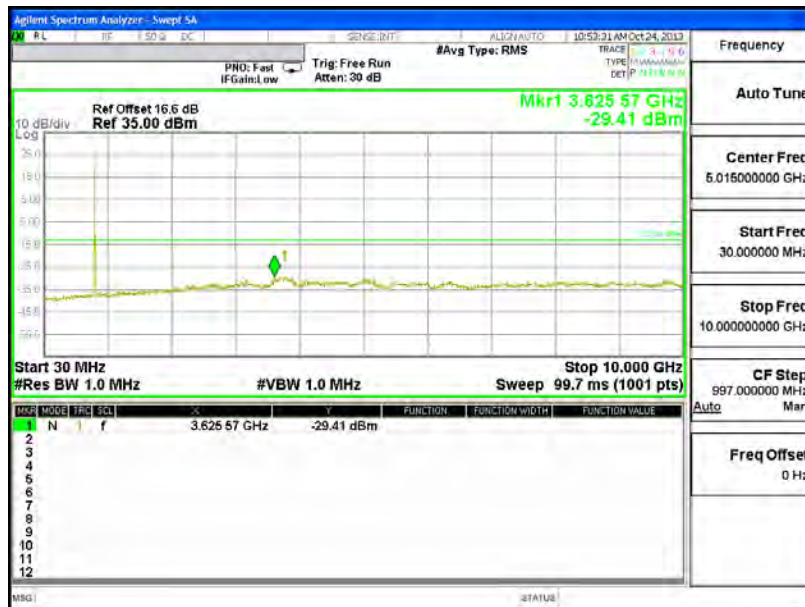


HIGH, RB1-0, 30 TO 10000 MHz

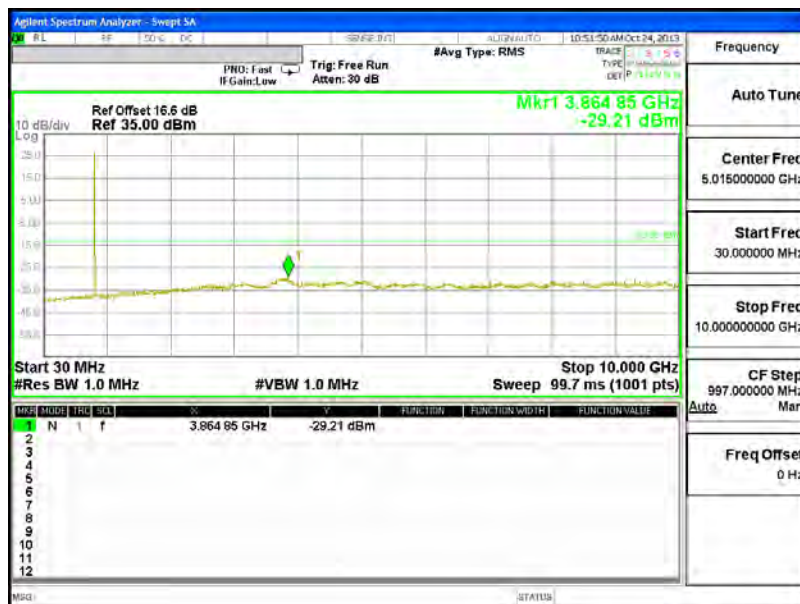


Band 5 (5MHz BANDWIDTH)**LTE 16QAM**

LOW, RB1-0, 30 TO 10000 MHz



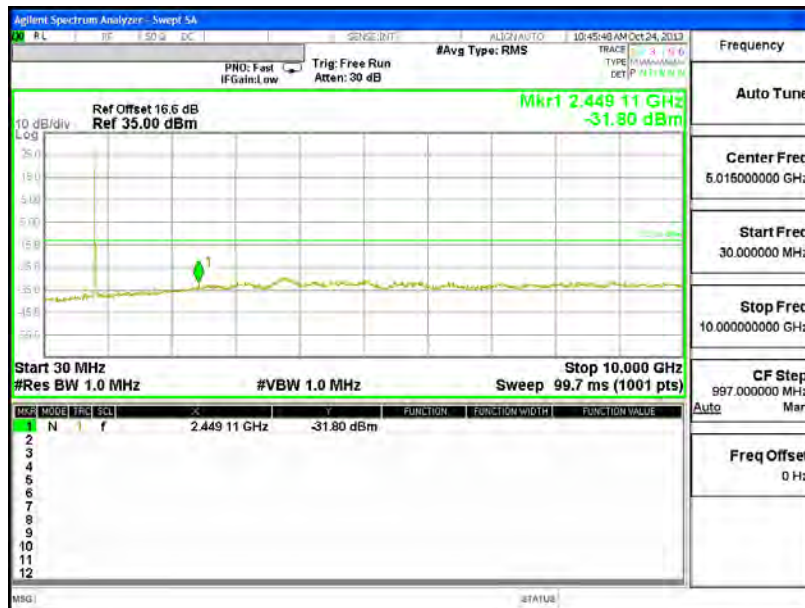
MID, RB1-0, 30 TO 10000 MHz



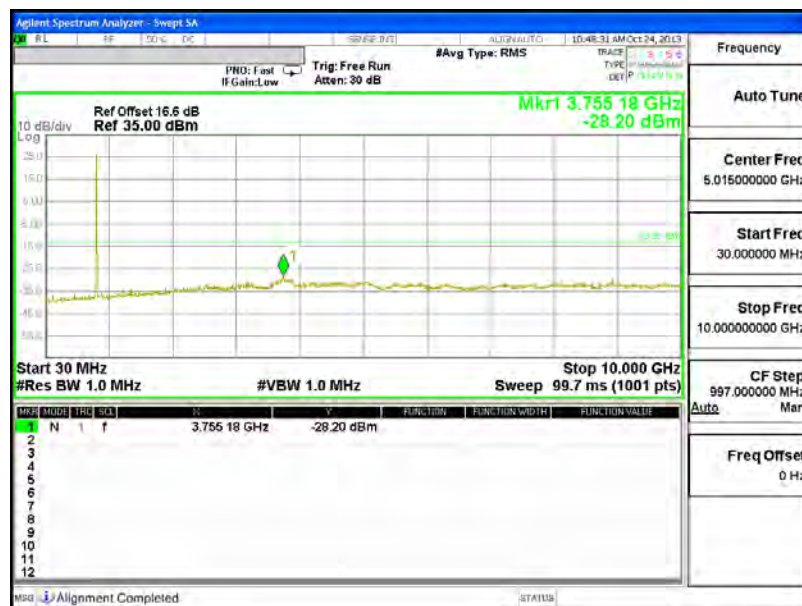


Band 5 (10MHz BANDWIDTH)**LTE QPSK**

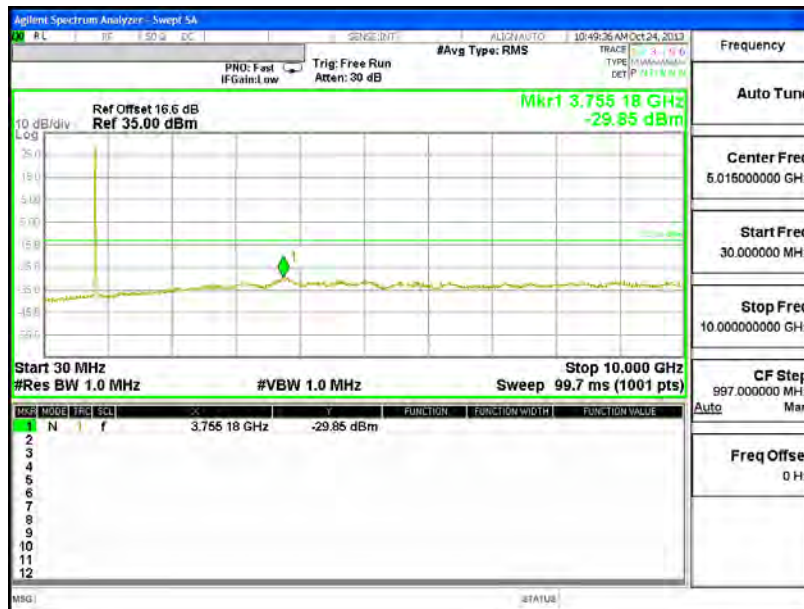
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

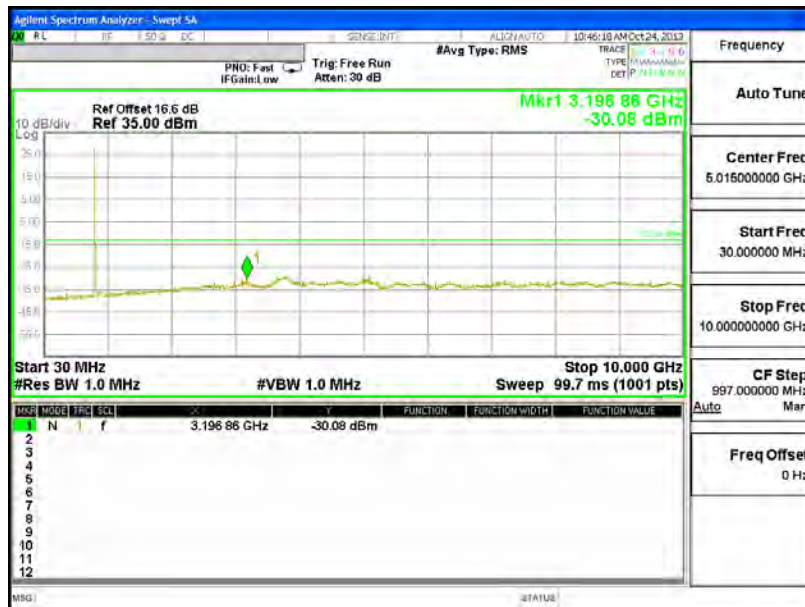


HIGH, RB1-0, 30 TO 10000 MHz

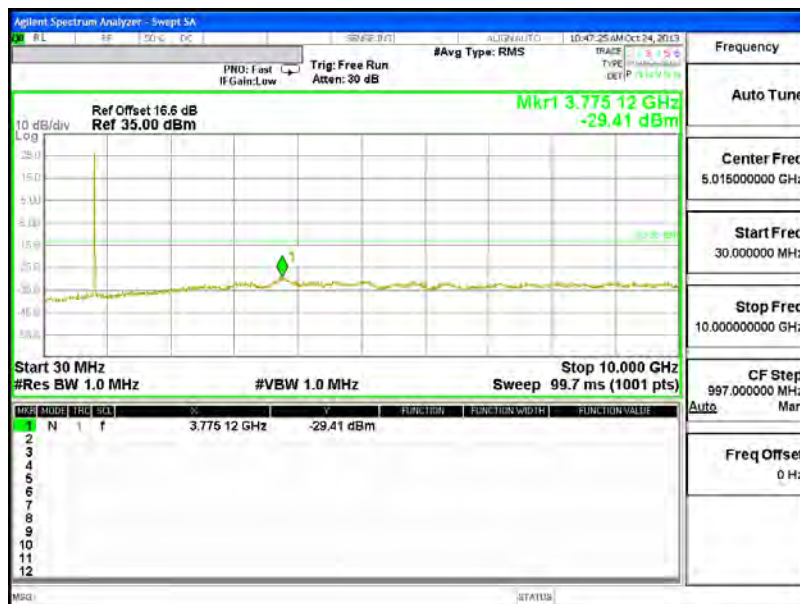


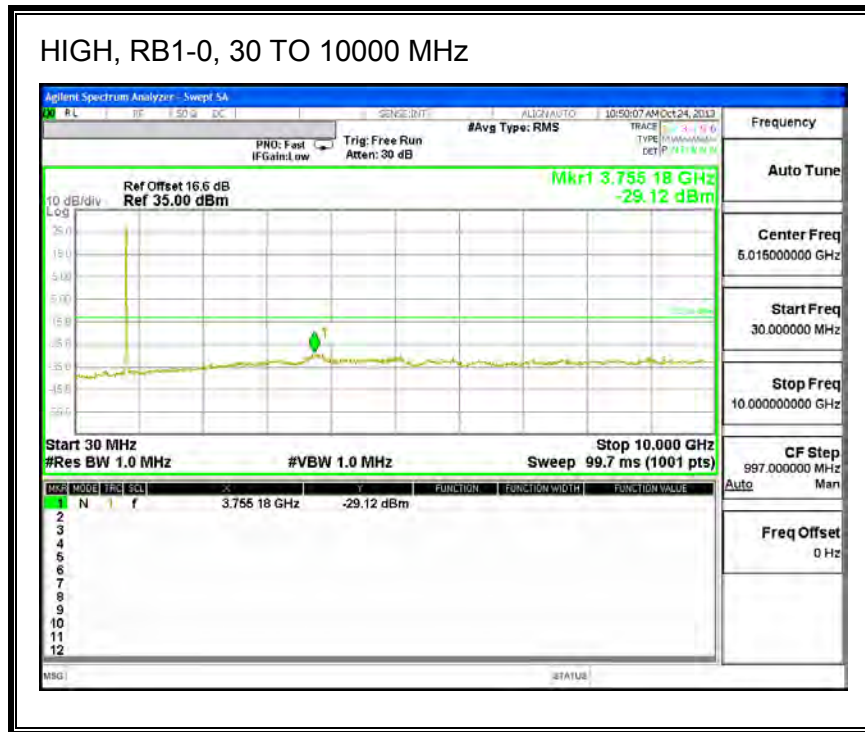
Band 5 (10MHz BANDWIDTH)**LTE 16QAM**

LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz



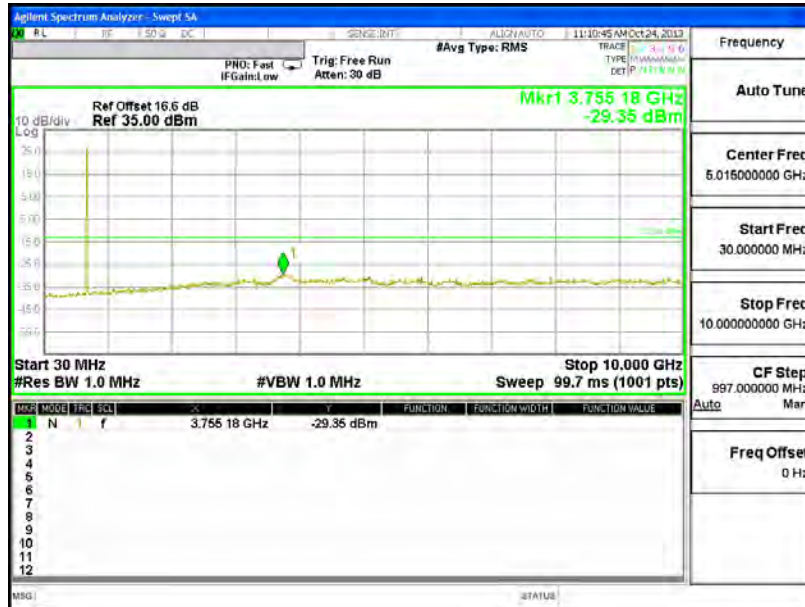


8.3.4. LTE BAND 17

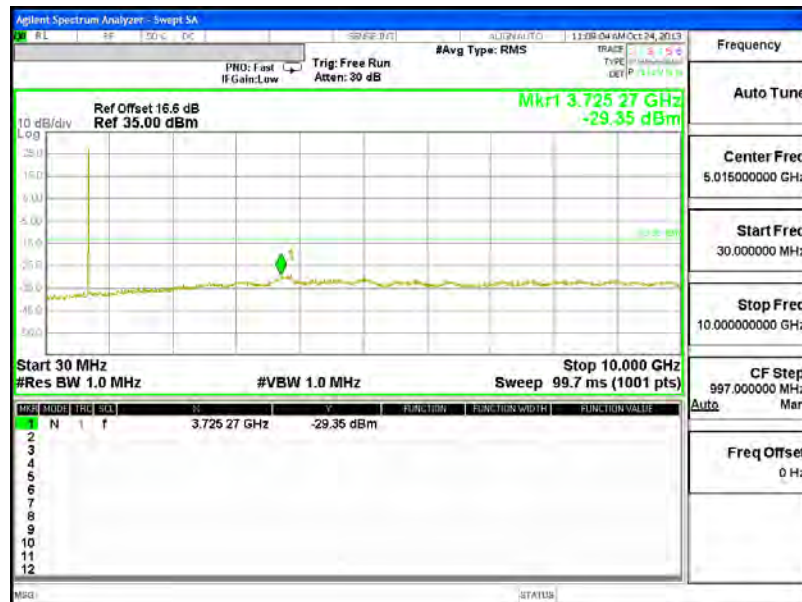
Band 17 (5MHz BANDWIDTH)

LTE QPSK

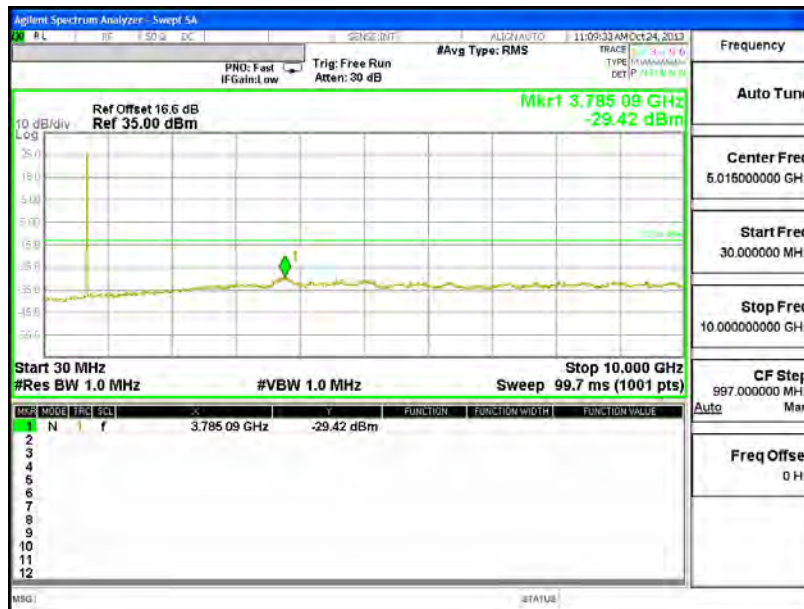
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

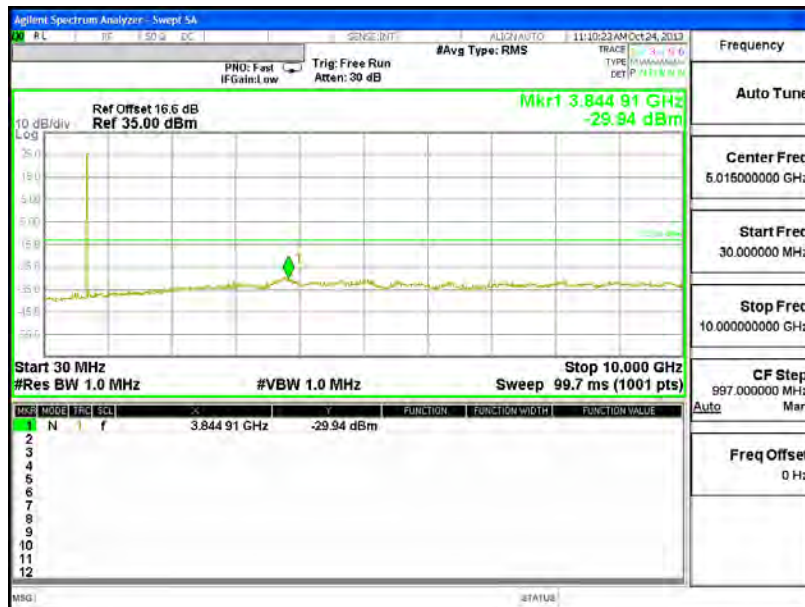


HIGH, RB1-0, 30 TO 10000 MHz

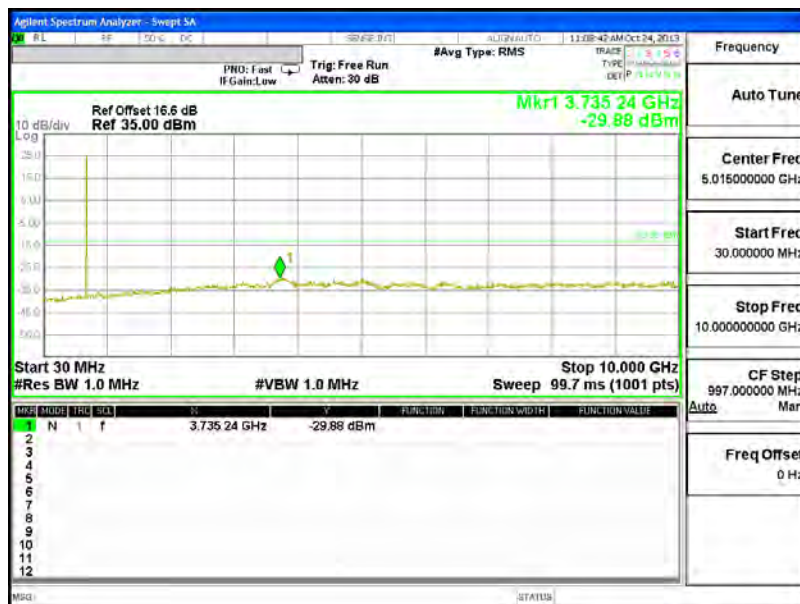


Band 17 (5MHz BANDWIDTH)**LTE 16QAM**

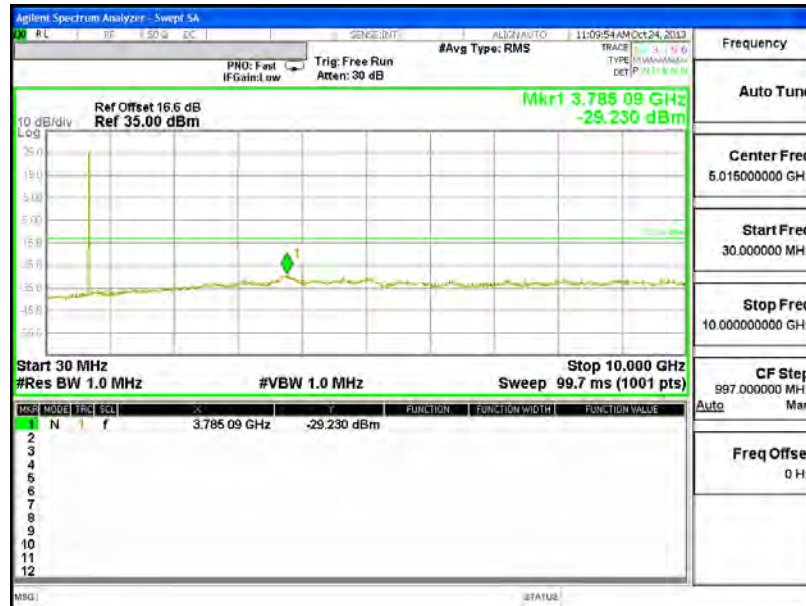
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

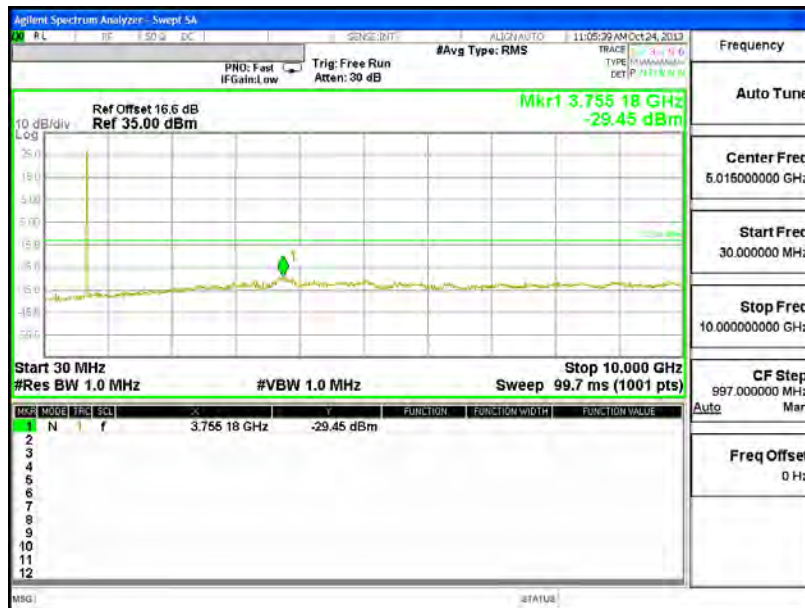


HIGH, RB1-0, 30 TO 10000 MHz

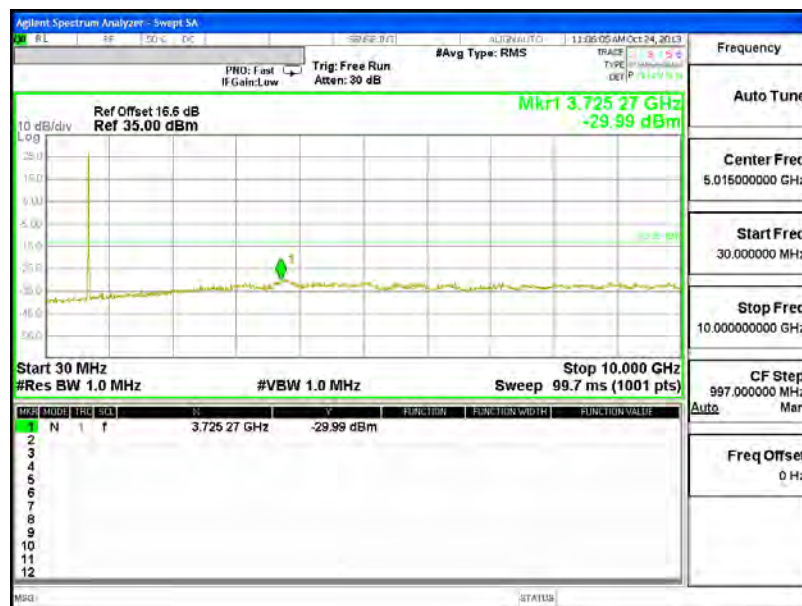


Band 17 (10MHz BANDWIDTH)**LTE QPSK**

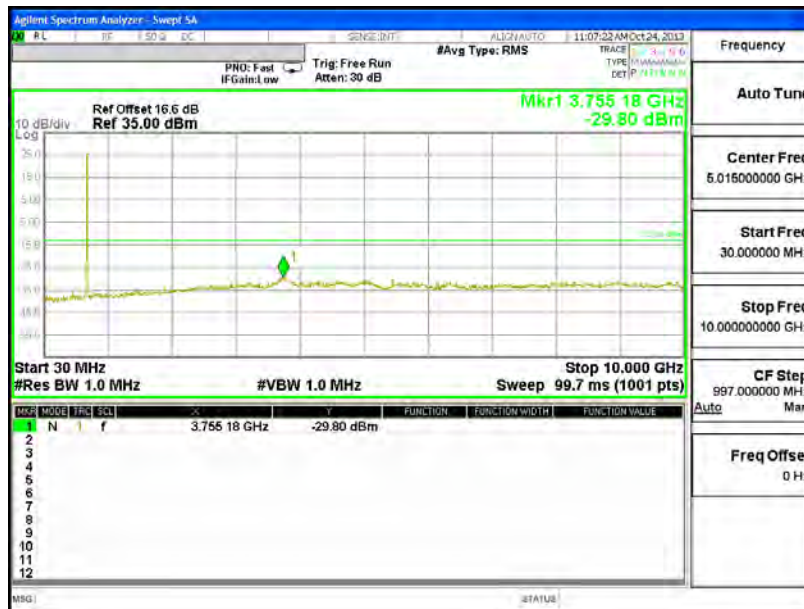
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz

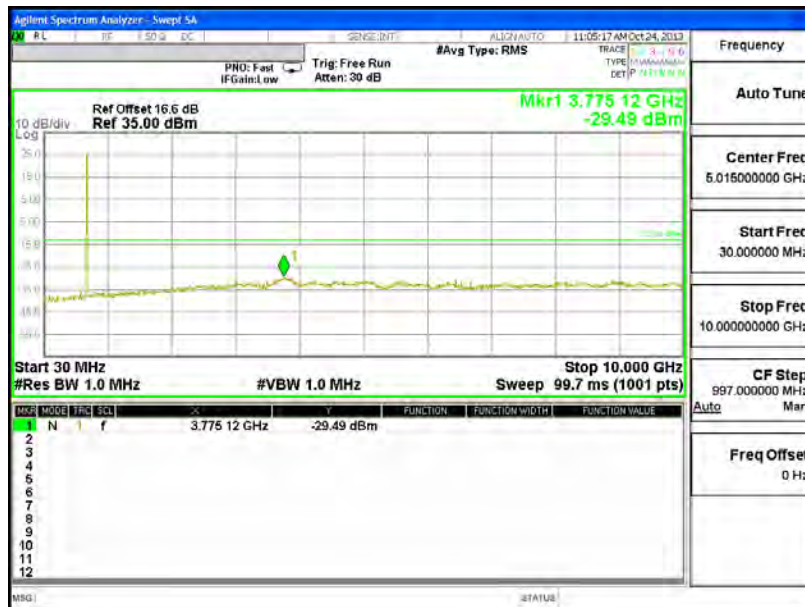


HIGH, RB1-0, 30 TO 10000 MHz

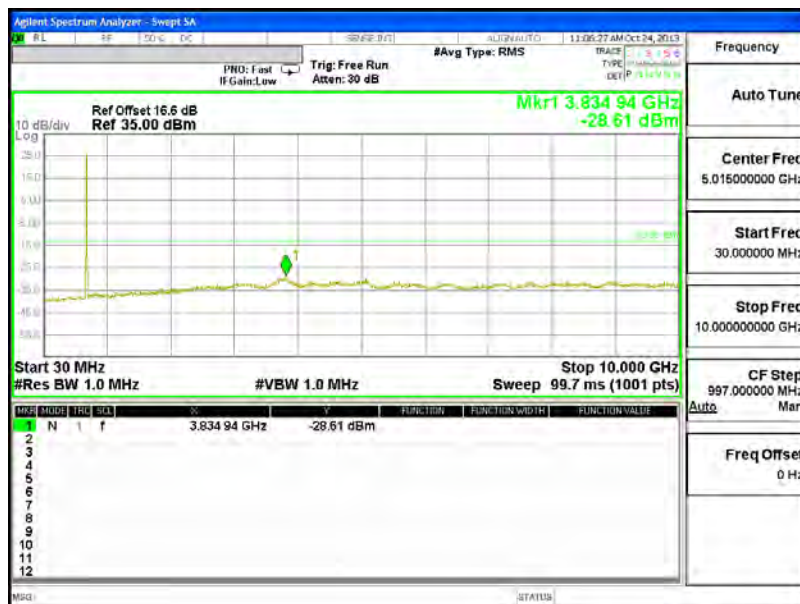


Band 17 (10MHz BANDWIDTH)**LTE 16QAM**

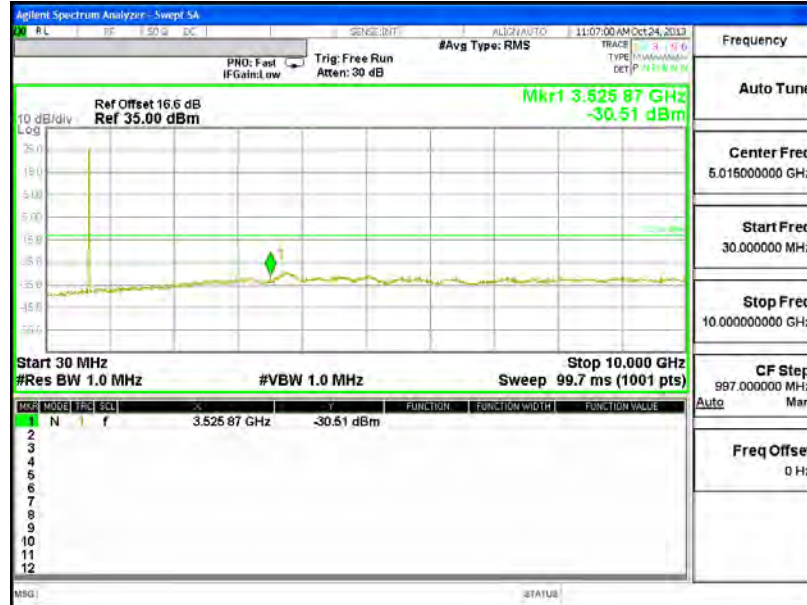
LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz



HIGH, RB1-0, 30 TO 10000 MHz



8.4. PEAK-TO-AVERAGE RATIO

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB

8.4.1. LTE BAND 2

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	1.4	RB1-0	1880	28.66	23.06	5.6
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	1.4	RB1-0	1880	28.74	22.22	6.52
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	3.0	RB1-0	1880	28.33	22.16	6.17
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	3.0	RB1-0	1880	28.18	21.45	6.73
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5.0	RB1-0	1880	28.65	22.23	6.42
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5.0	RB1-0	1880	28.51	21.49	7.02
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	10.0	RB1-0	1880	29.46	22.24	7.22
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10.0	RB1-0	1880	29.1	21.49	7.61
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	15.0	RB1-0	1880	27.24	21.29	5.95
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	15.0	RB1-0	1880	28.21	20.56	7.65
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	20.0	RB1-0	1880	26.6	19.80	6.80
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	20.0	RB1-0	1880	27.42	19.11	8.31
*Peak Reading = Average Reading + Peak-to-Average Ratio						

8.4.2. LTE BAND 4

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	1.4	RB1-0	1732.5	25.15	21.49	3.66
Mode	Channel Band-width	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	1.4	RB1-0	1732.5	25.33	21.36	3.97
*Peak Reading = Average Reading + Peak-to-Average Ratio						

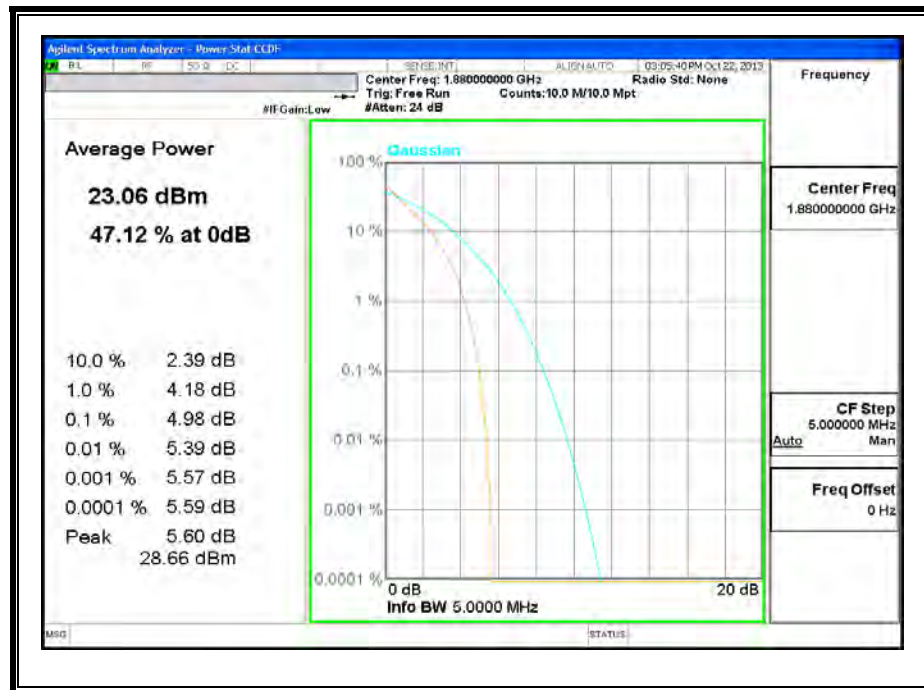
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	3.0	RB1-0	1732.5	25.18	21.44	3.74
Mode	Channel Band-width	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	3.0	RB1-0	1732.5	25.29	21.25	4.04
*Peak Reading = Average Reading + Peak-to-Average Ratio						

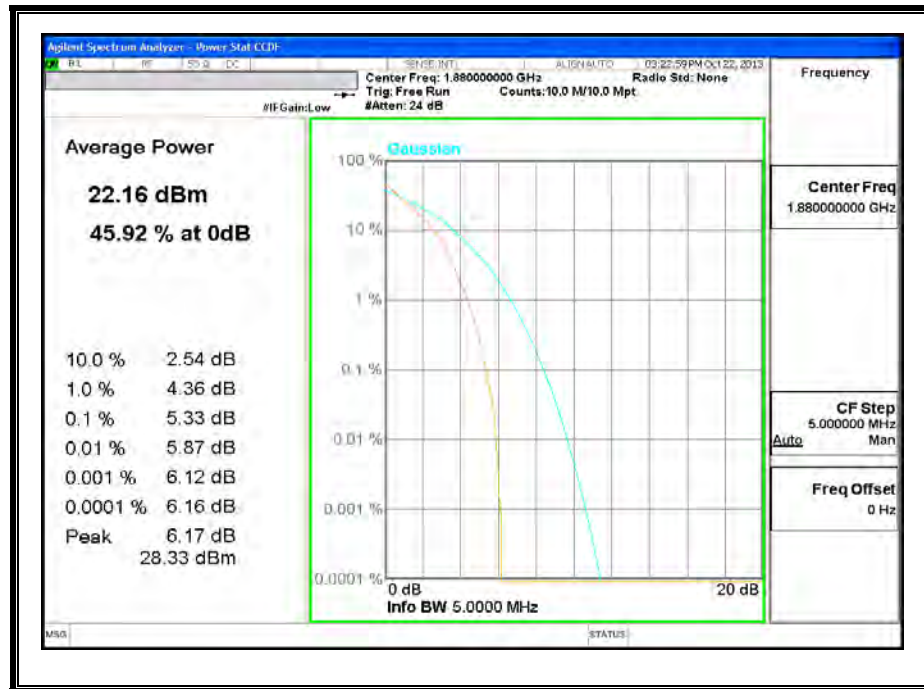
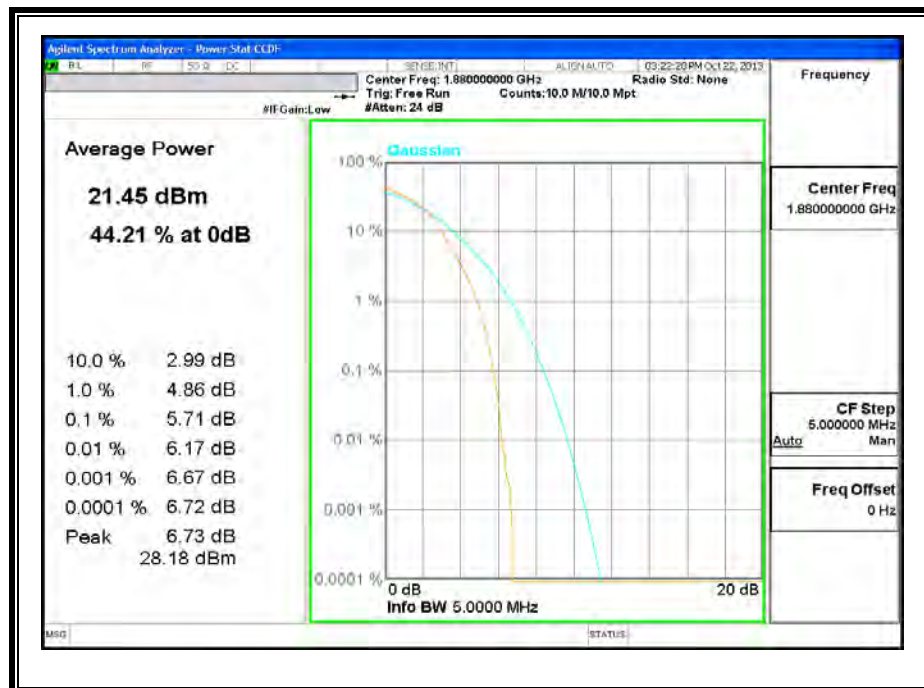
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5.0	RB1-0	1732.5	25.37	21.47	3.90
Mode	Channel Band-width	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5.0	RB1-0	1732.5	25.51	21.27	4.24
*Peak Reading = Average Reading + Peak-to-Average Ratio						

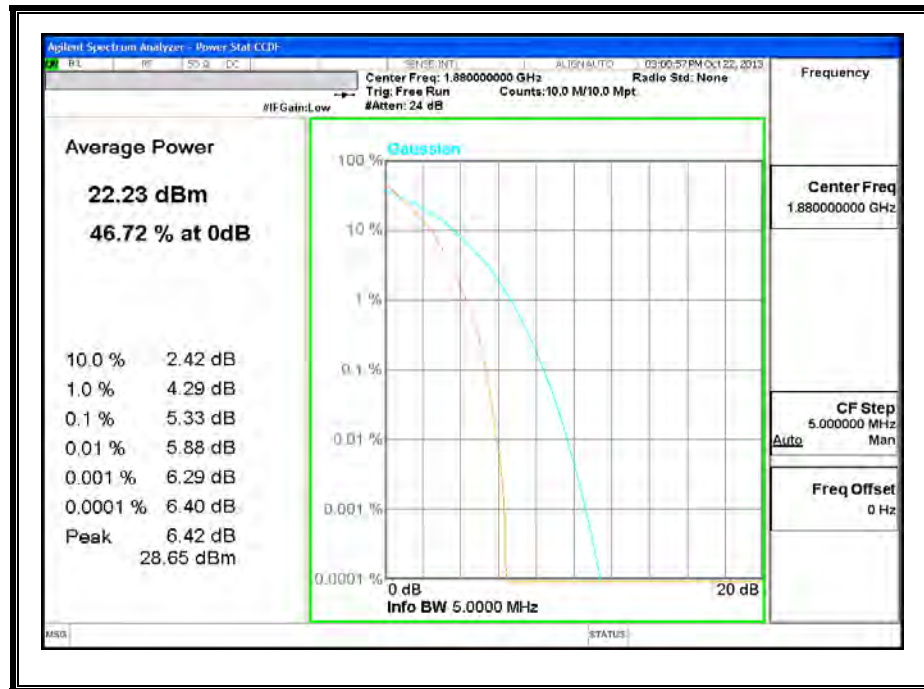
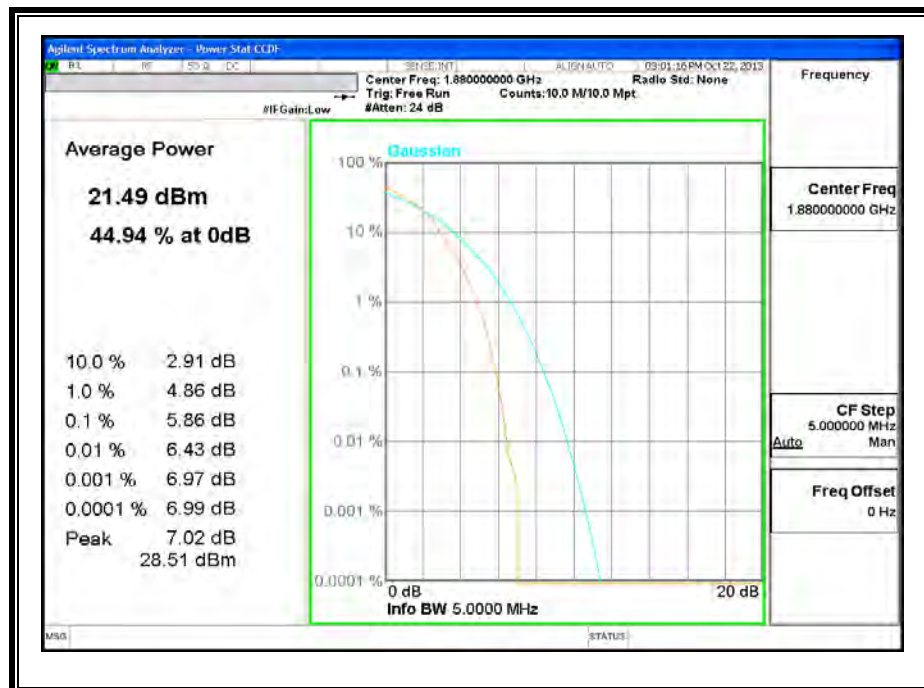
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	10.0	RB1-0	1732.5	27.14	21.5	5.64
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10.0	RB1-0	1732.5	27.28	21.29	5.99
*Peak Reading = Average Reading + Peak-to-Average Ratio						

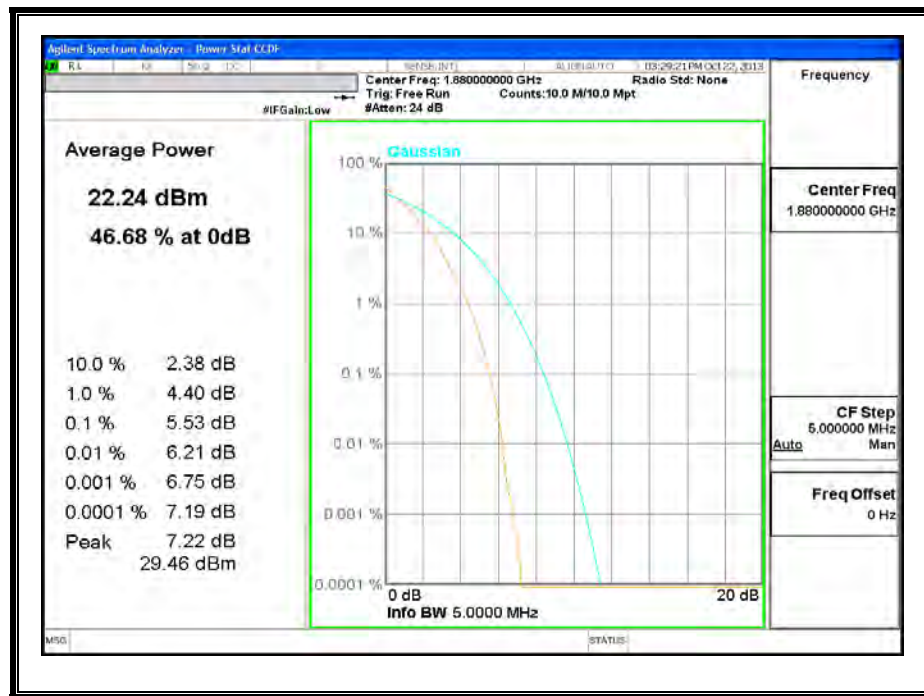
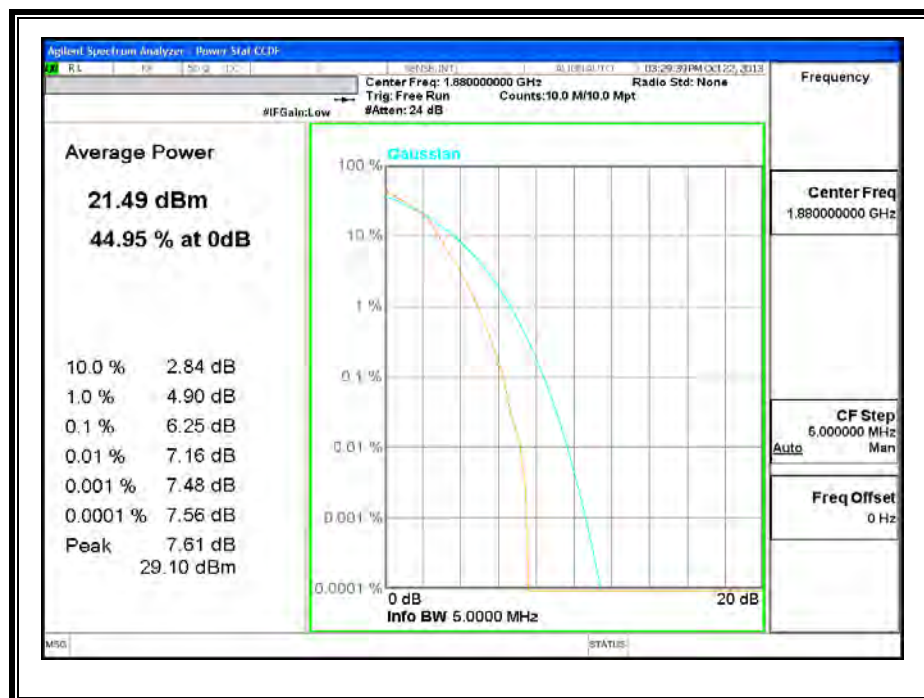
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	15.0	RB1-0	1732.5	26.37	20.27	6.10
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	15.0	RB1-0	1732.5	27.35	20.15	7.20
*Peak Reading = Average Reading + Peak-to-Average Ratio						

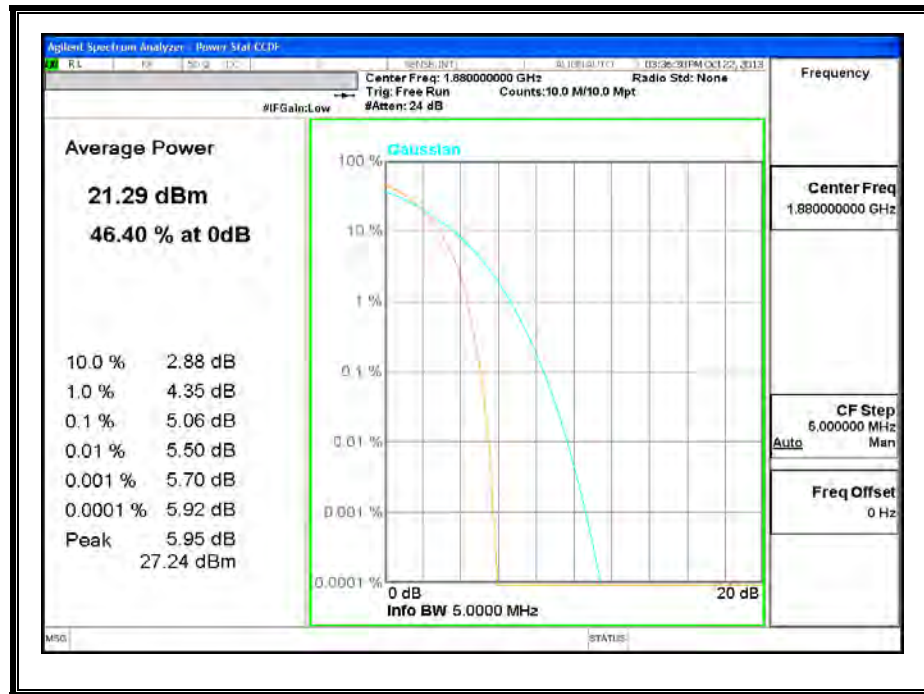
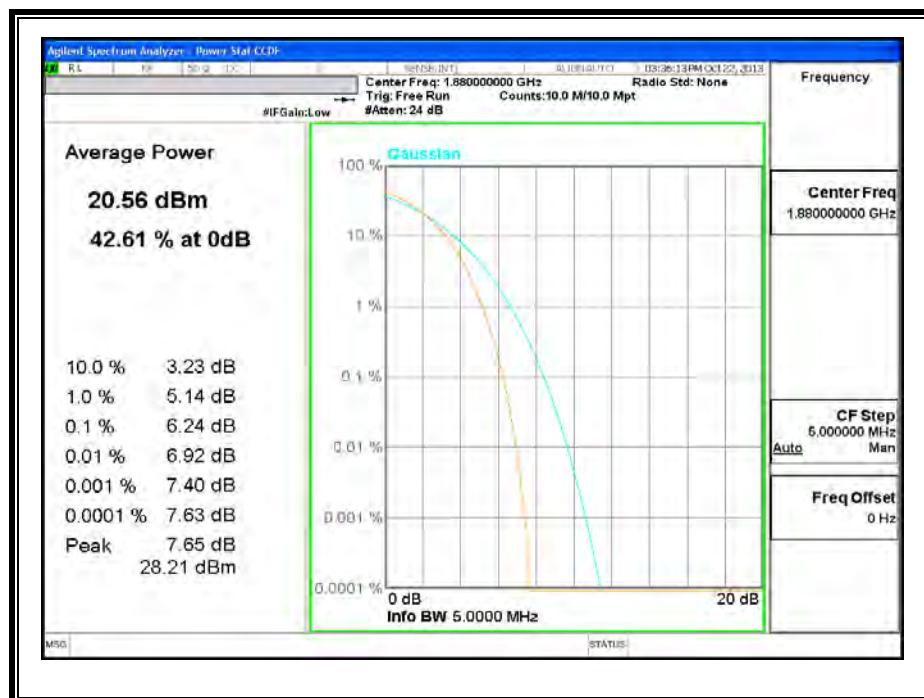
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	20.0	RB1-0	1732.5	25.75	18.78	6.97
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	20.0	RB1-0	1732.5	26.44	18.69	7.75
*Peak Reading = Average Reading + Peak-to-Average Ratio						

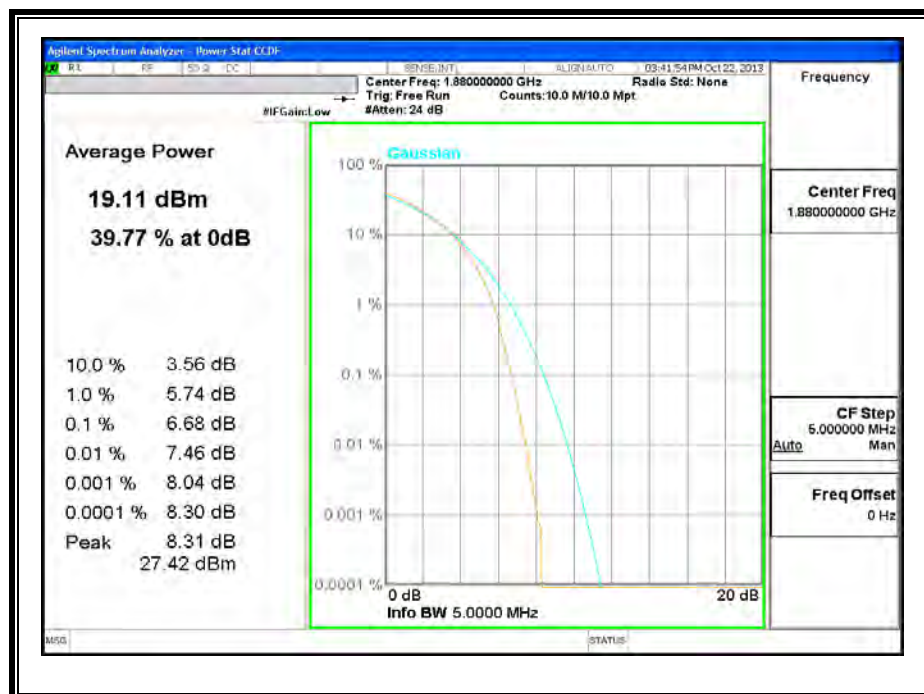
LTE BAND 2**1.4MHz QPSK****1.4MHz 16QAM**

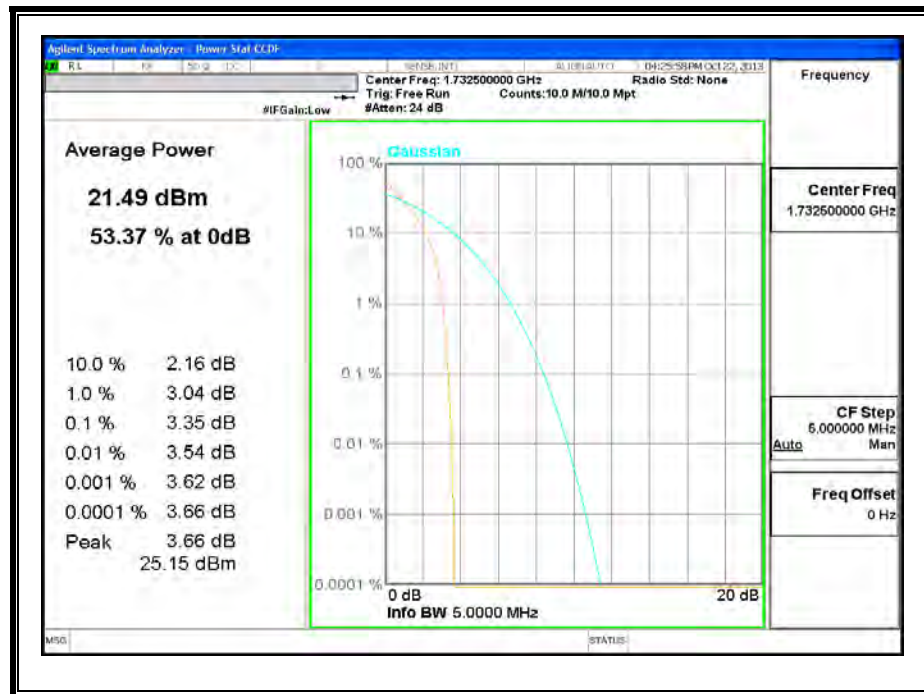
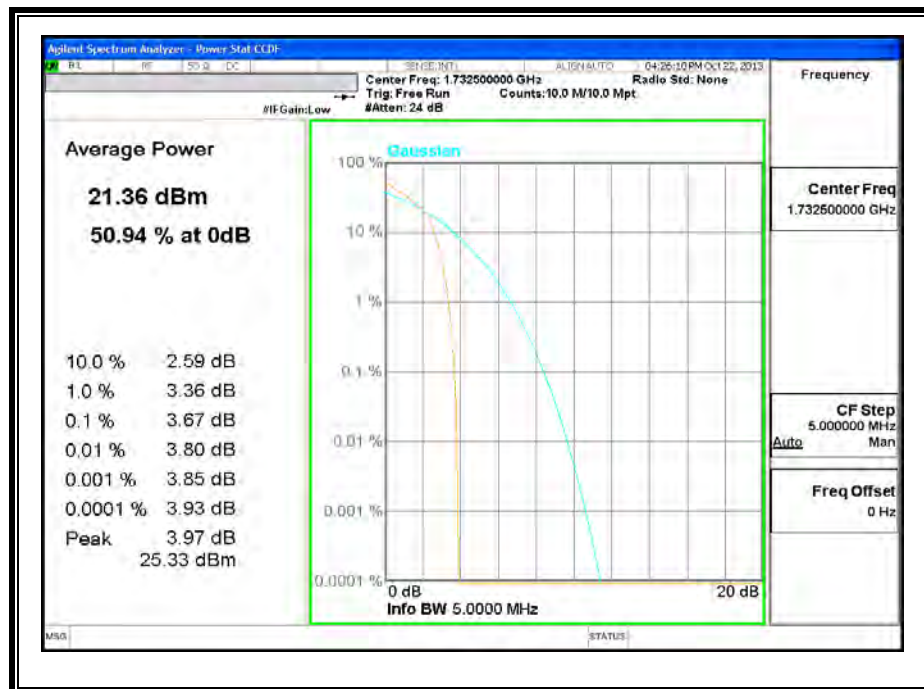
3.0MHz QPSK**3.0MHz 16QAM**

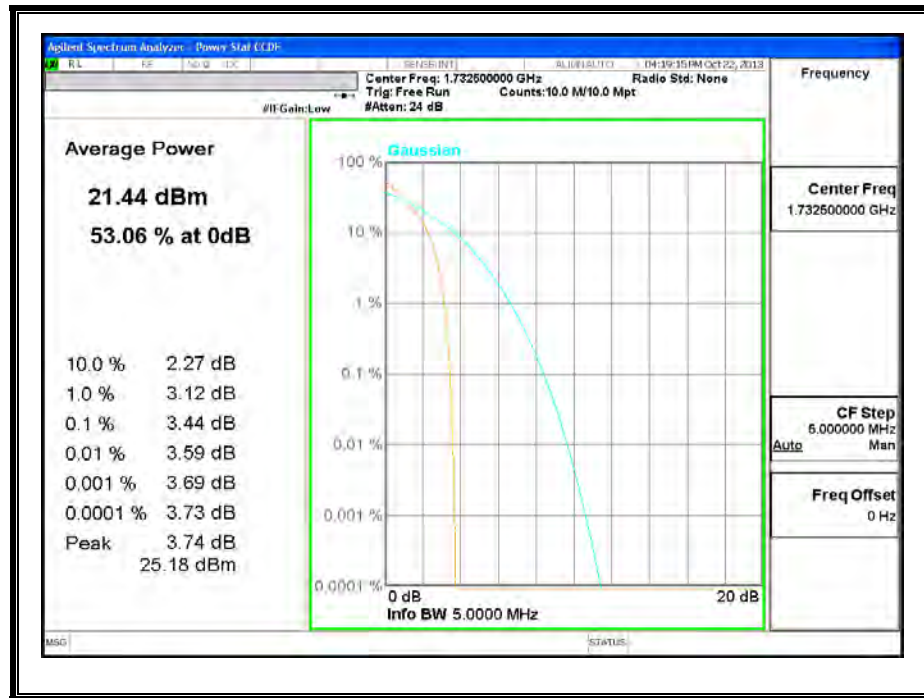
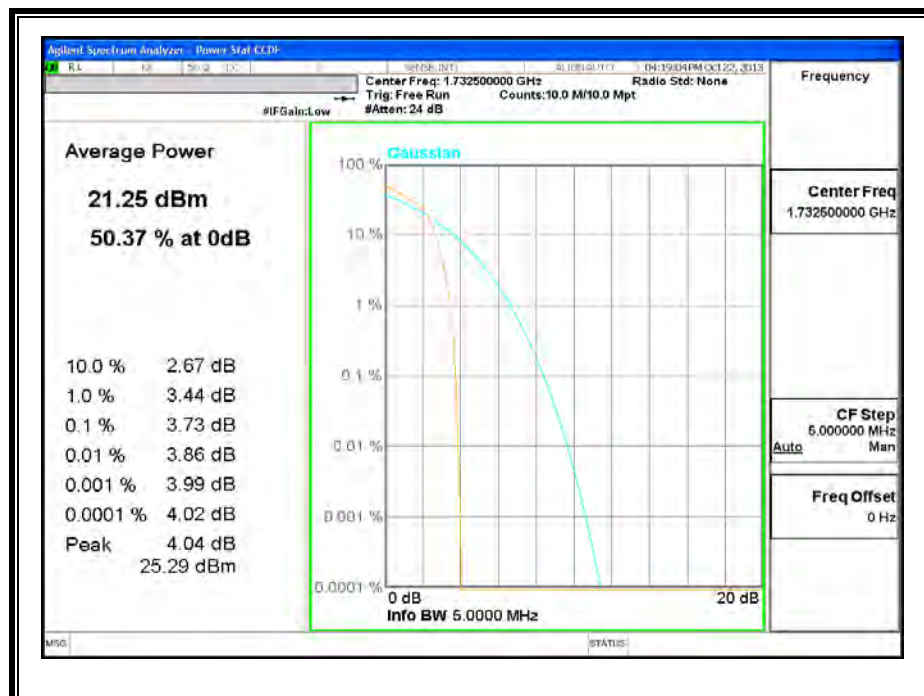
5.0MHz QPSK**5.0MHz 16QAM**

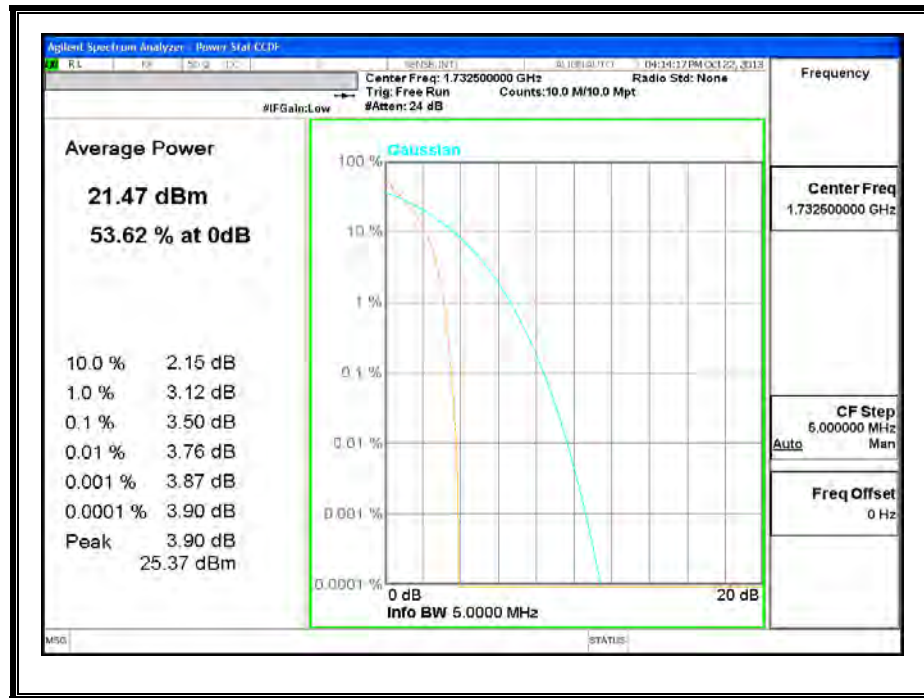
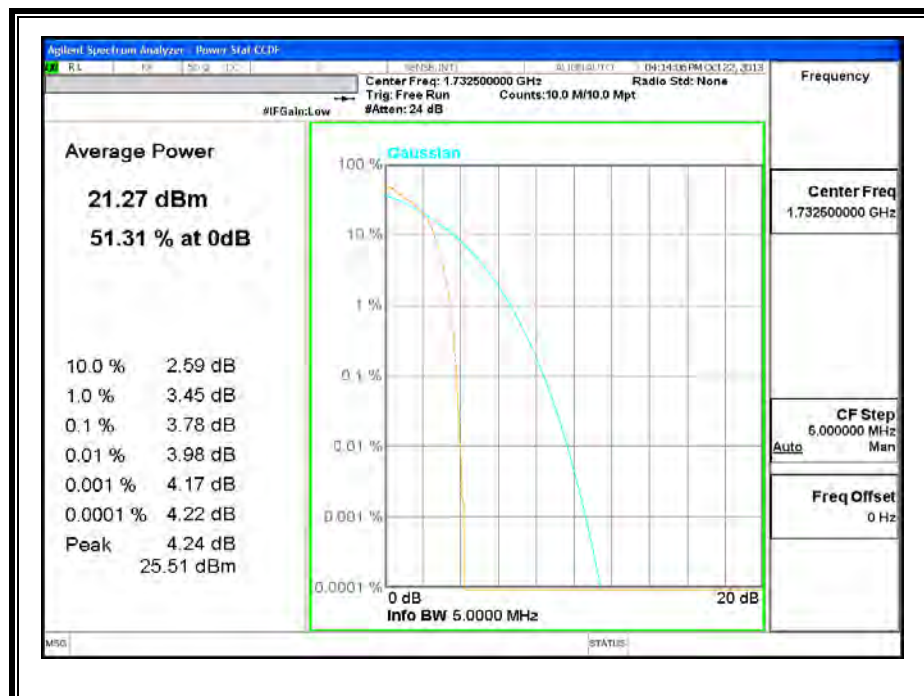
10MHz QPSK**10MHz 16QAM**

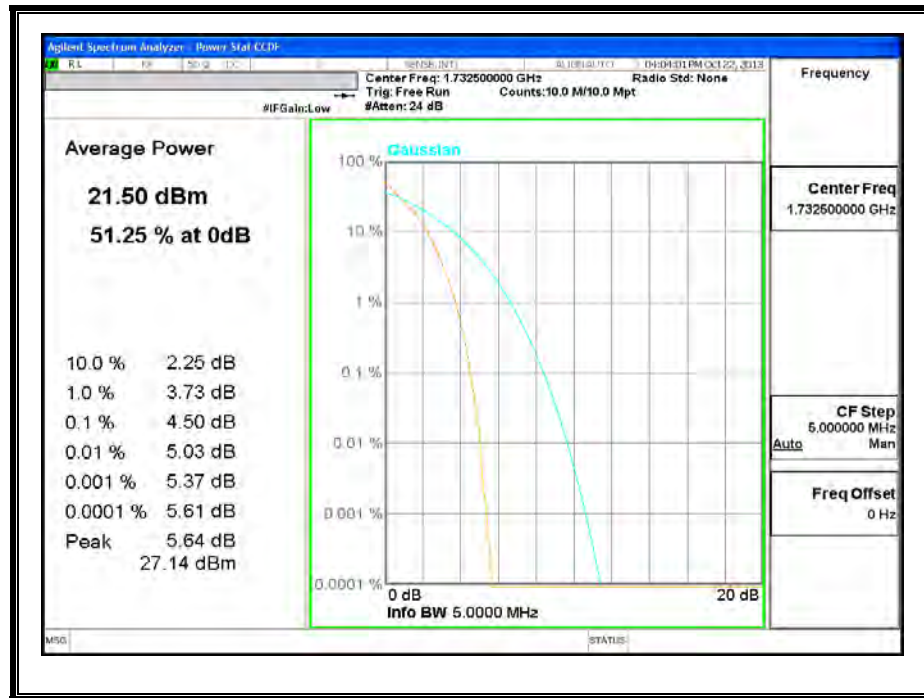
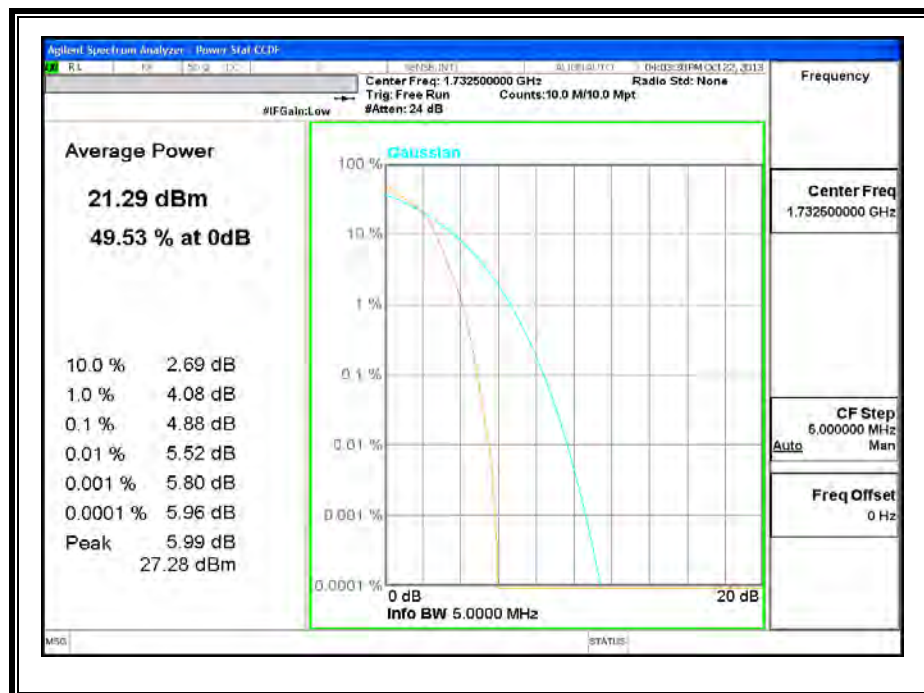
15MHz QPSK**15MHz 16QAM**

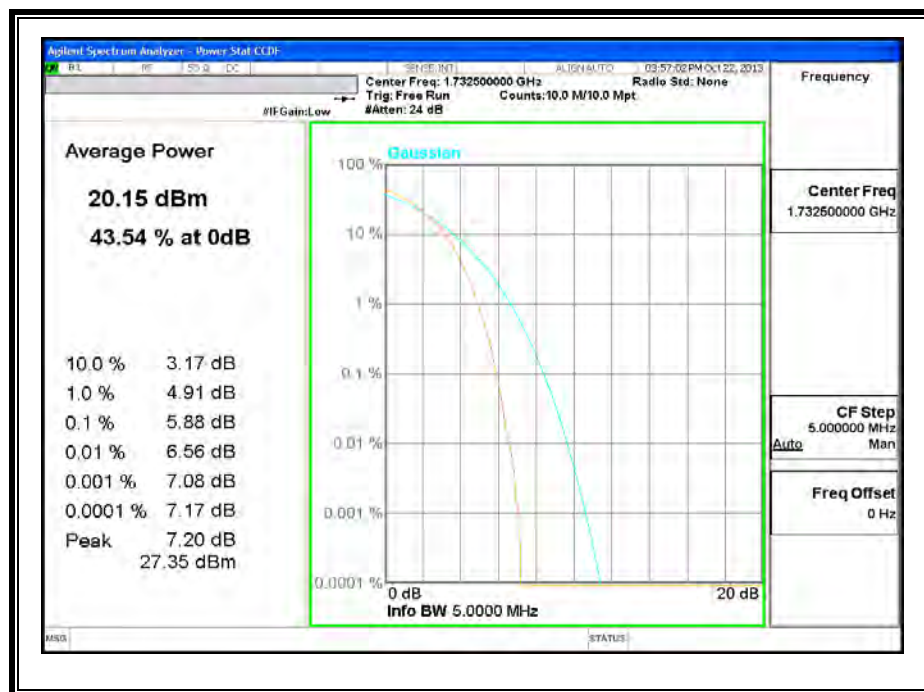
20MHz QPSK**20MHz 16QAM**

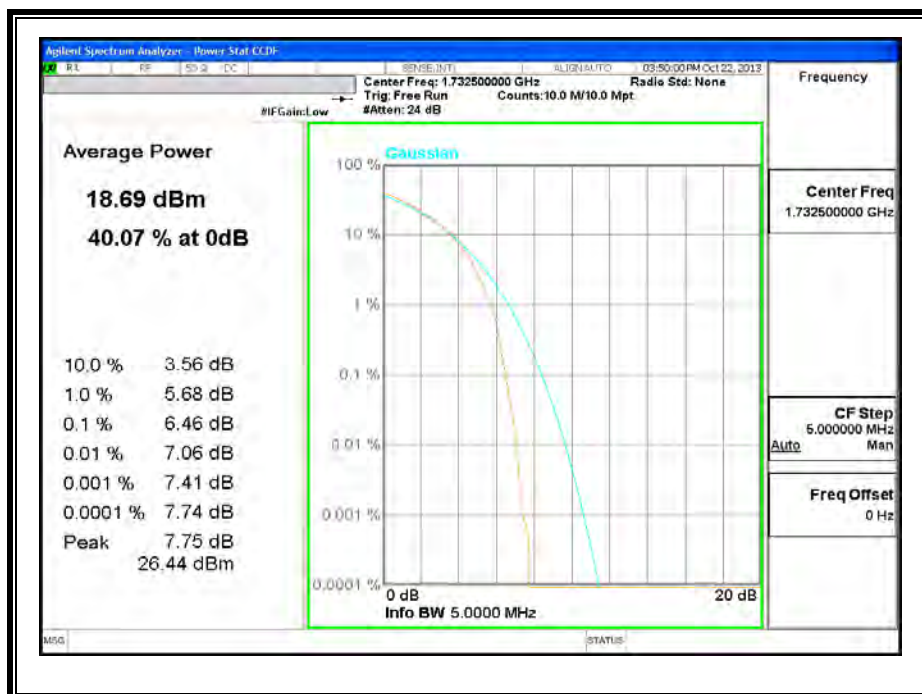
LTE BAND 4**1.4MHz QPSK****1.4MHz 16QAM**

3.0MHz QPSK**3.0MHz 16QAM**

5.0MHz QPSK**5.0MHz 16QAM**

10MHz QPSK**10MHz 16QAM**

15MHz QPSK**15MHz 16QAM**

20MHz QPSK**20MHz 16QAM**

8.5. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = -30° to $+50^{\circ}\text{C}$
- Voltage = low voltage, 10.8VDC, Normal, 12.0VDC and High voltage, 13.2VDC.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 17

RESULTS

See the following pages.

LTE BAND 2, QPSK – 1880.0 MHz

Reference Frequency: Mid Channel 1880.000009 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	1879.999982	0.014	2.5
12.00	40	1879.999979	0.016	2.5
12.00	30	1880.000009	0.000	2.5
12.00	20	1880.000009	0	2.5
12.00	10	1880.000010	0.000	2.5
12.00	0	1880.000000	0.005	2.5
12.00	-10	1880.000010	-0.001	2.5
12.00	-20	1880.000011	-0.001	2.5
12.00	-30	1880.000009	0.000	2.5
Reference Frequency: Mid Channel 1880.000009 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	1880.000009	0	2.5
13.20	20	1880.000018	-0.005	2.5
10.80	20	1880.000025	-0.009	2.5
End Voltage(7.5V)	20	1880.000015	-0.003	2.5

LTE BAND 2, 16QAM – 1880.0 MHz

Reference Frequency: Mid Channel 1880.000007 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	1880.000030	-0.012	2.5
12.00	40	1879.999979	0.015	2.5
12.00	30	1880.000007	0.000	2.5
12.00	20	1880.000007	0	2.5
12.00	10	1880.000009	-0.001	2.5
12.00	0	1880.000007	0.000	2.5
12.00	-10	1880.000004	0.002	2.5
12.00	-20	1880.000005	0.001	2.5
12.00	-30	1880.000006	0.001	2.5
Reference Frequency: Mid Channel 1880.000007 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	1880.000007	0	2.5
13.20	20	1880.000014	-0.004	2.5
10.80	20	1880.000009	-0.001	2.5
End Voltage(7.5V)	20	1880.000008	-0.001	2.5

LTE BAND 4 – 1732.5 MHz QPSK

Reference Frequency: Mid Channel 1732.499975MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	1732.500021	-0.026	2.5
12.00	40	1732.500016	-0.023	2.5
12.00	30	1732.500021	-0.026	2.5
12.00	20	1732.499975	0	2.5
12.00	10	1732.500016	-0.023	2.5
12.00	0	1732.499984	-0.005	2.5
12.00	-10	1732.499982	-0.004	2.5
12.00	-20	1732.499985	-0.005	2.5
12.00	-30	1732.499984	-0.005	2.5

Reference Frequency: Mid Channel 1732.499975MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	1732.499975	0	2.5
13.20	20	1732.499984	-0.005	2.5
10.80	20	1732.499988	-0.008	2.5
End Voltage(7.5V)	20	1732.499972	0.002	2.5

LTE BAND 4 – 1732.5 MHz, 16QAM

Reference Frequency: Mid Channel 1732.499983MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	1732.500021	-0.022	2.5
12.00	40	1732.500018	-0.020	2.5
12.00	30	1732.500021	-0.022	2.5
12.00	20	1732.499983	0	2.5
12.00	10	1732.499982	0.001	2.5
12.00	0	1732.499980	0.002	2.5
12.00	-10	1732.499980	0.002	2.5
12.00	-20	1732.499984	-0.001	2.5
12.00	-30	1732.499986	-0.001	2.5

Reference Frequency: Mid Channel 1732.499983MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	1732.499983	0	2.5
13.20	20	1732.499986	-0.002	2.5
10.80	20	1732.499991	-0.005	2.5
End Voltage(7.5V)	20	1732.499979	0.002	2.5

LTE BAND 5 – 836.5 MHz QPSK

Reference Frequency: Mid Channel 836.500004 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	836.500000	0.005	2.5
12.00	40	836.499998	0.007	2.5
12.00	30	836.499987	0.020	2.5
12.00	20	836.500004	0	2.5
12.00	10	836.499998	0.007	2.5
12.00	0	836.499999	0.006	2.5
12.00	-10	836.500000	0.005	2.5
12.00	-20	836.499998	0.007	2.5
12.00	-30	836.499999	0.006	2.5
Reference Frequency: Mid Channel 836.500004 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	836.500004	0	2.5
13.20	20	836.500015	-0.013	2.5
10.80	20	836.500017	-0.016	2.5
End Voltage(7.5V)	20	836.500001	0.004	2.5

LTE BAND 5 – 836.5 MHz, 16QAM

Reference Frequency: Mid Channel 836.500008 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	836.499998	0.012	2.5
12.00	40	836.499995	0.016	2.5
12.00	30	836.499994	0.017	2.5
12.00	20	836.500008	0	2.5
12.00	10	836.499997	0.013	2.5
12.00	0	836.499992	0.019	2.5
12.00	-10	836.499992	0.019	2.5
12.00	-20	836.499995	0.016	2.5
12.00	-30	836.499997	0.013	2.5
Reference Frequency: Mid Channel 836.500008 MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	836.500008	0	2.5
13.20	20	836.500016	-0.010	2.5
10.80	20	836.500021	-0.016	2.5
End Voltage(7.5V)	20	836.500003	0.006	2.5

LTE BAND 17 – 710.0 MHz QPSK

Reference Frequency: Mid Channel 709.999990MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	709.999981	0.012	2.5
12.00	40	709.999994	-0.005	2.5
12.00	30	709.999992	-0.004	2.5
12.00	20	709.999990	0	2.5
12.00	10	709.999991	-0.002	2.5
12.00	0	709.999992	-0.003	2.5
12.00	-10	709.999995	-0.007	2.5
12.00	-20	709.999993	-0.004	2.5
12.00	-30	709.999992	-0.003	2.5
Reference Frequency: Mid Channel 709.999990MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	709.999990	0	2.5
13.20	20	709.999994	-0.006	2.5
10.80	20	709.999997	-0.010	2.5
End Voltage(7.5V)	20	709.999987	0.004	2.5

LTE BAND 17 – 710.0 MHz, 16QAM

Reference Frequency: Mid Channel 709.999987.0MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	50	709.999981	0.008	2.5
12.00	40	709.999989	-0.003	2.5
12.00	30	709.999986	0.001	2.5
12.00	20	709.999987	0	2.5
12.00	10	709.999984	0.004	2.5
12.00	0	709.999985	0.003	2.5
12.00	-10	709.999983	0.005	2.5
12.00	-20	709.999985	0.002	2.5
12.00	-30	709.999985	0.002	2.5
Reference Frequency: Mid Channel 709.999987MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
12.00	20	709.999987	0	2.5
13.20	20	709.999992	-0.007	2.5
10.80	20	709.999995	-0.011	2.5
End Voltage(7.5V)	20	709.999982	0.007	2.5

9. RADIATED TEST RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232 and §27.50

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

KDB 971168 v02r01 RF power output using broadband peak and average power meter method.

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 17

RESULTS

BAND 2**EIRP LTE Band 2 (1.4 MHz BANDWIDTH)**

Mode	RB Offset/ RB Size	f (MHz)	EIRP (Average)	
			dBm	mW
1.4MHz Band QPSK	1/0	1850.7	24.80	302.00
		1880.0	25.95	393.55
		1909.3	24.97	314.05
1.4MHz Band 16QAM	1/0	1850.7	23.95	248.31
		1880.0	25.20	331.13
		1909.3	24.12	258.23

EIRP LTE Band 2 (3MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP (Average)	
			dBm	mW
3.0MHz Band QPSK	1/0	1851.5	24.55	285.10
		1880.0	25.70	371.54
		1908.5	25.42	348.34
3.0MHz Band 16QAM	1/0	1851.5	23.75	237.14
		1880.0	24.90	309.03
		1908.5	24.52	283.14

EIRP LTE Band 2 (5MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP (Average)	
			dBm	mW
5.0MHz Band QPSK	1/0	1852.5	24.65	291.74
		1880.0	26.00	398.11
		1907.5	25.52	356.45
5.0MHz Band 16QAM	1/0	1852.5	23.75	237.14
		1880.0	25.10	323.59
		1907.5	24.52	283.14

EIRP LTE Band 2 (10MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP (Average)	
			dBm	mW
10.0MHz Band QPSK	1/0	1855.0	25.05	319.89
		1880.0	26.40	436.52
		1905.0	25.62	364.75
10.0MHz Band 16QAM	1/0	1855.0	24.15	260.02
		1880.0	25.50	354.81
		1905.0	24.62	289.73

EIRP LTE Band 2 (15MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP (Average)	
			dBm	mW
15MHz Band QPSK	1/0	1857.5	25.05	319.89
		1880.0	26.40	436.52
		1902.5	25.32	340.41
15MHz Band 16QAM	1/0	1857.5	23.75	237.14
		1880.0	25.10	323.59
		1902.5	23.92	246.60

EIRP LTE Band 2 (20MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP (Average)	
			dBm	mW
20.0MHz Band QPSK	1/0	1860.0	24.75	298.54
		1880.0	25.30	338.84
		1900.0	25.22	332.66
20MHz Band 16QAM	1/0	1860.0	23.75	237.14
		1880.0	24.40	275.42
		1900.0	24.22	264.24

BAND 4**EIRP LTE Band 4 (1.4 MHz BANDWIDTH)**

Mode	RB Offset/ RB Size	f (MHz)	EIRP(Average)	
			dBm	mW
1.4 MHZ BAND QPSK	1/0	1710.7	23.26	211.84
		1732.5	23.45	221.31
		1754.3	24.45	278.61
1.4 MHZ BAND 16QAM	1/0	1710.7	22.36	172.19
		1732.5	22.55	179.89
		1754.3	23.55	226.46

EIRP LTE Band 4 (3MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP(Average)	
			dBm	mW
3.0 MHZ BAND QPSK	1/0	1711.5	23.46	221.82
		1732.5	23.55	226.46
		1753.5	24.15	260.02
3.0 MHZ BAND 16QAM	1/0	1711.5	22.56	180.30
		1732.5	22.65	184.08
		1753.5	23.25	211.35

EIRP LTE Band 4 (5MHz BANDWIDTH)

Mode	RB Offset/ RB size	f (MHz)	EIRP(Average)	
			dBm	mW
5.0 MHZ BAND QPSK	1/0	1712.5	23.36	216.77
		1732.5	23.55	226.46
		1752.5	23.85	242.66
5.0 MHZ BAND 16QAM	1/0	1712.5	22.36	172.19
		1732.5	22.65	184.08
		1752.5	22.95	197.24

EIRP LTE Band 4 (10MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP(Average)	
			dBm	mW
10.0 MHZ BAND QPSK	1/0	1715.0	23.46	221.82
		1732.5	23.85	242.66
		1750.0	23.35	216.27
10.0 MHZ BAND 16QAM	1/0	1715.0	22.46	176.20
		1732.5	22.85	192.75
		1750.0	22.45	175.79

EIRP LTE Band 4 (15MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP(Average)	
			dBm	mW
15.0 MHZ BAND QPSK	1/0	1717.5	23.16	207.01
		1732.5	24.05	254.10
		1747.5	23.15	206.54
15.0 MHZ BAND 16QAM	1/0	1717.5	22.16	164.44
		1732.5	23.05	201.84
		1747.5	22.15	164.06

EIRP LTE Band 4 (20MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	EIRP(Average)	
			dBm	mW
20.0 MHZ BAND QPSK	1/0	1720.0	22.26	168.27
		1732.5	24.15	260.02
		1745.0	23.45	221.31
20.0 MHZ BAND 16QAM	1/0	1720.0	21.36	136.77
		1732.5	23.25	211.35
		1745.0	22.55	179.89

BAND 5**ERP LTE Band 5 (1.4 MHz BANDWIDTH)**

Mode	RB Offset/ RB Size	f (MHz)	ERP (Average)	
			dBm	mW
1.4MHz Band QPSK	1/0	824.7	24.66	292.42
		836.5	23.36	216.77
		848.3	23.65	231.74
1.4MHz Band 16QAM	1/0	824.7	23.66	232.27
		836.5	22.36	172.19
		848.3	22.65	184.08

ERP LTE Band 5 (3MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	ERP (Average)	
			dBm	mW
3.0 MHZ BAND QPSK	1/0	825.5	24.86	306.20
		836.5	23.46	221.82
		847.5	23.85	242.66
3.0 MHZ BAND 16QAM	1/0	825.5	23.86	243.22
		836.5	22.56	180.30
		847.5	22.85	192.75

ERP LTE Band 5 (5MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	ERP (Average)	
			dBm	mW
5MHz Band QPSK	1/0	826.5	24.56	285.76
		836.5	23.26	211.84
		846.5	24.05	254.10
5MHz Band 16QAM	1/0	826.5	23.66	232.27
		836.5	22.26	168.27
		846.5	23.05	201.84

ERP LTE Band 5 (10MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	ERP (Average)	
			dBm	mW
10.0 MHZ BAND QPSK	1/0	829.0	24.86	306.20
		836.5	23.46	221.82
		844.0	24.05	254.10
10.0 MHZ BAND 16QAM	1/0	829.0	23.86	243.22
		836.5	22.46	176.20
		844.0	23.05	201.84

BAND 17**ERP LTE Band 17 (5MHz BANDWIDTH)**

Mode	RB Offset/ RB Size	f (MHz)	ERP (Average)	
			dBm	mW
5MHz Band QPSK	1/0	706.5	22.20	165.96
		710.0	20.69	117.22
		713.5	21.50	141.25
5MHz Band 16QAM	1/0	706.5	21.20	131.83
		710.0	19.69	93.11
		713.5	20.50	112.20

ERP LTE Band 17 (10MHz BANDWIDTH)

Mode	RB Offset/ RB Size	f (MHz)	ERP (Average)	
			dBm	mW
10.0 MHZ BAND QPSK	1/0	710.0	21.19	131.52
10.0 MHZ BAND 16QAM	1/0	710.0	20.19	104.47

9.1.1. LTE BAND 2**AVERAGE****EIRP LTE QPSK Band 2 (1.4 MHz BANDWIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								
Company:		Microsoft						
Project #:		13U15414						
Date:		12/30/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 2 QPSK 1.4MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	14.5	V	0.98	7.93	21.40	33.0	-11.6	
1.851	17.9	H	0.98	7.93	24.80	33.0	-8.2	
Mid Ch								
1.880	14.8	V	0.98	7.48	21.28	33.0	-11.7	
1.880	19.5	H	0.98	7.48	25.95	33.0	-7.1	
High Ch								
1.909	15.2	V	0.98	7.10	21.29	33.0	-11.7	
1.909	18.9	H	0.98	7.10	24.97	33.0	-8.0	
Rev. 10.15.13								

EIRP LTE 16QAM Band 2 (1.4 MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 16QAM 1.4MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	13.7	V	0.98	7.93	20.65	33.0	-12.4	
1.851	17.0	H	0.98	7.93	23.95	33.0	-9.1	
Mid Ch								
1.880	13.9	V	0.98	7.48	20.43	33.0	-12.6	
1.880	18.7	H	0.98	7.48	25.20	33.0	-7.8	
High Ch								
1.909	14.4	V	0.98	7.10	20.54	33.0	-12.5	
1.909	18.0	H	0.98	7.10	24.12	33.0	-8.9	

Rev. 10.15.13

EIRP LTE QPSK Band 2 (3MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 QPSK 3MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	14.1	V	0.98	7.93	21.05	33.0	-12.0	
1.852	17.6	H	0.98	7.93	24.55	33.0	-8.5	
Mid Ch								
1.880	14.0	V	0.98	7.48	20.53	33.0	-12.5	
1.880	19.2	H	0.98	7.48	25.70	33.0	-7.3	
High Ch								
1.909	14.0	V	0.98	7.10	20.14	33.0	-12.9	
1.909	19.3	H	0.98	7.10	25.42	33.0	-7.6	

Rev. 10.15.13

EIRP LTE 16QAM Band 2 (3MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 16QAM 3MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	13.3	V	0.98	7.93	20.25	33.0	-12.8	
1.852	16.8	H	0.98	7.93	23.75	33.0	-9.3	
Mid Ch								
1.880	13.2	V	0.98	7.48	19.73	33.0	-13.3	
1.880	18.4	H	0.98	7.48	24.90	33.0	-8.1	
High Ch								
1.909	13.3	V	0.98	7.10	19.44	33.0	-13.6	
1.909	18.4	H	0.98	7.10	24.52	33.0	-8.5	

Rev. 10.15.13

EIRP LTE QPSK Band 2 (5MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 QPSK 5MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	14.1	V	0.98	7.93	21.05	33.0	-12.0	
1.853	17.7	H	0.98	7.93	24.65	33.0	-8.4	
Mid Ch								
1.880	13.9	V	0.98	7.48	20.43	33.0	-12.6	
1.880	19.5	H	0.98	7.48	26.00	33.0	-7.0	
High Ch								
1.908	13.5	V	0.98	7.10	19.64	33.0	-13.4	
1.908	19.4	H	0.98	7.10	25.52	33.0	-7.5	

Rev. 10.15.13

EIRP LTE 16QAM Band 2 (5MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 16QAM 5MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	13.2	V	0.98	7.93	20.15	33.0	-12.9	
1.853	16.8	H	0.98	7.93	23.75	33.0	-9.3	
Mid Ch								
1.880	13.0	V	0.98	7.48	19.53	33.0	-13.5	
1.880	18.6	H	0.98	7.48	25.10	33.0	-7.9	
High Ch								
1.908	12.7	V	0.98	7.10	18.84	33.0	-14.2	
1.908	18.4	H	0.98	7.10	24.52	33.0	-8.5	

Rev. 10.15.13

EIRP LTE QPSK Band 2 (10MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 QPSK 10MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	17.1	V	0.98	7.93	24.05	33.0	-9.0	
1.855	18.1	H	0.98	7.93	25.05	33.0	-8.0	
Mid Ch								
1.880	17.7	V	0.98	7.48	24.23	33.0	-8.8	
1.880	19.9	H	0.98	7.48	26.40	33.0	-6.6	
High Ch								
1.905	18.1	V	0.98	7.10	24.24	33.0	-8.8	
1.905	19.5	H	0.98	7.10	25.62	33.0	-7.4	

Rev. 10.15.13

EIRP LTE 16QAM Band 2 (10MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 16QAM 10MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	16.2	V	0.98	7.93	23.15	33.0	-9.9	
1.855	17.2	H	0.98	7.93	24.15	33.0	-8.9	
Mid Ch								
1.880	16.8	V	0.98	7.48	23.33	33.0	-9.7	
1.880	19.0	H	0.98	7.48	25.50	33.0	-7.5	
High Ch								
1.905	17.1	V	0.98	7.10	23.24	33.0	-9.8	
1.905	18.5	H	0.98	7.10	24.62	33.0	-8.4	

Rev. 10.15.13

EIRP LTE QPSK Band 2 (15MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 QPSK 15MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	15.3	V	0.98	7.93	22.25	33.0	-10.8	
1.858	18.1	H	0.98	7.93	25.05	33.0	-8.0	
Mid Ch								
1.880	16.2	V	0.98	7.48	22.73	33.0	-10.3	
1.880	19.9	H	0.98	7.48	26.40	33.0	-6.6	
High Ch								
1.903	15.9	V	0.98	7.10	22.04	33.0	-11.0	
1.903	19.2	H	0.98	7.10	25.32	33.0	-7.7	

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EIRP LTE 16QAM Band 2 (15MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 16QAM 15MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	14.1	V	0.98	7.93	21.05	33.0	-12.0	
1.858	16.8	H	0.98	7.93	23.75	33.0	-9.3	
Mid Ch								
1.880	14.9	V	0.98	7.48	21.43	33.0	-11.6	
1.880	18.6	H	0.98	7.48	25.10	33.0	-7.9	
High Ch								
1.903	14.6	V	0.98	7.10	20.74	33.0	-12.3	
1.903	17.8	H	0.98	7.10	23.92	33.0	-9.1	

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EIRP LTE QPSK Band 2 (20MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 QPSK 20MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	17.1	V	0.98	7.93	24.05	33.0	-9.0	
1.860	17.8	H	0.98	7.93	24.75	33.0	-8.3	
Mid Ch								
1.880	17.3	V	0.98	7.48	23.83	33.0	-9.2	
1.880	18.8	H	0.98	7.48	25.30	33.0	-7.7	
High Ch								
1.900	17.6	V	0.98	7.10	23.74	33.0	-9.3	
1.900	19.1	H	0.98	7.10	25.22	33.0	-7.8	

Rev. 10.15.13

EIRP LTE 16QAM Band 2 (20MHz BANDWIDTH)**High Frequency Fundamental Measurement
Compliance Certification Services Chamber D**

Company: Microsoft
Project #: 13U15414
Date: 12/30/13
Test Engineer: R.ZHENG
Configuration: EUT with keyboard
Mode: LTE Band 2 16QAM 20MHz BW

Test Equipment:

Receiving: Horn T344, and Chamber D SMA Cables

Substitution: Horn T60 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	16.2	V	0.98	7.93	23.15	33.0	-9.9	
1.860	16.8	H	0.98	7.93	23.75	33.0	-9.3	
Mid Ch								
1.880	16.4	V	0.98	7.48	22.93	33.0	-10.1	
1.880	17.9	H	0.98	7.48	24.40	33.0	-8.6	
High Ch								
1.900	16.5	V	0.98	7.10	22.64	33.0	-10.4	
1.900	18.1	H	0.98	7.10	24.22	33.0	-8.8	

Rev. 10.15.13

9.1.2. LTE BAND 4**AVERAGE****EIRP LTE QPSK Band 4 (1.4 MHz BANDWIDTH)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 QPSK 1.4MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.711	15.1	V	0.95	8.49	22.63	30.0	-7.4	
1.711	15.7	H	0.95	8.49	23.26	30.0	-6.7	
Mid Ch								
1.733	15.1	V	0.95	8.60	22.79	30.0	-7.2	
1.733	15.8	H	0.95	8.60	23.45	30.0	-6.6	
High Ch								
1.754	15.4	V	0.95	8.70	23.17	30.0	-6.8	
1.754	16.7	H	0.95	8.70	24.45	30.0	-5.6	
Rev. 10.15.13								

EIRP LTE 16QAM Band 4 (1.4 MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 16QAM 1.4MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.711	14.2	V	0.95	8.49	21.73	30.0	-8.3	
1.711	14.8	H	0.95	8.49	22.36	30.0	-7.6	
Mid Ch								
1.733	14.2	V	0.95	8.60	21.89	30.0	-8.1	
1.733	14.9	H	0.95	8.60	22.55	30.0	-7.5	
High Ch								
1.754	14.5	V	0.95	8.70	22.27	30.0	-7.7	
1.754	15.8	H	0.95	8.70	23.55	30.0	-6.5	
Rev. 10.15.13								

EIRP LTE QPSK Band 4 (3MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 QPSK 3MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	14.7	V	0.95	8.49	22.23	30.0	-7.8	
1.712	15.9	H	0.95	8.49	23.46	30.0	-6.5	
Mid Ch								
1.733	15.2	V	0.95	8.60	22.89	30.0	-7.1	
1.733	15.9	H	0.95	8.60	23.55	30.0	-6.5	
High Ch								
1.753	15.1	V	0.95	8.70	22.87	30.0	-7.1	
1.753	16.4	H	0.95	8.70	24.15	30.0	-5.9	
Rev. 10.15.13								

EIRP LTE 16QAM Band 4 (3MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/25/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT with keyboard							
Mode:	LTE Band 4 16QAM 3MHz BW							
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	13.8	V	0.95	8.49	21.33	30.0	-8.7	
1.712	15.0	H	0.95	8.49	22.56	30.0	-7.4	
Mid Ch								
1.733	14.3	V	0.95	8.60	21.99	30.0	-8.0	
1.733	15.0	H	0.95	8.60	22.65	30.0	-7.4	
High Ch								
1.753	14.2	V	0.95	8.70	21.97	30.0	-8.0	
1.753	15.5	H	0.95	8.70	23.25	30.0	-6.8	
Rev. 10.15.13								

EIRP LTE QPSK Band 4 (5MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 QPSK 5MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	14.9	V	0.95	8.49	22.43	30.0	-7.6	
1.712	15.8	H	0.95	8.49	23.36	30.0	-6.6	
Mid Ch								
1.733	15.4	V	0.95	8.60	23.09	30.0	-6.9	
1.733	15.9	H	0.95	8.60	23.55	30.0	-6.5	
High Ch								
1.753	14.9	V	0.95	8.70	22.67	30.0	-7.3	
1.753	16.1	H	0.95	8.70	23.85	30.0	-6.2	
Rev. 10.15.13								

EIRP LTE 16QAM Band 4 (5MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 16QAM 5MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	14.0	V	0.95	8.49	21.53	30.0	-8.5	
1.712	14.8	H	0.95	8.49	22.36	30.0	-7.6	
Mid Ch								
1.733	14.5	V	0.95	8.60	22.19	30.0	-7.8	
1.733	15.0	H	0.95	8.60	22.65	30.0	-7.4	
High Ch								
1.753	14.0	V	0.95	8.70	21.77	30.0	-8.2	
1.753	15.2	H	0.95	8.70	22.95	30.0	-7.1	
Rev. 10.15.13								

EIRP LTE QPSK Band 4 (10MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/25/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT with keyboard							
Mode:	LTE Band 4 QPSK 10MHz BW							
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.715	14.6	V	0.95	8.49	22.13	30.0	-7.9	
1.715	15.9	H	0.95	8.49	23.46	30.0	-6.5	
Mid Ch								
1.733	15.6	V	0.95	8.60	23.29	30.0	-6.7	
1.733	16.2	H	0.95	8.60	23.85	30.0	-6.2	
High Ch								
1.750	14.0	V	0.95	8.70	21.77	30.0	-8.2	
1.750	15.6	H	0.95	8.70	23.35	30.0	-6.7	
Rev. 10.15.13								

EIRP LTE 16QAM Band 4 (10MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 16QAM 10MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.715	13.6	V	0.95	8.49	21.13	30.0	-8.9	
1.715	14.9	H	0.95	8.49	22.46	30.0	-7.5	
Mid Ch								
1.733	14.6	V	0.95	8.60	22.29	30.0	-7.7	
1.733	15.2	H	0.95	8.60	22.85	30.0	-7.2	
High Ch								
1.750	13.1	V	0.95	8.70	20.87	30.0	-9.1	
1.750	14.7	H	0.95	8.70	22.45	30.0	-7.6	
Rev. 10.15.13								

EIRP LTE QPSK Band 4 (15MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 QPSK 15MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.718	15.1	V	0.95	8.49	22.63	30.0	-7.4	
1.718	15.6	H	0.95	8.49	23.16	30.0	-6.8	
Mid Ch								
1.733	15.8	V	0.95	8.60	23.49	30.0	-6.5	
1.733	16.4	H	0.95	8.60	24.05	30.0	-6.0	
High Ch								
1.748	13.6	V	0.95	8.70	21.37	30.0	-8.6	
1.748	15.4	H	0.95	8.70	23.15	30.0	-6.9	
Rev. 10.15.13								

EIRP LTE 16QAM Band 4 (15MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 16QAM 15MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.718	14.1	V	0.95	8.49	21.63	30.0	-8.4	
1.718	14.6	H	0.95	8.49	22.16	30.0	-7.8	
Mid Ch								
1.733	14.8	V	0.95	8.60	22.49	30.0	-7.5	
1.733	15.4	H	0.95	8.60	23.05	30.0	-7.0	
High Ch								
1.748	12.6	V	0.95	8.70	20.37	30.0	-9.6	
1.748	14.4	H	0.95	8.70	22.15	30.0	-7.9	
Rev. 10.15.13								

EIRP LTE QPSK Band 4 (20MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 QPSK 20MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.720	14.3	V	0.95	8.49	21.83	30.0	-8.2	
1.720	14.7	H	0.95	8.49	22.26	30.0	-7.7	
Mid Ch								
1.733	15.6	V	0.95	8.60	23.29	30.0	-6.7	
1.733	16.5	H	0.95	8.60	24.15	30.0	-5.9	
High Ch								
1.745	14.3	V	0.95	8.70	22.07	30.0	-7.9	
1.745	15.7	H	0.95	8.70	23.45	30.0	-6.6	
Rev. 10.15.13								

EIRP LTE 16QAM Band 4 (20MHz BANDWIDTH)

High Frequency Fundamental Measurement Compliance Certification Services Chamber D								Main
Company:		Microsoft						
Project #:		13U15414						
Date:		10/25/13						
Test Engineer:		R.ZHENG						
Configuration:		EUT with keyboard						
Mode:		LTE Band 4 16QAM 20MHz BW						
Test Equipment:								
Receiving: Horn T344, and Chamber D SMA Cables								
Substitution: Horn T60 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.720	13.4	V	0.95	8.49	20.93	30.0	-9.1	
1.720	13.8	H	0.95	8.49	21.36	30.0	-8.6	
Mid Ch								
1.733	14.7	V	0.95	8.60	22.39	30.0	-7.6	
1.733	15.6	H	0.95	8.60	23.25	30.0	-6.8	
High Ch								
1.745	13.4	V	0.95	8.70	21.17	30.0	-8.8	
1.745	14.8	H	0.95	8.70	22.55	30.0	-7.5	
Rev. 10.15.13								

9.1.3. LTE BAND 5**AVERAGE****ERP LTE QPSK Band 5 (1.4 MHz BANDWIDTH)**

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/24/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 QPSK 1.4MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	19.51	V	0.7	0.0	18.86	38.5	-19.6	
824.70	25.31	H	0.7	0.0	24.66	38.5	-13.8	
Mid Ch								
836.50	18.61	V	0.7	0.0	17.96	38.5	-20.5	
836.50	24.01	H	0.7	0.0	23.36	38.5	-15.1	
High Ch								
848.30	19.20	V	0.7	0.0	18.55	38.5	-19.9	
848.30	24.30	H	0.7	0.0	23.65	38.5	-14.8	
Rev. 10.15.13								

ERP LTE 16QAM Band 5 (1.4 MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/24/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 16QAM 1.4MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	18.51	V	0.7	0.0	17.86	38.5	-20.6	
824.70	24.31	H	0.7	0.0	23.66	38.5	-14.8	
Mid Ch								
836.50	17.61	V	0.7	0.0	16.96	38.5	-21.5	
836.50	23.01	H	0.7	0.0	22.36	38.5	-16.1	
High Ch								
848.30	18.20	V	0.7	0.0	17.55	38.5	-20.9	
848.30	23.30	H	0.7	0.0	22.65	38.5	-15.8	
Rev. 10.15.13								

ERP LTE QPSK Band 5 (3MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/24/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 QPSK 3MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	19.61	V	0.7	0.0	18.96	38.5	-19.5	
825.50	25.51	H	0.7	0.0	24.86	38.5	-13.6	
Mid Ch								
836.50	18.41	V	0.7	0.0	17.76	38.5	-20.7	
836.50	24.11	H	0.7	0.0	23.46	38.5	-15.0	
High Ch								
847.50	19.20	V	0.7	0.0	18.55	38.5	-19.9	
847.50	24.50	H	0.7	0.0	23.85	38.5	-14.6	
Rev. 10.15.13								

ERP LTE 16QAM Band 5 (3MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/24/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 16QAM 3MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	18.61	V	0.7	0.0	17.96	38.5	-20.5	
825.50	24.51	H	0.7	0.0	23.86	38.5	-14.6	
Mid Ch								
836.50	17.41	V	0.7	0.0	16.76	38.5	-21.7	
836.50	23.21	H	0.7	0.0	22.56	38.5	-15.9	
High Ch								
847.50	18.20	V	0.7	0.0	17.55	38.5	-20.9	
847.50	23.50	H	0.7	0.0	22.85	38.5	-15.6	
Rev. 10.15.13								

ERP LTE QPSK Band 5 (5MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/23/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 QPSK 5MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	19.71	V	0.7	0.0	19.06	38.5	-19.4	
826.50	25.21	H	0.7	0.0	24.56	38.5	-13.9	
Mid Ch								
836.50	18.51	V	0.7	0.0	17.86	38.5	-20.6	
836.50	23.91	H	0.7	0.0	23.26	38.5	-15.2	
High Ch								
846.50	19.50	V	0.7	0.0	18.85	38.5	-19.6	
846.50	24.70	H	0.7	0.0	24.05	38.5	-14.4	
Rev. 10.15.13								

ERP LTE 16QAM Band 5 (5MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/23/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 16QAM 5MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber d Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	18.71	V	0.7	0.0	18.06	38.5	-20.4	
826.50	24.31	H	0.7	0.0	23.66	38.5	-14.8	
Mid Ch								
836.50	17.61	V	0.7	0.0	16.96	38.5	-21.5	
836.50	22.91	H	0.7	0.0	22.26	38.5	-16.2	
High Ch								
846.50	18.50	V	0.7	0.0	17.85	38.5	-20.6	
846.50	23.70	H	0.7	0.0	23.05	38.5	-15.4	
Rev. 10.15.13								

ERP LTE QPSK Band 5 (10MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/23/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 QPSK 10MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	19.71	V	0.7	0.0	19.06	38.5	-19.4	
829.00	25.51	H	0.7	0.0	24.86	38.5	-13.6	
Mid Ch								
836.50	18.61	V	0.7	0.0	17.96	38.5	-20.5	
836.50	24.11	H	0.7	0.0	23.46	38.5	-15.0	
High Ch								
844.00	19.70	V	0.7	0.0	19.05	38.5	-19.4	
844.00	24.70	H	0.7	0.0	24.05	38.5	-14.4	
Rev. 10.15.13								

ERP LTE 16QAM Band 5 (10MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								Main
Company:	Microsoft							
Project #:	13U15414							
Date:	10/23/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 5 16QAM 10MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	18.71	V	0.7	0.0	18.06	38.5	-20.4	
829.00	24.51	H	0.7	0.0	23.86	38.5	-14.6	
Mid Ch								
836.50	17.61	V	0.7	0.0	16.96	38.5	-21.5	
836.50	23.11	H	0.7	0.0	22.46	38.5	-16.0	
High Ch								
844.00	18.70	V	0.7	0.0	18.05	38.5	-20.4	
844.00	23.70	H	0.7	0.0	23.05	38.5	-15.4	
Rev. 10.15.13								

9.1.4. LTE BAND 17**AVERAGE****ERP LTE QPSK Band 17 (5MHz BANDWIDTH)**

High Frequency Substitution Measurement Compliance Certification Services Chamber D								
Main								
Company:	Microsoft							
Project #:	13U15414							
Date:	10/25/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 17 QPSK 5MHz BW							
<u>Test Equipment:</u>								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	14.50	V	0.55	0.0	13.95	34.8	-20.8	
706.50	22.75	H	0.55	0.0	22.20	34.8	-12.6	
Mid Ch								
710.00	13.45	V	0.55	0.0	12.90	34.8	-21.9	
710.00	21.24	H	0.55	0.0	20.69	34.8	-14.1	
High Ch								
713.50	12.90	V	0.55	0.0	12.35	34.8	-22.4	
713.50	22.05	H	0.55	0.0	21.50	34.8	-13.3	
Rev. 10.15.13								

ERP LTE 16QAM Band 17 (5MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								
Main								
Company:	Microsoft							
Project #:	13U15414							
Date:	10/25/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 17 16QAM 5MHz BW							
Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	13.50	V	0.55	0.0	12.95	34.8	-21.8	
706.50	21.75	H	0.55	0.0	21.20	34.8	-13.6	
Mid Ch								
710.00	12.45	V	0.55	0.0	11.90	34.8	-22.9	
710.00	20.24	H	0.55	0.0	19.69	34.8	-15.1	
High Ch								
713.50	11.90	V	0.55	0.0	11.35	34.8	-23.4	
713.50	21.05	H	0.55	0.0	20.50	34.8	-14.3	
Rev. 10.15.13								

ERP LTE QPSK Band 17 (10MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D																																			
Main Company: Microsoft Project #: 13U15414 Date: 10/25/13 Test Engineer: R.ZHENG Configuration: EUT only Mode: LTE Band 17 QPSK 10MHz BW Test Equipment: Receiving: Sunol T407, and Chamber D Cable Substitution: Dipole S/N: 00022117, and 8ft SMA Cable <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>710.00</td> <td>14.55</td> <td>V</td> <td>0.55</td> <td>0.0</td> <td>14.00</td> <td>34.8</td> <td>-20.8</td> <td></td> </tr> <tr> <td>710.00</td> <td>21.74</td> <td>H</td> <td>0.55</td> <td>0.0</td> <td>21.19</td> <td>34.8</td> <td>-13.6</td> <td></td> </tr> </tbody> </table> Rev. 10.15.13									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	710.00	14.55	V	0.55	0.0	14.00	34.8	-20.8		710.00	21.74	H	0.55	0.0	21.19	34.8	-13.6	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																											
710.00	14.55	V	0.55	0.0	14.00	34.8	-20.8																												
710.00	21.74	H	0.55	0.0	21.19	34.8	-13.6																												

ERP LTE 16QAM Band 17 (10MHz BANDWIDTH)

High Frequency Substitution Measurement Compliance Certification Services Chamber D								
Main								
Company:	Microsoft							
Project #:	13U15414							
Date:	10/25/13							
Test Engineer:	R.ZHENG							
Configuration:	EUT only							
Mode:	LTE Band 17 16QAM 10MHz BW							
 Test Equipment:								
Receiving: Sunol T407, and Chamber D Cable								
Substitution: Dipole S/N: 00022117, and 8ft SMA Cable								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
710.00	13.55	V	0.55	0.0	13.00	34.8	-21.8	
710.00	20.74	H	0.55	0.0	20.19	34.8	-14.6	
Rev. 10.15.13								

9.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §27.53

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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 emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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 emissions are attenuated at least 26 dB below the transmitter power.

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 17

RESULTS

9.2.1. LTE BAND 2**QPSK Band 2 (1.4 MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_QPSK_1.4MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.7MHz)									
3.701	-8.6	V	3.0	36.8	1.0	-44.5	-13.0	-31.5	
5.552	-8.8	V	3.0	36.3	1.0	-44.1	-13.0	-31.1	
3.701	-7.1	H	3.0	36.8	1.0	-42.9	-13.0	-29.9	
Mid Ch, (1880.0MHz)									
3.760	-5.2	V	3.0	36.8	1.0	-41.0	-13.0	-28.0	
3.760	-2.1	H	3.0	36.8	1.0	-37.8	-13.0	-24.8	
High Ch, (1909.3MHz)									
3.819	-5.0	V	3.0	36.7	1.0	-40.7	-13.0	-27.7	
3.819	-2.8	H	3.0	36.7	1.0	-38.5	-13.0	-25.5	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 2 (1.4 MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_16QAM_1.4MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.7MHz)									
3.701	-7.6	V	3.0	36.8	1.0	-43.4	-13.0	-30.4	
5.552	-9.1	V	3.0	36.3	1.0	-44.4	-13.0	-31.4	
3.701	-7.9	H	3.0	36.8	1.0	-43.7	-13.0	-30.7	
Mid Ch, (1880.0MHz)									
3.760	-5.4	V	3.0	36.8	1.0	-41.2	-13.0	-28.2	
3.760	-2.5	H	3.0	36.8	1.0	-38.2	-13.0	-25.2	
High Ch, (1909.3MHz)									
3.819	-6.2	V	3.0	36.7	1.0	-41.9	-13.0	-28.9	
3.819	-2.5	H	3.0	36.7	1.0	-38.2	-13.0	-25.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 2 (3MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_QPSK_3MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.5MHz)									
3.703	-9.6	V	3.0	36.8	1.0	-45.4	-13.0	-32.4	
5.555	-6.8	V	3.0	36.3	1.0	-42.1	-13.0	-29.1	
3.703	-6.4	H	3.0	36.8	1.0	-42.2	-13.0	-29.2	
5.555	-8.8	H	3.0	36.3	1.0	-44.1	-13.0	-31.1	
Mid Ch, (1880.0MHz)									
3.760	-6.4	V	3.0	36.8	1.0	-42.2	-13.0	-29.2	
5.640	-8.2	V	3.0	36.3	1.0	-43.5	-13.0	-30.5	
7.520	-18.3	V	3.0	36.6	1.0	-53.9	-13.0	-40.9	
3.760	-1.9	H	3.0	36.8	1.0	-37.7	-13.0	-24.7	
5.640	-19.9	H	3.0	36.3	1.0	-55.2	-13.0	-42.2	
7.520	-17.2	H	3.0	36.6	1.0	-52.8	-13.0	-39.8	
High Ch, (1908.5MHz)									
3.817	-5.6	V	3.0	36.7	1.0	-41.4	-13.0	-28.4	
3.817	-2.1	H	3.0	36.7	1.0	-37.8	-13.0	-24.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 2 (3MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_16QAM_3MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.5MHz)									
3.703	-10.2	V	3.0	36.8	1.0	-46.0	-13.0	-33.0	
5.555	-7.8	V	3.0	36.3	1.0	-43.1	-13.0	-30.1	
3.703	-5.4	H	3.0	36.8	1.0	-41.2	-13.0	-28.2	
5.555	-10.9	H	3.0	36.3	1.0	-46.2	-13.0	-33.2	
Mid Ch, (1880.0MHz)									
3.760	-6.0	V	3.0	36.8	1.0	-41.8	-13.0	-28.8	
5.640	-7.5	V	3.0	36.3	1.0	-42.8	-13.0	-29.8	
7.520	-17.6	V	3.0	36.6	1.0	-53.2	-13.0	-40.2	
3.760	-2.0	H	3.0	36.8	1.0	-37.7	-13.0	-24.7	
5.640	-19.8	H	3.0	36.3	1.0	-55.1	-13.0	-42.1	
7.520	-18.3	H	3.0	36.6	1.0	-53.9	-13.0	-40.9	
High Ch, (1908.5MHz)									
3.817	-3.6	V	3.0	36.7	1.0	-39.3	-13.0	-26.3	
3.817	-2.1	H	3.0	36.7	1.0	-37.8	-13.0	-24.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 2 (5MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_QPSK_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.5MHz)									
3.705	-10.1	V	3.0	36.8	1.0	-45.9	-13.0	-32.9	
5.558	-8.3	V	3.0	36.3	1.0	-43.6	-13.0	-30.6	
3.705	-6.5	H	3.0	36.8	1.0	-42.3	-13.0	-29.3	
5.558	-8.2	H	3.0	36.3	1.0	-43.5	-13.0	-30.5	
Mid Ch, (1880.0MHz)									
3.760	-6.0	V	3.0	36.8	1.0	-41.8	-13.0	-28.8	
5.640	-11.9	V	3.0	36.3	1.0	-47.2	-13.0	-34.2	
7.520	-17.8	V	3.0	36.6	1.0	-53.4	-13.0	-40.4	
3.760	-2.0	H	3.0	36.8	1.0	-37.7	-13.0	-24.7	
5.640	-18.8	H	3.0	36.3	1.0	-54.1	-13.0	-41.1	
7.520	-18.3	H	3.0	36.6	1.0	-53.9	-13.0	-40.9	
High Ch, (1907.5MHz)									
3.815	-5.1	V	3.0	36.7	1.0	-40.8	-13.0	-27.8	
3.815	-2.5	H	3.0	36.7	1.0	-38.2	-13.0	-25.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 2 (5MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_16QAM_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.5MHz)									
3.705	-9.2	V	3.0	36.8	1.0	-45.0	-13.0	-32.0	
5.558	-8.6	V	3.0	36.3	1.0	-43.9	-13.0	-30.9	
3.705	-7.9	H	3.0	36.8	1.0	-43.7	-13.0	-30.7	
5.558	-5.9	H	3.0	36.3	1.0	-41.2	-13.0	-28.2	
Mid Ch, (1880.0MHz)									
3.760	-5.9	V	3.0	36.8	1.0	-41.7	-13.0	-28.7	
5.640	-10.9	V	3.0	36.3	1.0	-46.2	-13.0	-33.2	
7.520	-16.5	V	3.0	36.6	1.0	-52.1	-13.0	-39.1	
3.760	-1.8	H	3.0	36.8	1.0	-37.6	-13.0	-24.6	
5.640	-19.6	H	3.0	36.3	1.0	-54.9	-13.0	-41.9	
7.520	-16.7	H	3.0	36.6	1.0	-52.3	-13.0	-39.3	
High Ch, (1907.5MHz)									
3.815	-4.0	V	3.0	36.7	1.0	-39.7	-13.0	-26.7	
3.815	-2.7	H	3.0	36.7	1.0	-38.4	-13.0	-25.4	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 2 (10MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_QPSK_10MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855.0MHz)									
3.710	-9.5	V	3.0	36.8	1.0	-45.4	-13.0	-32.4	
5.565	-8.2	V	3.0	36.3	1.0	-43.5	-13.0	-30.5	
3.710	-6.1	H	3.0	36.8	1.0	-41.9	-13.0	-28.9	
5.565	-13.1	H	3.0	36.3	1.0	-48.4	-13.0	-35.4	
Mid Ch, (1880.0MHz)									
3.760	-6.2	V	3.0	36.8	1.0	-41.9	-13.0	-28.9	
5.640	-9.4	V	3.0	36.3	1.0	-44.7	-13.0	-31.7	
7.520	-17.8	V	3.0	36.6	1.0	-53.4	-13.0	-40.4	
3.760	-1.7	H	3.0	36.8	1.0	-37.5	-13.0	-24.5	
5.640	-19.1	H	3.0	36.3	1.0	-54.4	-13.0	-41.4	
7.520	-18.7	H	3.0	36.6	1.0	-54.3	-13.0	-41.3	
High Ch, (1905.0MHz)									
3.810	-5.5	V	3.0	36.7	1.0	-41.2	-13.0	-28.2	
3.810	-5.6	H	3.0	36.7	1.0	-41.4	-13.0	-28.4	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 2 (10MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_16QAM_10MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855.0MHz)									
3.710	-9.0	V	3.0	36.8	1.0	-44.8	-13.0	-31.8	
5.565	-8.7	V	3.0	36.3	1.0	-44.0	-13.0	-31.0	
3.710	-7.3	H	3.0	36.8	1.0	-43.1	-13.0	-30.1	
5.565	-15.1	H	3.0	36.3	1.0	-50.4	-13.0	-37.4	
Mid Ch, (1880.0MHz)									
3.760	-6.2	V	3.0	36.8	1.0	-42.0	-13.0	-29.0	
5.640	-8.2	V	3.0	36.3	1.0	-43.5	-13.0	-30.5	
7.520	-16.6	V	3.0	36.6	1.0	-52.2	-13.0	-39.2	
3.760	-2.7	H	3.0	36.8	1.0	-38.4	-13.0	-25.4	
5.640	-20.4	H	3.0	36.3	1.0	-55.7	-13.0	-42.7	
7.520	-18.7	H	3.0	36.6	1.0	-54.3	-13.0	-41.3	
High Ch, (1905.0MHz)									
3.810	-6.1	V	3.0	36.7	1.0	-41.9	-13.0	-28.9	
3.810	-4.1	H	3.0	36.7	1.0	-39.8	-13.0	-26.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 2 (15MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_QPSK_15MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1857.5MHz)									
3.715	-8.9	V	3.0	36.8	1.0	-44.7	-13.0	-31.7	
5.573	-8.8	V	3.0	36.3	1.0	-44.1	-13.0	-31.1	
3.715	-6.6	H	3.0	36.8	1.0	-42.4	-13.0	-29.4	
5.573	-15.6	H	3.0	36.3	1.0	-50.9	-13.0	-37.9	
Mid Ch, (1880.0MHz)									
3.760	-7.0	V	3.0	36.8	1.0	-42.8	-13.0	-29.8	
5.640	-15.1	V	3.0	36.3	1.0	-50.4	-13.0	-37.4	
7.520	-17.5	V	3.0	36.6	1.0	-53.1	-13.0	-40.1	
3.760	-2.0	H	3.0	36.8	1.0	-37.7	-13.0	-24.7	
5.640	-17.6	H	3.0	36.3	1.0	-52.9	-13.0	-39.9	
7.520	-16.6	H	3.0	36.6	1.0	-52.2	-13.0	-39.2	
High Ch, (1902.5MHz)									
3.805	-8.1	V	3.0	36.7	1.0	-43.8	-13.0	-30.8	
3.805	-4.5	H	3.0	36.7	1.0	-40.2	-13.0	-27.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 2 (15MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_16QAM_15MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1857.5MHz)									
3.715	-9.6	V	3.0	36.8	1.0	-45.4	-13.0	-32.4	
5.573	-8.4	V	3.0	36.3	1.0	-43.7	-13.0	-30.7	
3.715	-5.8	H	3.0	36.8	1.0	-41.6	-13.0	-28.6	
5.573	-13.9	H	3.0	36.3	1.0	-49.2	-13.0	-36.2	
Mid Ch, (1880.0MHz)									
3.760	-7.0	V	3.0	36.8	1.0	-42.7	-13.0	-29.7	
5.640	-13.8	V	3.0	36.3	1.0	-49.1	-13.0	-36.1	
7.520	-16.2	V	3.0	36.6	1.0	-51.8	-13.0	-38.8	
3.760	-1.2	H	3.0	36.8	1.0	-36.9	-13.0	-23.9	
5.640	-17.4	H	3.0	36.3	1.0	-52.7	-13.0	-39.7	
7.520	-15.6	H	3.0	36.6	1.0	-51.2	-13.0	-38.2	
High Ch, (1902.5MHz)									
3.805	-7.6	V	3.0	36.7	1.0	-43.4	-13.0	-30.4	
3.805	-4.4	H	3.0	36.7	1.0	-40.1	-13.0	-27.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 2 (20MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_QPSK_20MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860.0MHz)									
3.720	-9.1	V	3.0	36.8	1.0	-44.9	-13.0	-31.9	
5.580	-5.8	V	3.0	36.3	1.0	-41.1	-13.0	-28.1	
3.720	-6.8	H	3.0	36.8	1.0	-42.6	-13.0	-29.6	
5.580	-15.5	H	3.0	36.3	1.0	-50.8	-13.0	-37.8	
Mid Ch, (1880.0MHz)									
3.760	-7.2	V	3.0	36.8	1.0	-43.0	-13.0	-30.0	
5.640	-13.5	V	3.0	36.3	1.0	-48.9	-13.0	-35.9	
7.520	-15.5	V	3.0	36.6	1.0	-51.1	-13.0	-38.1	
3.760	-2.6	H	3.0	36.8	1.0	-38.4	-13.0	-25.4	
5.640	-19.7	H	3.0	36.3	1.0	-55.0	-13.0	-42.0	
7.520	-16.1	H	3.0	36.6	1.0	-51.7	-13.0	-38.7	
High Ch, (1900.0MHz)									
3.800	-0.9	V	3.0	36.7	1.0	-36.6	-13.0	-23.6	
3.800	0.6	H	3.0	36.7	1.0	-35.1	-13.0	-22.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 2 (20MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/24/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 2_16QAM_20MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860.0MHz)									
3.720	-8.4	V	3.0	36.8	1.0	-44.2	-13.0	-31.2	
5.580	-4.5	V	3.0	36.3	1.0	-39.8	-13.0	-26.8	
3.720	-6.6	H	3.0	36.8	1.0	-42.4	-13.0	-29.4	
5.580	-16.1	H	3.0	36.3	1.0	-51.4	-13.0	-38.4	
Mid Ch, (1880.0MHz)									
3.760	-7.4	V	3.0	36.8	1.0	-43.1	-13.0	-30.1	
5.640	-13.8	V	3.0	36.3	1.0	-49.1	-13.0	-36.1	
7.520	-16.1	V	3.0	36.6	1.0	-51.7	-13.0	-38.7	
3.760	-2.1	H	3.0	36.8	1.0	-37.8	-13.0	-24.8	
5.640	-19.8	H	3.0	36.3	1.0	-55.1	-13.0	-42.1	
7.520	-15.1	H	3.0	36.6	1.0	-50.7	-13.0	-37.7	
High Ch, (1900.0MHz)									
3.800	-1.0	V	3.0	36.7	1.0	-36.7	-13.0	-23.7	
3.800	0.6	H	3.0	36.7	1.0	-35.2	-13.0	-22.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

9.2.2. LTE BAND 4**QPSK Band 4 (1.4 MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_QPSK_1.4MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1710.7MHz)									
3.421	-19.0	V	3.0	37.0	1.0	-55.1	-13.0	-42.1	
3.421	-23.8	H	3.0	37.0	1.0	-59.8	-13.0	-46.8	
Mid Ch, (1732.5MHz)									
3.465	-24.5	V	3.0	37.0	1.0	-60.5	-13.0	-47.5	
3.465	-18.7	H	3.0	37.0	1.0	-54.7	-13.0	-41.7	
High Ch, (1754.3MHz)									
3.509	-21.4	V	3.0	37.0	1.0	-57.4	-13.0	-44.4	
7.017	-15.5	V	3.0	36.5	1.0	-51.0	-13.0	-38.0	
3.509	-18.1	H	3.0	37.0	1.0	-54.1	-13.0	-41.1	
7.017	-16.6	H	3.0	36.5	1.0	-52.0	-13.0	-39.0	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_16QAM_1.4MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1710.7MHz)									
3.421	-19.5	V	3.0	37.0	1.0	-55.5	-13.0	-42.5	
3.421	-23.5	H	3.0	37.0	1.0	-59.6	-13.0	-46.6	
Mid Ch, (1732.5MHz)									
3.465	-26.4	V	3.0	37.0	1.0	-62.4	-13.0	-49.4	
3.465	-19.1	H	3.0	37.0	1.0	-55.1	-13.0	-42.1	
High Ch, (1754.3MHz)									
3.509	-21.5	V	3.0	37.0	1.0	-57.4	-13.0	-44.4	
7.017	-14.9	V	3.0	36.5	1.0	-50.4	-13.0	-37.4	
3.509	-18.4	H	3.0	37.0	1.0	-54.3	-13.0	-41.3	
7.017	-15.2	H	3.0	36.5	1.0	-50.7	-13.0	-37.7	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 4 (3MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_QPSK_3MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1711.5MHz)									
3.423	-20.3	V	3.0	37.0	1.0	-56.4	-13.0	-43.4	
3.423	-23.6	H	3.0	37.0	1.0	-59.7	-13.0	-46.7	
Mid Ch, (1732.5MHz)									
3.465	-24.0	V	3.0	37.0	1.0	-60.0	-13.0	-47.0	
3.465	-19.2	H	3.0	37.0	1.0	-55.2	-13.0	-42.2	
High Ch, (1753.5MHz)									
3.507	-23.5	V	3.0	37.0	1.0	-59.5	-13.0	-46.5	
7.014	-15.2	V	3.0	36.5	1.0	-50.7	-13.0	-37.7	
3.507	-19.7	H	3.0	37.0	1.0	-55.7	-13.0	-42.7	
7.014	-14.3	H	3.0	36.5	1.0	-49.8	-13.0	-36.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 4 (3MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_16QAM_3MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1711.5MHz)									
3.423	-19.6	V	3.0	37.0	1.0	-55.6	-13.0	-42.6	
3.423	-22.2	H	3.0	37.0	1.0	-58.2	-13.0	-45.2	
Mid Ch, (1732.5MHz)									
3.465	-23.3	V	3.0	37.0	1.0	-59.3	-13.0	-46.3	
3.465	-18.8	H	3.0	37.0	1.0	-54.8	-13.0	-41.8	
High Ch, (1753.5MHz)									
3.507	-23.9	V	3.0	37.0	1.0	-59.8	-13.0	-46.8	
7.014	-14.4	V	3.0	36.5	1.0	-49.9	-13.0	-36.9	
3.507	-18.6	H	3.0	37.0	1.0	-54.5	-13.0	-41.5	
7.014	-16.1	H	3.0	36.5	1.0	-51.6	-13.0	-38.6	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 4 (5MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_QPSK_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5MHz)									
3.425	-20.4	V	3.0	37.0	1.0	-56.4	-13.0	-43.4	
3.425	-24.6	H	3.0	37.0	1.0	-60.6	-13.0	-47.6	
Mid Ch, (1732.5MHz)									
3.465	-24.5	V	3.0	37.0	1.0	-60.5	-13.0	-47.5	
3.465	-19.6	H	3.0	37.0	1.0	-55.6	-13.0	-42.6	
High Ch, (1752.5MHz)									
3.505	-25.4	V	3.0	37.0	1.0	-61.3	-13.0	-48.3	
7.010	-16.4	V	3.0	36.5	1.0	-51.9	-13.0	-38.9	
3.505	-22.3	H	3.0	37.0	1.0	-58.3	-13.0	-45.3	
7.010	-17.2	H	3.0	36.5	1.0	-52.7	-13.0	-39.7	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 4 (5MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_16QAM_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5MHz)									
3.425	-19.3	V	3.0	37.0	1.0	-55.4	-13.0	-42.4	
3.425	-22.9	H	3.0	37.0	1.0	-58.9	-13.0	-45.9	
Mid Ch, (1732.5MHz)									
3.465	-24.7	V	3.0	37.0	1.0	-60.7	-13.0	-47.7	
3.465	-19.2	H	3.0	37.0	1.0	-55.2	-13.0	-42.2	
High Ch, (1752.5MHz)									
3.505	-24.4	V	3.0	37.0	1.0	-60.4	-13.0	-47.4	
7.010	-15.8	V	3.0	36.5	1.0	-51.3	-13.0	-38.3	
3.505	-19.8	H	3.0	37.0	1.0	-55.8	-13.0	-42.8	
7.010	-17.2	H	3.0	36.5	1.0	-52.7	-13.0	-39.7	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 4 (10MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_QPSK_10MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715.0MHz)									
3.430	-18.7	V	3.0	37.0	1.0	-54.8	-13.0	-41.8	
3.430	-23.3	H	3.0	37.0	1.0	-59.3	-13.0	-46.3	
Mid Ch, (1732.5MHz)									
3.465	-24.0	V	3.0	37.0	1.0	-60.0	-13.0	-47.0	
3.465	-19.4	H	3.0	37.0	1.0	-55.4	-13.0	-42.4	
High Ch, (1750.0MHz)									
3.500	-22.5	V	3.0	37.0	1.0	-58.4	-13.0	-45.4	
7.000	-18.1	V	3.0	36.5	1.0	-53.5	-13.0	-40.5	
3.500	-22.5	H	3.0	37.0	1.0	-58.5	-13.0	-45.5	
7.000	-17.7	H	3.0	36.5	1.0	-53.2	-13.0	-40.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 4 (10MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_16QAM_10MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715.0MHz)									
3.430	-18.4	V	3.0	37.0	1.0	-54.4	-13.0	-41.4	
3.430	-22.9	H	3.0	37.0	1.0	-58.9	-13.0	-45.9	
Mid Ch, (1732.5MHz)									
3.465	-24.0	V	3.0	37.0	1.0	-60.0	-13.0	-47.0	
3.465	-18.6	H	3.0	37.0	1.0	-54.6	-13.0	-41.6	
High Ch, (1750.0MHz)									
3.500	-25.2	V	3.0	37.0	1.0	-61.1	-13.0	-48.1	
7.000	-15.8	V	3.0	36.5	1.0	-51.3	-13.0	-38.3	
3.500	-22.1	H	3.0	37.0	1.0	-58.1	-13.0	-45.1	
7.000	-16.7	H	3.0	36.5	1.0	-52.1	-13.0	-39.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 4 (15MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_QPSK_15MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1717.5MHz)									
3.435	-19.3	V	3.0	37.0	1.0	-55.3	-13.0	-42.3	
3.435	-23.1	H	3.0	37.0	1.0	-59.1	-13.0	-46.1	
Mid Ch, (1732.5MHz)									
3.465	-24.1	V	3.0	37.0	1.0	-60.1	-13.0	-47.1	
3.465	-19.9	H	3.0	37.0	1.0	-55.9	-13.0	-42.9	
High Ch, (1747.5MHz)									
3.495	-23.9	V	3.0	37.0	1.0	-59.9	-13.0	-46.9	
6.990	-17.5	V	3.0	36.5	1.0	-52.9	-13.0	-39.9	
3.495	-26.1	H	3.0	37.0	1.0	-62.1	-13.0	-49.1	
6.990	-18.4	H	3.0	36.5	1.0	-53.8	-13.0	-40.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 4 (15MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_16QAM_15MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1717.5MHz)									
3.435	-19.1	V	3.0	37.0	1.0	-55.1	-13.0	-42.1	
3.435	-22.3	H	3.0	37.0	1.0	-58.3	-13.0	-45.3	
Mid Ch, (1732.5MHz)									
3.465	-23.6	V	3.0	37.0	1.0	-59.6	-13.0	-46.6	
3.465	-17.9	H	3.0	37.0	1.0	-53.9	-13.0	-40.9	
High Ch, (1747.5MHz)									
3.495	-23.5	V	3.0	37.0	1.0	-59.5	-13.0	-46.5	
6.990	-16.7	V	3.0	36.5	1.0	-52.2	-13.0	-39.2	
3.495	-25.2	H	3.0	37.0	1.0	-61.2	-13.0	-48.2	
6.990	-18.3	H	3.0	36.5	1.0	-53.8	-13.0	-40.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 4 (20MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_QPSK_20MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1720.0MHz)									
3.440	-19.5	V	3.0	37.0	1.0	-55.5	-13.0	-42.5	
3.440	-23.2	H	3.0	37.0	1.0	-59.2	-13.0	-46.2	
Mid Ch, (1732.5MHz)									
3.465	-1.4	V	3.0	37.0	10.0	-28.4	-13.0	-15.4	
3.465	-23.6	V	3.0	37.0	1.0	-59.6	-13.0	-46.6	
3.465	-20.0	H	3.0	37.0	1.0	-56.0	-13.0	-43.0	
High Ch, (1745.0MHz)									
3.490	-21.1	V	3.0	37.0	1.0	-57.1	-13.0	-44.1	
6.980	-19.0	V	3.0	36.5	1.0	-54.4	-13.0	-41.4	
3.490	-27.5	H	3.0	37.0	1.0	-63.5	-13.0	-50.5	
6.980	-18.2	H	3.0	36.5	1.0	-53.7	-13.0	-40.7	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 4 (20MHz BANDWIDTH)

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 4_16QAM_20MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1720.0MHz)									
3.440	-19.0	V	3.0	37.0	1.0	-55.0	-13.0	-42.0	
3.440	-22.9	H	3.0	37.0	1.0	-58.9	-13.0	-45.9	
Mid Ch, (1732.5MHz)									
3.465	-23.3	V	3.0	37.0	1.0	-59.3	-13.0	-46.3	
3.465	-20.6	H	3.0	37.0	1.0	-56.6	-13.0	-43.6	
High Ch, (1745.0MHz)									
3.490	-20.4	V	3.0	37.0	1.0	-56.4	-13.0	-43.4	
6.980	-17.1	V	3.0	36.5	1.0	-52.5	-13.0	-39.5	
3.490	-26.4	H	3.0	37.0	1.0	-62.3	-13.0	-49.3	
6.980	-18.8	H	3.0	36.5	1.0	-54.3	-13.0	-41.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

9.2.3. LTE BAND 5**QPSK Band 5 (1.4 MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_QPSK_1.4MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-19.1	V	3.0	38.2	10.0	-47.2	-13.0	-34.2	
2.474	-17.8	V	3.0	37.5	10.0	-45.3	-13.0	-32.3	
1.649	-17.4	H	3.0	38.2	10.0	-45.6	-13.0	-32.6	
2.474	-23.4	H	3.0	37.5	10.0	-50.9	-13.0	-37.9	
Mid Ch, (836.5MHz)									
1.673	-17.0	V	3.0	38.1	10.0	-45.1	-13.0	-32.1	
2.510	-17.6	V	3.0	37.5	10.0	-45.1	-13.0	-32.1	
1.673	-16.3	H	3.0	38.1	10.0	-44.5	-13.0	-31.5	
2.510	-21.0	H	3.0	37.5	10.0	-48.5	-13.0	-35.5	
High Ch, 848.3MHz)									
1.697	-18.0	V	3.0	38.1	10.0	-46.1	-13.0	-33.1	
2.545	-20.7	V	3.0	37.5	10.0	-48.1	-13.0	-35.1	
1.697	-14.3	H	3.0	38.1	10.0	-42.4	-13.0	-29.4	
2.545	-23.6	H	3.0	37.5	10.0	-51.0	-13.0	-38.0	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 5 (1.4 MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_16QAM_1.4MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-17.7	V	3.0	38.2	10.0	-45.8	-13.0	-32.8	
2.474	-18.4	V	3.0	37.5	10.0	-45.8	-13.0	-32.8	
1.649	-16.8	H	3.0	38.2	10.0	-45.0	-13.0	-32.0	
2.474	-23.0	H	3.0	37.5	10.0	-50.5	-13.0	-37.5	
Mid Ch, (836.5MHz)									
1.673	-16.3	V	3.0	38.1	10.0	-44.4	-13.0	-31.4	
2.510	-15.8	V	3.0	37.5	10.0	-43.3	-13.0	-30.3	
1.673	-16.4	H	3.0	38.1	10.0	-44.5	-13.0	-31.5	
2.510	-21.2	H	3.0	37.5	10.0	-48.7	-13.0	-35.7	
High Ch, 848.3MHz									
1.697	-16.8	V	3.0	38.1	10.0	-44.8	-13.0	-31.8	
2.545	-20.6	V	3.0	37.5	10.0	-48.0	-13.0	-35.0	
1.697	-14.8	H	3.0	38.1	10.0	-42.9	-13.0	-29.9	
2.545	-25.9	H	3.0	37.5	10.0	-53.3	-13.0	-40.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 5 (3MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_QPSK_3MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-18.4	V	3.0	38.2	10.0	-46.6	-13.0	-33.6	
2.477	-17.8	V	3.0	37.5	10.0	-45.3	-13.0	-32.3	
1.651	-17.5	H	3.0	38.2	10.0	-45.7	-13.0	-32.7	
2.477	-22.9	H	3.0	37.5	10.0	-50.4	-13.0	-37.4	
Mid Ch, (836.5MHz)									
1.673	-16.4	V	3.0	38.1	10.0	-44.5	-13.0	-31.5	
2.510	-17.3	V	3.0	37.5	10.0	-44.8	-13.0	-31.8	
1.673	-16.1	H	3.0	38.1	10.0	-44.2	-13.0	-31.2	
2.510	-22.6	H	3.0	37.5	10.0	-50.0	-13.0	-37.0	
High Ch, (847.5MHz)									
1.695	-14.7	V	3.0	38.1	10.0	-42.8	-13.0	-29.8	
2.543	-15.0	V	3.0	37.5	10.0	-42.4	-13.0	-29.4	
1.695	-20.0	H	3.0	38.1	10.0	-48.1	-13.0	-35.1	
2.543	-22.5	H	3.0	37.5	10.0	-50.0	-13.0	-37.0	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 5 (3MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_16QAM_3MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-18.8	V	3.0	38.2	10.0	-47.0	-13.0	-34.0	
2.477	-18.4	V	3.0	37.5	10.0	-45.9	-13.0	-32.9	
1.651	-17.0	H	3.0	38.2	10.0	-45.1	-13.0	-32.1	
2.477	-21.7	H	3.0	37.5	10.0	-49.1	-13.0	-36.1	
Mid Ch, (836.5MHz)									
1.673	-16.2	V	3.0	38.1	10.0	-44.3	-13.0	-31.3	
2.510	-17.2	V	3.0	37.5	10.0	-44.6	-13.0	-31.6	
1.673	-15.5	H	3.0	38.1	10.0	-43.6	-13.0	-30.6	
2.510	-24.8	H	3.0	37.5	10.0	-52.3	-13.0	-39.3	
High Ch, (847.5MHz)									
1.695	-19.9	V	3.0	38.1	10.0	-48.0	-13.0	-35.0	
2.543	-15.3	V	3.0	37.5	10.0	-42.8	-13.0	-29.8	
1.695	-20.3	H	3.0	38.1	10.0	-48.4	-13.0	-35.4	
2.543	-22.0	H	3.0	37.5	10.0	-49.4	-13.0	-36.4	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 5 (5MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_QPSK_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.653	-18.0	V	3.0	38.1	10.0	-46.1	-13.0	-33.1	
2.480	-19.1	V	3.0	37.5	10.0	-46.6	-13.0	-33.6	
1.653	-17.5	H	3.0	38.1	10.0	-45.6	-13.0	-32.6	
2.480	-22.5	H	3.0	37.5	10.0	-50.0	-13.0	-37.0	
Mid Ch, (836.5MHz)									
1.673	-16.6	V	3.0	38.1	10.0	-44.7	-13.0	-31.7	
2.510	-20.5	V	3.0	37.5	10.0	-48.0	-13.0	-35.0	
1.673	-16.4	H	3.0	38.1	10.0	-44.6	-13.0	-31.6	
2.510	-23.3	H	3.0	37.5	10.0	-50.7	-13.0	-37.7	
High Ch, (846.5MHz)									
1.693	-20.4	V	3.0	38.1	10.0	-48.5	-13.0	-35.5	
2.540	-17.1	V	3.0	37.5	10.0	-44.5	-13.0	-31.5	
1.693	-19.2	H	3.0	38.1	10.0	-47.3	-13.0	-34.3	
2.540	-23.3	H	3.0	37.5	10.0	-50.8	-13.0	-37.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 5 (5MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_16QAM_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.653	-17.9	V	3.0	38.1	10.0	-46.0	-13.0	-33.0	
2.480	-18.8	V	3.0	37.5	10.0	-46.3	-13.0	-33.3	
1.653	-16.9	H	3.0	38.1	10.0	-45.0	-13.0	-32.0	
2.480	-22.7	H	3.0	37.5	10.0	-50.2	-13.0	-37.2	
Mid Ch, (836.5MHz)									
1.673	-16.4	V	3.0	38.1	10.0	-44.5	-13.0	-31.5	
2.510	-21.8	V	3.0	37.5	10.0	-49.2	-13.0	-36.2	
1.673	-16.0	H	3.0	38.1	10.0	-44.1	-13.0	-31.1	
2.510	-24.1	H	3.0	37.5	10.0	-51.5	-13.0	-38.5	
High Ch, (846.5MHz)									
1.693	-19.7	V	3.0	38.1	10.0	-47.8	-13.0	-34.8	
2.540	-17.1	V	3.0	37.5	10.0	-44.5	-13.0	-31.5	
1.693	-18.5	H	3.0	38.1	10.0	-46.6	-13.0	-33.6	
2.540	-22.9	H	3.0	37.5	10.0	-50.4	-13.0	-37.4	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

QPSK Band 5 (10MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_QPSK_10MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829.0MHz)									
1.658	-18.2	V	3.0	38.1	10.0	-46.4	-13.0	-33.4	
2.487	-20.5	V	3.0	37.5	10.0	-48.0	-13.0	-35.0	
1.658	-17.3	H	3.0	38.1	10.0	-45.4	-13.0	-32.4	
2.487	-23.0	H	3.0	37.5	10.0	-50.4	-13.0	-37.4	
Mid Ch, (836.5MHz)									
1.673	-18.4	V	3.0	38.1	10.0	-46.5	-13.0	-33.5	
2.510	-15.0	V	3.0	37.5	10.0	-42.4	-13.0	-29.4	
1.673	-17.2	H	3.0	38.1	10.0	-45.4	-13.0	-32.4	
2.510	-22.5	H	3.0	37.5	10.0	-49.9	-13.0	-36.9	
High Ch, (844.0MHz)									
1.688	-18.2	V	3.0	38.1	10.0	-46.3	-13.0	-33.3	
2.532	-20.9	V	3.0	37.5	10.0	-48.4	-13.0	-35.4	
1.688	-18.8	H	3.0	38.1	10.0	-46.9	-13.0	-33.9	
2.532	-24.9	H	3.0	37.5	10.0	-52.3	-13.0	-39.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 5 (10MHz BANDWIDTH)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/25/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 5_16QAM_10MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber D		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829.0MHz)									
1.658	-18.1	V	3.0	38.1	10.0	-46.2	-13.0	-33.2	
2.487	-19.9	V	3.0	37.5	10.0	-47.3	-13.0	-34.3	
1.658	-16.7	H	3.0	38.1	10.0	-44.9	-13.0	-31.9	
2.487	-23.7	H	3.0	37.5	10.0	-51.2	-13.0	-38.2	
Mid Ch, (836.5MHz)									
1.673	-17.5	V	3.0	38.1	10.0	-45.7	-13.0	-32.7	
2.510	-15.0	V	3.0	37.5	10.0	-42.5	-13.0	-29.5	
1.673	-16.0	H	3.0	38.1	10.0	-44.2	-13.0	-31.2	
2.510	-22.6	H	3.0	37.5	10.0	-50.1	-13.0	-37.1	
High Ch, (844.0MHz)									
1.688	-18.3	V	3.0	38.1	10.0	-46.4	-13.0	-33.4	
2.532	-21.0	V	3.0	37.5	10.0	-48.4	-13.0	-35.4	
1.688	-17.6	H	3.0	38.1	10.0	-45.7	-13.0	-32.7	
2.532	-25.5	H	3.0	37.5	10.0	-53.0	-13.0	-40.0	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

9.2.4. LTE BAND 17**QPSK Band 17 (5MHz BANDWIDTH)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Microsoft							
Project #:		13U15414							
Date:		10/28/13							
Test Engineer:		Tina Chu							
Configuration:		LTE BAND 17_QPSK_5MHz BW							
Mode:									
Chamber		Pre-amplifier		Filter		Limit			
3m Chamber E		T144 8449B		Filter 1		Part 27			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.413	9.7	V	3.0	38.6	1.0	-27.9	-13.0	-14.9	
2.120	-5.6	V	3.0	37.6	1.0	-42.3	-13.0	-29.3	
2.826	-5.0	V	3.0	37.4	1.0	-41.4	-13.0	-28.4	
3.533	-7.3	V	3.0	36.9	1.0	-43.2	-13.0	-30.2	
4.239	-11.5	V	3.0	36.5	1.0	-47.0	-13.0	-34.0	
1.413	0.0	H	3.0	38.6	1.0	-37.6	-13.0	-24.6	
2.120	-13.8	H	3.0	37.6	1.0	-50.4	-13.0	-37.4	
2.826	-13.5	H	3.0	37.4	1.0	-49.9	-13.0	-36.9	
3.533	-4.7	H	3.0	36.9	1.0	-40.6	-13.0	-27.6	
4.239	-11.0	H	3.0	36.5	1.0	-46.5	-13.0	-33.5	
Mid Ch, (711.0MHz)									
1.422	12.9	V	3.0	38.5	1.0	-24.7	-13.0	-11.7	
2.133	-16.4	V	3.0	37.6	1.0	-53.0	-13.0	-40.0	
2.844	-7.4	V	3.0	37.4	1.0	-43.8	-13.0	-30.8	
3.555	-8.0	V	3.0	36.9	1.0	-43.9	-13.0	-30.9	
4.266	-16.3	V	3.0	36.5	1.0	-51.8	-13.0	-38.8	
1.422	4.1	H	3.0	38.5	1.0	-33.5	-13.0	-20.5	
2.133	-8.4	H	3.0	37.6	1.0	-45.0	-13.0	-32.0	
2.844	-19.5	H	3.0	37.4	1.0	-55.9	-13.0	-42.9	
3.555	-9.7	H	3.0	36.9	1.0	-45.7	-13.0	-32.7	
4.266	-14.8	H	3.0	36.5	1.0	-50.3	-13.0	-37.3	
High Ch, (713.5MHz)									
1.427	8.2	V	3.0	38.5	1.0	-29.3	-13.0	-16.3	
2.141	-0.3	V	3.0	37.6	1.0	-37.0	-13.0	-24.0	
2.854	-1.2	V	3.0	37.4	1.0	-37.6	-13.0	-24.6	
3.568	-5.9	V	3.0	36.9	1.0	-41.8	-13.0	-28.8	
4.281	-9.3	V	3.0	36.5	1.0	-44.8	-13.0	-31.8	
1.427	3.5	H	3.0	38.5	1.0	-34.0	-13.0	-21.0	
2.141	-8.6	H	3.0	37.6	1.0	-45.2	-13.0	-32.2	
2.854	-10.2	H	3.0	37.4	1.0	-46.6	-13.0	-33.6	
3.568	-3.1	H	3.0	36.9	1.0	-39.0	-13.0	-26.0	
4.281	-12.6	H	3.0	36.5	1.0	-48.1	-13.0	-35.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

16QAM Band 17 (5MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Microsoft
 Project #: 13U15414
 Date: 10/28/13
 Test Engineer: Tina Chu
 Configuration: LTE BAND 17_16QAM_5MHz BW
 Mode:

Chamber	Pre-amplifier	Filter	Limit
3m Chamber E	T144 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.413	9.1	V	3.0	38.6	1.0	-28.5	-13.0	-15.5	
2.120	-5.9	V	3.0	37.6	1.0	-42.5	-13.0	-29.5	
2.826	-5.5	V	3.0	37.4	1.0	-41.8	-13.0	-28.8	
3.533	-7.6	V	3.0	36.9	1.0	-43.5	-13.0	-30.5	
4.239	-11.1	V	3.0	36.5	1.0	-46.6	-13.0	-33.6	
1.413	-0.9	H	3.0	38.6	1.0	-38.5	-13.0	-25.5	
2.120	-13.8	H	3.0	37.6	1.0	-50.5	-13.0	-37.5	
2.826	-14.1	H	3.0	37.4	1.0	-50.5	-13.0	-37.5	
3.533	-4.0	H	3.0	36.9	1.0	-39.9	-13.0	-26.9	
4.239	-10.5	H	3.0	36.5	1.0	-46.0	-13.0	-33.0	
Mid Ch, (711.0MHz)									
1.422	12.5	V	3.0	38.5	1.0	-25.1	-13.0	-12.1	
2.133	-16.5	V	3.0	37.6	1.0	-53.1	-13.0	-40.1	
2.844	-8.0	V	3.0	37.4	1.0	-44.4	-13.0	-31.4	
3.555	-7.1	V	3.0	36.9	1.0	-43.0	-13.0	-30.0	
4.266	-14.2	V	3.0	36.5	1.0	-49.7	-13.0	-36.7	
1.422	3.8	H	3.0	38.5	1.0	-33.8	-13.0	-20.8	
2.133	-8.8	H	3.0	37.6	1.0	-45.4	-13.0	-32.4	
2.844	-20.0	H	3.0	37.4	1.0	-56.4	-13.0	-43.4	
3.555	-9.6	H	3.0	36.9	1.0	-45.5	-13.0	-32.5	
4.266	-14.8	H	3.0	36.5	1.0	-50.3	-13.0	-37.3	
High Ch, (713.5MHz)									
1.427	7.9	V	3.0	38.5	1.0	-29.6	-13.0	-16.6	
2.141	-1.2	V	3.0	37.6	1.0	-37.8	-13.0	-24.8	
2.854	-2.1	V	3.0	37.4	1.0	-38.5	-13.0	-25.5	
3.568	-5.9	V	3.0	36.9	1.0	-41.8	-13.0	-28.8	
4.281	-10.6	V	3.0	36.5	1.0	-46.1	-13.0	-33.1	
1.427	3.1	H	3.0	38.5	1.0	-34.4	-13.0	-21.4	
2.141	-9.4	H	3.0	37.6	1.0	-46.0	-13.0	-33.0	
2.854	-10.5	H	3.0	37.4	1.0	-46.9	-13.0	-33.9	
3.568	-3.1	H	3.0	36.9	1.0	-39.1	-13.0	-26.1	
4.281	-12.2	H	3.0	36.5	1.0	-47.7	-13.0	-34.7	

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

QPSK Band 17 (10MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Microsoft
 Project #: 13U15414
 Date: 10/28/13
 Test Engineer: Tina Chu
 Configuration: LTE BAND 17_QPSK_10MHz BW
 Mode:

Chamber	Pre-amplifier	Filter	Limit
3m Chamber E	T144 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709.0MHz)									
1.418	9.9	V	3.0	38.6	1.0	-27.6	-13.0	-14.6	
2.127	-5.8	V	3.0	37.6	1.0	-42.4	-13.0	-29.4	
2.836	-4.4	V	3.0	37.4	1.0	-40.8	-13.0	-27.8	
3.545	-6.5	V	3.0	36.9	1.0	-42.5	-13.0	-29.5	
4.254	-12.1	V	3.0	36.5	1.0	-47.6	-13.0	-34.6	
1.418	-0.2	H	3.0	38.6	1.0	-37.7	-13.0	-24.7	
2.127	-14.5	H	3.0	37.6	1.0	-51.2	-13.0	-38.2	
2.836	-13.0	H	3.0	37.4	1.0	-49.3	-13.0	-36.3	
3.545	-4.7	H	3.0	36.9	1.0	-40.7	-13.0	-27.7	
4.254	-11.4	H	3.0	36.5	1.0	-46.9	-13.0	-33.9	
Mid Ch, (710.0MHz)									
1.420	9.9	V	3.0	38.5	1.0	-27.7	-13.0	-14.7	
2.130	-7.6	V	3.0	37.6	1.0	-44.2	-13.0	-31.2	
2.840	-3.5	V	3.0	37.4	1.0	-39.9	-13.0	-26.9	
3.550	-8.5	V	3.0	36.9	1.0	-44.4	-13.0	-31.4	
4.260	-17.4	V	3.0	36.5	1.0	-52.9	-13.0	-39.9	
1.420	0.8	H	3.0	38.5	1.0	-36.8	-13.0	-23.8	
2.130	-6.2	H	3.0	37.6	1.0	-42.8	-13.0	-29.8	
2.840	-12.7	H	3.0	37.4	1.0	-49.1	-13.0	-36.1	
3.550	-8.4	H	3.0	36.9	1.0	-44.3	-13.0	-31.3	
4.260	-13.5	H	3.0	36.5	1.0	-49.0	-13.0	-36.0	
High Ch, (711.0MHz)									
1.422	10.4	V	3.0	38.5	1.0	-27.2	-13.0	-14.2	
2.133	5.2	V	3.0	37.6	1.0	-31.4	-13.0	-18.4	
2.844	-4.3	V	3.0	37.4	1.0	-40.7	-13.0	-27.7	
3.555	-9.1	V	3.0	36.9	1.0	-45.0	-13.0	-32.0	
4.266	-16.6	V	3.0	36.5	1.0	-52.1	-13.0	-39.1	
1.422	1.0	H	3.0	38.5	1.0	-36.6	-13.0	-23.6	
2.133	-5.6	H	3.0	37.6	1.0	-42.2	-13.0	-29.2	
2.844	-16.0	H	3.0	37.4	1.0	-52.4	-13.0	-39.4	
3.555	-8.9	H	3.0	36.9	1.0	-44.8	-13.0	-31.8	
4.266	-15.8	H	3.0	36.5	1.0	-51.3	-13.0	-38.3	

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (10MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Microsoft
 Project #: 13U15414
 Date: 10/28/13
 Test Engineer: Tina Chu
 Configuration: LTE BAND 17_16QAM_10MHz BW
 Mode:

Chamber	Pre-amplifier	Filter	Limit
3m Chamber E	T144 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709.0MHz)									
1.418	9.3	V	3.0	38.6	1.0	-28.2	-13.0	-15.2	
2.127	-6.0	V	3.0	37.6	1.0	-42.6	-13.0	-29.6	
2.836	-5.1	V	3.0	37.4	1.0	-41.5	-13.0	-28.5	
3.545	-5.9	V	3.0	36.9	1.0	-41.8	-13.0	-28.8	
4.254	-11.0	V	3.0	36.5	1.0	-46.5	-13.0	-33.5	
1.418	-1.4	H	3.0	38.6	1.0	-38.9	-13.0	-25.9	
2.127	-14.9	H	3.0	37.6	1.0	-51.5	-13.0	-38.5	
2.836	-13.7	H	3.0	37.4	1.0	-50.1	-13.0	-37.1	
3.545	-4.1	H	3.0	36.9	1.0	-40.1	-13.0	-27.1	
4.254	-11.5	H	3.0	36.5	1.0	-47.0	-13.0	-34.0	
Mid Ch, (710.0MHz)									
1.420	9.6	V	3.0	38.5	1.0	-28.0	-13.0	-15.0	
2.130	-7.5	V	3.0	37.6	1.0	-44.2	-13.0	-31.2	
2.840	-3.5	V	3.0	37.4	1.0	-39.9	-13.0	-26.9	
3.550	-8.7	V	3.0	36.9	1.0	-44.7	-13.0	-31.7	
4.260	-17.1	V	3.0	36.5	1.0	-52.6	-13.0	-39.6	
1.420	0.5	H	3.0	38.5	1.0	-37.1	-13.0	-24.1	
2.130	-6.7	H	3.0	37.6	1.0	-43.4	-13.0	-30.4	
2.840	-13.4	H	3.0	37.4	1.0	-49.8	-13.0	-36.8	
3.550	-7.7	H	3.0	36.9	1.0	-43.7	-13.0	-30.7	
4.260	-13.9	H	3.0	36.5	1.0	-49.4	-13.0	-36.4	
High Ch, (711.0MHz)									
1.422	9.6	V	3.0	38.5	1.0	-28.0	-13.0	-15.0	
2.133	4.2	V	3.0	37.6	1.0	-32.4	-13.0	-19.4	
2.844	-4.8	V	3.0	37.4	1.0	-41.2	-13.0	-28.2	
3.555	-8.6	V	3.0	36.9	1.0	-44.5	-13.0	-31.5	
4.266	-15.4	V	3.0	36.5	1.0	-50.9	-13.0	-37.9	
1.422	0.3	H	3.0	38.5	1.0	-37.3	-13.0	-24.3	
2.133	-4.5	H	3.0	37.6	1.0	-41.1	-13.0	-28.1	
2.844	-16.4	H	3.0	37.4	1.0	-52.8	-13.0	-39.8	
3.555	-6.2	H	3.0	36.9	1.0	-42.2	-13.0	-29.2	
4.266	-15.8	H	3.0	36.5	1.0	-51.4	-13.0	-38.4	

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.