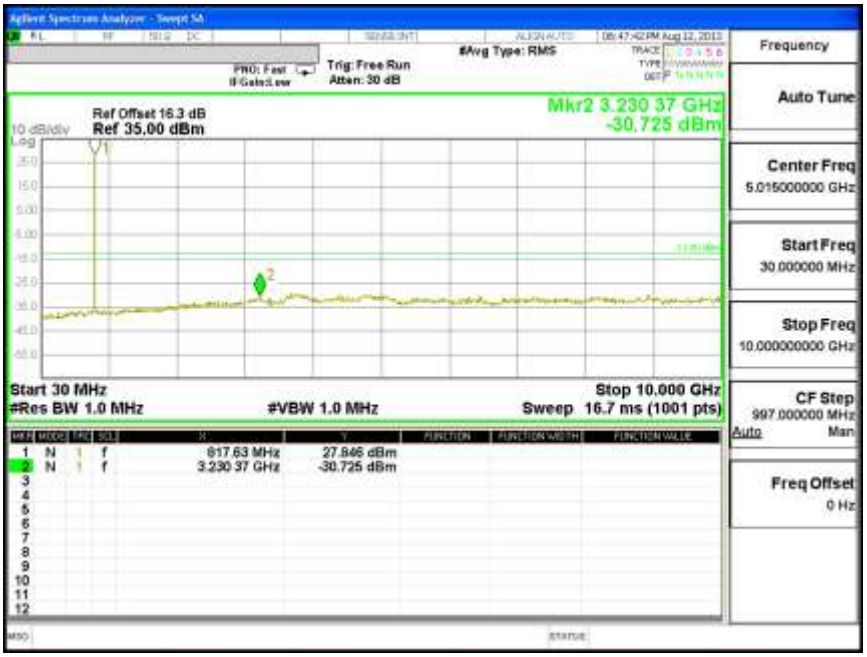
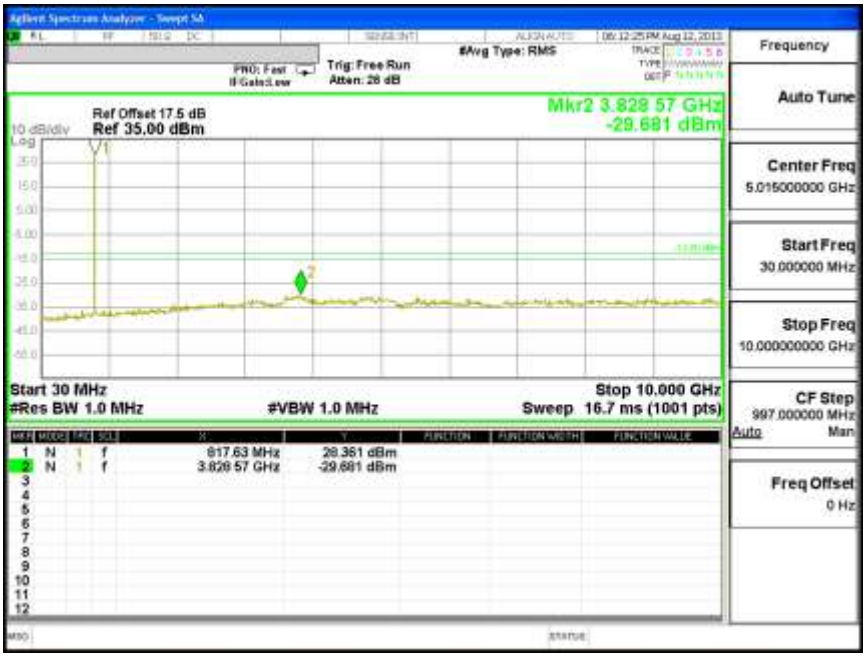
HIGH, RB1-0, 30 TO 10000 MHz

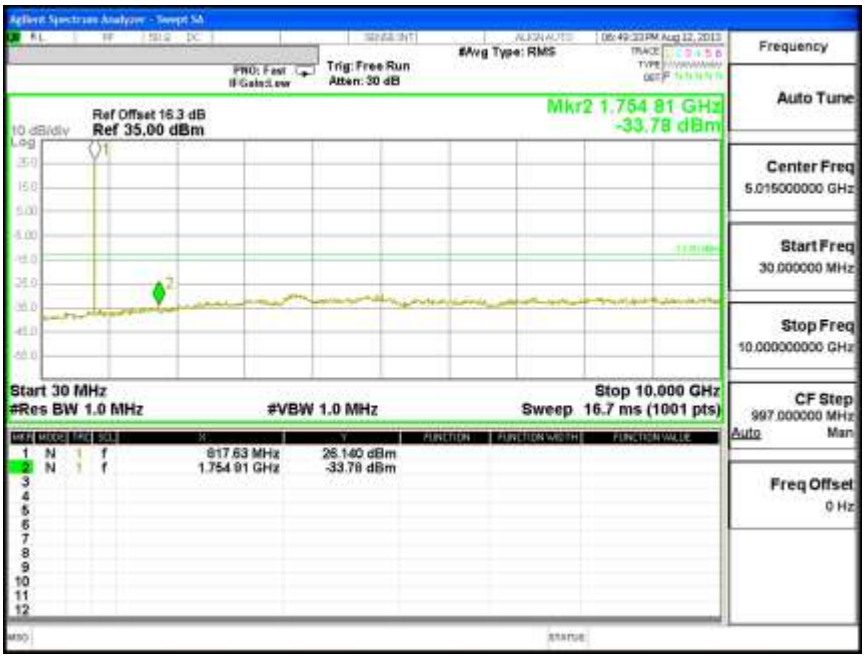


LTE 16QAM

LOW, RB1-0, 30 TO 10000 MHz



MID, RB1-0, 30 TO 10000 MHz



HIGH, RB1-0, 30 TO 10000 MHz

8.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

§22.355 & RSS-132 4.3 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

RSS-133 6.3 - 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°C
- Voltage =low voltage, 3.4VDC, Normal, 3.8VDC and High voltage, 4.3VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC 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 +50ºC 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 13
- LTE Band 17
- LTE Band 25
- LTE Band 26

RESULTS

See the following pages.

LTE BAND 2, QPSK – 1880.0 MHz

Reference Frequency: LTE Band 2_1879.999974 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999958	0.009	2.5
3.80	40	1879.999971	0.002	2.5
3.80	30	1879.999972	0.001	2.5
3.80	***20***	***1879.999974***	***0***	2.5
3.80	10	1879.999978	-0.002	2.5
3.80	0	1879.999981	-0.004	2.5
3.80	-10	1879.999983	-0.005	2.5
3.80	-20	1879.999982	-0.004	2.5
3.80	-30	1879.999987	-0.007	2.5

Reference Frequency: LTE Band 2_ Mid Channel 1880.000009 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1879.999974***	***0***	***2.5***
4.20	20	1879.999969	*0.003*	2.5
3.40	20	1879.999978	*-0.002*	2.5
End Voltage(3.3)	20	1879.999978	*-0.002*	2.5

LTE BAND 2, 16QAM – 1880.0 MHz

Reference Frequency: LTE Band 2_1879.999975 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999978	-0.002	2.5
3.80	40	1879.999971	0.002	2.5
3.80	30	1879.999974	0.001	2.5
3.80	***20***	***1879.999975***	***0***	2.5
3.80	10	1879.999972	0.002	2.5
3.80	0	1879.999981	-0.003	2.5
3.80	-10	1879.999979	-0.002	2.5
3.80	-20	1879.999978	-0.001	2.5
3.80	-30	1879.999977	-0.001	2.5

Reference Frequency: LTE Band 2_Mid Channel 1879.999984 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1879.999975***	***0***	***2.5***
4.20	20	1879.999972	*0.002*	2.5
3.40	20	1879.999987	*-0.006*	2.5
End Voltage(3.2)	20	1879.999987	*-0.006*	2.5

LTE BAND 4 – 1732.5 MHz QPSK

Reference Frequency: LTE Band 4_Mid Channel 1732.5000078MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1732.500018	-0.0059	2.5
3.80	40	1732.500019	-0.0065	2.5
3.80	30	1732.500018	-0.0059	2.5
3.80	***20***	***1732.5000078***	***0***	2.5
3.80	10	*1732.500018*	-0.0059	2.5
3.80	0	*1732.500017*	-0.0053	2.5
3.80	-10	1732.500021	-0.0076	2.5
3.80	-20	*1732.500021*	-0.0076	2.5
3.80	-30	1732.500020	-0.0070	2.5

Reference Frequency: LTE Band 4_Mid Channel 1732.500011 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1732.5000078***	***0***	***2.5***
4.20	20	1732.5000085	*-0.0004*	2.5
3.40	20	1732.500009	*-0.0006*	2.5
End Volt(3.1)	20	1732.500009	*-0.0006*	2.5

LTE BAND 4 – 1732.5 MHZ, 16QAM

Reference Frequency: LTE Band 4_Mid Channle 1732.500009 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1732.500015	-0.0035	2.5
3.80	40	1732.500016	-0.0040	2.5
3.80	30	1732.500017	-0.0046	2.5
3.80	***20***	***1732.500009***	***0***	2.5
3.80	10	1732.500016	-0.0040	2.5
3.80	0	1732.500014	-0.0029	2.5
3.80	-10	1732.500018	-0.0052	2.5
3.80	-20	1732.500017	-0.0046	2.5
3.80	-30	1732.500019	-0.0058	2.5

Reference Frequency: LTE Band 4_Mid Channel 1732.500009MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1732.500009***	***0***	***2.5***
4.20	20	1732.500018	*-0.0052*	2.5
3.40	20	1732.500016	*-0.0040*	2.5
End Volt(3.2)	20	1732.500015	*-0.0035*	2.5

LTE Band 5 QPSK – MID CHANNEL

Reference Frequency: LTE Band 5_Mid Channe 836.500005 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.500009	-0.005	2.5
3.80	40	836.500009	-0.005	2.5
3.80	30	836.500009	-0.005	2.5
3.80	***20***	***836.500005***	***0***	2.5
3.80	10	836.500009	-0.005	2.5
3.80	0	836.500008	-0.004	2.5
3.80	-10	836.500009	-0.005	2.5
3.80	-20	836.500010	-0.006	2.5
3.80	-30	836.500009	-0.005	2.5

Reference Frequency: LTE Band 5_Mid channel 836.500005 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***836.500005***	***0***	***2.5***
4.20	20	836.500008	-0.004	2.5
3.40	20	836.500006	-0.001	2.5
End Volt(3.2)	20	836.500003	0.002	2.5

LTE Band 5 16QAM – MID CHANNEL

Reference Frequency: LTE Band 5_Mid Channel 836.500004 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.250 Hz				
Power Supply (Vac)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.500007	-0.004	2.5
3.80	40	836.500007	-0.004	2.5
3.80	30	836.500009	-0.006	2.5
3.80	***20***	***836.500004***	***0***	2.5
3.80	10	836.500009	-0.006	2.5
3.80	0	836.500008	-0.005	2.5
3.80	-10	836.500007	-0.004	2.5
3.80	-20	836.500008	-0.005	2.5
3.80	-30	836.500008	-0.005	2.5

Reference Frequency: LTE Band 5_Mid Channel 36.500004 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.250 Hz				
Power Supply (Vac)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***836.500004***	***0***	***2.5***
4.20	20	836.500007	*-0.004*	2.5
3.30	20	836.500004	*0.000*	2.5
End Volt(3.2)	20	836.500002	*0.002*	2.5

LTE BAND 13, QPSK – 782.000 MHz

Reference Frequency: LTE Band 13_782.000006MHz @ 20°C Limit: to stay +- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	782.000009	-0.004	2.5
3.80	40	782.000008	-0.002	2.5
3.80	30	781.999995	0.014	2.5
3.80	***20***	***782.000006***	***0***	2.5
3.80	10	781.999993	0.017	2.5
3.80	0	782.000004	0.003	2.5
3.80	-10	781.999994	0.015	2.5
3.80	-20	781.999997	0.012	2.5
3.80	-30	781.999996	0.013	2.5

Reference Frequency: LTE Band 13_Mid Channel 782.000006MHz @ 20°C Limit: to stay +- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***782.000006***	***0***	***2.5***
4.20	20	781.999947	*0.076*	2.5
3.40	20	781.999995	*0.015*	2.5
End Voltage(3.2)	20	781.999994	*0.015*	2.5

LTE BAND 13, 16QAM– 782.000 MHz

Reference Frequency: LTE Band 13_781.999987 MHz @ 20°C Limit: to stay +- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	781.999995	-0.010	2.5
3.80	40	781.999993	-0.008	2.5
3.80	30	781.999991	-0.005	2.5
3.80	***20***	***781.999987***	***0***	2.5
3.80	10	781.999986	0.001	2.5
3.80	0	781.999985	0.003	2.5
3.80	-10	781.999989	-0.003	2.5
3.80	-20	781.999983	0.005	2.5
3.80	-30	781.999981	0.008	2.5

Reference Frequency: LTE Band 13_Mid Channel 781.999987MHz @ 20°C Limit: to stay +- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***781.999987***	***0***	***2.5***
4.20	20	781.999988	*-0.001*	2.5
3.40	20	781.999991	*-0.005*	2.5
End Voltage(3.2)	20	781.999991	*-0.005*	2.5

LTE BAND 17 – 710 MHz, 5MHz

Reference Frequency: LTE Band 17_Mid Channe 709.999994 MHz @ 20°C Limit: to stay +- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	710.000008	-0.020	2.5
3.80	40	710.000009	-0.021	2.5
3.80	30	710.000006	-0.017	2.5
3.80	***20***	***709.999994***	***0***	2.5
3.80	10	709.999993	0.001	2.5
3.80	0	709.999992	0.003	2.5
3.80	-10	709.999993	0.001	2.5
3.80	-20	709.999991	0.004	2.5
3.80	-30	709.999989	0.007	2.5

Reference Frequency: LTE Band 17_Mid channel 709.999994 MHz @ 20°C Limit: to stay +- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***709.999994***	***0***	***2.5***
4.20	20	***709.999996***	-0.003	2.5
3.40	20	***709.999998***	-0.006	2.5
End Volt(3.2)	20	***709.999998***	-0.006	2.5

LTE BAND 17 – 710 MHz, 10MHz

Reference Frequency: LTE Band 17_Mid Channel 710.000005 MHz @ 20°C Limit: to stay +- 2.5 ppm = 1775.000 Hz				
Power Supply (Vac)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	710.000010	-0.007	2.5
3.80	40	710.000009	-0.006	2.5
3.80	30	710.000010	-0.007	2.5
3.80	***20***	***710.000005***	***0***	2.5
3.80	10	710.000009	-0.006	2.5
3.80	0	710.000008	-0.004	2.5
3.80	-10	710.000007	-0.003	2.5
3.80	-20	710.000003	0.003	2.5
3.80	-30	710.000009	-0.006	2.5

Reference Frequency: LTE Band 17_Mid Channel 710.000005MHz @ 20°C Limit: to stay +- 2.5 ppm = 1775.000 Hz				
Power Supply (Vac)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***710.000005***	***0***	***2.5***
4.20	20	710.000002	*0.004*	2.5
3.40	20	710.000003	*0.003*	2.5
End Volt(3.2)	20	710.000002	*0.004*	2.5

LTE BAND 25, QPSK – 1882.500 MHz

Reference Frequency: LTE Band 25_1882.499974 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4706.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1882.499979	-0.003	2.5
3.80	40	1882.500007	-0.018	2.5
3.80	30	1882.500004	-0.016	2.5
3.80	***20***	***1882.499974***	***0***	2.5
3.80	10	1882.500004	-0.016	2.5
3.80	0	1882.500004	-0.016	2.5
3.80	-10	1882.500001	-0.014	2.5
3.80	-20	1882.500003	-0.015	2.5
3.80	-30	1882.500006	-0.017	2.5

Reference Frequency: LTE Band 25_Mid Channel 1882.499974MHz @ 20°C Limit: to stay +- 2.5 ppm = 4706.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1882.499974***	***0***	***2.5***
4.20	20	1882.499976	*-0.001*	2.5
3.50	20	1882.499978	*-0.002*	2.5
End Voltage(3.3)	20	1882.499978	*-0.002*	2.5

LTE BAND 25, 16QAM– 836.500 MHz

Reference Frequency: LTE Band 25_1882.500019 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4706.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1882.499991	0.015	2.5
3.80	40	1882.499989	0.016	2.5
3.80	30	1882.499997	0.012	2.5
3.80	***20***	***1882.500019***	***0***	2.5
3.80	10	1882.500082	-0.033	2.5
3.80	0	1882.500091	-0.038	2.5
3.80	-10	1882.500085	-0.035	2.5
3.80	-20	1882.500081	-0.033	2.5
3.80	-30	1882.500079	-0.032	2.5

Reference Frequency: LTE Band 25_Mid Channel 1882.500019 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4706.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1882.500019***	***0***	***2.5***
4.20	20	1882.499989	*0.016*	2.5
3.40	20	1882.499985	*0.018*	2.5
End Voltage(3.3)	20	1882.499985	*0.018*	2.5

LTE BAND 26 – 831.5 MHz, QPSK

Reference Frequency: LTE Band 26_Mid Channel 831.499996 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2078.750 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	831.499994	0.002	2.5
3.80	40	831.499995	0.001	2.5
3.80	30	831.499995	0.001	2.5
3.80	***20***	***831.499996***	***0***	2.5
3.80	10	831.499995	0.001	2.5
3.80	0	831.499996	0.000	2.5
3.80	-10	831.499996	0.000	2.5
3.80	-20	831.499996	0.000	2.5
3.80	-30	831.499997	-0.001	2.5

Reference Frequency: LTE Band 26_Mid Channel 831.499996 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2078.750 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***831.499996***	***0***	***2.5***
4.20	20	831.499995	0.001	2.5
3.40	20	831.499997	-0.001	2.5
End Voltage (3.2)	20	831.499997	-0.001	2.5

LTE BAND 26 – 831.5 MHz, 16QAM

Reference Frequency: LTE Band 26_Mid Channel 831.499980 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2078.750 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	*831.499981*	-0.001	2.5
3.80	40	*831.499987*	-0.008	2.5
3.80	30	*831.499983*	-0.003	2.5
3.80	***20***	***831.499980***	***0***	2.5
3.80	10	*831.499977*	0.004	2.5
3.80	0	*831.499971*	0.011	2.5
3.80	-10	*831.499978*	0.002	2.5
3.80	-20	*831.499975*	0.006	2.5
3.80	-30	*831.499976*	0.005	2.5

Reference Frequency: LTE Band 26_Mid Channel 831.499980 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2078.750 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***831.499980***	***0***	***2.5***
4.20	20	831.499995	-0.018	2.5
3.40	20	831.499996	-0.019	2.5
End Voltage (3.2)	20	831.499996	-0.019	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 13
- LTE Band 17
- LTE Band 25
- LTE Band 26

RESULTS

BAND 2

EIRP LTE Band 2 (1.4 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP (Peak)	
			dBm	mW
1.4MHz Band QPSK	6/0	1850.7	**29.65**	922.57
		1880.0	28.49	706.32
		1909.3	28.29	674.53
1.4MHz Band 16QAM	6/0	1850.7	**28.65**	732.82
		1880.0	27.49	561.05
		1909.3	27.29	535.80

EIRP LTE Band 2 (3.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP (Peak)	
			dBm	mW
3.0MHz Band QPSK	15/0	1851.5	**29.62**	916.22
		1880.0	29.13	818.46
		1908.5	28.19	659.17
3.0MHz Band 16QAM	15/0	1851.5	**28.62**	727.78
		1880.0	28.13	650.13
		1908.5	27.19	523.60

EIRP LTE Band 2 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP (Peak)	
			dBm	mW
5.0MHz Band QPSK	25/0	1852.5	**29.31**	853.10
		1880.0	28.29	674.53
		1907.5	26.92	492.04
5.0MHz Band 16QAM	25/0	1852.5	**28.37**	687.07
		1880.0	27.33	540.75
		1907.5	25.91	389.94

EIRP LTE Band 2 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP (Peak)	
			dBm	mW
10.0MHz Band QPSK	50/0	1855.0	**29.47**	885.12
		1880.0	28.67	736.21
		1905.0	27.24	529.66
10.0MHz Band 16QAM	50/0	1855.0	**28.43**	696.63
		1880.0	27.67	584.79
		1905.0	26.29	425.60

EIRP LTE Band 2 (15.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP (Peak)	
			dBm	mW
15MHz Band QPSK	75/0	1857.5	**29.59**	909.91
		1880.0	29.36	862.98
		1902.5	28.03	635.33
15MHz Band 16QAM	75/0	1857.5	**28.59**	722.77
		1880.0	28.36	685.49
		1902.5	27.03	504.66

EIRP LTE Band 2 (20.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP (Peak)	
			dBm	mW
20.0MHz Band QPSK	100/0	1860.0	**29.45**	881.05
		1880.0	28.97	788.86
		1900.0	27.78	599.79
20MHz Band 16QAM	100/0	1860.0	**28.40**	691.83
		1880.0	27.99	629.51
		1900.0	26.79	477.53

BAND 4

LAT EIRP LTE Band 4 (1.4 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
1.4 MHZ BAND QPSK	6/0	1710.7	**27.17**	521.19
		1732.5	26.20	416.87
		1754.3	26.40	436.52
1.4 MHZ BAND 16QAM	6/0	1710.7	**26.23**	419.76
		1732.5	25.18	329.61
		1754.3	25.49	354.00

EIRP LTE Band 4 (3.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
3.0 MHZ BAND QPSK	15/0	1711.5	**26.99**	500.03
		1732.5	26.39	435.51
		1753.5	25.49	354.00
3.0 MHZ BAND 16QAM	15/0	1711.5	**25.94**	392.64
		1732.5	25.43	349.14
		1753.5	24.47	279.90

EIRP LTE Band 4 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
5.0 MHZ BAND QPSK	25/0	1712.5	**27.73**	592.93
		1732.5	27.02	503.50
		1752.5	25.99	397.19
5.0 MHZ BAND 16QAM	25/0	1712.5	**26.74**	472.06
		1732.5	26.05	402.72
		1752.5	25.05	319.89

EIRP LTE Band 4 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
10.0 MHZ BAND QPSK	50/0	1715.0	27.29	535.80
		1732.5	27.12	515.23
		1750.0	**27.67**	584.79
10.0 MHZ BAND 16QAM	50/0	1715.0	26.34	430.53
		1732.5	26.16	413.05
		1750.0	**26.72**	469.89

EIRP LTE Band 4 (15.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
15.0 MHZ BAND QPSK	75/0	1717.5	**28.02**	633.87
		1732.5	27.31	538.27
		1747.5	26.34	430.53
15.0 MHZ BAND 16QAM	75/0	1717.5	**27.04**	505.82
		1732.5	26.37	433.51
		1747.5	25.39	345.94

EIRP LTE Band 4 (20.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
20.0 MHZ BAND QPSK	100/0	1720.0	**28.16**	654.64
		1732.5	27.42	552.08
		1745.0	26.95	495.45
20.0 MHZ BAND 16QAM	100/0	1720.0	**27.28**	534.56
		1732.5	26.39	435.51
		1745.0	26.04	401.79

BAND 5

ERP LTE Band 5 (1.4 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
1.4MHz Band QPSK	1/0	824.7	**19.44**	87.90
		836.5	18.92	77.98
		848.3	18.88	77.27
1.4MHz Band 16QAM	1/0	824.7	**18.40**	69.18
		836.5	17.96	62.52
		848.3	17.91	61.80

ERP LTE Band 5 (3.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
3.0 MHZ BAND QPSK	1/0	825.5	**19.42**	87.50
		836.5	18.98	79.07
		847.5	18.79	75.68
3.0 MHZ BAND 16QAM	1/0	825.5	**18.47**	70.31
		836.5	18.05	63.83
		847.5	17.80	60.26

ERP LTE Band 5 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
5MHz Band QPSK	1/0	826.5	**19.32**	85.51
		836.5	19.05	80.35
		846.5	18.74	74.82
5MHz Band 16QAM	1/0	826.5	**18.30**	67.61
		836.5	18.05	63.83
		846.5	17.77	59.84

ERP LTE Band 5 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
10.0 MHZ BAND QPSK	1/0	829.0	**19.33**	85.70
		836.5	18.77	75.34
		844.0	18.56	71.78
10.0 MHZ BAND 16QAM	1/0	829.0	**18.30**	67.61
		836.5	17.80	60.26
		844.0	17.49	56.10

BAND 13

ERP LTE Band 13 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
5.0 MHZ BAND QPSK	1/0	779.5	20.00	100.00
		782.0	**20.70**	117.49
		784.5	20.40	109.65
5.0 MHZ BAND 16QAM	1/0	779.5	19.10	81.28
		782.0	**19.80**	95.50
		784.5	19.50	89.13

ERP BAND 13 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
10 MHZ BAND QPSK	1/0	782.0	20.30	107.15
10 MHz BAND 16QAM	1/0		19.40	87.10

BAND 17

ERP LTE Band 17 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
5MHz Band QPSK	1/0	706.5	19.30	85.11
		710.0	20.00	100.00
		713.5	**20.50**	112.20
5MHz Band 16QAM	1/0	706.5	18.30	67.61
		710.0	19.00	79.43
		713.5	**19.50**	89.13

ERP LTE Band 17 (10.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	ERP (Average)	
			dBm	mW
10.0 MHZ BAND QPSK	1/0	709.0	19.10	81.28
		710.0	19.90	97.72
		711.0	**20.40**	109.65
10.0 MHZ BAND 16QAM	1/0	709.0	18.20	66.07
		710.0	18.90	77.62
		711.0	**19.40**	87.10

BAND 25

EIRP LTE Band 25 (1.4MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
1.4 MHZ BAND QPSK	6/0	1850.7	27.84	608.14
		1880.0	**28.55**	716.14
		1914.3	27.77	598.41
1.4 MHZ BAND 16QAM	6/0	1850.7	27.04	505.82
		1880.0	**27.75**	595.66
		1914.3	27.07	509.33

EIRP LTE Band 25 (3.0MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
3.0 MHZ BAND QPSK	15/0	1851.5	27.64	580.76
		1880.0	**28.45**	699.84
		1913.5	28.07	641.21
3.0 MHZ BAND 16QAM	15/0	1851.5	26.84	483.06
		1880.0	27.55	568.85
		1913.5	**28.17**	656.15

EIRP LTE Band 25 (5.0MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
5.0 MHZ BAND QPSK	25/0	1852.5	28.94	783.43
		1880.0	**29.15**	822.24
		1912.5	27.37	545.76
5.0 MHZ BAND 16QAM	25/0	1852.5	28.04	636.80
		1880.0	**28.25**	668.34
		1912.5	26.57	453.94

EIRP LTE Band 25 (10.0MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
10.0 MHZ BAND QPSK	50/0	1855.0	28.84	765.60
		1880.0	**29.25**	841.40
		1910.0	28.67	736.21
10.0 MHZ BAND 16QAM	50/0	1855.0	27.94	622.30
		1880.0	**28.35**	683.91
		1910.0	27.77	598.41

EIRP LTE Band 25 (15.0MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
15.0 MHZ BAND QPSK	75/0	1857.5	29.14	820.35
		1880.0	**29.35**	860.99
		1907.5	28.27	671.43
15.0 MHZ BAND 16QAM	75/0	1857.5	28.24	666.81
		1880.0	**28.55**	716.14
		1907.5	27.47	558.47

EIRP LTE Band 25 (20.0MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
20.0 MHZ BAND QPSK	100/0	1860.0	29.24	839.46
		1880.0	**29.55**	901.57
		1905.0	28.47	703.07
20.0 MHZ BAND 16QAM	100/0	1860.0	28.34	682.34
		1880.0	**28.65**	732.82
		1905.0	27.57	571.48

BAND 26

ERP LTE Band 26 (3.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
3.0 MHZ BAND QPSK	1/0	820.3	**20.30**	107.15
		821.3	20.20	104.71
		822.3	19.60	91.20
3.0 MHZ BAND 16QAM	1/0	820.3	**19.30**	85.11
		821.3	19.30	85.11
		822.3	18.70	74.13

ERP LTE Band 26 (5.0 MHz BAND WIDTH)

Mode	RB/RB SIZE	f (MHz)	EIRP(Peak)	
			dBm	mW
5.0 MHZ BAND QPSK	1/0	818.8	**20.20**	104.71
		821.3	20.10	102.33
		823.8	19.60	91.20
5.0 MHZ BAND 16QAM	1/0	818.8	**19.30**	85.11
		821.3	19.20	83.18
		823.8	18.70	74.13

9.1.1. LTE BAND 2

EIRP LTE QPSK Band 2 (1.4 MHz BAND WIDTH)

PEAK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT Only
Mode:	LTE Band 2, 1.4MHz BW
	QPSK, Peak, RB6-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	17.9	V	0.85	7.94	25.00	33.0	-8.0	
1.851	21.7	H	0.85	8.80	29.65	33.0	-3.4	
Mid Ch								
1.880	19.6	V	0.85	7.95	26.65	33.0	-6.4	
1.880	20.7	H	0.85	8.68	28.49	33.0	-4.5	
High Ch								
1.909	18.8	V	0.85	7.97	25.93	33.0	-7.1	
1.909	20.6	H	0.85	8.57	28.29	33.0	-4.7	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (1.4 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 1.4MHz BW
16QAM, Peak, RB6-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	16.9	V	0.85	7.94	24.00	33.0	-9.0	
1.851	20.7	H	0.85	8.80	28.65	33.0	-4.4	
Mid Ch								
1.880	18.6	V	0.85	7.95	25.65	33.0	-7.4	
1.880	19.7	H	0.85	8.68	27.49	33.0	-5.5	
High Ch								
1.909	17.8	V	0.85	7.97	24.93	33.0	-8.1	
1.909	19.6	H	0.85	8.57	27.29	33.0	-5.7	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 3MHz BW
QPSK, Peak, RB15-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	19.6	V	0.85	7.94	26.70	33.0	-6.3	
1.852	21.7	H	0.85	8.80	29.62	33.0	-3.4	
Mid Ch								
1.880	19.8	V	0.85	7.95	26.94	33.0	-6.1	
1.880	21.3	H	0.85	8.68	29.13	33.0	-3.9	
High Ch								
1.909	19.0	V	0.85	7.97	26.15	33.0	-6.9	
1.909	20.5	H	0.85	8.57	28.19	33.0	-4.8	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 3MHz BW
16QAM, Peak, RB15-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	18.6	V	0.85	7.94	25.70	33.0	-7.3	
1.852	20.7	H	0.85	8.80	28.62	33.0	-4.4	
Mid Ch								
1.880	18.8	V	0.85	7.95	25.94	33.0	-7.1	
1.880	20.3	H	0.85	8.68	28.13	33.0	-4.9	
High Ch								
1.909	18.0	V	0.85	7.97	25.15	33.0	-7.9	
1.909	19.5	H	0.85	8.57	27.19	33.0	-5.8	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 5MHz BW
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	19.6	V	0.85	7.94	26.66	33.0	-6.3	
1.853	21.4	H	0.85	8.80	29.31	33.0	-3.7	
Mid Ch								
1.880	19.5	V	0.85	7.95	26.62	33.0	-6.4	
1.880	20.5	H	0.85	8.68	28.29	33.0	-4.7	
High Ch								
1.908	18.8	V	0.85	7.97	25.94	33.0	-7.1	
1.908	19.2	H	0.85	8.57	26.92	33.0	-6.1	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 5MHz BW
16QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	18.6	V	0.85	7.94	25.69	33.0	-7.3	
1.853	20.4	H	0.85	8.80	28.37	33.0	-4.6	
Mid Ch								
1.880	18.6	V	0.85	7.95	25.67	33.0	-7.3	
1.880	19.5	H	0.85	8.68	27.33	33.0	-5.7	
High Ch								
1.908	17.9	V	0.85	7.97	24.97	33.0	-8.0	
1.908	18.2	H	0.85	8.57	25.91	33.0	-7.1	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 10MHz BW
QPSK, Peak, RB50-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	19.7	V	0.85	7.94	26.78	33.0	-6.2	
1.855	21.5	H	0.85	8.80	29.47	33.0	-3.5	
Mid Ch								
1.880	19.7	V	0.85	7.95	26.82	33.0	-6.2	
1.880	20.8	H	0.85	8.68	28.67	33.0	-4.3	
High Ch								
1.905	19.2	V	0.85	7.97	26.30	33.0	-6.7	
1.905	19.5	H	0.85	8.57	27.24	33.0	-5.8	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 10MHz BW
16QAM, Peak, RB50-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	18.8	V	0.85	7.94	25.85	33.0	-7.2	
1.855	20.5	H	0.85	8.80	28.43	33.0	-4.6	
Mid Ch								
1.880	18.7	V	0.85	7.95	25.80	33.0	-7.2	
1.880	19.8	H	0.85	8.68	27.67	33.0	-5.3	
High Ch								
1.905	18.3	V	0.85	7.97	25.37	33.0	-7.6	
1.905	18.6	H	0.85	8.57	26.29	33.0	-6.7	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 15MHz BW
QPSK, Peak, RB75-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	20.6	V	0.85	7.94	27.67	33.0	-5.3	
1.858	21.6	H	0.85	8.80	29.59	33.0	-3.4	
Mid Ch								
1.880	20.8	V	0.85	7.95	27.91	33.0	-5.1	
1.880	21.5	H	0.85	8.68	29.36	33.0	-3.6	
High Ch								
1.903	20.1	V	0.85	7.97	27.21	33.0	-5.8	
1.903	20.3	H	0.85	8.57	28.03	33.0	-5.0	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 15MHz BW
16QAM, Peak, RB75-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	19.6	V	0.85	7.94	26.67	33.0	-6.3	
1.858	20.6	H	0.85	8.80	28.59	33.0	-4.4	
Mid Ch								
1.880	19.8	V	0.85	7.95	26.91	33.0	-6.1	
1.880	20.5	H	0.85	8.68	28.36	33.0	-4.6	
High Ch								
1.903	19.1	V	0.85	7.97	26.21	33.0	-6.8	
1.903	19.3	H	0.85	8.57	27.03	33.0	-6.0	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 20MHz BW
QPSK, Peak, RB100-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	20.0	V	0.85	7.94	27.12	33.0	-5.9	
1.860	21.5	H	0.85	8.80	29.45	33.0	-3.6	
Mid Ch								
1.880	20.1	V	0.85	7.95	27.16	33.0	-5.8	
1.880	21.1	H	0.85	8.68	28.97	33.0	-4.0	
High Ch								
1.900	19.8	V	0.85	7.97	26.92	33.0	-6.1	
1.900	20.1	H	0.85	8.57	27.78	33.0	-5.2	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 2, 20MHz BW
16QAM, Peak, RB100-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	19.0	V	0.85	7.94	26.09	33.0	-6.9	
1.860	20.5	H	0.85	8.80	28.40	33.0	-4.6	
Mid Ch								
1.880	19.2	V	0.85	7.95	26.27	33.0	-6.7	
1.880	20.2	H	0.85	8.68	27.99	33.0	-5.0	
High Ch								
1.900	18.9	V	0.85	7.97	25.98	33.0	-7.0	
1.900	19.1	H	0.85	8.57	26.79	33.0	-6.2	

Rev. 3.17.11

9.1.2. LTE BAND 4

EIRP LTE QPSK Band 4 (1.4 MHz BAND WIDTH)

PEAK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT Only
Mode:	LTE Band 4, 1.4MHz BW
	QPSK, Peak, RB6-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	20.2	V	1.50	8.16	26.81	30.0	-3.2	
1.711	20.1	H	1.50	8.59	27.17	30.0	-2.8	
Mid Ch								
1.733	19.4	V	1.50	8.11	25.98	30.0	-4.0	
1.733	19.0	H	1.50	8.69	26.20	30.0	-3.8	
High Ch								
1.754	18.9	V	1.50	8.07	25.50	30.0	-4.5	
1.754	19.1	H	1.50	8.79	26.40	30.0	-3.6	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (1.4 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 1.4MHz BW
16QAM, Peak, RB6-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	19.2	V	1.50	8.16	25.89	30.0	-4.1	
1.711	19.1	H	1.50	8.59	26.23	30.0	-3.8	
Mid Ch								
1.733	18.4	V	1.50	8.11	25.04	30.0	-5.0	
1.733	18.0	H	1.50	8.69	25.18	30.0	-4.8	
High Ch								
1.754	18.0	V	1.50	8.07	24.52	30.0	-5.5	
1.754	18.2	H	1.50	8.79	25.49	30.0	-4.5	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 3MHz BW
QPSK, Peak, RB15-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	20.1	V	1.50	8.16	26.74	30.0	-3.3	
1.712	19.9	H	1.50	8.59	26.99	30.0	-3.0	
Mid Ch								
1.733	19.7	V	1.50	8.11	26.35	30.0	-3.7	
1.733	19.2	H	1.50	8.69	26.39	30.0	-3.6	
High Ch								
1.754	18.8	V	1.50	8.07	25.37	30.0	-4.6	
1.754	18.2	H	1.50	8.79	25.49	30.0	-4.5	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 3MHz BW
16QAM, Peak, RB15-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	19.1	V	1.50	8.16	25.79	30.0	-4.2	
1.712	18.9	H	1.50	8.59	25.94	30.0	-4.1	
Mid Ch								
1.733	18.7	V	1.50	8.11	25.30	30.0	-4.7	
1.733	18.2	H	1.50	8.69	25.43	30.0	-4.6	
High Ch								
1.754	17.8	V	1.50	8.07	24.36	30.0	-5.6	
1.754	17.2	H	1.50	8.79	24.47	30.0	-5.5	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 5MHz BW
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.713	20.2	V	1.50	8.16	26.88	30.0	-3.1	
1.713	20.6	H	1.50	8.59	27.73	30.0	-2.3	
Mid Ch								
1.733	20.0	V	1.50	8.11	26.62	30.0	-3.4	
1.733	19.8	H	1.50	8.69	27.02	30.0	-3.0	
High Ch								
1.753	19.4	V	1.50	8.07	25.92	30.0	-4.1	
1.753	18.7	H	1.50	8.79	25.99	30.0	-4.0	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 5MHz BW
16QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.713	19.2	V	1.50	8.16	25.89	30.0	-4.1	
1.713	19.7	H	1.50	8.59	26.74	30.0	-3.3	
Mid Ch								
1.733	19.1	V	1.50	8.11	25.70	30.0	-4.3	
1.733	18.9	H	1.50	8.69	26.05	30.0	-4.0	
High Ch								
1.753	18.4	V	1.50	8.07	24.97	30.0	-5.0	
1.753	17.8	H	1.50	8.79	25.05	30.0	-5.0	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 10MHz BW
QPSK, Peak, RB50-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	20.6	V	1.50	8.16	27.21	30.0	-2.8	
1.715	20.2	H	1.50	8.59	27.29	30.0	-2.7	
Mid Ch								
1.733	20.3	V	1.50	8.11	26.93	30.0	-3.1	
1.733	19.9	H	1.50	8.69	27.12	30.0	-2.9	
High Ch								
1.750	19.7	V	1.50	8.07	26.23	30.0	-3.8	
1.750	20.4	H	1.50	8.79	27.67	30.0	-2.3	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 10MHz BW
16QAM, Peak, RB50-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	19.6	V	1.50	8.16	26.24	30.0	-3.8	
1.715	19.3	H	1.50	8.59	26.34	30.0	-3.7	
Mid Ch								
1.733	19.4	V	1.50	8.11	25.98	30.0	-4.0	
1.733	19.0	H	1.50	8.69	26.16	30.0	-3.8	
High Ch								
1.750	18.7	V	1.50	8.07	25.27	30.0	-4.7	
1.750	19.4	H	1.50	8.79	26.72	30.0	-3.3	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 15MHz BW
QPSK, Peak, RB75-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	20.9	V	1.50	8.16	27.60	30.0	-2.4	
1.718	20.9	H	1.50	8.59	28.02	30.0	-2.0	
Mid Ch								
1.733	20.3	V	1.50	8.11	26.90	30.0	-3.1	
1.733	20.1	H	1.50	8.69	27.31	30.0	-2.7	
High Ch								
1.748	19.7	V	1.50	8.07	26.29	30.0	-3.7	
1.748	19.1	H	1.50	8.79	26.34	30.0	-3.7	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 15MHz BW
16QAM, Peak, RB75-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	20.0	V	1.50	8.16	26.63	30.0	-3.4	
1.718	20.0	H	1.50	8.59	27.04	30.0	-3.0	
Mid Ch								
1.733	19.4	V	1.50	8.11	25.98	30.0	-4.0	
1.733	19.2	H	1.50	8.69	26.37	30.0	-3.6	
High Ch								
1.748	18.8	V	1.50	8.07	25.32	30.0	-4.7	
1.748	18.1	H	1.50	8.79	25.39	30.0	-4.6	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 20MHz BW
QPSK, Peak, RB100-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	21.2	V	1.50	8.16	27.82	30.0	-2.2	
1.720	21.1	H	1.50	8.59	28.16	30.0	-1.8	
Mid Ch								
1.733	20.5	V	1.50	8.11	27.15	30.0	-2.9	
1.733	20.2	H	1.50	8.69	27.42	30.0	-2.6	
High Ch								
1.745	20.4	V	1.50	8.07	26.92	30.0	-3.1	
1.745	19.7	H	1.50	8.79	26.95	30.0	-3.1	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT Only
Mode: LTE Band 4, 20MHz BW
16QAM, Peak, RB100-0

Test Equipment:
Receiving: Horn T344, and Chamber D SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable Warehouse

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	20.2	V	1.50	8.16	26.81	30.0	-3.2	
1.720	20.2	H	1.50	8.59	27.28	30.0	-2.7	
Mid Ch								
1.733	19.5	V	1.50	8.11	26.15	30.0	-3.9	
1.733	19.2	H	1.50	8.69	26.39	30.0	-3.6	
High Ch								
1.745	19.4	V	1.50	8.07	25.96	30.0	-4.0	
1.745	18.8	H	1.50	8.79	26.04	30.0	-4.0	

Rev. 3.17.11

9.1.3. LTE BAND 5

ERP LTE QPSK Band 5 (1.4 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	LTE Band 5 , 1.4MHz BW QPSK, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	14.68	V	0.6	0.0	14.08	38.5	-24.4	
824.70	20.04	H	0.6	0.0	19.44	38.5	-19.0	
Mid Ch								
836.50	14.15	V	0.6	0.0	13.55	38.5	-24.9	
836.50	19.52	H	0.6	0.0	18.92	38.5	-19.5	
High Ch								
848.30	14.46	V	0.6	0.0	13.86	38.5	-24.6	
848.30	19.48	H	0.6	0.0	18.88	38.5	-19.6	

Rev. 3.17.11

ERP LTE 16QAM Band 5 (1.4 MHz BAND WIDTH)

Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: LTE Band 5 , 1.4MHz BW
16QAM, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	13.75	V	0.6	0.0	13.15	38.5	-25.3	
824.70	19.00	H	0.6	0.0	18.40	38.5	-20.0	
Mid Ch								
836.50	13.17	V	0.6	0.0	12.57	38.5	-25.9	
836.50	18.56	H	0.6	0.0	17.96	38.5	-20.5	
High Ch								
848.30	13.54	V	0.6	0.0	12.94	38.5	-25.5	
848.30	18.51	H	0.6	0.0	17.91	38.5	-20.5	

Rev. 3.17.11

ERP LTE QPSK Band 5 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	LTE Band 5 , 3MHz BW
	QPSK, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	14.60	V	0.6	0.0	14.00	38.5	-24.4	
825.50	20.02	H	0.6	0.0	19.42	38.5	-19.0	
Mid Ch								
836.50	14.26	V	0.6	0.0	13.66	38.5	-24.8	
836.50	19.58	H	0.6	0.0	18.98	38.5	-19.5	
High Ch								
847.50	14.40	V	0.6	0.0	13.80	38.5	-24.6	
847.50	19.39	H	0.6	0.0	18.79	38.5	-19.7	

Rev. 3.17.11

ERP LTE 16QAM Band 5 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: LTE Band 5 , 3MHz BW
16QAM, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	13.62	V	0.6	0.0	13.02	38.5	-25.4	
825.50	19.07	H	0.6	0.0	18.47	38.5	-20.0	
Mid Ch								
836.50	13.33	V	0.6	0.0	12.73	38.5	-25.7	
836.50	18.65	H	0.6	0.0	18.05	38.5	-20.4	
High Ch								
847.50	13.44	V	0.6	0.0	12.84	38.5	-25.6	
847.50	18.40	H	0.6	0.0	17.80	38.5	-20.6	

Rev. 3.17.11

ERP LTE QPSK Band 5 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	LTE Band 5 , 5MHz BW QPSK, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	14.80	V	0.6	0.0	14.20	38.5	-24.2	
826.50	19.92	H	0.6	0.0	19.32	38.5	-19.1	
Mid Ch								
836.50	14.37	V	0.6	0.0	13.77	38.5	-24.7	
836.50	19.65	H	0.6	0.0	19.05	38.5	-19.4	
High Ch								
846.50	14.22	V	0.6	0.0	13.62	38.5	-24.8	
846.50	19.34	H	0.6	0.0	18.74	38.5	-19.7	

Rev. 3.17.11

ERP LTE 16QAM Band 5 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: LTE Band 5 , 5MHz BW
16QAM, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	13.81	V	0.6	0.0	13.21	38.5	-25.2	
826.50	18.90	H	0.6	0.0	18.30	38.5	-20.1	
Mid Ch								
836.50	13.42	V	0.6	0.0	12.82	38.5	-25.6	
836.50	18.65	H	0.6	0.0	18.05	38.5	-20.4	
High Ch								
846.50	13.18	V	0.6	0.0	12.58	38.5	-25.9	
846.50	18.37	H	0.6	0.0	17.77	38.5	-20.7	

Rev. 3.17.11

ERP LTE QPSK Band 5 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: LTE Band 5 , 10MHz BW
QPSK, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	14.71	V	0.6	0.0	14.11	38.5	-24.3	
829.00	19.93	H	0.6	0.0	19.33	38.5	-19.1	
Mid Ch								
836.50	14.18	V	0.6	0.0	13.58	38.5	-24.9	
836.50	19.37	H	0.6	0.0	18.77	38.5	-19.7	
High Ch								
844.00	14.05	V	0.6	0.0	13.45	38.5	-25.0	
844.00	19.16	H	0.6	0.0	18.56	38.5	-19.9	

Rev. 3.17.11

ERP LTE 16QAM Band 5 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: LTE Band 5 , 10MHz BW
16QAM, Average, RB1-0

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

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	13.64	V	0.6	0.0	13.04	38.5	-25.4	
829.00	18.90	H	0.6	0.0	18.30	38.5	-20.1	
Mid Ch								
836.50	13.18	V	0.6	0.0	12.58	38.5	-25.9	
836.50	18.40	H	0.6	0.0	17.80	38.5	-20.6	
High Ch								
844.00	12.95	V	0.6	0.0	12.35	38.5	-26.1	
844.00	18.09	H	0.6	0.0	17.49	38.5	-21.0	

Rev. 3.17.11

9.1.4. LTE BAND 13

ERP LTE QPSK, Band 13 (5.0 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE BAND 13
QPSK, 5MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	12.20	V	0.9	0.0	11.30	38.5	-27.1	
779.50	20.90	H	0.9	0.0	20.00	38.5	-18.4	
Mid Ch								
782.00	12.40	V	0.9	0.0	11.50	38.5	-26.9	
782.00	21.60	H	0.9	0.0	20.70	38.5	-17.7	
High Ch								
784.50	12.10	V	0.9	0.0	11.20	38.5	-27.2	
784.50	21.30	H	0.9	0.0	20.40	38.5	-18.0	

Rev. 3.17.11

ERP LTE 16QAM Band 13 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE BAND 13
16QAM, 5MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	11.20	V	0.9	0.0	10.30	38.5	-28.1	
779.50	20.00	H	0.9	0.0	19.10	38.5	-19.3	
Mid Ch								
782.00	11.50	V	0.9	0.0	10.60	38.5	-27.8	
782.00	20.70	H	0.9	0.0	19.80	38.5	-18.6	
High Ch								
784.50	11.20	V	0.9	0.0	10.30	38.5	-28.1	
784.50	20.40	H	0.9	0.0	19.50	38.5	-18.9	

Rev. 3.17.11

ERP LTE QPSK Band 13 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13u15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE BAND 13
QPSK, 10MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Mid Ch								
782.00	13.50	V	0.9	0.0	12.60	38.5	-25.8	
782.00	21.20	H	0.9	0.0	20.30	38.5	-18.1	

Rev. 3.17.11

ERP LTE 16QAM Band 13 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13u15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE BAND 13
16QAM, 10MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Mid Ch								
782.00	12.60	V	0.9	0.0	11.70	38.5	-26.7	
782.00	20.30	H	0.9	0.0	19.40	38.5	-19.0	

Rev. 3.17.11

9.1.5. LTE BAND 17

ERP LTE QPSK, Band 17 (5.0 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13u15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 5MHz BW
QPSK, B17 5MHz AVG RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

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	11.40	V	0.9	0.0	10.50	34.8	-24.3	
706.50	20.20	H	0.9	0.0	19.30	34.8	-15.5	
Mid Ch								
710.00	12.00	V	0.9	0.0	11.10	34.8	-23.7	
710.00	20.90	H	0.9	0.0	20.00	34.8	-14.8	
High Ch								
713.50	12.40	V	0.9	0.0	11.50	34.8	-23.3	
713.50	21.40	H	0.9	0.0	20.50	34.8	-14.3	

Rev. 3.17.11

ERP LTE 16QAM Band 17 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13u15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 5MHz BW
16QAM, B17 5MHz AVG RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

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	10.40	V	0.9	0.0	9.50	34.8	-25.3	
706.50	19.20	H	0.9	0.0	18.30	34.8	-16.5	
Mid Ch								
710.00	11.00	V	0.9	0.0	10.10	34.8	-24.7	
710.00	19.90	H	0.9	0.0	19.00	34.8	-15.8	
High Ch								
713.50	11.40	V	0.9	0.0	10.50	34.8	-24.3	
713.50	20.40	H	0.9	0.0	19.50	34.8	-15.3	

Rev. 3.17.11

ERP LTE QPSK Band 17 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13u15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 10MHz BW
QPSK 10MHz AVG RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
709.00	11.00	V	0.9	0.0	10.10	34.8	-24.7	
709.00	20.00	H	0.9	0.0	19.10	34.8	-15.7	
Mid Ch								
710.00	11.10	V	0.9	0.0	10.20	34.8	-24.6	
710.00	20.80	H	0.9	0.0	19.90	34.8	-14.9	
High Ch								
711.00	11.30	V	0.9	0.0	10.40	34.8	-24.4	
711.00	21.30	H	0.9	0.0	20.40	34.8	-14.4	

Rev. 3.17.11

ERP LTE 16QAM Band 17 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company:	Apple
Project #:	13u15668
Date:	09/03/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	LTE Band 17, 5MHz BW
	16QAM, B17 5MHz AVG RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

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	10.40	V	0.9	0.0	9.50	34.8	-25.3	
706.50	19.20	H	0.9	0.0	18.30	34.8	-16.5	
Mid Ch								
710.00	11.00	V	0.9	0.0	10.10	34.8	-24.7	
710.00	19.90	H	0.9	0.0	19.00	34.8	-15.8	
High Ch								
713.50	11.40	V	0.9	0.0	10.50	34.8	-24.3	
713.50	20.30	H	0.9	0.0	19.40	34.8	-15.4	

Rev. 3.17.11

9.1.6. LTE BAND 25

EIRP LTE QPSK Band 25 (1.4 MHz BAND WIDTH)

PEAK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 1.4MHz BW
QPSK, Peak, RB6-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	21.0	V	1.50	7.94	27.44	33.0	-5.6	
1.851	21.2	H	1.50	8.14	27.84	33.0	-5.2	
Mid Ch								
1.883	22.1	V	1.50	7.95	28.55	33.0	-4.5	
1.883	20.8	H	1.50	8.26	27.56	33.0	-5.4	
High Ch								
1.914	21.3	V	1.50	7.97	27.77	33.0	-5.2	
1.914	20.2	H	1.50	8.38	27.08	33.0	-5.9	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (1.4 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 1.4MHz BW
16QAM, Peak, RB6-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	20.3	V	1.50	7.94	26.74	33.0	-6.3	
1.851	20.4	H	1.50	8.14	27.04	33.0	-6.0	
Mid Ch								
1.883	21.3	V	1.50	7.95	27.75	33.0	-5.3	
1.883	19.9	H	1.50	8.26	26.66	33.0	-6.3	
High Ch								
1.914	20.6	V	1.50	7.97	27.07	33.0	-5.9	
1.914	19.4	H	1.50	8.38	26.28	33.0	-6.7	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 3MHz BW
QPSK, Peak, RB15-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	20.9	V	1.50	7.94	27.34	33.0	-5.7	
1.852	21.0	H	1.50	8.14	27.64	33.0	-5.4	
Mid Ch								
1.883	22.0	V	1.50	7.95	28.45	33.0	-4.6	
1.883	20.5	H	1.50	8.26	27.26	33.0	-5.7	
High Ch								
1.914	21.6	V	1.50	7.97	28.07	33.0	-4.9	
1.914	20.1	H	1.50	8.38	26.98	33.0	-6.0	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 3MHz BW
16QAM, Peak, RB15-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	20.1	V	1.50	7.94	26.54	33.0	-6.5	
1.852	20.2	H	1.50	8.14	26.84	33.0	-6.2	
Mid Ch								
1.883	21.1	V	1.50	7.95	27.55	33.0	-5.5	
1.883	19.7	H	1.50	8.26	26.46	33.0	-6.5	
High Ch								
1.914	21.7	V	1.50	7.97	28.17	33.0	-4.8	
1.914	19.2	H	1.50	8.38	26.08	33.0	-6.9	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 5MHz BW
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	22.5	V	1.50	7.94	28.94	33.0	-4.1	
1.853	20.8	H	1.50	8.14	27.44	33.0	-5.6	
Mid Ch								
1.883	22.7	V	1.50	7.95	29.15	33.0	-3.9	
1.883	21.1	H	1.50	8.26	27.86	33.0	-5.1	
High Ch								
1.913	20.9	V	1.50	7.97	27.37	33.0	-5.6	
1.913	19.5	H	1.50	8.38	26.38	33.0	-6.6	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 5MHz BW
16QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	21.6	V	1.50	7.94	28.04	33.0	-5.0	
1.853	19.9	H	1.50	8.14	26.54	33.0	-6.5	
Mid Ch								
1.883	21.8	V	1.50	7.95	28.25	33.0	-4.8	
1.883	20.1	H	1.50	8.26	26.86	33.0	-6.1	
High Ch								
1.913	20.1	V	1.50	7.97	26.57	33.0	-6.4	
1.913	18.6	H	1.50	8.38	25.48	33.0	-7.5	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 10MHz BW
QPSK, Peak, RB 50-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	22.4	V	1.50	7.94	28.84	33.0	-4.2	
1.855	21.3	H	1.50	8.14	27.94	33.0	-5.1	
Mid Ch								
1.883	22.8	V	1.50	7.95	29.25	33.0	-3.8	
1.883	21.2	H	1.50	8.26	27.96	33.0	-5.0	
High Ch								
1.910	22.2	V	1.50	7.97	28.67	33.0	-4.3	
1.910	20.6	H	1.50	8.38	27.48	33.0	-5.5	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 10MHz BW
16QAM, Peak, RB 50-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	21.5	V	1.50	7.94	27.94	33.0	-5.1	
1.855	20.4	H	1.50	8.14	27.04	33.0	-6.0	
Mid Ch								
1.883	21.9	V	1.50	7.95	28.35	33.0	-4.7	
1.883	20.3	H	1.50	8.26	27.06	33.0	-5.9	
High Ch								
1.910	21.3	V	1.50	7.97	27.77	33.0	-5.2	
1.910	19.6	H	1.50	8.38	26.48	33.0	-6.5	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 15MHz BW
QPSK, Peak, RB75-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	22.7	V	1.50	7.94	29.14	33.0	-3.9	
1.858	21.8	H	1.50	8.14	28.44	33.0	-4.6	
Mid Ch								
1.883	22.9	V	1.50	7.95	29.35	33.0	-3.7	
1.883	21.7	H	1.50	8.26	28.46	33.0	-4.5	
High Ch								
1.908	21.8	V	1.50	7.97	28.27	33.0	-4.7	
1.908	20.7	H	1.50	8.38	27.58	33.0	-5.4	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 15MHz BW
16QAM, Peak, RB75-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	21.8	V	1.50	7.94	28.24	33.0	-4.8	
1.858	20.9	H	1.50	8.14	27.54	33.0	-5.5	
Mid Ch								
1.883	22.1	V	1.50	7.95	28.55	33.0	-4.5	
1.883	20.8	H	1.50	8.26	27.56	33.0	-5.4	
High Ch								
1.908	21.0	V	1.50	7.97	27.47	33.0	-5.5	
1.908	19.8	H	1.50	8.38	26.68	33.0	-6.3	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 20MHz BW
QPSK, Peak, RB100-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	22.8	V	1.50	7.94	29.24	33.0	-3.8	
1.860	21.7	H	1.50	8.14	28.34	33.0	-4.7	
Mid Ch								
1.883	23.1	V	1.50	7.95	29.55	33.0	-3.5	
1.883	22.0	H	1.50	8.26	28.76	33.0	-4.2	
High Ch								
1.905	22.0	V	1.50	7.97	28.47	33.0	-4.5	
1.905	20.7	H	1.50	8.38	27.58	33.0	-5.4	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/04/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 25, 20MHz BW
16QAM, Peak, RB100-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T60 Substitution, 8ft SMA Cable (245185004) Warehouse

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	21.9	V	1.50	7.94	28.34	33.0	-4.7	
1.860	20.8	H	1.50	8.14	27.44	33.0	-5.6	
Mid Ch								
1.883	22.2	V	1.50	7.95	28.65	33.0	-4.4	
1.883	21.0	H	1.50	8.26	27.76	33.0	-5.2	
High Ch								
1.905	21.1	V	1.50	7.97	27.57	33.0	-5.4	
1.905	19.7	H	1.50	8.38	26.58	33.0	-6.4	

Rev. 3.17.11

9.1.7. LTE BAND 26

ERP LTE QPSK Band 26 (3.0 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 26, 3MHz BW
QPSK, Average, RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
820.30	15.40	V	0.8	0.0	14.60	38.5	-23.8	
820.30	21.10	H	0.8	0.0	20.30	38.5	-18.1	
Mid Ch								
821.30	15.70	V	0.8	0.0	14.90	38.5	-23.5	
821.30	21.00	H	0.8	0.0	20.20	38.5	-18.2	
High Ch								
822.30	15.20	V	0.8	0.0	14.40	38.5	-24.0	
822.30	20.40	H	0.8	0.0	19.60	38.5	-18.8	

Rev. 3.17.11

ERP LTE 16QAM Band 26 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 26, 3MHz BW
16QAM, Average, RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
820.30	14.50	V	0.8	0.0	13.70	38.5	-24.7	
820.30	20.10	H	0.8	0.0	19.30	38.5	-19.1	
Mid Ch								
821.30	14.70	V	0.8	0.0	13.90	38.5	-24.5	
821.30	20.10	H	0.8	0.0	19.30	38.5	-19.1	
High Ch								
822.30	14.30	V	0.8	0.0	13.50	38.5	-24.9	
822.30	19.50	H	0.8	0.0	18.70	38.5	-19.7	

Rev. 3.17.11

ERP LTE QPSK Band 26 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 26, 5MHz BW
QPSK, Average, RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
818.80	16.60	V	0.8	0.0	15.80	38.5	-22.6	
818.80	21.00	H	0.8	0.0	20.20	38.5	-18.2	
Mid Ch								
821.30	16.40	V	0.8	0.0	15.60	38.5	-22.8	
821.30	20.90	H	0.8	0.0	20.10	38.5	-18.3	
High Ch								
823.80	16.20	V	0.8	0.0	15.40	38.5	-23.0	
823.80	20.40	H	0.8	0.0	19.60	38.5	-18.8	

Rev. 3.17.11

ERP LTE 16QAM Band 26 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: T Wang
Configuration: EUT Only
Mode: LTE Band 26, 5MHz BW
16QAM, Average, RB1-0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
818.80	15.70	V	0.8	0.0	14.90	38.5	-23.5	
818.80	20.10	H	0.8	0.0	19.30	38.5	-19.1	
Mid Ch								
821.30	15.60	V	0.8	0.0	14.80	38.5	-23.6	
821.30	20.00	H	0.8	0.0	19.20	38.5	-19.2	
High Ch								
823.80	15.30	V	0.8	0.0	14.50	38.5	-23.9	
823.80	19.50	H	0.8	0.0	18.70	38.5	-19.7	

Rev. 3.17.11

9.1. 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

LTE BAND 5

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	1.4	RB1-0	836.5	28.78	23.98	4.8
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	1.4	RB1-0	836.5	28.63	22.89	5.74
*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	RB1-0	836.5	29.04	24.04	5
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	3	RB1-0	836.5	28.68	22.97	5.71
*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	RB1-0	836.5	28.91	23.98	4.93
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	836.5	28.61	22.76	5.85
*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	RB1-0	836.5	29.01	23.9	5.11

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	836.5	28.59	22.8	5.79

*Peak Reading = Average Reading + Peak-to-Average Ratio

LTE BAND 13

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	RB1-0	782	27.94	23.81	4.13

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	782	27.94	22.66	5.28

*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	RB1-0	782	27.86	24.01	3.85

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	782	27.87	22.93	4.94

*Peak Reading = Average Reading + Peak-to-Average Ratio

LTE BAND 17

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	RB1-0	710	28.51	23.99	4.52

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	710	28.41	22.73	5.68

*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	RB1-0	710	28.04	23.98	4.06

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	710	28.01	23.04	4.97

*Peak Reading = Average Reading + Peak-to-Average Ratio

LTE BAND 26

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	RB1-0	821.3	28.75	23.06	5.69

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	821.3	28.12	21.86	6.26

*Peak Reading = Average Reading + Peak-to-Average Ratio

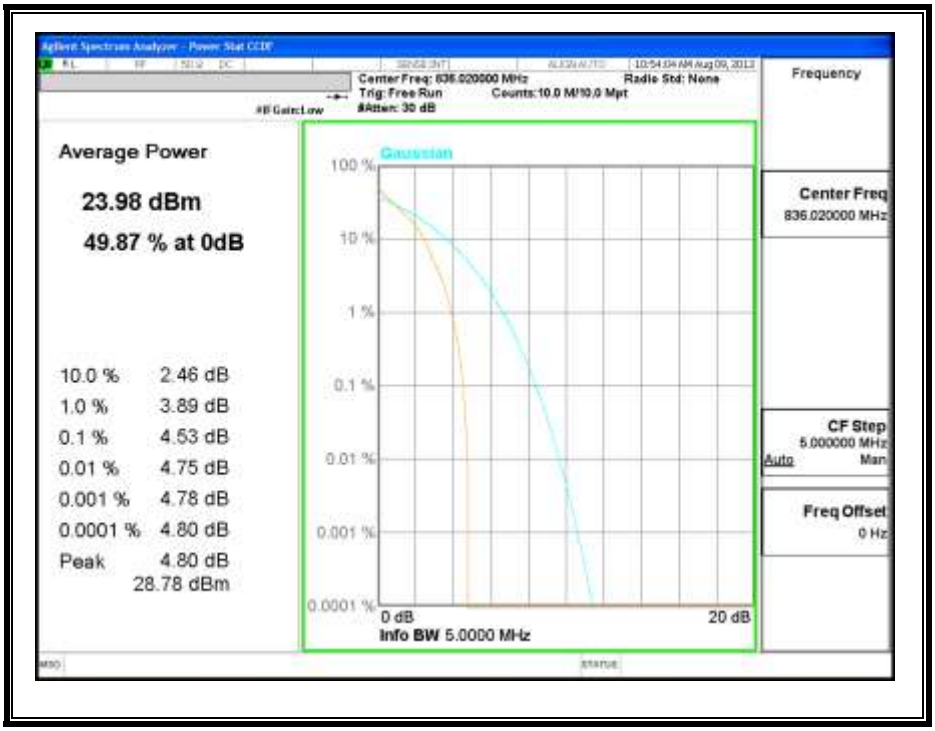
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	10	RB1-0	710	28.58	23.28	5.3

Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	710	28.53	22.3	6.23

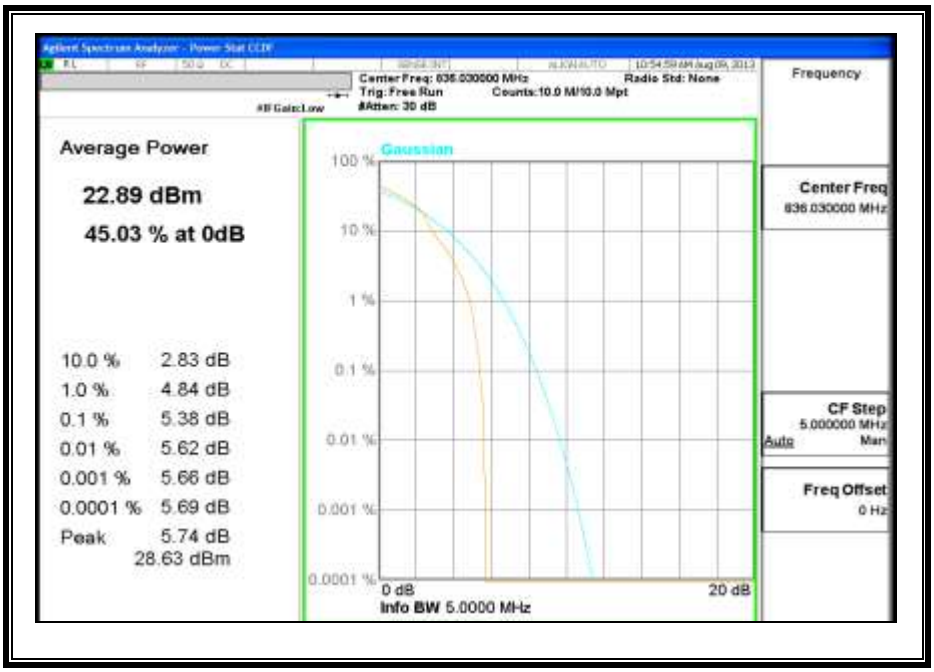
*Peak Reading = Average Reading + Peak-to-Average Ratio

LTE BAND 5

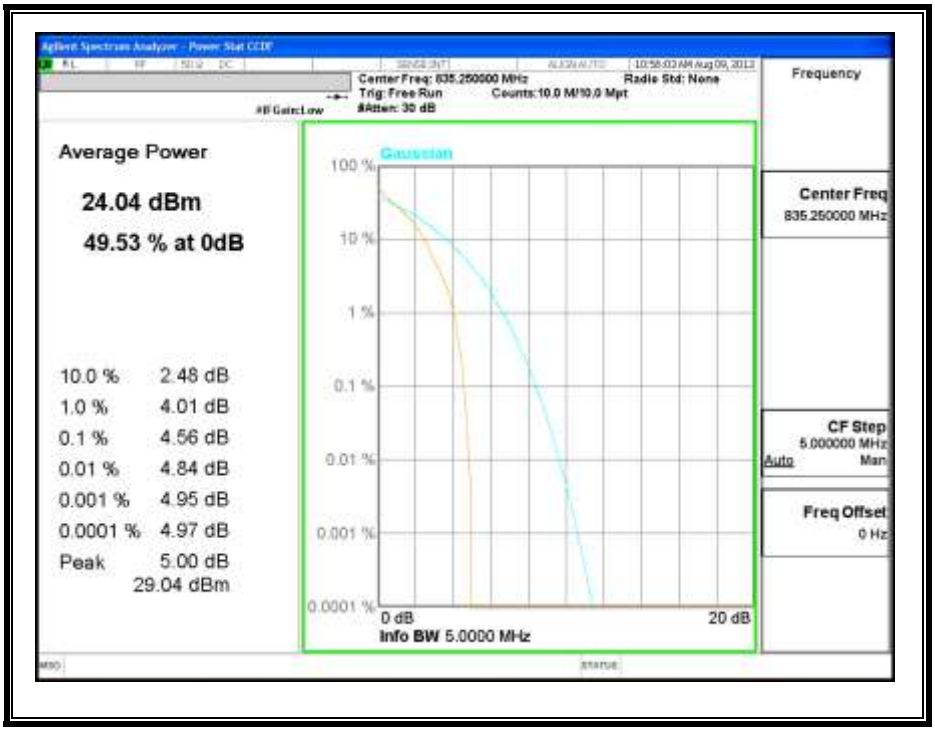
1.4MHz_QPSK



1.4MHz_16QAM

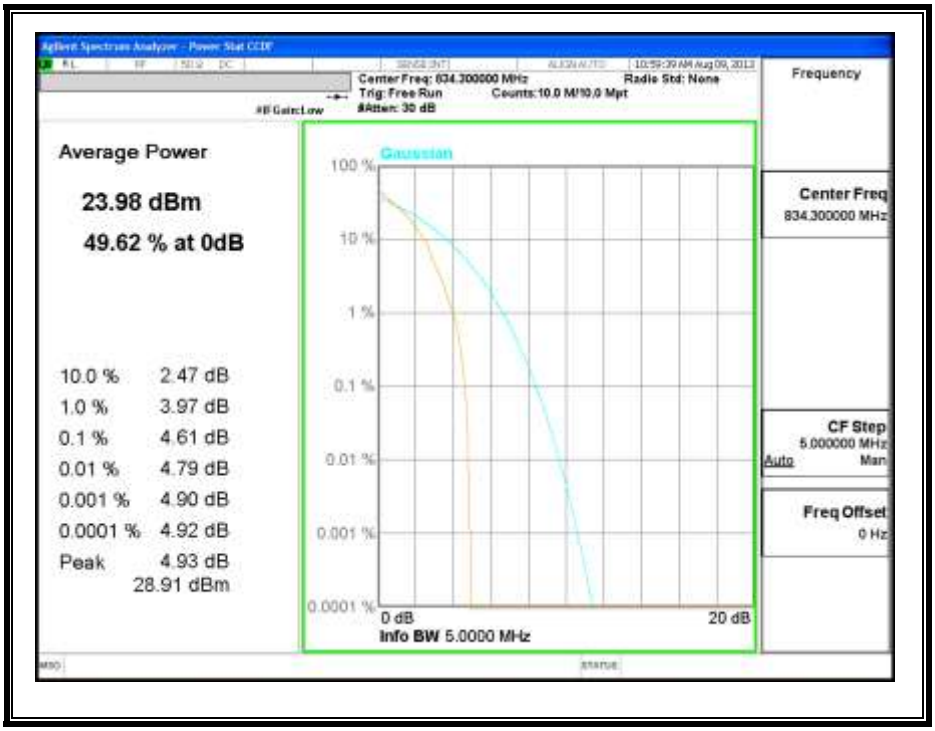


3.0MHz_QPSK

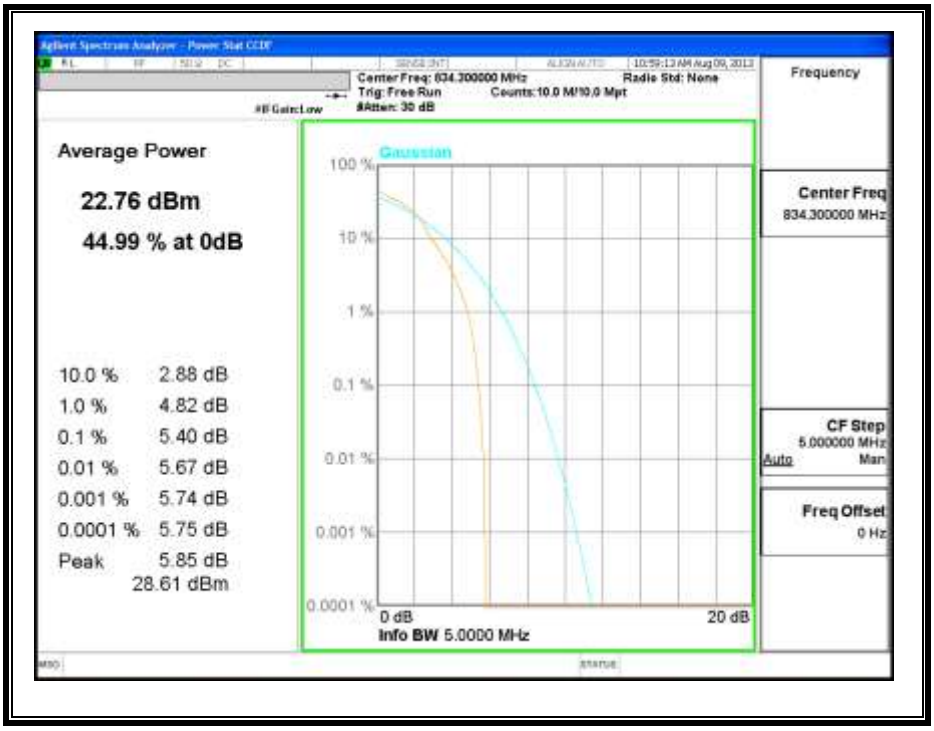


3.0MHz_16QAM

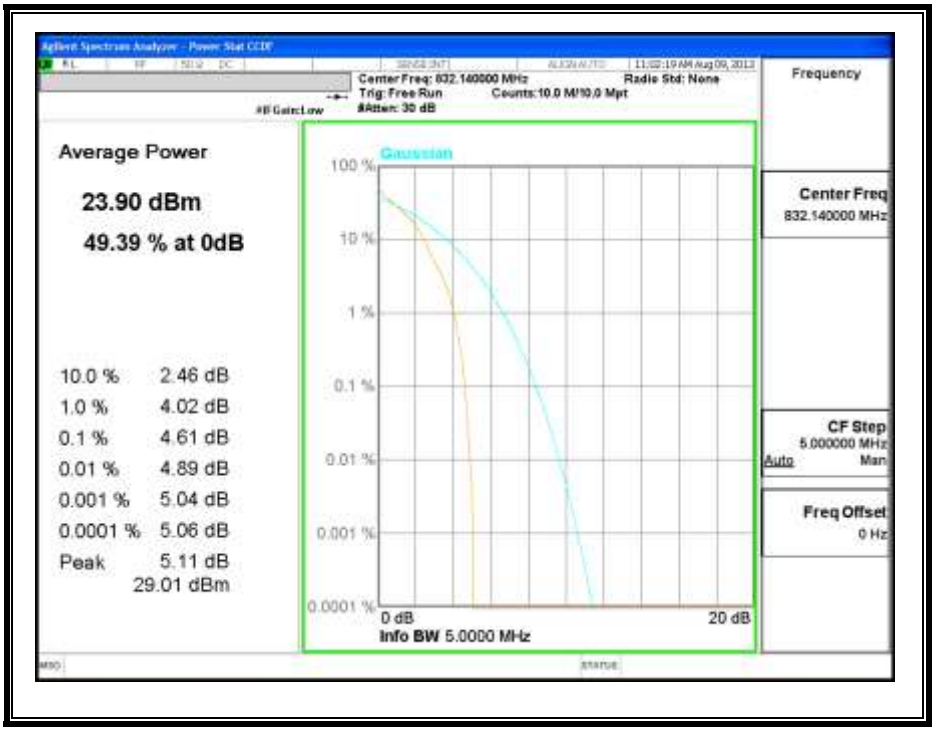
5.0MHz_QPSK



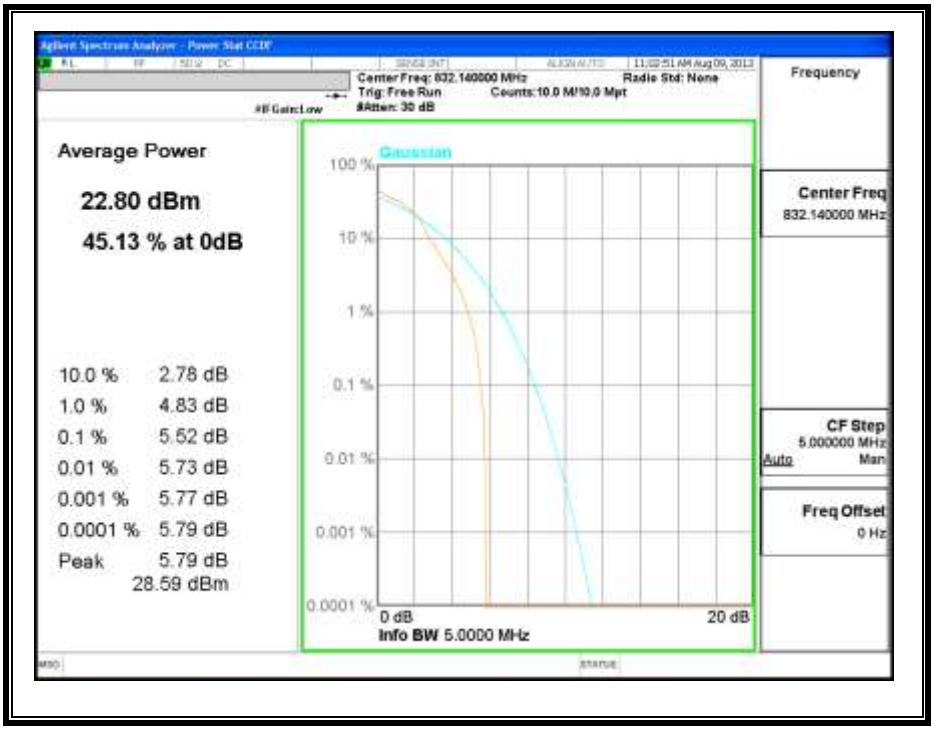
5.0MHz_16QAM



10MHz_QPSK

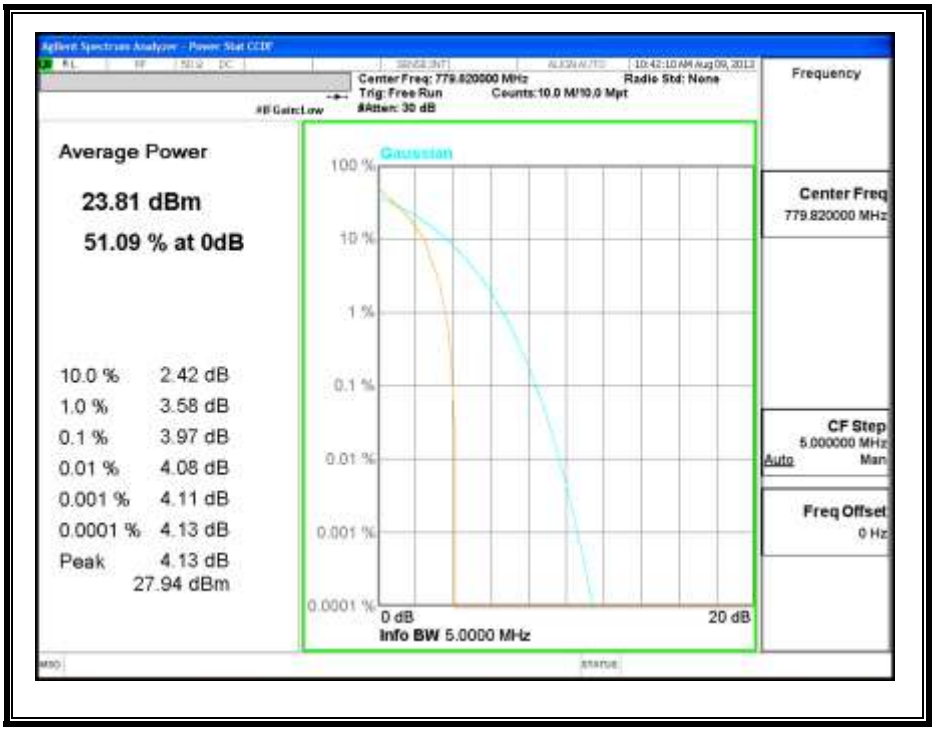


10MHz_16QAM

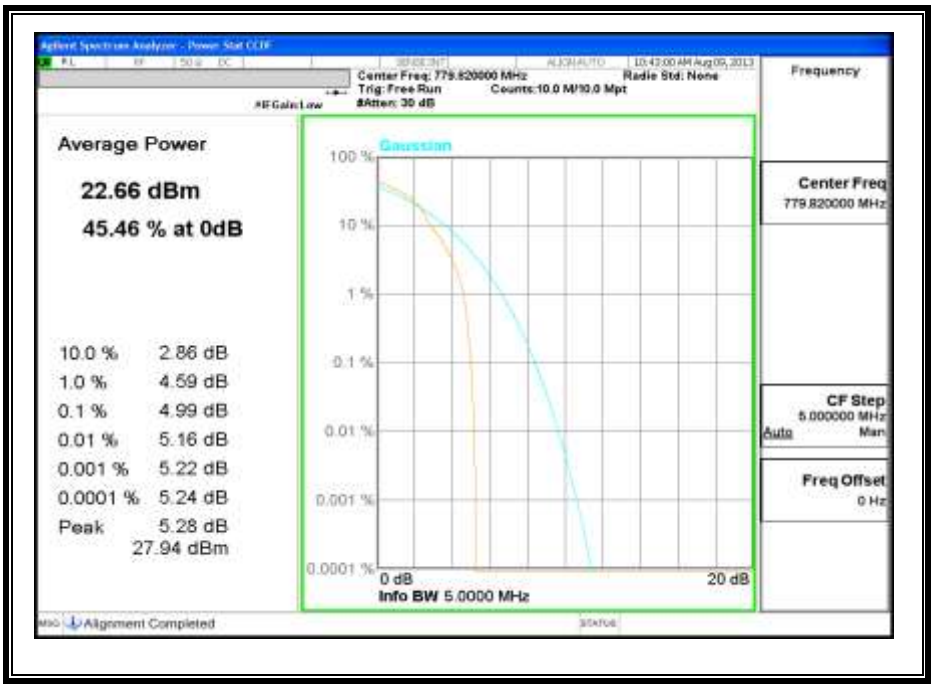


BAND 13

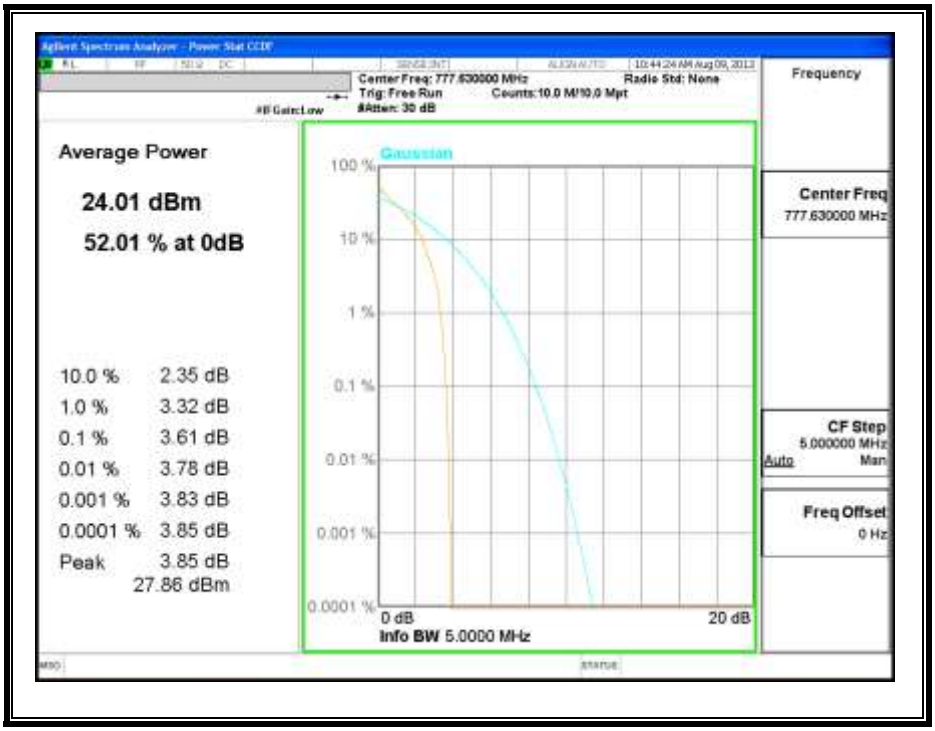
5.0MHz_QPSK



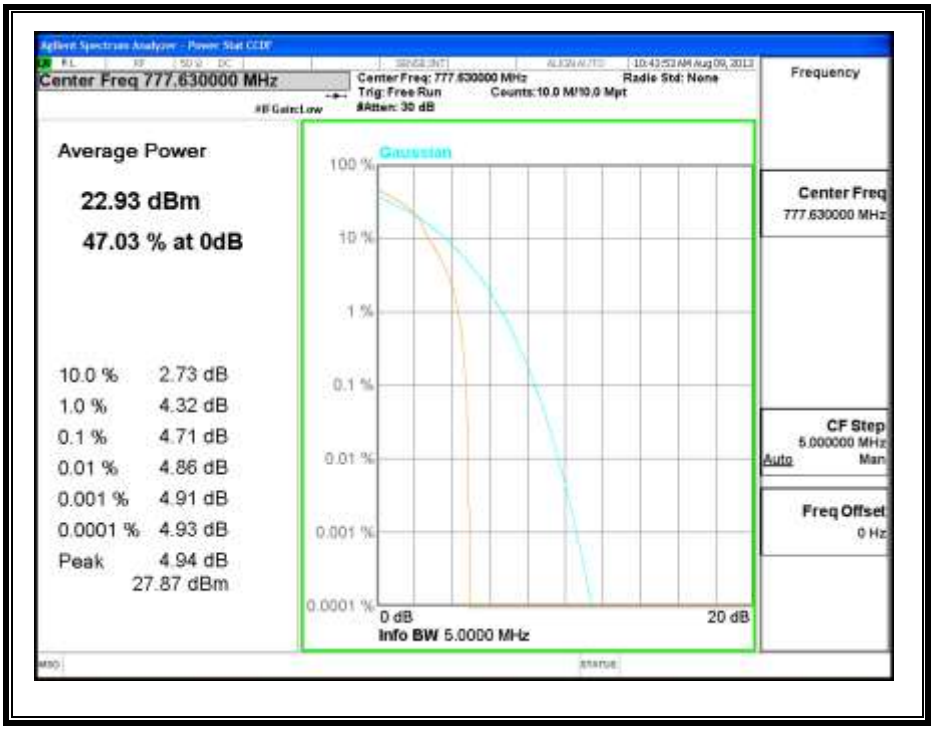
5.0MHz_16QAM



10MHz_QPSK

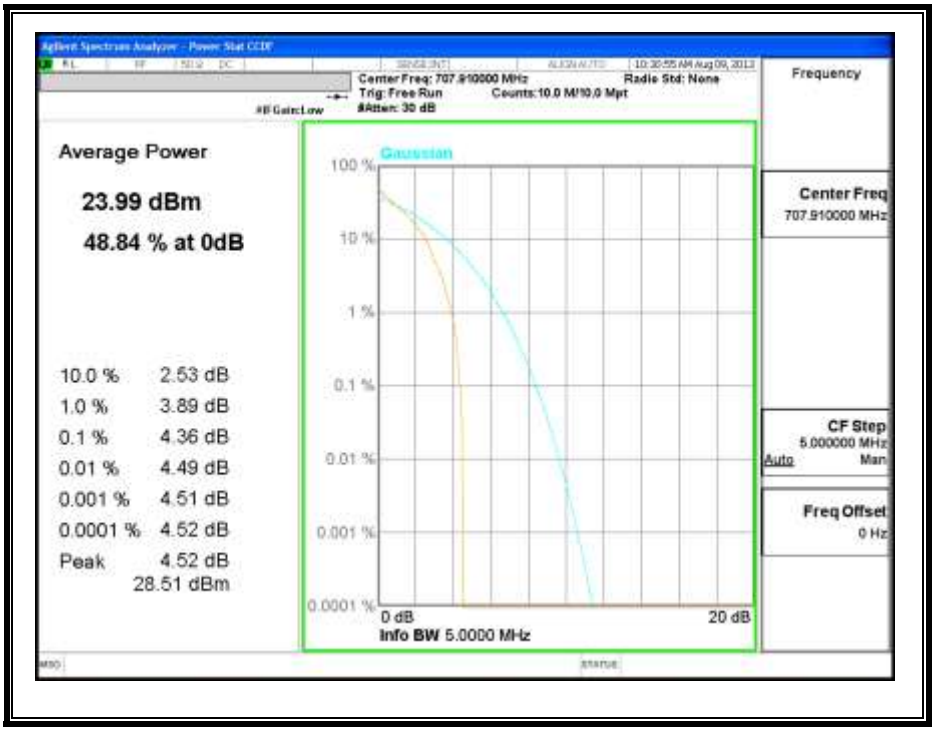


10MHz_16QAM

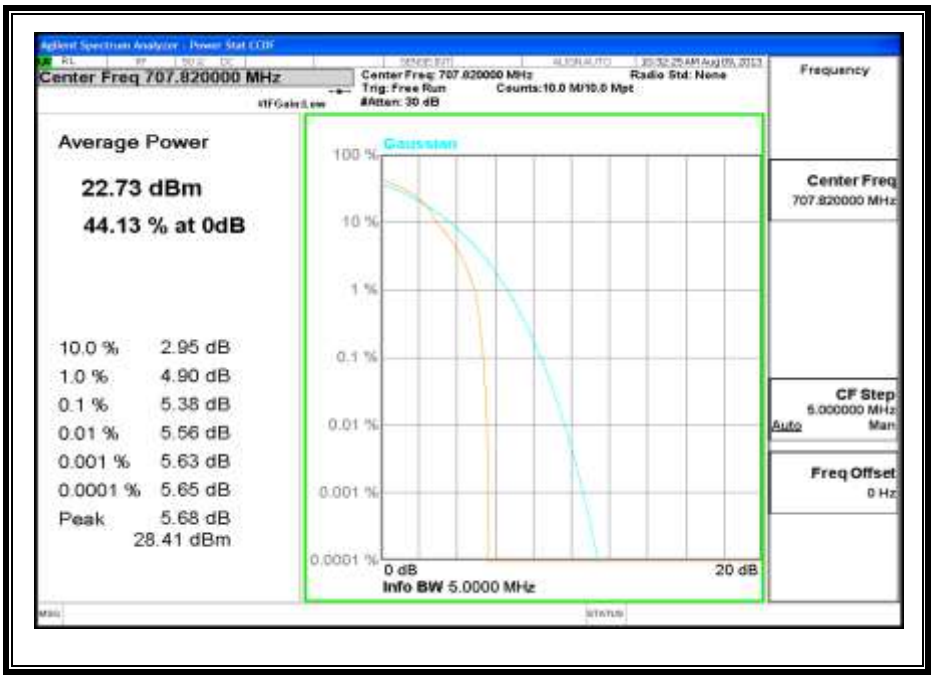


BAND 17

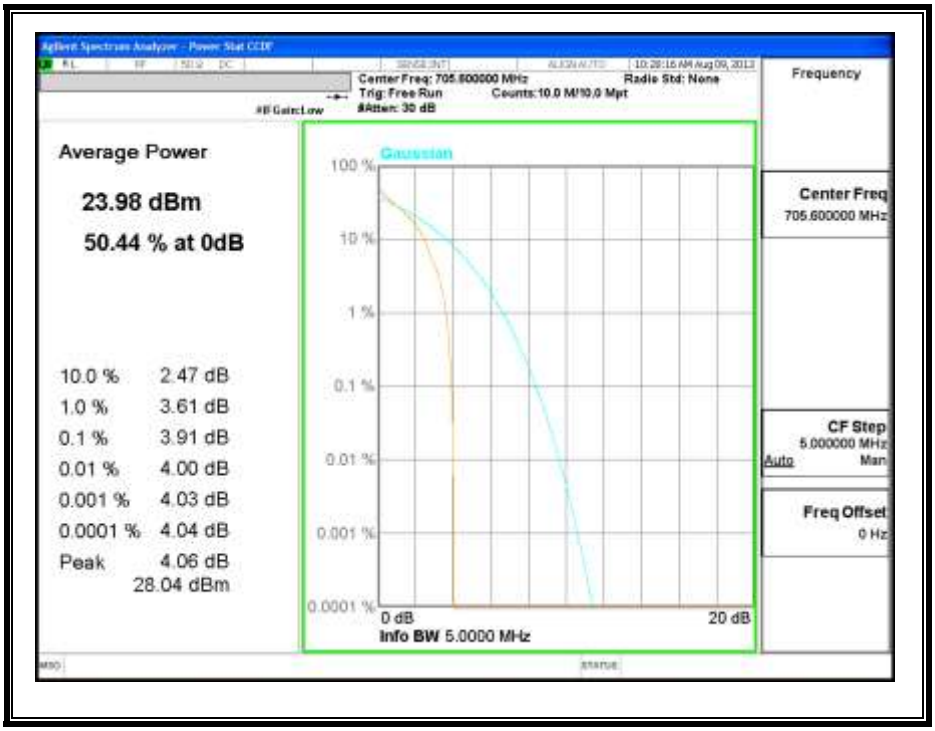
5.0MHz_QPSK



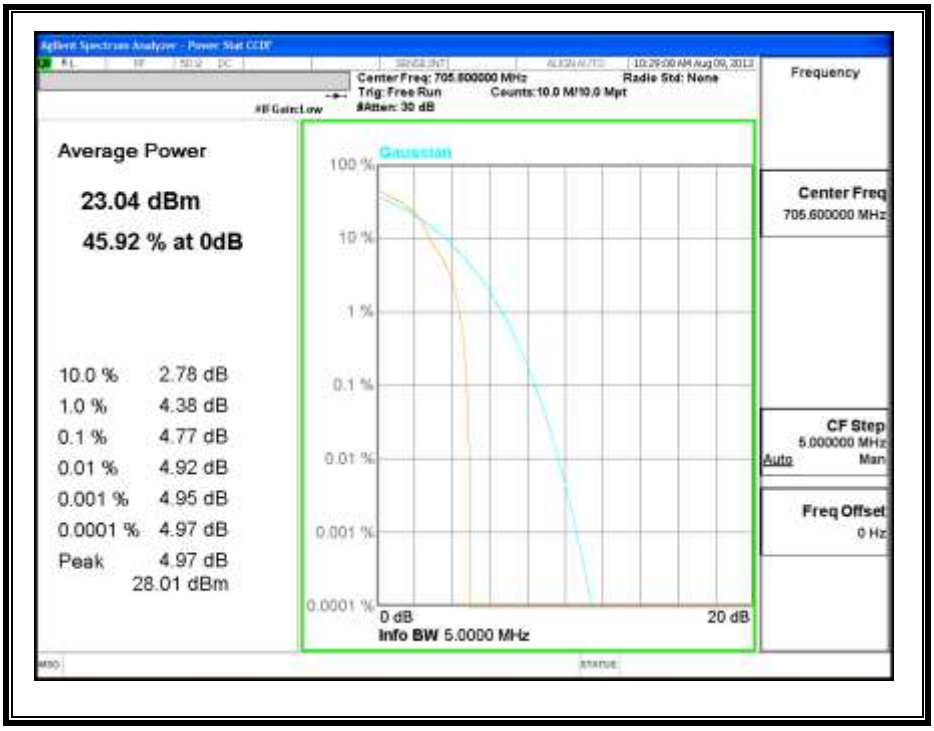
5.0MHz_16QAM



10MHz_QPSK

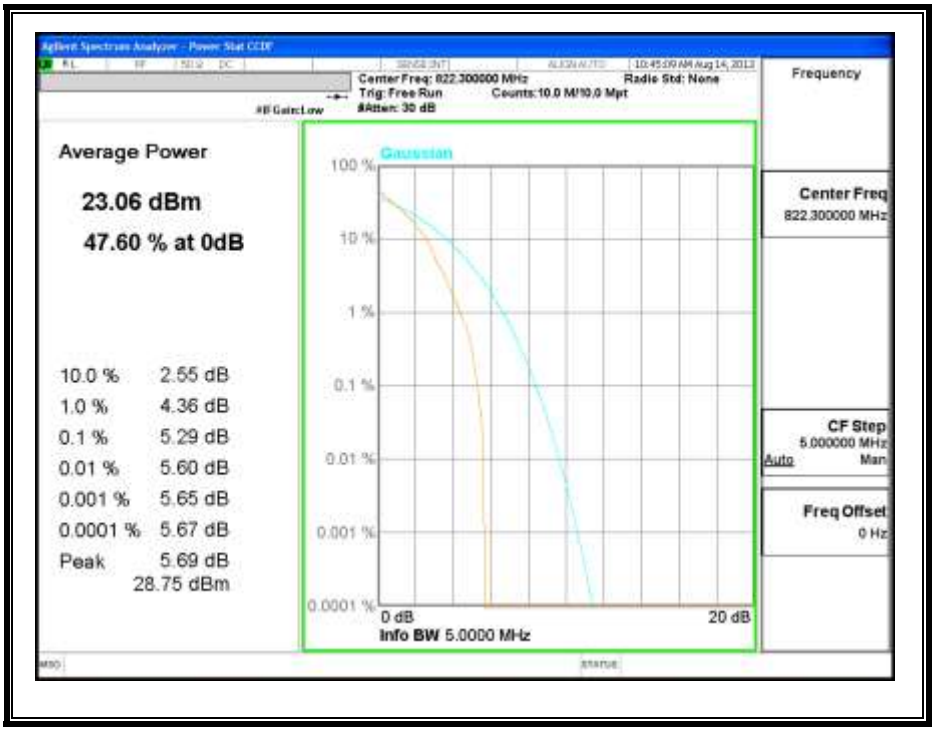


10MHz_16QAM

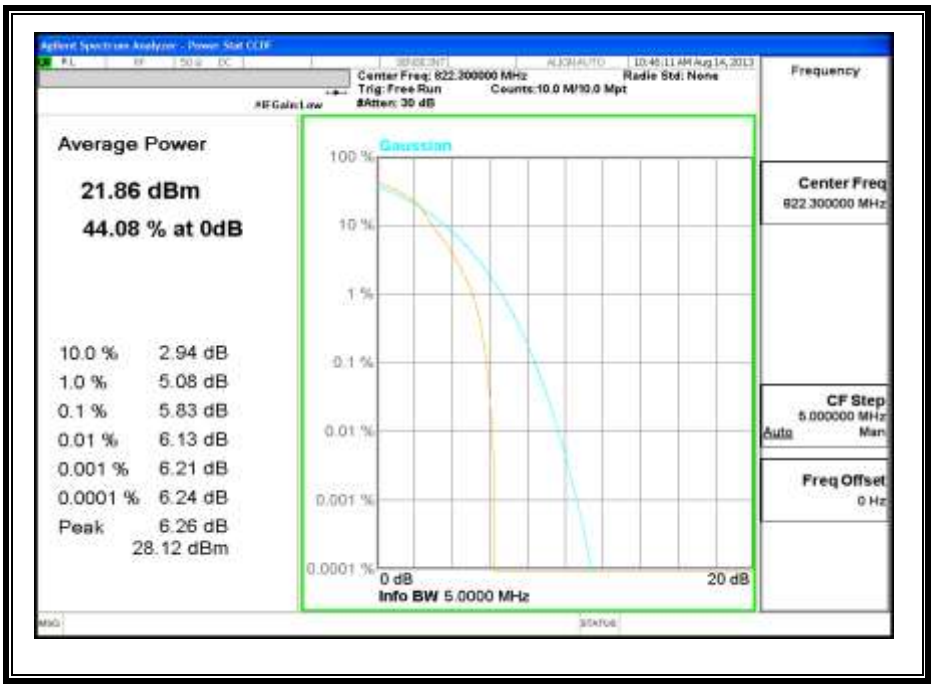


BAND 26

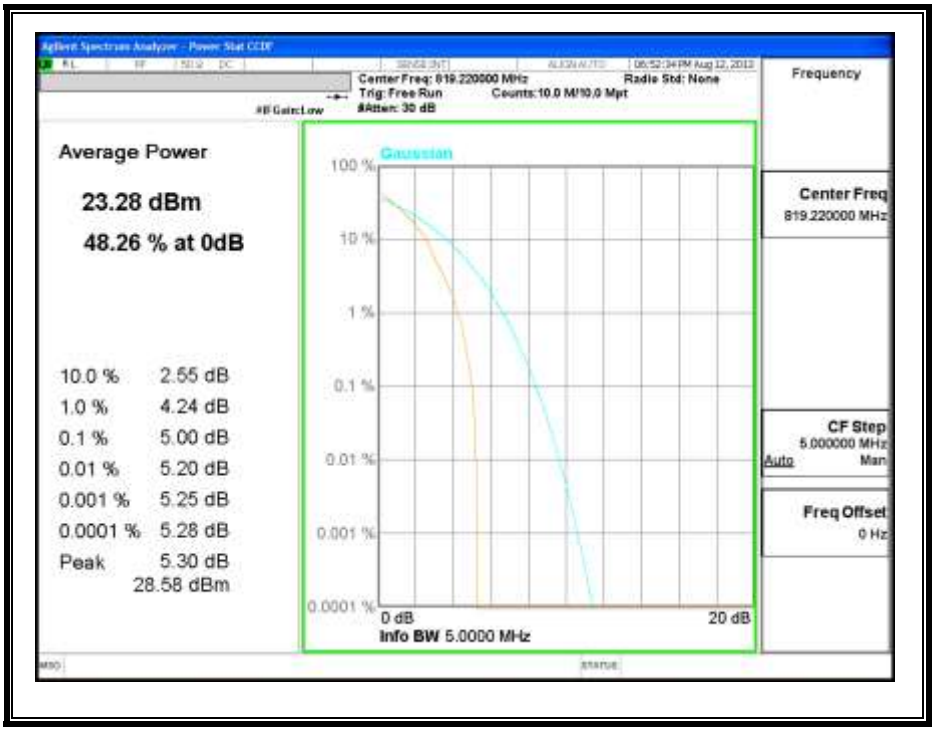
3.0MHz_QPSK



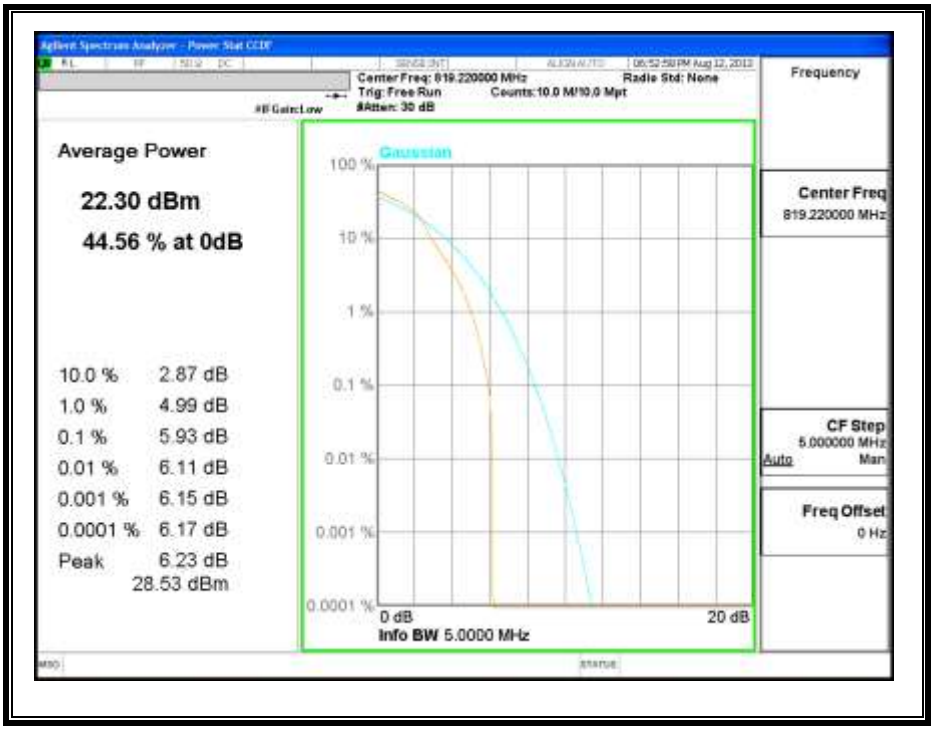
3.0MHz_16QAM



5.0MHz_QPSK



5.0MHz_16QAM



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 log10(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, 4, 5, 13, 17, 25 and 26

RESULTS

9.2.1. LTE BAND 2

QPSK BAND 2QPSK Band 2(1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE band 2, 1.4MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.702	-26.7	V	3.0	30.2	1.0	-55.9	-13.0	-42.9	
5.553	-30.2	V	3.0	28.4	1.0	-57.6	-13.0	-44.6	
3.702	-26.7	H	3.0	30.2	1.0	-55.9	-13.0	-42.9	
5.553	-28.6	H	3.0	28.4	1.0	-56.0	-13.0	-43.0	
Mid Ch, (1880 MHz)									
3.760	-26.4	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
5.640	-29.5	V	3.0	28.3	1.0	-56.8	-13.0	-43.8	
3.760	-26.6	H	3.0	30.1	1.0	-55.7	-13.0	-42.7	
5.640	-28.4	H	3.0	28.3	1.0	-55.7	-13.0	-42.7	
High Ch, (1909.3 MHz)									
3.819	-26.3	V	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.728	-29.8	V	3.0	28.2	1.0	-57.0	-13.0	-44.0	
3.819	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
5.728	-28.2	H	3.0	28.2	1.0	-55.4	-13.0	-42.4	

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: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 1.4MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.702	-27.7	V	3.0	30.2	1.0	-56.9	-13.0	-43.9	
5.553	-31.2	V	3.0	28.4	1.0	-58.6	-13.0	-45.6	
3.702	-27.7	H	3.0	30.2	1.0	-56.9	-13.0	-43.9	
5.553	-29.6	H	3.0	28.4	1.0	-57.0	-13.0	-44.0	
Mid Ch, (1880 MHz)									
3.760	-27.4	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
5.640	-30.5	V	3.0	28.3	1.0	-57.8	-13.0	-44.8	
3.760	-27.6	H	3.0	30.1	1.0	-56.7	-13.0	-43.7	
5.640	-29.3	H	3.0	28.3	1.0	-56.6	-13.0	-43.6	
High Ch, (1909.3 MHz)									
3.819	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.728	-30.8	V	3.0	28.2	1.0	-58.0	-13.0	-45.0	
3.819	-27.9	H	3.0	30.1	1.0	-57.0	-13.0	-44.0	
5.728	-29.0	H	3.0	28.2	1.0	-56.2	-13.0	-43.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 3MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.704	-26.6	V	3.0	30.2	1.0	-55.8	-13.0	-42.8	
5.556	-30.4	V	3.0	28.4	1.0	-57.7	-13.0	-44.7	
3.704	-26.5	H	3.0	30.2	1.0	-55.7	-13.0	-42.7	
5.556	-28.8	H	3.0	28.4	1.0	-56.2	-13.0	-43.2	
Mid Ch, (1880 MHz)									
3.760	-26.4	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
5.640	-29.3	V	3.0	28.3	1.0	-56.6	-13.0	-43.6	
3.760	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
5.640	-27.5	H	3.0	28.3	1.0	-54.8	-13.0	-41.8	
High Ch, (1909 MHz)									
3.818	-25.9	V	3.0	30.1	1.0	-55.0	-13.0	-42.0	
5.727	-30.3	V	3.0	28.2	1.0	-57.5	-13.0	-44.5	
3.818	-26.4	H	3.0	30.1	1.0	-55.5	-13.0	-42.5	
5.727	-24.9	H	3.0	28.2	1.0	-52.1	-13.0	-39.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 3MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.704	-27.6	V	3.0	30.2	1.0	-56.8	-13.0	-43.8	
5.556	-31.4	V	3.0	28.4	1.0	-58.7	-13.0	-45.7	
3.704	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
5.556	-29.8	H	3.0	28.4	1.0	-57.2	-13.0	-44.2	
Mid Ch, (1880 MHz)									
3.760	-27.4	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
5.640	-30.3	V	3.0	28.3	1.0	-57.6	-13.0	-44.6	
3.760	-28.1	H	3.0	30.1	1.0	-57.2	-13.0	-44.2	
5.640	-28.5	H	3.0	28.3	1.0	-55.8	-13.0	-42.8	
High Ch, (1909 MHz)									
3.818	-26.9	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
5.727	-31.3	V	3.0	28.2	1.0	-58.5	-13.0	-45.5	
3.818	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
5.727	-26.9	H	3.0	28.2	1.0	-54.1	-13.0	-41.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1853 MHz)									
3.706	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
5.559	-27.6	V	3.0	28.4	1.0	-54.9	-13.0	-41.9	
3.706	-26.8	H	3.0	30.2	1.0	-56.0	-13.0	-43.0	
5.559	-28.4	H	3.0	28.4	1.0	-55.8	-13.0	-42.8	
Mid Ch, (1880 MHz)									
3.760	-25.8	V	3.0	30.1	1.0	-55.0	-13.0	-42.0	
5.640	-29.3	V	3.0	28.3	1.0	-56.6	-13.0	-43.6	
3.760	-26.1	H	3.0	30.1	1.0	-55.2	-13.0	-42.2	
5.640	-27.8	H	3.0	28.3	1.0	-55.1	-13.0	-42.1	
High Ch, (1908 MHz)									
3.816	-26.6	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
5.724	-27.7	V	3.0	28.2	1.0	-54.9	-13.0	-41.9	
3.816	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
5.724	-28.0	H	3.0	28.2	1.0	-55.2	-13.0	-42.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1853 MHz)									
3.706	-27.5	V	3.0	30.2	1.0	-56.7	-13.0	-43.7	
5.559	-28.6	V	3.0	28.4	1.0	-55.9	-13.0	-42.9	
3.706	-27.8	H	3.0	30.2	1.0	-57.0	-13.0	-44.0	
5.559	-29.4	H	3.0	28.4	1.0	-56.8	-13.0	-43.8	
Mid Ch, (1880 MHz)									
3.760	-26.8	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
5.640	-30.3	V	3.0	28.3	1.0	-57.6	-13.0	-44.6	
3.760	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
5.640	-28.8	H	3.0	28.3	1.0	-56.1	-13.0	-43.1	
High Ch, (1908 MHz)									
3.816	-27.6	V	3.0	30.1	1.0	-56.7	-13.0	-43.7	
5.724	-28.7	V	3.0	28.2	1.0	-55.9	-13.0	-42.9	
3.816	-28.1	H	3.0	30.1	1.0	-57.2	-13.0	-44.2	
5.724	-29.0	H	3.0	28.2	1.0	-56.2	-13.0	-43.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE band 2, 10MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.701	-26.1	V	3.0	30.2	1.0	-55.3	-13.0	-42.3	
5.551	-29.8	V	3.0	28.4	1.0	-57.2	-13.0	-44.2	
3.701	-26.6	H	3.0	30.2	1.0	-55.8	-13.0	-42.8	
5.551	-28.4	H	3.0	28.4	1.0	-55.8	-13.0	-42.8	
Mid Ch, (1880 MHz)									
3.750	-26.3	V	3.0	30.2	1.0	-55.5	-13.0	-42.5	
5.625	-28.0	V	3.0	28.3	1.0	-55.3	-13.0	-42.3	
3.750	-27.2	H	3.0	30.2	1.0	-56.3	-13.0	-43.3	
5.625	-28.7	H	3.0	28.3	1.0	-56.0	-13.0	-43.0	
High Ch, (1905 MHz)									
3.801	-26.3	V	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.702	-28.7	V	3.0	28.2	1.0	-56.0	-13.0	-43.0	
3.801	-26.5	H	3.0	30.1	1.0	-55.6	-13.0	-42.6	
5.702	-28.5	H	3.0	28.2	1.0	-55.8	-13.0	-42.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE band 2, 10MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.701	-27.1	V	3.0	30.2	1.0	-56.3	-13.0	-43.3	
5.551	-30.8	V	3.0	28.4	1.0	-58.2	-13.0	-45.2	
3.701	-27.6	H	3.0	30.2	1.0	-56.8	-13.0	-43.8	
5.551	-29.3	H	3.0	28.4	1.0	-56.7	-13.0	-43.7	
Mid Ch, (1880 MHz)									
3.750	-27.3	V	3.0	30.2	1.0	-56.5	-13.0	-43.5	
5.625	-29.0	V	3.0	28.3	1.0	-56.3	-13.0	-43.3	
3.750	-28.2	H	3.0	30.2	1.0	-57.3	-13.0	-44.3	
5.625	-29.7	H	3.0	28.3	1.0	-57.0	-13.0	-44.0	
High Ch, (1905 MHz)									
3.801	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.702	-29.7	V	3.0	28.2	1.0	-57.0	-13.0	-44.0	
3.801	-27.6	H	3.0	30.1	1.0	-56.7	-13.0	-43.7	
5.702	-29.4	H	3.0	28.2	1.0	-56.7	-13.0	-43.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 15MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1858 MHz)									
3.703	-26.4	V	3.0	30.2	1.0	-55.6	-13.0	-42.6	
5.554	-30.4	V	3.0	28.4	1.0	-57.8	-13.0	-44.8	
3.703	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
5.554	-28.5	H	3.0	28.4	1.0	-55.9	-13.0	-42.9	
Mid Ch, (1880 MHz)									
3.760	-25.3	V	3.0	30.1	1.0	-54.5	-13.0	-41.5	
5.621	-29.6	V	3.0	28.3	1.0	-56.9	-13.0	-43.9	
3.760	-26.3	H	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.621	-28.0	H	3.0	28.3	1.0	-55.3	-13.0	-42.3	
High Ch, (1903 MHz)									
3.806	-26.5	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
5.709	-30.4	V	3.0	28.2	1.0	-57.6	-13.0	-44.6	
3.806	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
5.709	-28.1	H	3.0	28.2	1.0	-55.3	-13.0	-42.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 15MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1858 MHz)									
3.703	-27.4	V	3.0	30.2	1.0	-56.6	-13.0	-43.6	
5.554	-31.4	V	3.0	28.4	1.0	-58.8	-13.0	-45.8	
3.703	-27.9	H	3.0	30.2	1.0	-57.1	-13.0	-44.1	
5.554	-29.5	H	3.0	28.4	1.0	-56.9	-13.0	-43.9	
Mid Ch, (1880 MHz)									
3.760	-26.3	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
5.621	-30.6	V	3.0	28.3	1.0	-57.9	-13.0	-44.9	
3.760	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.621	-29.0	H	3.0	28.3	1.0	-56.3	-13.0	-43.3	
High Ch, (1903 MHz)									
3.806	-27.5	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
5.709	-31.4	V	3.0	28.2	1.0	-58.6	-13.0	-45.6	
3.806	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
5.709	-29.0	H	3.0	28.2	1.0	-56.2	-13.0	-43.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 20MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.720	-26.8	V	3.0	30.2	1.0	-56.0	-13.0	-43.0	
5.580	-29.6	V	3.0	28.3	1.0	-57.0	-13.0	-44.0	
3.720	-25.4	H	3.0	30.2	1.0	-54.6	-13.0	-41.6	
5.580	-26.7	H	3.0	28.3	1.0	-54.0	-13.0	-41.0	
Mid Ch, (1880 MHz)									
3.760	-25.7	V	3.0	30.1	1.0	-54.9	-13.0	-41.9	
5.640	-29.6	V	3.0	28.3	1.0	-56.9	-13.0	-43.9	
3.760	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
5.640	-28.6	H	3.0	28.3	1.0	-55.9	-13.0	-42.9	
High Ch, (1900 MHz)									
3.800	-25.8	V	3.0	30.1	1.0	-54.9	-13.0	-41.9	
5.700	-28.3	V	3.0	28.2	1.0	-55.6	-13.0	-42.6	
3.800	-26.5	H	3.0	30.1	1.0	-55.6	-13.0	-42.6	
5.700	-28.3	H	3.0	28.2	1.0	-55.6	-13.0	-42.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 2, 20MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.720	-27.9	V	3.0	30.2	1.0	-57.1	-13.0	-44.1	
5.580	-30.6	V	3.0	28.3	1.0	-58.0	-13.0	-45.0	
3.720	-26.5	H	3.0	30.2	1.0	-55.7	-13.0	-42.7	
5.580	-27.7	H	3.0	28.3	1.0	-55.0	-13.0	-42.0	
Mid Ch, (1880 MHz)									
3.760	-26.7	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
5.640	-30.6	V	3.0	28.3	1.0	-57.9	-13.0	-44.9	
3.760	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
5.640	-29.6	H	3.0	28.3	1.0	-56.9	-13.0	-43.9	
High Ch, (1900 MHz)									
3.800	-26.8	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
5.700	-29.3	V	3.0	28.2	1.0	-56.6	-13.0	-43.6	
3.800	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
5.700	-29.3	H	3.0	28.2	1.0	-56.6	-13.0	-43.6	

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:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE band 4, 1.4MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1710.7 MHz)									
3.421	-26.8	V	3.0	30.4	1.0	-56.3	-13.0	-43.3	
5.132	-30.2	V	3.0	28.8	1.0	-58.0	-13.0	-45.0	
3.421	-27.4	H	3.0	30.4	1.0	-56.8	-13.0	-43.8	
5.132	-29.2	H	3.0	28.8	1.0	-56.9	-13.0	-43.9	
Mid Ch, (1732.5 MHz)									
3.465	-27.4	V	3.0	30.4	1.0	-56.8	-13.0	-43.8	
5.198	-30.7	V	3.0	28.7	1.0	-58.4	-13.0	-45.4	
3.465	-27.2	H	3.0	30.4	1.0	-56.6	-13.0	-43.6	
5.198	-28.6	H	3.0	28.7	1.0	-56.3	-13.0	-43.3	
High Ch, (1754.3 MHz)									
3.509	-27.6	V	3.0	30.4	1.0	-57.0	-13.0	-44.0	
5.263	-30.8	V	3.0	28.6	1.0	-58.4	-13.0	-45.4	
3.509	-27.3	H	3.0	30.4	1.0	-56.6	-13.0	-43.6	
5.263	-28.9	H	3.0	28.6	1.0	-56.6	-13.0	-43.6	

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: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 1.4MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1710.7 MHz)									
3.421	-27.7	V	3.0	30.4	1.0	-57.2	-13.0	-44.2	
5.132	-31.0	V	3.0	28.8	1.0	-58.8	-13.0	-45.8	
3.421	-28.3	H	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.132	-30.0	H	3.0	28.8	1.0	-57.7	-13.0	-44.7	
Mid Ch, (1732.5 MHz)									
3.465	-28.3	V	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.198	-31.7	V	3.0	28.7	1.0	-59.4	-13.0	-46.4	
3.465	-28.1	H	3.0	30.4	1.0	-57.5	-13.0	-44.5	
5.198	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	
High Ch, (1754.3 MHz)									
3.509	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.263	-31.8	V	3.0	28.6	1.0	-59.4	-13.0	-46.4	
3.509	-28.3	H	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.263	-29.6	H	3.0	28.6	1.0	-57.3	-13.0	-44.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 3MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1711.5 MHz)									
3.423	-27.2	V	3.0	30.4	1.0	-56.7	-13.0	-43.7	
5.135	-29.5	V	3.0	28.8	1.0	-57.3	-13.0	-44.3	
3.423	-28.1	H	3.0	30.4	1.0	-57.5	-13.0	-44.5	
5.135	-28.3	H	3.0	28.8	1.0	-56.0	-13.0	-43.0	
Mid Ch, (1732.5 MHz)									
3.465	-27.5	V	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.198	-30.8	V	3.0	28.7	1.0	-58.5	-13.0	-45.5	
3.465	-27.7	H	3.0	30.4	1.0	-57.1	-13.0	-44.1	
5.198	-28.9	H	3.0	28.7	1.0	-56.6	-13.0	-43.6	
High Ch, (1753.5 MHz)									
3.507	-27.2	V	3.0	30.4	1.0	-56.6	-13.0	-43.6	
5.261	-30.6	V	3.0	28.6	1.0	-58.2	-13.0	-45.2	
3.507	-27.6	H	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.261	-28.9	H	3.0	28.6	1.0	-56.6	-13.0	-43.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 3MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1711.5 MHz)									
3.423	-28.1	V	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.135	-30.4	V	3.0	28.8	1.0	-58.2	-13.0	-45.2	
3.423	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.135	-29.3	H	3.0	28.8	1.0	-57.0	-13.0	-44.0	
Mid Ch, (1732.5 MHz)									
3.465	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.198	-31.6	V	3.0	28.7	1.0	-59.3	-13.0	-46.3	
3.465	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
High Ch, (1753.5 MHz)									
3.507	-28.2	V	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.261	-31.6	V	3.0	28.6	1.0	-59.2	-13.0	-46.2	
3.507	-28.6	H	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.261	-29.7	H	3.0	28.6	1.0	-57.4	-13.0	-44.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 5MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1712.5 MHz)									
3.425	-27.4	V	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.138	-29.9	V	3.0	28.8	1.0	-57.7	-13.0	-44.7	
3.425	-28.0	H	3.0	30.4	1.0	-57.4	-13.0	-44.4	
5.138	-28.2	H	3.0	28.8	1.0	-55.9	-13.0	-42.9	
Mid Ch, (1732.5 MHz)									
3.465	-27.2	V	3.0	30.4	1.0	-56.6	-13.0	-43.6	
5.198	-30.8	V	3.0	28.7	1.0	-58.5	-13.0	-45.5	
3.465	-27.3	H	3.0	30.4	1.0	-56.7	-13.0	-43.7	
5.198	-29.6	H	3.0	28.7	1.0	-57.3	-13.0	-44.3	
High Ch, (1752.5 MHz)									
3.505	-27.1	V	3.0	30.4	1.0	-56.5	-13.0	-43.5	
5.258	-30.8	V	3.0	28.6	1.0	-58.4	-13.0	-45.4	
3.505	-27.5	H	3.0	30.4	1.0	-56.8	-13.0	-43.8	
5.258	-29.0	H	3.0	28.6	1.0	-56.7	-13.0	-43.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 5MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1712.5 MHz)									
3.425	-28.4	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.138	-30.8	V	3.0	28.8	1.0	-58.6	-13.0	-45.6	
3.425	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.138	-29.2	H	3.0	28.8	1.0	-56.9	-13.0	-43.9	
Mid Ch, (1732.5 MHz)									
3.465	-28.2	V	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.198	-31.8	V	3.0	28.7	1.0	-59.5	-13.0	-46.5	
3.465	-28.3	H	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.198	-30.6	H	3.0	28.7	1.0	-58.3	-13.0	-45.3	
High Ch, (1752.5 MHz)									
3.505	-28.1	V	3.0	30.4	1.0	-57.5	-13.0	-44.5	
5.258	-31.8	V	3.0	28.6	1.0	-59.4	-13.0	-46.4	
3.505	-28.4	H	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.258	-30.0	H	3.0	28.6	1.0	-57.7	-13.0	-44.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 10MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.430	-27.6	V	3.0	30.4	1.0	-57.0	-13.0	-44.0	
5.145	-30.2	V	3.0	28.8	1.0	-57.9	-13.0	-44.9	
3.430	-28.2	H	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.145	-28.5	H	3.0	28.8	1.0	-56.2	-13.0	-43.2	
Mid Ch, (1732.5 MHz)									
3.456	-27.0	V	3.0	30.4	1.0	-56.4	-13.0	-43.4	
5.184	-31.0	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.456	-27.0	H	3.0	30.4	1.0	-56.4	-13.0	-43.4	
5.184	-29.8	H	3.0	28.7	1.0	-57.5	-13.0	-44.5	
High Ch, (1750 MHz)									
3.491	-27.2	V	3.0	30.4	1.0	-56.6	-13.0	-43.6	
5.236	-30.7	V	3.0	28.7	1.0	-58.4	-13.0	-45.4	
3.491	-27.3	H	3.0	30.4	1.0	-56.7	-13.0	-43.7	
5.236	-29.4	H	3.0	28.7	1.0	-57.0	-13.0	-44.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 10MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.430	-28.6	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.145	-31.2	V	3.0	28.8	1.0	-58.9	-13.0	-45.9	
3.430	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.145	-29.5	H	3.0	28.8	1.0	-57.2	-13.0	-44.2	
Mid Ch, (1732.5 MHz)									
3.465	-28.0	V	3.0	30.4	1.0	-57.4	-13.0	-44.4	
5.198	-32.1	V	3.0	28.7	1.0	-59.8	-13.0	-46.8	
3.465	-28.0	H	3.0	30.4	1.0	-57.4	-13.0	-44.4	
5.198	-30.8	H	3.0	28.7	1.0	-58.5	-13.0	-45.5	
High Ch, (1750 MHz)									
3.500	-28.2	V	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.250	-31.7	V	3.0	28.7	1.0	-59.4	-13.0	-46.4	
3.500	-28.3	H	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.250	-30.3	H	3.0	28.7	1.0	-58.0	-13.0	-45.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 15MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1717.5 MHz)									
3.435	-27.5	V	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.153	-30.1	V	3.0	28.7	1.0	-57.8	-13.0	-44.8	
3.435	-27.5	H	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.153	-28.7	H	3.0	28.7	1.0	-56.4	-13.0	-43.4	
Mid Ch, (1732.5 MHz)									
3.465	-27.7	V	3.0	30.4	1.0	-57.1	-13.0	-44.1	
5.198	-30.3	V	3.0	28.7	1.0	-58.0	-13.0	-45.0	
3.465	-27.7	H	3.0	30.4	1.0	-57.1	-13.0	-44.1	
5.198	-28.9	H	3.0	28.7	1.0	-56.6	-13.0	-43.6	
High Ch, (1747.5 MHz)									
3.495	-27.5	V	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.243	-30.2	V	3.0	28.7	1.0	-57.9	-13.0	-44.9	
3.495	-28.1	H	3.0	30.4	1.0	-57.4	-13.0	-44.4	
5.243	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 15MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1717.5 MHz)									
3.435	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.153	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.435	-28.5	H	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.153	-29.7	H	3.0	28.7	1.0	-57.4	-13.0	-44.4	
Mid Ch, (1732.5 MHz)									
3.465	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	
High Ch, (1747.5 MHz)									
3.495	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.243	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.495	-29.1	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.243	-30.5	H	3.0	28.7	1.0	-58.2	-13.0	-45.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 20MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.440	-28.0	V	3.0	30.4	1.0	-57.4	-13.0	-44.4	
5.160	-30.7	V	3.0	28.7	1.0	-58.4	-13.0	-45.4	
3.440	-28.1	H	3.0	30.4	1.0	-57.5	-13.0	-44.5	
5.160	-28.5	H	3.0	28.7	1.0	-56.2	-13.0	-43.2	
Mid Ch, (1732.5 MHz)									
3.465	-27.5	V	3.0	30.4	1.0	-56.9	-13.0	-43.9	
5.198	-30.8	V	3.0	28.7	1.0	-58.5	-13.0	-45.5	
3.465	-27.9	H	3.0	30.4	1.0	-57.3	-13.0	-44.3	
5.198	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	
High Ch, (1745 MHz)									
3.490	-27.7	V	3.0	30.4	1.0	-57.1	-13.0	-44.1	
5.235	-29.6	V	3.0	28.7	1.0	-57.3	-13.0	-44.3	
3.490	-28.2	H	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.235	-29.3	H	3.0	28.7	1.0	-56.9	-13.0	-43.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 4, 20MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.440	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.160	-31.7	V	3.0	28.7	1.0	-59.4	-13.0	-46.4	
3.440	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.160	-29.4	H	3.0	28.7	1.0	-57.1	-13.0	-44.1	
Mid Ch, (1732.5 MHz)									
3.465	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.198	-31.8	V	3.0	28.7	1.0	-59.5	-13.0	-46.5	
3.465	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.198	-30.5	H	3.0	28.7	1.0	-58.2	-13.0	-45.2	
High Ch, (1745 MHz)									
3.490	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.235	-30.6	V	3.0	28.7	1.0	-58.3	-13.0	-45.3	
3.490	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.235	-30.3	H	3.0	28.7	1.0	-57.9	-13.0	-44.9	

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:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE B5 1.4M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-27.1	V	3.0	32.7	1.0	-58.8	-13.0	-45.8	
2.474	-24.2	V	3.0	31.4	1.0	-54.6	-13.0	-41.6	
1.649	-29.1	H	3.0	32.7	1.0	-60.8	-13.0	-47.8	
2.474	-27.1	H	3.0	31.4	1.0	-57.5	-13.0	-44.5	
Mid Ch, (836.5MHz)									
1.673	-27.4	V	3.0	32.6	1.0	-59.0	-13.0	-46.0	
2.510	-23.8	V	3.0	31.5	1.0	-54.3	-13.0	-41.3	
1.673	-29.1	H	3.0	32.6	1.0	-60.7	-13.0	-47.7	
2.510	-26.7	H	3.0	31.5	1.0	-57.2	-13.0	-44.2	
High Ch, (848.3MHz)									
1.697	-27.2	V	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.545	-25.7	V	3.0	31.4	1.0	-56.2	-13.0	-43.2	
1.697	-29.2	H	3.0	32.6	1.0	-60.7	-13.0	-47.7	
2.545	-26.6	H	3.0	31.4	1.0	-57.0	-13.0	-44.0	

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: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 1.4M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-28.1	V	3.0	32.7	1.0	-59.8	-13.0	-46.8	
2.474	-25.2	V	3.0	31.4	1.0	-55.6	-13.0	-42.6	
1.649	-30.1	H	3.0	32.7	1.0	-61.8	-13.0	-48.8	
2.474	-28.0	H	3.0	31.4	1.0	-58.4	-13.0	-45.4	
Mid Ch, (836.5MHz)									
1.673	-28.1	V	3.0	32.6	1.0	-59.7	-13.0	-46.7	
2.510	-24.8	V	3.0	31.5	1.0	-55.3	-13.0	-42.3	
1.673	-30.0	H	3.0	32.6	1.0	-61.6	-13.0	-48.6	
2.510	-27.7	H	3.0	31.5	1.0	-58.2	-13.0	-45.2	
High Ch, (848.3MHz)									
1.697	-28.1	V	3.0	32.6	1.0	-59.6	-13.0	-46.6	
2.545	-26.6	V	3.0	31.4	1.0	-57.1	-13.0	-44.1	
1.697	-30.2	H	3.0	32.6	1.0	-61.7	-13.0	-48.7	
2.545	-27.6	H	3.0	31.4	1.0	-58.0	-13.0	-45.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 3M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-26.6	V	3.0	32.7	1.0	-58.3	-13.0	-45.3	
2.477	-25.5	V	3.0	31.4	1.0	-55.9	-13.0	-42.9	
1.651	-28.3	H	3.0	32.7	1.0	-60.0	-13.0	-47.0	
2.477	-27.2	H	3.0	31.4	1.0	-57.6	-13.0	-44.6	
Mid Ch, (836.5MHz)									
1.673	-26.2	V	3.0	32.6	1.0	-57.8	-13.0	-44.8	
2.510	-25.4	V	3.0	31.5	1.0	-55.9	-13.0	-42.9	
1.673	-28.5	H	3.0	32.6	1.0	-60.1	-13.0	-47.1	
2.510	-27.2	H	3.0	31.5	1.0	-57.7	-13.0	-44.7	
High Ch, (847.5MHz)									
1.694	-26.3	V	3.0	32.6	1.0	-57.8	-13.0	-44.8	
2.541	-25.5	V	3.0	31.4	1.0	-55.9	-13.0	-42.9	
1.694	-28.6	H	3.0	32.6	1.0	-60.1	-13.0	-47.1	
2.541	-27.3	H	3.0	31.4	1.0	-57.8	-13.0	-44.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 3M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-27.6	V	3.0	32.7	1.0	-59.3	-13.0	-46.3	
2.477	-26.5	V	3.0	31.4	1.0	-56.9	-13.0	-43.9	
1.651	-29.3	H	3.0	32.7	1.0	-61.0	-13.0	-48.0	
2.477	-28.2	H	3.0	31.4	1.0	-58.6	-13.0	-45.6	
Mid Ch, (836.5MHz)									
1.673	-27.1	V	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.510	-26.3	V	3.0	31.5	1.0	-56.8	-13.0	-43.8	
1.673	-29.5	H	3.0	32.6	1.0	-61.1	-13.0	-48.1	
2.510	-28.1	H	3.0	31.5	1.0	-58.6	-13.0	-45.6	
High Ch, (847.5MHz)									
1.695	-27.4	V	3.0	32.6	1.0	-58.9	-13.0	-45.9	
2.543	-26.5	V	3.0	31.4	1.0	-56.9	-13.0	-43.9	
1.695	-29.4	H	3.0	32.6	1.0	-60.9	-13.0	-47.9	
2.543	-28.1	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 5M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.649	-26.8	V	3.0	32.7	1.0	-58.5	-13.0	-45.5	
2.473	-25.6	V	3.0	31.4	1.0	-56.0	-13.0	-43.0	
1.649	-27.8	H	3.0	32.7	1.0	-59.5	-13.0	-46.5	
2.473	-27.0	H	3.0	31.4	1.0	-57.4	-13.0	-44.4	
Mid Ch, (836.5MHz)									
1.668	-26.6	V	3.0	32.6	1.0	-58.2	-13.0	-45.2	
2.503	-25.6	V	3.0	31.5	1.0	-56.1	-13.0	-43.1	
1.668	-28.3	H	3.0	32.6	1.0	-59.9	-13.0	-46.9	
2.503	-27.0	H	3.0	31.5	1.0	-57.5	-13.0	-44.5	
High Ch, (846.5MHz)									
1.689	-26.4	V	3.0	32.6	1.0	-57.9	-13.0	-44.9	
2.533	-25.6	V	3.0	31.5	1.0	-56.1	-13.0	-43.1	
1.689	-28.7	H	3.0	32.6	1.0	-60.3	-13.0	-47.3	
2.533	-27.5	H	3.0	31.5	1.0	-58.0	-13.0	-45.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 5M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.649	-27.8	V	3.0	32.7	1.0	-59.5	-13.0	-46.5	
2.473	-26.6	V	3.0	31.4	1.0	-57.0	-13.0	-44.0	
1.649	-28.9	H	3.0	32.7	1.0	-60.6	-13.0	-47.6	
2.473	-28.1	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	
Mid Ch, (836.5MHz)									
1.668	-27.6	V	3.0	32.6	1.0	-59.2	-13.0	-46.2	
2.503	-26.6	V	3.0	31.5	1.0	-57.1	-13.0	-44.1	
1.668	-29.3	H	3.0	32.6	1.0	-60.9	-13.0	-47.9	
2.503	-28.0	H	3.0	31.5	1.0	-58.5	-13.0	-45.5	
High Ch, (846.5MHz)									
1.689	-27.4	V	3.0	32.6	1.0	-58.9	-13.0	-45.9	
2.533	-26.6	V	3.0	31.5	1.0	-57.1	-13.0	-44.1	
1.689	-29.7	H	3.0	32.6	1.0	-61.3	-13.0	-48.3	
2.533	-28.5	H	3.0	31.5	1.0	-59.0	-13.0	-46.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 10M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829MHz)									
1.649	-25.4	V	3.0	32.7	1.0	-57.1	-13.0	-44.1	
2.474	-25.6	V	3.0	31.4	1.0	-56.0	-13.0	-43.0	
1.649	-28.7	H	3.0	32.7	1.0	-60.4	-13.0	-47.4	
2.474	-27.1	H	3.0	31.4	1.0	-57.5	-13.0	-44.5	
Mid Ch, (836.5MHz)									
1.664	-27.3	V	3.0	32.6	1.0	-58.9	-13.0	-45.9	
2.496	-25.1	V	3.0	31.5	1.0	-55.6	-13.0	-42.6	
1.664	-29.3	H	3.0	32.6	1.0	-60.9	-13.0	-47.9	
2.496	-26.6	H	3.0	31.5	1.0	-57.1	-13.0	-44.1	
High Ch, (844MHz)									
1.680	-27.1	V	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.519	-25.3	V	3.0	31.5	1.0	-55.8	-13.0	-42.8	
1.680	-29.4	H	3.0	32.6	1.0	-61.0	-13.0	-48.0	
2.519	-26.8	H	3.0	31.5	1.0	-57.3	-13.0	-44.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE B5 10M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829MHz)									
1.649	-26.5	V	3.0	32.7	1.0	-58.2	-13.0	-45.2	
2.474	-26.6	V	3.0	31.4	1.0	-57.0	-13.0	-44.0	
1.649	-29.6	H	3.0	32.7	1.0	-61.3	-13.0	-48.3	
2.474	-28.2	H	3.0	31.4	1.0	-58.6	-13.0	-45.6	
Mid Ch, (836.5MHz)									
1.664	-28.3	V	3.0	32.6	1.0	-59.9	-13.0	-46.9	
2.496	-26.1	V	3.0	31.5	1.0	-56.6	-13.0	-43.6	
1.664	-30.4	H	3.0	32.6	1.0	-62.0	-13.0	-49.0	
2.496	-27.6	H	3.0	31.5	1.0	-58.1	-13.0	-45.1	
High Ch, (844MHz)									
1.680	-28.1	V	3.0	32.6	1.0	-59.7	-13.0	-46.7	
2.519	-26.3	V	3.0	31.5	1.0	-56.8	-13.0	-43.8	
1.680	-30.4	H	3.0	32.6	1.0	-62.0	-13.0	-49.0	
2.519	-27.8	H	3.0	31.5	1.0	-58.3	-13.0	-45.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

9.2.4. LTE BAND 13

QPSK Band 13 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	TX, LTE Band 13, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.555	-17.1	V	3.0	32.9	1.0	-49.0	-13.0	-36.0	
2.332	-14.0	V	3.0	31.1	1.0	-44.1	-13.0	-31.1	
1.555	-27.8	H	3.0	32.9	1.0	-59.6	-13.0	-46.6	
2.332	-17.4	H	3.0	31.1	1.0	-47.6	-13.0	-34.6	
Mid Ch, (782 MHz)									
1.560	-20.4	V	3.0	32.9	1.0	-52.3	-13.0	-39.3	
2.340	-14.7	V	3.0	31.1	1.0	-44.8	-13.0	-31.8	
1.560	-28.0	H	3.0	32.9	1.0	-59.9	-13.0	-46.9	
2.340	-17.2	H	3.0	31.1	1.0	-47.3	-13.0	-34.3	
High Ch, (784.5 MHz)									
1.565	-15.1	V	3.0	32.9	1.0	-46.9	-13.0	-33.9	
2.347	-13.3	V	3.0	31.1	1.0	-43.4	-13.0	-30.4	
1.565	-27.5	H	3.0	32.9	1.0	-59.3	-13.0	-46.3	
2.347	-16.9	H	3.0	31.1	1.0	-47.0	-13.0	-34.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 13 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	TX, LTE Band 13, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.555	-18.1	V	3.0	32.9	1.0	-50.0	-13.0	-37.0	
2.332	-15.0	V	3.0	31.1	1.0	-45.2	-13.0	-32.2	
1.555	-28.7	H	3.0	32.9	1.0	-60.6	-13.0	-47.6	
2.332	-18.3	H	3.0	31.1	1.0	-48.5	-13.0	-35.5	
Mid Ch, (782 MHz)									
1.560	-21.4	V	3.0	32.9	1.0	-53.3	-13.0	-40.3	
2.340	-15.7	V	3.0	31.1	1.0	-45.9	-13.0	-32.9	
1.560	-29.0	H	3.0	32.9	1.0	-60.8	-13.0	-47.8	
2.340	-18.2	H	3.0	31.1	1.0	-48.3	-13.0	-35.3	
High Ch, (784.5 MHz)									
1.565	-16.0	V	3.0	32.9	1.0	-47.9	-13.0	-34.9	
2.347	-14.2	V	3.0	31.1	1.0	-44.3	-13.0	-31.3	
1.565	-27.4	H	3.0	32.9	1.0	-59.3	-13.0	-46.3	
2.347	-17.8	H	3.0	31.1	1.0	-47.9	-13.0	-34.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

LTE QPSK Radiated Measurement in 1559-1610MHz Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	TX, LTE Band 13, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.555	-17.1	V	3.0	32.9	1.0	-49.0	-40.0	-9.0	
1.555	-27.8	H	3.0	32.9	1.0	-59.6	-40.0	-19.6	
Mid Ch, (782 MHz)									
1.560	-20.4	V	3.0	32.9	1.0	-52.3	-40.0	-12.3	
1.560	-28.0	H	3.0	32.9	1.0	-59.8	-40.0	-19.8	
High Ch, (784.5 MHz)									
1.564	-15.0	V	3.0	32.9	1.0	-46.9	-40.0	-6.9	
1.564	-27.5	H	3.0	32.9	1.0	-59.4	-40.0	-19.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

LTE 16QAM Radiated Measurement in 1559-1610MHz Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	TX, LTE Band 13, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.555	-18.1	V	3.0	32.9	1.0	-50.0	-40.0	-10.0	
1.555	-28.8	H	3.0	32.9	1.0	-60.7	-40.0	-20.7	
Mid Ch, (782 MHz)									
1.560	-21.4	V	3.0	32.9	1.0	-53.3	-40.0	-13.3	
1.560	-29.0	H	3.0	32.9	1.0	-60.8	-40.0	-20.8	
High Ch, (784.5 MHz)									
1.564	-16.1	V	3.0	32.9	1.0	-47.9	-40.0	-7.9	
1.564	-28.5	H	3.0	32.9	1.0	-60.4	-40.0	-20.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK/16QAM Band 13 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: TX, LTE band 13, 10MHz, QPSK/16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
QPSK									
Mid Ch, (782 MHz)									
1.555	-18.5	V	3.0	32.9	1.0	-50.3	-13.0	-37.3	
2.333	-13.5	V	3.0	31.1	1.0	-43.7	-13.0	-30.7	
1.555	-26.2	H	3.0	32.9	1.0	-58.1	-13.0	-45.1	
2.333	-17.4	H	3.0	31.1	1.0	-47.6	-13.0	-34.6	
16QAM									
Mid Ch, (782 MHz)									
1.555	-19.4	V	3.0	32.9	1.0	-51.3	-13.0	-38.3	
2.333	-14.6	V	3.0	31.1	1.0	-44.7	-13.0	-31.7	
1.555	-27.1	H	3.0	32.9	1.0	-59.0	-13.0	-46.0	
2.333	-18.4	H	3.0	31.1	1.0	-48.6	-13.0	-35.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

LTE QPSK/16QAM Radiated Measurement in 1559-1610MHz Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	TX, LTE Band 13, 10MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
QPSK, Mid Ch, (782 MHz)									
1.555	-18.4	V	3.0	32.9	1.0	-50.3	-40.0	-10.3	
1.555	-26.2	H	3.0	32.9	1.0	-58.0	-40.0	-18.0	
16QAM, Mid Ch, (782 MHz)									
Mid Ch, (782 MHz)									
1.555	-19.4	V	3.0	32.9	1.0	-51.3	-13.0	-38.3	
1.555	-18.3	H	3.0	32.9	1.0	-50.1	-13.0	-37.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

9.2.5. LTE BAND 17

QPSK Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	M. Hua
Configuration:	EUT only
Mode:	TX, LTE B17 5M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.409	-21.8	V	3.0	33.1	1.0	-53.9	-13.0	-40.9	
2.113	-21.6	V	3.0	31.6	1.0	-52.2	-13.0	-39.2	
1.409	-23.3	H	3.0	33.1	1.0	-55.4	-13.0	-42.4	
2.113	-20.1	H	3.0	31.6	1.0	-50.7	-13.0	-37.7	
Mid Ch, (710MHz)									
1.416	-15.4	V	3.0	33.1	1.0	-47.5	-13.0	-34.5	
5.212	-23.7	V	3.0	28.7	1.0	-51.4	-13.0	-38.4	
1.416	-14.9	H	3.0	33.1	1.0	-47.0	-13.0	-34.0	
2.124	-20.6	H	3.0	31.6	1.0	-51.2	-13.0	-38.2	
High Ch, (713.5MHz)									
1.423	-17.9	V	3.0	33.1	1.0	-50.0	-13.0	-37.0	
2.134	-14.6	V	3.0	31.6	1.0	-45.2	-13.0	-32.2	
1.423	-18.3	H	3.0	33.1	1.0	-50.4	-13.0	-37.4	
2.134	-14.6	H	3.0	31.6	1.0	-45.2	-13.0	-32.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: TX, LTE B17 5M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.409	-22.7	V	3.0	33.1	1.0	-54.8	-13.0	-41.8	
2.113	-22.6	V	3.0	31.6	1.0	-53.2	-13.0	-40.2	
1.409	-24.3	H	3.0	33.1	1.0	-56.4	-13.0	-43.4	
2.113	-20.9	H	3.0	31.6	1.0	-51.6	-13.0	-38.6	
Mid Ch, (710MHz)									
1.416	-16.4	V	3.0	33.1	1.0	-48.5	-13.0	-35.5	
5.212	-24.7	V	3.0	28.7	1.0	-52.4	-13.0	-39.4	
1.416	-16.0	H	3.0	33.1	1.0	-48.1	-13.0	-35.1	
2.124	-21.6	H	3.0	31.6	1.0	-52.2	-13.0	-39.2	
High Ch, (713.5MHz)									
1.423	-18.8	V	3.0	33.1	1.0	-50.9	-13.0	-37.9	
2.134	-15.6	V	3.0	31.6	1.0	-46.2	-13.0	-33.2	
1.423	-19.3	H	3.0	33.1	1.0	-51.4	-13.0	-38.4	
2.134	-15.6	H	3.0	31.6	1.0	-46.1	-13.0	-33.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: TX, LTE B17 10M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709MHz)									
1.409	-21.6	V	3.0	33.1	1.0	-53.7	-13.0	-40.7	
2.114	-20.3	V	3.0	31.6	1.0	-50.9	-13.0	-37.9	
1.409	-23.3	H	3.0	33.1	1.0	-55.4	-13.0	-42.4	
2.114	-20.2	H	3.0	31.6	1.0	-50.8	-13.0	-37.8	
Mid Ch, (710MHz)									
1.411	-20.3	V	3.0	33.1	1.0	-52.4	-13.0	-39.4	
2.116	-18.7	V	3.0	31.6	1.0	-49.3	-13.0	-36.3	
1.411	-17.9	H	3.0	33.1	1.0	-50.0	-13.0	-37.0	
2.117	-19.6	H	3.0	31.6	1.0	-50.2	-13.0	-37.2	
High Ch, (711MHz)									
1.414	-18.3	V	3.0	33.1	1.0	-50.3	-13.0	-37.3	
2.120	-16.6	V	3.0	31.6	1.0	-47.2	-13.0	-34.2	
1.413	-15.0	H	3.0	33.1	1.0	-47.1	-13.0	-34.1	
2.120	-16.9	H	3.0	31.6	1.0	-47.5	-13.0	-34.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: M. Hua
Configuration: EUT only
Mode: TX, LTE B17 10M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709MHz)									
1.409	-22.5	V	3.0	33.1	1.0	-54.6	-13.0	-41.6	
2.114	-21.3	V	3.0	31.6	1.0	-51.9	-13.0	-38.9	
1.409	-24.3	H	3.0	33.1	1.0	-56.4	-13.0	-43.4	
2.114	-21.2	H	3.0	31.6	1.0	-51.8	-13.0	-38.8	
Mid Ch, (710MHz)									
1.411	-21.3	V	3.0	33.1	1.0	-53.4	-13.0	-40.4	
2.116	-19.7	V	3.0	31.6	1.0	-50.3	-13.0	-37.3	
1.411	-18.8	H	3.0	33.1	1.0	-50.9	-13.0	-37.9	
2.117	-20.6	H	3.0	31.6	1.0	-51.2	-13.0	-38.2	
High Ch, (711MHz)									
1.414	-19.2	V	3.0	33.1	1.0	-51.3	-13.0	-38.3	
2.120	-17.6	V	3.0	31.6	1.0	-48.2	-13.0	-35.2	
1.413	-16.0	H	3.0	33.1	1.0	-48.1	-13.0	-35.1	
2.120	-17.9	H	3.0	31.6	1.0	-48.5	-13.0	-35.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

9.2.6. LTE BAND 25

QPSK Band 25 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE band 25, 1.4MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1850.7 MHz)									
3.701	-25.7	V	3.0	30.2	1.0	-54.9	-13.0	-41.9	
5.552	-28.7	V	3.0	28.4	1.0	-56.1	-13.0	-43.1	
3.701	-26.2	H	3.0	30.2	1.0	-55.4	-13.0	-42.4	
5.552	-27.4	H	3.0	28.4	1.0	-54.8	-13.0	-41.8	
Mid Ch, (1882.5 MHz)									
3.765	-25.1	V	3.0	30.1	1.0	-54.3	-13.0	-41.3	
5.648	-24.7	V	3.0	28.3	1.0	-52.0	-13.0	-39.0	
3.765	-26.3	H	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.648	-27.4	H	3.0	28.3	1.0	-54.7	-13.0	-41.7	
High Ch, (1914.3 MHz)									
3.829	-25.9	V	3.0	30.1	1.0	-55.0	-13.0	-42.0	
5.743	-25.7	V	3.0	28.2	1.0	-52.9	-13.0	-39.9	
3.829	-26.4	H	3.0	30.1	1.0	-55.5	-13.0	-42.5	
5.743	-27.1	H	3.0	28.2	1.0	-54.3	-13.0	-41.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 25, 1.4MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1850.7 MHz)									
3.701	-26.6	V	3.0	30.2	1.0	-55.8	-13.0	-42.8	
5.552	-29.5	V	3.0	28.4	1.0	-56.9	-13.0	-43.9	
3.701	-27.1	H	3.0	30.2	1.0	-56.3	-13.0	-43.3	
5.552	-28.3	H	3.0	28.4	1.0	-55.7	-13.0	-42.7	
Mid Ch, (1882.5 MHz)									
3.765	-25.9	V	3.0	30.1	1.0	-55.1	-13.0	-42.1	
5.648	-25.8	V	3.0	28.3	1.0	-53.1	-13.0	-40.1	
3.765	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.648	-28.2	H	3.0	28.3	1.0	-55.5	-13.0	-42.5	
High Ch, (1914.3 MHz)									
3.829	-26.9	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
5.743	-26.7	V	3.0	28.2	1.0	-53.9	-13.0	-40.9	
3.829	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
5.743	-28.0	H	3.0	28.2	1.0	-55.2	-13.0	-42.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE band 25, 3MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1851.5 MHz)									
3.703	-26.4	V	3.0	30.2	1.0	-55.6	-13.0	-42.6	
5.555	-29.4	V	3.0	28.4	1.0	-56.8	-13.0	-43.8	
3.703	-26.8	H	3.0	30.2	1.0	-56.0	-13.0	-43.0	
5.555	-28.6	H	3.0	28.4	1.0	-56.0	-13.0	-43.0	
Mid Ch, (1882.5 MHz)									
3.765	-25.7	V	3.0	30.1	1.0	-54.9	-13.0	-41.9	
5.646	-28.3	V	3.0	28.3	1.0	-55.6	-13.0	-42.6	
3.765	-26.2	H	3.0	30.1	1.0	-55.3	-13.0	-42.3	
5.646	-27.4	H	3.0	28.3	1.0	-54.7	-13.0	-41.7	
High Ch, (1913.5 MHz)									
3.827	-26.4	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
5.741	-29.3	V	3.0	28.2	1.0	-56.5	-13.0	-43.5	
3.827	-26.3	H	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.741	-28.2	H	3.0	28.2	1.0	-55.4	-13.0	-42.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE Band 25, 3MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1851.5 MHz)									
3.703	-27.4	V	3.0	30.2	1.0	-56.6	-13.0	-43.6	
5.555	-30.3	V	3.0	28.4	1.0	-57.7	-13.0	-44.7	
3.703	-27.8	H	3.0	30.2	1.0	-57.0	-13.0	-44.0	
5.555	-29.5	H	3.0	28.4	1.0	-56.9	-13.0	-43.9	
Mid Ch, (1882.5 MHz)									
3.765	-26.7	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
5.646	-29.3	V	3.0	28.3	1.0	-56.6	-13.0	-43.6	
3.765	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.646	-28.4	H	3.0	28.3	1.0	-55.7	-13.0	-42.7	
High Ch, (1913.5 MHz)									
3.827	-27.4	V	3.0	30.1	1.0	-56.5	-13.0	-43.5	
5.741	-30.2	V	3.0	28.2	1.0	-57.4	-13.0	-44.4	
3.827	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.741	-29.1	H	3.0	28.2	1.0	-56.3	-13.0	-43.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1852.5 MHz)									
3.701	-25.8	V	3.0	30.2	1.0	-55.0	-13.0	-42.0	
5.551	-29.6	V	3.0	28.4	1.0	-57.0	-13.0	-44.0	
3.701	-26.8	H	3.0	30.2	1.0	-56.0	-13.0	-43.0	
5.551	-28.3	H	3.0	28.4	1.0	-55.7	-13.0	-42.7	
Mid Ch, (1882.5 MHz)									
3.761	-25.4	V	3.0	30.1	1.0	-54.6	-13.0	-41.6	
5.641	-29.3	V	3.0	28.3	1.0	-56.6	-13.0	-43.6	
3.761	-26.1	H	3.0	30.1	1.0	-55.2	-13.0	-42.2	
5.641	-28.3	H	3.0	28.3	1.0	-55.6	-13.0	-42.6	
High Ch, (1912.5 MHz)									
3.820	-26.1	V	3.0	30.1	1.0	-55.2	-13.0	-42.2	
5.731	-29.2	V	3.0	28.2	1.0	-56.4	-13.0	-43.4	
3.820	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
5.731	-28.1	H	3.0	28.2	1.0	-55.3	-13.0	-42.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1852.5 MHz)									
3.701	-26.9	V	3.0	30.2	1.0	-56.1	-13.0	-43.1	
5.551	-30.2	V	3.0	28.4	1.0	-57.6	-13.0	-44.6	
3.701	-27.8	H	3.0	30.2	1.0	-57.0	-13.0	-44.0	
5.551	-29.2	H	3.0	28.4	1.0	-56.6	-13.0	-43.6	
Mid Ch, (1882.5 MHz)									
3.761	-26.5	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
5.641	-30.3	V	3.0	28.3	1.0	-57.6	-13.0	-44.6	
3.761	-27.2	H	3.0	30.1	1.0	-56.3	-13.0	-43.3	
5.641	-29.1	H	3.0	28.3	1.0	-56.4	-13.0	-43.4	
High Ch, (1912.5 MHz)									
3.820	-27.1	V	3.0	30.1	1.0	-56.2	-13.0	-43.2	
5.731	-30.2	V	3.0	28.2	1.0	-57.4	-13.0	-44.4	
3.820	-27.6	H	3.0	30.1	1.0	-56.7	-13.0	-43.7	
5.731	-29.0	H	3.0	28.2	1.0	-56.2	-13.0	-43.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 10MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.699	-26.6	V	3.0	30.2	1.0	-55.8	-13.0	-42.8	
5.548	-29.8	V	3.0	28.4	1.0	-57.2	-13.0	-44.2	
3.699	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
5.548	-28.7	H	3.0	28.4	1.0	-56.1	-13.0	-43.1	
Mid Ch, (1882.5 MHz)									
3.756	-26.4	V	3.0	30.2	1.0	-55.6	-13.0	-42.6	
5.634	-29.5	V	3.0	28.3	1.0	-56.7	-13.0	-43.7	
3.756	-26.6	H	3.0	30.2	1.0	-55.7	-13.0	-42.7	
5.634	-28.6	H	3.0	28.3	1.0	-55.9	-13.0	-42.9	
High Ch, (1910 MHz)									
3.811	-26.3	V	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.717	-29.1	V	3.0	28.2	1.0	-56.3	-13.0	-43.3	
3.811	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
5.717	-28.7	H	3.0	28.2	1.0	-55.9	-13.0	-42.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 10MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.699	-27.6	V	3.0	30.2	1.0	-56.8	-13.0	-43.8	
5.548	-30.8	V	3.0	28.4	1.0	-58.2	-13.0	-45.2	
3.699	-27.9	H	3.0	30.2	1.0	-57.1	-13.0	-44.1	
5.548	-29.7	H	3.0	28.4	1.0	-57.1	-13.0	-44.1	
Mid Ch, (1882.5 MHz)									
3.756	-27.4	V	3.0	30.2	1.0	-56.6	-13.0	-43.6	
5.634	-30.5	V	3.0	28.3	1.0	-57.7	-13.0	-44.7	
3.756	-27.6	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
5.634	-29.4	H	3.0	28.3	1.0	-56.7	-13.0	-43.7	
High Ch, (1910 MHz)									
3.811	-27.4	V	3.0	30.1	1.0	-56.5	-13.0	-43.5	
5.717	-30.1	V	3.0	28.2	1.0	-57.3	-13.0	-44.3	
3.811	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
5.717	-29.7	H	3.0	28.2	1.0	-56.9	-13.0	-43.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 15MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1857.5 MHz)									
3.702	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
5.553	-29.5	V	3.0	28.4	1.0	-56.9	-13.0	-43.9	
3.702	-26.7	H	3.0	30.2	1.0	-55.9	-13.0	-42.9	
5.553	-29.2	H	3.0	28.4	1.0	-56.6	-13.0	-43.6	
Mid_Ch, (1882.5 MHz)									
3.753	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
5.629	-29.6	V	3.0	28.3	1.0	-56.9	-13.0	-43.9	
3.753	-26.8	H	3.0	30.2	1.0	-55.9	-13.0	-42.9	
5.629	-28.9	H	3.0	28.3	1.0	-56.2	-13.0	-43.2	
High Ch, (1907.5 MHz)									
3.802	-26.4	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
5.702	-29.5	V	3.0	28.2	1.0	-56.8	-13.0	-43.8	
3.802	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
5.702	-28.6	H	3.0	28.2	1.0	-55.9	-13.0	-42.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 15MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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, (1857.5 MHz)									
3.702	-27.5	V	3.0	30.2	1.0	-56.7	-13.0	-43.7	
5.553	-30.4	V	3.0	28.4	1.0	-57.8	-13.0	-44.8	
3.702	-27.7	H	3.0	30.2	1.0	-56.9	-13.0	-43.9	
5.553	-30.1	H	3.0	28.4	1.0	-57.5	-13.0	-44.5	
Mid Ch, (1882.5 MHz)									
3.753	-27.5	V	3.0	30.2	1.0	-56.7	-13.0	-43.7	
5.629	-30.6	V	3.0	28.3	1.0	-57.9	-13.0	-44.9	
3.753	-27.8	H	3.0	30.2	1.0	-56.9	-13.0	-43.9	
5.629	-29.9	H	3.0	28.3	1.0	-57.2	-13.0	-44.2	
High Ch, (1907.5 MHz)									
3.802	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.702	-30.4	V	3.0	28.2	1.0	-57.7	-13.0	-44.7	
3.802	-28.0	H	3.0	30.1	1.0	-57.1	-13.0	-44.1	
5.702	-29.5	H	3.0	28.2	1.0	-56.8	-13.0	-43.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 20MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.702	-26.6	V	3.0	30.2	1.0	-55.8	-13.0	-42.8	
5.553	-29.7	V	3.0	28.4	1.0	-57.1	-13.0	-44.1	
3.702	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
5.553	-29.0	H	3.0	28.4	1.0	-56.4	-13.0	-43.4	
Mid Ch, (1882.5 MHz)									
3.747	-26.4	V	3.0	30.2	1.0	-55.6	-13.0	-42.6	
5.620	-29.8	V	3.0	28.3	1.0	-57.1	-13.0	-44.1	
3.747	-25.8	H	3.0	30.2	1.0	-54.9	-13.0	-41.9	
5.620	-28.9	H	3.0	28.3	1.0	-56.2	-13.0	-43.2	
High Ch, (1905 MHz)									
3.792	-26.3	V	3.0	30.1	1.0	-55.4	-13.0	-42.4	
5.688	-29.3	V	3.0	28.2	1.0	-56.5	-13.0	-43.5	
3.792	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
5.688	-28.6	H	3.0	28.2	1.0	-55.8	-13.0	-42.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 25, 20MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 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 MHz)									
3.702	-27.6	V	3.0	30.2	1.0	-56.8	-13.0	-43.8	
5.553	-30.6	V	3.0	28.4	1.0	-58.0	-13.0	-45.0	
3.702	-27.9	H	3.0	30.2	1.0	-57.1	-13.0	-44.1	
5.553	-29.9	H	3.0	28.4	1.0	-57.3	-13.0	-44.3	
Mid Ch, (1882.5 MHz)									
3.747	-27.4	V	3.0	30.2	1.0	-56.6	-13.0	-43.6	
5.620	-30.9	V	3.0	28.3	1.0	-58.2	-13.0	-45.2	
3.747	-26.9	H	3.0	30.2	1.0	-56.0	-13.0	-43.0	
5.620	-29.7	H	3.0	28.3	1.0	-57.0	-13.0	-44.0	
High Ch, (1905 MHz)									
3.792	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
5.688	-30.2	V	3.0	28.2	1.0	-57.4	-13.0	-44.4	
3.792	-28.0	H	3.0	30.1	1.0	-57.1	-13.0	-44.1	
5.688	-29.6	H	3.0	28.2	1.0	-56.8	-13.0	-43.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

9.2.7. LTE BAND 26

QPSK Band 26 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE Band 26 3MHz QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (820.3MHz)									
1.638	-26.1	V	3.0	32.7	1.0	-57.8	-13.0	-44.8	
2.457	-24.5	V	3.0	31.3	1.0	-54.8	-13.0	-41.8	
1.638	-29.3	H	3.0	32.7	1.0	-61.0	-13.0	-48.0	
2.457	-27.3	H	3.0	31.3	1.0	-57.6	-13.0	-44.6	
Mid Ch, (821.3MHz)									
1.640	-27.4	V	3.0	32.7	1.0	-59.1	-13.0	-46.1	
2.460	-25.2	V	3.0	31.3	1.0	-55.5	-13.0	-42.5	
1.640	-29.0	H	3.0	32.7	1.0	-60.7	-13.0	-47.7	
2.460	-27.1	H	3.0	31.3	1.0	-57.4	-13.0	-44.4	
High Ch, (822.3MHz)									
1.642	-27.3	V	3.0	32.7	1.0	-59.0	-13.0	-46.0	
2.464	-25.6	V	3.0	31.3	1.0	-55.9	-13.0	-42.9	
1.642	-28.9	H	3.0	32.7	1.0	-60.6	-13.0	-47.6	
2.464	-27.2	H	3.0	31.3	1.0	-57.5	-13.0	-44.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 26 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U15668
Date:	09/03/13
Test Engineer:	R Zheng
Configuration:	EUT only
Mode:	TX, LTE Band 26 3MHz 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (820.3MHz)									
1.638	-27.1	V	3.0	32.7	1.0	-58.8	-13.0	-45.8	
2.457	-25.5	V	3.0	31.3	1.0	-55.8	-13.0	-42.8	
1.638	-30.2	H	3.0	32.7	1.0	-61.9	-13.0	-48.9	
2.457	-28.1	H	3.0	31.3	1.0	-58.4	-13.0	-45.4	
Mid Ch, (821.3MHz)									
1.640	-28.3	V	3.0	32.7	1.0	-60.0	-13.0	-47.0	
2.460	-26.2	V	3.0	31.3	1.0	-56.5	-13.0	-43.5	
1.640	-30.0	H	3.0	32.7	1.0	-61.7	-13.0	-48.7	
2.460	-28.1	H	3.0	31.3	1.0	-58.4	-13.0	-45.4	
High Ch, (822.3MHz)									
1.642	-28.3	V	3.0	32.7	1.0	-60.0	-13.0	-47.0	
2.464	-26.6	V	3.0	31.3	1.0	-56.9	-13.0	-43.9	
1.642	-29.9	H	3.0	32.7	1.0	-61.6	-13.0	-48.6	
2.464	-28.2	H	3.0	31.3	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 26 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 26 5MHz QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (818.8MHz)									
1.633	-26.5	V	3.0	32.7	1.0	-58.2	-13.0	-45.2	
2.450	-23.4	V	3.0	31.3	1.0	-53.6	-13.0	-40.6	
1.633	-28.1	H	3.0	32.7	1.0	-59.8	-13.0	-46.8	
2.450	-25.2	H	3.0	31.3	1.0	-55.4	-13.0	-42.4	
Mid Ch, (821.3MHz)									
1.638	-26.3	V	3.0	32.7	1.0	-58.0	-13.0	-45.0	
2.457	-23.8	V	3.0	31.3	1.0	-54.1	-13.0	-41.1	
1.638	-28.0	H	3.0	32.7	1.0	-59.7	-13.0	-46.7	
2.457	-23.9	H	3.0	31.3	1.0	-54.2	-13.0	-41.2	
High Ch, (823.8MHz)									
1.643	-27.6	V	3.0	32.7	1.0	-59.3	-13.0	-46.3	
2.465	-25.1	V	3.0	31.3	1.0	-55.4	-13.0	-42.4	
1.643	-28.6	H	3.0	32.7	1.0	-60.3	-13.0	-47.3	
2.465	-22.9	H	3.0	31.3	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 26 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U15668
Date: 09/03/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: TX, LTE Band 26 5MHz 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (818.8MHz)									
1.633	-27.5	V	3.0	32.7	1.0	-59.2	-13.0	-46.2	
2.450	-24.3	V	3.0	31.3	1.0	-54.5	-13.0	-41.5	
1.633	-29.1	H	3.0	32.7	1.0	-60.8	-13.0	-47.8	
2.450	-26.2	H	3.0	31.3	1.0	-56.4	-13.0	-43.4	
Mid Ch, (821.3MHz)									
1.638	-27.3	V	3.0	32.7	1.0	-59.0	-13.0	-46.0	
2.457	-24.8	V	3.0	31.3	1.0	-55.1	-13.0	-42.1	
1.638	-29.0	H	3.0	32.7	1.0	-60.7	-13.0	-47.7	
2.457	-24.9	H	3.0	31.3	1.0	-55.2	-13.0	-42.2	
High Ch, (823.8MHz)									
1.643	-28.6	V	3.0	32.7	1.0	-60.3	-13.0	-47.3	
2.465	-26.1	V	3.0	31.3	1.0	-56.4	-13.0	-43.4	
1.643	-29.6	H	3.0	32.7	1.0	-61.3	-13.0	-48.3	
2.465	-23.9	H	3.0	31.3	1.0	-54.2	-13.0	-41.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.