7.2.3 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: Only record the worst condition of each test mode:

7.2.4 MEASUREMENT RESULT

LTE Band 2
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3720	V	-55.76	-13	-42.76
748.3	V	-60.20	-13	-47.20
257.2	V	-64.72	-13	-51.72
3720	H	-54.77	-13	-41.77
640.2	H	-60.42	-13	-47.42
221.4	H	-64.34	-13	-51.34

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3760	V	-54.88	-13	-41.88
533.1	V	-61.19	-13	-48.19
256.5	V	-60.36	-13	-47.36
3760	H	-56.21	-13	-43.21
850.2	H	-62.51	-13	-49.51
451.4	H	-62.54	-13	-49.54

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3800	V	-55.57	-13	-42.57
611.1	V	-60.87	-13	-47.87
256.5	V	-61.94	-13	-48.94
3800	H	-54.35	-13	-41.35
586.2	H	-60.22	-13	-47.22
351.4	H	-61.30	-13	-48.30

LTE Band 4

Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3440	V	-54.49	-13	-41.49
896.6	V	-62.80	-13	-49.80
487.5	V	-62.45	-13	-49.45
3440	H	-55.94	-13	-42.94
789.3	H	-61.35	-13	-48.35
545.6	H	-60.44	-13	-47.44

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3465	V	-54.45	-13	-41.45
859.4	V	-61.85	-13	-48.85
765.9	V	-63.07	-13	-50.07
3465	H	-54.84	-13	-41.84
564.5	H	-61.02	-13	-48.02
265.9	H	-61.37	-13	-48.37

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
3490	V	-54.96	-13	-41.96
687.4	V	-62.29	-13	-49.29
586.4	V	-62.42	-13	-49.42
3490	H	-56.25	-13	-43.25
489.5	H	-61.26	-13	-48.26
357.1	H	-61.41	-13	-48.41

LTE Band 5

Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1658	V	-56.22	-13	-43.22
564.5	V	-62.46	-13	-49.46
364.3	V	-63.68	-13	-50.68
1658	H	-56.32	-13	-43.32
578.3	H	-61.42	-13	-48.42
354.1	H	-60.98	-13	-47.98

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1673	V	-55.60	-13	-42.60
896.3	V	-61.47	-13	-48.47
784.1	V	-62.85	-13	-49.85
1673	H	-55.58	-13	-42.58
564.1	H	-60.66	-13	-47.66
285.6	H	-60.23	-13	-47.23

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1688	V	-53.94	-13	-40.94
563.5	V	-61.51	-13	-48.51
345.1	V	-60.94	-13	-47.94
1688	H	-55.67	-13	-42.67
354.1	H	-61.09	-13	-48.09
253.6	H	-61.10	-13	-48.10

LTE Band 12
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1408	V	-55.02	-13	-42.02
533.45	V	-61.94	-13	-48.94
469.42	V	-62.92	-13	-49.92
1408	H	-55.82	-13	-42.82
543.31	H	-61.50	-13	-48.50
470.25	H	-60.34	-13	-47.34

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1415	V	-55.95	-13	-42.95
529.34	V	-61.63	-13	-48.63
470.25	V	-61.55	-13	-48.55
1415	H	-54.93	-13	-41.93
544.58	H	-61.48	-13	-48.48
458.66	H	-61.53	-13	-48.53

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1422	V	-56.33	-13	-43.33
535.11	V	-62.43	-13	-49.43
476.24	V	-62.95	-13	-49.95
1422	H	-55.12	-13	-42.12
522.28	H	-60.04	-13	-47.04
458.69	H	-62.05	-13	-49.05

LTE Band 13
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1564	V	-54.76	-13	-41.76
512.11	V	-62.11	-13	-49.11
351.55	V	-62.72	-13	-49.72
1564	H	-56.02	-13	-43.02
498.33	H	-61.97	-13	-48.97
452.21	H	-64.96	-13	-51.96

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1425	V	-55.90	-13	-42.90
602.34	V	-61.97	-13	-48.97
496.25	V	-61.39	-13	-48.39
1528	H	-55.29	-13	-42.29
478.58	H	-61.00	-13	-48.00
358.66	H	-61.69	-13	-48.69

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1365	V	-56.25	-13	-43.25
586.53	V	-62.59	-13	-49.59
462.10	V	-62.57	-13	-49.57
1422	H	-55.36	-13	-42.36
575.28	H	-60.45	-13	-47.45
469.69	H	-61.61	-13	-48.61

LTE Band 17
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1420	V	-53.11	-13	-40.11
563.22	V	-60.54	-13	-47.54
365.54	V	-61.58	-13	-48.58
1420	H	-54.36	-13	-41.36
585.13	H	-61.94	-13	-48.94
456.66	H	-60.13	-13	-47.13

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1435	V	-53.69	-13	-40.69
600.52	V	-60.11	-13	-47.11
523.33	V	-61.03	-13	-48.03
1466	H	-52.49	-13	-39.49
588.11	H	-60.03	-13	-47.03
469.58	H	-60.33	-13	-47.33

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1496	V	-57.28	-13	-44.28
496.28	V	-62.39	-13	-49.39
286.33	V	-61.42	-13	-48.42
1485	H	-56.23	-13	-43.23
438.25	H	-60.45	-13	-47.45
396.12	H	-61.46	-13	-48.46

LTE Band 30
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1408	V	-54.30	-40	-14.30
533.45	V	-62.51	-40	-22.51
469.42	V	-62.45	-40	-22.45
1408	H	-56.04	-40	-16.04
543.31	H	-62.01	-40	-22.01
470.25	H	-69.48	-40	-29.48

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1415	V	-55.85	-40	-22.85
529.34	V	-62.18	-40	-29.18
470.25	V	-61.32	-40	-28.32
1415	H	-55.57	-40	-22.57
544.58	H	-61.19	-40	-28.19
458.66	H	-61.65	-40	-28.65

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1422	V	-55.97	-40	-22.97
535.11	V	-62.70	-40	-29.70
476.24	V	-62.51	-40	-29.51
1422	H	-55.52	-40	-22.52
522.28	H	-60.84	-40	-27.84
458.69	H	-61.32	-40	-28.32

Note: 1. Margin = Emission Level -Limit
2. (30MHz-26GHz) Below 30MHZ no Spurious found and above is the worst mode data

8. FREQUENCY STABILITY

8.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1 Measure the carrier frequency at room temperature.

2 Subject the EUT to overnight soak at -10℃. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

3 Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

5 Subject the EUT to overnight soak at +50℃.

6 With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7 Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8 At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

8.2 PROVISIONS APPLICABLE

8.2.1 For Hand carried battery powered equipment

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

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

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

8.2.2 For equipment powered by primary supply voltage

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

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

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

8.3 MEASUREMENT RESULT (WORST)

LTE Band 2

Middle Channel, f_O = 1880 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	-4.86	-0.002587
0		-2.49	-0.001345
10		-2.49	-0.001345
20		-2.33	-0.001260
30		-0.86	-0.000464
40		-1.22	-0.000647
50		-2.30	-0.001225
25	4.2	-1.57	-0.000837
	3.5	-3.35	-0.001781

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

LTE Band 4

Middle Channel, f_O = 1732.5 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	1.32	0.000769
0		2.23	0.001304
10		0.00	0.000000
20		0.93	0.000544
30		0.56	0.000322
40		1.23	0.000710
50		0.54	0.000314
25	4.2	1.36	0.000784
	3.5	-2.40	-0.001370

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

LTE Band 5

Middle Channel, f_O = 836.5 MHz				
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-0.03	-0.000034	±2.5
0		-0.34	-0.000410	±2.5
10		0.13	0.000154	±2.5
20		0.62	0.000735	±2.5
30		-0.03	-0.000034	±2.5
40		0.43	0.000506	±2.5
50		-0.04	-0.000051	±2.5
25	4.2	0.63	0.000742	±2.5
	3.5	-2.32	-0.002810	±2.5

LTE Band 12

Middle Channel, f_O = 1882.5 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	-1.16	-0.001638
0		0.96	0.001355
10		0.34	0.000485
20		0.04	0.000061
30		-1.26	-0.001760
40		-1.34	-0.001880
50		-1.03	-0.001440
25	4.2	-1.60	-0.002240
	3.5	-1.13	-0.001615

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

LTE Band 13

Middle Channel, f_O = 782.0MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	-2.88	-0.003689
0		-1.07	-0.001376
10		-0.99	-0.001266
20		-1.56	-0.002000
30		-1.49	-0.001896
40		-1.02	-0.001295
50		-0.72	-0.000912
25	4.2	-2.22	-0.002826
	3.5	-2.19	-0.002808

LTE Band 17

Middle Channel, f_O = 1882.5 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	-0.29	-0.000403
0		-0.53	-0.000742
10		-2.03	-0.002875
20		-3.79	-0.005366
30		-1.87	-0.002652
40		-3.25	-0.004596
50		-1.90	-0.002693
25	4.2	-0.24	-0.000343
	3.5	-0.69	-0.000967

LTE Band 30

Middle Channel, f_O = 782.0MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	-2.59	-0.003322
0		-2.19	-0.002808
10		-1.66	-0.002129
20		-0.51	-0.000661
30		-1.10	-0.001409
40		-3.10	-0.003970
50		-3.23	-0.004134
25	4.2	0.01	0.000018
	3.5	-0.63	-0.000802

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

The EUT doesn't work below -10℃

9. OCCUPIED BANDWIDTH

9.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

9.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

9.3 MEASUREMENT RESULT

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

LTE Band 2

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0794	PASS
	MCH	6	0	1.0749	PASS
	HCH	6	0	1.0811	PASS
16QAM	LCH	6	0	1.0807	PASS
	MCH	6	0	1.0796	PASS
	HCH	6	0	1.0798	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6854	PASS
	MCH	15	0	2.6903	PASS
	HCH	15	0	2.6887	PASS
16QAM	LCH	15	0	2.6834	PASS
	MCH	15	0	2.6888	PASS
	HCH	15	0	2.8930	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4812	PASS
	MCH	25	0	4.4749	PASS
	HCH	25	0	4.4751	PASS
16QAM	LCH	25	0	4.4884	PASS
	MCH	25	0	4.4819	PASS
	HCH	25	0	4.4738	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9439	PASS
	MCH	50	0	8.9189	PASS
	HCH	50	0	8.9164	PASS
16QAM	LCH	50	0	8.9333	PASS
	MCH	50	0	8.9351	PASS
	HCH	50	0	8.9047	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.415	PASS
	MCH	75	0	13.393	PASS
	HCH	75	0	13.358	PASS
16QAM	LCH	75	0	13.410	PASS
	MCH	75	0	13.393	PASS
	HCH	75	0	13.363	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	17.868	PASS
	MCH	100	0	17.830	PASS
	HCH	100	0	17.820	PASS
16QAM	LCH	100	0	17.879	PASS
	MCH	100	0	17.828	PASS
	HCH	100	0	17.800	PASS

LTE Band 4

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0791	PASS
	MCH	6	0	1.0753	PASS
	HCH	6	0	1.0787	PASS
16QAM	LCH	6	0	1.0790	PASS
	MCH	6	0	1.0793	PASS
	HCH	6	0	1.0777	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6848	PASS
	MCH	15	0	2.6869	PASS
	HCH	15	0	2.6834	PASS
16QAM	LCH	15	0	2.6874	PASS
	MCH	15	0	2.6883	PASS
	HCH	15	0	2.6854	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4719	PASS
	MCH	25	0	4.4771	PASS
	HCH	25	0	4.4801	PASS
16QAM	LCH	25	0	4.4769	PASS
	MCH	25	0	4.4881	PASS
	HCH	25	0	4.4775	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9264	PASS
	MCH	50	0	8.9326	PASS
	HCH	50	0	8.9315	PASS
16QAM	LCH	50	0	8.9224	PASS
	MCH	50	0	8.9249	PASS
	HCH	50	0	8.9148	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	13.413	PASS
	MCH	75	0	13.420	PASS
	HCH	75	0	13.364	PASS
16QAM	LCH	75	0	13.405	PASS
	MCH	75	0	13.410	PASS
	HCH	75	0	13.360	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	17.899	PASS
	MCH	100	0	17.869	PASS
	HCH	100	0	17.793	PASS
16QAM	LCH	100	0	17.897	PASS
	MCH	100	0	17.850	PASS
	HCH	100	0	17.769	PASS

LTE Band 5

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0779	PASS
	MCH	6	0	1.0750	PASS
	HCH	6	0	1.0787	PASS
16QAM	LCH	6	0	1.0795	PASS
	MCH	6	0	1.0781	PASS
	HCH	6	0	1.0817	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6814	PASS
	MCH	15	0	2.6854	PASS
	HCH	15	0	2.6851	PASS
16QAM	LCH	15	0	2.6842	PASS
	MCH	15	0	2.6897	PASS
	HCH	15	0	2.6848	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4746	PASS
	MCH	25	0	4.4765	PASS
	HCH	25	0	4.4772	PASS
16QAM	LCH	25	0	4.4790	PASS
	MCH	25	0	4.4821	PASS
	HCH	25	0	4.4837	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9216	PASS
	MCH	50	0	8.9371	PASS
	HCH	50	0	8.9404	PASS
16QAM	LCH	50	0	8.9099	PASS
	MCH	50	0	8.9445	PASS
	HCH	50	0	8.9342	PASS

LTE Band 12

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.0754	PASS
	MCH	6	0	1.0784	PASS
	HCH	6	0	1.0773	PASS
16QAM	LCH	6	0	1.0799	PASS
	MCH	6	0	1.0785	PASS
	HCH	6	0	1.0828	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth:3 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.6814	PASS
	MCH	15	0	2.6852	PASS
	HCH	15	0	2.6813	PASS
16QAM	LCH	15	0	2.6840	PASS
	MCH	15	0	2.6839	PASS
	HCH	15	0	2.6818	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4757	PASS
	MCH	25	0	4.4763	PASS
	HCH	25	0	4.4701	PASS
16QAM	LCH	25	0	4.4780	PASS
	MCH	25	0	4.4881	PASS
	HCH	25	0	4.4668	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9332	PASS
	MCH	50	0	8.9497	PASS
	HCH	50	0	8.9124	PASS
16QAM	LCH	50	0	8.9227	PASS
	MCH	50	0	8.9656	PASS
	HCH	50	0	8.8922	PASS

LTE BAND 13

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4761	PASS
	MCH	25	0	4.4736	PASS
	HCH	25	0	4.4762	PASS
16QAM	LCH	25	0	4.4860	PASS
	MCH	25	0	4.4724	PASS
	HCH	25	0	4.4812	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9350	PASS
	MCH	50	0	8.9226	PASS
	HCH	50	0	8.9253	PASS
16QAM	LCH	50	0	8.9187	PASS
	MCH	50	0	8.9206	PASS
	HCH	50	0	8.9202	PASS

LTE Band 17

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4838	PASS
	MCH	25	0	4.4702	PASS
	HCH	25	0	4.4759	PASS
16QAM	LCH	25	0	4.4892	PASS
	MCH	25	0	4.4755	PASS
	HCH	25	0	4.4551	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9363	PASS
	MCH	50	0	8.9126	PASS
	HCH	50	0	8.9088	PASS
16QAM	LCH	50	0	8.9439	PASS
	MCH	50	0	8.9304	PASS
	HCH	50	0	8.8887	PASS

LTE BAND 30

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth(MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.4771	PASS
	MCH	25	0	4.4805	PASS
	HCH	25	0	4.4806	PASS
16QAM	LCH	25	0	4.4737	PASS
	MCH	25	0	4.4761	PASS
	HCH	25	0	4.4879	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	8.9410	PASS
	MCH	50	0	8.9443	PASS
	HCH	50	0	8.9346	PASS
16QAM	LCH	50	0	8.9407	PASS
	MCH	50	0	8.9362	PASS
	HCH	50	0	8.9418	PASS

Note: Please refers to Appendix B for compliance test plots for Occupied Bandwidth (99%)

10. EMISSION BANDWIDTH

10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

10.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

10.3 MEASUREMENT RESULT

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

LTE Band 2

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.251	PASS
	MCH	6	0	1.224	PASS
	HCH	6	0	1.260	PASS
16QAM	LCH	6	0	1.250	PASS
	MCH	6	0	1.232	PASS
	HCH	6	0	1.267	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.887	PASS
	MCH	15	0	2.891	PASS
	HCH	15	0	2.874	PASS
16QAM	LCH	15	0	2.871	PASS
	MCH	15	0	2.902	PASS
	HCH	15	0	2.893	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.863	PASS
	MCH	25	0	4.827	PASS
	HCH	25	0	4.833	PASS
16QAM	LCH	25	0	4.841	PASS
	MCH	25	0	4.796	PASS
	HCH	25	0	4.796	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.492	PASS
	MCH	50	0	9.415	PASS
	HCH	50	0	9.439	PASS
16QAM	LCH	50	0	9.443	PASS
	MCH	50	0	9.474	PASS
	HCH	50	0	9.418	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	14.16	PASS
	MCH	75	0	14.07	PASS
	HCH	75	0	14.03	PASS
16QAM	LCH	75	0	14.05	PASS
	MCH	75	0	14.06	PASS
	HCH	75	0	14.07	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	18.73	PASS
	MCH	100	0	18.52	PASS
	HCH	100	0	18.58	PASS
16QAM	LCH	100	0	18.65	PASS
	MCH	100	0	18.60	PASS
	HCH	100	0	18.55	PASS

LTE Band 4

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.253	PASS
	MCH	6	0	1.231	PASS
	HCH	6	0	1.237	PASS
16QAM	LCH	6	0	1.247	PASS
	MCH	6	0	1.229	PASS
	HCH	6	0	1.222	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.878	PASS
	MCH	15	0	2.918	PASS
	HCH	15	0	2.877	PASS
16QAM	LCH	15	0	2.888	PASS
	MCH	15	0	2.923	PASS
	HCH	15	0	2.884	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.821	PASS
	MCH	25	0	4.837	PASS
	HCH	25	0	4.825	PASS
16QAM	LCH	25	0	4.824	PASS
	MCH	25	0	4.830	PASS
	HCH	25	0	4.834	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.433	PASS
	MCH	50	0	9.497	PASS
	HCH	50	0	9.451	PASS
16QAM	LCH	50	0	9.433	PASS
	MCH	50	0	9.458	PASS
	HCH	50	0	9.481	PASS

Channel Bandwidth: 15 MHz

Channel Bandwidth: 15 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	75	0	14.04	PASS
	MCH	75	0	14.22	PASS
	HCH	75	0	13.96	PASS
16QAM	LCH	75	0	14.13	PASS
	MCH	75	0	13.98	PASS
	HCH	75	0	13.98	PASS

Channel Bandwidth: 20 MHz

Channel Bandwidth: 20 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	100	0	18.68	PASS
	MCH	100	0	18.65	PASS
	HCH	100	0	18.57	PASS
16QAM	LCH	100	0	18.65	PASS
	MCH	100	0	18.66	PASS
	HCH	100	0	18.52	PASS

LTE Band 5

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.238	PASS
	MCH	6	0	1.227	PASS
	HCH	6	0	1.221	PASS
16QAM	LCH	6	0	1.262	PASS
	MCH	6	0	1.238	PASS
	HCH	6	0	1.232	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.898	PASS
	MCH	15	0	2.892	PASS
	HCH	15	0	2.888	PASS
16QAM	LCH	15	0	2.905	PASS
	MCH	15	0	2.899	PASS
	HCH	15	0	2.887	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.836	PASS
	MCH	25	0	4.796	PASS
	HCH	25	0	4.891	PASS
16QAM	LCH	25	0	4.820	PASS
	MCH	25	0	4.765	PASS
	HCH	25	0	4.793	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.400	PASS
	MCH	50	0	9.500	PASS
	HCH	50	0	9.558	PASS
16QAM	LCH	50	0	9.404	PASS
	MCH	50	0	9.432	PASS
	HCH	50	0	9.477	PASS

LTE Band 12

Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	6	0	1.236	PASS
	MCH	6	0	1.244	PASS
	HCH	6	0	1.241	PASS
16QAM	LCH	6	0	1.226	PASS
	MCH	6	0	1.219	PASS
	HCH	6	0	1.251	PASS

Channel Bandwidth: 3 MHz

Channel Bandwidth: 3MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	15	0	2.878	PASS
	MCH	15	0	2.901	PASS
	HCH	15	0	2.866	PASS
16QAM	LCH	15	0	2.880	PASS
	MCH	15	0	2.900	PASS
	HCH	15	0	2.895	PASS

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.811	PASS
	MCH	25	0	4.819	PASS
	HCH	25	0	4.772	PASS
16QAM	LCH	25	0	4.797	PASS
	MCH	25	0	4.809	PASS
	HCH	25	0	4.774	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.471	PASS
	MCH	50	0	9.428	PASS
	HCH	50	0	9.346	PASS
16QAM	LCH	50	0	9.488	PASS
	MCH	50	0	9.481	PASS
	HCH	50	0	9.389	PASS

LTE BAND 13

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.814	PASS
	MCH	25	0	4.791	PASS
	HCH	25	0	4.815	PASS
16QAM	LCH	25	0	4.787	PASS
	MCH	25	0	4.794	PASS
	HCH	25	0	4.836	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.406	PASS
	MCH	50	0	9.464	PASS
	HCH	50	0	9.483	PASS
16QAM	LCH	50	0	9.387	PASS
	MCH	50	0	9.376	PASS
	HCH	50	0	9.411	PASS

LTE BAND 17

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.875	PASS
	MCH	25	0	4.832	PASS
	HCH	25	0	4.770	PASS
16QAM	LCH	25	0	4.826	PASS
	MCH	25	0	4.830	PASS
	HCH	25	0	4.773	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.496	PASS
	MCH	50	0	9.434	PASS
	HCH	50	0	9.401	PASS
16QAM	LCH	50	0	9.412	PASS
	MCH	50	0	9.473	PASS
	HCH	50	0	9.378	PASS

LTE BAND 30

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	25	0	4.812	PASS
	MCH	25	0	4.813	PASS
	HCH	25	0	4.823	PASS
16QAM	LCH	25	0	4.830	PASS
	MCH	25	0	4.853	PASS
	HCH	25	0	4.850	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10MHz					
Modulation	Channel	RB Configuration		26dB Bandwidth (MHz)	Verdict
		Size	Offset		
QPSK	LCH	50	0	9.514	PASS
	MCH	50	0	9.486	PASS
	HCH	50	0	9.505	PASS
16QAM	LCH	50	0	9.458	PASS
	MCH	50	0	9.463	PASS
	HCH	50	0	9.450	PASS

Note: Please refers to Appendix B for compliance test plots for emission bandwidth (-26dBc)

11. BAND EDGE

11.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

11.2 PROVISIONS APPLICABLE

As Specified in FCC rules of §2.1051 §24.238(a) §27.53(g) §27.53(h) §27.53(m)
KDB 971168 D01v03 – Section 6.0

11.3 MEASUREMENT RESULT

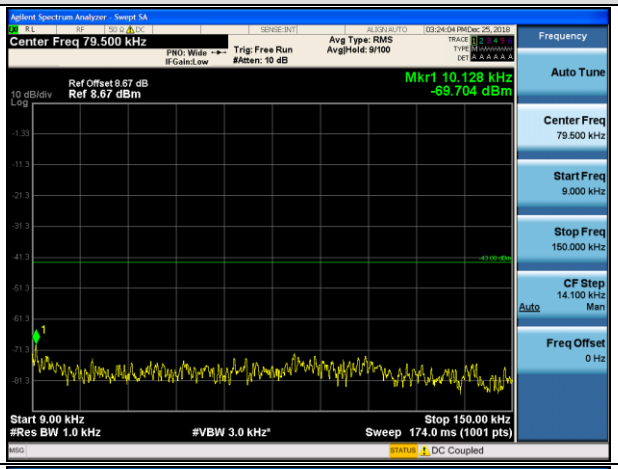
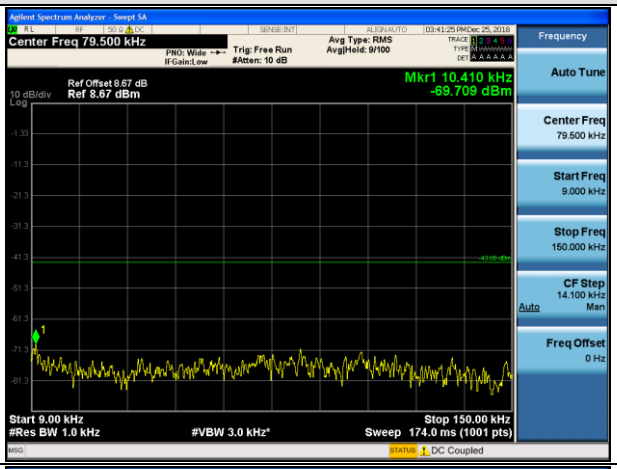
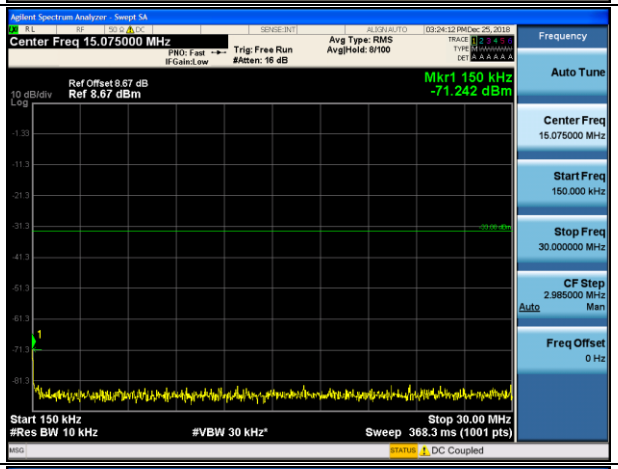
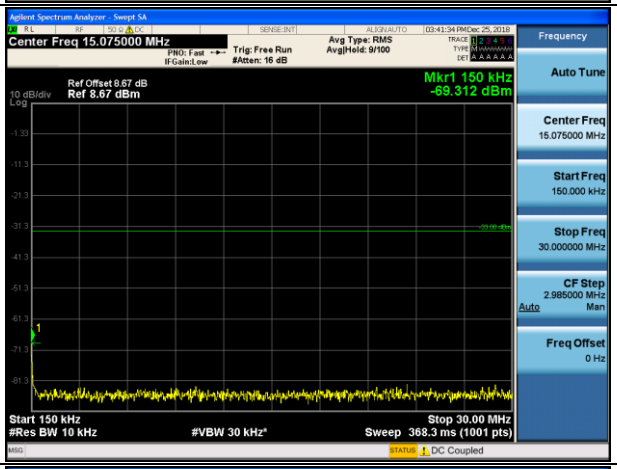
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequency. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

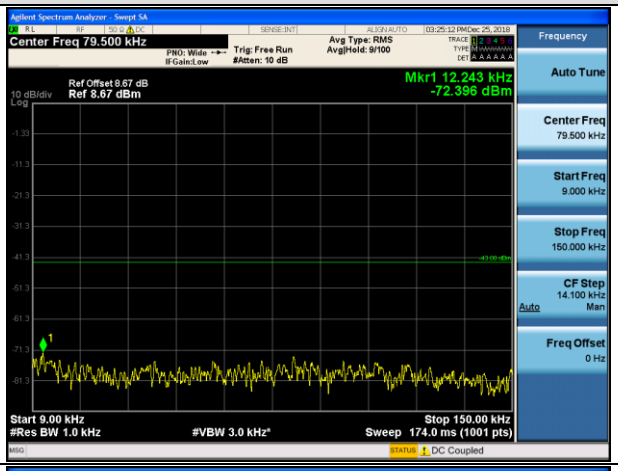
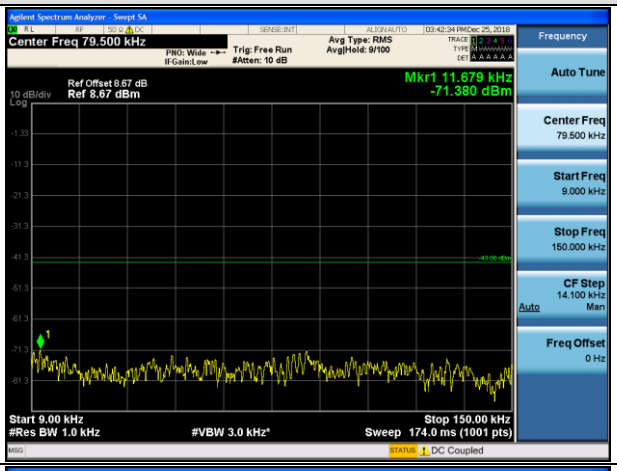
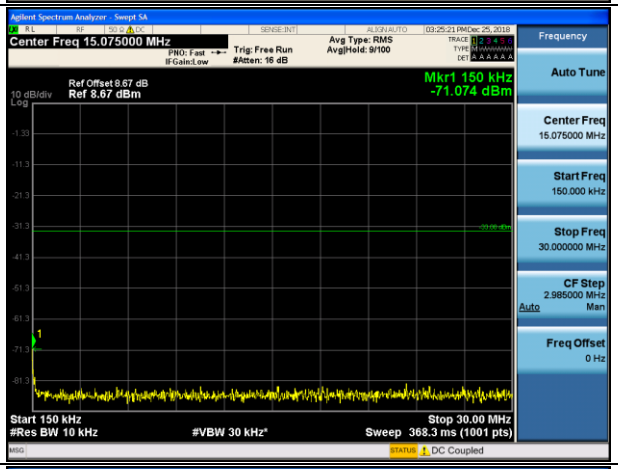
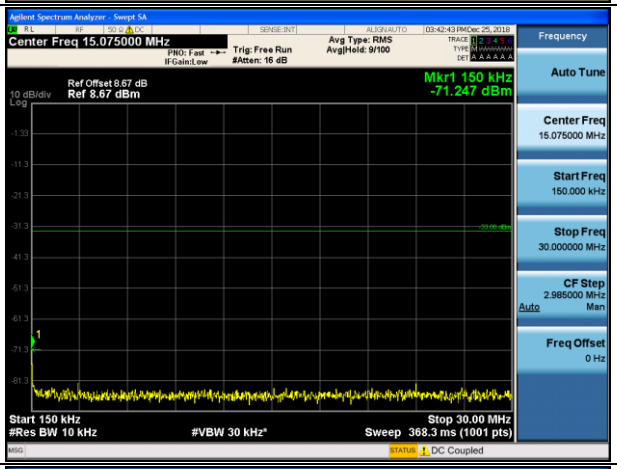
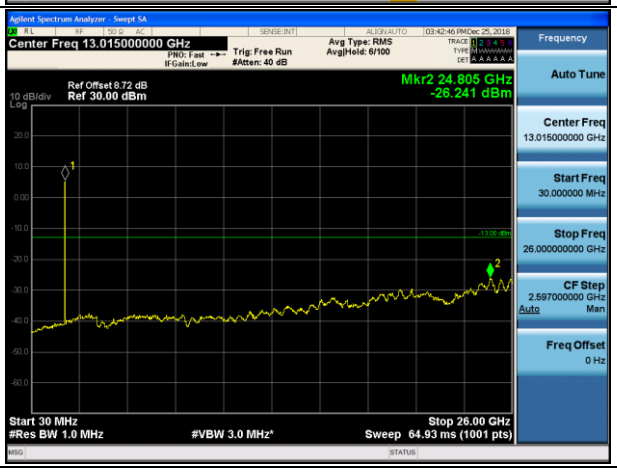
For Band 7:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

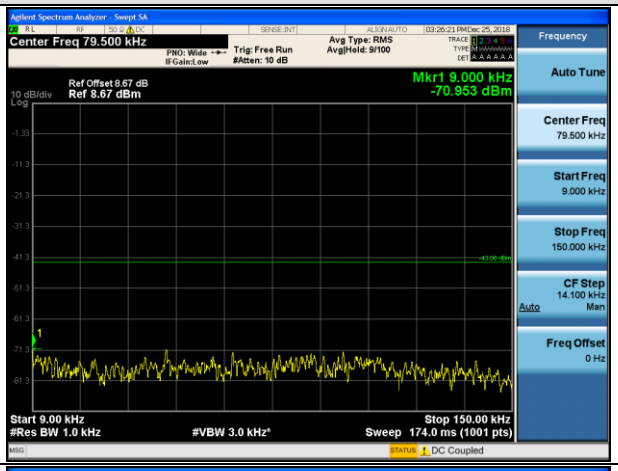
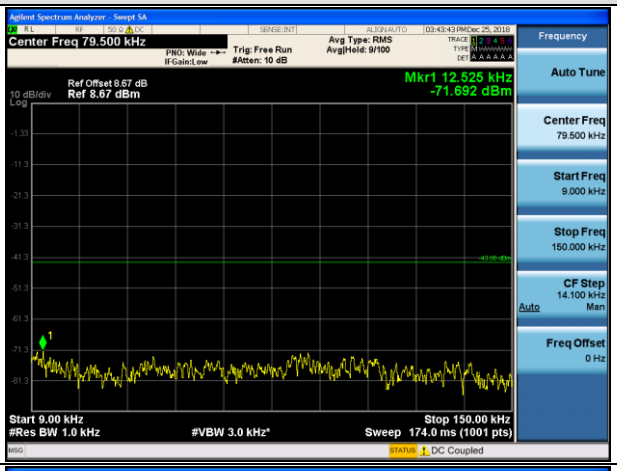
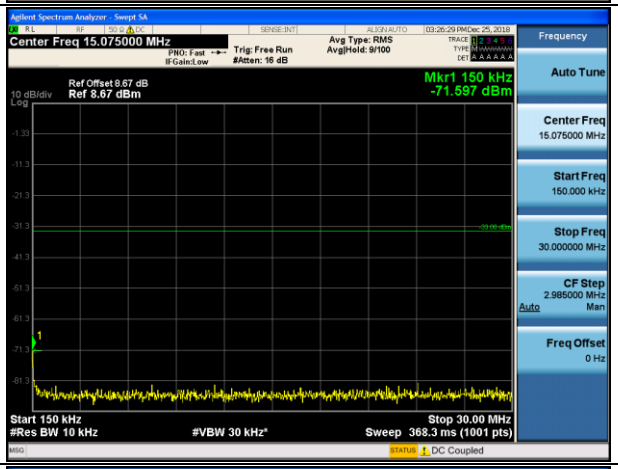
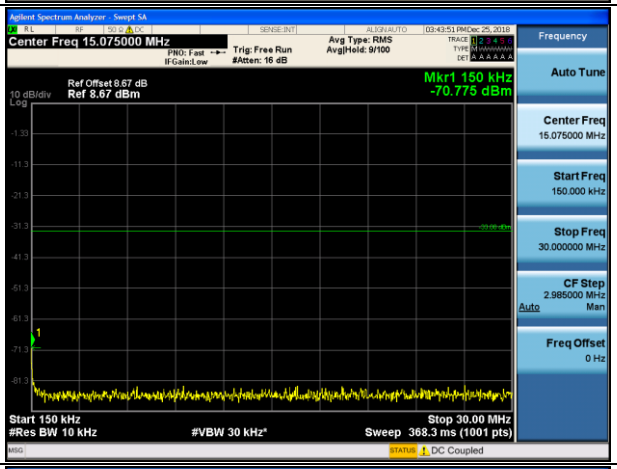
Please refers to Appendix C for compliance test plots for band edge

APPENDIX A TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

LTE BAND 2

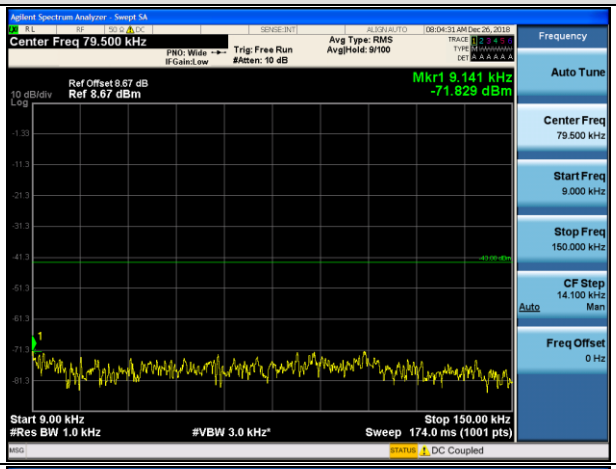
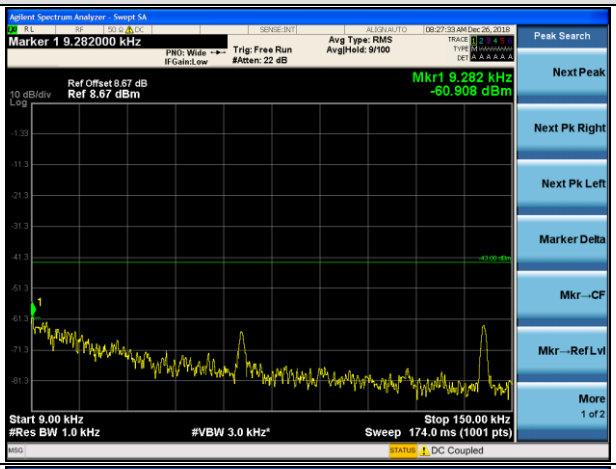
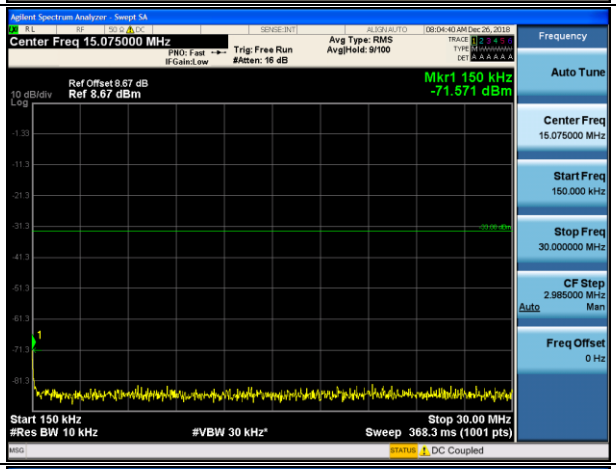
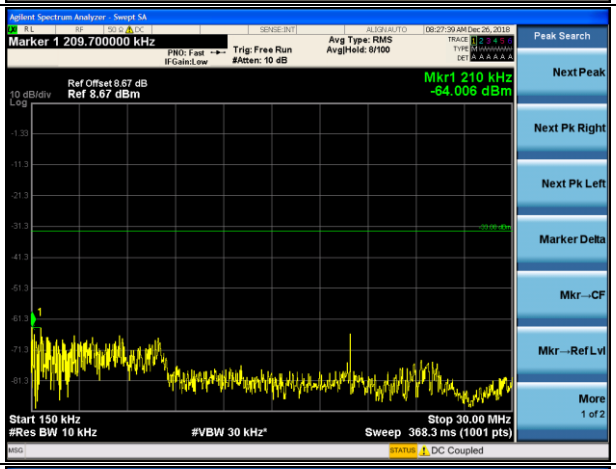
1.4MHz_LCH_QPSK_1RB#0	20MHz_LCH_QPSK_1RB#0
	
	
	

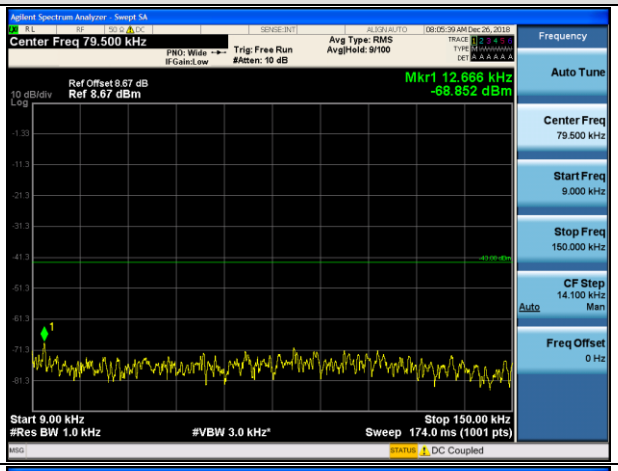
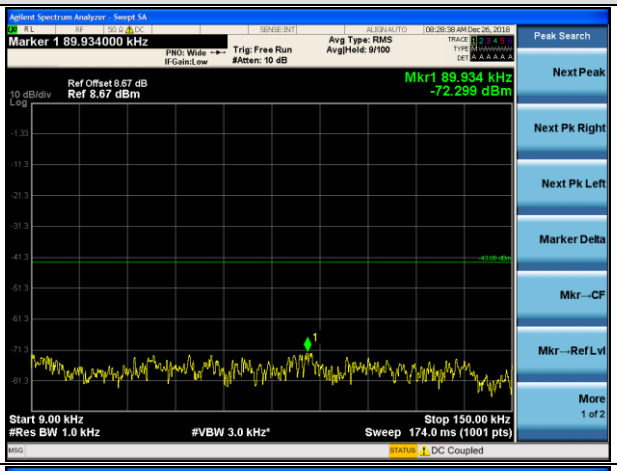
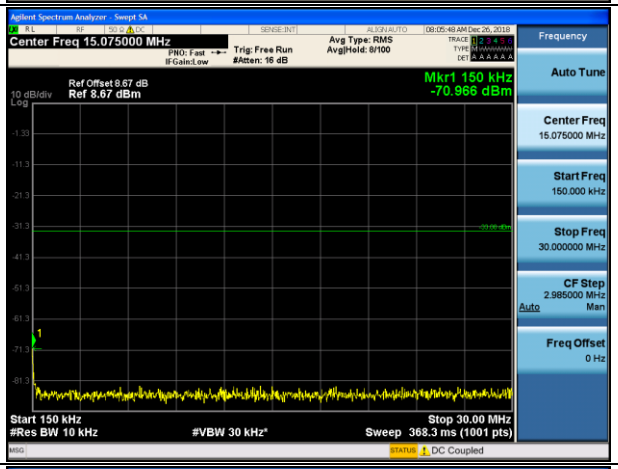
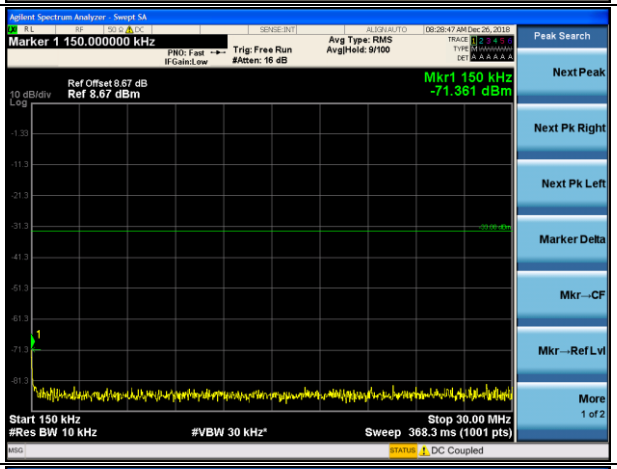
1.4MHz_MCH_QPSK_1RB#0	20MHz_MCH_QPSK_1RB#0
	
	
	

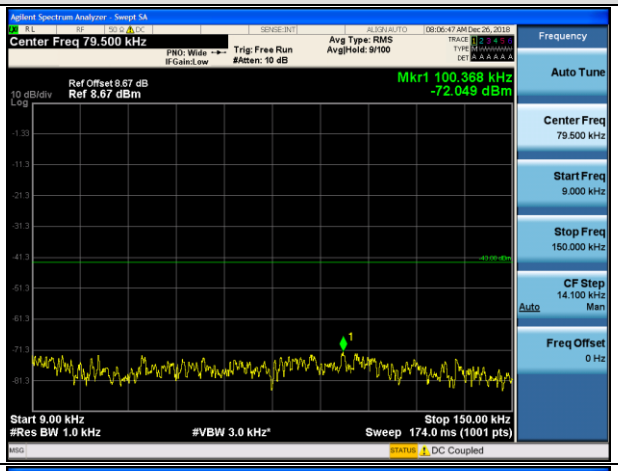
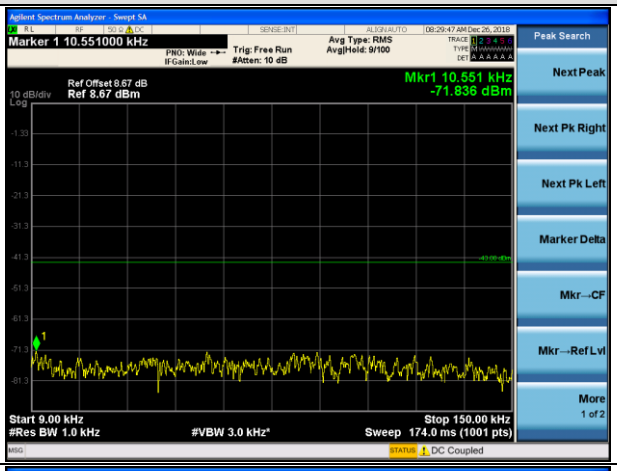
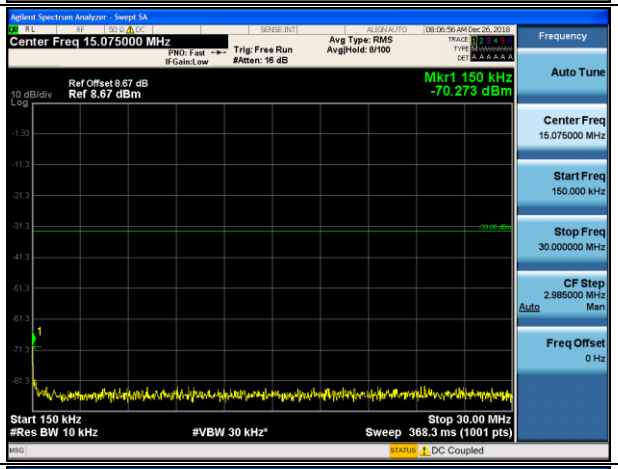
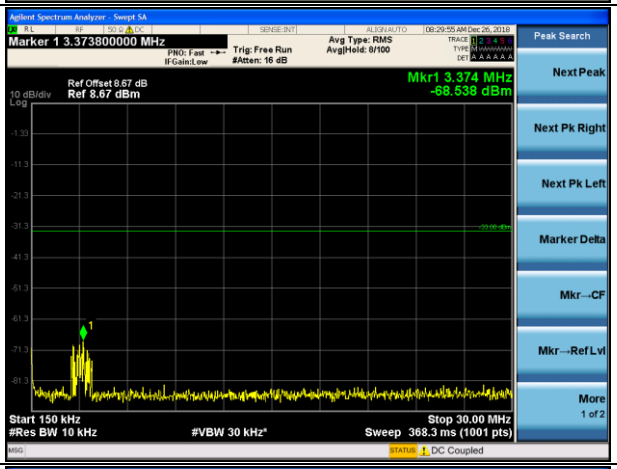
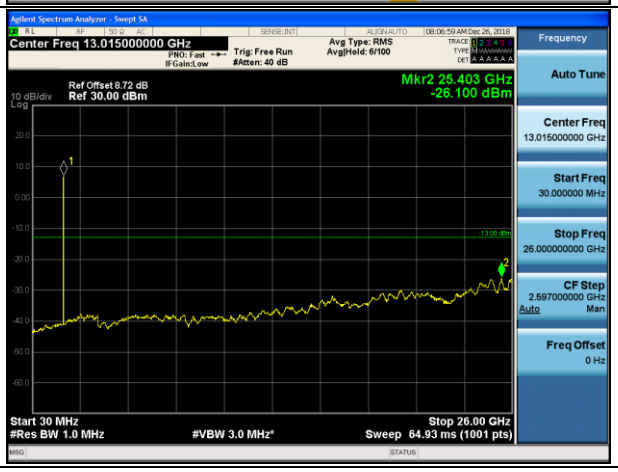
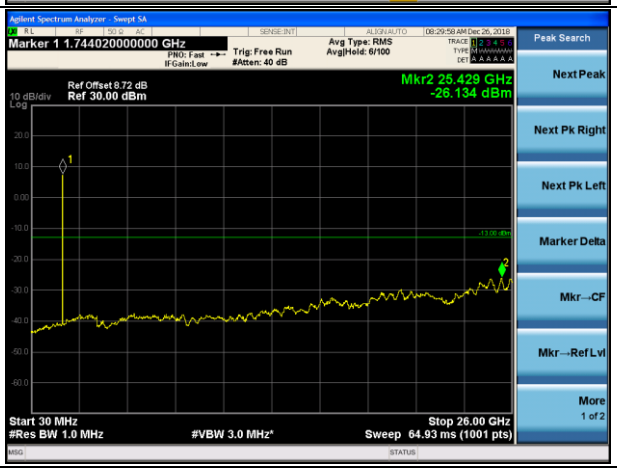
1.4MHz_HCH_QPSK_1RB#0	20MHz_HCH_QPSK_1RB#0
	
	
	

TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

LTE BAND 4

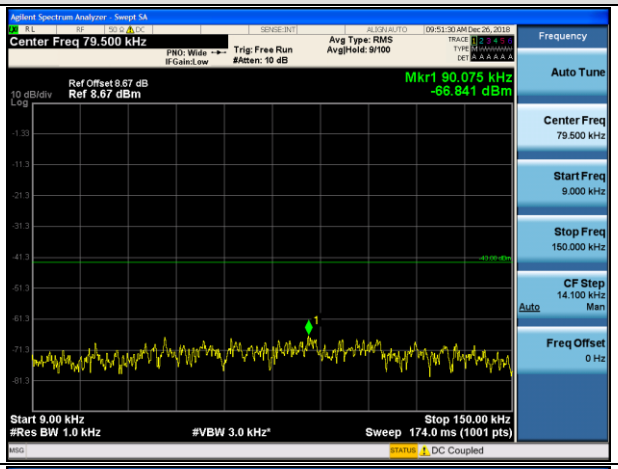
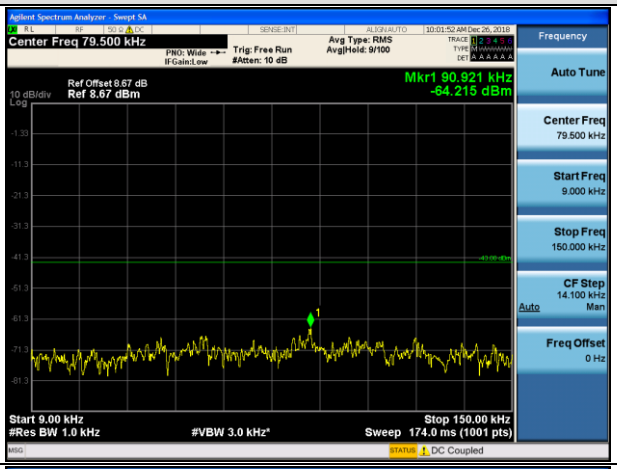
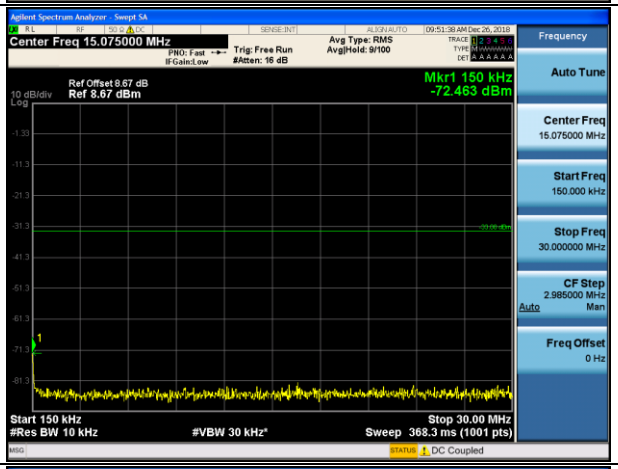
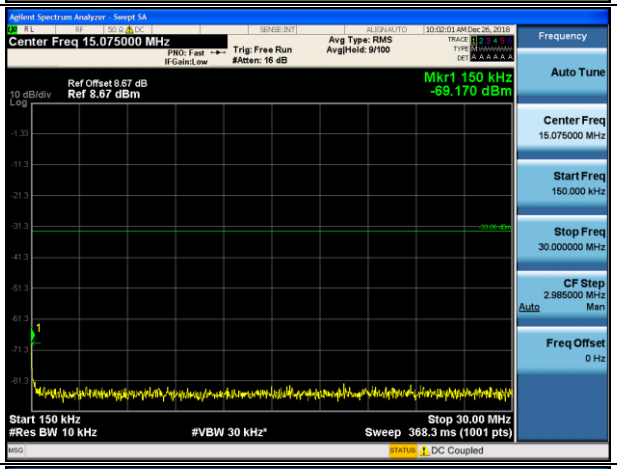
1.4MHz_LCH_QPSK_1RB#0	20MHz_LCH_QPSK_1RB#0
	
	
	

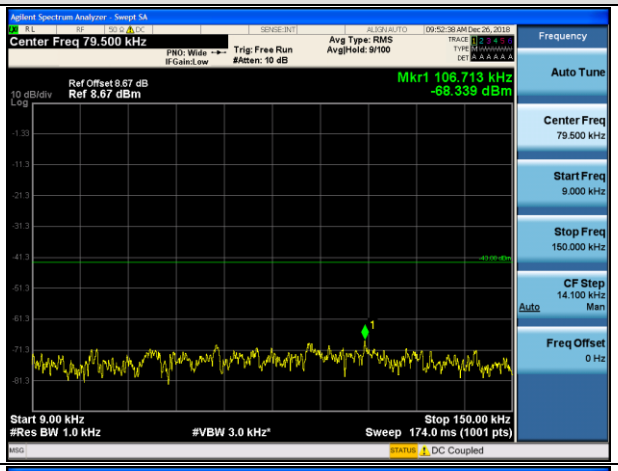
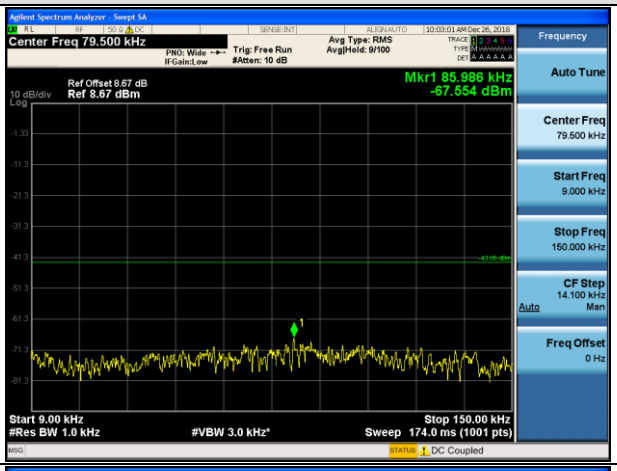
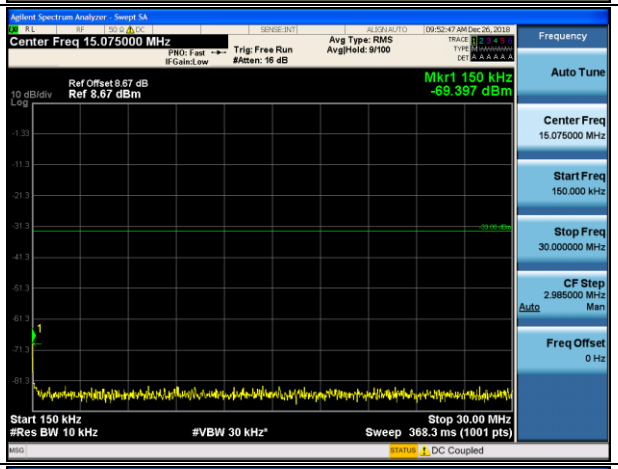
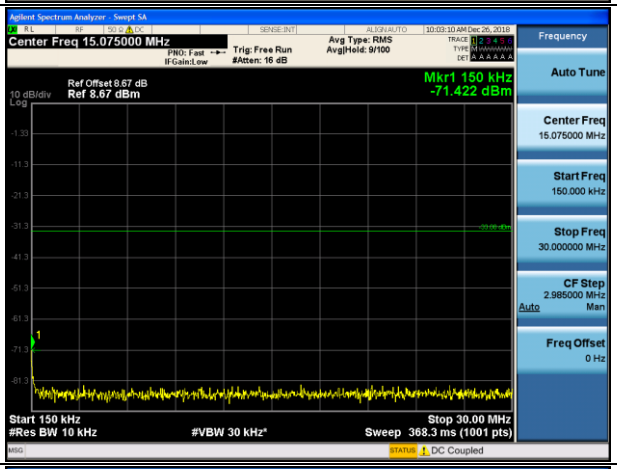
1.4MHz_MCH_QPSK_1RB#0	20MHz_MCH_QPSK_1RB#0
	
	
	

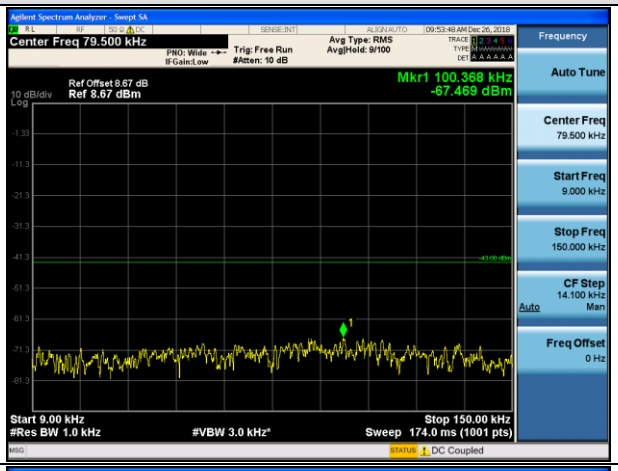
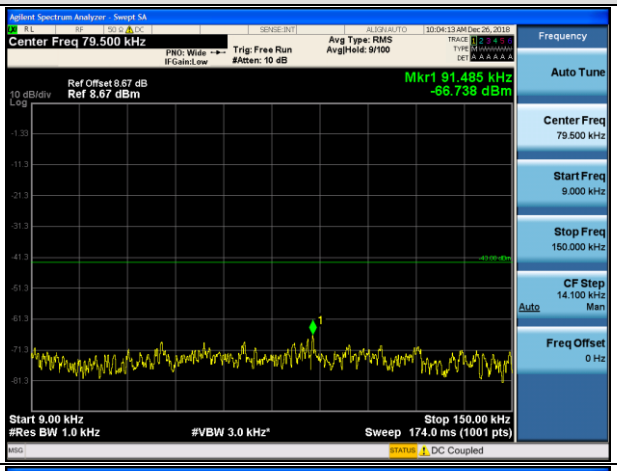
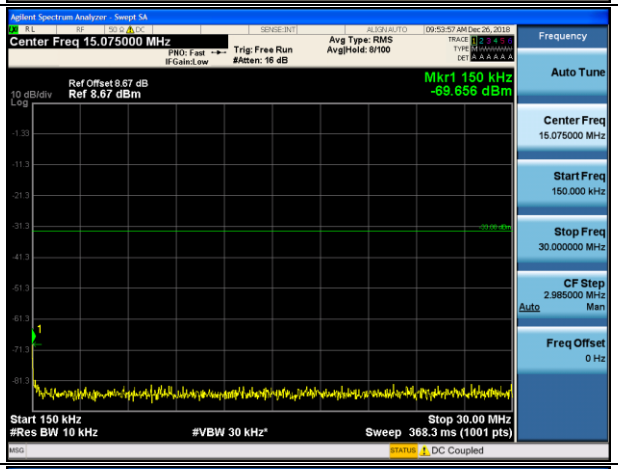
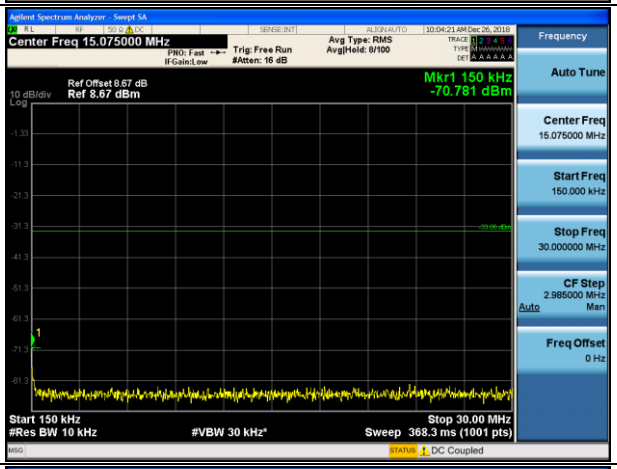
1.4MHz_HCH_QPSK_1RB#0	20MHz_HCH_QPSK_1RB#0
	
	
	

TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

LTE BAND 5

1.4MHz_LCH_QPSK_1RB#0	10MHz_LCH_QPSK_1RB#0
	
	
	

1.4MHz_MCH_QPSK_1RB#0	10MHz_MCH_QPSK_1RB#0
	
	
	

1.4MHz_HCH_QPSK_1RB#0	10MHz_HCH_QPSK_1RB#0
	
	
	

TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

LTE BAND 12

1.4MHz_LCH_QPSK_1RB#0	10MHz_LCH_QPSK_1RB#0