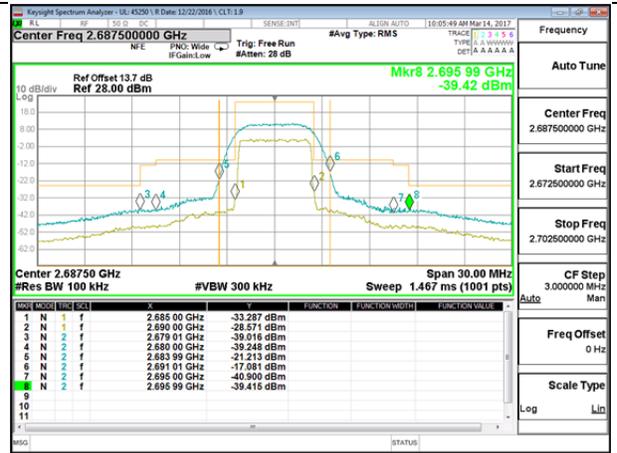
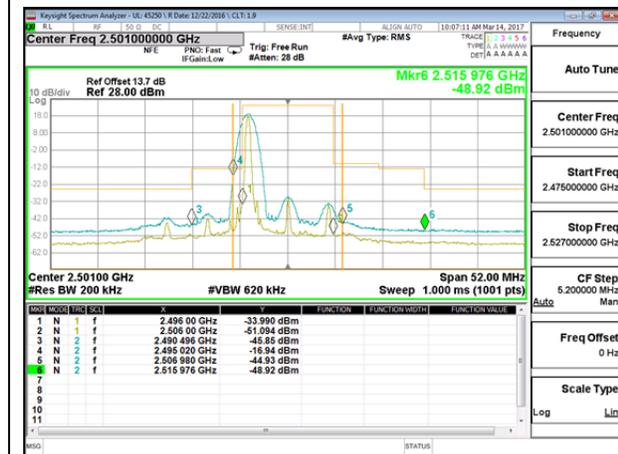


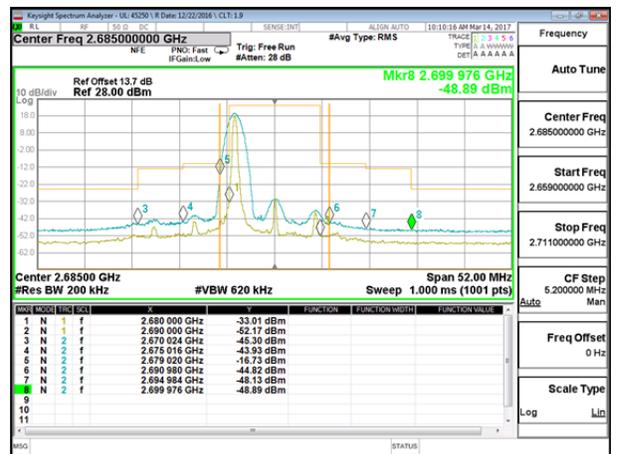
LTE B41 5MHz 16QAM Low Channel FRB



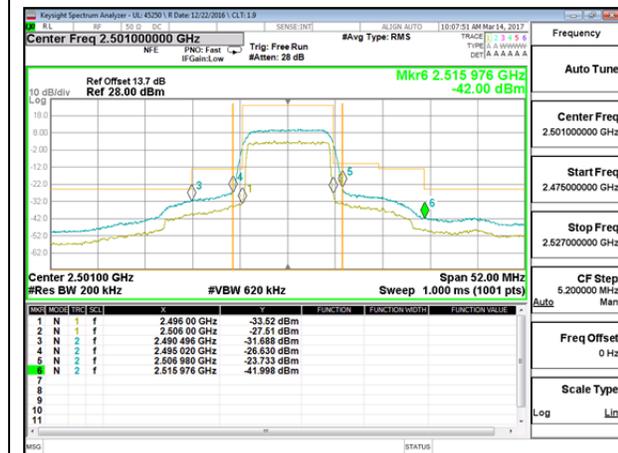
LTE B41 5MHz 16QAM High Channel FRB



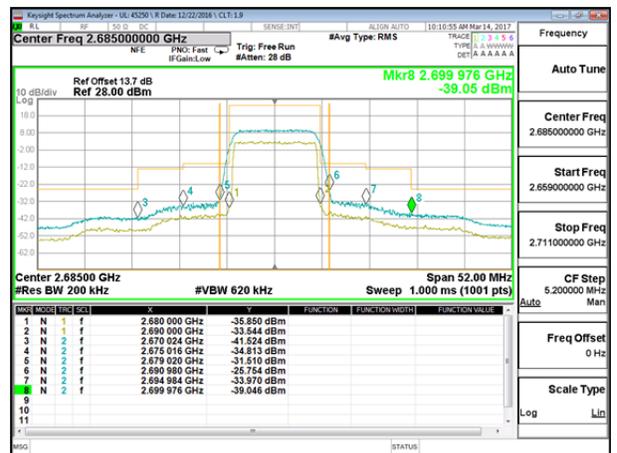
LTE B41 10MHz QPSK Low Channel 1RB



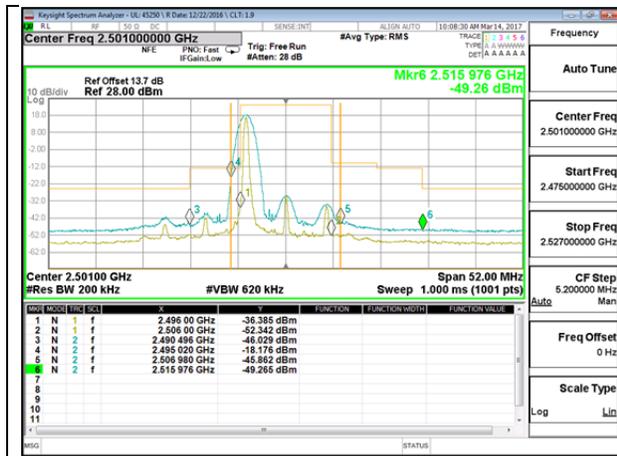
LTE B41 10MHz QPSK High Channel 1RB



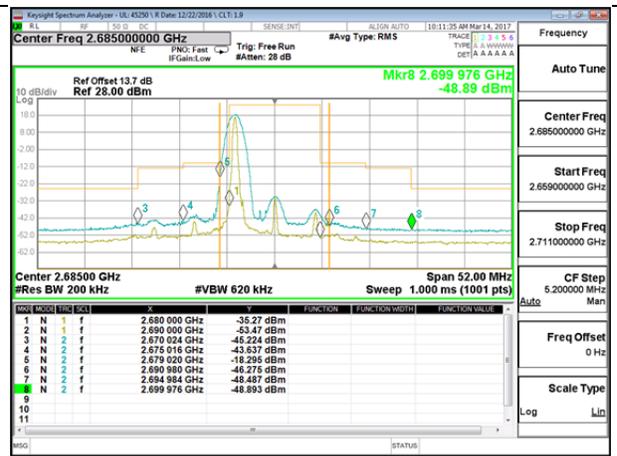
LTE B41 10MHz QPSK Low Channel FRB



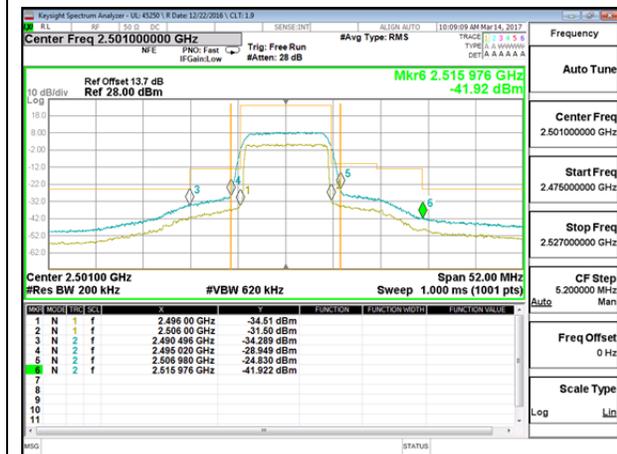
LTE B41 10MHz QPSK High Channel FRB



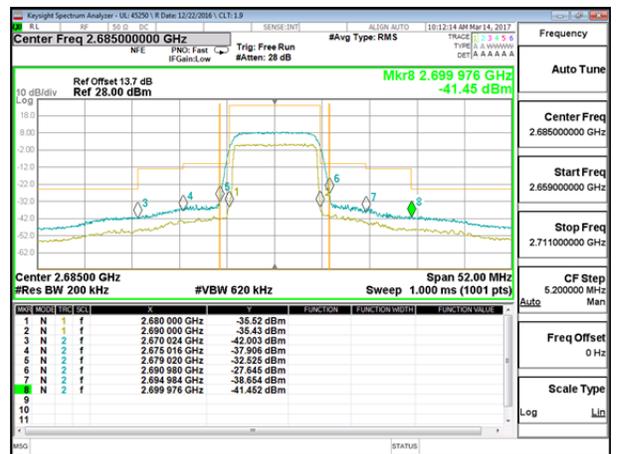
LTE B41 10MHz 16QAM Low Channel 1RB



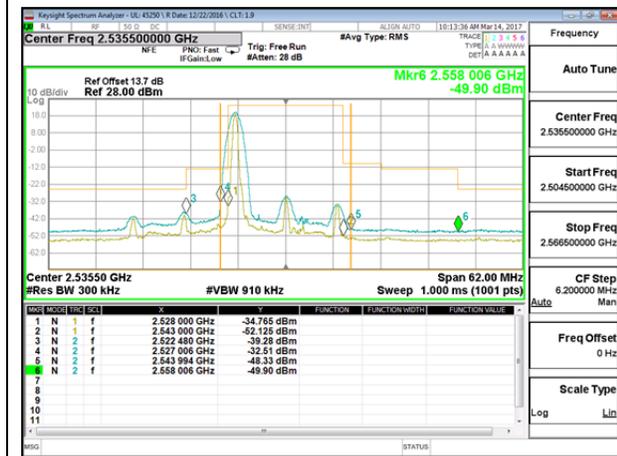
LTE B41 10MHz 16QAM High Channel 1RB



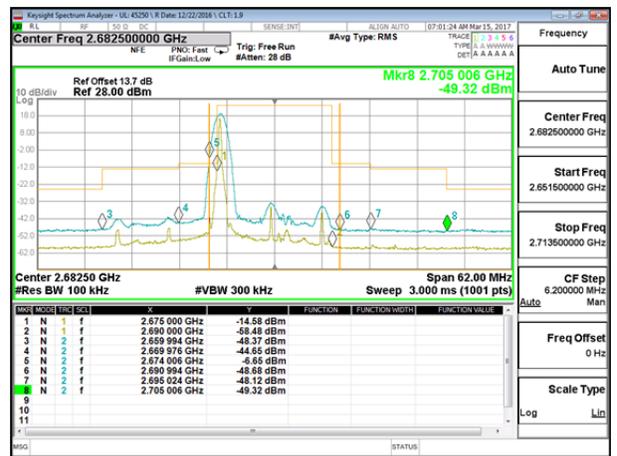
LTE B41 10MHz 16QAM Low Channel FRB



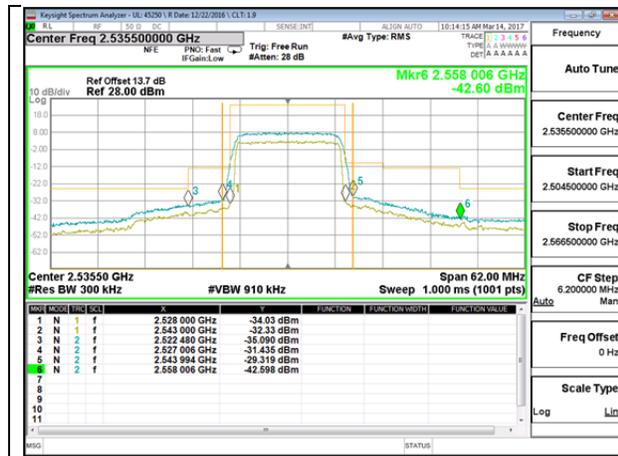
LTE B41 10MHz 16QAM High Channel FRB



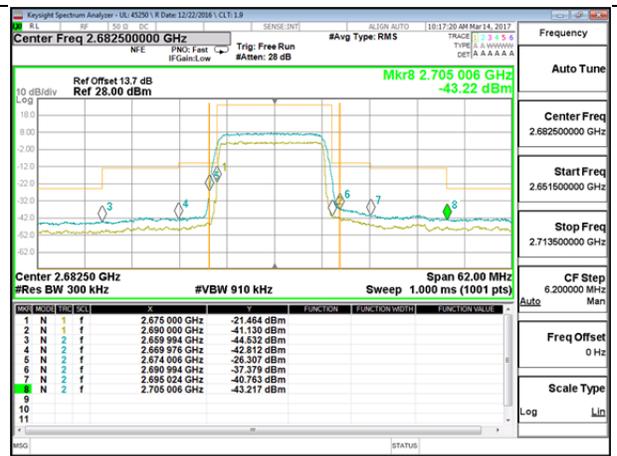
LTE B41 15MHz QPSK Low Channel 1RB



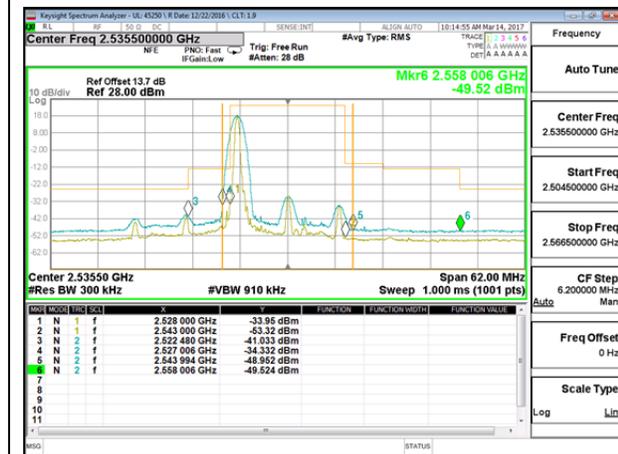
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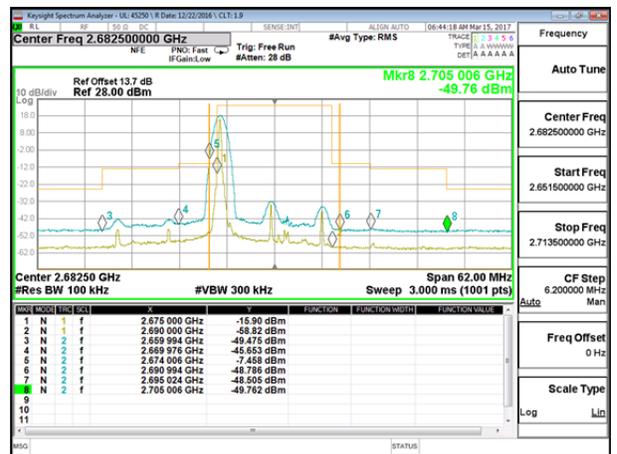
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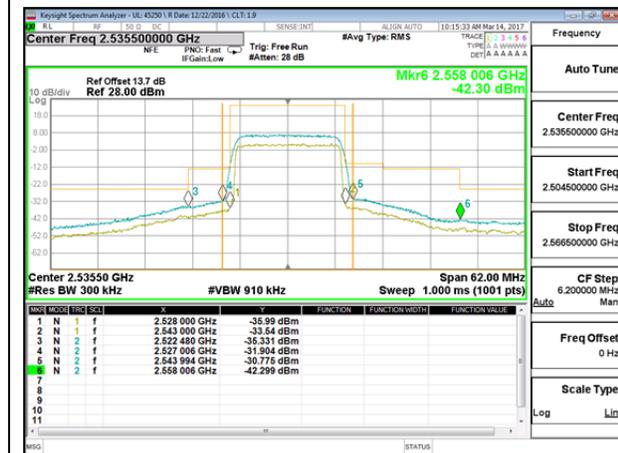
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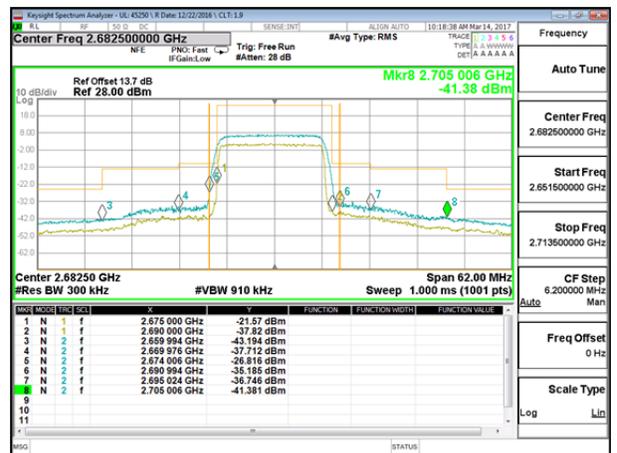
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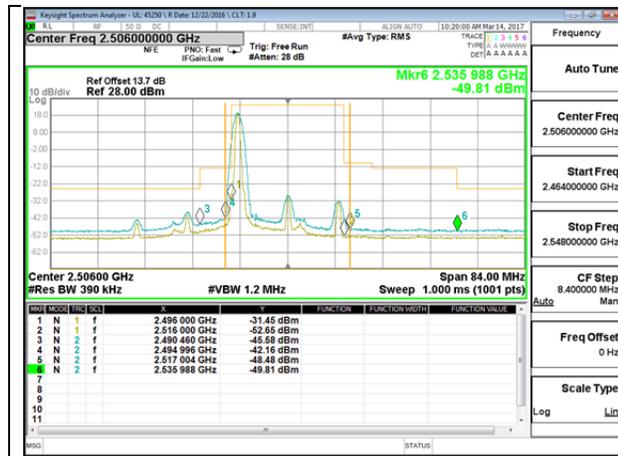
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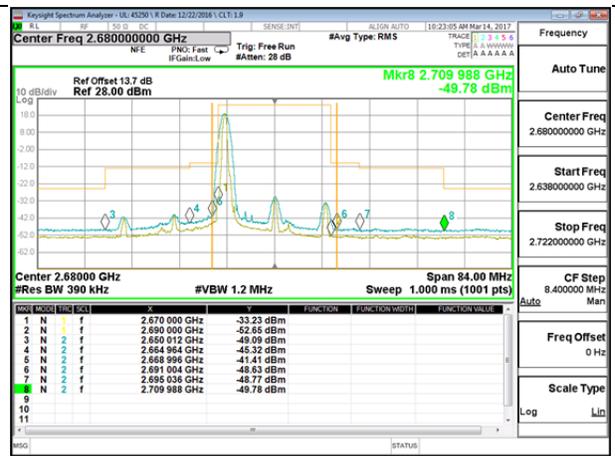
LTE B41 15MHz 16QAM Low Channel FRB



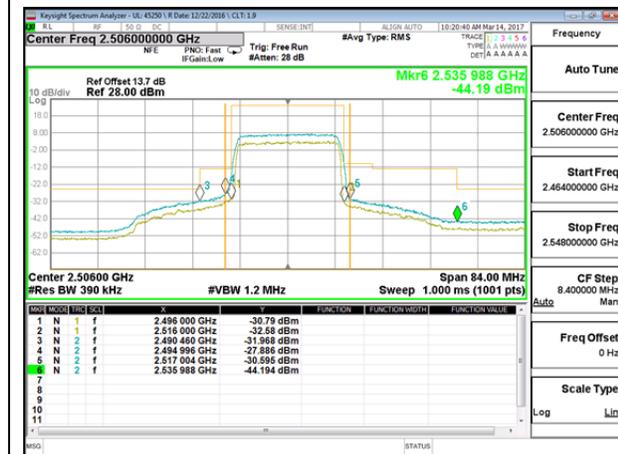
LTE B41 15MHz 16QAM High Channel FRB



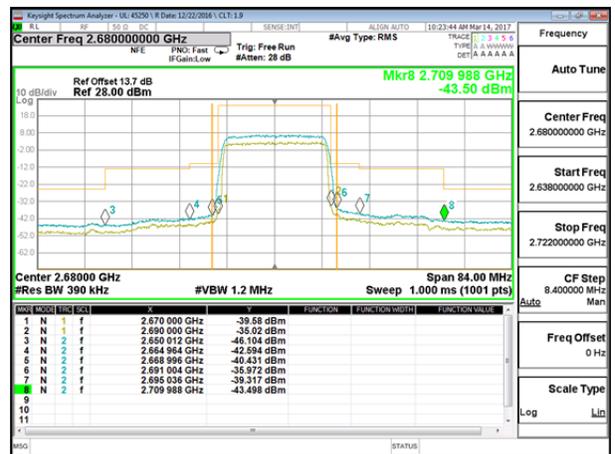
LTE B41 20MHz QPSK Low Channel 1RB



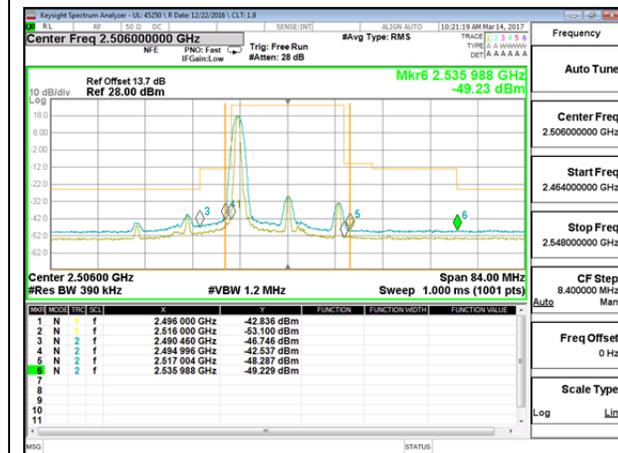
LTE B41 20MHz QPSK High Channel 1RB



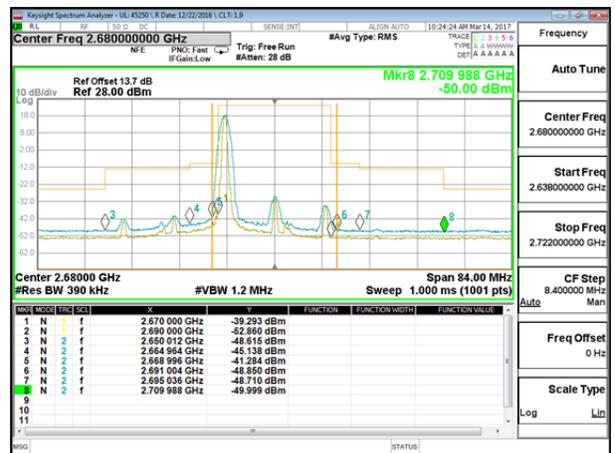
LTE B41 20MHz QPSK Low Channel FRB



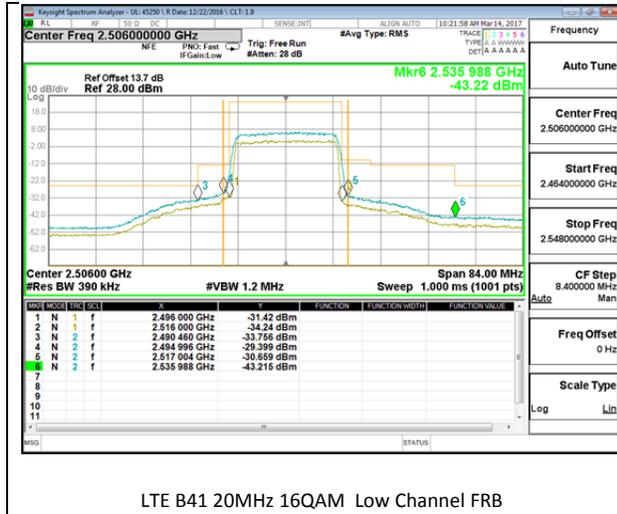
LTE B41 20MHz QPSK High Channel FRB



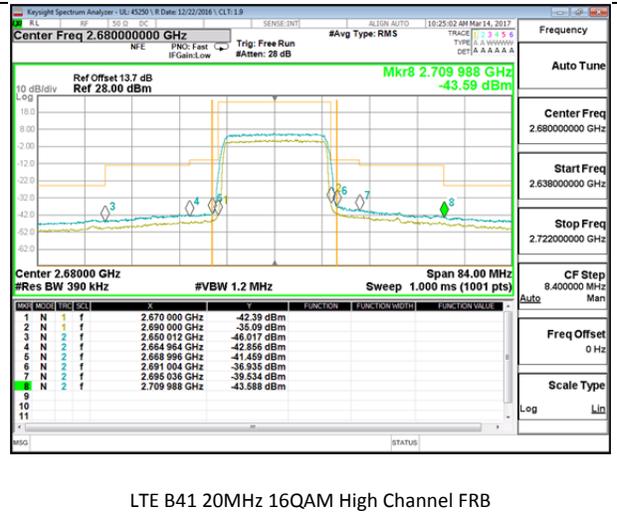
LTE B41 20MHz 16QAM Low Channel 1RB



LTE B41 20MHz 16QAM High Channel 1RB



LTE B41 20MHz 16QAM Low Channel FRB



LTE B41 20MHz 16QAM High Channel FRB

15. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53

LIMITS

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.

Part 27: (m)(4) (4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

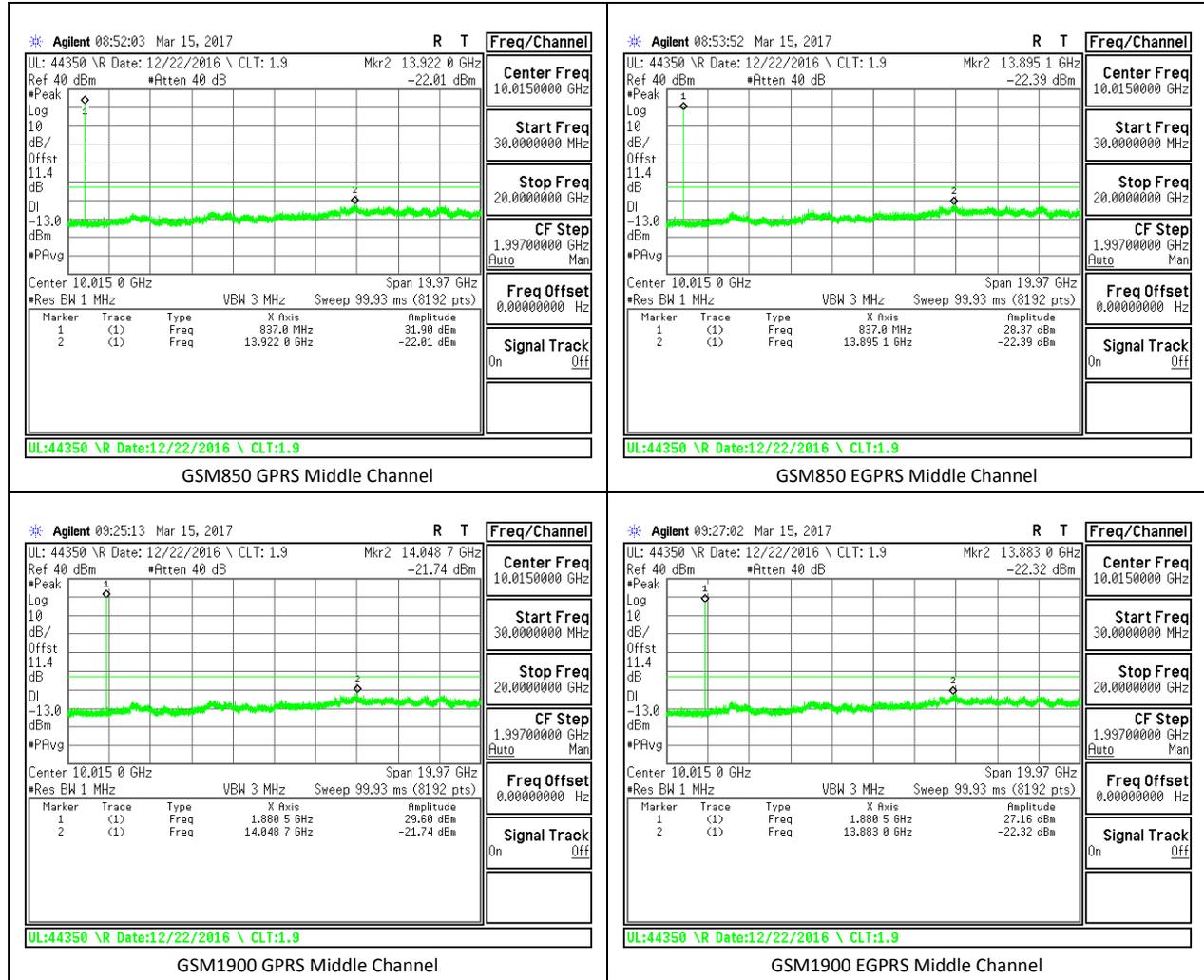
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in a maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

RESULTS

15.1. OUT OF BAND EMISSIONS RESULT AND PLOTS

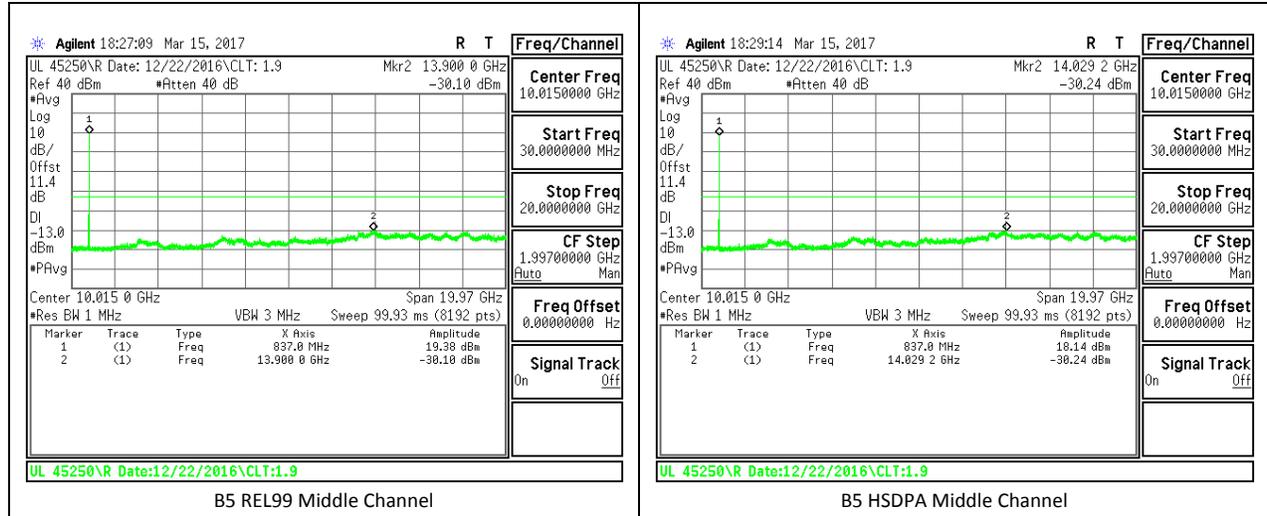
GSM

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM 850	GPRS	824.2	-22.94	-13	-9.94
		836.6	-22.01	-13	-9.01
		848.8	-22.23	-13	-9.23
	EGPRS	824.2	-21.76	-13	-8.76
		836.6	-22.39	-13	-9.39
		848.8	-22.44	-13	-9.44
GSM 1900	GPRS	1850.2	-22.7	-13	-9.7
		1880	-21.74	-13	-8.74
		1909.8	-22.49	-13	-9.49
	EGPRS	1850.2	-22.61	-13	-9.61
		1880	-22.32	-13	-9.32
		1909.8	-22.05	-13	-9.05



WCDMA

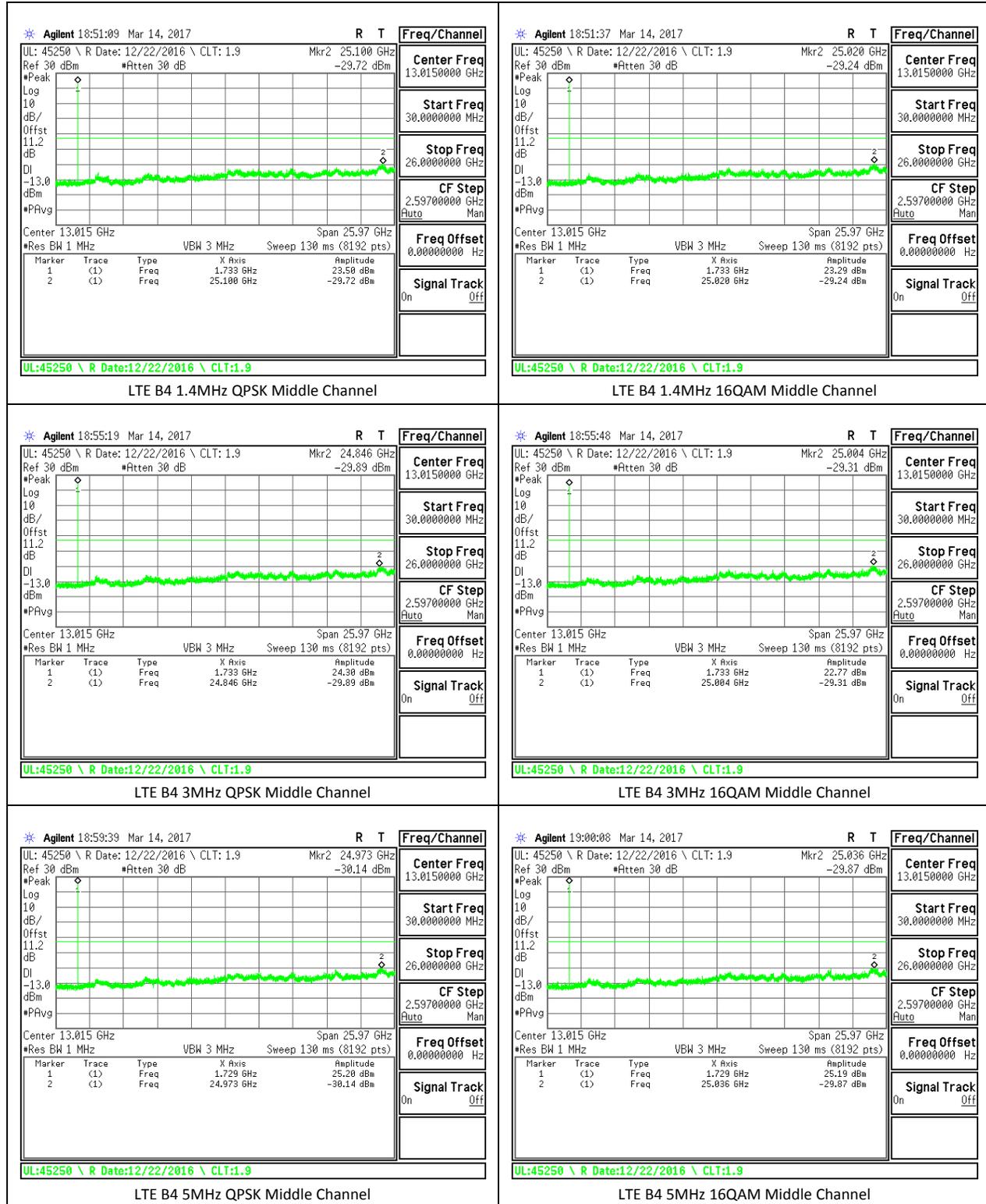
Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
Band 5	REL99	826.4	-30.04	-13	-17.04
		836.6	-30.1	-13	-17.1
		846.6	-30.19	-13	-17.19
	HSDPA	826.4	-29.54	-13	-16.54
		836.6	-30.24	-13	-17.24
		846.6	-29.78	-13	-16.78

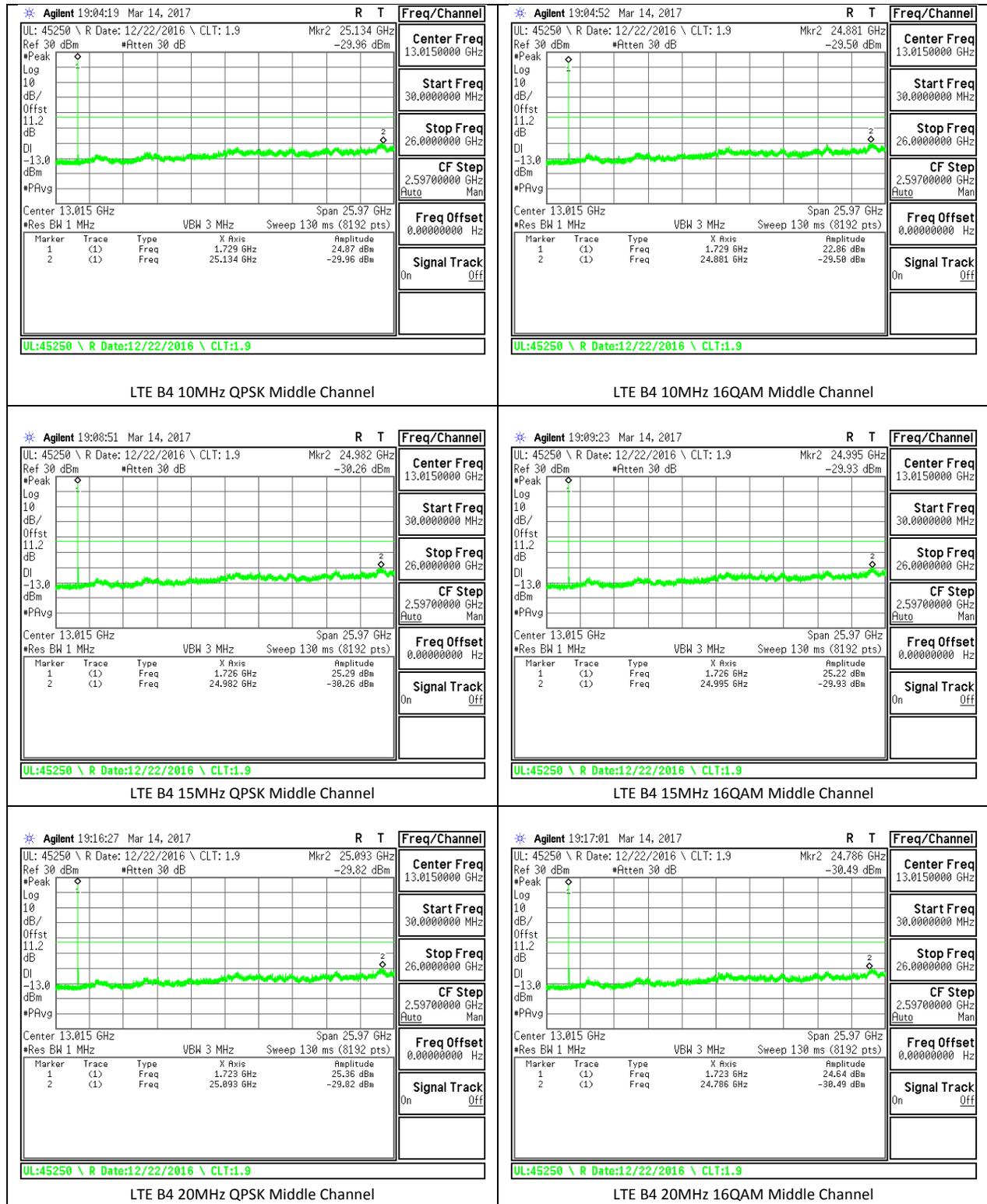


LTE Band 4

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	20	16QAM	1720	-29.23	-13	-16.23
			1732.5	-30.49	-13	-17.49
			1745	-29.8	-13	-16.8
		QPSK	1720	-29.88	-13	-16.88
			1732.5	-29.82	-13	-16.82
			1745	-29.79	-13	-16.79
	15	16QAM	1717.5	-29.96	-13	-16.96
			1732.5	-29.93	-13	-16.93
			1747.5	-30.32	-13	-17.32
		QPSK	1717.5	-29.99	-13	-16.99
			1732.5	-30.26	-13	-17.26
			1747.5	-30.08	-13	-17.08
	10	16QAM	1715	-29.65	-13	-16.65
			1732.5	-29.5	-13	-16.5
			1750	-29.94	-13	-16.94
		QPSK	1715	-28.89	-13	-15.89
			1732.5	-29.96	-13	-16.96
			1750	-29.85	-13	-16.85
	5	16QAM	1712.5	-29.63	-13	-16.63
			1732.5	-29.87	-13	-16.87
			1752.5	-30.44	-13	-17.44
		QPSK	1712.5	-29.8	-13	-16.8
			1732.5	-30.14	-13	-17.14
			1752.5	-30.14	-13	-17.14

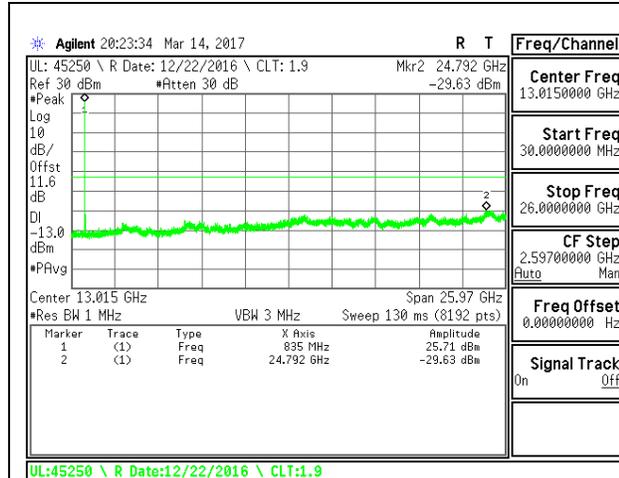
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	3	16QAM	1711.5	-29.68	-13	-16.68
			1732.5	-29.31	-13	-16.31
			1753.5	-30.25	-13	-17.25
		QPSK	1711.5	-30.27	-13	-17.27
			1732.5	-29.89	-13	-16.89
			1753.5	-30.3	-13	-17.3
	1.4	16QAM	1710.7	-29.91	-13	-16.91
			1732.5	-29.24	-13	-16.24
			1754.3	-29.83	-13	-16.83
		QPSK	1710.7	-29.39	-13	-16.39
			1732.5	-29.72	-13	-16.72
			1754.3	-29.88	-13	-16.88



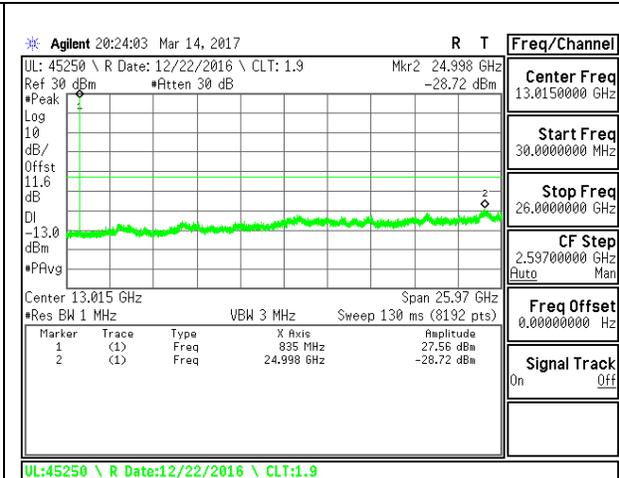


LTE Band 5

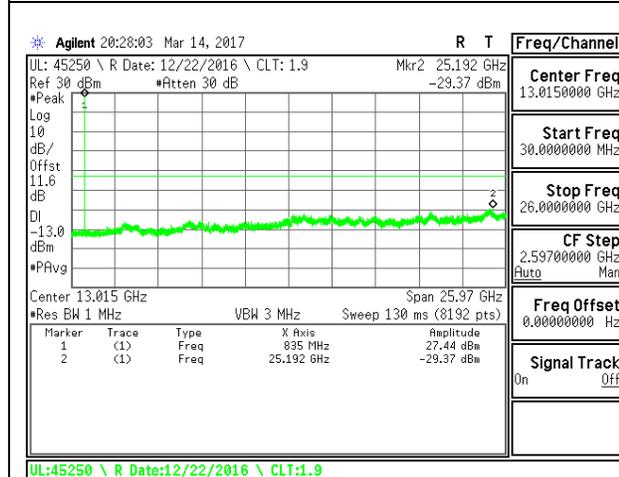
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	10	16QAM	829	-29.32	-13	-16.32
			836.5	-28.87	-13	-15.87
			844	-29.13	-13	-16.13
		QPSK	829	-28.8	-13	-15.8
			836.5	-29.34	-13	-16.34
			844	-29.04	-13	-16.04
	5	16QAM	826.5	-29.75	-13	-16.75
			836.5	-29.6	-13	-16.6
			846.5	-29.66	-13	-16.66
		QPSK	826.5	-29.24	-13	-16.24
			836.5	-29.54	-13	-16.54
			846.5	-29.04	-13	-16.04
	3	16QAM	825.5	-29.87	-13	-16.87
			836.5	-28.68	-13	-15.68
			847.5	-28.78	-13	-15.78
		QPSK	825.5	-29.07	-13	-16.07
			836.5	-29.37	-13	-16.37
			847.5	-29.07	-13	-16.07
	1.4	16QAM	824.7	-29.59	-13	-16.59
			836.5	-28.72	-13	-15.72
			848.3	-29.01	-13	-16.01
		QPSK	824.7	-30.07	-13	-17.07
			836.5	-29.63	-13	-16.63
			848.3	-29.17	-13	-16.17



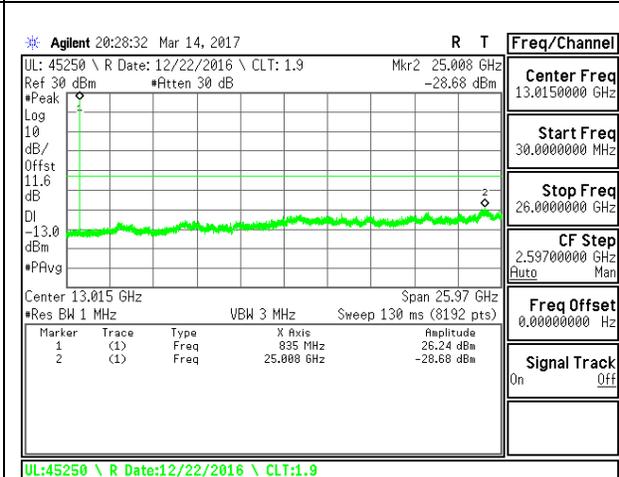
LTE B5 1.4MHz QPSK Middle Channel



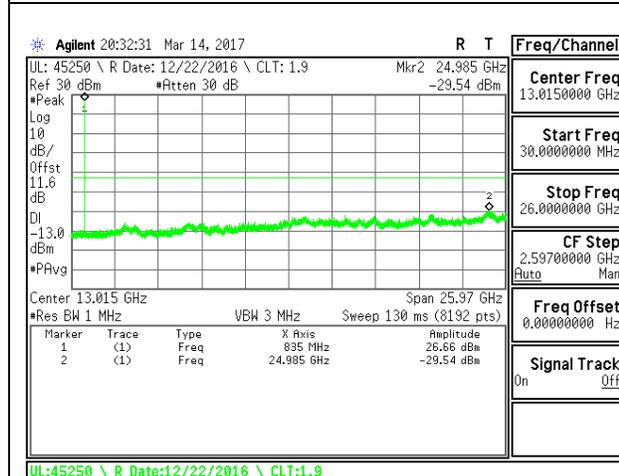
LTE B5 1.4MHz 16QAM Middle Channel



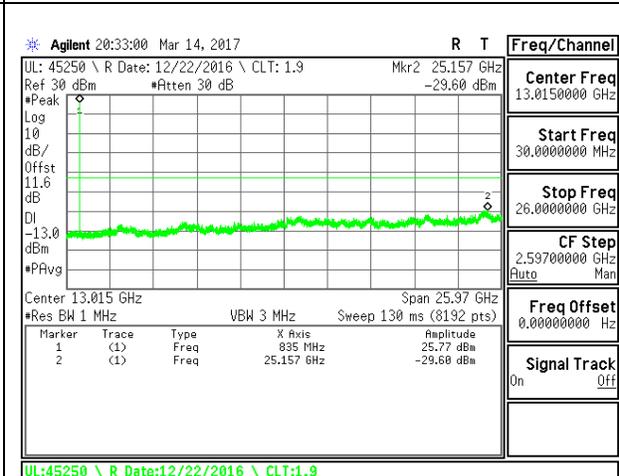
LTE B5 3MHz QPSK Middle Channel



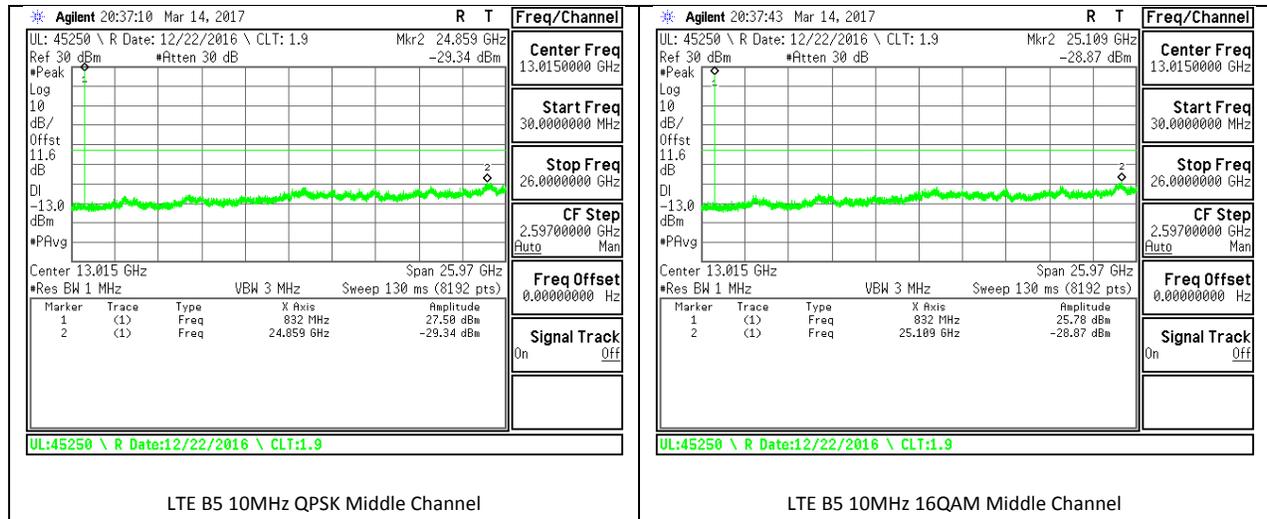
LTE B5 3MHz 16QAM Middle Channel



LTE B5 5MHz QPSK Middle Channel

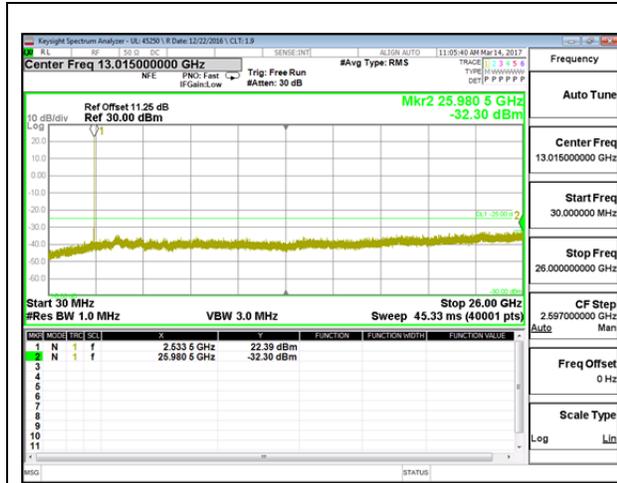


LTE B5 5MHz 16QAM Middle Channel

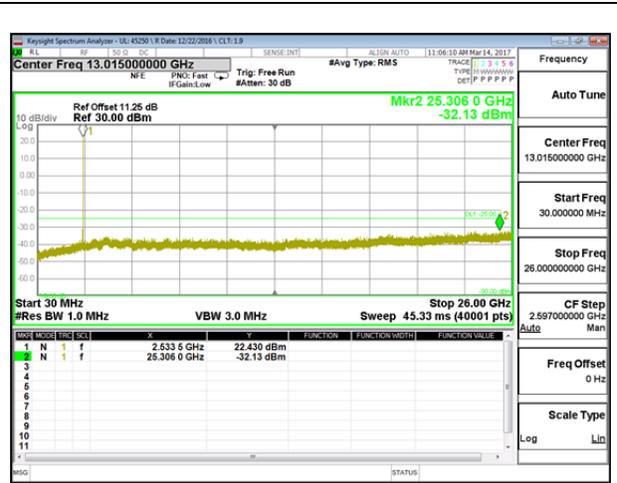


LTE Band 7

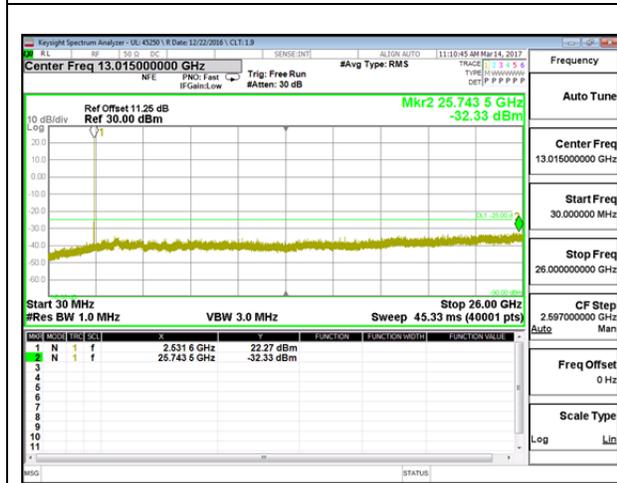
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE7	20	16QAM	2510	-31.84	-25	-6.84
			2535	-32.04	-25	-7.04
			2560	-32.31	-25	-7.31
		QPSK	2510	-31.69	-25	-6.69
			2535	-31.46	-25	-6.46
			2560	-31.13	-25	-6.13
	15	16QAM	2507.5	-31.9	-25	-6.9
			2535	-31.94	-25	-6.94
			2562.5	-31.94	-25	-6.94
		QPSK	2507.5	-32.23	-25	-7.23
			2535	-30.96	-25	-5.96
			2562.5	-32.45	-25	-7.45
	10	16QAM	2505	-31.84	-25	-6.84
			2535	-32.33	-25	-7.33
			2565	-32.56	-25	-7.56
		QPSK	2505	-32.46	-25	-7.46
			2535	-32.33	-25	-7.33
			2565	-31.68	-25	-6.68
	5	16QAM	2502.5	-32	-25	-7
			2535	-32.13	-25	-7.13
			2567.5	-32.42	-25	-7.42
		QPSK	2502.5	-31.05	-25	-6.05
			2535	-32.3	-25	-7.3
			2567.5	-31.99	-25	-6.99



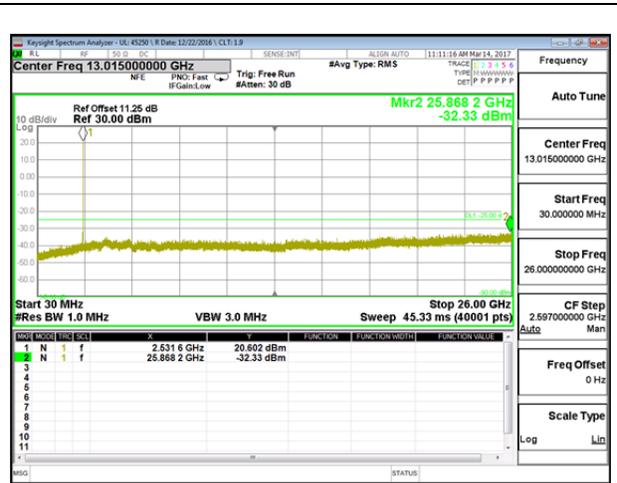
LTE B7 5MHz QPSK Middle Channel



LTE B7 5MHz 16QAM Middle Channel



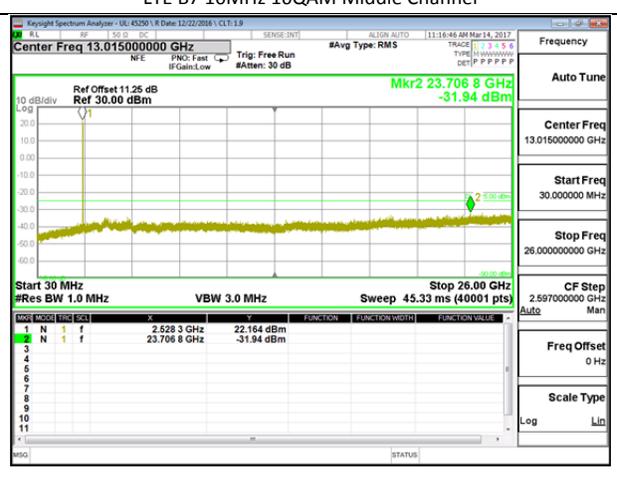
LTE B7 10MHz QPSK Middle Channel



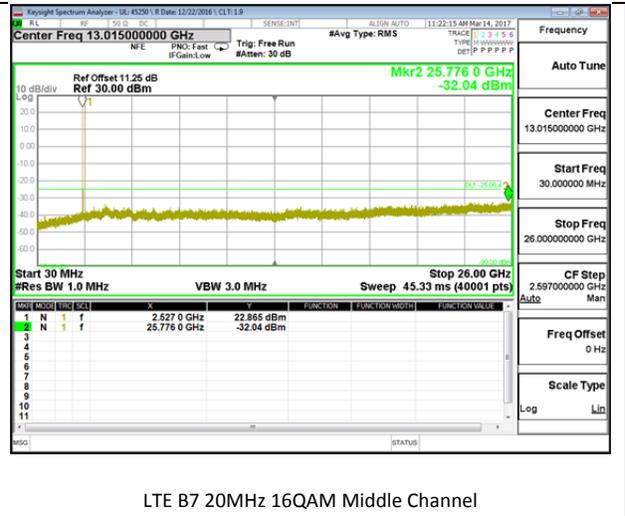
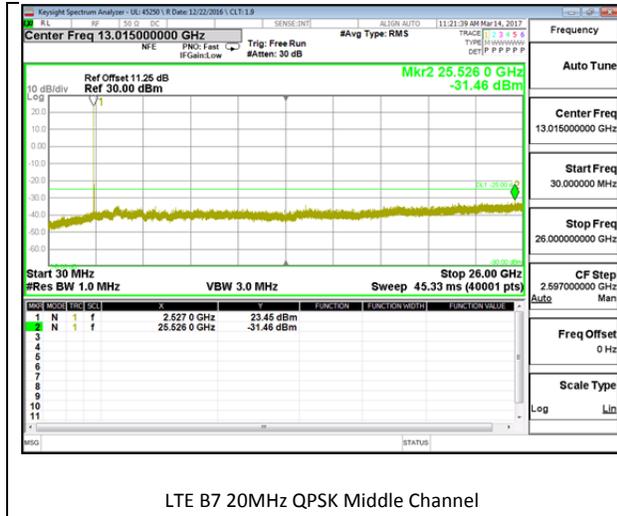
LTE B7 10MHz 16QAM Middle Channel



LTE B7 15MHz QPSK Middle Channel

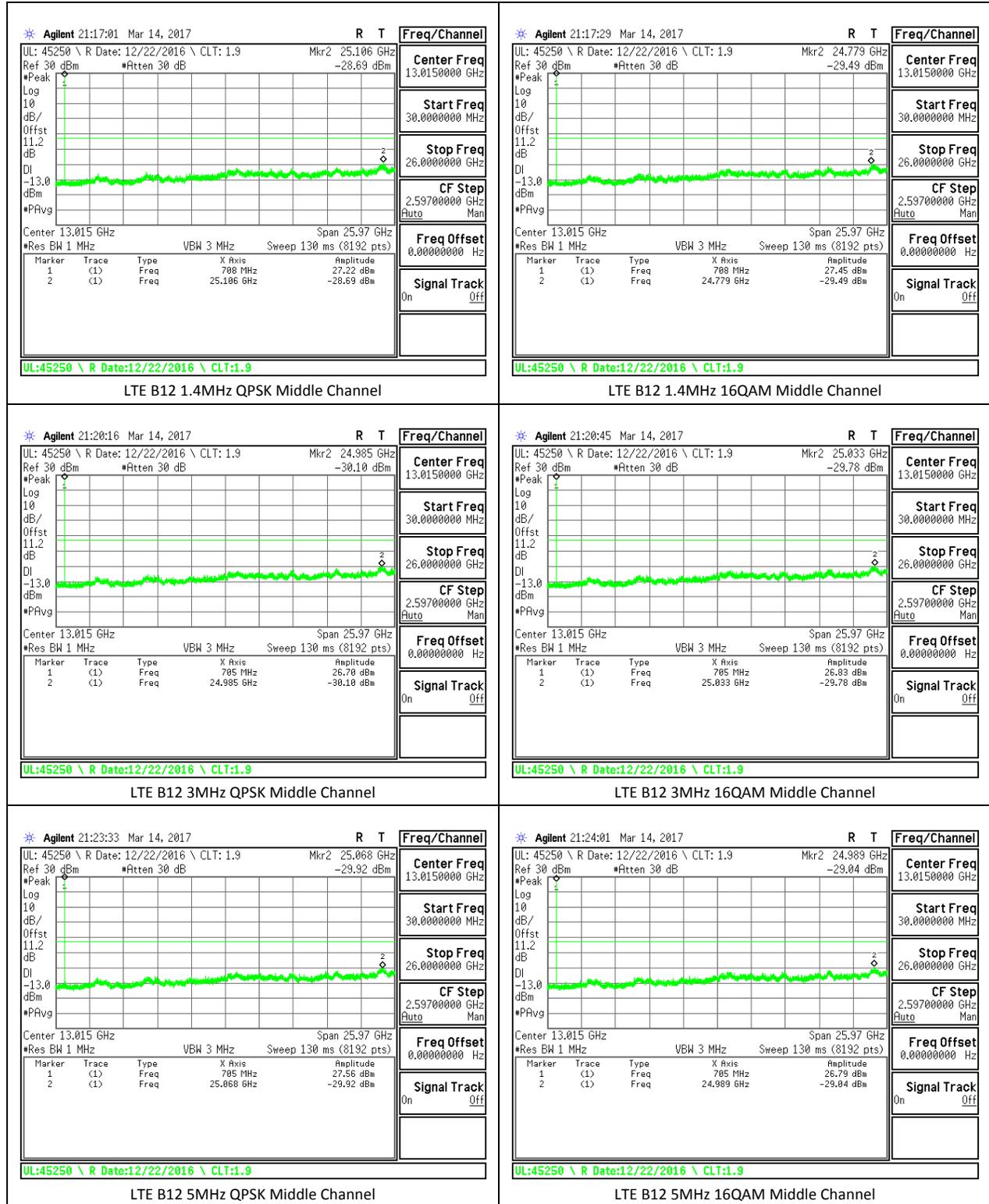


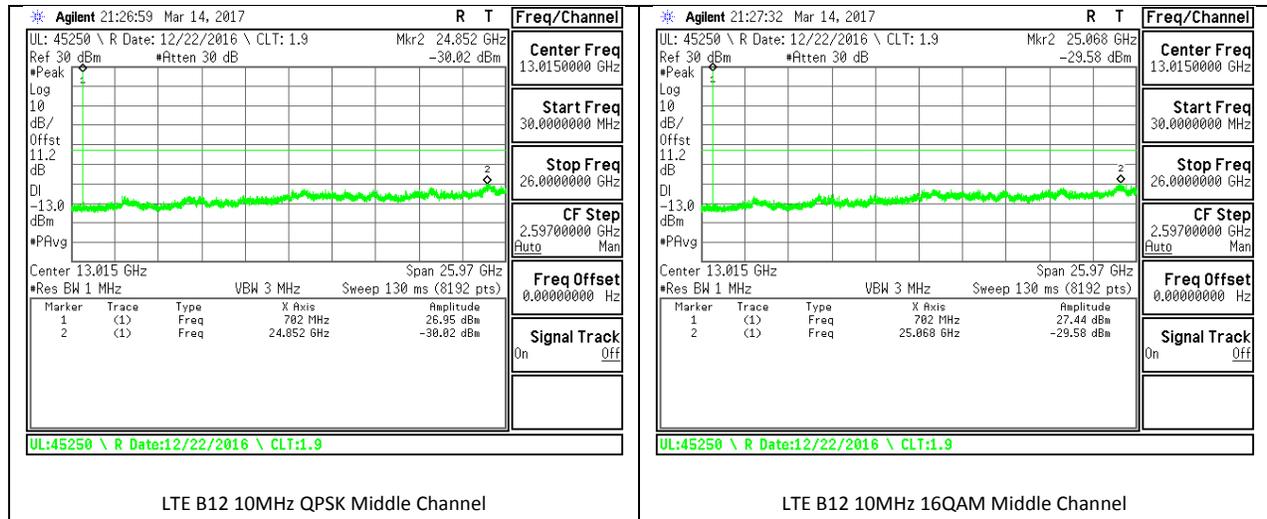
LTE B7 15MHz 16QAM Middle Channel



LTE Band 12

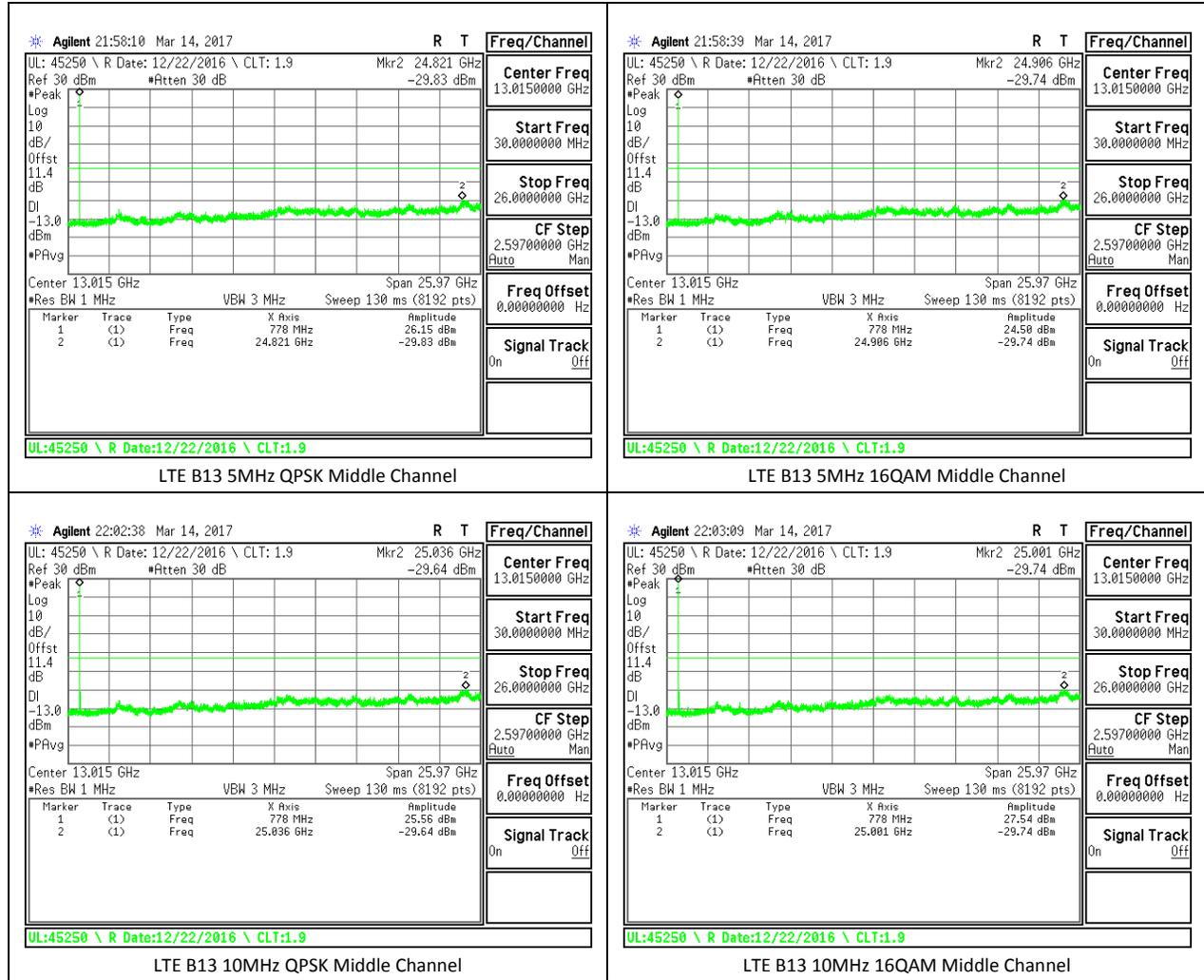
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE12	10	16QAM	704	-29.62	-13	-16.62
			707.5	-29.58	-13	-16.58
			711	-28.96	-13	-15.96
		QPSK	704	-29.41	-13	-16.41
			707.5	-30.02	-13	-17.02
			711	-29.92	-13	-16.92
	5	16QAM	701.5	-30.22	-13	-17.22
			707.5	-29.04	-13	-16.04
			713.5	-29.13	-13	-16.13
		QPSK	701.5	-29.47	-13	-16.47
			707.5	-29.92	-13	-16.92
			713.5	-29.94	-13	-16.94
	3	16QAM	700.5	-29.35	-13	-16.35
			707.5	-29.78	-13	-16.78
			714.5	-30.05	-13	-17.05
		QPSK	700.5	-29.65	-13	-16.65
			707.5	-30.1	-13	-17.1
			714.5	-28.9	-13	-15.9
	1.4	16QAM	699.7	-29.58	-13	-16.58
			707.5	-29.49	-13	-16.49
			715.3	-30.06	-13	-17.06
		QPSK	699.7	-29.3	-13	-16.3
			707.5	-28.69	-13	-15.69
			715.3	-30.07	-13	-17.07





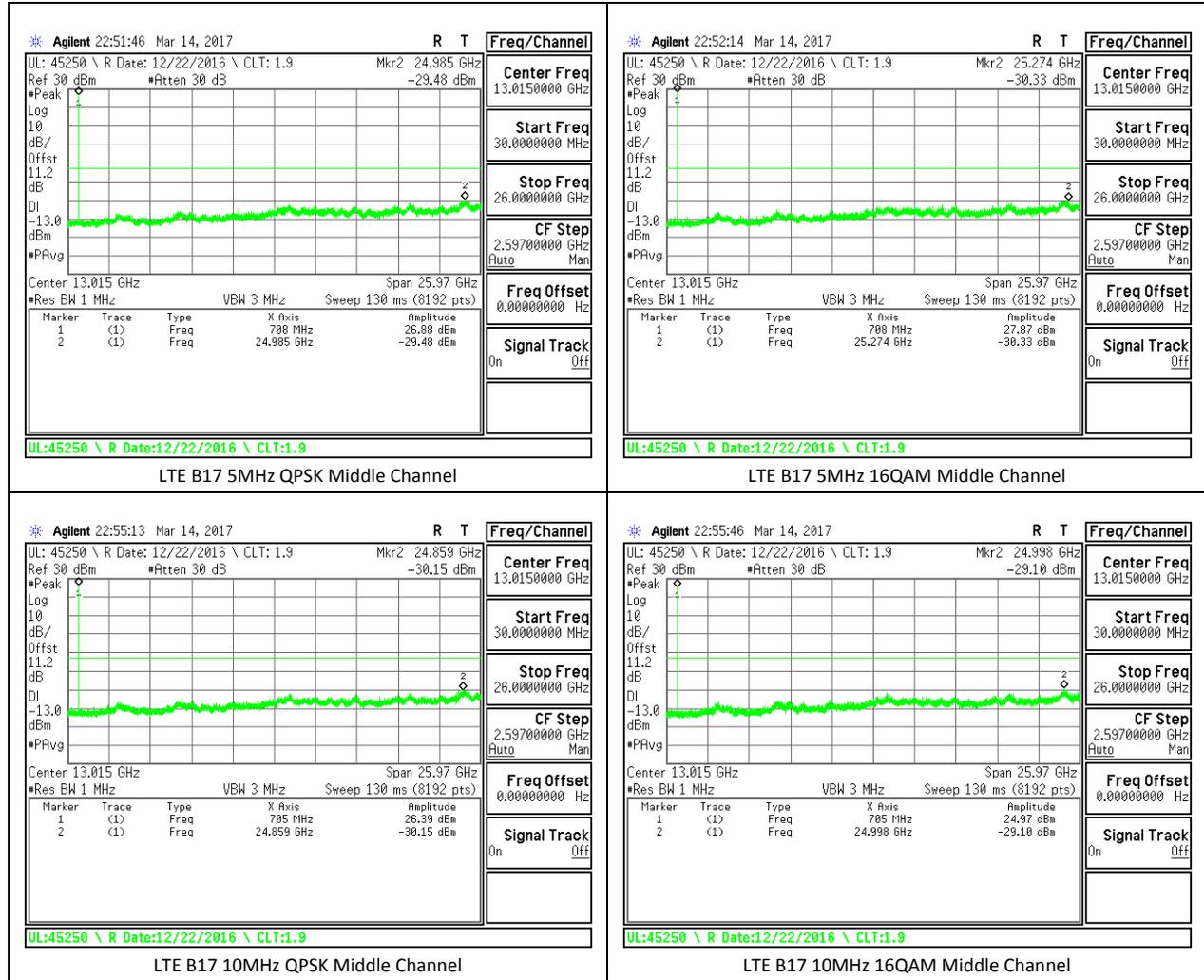
LTE Band 13

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE13	10	16QAM	782	-29.75	-13	-16.75
			782	-29.74	-13	-16.74
			782	-29.74	-13	-16.74
		QPSK	782	-29.92	-13	-16.92
			782	-29.64	-13	-16.64
			782	-29.64	-13	-16.64
	5	16QAM	779.5	-29.56	-13	-16.56
			782	-29.74	-13	-16.74
			784.5	-29.61	-13	-16.61
		QPSK	779.5	-30.1	-13	-17.1
			782	-29.83	-13	-16.83
			784.5	-28.76	-13	-15.76



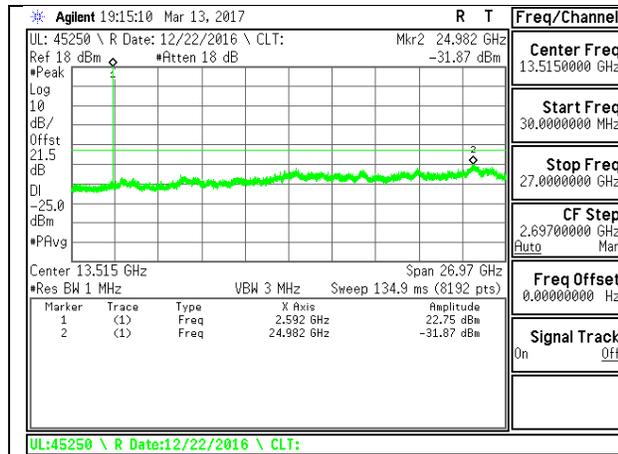
LTE Band 17

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE17	10	16QAM	709	-30.24	-13	-17.24
			710	-29.10	-13	-16.10
			711	-29.57	-13	-16.57
		QPSK	709	-29.85	-13	-16.85
			710	-30.15	-13	-17.15
			711	-29.55	-13	-16.55
	5	16QAM	706.5	-30.01	-13	-17.01
			710	-30.33	-13	-17.33
			713.5	-29.74	-13	-16.74
		QPSK	706.5	-29.26	-13	-16.26
			710	-29.48	-13	-16.48
			713.5	-29.45	-13	-16.45

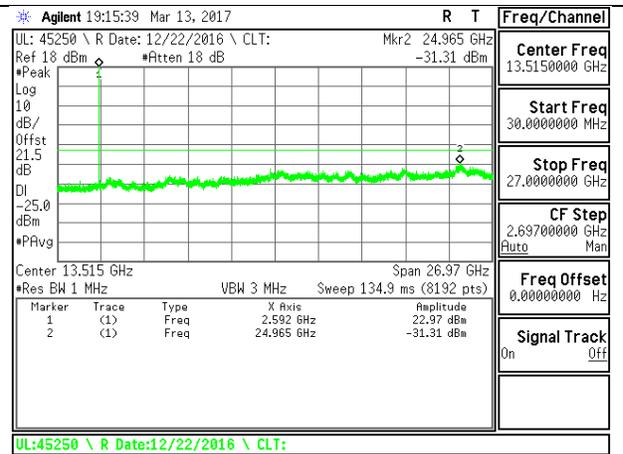


LTE Band 41

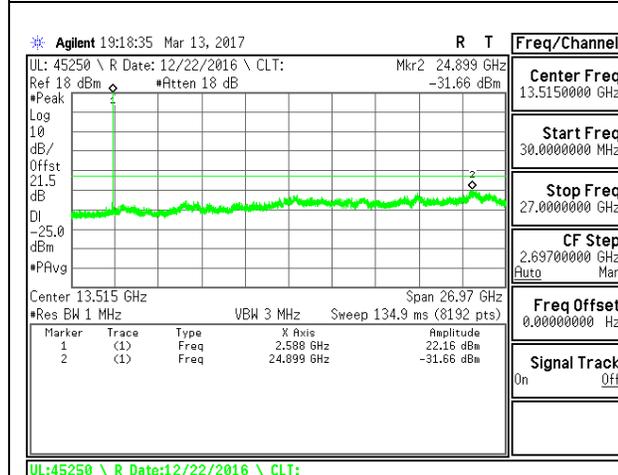
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE41	20	16QAM	2506	-30.73	-25	-5.73
			2593	-32.22	-25	-7.22
			2680	-31.75	-25	-6.75
		QPSK	2506	-31.55	-25	-6.55
			2593	-31.38	-25	-6.38
			2680	-32.53	-25	-7.53
	15	16QAM	2503.5	-31.97	-25	-6.97
			2593	-31.24	-25	-6.24
			2682.5	-32.27	-25	-7.27
		QPSK	2503.5	-31.64	-25	-6.64
			2593	-31.94	-25	-6.94
			2682.5	-32.13	-25	-7.13
	10	16QAM	2501	-30.75	-25	-5.75
			2593	-31.77	-25	-6.77
			2685	-31.64	-25	-6.64
		QPSK	2501	-32.28	-25	-7.28
			2593	-31.66	-25	-6.66
			2685	-32.25	-25	-7.25
	5	16QAM	2498.5	-31.86	-25	-6.86
			2593	-31.31	-25	-6.31
			2687.5	-32.4	-25	-7.4
		QPSK	2498.5	-31.88	-25	-6.88
			2593	-31.87	-25	-6.87
			2687.5	-31.02	-25	-6.02



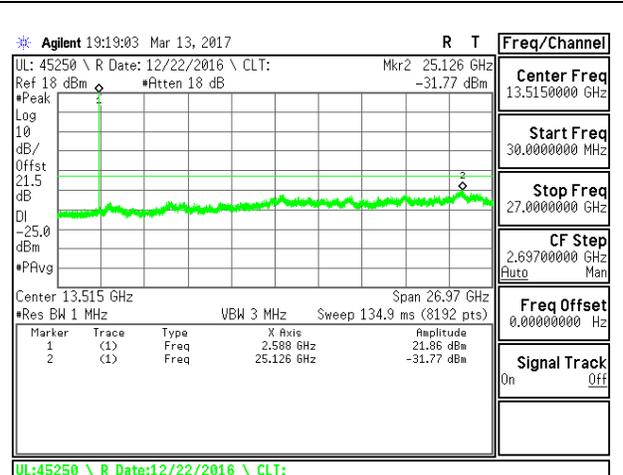
LTE B41 5MHz QPSK Middle Channel



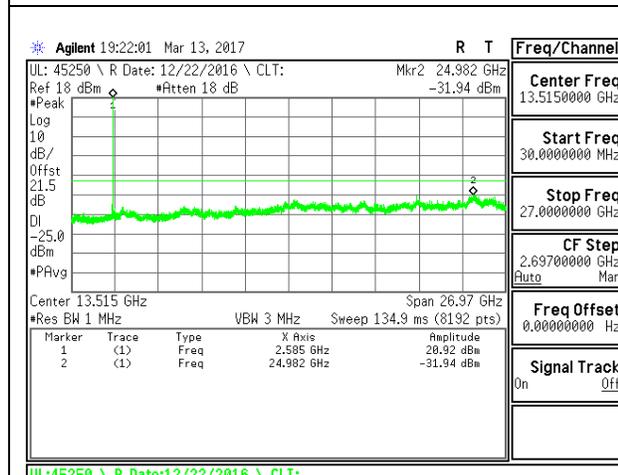
LTE B41 5MHz 16QAM Middle Channel



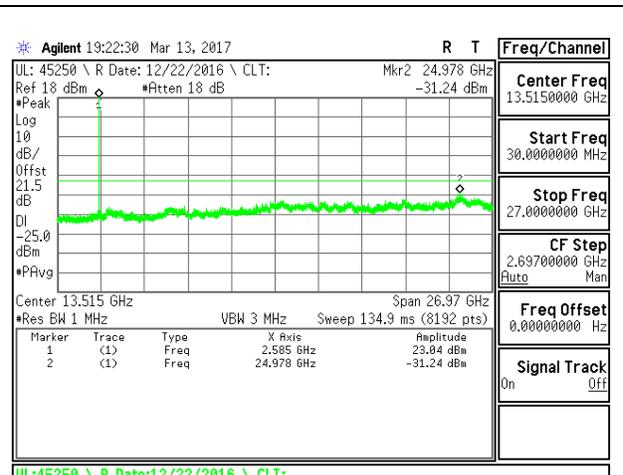
LTE B41 10MHz QPSK Middle Channel



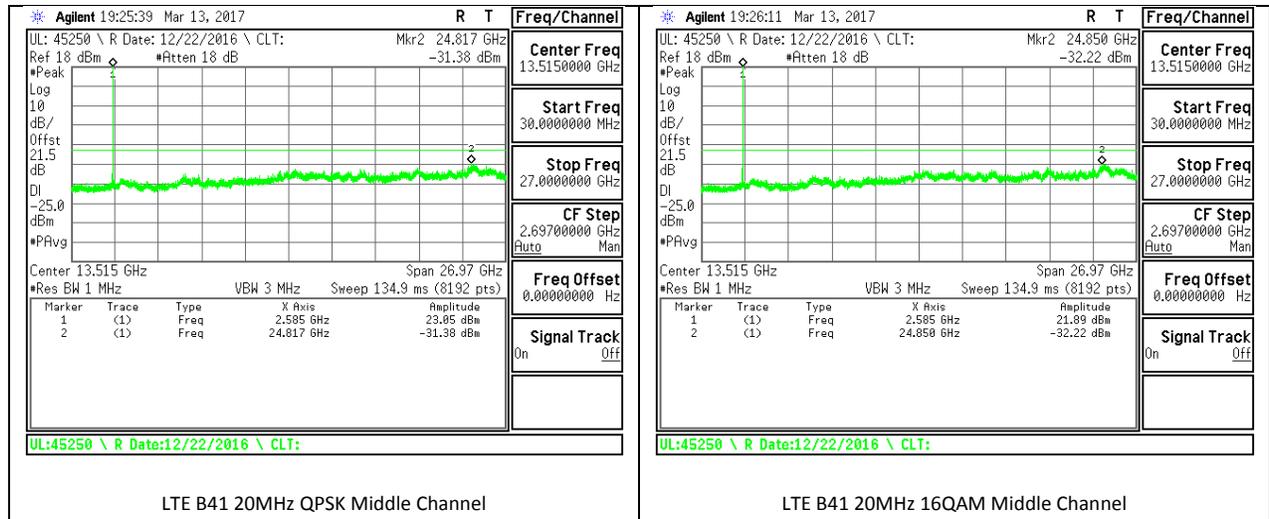
LTE B41 10MHz 16QAM Middle Channel



LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel



16. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

Results

Tested By	Jude Semana
Date	3/17/2017

16.1. FREQUENCY STABILITY RESULTS

GSM 850

Reference Frequency: Cellular Mid Channel				
			836.6	MHz @ 20°C
			Limit: to stay +/- 2.5 ppm =	2091.500 Hz
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	55	836.600023	-0.004	2.5
3.80	40	836.600016	0.003	2.5
3.80	30	836.600012	0.008	2.5
3.80	20	836.600019	0	2.5
3.80	10	836.600018	0.001	2.5
3.80	0	836.600018	0.002	2.5
3.80	-10	836.600011	0.010	2.5
3.80	-20	836.600012	0.009	2.5
3.80	-30	836.600008	0.013	2.5

Reference Frequency: Cellular Mid Channel				
			836.6	MHz @ 20°C
			Limit: to stay +/- 2.5 ppm =	2091.500 Hz
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	836.600019	0	2.5
4.20	20	836.6000062	0.016	2.5
3.60	20	836.6000029	0.019	2.5

GSM 1900

Reference Frequency: PCS Mid Channel 1880MHz @ 20°C				
			4700.000	Hz
			Limit: to stay +/- 2.5 ppm =	
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	55	1880.000014	0.002	2.5
3.80	40	1880.000016	0.001	2.5
3.80	30	1880.000012	0.003	2.5
3.80	20	1880.000018	0	2.5
3.80	10	1880.000001	0.004	2.5
3.80	0	1880.000012	0.003	2.5
3.80	-10	1880.000009	0.004	2.5
3.80	-20	1880.000011	0.003	2.5
3.80	-30	1880.000014	0.002	2.5

Reference Frequency: PCS Mid Channel 1732.500012MHz @ 20°C				
			4700.000	Hz
			Limit: to stay +/- 2.5 ppm =	
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	1880.000018	0	2.5
3.60	20	1880.000006	0.006	2.5
4.20	20	1879.999988	0.016	2.5

LTE Band 4

Reference Frequency: Mid Channel 1732.500012MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	55	1732.499986	0.002	2.5
3.80	40	1732.499986	0.003	2.5
3.80	30	1732.499989	0.001	2.5
3.80	20	1732.499990	0	2.5
3.80	10	1732.499991	0.000	2.5
3.80	0	1732.499999	0.000	2.5
3.80	-10	1732.499992	-0.001	2.5
3.80	-20	1732.499993	-0.002	2.5
3.80	-30	1732.499991	-0.001	2.5

Reference Frequency: Mid Channel 1732.500012MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	1732.499990	0	2.5
3.60	20	1732.500006	-0.009	2.5
4.20	20	1732.500007	-0.010	2.5

LTE Band 7

Reference Frequency: Mid Channel 2535.000019 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 6337.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	55	2535.000011	0.001	2.5
3.80	40	2535.000010	0.001	2.5
3.80	30	2535.000012	0.000	2.5
3.80	20	2535.000012	0	2.5
3.80	10	2535.000014	-0.001	2.5
3.80	0	2535.000013	0.000	2.5
3.80	-10	2535.000011	0.000	2.5
3.80	-20	2535.000008	0.002	2.5
3.80	-30	2535.000014	0.000	2.5

Reference Frequency: Mid Channel 2535.000019 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 6337.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	2535.000012	0	2.5
4.20	20	2534.999989	0.009	2.5
3.6	20	2535.000013	0	2.5

LTE Band 12

Reference Frequency: Mid Channel 707.5 MHz @ 20°C Limit: to stay +/- 2.5 ppm = 1768.750 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	55	707.499983	0.003	2.5
3.80	40	707.499988	-0.004	2.5
3.80	30	707.499985	0.001	2.5
3.80	20	707.499985	0	2.5
3.80	10	707.499990	-0.007	2.5
3.80	0	707.499992	-0.009	2.5
3.80	-10	707.499988	-0.004	2.5
3.80	-20	707.499982	0.004	2.5
3.80	-30	707.499984	0.001	2.5

Reference Frequency: Mid Channel 707.5 MHz @ 20°C Limit: to stay +/- 2.5 ppm = 1768.750 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	707.499985	0	2.5
4.20	20	707.4999863	-0.002	2.5
3.60	20	707.5000096	-0.035	2.5

LTE Band 13

Reference Frequency: Mid Channel 782 MHz @ 20°C Limit: to stay +/- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	55	781.999993	-0.002	2.5
3.80	40	781.999991	-0.001	2.5
3.80	30	781.999990	0.001	2.5
3.80	20	781.999991	0	2.5
3.80	10	781.999995	-0.005	2.5
3.80	0	781.999994	-0.004	2.5
3.80	-10	781.999988	0.004	2.5
3.80	-20	781.999986	0.006	2.5
3.80	-30	781.999989	0.003	2.5

Reference Frequency: Mid Channel 782 MHz @ 20°C Limit: to stay +/- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	781.999991	0	2.5
4.20	20	782.0000099	-0.024	2.5
3.60	20	781.9999894	0.002	2.5

17. RADIATED TEST RESULTS

17.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2. 1046, §22. 913, §24. 232, §27

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 (b) - (10) Portable stations (handheld devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP. (LTE B13)

27.50 (c) - (10) Portable stations (handheld devices) are limited to 3 watts ERP; (LTE B17)

27.50 (d) - (4) Fixed, mobile, and portable (handheld) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.(Band 4)

27.50 (h) - (2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power. (LTE B41 & 7)

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

TEST PROCEDURE

ANSI / TIA / EIA 603D Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

a) Set the RBW \geq OBW; b) Set VBW $\geq 3 \times$ RBW; c) Set span $\geq 2 \times$ RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points \geq span/RBW; g) Trace mode = max hold;

For average power measurement with a PSA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW $\geq 3 \times$ RBW; d) Set number of points in sweep $\geq 2 \times$ span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 98 ; h) Use trigger to capture bursts If burst duty cycle < 98 ; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

17.1.1. ERP/EIRP RESULTS AND TABLE

GSM

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
GSM850	GPRS	128	824.2	28.29	674.53
		190	836.6	27.66	583.45
		251	848.8	28.48	704.69
	EGPRS	128	824.2	24.16	260.62
		190	836.6	23.57	227.51
		251	848.8	24.32	270.40
GSM1900	GPRS	512	1850.2	28.35	683.91
		661	1880	28.90	776.25
		810	1909.8	29.20	831.76
	EGPRS	512	1850.2	25.87	386.37
		661	1880	26.28	424.62
		810	1909.8	26.70	467.74

High Frequency Substitution Measurement UL Verification Services, Inc.								
Company: SOMC								
Project #: 11626381								
Date: 3/15/2017								
Test Engineer: 43574 JS								
Configuration: EUT Only								
Location: Chamber A								
Mode: GPRS 850 MHz Fundamentals								
Test Equipment:								
Receiving: Hybrid T130, and Chamber A SMA Cables								
Substitution: Dipole T273, SMA Cable (SN # 506392) Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	15.30	V	0.9	0.0	14.40	38.5	-24.1	
824.20	29.19	H	0.9	0.0	28.29	38.5	-10.2	
Mid Ch								
836.60	14.50	V	0.9	0.0	13.60	38.5	-24.9	
836.60	28.56	H	0.9	0.0	27.66	38.5	-10.8	
High Ch								
848.80	15.10	V	0.9	0.0	14.20	38.5	-24.3	
848.80	29.38	H	0.9	0.0	28.48	38.5	-10.0	

GSM850 GPRS

High Frequency Substitution Measurement UL Verification Services, Inc.								
Company: SOMC								
Project #: 11626381								
Date: 3/15/2017								
Test Engineer: 43574 JS								
Configuration: EUT Only								
Location: Chamber A								
Mode: EGPRS 850 MHz Fundamentals								
Test Equipment:								
Receiving: Hybrid T130, and Chamber A SMA Cables								
Substitution: Dipole T273, SMA Cable (SN # 506392) Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	10.60	V	0.9	0.0	9.70	38.5	-28.8	
824.20	25.06	H	0.9	0.0	24.16	38.5	-14.3	
Mid Ch								
836.60	9.53	V	0.9	0.0	8.63	38.5	-29.9	
836.60	24.47	H	0.9	0.0	23.57	38.5	-14.9	
High Ch								
848.80	10.50	V	0.9	0.0	9.60	38.5	-28.9	
848.80	25.22	H	0.9	0.0	24.32	38.5	-14.2	

GSM850 EGPRS

High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C								
Company: SOMC								
Project #: 11626381								
Date: 3/15/2017								
Test Engineer: 43574 JS								
Configuration: EUT Only								
Location: Chamber A								
Mode: GPRS 1900								
Test Equipment:								
Receiving: Horn T711 and Chamber A SMA Cables								
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	9.45	V	0.9	7.2	15.75	33.0	-17.3	
1850.20	22.05	H	0.9	7.2	28.35	33.0	-4.6	
Mid Ch								
1880.00	11.00	V	0.9	7.2	17.30	33.0	-15.7	
1880.00	22.60	H	0.9	7.2	28.90	33.0	-4.1	
High Ch								
1909.80	10.14	V	0.9	7.2	16.44	33.0	-16.6	
1909.80	22.90	H	0.9	7.2	29.20	33.0	-3.8	

GSM1900 GPRS

High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C								
Company: SOMC								
Project #: 11626381								
Date: 3/15/2017								
Test Engineer: 43574 JS								
Configuration: EUT Only								
Location: Chamber A								
Mode: EGPRS 1900								
Test Equipment:								
Receiving: Horn T711 and Chamber A SMA Cables								
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	7.45	V	0.9	7.2	13.75	33.0	-19.3	
1850.20	19.57	H	0.9	7.2	25.87	33.0	-7.1	
Mid Ch								
1880.00	8.00	V	0.9	7.2	14.30	33.0	-18.7	
1880.00	19.98	H	0.9	7.2	26.28	33.0	-6.7	
High Ch								
1909.80	7.76	V	0.9	7.2	14.06	33.0	-18.9	
1909.80	20.40	H	0.9	7.2	26.70	33.0	-6.3	

GSM1900 EGPRS

Rev: 3 17 11
 Note: For Band 4 EIRP limit is 30dBm

Rev: 3 17 11
 Note: For Band 4 EIRP limit is 30dBm

WCDMA

Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
Band 5	REL99	4132	826.4	17.76	59.70
		4183	836.6	18.57	71.94
		4233	846.6	18.93	78.16
	HSDPA	4132	826.4	16.45	44.16
		4183	836.6	16.87	48.64
		4233	846.6	17.79	60.12

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMAC
Project #: 11626381
Date: 3/15/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber B
Mode: Rel99 Band 5 Fundamentals

Test Equipment:
 Receiving: Hybrid T243, and Chamber B SMA Cables
 Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	12.77	V	0.4	0.0	12.40	38.5	-26.1	
826.40	18.13	H	0.4	0.0	17.76	38.5	-20.7	
Mid Ch								
836.60	12.23	V	0.4	0.0	11.85	38.5	-26.6	
836.60	18.95	H	0.4	0.0	18.57	38.5	-19.9	
High Ch								
846.60	11.58	V	0.4	0.0	11.20	38.5	-27.3	
846.60	19.31	H	0.4	0.0	18.93	38.5	-19.6	

B5 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMAC
Project #: 11626381
Date: 3/15/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber B
Mode: HSDPA Band 5 Fundamentals

Test Equipment:
 Receiving: Hybrid T243, and Chamber B SMA Cables
 Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	11.43	V	0.4	0.0	11.06	38.5	-27.4	
826.40	16.82	H	0.4	0.0	16.45	38.5	-22.1	
Mid Ch								
836.60	11.68	V	0.4	0.0	11.31	38.5	-27.2	
836.60	17.25	H	0.4	0.0	16.87	38.5	-21.6	
High Ch								
846.60	10.91	V	0.4	0.0	10.53	38.5	-28.0	
846.60	18.17	H	0.4	0.0	17.79	38.5	-20.7	

B5 HSDPA

LTE Band 4

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1710.7	20.43	110.41
		1/0	1732.5	20.78	119.67
		1/0	1754.3	21.20	131.83
	16QAM	1/0	1710.7	18.47	70.31
		1/0	1732.5	20.47	111.43
		1/0	1754.3	21.05	127.35
3	QPSK	1/0	1711.5	19.73	93.97
		1/0	1732.5	21.33	135.83
		1/0	1753.5	21.72	148.59
	16QAM	1/0	1711.5	18.97	78.89
		1/0	1732.5	20.43	110.41
		1/0	1753.5	20.87	122.18
5	QPSK	1/0	1712.5	19.90	97.72
		1/0	1732.5	20.34	108.14
		1/0	1752.5	21.55	142.89
	16QAM	1/0	1712.5	18.99	79.25
		1/0	1732.5	19.51	89.33
		1/0	1752.5	20.87	122.18
10	QPSK	1/0	1715	19.00	79.43
		1/0	1732.5	20.51	112.46
		1/0	1750	20.56	113.76
	16QAM	1/0	1715	18.20	66.07
		1/0	1732.5	19.58	90.78
		1/0	1750	19.74	94.19
15	QPSK	1/0	1717.5	19.80	95.50
		1/0	1732.5	21.30	134.90
		1/0	1747.5	20.70	117.49
	16QAM	1/0	1717.5	18.88	77.27
		1/0	1732.5	20.32	107.65
		1/0	1747.5	19.99	99.77
20	QPSK	1/0	1720	18.97	78.89
		1/0	1732.5	21.09	128.53
		1/0	1745	20.81	120.50
	16QAM	1/0	1720	18.16	65.46
		1/0	1732.5	20.51	112.46
		1/0	1745	20.09	102.09