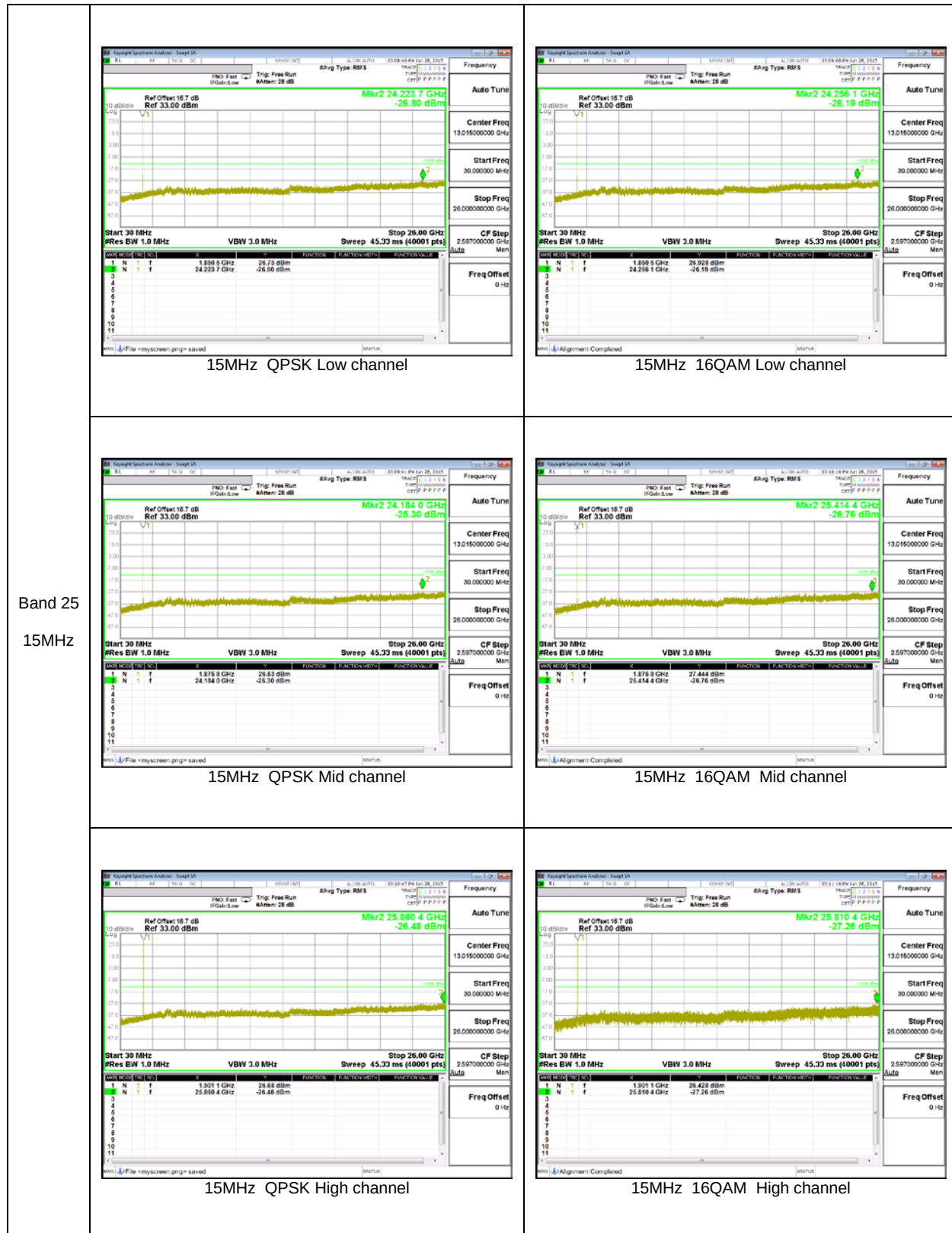
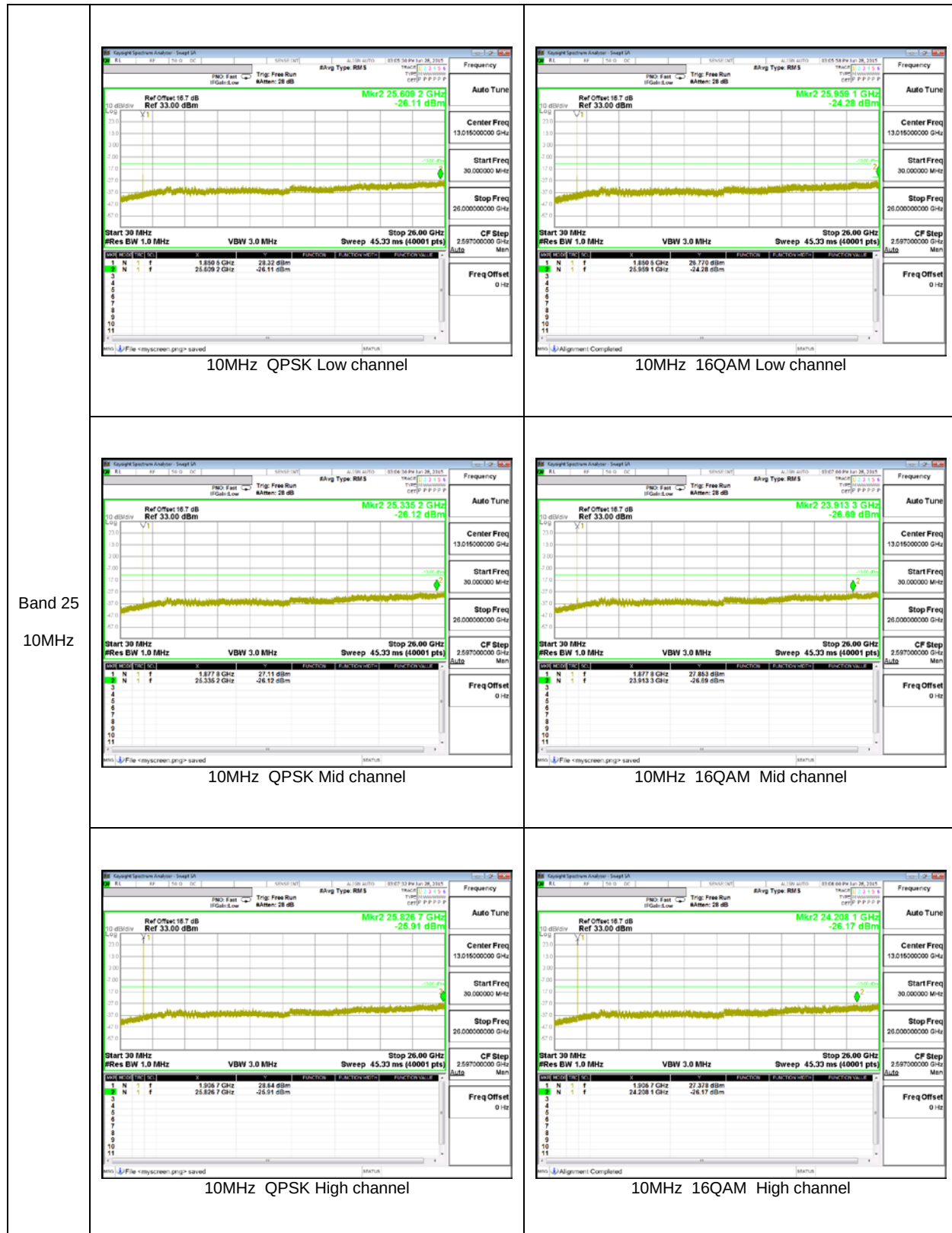
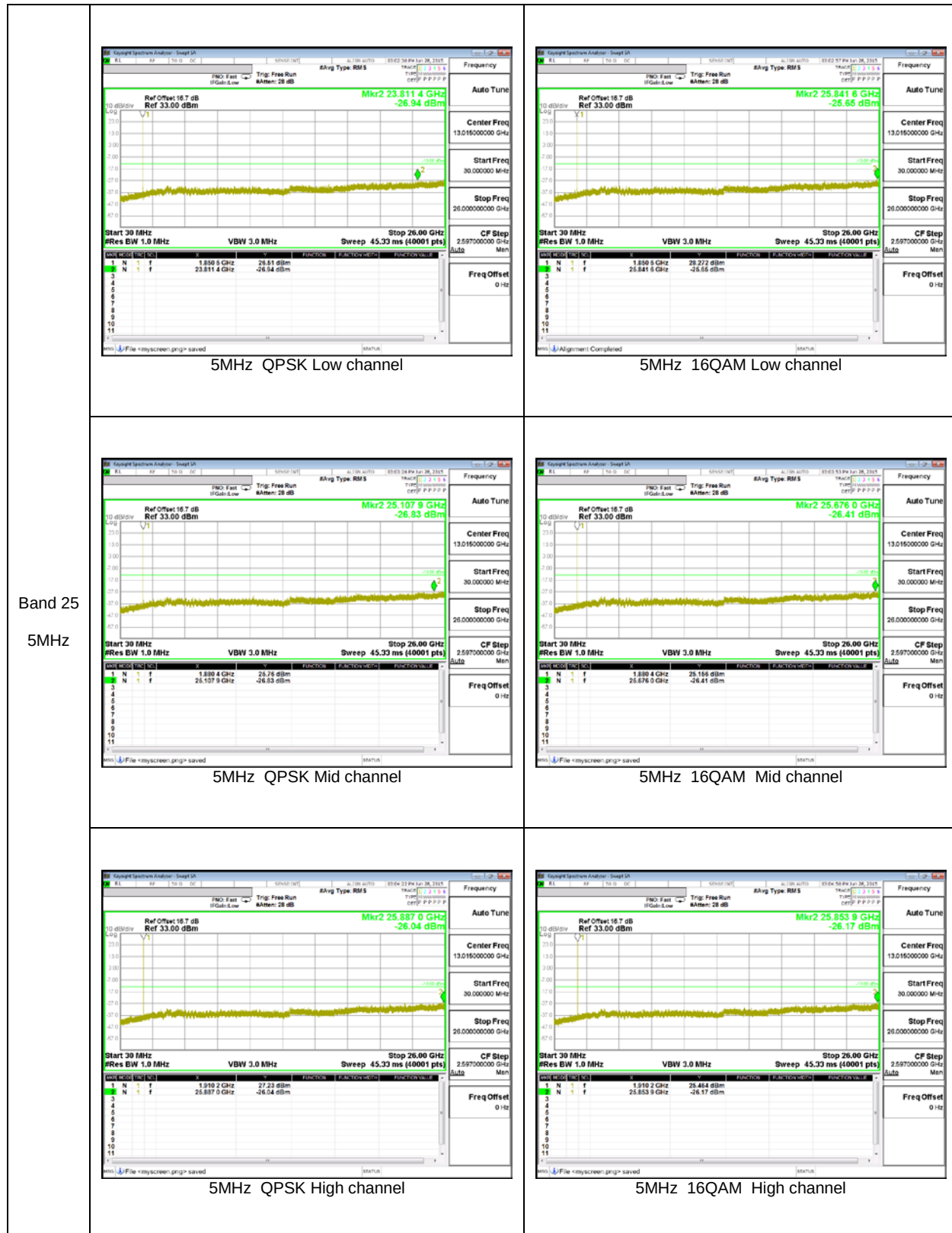
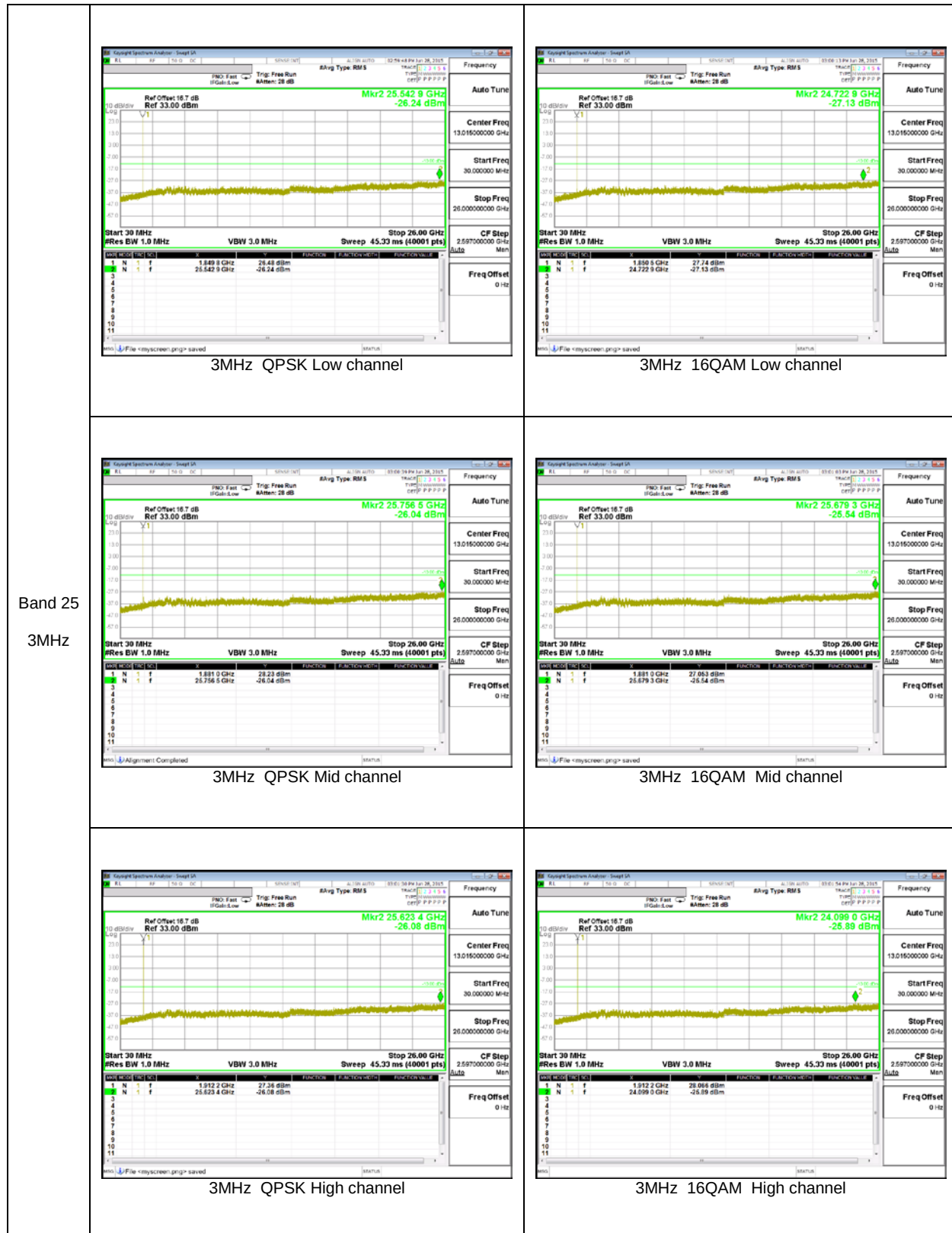
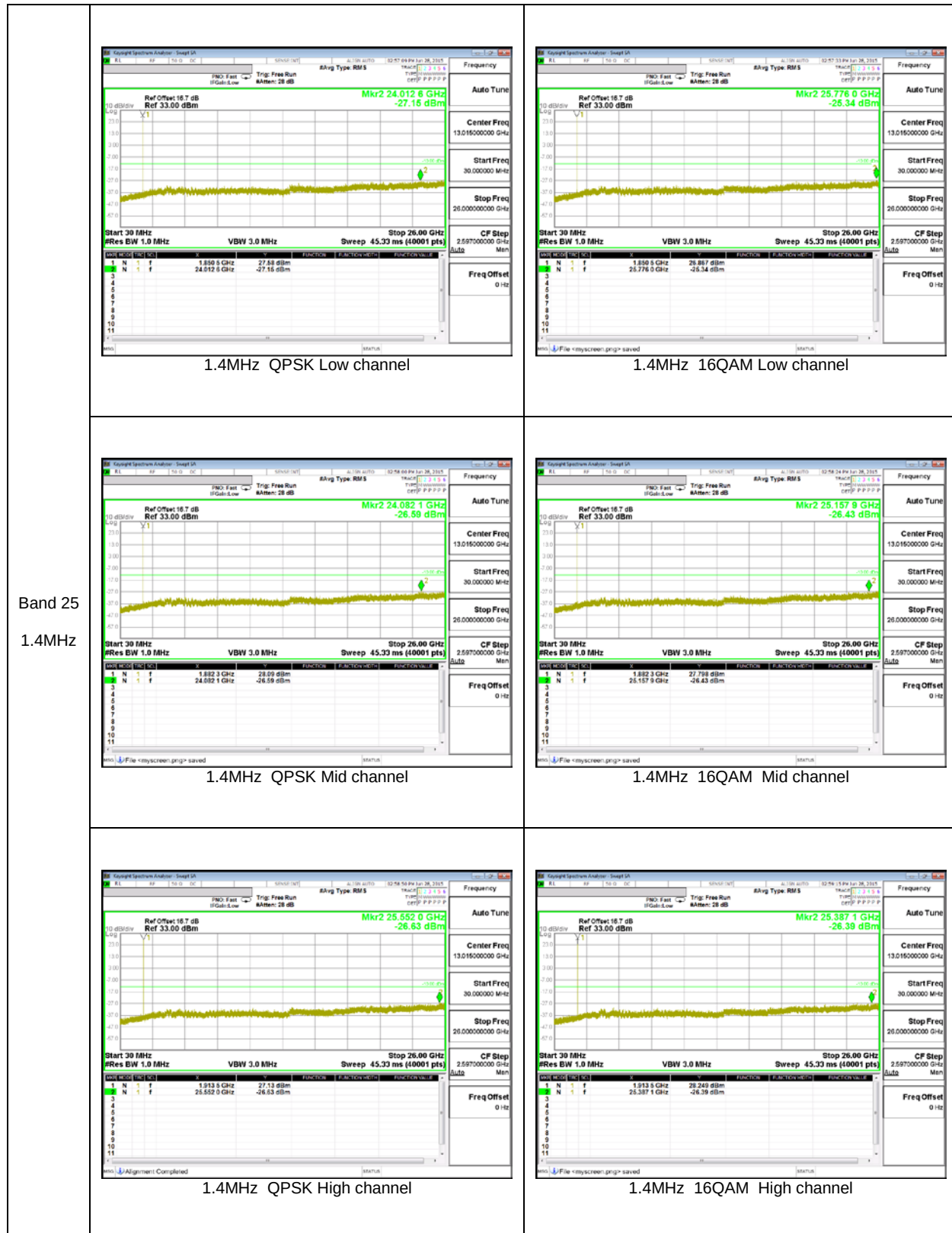




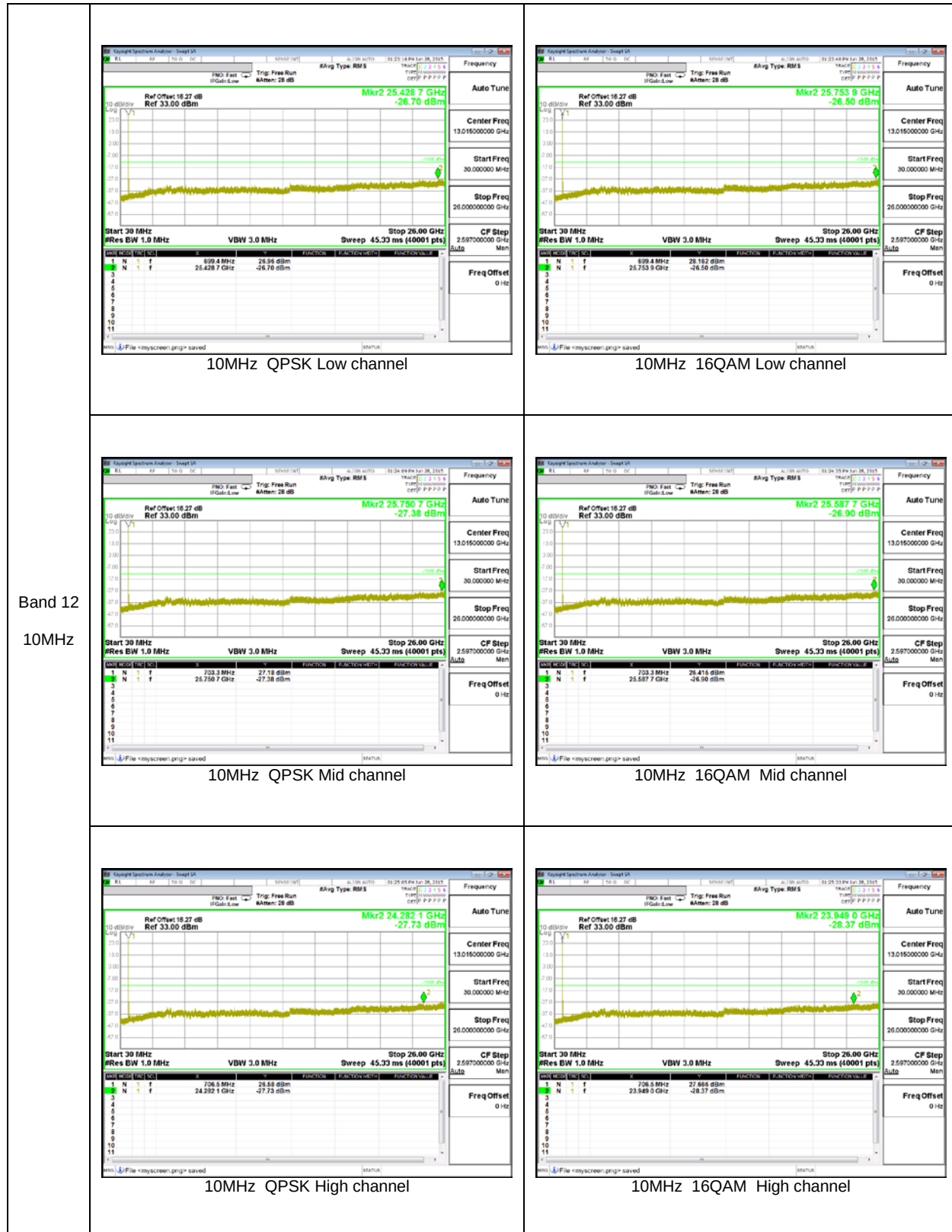


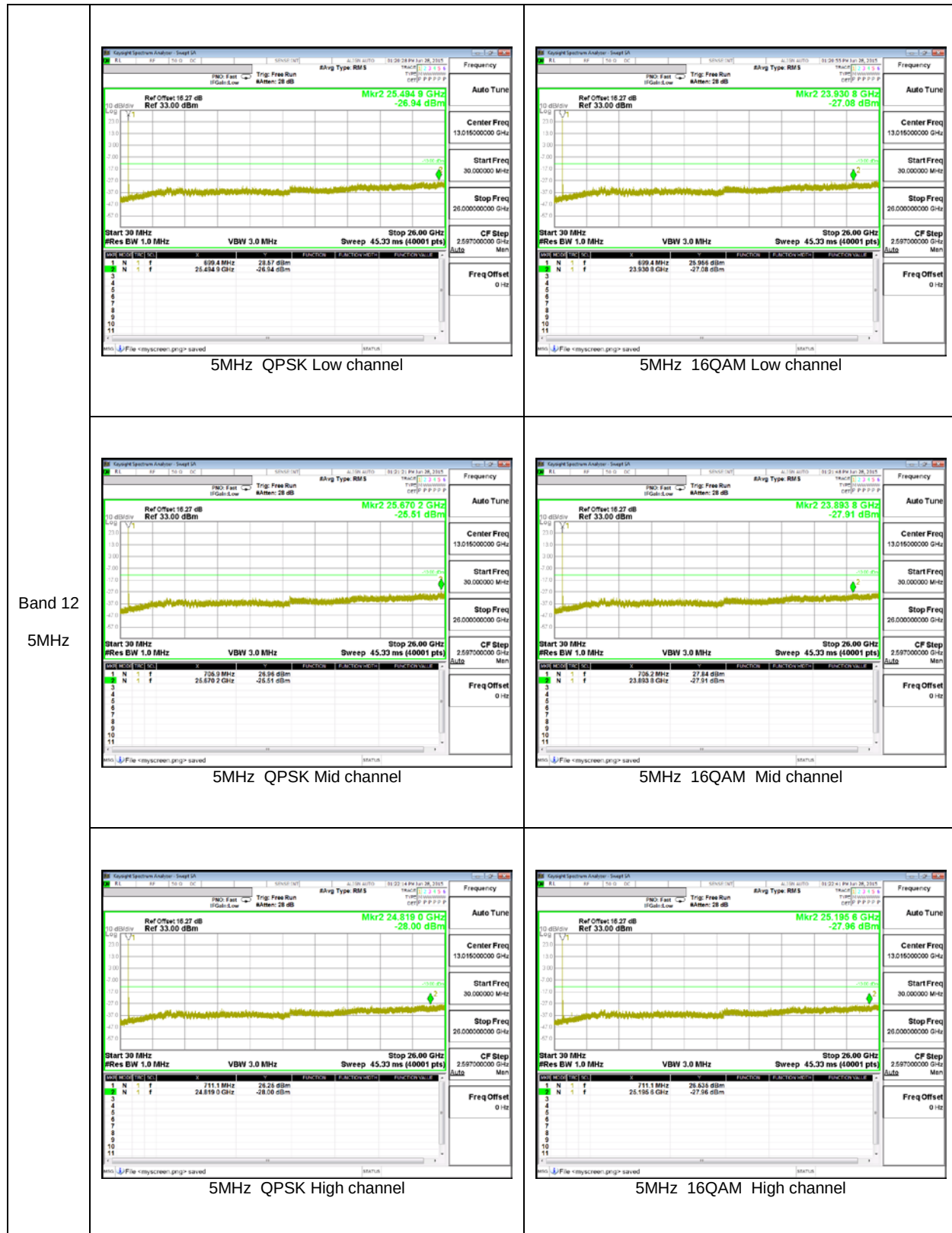


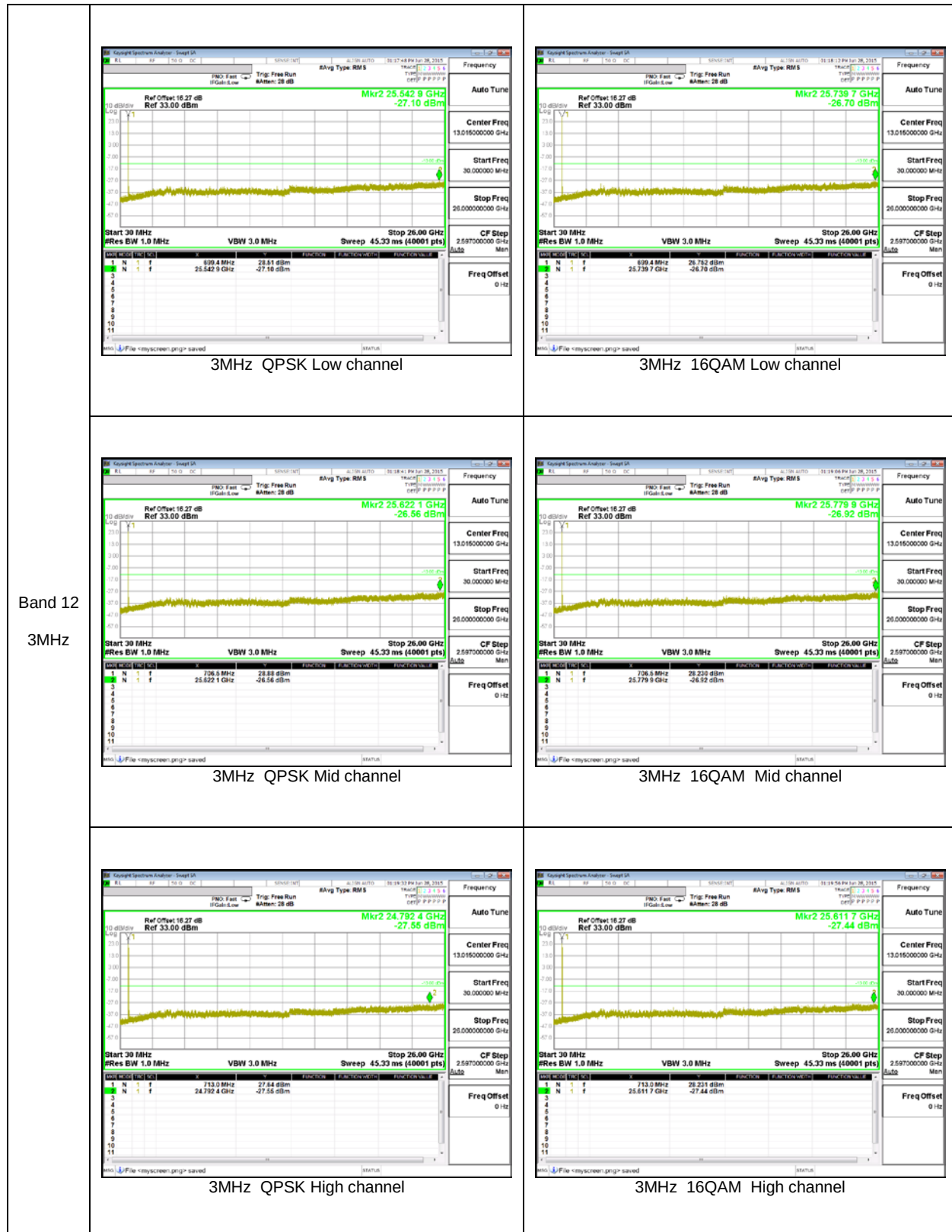


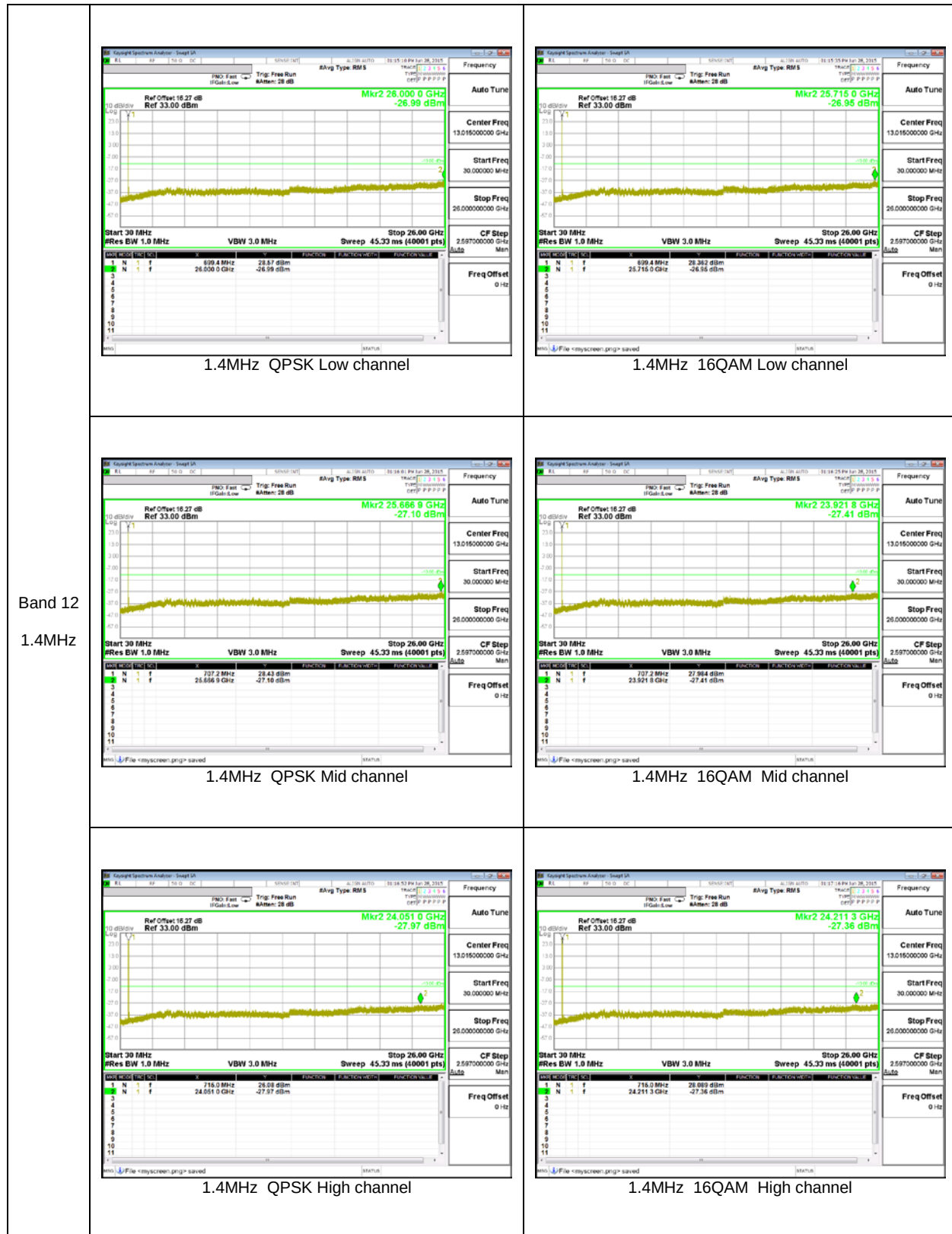


LTE Band 12

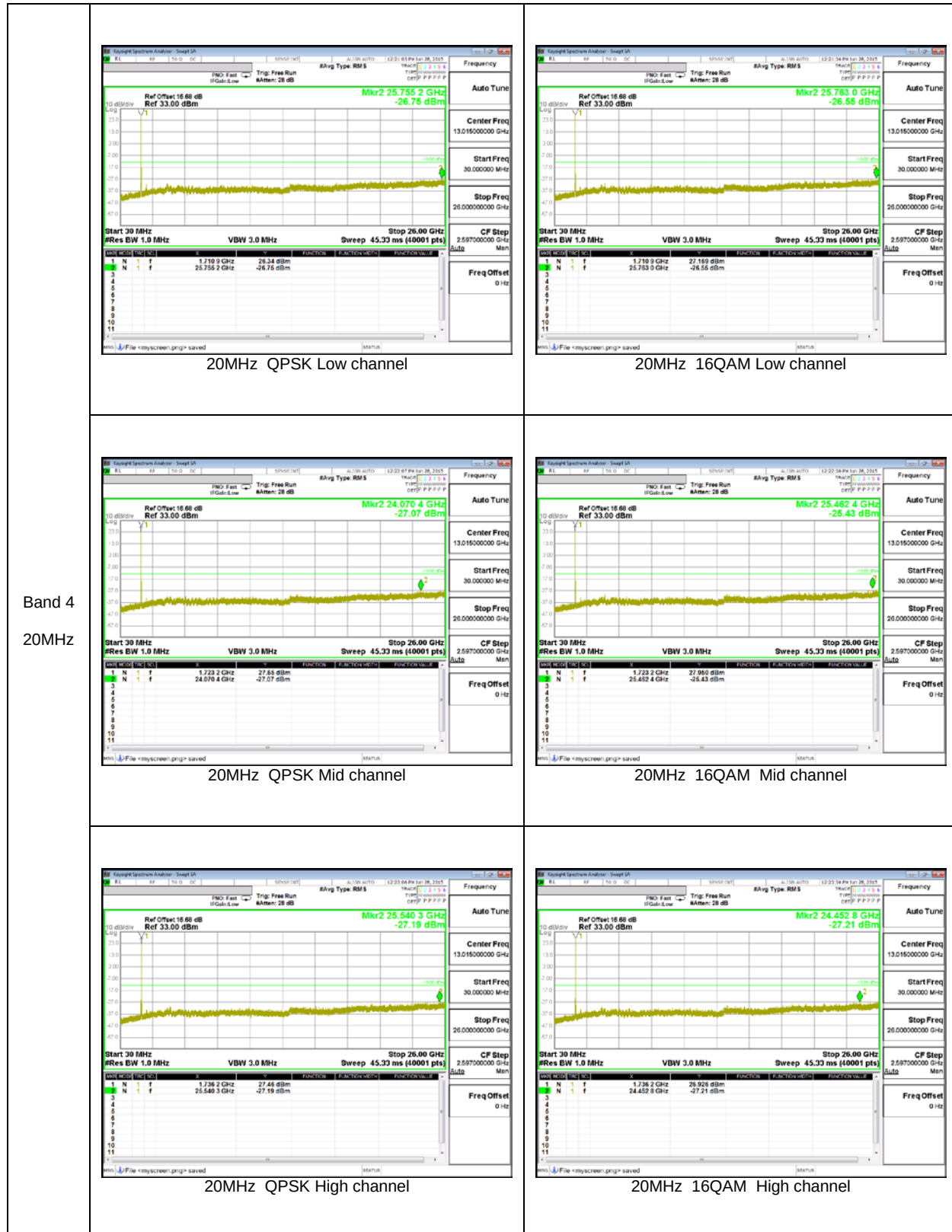


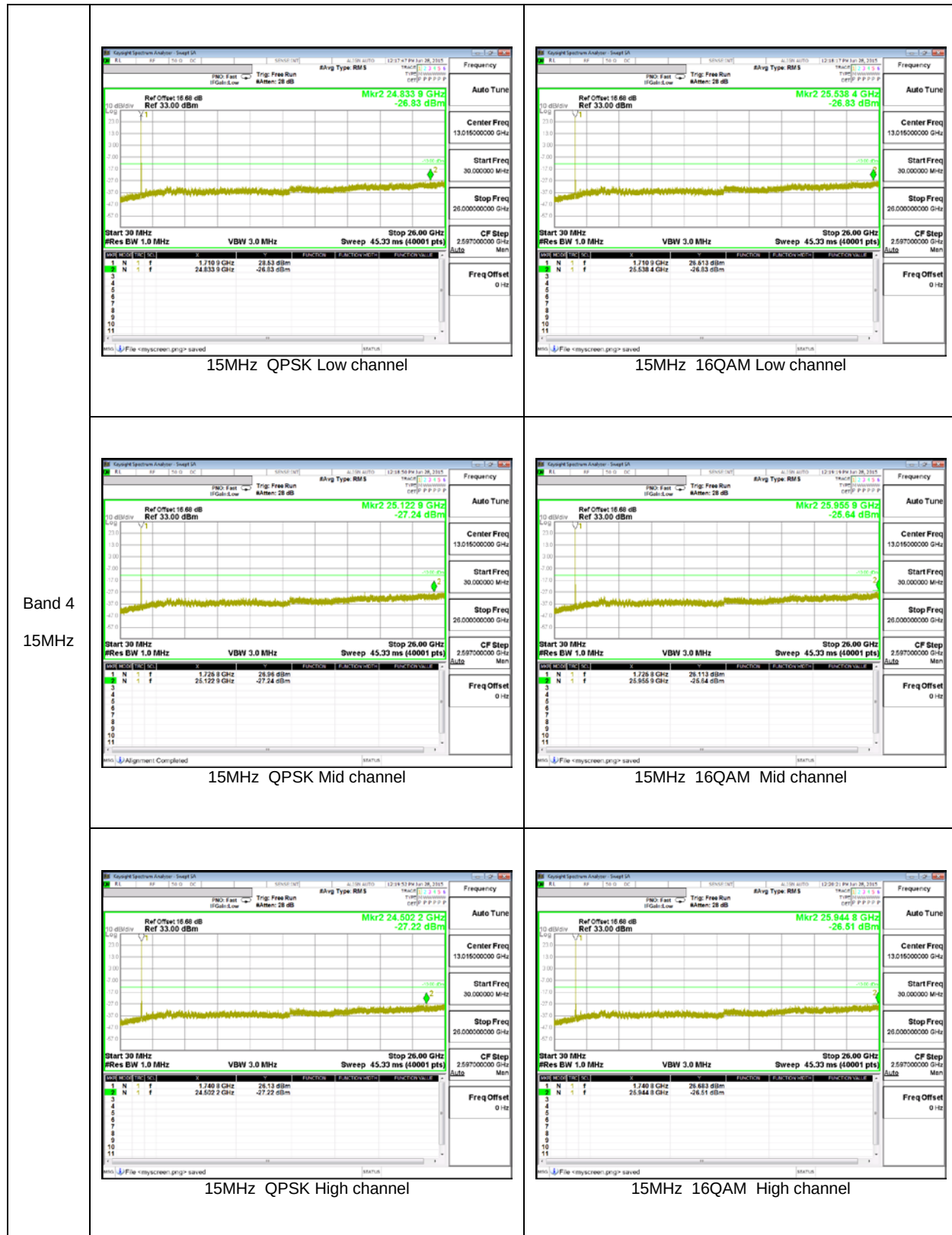


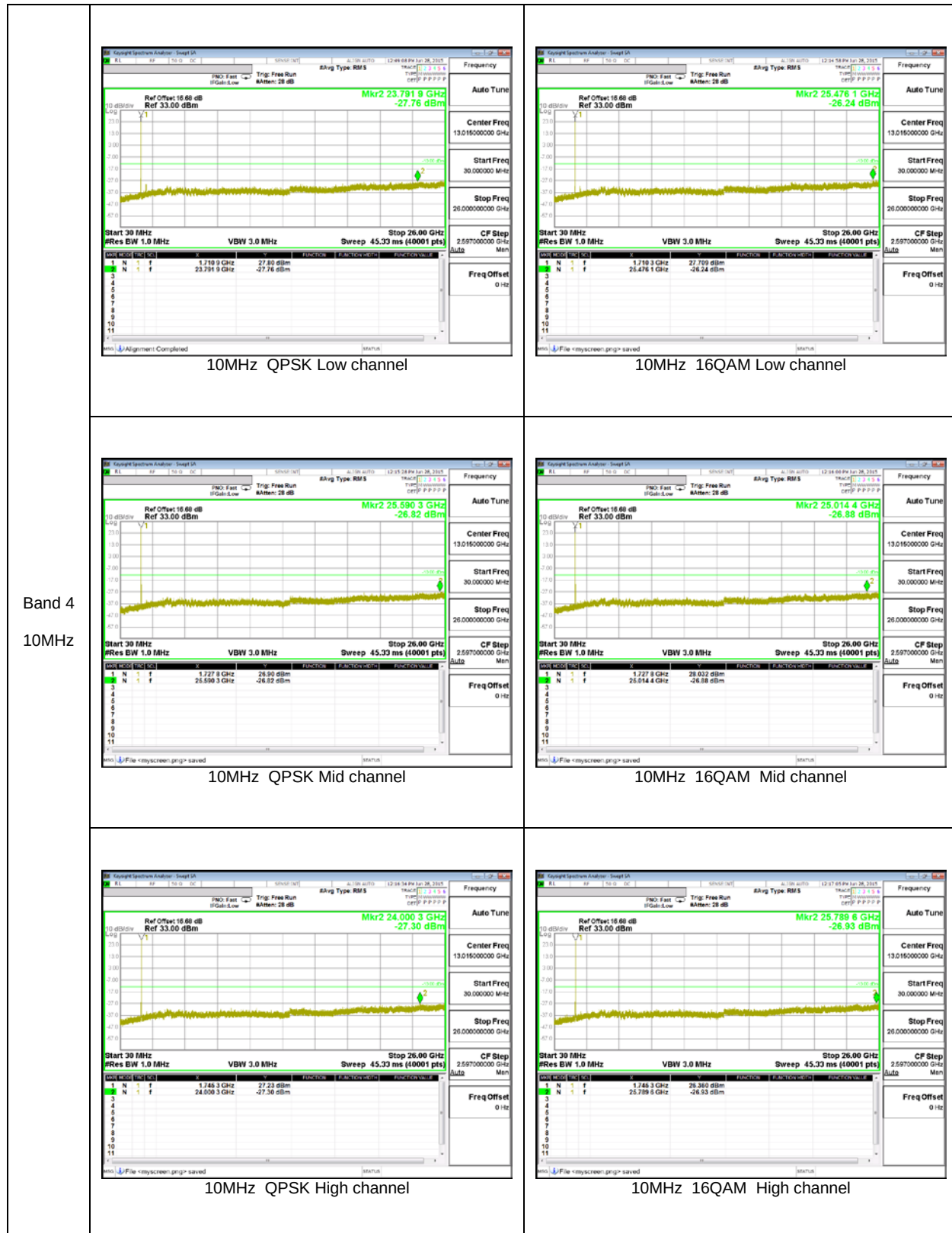


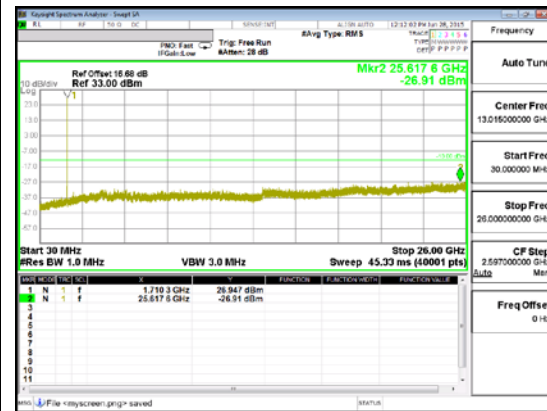
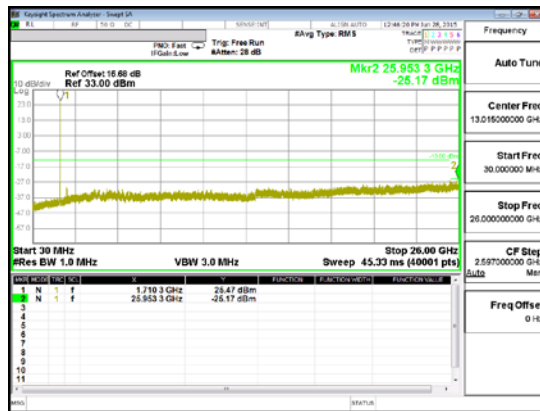


LTE Band 4

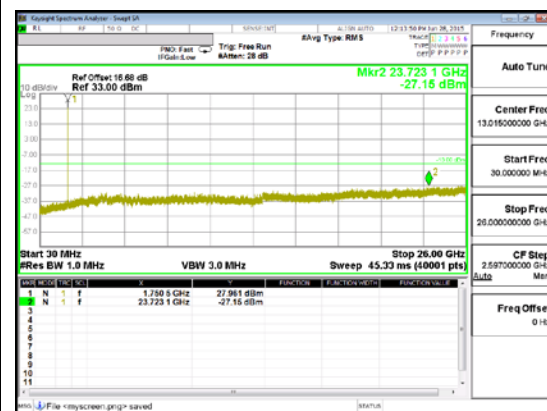
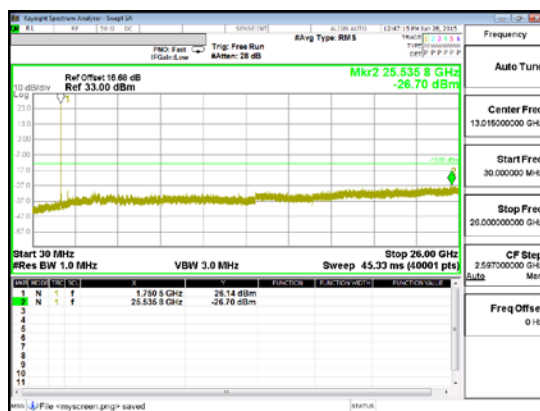
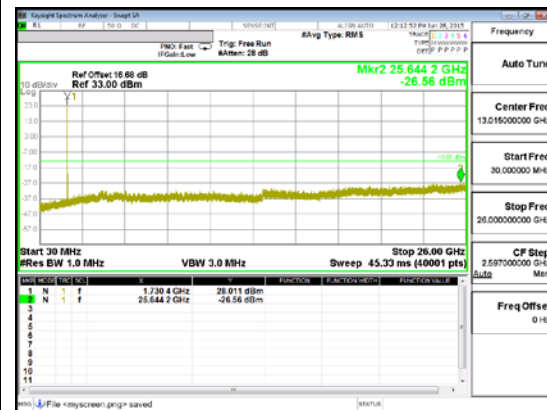
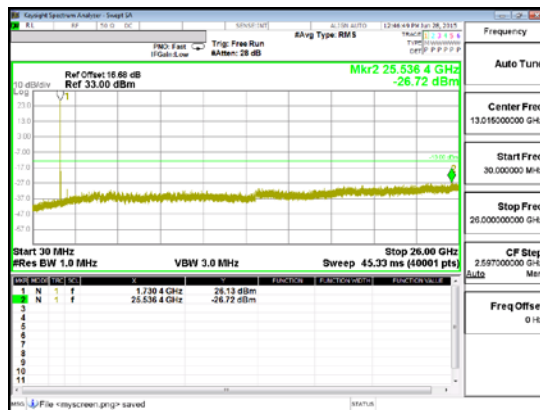


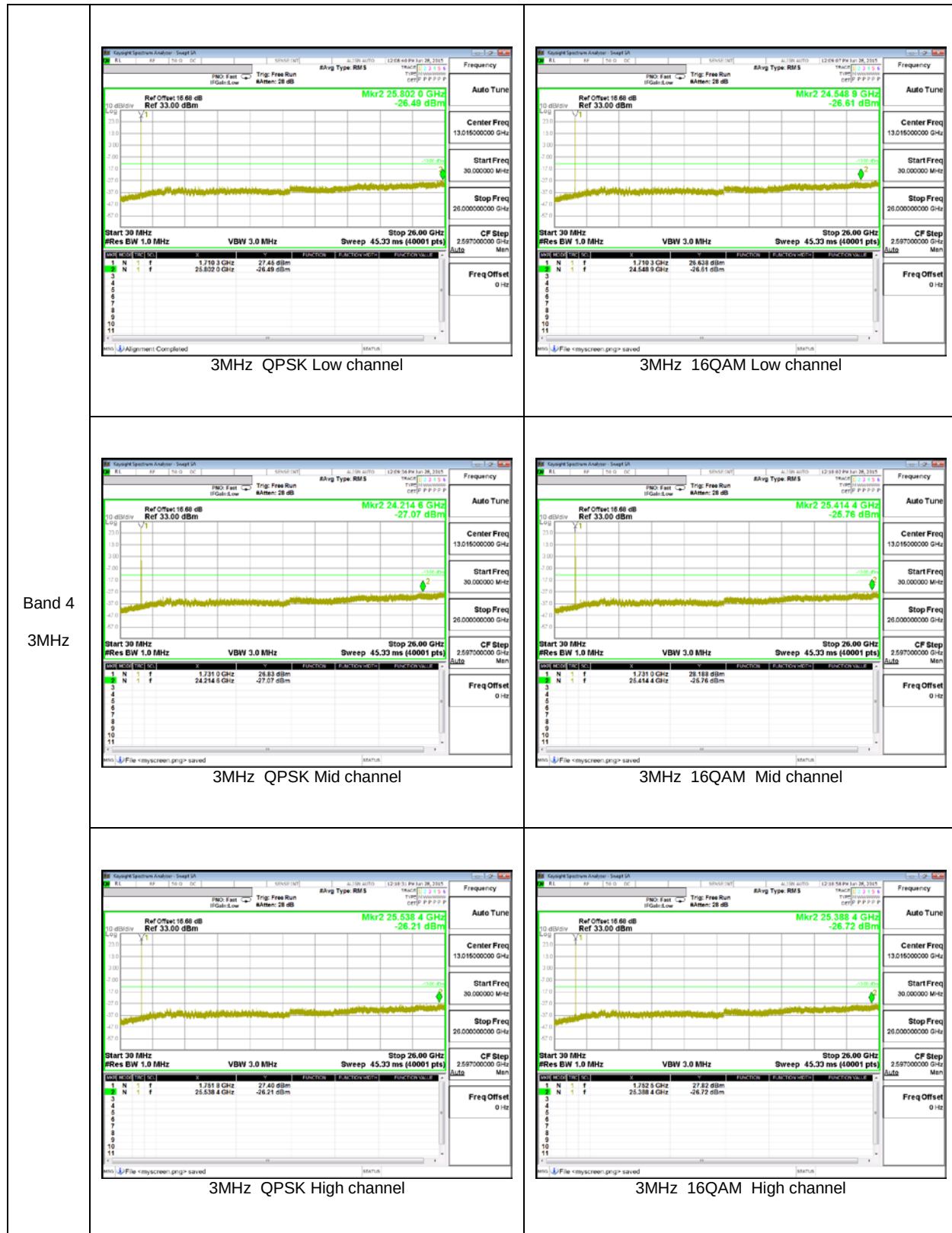


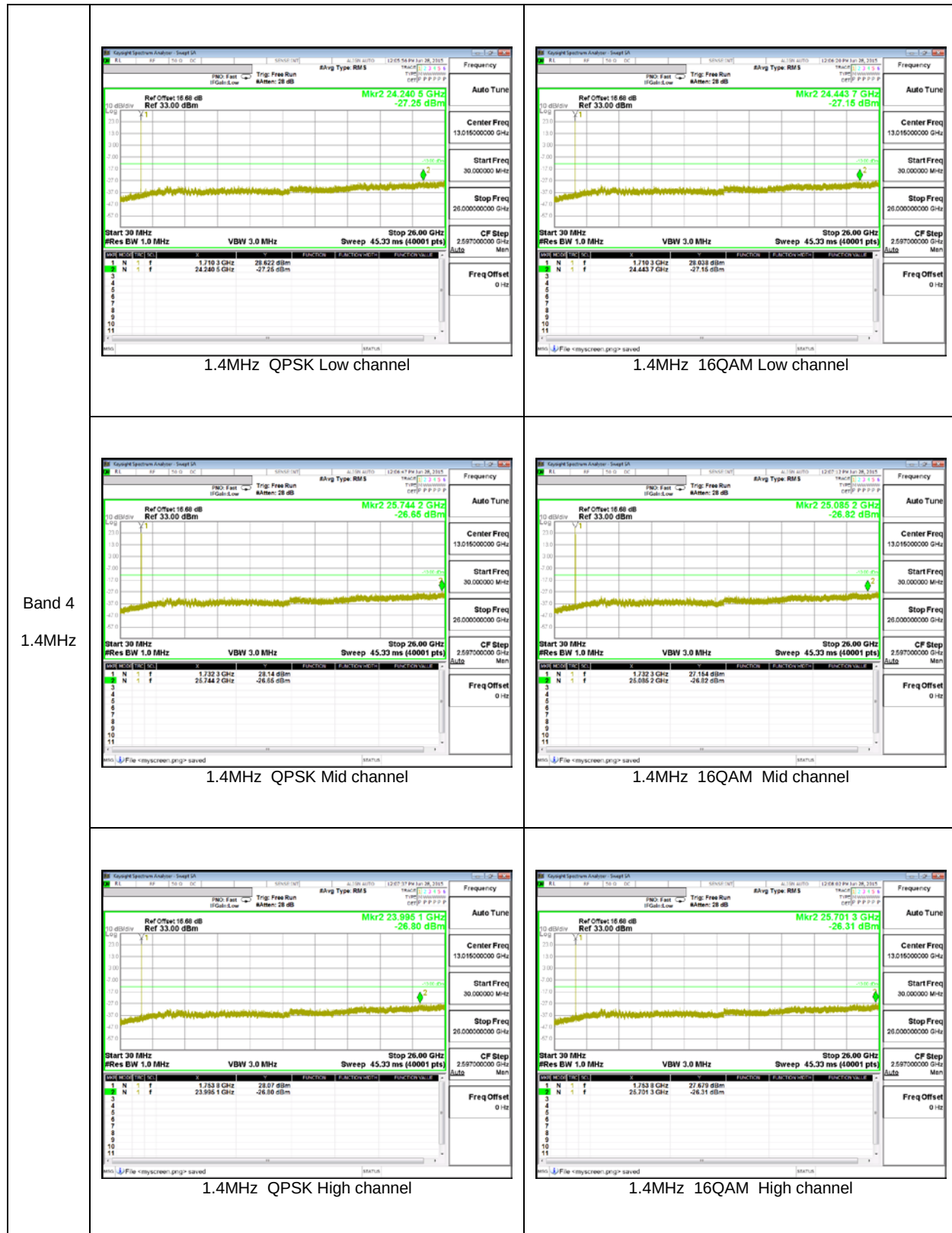




Band 4
5MHz







10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54 and §90.213

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.

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

RESULTS

See the following pages.

10.4.1. FREQUENCY STABILITY RESULTS

LTE Band 41, Channel 40620, Frequency 2593.0 MHz

Reference Frequency: LTE Band41 Mid Channel 2593 MHz @ 20°C				
Limit: ± 2.5 ppm = 6482.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	2592.99996927	-0.004	2.5
3.80	40	2592.99995891	0.000	2.5
3.80	30	2592.99996074	-0.001	2.5
3.80	20	2592.99995935	0	2.5
3.80	10	2592.99995005	0.004	2.5
3.80	0	2592.99994626	0.005	2.5
3.80	-10	2592.99994484	0.006	2.5
3.80	-20	2592.99994367	0.006	2.5
3.80	-30	2592.99993989	0.008	2.5

Reference Frequency: LTE Band41 Mid Channel 2593 MHz @ 20°C				
Limit: ± 2.5 ppm = 6482.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	2592.99995935	0	2.5
4.20	20	2592.99994537	0.005	2.5
3.50	20	2592.99995289	0.002	2.5

LTE Band 25, Channel 26365, Frequency 1882.5 MHz

Reference Frequency: LTE Band25 Mid Channel 1882.5 MHz @ 20°C				
Limit: ± 2.5 ppm = 4706.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1882.49997979	0.004	2.5
3.80	40	1882.49998687	0.000	2.5
3.80	30	1882.49998326	0.002	2.5
3.80	20	1882.49998780	0	2.5
3.80	10	1882.49998722	0.000	2.5
3.80	0	1882.49998635	0.001	2.5
3.80	-10	1882.49997993	0.004	2.5
3.80	-20	1882.49998121	0.004	2.5
3.80	-30	1882.49998165	0.003	2.5

Reference Frequency: LTE Band25 Mid Channel 1882.5 MHz @ 20°C				
Limit: ± 2.5 ppm = 4706.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	1882.49998780	0	2.5
4.20	20	1882.49998029	0.004	2.5
3.50	20	1882.49998825	0.000	2.5

LTE Band 17

Due to frequency range and same output power setting, test was carried in LTE Band 12 to cover both LTE Band 12 and LTE Band 17.

LTE Band 12, Channel 23095, Frequency 707.5 MHz

Reference Frequency: LTE Band12 Mid Channel 707.5 MHz @ 20°C				
Limit: ± 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	50	707.49997635	0.013	2.5
3.80	40	707.49998920	-0.005	2.5
3.80	30	707.49998808	-0.003	2.5
3.80	20	707.49998566	0	2.5
3.80	10	707.49997970	0.008	2.5
3.80	0	707.49997867	0.010	2.5
3.80	-10	707.49997953	0.009	2.5
3.80	-20	707.49998149	0.006	2.5
3.80	-30	707.49998243	0.005	2.5

Reference Frequency: LTE Band12 Mid Channel 707.5 MHz @ 20°C				
Limit: ± 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	707.49998566	0	2.5
4.20	20	707.49998492	0.001	2.5
3.50	20	707.49998740	-0.002	2.5

LTE Band 5

Due to frequency range and same output power setting, test was carried in LTE Band 26 to cover both LTE Band 26 and LTE Band 5.

LTE Band 4, Channel 20174, Frequency 1732.5 MHz

Reference Frequency: LTE Band4 Mid Channel 1732.5 MHz @ 20°C				
Limit: ± 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	50	1732.49998803	-0.002	2.5
3.80	40	1732.49998775	-0.002	2.5
3.80	30	1732.49998651	-0.001	2.5
3.80	20	1732.49998437	0	2.5
3.80	10	1732.49998557	-0.001	2.5
3.80	0	1732.49998941	-0.003	2.5
3.80	-10	1732.49998323	0.001	2.5
3.80	-20	1732.49998763	-0.002	2.5
3.80	-30	1732.49999097	-0.004	2.5

Reference Frequency: LTE Band4 Mid Channel 1880 MHz @ 20°C				
Limit: ± 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	1732.49998437	0	2.5
4.20	20	1732.49998614	-0.001	2.5
3.50	20	1732.49998112	0.002	2.5

11. RADIATED TEST RESULTS

11.1. 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) Portable stations (hand-held devices) are limited to 3 watts ERP; (LTE B17)

27.50(d) - (4) Fixed, mobile, and portable (hand-held) 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 603C Clause 2.2.17; MXA setting reference to 971168 D01 v02r02

For peak power measurement with a MXA:

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 MXA:

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.

TEST RESULTS

11.1.1. ERP/EIRP Results

LTE Band 41

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 41	20	QPSK	1/0	2506.0	21.35	136.46
			1/0	2593.0	20.64	115.88
			1/0	2680.0	20.62	115.35
		16QAM	1/0	2506.0	20.56	113.76
			1/0	2593.0	19.53	89.74
			1/0	2680.0	19.43	87.70
	15	QPSK	1/0	2503.5	21.35	136.46
			1/0	2593.0	20.77	119.40
			1/0	2682.5	20.22	105.20
		16QAM	1/0	2503.5	20.51	112.46
			1/0	2593.0	19.64	92.04
			1/0	2682.5	19.18	82.79
	10	QPSK	1/0	2501.0	21.65	146.22
			1/0	2593.0	21.74	149.28
			1/0	2685.0	20.85	121.62
		16QAM	1/0	2501.0	20.54	113.24
			1/0	2593.0	20.64	115.88
			1/0	2685.0	19.84	96.38
	5	QPSK	1/0	2498.5	21.51	141.58
			1/0	2593.0	21.36	136.77
			1/0	2687.5	20.18	104.23
		16QAM	1/0	2498.5	17.80	60.26
			1/0	2593.0	20.38	109.14
			1/0	2687.5	19.41	87.30

LTE Band 25

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 25	20	QPSK	100/0	1860.0	20.54	113.24
			100/0	1882.5	20.49	111.94
			100/0	1905.0	20.10	102.33
		16QAM	100/0	1860.0	19.54	89.95
			100/0	1882.5	19.46	88.31
			100/0	1905.0	19.12	81.66
	15	QPSK	75/0	1857.5	20.34	108.14
			75/0	1882.5	20.29	106.91
			75/0	1907.5	19.96	99.08
		16QAM	75/0	1857.5	19.32	85.51
			75/0	1882.5	19.26	84.33
			75/0	1907.5	18.91	77.80
	10	QPSK	50/0	1855.0	20.08	101.86
			50/0	1882.5	20.45	110.92
			50/0	1910.0	19.68	92.90
		16QAM	50/0	1855.0	19.07	80.72
			50/0	1882.5	19.44	87.90
			50/0	1910.0	18.65	73.28
	5	QPSK	25/0	1852.5	19.90	97.72
			25/0	1882.5	20.52	112.72
			25/0	1912.5	19.60	91.20
		16QAM	25/0	1852.5	18.87	77.09
			25/0	1882.5	19.47	88.51
			25/0	1912.5	18.54	71.45
	3	QPSK	15/0	1851.5	19.87	97.05
			15/0	1882.5	20.46	111.17
			15/0	1913.5	19.61	91.41
		16QAM	15/0	1851.5	18.83	76.38
			15/0	1882.5	19.47	88.51
			15/0	1913.5	18.58	72.11
	1.4	QPSK	6/0	1850.7	17.71	59.02
			6/0	1882.5	18.36	68.55
			6/0	1914.3	20.28	106.66
		16QAM	6/0	1850.7	17.02	50.35
			6/0	1882.5	17.37	54.58
			6/0	1914.3	19.14	82.04

LTE Band 17

Due to frequency range and same output power setting, test was carried in LTE Band 12 to cover both LTE Band 12 and LTE Band 17.

LTE Band 12

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 12	10	QPSK	50/0	704.0	15.37	34.43
			50/0	707.5	15.49	35.40
			50/0	711.0	15.49	35.40
		16QAM	50/0	704.0	14.32	27.04
			50/0	707.5	14.41	27.61
			50/0	711.0	14.41	27.61
	5	QPSK	25/0	701.5	15.81	38.11
			25/0	707.5	15.99	39.72
			25/0	713.5	15.56	35.97
		16QAM	25/0	701.5	14.76	29.92
			25/0	707.5	14.94	31.19
			25/0	713.5	15.02	31.77
	3	QPSK	15/0	700.5	15.80	38.02
			15/0	707.5	16.13	41.02
			15/0	714.5	15.32	34.04
		16QAM	15/0	700.5	14.75	29.85
			15/0	707.5	15.13	32.58
			15/0	714.5	14.81	30.27
	1.4	QPSK	6/0	699.7	15.86	38.55
			6/0	707.5	16.05	40.27
			6/0	715.3	15.15	32.73
		16QAM	6/0	699.7	14.96	31.33
			6/0	707.5	15.05	31.99
			6/0	715.3	14.65	29.17

LTE Band 5

Due to frequency range and same output power setting, test was carried in LTE Band 26 to cover both LTE Band 26 and LTE Band 5.

LTE Band 4

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 4	20	QPSK	100/0	1720.0	21.20	131.83
			100/0	1732.5	21.05	127.35
			100/0	1745.0	19.49	88.92
		16QAM	100/0	1720.0	20.19	104.47
			100/0	1732.5	20.07	101.62
			100/0	1745.0	18.47	70.31
	15	QPSK	75/0	1717.5	21.42	138.68
			75/0	1732.5	20.84	121.34
			75/0	1747.5	18.75	74.99
		16QAM	75/0	1717.5	20.42	110.15
			75/0	1732.5	19.77	94.84
			75/0	1747.5	17.71	59.02
	10	QPSK	50/0	1715.0	21.06	127.64
			50/0	1732.5	20.61	115.08
			50/0	1750.0	19.82	95.94
		16QAM	50/0	1715.0	20.04	100.93
			50/0	1732.5	19.92	98.17
			50/0	1750.0	18.82	76.21
	5	QPSK	25/0	1712.5	21.14	130.02
			25/0	1732.5	20.65	116.14
			25/0	1752.5	17.97	62.66
		16QAM	25/0	1712.5	20.16	103.75
			25/0	1732.5	19.95	98.86
			25/0	1752.5	16.98	49.89
	3	QPSK	15/0	1711.5	21.14	130.02
			15/0	1732.5	20.74	118.58
			15/0	1753.5	18.07	64.12
		16QAM	15/0	1711.5	20.22	105.20
			15/0	1732.5	19.73	93.97
			15/0	1753.5	17.07	50.93
	1.4	QPSK	6/0	1710.7	19.25	84.14
			6/0	1732.5	18.77	75.34
			6/0	1754.3	16.20	41.69
		16QAM	6/0	1710.7	18.19	65.92
			6/0	1732.5	17.71	59.02
			6/0	1754.3	15.12	32.51