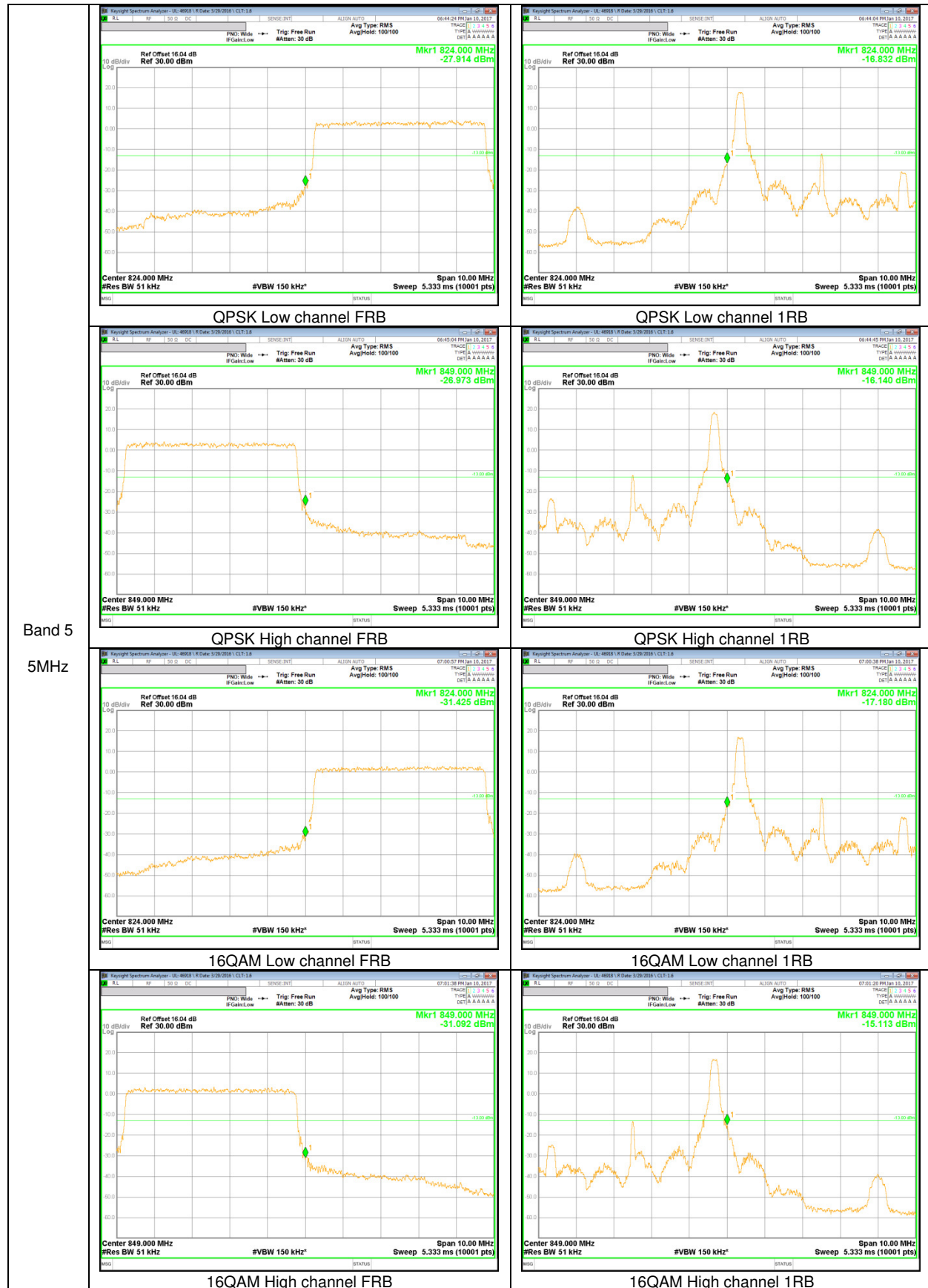
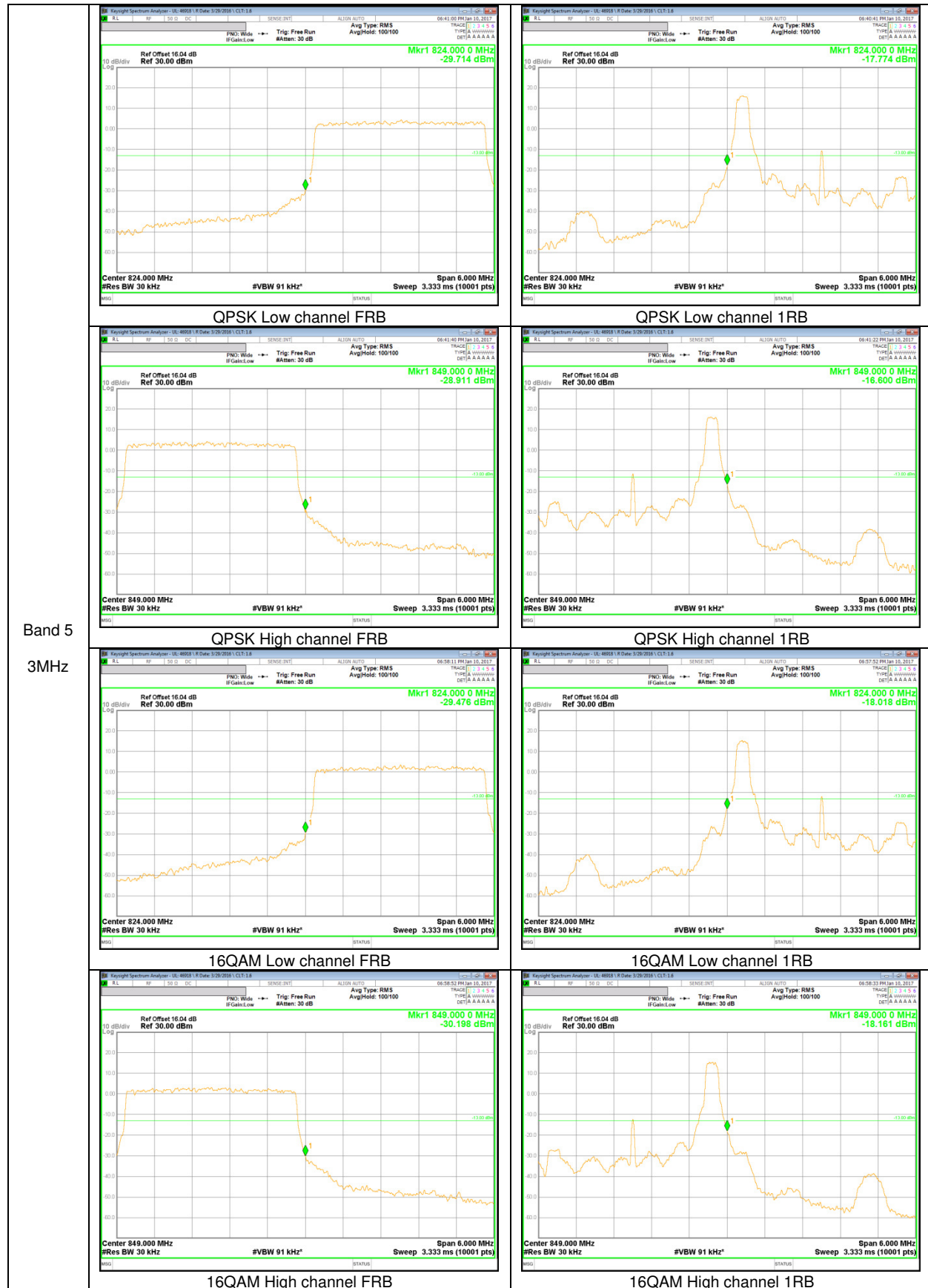
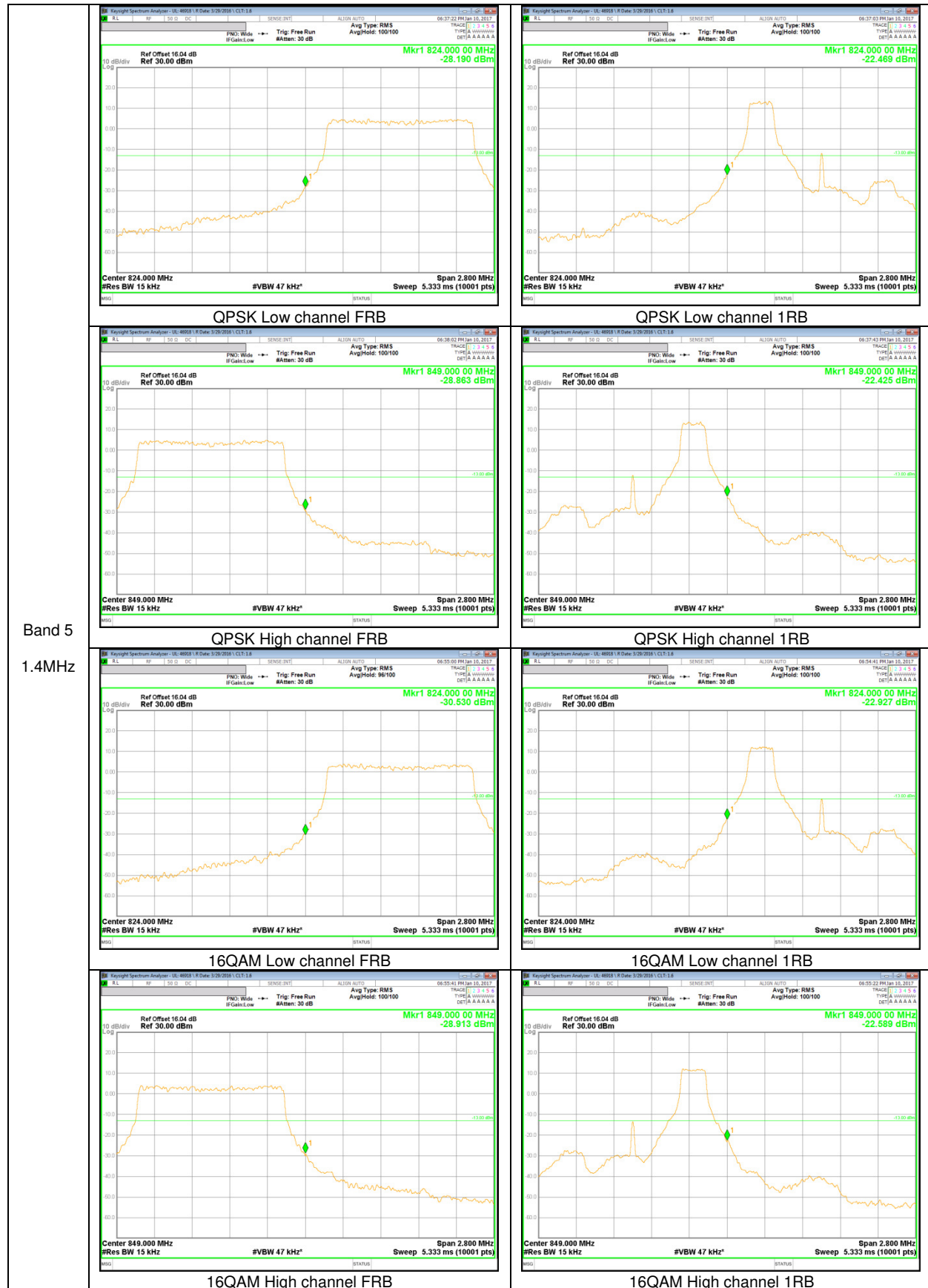






Band 5
3MHz



10.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §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.

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 maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

- a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz
(Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = peak;
- f) Ensure that the number of measurement points = Max (40001);
- g) Trace mode = max hold;

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

WCDMA

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
Band 5	REL99	826.4	-33.60	-13.00
		836.6	-33.65	
		846.6	-33.30	
	HSDPA	826.4	-33.82	
		836.6	-33.14	
		846.6	-33.99	
Band 2	REL99	1852.4	-33.33	
		1880.0	-33.09	
		1907.6	-33.32	
	HSDPA	1852.4	-33.26	
		1880.0	-33.18	
		1907.6	-33.71	

LTE 17

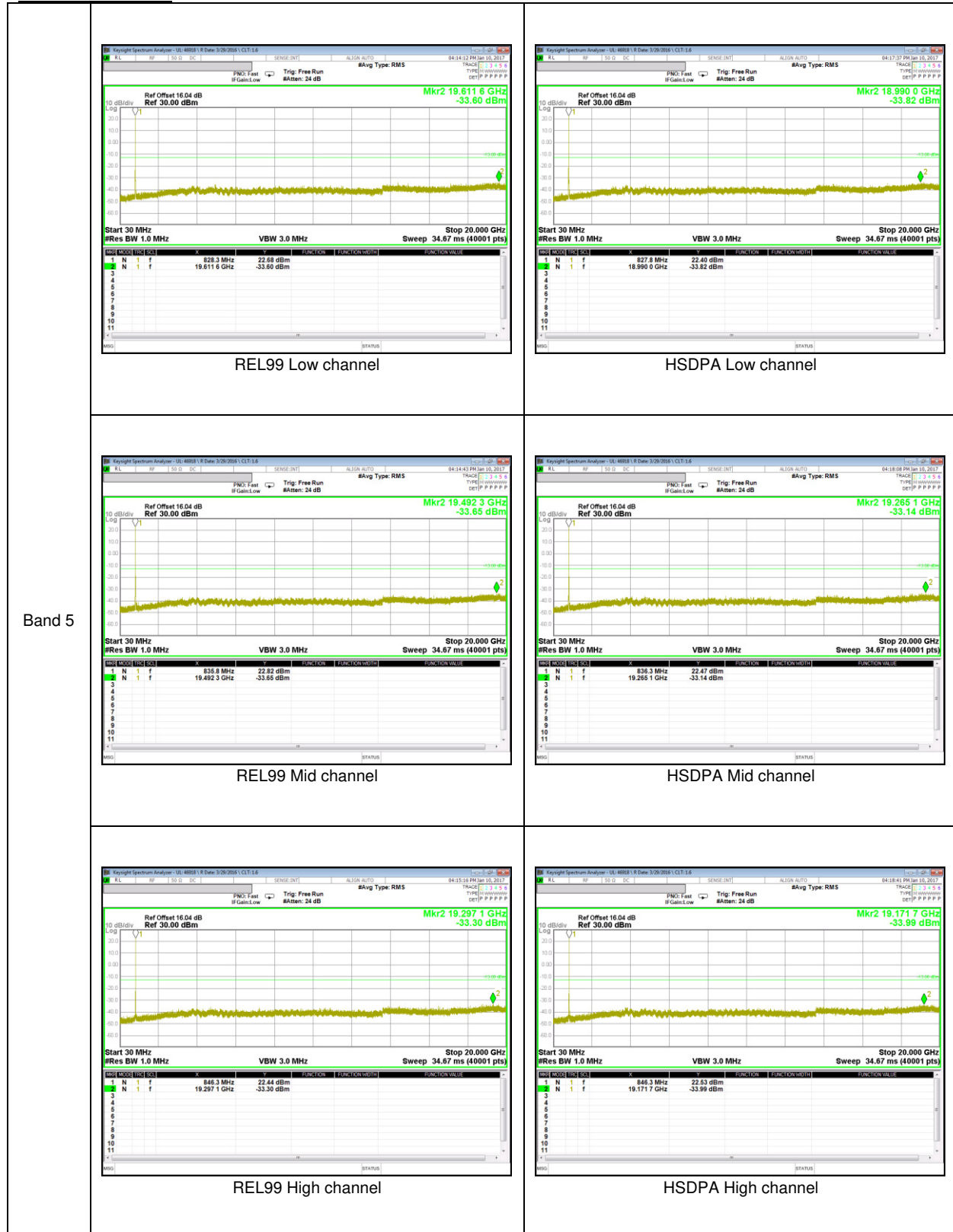
Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	709.0	-29.89	-13.00
		710.0	-28.40	
		711.0	-29.77	
	16QAM	709.0	-29.65	
		710.0	-30.07	
		711.0	-28.40	
5 MHz	QPSK	706.5	-29.01	
		710.0	-29.68	
		713.5	-29.67	
	16QAM	706.5	-29.57	
		710.0	-29.33	
		713.5	-29.67	

LTE 5

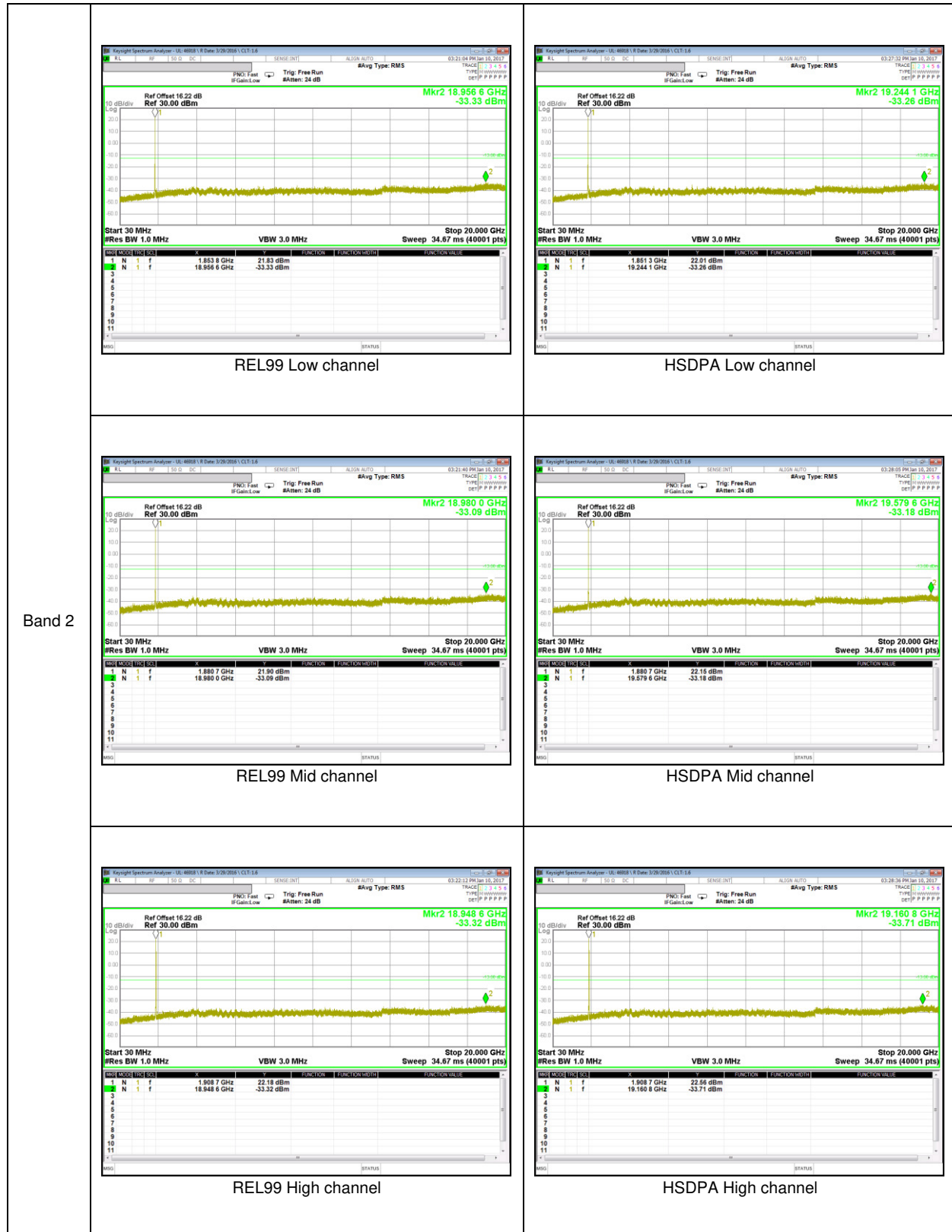
Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	829.0	-27.18	-13.00
		836.5	-26.93	
		844.0	-27.33	
	16QAM	829.0	-27.77	
		836.5	-27.34	
		844.0	-26.60	
5 MHz	QPSK	826.5	-27.58	
		836.5	-27.16	
		846.5	-27.11	
	16QAM	826.5	-26.64	
		836.5	-27.36	
		846.5	-27.52	
3 MHz	QPSK	825.5	-27.36	
		836.5	-27.07	
		847.5	-27.08	
	16QAM	825.5	-27.11	
		836.5	-26.67	
		847.5	-26.96	
1.4 MHz	QPSK	824.7	-26.50	
		836.5	-27.17	
		848.3	-26.84	
	16QAM	824.7	-27.88	
		836.5	-27.83	
		848.3	-25.91	

10.3.2. OUT OF BAND EMISSIONS PLOTS

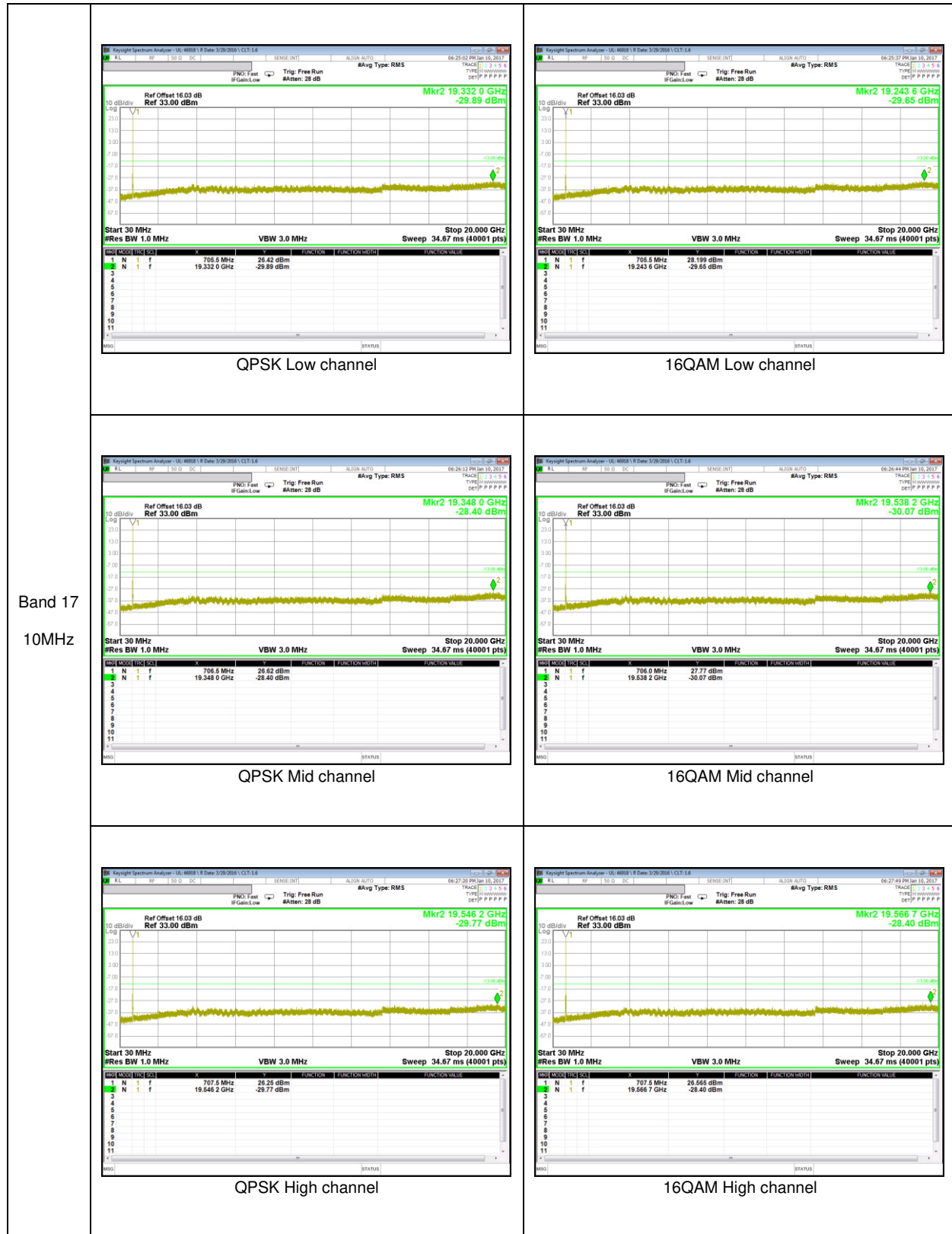
WCDMA Band 5

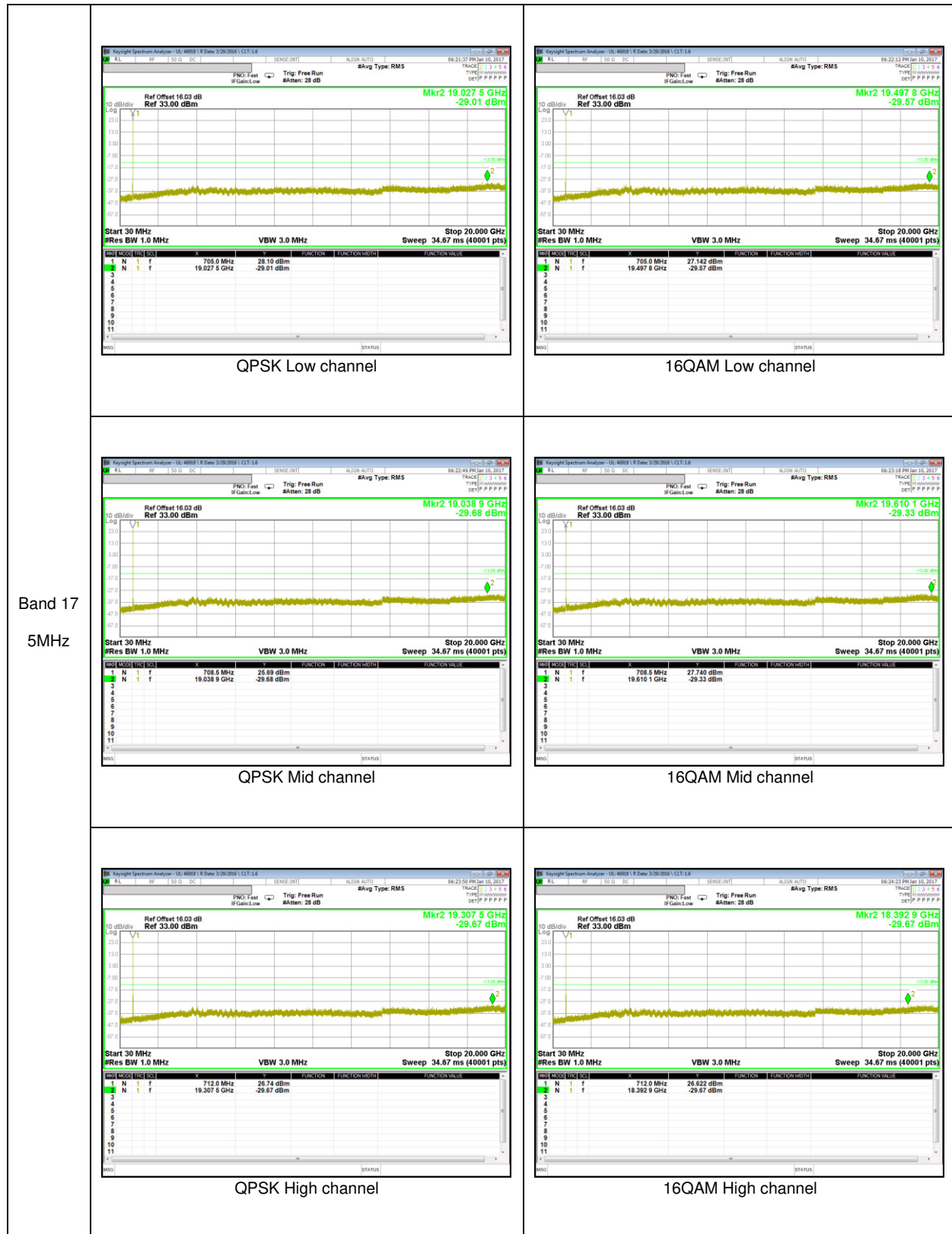


WCDMA Band 2

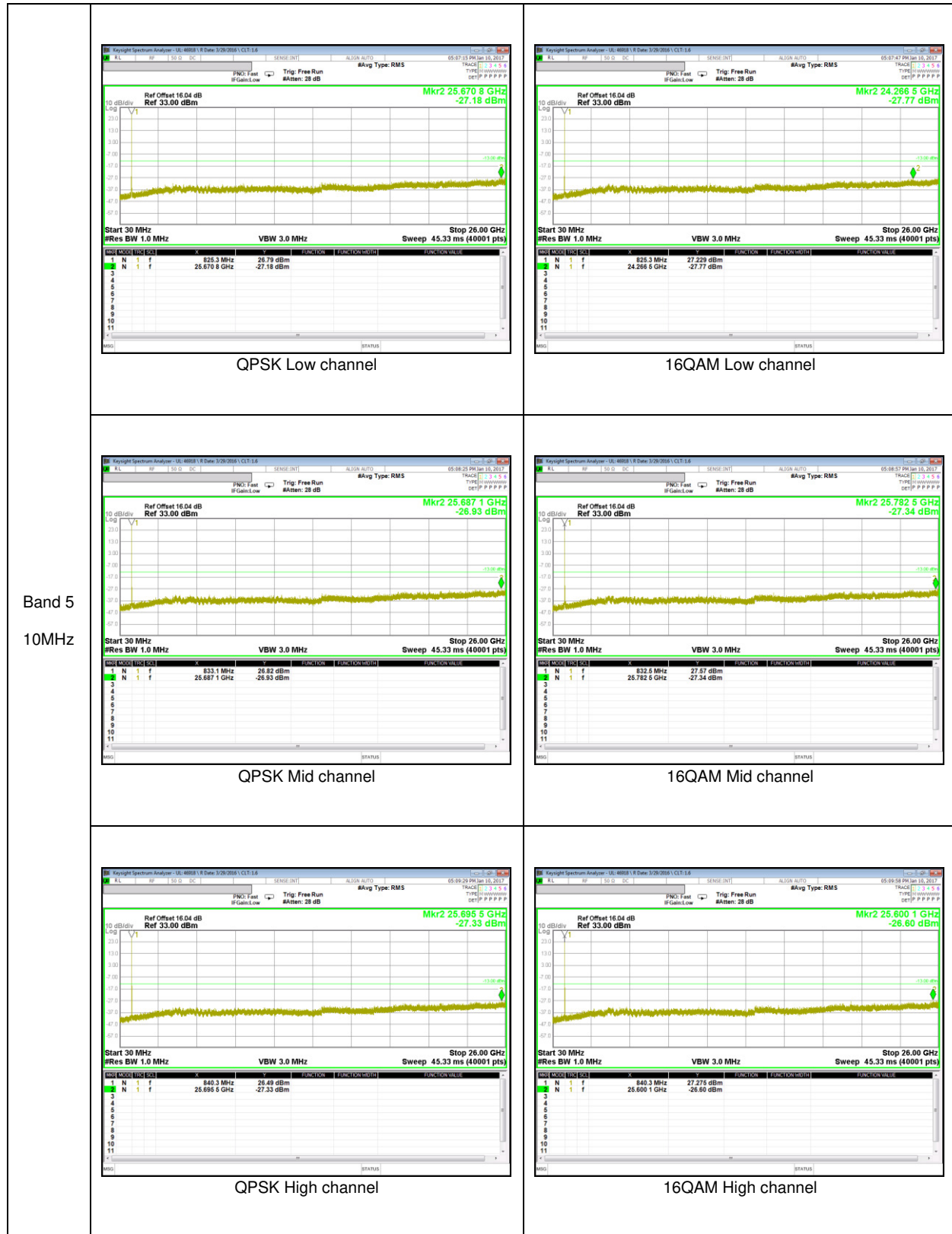


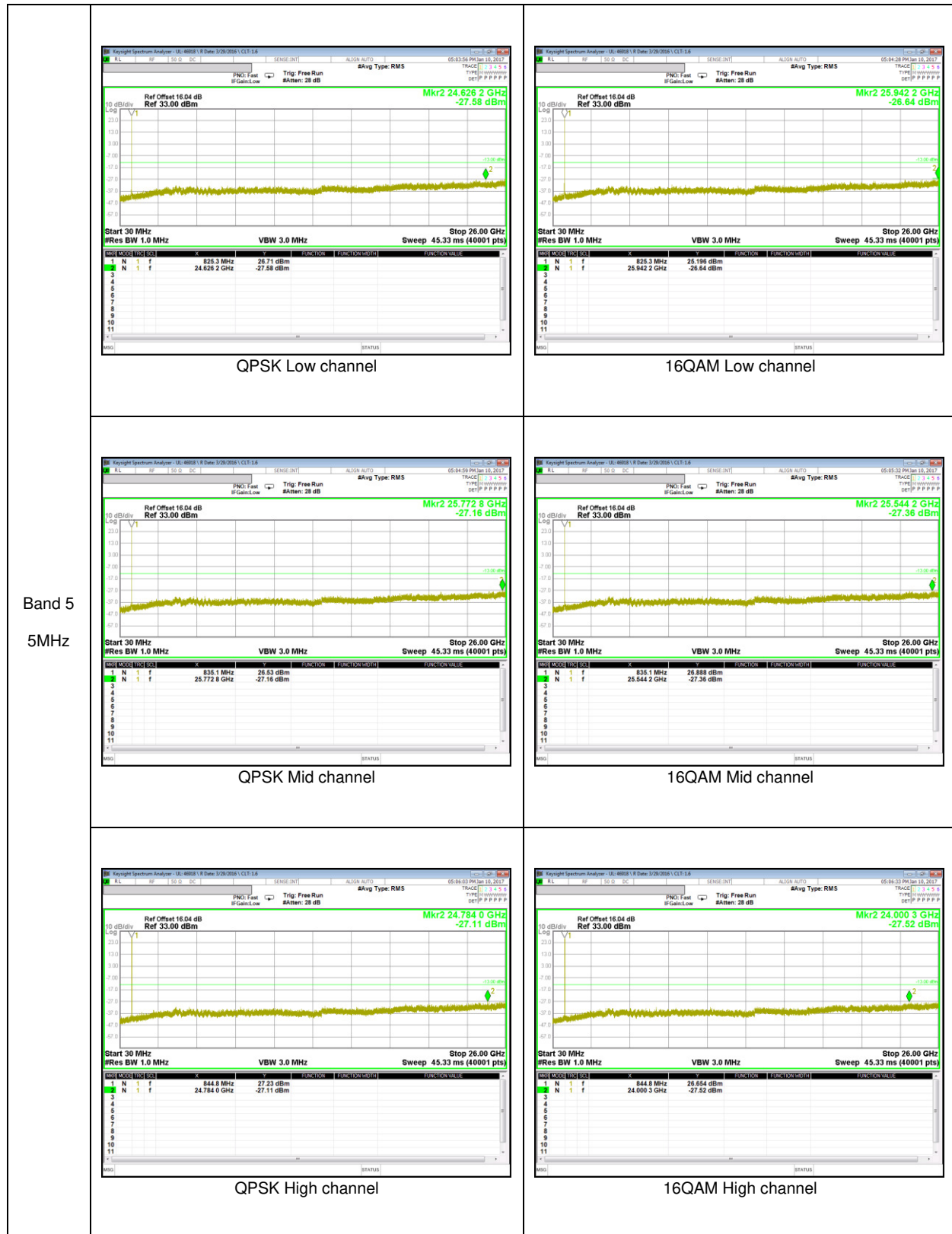
LTE Band 17

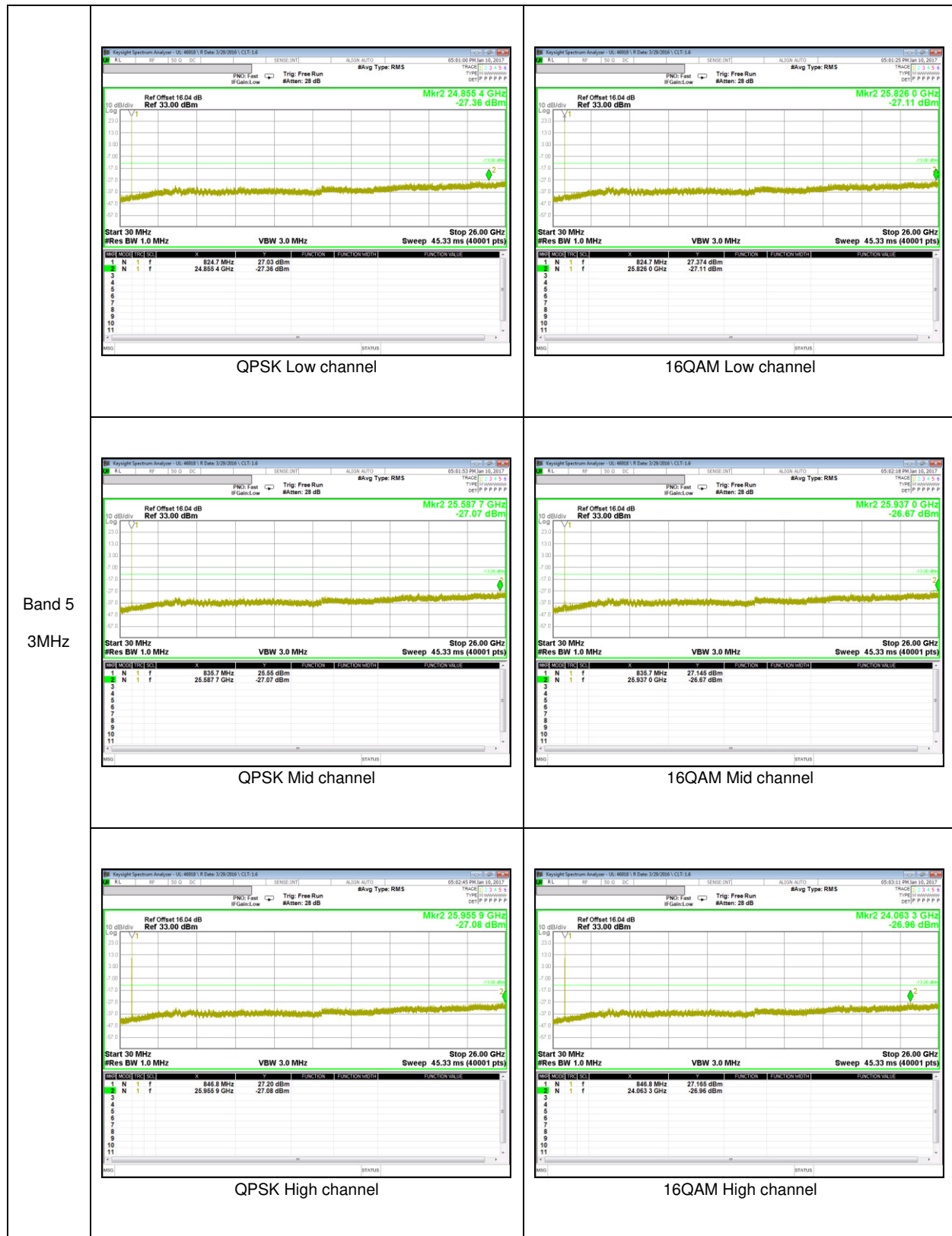


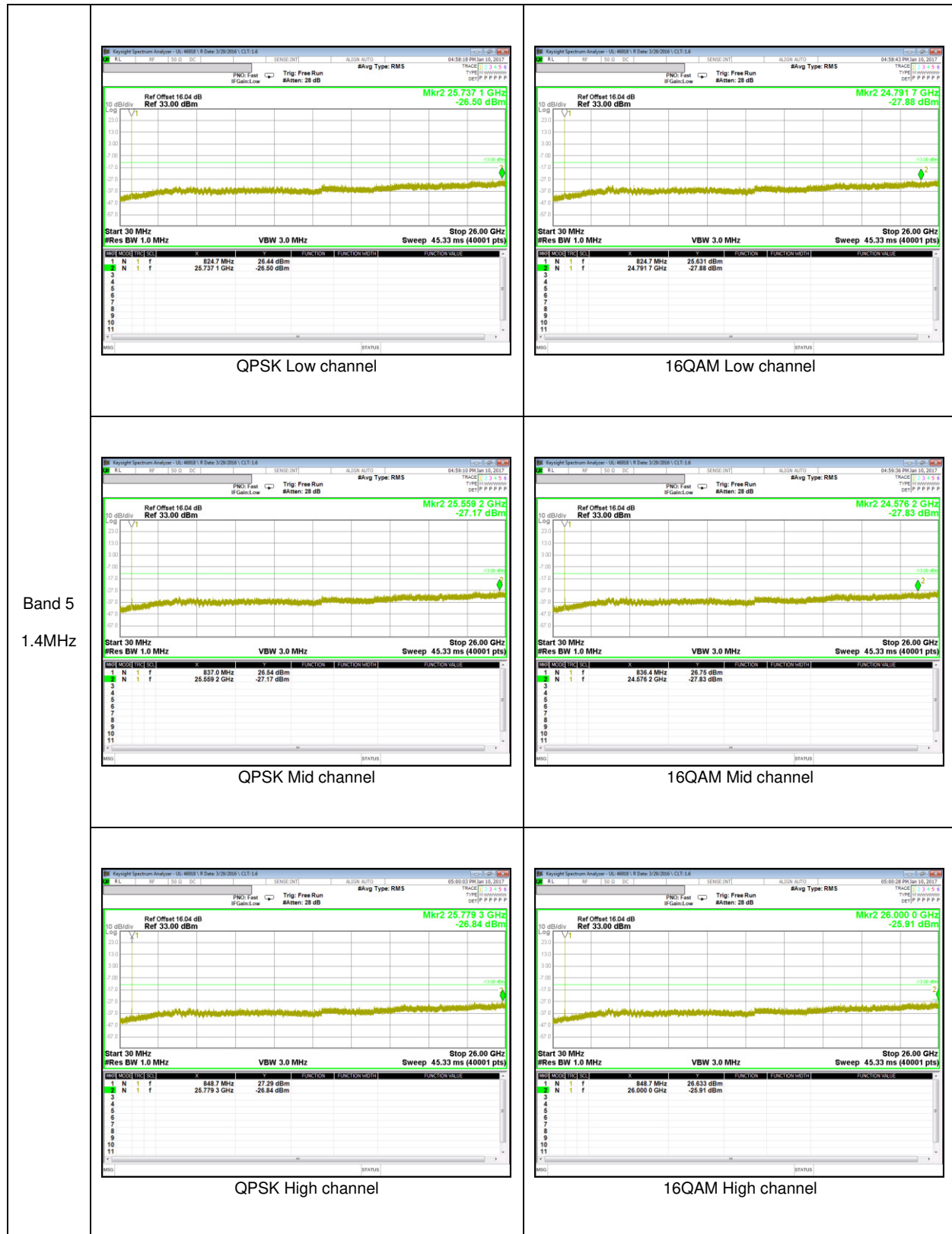


LTE Band 5









10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235 and §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

See the following pages.

10.4.1. FREQUENCY STABILITY RESULTS

LTE Band 17, Channel 23790, Frequency 710.0 MHz

Reference Frequency: LTE Band 17 Mid Channel 710 MHz @ 20°C				
Limit: +- 2.5 ppm = 1775.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	50	710.00000647	0.001	2.5
7.70	40	710.00000741	0.000	2.5
7.70	30	710.00000813	-0.001	2.5
7.70	20	710.00000748	0	2.5
7.70	10	710.00000727	0.000	2.5
7.70	0	710.00000793	-0.001	2.5
7.70	-10	710.00000707	0.001	2.5
7.70	-20	710.00000994	-0.003	2.5
7.70	-30	710.00000926	-0.003	2.5

Reference Frequency: LTE Band 17 Mid Channel 710 MHz @ 20°C				
Limit: +- 2.5 ppm = 1775.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	20	710.00000748	0	2.5
8.80	20	710.00000793	-0.001	2.5
7.35	20	710.00000674	0.001	2.5

LTE Band 5, Channel 20524, Frequency 836.5 MHz

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	50	836.50000810	0.000	2.5
7.70	40	836.50000871	-0.001	2.5
7.70	30	836.50000707	0.001	2.5
7.70	20	836.50000808	0	2.5
7.70	10	836.50000850	-0.001	2.5
7.70	0	836.50000592	0.003	2.5
7.70	-10	836.50000717	0.001	2.5
7.70	-20	836.50000860	-0.001	2.5
7.70	-30	836.50001036	-0.003	2.5

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	20	836.50000808	0	2.5
8.80	20	836.50000795	0.000	2.5
7.35	20	836.50000878	-0.001	2.5

WCDMA Band 5, Channel 4183, Frequency 836.6 MHz

Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	50	836.59999039	0.001	2.5
7.70	40	836.59999185	0.000	2.5
7.70	30	836.59999002	0.002	2.5
7.70	20	836.59999160	0	2.5
7.70	10	836.59999138	0.000	2.5
7.70	0	836.59999275	-0.001	2.5
7.70	-10	836.59999087	0.001	2.5
7.70	-20	836.59999175	0.000	2.5
7.70	-30	836.59999051	0.001	2.5

Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	20	836.59999160	0	2.5
8.80	20	836.59999177	0.000	2.5
7.35	20	836.59999114	0.001	2.5

WCDMA Band 2, Channel 9400, Frequency 1880.0 MHz

Reference Frequency: WCDMA Band 2 Mid Channel 1880.0 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	50	1879.99998516	-0.004	2.5
7.70	40	1879.99998610	-0.004	2.5
7.70	30	1879.99998458	-0.003	2.5
7.70	20	1879.99997829	0	2.5
7.70	10	1879.99998161	-0.002	2.5
7.70	0	1879.99998111	-0.001	2.5
7.70	-10	1879.99998274	-0.002	2.5
7.70	-20	1879.99998028	-0.001	2.5
7.70	-30	1879.99997962	-0.001	2.5

Reference Frequency: WCDMA Band 2 Mid Channel 1880.0 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
7.70	20	1879.99997829	0	2.5
8.80	20	1879.99997957	-0.001	2.5
7.35	20	1879.99997838	0.000	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) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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; ESU40 setting reference to 971168 D01 v02r02

For peak power measurement with a ESU40:

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 ESU40:

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

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	17.59	57.41
		4183	836.6	17.00	50.12
		4233	846.6	17.26	53.21
	HSDPA	4132	826.4	17.20	52.48
		4183	836.6	17.05	50.70
		4233	846.6	17.48	55.98
Band 2	REL99	9262	1852.4	23.68	233.35
		9400	1880.0	23.54	225.94
		9538	1907.6	22.23	167.11
	HSDPA	9262	1852.4	23.27	212.32
		9400	1880.0	23.16	207.01
		9538	1907.6	21.90	154.88

WCDMA equipped with keyboard

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	17.40	54.95
		4183	836.6	17.42	55.21
		4233	846.6	17.15	51.88
Band 2	REL99	9262	1852.4	22.68	185.35
		9400	1880.0	23.50	223.87
		9538	1907.6	22.87	193.64

LTE Band 17

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 17	10	QPSK	50/0	709.0	10.92	12.36
			50/0	710.0	10.86	12.19
			50/0	711.0	10.83	12.11
		16QAM	50/0	709.0	9.84	9.64
			50/0	710.0	9.88	9.73
			50/0	711.0	9.88	9.73
	5	QPSK	25/0	706.5	10.55	11.35
			25/0	710.0	10.70	11.75
			25/0	713.5	10.84	12.13
		16QAM	25/0	706.5	9.57	9.06
			25/0	710.0	9.69	9.31
			25/0	713.5	9.90	9.77

LTE Band 17 equipped with keyboard

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 17	10	QPSK	50/0	709.0	6.96	4.97
			50/0	710.0	6.48	4.45
			50/0	711.0	6.66	4.63

LTE Band 5

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 5	10	QPSK	50/0	829.0	16.40	43.65
			50/0	836.5	17.11	51.40
			50/0	844.0	17.08	51.05
		16QAM	50/0	829.0	15.44	34.99
			50/0	836.5	16.02	39.99
			50/0	844.0	16.09	40.64
	5	QPSK	25/0	826.5	16.66	46.34
			25/0	836.5	16.92	49.20
			25/0	846.5	16.74	47.21
		16QAM	25/0	826.5	15.68	36.98
			25/0	836.5	15.96	39.45
			25/0	846.5	16.29	42.56
	3	QPSK	15/0	825.5	16.76	47.42
			15/0	836.5	16.22	41.88
			15/0	847.5	16.91	49.09
		16QAM	15/0	825.5	15.77	37.76
			15/0	836.5	15.19	33.04
			15/0	847.5	16.41	43.75
	1.4	QPSK	6/0	824.7	14.64	29.11
			6/0	836.5	14.82	30.34
			6/0	848.3	14.83	30.41
		16QAM	6/0	824.7	13.83	24.15
			6/0	836.5	13.85	24.27
			6/0	848.3	14.27	26.73

LTE Band 5 equipped with keyboard

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 5	10	QPSK	50/0	829.0	15.81	38.11
			50/0	836.5	16.84	48.31
			50/0	844.0	15.58	36.14

11.1.2. ERP/EIRP DATA

WCDMA Band 5

WCDMA Band 5 REL99	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 01-09-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: Rel 99_850 MHz Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. <table> <tr> <th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr> <tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>826.40</td><td>14.46</td><td>V</td><td>1.1</td><td>-1.5</td><td>11.85</td><td>38.5</td><td>-26.6</td><td></td></tr> <tr><td>826.40</td><td>20.20</td><td>H</td><td>1.1</td><td>-1.5</td><td>17.59</td><td>38.5</td><td>-20.9</td><td></td></tr> <tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>836.60</td><td>14.22</td><td>V</td><td>1.1</td><td>-1.4</td><td>11.73</td><td>38.5</td><td>-26.7</td><td></td></tr> <tr><td>836.60</td><td>19.49</td><td>H</td><td>1.1</td><td>-1.4</td><td>17.00</td><td>38.5</td><td>-21.5</td><td></td></tr> <tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>846.60</td><td>15.69</td><td>V</td><td>1.1</td><td>-1.3</td><td>13.31</td><td>38.5</td><td>-25.1</td><td></td></tr> <tr><td>846.60</td><td>19.64</td><td>H</td><td>1.1</td><td>-1.3</td><td>17.26</td><td>38.5</td><td>-21.2</td><td></td></tr> </table> Rev. 3.17.11								f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									826.40	14.46	V	1.1	-1.5	11.85	38.5	-26.6		826.40	20.20	H	1.1	-1.5	17.59	38.5	-20.9		Mid Ch									836.60	14.22	V	1.1	-1.4	11.73	38.5	-26.7		836.60	19.49	H	1.1	-1.4	17.00	38.5	-21.5		High Ch									846.60	15.69	V	1.1	-1.3	13.31	38.5	-25.1		846.60	19.64	H	1.1	-1.3	17.26	38.5	-21.2	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
Low Ch																																																																																																		
826.40	14.46	V	1.1	-1.5	11.85	38.5	-26.6																																																																																											
826.40	20.20	H	1.1	-1.5	17.59	38.5	-20.9																																																																																											
Mid Ch																																																																																																		
836.60	14.22	V	1.1	-1.4	11.73	38.5	-26.7																																																																																											
836.60	19.49	H	1.1	-1.4	17.00	38.5	-21.5																																																																																											
High Ch																																																																																																		
846.60	15.69	V	1.1	-1.3	13.31	38.5	-25.1																																																																																											
846.60	19.64	H	1.1	-1.3	17.26	38.5	-21.2																																																																																											
WCDMA Band 5 HSDPA	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 01-09-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: HSDPA_850 MHz Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. <table> <tr> <th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr> <tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>826.40</td><td>14.36</td><td>V</td><td>1.1</td><td>-1.5</td><td>11.75</td><td>38.5</td><td>-26.7</td><td></td></tr> <tr><td>826.40</td><td>19.81</td><td>H</td><td>1.1</td><td>-1.5</td><td>17.20</td><td>38.5</td><td>-21.3</td><td></td></tr> <tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>836.60</td><td>13.43</td><td>V</td><td>1.1</td><td>-1.4</td><td>10.94</td><td>38.5</td><td>-27.5</td><td></td></tr> <tr><td>836.60</td><td>19.54</td><td>H</td><td>1.1</td><td>-1.4</td><td>17.05</td><td>38.5</td><td>-21.4</td><td></td></tr> <tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>846.60</td><td>15.53</td><td>V</td><td>1.1</td><td>-1.3</td><td>13.15</td><td>38.5</td><td>-25.3</td><td></td></tr> <tr><td>846.60</td><td>19.86</td><td>H</td><td>1.1</td><td>-1.3</td><td>17.48</td><td>38.5</td><td>-21.0</td><td></td></tr> </table> Rev. 3.17.11								f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									826.40	14.36	V	1.1	-1.5	11.75	38.5	-26.7		826.40	19.81	H	1.1	-1.5	17.20	38.5	-21.3		Mid Ch									836.60	13.43	V	1.1	-1.4	10.94	38.5	-27.5		836.60	19.54	H	1.1	-1.4	17.05	38.5	-21.4		High Ch									846.60	15.53	V	1.1	-1.3	13.15	38.5	-25.3		846.60	19.86	H	1.1	-1.3	17.48	38.5	-21.0	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
Low Ch																																																																																																		
826.40	14.36	V	1.1	-1.5	11.75	38.5	-26.7																																																																																											
826.40	19.81	H	1.1	-1.5	17.20	38.5	-21.3																																																																																											
Mid Ch																																																																																																		
836.60	13.43	V	1.1	-1.4	10.94	38.5	-27.5																																																																																											
836.60	19.54	H	1.1	-1.4	17.05	38.5	-21.4																																																																																											
High Ch																																																																																																		
846.60	15.53	V	1.1	-1.3	13.15	38.5	-25.3																																																																																											
846.60	19.86	H	1.1	-1.3	17.48	38.5	-21.0																																																																																											

WCDMA Band 5 equipped with keyboard

WCDMA

Band 5
REL99

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung

Project #: 4787821360

Date: 02-03-17

Test Engineer: JH Park

Configuration: EUT / Keyboard

Mode: Rel 99_850 MHz

Test Equipment:

Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)

Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	20.01	V	1.1	-1.5	17.40	38.5	-21.1	
826.40	18.78	H	1.1	-1.5	16.17	38.5	-22.3	
Mid Ch								
836.60	19.91	V	1.1	-1.4	17.42	38.5	-21.0	
836.60	18.65	H	1.1	-1.4	16.16	38.5	-22.3	
High Ch								
846.60	19.53	V	1.1	-1.3	17.15	38.5	-21.3	
846.60	17.88	H	1.1	-1.3	15.50	38.5	-23.0	

Rev. 3.17.11

WCDMA Band 2

WCDMA Band 2 REL99	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 01-09-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: REL99_1900 MHz Test Equipment: Receiving: 3117[00168724] and Chamber 1 SMA Cables Substitution: 3115[00161451] Substitution, 3m SMA Cable Ware house								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
	Low Ch								
	1852.40	4.02	V	1.60	8.79	11.21	33.0	-21.8	
	1852.40	16.49	H	1.60	8.79	23.68	33.0	-9.3	
	Mid Ch								
	1880.00	6.08	V	1.62	8.62	13.08	33.0	-19.9	
	1880.00	16.54	H	1.62	8.62	23.54	33.0	-9.5	
	High Ch								
	1907.60	3.45	V	1.63	8.45	10.27	33.0	-22.7	
	1907.60	15.41	H	1.63	8.45	22.23	33.0	-10.8	
	Rev. 3.17.11								
	Note: For Band 4 EIRP limit is 30dBm								
WCDMA Band 2 HSDPA	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 01-09-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: HSDPA_1900 MHz Test Equipment: Receiving: 3117[00168724] and Chamber 1 SMA Cables Substitution: 3115[00161451] Substitution, 3m SMA Cable Ware house								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
	Low Ch								
	1852.40	3.62	V	1.60	8.79	10.81	33.0	-22.2	
	1852.40	16.08	H	1.60	8.79	23.27	33.0	-9.7	
	Mid Ch								
	1880.00	5.70	V	1.62	8.62	12.70	33.0	-20.3	
	1880.00	16.16	H	1.62	8.62	23.16	33.0	-9.8	
	High Ch								
	1907.60	2.62	V	1.63	8.45	9.44	33.0	-23.6	
	1907.60	15.08	H	1.63	8.45	21.90	33.0	-11.1	
	Rev. 3.17.11								
	Note: For Band 4 EIRP limit is 30dBm								

WCDMA Band 2 equipped with keyboard

WCDMA Band 2 REL99	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 02-03-17 Test Engineer: JH Park Configuration: EUT / Keyboard Mode: REL99_1900 MHz Test Equipment: Receiving: 3117[00168724] and Chamber 1 SMA Cables Substitution: 3115[00161451] Substitution, 3m SMA Cable Ware house								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
	Low Ch								
	1852.40	15.49	V	1.60	8.79	22.68	33.0	-10.3	
	1852.40	14.94	H	1.60	8.79	22.13	33.0	-10.9	
	Mid Ch								
	1880.00	16.15	V	1.62	8.62	23.15	33.0	-9.8	
	1880.00	16.50	H	1.62	8.62	23.50	33.0	-9.5	
	High Ch								
	1907.60	15.70	V	1.63	8.45	22.52	33.0	-10.5	
	1907.60	16.05	H	1.63	8.45	22.87	33.0	-10.1	
Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									

LTE Band 17

LTE Band 17 10MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 01-25-17 Test Engineer: Chan Park Configuration: EUT / X-Position Mode: LTE Band 17, QPSK, 10MHz Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>709.00</td><td>6.96</td><td>V</td><td>1.0</td><td>-1.6</td><td>4.36</td><td>34.8</td><td>-30.4</td><td></td></tr><tr><td>709.00</td><td>13.52</td><td>H</td><td>1.0</td><td>-1.6</td><td>10.92</td><td>34.8</td><td>-23.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>710.00</td><td>6.83</td><td>V</td><td>1.0</td><td>-1.6</td><td>4.23</td><td>34.8</td><td>-30.5</td><td></td></tr><tr><td>710.00</td><td>13.46</td><td>H</td><td>1.0</td><td>-1.6</td><td>10.86</td><td>34.8</td><td>-23.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>711.00</td><td>7.01</td><td>V</td><td>1.0</td><td>-1.6</td><td>4.41</td><td>34.8</td><td>-30.4</td><td></td></tr><tr><td>711.00</td><td>13.43</td><td>H</td><td>1.0</td><td>-1.6</td><td>10.83</td><td>34.8</td><td>-23.9</td><td></td></tr></table> Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									709.00	6.96	V	1.0	-1.6	4.36	34.8	-30.4		709.00	13.52	H	1.0	-1.6	10.92	34.8	-23.9		Mid Ch									710.00	6.83	V	1.0	-1.6	4.23	34.8	-30.5		710.00	13.46	H	1.0	-1.6	10.86	34.8	-23.9		High Ch									711.00	7.01	V	1.0	-1.6	4.41	34.8	-30.4		711.00	13.43	H	1.0	-1.6	10.83	34.8	-23.9	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	709.00	6.96	V	1.0	-1.6	4.36	34.8	-30.4																																																																																											
	709.00	13.52	H	1.0	-1.6	10.92	34.8	-23.9																																																																																											
	Mid Ch																																																																																																		
	710.00	6.83	V	1.0	-1.6	4.23	34.8	-30.5																																																																																											
	710.00	13.46	H	1.0	-1.6	10.86	34.8	-23.9																																																																																											
	High Ch																																																																																																		
	711.00	7.01	V	1.0	-1.6	4.41	34.8	-30.4																																																																																											
	711.00	13.43	H	1.0	-1.6	10.83	34.8	-23.9																																																																																											
	LTE Band 17 10MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 01-25-17 Test Engineer: Chan Park Configuration: EUT / X-Position Mode: LTE Band 17 16QAM, 10MHz Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>709.00</td><td>5.93</td><td>V</td><td>1.0</td><td>-1.6</td><td>3.33</td><td>34.8</td><td>-31.4</td><td></td></tr><tr><td>709.00</td><td>12.44</td><td>H</td><td>1.0</td><td>-1.6</td><td>9.84</td><td>34.8</td><td>-24.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>710.00</td><td>5.85</td><td>V</td><td>1.0</td><td>-1.6</td><td>3.25</td><td>34.8</td><td>-31.5</td><td></td></tr><tr><td>710.00</td><td>12.48</td><td>H</td><td>1.0</td><td>-1.6</td><td>9.88</td><td>34.8</td><td>-24.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>711.00</td><td>6.04</td><td>V</td><td>1.0</td><td>-1.6</td><td>3.44</td><td>34.8</td><td>-31.3</td><td></td></tr><tr><td>711.00</td><td>12.48</td><td>H</td><td>1.0</td><td>-1.6</td><td>9.88</td><td>34.8</td><td>-24.9</td><td></td></tr></table> Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									709.00	5.93	V	1.0	-1.6	3.33	34.8	-31.4		709.00	12.44	H	1.0	-1.6	9.84	34.8	-24.9		Mid Ch									710.00	5.85	V	1.0	-1.6	3.25	34.8	-31.5		710.00	12.48	H	1.0	-1.6	9.88	34.8	-24.9		High Ch									711.00	6.04	V	1.0	-1.6	3.44	34.8	-31.3		711.00	12.48	H	1.0	-1.6	9.88	34.8	-24.9
f MHz		SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
Low Ch																																																																																																			
709.00		5.93	V	1.0	-1.6	3.33	34.8	-31.4																																																																																											
709.00		12.44	H	1.0	-1.6	9.84	34.8	-24.9																																																																																											
Mid Ch																																																																																																			
710.00		5.85	V	1.0	-1.6	3.25	34.8	-31.5																																																																																											
710.00		12.48	H	1.0	-1.6	9.88	34.8	-24.9																																																																																											
High Ch																																																																																																			
711.00		6.04	V	1.0	-1.6	3.44	34.8	-31.3																																																																																											
711.00		12.48	H	1.0	-1.6	9.88	34.8	-24.9																																																																																											

LTE Band 17 5MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-25-17 Test Engineer: Chan Park Configuration: EUT / X-Position Mode: LTE Band 17, QPSK , 5MHz								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	706.50	6.63	V	1.0	-1.6	4.03	34.8	-30.7	
	706.50	13.15	H	1.0	-1.6	10.55	34.8	-24.2	
	Mid Ch								
	710.00	6.74	V	1.0	-1.6	4.14	34.8	-30.6	
	710.00	13.30	H	1.0	-1.6	10.70	34.8	-24.1	
	High Ch								
	713.50	6.86	V	1.0	-1.6	4.26	34.8	-30.5	
	713.50	13.44	H	1.0	-1.6	10.84	34.8	-23.9	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								
LTE Band 17 5MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-25-17 Test Engineer: Chan Park Configuration: EUT / X-Position Mode: LTE Band 17 16QAM, 5MHz								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	706.50	5.53	V	1.0	-1.6	2.93	34.8	-31.8	
	706.50	12.17	H	1.0	-1.6	9.57	34.8	-25.2	
	Mid Ch								
	710.00	5.73	V	1.0	-1.6	3.13	34.8	-31.6	
	710.00	12.29	H	1.0	-1.6	9.69	34.8	-25.1	
	High Ch								
	713.50	5.91	V	1.0	-1.6	3.31	34.8	-31.5	
	713.50	12.50	H	1.0	-1.6	9.90	34.8	-24.9	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE Band 17 equipped with keyboard

LTE Band 17 10MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2 Company: Samsung Project #: 4787821360 Date: 02-03-17 Test Engineer: JH Park Configuration: EUT / Keyboard Mode: LTE Band 17, QPSK, 10MHz Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
	Low Ch								
	709.00	9.56	V	1.0	-1.6	6.96	34.8	-27.8	
	709.00	8.68	H	1.0	-1.6	6.08	34.8	-28.7	
	Mid Ch								
	710.00	9.08	V	1.0	-1.6	6.48	34.8	-28.3	
	710.00	8.77	H	1.0	-1.6	6.17	34.8	-28.6	
	High Ch								
	711.00	9.26	V	1.0	-1.6	6.66	34.8	-28.1	
	711.00	8.75	H	1.0	-1.6	6.15	34.8	-28.6	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

LTE Band 5

LTE Band 5 10MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: TX, LTE BAND 5, 10MHz BW,QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	829.00	12.67	V	1.1	-1.5	10.09	38.5	-28.4	
	829.00	18.98	H	1.1	-1.5	16.40	38.5	-22.1	
	Mid Ch								
	836.50	12.93	V	1.1	-1.4	10.44	38.5	-28.0	
	836.50	19.60	H	1.1	-1.4	17.11	38.5	-21.3	
	High Ch								
	844.00	12.28	V	1.1	-1.3	9.89	38.5	-28.6	
	844.00	19.50	H	1.1	-1.3	17.08	38.5	-21.4	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								
LTE Band 5 10MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 10MHz FUND 16QAM								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	829.00	11.67	V	1.1	-1.5	9.09	38.5	-29.4	
	829.00	18.02	H	1.1	-1.5	15.44	38.5	-23.0	
	Mid Ch								
	836.50	11.88	V	1.1	-1.4	9.37	38.5	-29.1	
	836.50	18.53	H	1.1	-1.4	16.02	38.5	-22.4	
	High Ch								
	844.00	11.30	V	1.1	-1.3	8.88	38.5	-29.6	
	844.00	18.51	H	1.1	-1.3	16.09	38.5	-22.4	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE Band 5 5MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 5MHz FUND QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	826.50	12.23	V	1.1	-1.5	9.63	38.5	-28.8	
	826.50	19.26	H	1.1	-1.5	16.66	38.5	-21.8	
	Mid Ch								
	836.50	13.16	V	1.1	-1.4	10.67	38.5	-27.8	
	836.50	19.41	H	1.1	-1.4	16.92	38.5	-21.5	
	High Ch								
	846.50	12.18	V	1.6	-1.3	9.30	38.5	-29.1	
	846.50	19.62	H	1.6	-1.3	16.74	38.5	-21.7	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									
LTE Band 5 5MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 5MHz FUND 16QAM								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	826.50	11.26	V	1.1	-1.5	8.66	38.5	-29.8	
	826.50	18.28	H	1.1	-1.5	15.68	38.5	-22.8	
	Mid Ch								
	836.50	12.17	V	1.1	-1.4	9.68	38.5	-28.8	
	836.50	18.45	H	1.1	-1.4	15.96	38.5	-22.5	
	High Ch								
	846.50	11.19	V	1.1	-1.3	8.81	38.5	-29.6	
	846.50	18.67	H	1.1	-1.3	16.29	38.5	-22.2	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

LTE Band 5 3MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 3MHz FUND QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	825.50	11.80	V	1.1	-1.5	9.20	38.5	-29.3	
	825.50	19.36	H	1.1	-1.5	16.76	38.5	-21.7	
	Mid Ch								
	836.50	12.85	V	1.1	-1.4	10.36	38.5	-28.1	
	836.50	18.71	H	1.1	-1.4	16.22	38.5	-22.2	
	High Ch								
	847.50	13.87	V	1.6	-1.3	10.99	38.5	-27.5	
	847.50	19.79	H	1.6	-1.3	16.91	38.5	-21.5	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								
LTE Band 5 3MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 3MHz FUND 16QAM								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	825.50	10.86	V	1.1	-1.5	8.26	38.5	-30.2	
	825.50	18.37	H	1.1	-1.5	15.77	38.5	-22.7	
	Mid Ch								
	836.50	11.87	V	1.1	-1.4	9.38	38.5	-29.1	
	836.50	17.68	H	1.1	-1.4	15.19	38.5	-23.3	
	High Ch								
	847.50	12.90	V	1.1	-1.3	10.52	38.5	-27.9	
	847.50	18.79	H	1.1	-1.3	16.41	38.5	-22.0	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE Band 5 1.4MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 1.4MHz FUND QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	824.70	10.10	V	1.1	-1.5	7.50	38.5	-31.0	
	824.70	17.24	H	1.1	-1.5	14.64	38.5	-23.8	
	Mid Ch								
	836.50	10.00	V	1.1	-1.4	7.51	38.5	-30.9	
	836.50	17.31	H	1.1	-1.4	14.82	38.5	-23.6	
	High Ch								
	848.30	9.36	V	1.6	-1.3	6.48	38.5	-32.0	
	848.30	17.71	H	1.6	-1.3	14.83	38.5	-23.6	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								
LTE Band 5 1.4MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 01-10-17 Test Engineer: JH Park Configuration: EUT ONLY, X Position Mode: LTE5 1.4MHz FUND 16QAM								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	824.70	9.18	V	1.1	-1.5	6.58	38.5	-31.9	
	824.70	16.43	H	1.1	-1.5	13.83	38.5	-24.6	
	Mid Ch								
	836.50	9.00	V	1.1	-1.4	6.51	38.5	-31.9	
	836.50	16.34	H	1.1	-1.4	13.85	38.5	-24.6	
	High Ch								
	848.30	8.28	V	1.1	-1.3	5.90	38.5	-32.6	
	848.30	16.65	H	1.1	-1.3	14.27	38.5	-24.2	
	Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE Band 5 equipped with keyboard

LTE Band 5 10MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 2								
	Company: Samsung Project #: 4787821360 Date: 02-03-17 Test Engineer: JH Park Configuration: EUT / Keyboard Mode: TX, LTE BAND 5, 10MHz BW,QPSK								
	Test Equipment: Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	829.00	18.39	V	1.1	-1.5	15.81	38.5	-22.6	
	829.00	16.69	H	1.1	-1.5	14.11	38.5	-24.3	
	Mid Ch								
	836.50	19.33	V	1.1	-1.4	16.84	38.5	-21.6	
	836.50	16.45	H	1.1	-1.4	13.96	38.5	-24.5	
	High Ch								
	844.00	17.97	V	1.1	-1.3	15.58	38.5	-22.9	
	844.00	15.71	H	1.1	-1.3	13.29	38.5	-25.2	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

Part 22.917(a) & Part 24.238(a) & Part 27.53(g) - 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.

TEST PROCEDURE

ANSI / TIA / EIA 603D Clause 2.2.12; ESU40 setting reference to 971168 D01 v02r02

- a) Set the RBW = 100 KHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = peak (RMS for average measurement);
- f) Ensure that the number of measurement points $\geq$ span/RBW;
- g) Trace mode = max hold;

RESULTS

11.2.1. SPURIOUS RADIATION PLOTS

WCDMA Band 5

UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4787821360							
Date:		01-09-17							
Test Engineer:		JH Park							
Configuration:		EUT / AC Adapter / Earphone / X Position							
Mode:		Tx, REL99,850MHz							
Chamber		Pre-amplifier		Filter		Limit			
Chamber 2		AFS42		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-18.2	V	3.0	38.2	1.0	-55.5	-13.0	-42.5	
2.4790	-22.1	V	3.0	38.8	1.0	-59.9	-13.0	-46.9	
3.3056	-20.8	V	3.0	39.4	1.0	-59.2	-13.0	-46.2	
1.6520	-19.5	H	3.0	38.2	1.0	-56.7	-13.0	-43.7	
2.4790	-22.5	H	3.0	38.8	1.0	-60.3	-13.0	-47.3	
3.3056	-20.7	H	3.0	39.4	1.0	-59.2	-13.0	-46.2	
Mid Ch, 836.6MHz									
1.6732	-22.9	V	3.0	38.2	1.0	-60.1	-13.0	-47.1	
2.5098	-11.1	V	3.0	38.8	1.0	-49.0	-13.0	-36.0	
3.3464	-20.5	V	3.0	39.5	1.0	-59.0	-13.0	-46.0	
1.6732	-24.0	H	3.0	38.2	1.0	-61.2	-13.0	-48.2	
2.5098	-4.2	H	3.0	38.8	1.0	-42.0	-13.0	-29.0	
3.3464	-20.5	H	3.0	39.5	1.0	-59.0	-13.0	-46.0	
High Ch, 846.6MHz									
1.6932	-14.6	V	3.0	38.2	1.0	-51.9	-13.0	-38.9	
2.5390	-16.6	V	3.0	38.9	1.0	-54.5	-13.0	-41.5	
3.3860	-20.1	V	3.0	39.5	1.0	-58.6	-13.0	-45.6	
1.6932	-16.4	H	3.0	38.2	1.0	-53.7	-13.0	-40.7	
2.5390	-10.1	H	3.0	38.9	1.0	-47.9	-13.0	-34.9	
3.3860	-20.3	H	3.0	39.5	1.0	-58.8	-13.0	-45.8	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4787821360							
Date:		01-09-17							
Test Engineer:		JH Park							
Configuration:		EUT / AC Adapter / Earphone / X Position							
Mode:		Tx, HSDPA,850MHz							
Chamber		Pre-amplifier		Filter		Limit			
Chamber 2		AFS42		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-19.3	V	3.0	38.2	1.0	-56.5	-13.0	-43.5	
2.4790	-22.1	V	3.0	38.8	1.0	-59.9	-13.0	-46.9	
3.3056	-20.8	V	3.0	39.4	1.0	-59.3	-13.0	-46.3	
1.6520	-20.3	H	3.0	38.2	1.0	-57.5	-13.0	-44.5	
2.4790	-22.7	H	3.0	38.8	1.0	-60.5	-13.0	-47.5	
3.3056	-20.9	H	3.0	39.4	1.0	-59.4	-13.0	-46.4	
Mid Ch, 836.6MHz									
1.6732	-24.3	V	3.0	38.2	1.0	-61.5	-13.0	-48.5	
2.5098	-12.4	V	3.0	38.8	1.0	-50.3	-13.0	-37.3	
3.3464	-20.8	V	3.0	39.5	1.0	-59.2	-13.0	-46.2	
1.6732	-23.9	H	3.0	38.2	1.0	-61.1	-13.0	-48.1	
2.5098	-6.2	H	3.0	38.8	1.0	-44.1	-13.0	-31.1	
3.3464	-20.9	H	3.0	39.5	1.0	-59.3	-13.0	-46.3	
High Ch, 846.6MHz									
1.6932	-16.1	V	3.0	38.2	1.0	-53.3	-13.0	-40.3	
2.5390	-16.6	V	3.0	38.9	1.0	-54.5	-13.0	-41.5	
3.3860	-20.8	V	3.0	39.5	1.0	-59.3	-13.0	-46.3	
1.6932	-18.3	H	3.0	38.2	1.0	-55.6	-13.0	-42.6	
2.5390	-12.9	H	3.0	38.9	1.0	-50.7	-13.0	-37.7	
3.3860	-20.7	H	3.0	39.5	1.0	-59.2	-13.0	-46.2	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

WCDMA Band 5 equipped with keyboard

UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement											
WCDMA Band 5 REL99		Company: Samsung Project #: 4787821360 Date: 02-03-17 Test Engineer: JH Park Configuration: EUT / AC Adapter / Earphone / Keyboard Mode: Tx, REL99,850MHz									
		Chamber		Pre-amplifier		Filter		Limit			
		Chamber 2		AFS42		Filter 1		Part 22			
		f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Low Ch, 826.40MHz									
		1.6520	-19.1	V	3.0	38.2	1.0	-56.4	-13.0	-43.4	
		2.4790	-20.3	V	3.0	38.8	1.0	-58.1	-13.0	-45.1	
		3.3056	-20.8	V	3.0	39.4	1.0	-59.3	-13.0	-46.3	
		1.6520	-16.8	H	3.0	38.2	1.0	-54.0	-13.0	-41.0	
		2.4790	-21.0	H	3.0	38.8	1.0	-58.8	-13.0	-45.8	
3.3056	-21.0	H	3.0	39.4	1.0	-59.4	-13.0	-46.4			
Mid Ch, 836.6MHz											
1.6732	-21.6	V	3.0	38.2	1.0	-58.9	-13.0	-45.9			
2.5098	-7.5	V	3.0	38.8	1.0	-45.4	-13.0	-32.4			
3.3464	-19.9	V	3.0	39.5	1.0	-58.3	-13.0	-45.3			
1.6732	-22.2	H	3.0	38.2	1.0	-59.5	-13.0	-46.5			
2.5098	-4.4	H	3.0	38.8	1.0	-42.3	-13.0	-29.3			
3.3464	-20.6	H	3.0	39.5	1.0	-59.1	-13.0	-46.1			
High Ch, 846.6MHz											
1.6932	-14.1	V	3.0	38.2	1.0	-51.3	-13.0	-38.3			
2.5390	-18.7	V	3.0	38.9	1.0	-56.6	-13.0	-43.6			
3.3860	-20.8	V	3.0	39.5	1.0	-59.3	-13.0	-46.3			
1.6932	-16.2	H	3.0	38.2	1.0	-53.5	-13.0	-40.5			
2.5390	-12.5	H	3.0	38.9	1.0	-50.3	-13.0	-37.3			
3.3860	-20.8	H	3.0	39.5	1.0	-59.3	-13.0	-46.3			
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.											