

5.4 99% and -26 dB Occupied Bandwidth

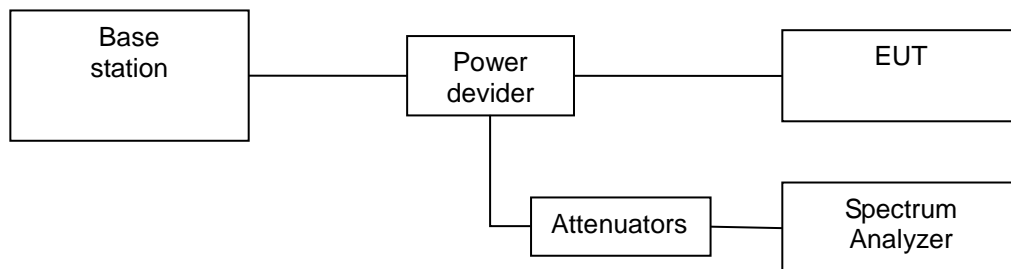
5.4.1 Limit

N/A

5.4.2 Test procedure

1. The EUT' RF output port was connected to Spectrum Analyzer and Base Station via power divider.
2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth

5.4.3 Test setup



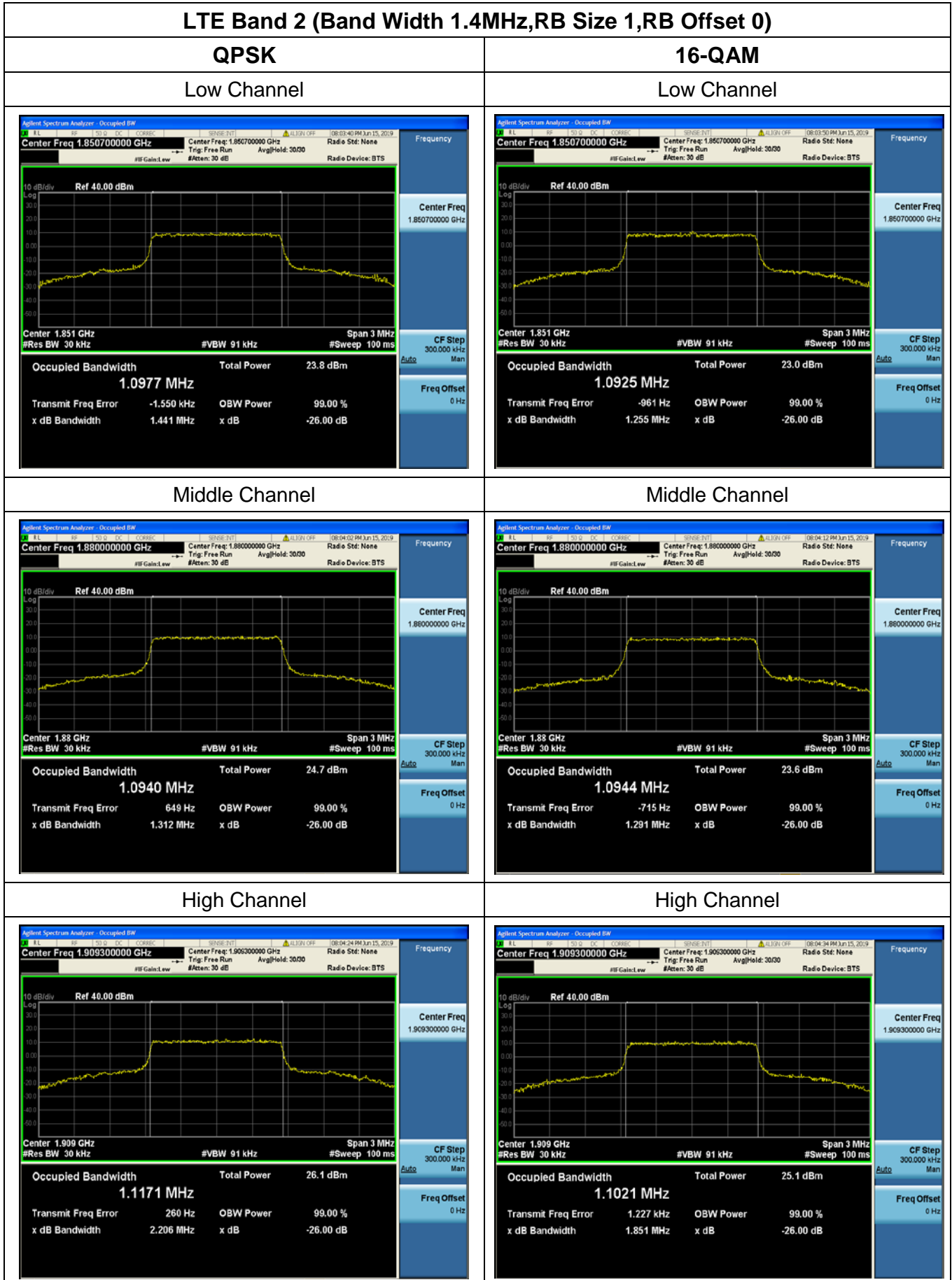
5.4.4 Test results

Note1: all modes of RB configurations have been tested, and only worst configuration data listed.

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band2	1.4MHz	QPSK	18607	6RB#0	1.0977	1.441	PASS
Band2	1.4MHz	QPSK	18900	6RB#0	1.0940	1.312	PASS
Band2	1.4MHz	QPSK	19193	6RB#0	1.1171	2.206	PASS
Band2	1.4MHz	16QAM	18607	6RB#0	1.0925	1.255	PASS
Band2	1.4MHz	16QAM	18900	6RB#0	1.0944	1.291	PASS
Band2	1.4MHz	16QAM	19193	6RB#0	1.1021	1.851	PASS
Band2	3MHz	QPSK	18615	15RB#0	2.7009	2.918	PASS
Band2	3MHz	QPSK	18900	15RB#0	2.7050	2.997	PASS
Band2	3MHz	QPSK	19185	15RB#0	2.7123	4.334	PASS
Band2	3MHz	16QAM	18615	15RB#0	2.7024	2.939	PASS
Band2	3MHz	16QAM	18900	15RB#0	2.6976	2.923	PASS
Band2	3MHz	16QAM	19185	15RB#0	2.7060	3.077	PASS
Band2	5MHz	QPSK	18625	25RB#0	4.5094	5.453	PASS
Band2	5MHz	QPSK	18900	25RB#0	4.5154	4.967	PASS
Band2	5MHz	QPSK	19175	25RB#0	4.5359	6.382	PASS
Band2	5MHz	16QAM	18625	25RB#0	4.5251	5.078	PASS
Band2	5MHz	16QAM	18900	25RB#0	4.5162	4.975	PASS
Band2	5MHz	16QAM	19175	25RB#0	4.5274	5.045	PASS
Band2	10MHz	QPSK	18650	50RB#0	9.0059	10.37	PASS
Band2	10MHz	QPSK	18900	50RB#0	9.0074	9.823	PASS
Band2	10MHz	QPSK	19150	50RB#0	9.0208	11.35	PASS
Band4	1.4MHz	QPSK	19957	6RB#0	1.0930	1.247	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	1.0936	1.237	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	1.0993	1.267	PASS
Band4	1.4MHz	16QAM	19957	6RB#0	1.0896	1.254	PASS
Band4	1.4MHz	16QAM	20175	6RB#0	1.0931	1.261	PASS
Band4	1.4MHz	16QAM	20393	6RB#0	1.0921	1.248	PASS
Band4	3MHz	QPSK	19965	15RB#0	2.6959	2.887	PASS
Band4	3MHz	QPSK	20175	15RB#0	2.6958	2.877	PASS
Band4	3MHz	QPSK	20385	15RB#0	2.7016	2.908	PASS
Band4	3MHz	16QAM	19965	15RB#0	2.6942	2.894	PASS
Band4	3MHz	16QAM	20175	15RB#0	2.6903	2.902	PASS
Band4	3MHz	16QAM	20385	15RB#0	2.6944	2.909	PASS
Band4	5MHz	QPSK	19975	25RB#0	4.5157	4.924	PASS
Band4	5MHz	QPSK	20175	25RB#0	4.5138	4.955	PASS
Band4	5MHz	QPSK	20375	25RB#0	4.5128	4.942	PASS
Band4	5MHz	16QAM	19975	25RB#0	4.5179	4.943	PASS
Band4	5MHz	16QAM	20175	25RB#0	4.5139	4.909	PASS
Band4	5MHz	16QAM	20375	25RB#0	4.5158	4.954	PASS
Band4	10MHz	QPSK	20000	50RB#0	8.9824	9.610	PASS
Band4	10MHz	QPSK	20175	50RB#0	8.9986	9.605	PASS
Band4	10MHz	QPSK	20350	50RB#0	8.9885	9.558	PASS
Band12	1.4MHz	QPSK	23017	6RB#0	1.0931	1.244	PASS
Band12	1.4MHz	QPSK	23095	6RB#0	1.0912	1.236	PASS
Band12	1.4MHz	QPSK	23173	6RB#0	1.0919	1.244	PASS
Band12	1.4MHz	16QAM	23017	6RB#0	1.0905	1.250	PASS
Band12	1.4MHz	16QAM	23095	6RB#0	1.0920	1.254	PASS
Band12	1.4MHz	16QAM	23173	6RB#0	1.0933	1.261	PASS
Band12	3MHz	QPSK	23025	15RB#0	2.6940	2.892	PASS
Band12	3MHz	QPSK	23095	15RB#0	2.6981	2.901	PASS
Band12	3MHz	QPSK	23165	15RB#0	2.7061	2.899	PASS
Band12	3MHz	16QAM	23025	15RB#0	2.6958	2.902	PASS
Band12	3MHz	16QAM	23095	15RB#0	2.6930	2.893	PASS
Band12	3MHz	16QAM	23165	15RB#0	2.7000	2.910	PASS
Band12	5MHz	QPSK	23035	25RB#0	4.5124	4.893	PASS

Band12	5MHz	QPSK	23095	25RB#0	4.5037	4.898	PASS
Band12	5MHz	QPSK	23155	25RB#0	4.5257	4.893	PASS
Band12	5MHz	16QAM	23035	25RB#0	4.5173	4.925	PASS
Band12	5MHz	16QAM	23095	25RB#0	4.5122	4.922	PASS
Band12	5MHz	16QAM	23155	25RB#0	4.5264	4.907	PASS
Band12	10MHz	QPSK	23060	50RB#0	9.0268	9.602	PASS
Band12	10MHz	QPSK	23095	50RB#0	8.9821	9.522	PASS
Band12	10MHz	QPSK	23130	50RB#0	8.9708	9.515	PASS

Test plots



LTE Band 2 (Band Width 3MHz,RB Size 1,RB Offset 0)	
QPSK	16-QAM
Low Channel	Low Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.851500000 GHz</p> <p>Center Freq: 1.851500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 3000</p> <p>Radio St: None</p> <p>Radio Device: BTS</p> <p>Ref 40.00 dBm</p> <p>Center Freq: 1.851500000 GHz</p> <p>Center: 1.852 GHz</p> <p>#Res BW: 51 kHz</p> <p>#VBW: 150 kHz</p> <p>Span: 6 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 600.000 kHz</p> <p>Auto Man</p> <p>Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 2.7009 MHz</p> <p>Total Power: 23.2 dBm</p> <p>Transmit Freq Error: -480 Hz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.918 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.851500000 GHz</p> <p>Center Freq: 1.851500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 3000</p> <p>Radio St: None</p> <p>Radio Device: BTS</p> <p>Ref 40.00 dBm</p> <p>Center Freq: 1.851500000 GHz</p> <p>Center: 1.852 GHz</p> <p>#Res BW: 51 kHz</p> <p>#VBW: 150 kHz</p> <p>Span: 6 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 600.000 kHz</p> <p>Auto Man</p> <p>Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 2.7024 MHz</p> <p>Total Power: 22.4 dBm</p> <p>Transmit Freq Error: -615 Hz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.939 MHz</p>
Middle Channel	Middle Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.880000000 GHz</p> <p>Center Freq: 1.880000000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 3000</p> <p>Radio St: None</p> <p>Radio Device: BTS</p> <p>Ref 40.00 dBm</p> <p>Center Freq: 1.880000000 GHz</p> <p>Center: 1.88 GHz</p> <p>#Res BW: 51 kHz</p> <p>#VBW: 150 kHz</p> <p>Span: 6 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 600.000 kHz</p> <p>Auto Man</p> <p>Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 2.7050 MHz</p> <p>Total Power: 24.2 dBm</p> <p>Transmit Freq Error: 1.617 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.997 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.880000000 GHz</p> <p>Center Freq: 1.880000000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 3000</p> <p>Radio St: None</p> <p>Radio Device: BTS</p> <p>Ref 40.00 dBm</p> <p>Center Freq: 1.880000000 GHz</p> <p>Center: 1.88 GHz</p> <p>#Res BW: 51 kHz</p> <p>#VBW: 150 kHz</p> <p>Span: 6 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 600.000 kHz</p> <p>Auto Man</p> <p>Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 2.6976 MHz</p> <p>Total Power: 23.0 dBm</p> <p>Transmit Freq Error: -1.394 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 2.923 MHz</p>
High Channel	High Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.908500000 GHz</p> <p>Center Freq: 1.908500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 3000</p> <p>Radio St: None</p> <p>Radio Device: BTS</p> <p>Ref 40.00 dBm</p> <p>Center Freq: 1.908500000 GHz</p> <p>Center: 1.909 GHz</p> <p>#Res BW: 51 kHz</p> <p>#VBW: 150 kHz</p> <p>Span: 6 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 600.000 kHz</p> <p>Auto Man</p> <p>Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 2.7123 MHz</p> <p>Total Power: 25.3 dBm</p> <p>Transmit Freq Error: 1.965 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.334 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.908500000 GHz</p> <p>Center Freq: 1.908500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 3000</p> <p>Radio St: None</p> <p>Radio Device: BTS</p> <p>Ref 40.00 dBm</p> <p>Center Freq: 1.908500000 GHz</p> <p>Center: 1.909 GHz</p> <p>#Res BW: 51 kHz</p> <p>#VBW: 150 kHz</p> <p>Span: 6 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 600.000 kHz</p> <p>Auto Man</p> <p>Freq Offset: 0 Hz</p> <p>Occupied Bandwidth: 2.7060 MHz</p> <p>Total Power: 24.4 dBm</p> <p>Transmit Freq Error: -504 Hz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 3.077 MHz</p>

LTE Band 2 (Band Width 5MHz,RB Size 1,RB Offset 0)	
QPSK	16-QAM
Low Channel	Low Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.852500000 GHz Center Freq: 1.852500000 GHz Radio Std: None Frequency</p> <p>Trig: Free Run AvgHld: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center Freq: 1.852500000 GHz</p> <p>Center: 1.853 GHz Span 10 MHz CF Step: 1.000000 MHz #Res BW: 100 kHz #VBW: 300 kHz #Sweep: 100 ms</p> <p>Occupied Bandwidth: 4.5094 MHz Total Power: 22.6 dBm</p> <p>Transmit Freq Error: -5.347 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 5.453 MHz x dB: -26.00 dB</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.852500000 GHz Center Freq: 1.852500000 GHz Radio Std: None Frequency</p> <p>Trig: Free Run AvgHld: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center Freq: 1.852500000 GHz</p> <p>Center: 1.853 GHz Span 10 MHz CF Step: 1.000000 MHz #Res BW: 100 kHz #VBW: 300 kHz #Sweep: 100 ms</p> <p>Occupied Bandwidth: 4.5251 MHz Total Power: 23.1 dBm</p> <p>Transmit Freq Error: -3.141 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 5.078 MHz x dB: -26.00 dB</p>
Middle Channel	Middle Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.880000000 GHz Center Freq: 1.880000000 GHz Radio Std: None Frequency</p> <p>Trig: Free Run AvgHld: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center Freq: 1.880000000 GHz</p> <p>Center: 1.88 GHz Span 10 MHz CF Step: 1.000000 MHz #Res BW: 100 kHz #VBW: 300 kHz #Sweep: 100 ms</p> <p>Occupied Bandwidth: 4.5154 MHz Total Power: 24.4 dBm</p> <p>Transmit Freq Error: 3.247 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.967 MHz x dB: -26.00 dB</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.880000000 GHz Center Freq: 1.880000000 GHz Radio Std: None Frequency</p> <p>Trig: Free Run AvgHld: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center Freq: 1.880000000 GHz</p> <p>Center: 1.88 GHz Span 10 MHz CF Step: 1.000000 MHz #Res BW: 100 kHz #VBW: 300 kHz #Sweep: 100 ms</p> <p>Occupied Bandwidth: 4.5162 MHz Total Power: 23.3 dBm</p> <p>Transmit Freq Error: 547 Hz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.975 MHz x dB: -26.00 dB</p>
High Channel	High Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.907500000 GHz Center Freq: 1.907500000 GHz Radio Std: None Frequency</p> <p>Trig: Free Run AvgHld: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center Freq: 1.907500000 GHz</p> <p>Center: 1.908 GHz Span 10 MHz CF Step: 1.000000 MHz #Res BW: 100 kHz #VBW: 300 kHz #Sweep: 100 ms</p> <p>Occupied Bandwidth: 4.5359 MHz Total Power: 25.6 dBm</p> <p>Transmit Freq Error: -2.237 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 6.382 MHz x dB: -26.00 dB</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.907500000 GHz Center Freq: 1.907500000 GHz Radio Std: None Frequency</p> <p>Trig: Free Run AvgHld: 100/100 #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center Freq: 1.907500000 GHz</p> <p>Center: 1.908 GHz Span 10 MHz CF Step: 1.000000 MHz #Res BW: 100 kHz #VBW: 300 kHz #Sweep: 100 ms</p> <p>Occupied Bandwidth: 4.5274 MHz Total Power: 24.7 dBm</p> <p>Transmit Freq Error: 3.119 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 5.045 MHz x dB: -26.00 dB</p>

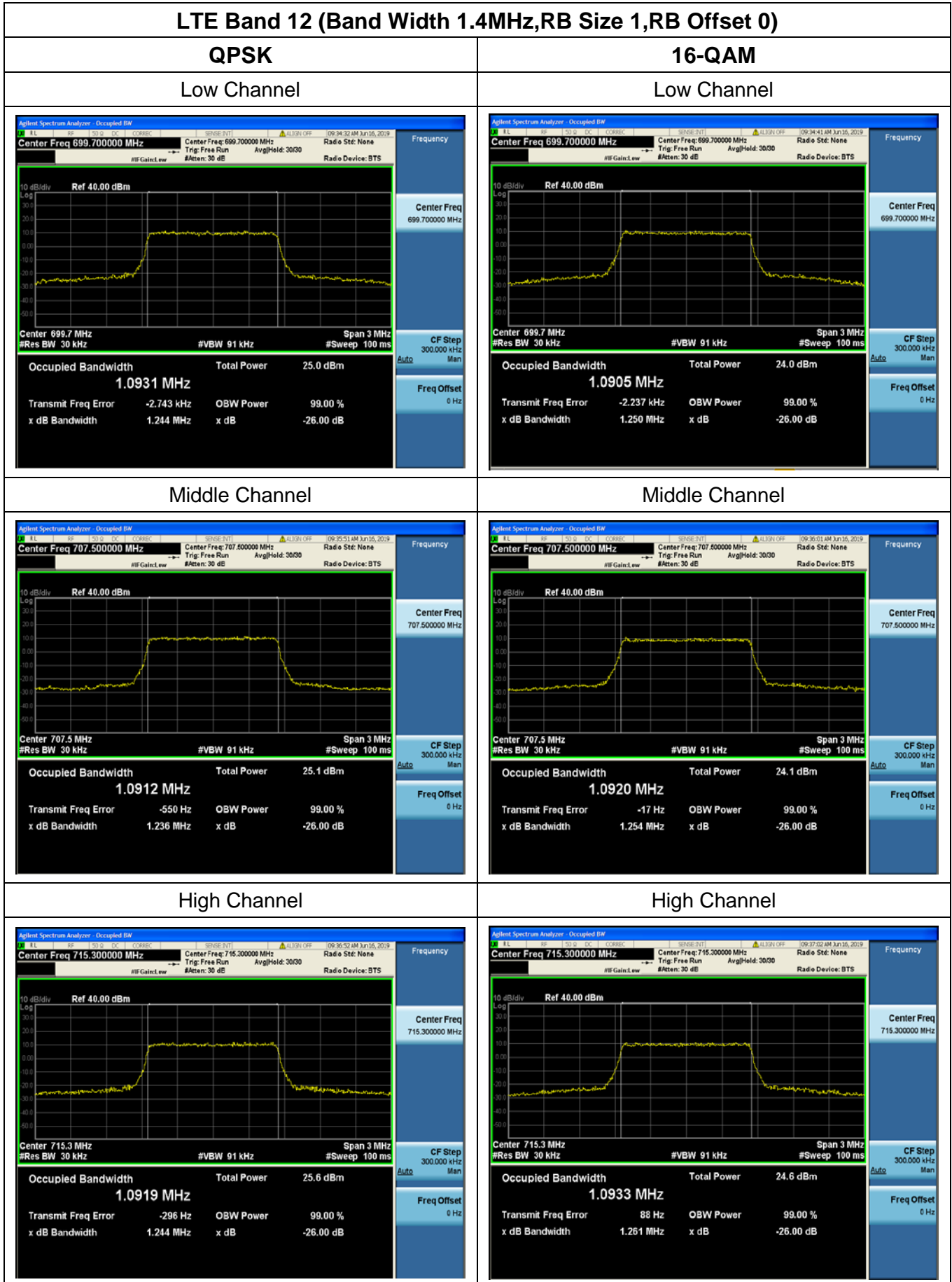
LTE Band 2 (Band Width 10MHz,RB Size 1,RB Offset 0)	
QPSK	--
Low Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.855000000 GHz Center Freq: 1.855000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 30/30</p> <p>Ref 40.00 dBm</p> <p>Center 1.855 GHz Span 20 MHz</p> <p>#Res BW 200 kHz #VBW 620 kHz #Sweep 100 ms</p> <p>Occupied Bandwidth Total Power 22.1 dBm</p> <p>9.0059 MHz</p> <p>Transmit Freq Error -8.830 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 10.37 MHz x dB -26.00 dB</p>	--
Middle Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.880000000 GHz Center Freq: 1.880000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 30/30</p> <p>Ref 40.00 dBm</p> <p>Center 1.88 GHz Span 20 MHz</p> <p>#Res BW 200 kHz #VBW 620 kHz #Sweep 100 ms</p> <p>Occupied Bandwidth Total Power 23.0 dBm</p> <p>9.0074 MHz</p> <p>Transmit Freq Error -205 Hz OBW Power 99.00 %</p> <p>x dB Bandwidth 9.823 MHz x dB -26.00 dB</p>	--
High Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.905000000 GHz Center Freq: 1.905000000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 30/30</p> <p>Ref 40.00 dBm</p> <p>Center 1.905 GHz Span 20 MHz</p> <p>#Res BW 200 kHz #VBW 620 kHz #Sweep 100 ms</p> <p>Occupied Bandwidth Total Power 23.6 dBm</p> <p>9.0208 MHz</p> <p>Transmit Freq Error 6.496 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 11.35 MHz x dB -26.00 dB</p>	--

LTE Band 4 (Band Width 1.4MHz, RB Size 1, RB Offset 0)	
QPSK	16-QAM
Low Channel	Low Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.710700000 GHz</p> <p>Occupied Bandwidth: 1.0930 MHz</p> <p>Total Power: 24.2 dBm</p> <p>Transmit Freq Error: -1.246 kHz</p> <p>OBW Power: 99.00%</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.710700000 GHz</p> <p>Occupied Bandwidth: 1.0896 MHz</p> <p>Total Power: 23.1 dBm</p> <p>Transmit Freq Error: -1.658 kHz</p> <p>OBW Power: 99.00%</p>
Middle Channel	Middle Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Occupied Bandwidth: 1.0936 MHz</p> <p>Total Power: 24.2 dBm</p> <p>Transmit Freq Error: -1.763 kHz</p> <p>OBW Power: 99.00%</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Occupied Bandwidth: 1.0931 MHz</p> <p>Total Power: 23.1 dBm</p> <p>Transmit Freq Error: -709 Hz</p> <p>OBW Power: 99.00%</p>
High Channel	High Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.754300000 GHz</p> <p>Occupied Bandwidth: 1.0993 MHz</p> <p>Total Power: 25.4 dBm</p> <p>Transmit Freq Error: -1.281 kHz</p> <p>OBW Power: 99.00%</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.754300000 GHz</p> <p>Occupied Bandwidth: 1.0921 MHz</p> <p>Total Power: 24.3 dBm</p> <p>Transmit Freq Error: -1.483 kHz</p> <p>OBW Power: 99.00%</p>

LTE Band 4 (Band Width 3MHz, RB Size 1, RB Offset 0)	
QPSK	16-QAM
Low Channel	Low Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.711500000 GHz</p> <p>Occupied Bandwidth: 2.6959 MHz</p> <p>Total Power: 23.7 dBm</p> <p>Transmit Freq Error: 2.671 kHz</p> <p>x dB Bandwidth: 2.887 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.711500000 GHz</p> <p>Occupied Bandwidth: 2.6942 MHz</p> <p>Total Power: 22.7 dBm</p> <p>Transmit Freq Error: -978 Hz</p> <p>x dB Bandwidth: 2.894 MHz</p>
Middle Channel	Middle Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Occupied Bandwidth: 2.6958 MHz</p> <p>Total Power: 23.7 dBm</p> <p>Transmit Freq Error: 3.003 kHz</p> <p>x dB Bandwidth: 2.877 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Occupied Bandwidth: 2.6903 MHz</p> <p>Total Power: 22.7 dBm</p> <p>Transmit Freq Error: -1.156 kHz</p> <p>x dB Bandwidth: 2.902 MHz</p>
High Channel	High Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.753500000 GHz</p> <p>Occupied Bandwidth: 2.7016 MHz</p> <p>Total Power: 24.8 dBm</p> <p>Transmit Freq Error: 715 Hz</p> <p>x dB Bandwidth: 2.908 MHz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.753500000 GHz</p> <p>Occupied Bandwidth: 2.6944 MHz</p> <p>Total Power: 23.7 dBm</p> <p>Transmit Freq Error: -3.344 kHz</p> <p>x dB Bandwidth: 2.909 MHz</p>

LTE Band 4 (Band Width 5MHz,RB Size 1,RB Offset 0)	
QPSK	16-QAM
Low Channel	Low Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.712500000 GHz</p> <p>Center Freq: 1.712500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 100/100</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm</p> <p>Center Freq: 1.712500000 GHz</p> <p>Center: 1.713 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 10 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 1.000000 MHz</p> <p>Auto Man</p> <p>Occupied Bandwidth: 4.5157 MHz</p> <p>Total Power: 23.9 dBm</p> <p>Transmit Freq Error: 885 Hz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.924 MHz</p> <p>x dB: -26.00 dB</p> <p>Freq Offset: 0 Hz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.712500000 GHz</p> <p>Center Freq: 1.712500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 100/100</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm</p> <p>Center Freq: 1.712500000 GHz</p> <p>Center: 1.713 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 10 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 1.000000 MHz</p> <p>Auto Man</p> <p>Occupied Bandwidth: 4.5179 MHz</p> <p>Total Power: 23.0 dBm</p> <p>Transmit Freq Error: -441 Hz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.943 MHz</p> <p>x dB: -26.00 dB</p> <p>Freq Offset: 0 Hz</p>
Middle Channel	Middle Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Center Freq: 1.732500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 100/100</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm</p> <p>Center Freq: 1.732500000 GHz</p> <p>Center: 1.733 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 10 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 1.000000 MHz</p> <p>Auto Man</p> <p>Occupied Bandwidth: 4.5138 MHz</p> <p>Total Power: 23.6 dBm</p> <p>Transmit Freq Error: -3.063 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.955 MHz</p> <p>x dB: -26.00 dB</p> <p>Freq Offset: 0 Hz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Center Freq: 1.732500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 100/100</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm</p> <p>Center Freq: 1.732500000 GHz</p> <p>Center: 1.733 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 10 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 1.000000 MHz</p> <p>Auto Man</p> <p>Occupied Bandwidth: 4.5139 MHz</p> <p>Total Power: 22.7 dBm</p> <p>Transmit Freq Error: -6.284 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.909 MHz</p> <p>x dB: -26.00 dB</p> <p>Freq Offset: 0 Hz</p>
High Channel	High Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.752500000 GHz</p> <p>Center Freq: 1.752500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 100/100</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm</p> <p>Center Freq: 1.752500000 GHz</p> <p>Center: 1.753 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 10 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 1.000000 MHz</p> <p>Auto Man</p> <p>Occupied Bandwidth: 4.5128 MHz</p> <p>Total Power: 25.0 dBm</p> <p>Transmit Freq Error: 3.543 kHz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.942 MHz</p> <p>x dB: -26.00 dB</p> <p>Freq Offset: 0 Hz</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.752500000 GHz</p> <p>Center Freq: 1.752500000 GHz</p> <p>Trig: Free Run</p> <p>AvgHld: 100/100</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm</p> <p>Center Freq: 1.752500000 GHz</p> <p>Center: 1.753 GHz</p> <p>#Res BW: 100 kHz</p> <p>#VBW: 300 kHz</p> <p>Span: 10 MHz</p> <p>#Sweep: 100 ms</p> <p>CF Step: 1.000000 MHz</p> <p>Auto Man</p> <p>Occupied Bandwidth: 4.5158 MHz</p> <p>Total Power: 24.0 dBm</p> <p>Transmit Freq Error: -203 Hz</p> <p>OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.954 MHz</p> <p>x dB: -26.00 dB</p> <p>Freq Offset: 0 Hz</p>

LTE Band 4 (Band Width 10MHz,RB Size 1,RB Offset 0)	
QPSK	--
Low Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.715000000 GHz</p> <p>Occupied Bandwidth: 8.9824 MHz</p> <p>Total Power: 22.5 dBm</p>	--
Middle Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz</p> <p>Occupied Bandwidth: 8.9986 MHz</p> <p>Total Power: 22.3 dBm</p>	--
High Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.750000000 GHz</p> <p>Occupied Bandwidth: 8.9885 MHz</p> <p>Total Power: 23.6 dBm</p>	--



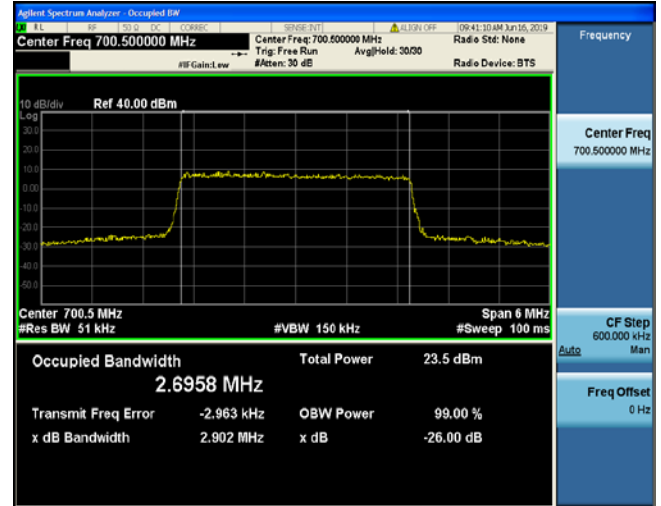
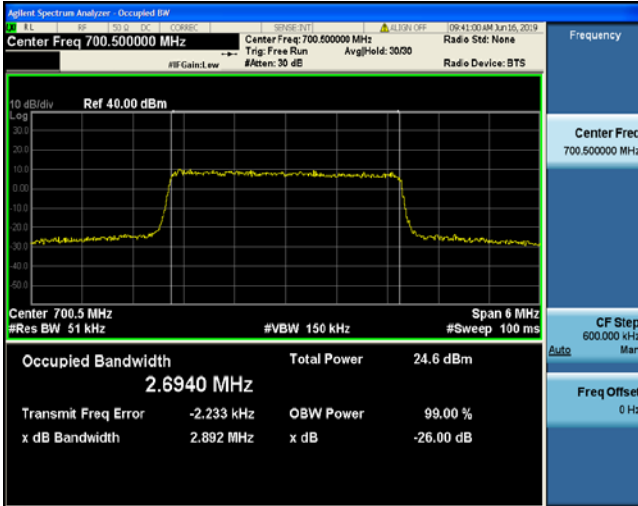
LTE Band 12 (Band Width 3MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

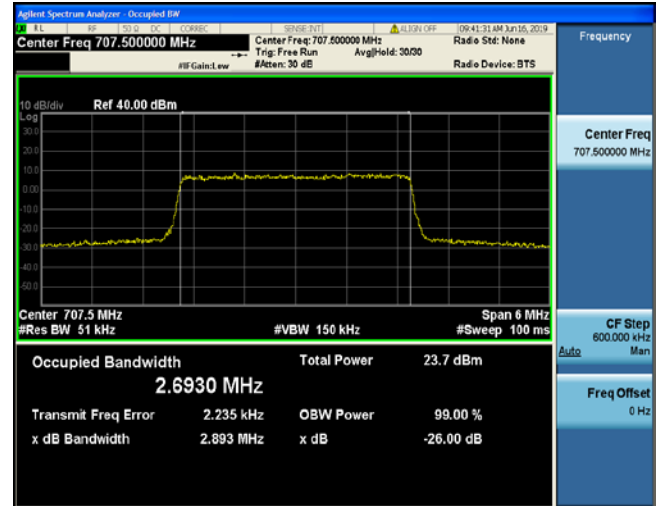
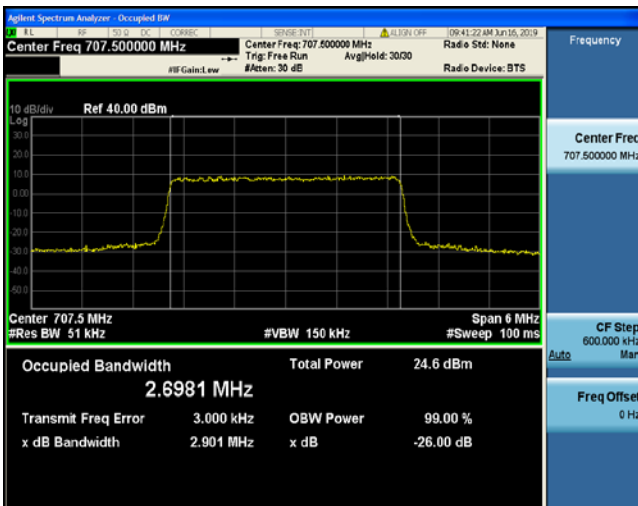
Low Channel

Low Channel



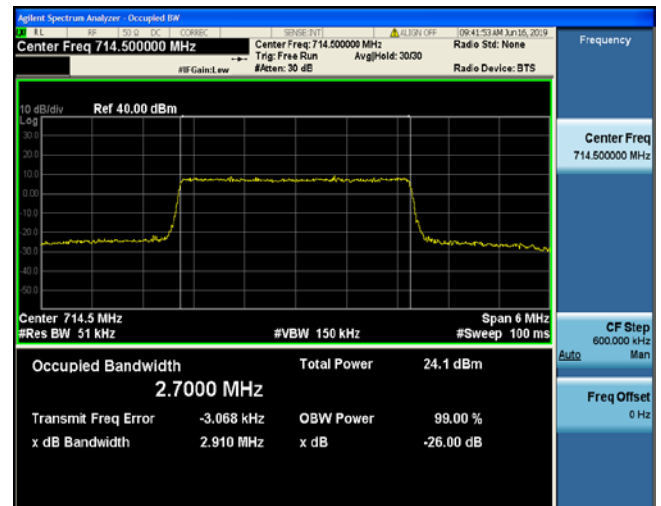
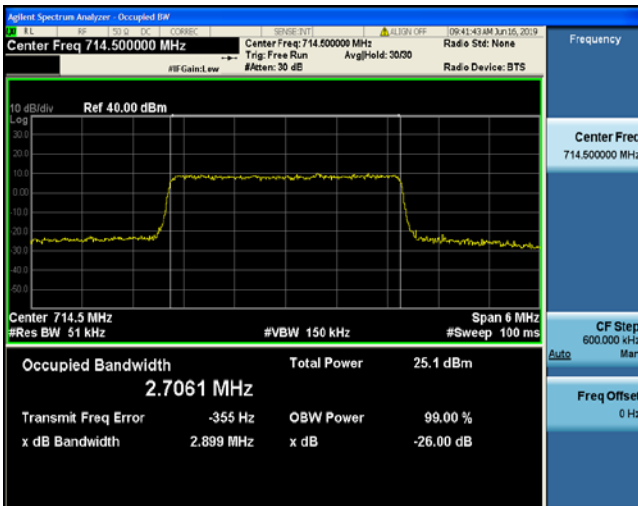
Middle Channel

Middle Channel



High Channel

High Channel



LTE Band 12 (Band Width 5MHz, RB Size 1, RB Offset 0)	
QPSK	16-QAM
Low Channel	Low Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 701.500000 MHz Center Freq: 701.500000 MHz Radio St: None Frequency</p> <p>Trig: Free Run AvgHold: 100/100 Radio Device: BTS</p> <p>Ref: 40.00 dBm</p> <p>Center Freq: 701.500000 MHz</p> <p>Center 701.5 MHz Span 10 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz #Sweep 100 ms</p> <p>CF Step 1.000000 MHz</p> <p>Occupied Bandwidth: 4.5124 MHz Total Power: 24.8 dBm</p> <p>Transmit Freq Error: -10.629 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.893 MHz x dB: -26.00 dB</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 701.500000 MHz Center Freq: 701.500000 MHz Radio St: None Frequency</p> <p>Trig: Free Run AvgHold: 100/100 Radio Device: BTS</p> <p>Ref: 40.00 dBm</p> <p>Center Freq: 701.500000 MHz</p> <p>Center 701.5 MHz Span 10 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz #Sweep 100 ms</p> <p>CF Step 1.000000 MHz</p> <p>Occupied Bandwidth: 4.5173 MHz Total Power: 23.9 dBm</p> <p>Transmit Freq Error: -8.100 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.925 MHz x dB: -26.00 dB</p>
Middle Channel	Middle Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 707.500000 MHz Center Freq: 707.500000 MHz Radio St: None Frequency</p> <p>Trig: Free Run AvgHold: 100/100 Radio Device: BTS</p> <p>Ref: 40.00 dBm</p> <p>Center Freq: 707.500000 MHz</p> <p>Center 707.5 MHz Span 10 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz #Sweep 100 ms</p> <p>CF Step 1.000000 MHz</p> <p>Occupied Bandwidth: 4.5037 MHz Total Power: 24.9 dBm</p> <p>Transmit Freq Error: 6.640 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.898 MHz x dB: -26.00 dB</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 707.500000 MHz Center Freq: 707.500000 MHz Radio St: None Frequency</p> <p>Trig: Free Run AvgHold: 100/100 Radio Device: BTS</p> <p>Ref: 40.00 dBm</p> <p>Center Freq: 707.500000 MHz</p> <p>Center 707.5 MHz Span 10 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz #Sweep 100 ms</p> <p>CF Step 1.000000 MHz</p> <p>Occupied Bandwidth: 4.5122 MHz Total Power: 23.9 dBm</p> <p>Transmit Freq Error: 6.216 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.922 MHz x dB: -26.00 dB</p>
High Channel	High Channel
<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 713.500000 MHz Center Freq: 713.500000 MHz Radio St: None Frequency</p> <p>Trig: Free Run AvgHold: 100/100 Radio Device: BTS</p> <p>Ref: 40.00 dBm</p> <p>Center Freq: 713.500000 MHz</p> <p>Center 713.5 MHz Span 10 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz #Sweep 100 ms</p> <p>CF Step 1.000000 MHz</p> <p>Occupied Bandwidth: 4.5257 MHz Total Power: 25.2 dBm</p> <p>Transmit Freq Error: -12.301 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.893 MHz x dB: -26.00 dB</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 713.500000 MHz Center Freq: 713.500000 MHz Radio St: None Frequency</p> <p>Trig: Free Run AvgHold: 100/100 Radio Device: BTS</p> <p>Ref: 40.00 dBm</p> <p>Center Freq: 713.500000 MHz</p> <p>Center 713.5 MHz Span 10 MHz</p> <p>#Res BW 100 kHz #VBW 300 kHz #Sweep 100 ms</p> <p>CF Step 1.000000 MHz</p> <p>Occupied Bandwidth: 4.5264 MHz Total Power: 24.3 dBm</p> <p>Transmit Freq Error: -2.978 kHz OBW Power: 99.00 %</p> <p>x dB Bandwidth: 4.907 MHz x dB: -26.00 dB</p>

LTE Band 12 (Band Width 10MHz,RB Size 1,RB Offset 0)	
QPSK	--
Low Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 704.000000 MHz Center Freq: 704.000000 MHz Trig: Free Run Avg/Hold: 30/30 Radio St: None Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center 704 MHz #Res BW 200 kHz #VBW 620 kHz Span 20 MHz #Sweep 100 ms</p> <p>Occupied Bandwidth: 9.0268 MHz Total Power: 23.6 dBm Transmit Freq Error: -8.902 kHz OBW Power: 99.00 % x dB Bandwidth: 9.602 MHz x dB: -26.00 dB</p> <p>Center Freq: 704.000000 MHz CF Step: 2.000000 MHz Freq Offset: 0 Hz</p>	--
Middle Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 707.500000 MHz Center Freq: 707.500000 MHz Trig: Free Run Avg/Hold: 30/30 Radio St: None Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center 707.5 MHz #Res BW 200 kHz #VBW 620 kHz Span 20 MHz #Sweep 100 ms</p> <p>Occupied Bandwidth: 8.9821 MHz Total Power: 23.6 dBm Transmit Freq Error: -2.531 kHz OBW Power: 99.00 % x dB Bandwidth: 9.522 MHz x dB: -26.00 dB</p> <p>Center Freq: 707.500000 MHz CF Step: 2.000000 MHz Freq Offset: 0 Hz</p>	--
High Channel	--
<p>Agilent Spectrum Analyzer - Occupied BW Center Freq: 711.000000 MHz Center Freq: 711.000000 MHz Trig: Free Run Avg/Hold: 30/30 Radio St: None Radio Device: BTS</p> <p>10 dB/div Ref 40.00 dBm Log Center 711 MHz #Res BW 200 kHz #VBW 620 kHz Span 20 MHz #Sweep 100 ms</p> <p>Occupied Bandwidth: 8.9708 MHz Total Power: 23.8 dBm Transmit Freq Error: -7.850 kHz OBW Power: 99.00 % x dB Bandwidth: 9.515 MHz x dB: -26.00 dB</p> <p>Center Freq: 711.000000 MHz CF Step: 2.000000 MHz Freq Offset: 0 Hz</p>	--

6 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

6.1.1 Limit

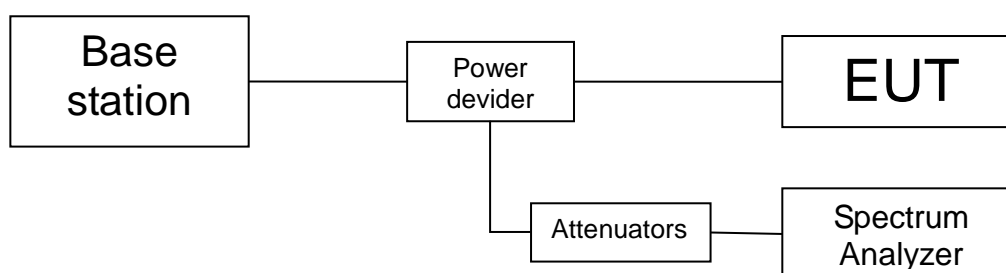
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB (-13 dBm).

Band7: 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.

6.1.2 Test procedure

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.
4. Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

6.1.3 Test setup



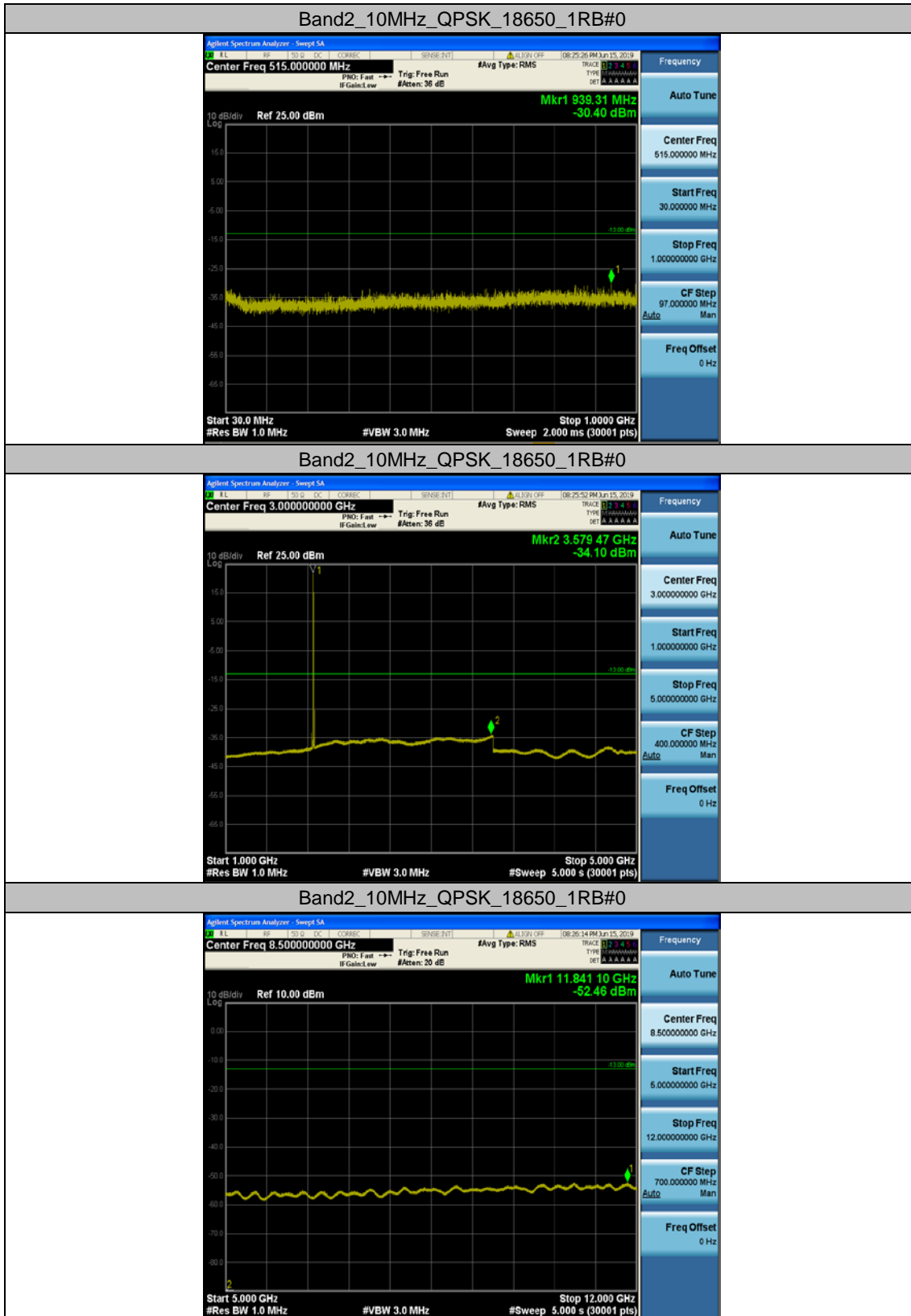
6.1.4 Test results

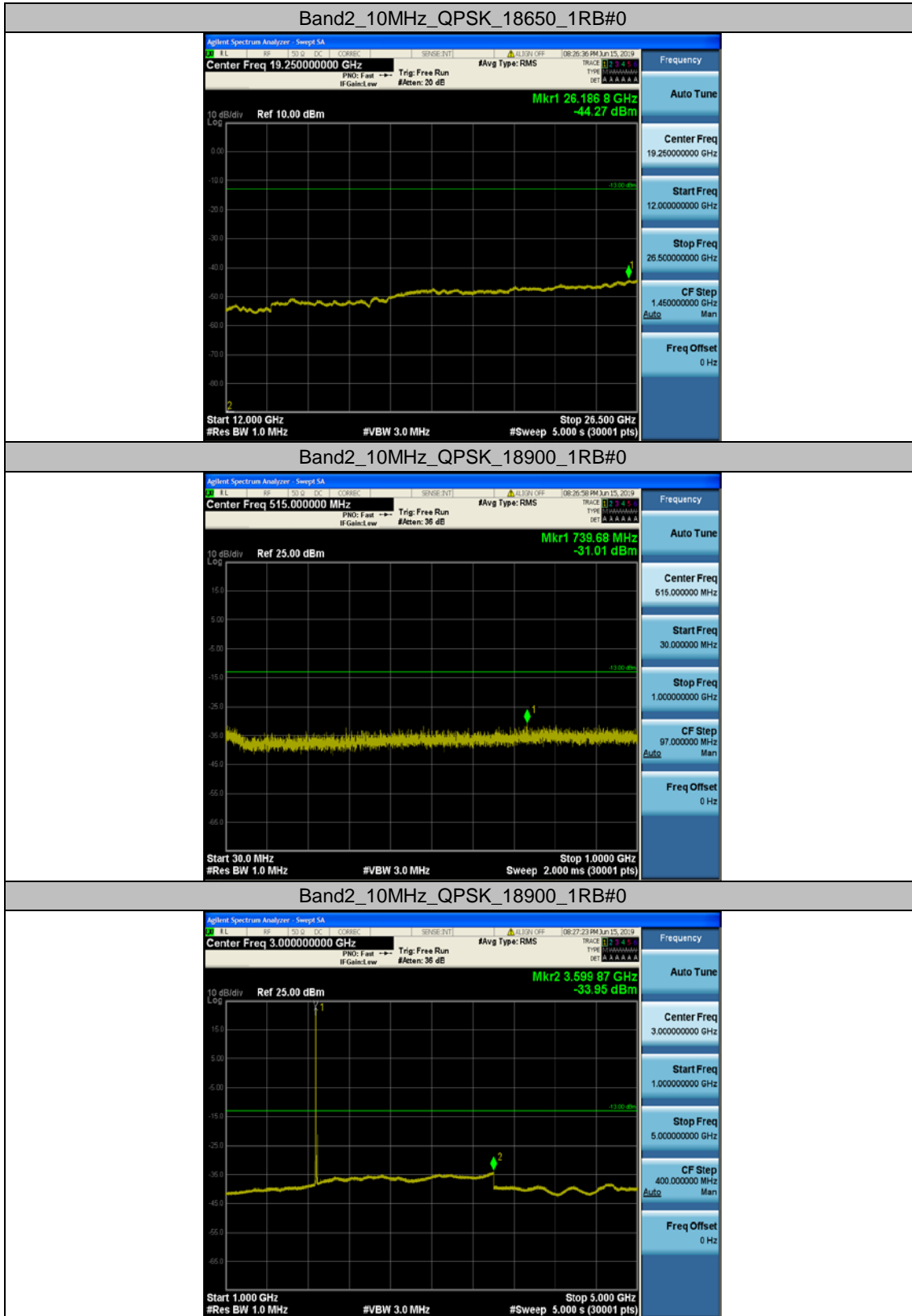
Note: All mode has been tested, only worst data(Middle channel) was shown in this report.

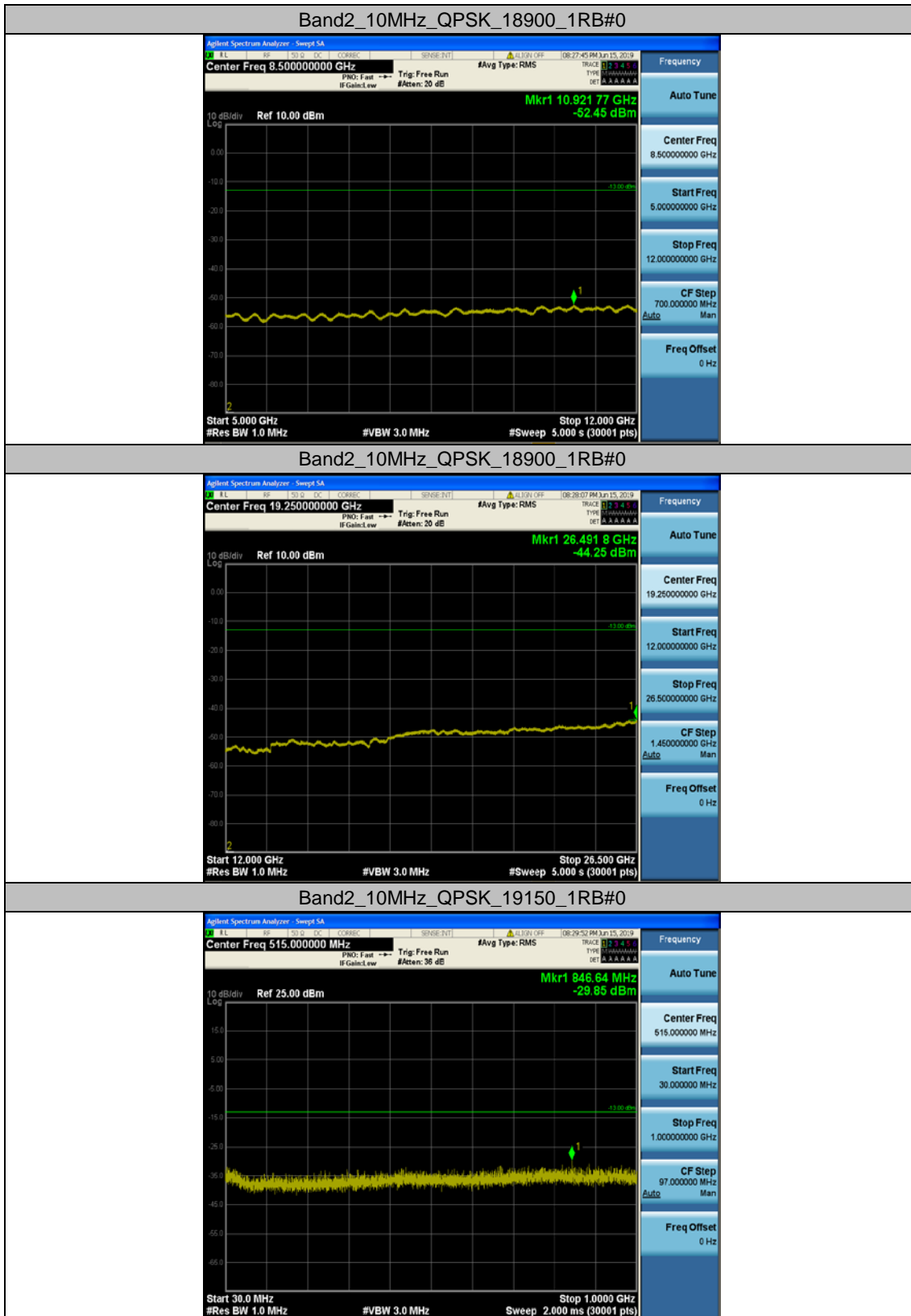
Band	Bandwidth	Modulation	Channel	RB Configuration	Frequency Range	Result (dBm)	Verdict
Band2	10MHz	QPSK	18650	1RB#0	Range3:30~1000MHz	-30.4	PASS
Band2	10MHz	QPSK	18650	1RB#0	Range4:1000~5000MHz	-34.1	PASS
Band2	10MHz	QPSK	18650	1RB#0	Range5:5000~12000MHz	-52.46	PASS
Band2	10MHz	QPSK	18650	1RB#0	Range6:12000~26500MHz	-44.27	PASS
Band2	10MHz	QPSK	18900	1RB#0	Range3:30~1000MHz	-31.01	PASS
Band2	10MHz	QPSK	18900	1RB#0	Range4:1000~5000MHz	-33.95	PASS
Band2	10MHz	QPSK	18900	1RB#0	Range5:5000~12000MHz	-52.45	PASS
Band2	10MHz	QPSK	18900	1RB#0	Range6:12000~26500MHz	-44.25	PASS
Band2	10MHz	QPSK	19150	1RB#0	Range3:30~1000MHz	-29.85	PASS
Band2	10MHz	QPSK	19150	1RB#0	Range4:1000~5000MHz	-33.86	PASS
Band2	10MHz	QPSK	19150	1RB#0	Range5:5000~12000MHz	-52.5	PASS
Band2	10MHz	QPSK	19150	1RB#0	Range6:12000~26500MHz	-44.18	PASS
Band4	10MHz	QPSK	20175	1RB#0	Range3:30~1000MHz	-30.01	PASS
Band4	10MHz	QPSK	20175	1RB#0	Range4:1000~5000MHz	-34.01	PASS
Band4	10MHz	QPSK	20175	1RB#0	Range5:5000~12000MHz	-52.51	PASS
Band4	10MHz	QPSK	20175	1RB#0	Range6:12000~26500MHz	-43.84	PASS
Band12	10MHz	QPSK	23095	1RB#0	Range3:30~1000MHz	-31.11	PASS
Band12	10MHz	QPSK	23095	1RB#0	Range4:1000~5000MHz	-33.3	PASS
Band12	10MHz	QPSK	23095	1RB#0	Range5:5000~12000MHz	-52.47	PASS
Band12	10MHz	QPSK	23095	1RB#0	Range6:12000~26500MHz	-44.39	PASS

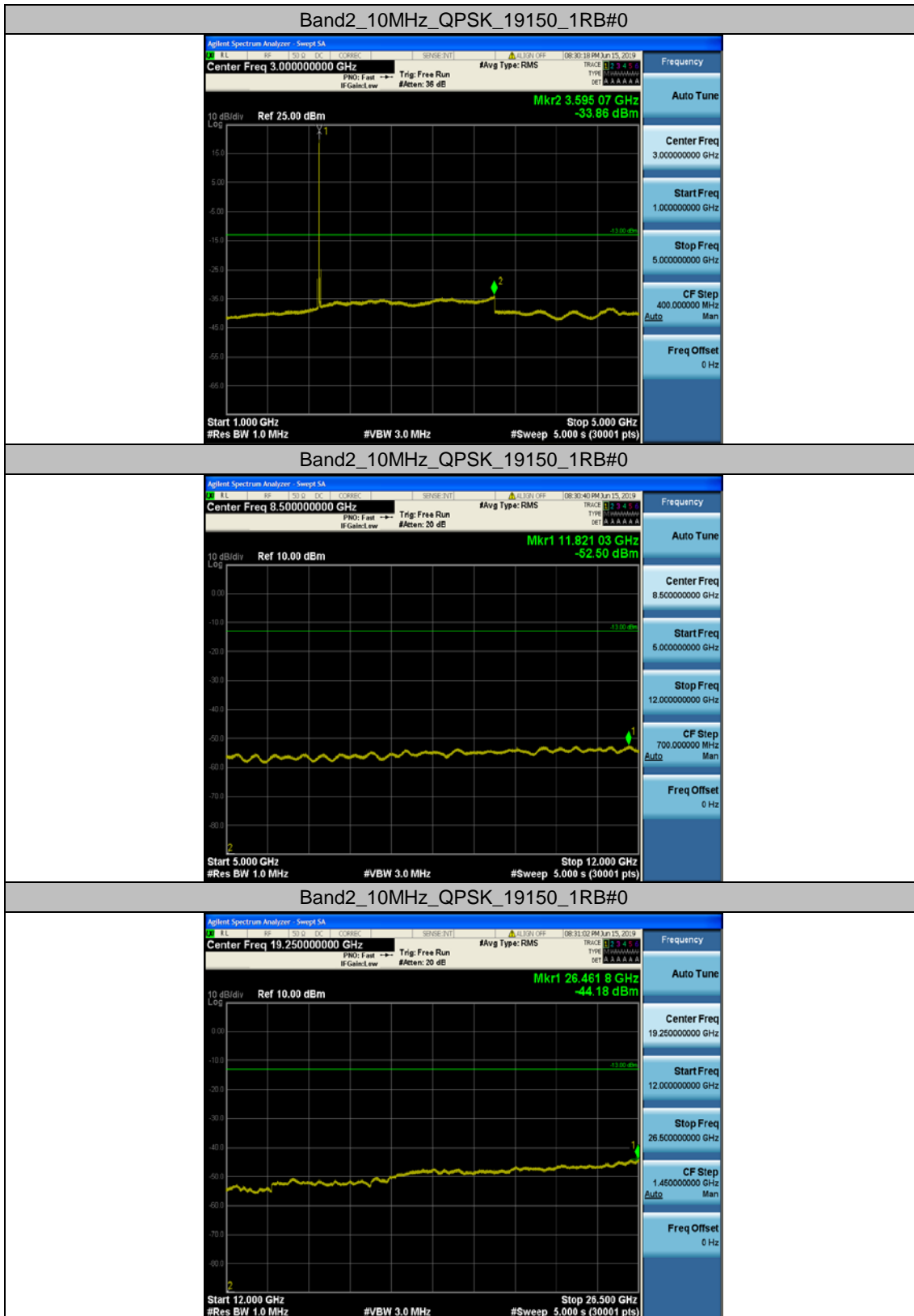
Test plots

Band2

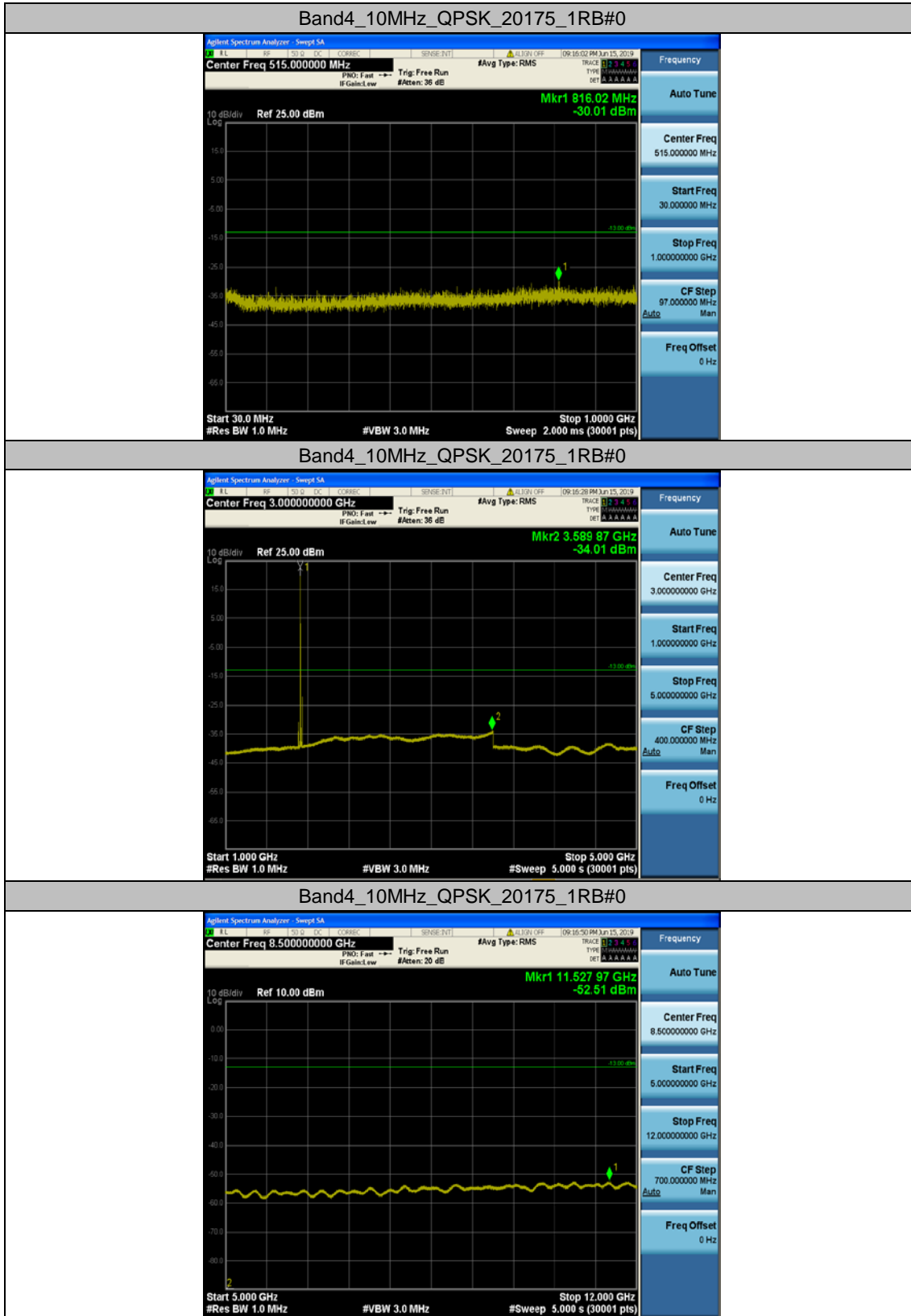






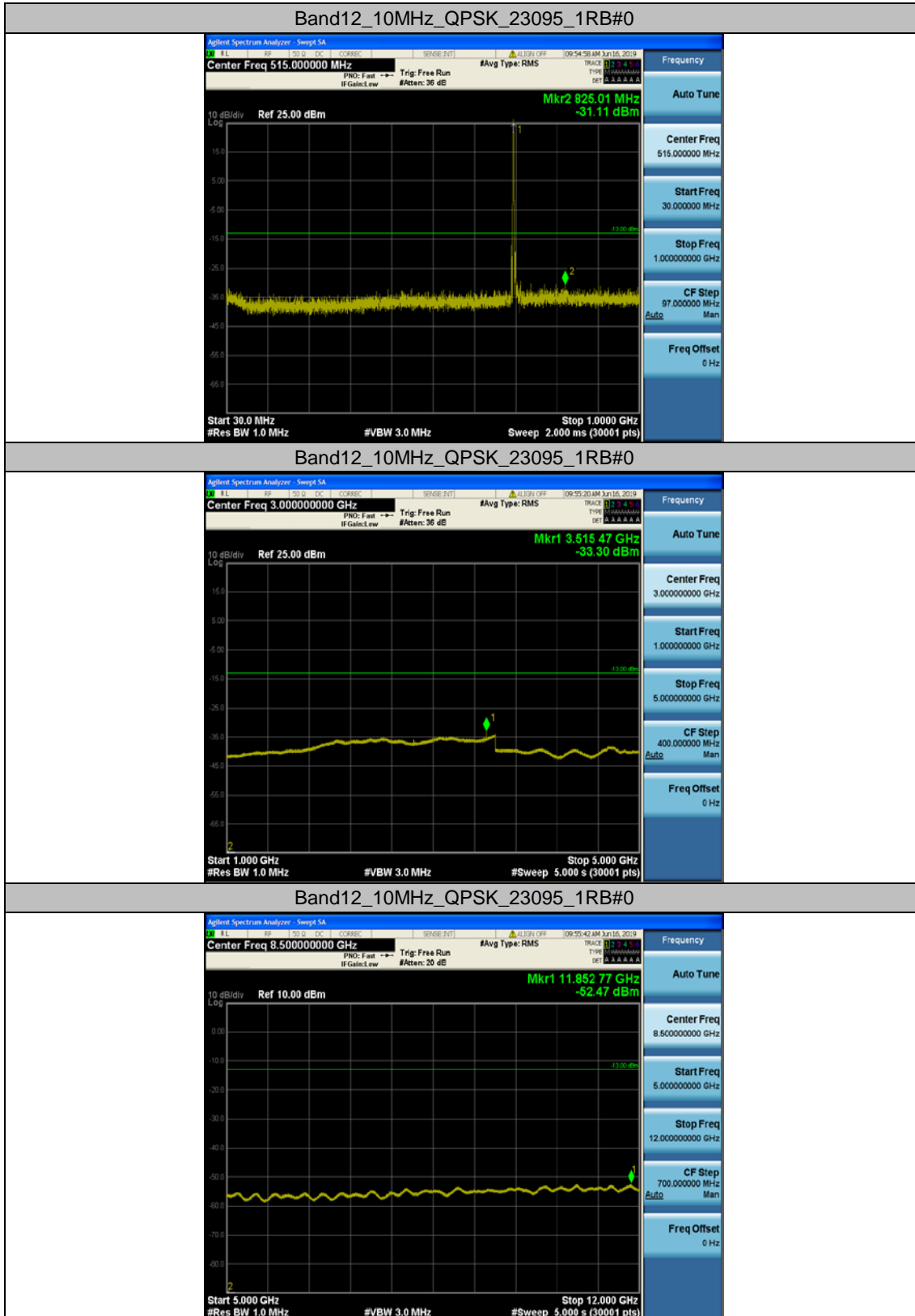


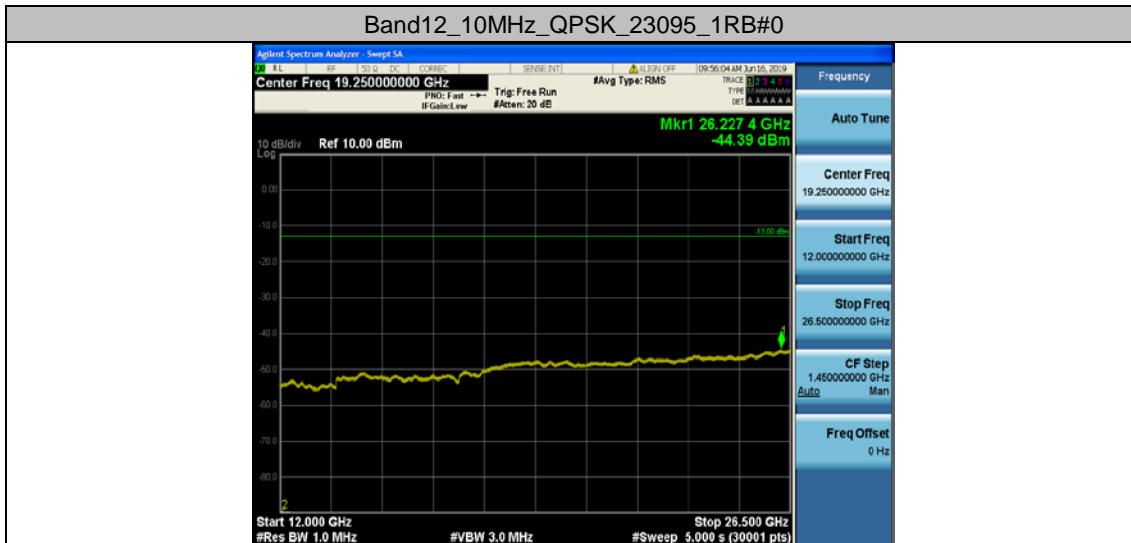
Band4





Band12





6.2 Band edge at antenna terminals

6.2.1 Limit

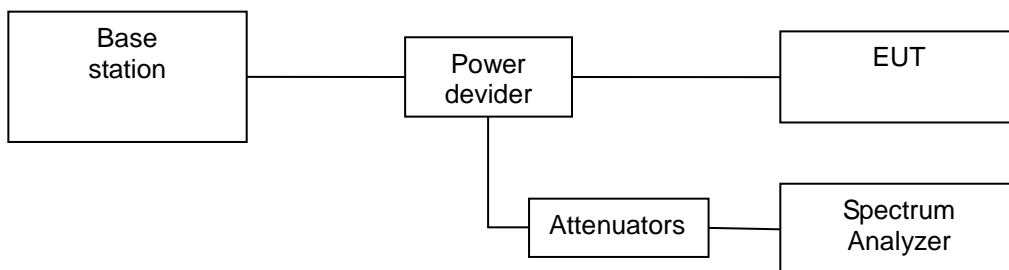
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

6.2.2 Test procedure

1. The testing follows FCC KDB 971168 v03 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 200kHz, VBW = 620kHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
= -13dBm.

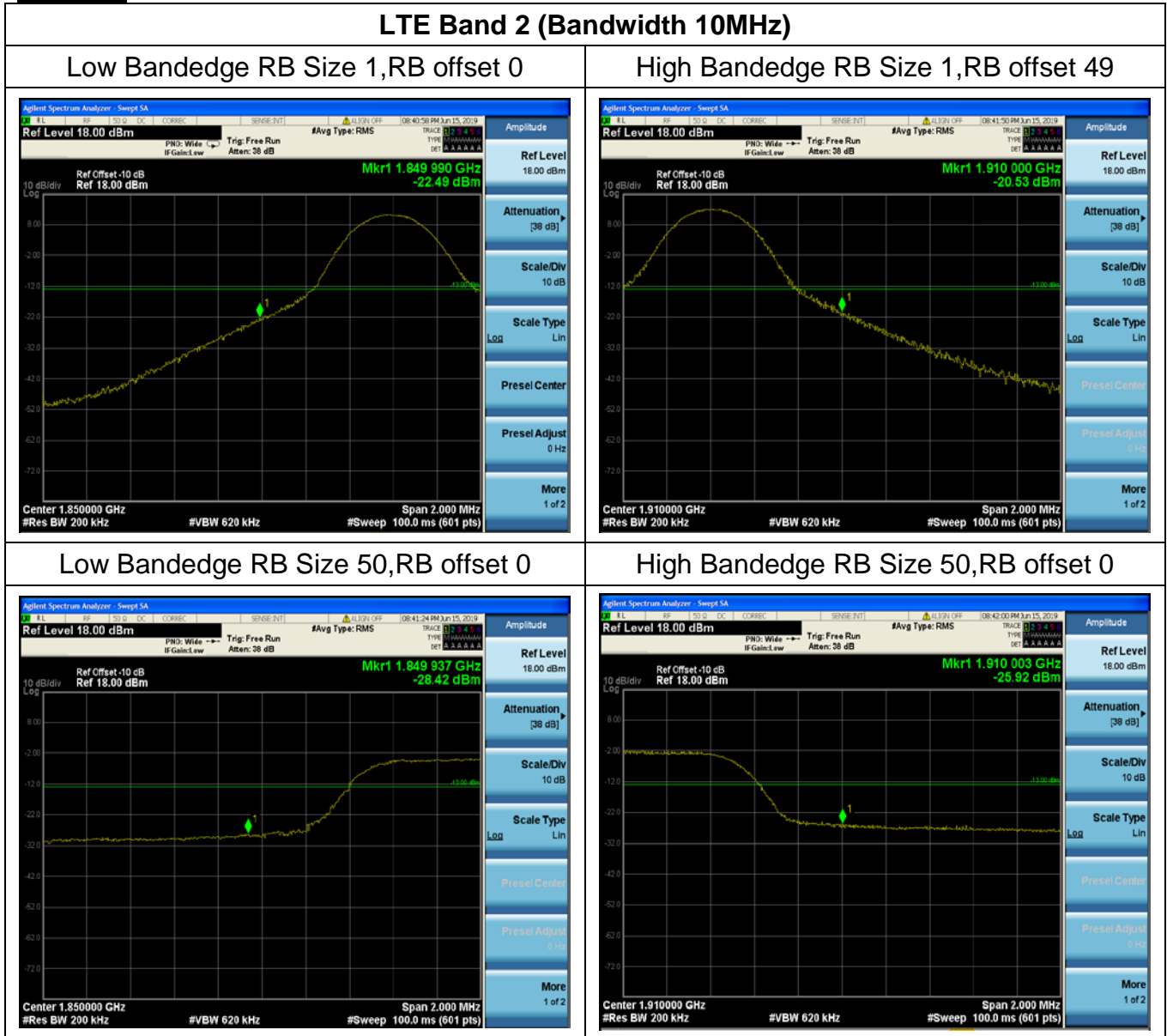
6.2.3 Test setup



6.2.4 Test results

Note: All mode has been tested, only worst data shown in this report.

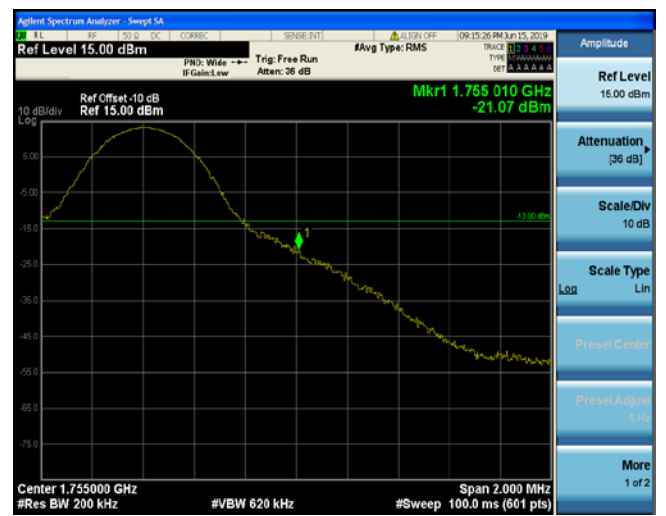
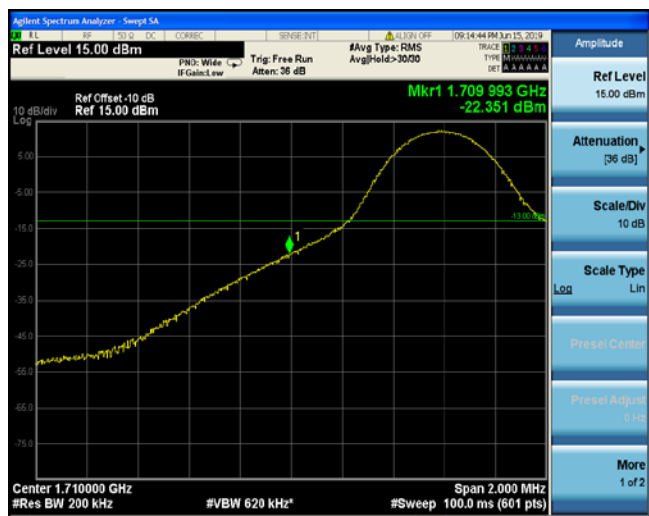
Test plots



LTE Band 4 (Bandwidth 10MHz)

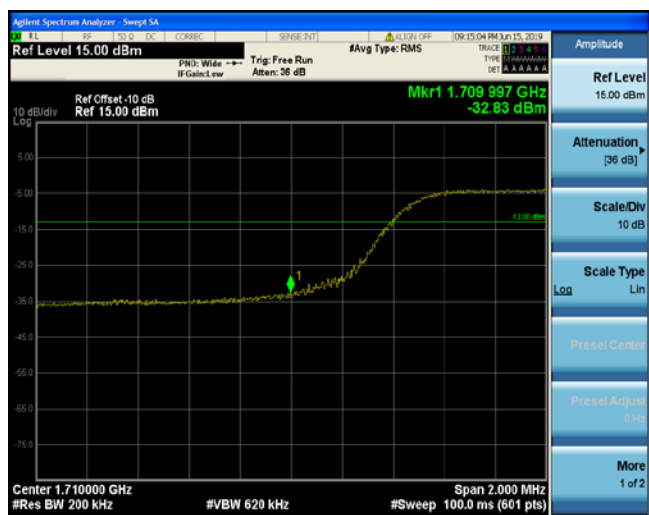
Low Bandedge RB Size 1, RB offset 0

High Bandedge RB Size 1, RB offset 99



Low Bandedge RB Size 50, RB offset 0

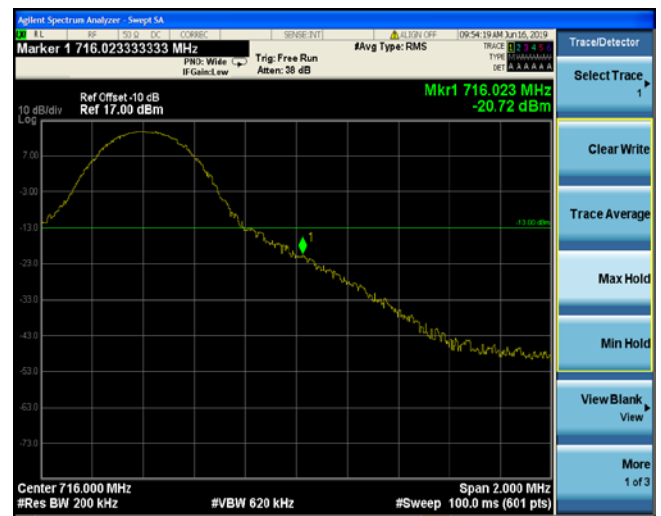
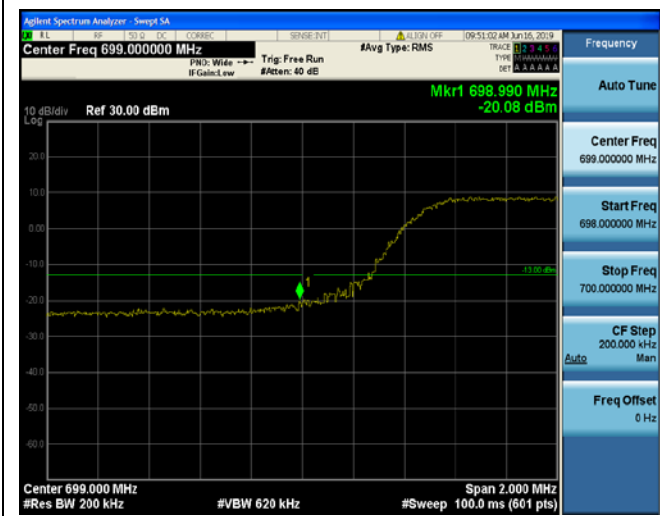
High Bandedge RB Size 50, RB offset 0



LTE Band 12 (Bandwidth 10MHz)

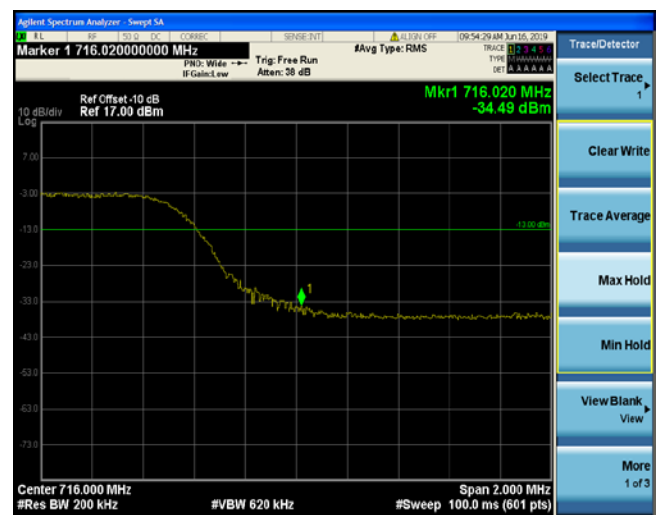
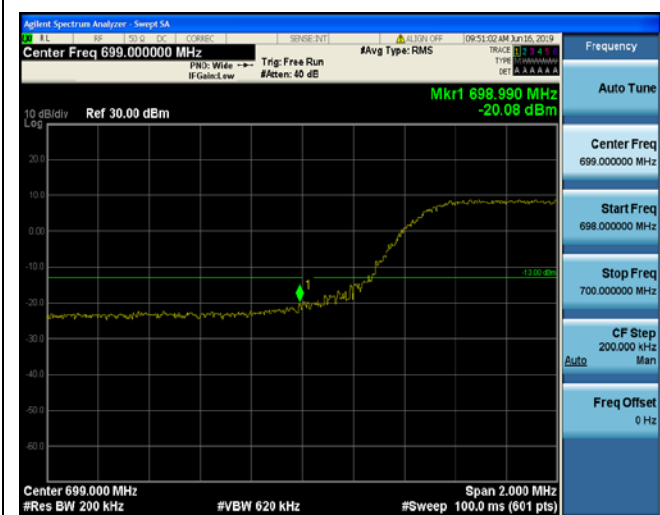
Low Bandedge RB Size 1, RB offset 0

High Bandedge RB Size 1, RB offset 49



Low Bandedge RB Size 50, RB offset 0

High Bandedge RB Size 50, RB offset 0



6.3 Field strength of spurious radiation measurement

6.3.1 Limit

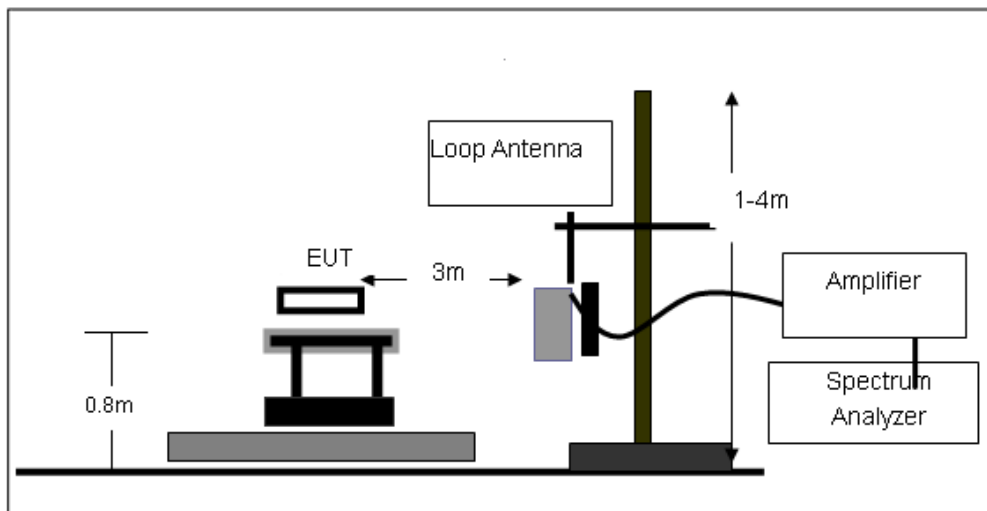
LTE Band 2, LTE Band 4, LTE Band 12: -13dBm

6.3.2 Test procedure

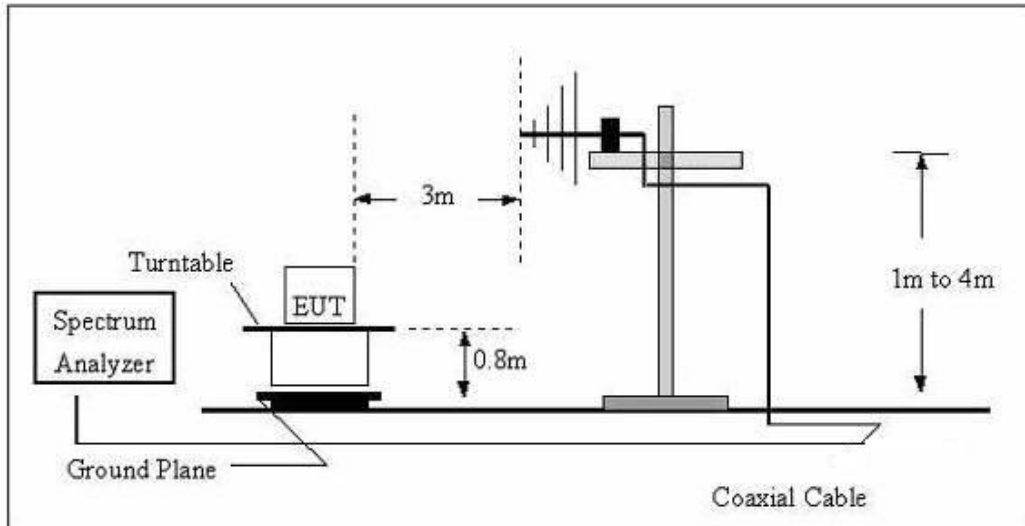
1. The EUT was placed on a non-conductive turntable using a nonconductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.
3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.
4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $ERP / EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$.

6.3.3 Test setup

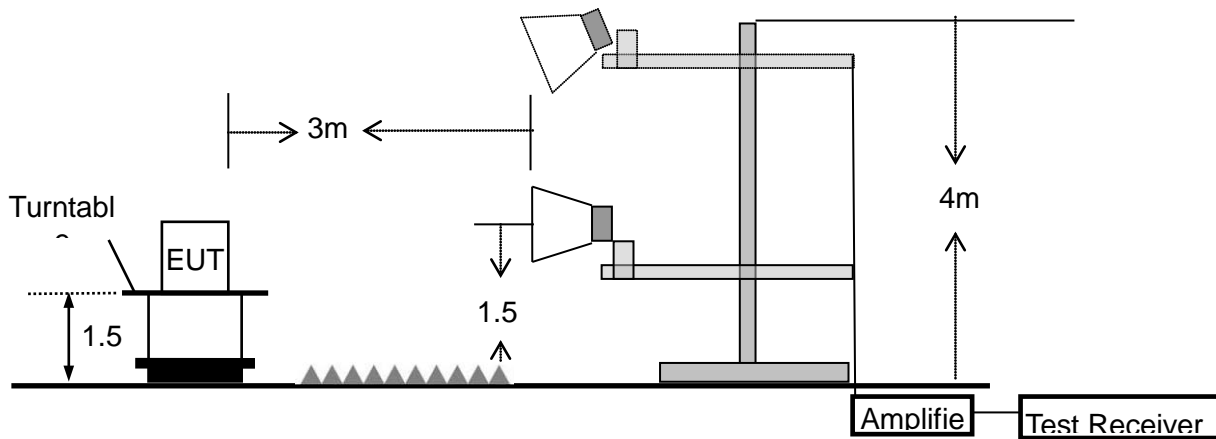
Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



6.3.4 Test results

Note: All the configuration was tested and only the worse case was reported

LTE Band 2 (30MHz – 19GHz)

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
1	277.0935	-65.26	16.13	-49.13	-13	36.13	H	Pass
2	410.3824	-64.97	19.5	-45.47	-13	32.47	H	Pass
3	603.5392	-64.09	21.6	-42.49	-13	29.49	H	Pass
4	12404.81	-65.61	13.15	-52.46	-13	39.46	H	Pass
5	14905.812	-58.81	16.21	-42.6	-13	29.6	H	Pass
6	15851.703	-61.03	4.08	-56.95	-13	43.95	H	Pass

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
1	100.2286	-64.27	14.67	-49.60	-13	-36.60	V	Pass
2	148.441	-64.37	12.37	-52.00	-13	-39.00	V	Pass
3	478.8455	-62.52	20.86	-41.66	-13	-28.66	V	Pass
4	11282.565	-59.78	9.96	-49.82	-13	-36.82	V	Pass
5	12340.681	-62.52	11.01	-51.51	-13	-38.51	V	Pass
6	12965.932	-62.02	12.01	-50.01	-13	-37.01	V	Pass
7	17965.3	-61.32	10.36	-50.96	-13	-37.96	V	Pass
8	17984.9	-59.17	11.52	-47.65	-13	-34.65	V	Pass

LTE Band 4 (30MHz – 18GHz)

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
1	369.4045	-63.33	18.49	-44.84	-13	-31.84	H	Pass
2	459.1143	-63.23	20.47	-42.76	-13	-29.76	H	Pass
3	656.53	-62.16	22.16	-40.00	-13	-27.00	H	Pass
4	12741.483	-62.70	11.68	-51.02	-13	-38.02	H	Pass
5	14008.016	-59.89	17.12	-42.77	-13	-29.77	H	Pass
6	14505.01	-58.41	16.65	-41.76	-13	-28.76	H	Pass
7	17521.14	-58.84	15.98	-42.86	-13	-29.86	H	Pass
8	17634.09	-58.80	17.32	-41.48	-13	-28.48	H	Pass

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
1	212.2694	-63.26	14.34	-48.92	-13	-35.92	V	Pass
2	325.5957	-64.63	17.34	-47.29	-13	-34.29	V	Pass
3	431.0316	-63.68	19.91	-43.77	-13	-30.77	V	Pass
4	13783.567	-60.21	16.67	-43.54	-13	-30.54	V	Pass
5	14232.465	-58.89	17.11	-41.78	-13	-28.78	V	Pass
6	14905.812	-58.67	16.21	-42.46	-13	-29.46	V	Pass
7	17102.02	-58.56	16.34	-42.22	-13	-29.22	V	Pass
8	17235.61	-53.57	17.42	-36.15	-13	-23.15	V	Pass

LTE Band 12 (30MHz – 18G)

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
1	293.0842	-62.64	16.51	-46.13	-13	-33.13	H	Pass
2	810.2653	-60.40	24.15	-36.25	-13	-23.25	H	Pass
3	958.7943	-61.95	25.98	-35.97	-13	-22.97	H	Pass
4	11298.597	-63.83	12.03	-51.80	-13	-38.80	H	Pass
5	12693.387	-64.57	13.48	-51.09	-13	-38.09	H	Pass
6	12869.739	-64.15	13.64	-50.51	-13	-37.51	H	Pass

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
1	325.5957	-63.91	17.34	-46.57	-13	-33.57	V	Pass
2	478.8455	-64.49	20.86	-43.63	-13	-30.63	V	Pass
3	919.2866	-61.58	25.64	-35.94	-13	-22.94	V	Pass
4	14232.465	-58.74	17.11	-41.63	-13	-28.63	V	Pass
5	14905.812	-58.67	16.21	-42.46	-13	-29.46	V	Pass
6	15274.549	-55.14	4.15	-50.99	-13	-37.99	V	Pass

6.4 Frequency Stability

6.4.1 Limit

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d) (2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.4VDC, with a nominal voltage of 3.85VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from over stress. These voltages represent a tolerance from -5.4% to 10.8%. For the purposes of measuring frequency stability these voltage limits are to be used.

6.4.2 Test procedure

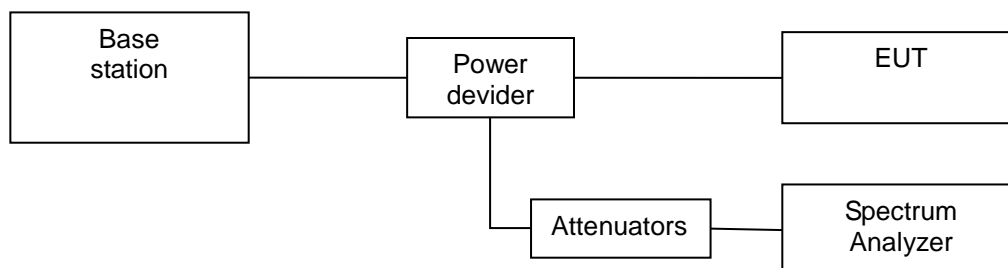
Test Procedures for Temperature Variation:

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

6.4.3 Test setup



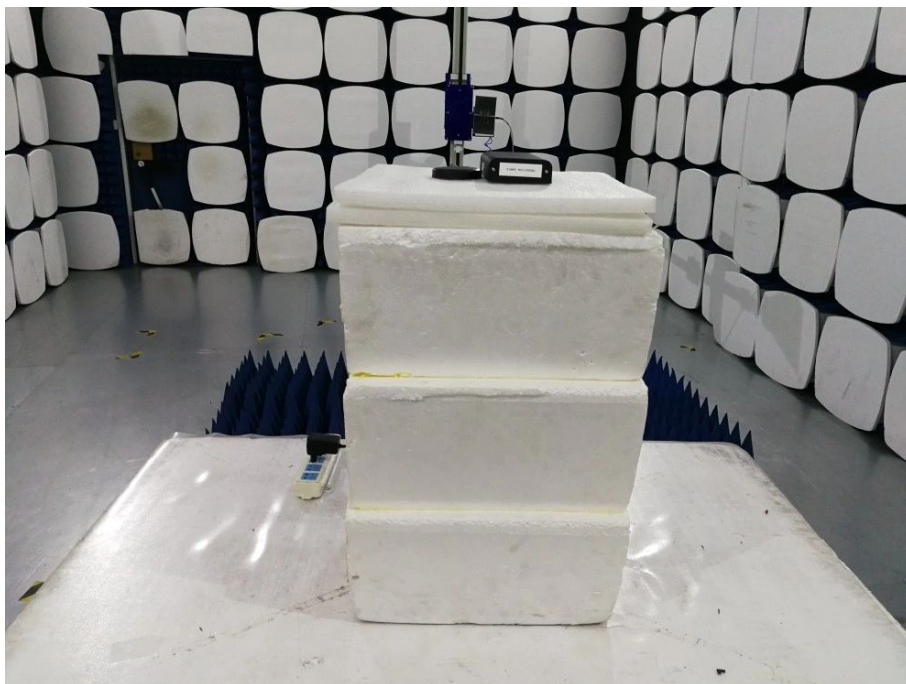
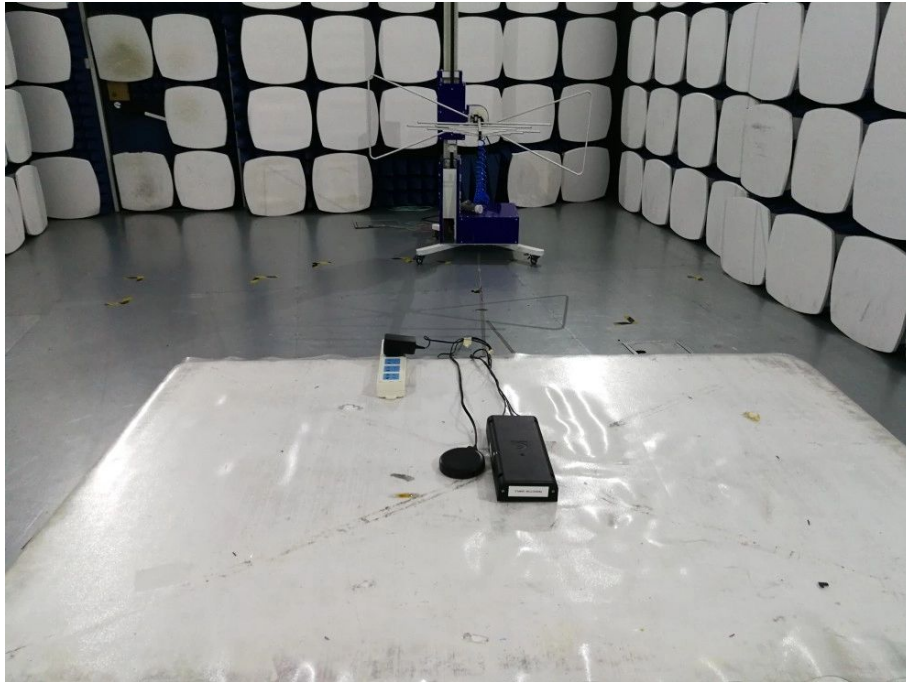
6.4.4 Test results

Voltage										
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	10MHz	QPSK	18650	50RB#0	VL	NT	-8.51	-0.004588	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	VN	NT	-6.72	-0.003623	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	VH	NT	-9.47	-0.005105	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	VL	NT	7.84	0.004170	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	VN	NT	-12.16	-0.006468	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	VH	NT	-7.44	-0.003957	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	VL	NT	-7.71	-0.004047	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	VN	NT	12.92	0.006782	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	VH	NT	5.49	0.002882	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	VL	NT	10.39	0.005997	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	VN	NT	10.83	0.006251	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	VH	NT	10.06	0.005807	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	VL	NT	5.55	0.007845	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	VN	NT	6.31	0.008919	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	VH	NT	5.09	0.007194	±2.5	PASS

Temperature										
Band	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	10MHz	QPSK	18650	50RB#0	NV	-30	-9.43	-0.005084	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	-20	-7.97	-0.004296	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	-10	-11.40	-0.006146	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	0	-9.17	-0.004943	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	10	-10.87	-0.005860	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	20	-8.90	-0.004798	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	30	-8.94	-0.004819	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	40	-7.95	-0.004286	±2.5	PASS
Band2	10MHz	QPSK	18650	50RB#0	NV	50	-7.72	-0.004162	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	-30	-8.91	-0.004739	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	-20	7.70	0.004096	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	-10	-8.55	-0.004548	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	0	7.31	0.003888	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	10	-8.01	-0.004261	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	20	-7.01	-0.003729	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	30	7.10	0.003777	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	40	6.79	0.003612	±2.5	PASS
Band2	10MHz	QPSK	18900	50RB#0	NV	50	-7.21	-0.003835	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	-30	8.85	0.004646	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	-20	7.77	0.004079	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	-10	9.91	0.005202	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	0	6.72	0.003528	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	10	8.77	0.004604	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	20	7.00	0.003675	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	30	8.90	0.004672	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	40	8.03	0.004215	±2.5	PASS
Band2	10MHz	QPSK	19150	50RB#0	NV	50	-8.85	-0.004646	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	-30	8.91	0.005143	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	-20	11.87	0.006851	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	-10	11.43	0.006597	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	0	9.84	0.005680	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	10	10.74	0.006199	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	20	9.26	0.005345	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	30	11.93	0.006886	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	40	10.06	0.005807	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	50	12.83	0.007405	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	-30	5.61	0.007929	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	-20	4.28	0.006049	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	-10	4.86	0.006869	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	0	4.63	0.006544	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	10	6.18	0.008735	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	20	5.58	0.007887	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	30	-4.85	-0.006855	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	40	-3.30	-0.004664	±2.5	PASS
Band12	10MHz	QPSK	23095	50RB#0	NV	50	5.15	0.007279	±2.5	PASS

Photographs of the Test Setup

Radiated emission



Photographs of the EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi190614E097-1.

----END OF REPORT----