



LTE band II - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
(30.39/30)=4.5+0.1=4.6 dB



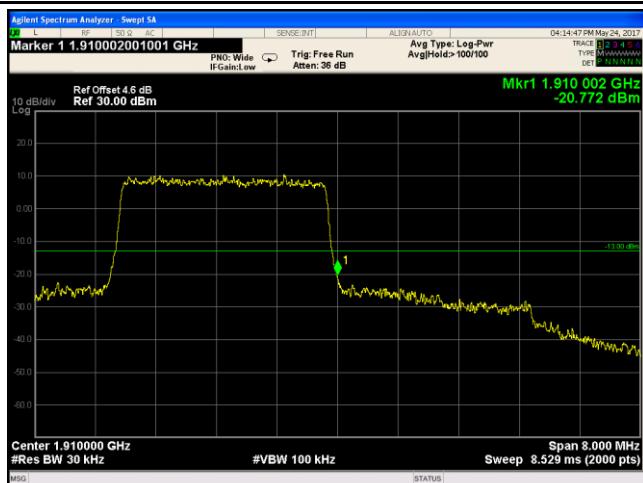
LTE band II - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
(30.36/30)=4.5+0.1=4.6 dB



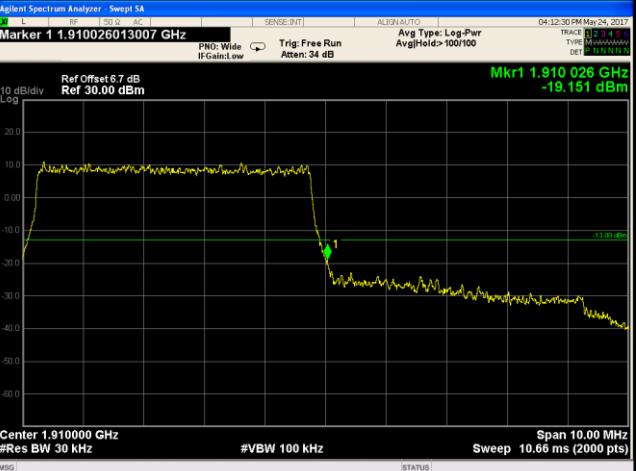
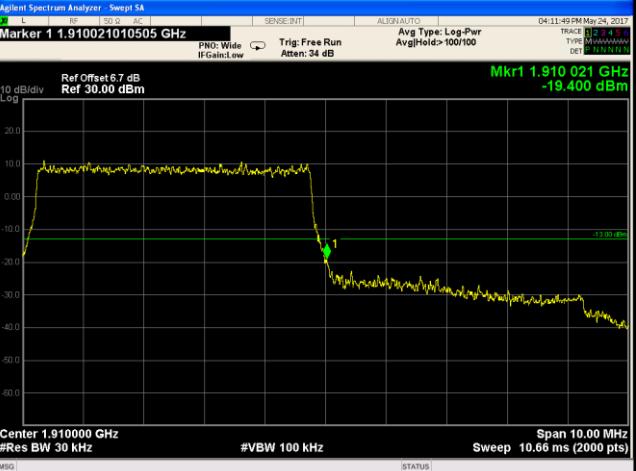
LTE band II - Low Channel 16QAM-3

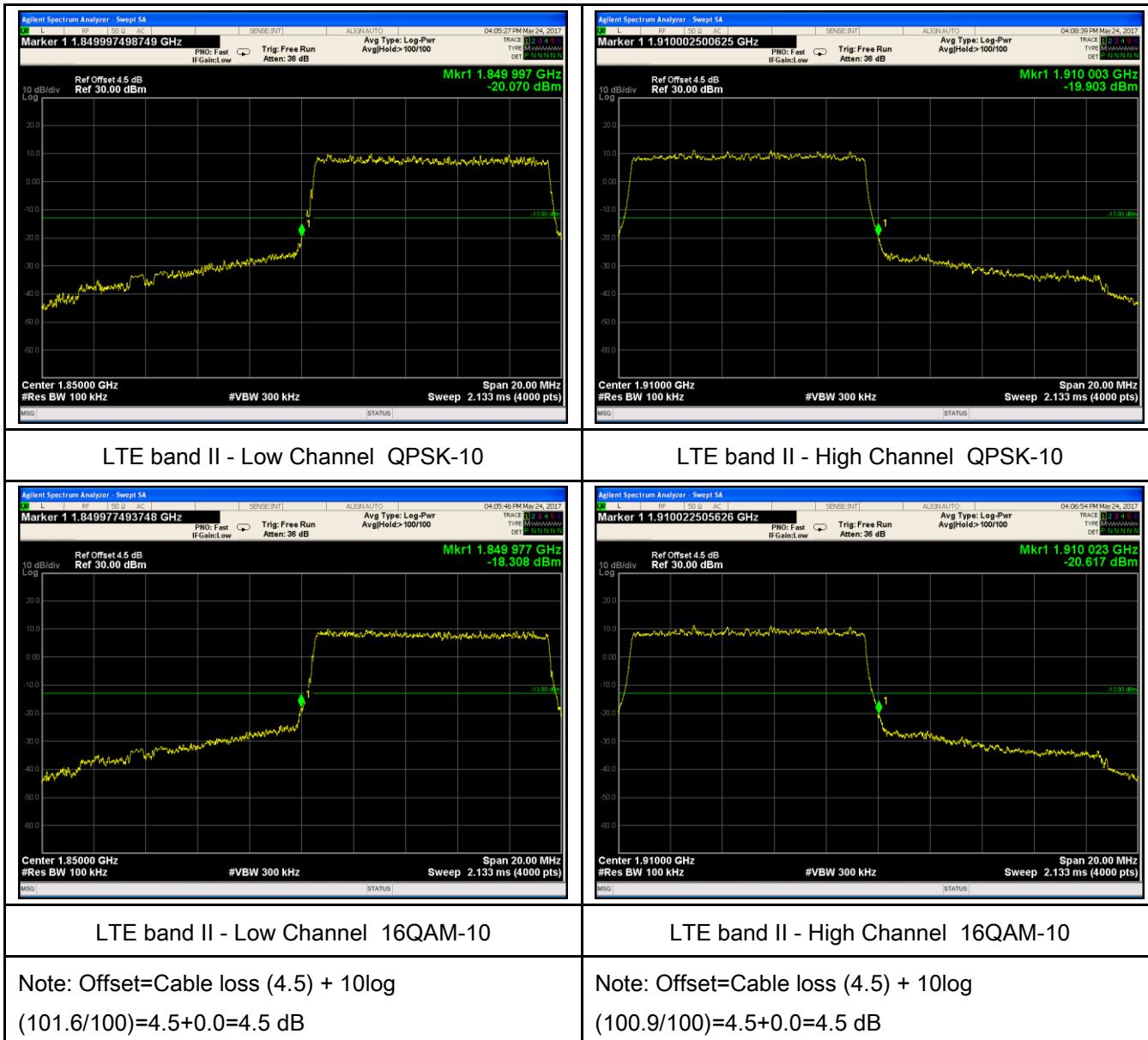
Note: Offset=Cable loss (4.5) + 10log
(30.63/30)=4.5+0.1=4.6 dB



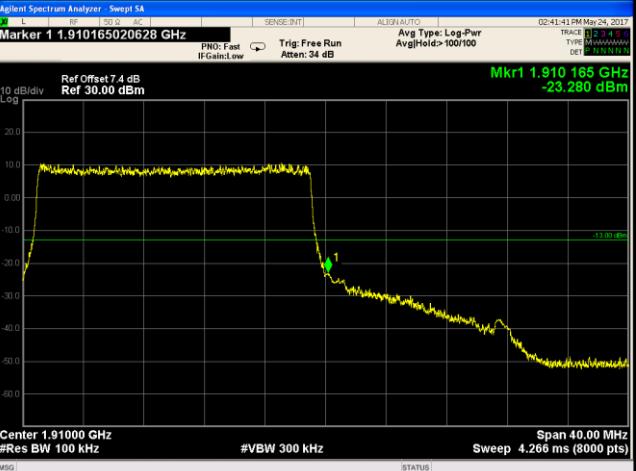
LTE band II - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
(30.40/30)=4.5+0.1=4.6 dB

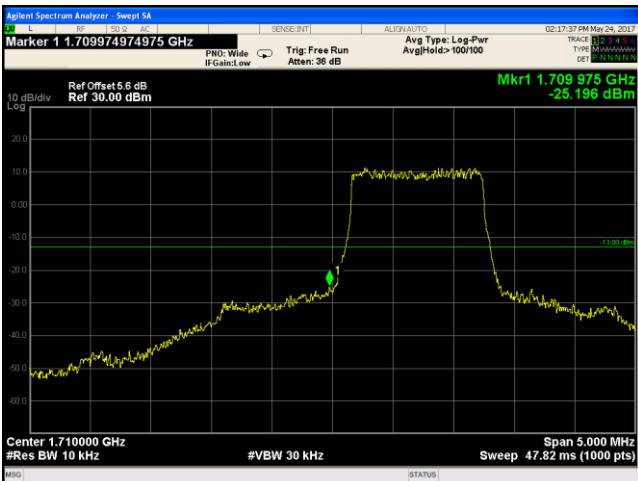
 <p>Marker 1 1.849967483742 GHz</p> <p>Ref Offset 5.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100 Trig: Free Run Atten: 34 dB</p> <p>Mkr1 1.849 967 GHz -19.529 dBm</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>	 <p>Marker 1 1.910026013007 GHz</p> <p>Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100 Trig: Free Run Atten: 34 dB</p> <p>Mkr1 1.910 026 GHz -18.151 dBm</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>
<p>LTE band II - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.36/30)=4.5+2.2=6.7 dB</p>	<p>LTE band II - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.06/30)=4.5+2.2=6.7 dB</p>
 <p>Marker 1 1.849977488744 GHz</p> <p>Ref Offset 5.8 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100 Trig: Free Run Atten: 34 dB</p> <p>Mkr1 1.849 977 GHz -17.454 dBm</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>	 <p>Marker 1 1.910021010505 GHz</p> <p>Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100 Trig: Free Run Atten: 34 dB</p> <p>Mkr1 1.910 021 GHz -19.400 dBm</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>
<p>LTE band II - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.55/30)=4.5+2.3=6.8 dB</p>	<p>LTE band II - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.03/30)=4.5+2.2=6.7 dB</p>



 <p>Marker 1 1.847871608951 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>Mkr1 1.847 872 GHz -22.500 dBm</p> <p>10 dB/div Ref Offset 5.3 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1 1.910005002188 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>Mkr1 1.910 005 GHz -22.191 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE band II - Low Channel QPSK-15</p>	<p>LTE band II - High Channel QPSK-15</p>
<p>Note: Offset=Cable loss (4.5) + 10log (149.8/100)=4.5+1.8=6.3 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (149.6/100)=4.5+1.7=6.2 dB</p>
 <p>Marker 1 1.849994374297 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>Mkr1 1.849 994 GHz -21.462 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1 A 1.910012503126 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>Mkr1 1.910 013 GHz -21.422 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE band II - Low Channel 16QAM-15</p>	<p>LTE band II - High Channel 16QAM-15</p>
<p>Note: Offset=Cable loss (4.5) + 10log (148.8/100)=4.5+1.7=6.2 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (147.3/100)=4.5+1.7=6.2 dB</p>

 <p>Marker 1 1.849859357420 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Aten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>10 dB/div Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.849 859 GHz -23.147 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Marker 1 1.910165020628 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Aten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>10 dB/div Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.910 165 GHz -23.280 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE band II - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (194.4/100)=4.5+2.9=7.4 dB</p>	<p>LTE band II - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (193.3/100)=4.5+2.9=7.4 dB</p>
 <p>Marker 1 1.849874359295 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Aten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>10 dB/div Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.849 874 GHz -23.119 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Marker 1 1.910115014377 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Aten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>TYPE: MWWWWWW DET: HNNNNNN</p> <p>10 dB/div Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>Mkr1 1.910 115 GHz -23.048 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE band II - Low Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (193.7/100)=4.5+2.9=7.4 dB</p>	<p>LTE band II - High Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (192.4/100)=4.5+2.8=7.3 dB</p>

LTE band IV (Part 27)



LTE band IV - Low Channel QPSK-1.4

LTE band IV - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.88/10)=4.5+1.1=5.6 dB

Note: Offset=Cable loss (4.5) + 10log
(12.65/10)=4.5+1.0=5.5 dB

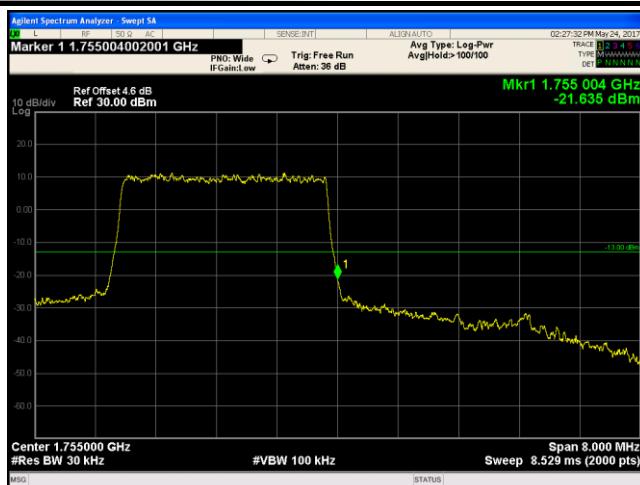


LTE band IV - Low Channel 16QAM-1.4

LTE band IV - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.91/10)=4.5+1.1=5.6 dB

Note: Offset=Cable loss (4.5) + 10log
(12.68/10)=4.5+1.0=5.5 dB



LTE band IV - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
(30.28/30)=4.5+0.0=4.5 dB

LTE band IV - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
(30.51/30)=4.5+0.1=4.6 dB



LTE band IV - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
(30.63/30)=4.5+0.1=4.6 dB

LTE band IV - High Channel 16QAM-3

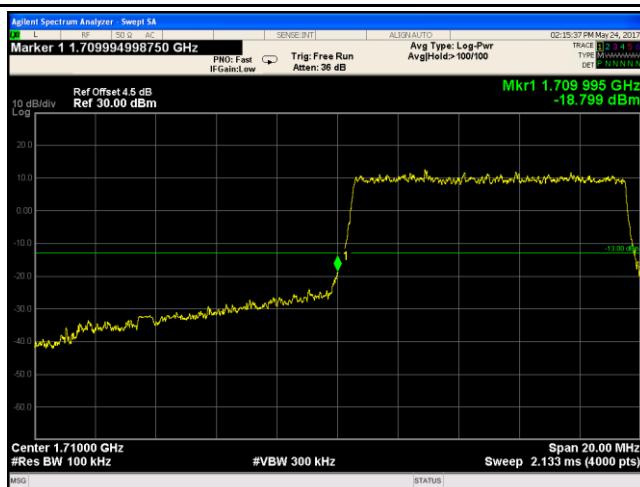
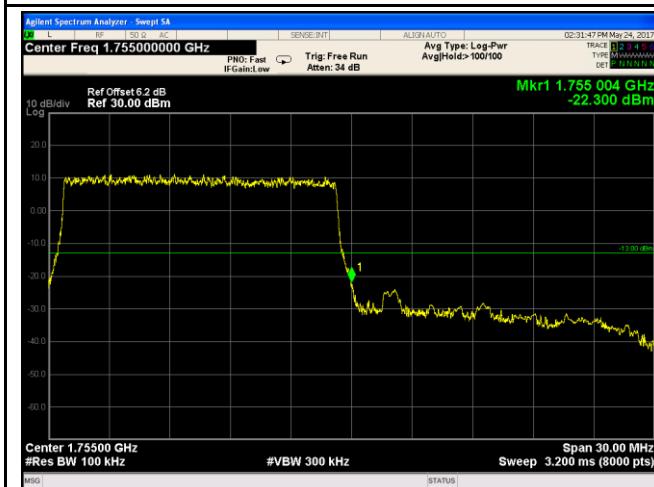
Note: Offset=Cable loss (4.5) + 10log
(30.32/30)=4.5+0.0=4.5 dB

 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.709954979991 GHz</p> <p>Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.710000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p> <p>Mkr1 1.709 955 GHz -18.783 dBm</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.755005002501 GHz</p> <p>Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.755000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p> <p>Mkr1 1.755 005 GHz -18.613 dBm</p>
<p>LTE band IV - Low Channel QPSK-5</p>	<p>LTE band IV - High Channel QPSK-5</p>
<p>Note: Offset=Cable loss (4.5) + 10log (50.18/30)=4.5+2.2=6.7 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (50.04/30)=4.5+2.2=6.7 dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.709954979991 GHz</p> <p>Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.710000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p> <p>Mkr1 1.709 955 GHz -19.734 dBm</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.755005002501 GHz</p> <p>Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.755000 GHz #Res BW 30 kHz #VBW 100 kHz Avg Type: Log-Pwr AvgHold: 100/100</p> <p>Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p> <p>Mkr1 1.755 005 GHz -18.049 dBm</p>
<p>LTE band IV - Low Channel 16QAM-5</p>	<p>LTE band IV - High Channel 16QAM-5</p>
<p>Note: Offset=Cable loss (4.5) + 10log (50.12/30)=4.5+2.2=6.7 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (50.26/30)=4.5+2.2=6.7 dB</p>



LTE band IV - Low Channel QPSK-10

LTE band IV - High Channel QPSK-10



LTE band IV - Low Channel 16QAM-10

LTE band IV - High Channel 16QAM-10

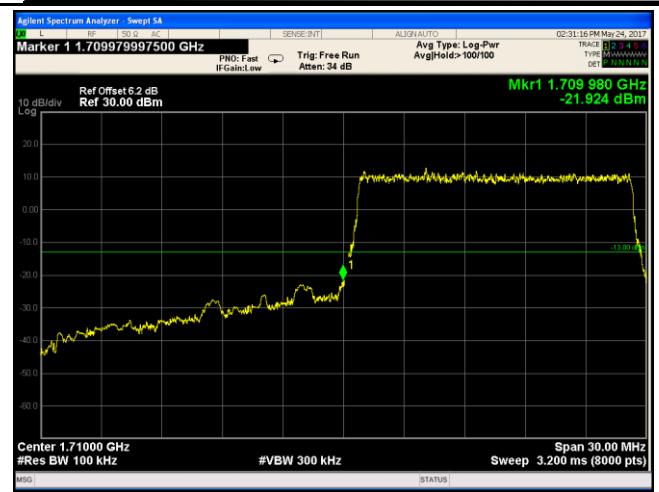
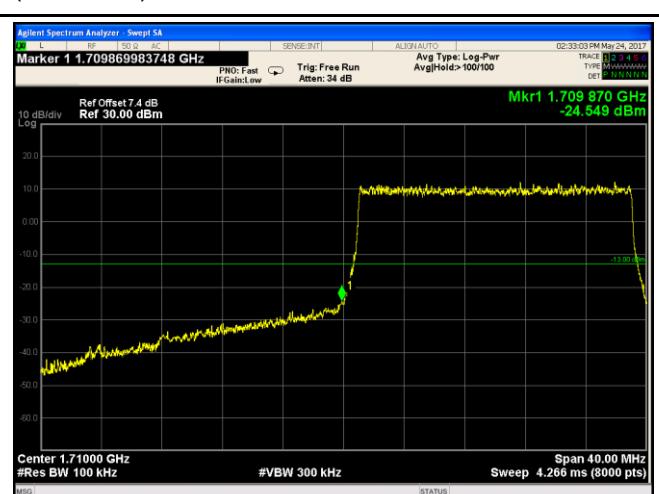
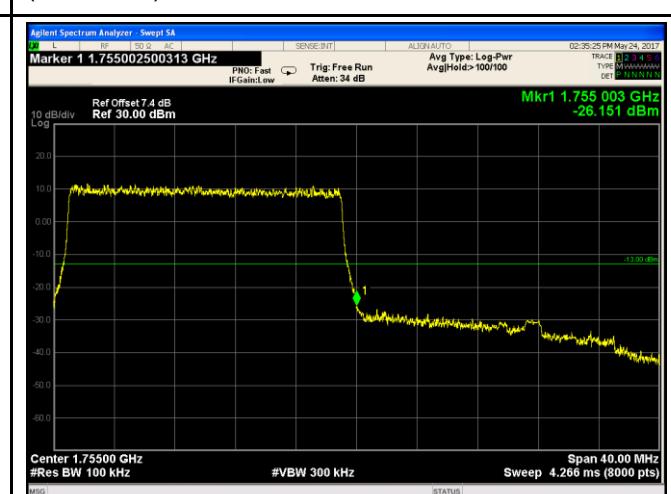


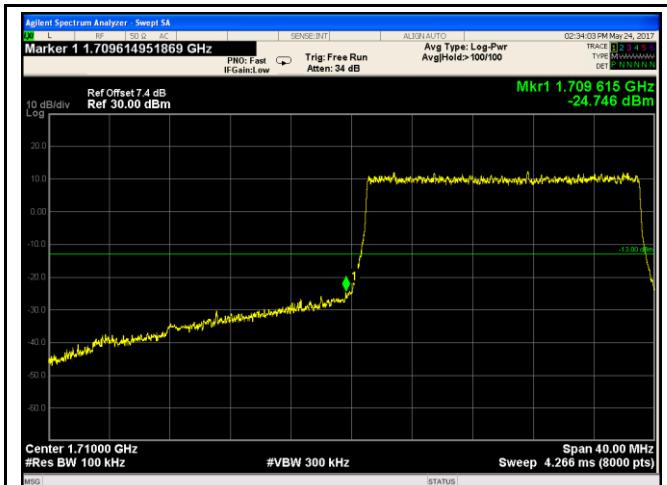
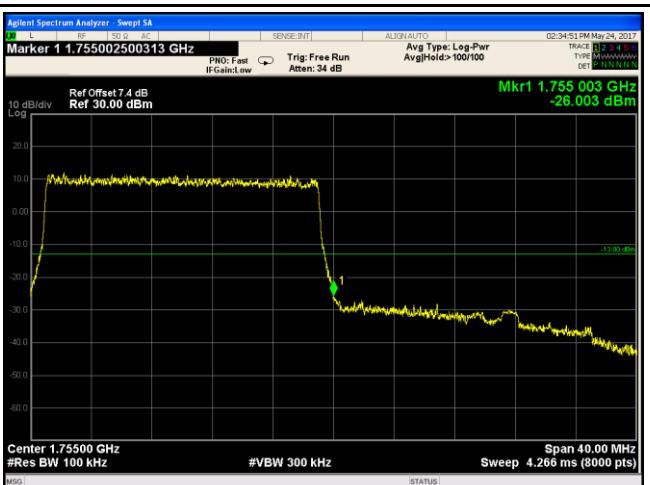
LTE band IV - Low Channel QPSK-15

LTE band IV - High Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log
(147.2/100)=4.5+1.7=6.2 dB

Note: Offset=Cable loss (4.5) + 10log
(149/100)=4.5+1.7=6.2 dB

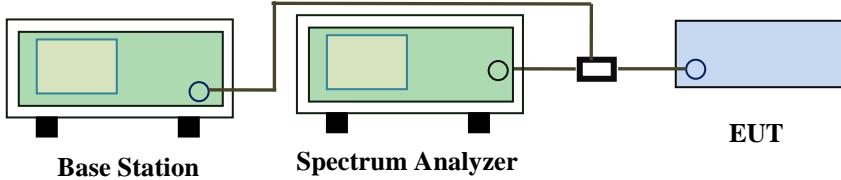
 <p>Marker 1.709979997500 GHz</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Mkr1 1.709 980 GHz -21.924 dBm</p> <p>Center 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1.755000000000 GHz</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Mkr1 1.755 004 GHz -22.300 dBm</p> <p>Center 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE band IV - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (149.1/100)=4.5+1.7=6.2 dB</p>	<p>LTE band IV - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (148.3/100)=4.5+1.7=6.2 dB</p>
 <p>Marker 1.709869983748 GHz</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.709 870 GHz -24.549 dBm</p> <p>Center 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Marker 1.755002500313 GHz</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.755 003 GHz -26.151 dBm</p> <p>Center 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE band IV - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (194.2/100)=4.5+2.9=7.4 dB</p>	<p>LTE band IV - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (196.1/100)=4.5+2.9=7.4 dB</p>

 <p>Marker 1 1.709614951869 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run AvgType: Log-Pwr AvgHold:>100/100</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.709 615 GHz -24.746 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.000 MHz (8000 pts)</p>	 <p>Marker 1 1.755002500313 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run AvgType: Log-Pwr AvgHold:>100/100</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.755 003 GHz -26.003 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.000 MHz (8000 pts)</p>
<p>LTE band IV - Low Channel 16QAM-20</p>	<p>LTE band IV - High Channel 16QAM-20</p>
<p>Note: Offset=Cable loss (4.5) + 10log (193/100)=4.5+2.9=7.4dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (193.1/100)=4.5+2.9=7.4 dB</p>

6.8 Band Edge 27.53(m)

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1024mbar
Test date :	May 24, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	According to FCC 27.53(m)(4) specified that power of any emmission ouutside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than $43+10\log(P)$ dB at the channel edge, the limit of emission equal to -13dBm. And $55+10\log(P)$ dB at 5.5MHz from the channel edges, the limit of emission equal to -25dBm. In the 1MHz bands immediately outside and adjacent to the frenqency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.	<input checked="" type="checkbox"/>
Test Setup	 <p>The diagram shows a test setup with three main components: a 'Base Station' (represented by a green rectangle with a white square inside), a 'Spectrum Analyzer' (represented by a green rectangle with a white square inside), and an 'EUT' (represented by a blue rectangle). A power divider (represented by a black rectangle with two output ports) is connected between the Base Station and the Spectrum Analyzer. The output ports of the power divider are connected to the Base Station and the Spectrum Analyzer. The output port of the Spectrum Analyzer is connected to the EUT.</p>	
Test Procedure	<ul style="list-style-type: none"> The EUT was connected to Spectrum Analyzer and Base Station via power divider. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers. 	
Remark		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Test Data Yes N/A

Test Plot Yes (See below) N/A

LTE band VII (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	20775	2500	QPSK	-23.345	-13
			16QAM	-20.338	-13
5	21425	2570	QPSK	-21.909	-13
			16QAM	-20.551	-13
10	20800	2500	QPSK	-24.648	-13
			16QAM	-21.759	-13
10	21400	2570	QPSK	-22.346	-13
			16QAM	-22.518	-13
15	20825	2500	QPSK	-24.367	-13
			16QAM	-25.322	-13
15	21400	2570	QPSK	-24.400	-13
			16QAM	-24.668	-13
20	20850	2500	QPSK	-29.560	-13
			16QAM	-29.442	-13
20	21350	2570	QPSK	-27.128	-13
			16QAM	-27.398	-13

LTE band VII (Part 27)



LTE band VII - Low Channel QPSK-5

LTE band VII - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log
(50.35/30)=4.5+2.2=6.7 dB

Note: Offset=Cable loss (4.5) + 10log
(50.54/30)=4.5+2.3=6.8 dB

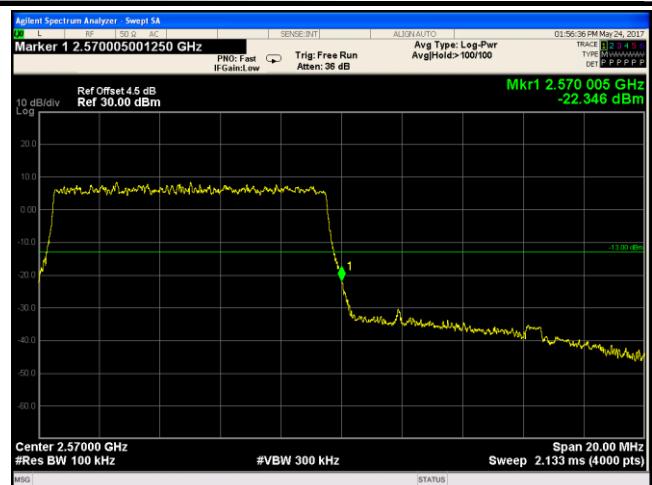


LTE band VII - Low Channel 16QAM-5

LTE band VII - High Channel 16QAM-5

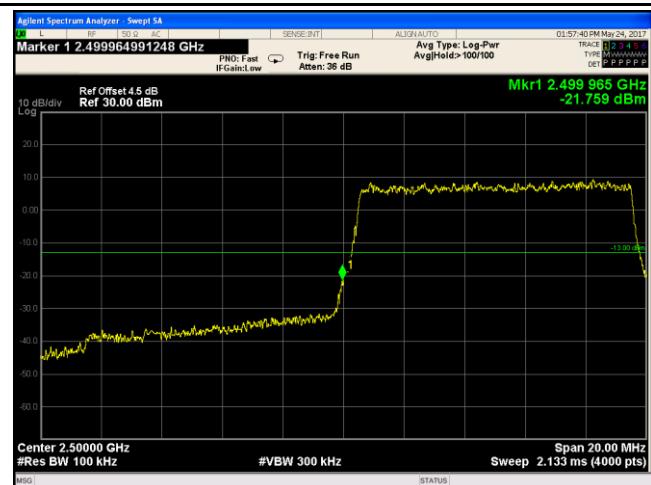
Note: Offset=Cable loss (4.5) + 10log
(49.95/30)=4.5+2.2=6.7 dB

Note: Offset=Cable loss (4.5) + 10log
(50.64/30)=4.5+2.3=6.8 dB



LTE band VII - Low Channel QPSK-10

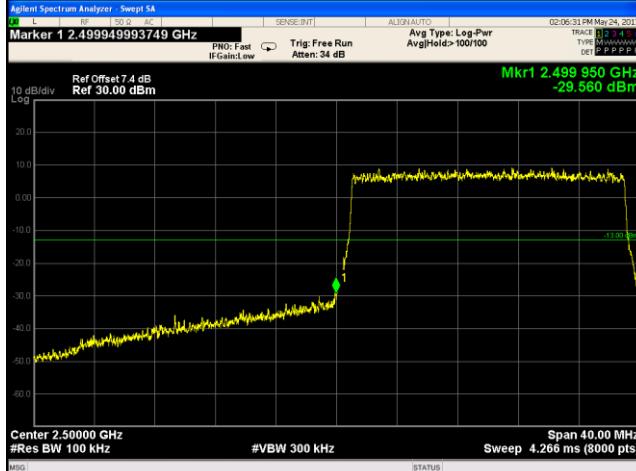
LTE band VII - High Channel QPSK-10



LTE band VII - Low Channel 16QAM-10

LTE band VII - High Channel 16QAM-10

 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.499998749219 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold:100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Mkr1 2.499 999 GHz -24.367 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.570015001875 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold:100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Mkr1 2.570 015 GHz -24.400 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE band VII - Low Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (148.3/100)=4.5+1.7=6.2 dB</p>	<p>LTE band VII - High Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (149/100)=4.5+1.7=6.2 dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.499998749219 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold:100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Mkr1 2.499 999 GHz -25.322 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.570060007501 GHz</p> <p>PN0: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold:100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Mkr1 2.570 060 GHz -24.668 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE band VII - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (147.3/100)=4.5+1.7=6.2dB</p>	<p>LTE band VII - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (148.2/100)=4.5+1.7=6.2 dB</p>

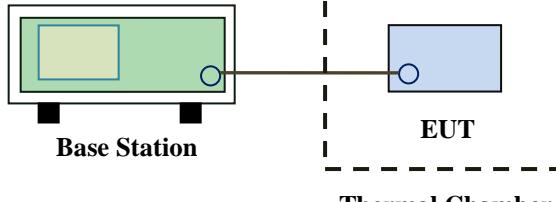
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.499949993749 GHz</p> <p>PN0: Fast IfGainLow Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 2.499 950 GHz -29.560 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.569993749219 GHz</p> <p>PN0: Fast IfGainLow Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 2.569 994 GHz -27.128 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE band VII - Low Channel QPSK-20</p>	<p>LTE band VII - High Channel QPSK-20</p>
<p>Note: Offset=Cable loss (4.5) + 10log (193.3/100)=4.5+2.9=7.4 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (194.3/100)=4.5+2.9=7.4dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.49888861233 GHz</p> <p>PN0: Fast IfGainLow Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 2.498 890 GHz -29.442 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 2.570005000625 GHz</p> <p>PN0: Fast IfGainLow Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>Mkr1 2.570 005 GHz -27.398 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE band VII - Low Channel 16QAM-20</p>	<p>LTE band VII - High Channel 16QAM-20</p>
<p>Note: Offset=Cable loss (4.5) + 10log (195.1/100)=4.5+2.9=7.4 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (192.4/100)=4.5+2.8=7.3 dB</p>

6.9 Frequency Stability

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1024mbar
Test date :	May 24, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable																																
§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54	a)	<p>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th> <th>Base, fixed (ppm)</th> <th>Mobile ≤ 3 watts (ppm)</th> <th>Mobile ≤ 3 watts (ppm)</th> </tr> </thead> <tbody> <tr> <td>5 to 50</td> <td>20.0</td> <td>0.0</td> <td>50.0</td> </tr> <tr> <td>50 to 450</td> <td>5.0</td> <td>5.0</td> <td>50.0</td> </tr> <tr> <td>450 to 512</td> <td>2.5</td> <td>5.0</td> <td>5.0</td> </tr> <tr> <td>821 to 896</td> <td>1.5</td> <td>2.5</td> <td>2.5</td> </tr> <tr> <td>928 to 929.</td> <td>5.0</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>929 to 960.</td> <td>1.5</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>2110 to 2220</td> <td>10.0</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p> <p>According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</p>	Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)	5 to 50	20.0	0.0	50.0	50 to 450	5.0	5.0	50.0	450 to 512	2.5	5.0	5.0	821 to 896	1.5	2.5	2.5	928 to 929.	5.0	N/A	N/A	929 to 960.	1.5	N/A	N/A	2110 to 2220	10.0	N/A	N/A	<input checked="" type="checkbox"/>
Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)																																
5 to 50	20.0	0.0	50.0																																
50 to 450	5.0	5.0	50.0																																
450 to 512	2.5	5.0	5.0																																
821 to 896	1.5	2.5	2.5																																
928 to 929.	5.0	N/A	N/A																																
929 to 960.	1.5	N/A	N/A																																
2110 to 2220	10.0	N/A	N/A																																

Test setup	 <p>Base Station</p> <p>EUT</p> <p>Thermal Chamber</p>
Procedure	<p>A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.</p> <p>Limit: The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.</p>
Remark	<p>Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of -10°C to $+55^\circ\text{C}$ at normal supply voltage.</p>
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

LTE band II (Part 24E) result

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-6	0.0032	2.5
0		-11	0.0059	2.5
10		-9	0.0048	2.5
20		-17	0.0090	2.5
30		-6	0.0032	2.5
40		-5	0.0027	2.5
50		-11	0.0059	2.5
55		-15	0.0080	2.5
25	4.2	-9	0.0048	2.5
	3.5	-8	0.0043	2.5

LTE band IV (Part 27) result

Middle Channel, $f_0 = 1732.5$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-9	0.0052	2.5
0		-14	0.0081	2.5
10		-15	0.0087	2.5
20		-11	0.0063	2.5
30		-8	0.0046	2.5
40		-10	0.0058	2.5
50		-9	0.0052	2.5
55		-16	0.0092	2.5
25	4.2	-9	0.0052	2.5
	3.5	-10	0.0058	2.5

LTE band VII (Part 27) result

Middle Channel, $f_0 = 2535$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-10	0.0039	2.5
0		-11	0.0043	2.5
10		-14	0.0055	2.5
20		-6	0.0024	2.5
30		-9	0.0036	2.5
40		-10	0.0039	2.5
50		-8	0.0032	2.5
55		-13	0.0051	2.5
25	4.2	-2	0.0008	2.5
	3.5	-8	0.0032	2.5

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/15/2016	09/14/2017	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Temperature/Humidity Chamber	UHL-270	001	10/08/2016	10/07/2017	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Power Amplifier	SMC150D	R1553-0313	03/08/2017	03/07/2018	<input checked="" type="checkbox"/>
Power Amplifier	S41-25D	R1553-0314	05/26/2017	05/25/2018	<input checked="" type="checkbox"/>
Tunable Notch Filter	3NF-800/1000-S	AA4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>

Test Report	17070365-FCC-R5
Page	103 of 119

Tunable Notch Filter	3NF- 1000/2000-S	AM 4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
----------------------	---------------------	------	------------	------------	-------------------------------------

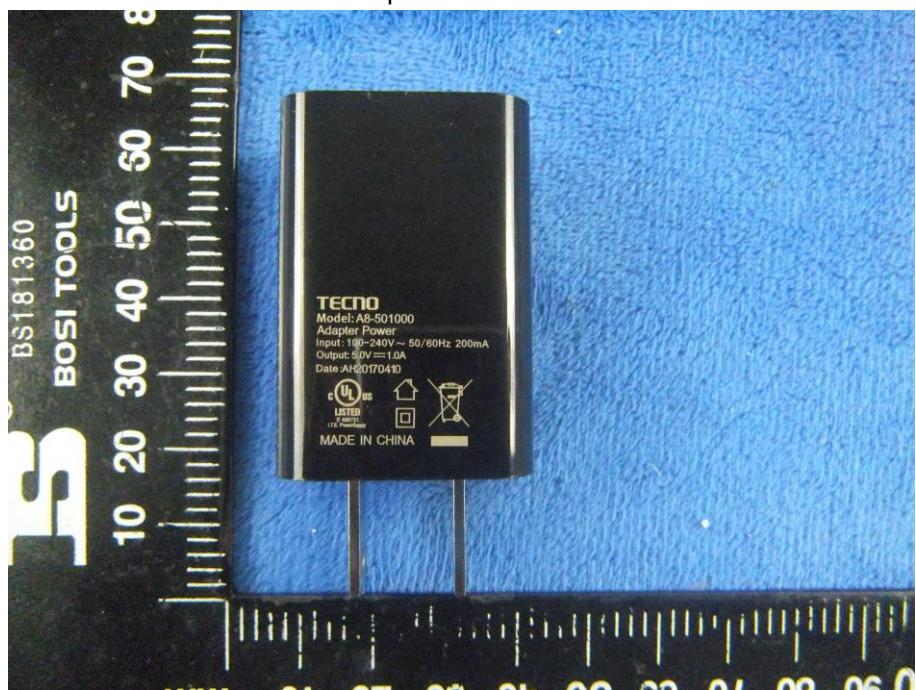
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

Whole Package View



Adapter - Front View



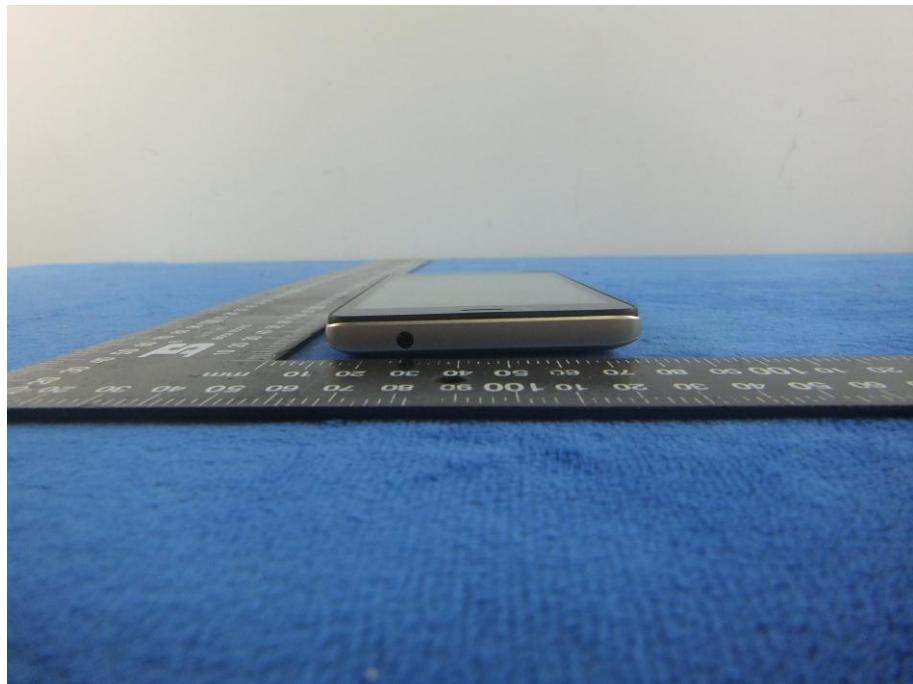
EUT - Front View



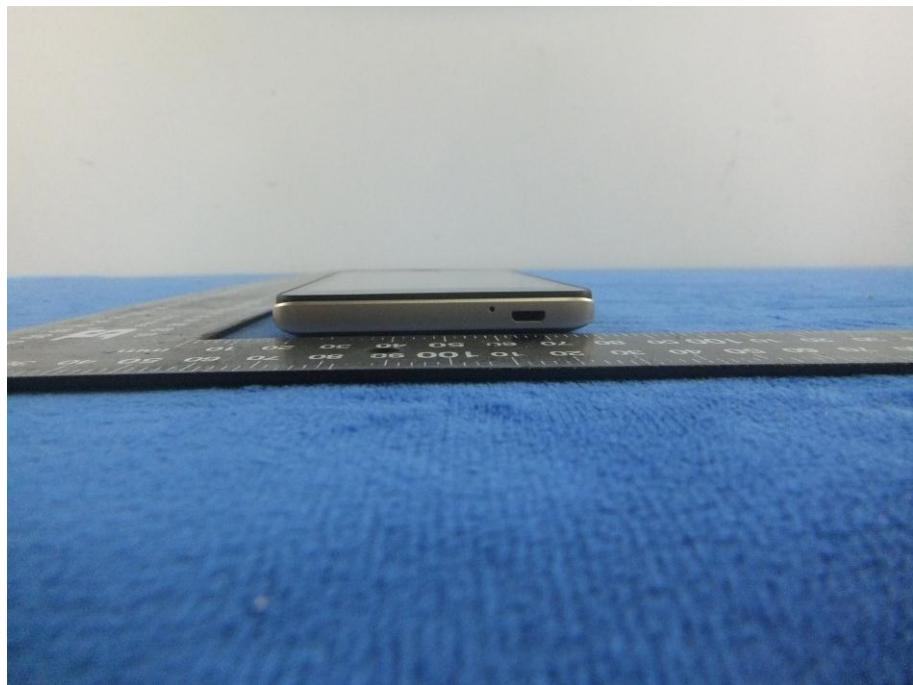
EUT - Rear View



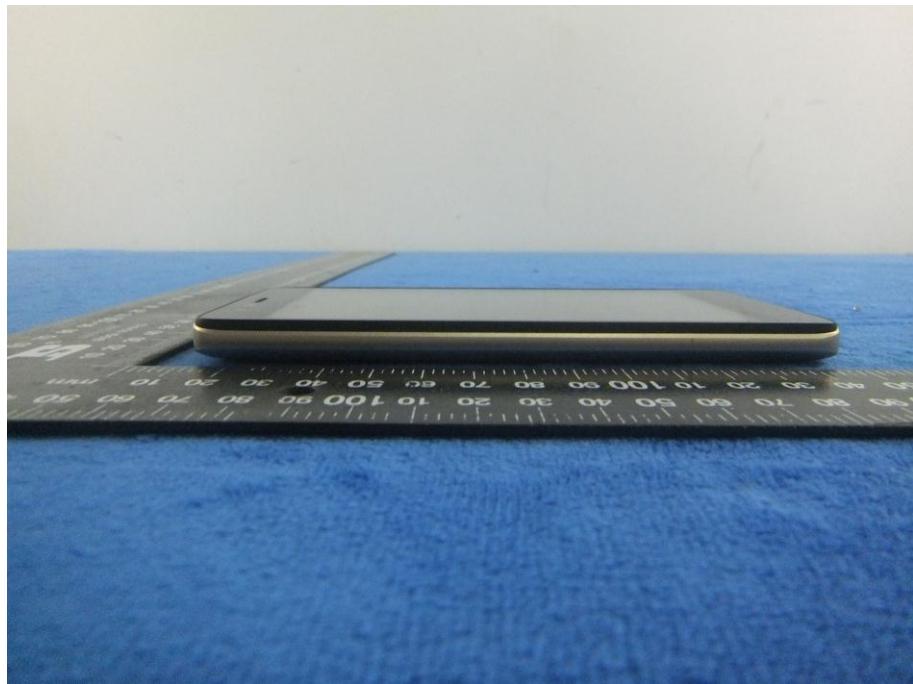
EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View



Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1



Cover Off - Top View 2



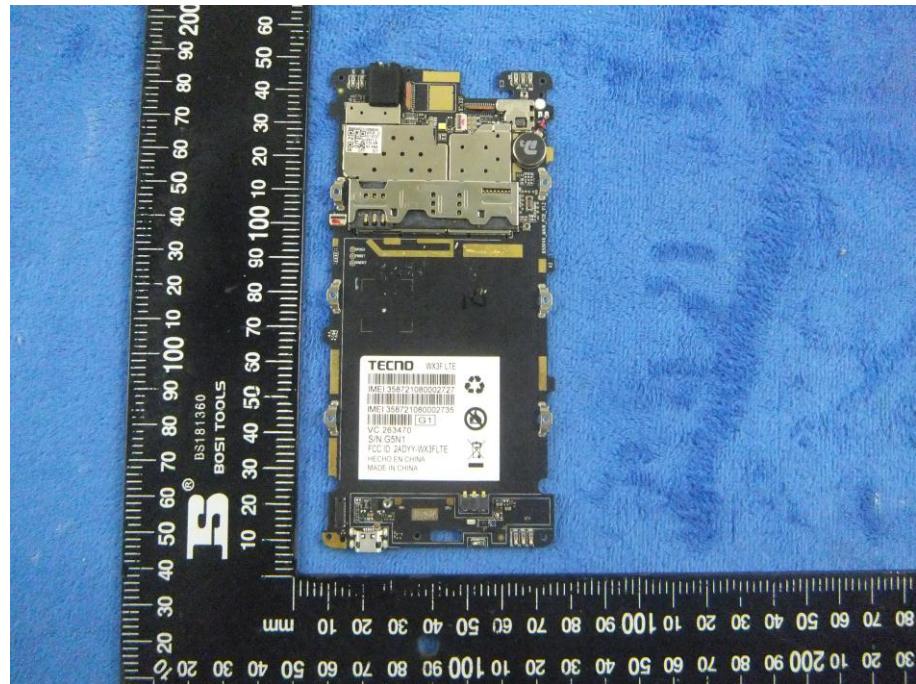
Battery - Front View



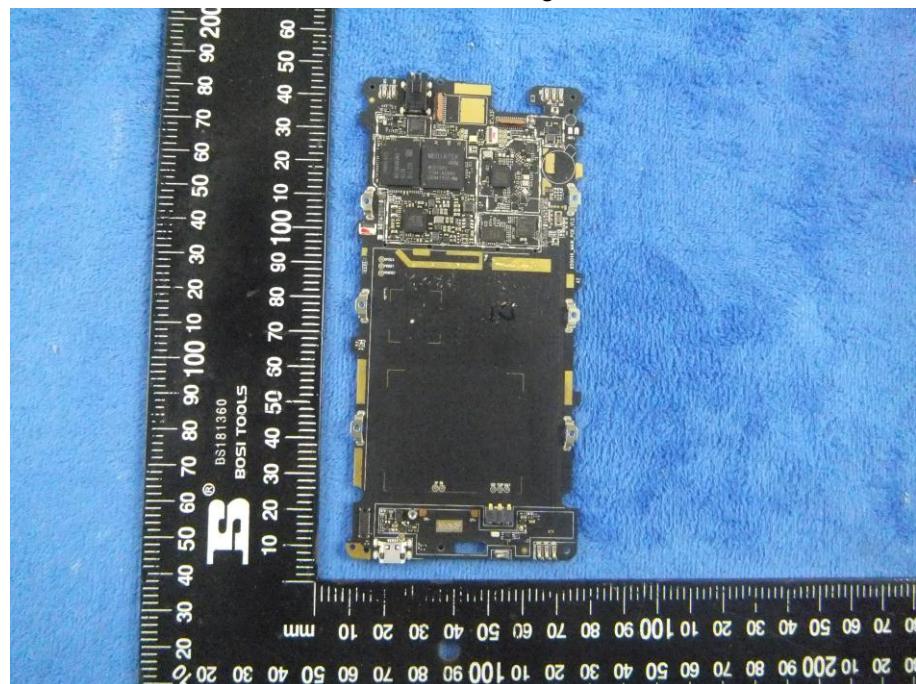
Battery - Rear View



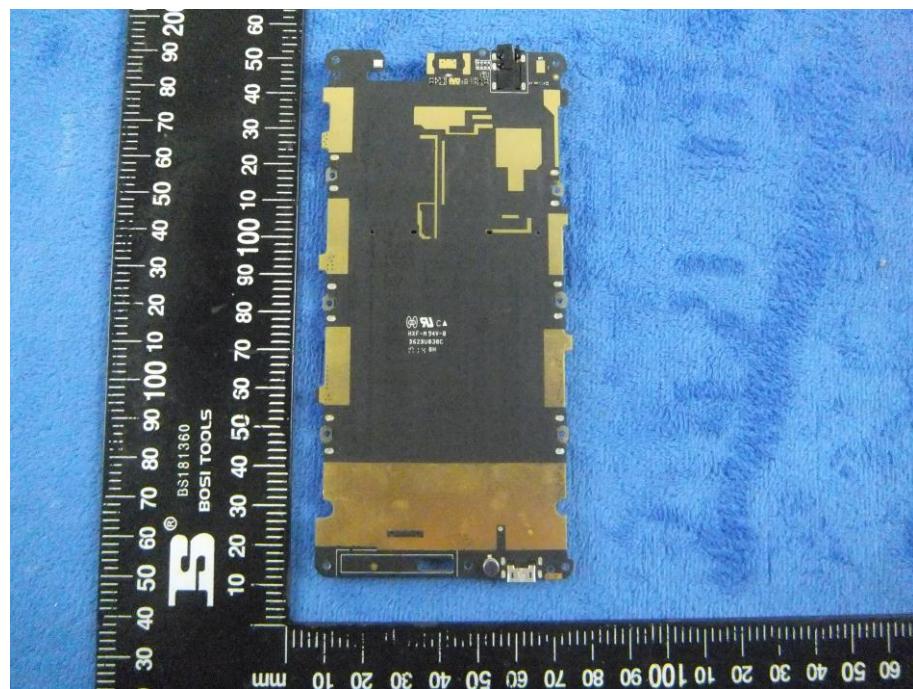
Mainboard with Shielding - Front View



Mainboard without Shielding - Front View



Mainboard – Rear View



LCD – Front View



LCD – Rear View



GSM/PCS/UMTS-FDD Antenna View



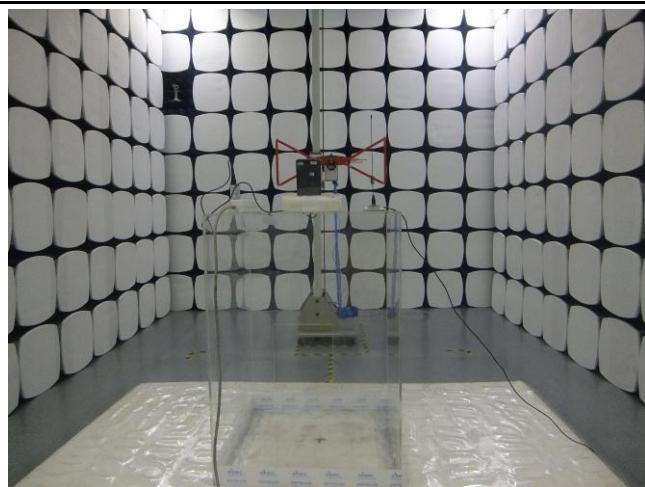
BT - Antenna View



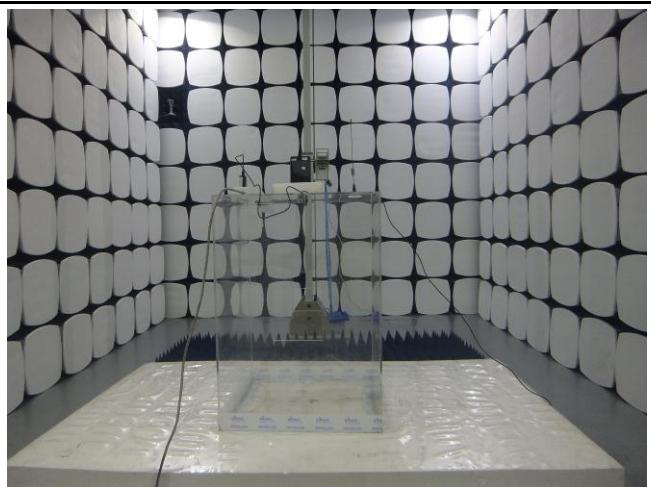
LTE - Antenna View



Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz

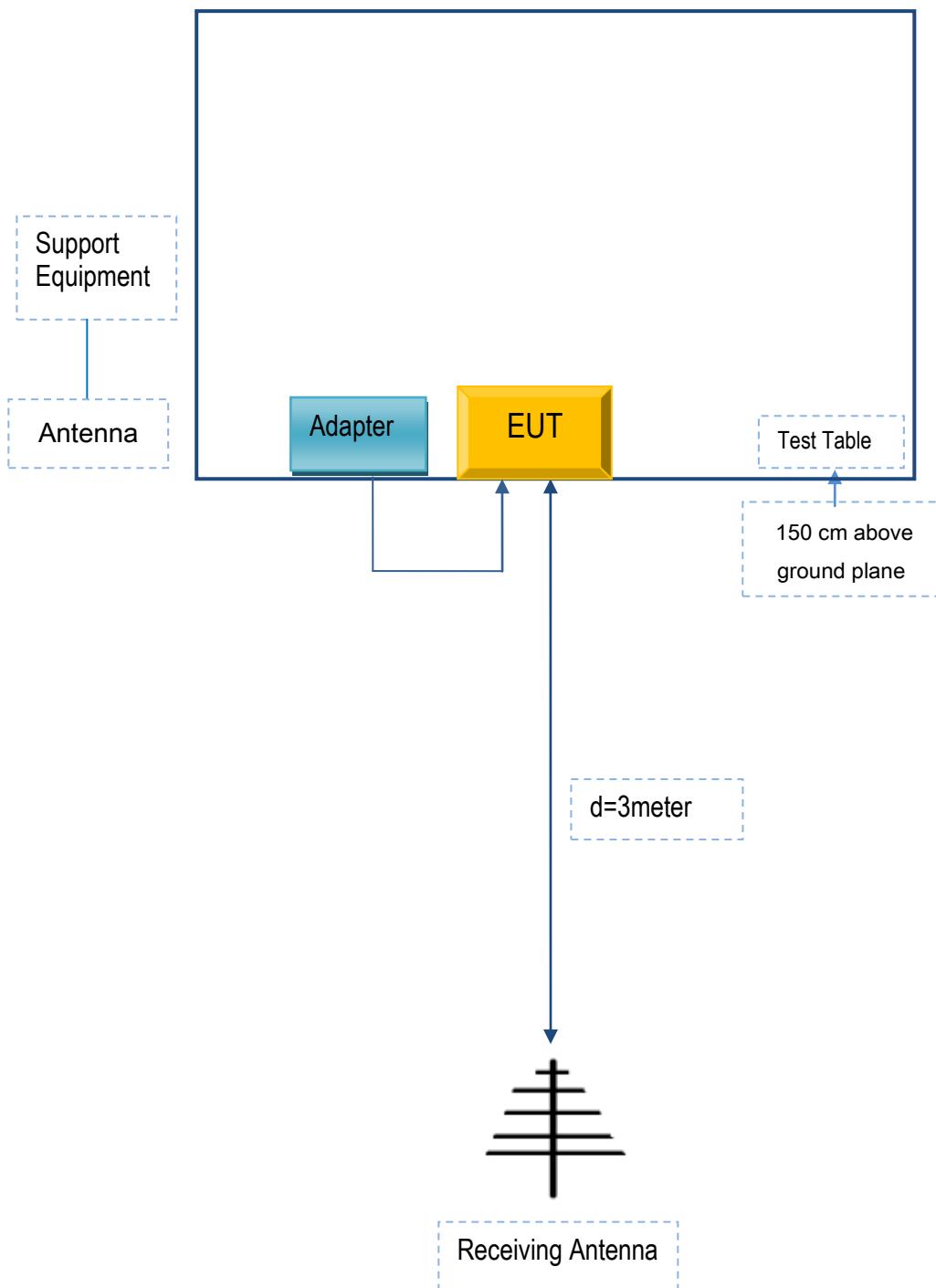


Radiated Spurious Emissions Test Setup Above 1GHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
TECNO MOBILE LIMITED	Adapter	A8-501000	SE503

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	SE503

Annex C.ii. EUT OPERATING CONDITIONS

N/A

Annex D. User Manual / Block Diagram / Schematics / Partlist

N/A

Annex E. DECLARATION OF SIMILARITY

N/A