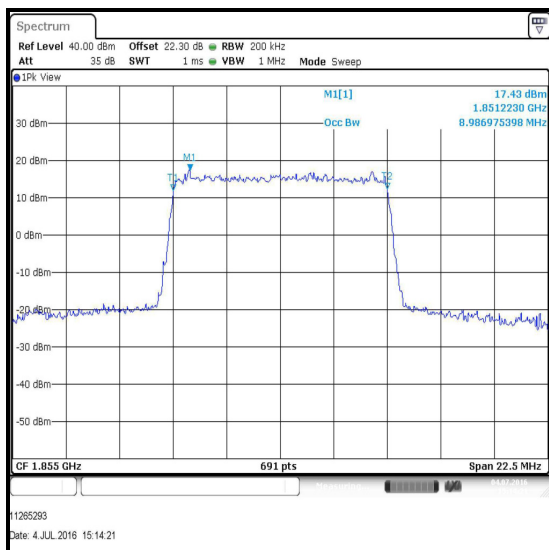
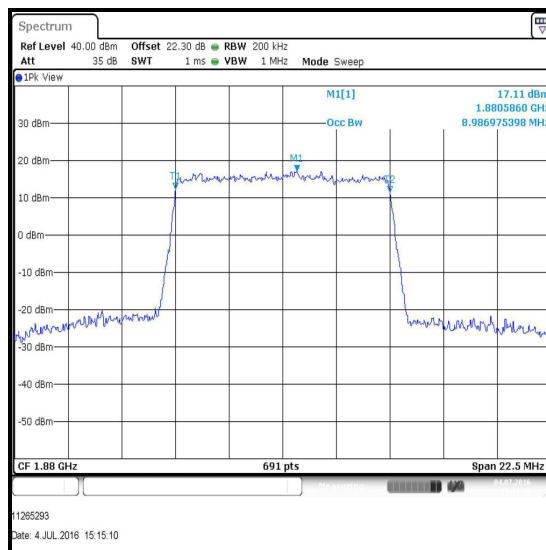
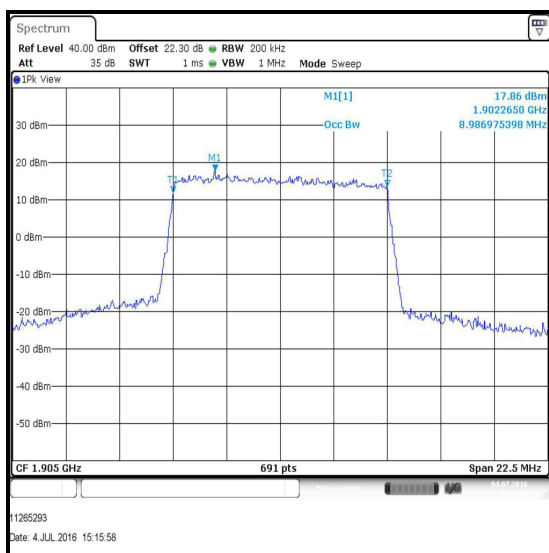


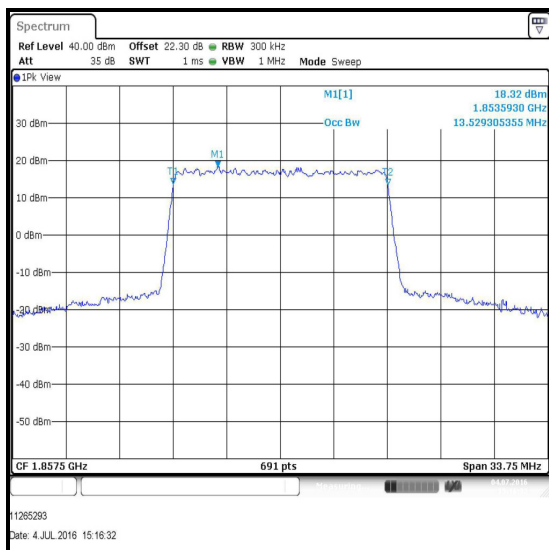
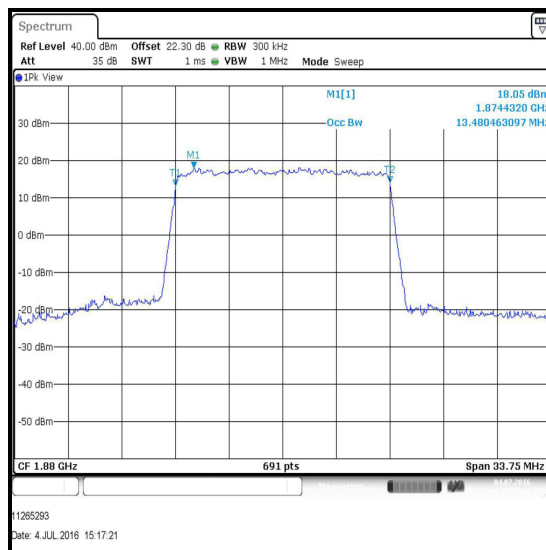
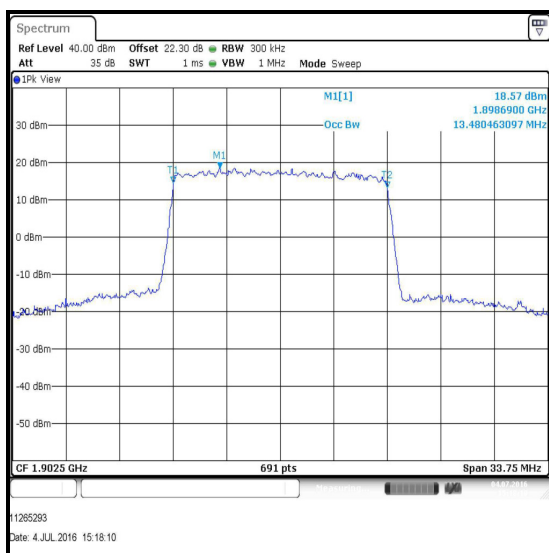
Transmitter Occupied Bandwidth (continued)**Results: 10 MHz Channel Bandwidth / 16QAM**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	50	0	200	1000	8.987
Middle	50	0	200	1000	8.987
Top	50	0	200	1000	8.987

**Bottom Channel / 16QAM****Middle Channel / 16QAM****Top Channel / 16QAM**

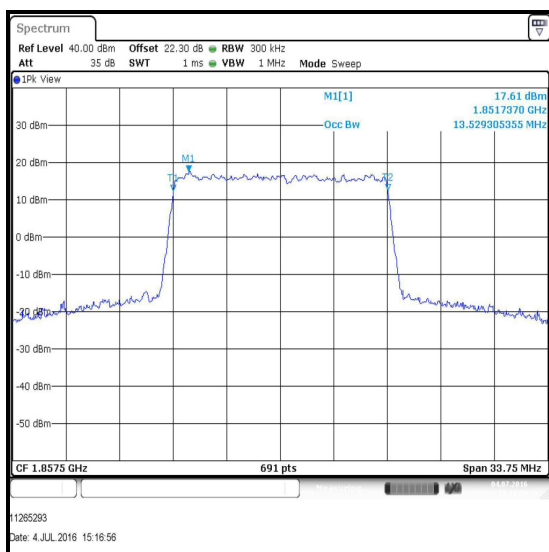
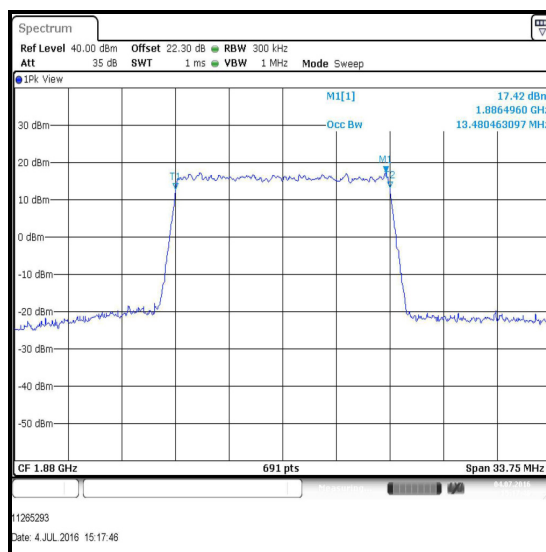
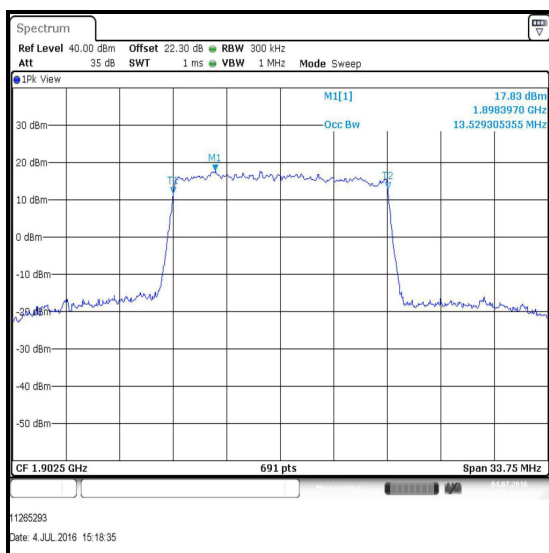
Transmitter Occupied Bandwidth (continued)**Results: 15 MHz Channel Bandwidth / QPSK**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	75	0	300	1000	13.529
Middle	75	0	300	1000	13.480
Top	75	0	300	1000	13.480

**Bottom Channel / QPSK****Middle Channel / QPSK****Top Channel / QPSK**

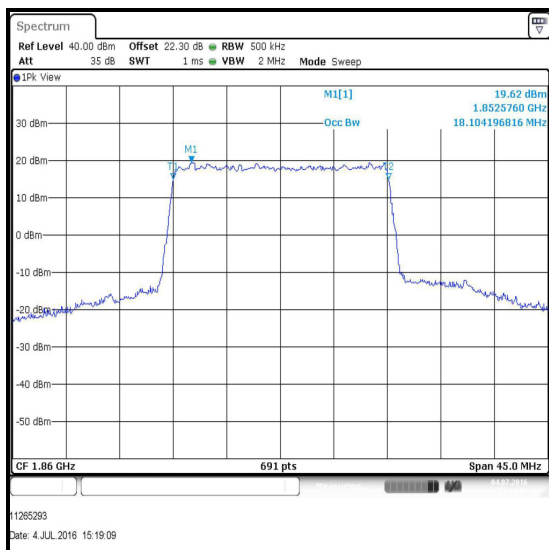
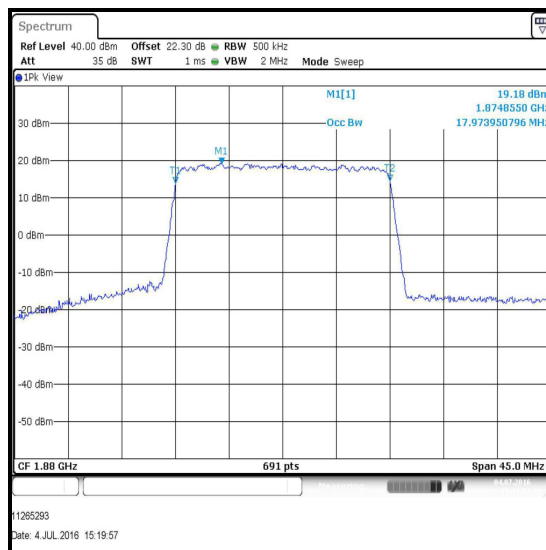
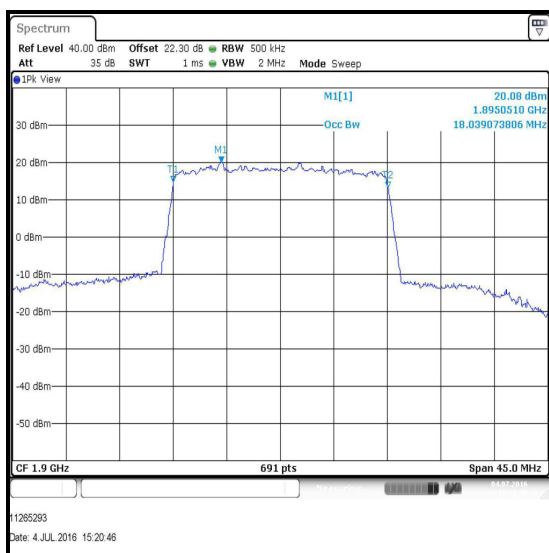
Transmitter Occupied Bandwidth (continued)**Results: 15 MHz Channel Bandwidth / 16QAM**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	75	0	300	1000	13.529
Middle	75	0	300	1000	13.480
Top	75	0	300	1000	13.529

**Bottom Channel / 16QAM****Middle Channel / 16QAM****Top Channel / 16QAM**

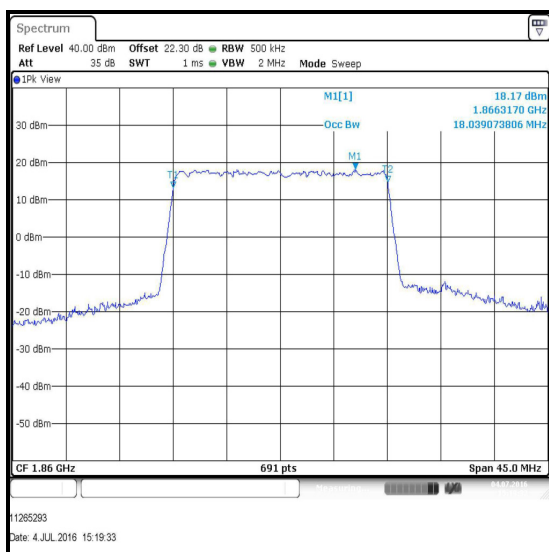
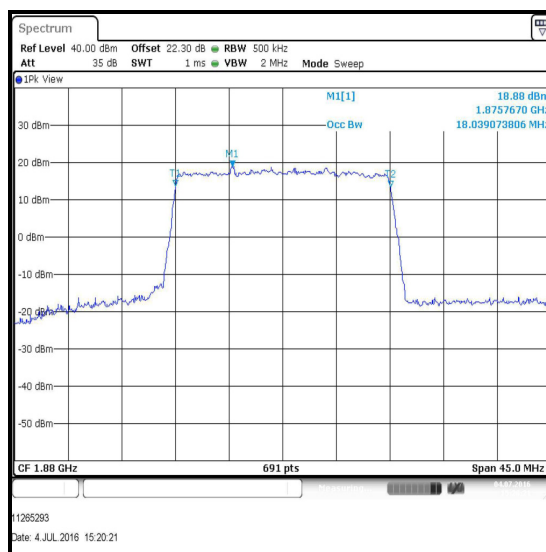
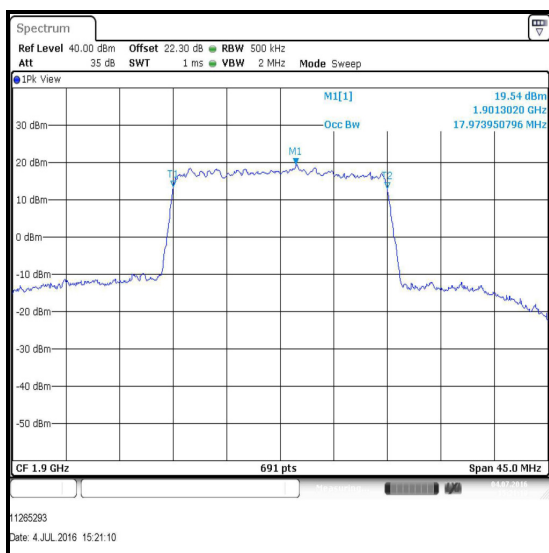
Transmitter Occupied Bandwidth (continued)**Results: 20 MHz Channel Bandwidth / QPSK**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	100	0	500	2000	18.104
Middle	100	0	500	2000	17.974
Top	100	0	500	2000	18.039

**Bottom Channel / QPSK****Middle Channel / QPSK****Top Channel / QPSK**

Transmitter Occupied Bandwidth (continued)**Results: 20 MHz Channel Bandwidth / 16QAM**

Channel	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
Bottom	100	0	500	2000	18.039
Middle	100	0	500	2000	18.039
Top	100	0	500	2000	17.974

**Bottom Channel / 16QAM****Middle Channel / 16QAM****Top Channel / 16QAM**

Transmitter Occupied Bandwidth (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2002	Thermohygrometer	Testo	608-H1	45041825	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145923	05 Apr 2017	12
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	27 Jun 2017	12
A2845	Attenuator	Radiall	R411.806.121	24325927	Calibrated before use	-
A2844	Attenuator	Radiall	R411.803.121	23404066	Calibrated before use	-
A2504	Directional Coupler	AtlanTecRF	CDC-003060-10	13122501839	Calibrated before use	-
S0562	Power Supply	Thurlby Thandar	PL330QMD	054895	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12
G0628	Signal Generator	Rohde & Schwarz	SMBV100A	261847	25 Jan 2017	12
M1835	Signal Analyser	Rohde & Schwarz	FSV30	103050	26 Feb 2017	12

5.2.5. Transmitter Out of Band Radiated Emissions - LAT**Test Summary:**

Test Engineers:	Nigel Davison & Andrew Edwards	Test Dates:	08 July 2016 to 17 July 2016
Test Sample IMEI:	358640070286456		

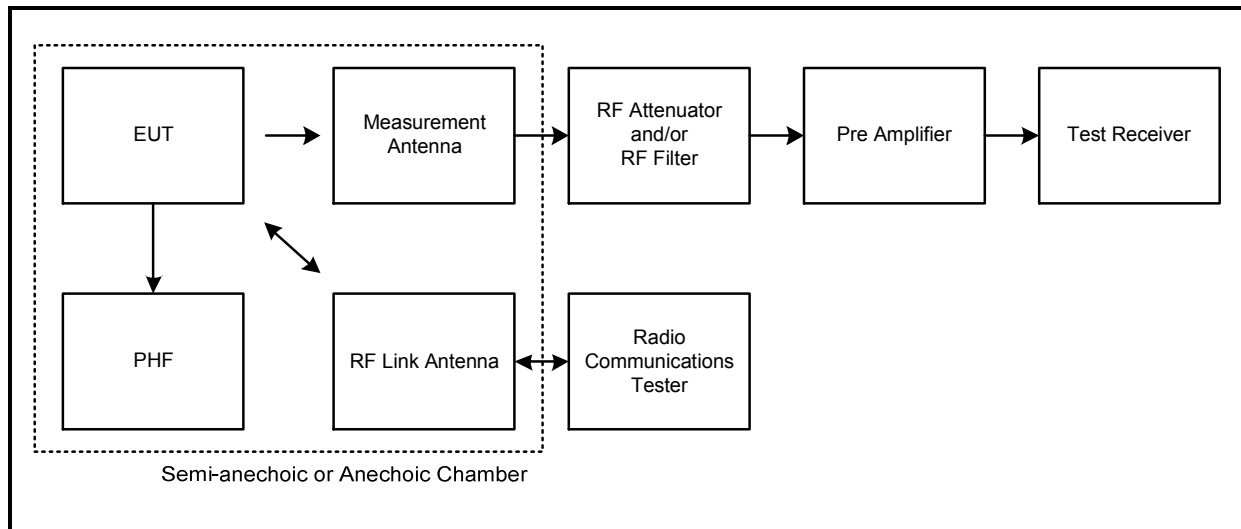
FCC Reference:	Parts 2.1053 & 24.238(a)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 24.238
Frequency Range:	30 MHz to 20 GHz
Configuration:	10 MHz, QPSK, 1RB, 0 Offset

Environmental Conditions:

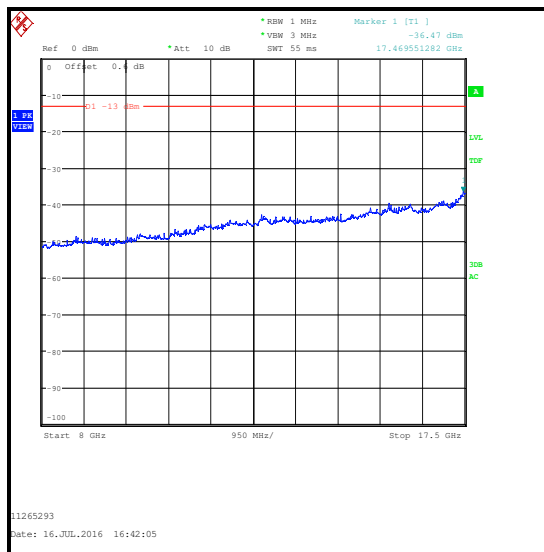
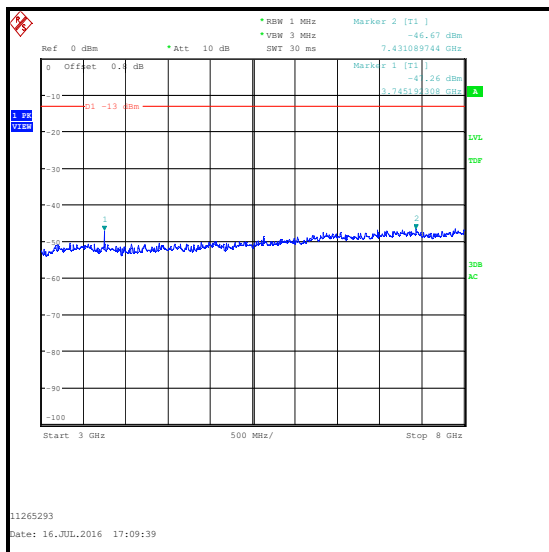
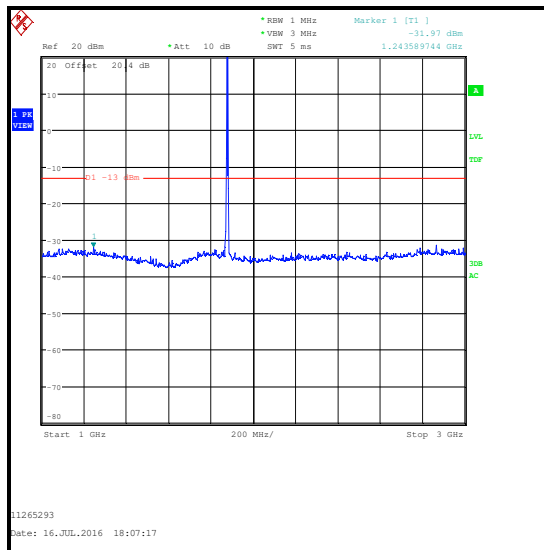
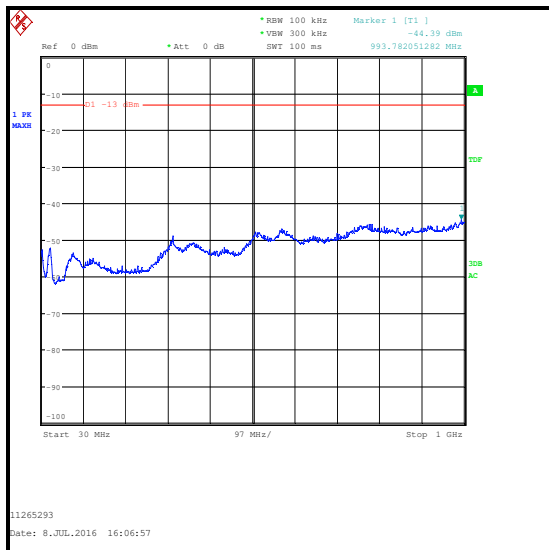
Temperature (°C):	25
Relative Humidity (%):	39 to 46

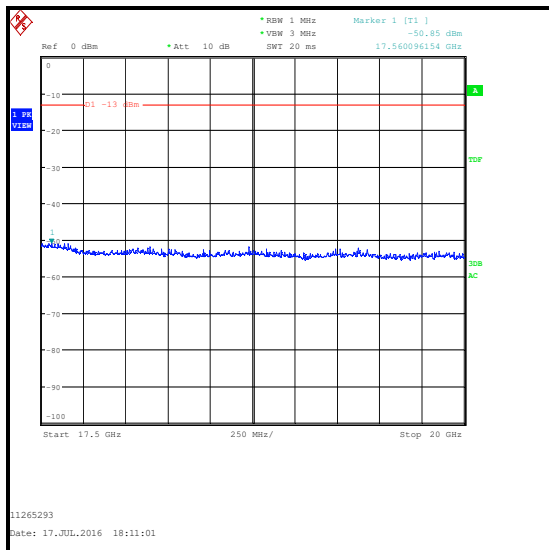
Note(s):

1. The EUT was set to transmit with a 10 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and was therefore deemed to be the worst case.
2. The emission seen on the 1 GHz to 3 GHz plot at approximately 1880 MHz is the EUT carrier.
3. All emissions were at least 20 dB below the specification limit or below the measurement system noise floor. Therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Middle channel results are recorded in this report and are representative of bottom and top channel results which are held on the UL IT server and available for inspection on request.
5. Pre-scan measurements below 1 GHz are performed on separate plots with different transducer factors for vertical and horizontal polarisation. The pre-scan plot for 30 MHz to 1 GHz in this test report is for vertical only. All other plots are stored on the company server and are available for inspection on request.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
7. Pre-scans above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
8. Radiated spurious emission testing between 150 kHz and 30 MHz was performed for support of the NFC test report. No spurious emissions were observed above the noise floor of the measurement system.

Transmitter Out of Band Radiated Emissions – LAT (continued)**Test setup for radiated measurements:****Results: Middle Channel**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1243.590	-32.0	-13.0	19.0	Complied

Transmitter Out of Band Radiated Emissions – LAT (continued)

Transmitter Out of Band Radiated Emissions – LAT (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	07 Apr 2017	12
A2890	Antenna	Schwarzbeck	HWRD 750	014	06 May 2017	12
A2892	Antenna	Schwarzbeck	BBHA 9170	9170-727	07 Apr 2017	12
A2863	Pre-Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2891	Pre-Amplifier	Schwarzbeck	BBV 9718	9718-306	07 Apr 2017	12
A2893	Pre-Amplifier	Schwarzbeck	BBV 9721	9721-021	07 Apr 2017	12
S0582	Power Supply	Schwarzbeck	PS9721	00005	Calibrated before use	-
M1818	Multimeter	Fluke	79 Series II	71811580	27 Apr 2017	12
A2918	Attenuator	AtlanTecRF	AN185W-20	832828#1	19 May 2017	12
A2914	High Pass Filter	AtlanTecRF	AFH-03000	2155	19 May 2017	12
A2947	High Pass Filter	AtlanTecRF	AFH-07000	1601900001	01 Jun 2017	12

5.2.6. Transmitter Out of Band Radiated Emissions - UAT**Test Summary:**

Test Engineer:	Andrew Edwards	Test Dates:	13 July 2016 to 17 July 2016
Test Sample IMEI:	358640070309175		

FCC Reference:	Parts 2.1053 & 24.238(a)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 24.238
Frequency Range:	30 MHz to 20 GHz
Configuration:	10 MHz, QPSK, 1RB, 0 Offset

Environmental Conditions:

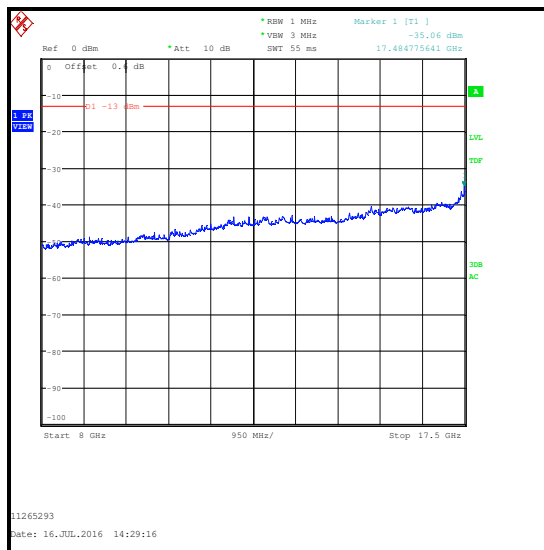
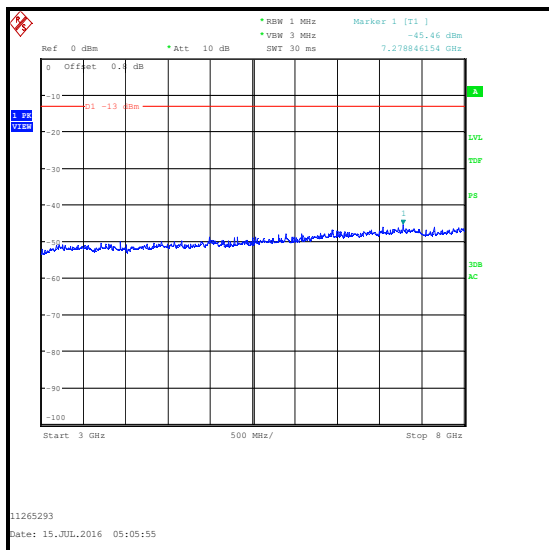
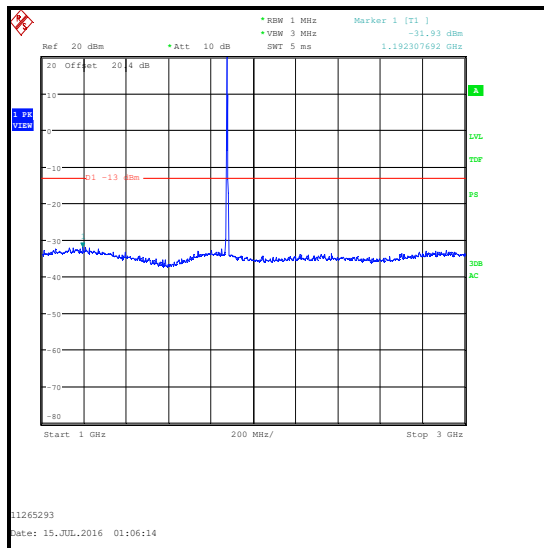
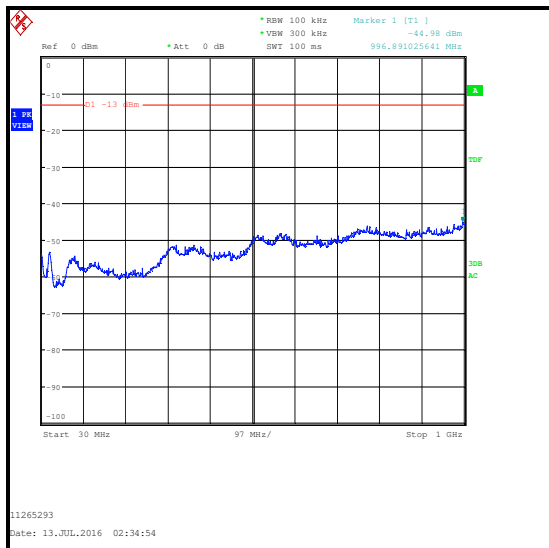
Temperature (°C):	25 to 26
Relative Humidity (%):	39 to 43

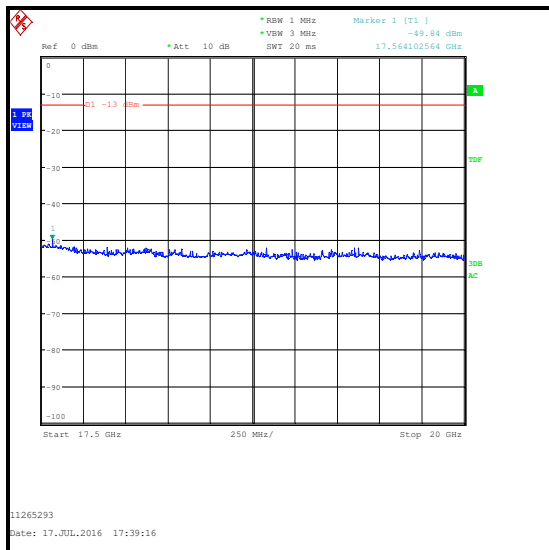
Note(s):

1. The EUT was set to transmit with a 10 MHz channel bandwidth with QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and was therefore deemed to be the worst case.
2. The emission seen on the 1 GHz to 3 GHz plot at approximately 1880 MHz is the EUT carrier.
3. No spurious emissions were detected above the measurement system noise floor therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Middle channel results are recorded in this report and are representative of bottom and top channel results which are held on the UL IT server and available for inspection on request.
5. Pre-scan measurements below 1 GHz are performed on separate plots with different transducer factors for vertical and horizontal polarisation. The pre-scan plot for 30 MHz to 1 GHz in this test report is for vertical only. All other plots are stored on the company server and are available if required.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
7. Pre-scans above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
8. Radiated spurious emission testing between 150 kHz and 30 MHz was performed for support of the NFC test report. No spurious emissions were observed above the noise floor of the measurement system.

Results: Middle Channel

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1192.308	-31.9	-13.0	18.9	Complied

Transmitter Out of Band Radiated Emissions – UAT (continued)

Transmitter Out of Band Radiated Emissions – UAT (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	07 Apr 2017	12
A2890	Antenna	Schwarzbeck	HWRD 750	014	06 May 2017	12
A2892	Antenna	Schwarzbeck	BBHA 9170	9170-727	07 Apr 2017	12
A2863	Pre-Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2891	Pre-Amplifier	Schwarzbeck	BBV 9718	9718-306	07 Apr 2017	12
A2893	Pre-Amplifier	Schwarzbeck	BBV 9721	9721-021	07 Apr 2017	12
S0582	Power Supply	Schwarzbeck	PS9721	00005	Calibrated before use	-
M1818	Multimeter	Fluke	79 Series II	71811580	27 Apr 2017	12
A2918	Attenuator	AtlanTecRF	AN185W-20	832828#1	19 May 2017	12
A2914	High Pass Filter	AtlanTecRF	AFH-03000	2155	19 May 2017	12
A2947	High Pass Filter	AtlanTecRF	AFH-07000	1601900001	01 Jun 2017	12

5.2.7. Transmitter Radiated Emissions at Band Edges - LAT**Test Summary:**

Test Engineer:	SunGil Park	Test Date:	15 July 2016
Test Sample IMEI:	358640070286456		

FCC Reference:	Parts 2.1053 & 24.238(a)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 24.238

Environmental Conditions:

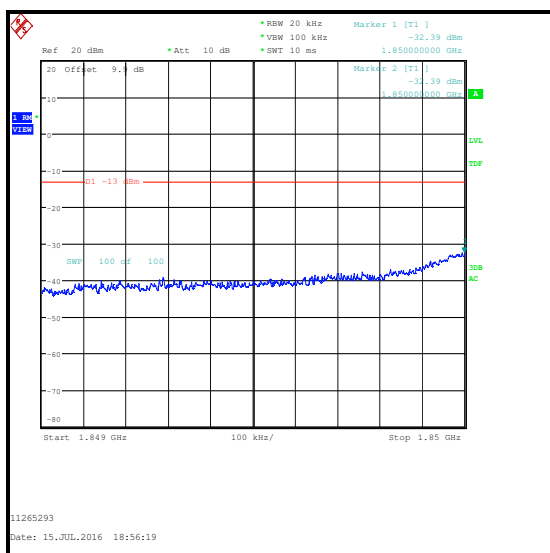
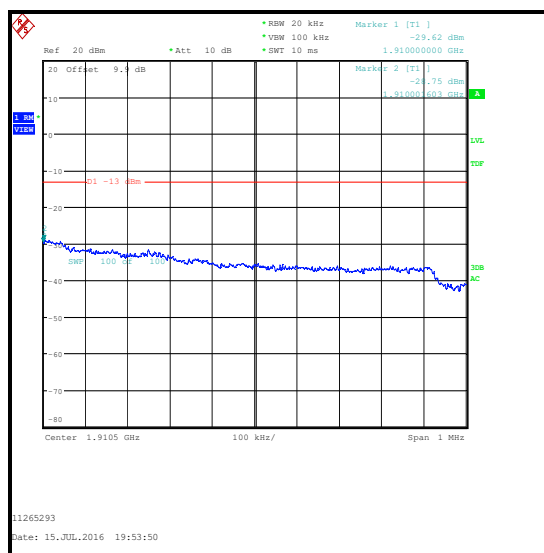
Temperature (°C):	25
Relative Humidity (%):	40

Note(s):

1. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor in line with the EUT.
3. 1.4 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 20 kHz (>1% of the widest 26 dB emission bandwidth) and video bandwidth 100 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
4. 3 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 30 kHz (1% of the widest 26 dB emission bandwidth) and video bandwidth 100 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
5. 5 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 50 kHz (1% of the widest 26 dB emission bandwidth) and video bandwidth 200 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
6. 10 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 100 kHz (>1% of the widest 26 dB emission bandwidth) and video bandwidth 300 kHz (three times the resolution bandwidth).
7. 15 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 200 kHz (1% of the widest 26 dB emission bandwidth) and video bandwidth 1 MHz (as close to > three times the resolution bandwidth as the test receiver allowed).
8. 20 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 200 kHz (>1% of the widest 26 dB emission bandwidth) and video bandwidth 1 MHz (three times the resolution bandwidth).

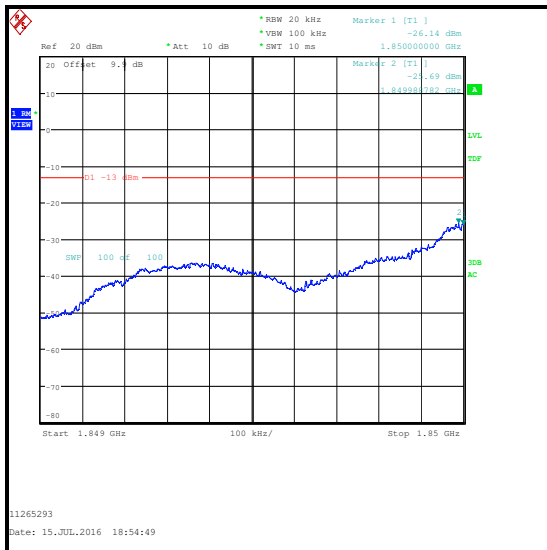
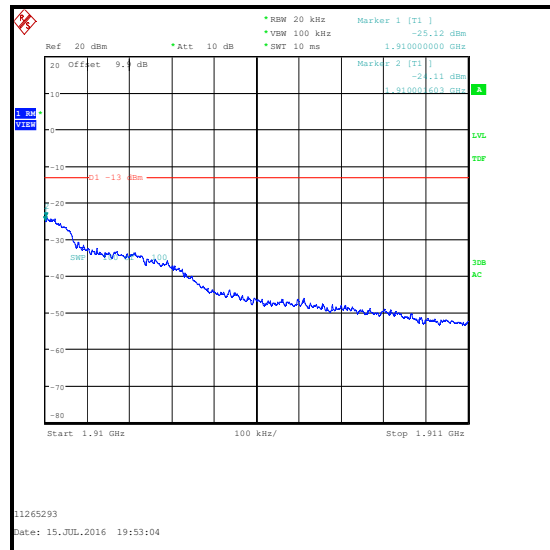
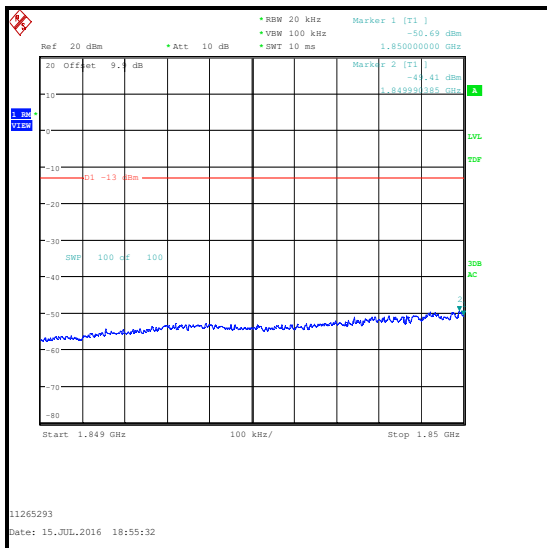
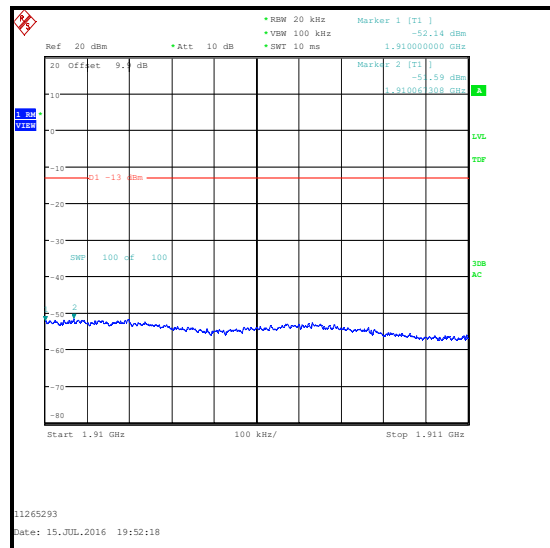
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 1.4 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	6	0	-32.4	-13.0	19.4	Complied
1910	6	0	-29.6	-13.0	16.6	Complied
1910.002	6	0	-28.7	-13.0	15.7	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

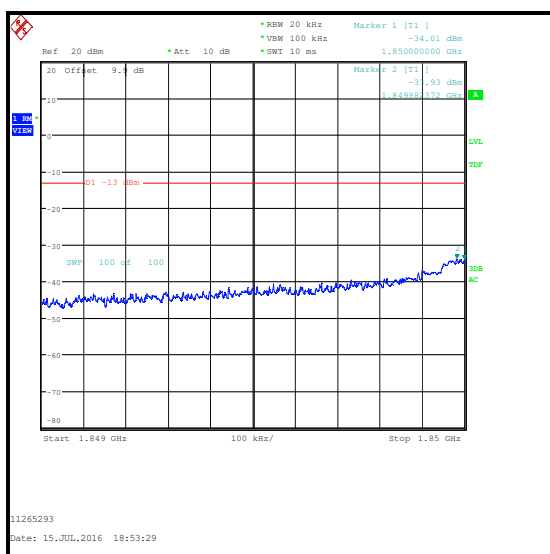
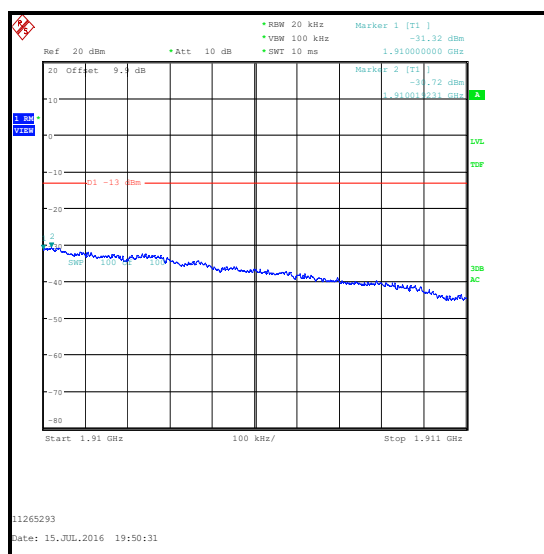
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 1.4 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.989	1	0	-25.7	-13.0	12.7	Complied
1850	1	0	-26.1	-13.0	13.1	Complied
1910	1	5	-25.1	-13.0	12.1	Complied
1910.002	1	5	-24.1	-13.0	11.1	Complied
1850	1	5	-50.7	-13.0	37.7	Complied
1910	1	0	-52.1	-13.0	39.1	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 5 offset / Upper Band Edge****QPSK / 1 RB 5 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

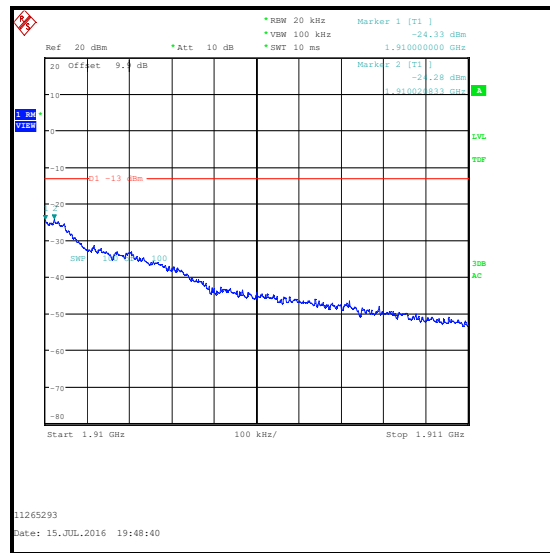
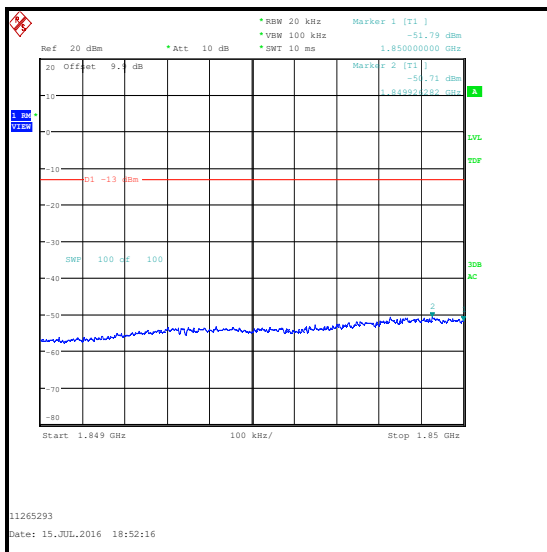
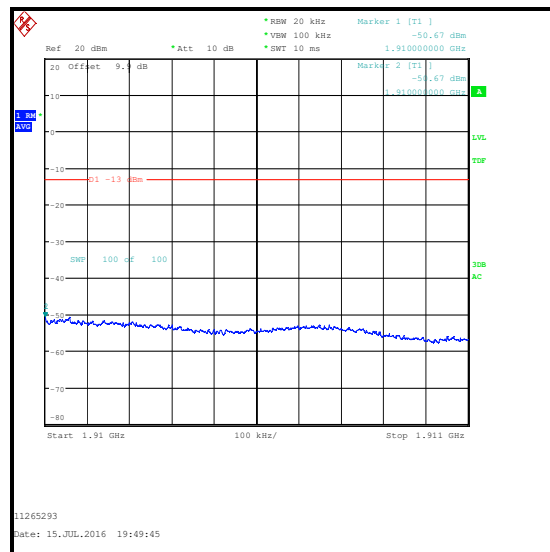
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 1.4 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.982	6	0	-33.9	-13.0	20.9	Complied
1850	6	0	-34.0	-13.0	21.0	Complied
1910	6	0	-31.3	-13.0	18.3	Complied
1910.019	6	0	-30.7	-13.0	17.7	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

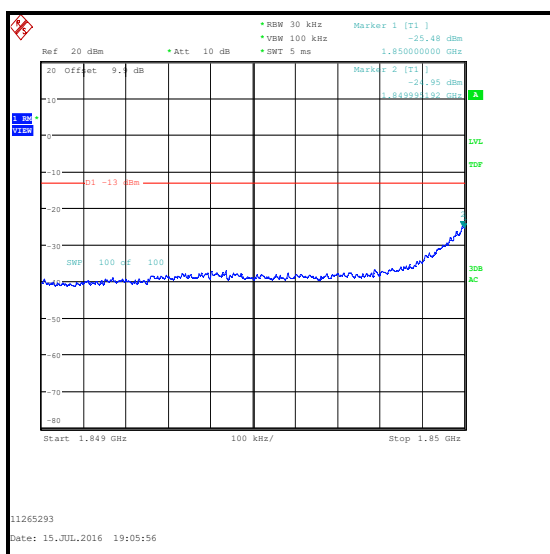
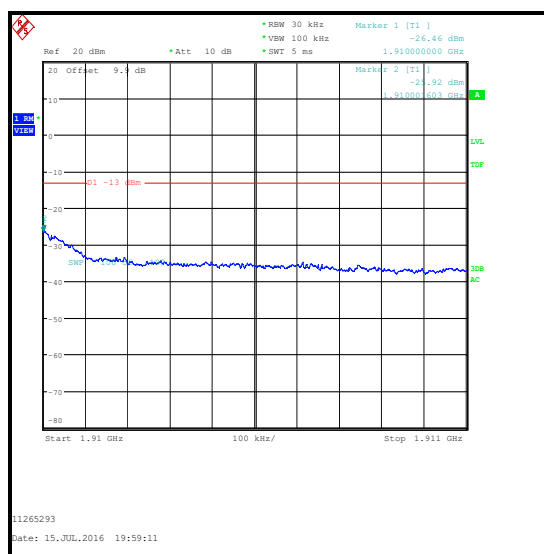
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 1.4 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	1	0	-25.7	-13.0	12.7	Complied
1850	1	0	-27.3	-13.0	14.3	Complied
1910	1	5	-24.3	-13.0	11.3	Complied
1850	1	5	-51.8	-13.0	38.8	Complied
1910	1	0	-50.7	-13.0	37.7	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 5 offset / Upper Band Edge****16QAM / 1 RB 5 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

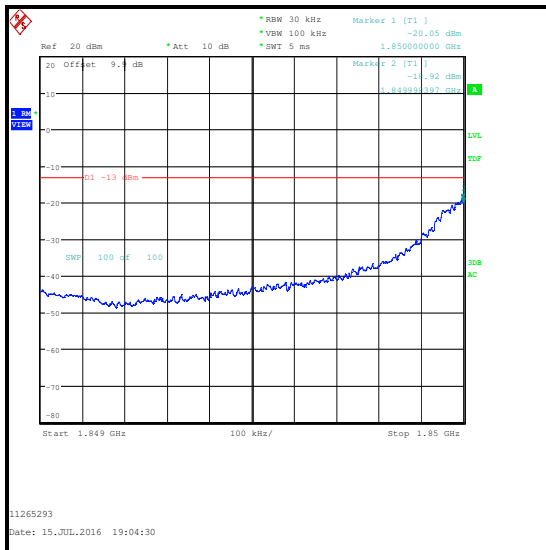
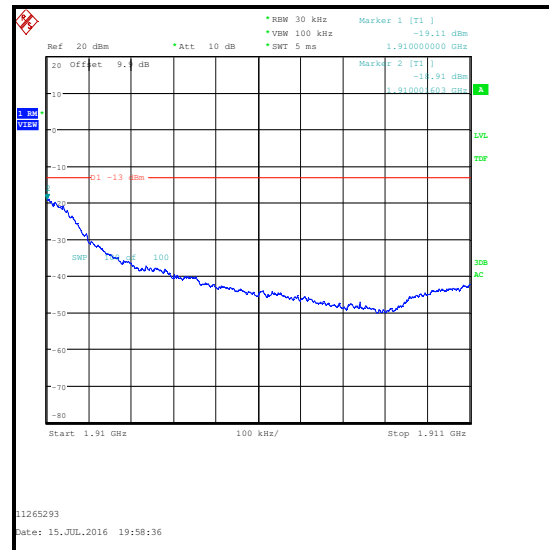
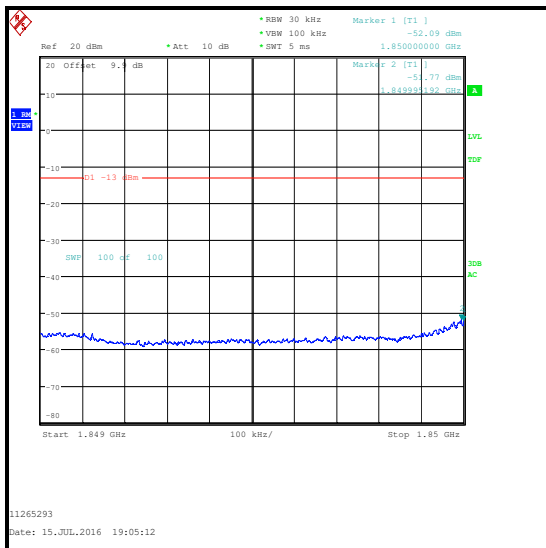
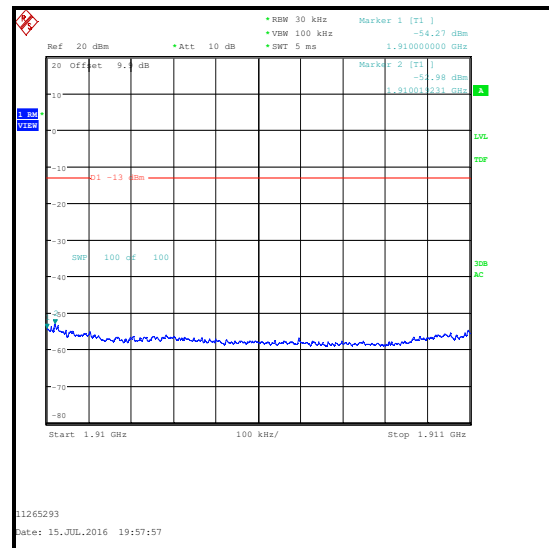
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 3 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	15	0	-25.0	-13.0	12.0	Complied
1850	15	0	-25.5	-13.0	12.5	Complied
1910	15	0	-26.5	-13.0	13.5	Complied
1910.002	15	0	-25.9	-13.0	12.9	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

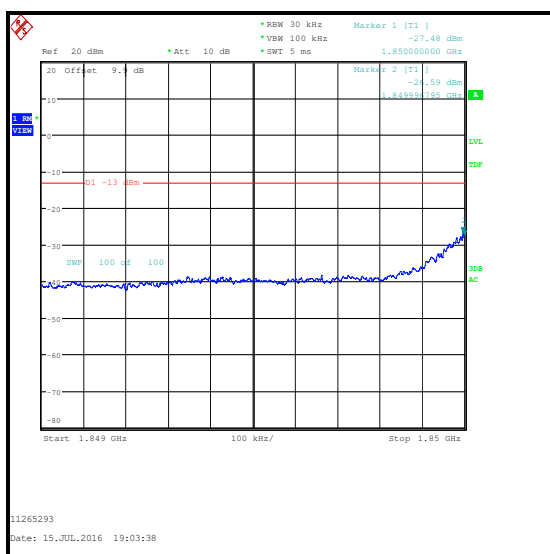
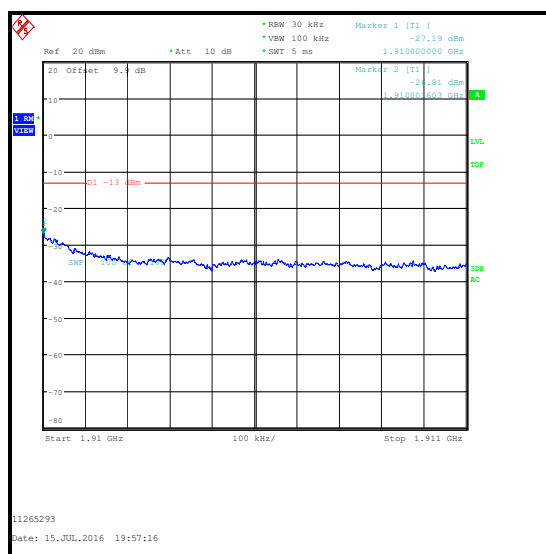
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 3 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.998	1	0	-18.9	-13.0	5.9	Complied
1850	1	0	-20.0	-13.0	7.0	Complied
1910	1	14	-19.1	-13.0	6.1	Complied
1910.002	1	14	-18.9	-13.0	5.9	Complied
1850	1	14	-52.1	-13.0	39.1	Complied
1910	1	0	-54.3	-13.0	41.3	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 14 offset / Upper Band Edge****QPSK / 1 RB 14 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 3 MHz Channel Bandwidth / 16QAM**

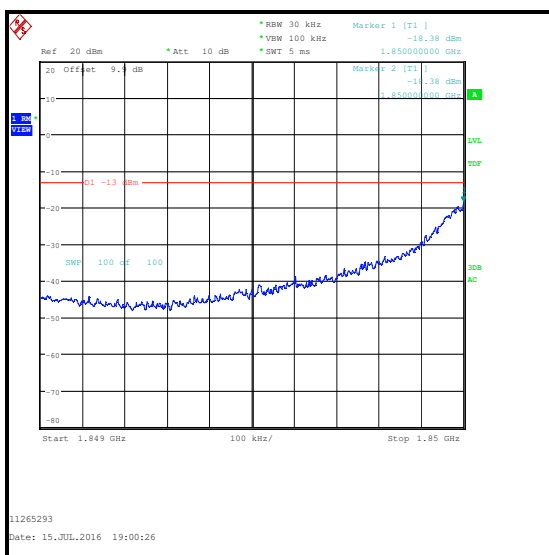
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	15	0	-26.6	-13.0	13.6	Complied
1850	15	0	-27.5	-13.0	14.5	Complied
1910	15	0	-27.2	-13.0	14.2	Complied
1910.002	15	0	-26.8	-13.0	13.8	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

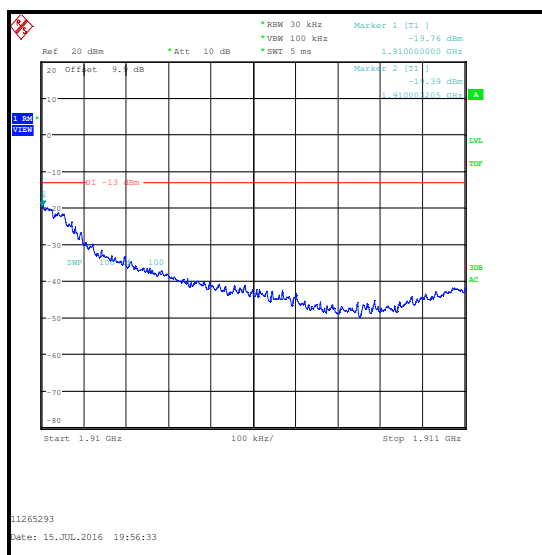
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 3 MHz Channel Bandwidth / 16QAM

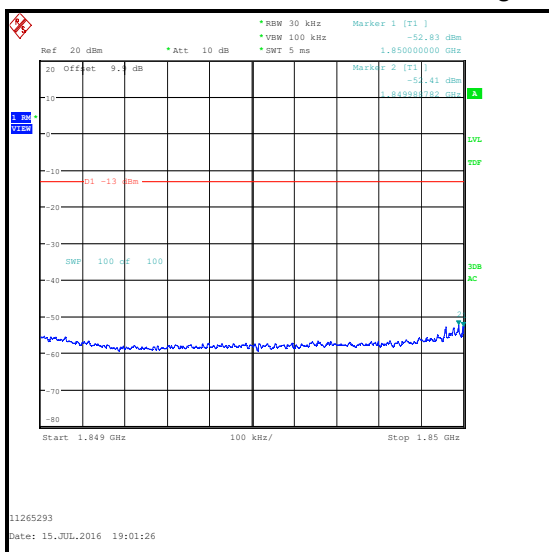
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-18.4	-13.0	5.4	Complied
1910	1	14	-19.8	-13.0	6.8	Complied
1910.003	1	14	-19.4	-13.0	6.4	Complied
1850	1	14	-58.2	-13.0	45.2	Complied
1910	1	0	-54.2	-13.0	41.2	Complied



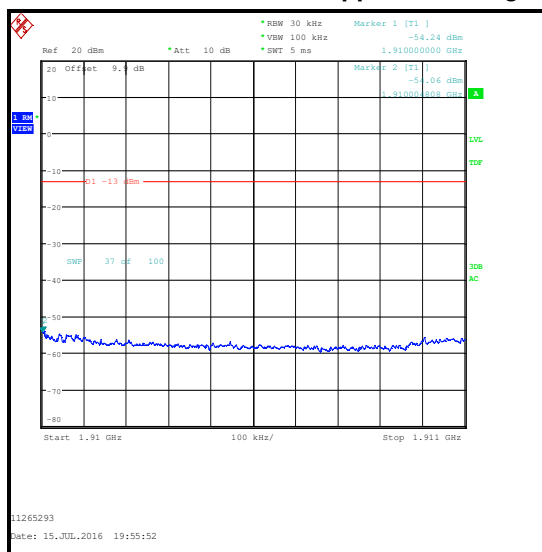
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 14 offset / Upper Band Edge



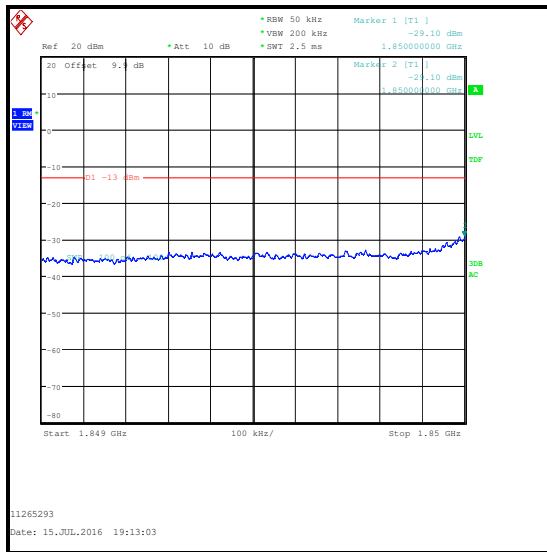
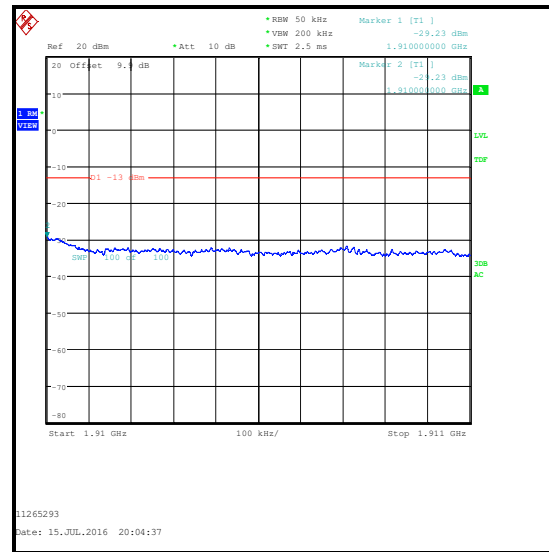
16QAM / 1 RB 14 offset / Lower Band Edge



16QAM / 1 RB 0 offset / Upper Band Edge

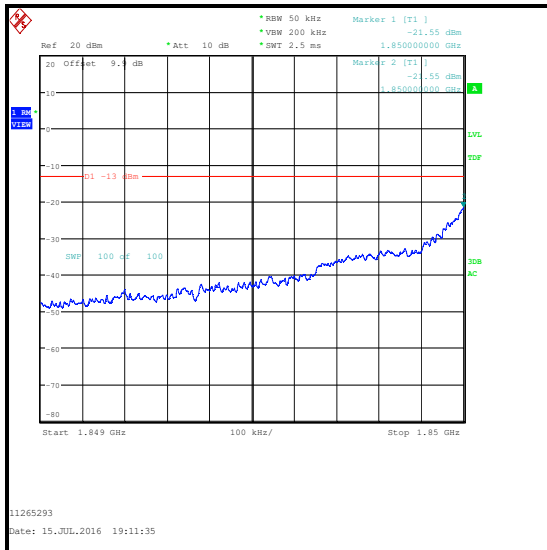
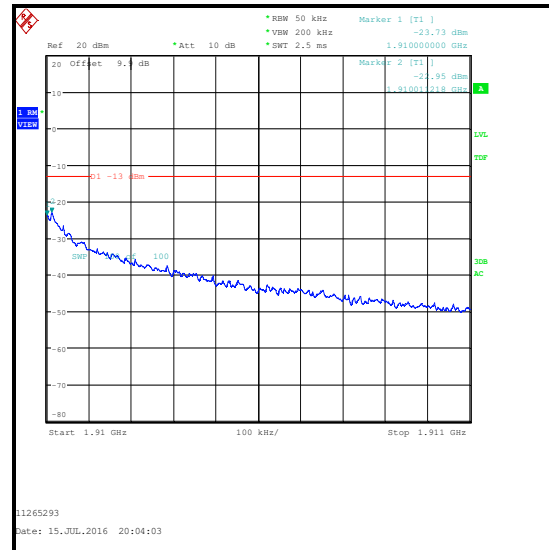
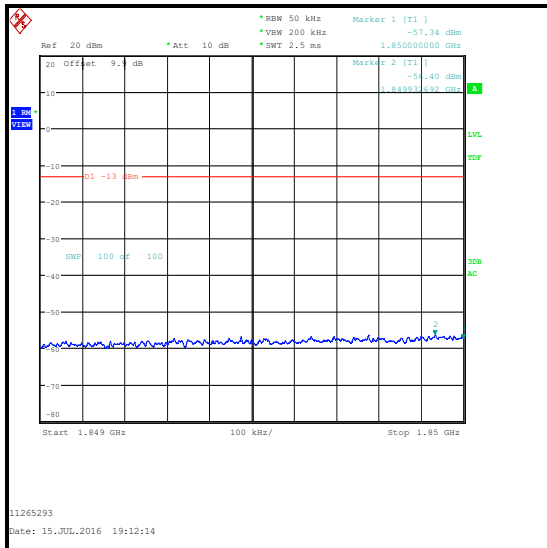
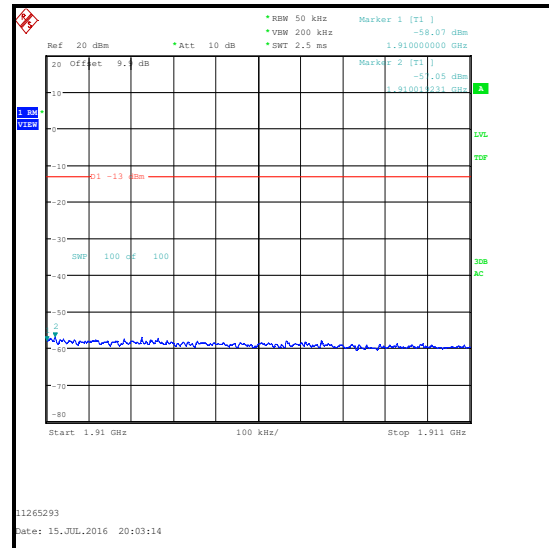
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 5 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	25	0	-29.1	-13.0	16.1	Complied
1910	25	0	-29.2	-13.0	16.2	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

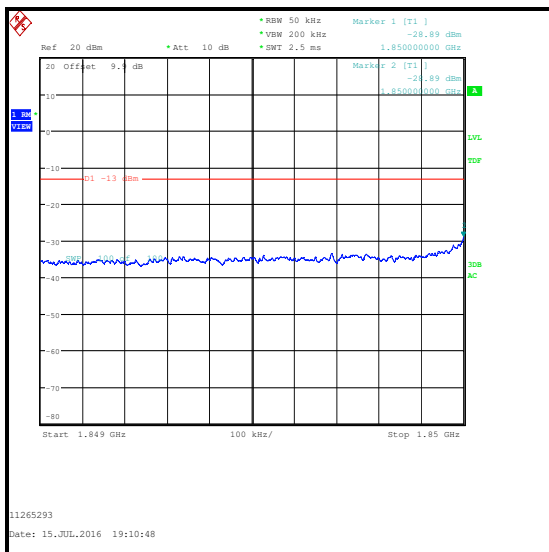
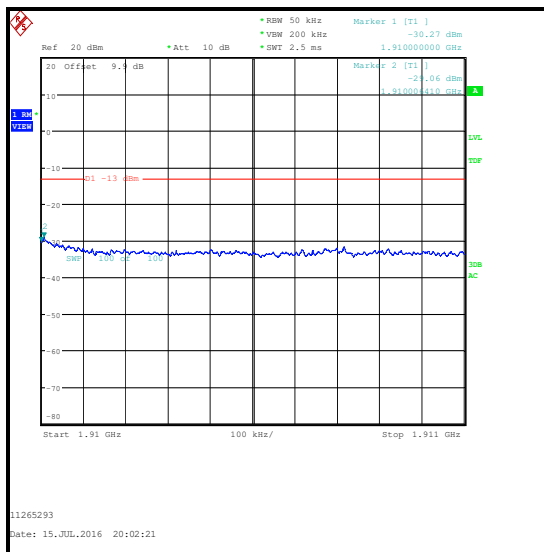
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 5 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-21.5	-13.0	8.5	Complied
1910	1	24	-23.7	-13.0	10.7	Complied
1910.011	1	24	-23.0	-13.0	10.0	Complied
1850	1	24	-57.3	-13.0	44.3	Complied
1910	1	0	-58.1	-13.0	45.1	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 24 offset / Upper Band Edge****QPSK / 1 RB 24 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

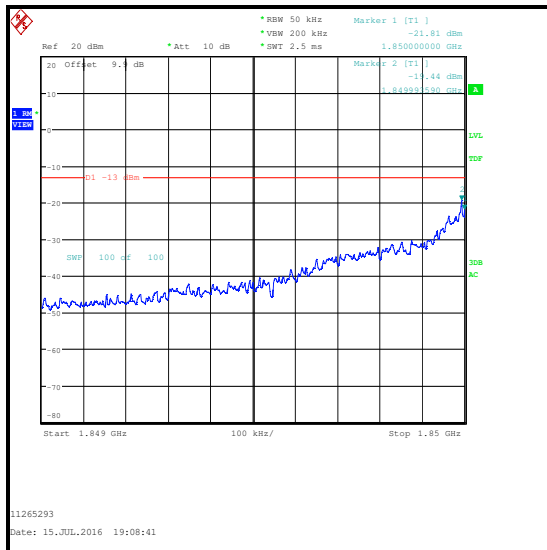
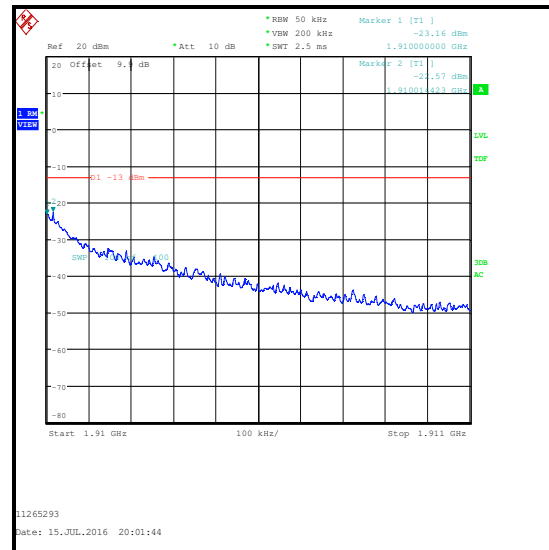
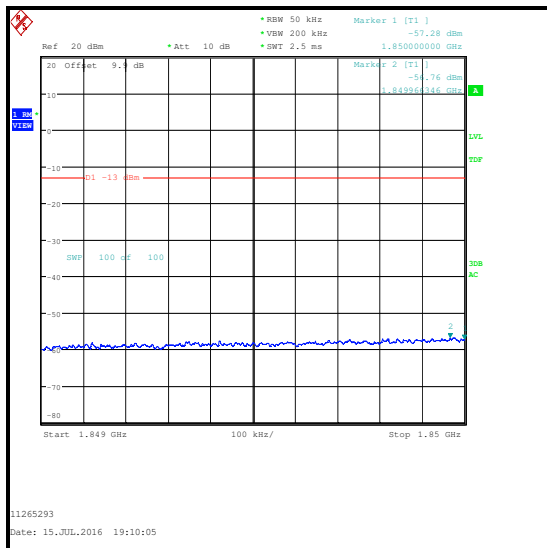
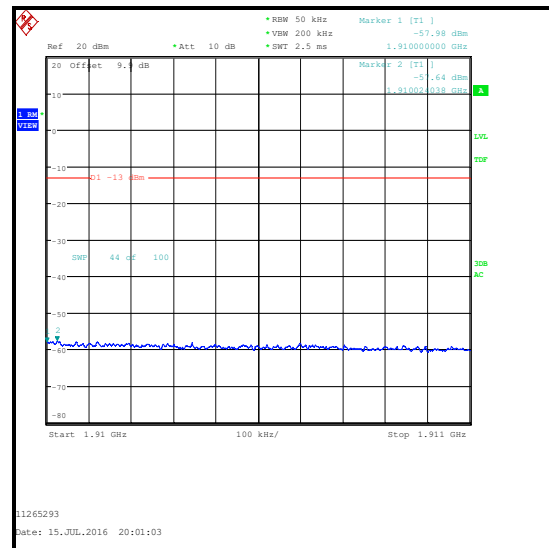
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 5 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	25	0	-28.9	-13.0	15.9	Complied
1910	25	0	-30.3	-13.0	17.3	Complied
1910.006	25	0	-29.1	-13.0	16.1	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 5 MHz Channel Bandwidth / 16QAM**

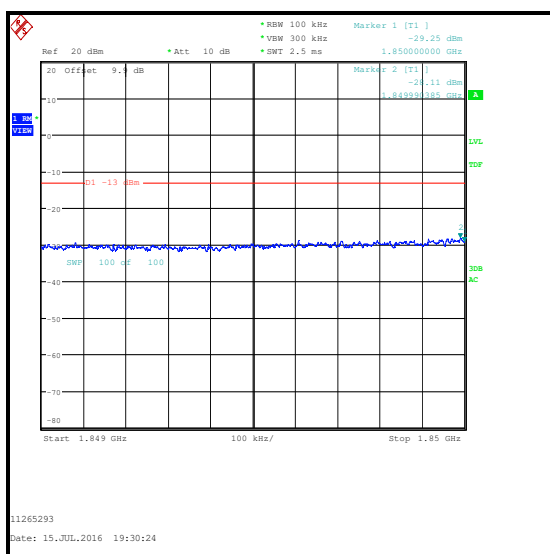
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.994	1	0	-19.4	-13.0	6.4	Complied
1850	1	0	-21.8	-13.0	8.8	Complied
1910	1	24	-23.2	-13.0	10.2	Complied
1910.014	1	24	-22.6	-13.0	9.6	Complied
1850	1	24	-57.3	-13.0	44.3	Complied
1910	1	0	-58.0	-13.0	45.0	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 24 offset / Upper Band Edge****16QAM / 1 RB 24 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

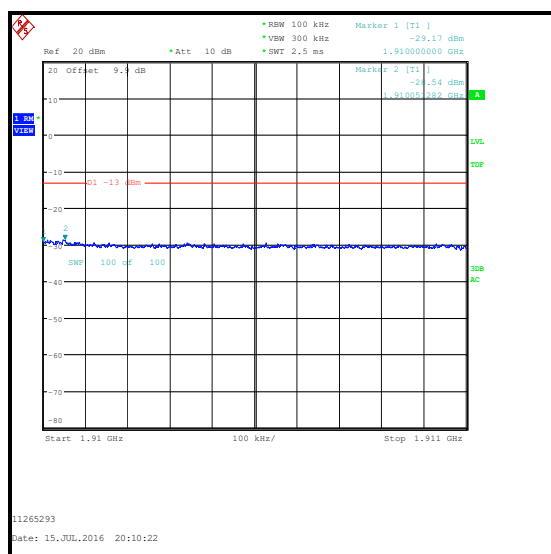
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.990	50	0	-28.1	-13.0	15.1	Complied
1850	50	0	-29.2	-13.0	16.2	Complied
1910	50	0	-29.2	-13.0	16.2	Complied
1910.051	50	0	-28.5	-13.0	15.5	Complied



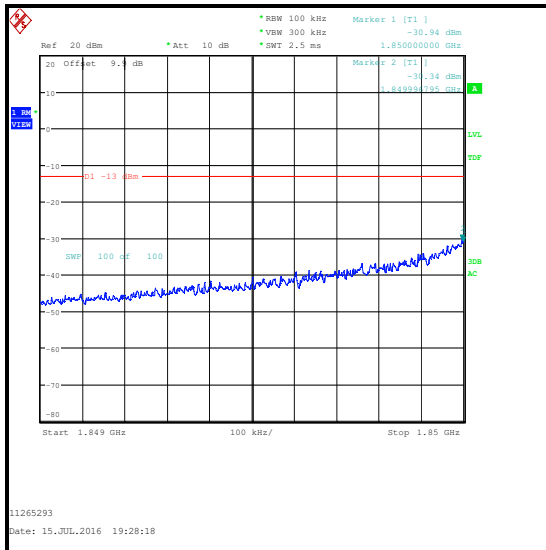
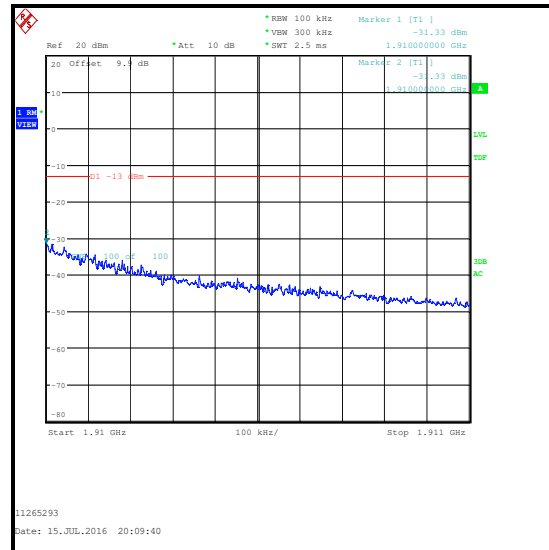
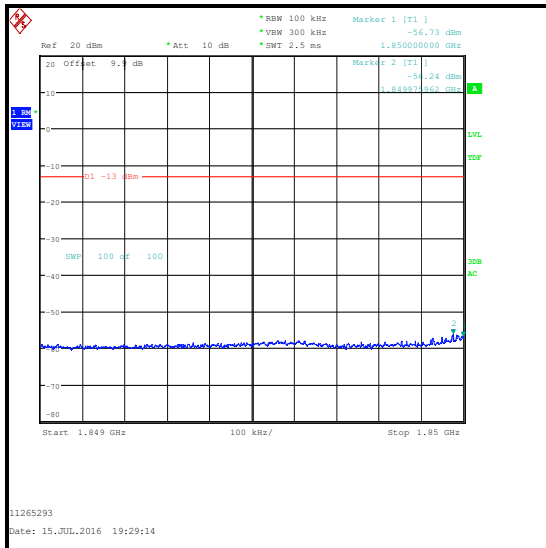
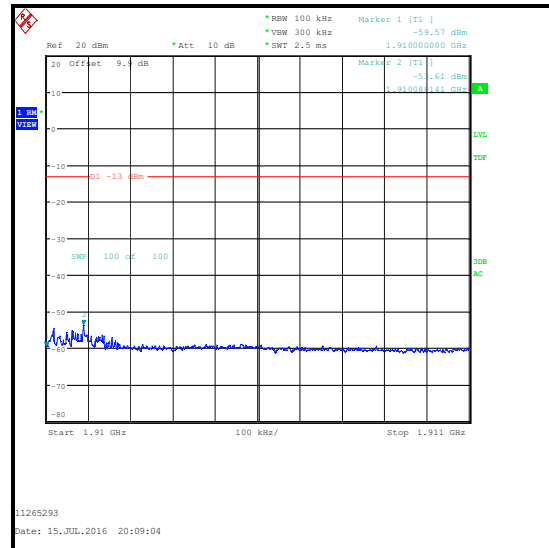
QPSK / Lower Band Edge



QPSK / Upper Band Edge

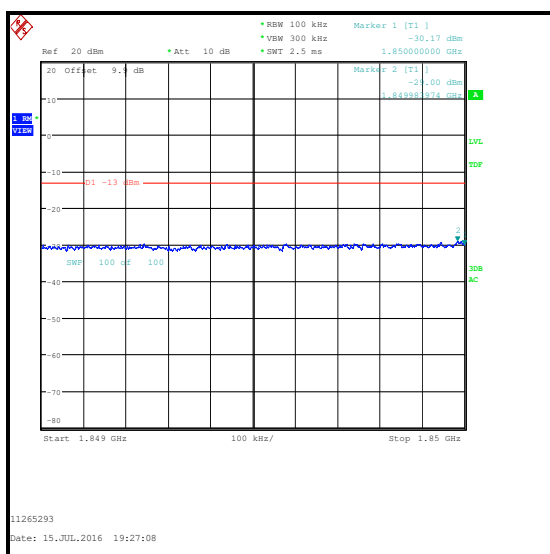
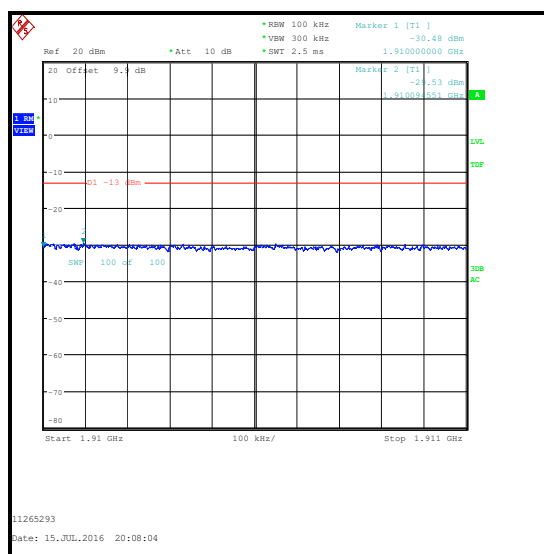
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 10 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	1	0	-30.3	-13.0	17.3	Complied
1850	1	0	-30.9	-13.0	17.9	Complied
1910	1	49	-31.3	-13.0	18.3	Complied
1850	1	49	-56.7	-13.0	43.7	Complied
1910	1	0	-59.6	-13.0	46.6	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 49 offset / Upper Band Edge****QPSK / 1 RB 49 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 10 MHz Channel Bandwidth / 16QAM**

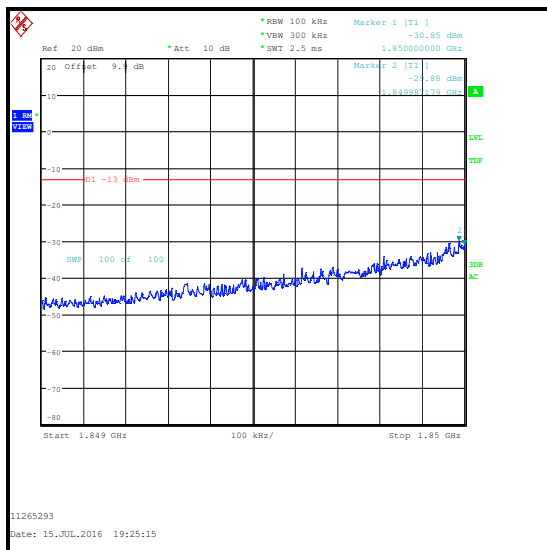
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.984	50	0	-29.0	-13.0	16.0	Complied
1850	50	0	-30.2	-13.0	17.2	Complied
1910	50	0	-30.5	-13.0	17.5	Complied
1910.095	50	0	-29.5	-13.0	16.5	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

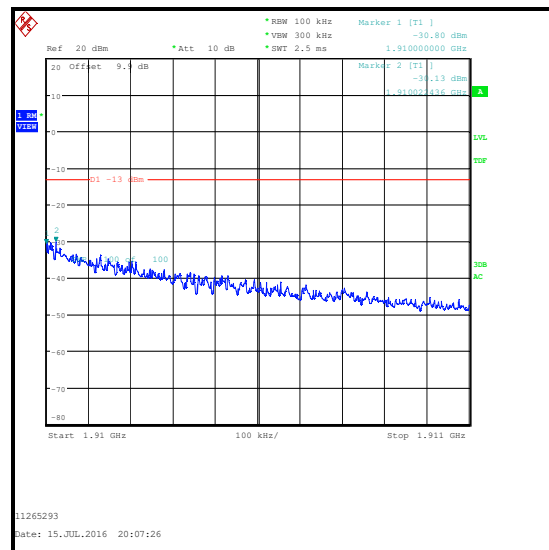
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 10 MHz Channel Bandwidth / 16QAM

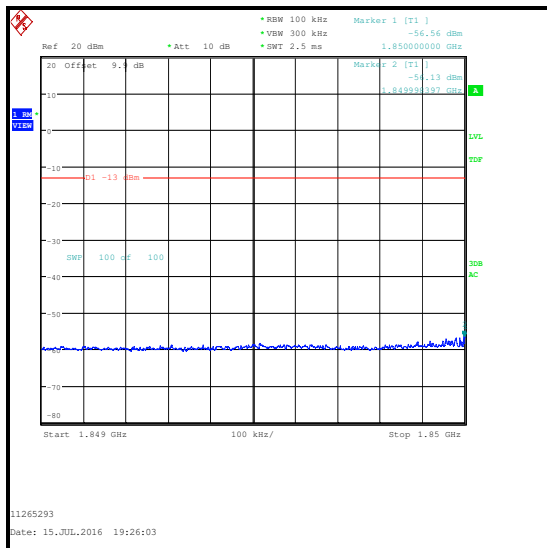
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.987	1	0	-29.9	-13.0	16.9	Complied
1850	1	0	-30.9	-13.0	17.9	Complied
1910	1	49	-30.8	-13.0	17.8	Complied
1910.022	1	49	-30.1	-13.0	17.1	Complied
1850	1	49	-56.6	-13.0	43.6	Complied
1910	1	0	-59.0	-13.0	46.0	Complied



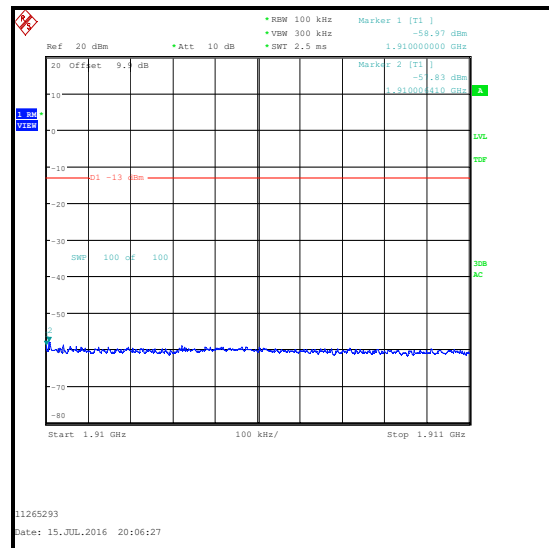
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 49 offset / Upper Band Edge



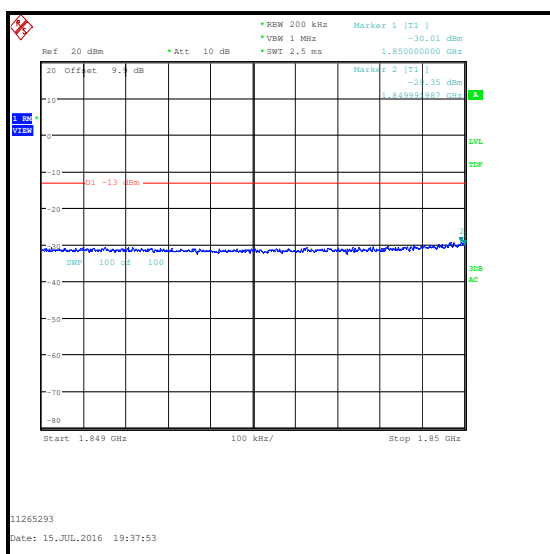
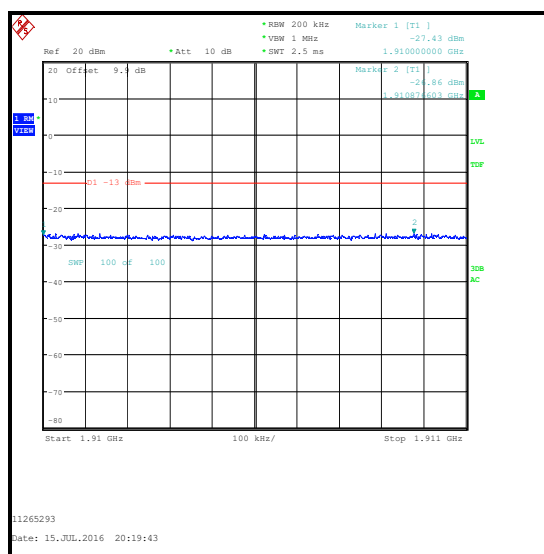
16QAM / 1 RB 49 offset / Lower Band Edge



16QAM / 1 RB 0 offset / Upper Band Edge

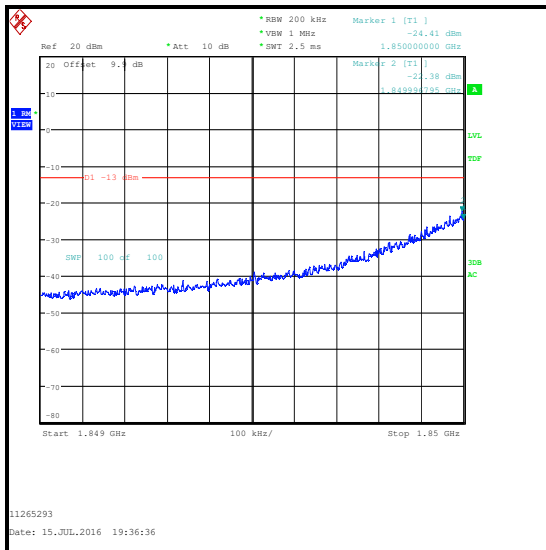
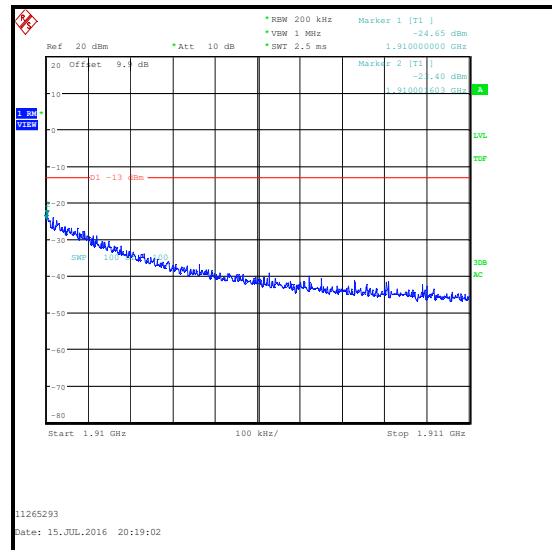
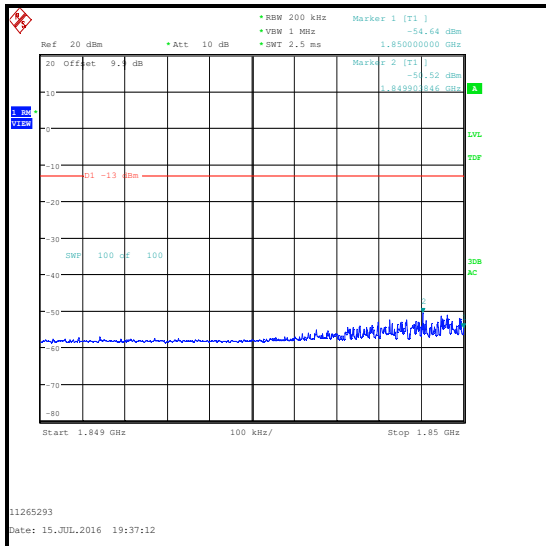
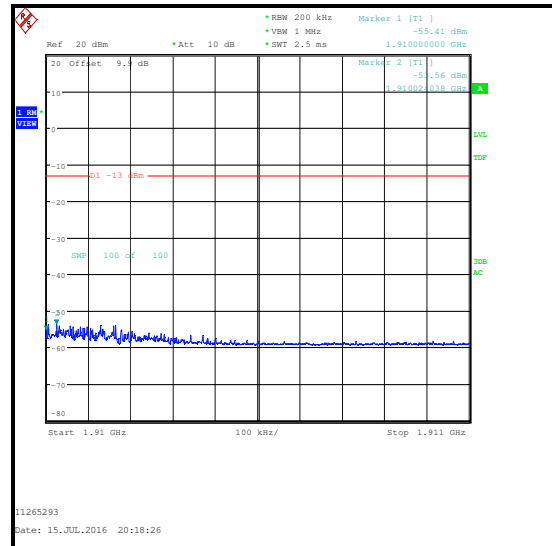
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 15 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.992	75	0	-29.4	-13.0	16.4	Complied
1850	75	0	-30.0	-13.0	17.0	Complied
1910	75	0	-27.4	-13.0	14.4	Complied
1910.877	75	0	-26.9	-13.0	13.9	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

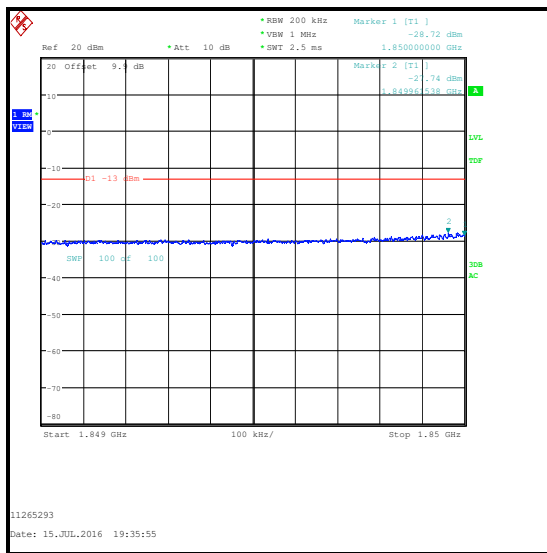
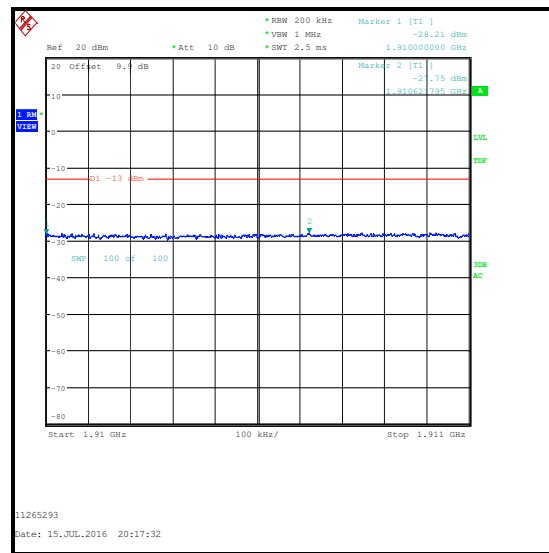
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 15 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	1	0	-22.4	-13.0	9.4	Complied
1850	1	0	-24.4	-13.0	11.4	Complied
1910	1	74	-24.6	-13.0	11.6	Complied
1910.002	1	74	-23.4	-13.0	10.4	Complied
1850	1	74	-54.6	-13.0	41.6	Complied
1910	1	0	-55.4	-13.0	42.4	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 74 offset / Upper Band Edge****QPSK / 1 RB 74 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

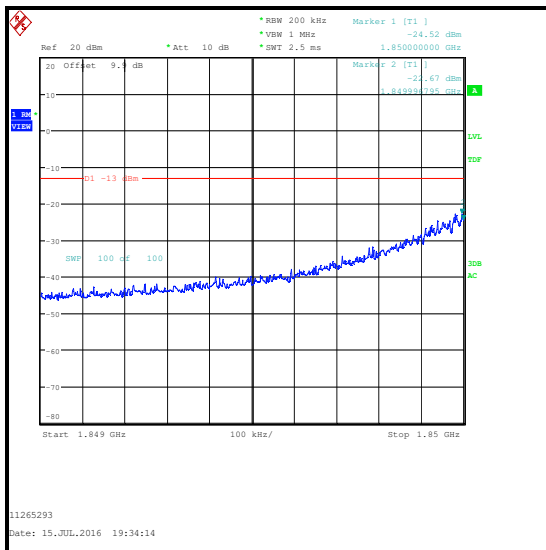
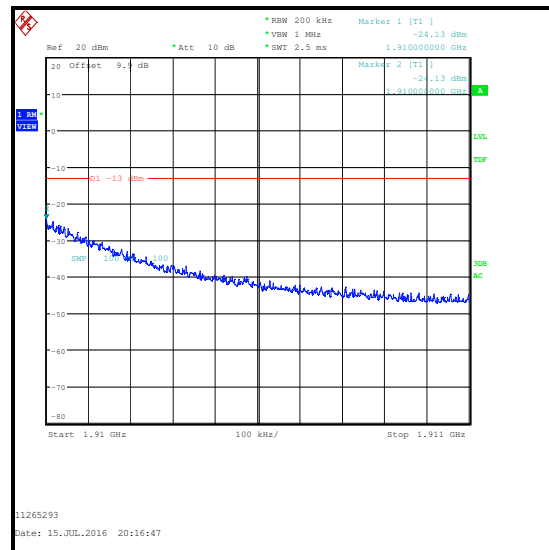
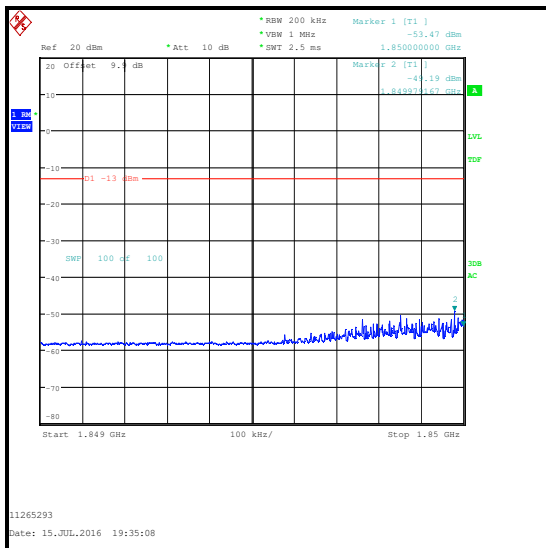
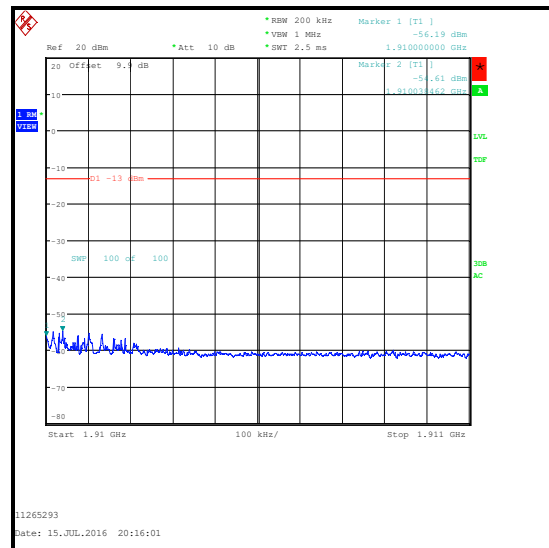
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 15 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.962	75	0	-27.7	-13.0	14.7	Complied
1850	75	0	-28.7	-13.0	15.7	Complied
1910	75	0	-28.2	-13.0	15.2	Complied
1910.622	75	0	-27.7	-13.0	14.7	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

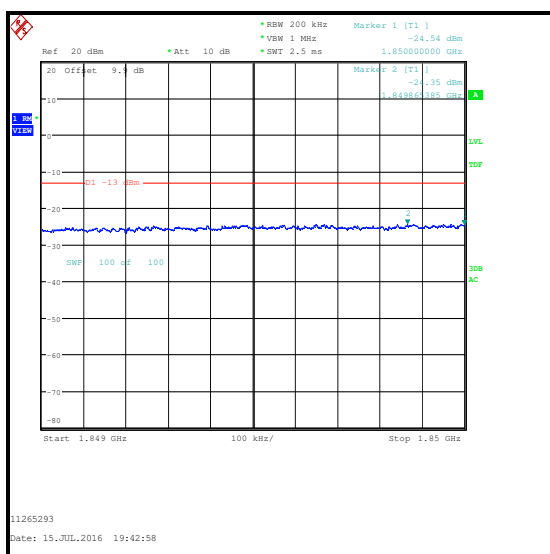
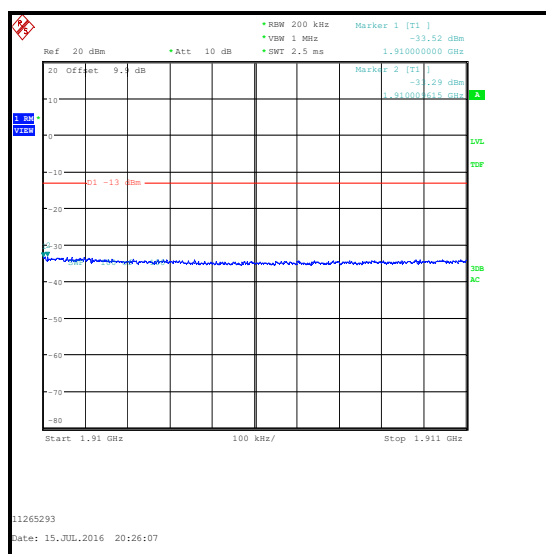
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 15 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	1	0	-22.7	-13.0	9.7	Complied
1850	1	0	-24.5	-13.0	11.5	Complied
1910	1	74	-24.1	-13.0	11.1	Complied
1850	1	74	-53.5	-13.0	40.5	Complied
1910	1	0	-56.2	-13.0	43.2	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 74 offset / Upper Band Edge****16QAM / 1 RB 74 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

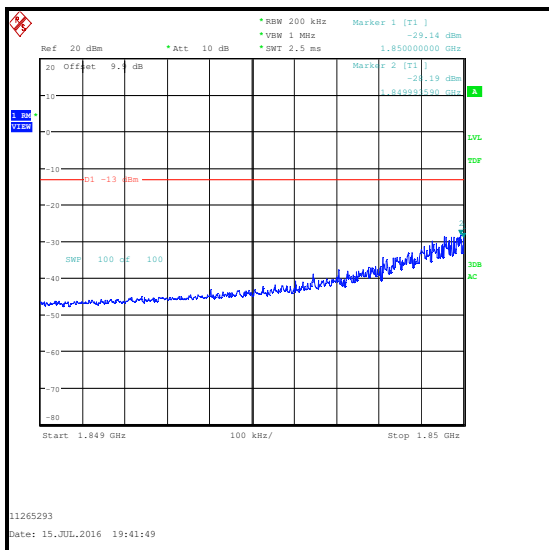
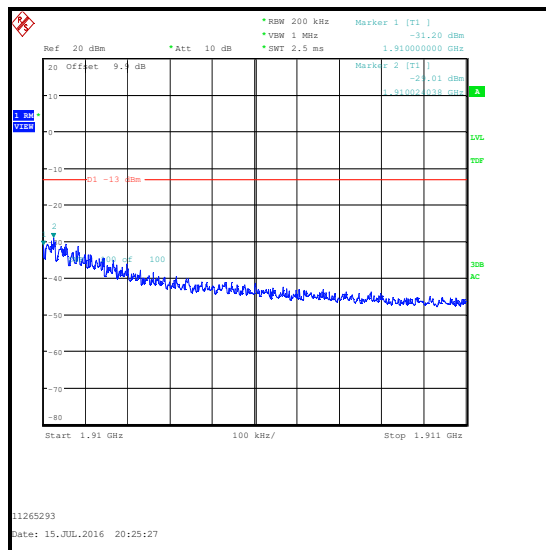
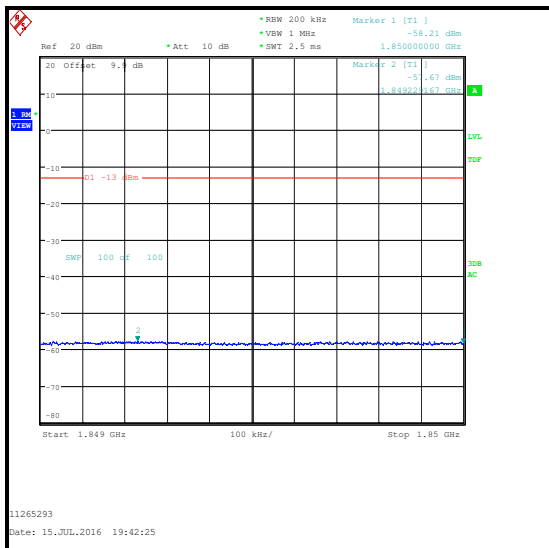
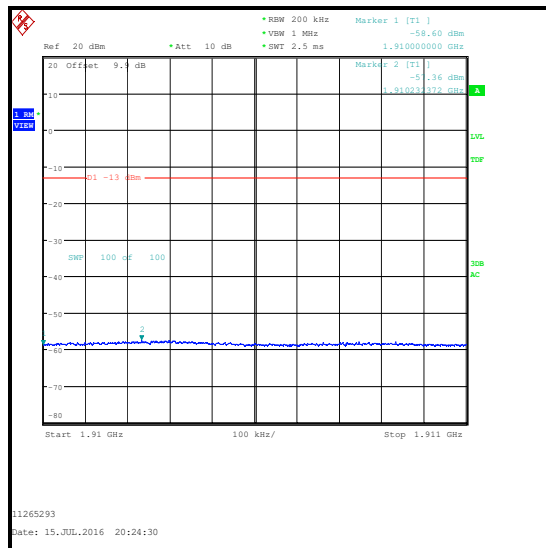
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 20 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.865	100	0	-24.3	-13.0	11.3	Complied
1850	100	0	-24.5	-13.0	11.5	Complied
1910	100	0	-33.5	-13.0	20.5	Complied
1910.010	100	0	-33.3	-13.0	20.3	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

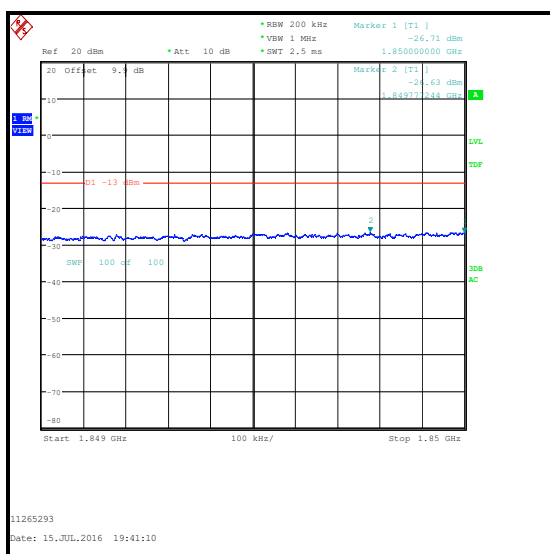
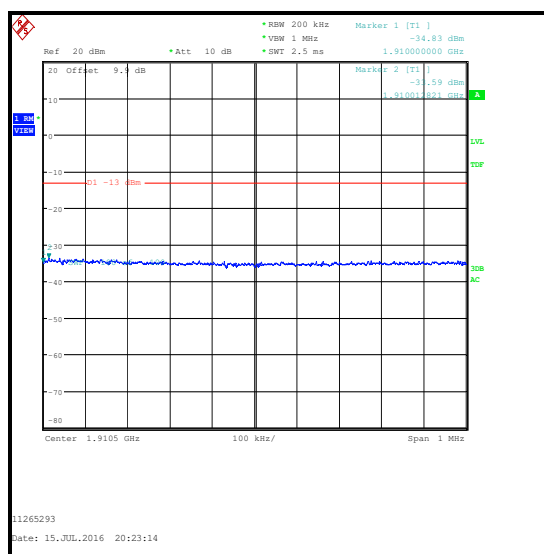
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 20 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.994	1	0	-28.2	-13.0	15.2	Complied
1850	1	0	-29.1	-13.0	16.1	Complied
1910	1	99	-31.2	-13.0	18.2	Complied
1910.024	1	99	-29.0	-13.0	16.0	Complied
1850	1	99	-58.2	-13.0	45.2	Complied
1910	1	0	-58.6	-13.0	45.6	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 99 offset / Upper Band Edge****QPSK / 1 RB 99 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

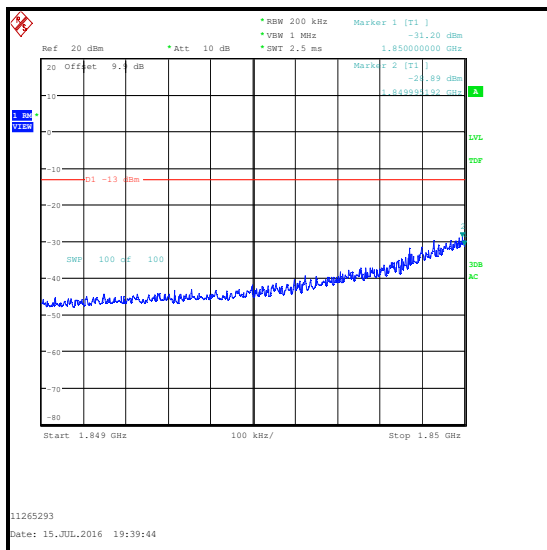
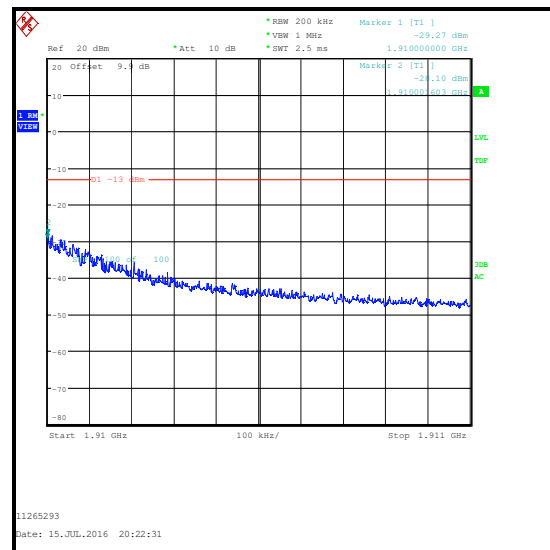
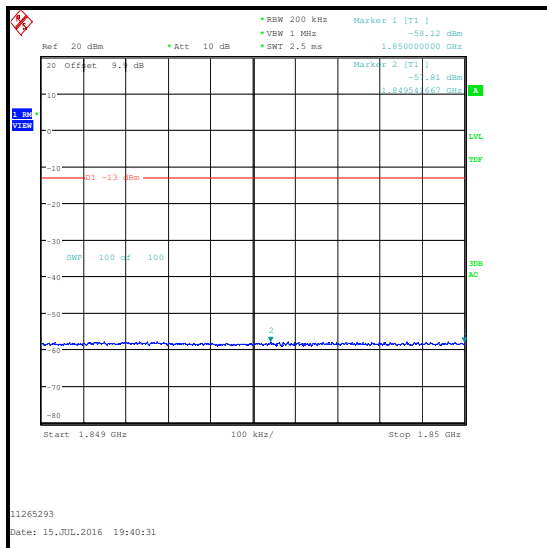
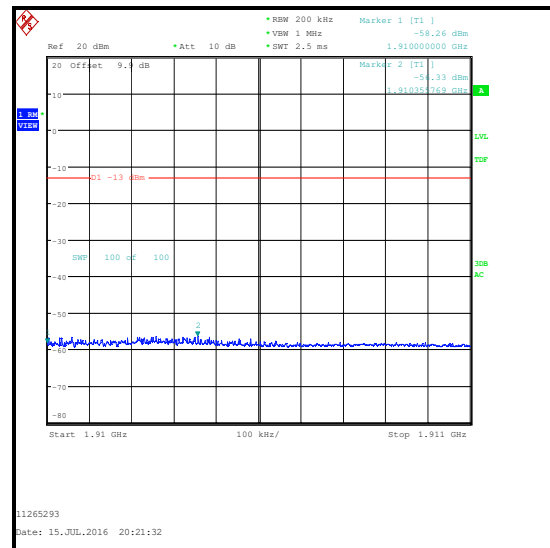
Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 20 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.777	100	0	-26.6	-13.0	13.6	Complied
1850	100	0	-26.7	-13.0	13.7	Complied
1910	100	0	-34.8	-13.0	21.8	Complied
1910.013	100	0	-33.6	-13.0	20.6	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - LAT**Results: 20 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	1	0	-28.9	-13.0	15.9	Complied
1850	1	0	-31.2	-13.0	18.2	Complied
1910	1	99	-29.3	-13.0	16.3	Complied
1910.002	1	99	-28.1	-13.0	15.1	Complied
1850	1	99	-58.1	-13.0	45.1	Complied
1910	1	0	-58.3	-13.0	45.3	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 99 offset / Upper Band Edge****16QAM / 1 RB 99 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - LAT**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12

5.2.8. Transmitter Radiated Emissions at Band Edges - UAT**Test Summary:**

Test Engineer:	SunGil Park	Test Date:	18 July 2016
Test Sample IMEI:	358640070309175		

FCC Reference:	Parts 2.1053 & 24.238(a)
Test Method Used:	KDB 971168 Section 6.1 referencing FCC Part 24.238

Environmental Conditions:

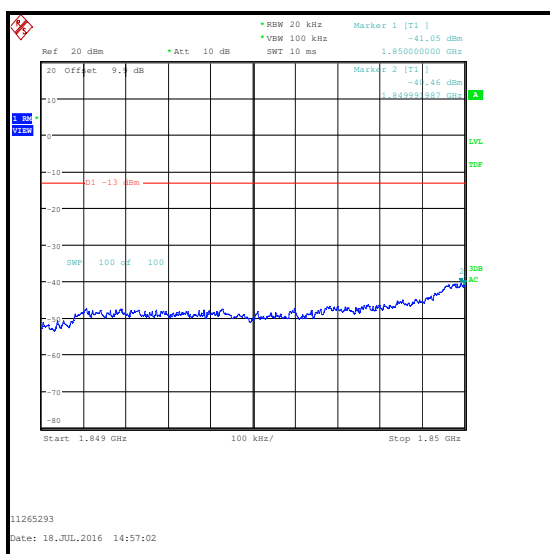
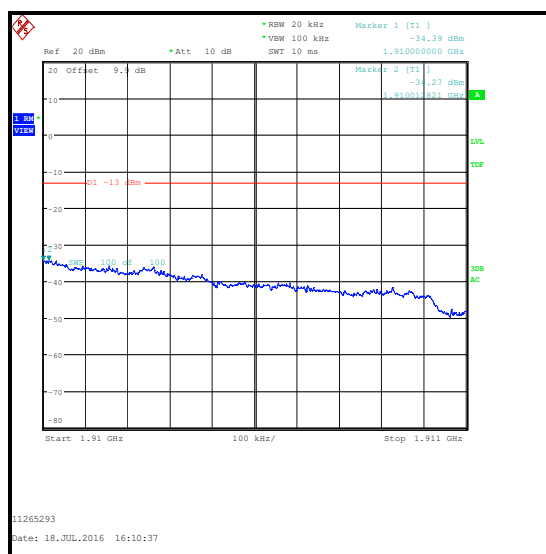
Temperature (°C):	26
Relative Humidity (%):	46

Note(s):

1. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource blocks settings as detailed in section 4.3 of this report.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor in line with the EUT.
3. 1.4 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 20 kHz (>1% of the widest 26 dB emission bandwidth) and video bandwidth 100 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
4. 3 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 30 kHz (1% of the widest 26 dB emission bandwidth) and video bandwidth 100 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
5. 5 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 50 kHz (1% of the widest 26 dB emission bandwidth) and video bandwidth 200 kHz (as close to > three times the resolution bandwidth as the test receiver allowed).
6. 10 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 100 kHz (>1% of the widest 26 dB emission bandwidth) and video bandwidth 300 kHz (three times the resolution bandwidth).
7. 15 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 200 kHz (1% of the widest 26 dB emission bandwidth) and video bandwidth 1 MHz (as close to > three times the resolution bandwidth as the test receiver allowed).
8. 20 MHz Channel bandwidth: In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 200 kHz (>1% of the widest 26 dB emission bandwidth) and video bandwidth 1 MHz (three times the resolution bandwidth).

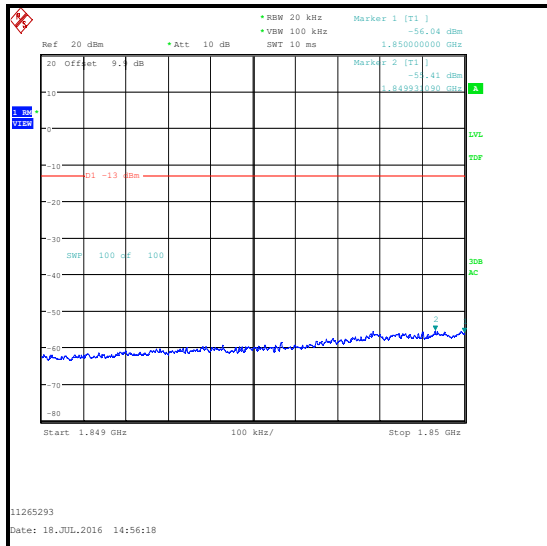
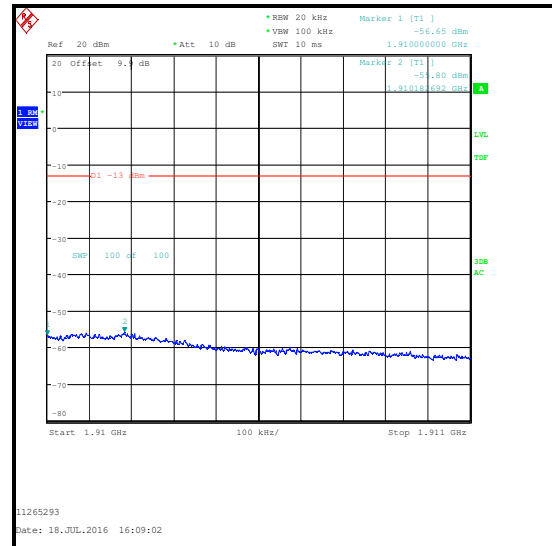
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 1.4 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.992	6	0	-40.5	-13.0	27.5	Complied
1850	6	0	-41.0	-13.0	28.0	Complied
1910	6	0	-34.4	-13.0	21.4	Complied
1910.013	6	0	-34.3	-13.0	21.3	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

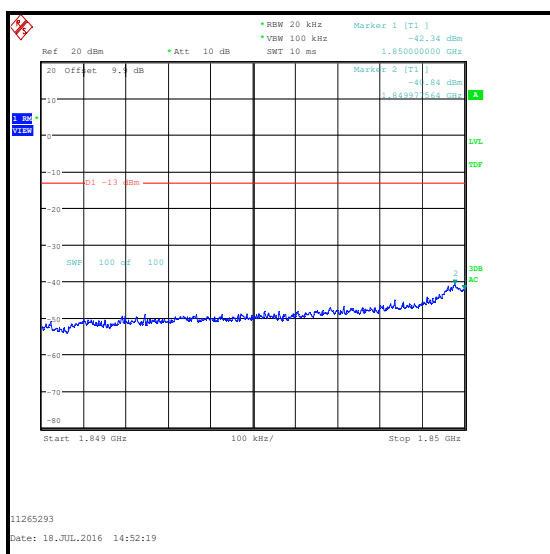
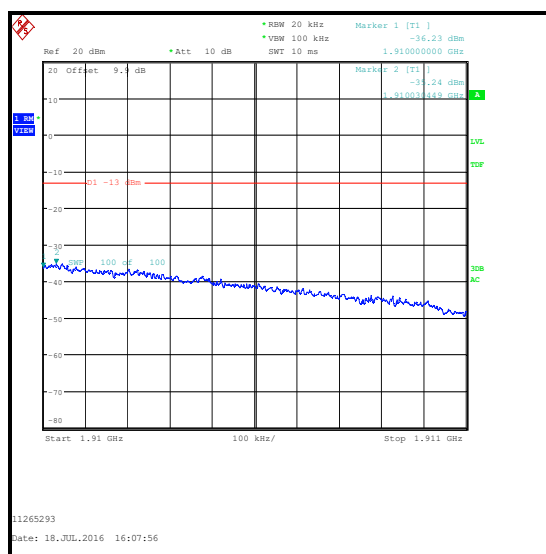
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 1.4 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.968	1	0	-31.7	-13.0	18.7	Complied
1850	1	0	-32.2	-13.0	19.2	Complied
1910	1	5	-28.9	-13.0	15.9	Complied
1910.005	1	5	-28.7	-13.0	15.7	Complied
1850	1	5	-56.0	-13.0	43.0	Complied
1910	1	0	-56.6	-13.0	43.6	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 5 offset / Upper Band Edge****QPSK / 1 RB 5 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

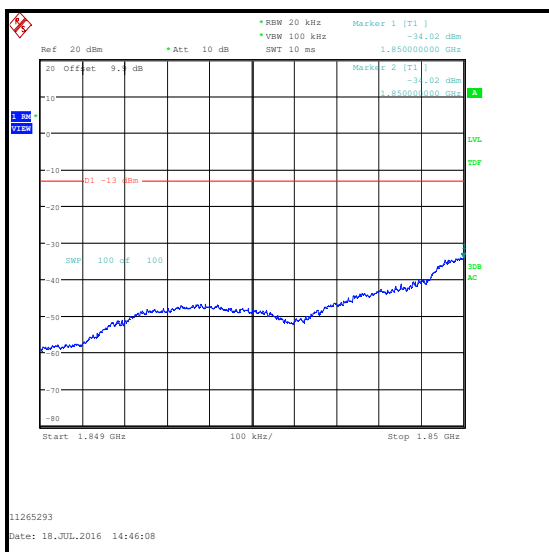
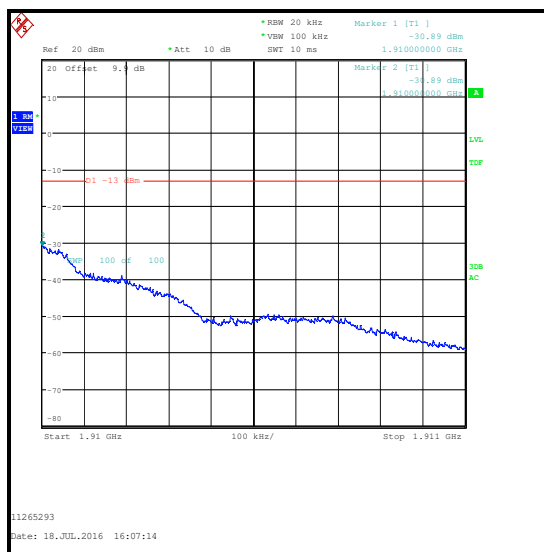
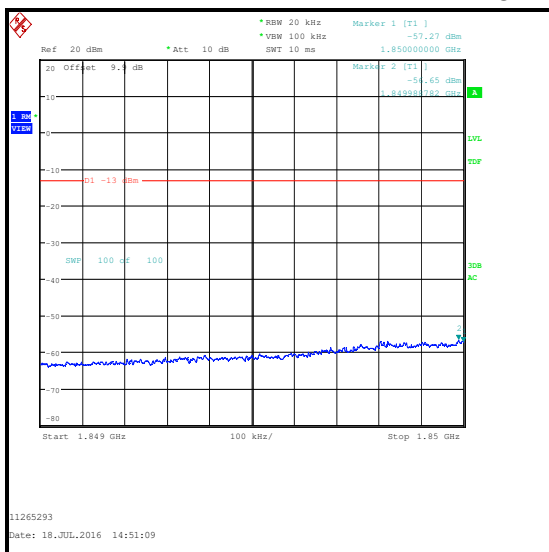
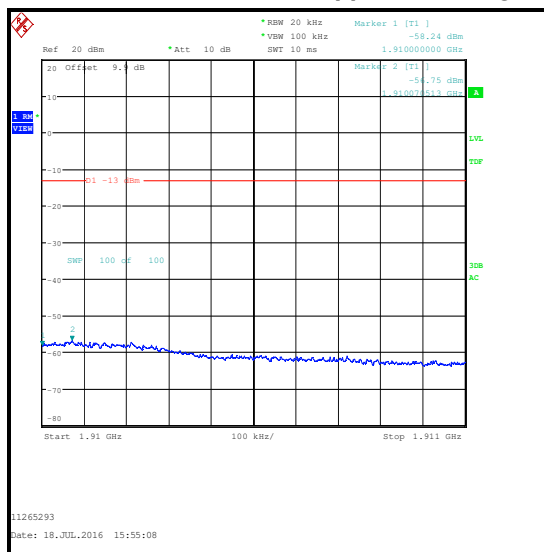
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 1.4 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.978	6	0	-40.8	-13.0	27.8	Complied
1850	6	0	-42.3	-13.0	29.3	Complied
1910	6	0	-36.2	-13.0	23.2	Complied
1910.030	6	0	-35.2	-13.0	22.2	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

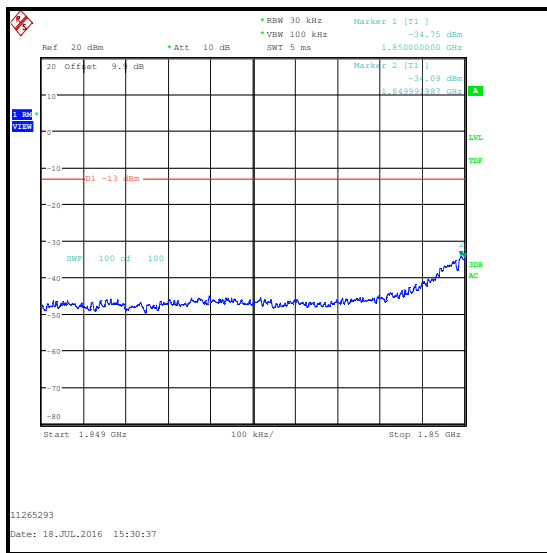
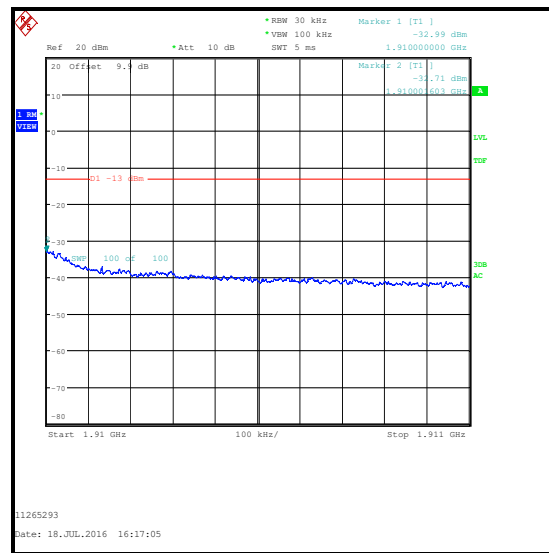
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 1.4 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-34.0	-13.0	21.0	Complied
1910	1	5	-30.9	-13.0	17.9	Complied
1850	1	5	-57.3	-13.0	44.3	Complied
1910	1	0	-58.2	-13.0	45.2	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 5 offset / Upper Band Edge****16QAM / 1 RB 5 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

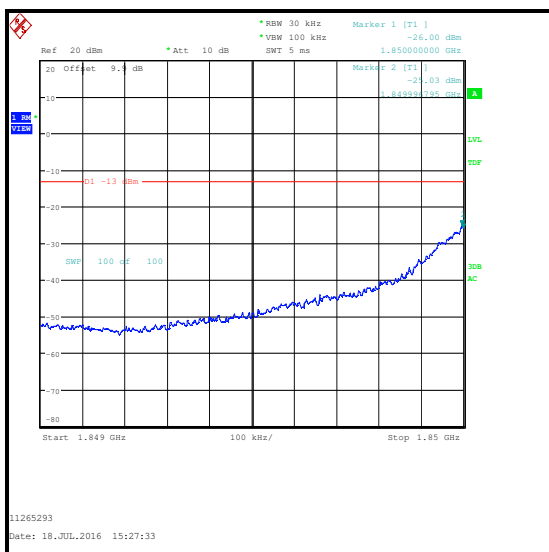
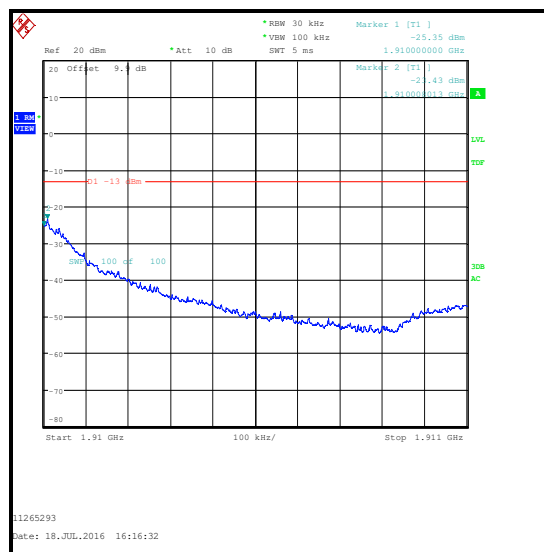
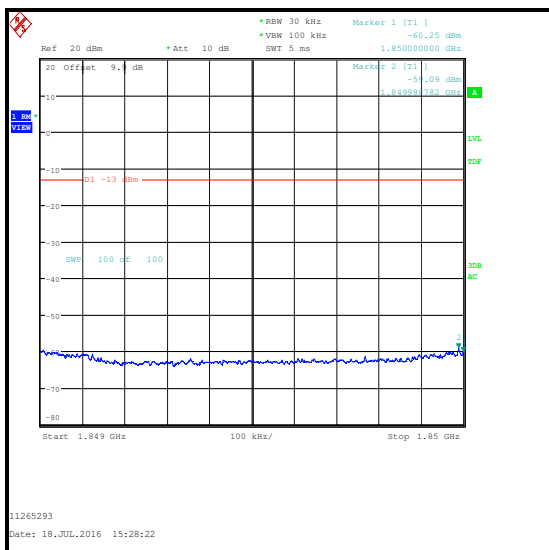
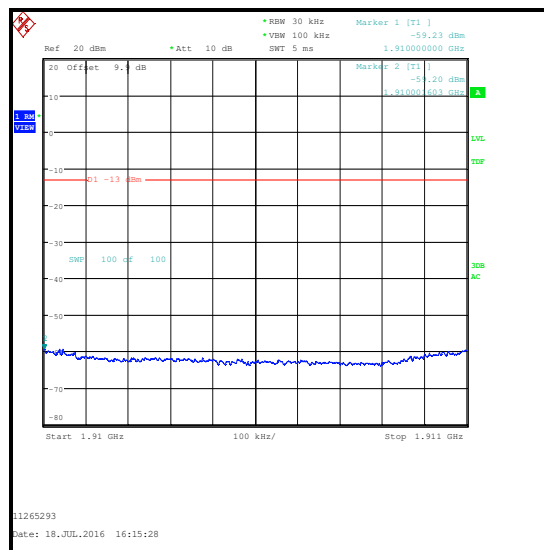
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 3 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.992	15	0	-34.1	-13.0	21.1	Complied
1850	15	0	-34.7	-13.0	21.7	Complied
1910	15	0	-33.0	-13.0	20.0	Complied
1910.002	15	0	-32.7	-13.0	19.7	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

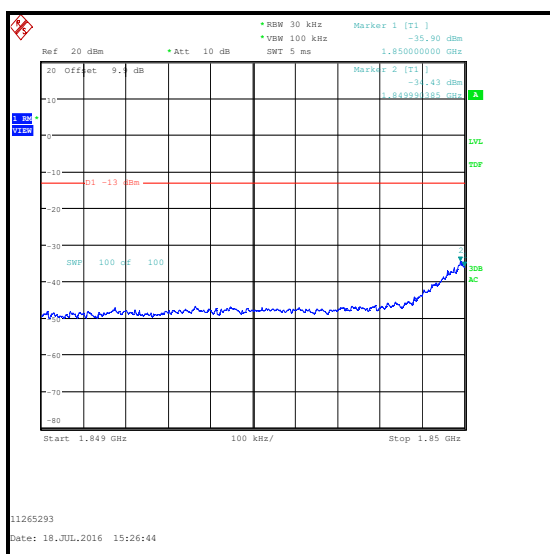
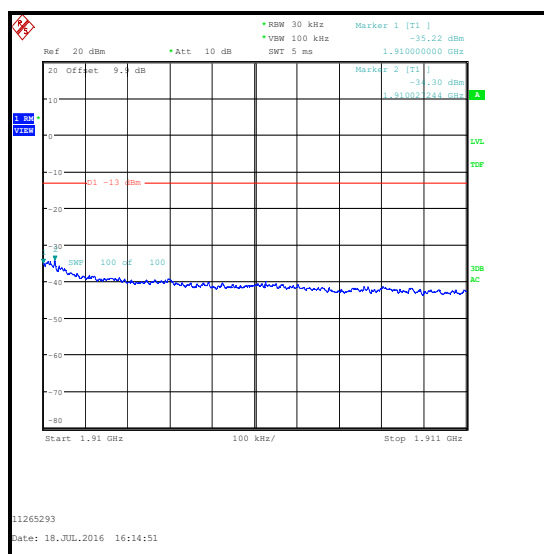
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 3 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	1	0	-25.0	-13.0	12.0	Complied
1850	1	0	-26.0	-13.0	13.0	Complied
1910	1	14	-25.3	-13.0	12.3	Complied
1910.008	1	14	-23.4	-13.0	10.4	Complied
1850	1	14	-60.2	-13.0	47.2	Complied
1910	1	0	-59.2	-13.0	46.2	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 14 offset / Upper Band Edge****QPSK / 1 RB 14 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

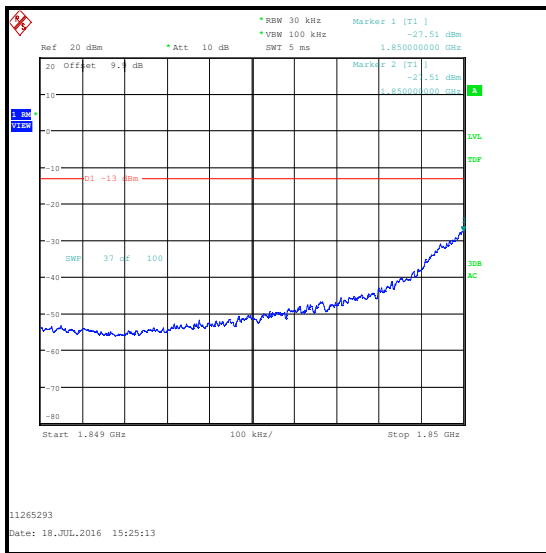
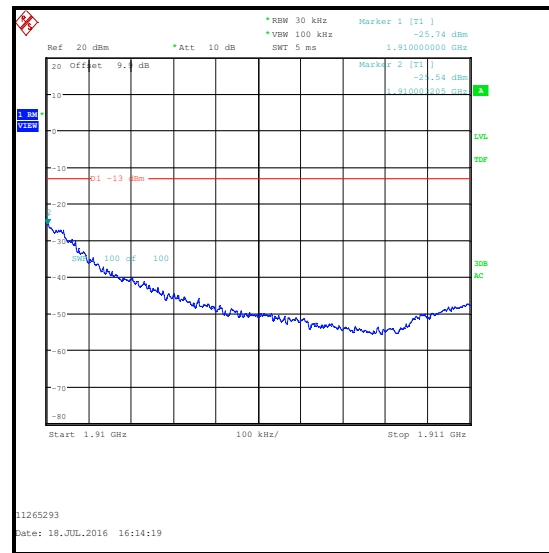
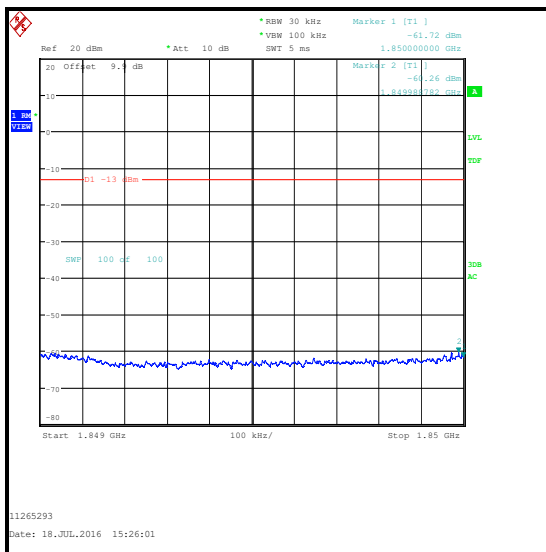
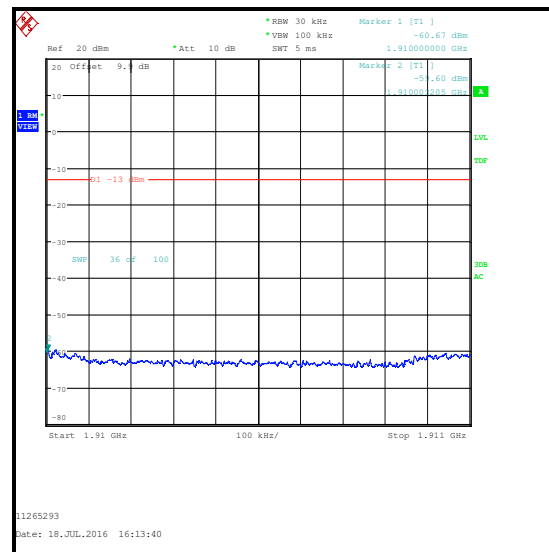
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 3 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.990	15	0	-34.4	-13.0	21.4	Complied
1850	15	0	-35.9	-13.0	22.9	Complied
1910	15	0	-35.2	-13.0	22.2	Complied
1910.027	15	0	-34.3	-13.0	21.3	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

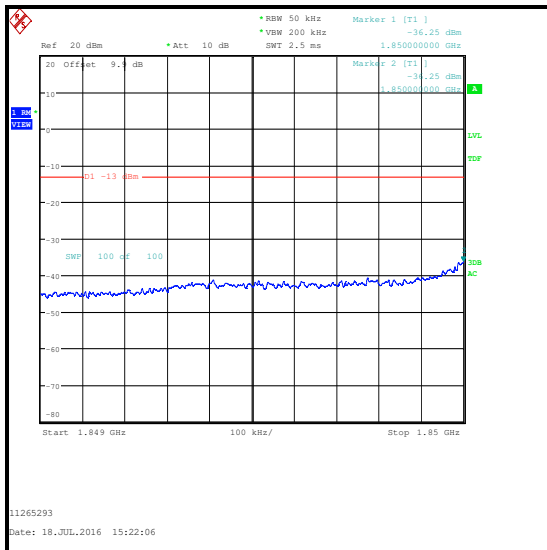
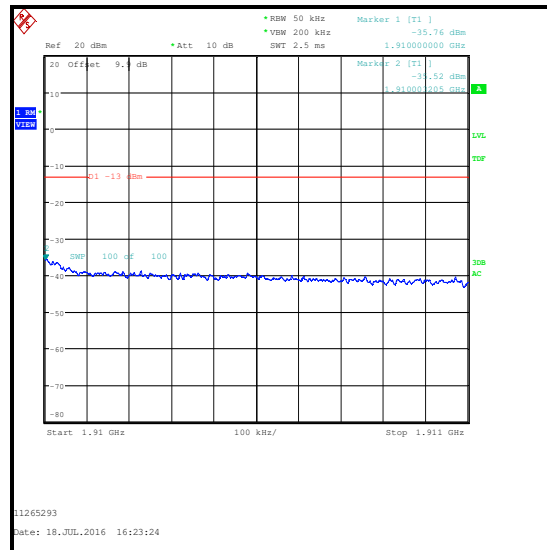
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 3 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-27.5	-13.0	14.5	Complied
1910	1	14	-25.7	-13.0	12.7	Complied
1910.003	1	14	-25.5	-13.0	12.5	Complied
1850	1	14	-61.7	-13.0	48.7	Complied
1910	1	0	-60.7	-13.0	47.7	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 14 offset / Upper Band Edge****16QAM / 1 RB 14 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

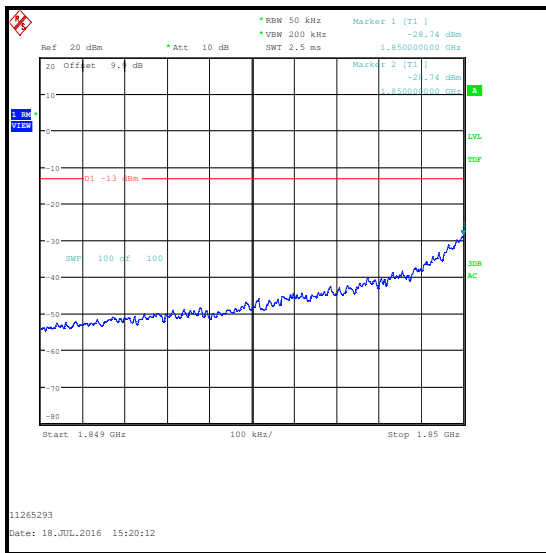
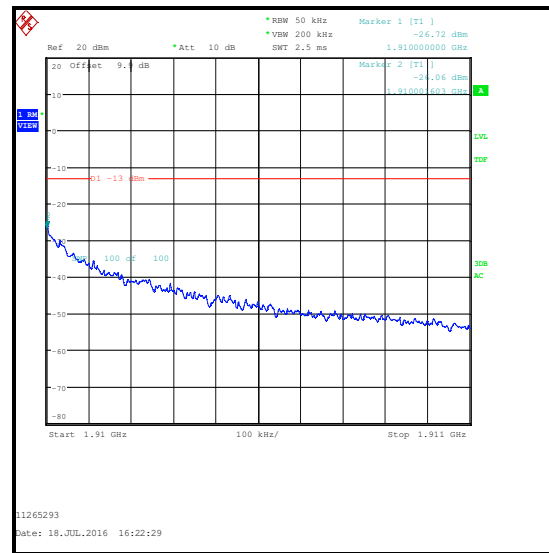
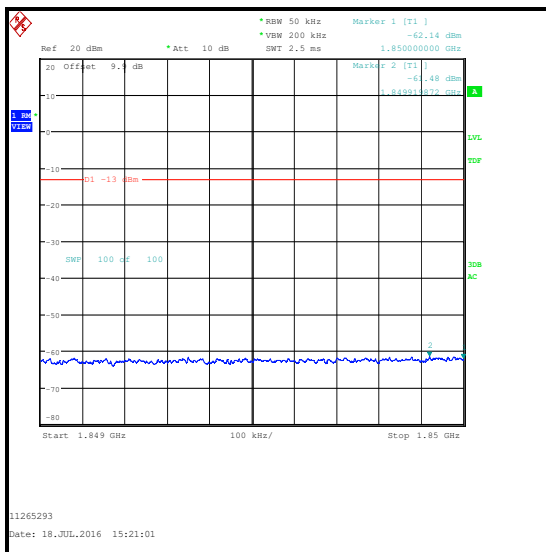
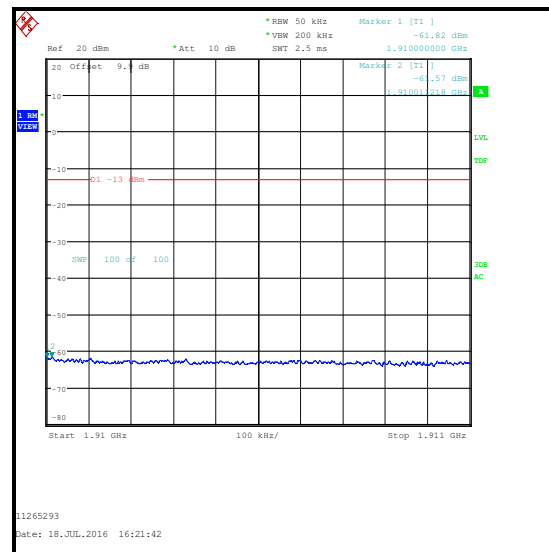
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 5 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	25	0	-36.2	-13.0	23.2	Complied
1910	25	0	-35.8	-13.0	22.8	Complied
1910.003	25	0	-35.5	-13.0	22.5	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

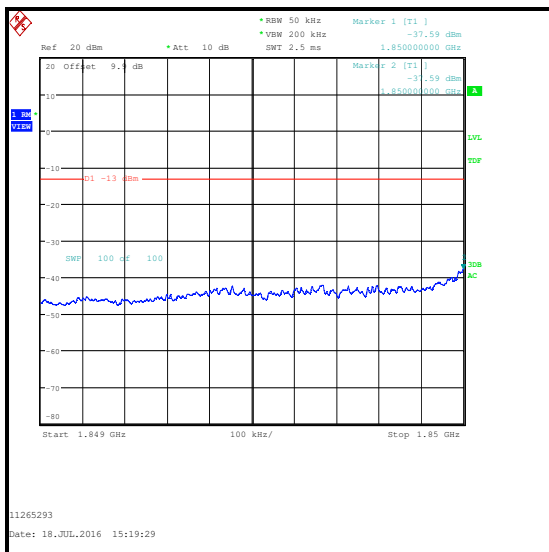
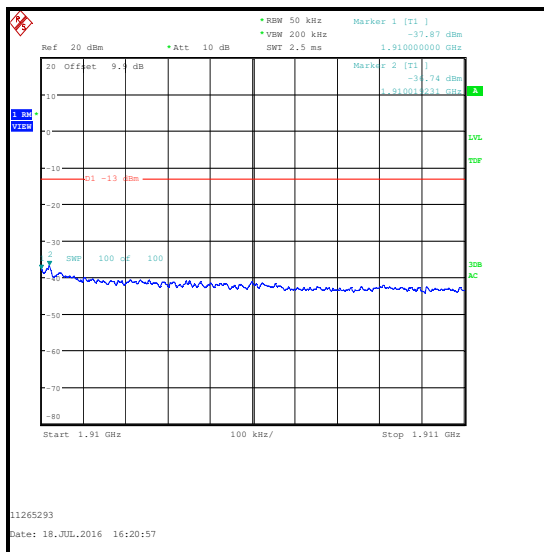
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 5 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-28.7	-13.0	15.7	Complied
1910	1	24	-26.7	-13.0	13.7	Complied
1910.002	1	24	-26.1	-13.0	13.1	Complied
1850	1	24	-62.1	-13.0	49.1	Complied
1910	1	0	-61.8	-13.0	48.8	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 24 offset / Upper Band Edge****QPSK / 1 RB 24 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

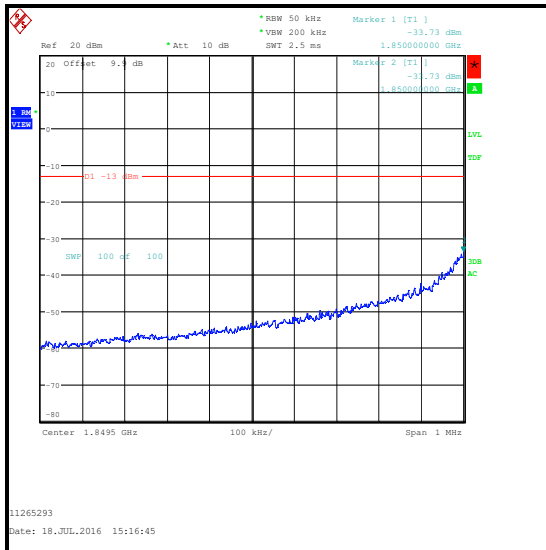
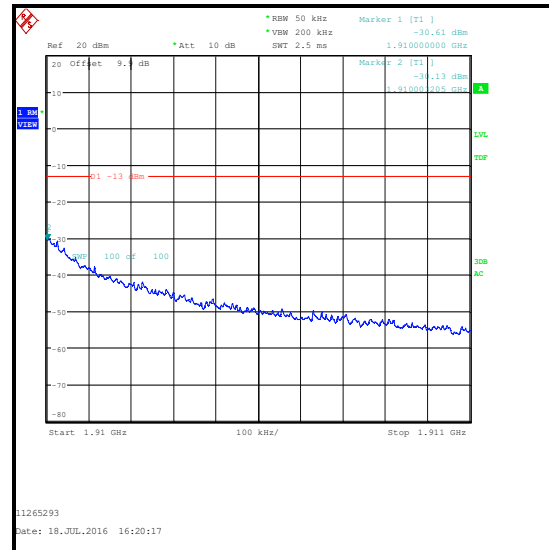
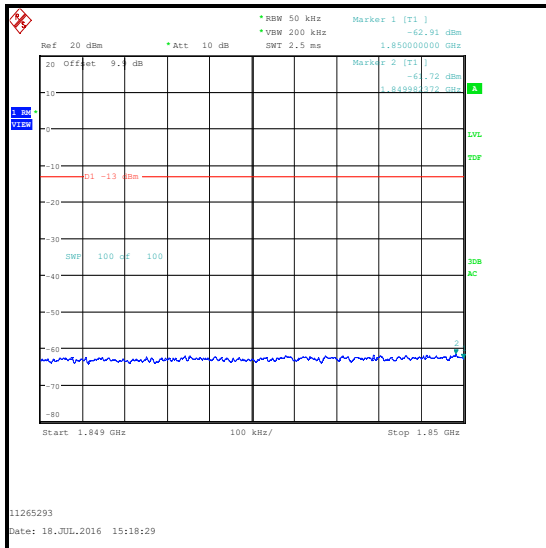
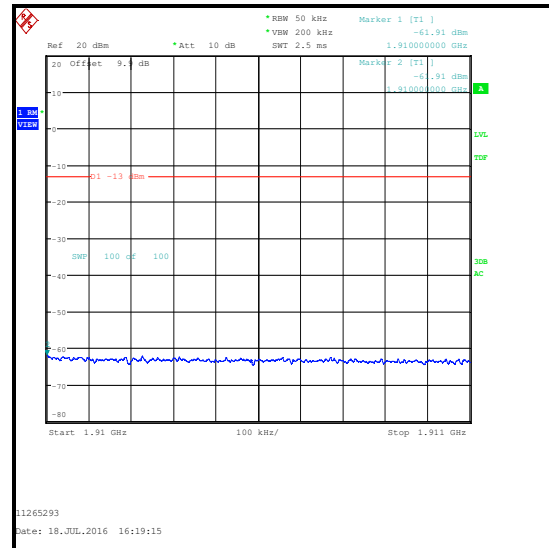
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 5 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	25	0	-37.6	-13.0	24.6	Complied
1910	25	0	-37.9	-13.0	24.9	Complied
1910.019	25	0	-36.7	-13.0	23.7	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

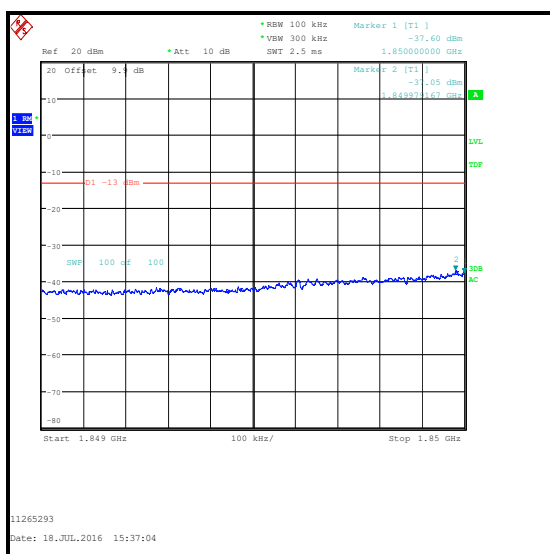
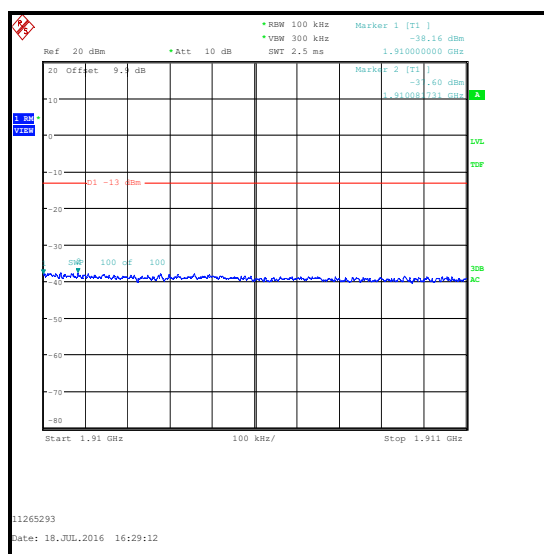
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 5 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-33.7	-13.0	20.7	Complied
1910	1	24	-30.6	-13.0	17.6	Complied
1910.003	1	24	-30.1	-13.0	17.1	Complied
1850	1	24	-62.9	-13.0	49.9	Complied
1910	1	0	-61.9	-13.0	48.9	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 24 offset / Upper Band Edge****16QAM / 1 RB 24 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

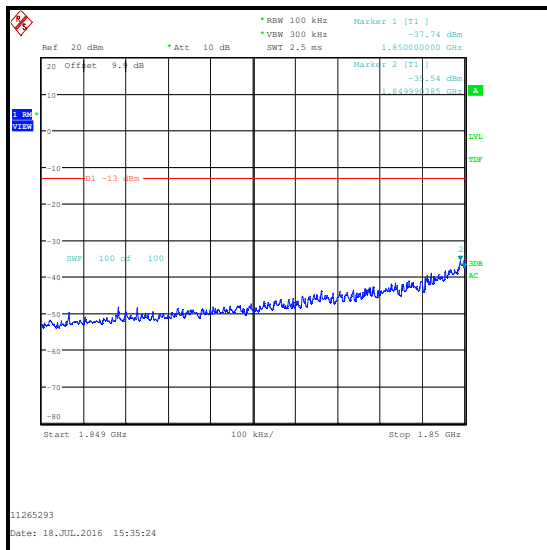
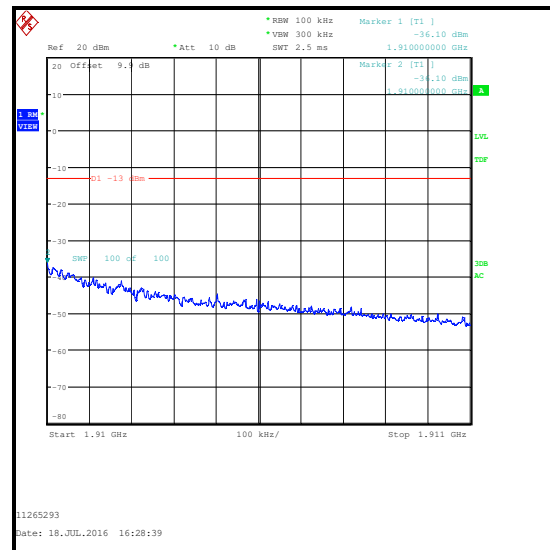
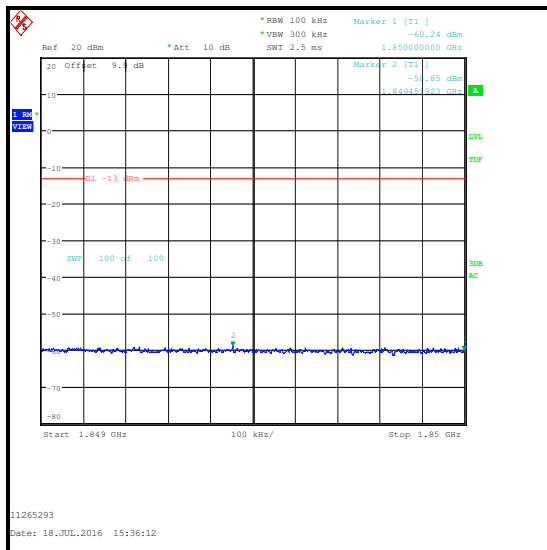
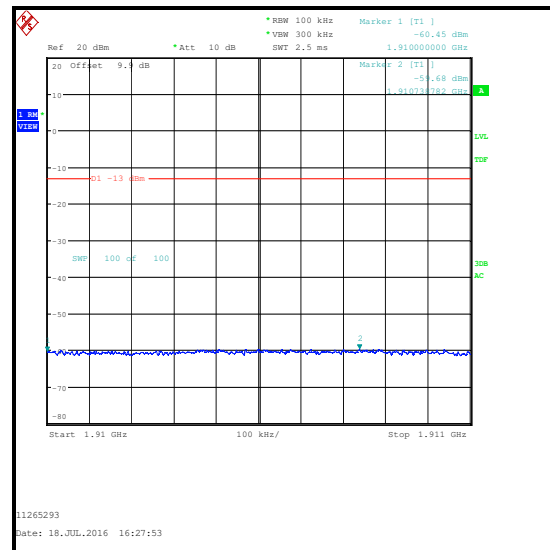
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 10 MHz Channel Bandwidth / QPSK**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.975	50	0	-37.0	-13.0	24.0	Complied
1850	50	0	-37.6	-13.0	24.6	Complied
1910	50	0	-38.2	-13.0	25.2	Complied
1910.082	50	0	-37.6	-13.0	24.6	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 10 MHz Channel Bandwidth / QPSK**

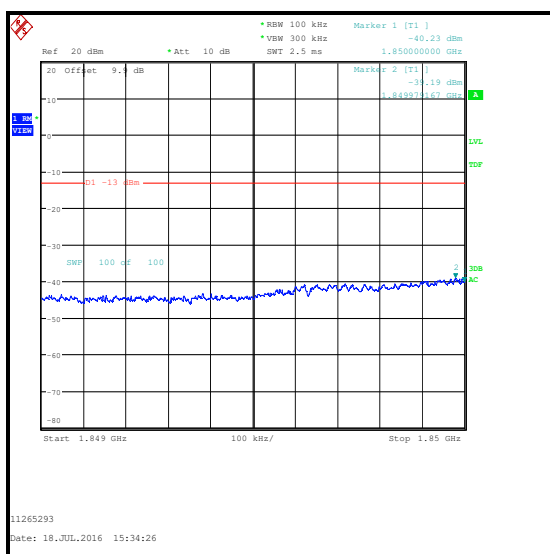
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.990	1	0	-35.5	-13.0	22.5	Complied
1850	1	0	-37.7	-13.0	24.7	Complied
1910	1	49	-36.1	-13.0	23.1	Complied
1850	1	49	-60.2	-13.0	47.2	Complied
1910	1	0	-60.4	-13.0	47.4	Complied

**QPSK / 1 RB 0 offset / Lower Band Edge****QPSK / 1 RB 49 offset / Upper Band Edge****QPSK / 1 RB 49 offset / Lower Band Edge****QPSK / 1 RB 0 offset / Upper Band Edge**

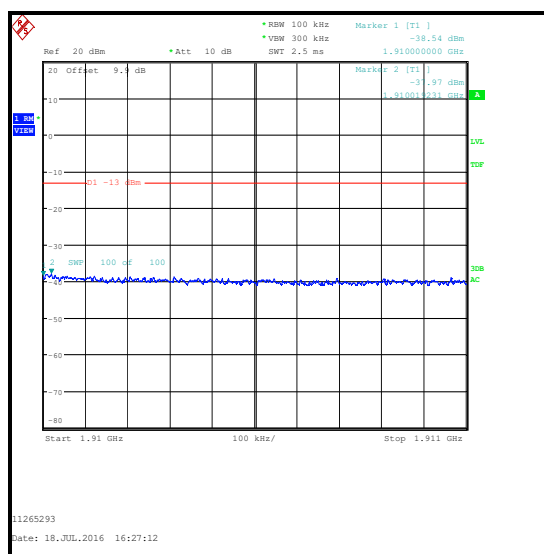
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.975	50	0	-39.2	-13.0	26.2	Complied
1850	50	0	-40.2	-13.0	27.2	Complied
1910	50	0	-38.5	-13.0	25.5	Complied
1910.019	50	0	-38.0	-13.0	25.0	Complied



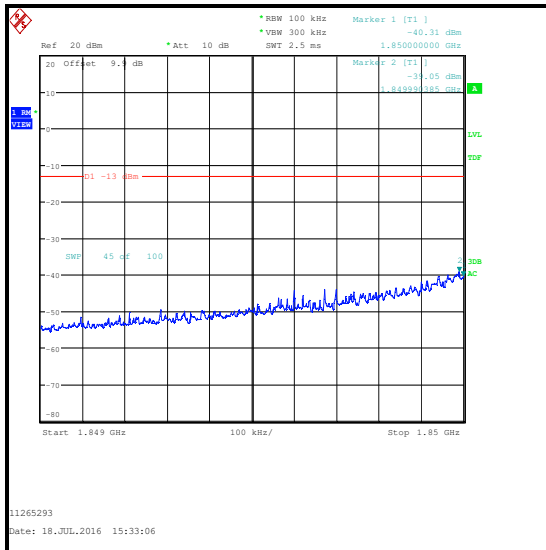
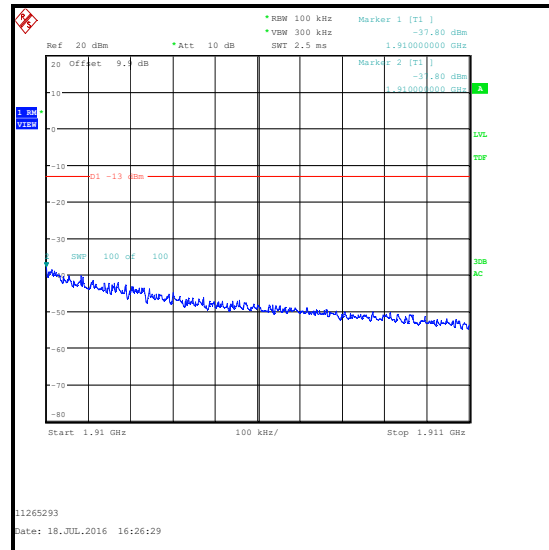
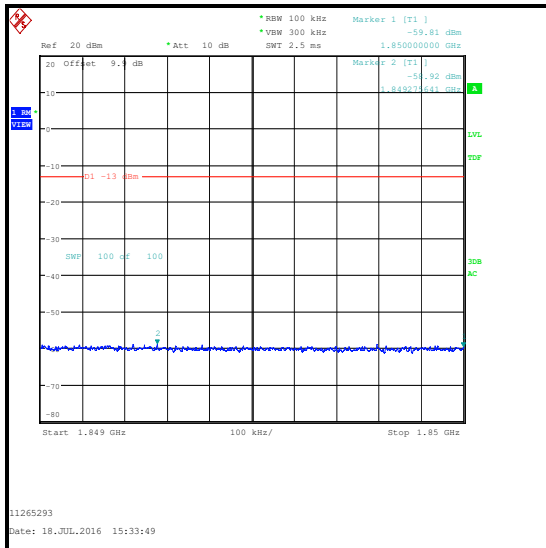
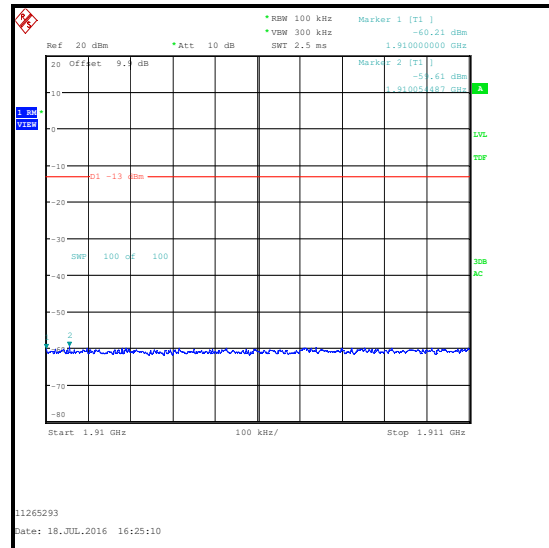
16QAM / Lower Band Edge



16QAM / Upper Band Edge

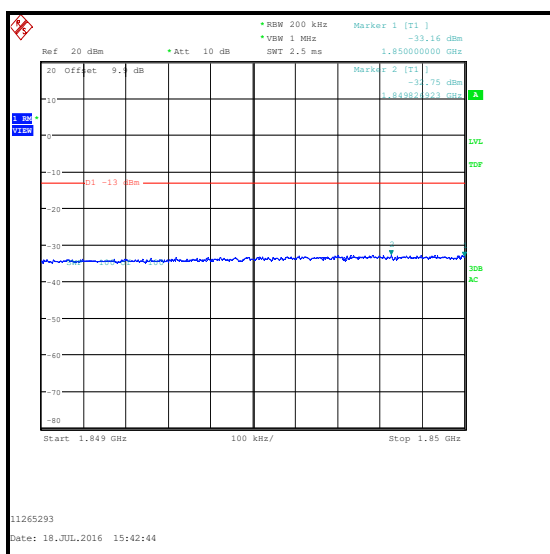
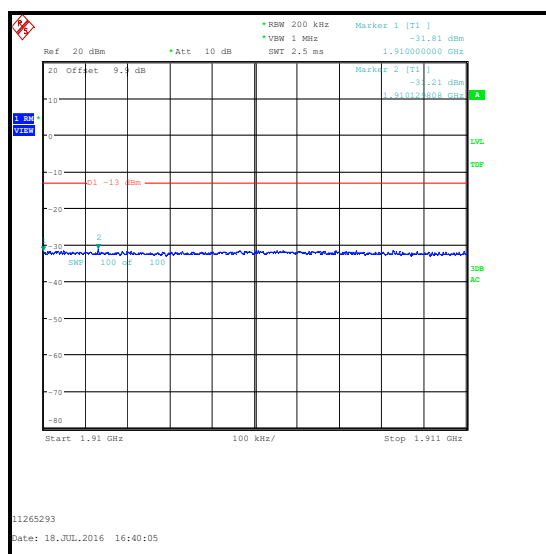
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 10 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.990	1	0	-39.0	-13.0	26.0	Complied
1850	1	0	-40.3	-13.0	27.3	Complied
1910	1	49	-37.8	-13.0	24.8	Complied
1850	1	49	-59.8	-13.0	46.8	Complied
1910	1	0	-60.2	-13.0	47.2	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 49 offset / Upper Band Edge****16QAM / 1 RB 49 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 15 MHz Channel Bandwidth / QPSK**

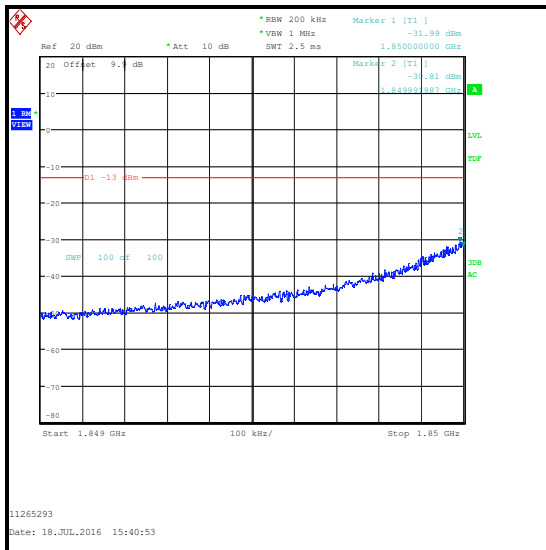
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.827	75	0	-32.7	-13.0	19.7	Complied
1850	75	0	-33.2	-13.0	20.2	Complied
1910	75	0	-31.8	-13.0	18.8	Complied
1910.130	75	0	-31.2	-13.0	18.2	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

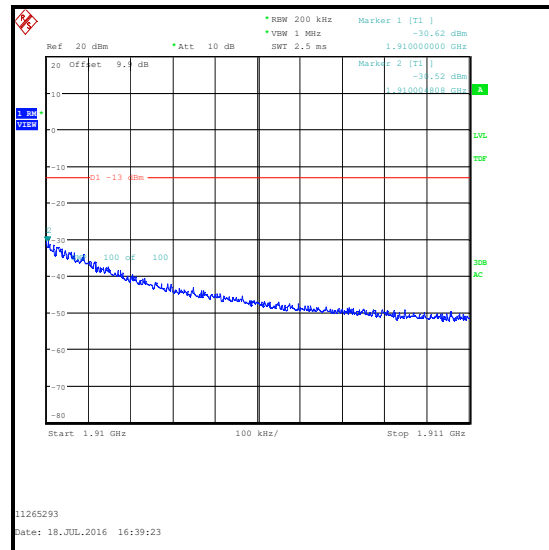
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 15 MHz Channel Bandwidth / QPSK

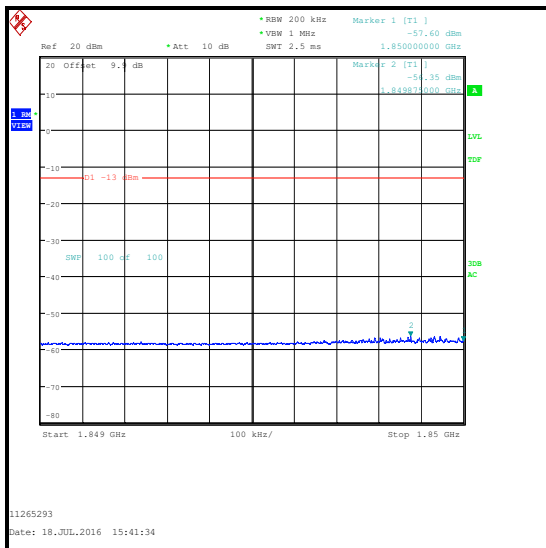
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.992	1	0	-30.8	-13.0	17.8	Complied
1850	1	0	-32.0	-13.0	19.0	Complied
1910	1	74	-30.6	-13.0	17.6	Complied
1910.005	1	74	-30.5	-13.0	17.5	Complied
1850	1	74	-57.6	-13.0	44.6	Complied
1910	1	0	-57.7	-13.0	44.7	Complied



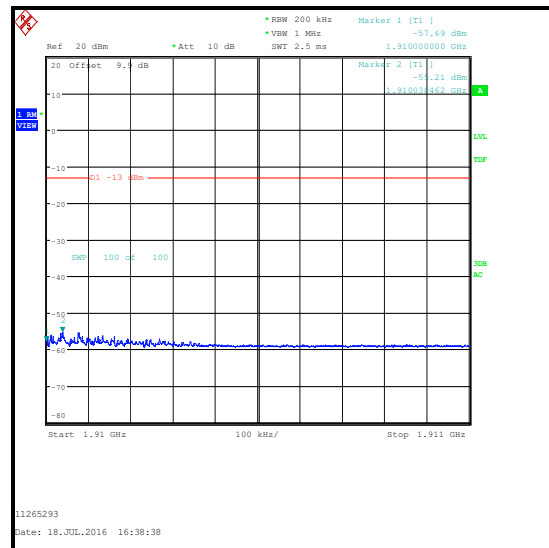
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 74 offset / Upper Band Edge



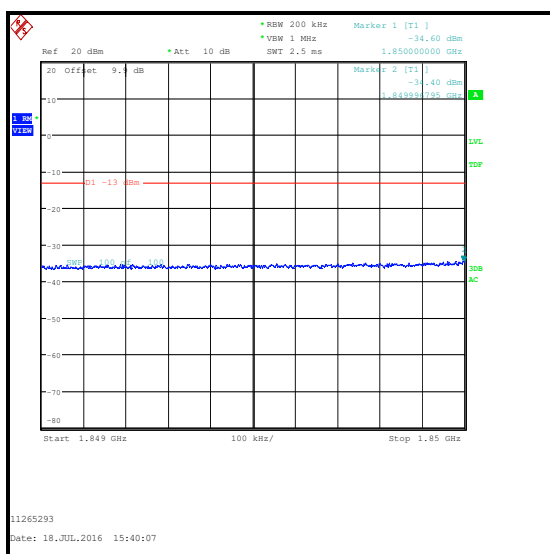
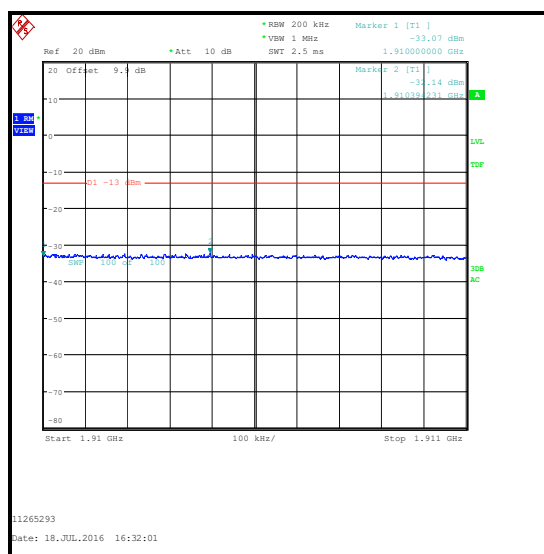
QPSK / 1 RB 74 offset / Lower Band Edge



QPSK / 1 RB 0 offset / Upper Band Edge

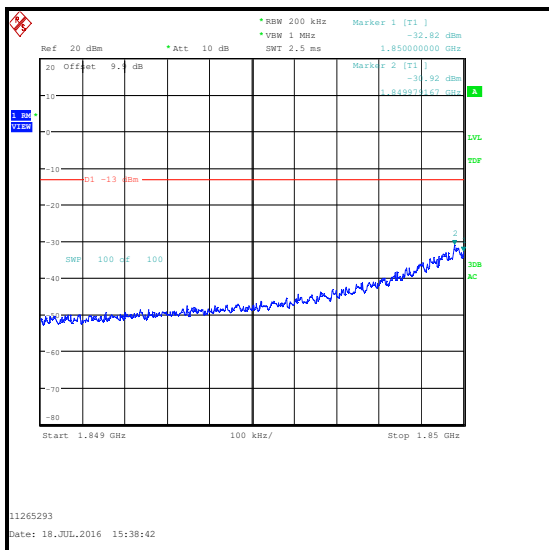
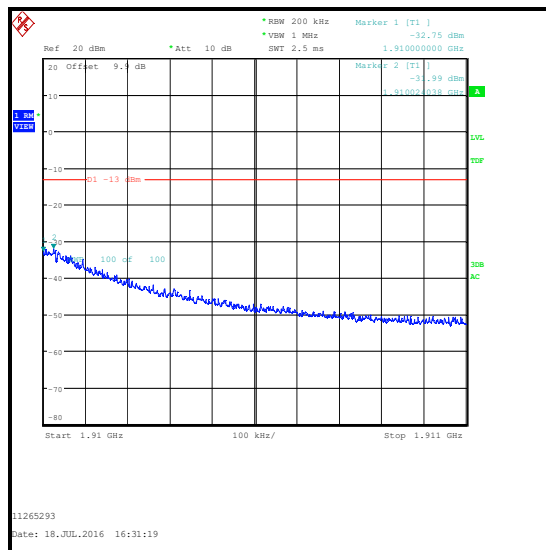
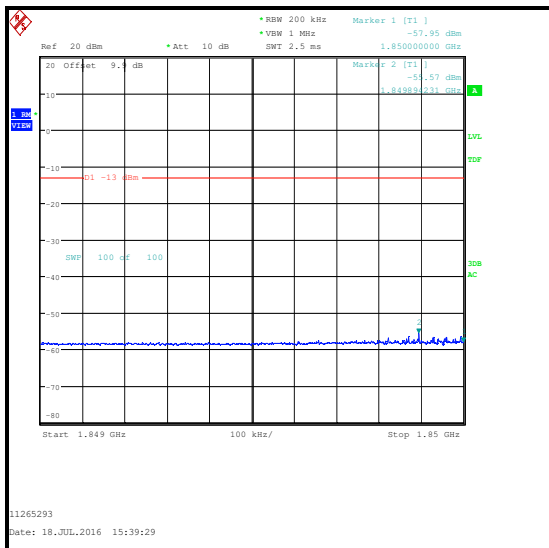
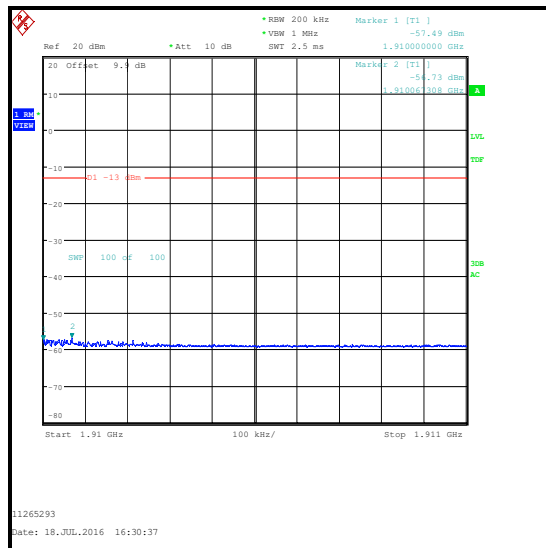
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 15 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	75	0	-34.4	-13.0	21.4	Complied
1850	75	0	-34.6	-13.0	21.6	Complied
1910	75	0	-33.1	-13.0	20.1	Complied
1910.394	75	0	-32.1	-13.0	19.1	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

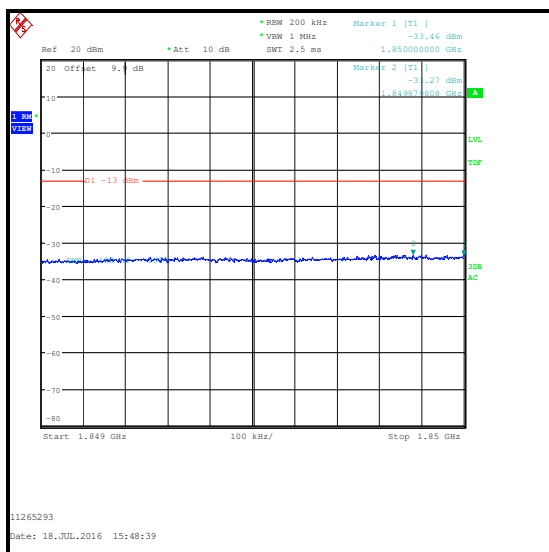
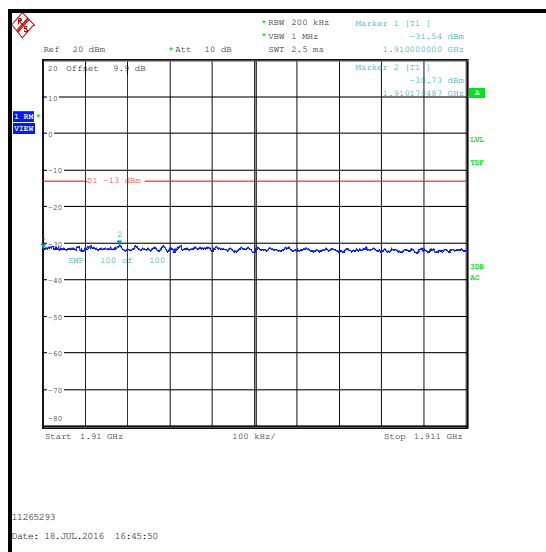
Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 15 MHz Channel Bandwidth / 16QAM**

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.979	1	0	-30.9	-13.0	17.9	Complied
1850	1	0	-32.8	-13.0	19.8	Complied
1910	1	74	-32.7	-13.0	19.7	Complied
1910.024	1	74	-32.0	-13.0	19.0	Complied
1850	1	74	-57.0	-13.0	44.0	Complied
1910	1	0	-57.5	-13.0	44.5	Complied

**16QAM / 1 RB 0 offset / Lower Band Edge****16QAM / 1 RB 74 offset / Upper Band Edge****16QAM / 1 RB 74 offset / Lower Band Edge****16QAM / 1 RB 0 offset / Upper Band Edge**

Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 20 MHz Channel Bandwidth / QPSK**

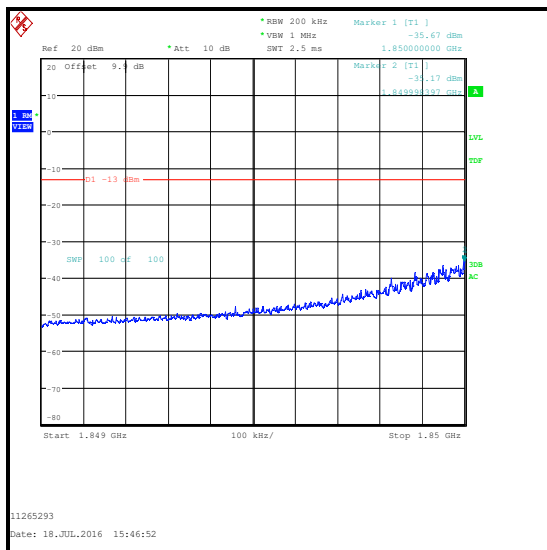
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.880	100	0	-33.3	-13.0	20.3	Complied
1850	100	0	-33.5	-13.0	20.5	Complied
1910	100	0	-31.5	-13.0	18.5	Complied
1910.179	100	0	-30.7	-13.0	17.7	Complied

**QPSK / Lower Band Edge****QPSK / Upper Band Edge**

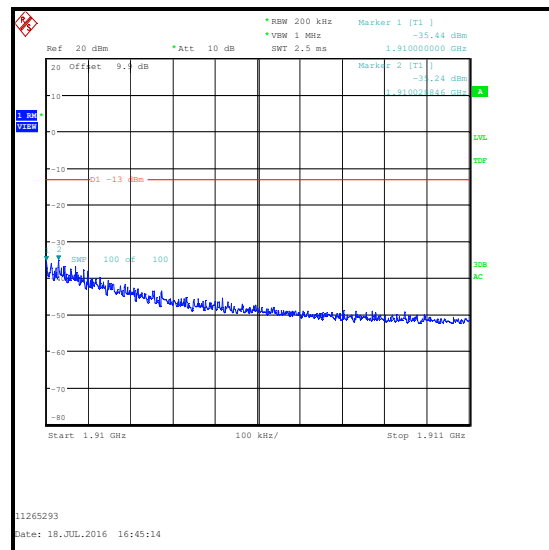
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 20 MHz Channel Bandwidth / QPSK

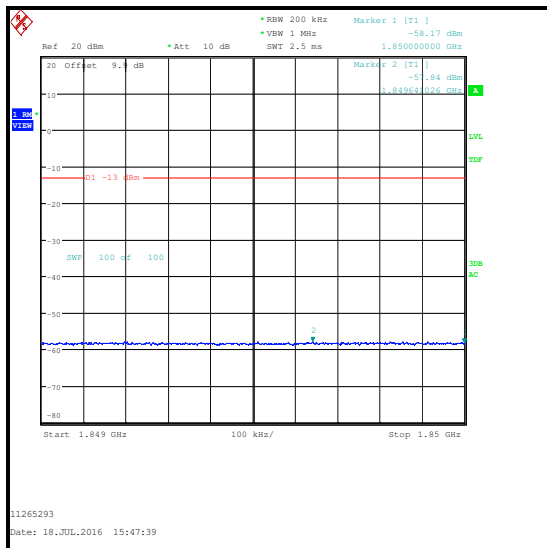
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.998	1	0	-35.2	-13.0	22.5	Complied
1850	1	0	-35.7	-13.0	22.7	Complied
1910	1	99	-35.4	-13.0	22.4	Complied
1910.029	1	99	-35.2	-13.0	22.2	Complied
1850	1	99	-58.2	-13.0	45.2	Complied
1910	1	0	-58.6	-13.0	45.6	Complied



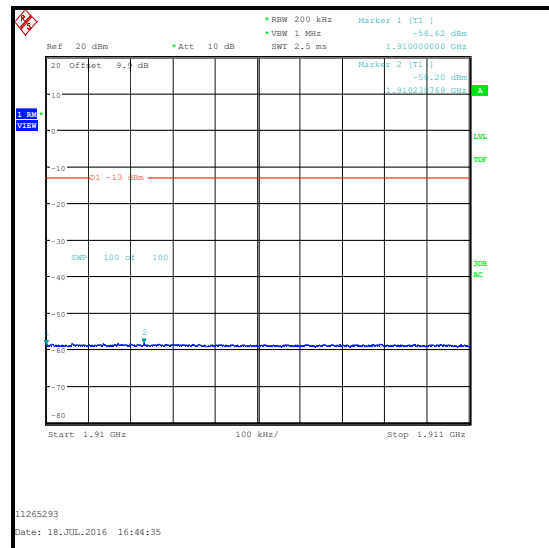
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 99 offset / Upper Band Edge



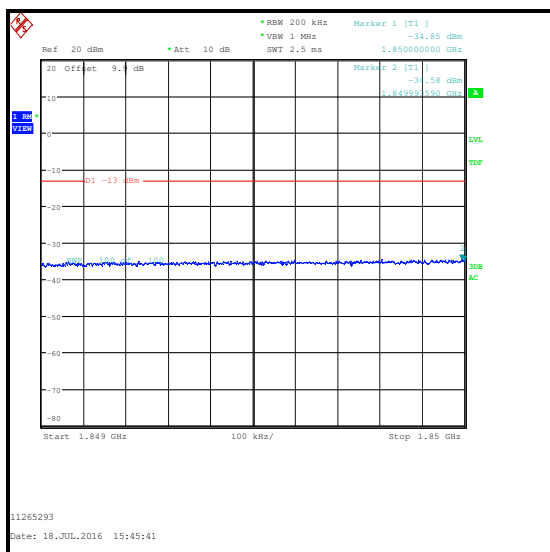
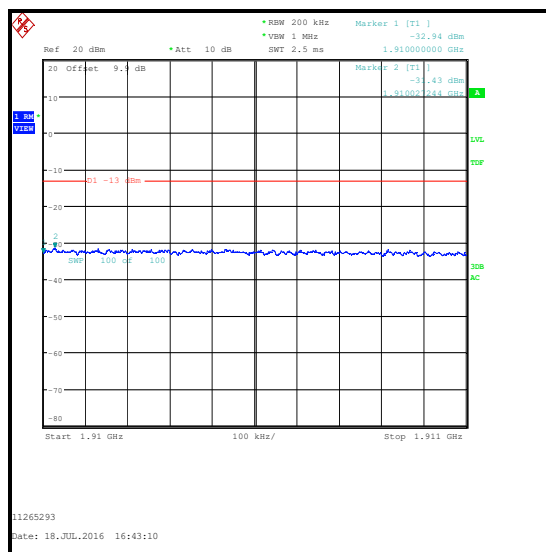
QPSK / 1 RB 99 offset / Lower Band Edge



QPSK / 1 RB 0 offset / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - UAT**Results: 20 MHz Channel Bandwidth / 16QAM**

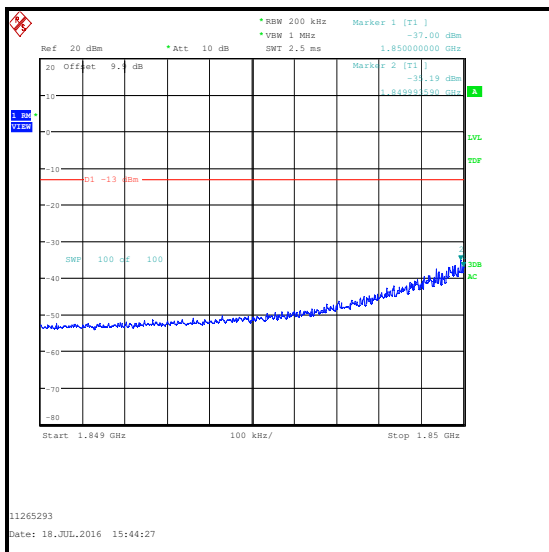
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.994	100	0	-34.6	-13.0	21.6	Complied
1850	100	0	-34.8	-13.0	21.8	Complied
1910	100	0	-32.9	-13.0	19.9	Complied
1910.027	100	0	-31.4	-13.0	18.4	Complied

**16QAM / Lower Band Edge****16QAM / Upper Band Edge**

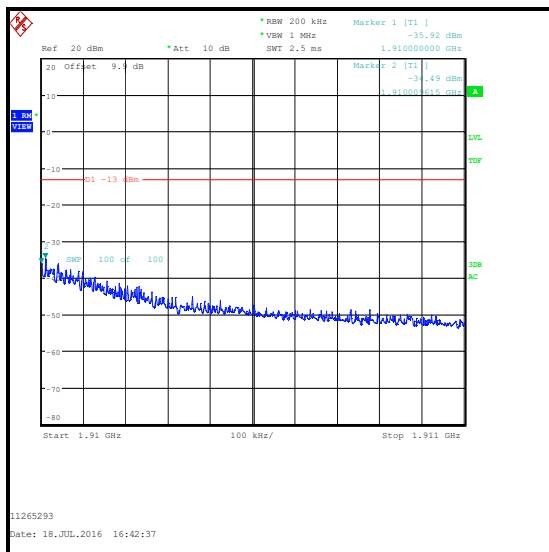
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 20 MHz Channel Bandwidth / 16QAM

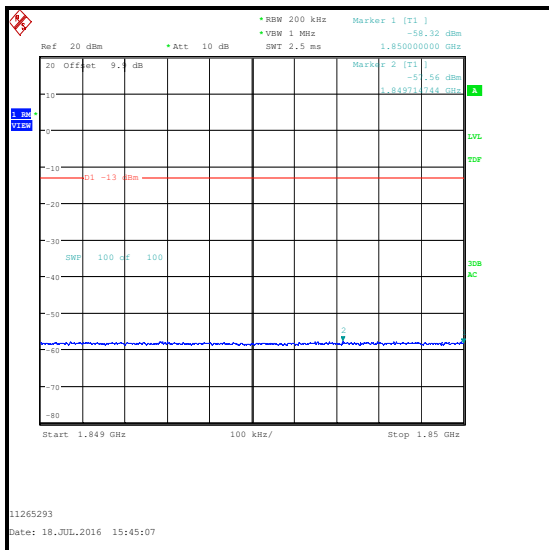
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.994	1	0	-35.2	-13.0	22.2	Complied
1850	1	0	-37.0	-13.0	24.0	Complied
1910	1	99	-35.9	-13.0	22.9	Complied
1910.006	1	99	-34.5	-13.0	21.5	Complied
1850	1	99	-58.3	-13.0	45.3	Complied
1910	1	0	-59.0	-13.0	46.0	Complied



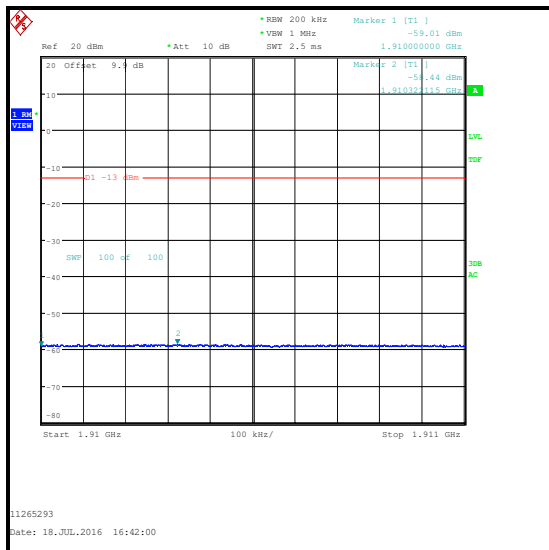
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 99 offset / Upper Band Edge



16QAM / 1 RB 99 offset / Lower Band Edge



16QAM / 1 RB 0 offset / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - UAT**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	17 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12

5.2.9. Transmitter Frequency Stability (Temperature Variation)**Test Summary:**

Test Engineer:	Stefan Ho	Test Dates:	03 June 2016 & 09 June 2016
Test Sample IMEI:	358640070266615		

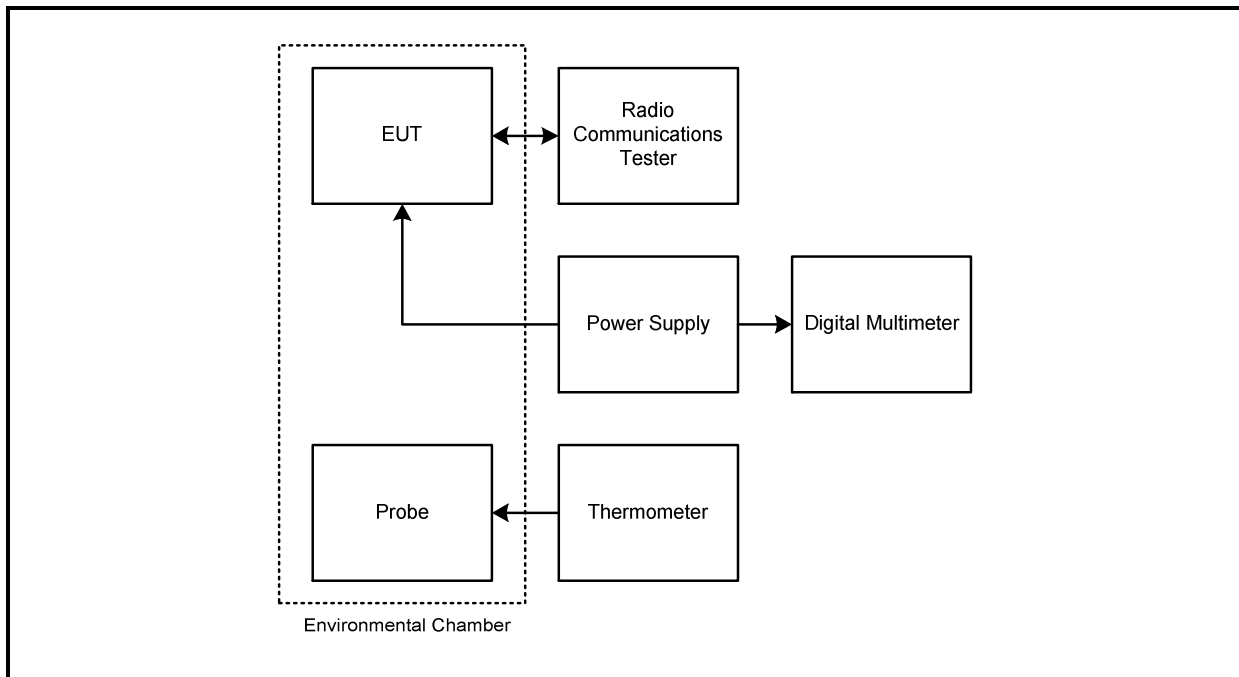
FCC Reference:	Parts 2.1055 & 24.235
Test Method Used:	KDB 971168 Section 9.0 referencing ANSI/TIA-603-D-2010 Section 2.2.2 and FCC Part 2.1055

Environmental Conditions:

Ambient Temperature (°C):	23
Ambient Relative Humidity (%):	46 to 48

Note(s):

1. Flying leads were connected internally to the EUT in place of the battery. These leads extended and connected to a bench power supply at the nominal voltage of 3.8 V.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

Test setup:

Transmitter Frequency Stability (Temperature Variation) (continued)**Results: Bottom Channel (1850.7 MHz)**

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	8	1850.700008	1850.0	0.700008	Complied
-20	8	1850.700008	1850.0	0.700008	Complied
-10	9	1850.700009	1850.0	0.700009	Complied
0	10	1850.700010	1850.0	0.700010	Complied
10	9	1850.700009	1850.0	0.700009	Complied
20	7	1850.700007	1850.0	0.700007	Complied
30	10	1850.700010	1850.0	0.700010	Complied
40	9	1850.700009	1850.0	0.700009	Complied
50	8	1850.700008	1850.0	0.700008	Complied

Results: Top Channel (1909.3 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	9	1909.299991	1910.0	0.700009	Complied
-20	11	1909.299989	1910.0	0.700011	Complied
-10	9	1909.299991	1910.0	0.700009	Complied
0	9	1909.299991	1910.0	0.700009	Complied
10	10	1909.299990	1910.0	0.700010	Complied
20	9	1909.299991	1910.0	0.700009	Complied
30	8	1909.299992	1910.0	0.700008	Complied
40	10	1909.299990	1910.0	0.700010	Complied
50	9	1909.299991	1910.0	0.700009	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2002	Thermohygrometer	Testo	608-H1	45041825	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW 500	145923	05 Apr 2017	12
M1815	Environmental Chamber	Votsch/Heraeus	VT4002	521/83083	Calibrated before use	-
M1642	Thermometer	Fluke	52II	18890119	25 Apr 2017	12
S021	DC power supply	TTI	CPX200	061034	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12

5.2.10. Transmitter Frequency Stability (Voltage Variation)**Test Summary:**

Test Engineer:	Stefan Ho	Test Date:	02 June 2016
Test Sample IMEI:	358640070266615		

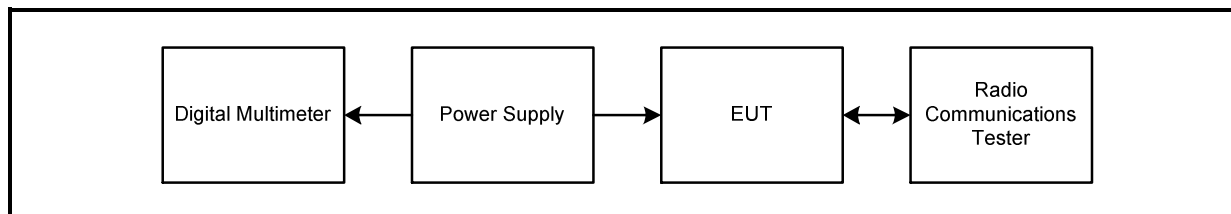
FCC Reference:	Parts 2.1055 & 24.235
Test Method Used:	KDB 971168 Section 9.0 referencing ANSI/TIA-603-D-2010 Section 2.2.2 and FCC Part 2.1055

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	48

Note(s):

1. Flying leads were connected internally to the EUT in place of the battery. These leads extended and connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

Test setup:

Transmitter Frequency Stability (Voltage Variation) (continued)**Results: Bottom Channel (1850.7 MHz)**

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.5	8	1850.700008	1850.0	0.700008	Complied
4.4	9	1850.700009	1850.0	0.700009	Complied

Results: Top Channel (1909.3 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
3.5	9	1909.299991	1910.0	0.700009	Complied
4.4	8	1909.299992	1910.0	0.700008	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2002	Thermohygrometer	Testo	608-H1	45041825	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW 500	145923	05 Apr 2017	12
S021	DC power supply	TTI	CPX200	061034	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	1850 to 1910 MHz	95%	± 1.36 dB
Frequency Stability	1850 to 1910 MHz	95%	± 23 Hz
Occupied Bandwidth	1850 to 1910 MHz	95%	± 3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	± 5.65 dB
Radiated Spurious Emissions	1 GHz to 20 GHz	95%	± 2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	-	-	Updates as requested by the TCB

--- END OF REPORT ---