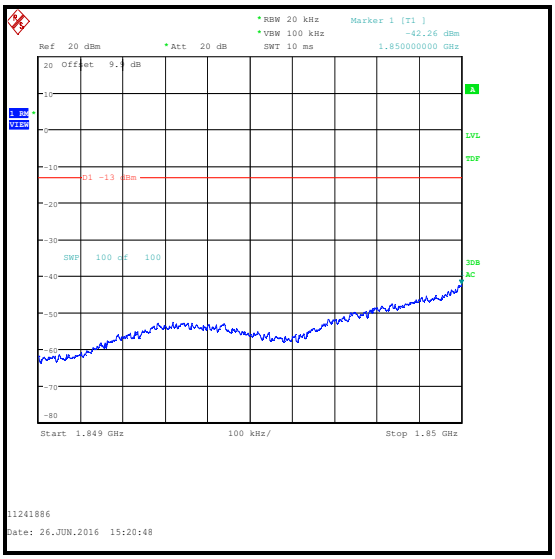
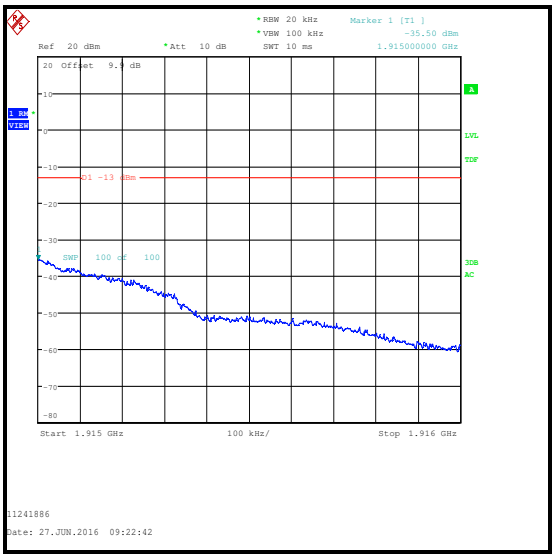
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 1.4 MHz Channel Bandwidth / 16QAM

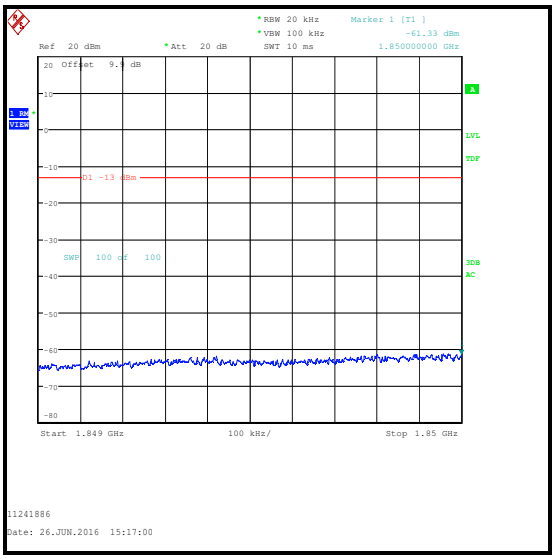
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-42.3	-13.0	29.3	Complied
1915	1	5	-35.5	-13.0	22.5	Complied
1850	1	5	-61.3	-13.0	48.3	Complied
1915	1	0	-58.4	-13.0	45.4	Complied
1915.013	1	0	-58.3	-13.0	45.3	Complied



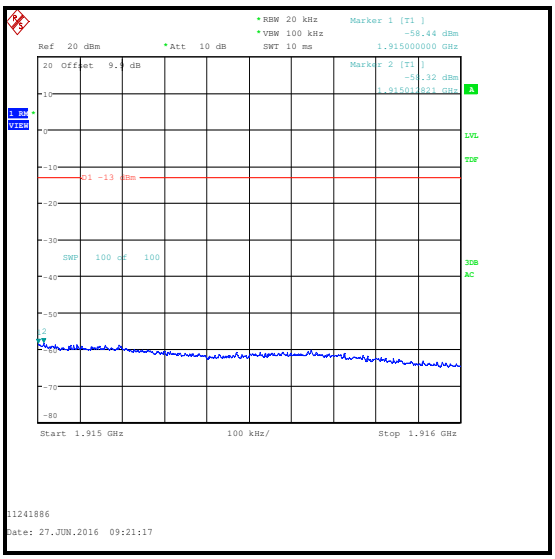
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 5 offset / Upper Band Edge



16QAM / 1 RB 5 offset / Lower Band Edge

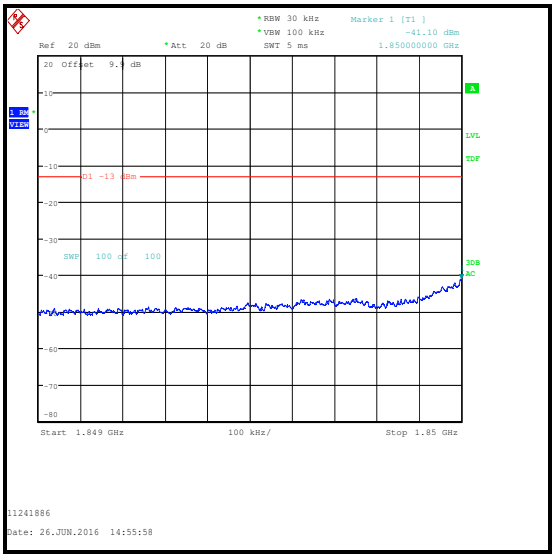


16QAM / 1 RB 0 offset / Upper Band Edge

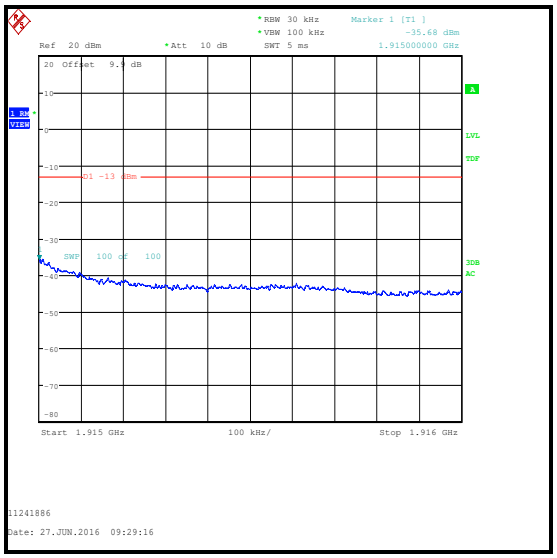
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 3 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	15	0	-41.1	-13.0	28.1	Complied
1915	15	0	-35.7	-13.0	22.7	Complied



QPSK / Lower Band Edge

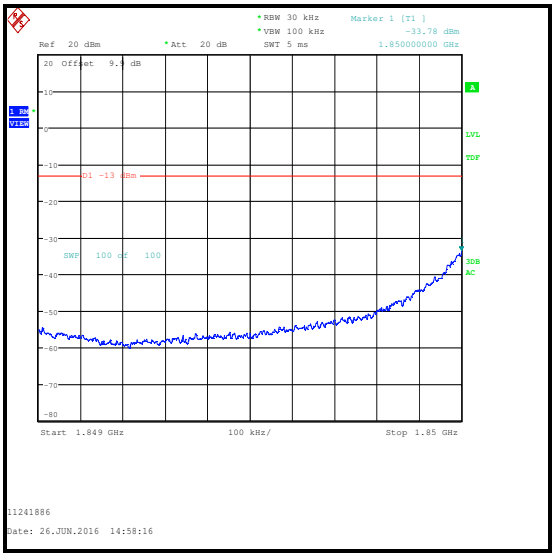


QPSK / Upper Band Edge

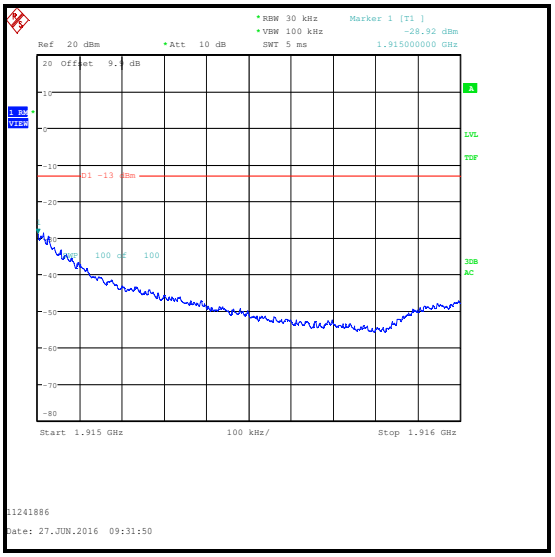
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 3 MHz Channel Bandwidth / QPSK

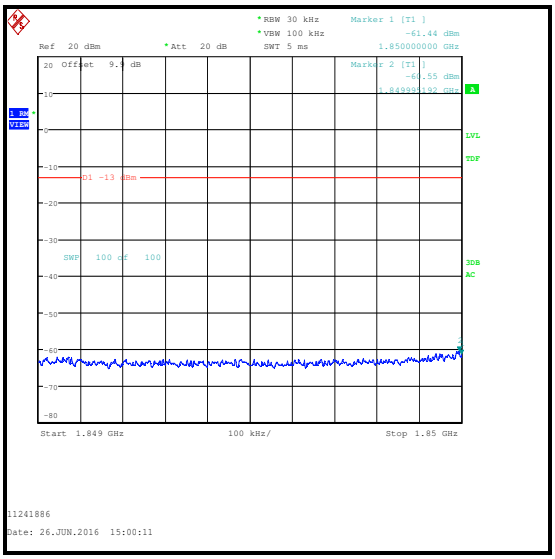
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-33.8	-13.0	20.8	Complied
1915	1	14	-28.9	-13.0	15.9	Complied
1850	1	14	-61.4	-13.0	48.4	Complied
1915	1	0	-62.5	-13.0	49.5	Complied



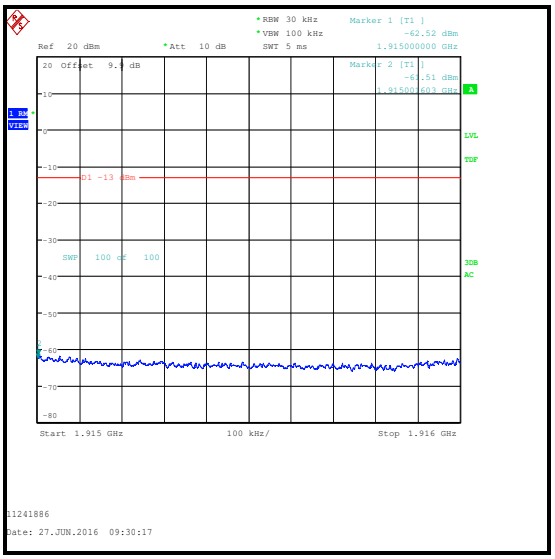
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 14 offset / Upper Band Edge



QPSK / 1 RB 14 offset / Lower Band Edge

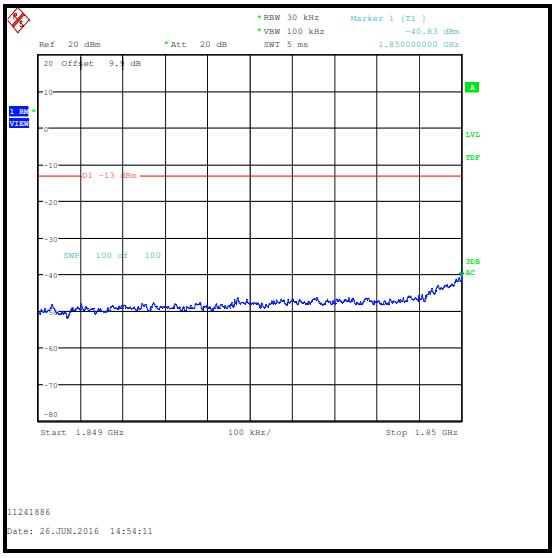


QPSK / 1 RB 0 offset / Upper Band Edge

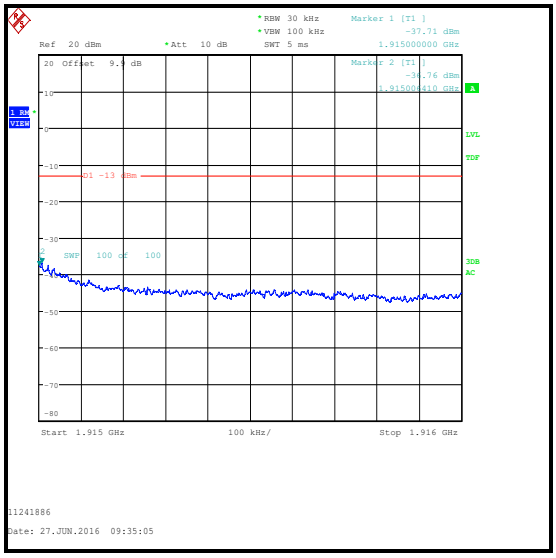
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 3 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	15	0	-40.8	-13.0	27.8	Complied
1915	15	0	-37.7	-13.0	24.7	Complied
1915.006	15	0	-36.8	-13.0	23.8	Complied



16QAM / Lower Band Edge

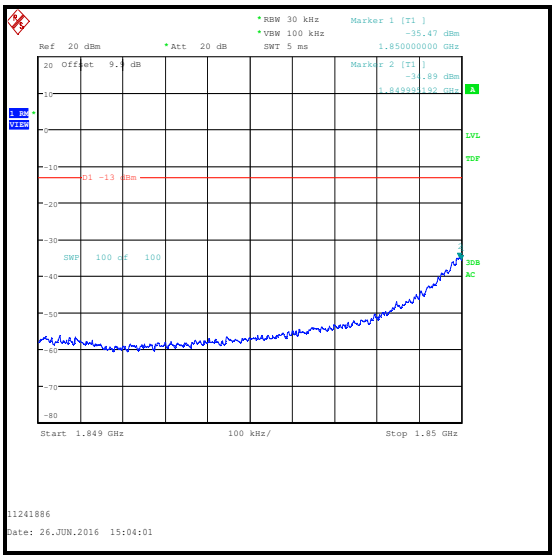


16QAM / Upper Band Edge

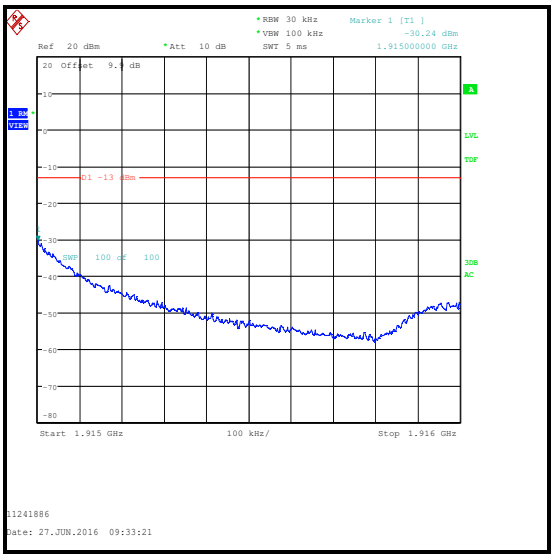
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 3 MHz Channel Bandwidth / 16QAM

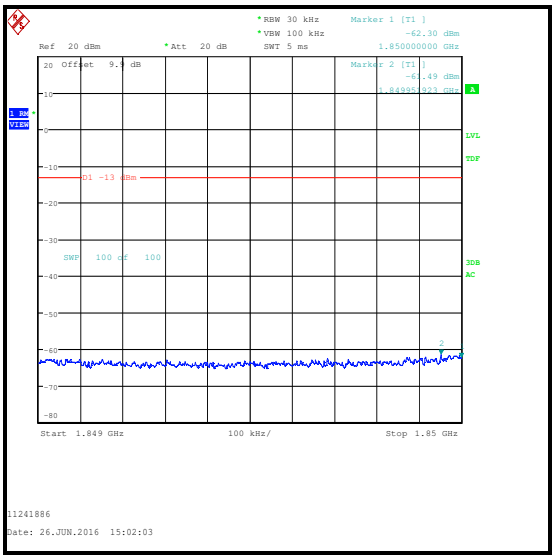
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	1	0	-34.9	-13.0	21.9	Complied
1850	1	0	-35.5	-13.0	22.5	Complied
1915	1	14	-30.2	-13.0	17.2	Complied
1850	1	14	-62.3	-13.0	49.3	Complied
1915	1	0	-63.7	-13.0	50.7	Complied



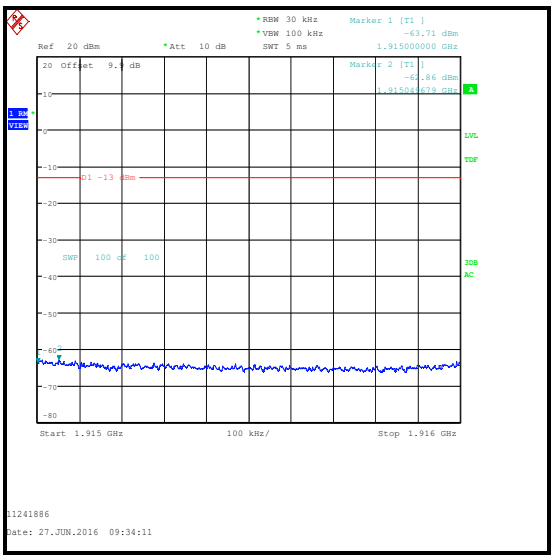
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 14 offset / Upper Band Edge



16QAM / 1 RB 14 offset / Lower Band Edge

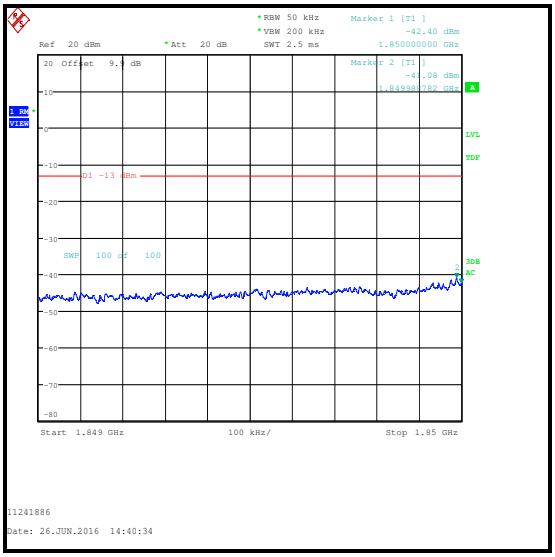


16QAM / 1 RB 0 offset / Upper Band Edge

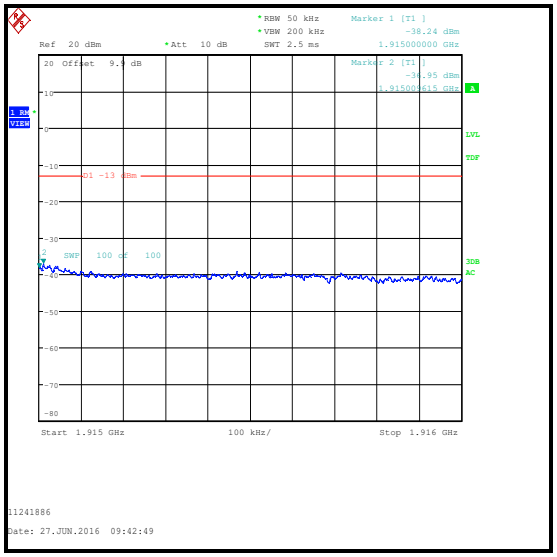
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.989	25	0	-41.1	-13.0	28.1	Complied
1850	25	0	-42.4	-13.0	29.4	Complied
1915	25	0	-38.2	-13.0	25.2	Complied
1915.010	25	0	-37.0	-13.0	24.0	Complied



QPSK / Lower Band Edge

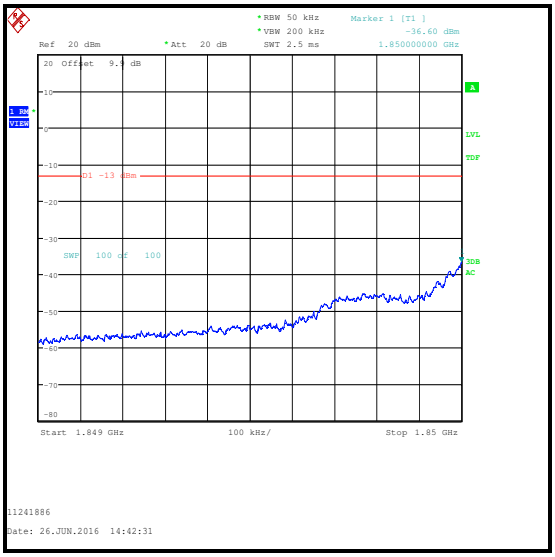


QPSK / Upper Band Edge

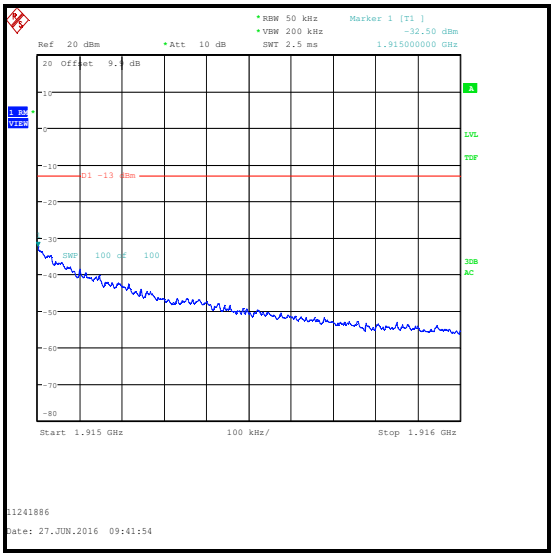
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 5 MHz Channel Bandwidth / QPSK

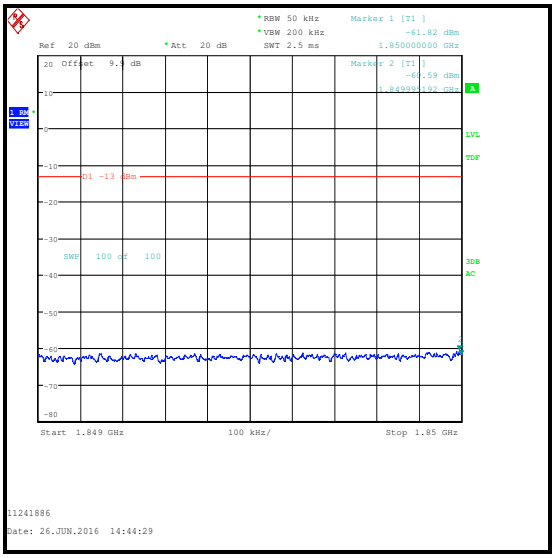
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-36.6	-13.0	23.6	Complied
1915	1	24	-32.5	-13.0	19.5	Complied
1850	1	24	-61.8	-13.0	48.8	Complied
1915	1	0	-64.3	-13.0	51.3	Complied



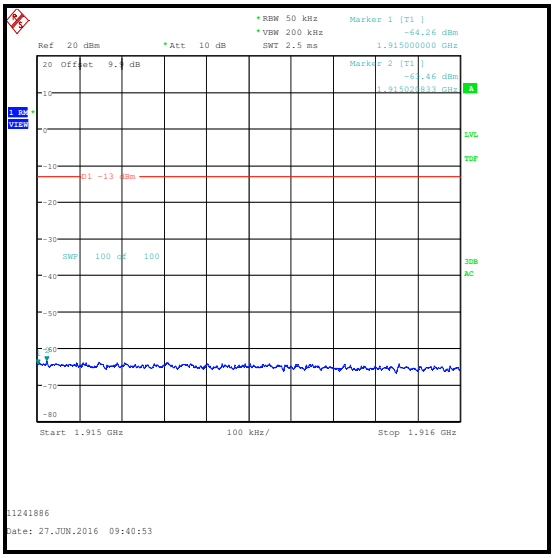
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 24 offset / Upper Band Edge



QPSK / 1 RB 24 offset / Lower Band Edge

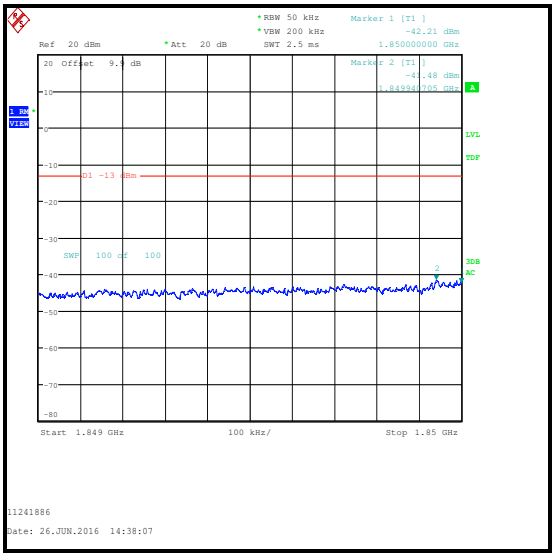


QPSK / 1 RB 0 offset / Upper Band Edge

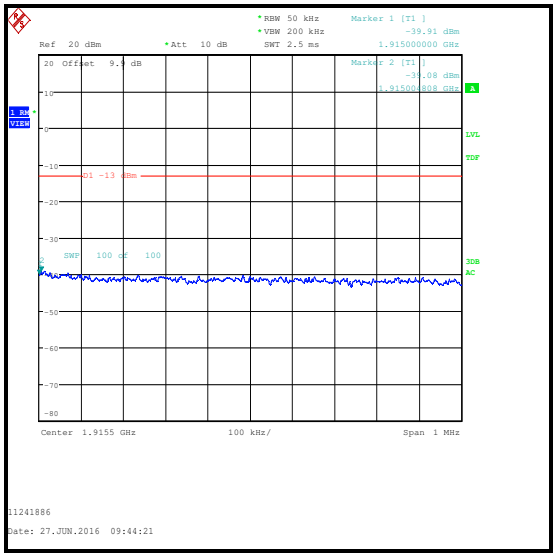
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.941	25	0	-41.5	-13.0	28.5	Complied
1850	25	0	-42.2	-13.0	29.2	Complied
1915	25	0	-39.9	-13.0	26.9	Complied
1915.005	25	0	-39.1	-13.0	26.1	Complied



16QAM / Lower Band Edge



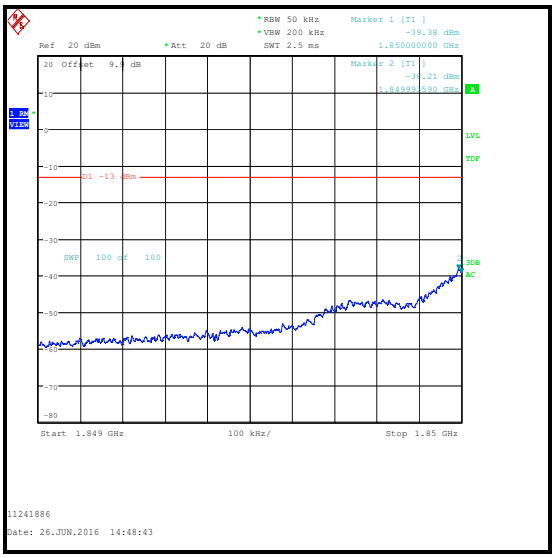
16QAM / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - LAT

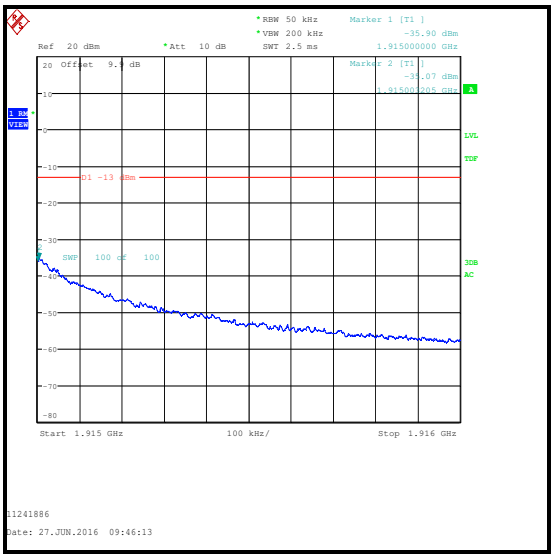
Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.994	1	0	-38.2	-13.0	25.2	Complied
1850	1	0	-39.4	-13.0	26.4	Complied
1915	1	24	-35.9	-13.0	22.9	Complied
1915.003	1	24	-35.1	-13.0	22.1	Complied
1850	1	24	-61.6	-13.0	48.6	Complied
1915	1	0	-64.1	-13.0	51.1	Complied

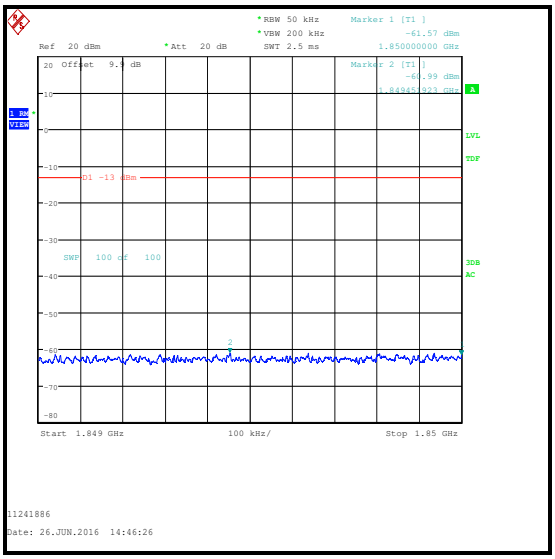
Transmitter Radiated Emissions at Band Edges (continued) - LAT



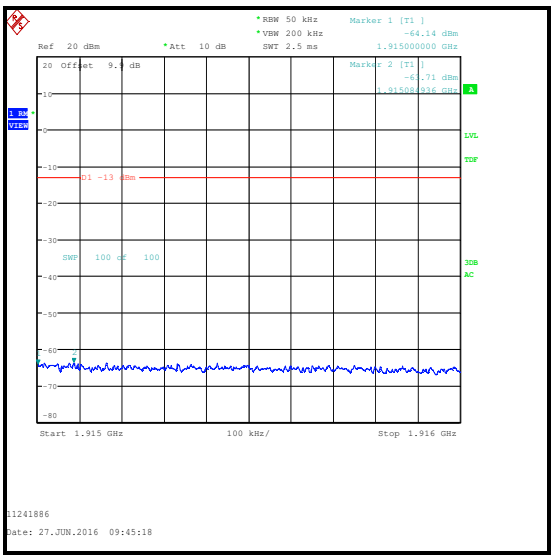
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 24 offset / Upper Band Edge



16QAM / 1 RB 24 offset / Lower Band Edge

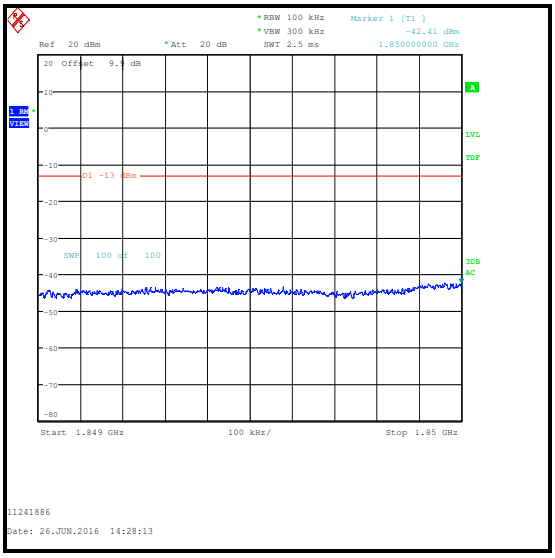


16QAM / 1 RB 0 offset / Upper Band Edge

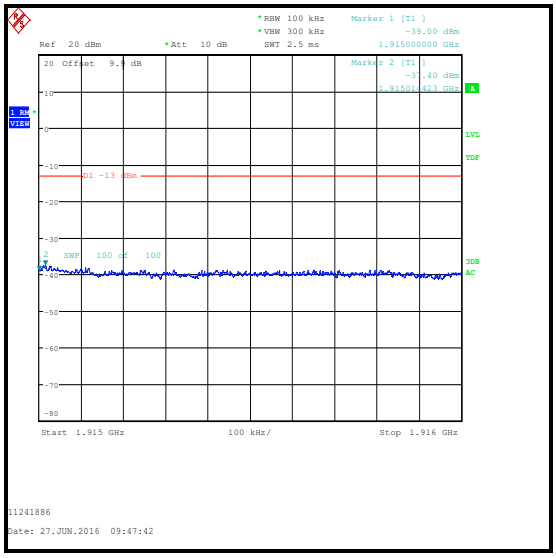
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	50	0	-42.4	-13.0	29.4	Complied
1915	50	0	-39.0	-13.0	26.0	Complied
1915.014	50	0	-37.4	-13.0	24.4	Complied



QPSK / Lower Band Edge



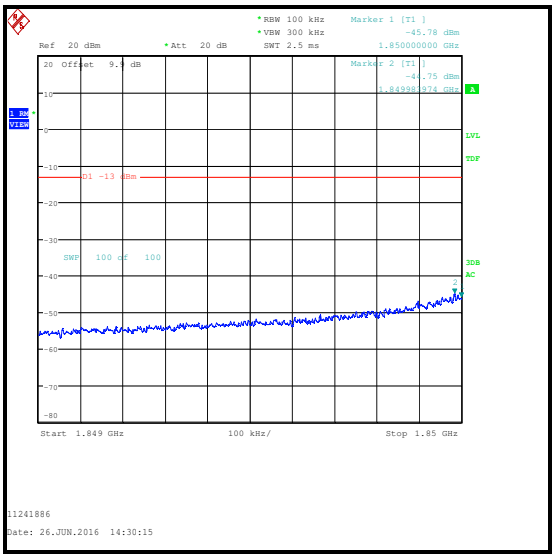
QPSK / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - LAT

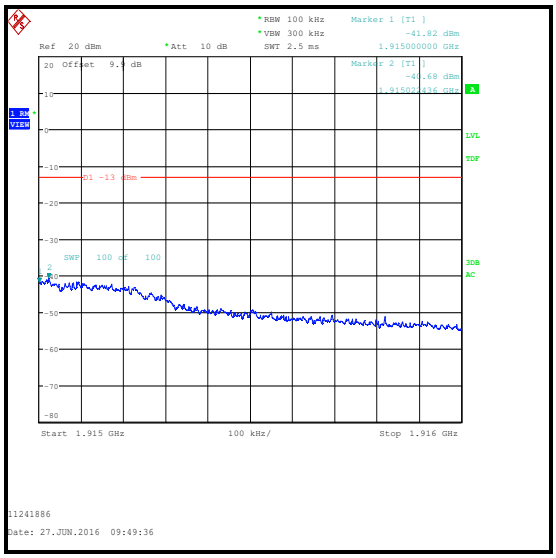
Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.984	1	0	-44.8	-13.0	21.8	Complied
1850	1	0	-45.8	-13.0	22.8	Complied
1915	1	49	-41.8	-13.0	28.8	Complied
1915.022	1	49	-40.7	-13.0	27.7	Complied
1850	1	49	-59.9	-13.0	46.9	Complied
1915	1	0	-62.2	-13.0	49.2	Complied

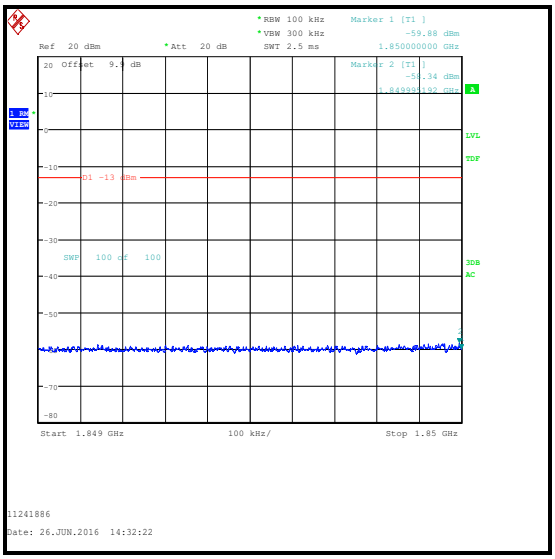
Transmitter Radiated Emissions at Band Edges (continued) - LAT



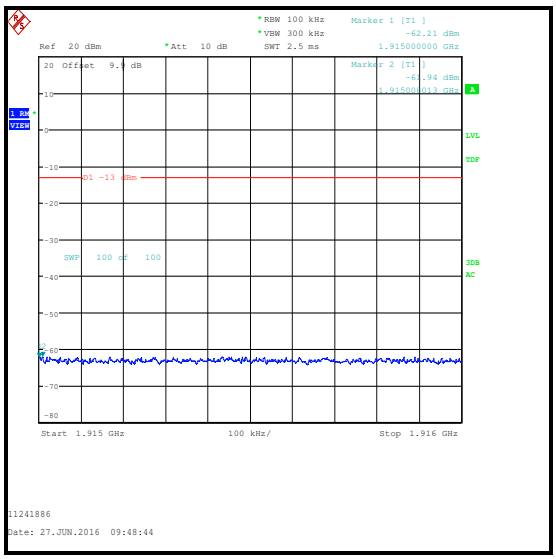
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 49 offset / Upper Band Edge



QPSK / 1 RB 49 offset / Lower Band Edge

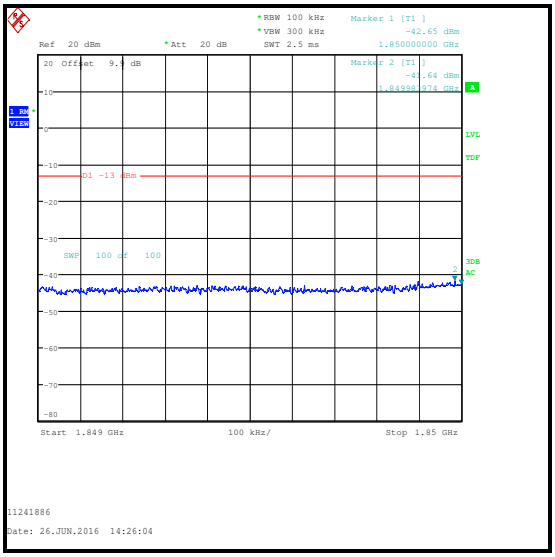


QPSK / 1 RB 0 offset / Upper Band Edge

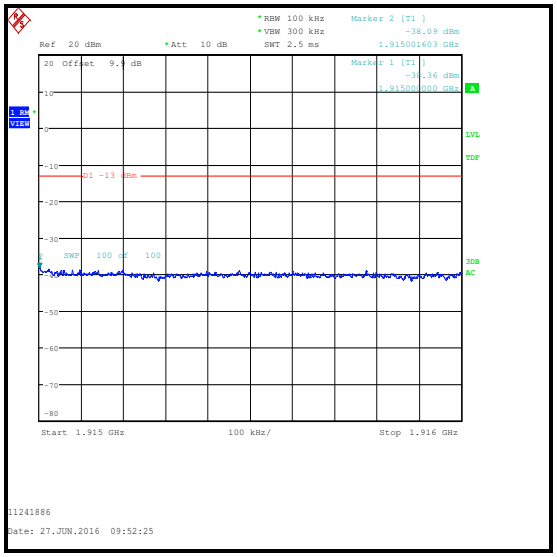
Transmitter Radiated Emissions at Band Edges (continued) - LAT

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	-41.6	-13.0	28.6	Complied
1850	50	0	-42.7	-13.0	29.7	Complied
1915	50	0	-38.4	-13.0	25.4	Complied
1915.002	50	0	-38.1	-13.0	25.1	Complied



16QAM / Lower Band Edge

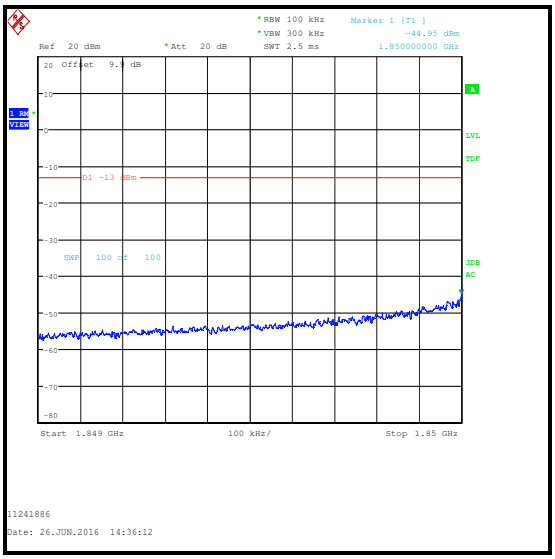


16QAM / Upper Band Edge

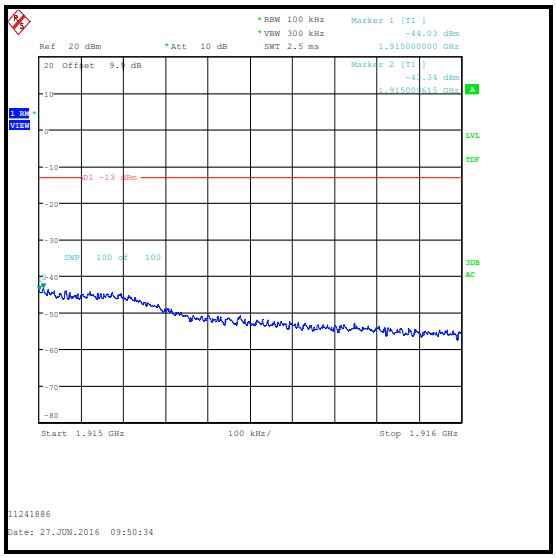
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 10 MHz Channel Bandwidth / 16QAM

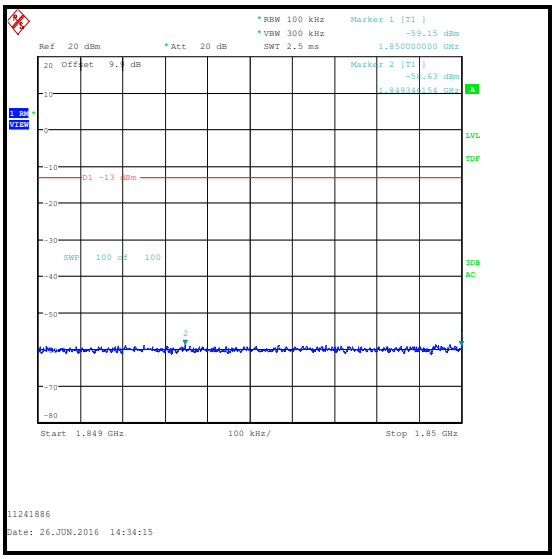
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-45.0	-13.0	32.0	Complied
1915	1	49	-44.0	-13.0	31.0	Complied
1915.010	1	49	-43.3	-13.0	30.3	Complied
1850	1	49	-59.2	-13.0	46.2	Complied
1915	1	0	-62.4	-13.0	49.4	Complied



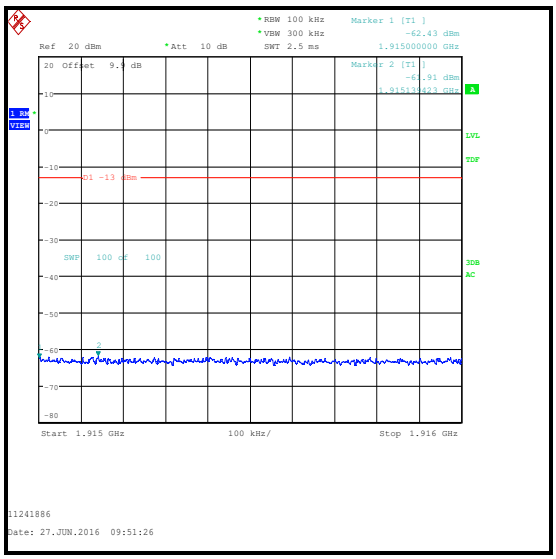
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 49 offset / Upper Band Edge



16QAM / 1 RB 49 offset / Lower Band Edge

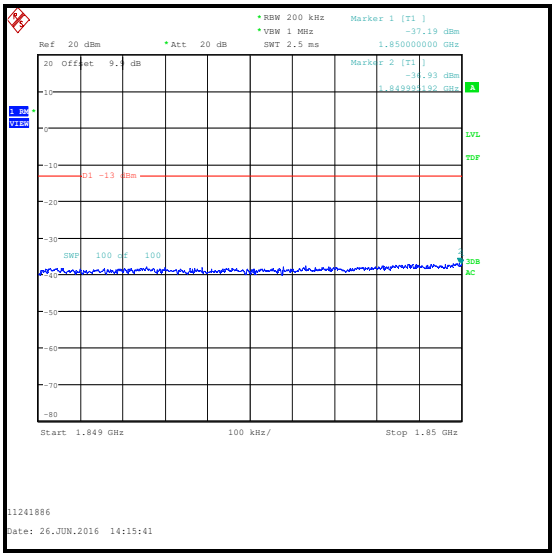


16QAM / 1 RB 0 offset / Upper Band Edge

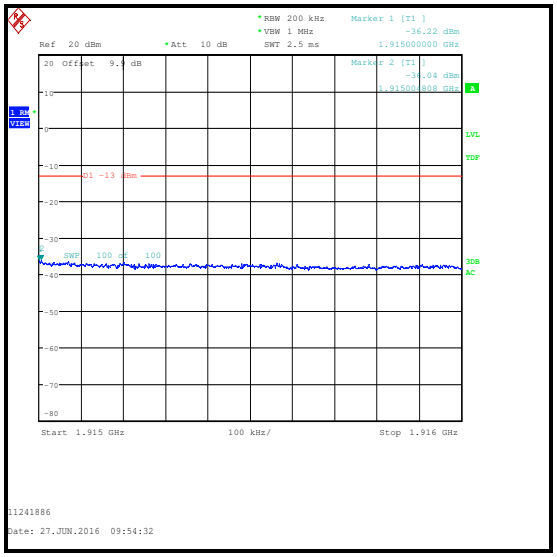
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 15 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	75	0	-36.9	-13.0	23.9	Complied
1850	75	0	-37.2	-13.0	24.2	Complied
1915	75	0	-36.2	-13.0	23.2	Complied
1915.005	75	0	-36.0	-13.0	23.0	Complied



QPSK / Lower Band Edge

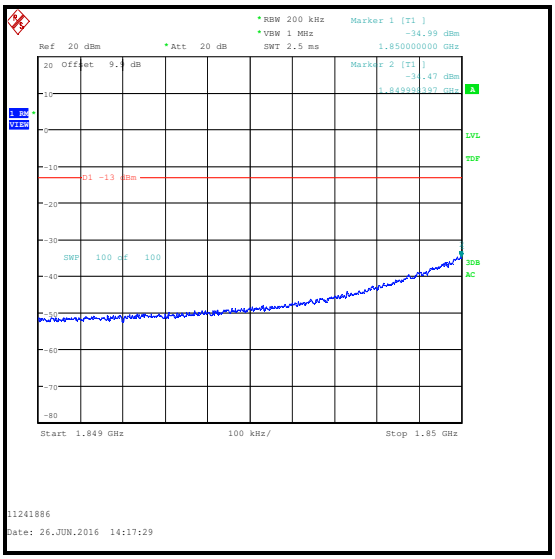


QPSK / Upper Band Edge

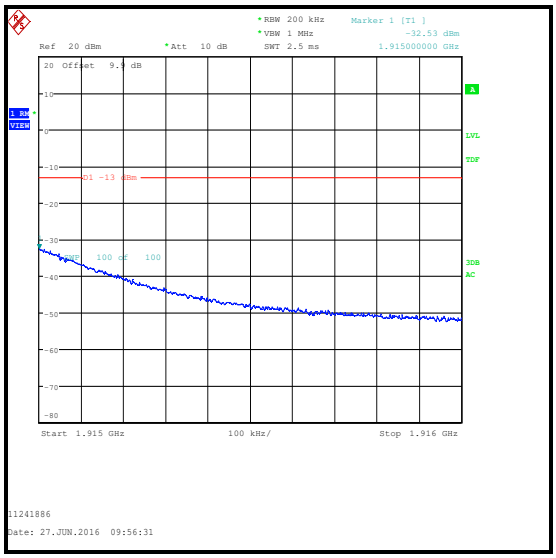
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 15 MHz Channel Bandwidth / QPSK

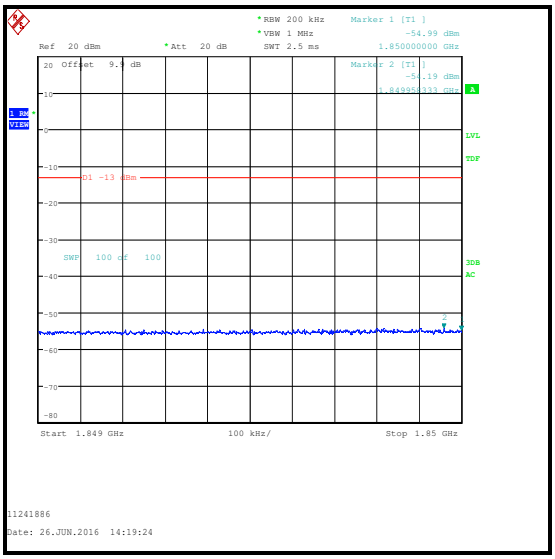
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.998	1	0	-34.5	-13.0	21.5	Complied
1850	1	0	-35.0	-13.0	22.0	Complied
1915	1	74	-32.5	-13.0	19.5	Complied
1850	1	74	-55.0	-13.0	42.0	Complied
1915	1	0	-58.6	-13.0	45.6	Complied



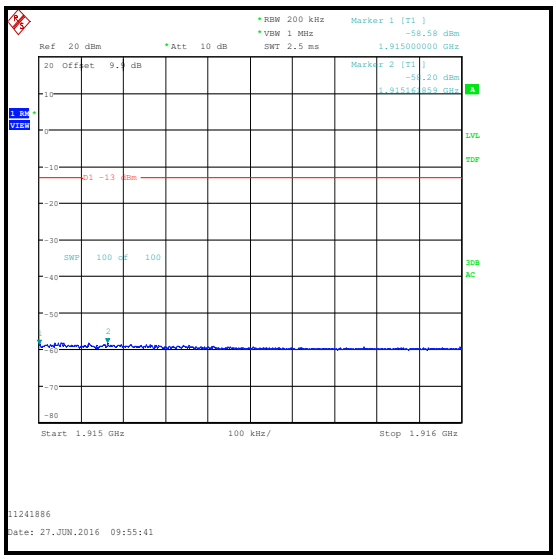
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 74 offset / Upper Band Edge



QPSK / 1 RB 74 offset / Lower Band Edge

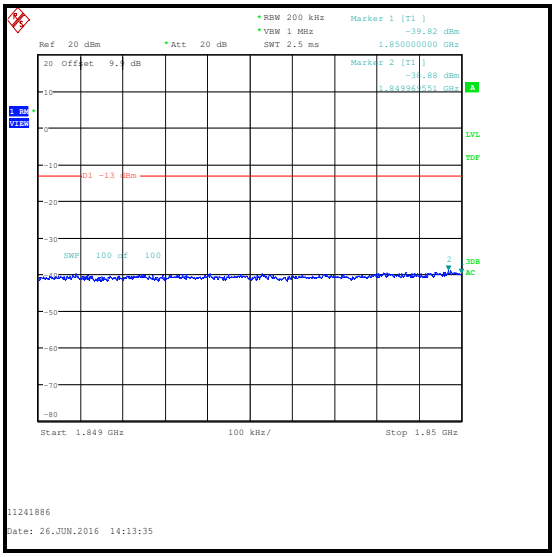


QPSK / 1 RB 0 offset / Upper Band Edge

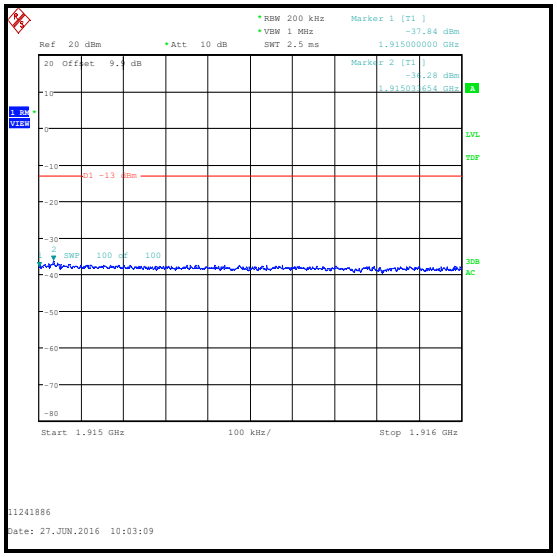
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 15 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.970	75	0	-38.9	-13.0	25.9	Complied
1850	75	0	-39.8	-13.0	26.8	Complied
1915	75	0	-37.8	-13.0	24.8	Complied
1915.034	75	0	-36.3	-13.0	23.3	Complied



16QAM / Lower Band Edge

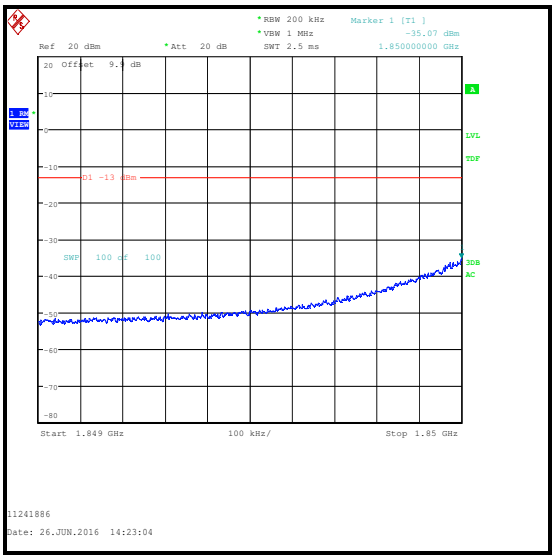


16QAM / Upper Band Edge

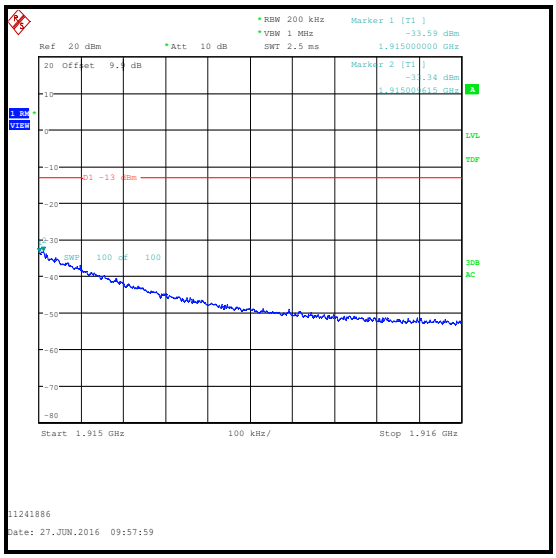
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 15 MHz Channel Bandwidth / 16QAM

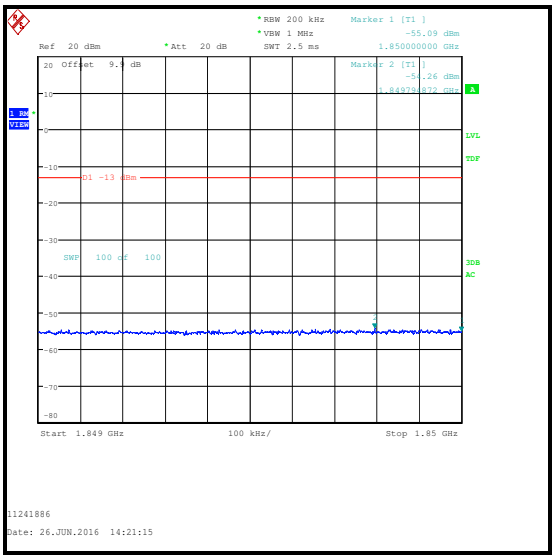
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-35.1	-13.0	22.1	Complied
1915	1	74	-33.6	-13.0	20.6	Complied
1915.010	1	74	-33.3	-13.0	20.3	Complied
1850	1	74	-55.1	-13.0	42.1	Complied
1915	1	0	-59.0	-13.0	46.0	Complied



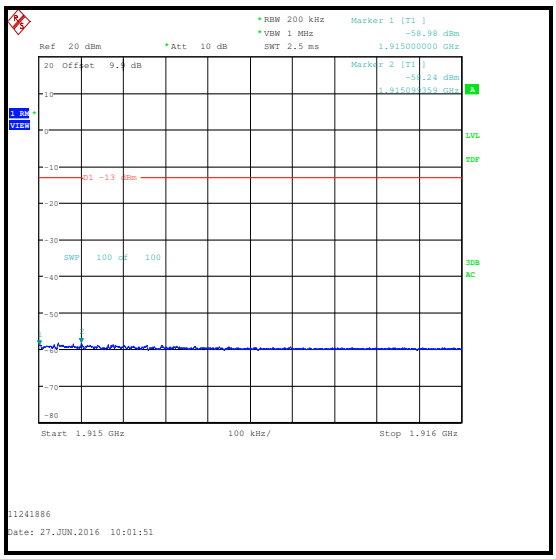
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 74 offset / Upper Band Edge



16QAM / 1 RB 74 offset / Lower Band Edge

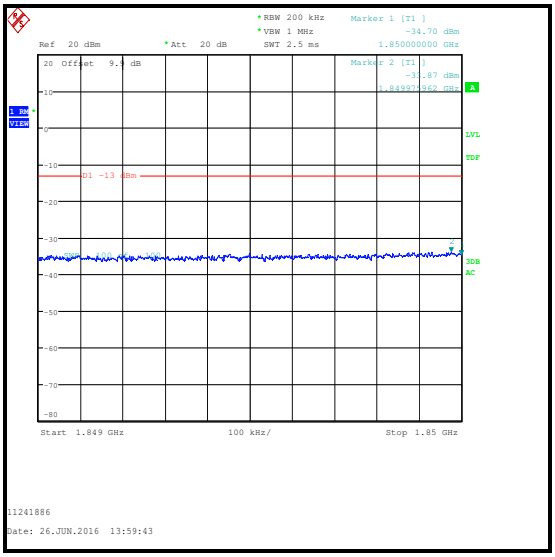


16QAM / 1 RB 0 offset / Upper Band Edge

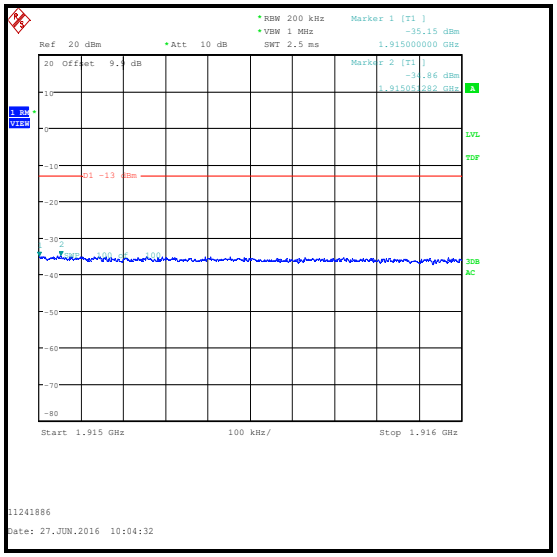
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 20 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.976	100	0	-33.9	-13.0	20.9	Complied
1850	100	0	-34.7	-13.0	21.7	Complied
1915	100	0	-35.2	-13.0	22.2	Complied
1915.051	100	0	-34.9	-13.0	21.9	Complied



QPSK / Lower Band Edge

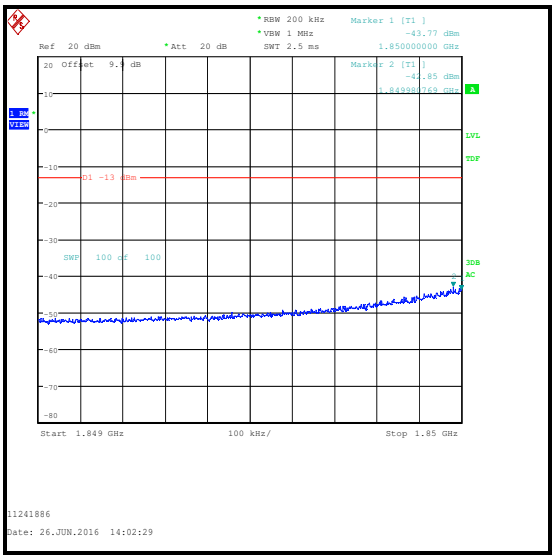


QPSK / Upper Band Edge

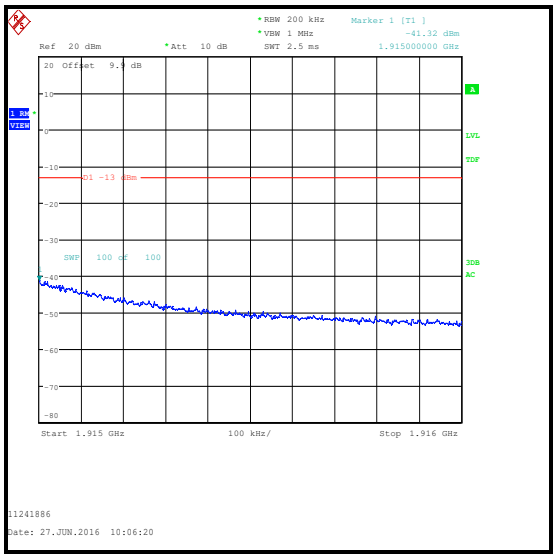
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 20 MHz Channel Bandwidth / QPSK

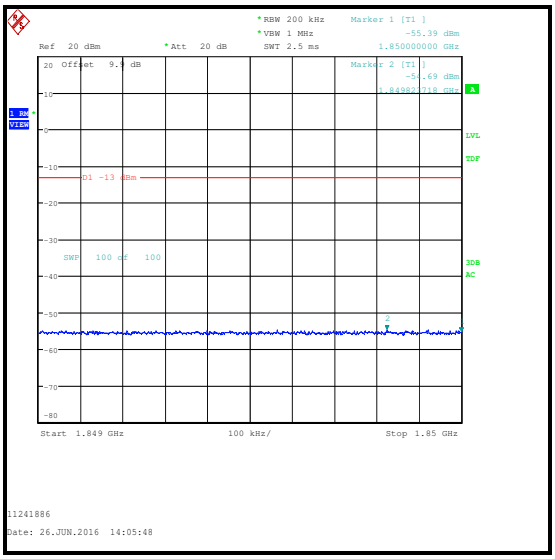
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.981	1	0	-42.9	-13.0	29.9	Complied
1850	1	0	-43.8	-13.0	30.8	Complied
1915	1	99	-41.3	-13.0	28.3	Complied
1850	1	99	-55.4	-13.0	42.4	Complied
1915	1	0	-59.2	-13.0	46.2	Complied



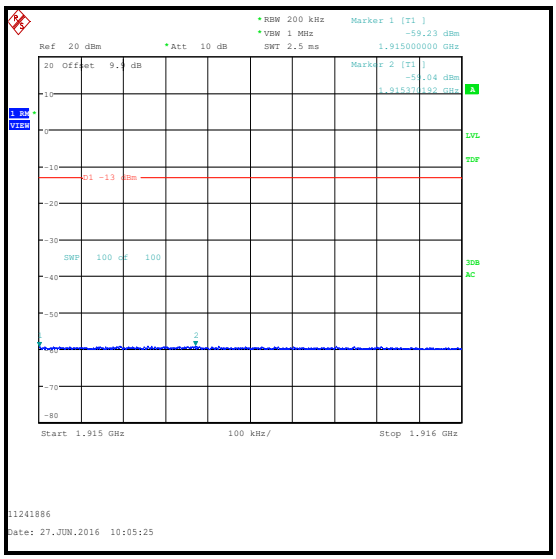
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 99 offset / Upper Band Edge



QPSK / 1 RB 99 offset / Lower Band Edge

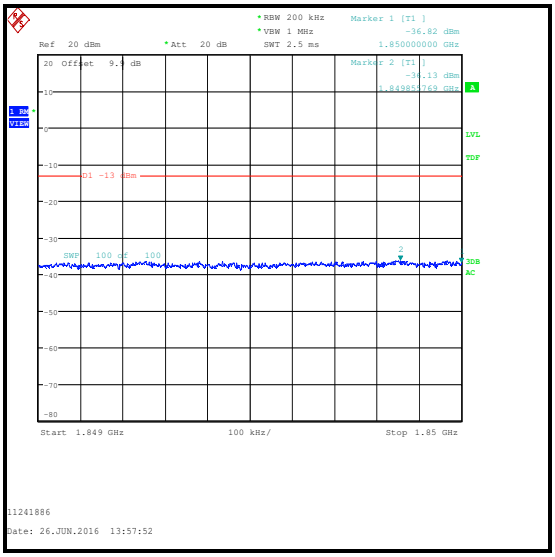


QPSK / 1 RB 0 offset / Upper Band Edge

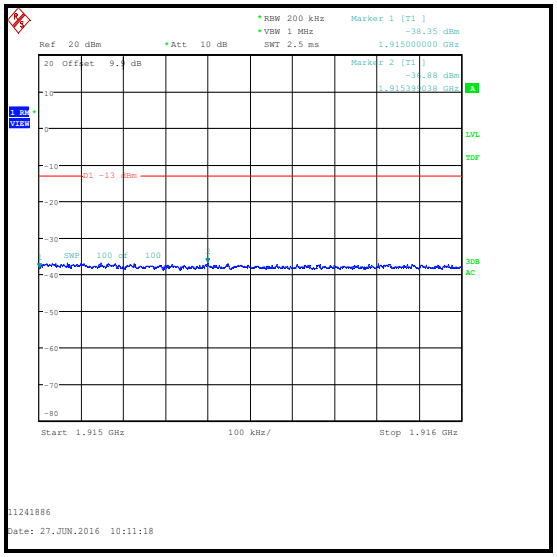
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 20 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.856	100	0	-36.1	-13.0	23.1	Complied
1850	100	0	-36.8	-13.0	23.8	Complied
1915	100	0	-38.4	-13.0	25.4	Complied
1915.399	100	0	-36.9	-13.0	23.9	Complied



16QAM / Lower Band Edge

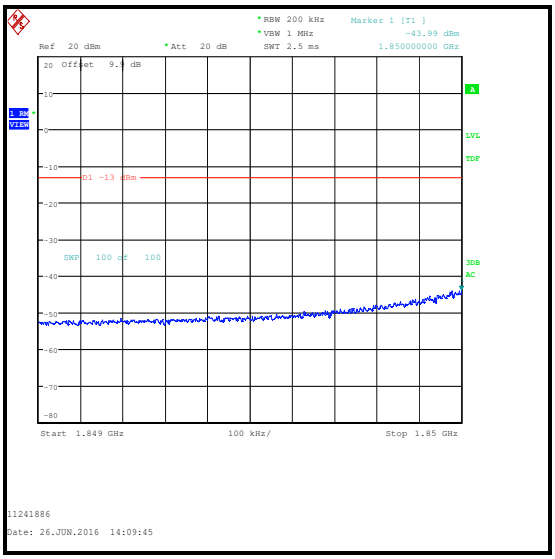


16QAM / Upper Band Edge

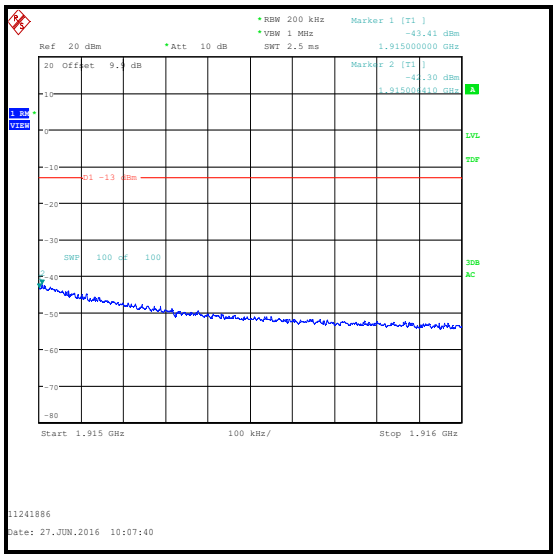
Transmitter Radiated Emissions at Band Edges (continued) - LAT

Results: 20 MHz Channel Bandwidth / 16QAM

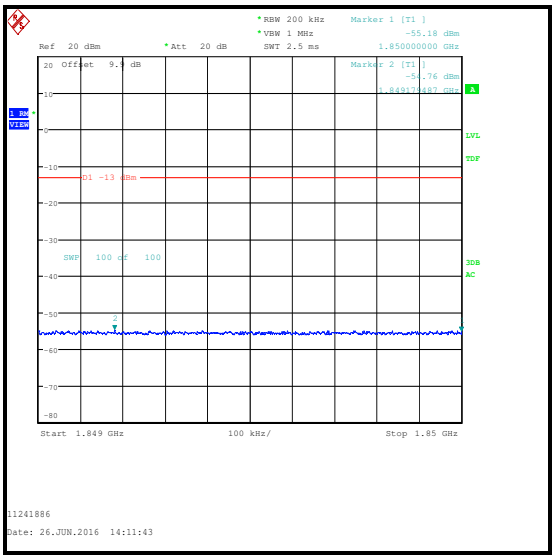
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-44.0	-13.0	31.0	Complied
1915	1	99	-43.4	-13.0	30.4	Complied
1915.006	1	99	-42.3	-13.0	29.3	Complied
1850	1	99	-55.2	-13.0	42.2	Complied
1915	1	0	-59.6	-13.0	46.6	Complied



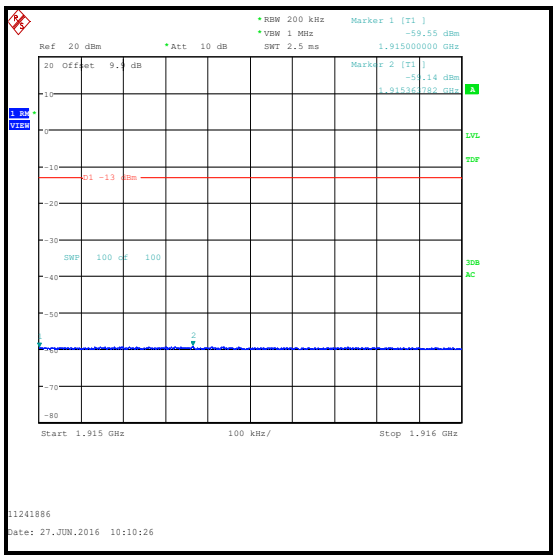
16QAM / 1 RB 0 offset / Lower Band Edge



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
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	07 Apr 2017	12

5.2.8. Transmitter Radiated Emissions at Band Edges - UAT

Test Summary:

Test Engineers:	Nick Steele & David Doyle	**Test Dates:**	26 June 2016 & 27 June 2016
Test Sample IMEI:	358640070022893		

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):	24 to 25
Relative Humidity (%):	44 to 47

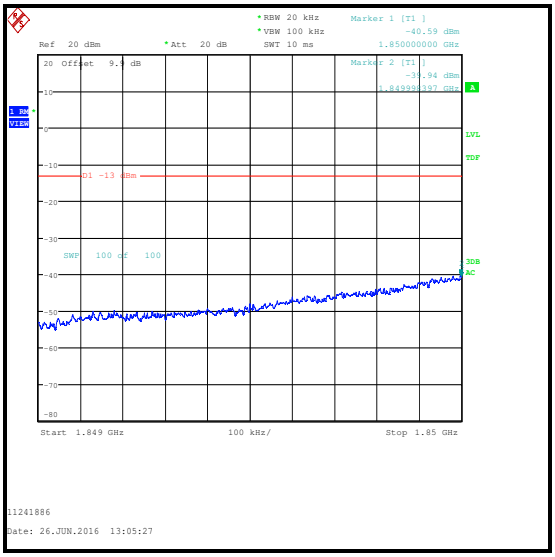
Note(s):

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).

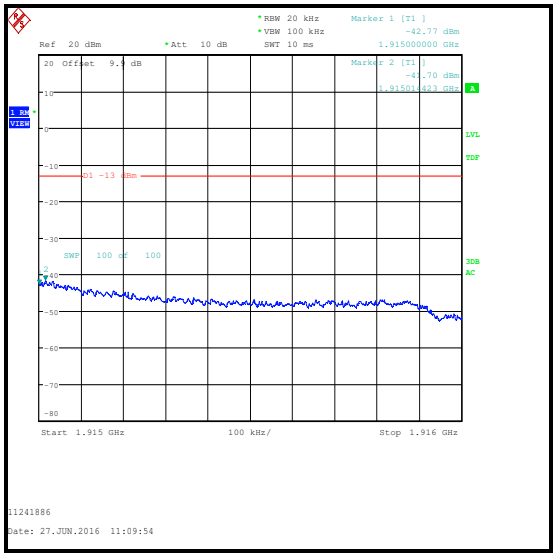
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 1.4 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.998	6	0	-39.9	-13.0	26.9	Complied
1850	6	0	-40.6	-13.0	27.6	Complied
1915	6	0	-42.8	-13.0	29.5	Complied
1915.014	6	0	-41.7	-13.0	28.7	Complied



QPSK / Lower Band Edge

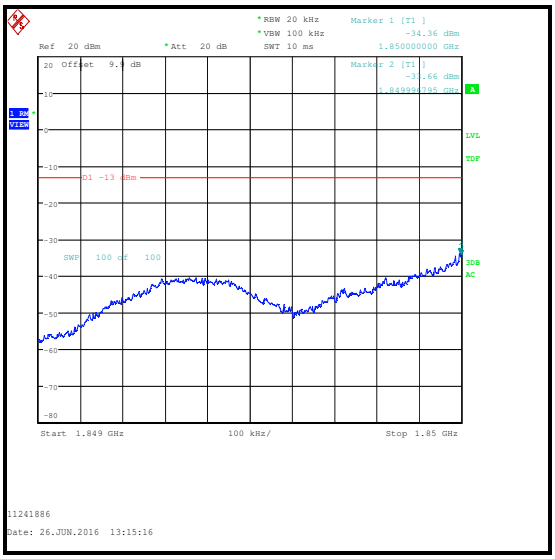


QPSK / Upper Band Edge

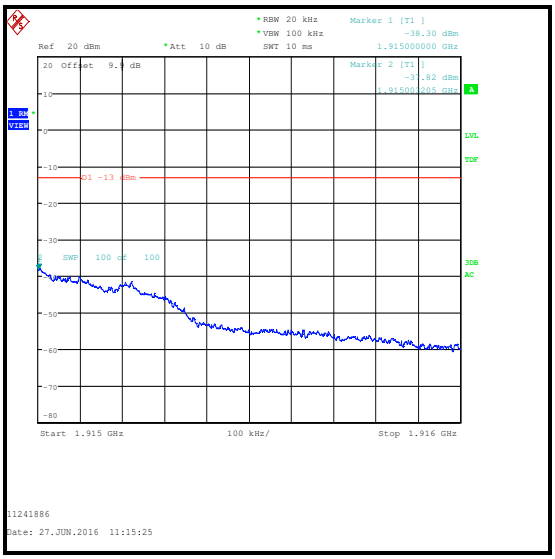
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 1.4 MHz Channel Bandwidth / QPSK

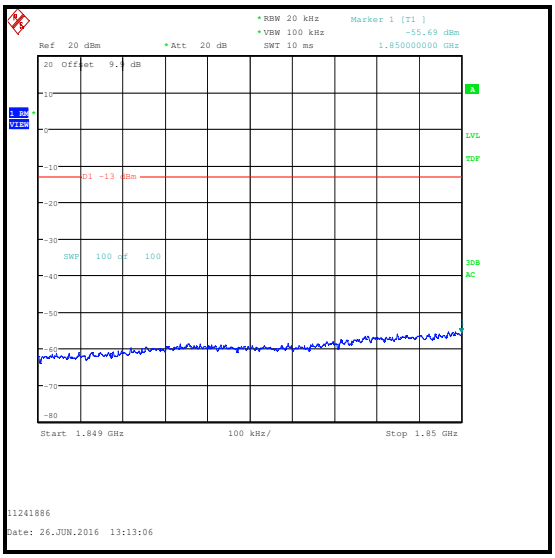
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	1	0	-33.7	-13.0	20.7	Complied
1850	1	0	-34.4	-13.0	21.4	Complied
1915	1	5	-38.3	-13.0	25.3	Complied
1915.003	1	5	-37.8	-13.0	24.8	Complied
1850	1	5	-55.7	-13.0	42.7	Complied
1915	1	0	-59.8	-13.0	46.8	Complied



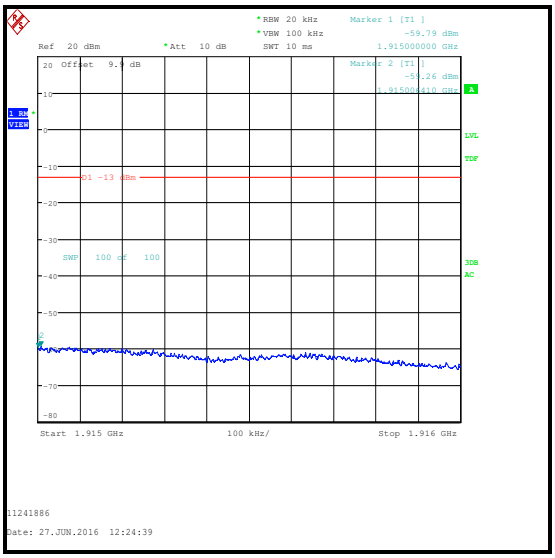
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 5 offset / Upper Band Edge



QPSK / 1 RB 5 offset / Lower Band Edge

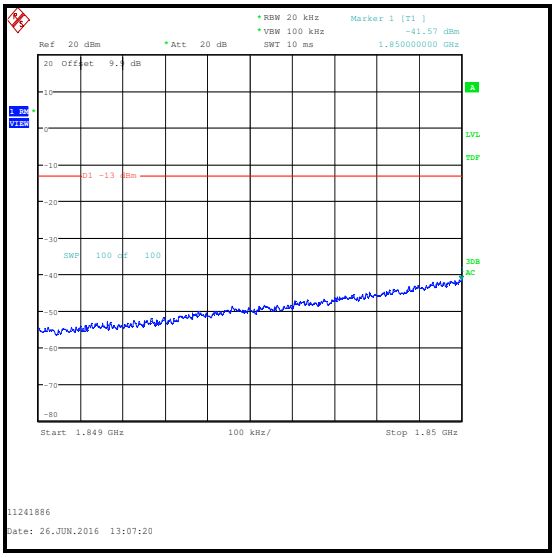


QPSK / 1 RB 0 offset / Upper Band Edge

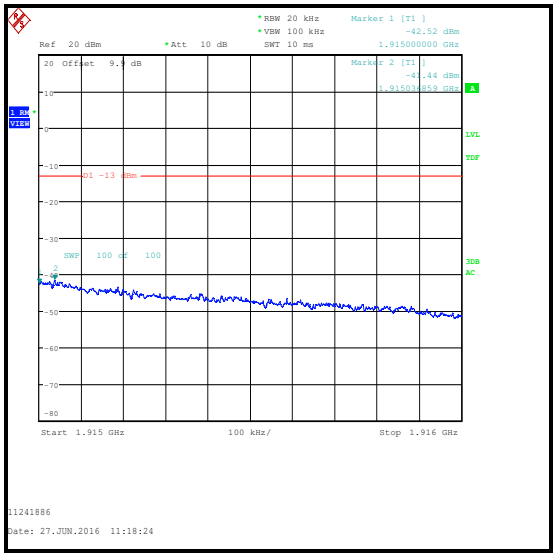
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 1.4 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	6	0	-41.6	-13.0	28.6	Complied
1915	6	0	-42.5	-13.0	29.5	Complied
1915.037	6	0	-41.4	-13.0	28.4	Complied



16QAM / Lower Band Edge

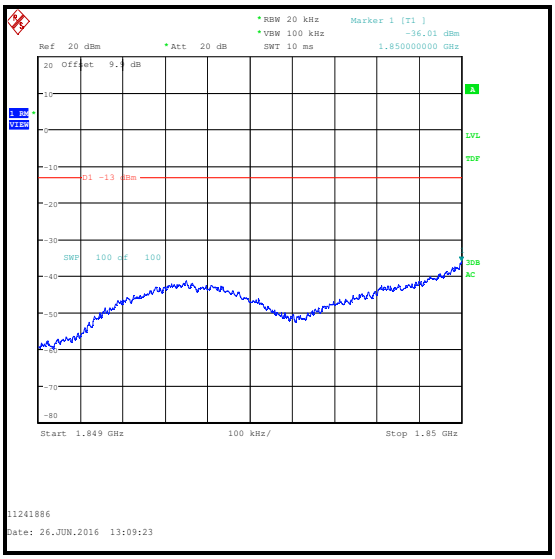


16QAM / Upper Band Edge

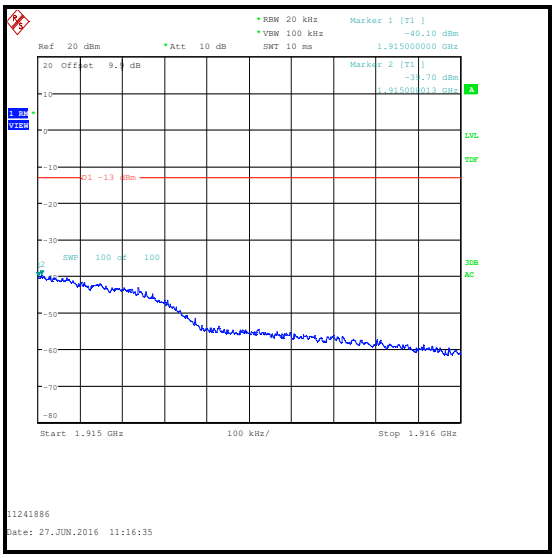
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 1.4 MHz Channel Bandwidth / 16QAM

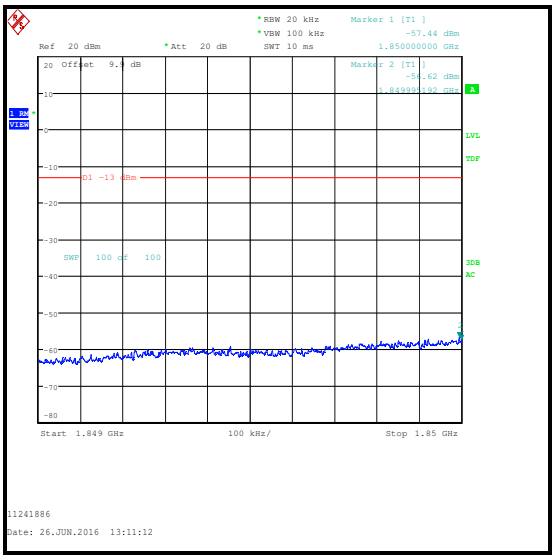
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-36.0	-13.0	23.0	Complied
1915	1	5	-40.1	-13.0	27.1	Complied
1915.008	1	5	-39.7	-13.0	26.7	Complied
1850	1	5	-57.4	-13.0	44.4	Complied
1915	1	0	-59.7	-13.0	46.7	Complied



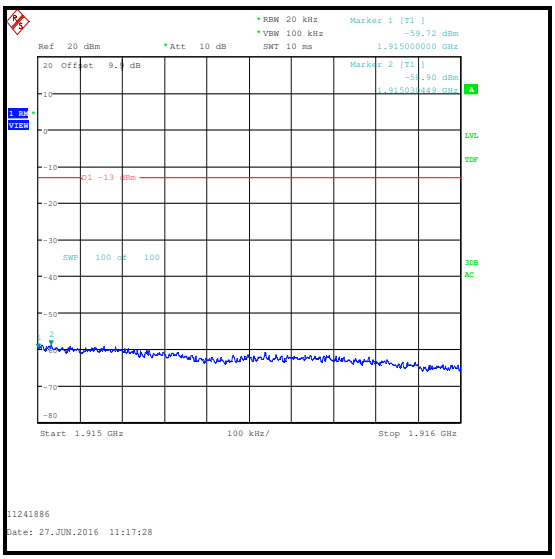
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 5 offset / Upper Band Edge



16QAM / 1 RB 5 offset / Lower Band Edge

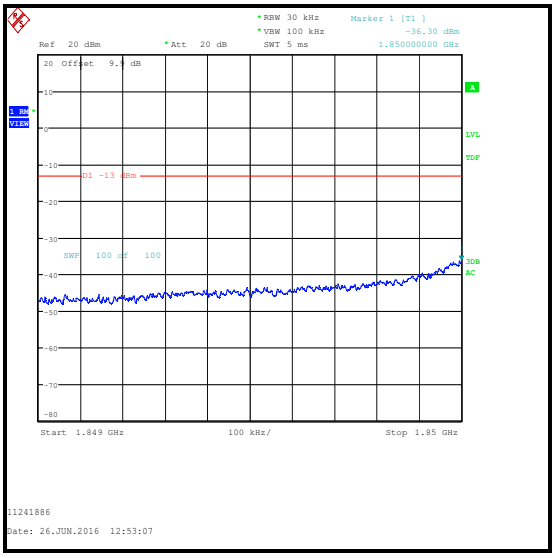


16QAM / 1 RB 0 offset / Upper Band Edge

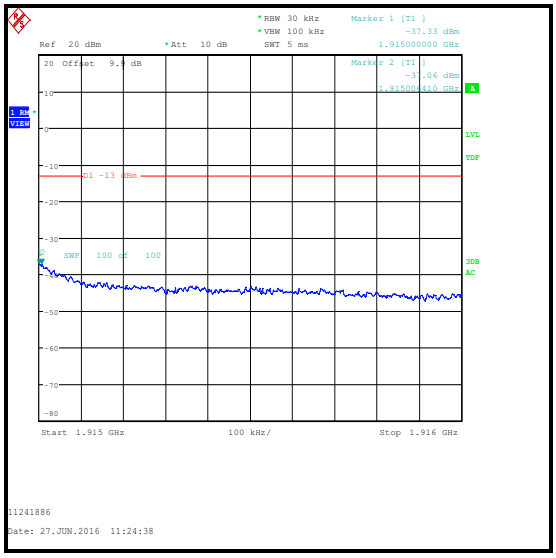
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 3 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	15	0	-36.3	-13.0	23.3	Complied
1915	15	0	-37.3	-13.0	24.3	Complied
1915.006	15	0	-37.1	-13.0	24.1	Complied



QPSK / Lower Band Edge

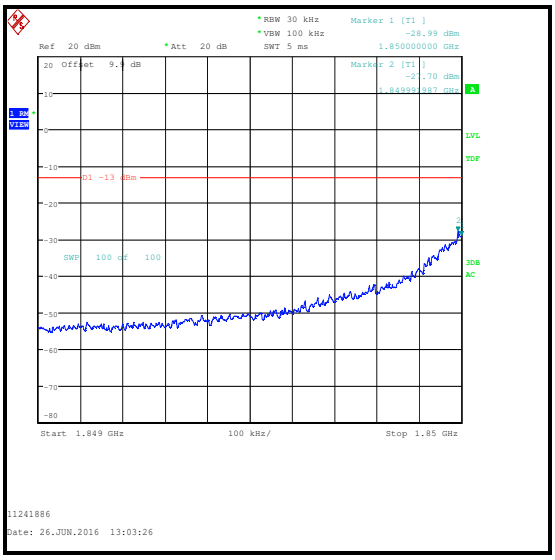


QPSK / Upper Band Edge

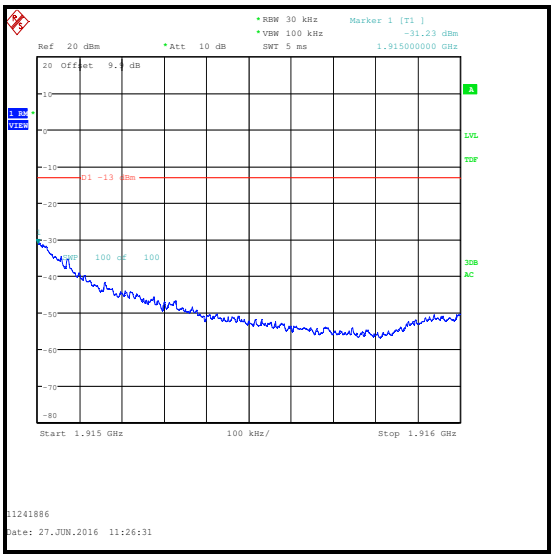
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 3 MHz Channel Bandwidth / QPSK

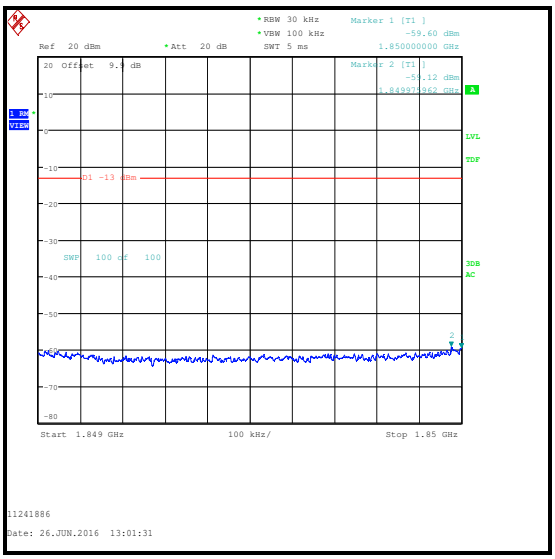
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.992	1	0	-27.7	-13.0	14.7	Complied
1850	1	0	-29.0	-13.0	16.0	Complied
1915	1	14	-31.2	-13.0	18.2	Complied
1850	1	14	-59.6	-13.0	46.6	Complied
1915	1	0	-61.9	-13.0	48.9	Complied



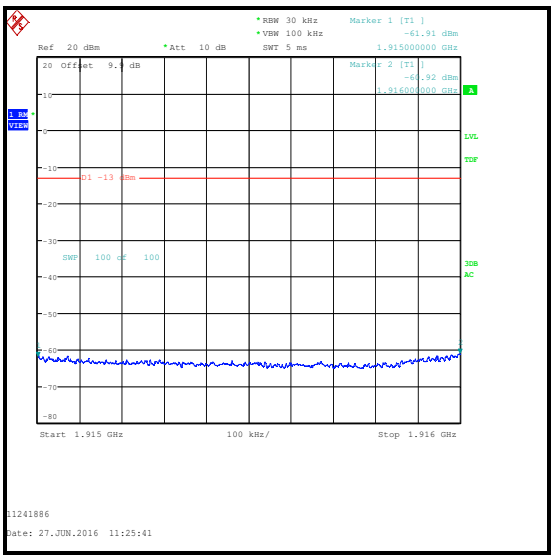
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 14 offset / Upper Band Edge



QPSK / 1 RB 14 offset / Lower Band Edge

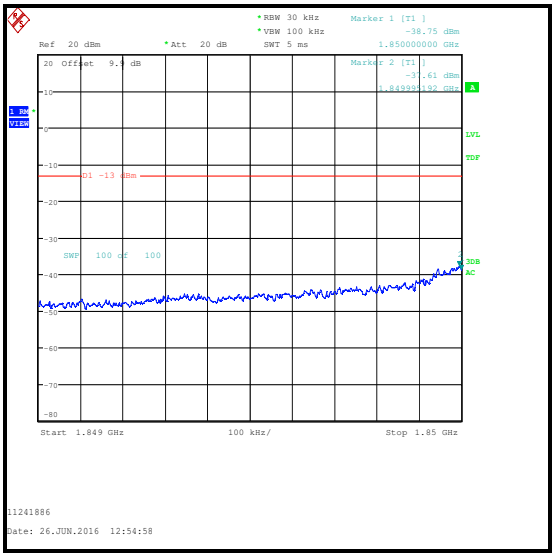


QPSK / 1 RB 0 offset / Upper Band Edge

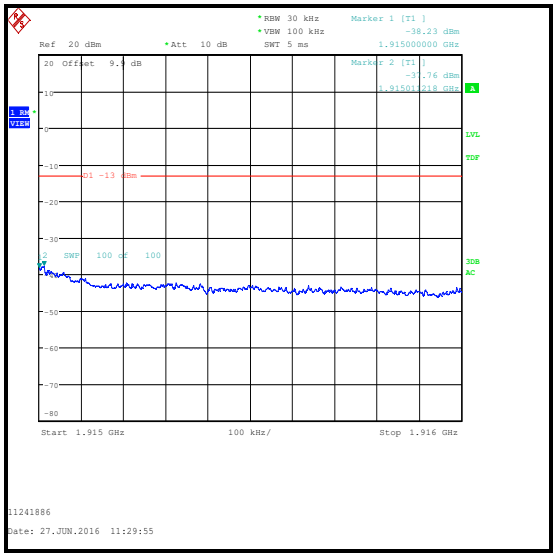
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 3 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	15	0	-37.6	-13.0	24.6	Complied
1850	15	0	-38.8	-13.0	25.8	Complied
1915	15	0	-38.2	-13.0	25.2	Complied
1915.011	15	0	-37.8	-13.0	24.8	Complied



16QAM / Lower Band Edge

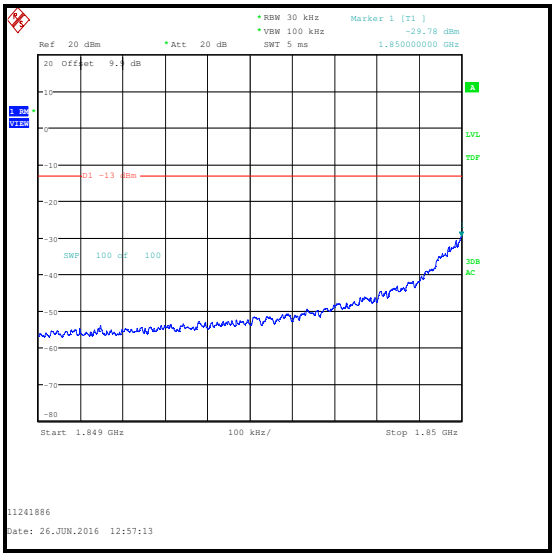


16QAM / Upper Band Edge

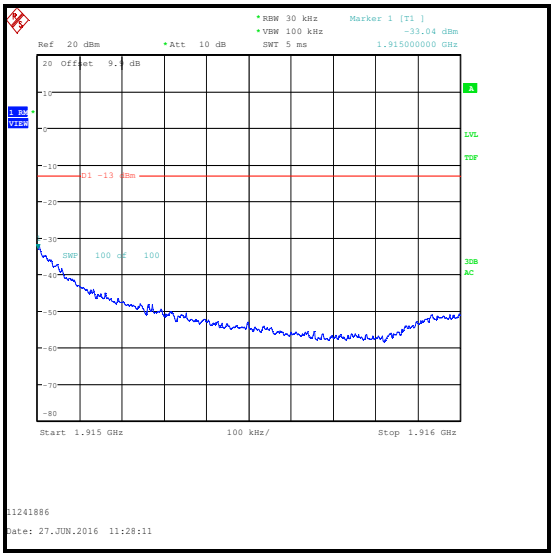
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 3 MHz Channel Bandwidth / 16QAM

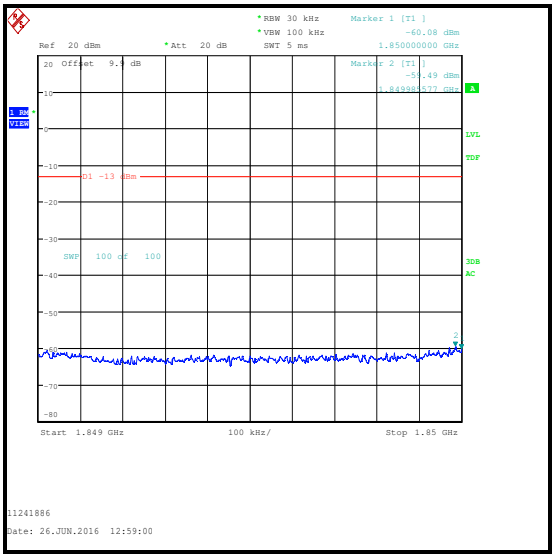
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-29.8	-13.0	16.8	Complied
1915	1	14	-33.0	-13.0	20.0	Complied
1850	1	14	-60.1	-13.0	47.1	Complied
1915	1	0	-62.8	-13.0	49.8	Complied



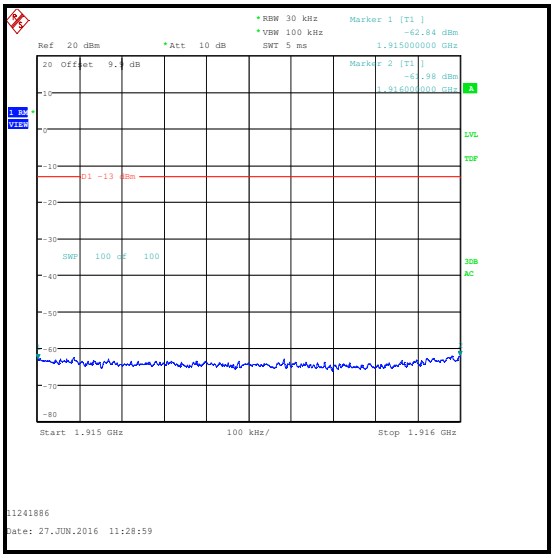
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 14 offset / Upper Band Edge



16QAM / 1 RB 14 offset / Lower Band Edge

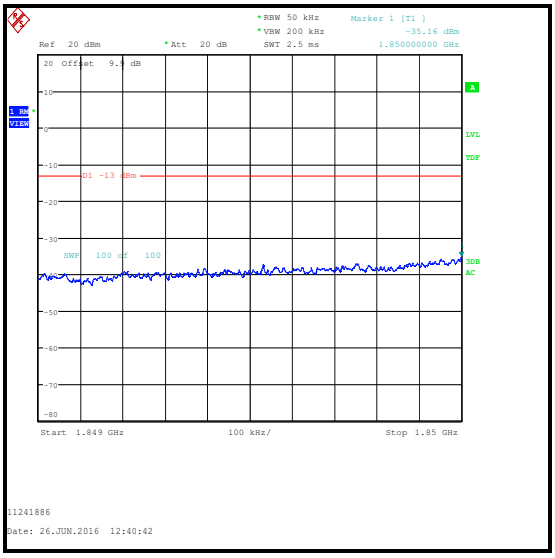


16QAM / 1 RB 0 offset / Upper Band Edge

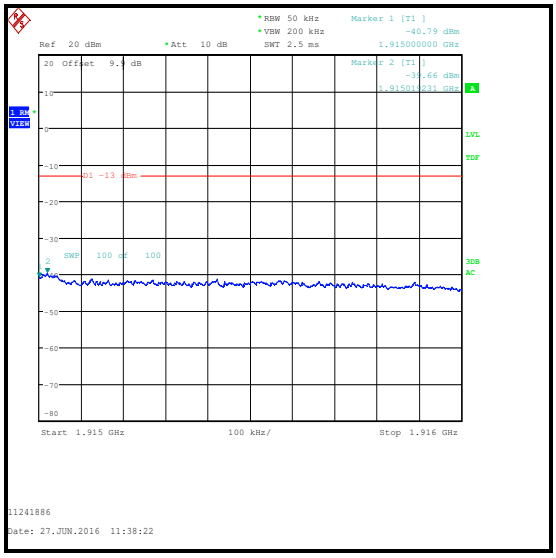
Transmitter Radiated Emissions at Band Edges (continued) - UAT

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	-35.2	-13.0	22.2	Complied
1915	25	0	-40.8	-13.0	27.8	Complied
1915.019	25	0	-39.7	-13.0	26.7	Complied



QPSK / Lower Band Edge



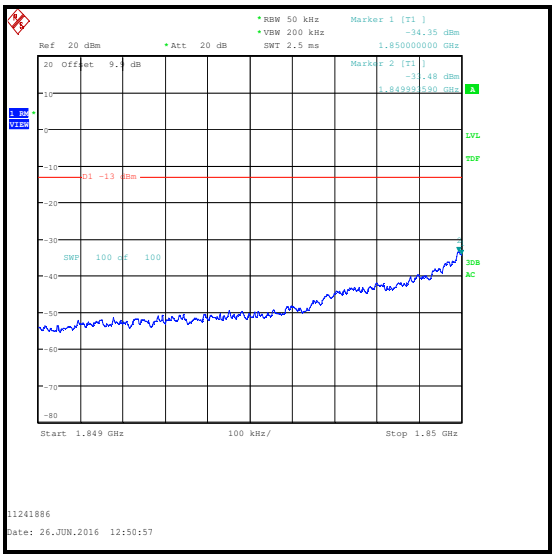
QPSK / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - UAT

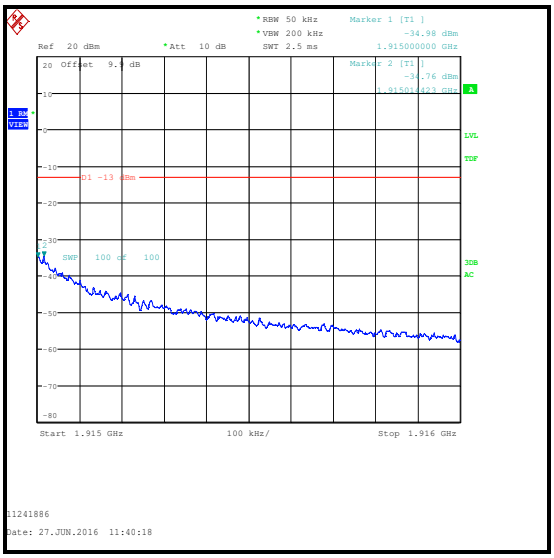
Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.994	1	0	-33.5	-13.0	20.5	Complied
1850	1	0	-34.4	-13.0	21.4	Complied
1915	1	24	-35.0	-13.0	22.0	Complied
1915.014	1	24	-34.8	-13.0	21.8	Complied
1850	1	24	-61.2	-13.0	48.2	Complied
1915	1	0	-63.6	-13.0	50.6	Complied

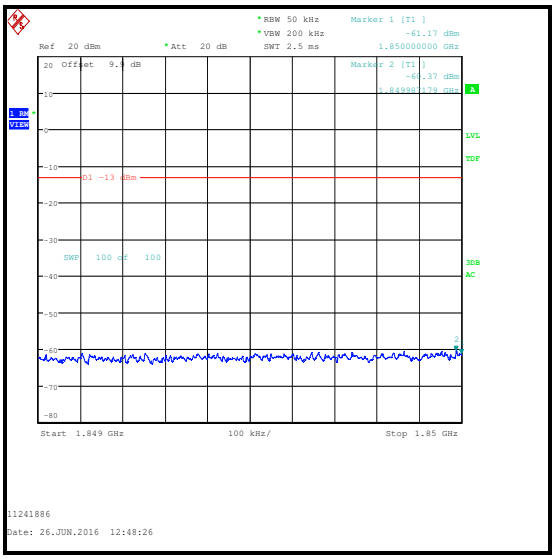
Transmitter Radiated Emissions at Band Edges (continued) – UAT



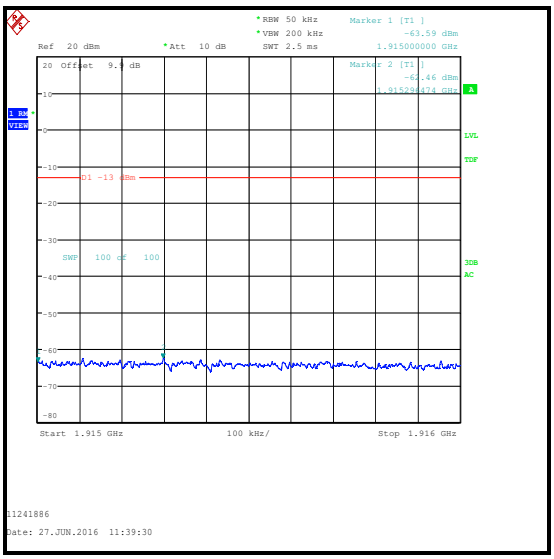
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 24 offset / Upper Band Edge



QPSK / 1 RB 24 offset / Lower Band Edge

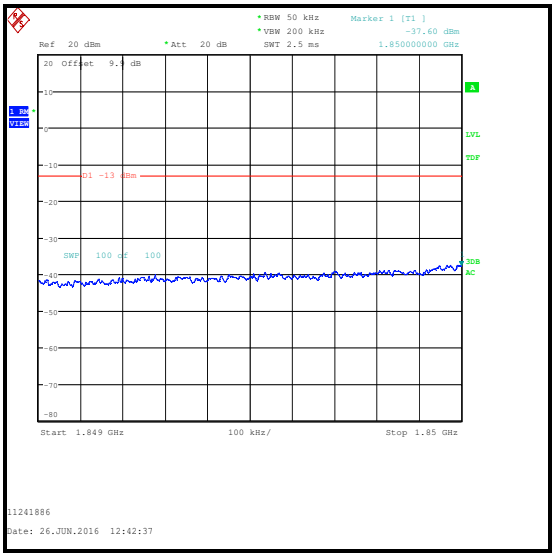


QPSK / 1 RB 0 offset / Upper Band Edge

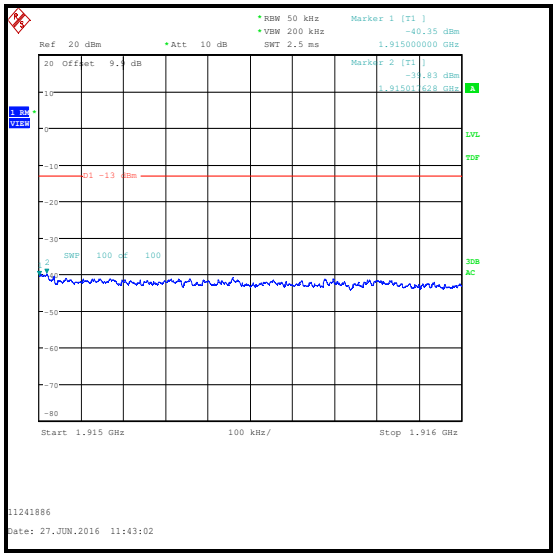
Transmitter Radiated Emissions at Band Edges (continued) - UAT

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
1915	25	0	-40.4	-13.0	27.4	Complied
1915.018	25	0	-39.8	-13.0	26.8	Complied



16QAM / Lower Band Edge

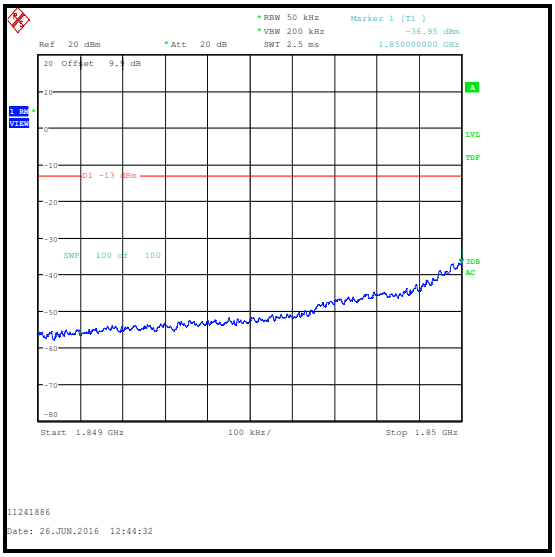


16QAM / Upper Band Edge

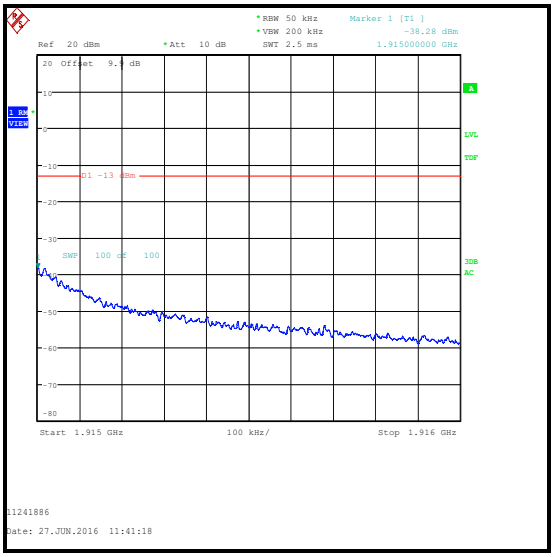
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 5 MHz Channel Bandwidth / 16QAM

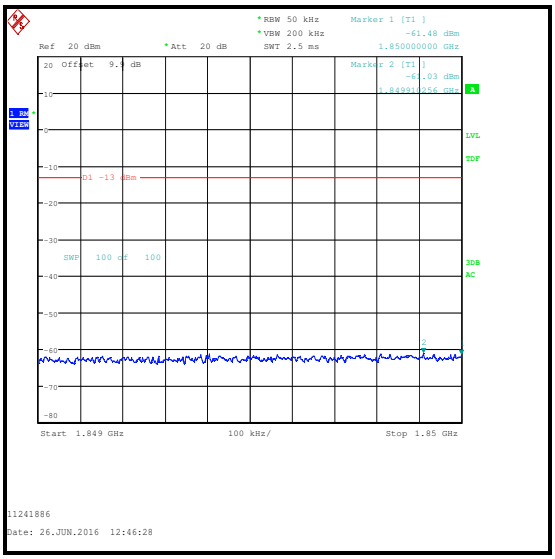
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-37.0	-13.0	24.0	Complied
1915	1	24	-38.3	-13.0	25.3	Complied
1850	1	24	-61.5	-13.0	48.5	Complied
1915	1	0	-63.8	-13.0	50.8	Complied



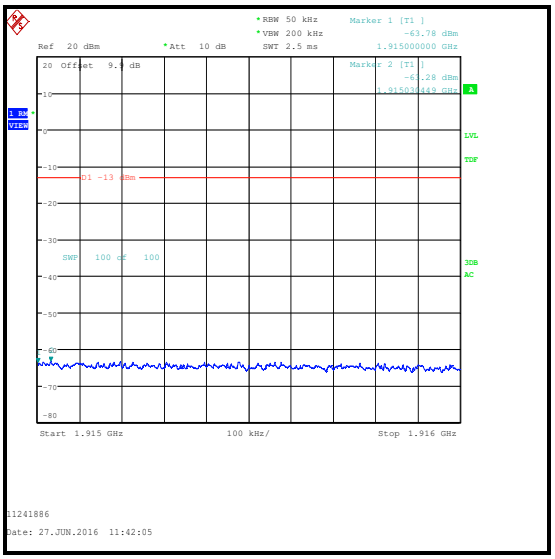
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 24 offset / Upper Band Edge



16QAM / 1 RB 24 offset / Lower Band Edge

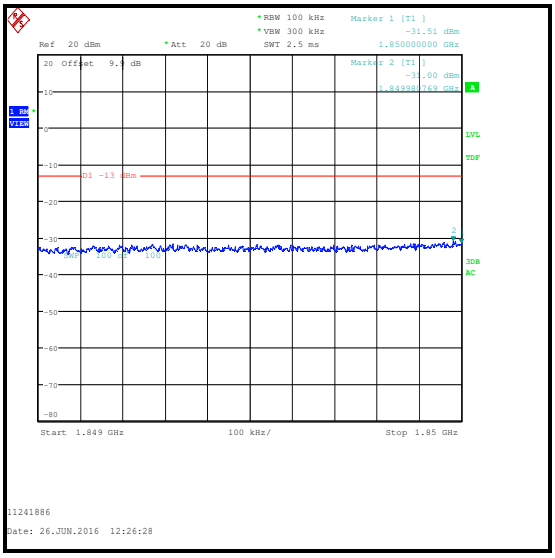


16QAM / 1 RB 0 offset / Upper Band Edge

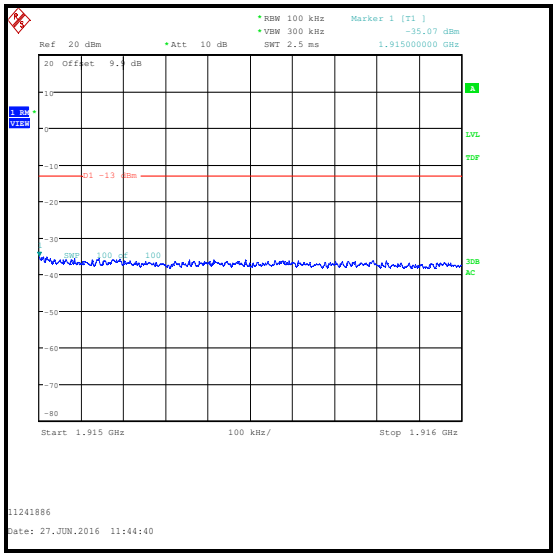
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.981	50	0	-31.0	-13.0	18.0	Complied
1850	50	0	-31.5	-13.0	18.5	Complied
1915	50	0	-35.1	-13.0	22.1	Complied



QPSK / Lower Band Edge

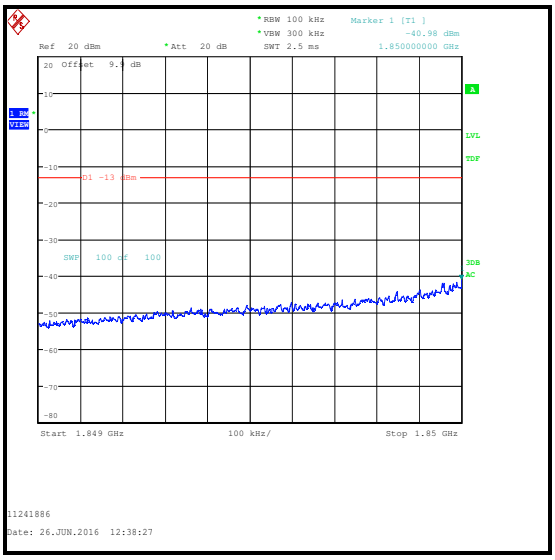


QPSK / Upper Band Edge

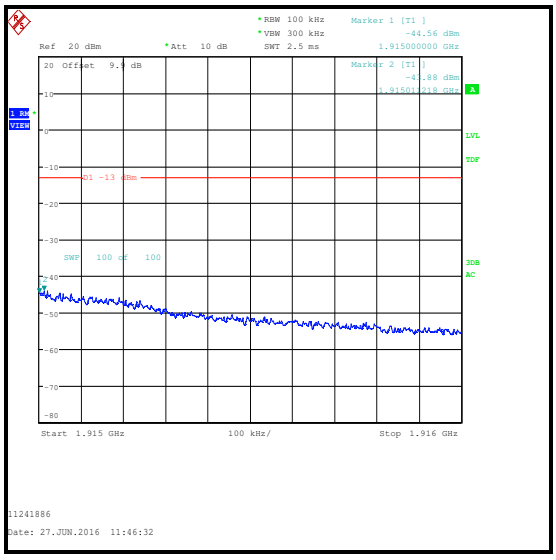
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 10 MHz Channel Bandwidth / QPSK

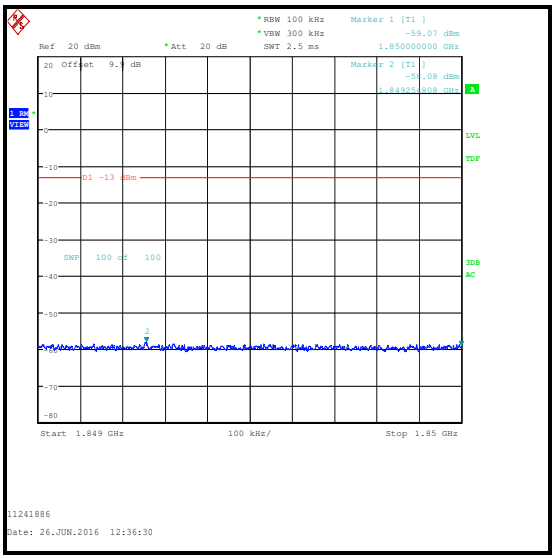
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-41.0	-13.0	28.0	Complied
1915	1	49	-44.6	-13.0	31.6	Complied
1915.011	1	49	-43.9	-13.0	30.9	Complied
1850	1	49	-59.1	-13.0	46.1	Complied
1915	1	0	-62.3	-13.0	49.3	Complied



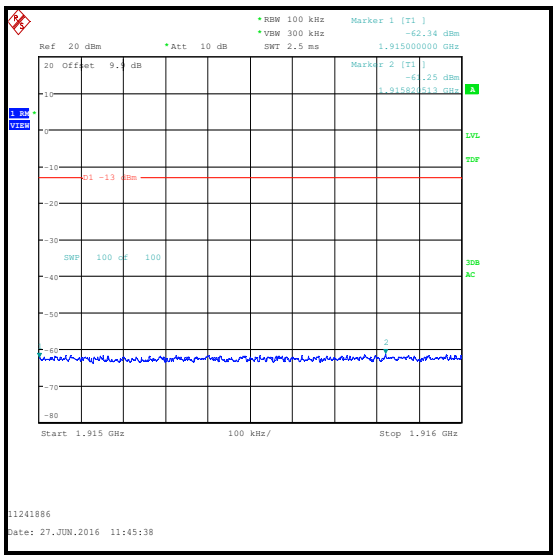
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 49 offset / Upper Band Edge



QPSK / 1 RB 49 offset / Lower Band Edge

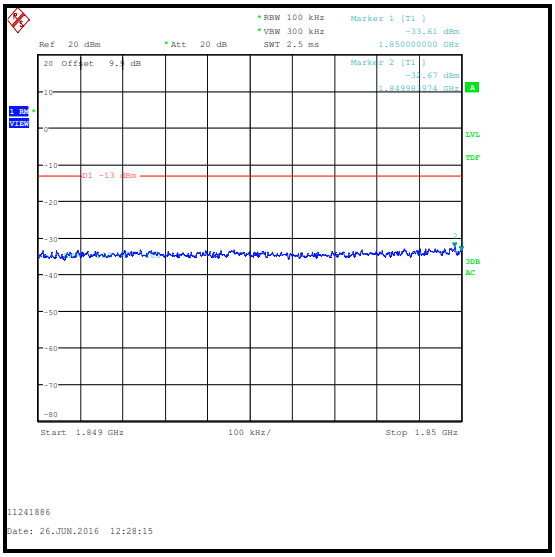


QPSK / 1 RB 0 offset / Upper Band Edge

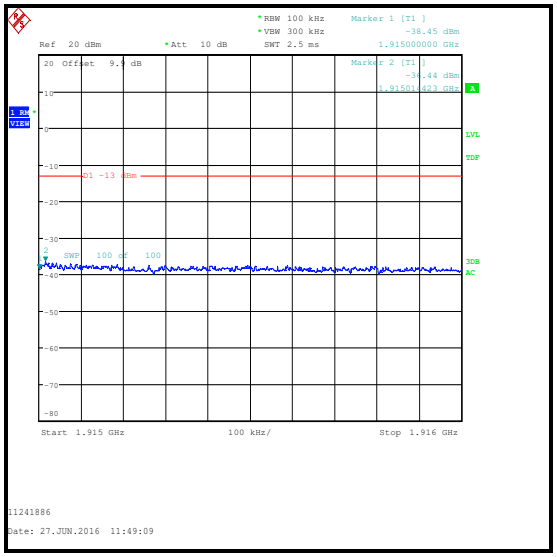
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.984	50	0	-32.7	-13.0	19.7	Complied
1850	50	0	-33.6	-13.0	20.6	Complied
1915	50	0	-38.5	-13.0	25.5	Complied
1915.014	50	0	-36.4	-13.0	23.4	Complied



16QAM / Lower Band Edge

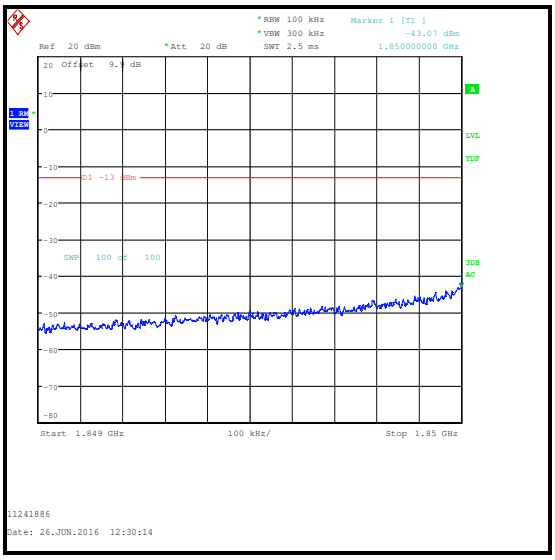


16QAM / Upper Band Edge

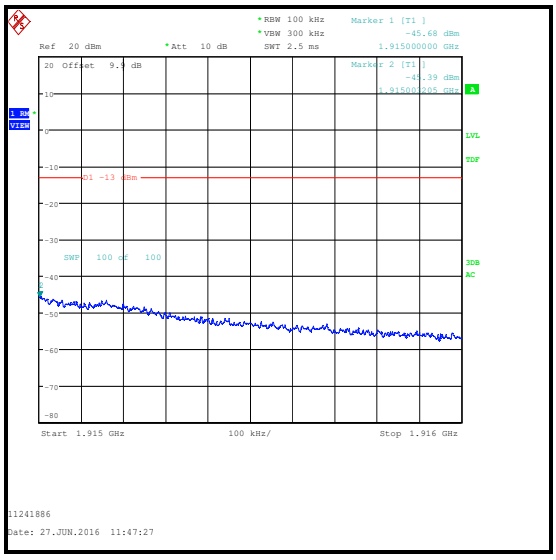
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 10 MHz Channel Bandwidth / 16QAM

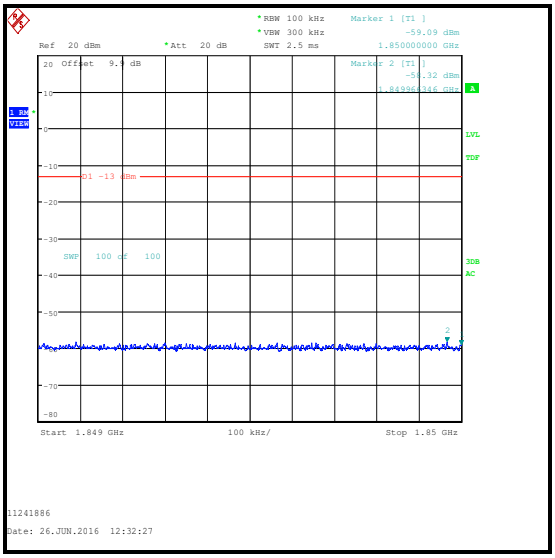
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-43.1	-13.0	30.1	Complied
1915	1	49	-45.7	-13.0	32.7	Complied
1915.003	1	49	-45.4	-13.0	32.4	Complied
1850	1	49	-59.1	-13.0	46.1	Complied
1915	1	0	-62.7	-13.0	49.7	Complied



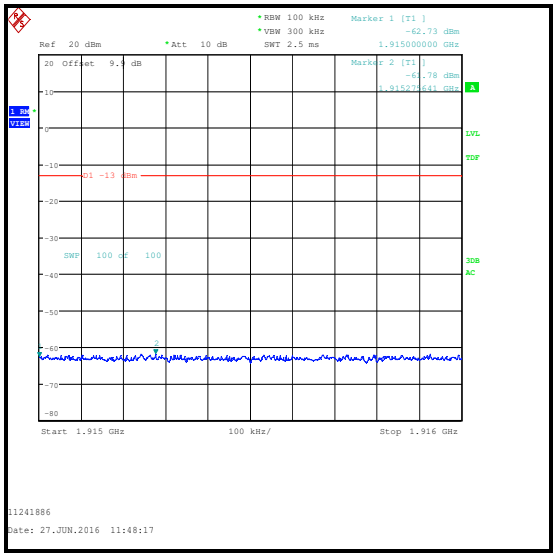
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 49 offset / Upper Band Edge



16QAM / 1 RB 49 offset / Lower Band Edge

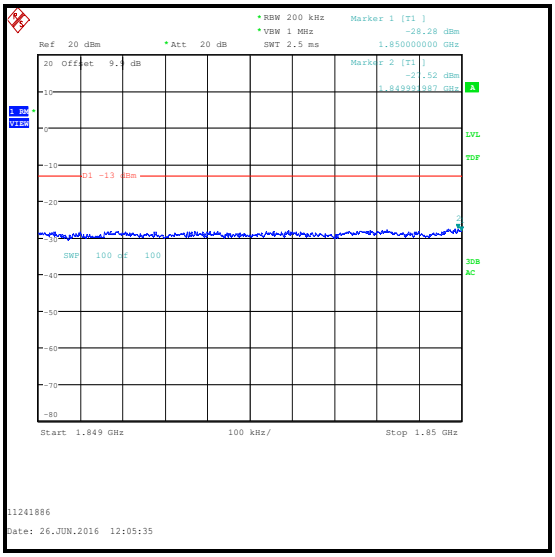


16QAM / 1 RB 0 offset / Upper Band Edge

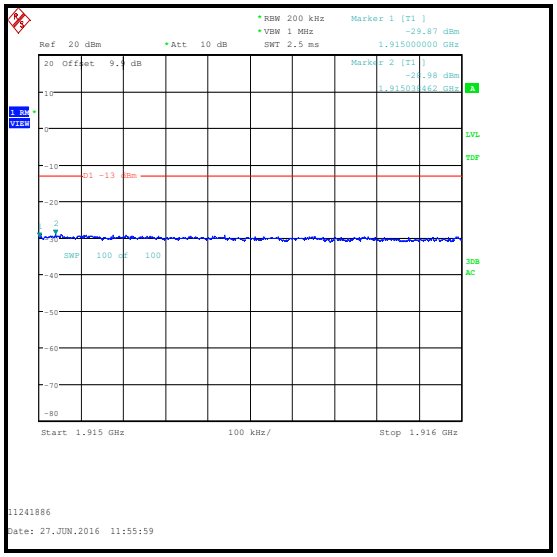
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 15 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.992	75	0	-27.5	-13.0	14.5	Complied
1850	75	0	-28.3	-13.0	15.3	Complied
1915	75	0	-29.9	-13.0	16.9	Complied
1915.038	75	0	-29.0	-13.0	16.0	Complied



QPSK / Lower Band Edge

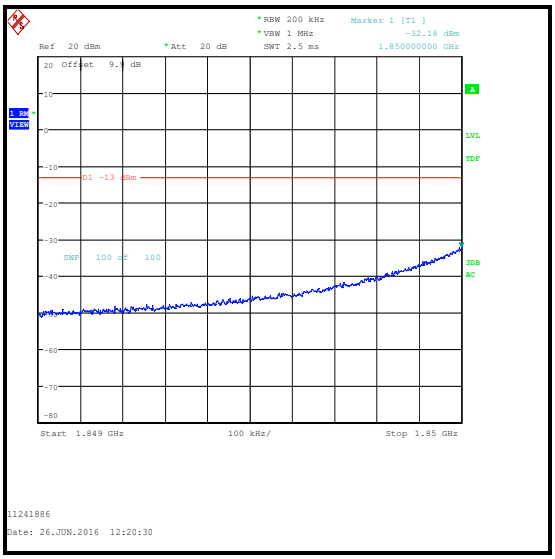


QPSK / Upper Band Edge

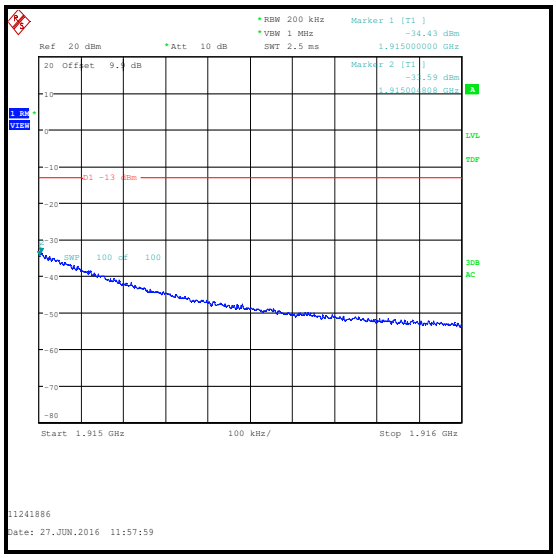
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 15 MHz Channel Bandwidth / QPSK

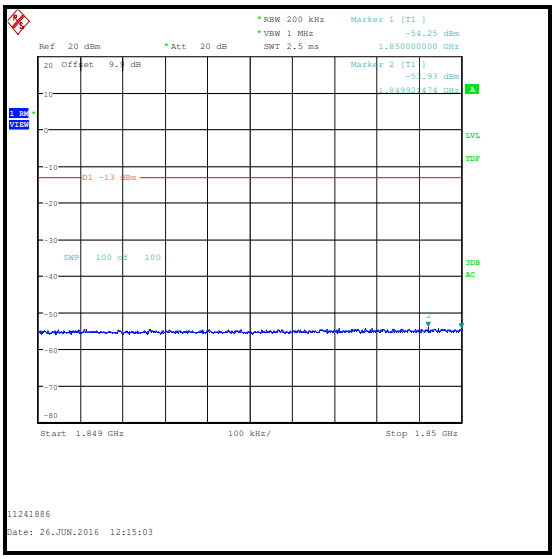
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	1	0	-32.2	-13.0	19.2	Complied
1915	1	74	-34.4	-13.0	21.4	Complied
1915.005	1	74	-33.6	-13.0	20.6	Complied
1850	1	74	-54.3	-13.0	41.3	Complied
1915	1	0	-59.4	-13.0	46.4	Complied



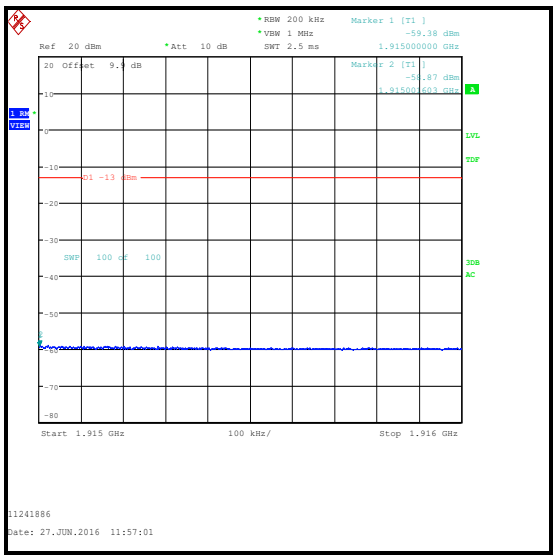
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 74 offset / Upper Band Edge



QPSK / 1 RB 74 offset / Lower Band Edge

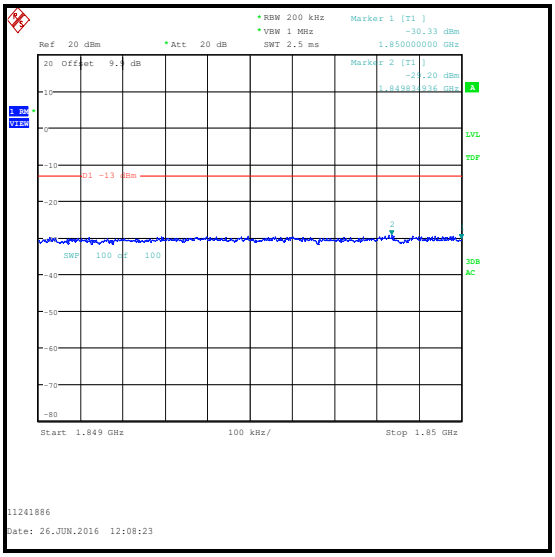


QPSK / 1 RB 0 offset / Upper Band Edge

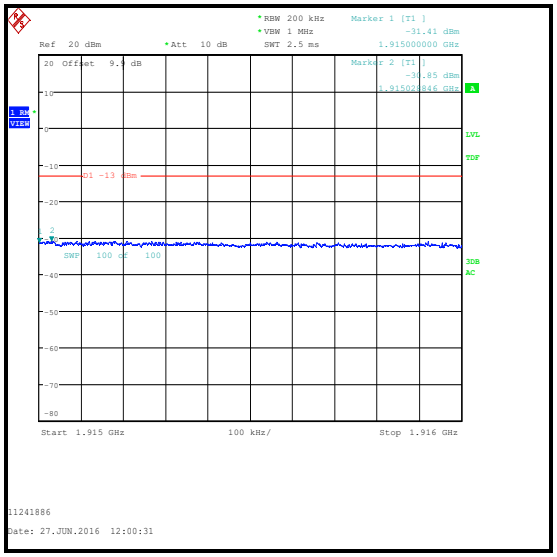
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 15 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.835	75	0	-29.2	-13.0	16.2	Complied
1850	75	0	-30.3	-13.0	17.3	Complied
1915	75	0	-31.4	-13.0	18.4	Complied
1915.029	75	0	-30.9	-13.0	17.9	Complied



16QAM / Lower Band Edge



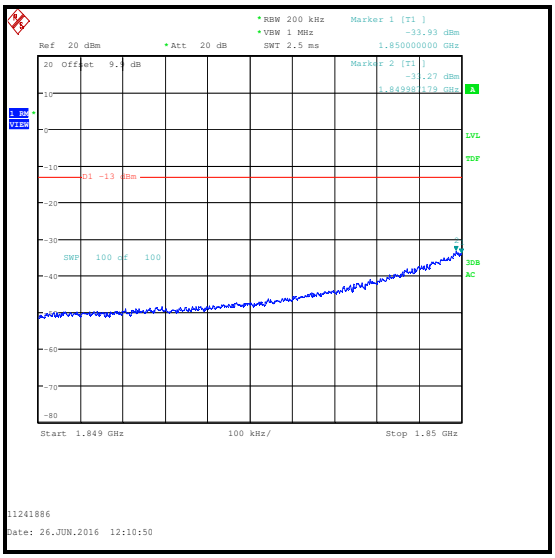
16QAM / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - UAT

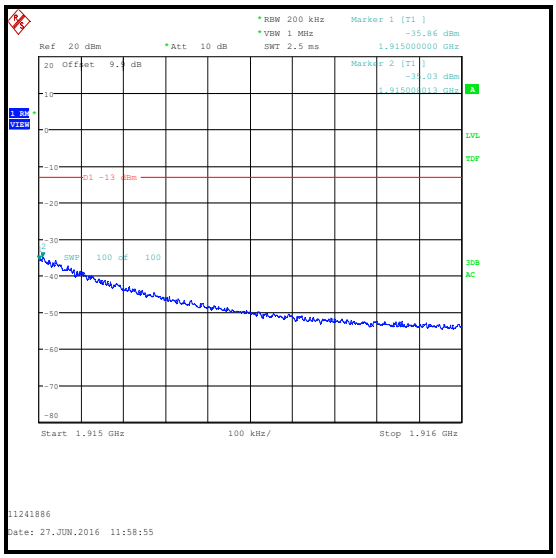
Results: 15 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.987	1	0	-33.3	-13.0	20.3	Complied
1850	1	0	-33.9	-13.0	20.9	Complied
1915	1	74	-35.9	-13.0	22.9	Complied
1915.008	1	74	-35.0	-13.0	22.0	Complied
1850	1	74	-55.0	-13.0	42.0	Complied
1915	1	0	-59.5	-13.0	46.5	Complied

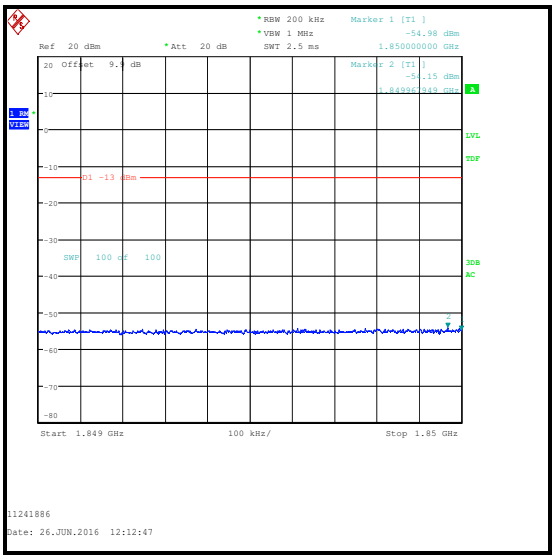
Transmitter Radiated Emissions at Band Edges (continued) – UAT



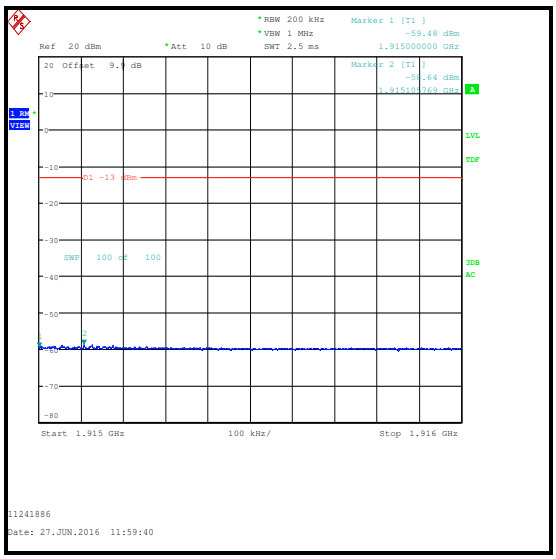
16QAM / 1 RB 0 offset / Lower Band Edge



16QAM / 1 RB 74 offset / Upper Band Edge



16QAM / 1 RB 74 offset / Lower Band Edge

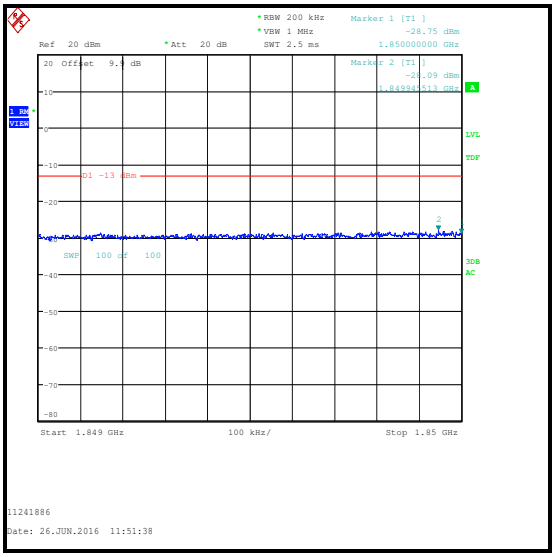


16QAM / 1 RB 0 offset / Upper Band Edge

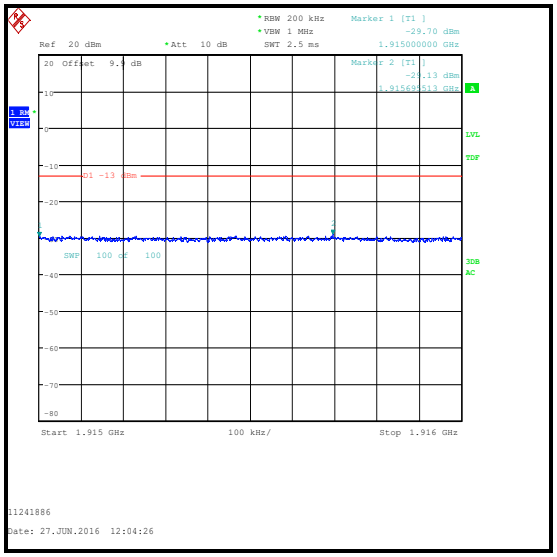
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 20 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.946	100	0	-28.1	-13.0	15.1	Complied
1850	100	0	-28.8	-13.0	15.8	Complied
1915	100	0	-29.7	-13.0	16.7	Complied
1915.696	100	0	-29.1	-13.0	16.1	Complied



QPSK / Lower Band Edge



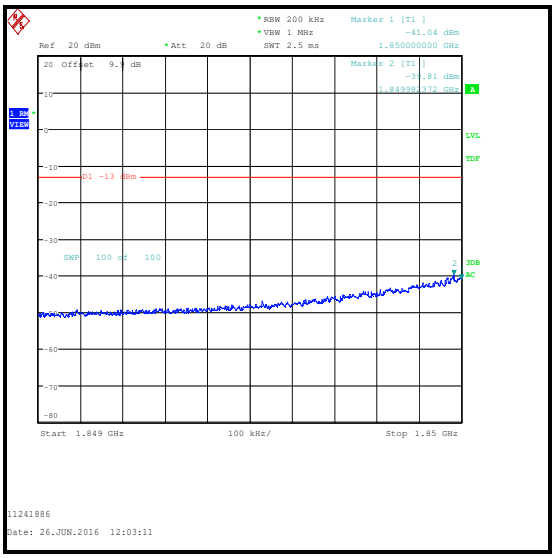
QPSK / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued) - UAT

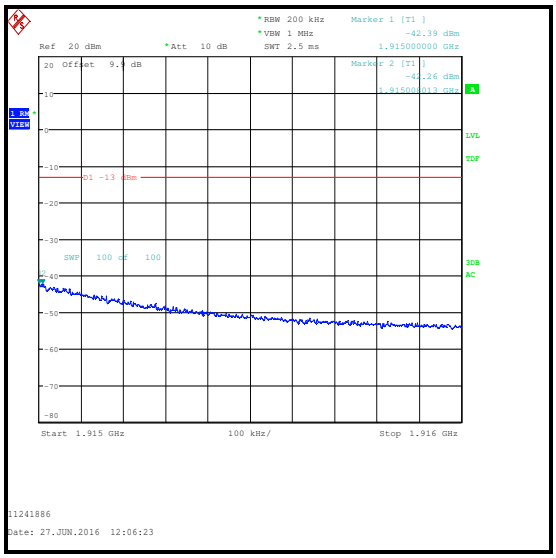
Results: 20 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.982	1	0	-39.8	-13.0	26.8	Complied
1850	1	0	-41.0	-13.0	28.0	Complied
1915	1	99	-42.4	-13.0	29.4	Complied
1915.008	1	99	-42.3	-13.0	29.3	Complied
1850	1	99	-55.1	-13.0	42.1	Complied
1915	1	0	-59.7	-13.0	46.7	Complied

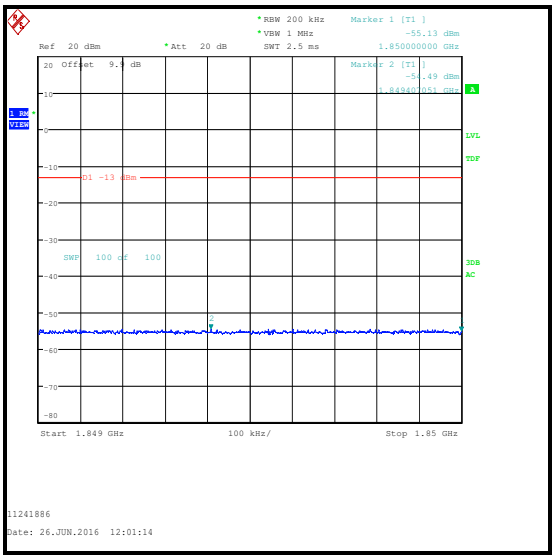
Transmitter Radiated Emissions at Band Edges (continued) – UAT



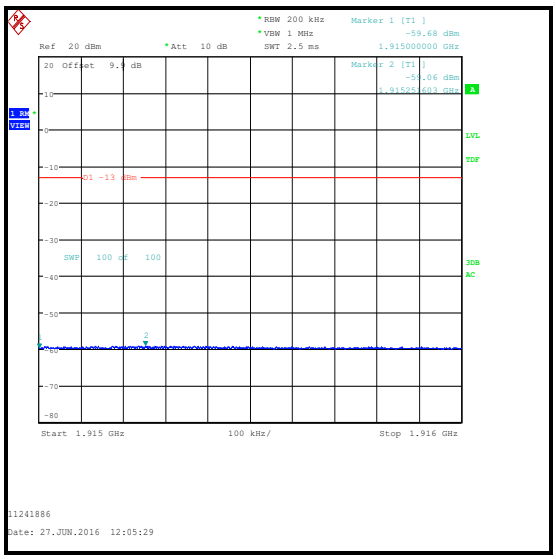
QPSK / 1 RB 0 offset / Lower Band Edge



QPSK / 1 RB 99 offset / Upper Band Edge



QPSK / 1 RB 99 offset / Lower Band Edge

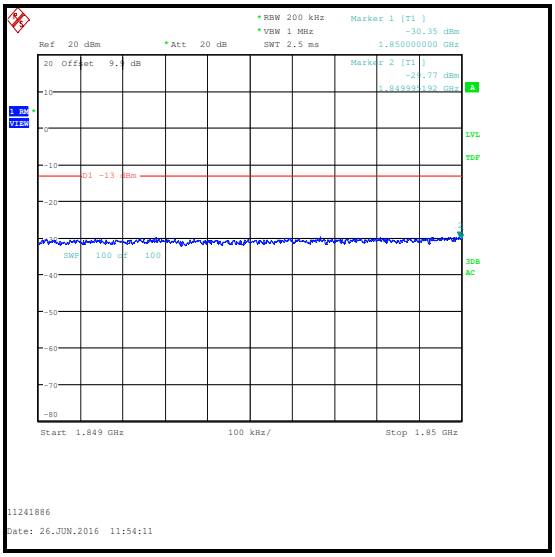


QPSK / 1 RB 0 offset / Upper Band Edge

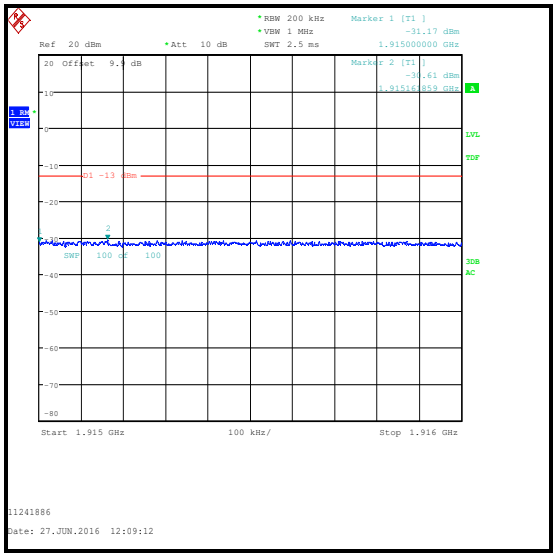
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 20 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.995	100	0	-29.8	-13.0	16.8	Complied
1850	100	0	-30.4	-13.0	17.4	Complied
1915	100	0	-31.2	-13.0	18.2	Complied
1915.162	100	0	-30.6	-13.0	17.6	Complied



16QAM / Lower Band Edge

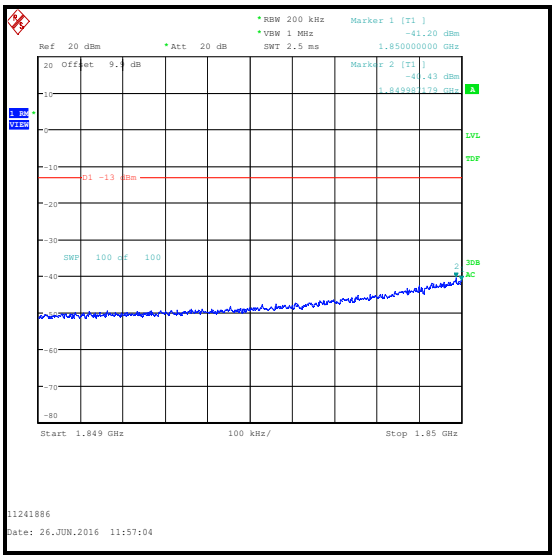


16QAM / Upper Band Edge

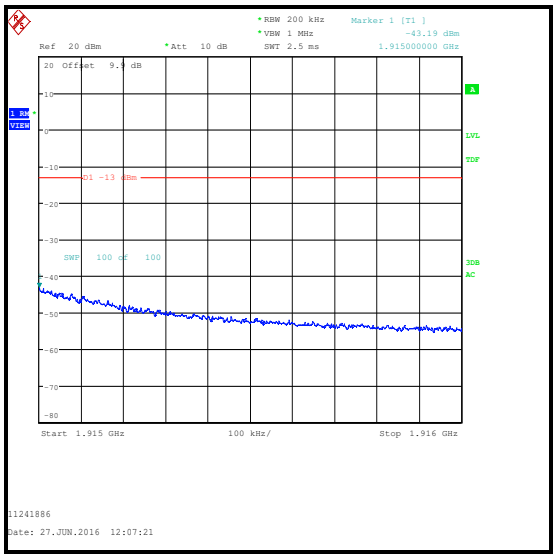
Transmitter Radiated Emissions at Band Edges (continued) - UAT

Results: 20 MHz Channel Bandwidth / 16QAM

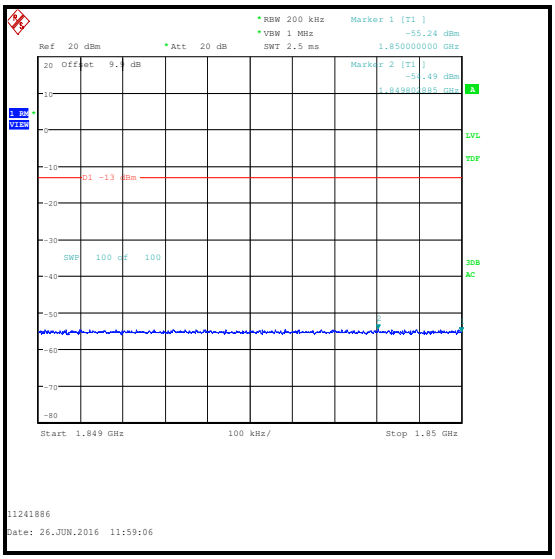
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.987	1	0	-40.4	-13.0	27.4	Complied
1850	1	0	-41.2	-13.0	28.2	Complied
1915	1	99	-43.2	-13.0	30.2	Complied
1850	1	99	-55.2	-13.0	42.2	Complied
1915	1	0	-59.6	-13.0	46.6	Complied



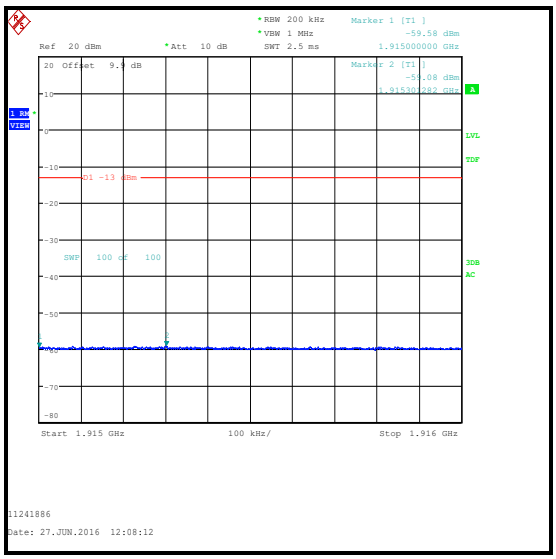
16QAM / 1 RB 0 offset / Lower Band Edge



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
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	07 Apr 2017	12

5.2.9. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineer:	Stefan Ho	**Test Date:**	12 May 2016
Test Sample Serial Number:	C7CRG02QH6DH		

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

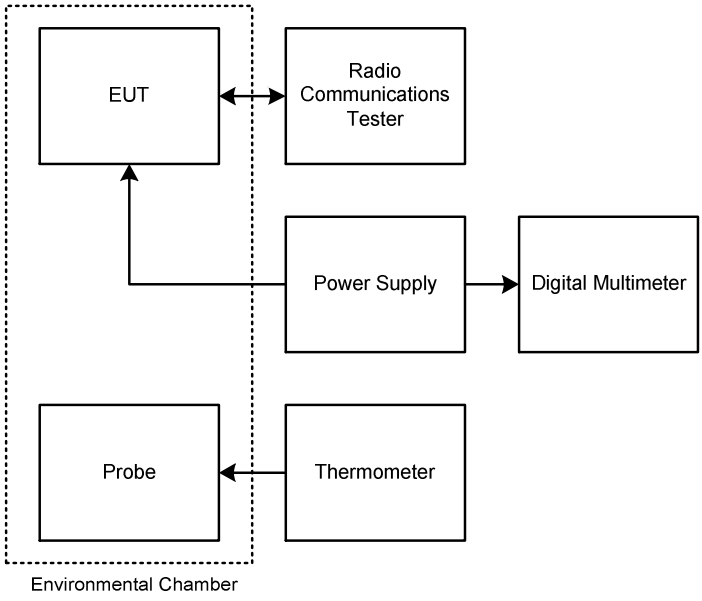
Environmental Conditions:

Ambient Temperature (°C):	25
Ambient Relative Humidity (%):	43

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	7	1850.699993	1850.0	0.699993	Complied
-20	14	1850.700014	1850.0	0.700014	Complied
-10	15	1850.699985	1850.0	0.699985	Complied
0	7	1850.699993	1850.0	0.699993	Complied
10	13	1850.699987	1850.0	0.699987	Complied
20	8	1850.699992	1850.0	0.699992	Complied
30	8	1850.699992	1850.0	0.699992	Complied
40	9	1850.699991	1850.0	0.699991	Complied
50	8	1850.699992	1850.0	0.699992	Complied

Results: Top Channel (1914.3 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	15	1914.299985	1915.0	0.700015	Complied
-20	8	1914.299992	1915.0	0.700008	Complied
-10	9	1914.299991	1915.0	0.700009	Complied
0	8	1914.299992	1915.0	0.700008	Complied
10	7	1914.299993	1915.0	0.700007	Complied
20	9	1914.299991	1915.0	0.700009	Complied
30	10	1914.299990	1915.0	0.700010	Complied
40	22	1914.299978	1915.0	0.700022	Complied
50	9	1914.299991	1915.0	0.700009	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW 500	145923	05 Apr 2017	12
M1674	Environmental Chamber	Espec Corporation	SU-241	90213139	Calibrated before use	-
M1642	Thermometer	Fluke	52II	18890119	25 Apr 2017	12
S021	DC power supply	TTI	CPX200	061034	Calibrated before use	-
M122	Multimeter	Fluke	77	64910017	21 Apr 2017	12

5.2.10. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineer:	Stefan Ho	**Test Date:**	12 May 2016
Test Sample Serial Number:	C7CRG02QH6DH		

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

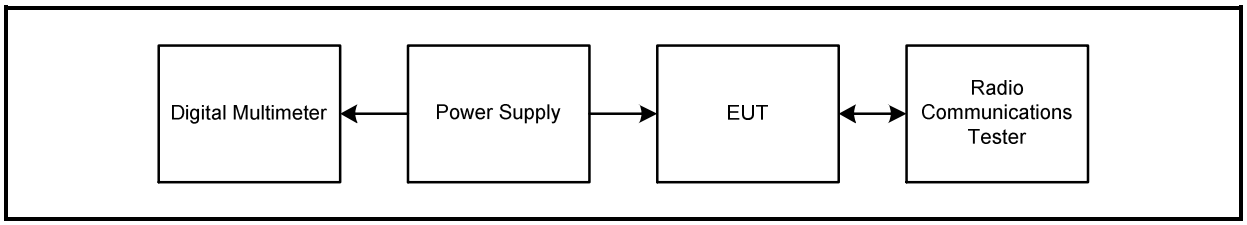
Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	43

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
3.4	7	1850.699993	1850.0	0.699993	Complied
4.2	8	1850.699992	1850.0	0.699992	Complied

Results: Top Channel (1914.3 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	8	1914.299992	1915.0	0.700008	Complied
4.2	10	1914.299990	1915.0	0.700010	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW 500	145923	05 Apr 2017	12
S0576	DC power supply	TTI	PL330QMD	066701	Calibrated before use	-
M122	Multimeter	Fluke	77	64910017	21 Apr 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 1915 MHz	95%	±1.36 dB
Frequency Stability	1850 to 1915 MHz	95%	±23 Hz
Occupied Bandwidth	1850 to 1915 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
3.0	-	-	Updates as requested by the TCB
4.0	-	-	Updates as requested by the TCB

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