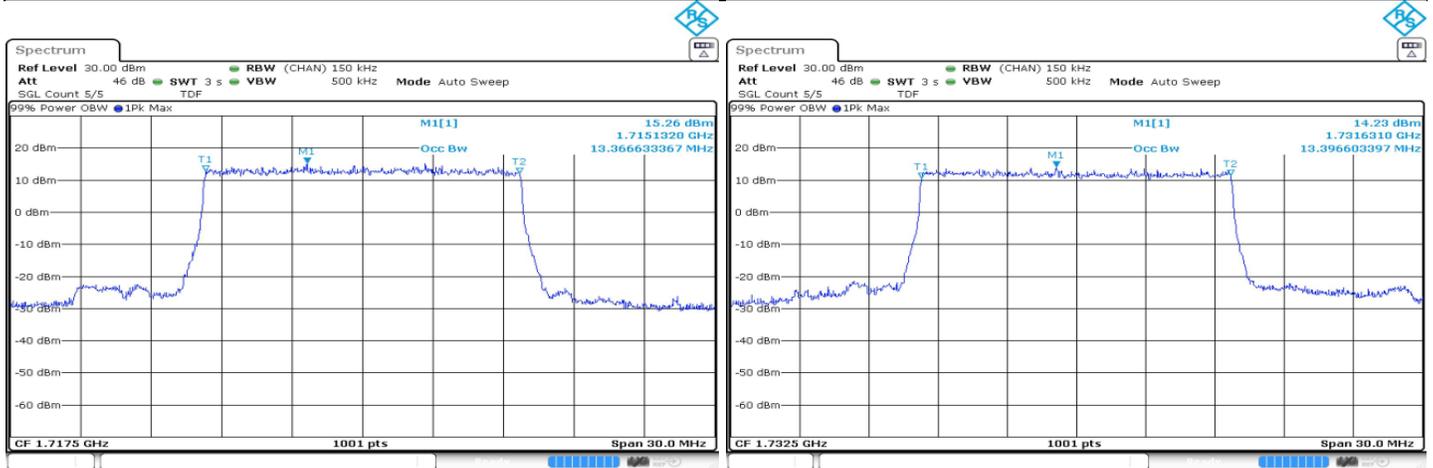


LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 15MHz/75/0	Low CH 20025	1717.5 MHz	13.367	13.367
	Mid CH 20175	1732.5 MHz	13.367	13.397
	High CH 20325	1747.5 MHz	13.367	13.367

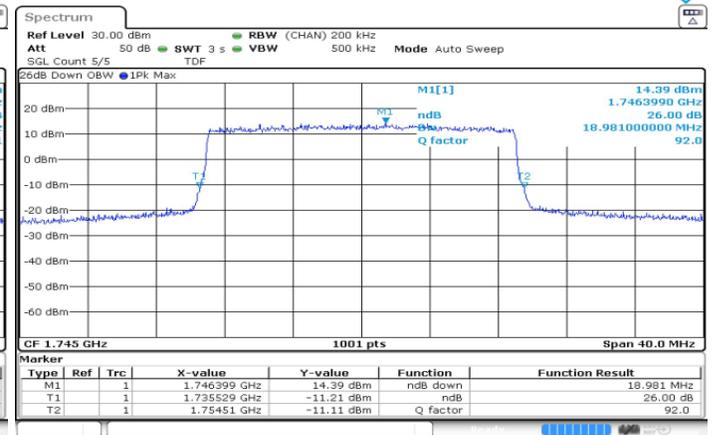
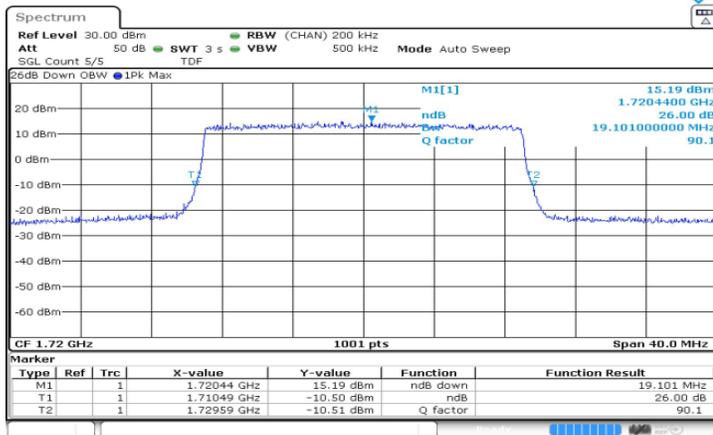
Spectrum Plot of Worst Value
99% Occupied Bandwidth

QPSK	16QAM
------	-------



LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 20MHz/100/0	Low CH 20050	1720 MHz	19.101	18.781
	Mid CH 20175	1732.5 MHz	18.901	18.861
	High CH 20300	1745 MHz	19.021	18.981

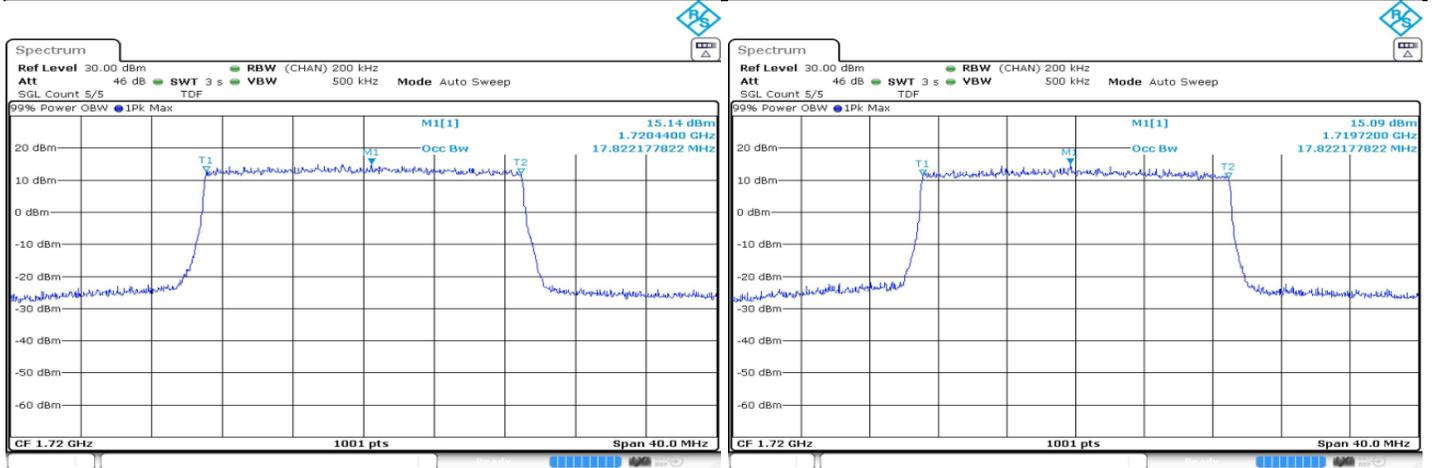
Spectrum Plot of Worst Value	
-26 dBc Bandwidth	
QPSK	16QAM



LTE Band/ BW/ RB Size/ RB Offset	Channel Number	Tx Frequency (MHz)	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4 / 20MHz/100/0	Low CH 20050	1720 MHz	17.822	17.822
	Mid CH 20175	1732.5 MHz	17.822	17.822
	High CH 20300	1745 MHz	17.782	17.822

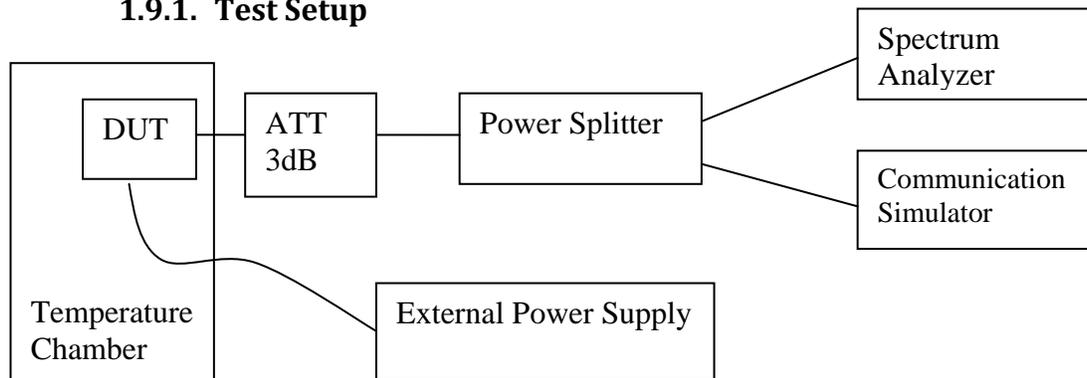
Spectrum Plot of Worst Value
99% Occupied Bandwidth

QPSK	16QAM
------	-------



1.9. Frequency Stability

1.9.1. Test Setup



- 1) The DUT is placed in the temperature chamber and DUT is power up by external power supply to control the DC input voltage.
- 2) The temperature chamber could control the temperature and humidity and external power supply could control the test voltage range from minimum to maximum operating voltage.
- 3) Measured frequency error from the communication simulator by vary below step :
 - i. Vary temperature of the temperature chamber from -20 ~ 60 deg C (10 deg C / Step) and set external supply voltage constant at nominal voltage.
 - ii. Vary external supply voltage from minimum to maximum operation voltage support by DUT and set temperature chamber constant at room temp.
- 4) All the measurement was done at mid channel for each band.

1.9.2. Test Limit

As per manufacturer declared product operating at -20 to 60 deg C with spec of +/- 0.1ppm.

1.9.3. Frequency Stability – LTE Band 4 (1710-1755MHz)

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		1710.7MHz		1754.3MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 4	60	1710.699984	-0.009357	1754.300011	0.006157
	50	1710.699978	-0.013112	1754.300013	0.00751
	40	1710.700015	0.009039	1754.299985	-0.008766
	30	1710.700016	0.009215	1754.299986	-0.00791
	20	1710.699968	-0.018447	1754.299983	-0.009965
	10	1710.699986	-0.008379	1754.299981	-0.011025
	0	1710.699971	-0.016825	1754.300022	0.012346
	-10	1710.699982	-0.010796	1754.299992	-0.004444
	-20	1710.700025	0.014433	1754.29999	-0.005602

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		1710.7MHz		1754.3MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1710.699986	-0.008145	1754.299984	-0.009263
	7.5	1710.700011	0.006614	1754.299988	-0.006589
	6	1710.699972	-0.016373	1754.300015	0.008448

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		1711.5MHz		1753.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1711.500019	0.0112	1753.500021	0.011731
	50	1711.500018	0.010515	1753.500019	0.010809
	40	1711.500023	0.013499	1753.500018	0.010132
	30	1711.500017	0.010155	1753.500021	0.012245
	20	1711.500018	0.010423	1753.500022	0.012604
	10	1711.500018	0.010807	1753.500018	0.010516
	0	1711.500021	0.012496	1753.500022	0.012506
	-10	1711.500018	0.010515	1753.500016	0.009251
	-20	1711.500018	0.010239	1753.500025	0.014089

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		1711.5MHz		1753.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1711.500018	0.01064	1753.50002	0.011193
	7.5	1711.500015	0.008576	1753.500019	0.010858
	6	1711.500017	0.009721	1753.500021	0.011894

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		1712.5MHz		1752.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 4	60	1712.499985	-0.008637	1752.500017	0.009787
	50	1712.499984	-0.009314	1752.500012	0.006832
	40	1712.499983	-0.009682	1752.500013	0.007167
	30	1712.499985	-0.008687	1752.499987	-0.007542
	20	1712.499987	-0.007501	1752.500016	0.009346
	10	1712.49998	-0.011636	1752.499982	-0.010473
	0	1712.499985	-0.008729	1752.500015	0.008669
	-10	1712.499983	-0.009673	1752.500021	0.01222
	-20	1712.499983	-0.009673	1752.499989	-0.006163

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		1712.5MHz		1752.5MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 4	9	1712.500014	0.008195	1752.500014	0.008146
	7.5	1712.499987	-0.007602	1752.499989	-0.006
	6	1712.499986	-0.008362	1752.500022	0.012375

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		1715MHz		1750MHz	
		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
LTE Band 4	60	1714.999986	-0.007991	1749.999981	-0.01088
	50	1714.999988	-0.007048	1749.999984	-0.009074
	40	1715.000014	0.008083	1749.999978	-0.012335
	30	1714.999987	-0.007674	1749.999979	-0.011828
	20	1715.000015	0.008692	1749.999984	-0.009074
	10	1715.000015	0.008458	1749.999982	-0.010292
	0	1715.000013	0.007849	1749.999983	-0.00994
	-10	1715.000018	0.010226	1750.00001	0.005444
	-20	1715.000013	0.007332	1749.999983	-0.009981

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		1715MHz		1750MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1714.999986	-0.008066	1749.999982	-0.010529
	7.5	1714.999979	-0.012295	1749.999981	-0.010676
	6	1714.99999	-0.005964	1749.999983	-0.009711

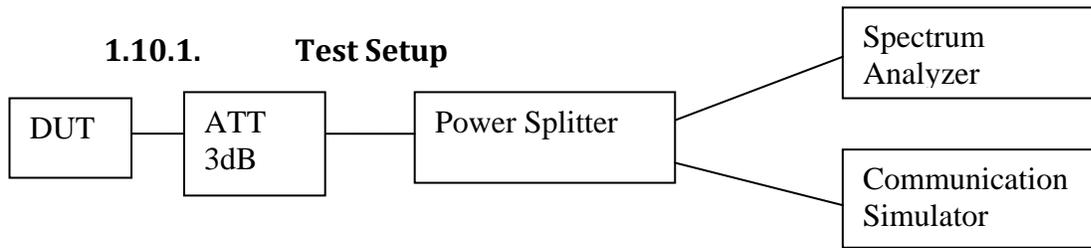
Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 15 MHz			
		Low Channel		High Channel	
		1717.5MHz		1747.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1717.500017	0.009737	1747.500018	0.010143
	50	1717.50002	0.011669	1747.500017	0.009651
	40	1717.500018	0.010286	1747.50002	0.011403
	30	1717.500017	0.010003	1747.500018	0.010216
	20	1717.500019	0.010903	1747.500019	0.011149
	10	1717.50002	0.011644	1747.500019	0.011068
	0	1717.500028	0.016175	1747.500018	0.010167
	-10	1717.500019	0.011136	1747.500018	0.01011
	-20	1717.500019	0.011261	1747.500017	0.00993

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 15 MHz			
		Low Channel		High Channel	
		1717.5MHz		1747.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1717.500017	0.010078	1747.500018	0.010347
	7.5	1717.500018	0.010295	1747.500018	0.010437
	6	1717.500017	0.010145	1747.500015	0.008775

Band	Temp (Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 20 MHz			
		Low Channel		High Channel	
		1720MHz		1745MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1719.999985	-0.008575	1744.999988	-0.00678
	50	1719.999983	-0.009706	1744.999983	-0.009993
	40	1719.999982	-0.010421	1744.999987	-0.007189
	30	1719.999982	-0.010463	1744.999986	-0.008058
	20	1719.999981	-0.010779	1744.999967	-0.018724
	10	1719.999982	-0.010504	1744.999978	-0.01278
	0	1719.99998	-0.011502	1745.000017	0.009649
	-10	1719.999992	-0.004857	1744.999993	-0.00396
	-20	1719.999982	-0.010737	1745.000013	0.007198

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 20 MHz			
		Low Channel		High Channel	
		1720MHz		1745MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1719.999983	-0.009889	1744.999987	-0.007501
	7.5	1719.999982	-0.010488	1744.999983	-0.00987
	6	1719.999983	-0.009731	1744.999989	-0.006419

1.10. Band Edge Conducted Spurious Emission

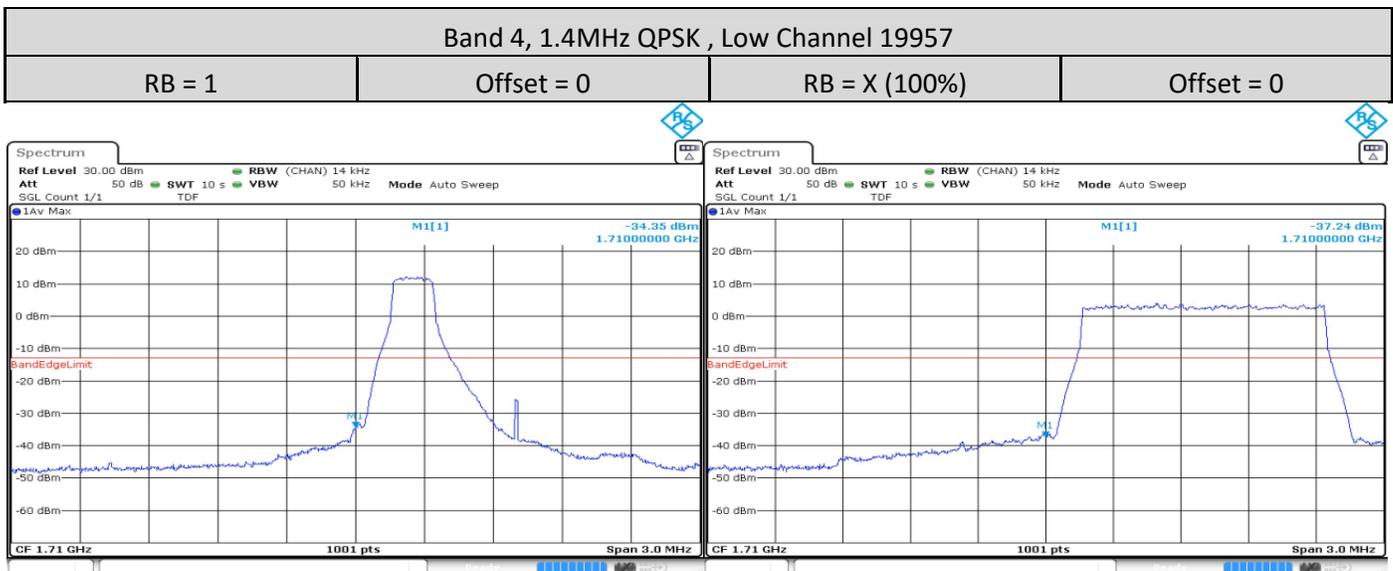


- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 5) The center frequency of spectrum is the band edge frequency, span is 3MHz, RBW is 1~3% of EBW and VBW is at least 3 times of RBW
- 6) Record the maximum trace plot into the test report.

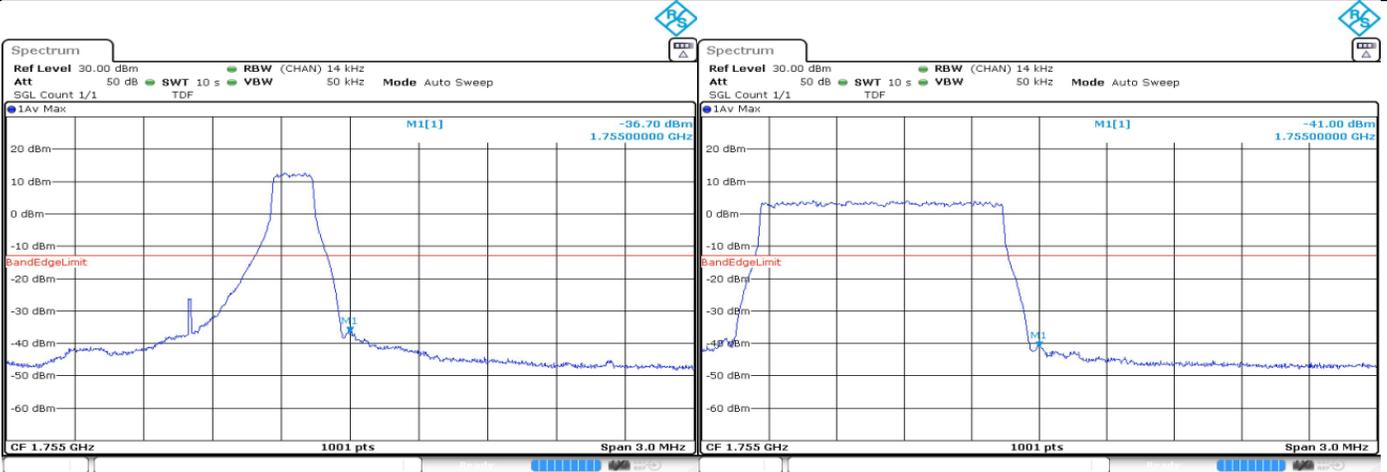
1.10.2. Test Limit

For operations in the 1710-1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB. In the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

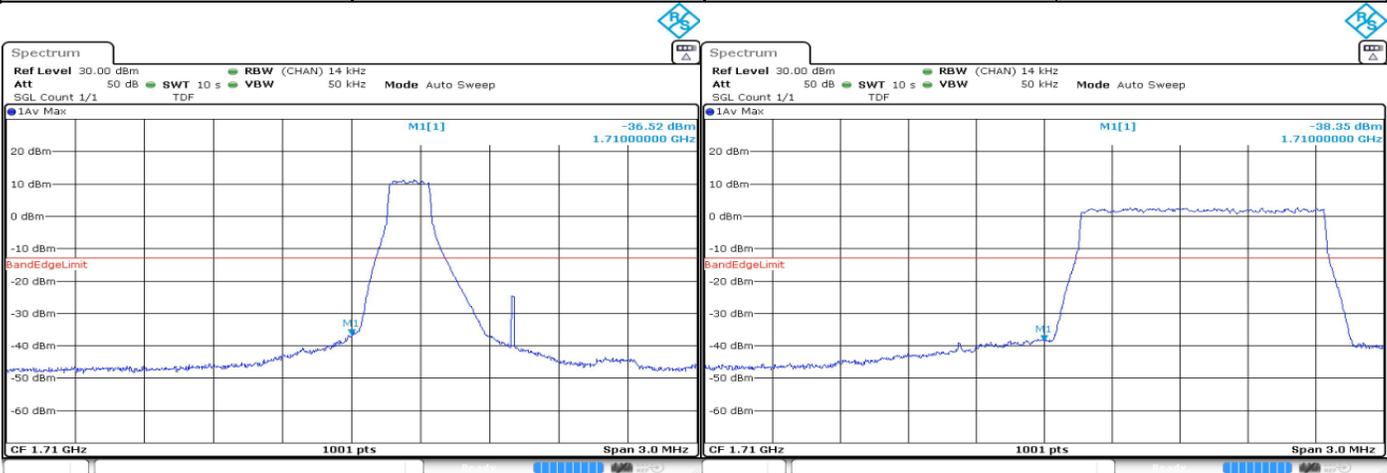
1.10.3. Band Edge Conducted Spurious Emission – LTE Band 4 (1710-1755MHz)



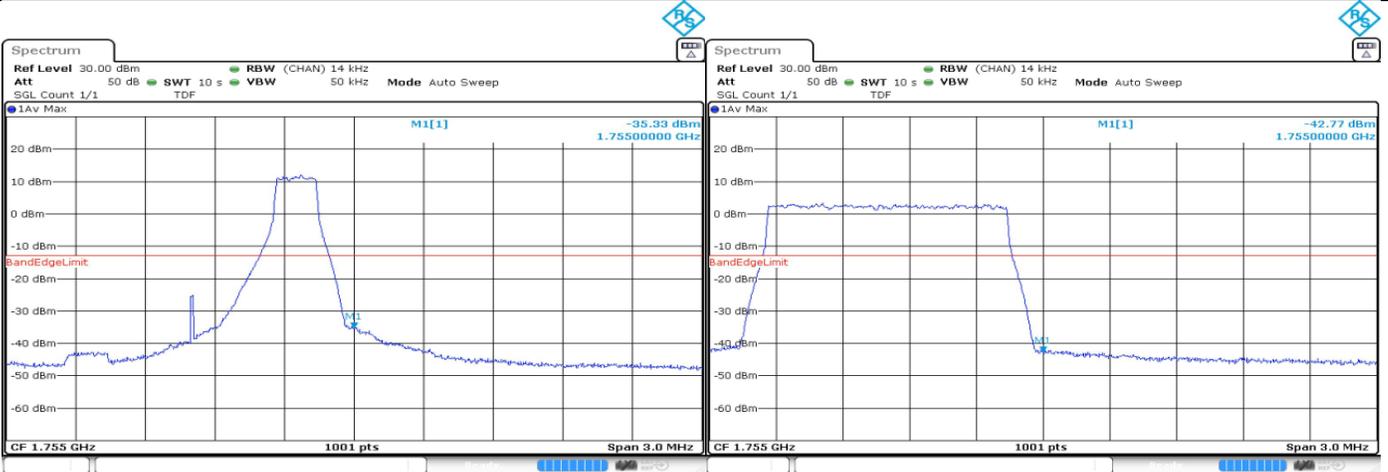
Band 4, 1.4MHz QPSK , High Channel 20393			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



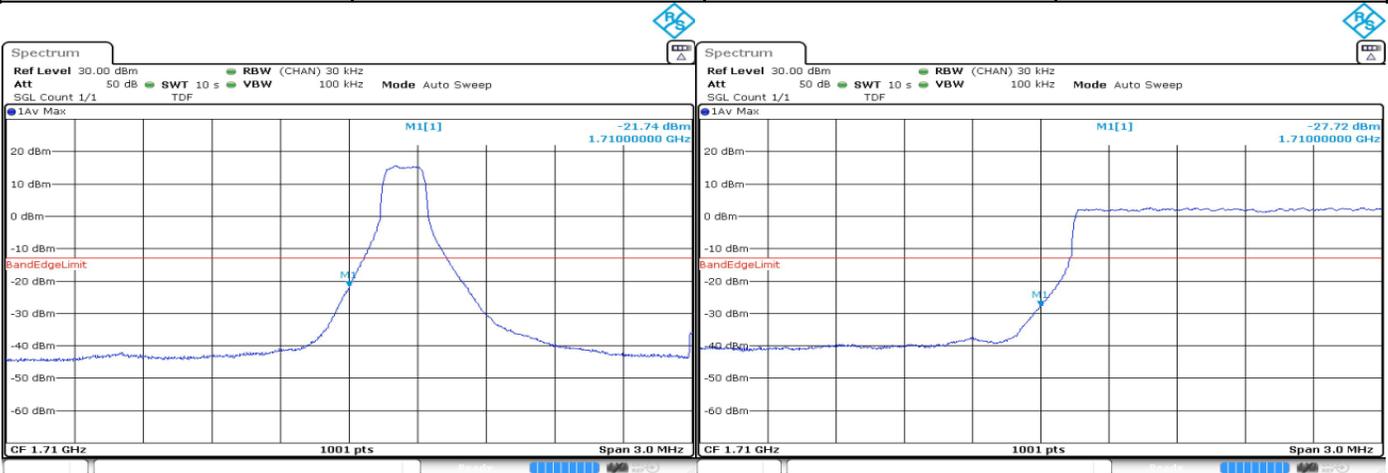
Band 4, 1.4MHz 16-QAM , Low Channel 19957			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



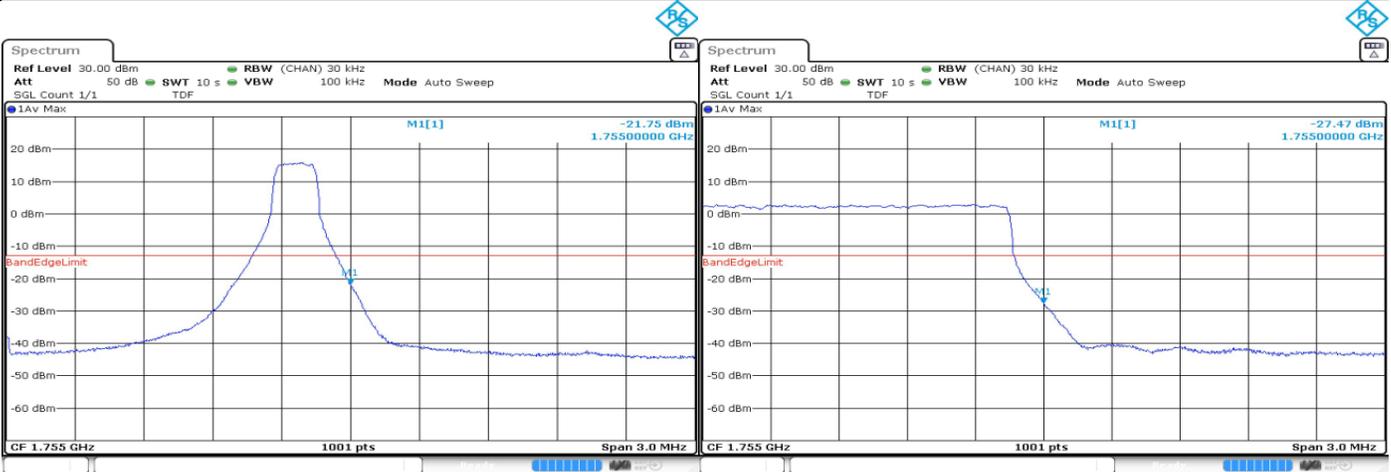
Band 4, 1.4MHz 16-QAM , High Channel 20393			
RB = 1	Offset =X-1	RB = X (100%)	Offset = 0



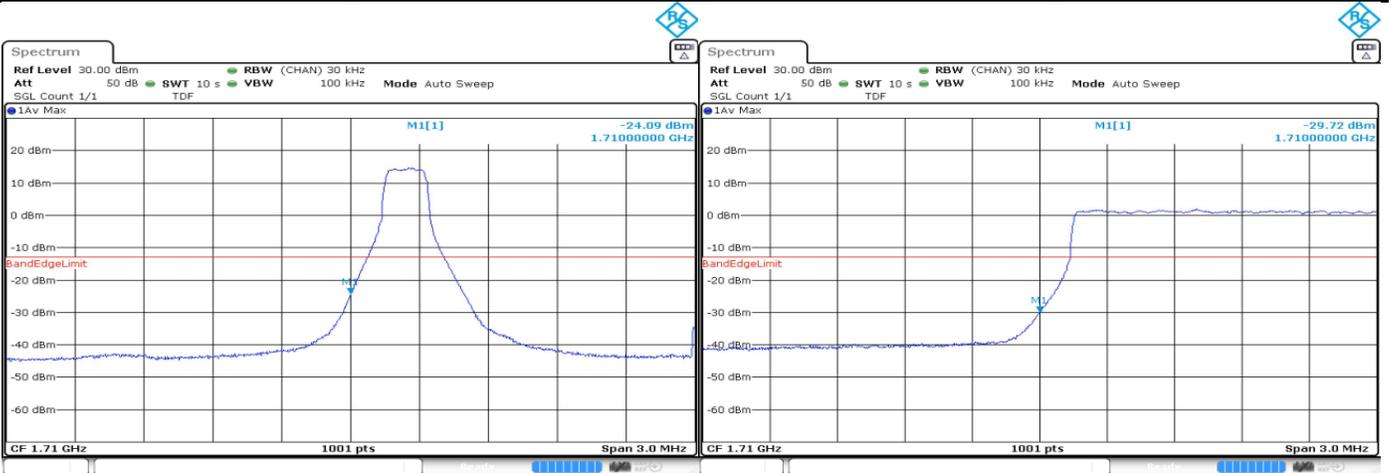
Band 4, 3MHz QPSK, Low CH 19965			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



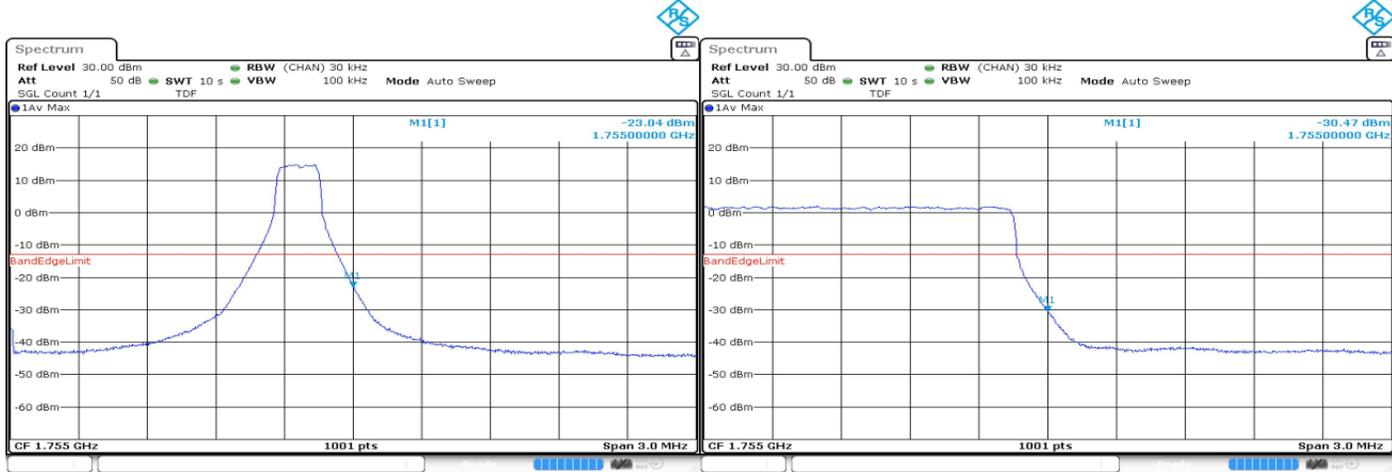
Band 4, 3MHz QPSK, High CH 20385			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



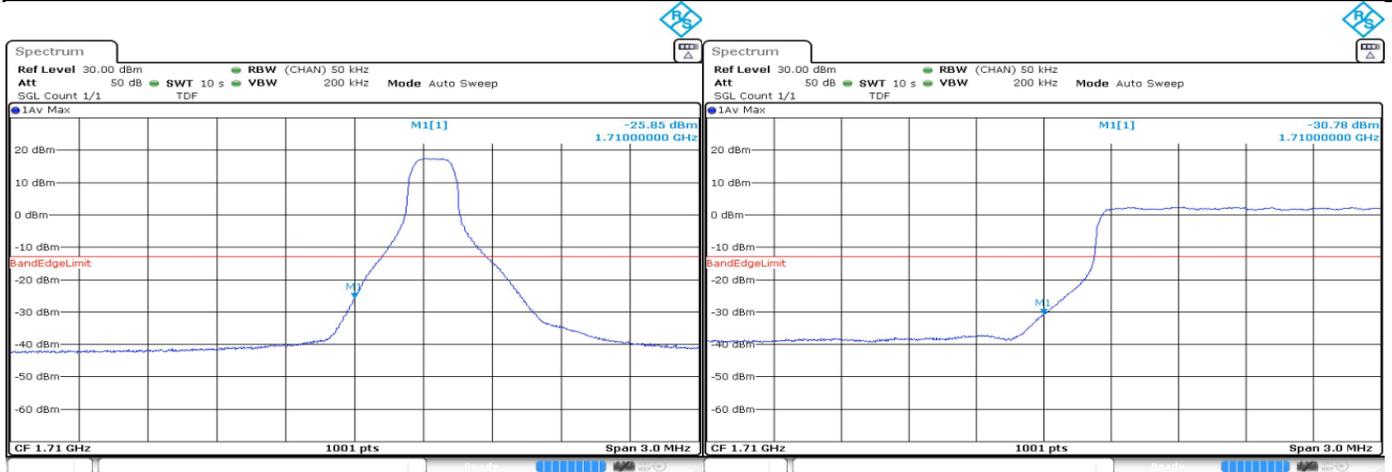
Band 4, 3MHz 16-QAM, Low CH 19965			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



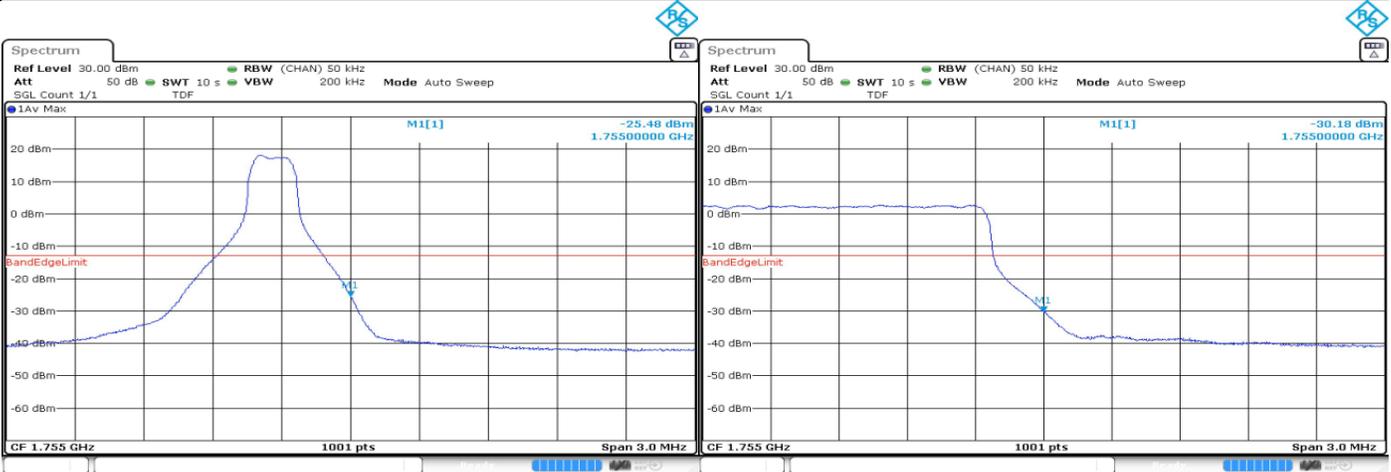
Band 4, 3MHz 16-QAM, High CH 20385			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



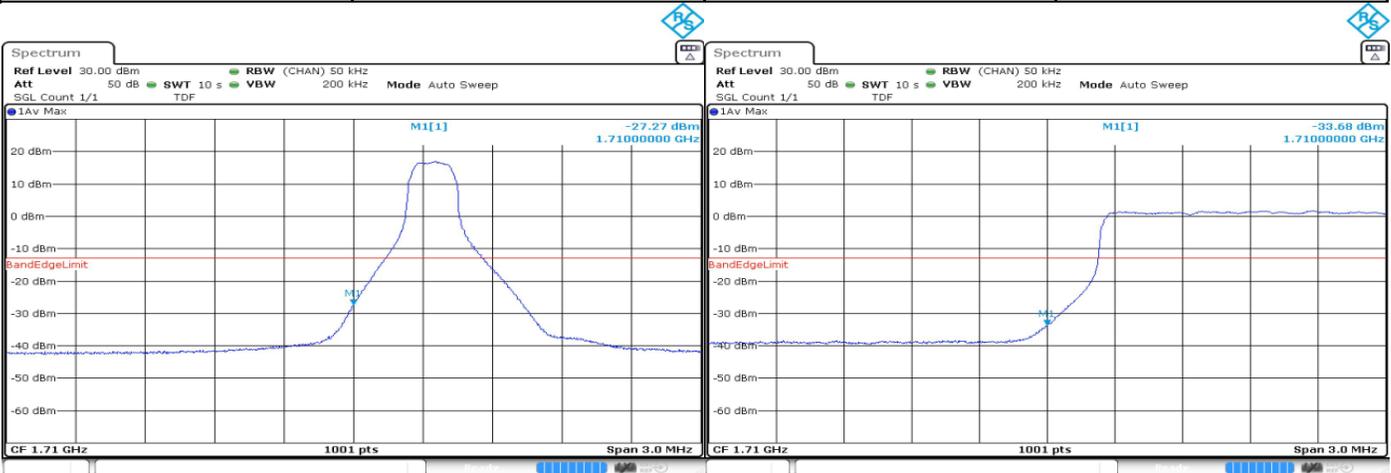
Band 4, 5MHz QPSK, Low CH 19975			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



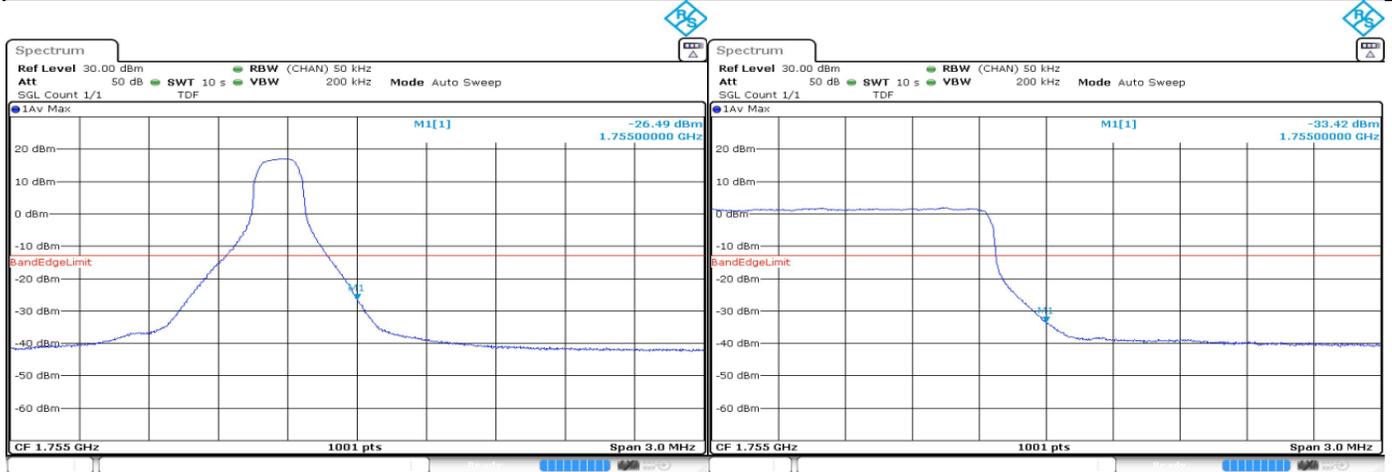
Band 4, 5MHz QPSK, High CH 20375			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



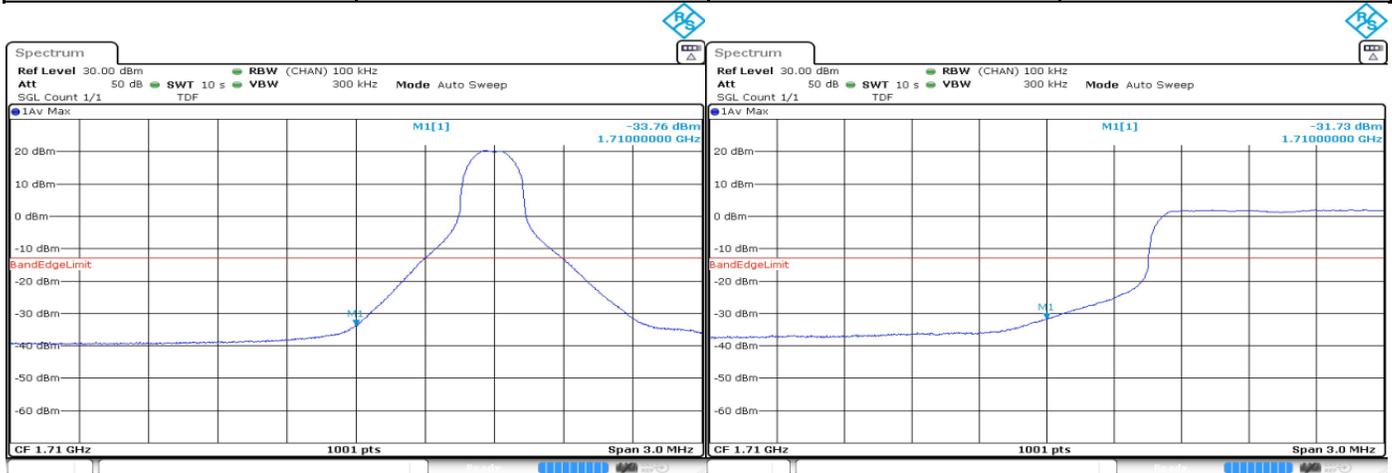
Band 4, 5MHz 16-QAM, Low CH 19975			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



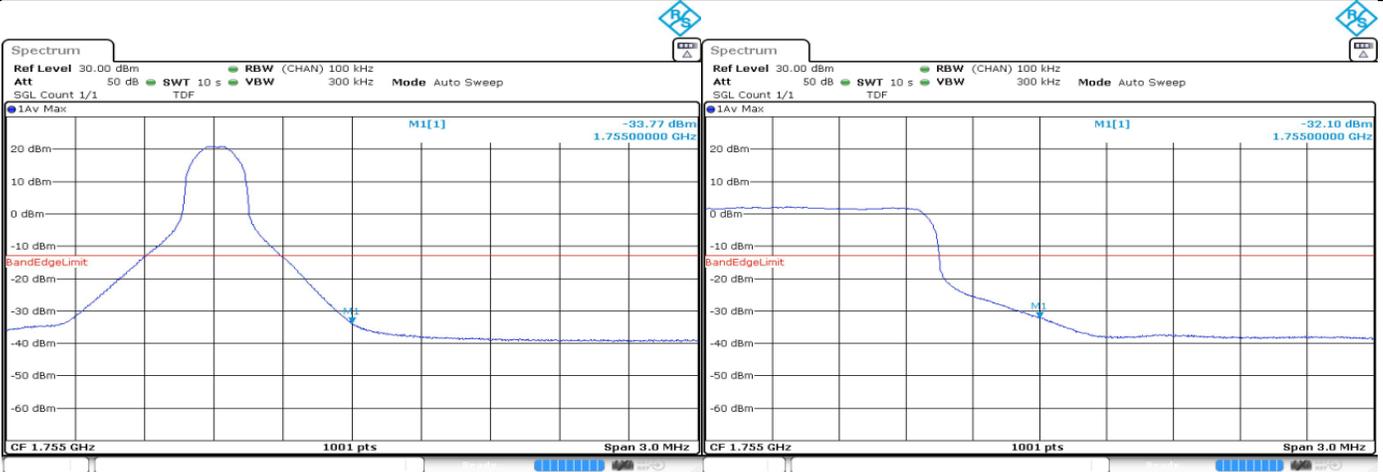
Band 4, 5MHz 16-QAM, High CH 20375			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



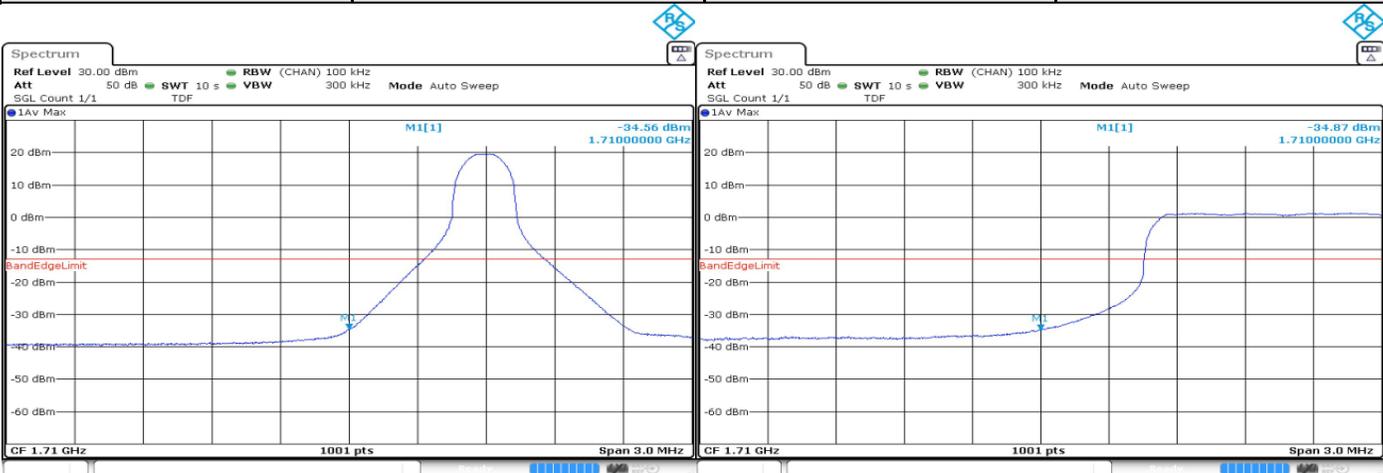
Band 4, 10MHz QPSK, Low CH 20000			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



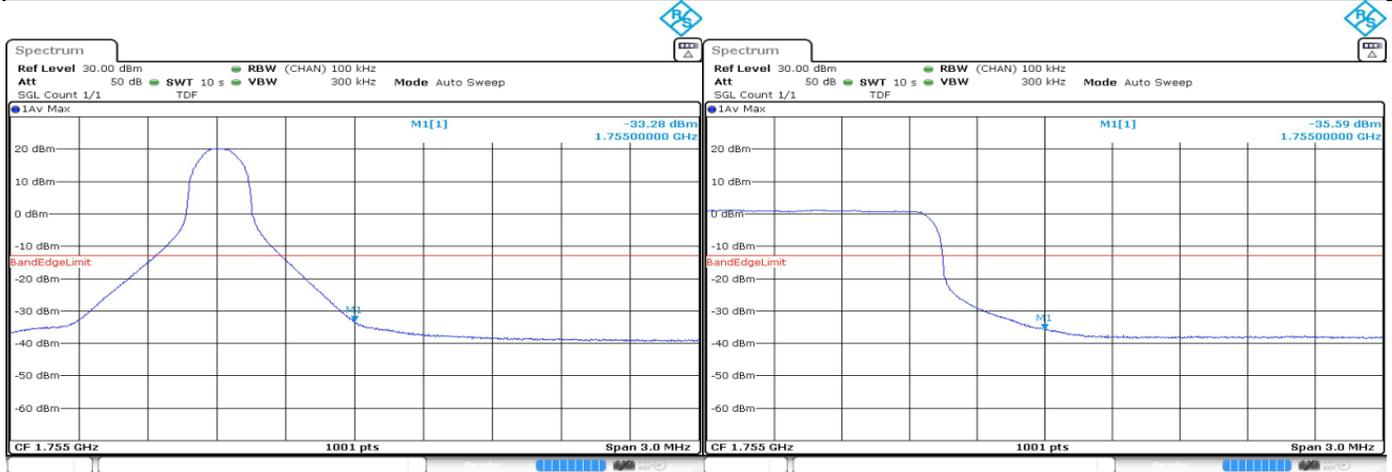
Band 4, 10MHz QPSK, High CH 20350			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



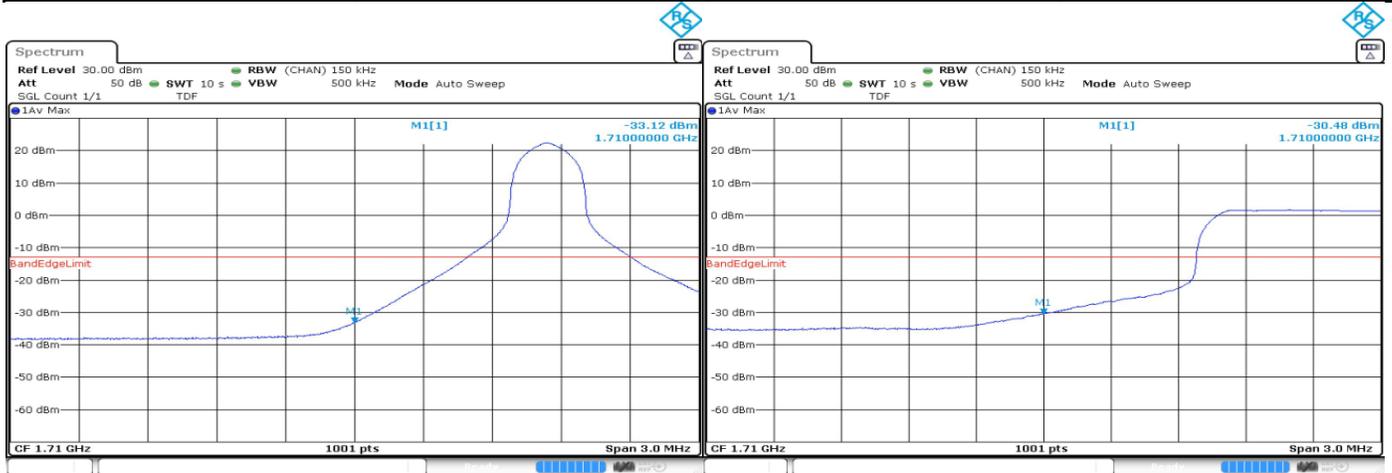
Band 4, 10MHz 16-QAM, Low CH 20000			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



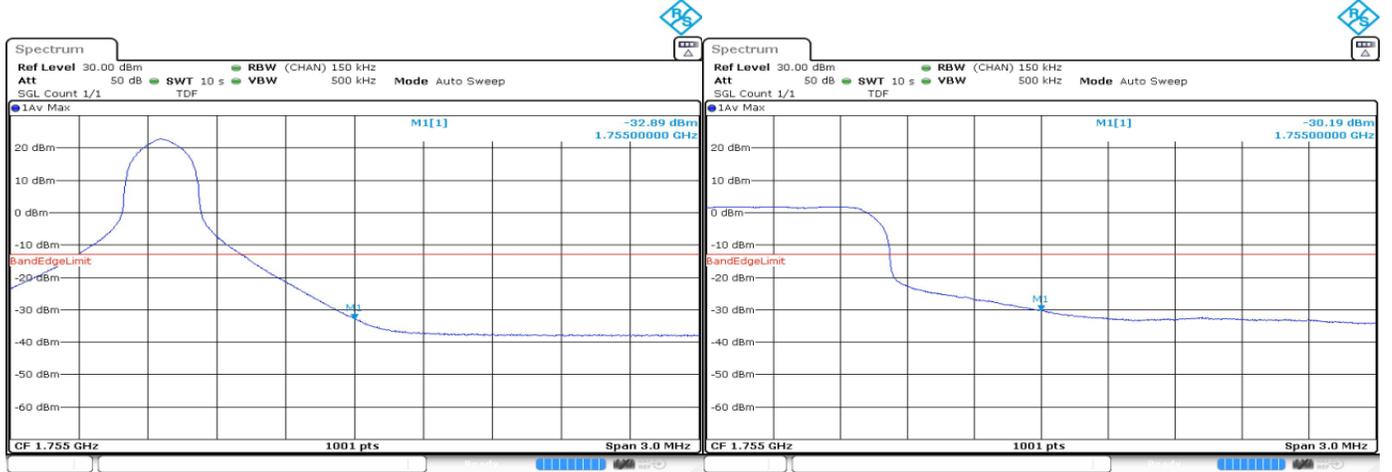
Band 4, 10MHz 16-QAM, High CH 20350			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



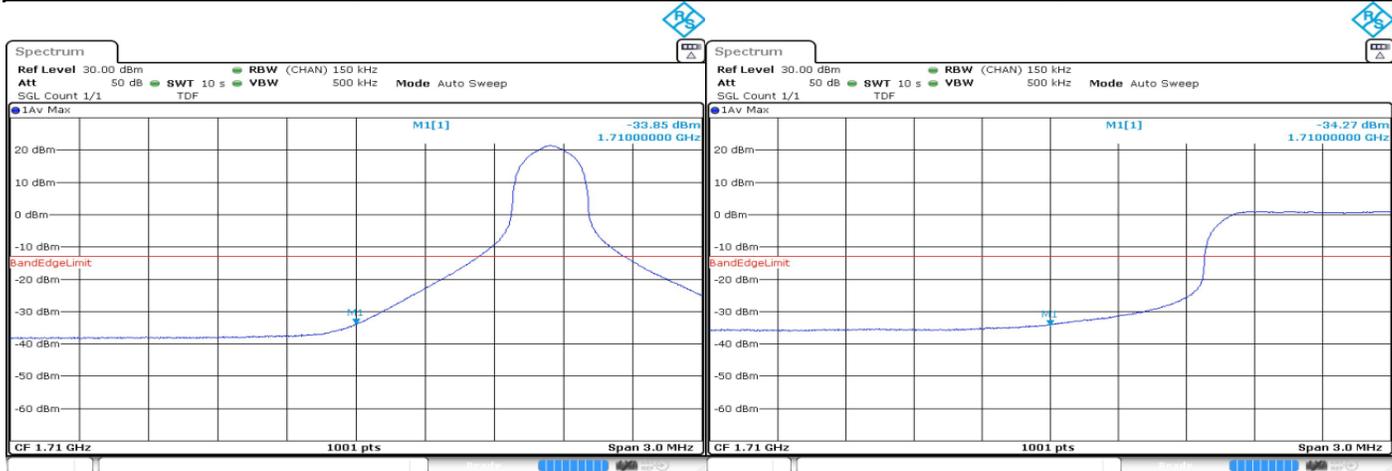
Band 4, 15MHz QPSK, Low CH 20025			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



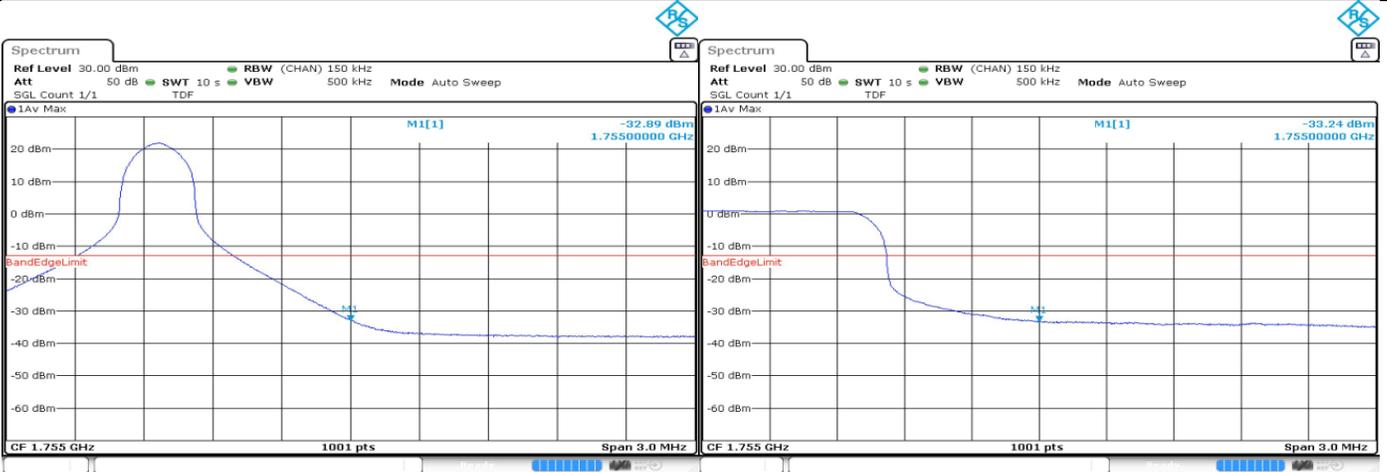
Band 4, 15MHz QPSK, High CH 20325			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



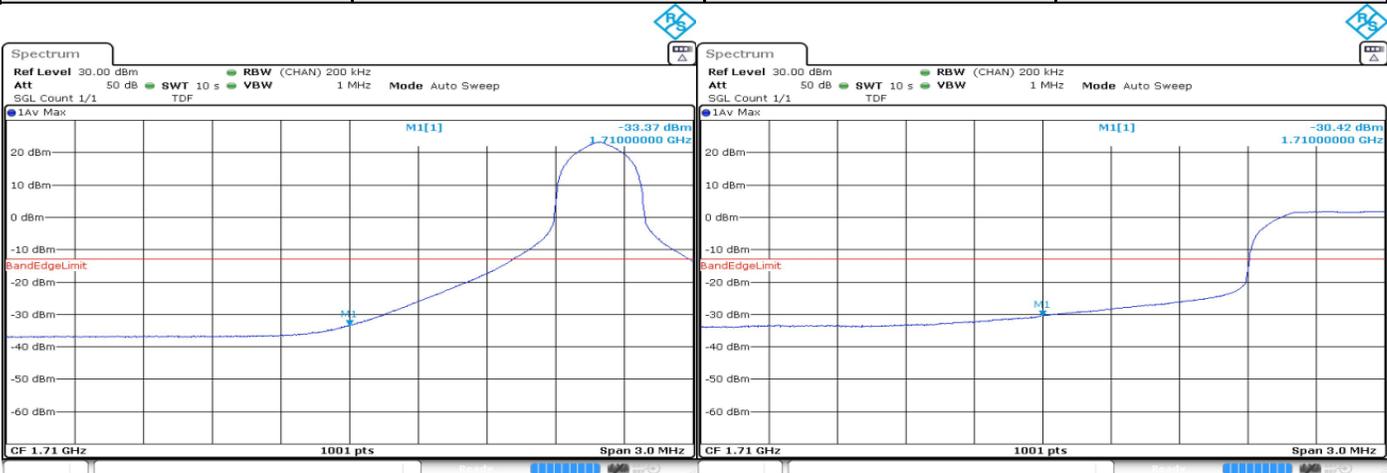
Band 4, 15MHz 16-QAM, Low CH 20025			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



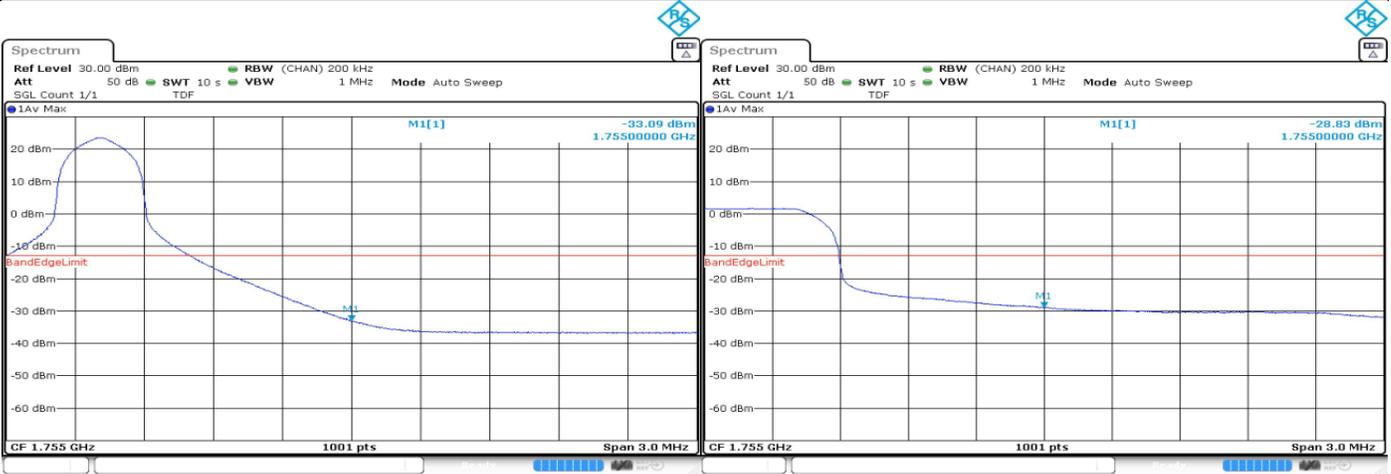
Band 4, 15MHz 16-QAM, High CH 20325			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



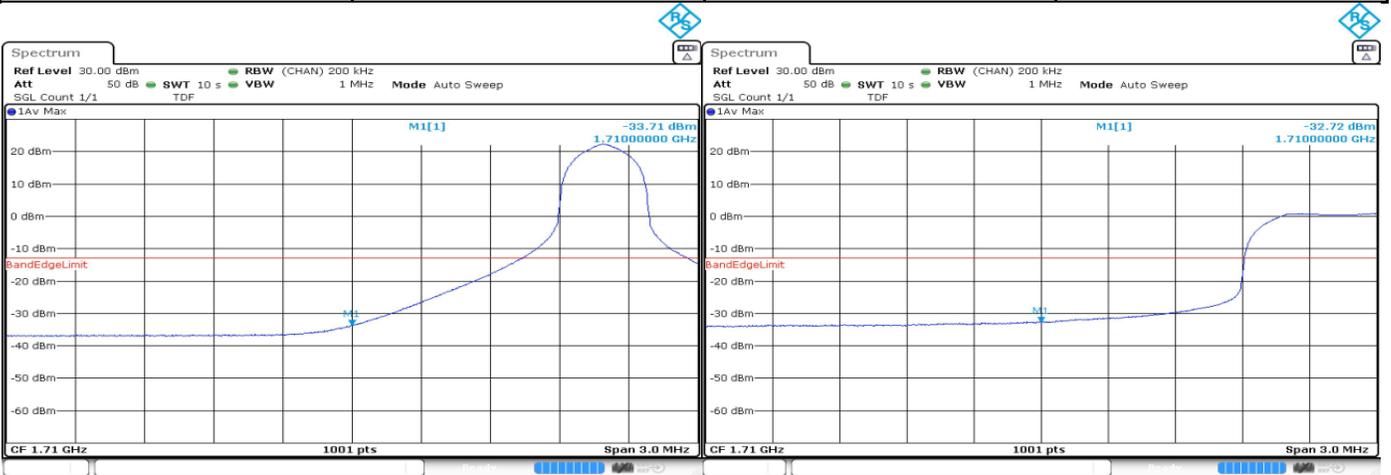
Band 4, 20MHz QPSK, Low CH 20050			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



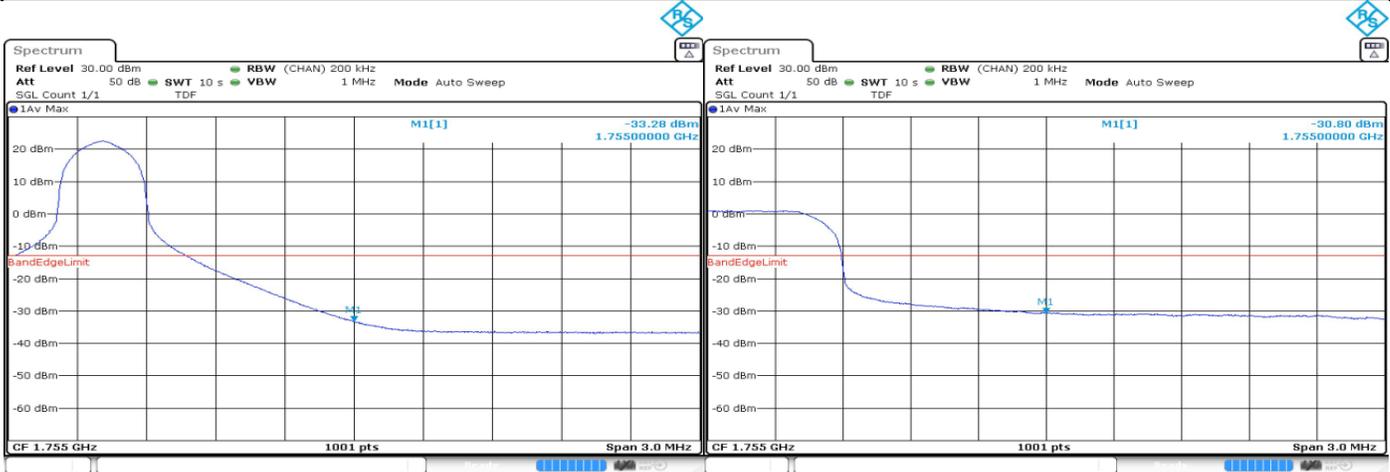
Band 4, 20MHz QPSK, High CH 20300			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



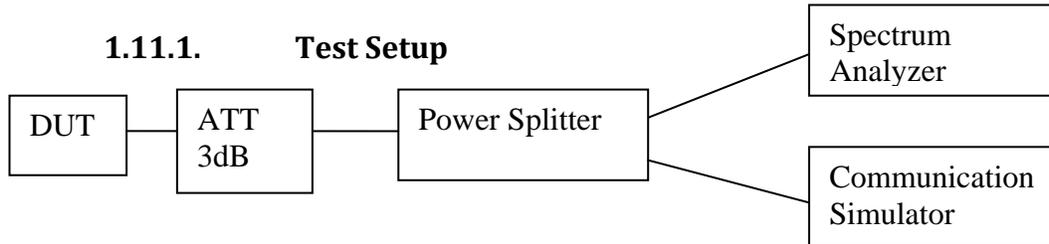
Band 4, 20MHz 16-QAM, Low CH 20050			
RB = 1	Offset = 0	RB = X (100%)	Offset = 0



Band 4, 20MHz 16-QAM, High CH 20300			
RB = 1	Offset = X-1	RB = X (100%)	Offset = 0



1.11. Conducted Spurious Emission



- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) Spectrum Analyzer setting, RBW = 1 MHz, VBW = 3 MHz.
- 5) The spurious emission of lowest, middle and highest channels with the highest RF powers were measured.
- 6) Record the maximum trace plot into the test report.

1.11.2. Test Limit

For operations in the 1710-1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB. The measurement instrumentation is employing a resolution bandwidth of 1 megahertz or greater.

1.11.3. Conducted Spurious Emissions - LTE Band 4 (1710-1755MHz)

1.4MHz

