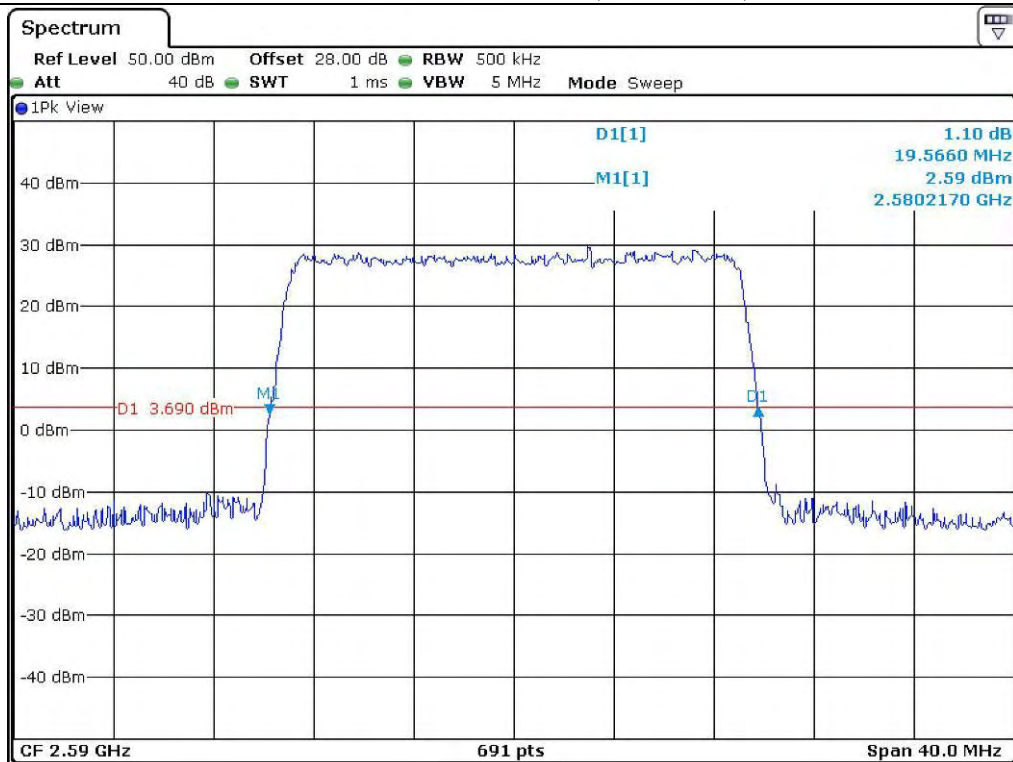
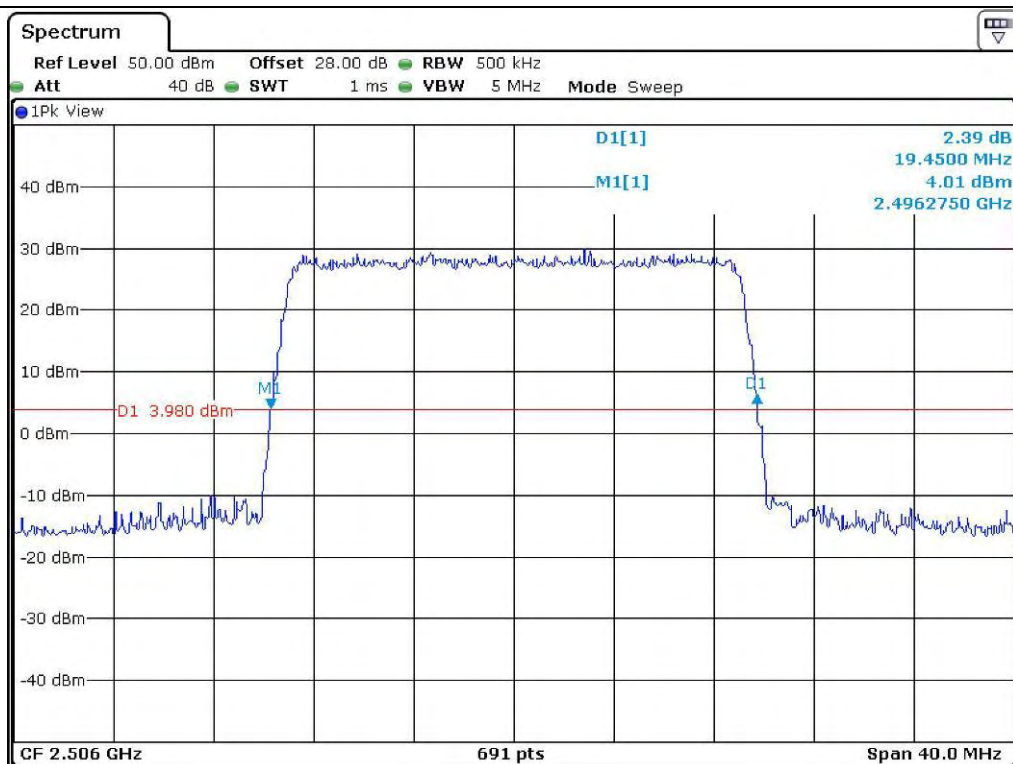
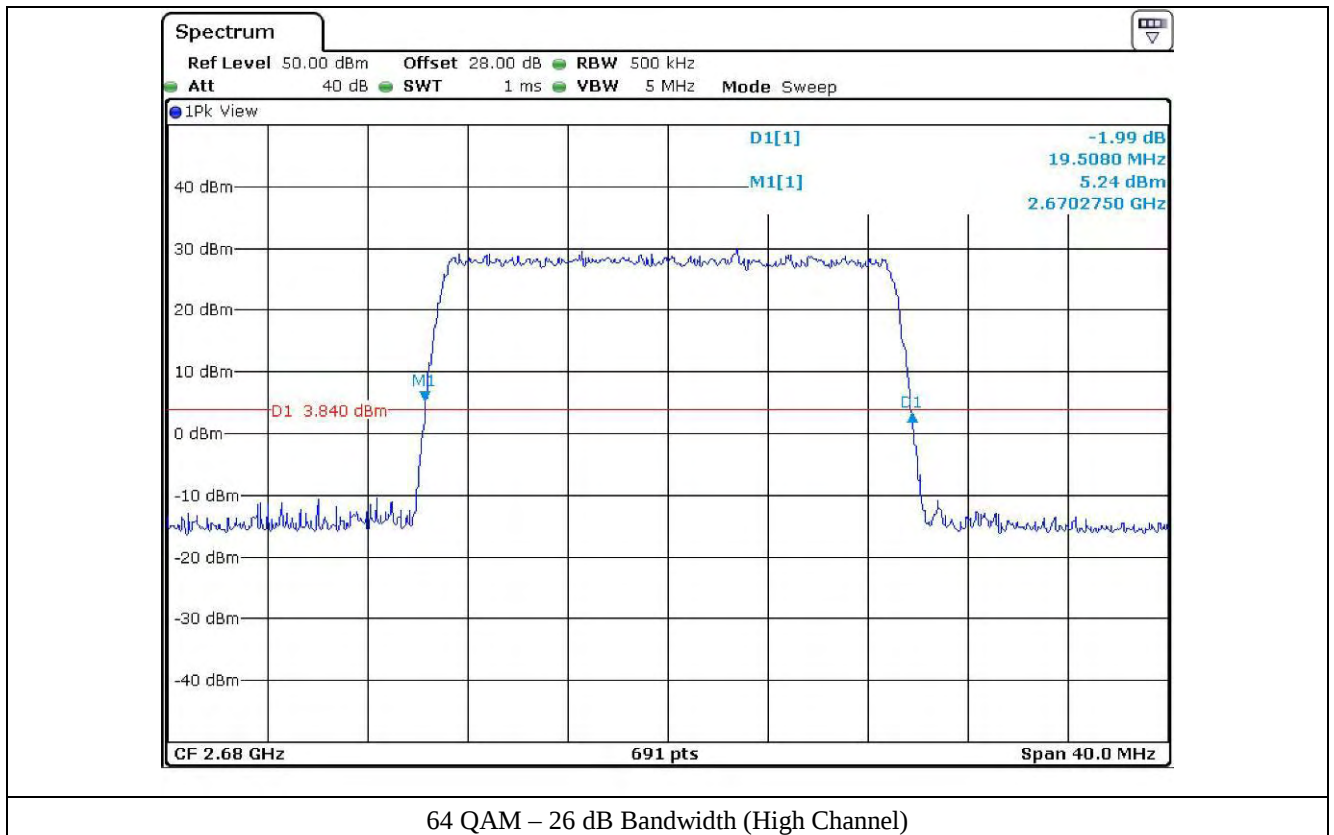
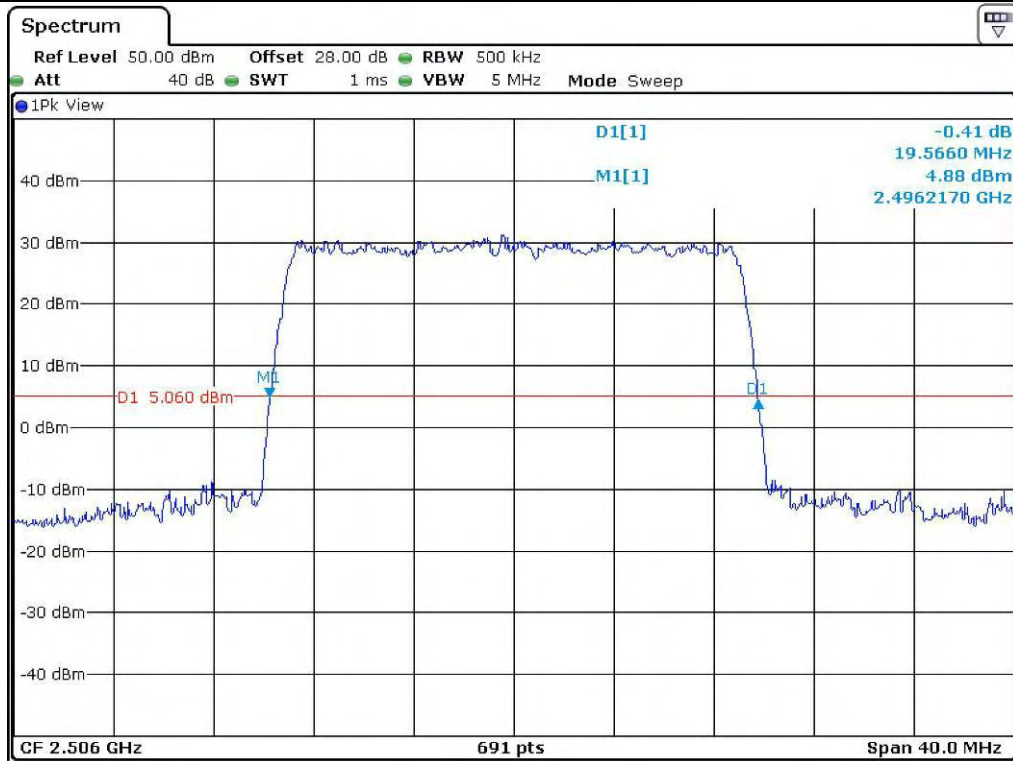
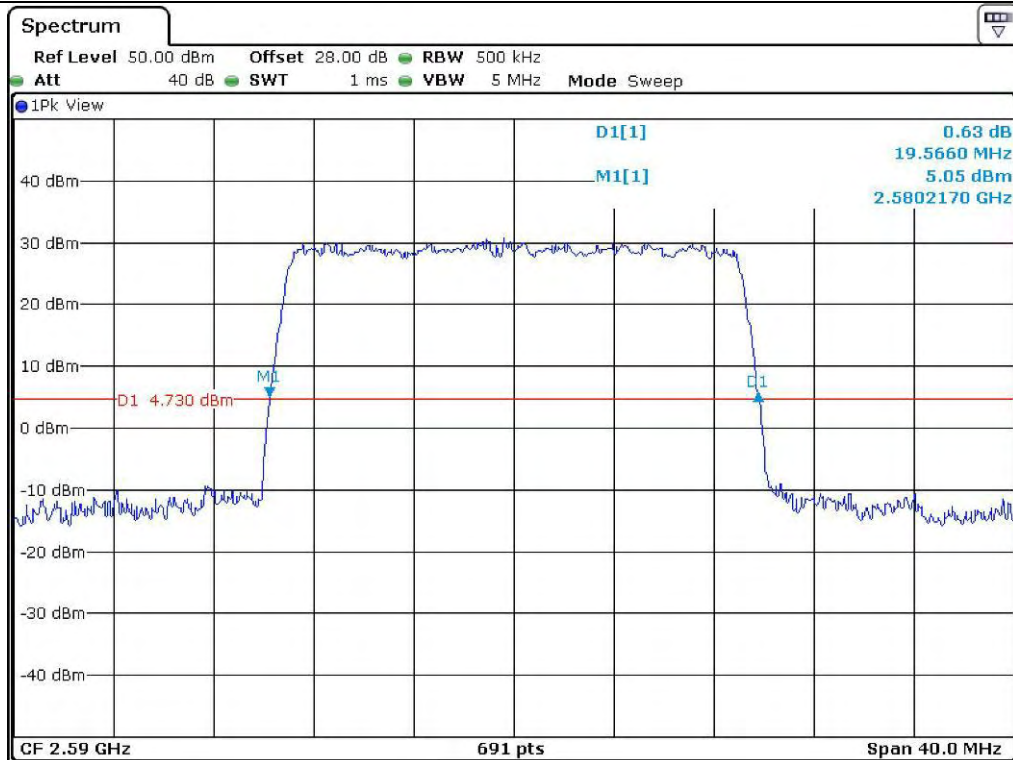




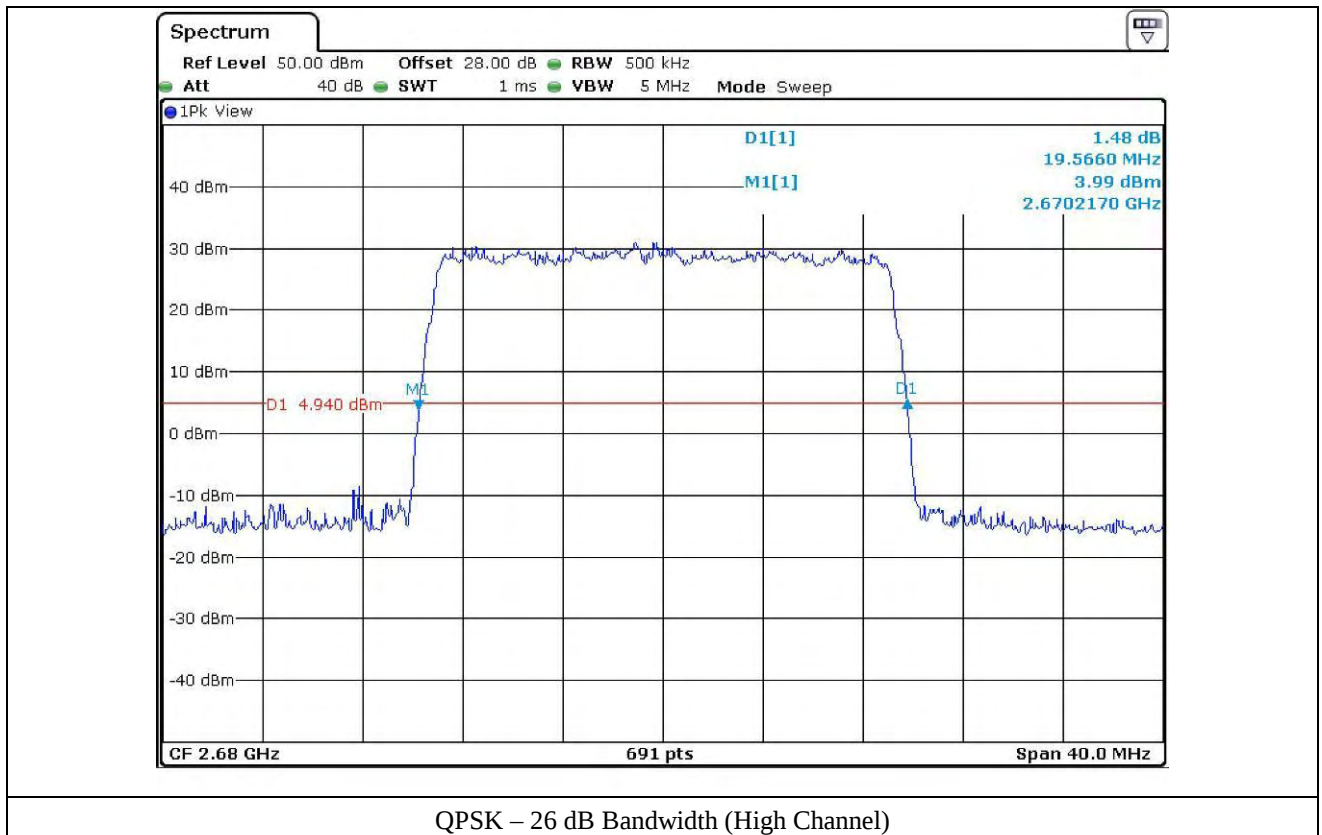


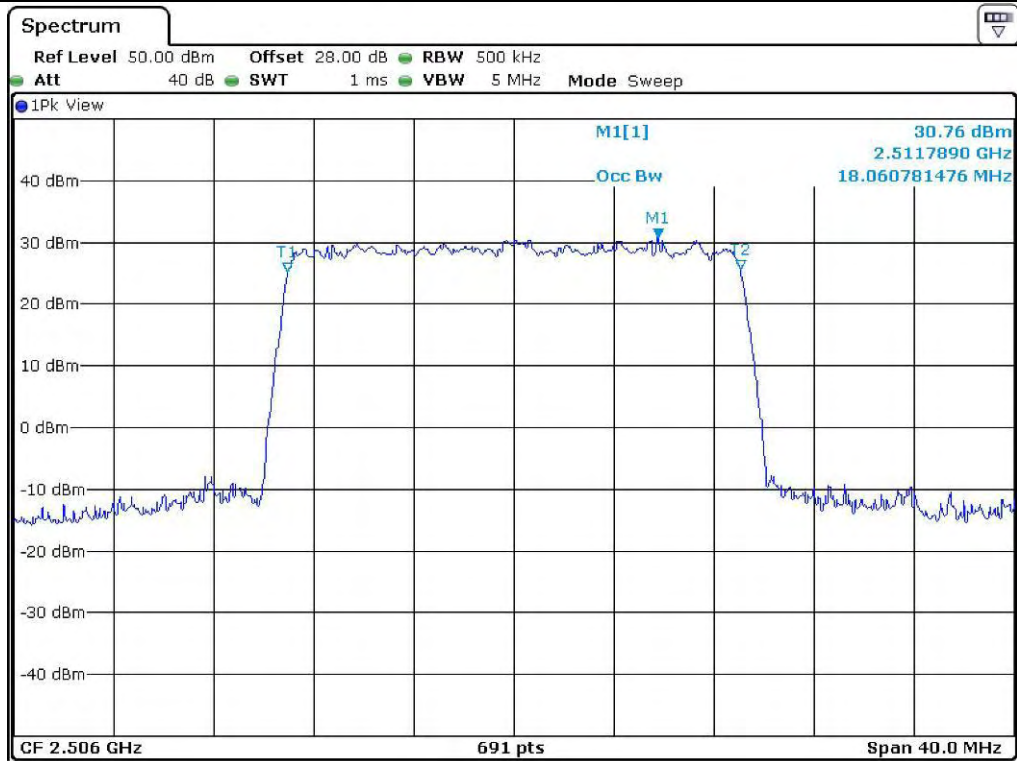


QPSK – 26 dB Bandwidth (Low Channel)

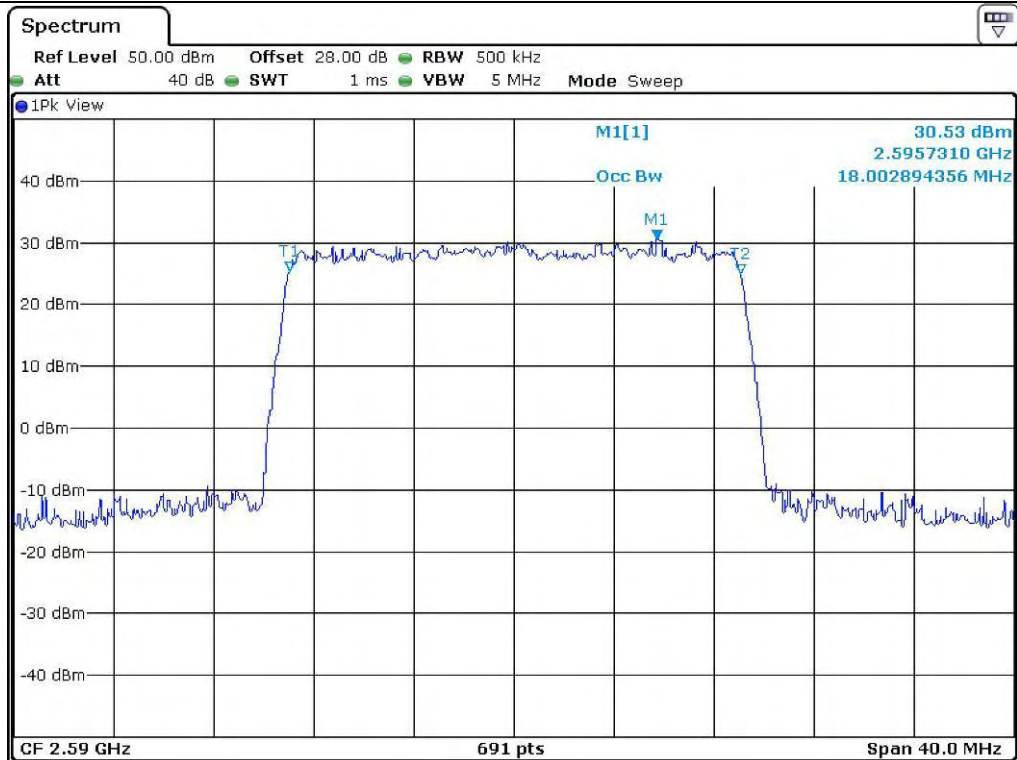


QPSK – 26 dB Bandwidth (Middle Channel)

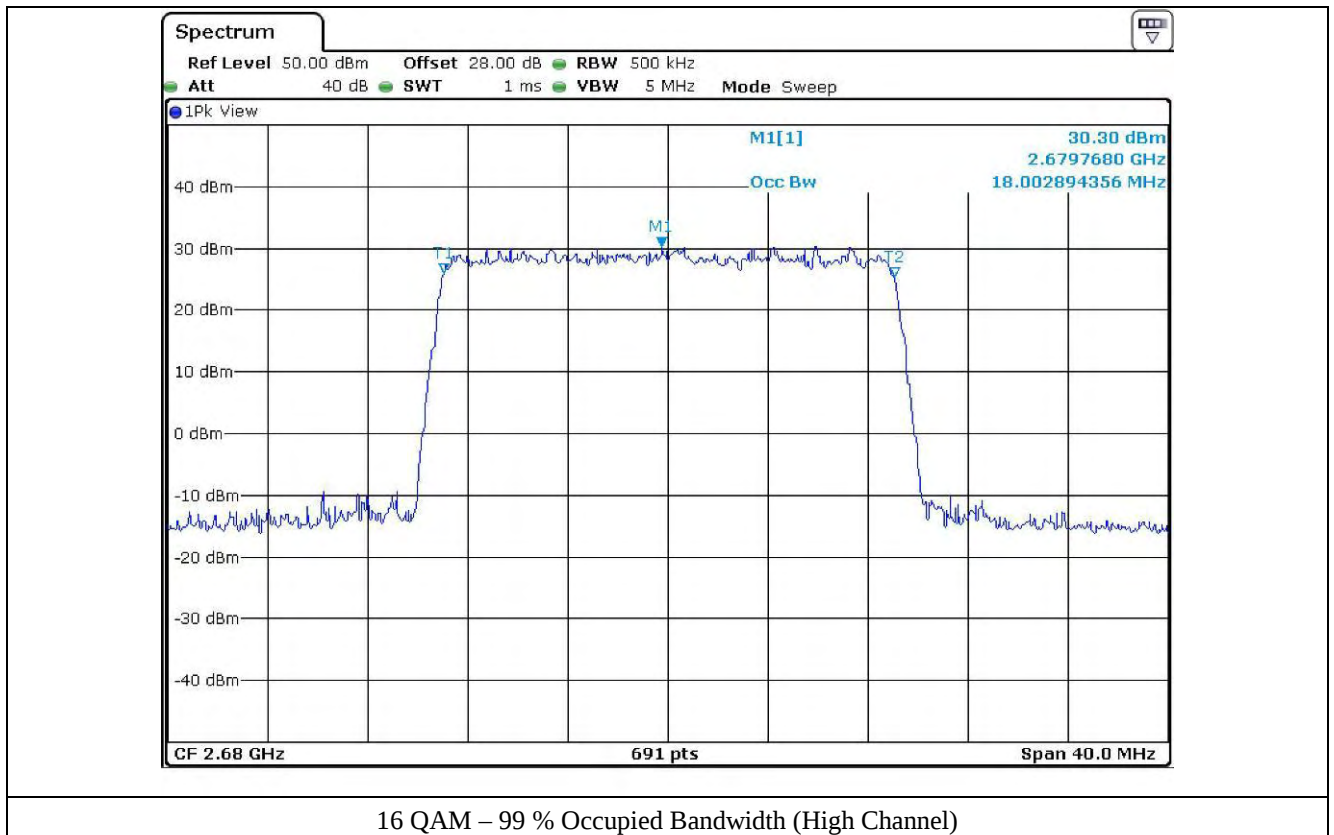


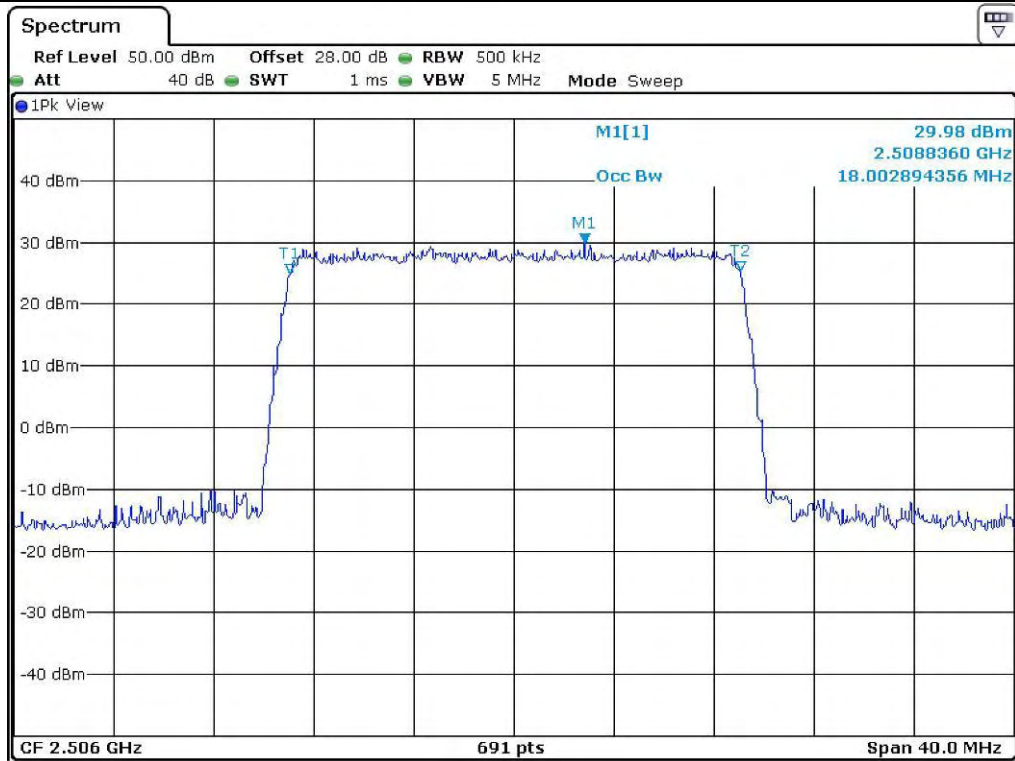


16 QAM – 99 % Occupied Bandwidth (Low Channel)

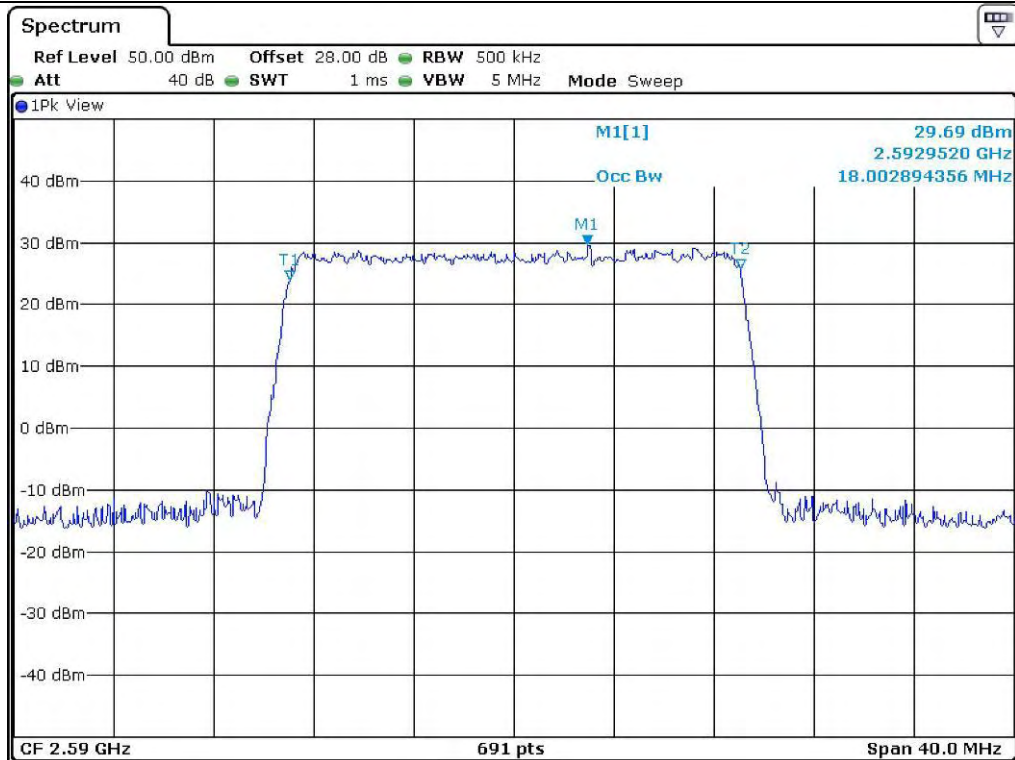


16 QAM – 99 % Occupied Bandwidth (Middle Channel)

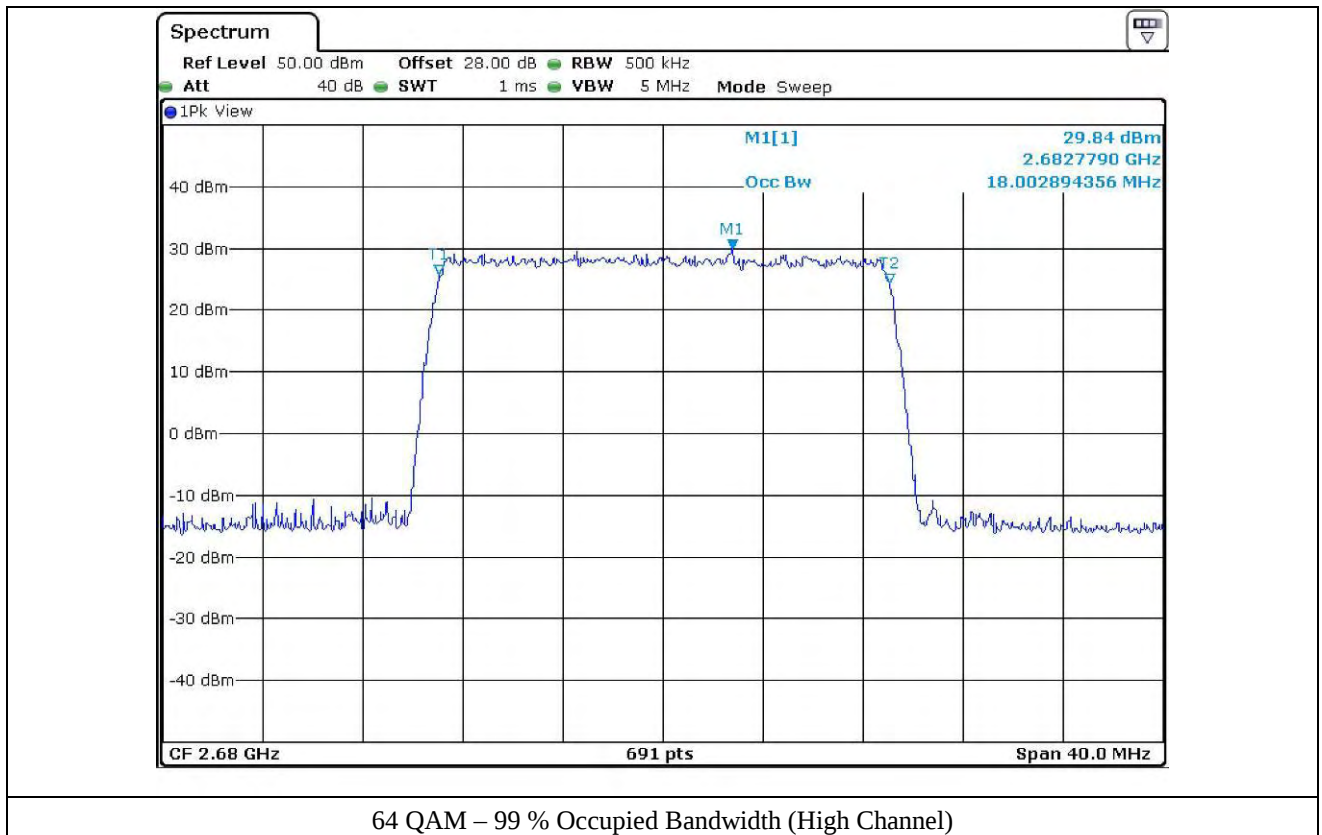


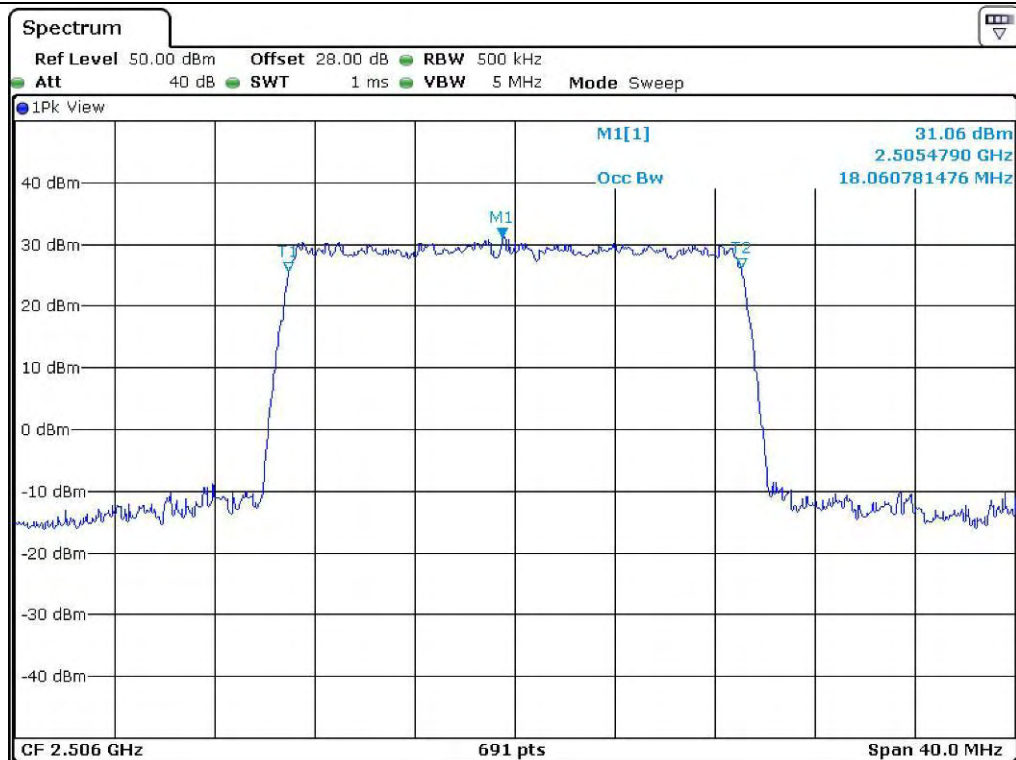


64 QAM – 99 % Occupied Bandwidth (Low Channel)

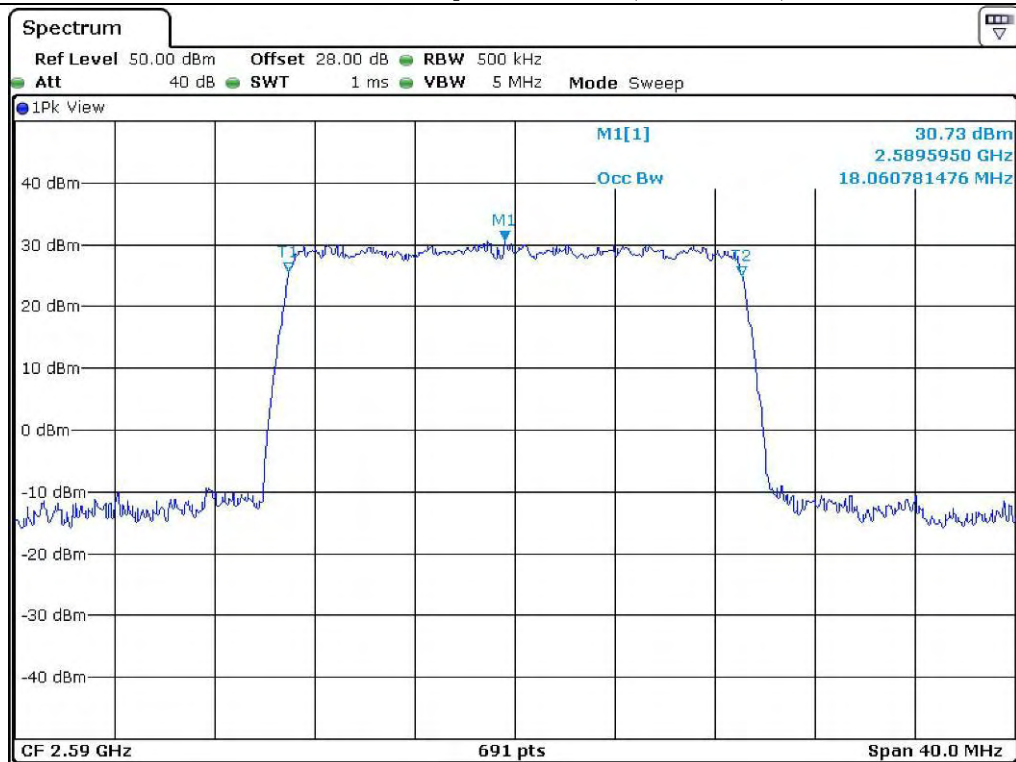


64 QAM – 99 % Occupied Bandwidth (Middle Channel)

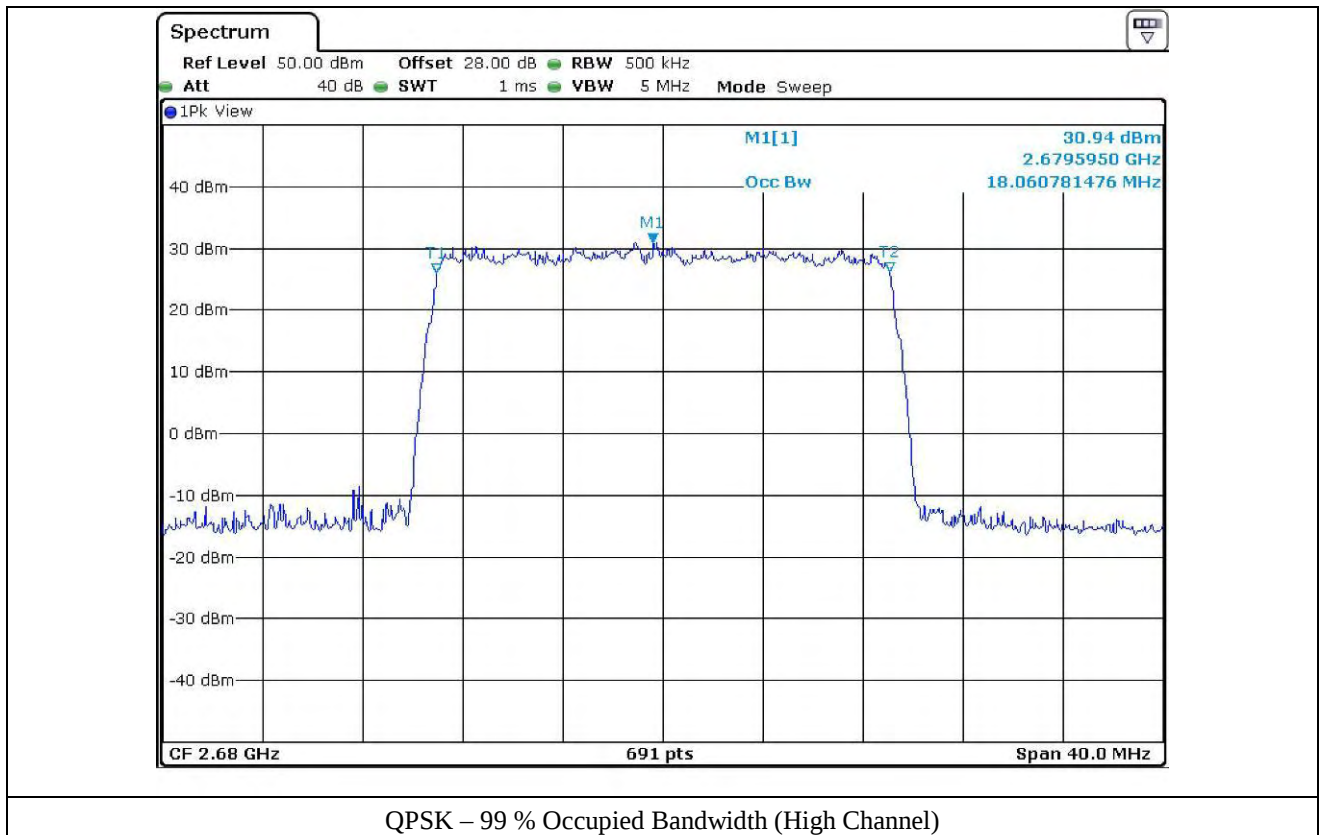




QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



6.5.2 Test Result (20 MHz/2 Carrier)

-. Test Date : July 31, 2014

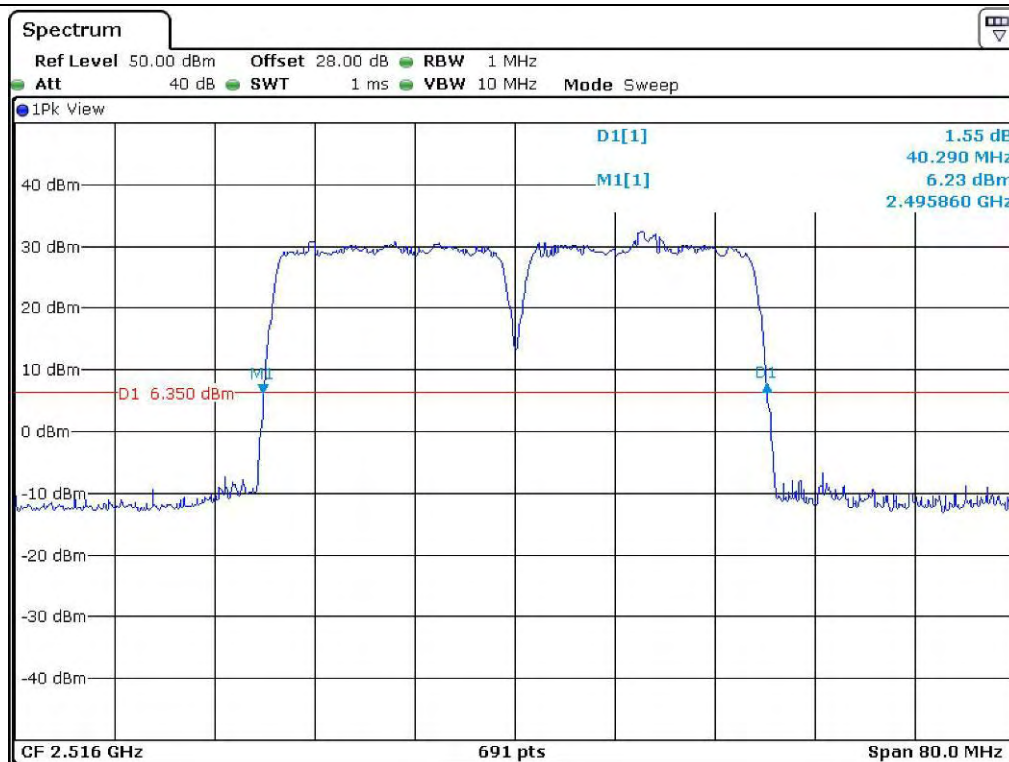
-. Test Result : Pass

Modulation	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	Low	40.300	38.000
	Middle	40.400	38.100
	High	40.400	38.100
64 QAM	Low	40.400	37.900
	Middle	40.400	38.000
	High	40.500	38.000
QPSK	Low	40.400	38.100
	Middle	40.300	38.100
	High	40.400	38.100

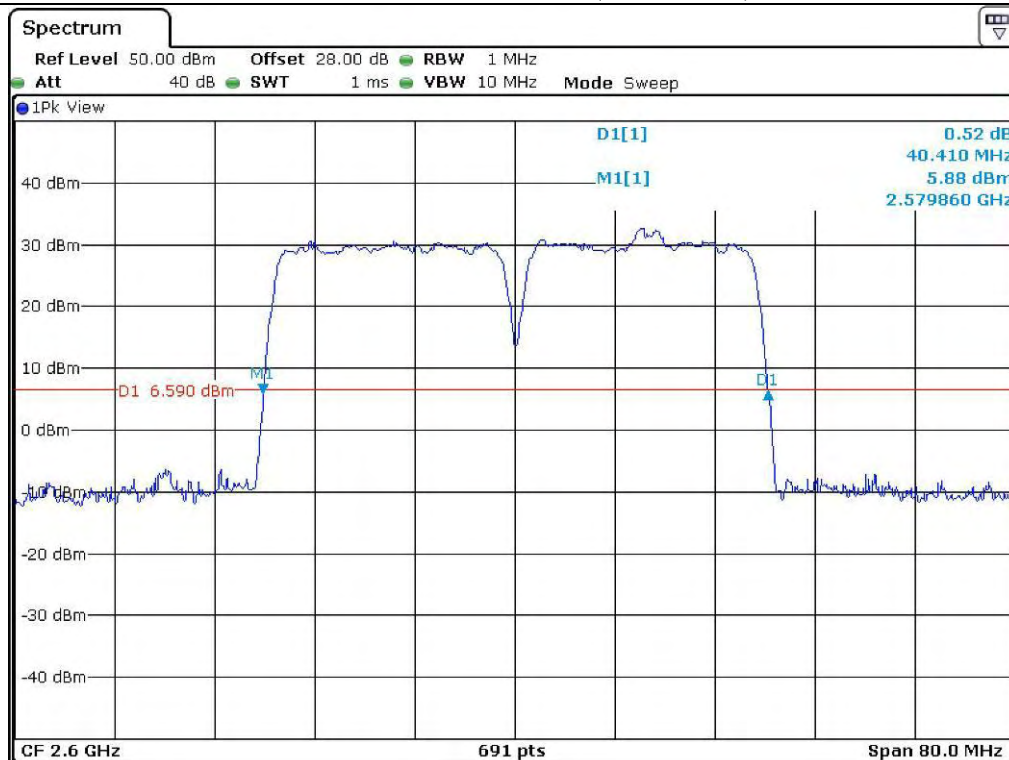
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



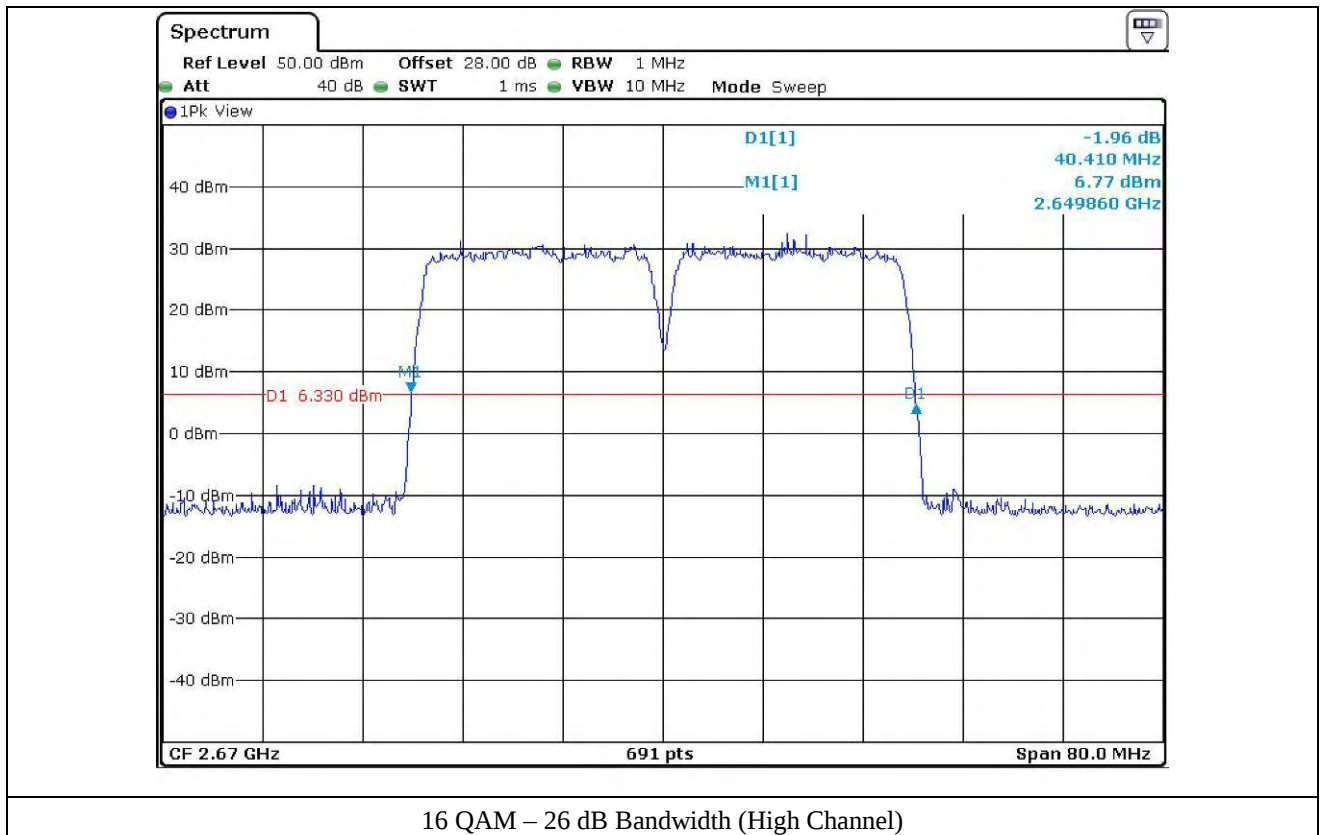
Tested by: Tae-Ho, Kim / Project Engineer

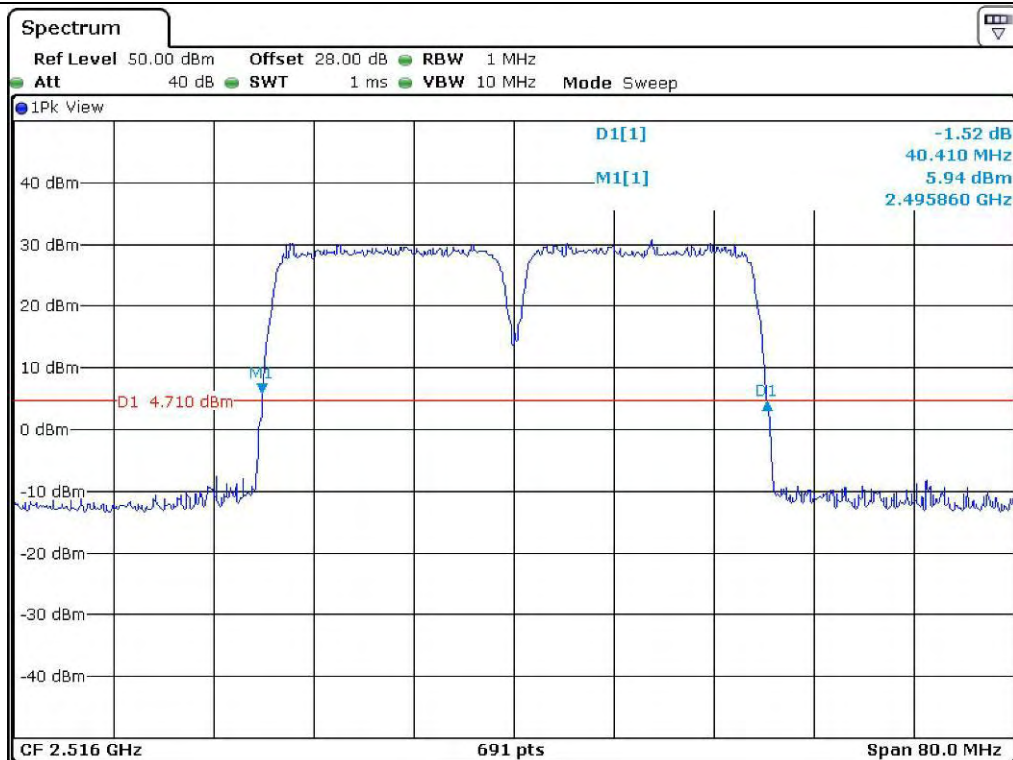


16 QAM – 26 dB Bandwidth (Low Channel)

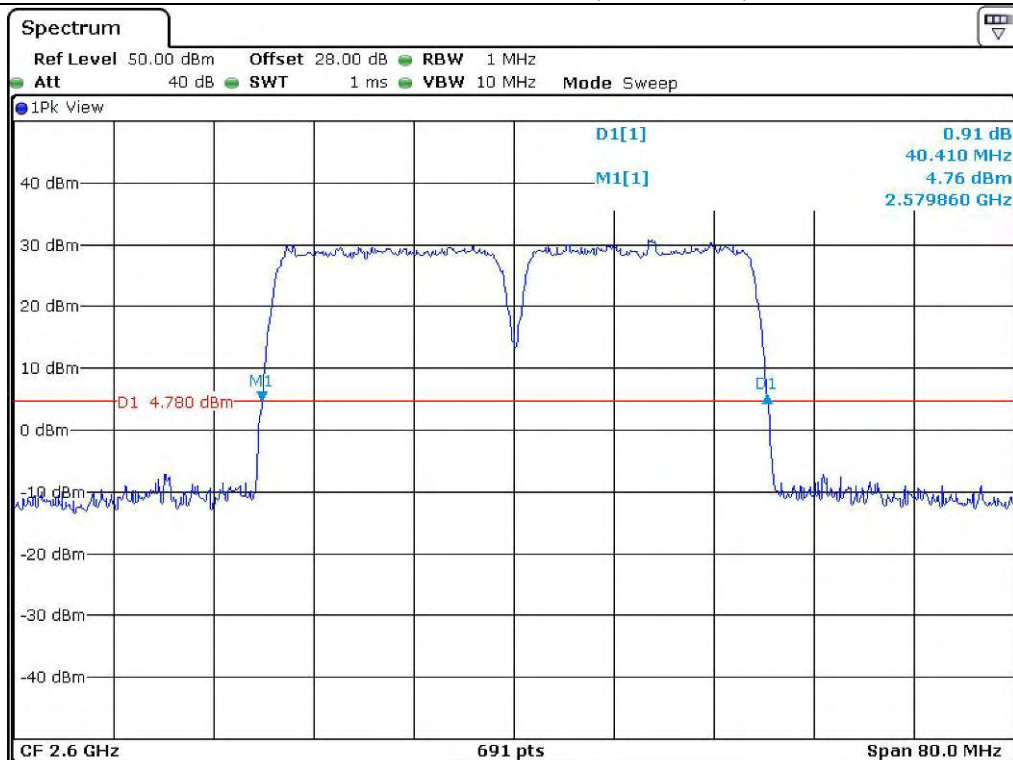


16 QAM – 26 dB Bandwidth (Middle Channel)

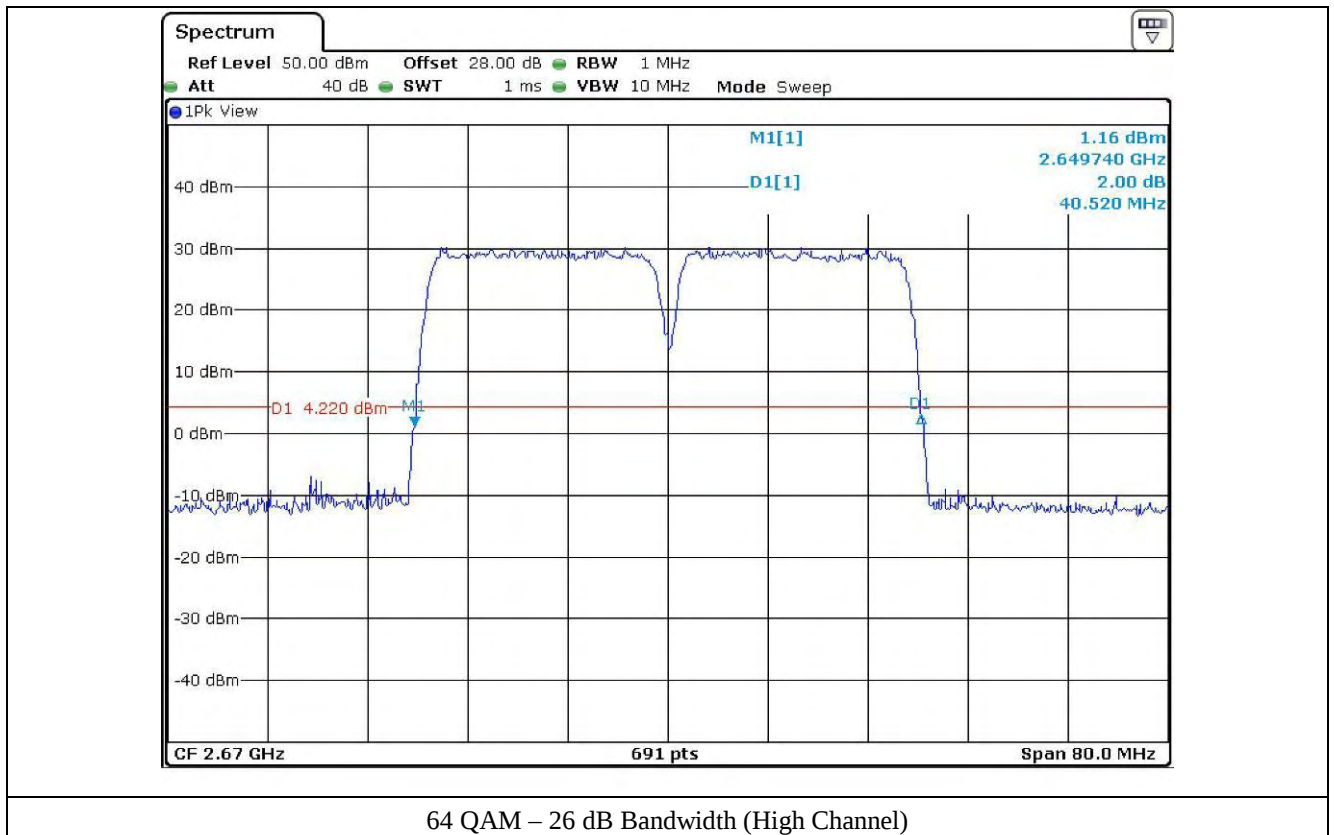


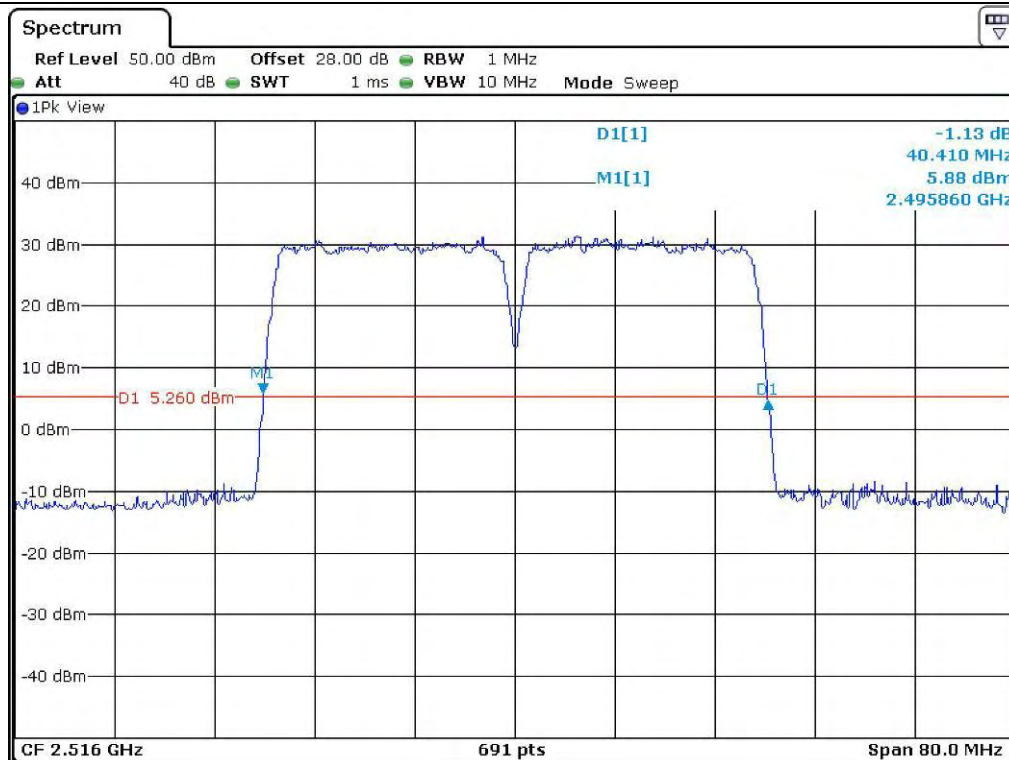


64 QAM – 26 dB Bandwidth (Low Channel)

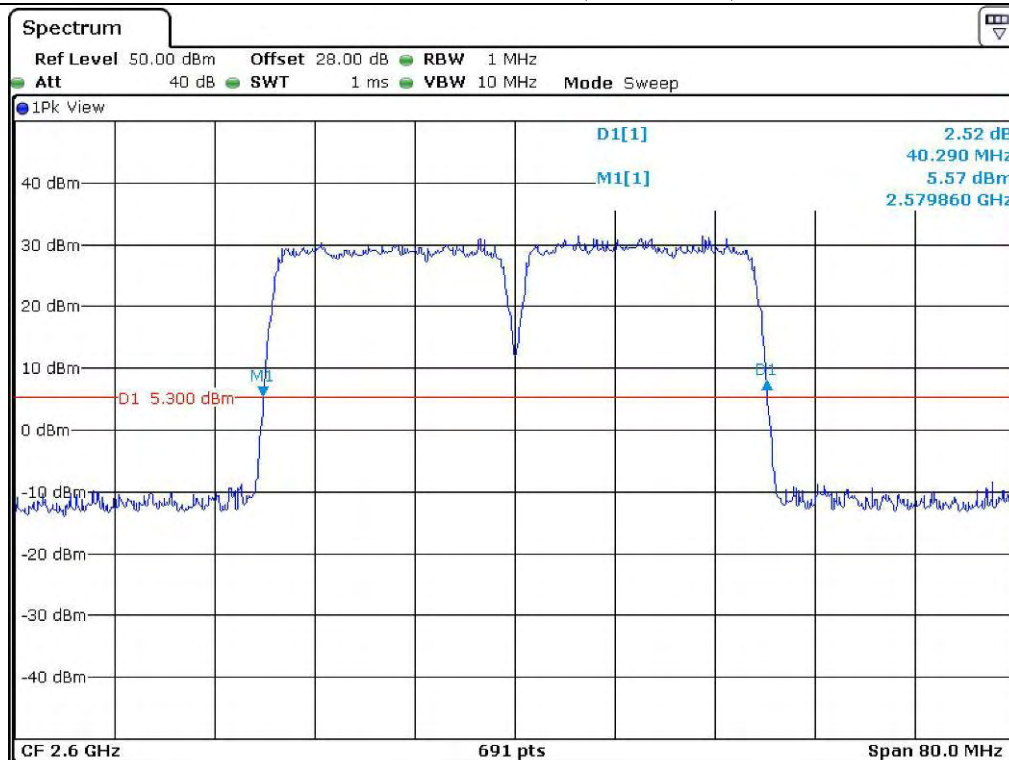


64 QAM – 26 dB Bandwidth (Middle Channel)

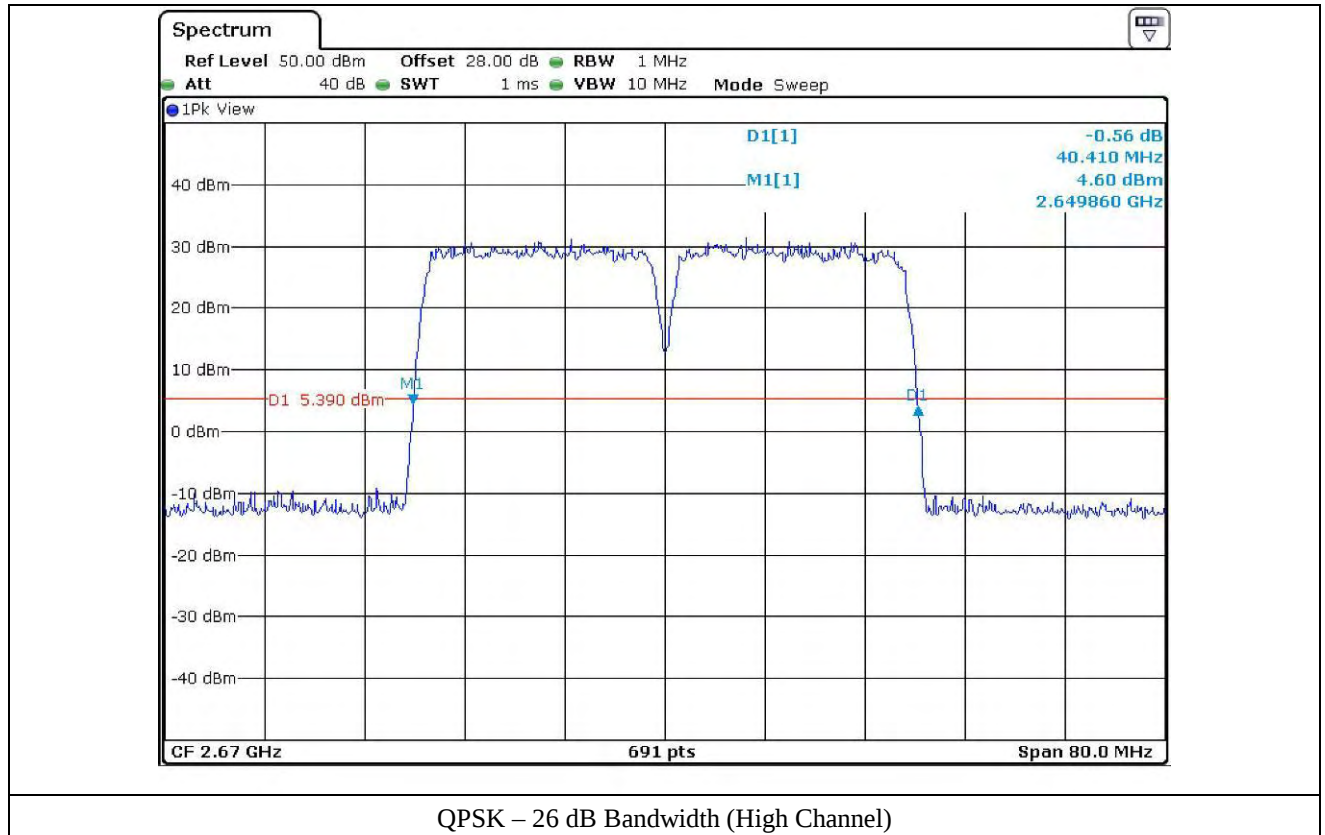


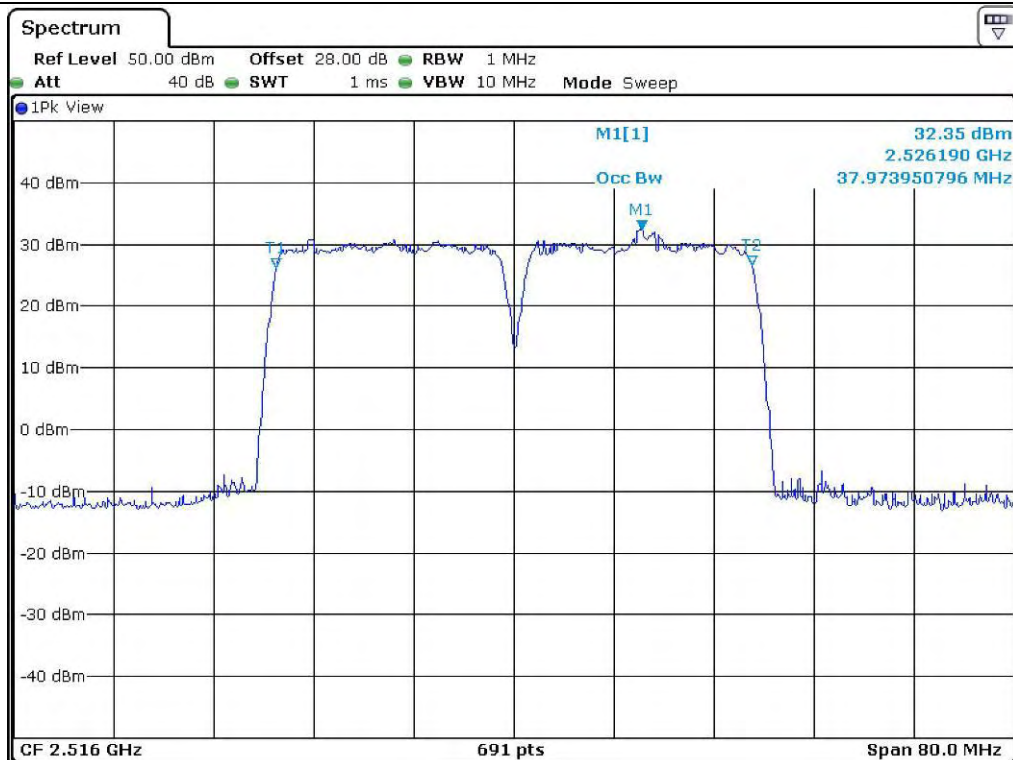


QPSK – 26 dB Bandwidth (Low Channel)

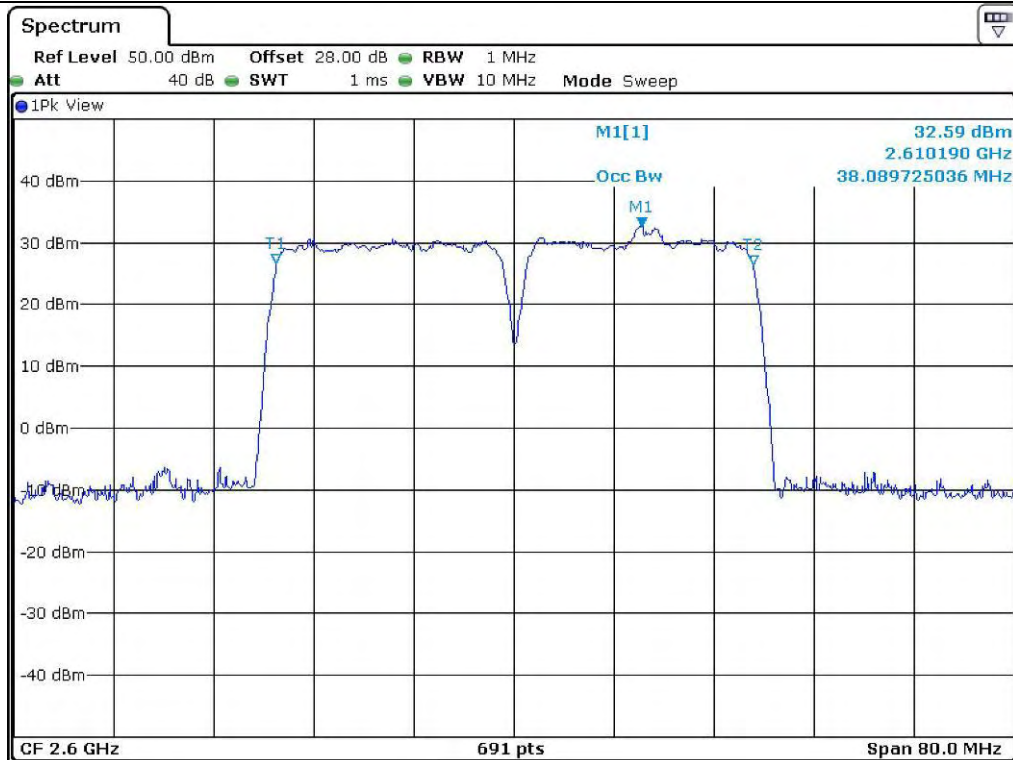


QPSK – 26 dB Bandwidth (Middle Channel)

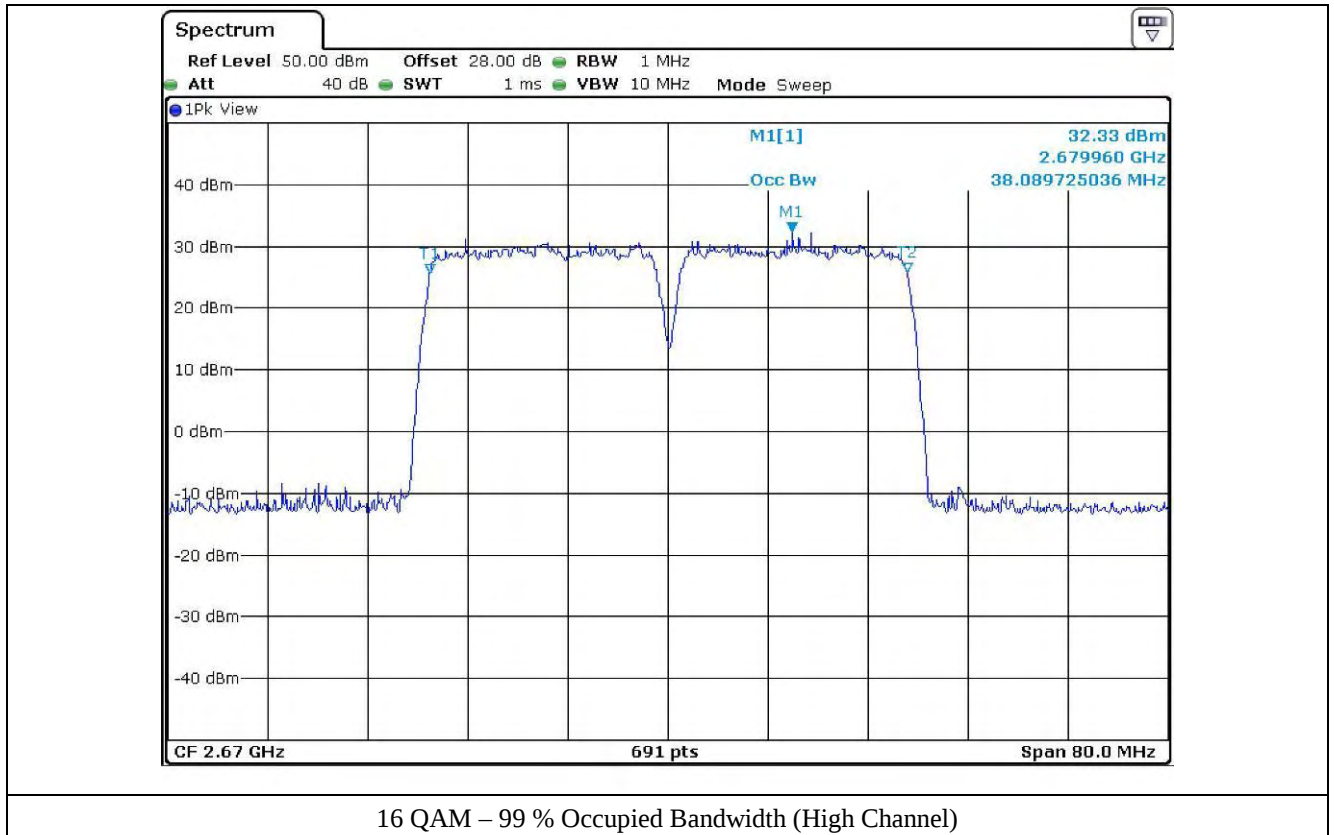


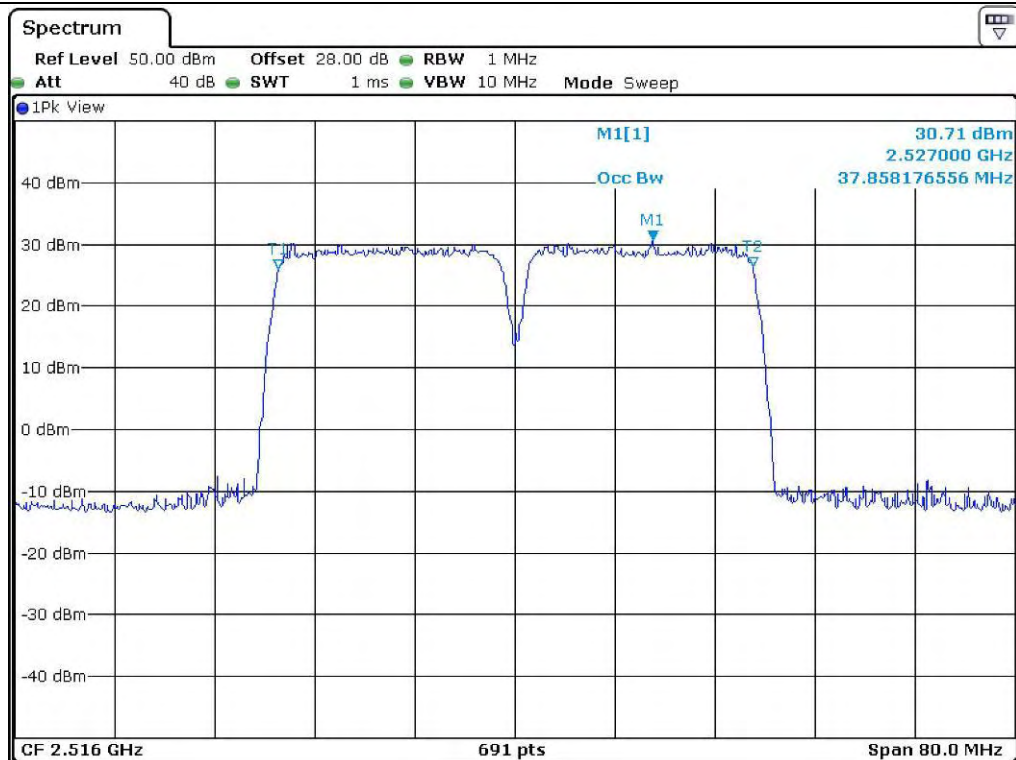


16 QAM – 99 % Occupied Bandwidth (Low Channel)

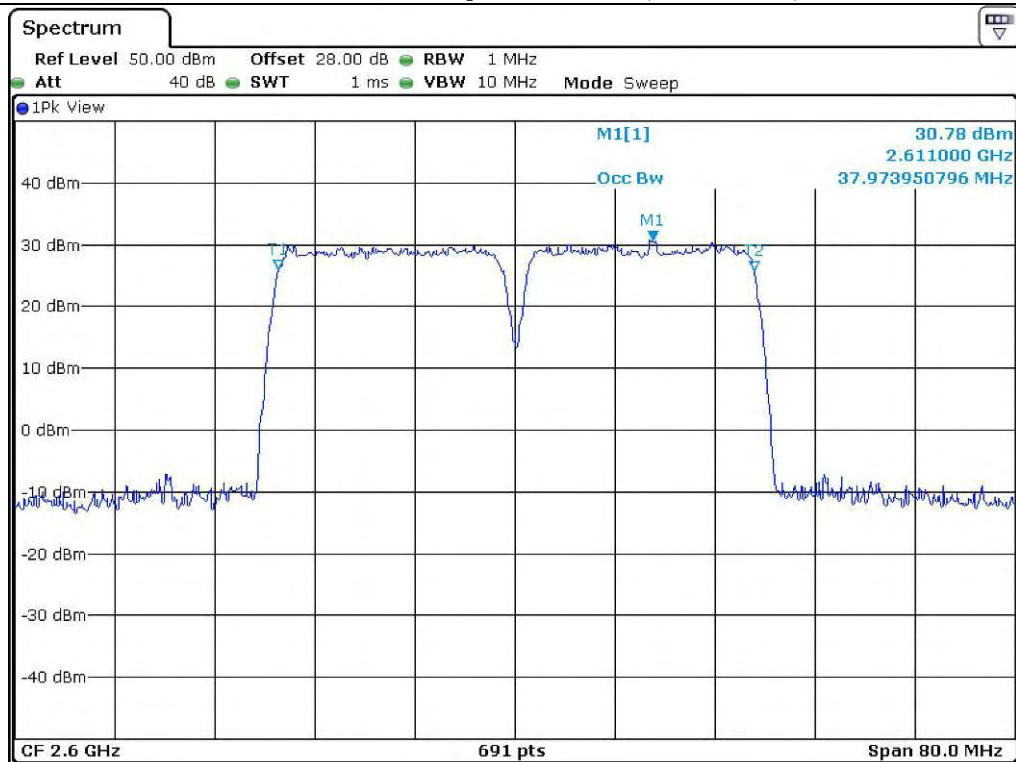


16 QAM – 99 % Occupied Bandwidth (Middle Channel)

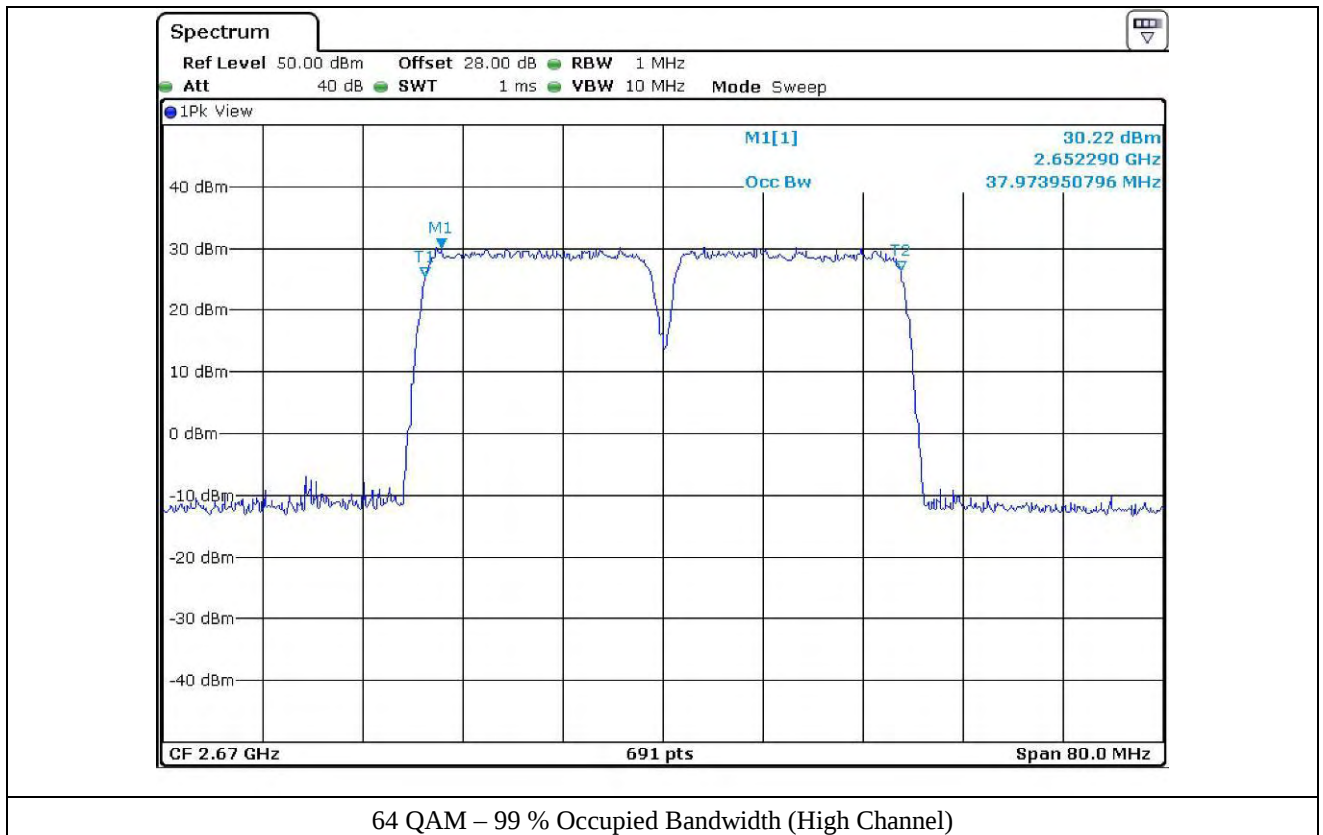


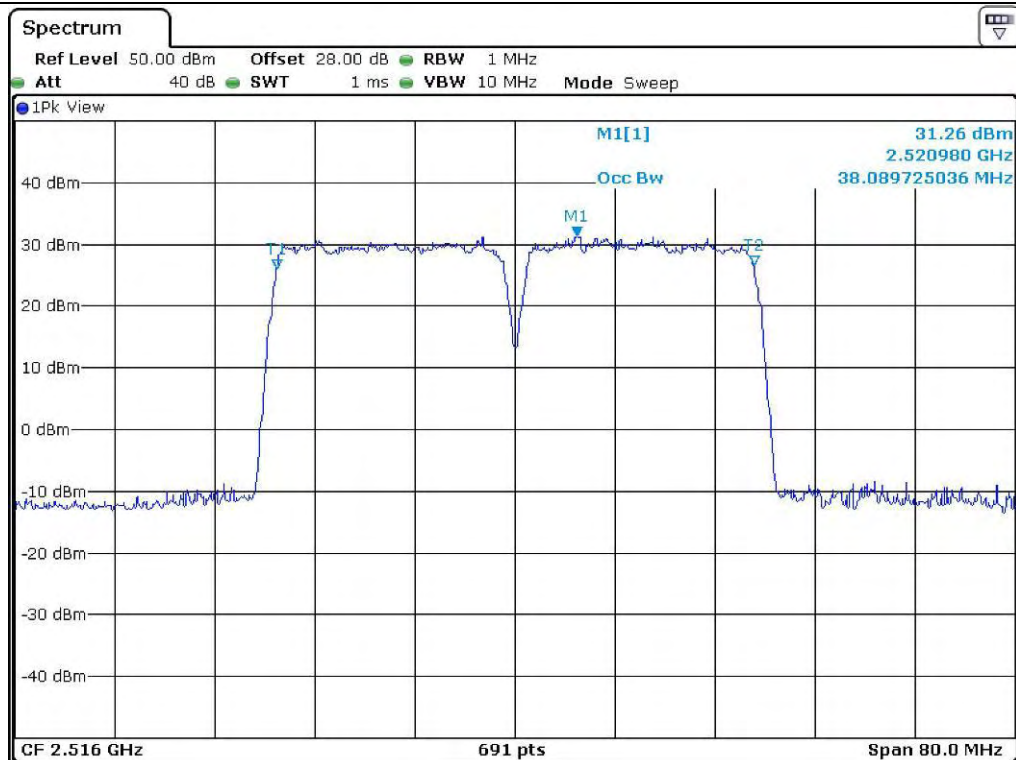


64 QAM – 99 % Occupied Bandwidth (Low Channel)

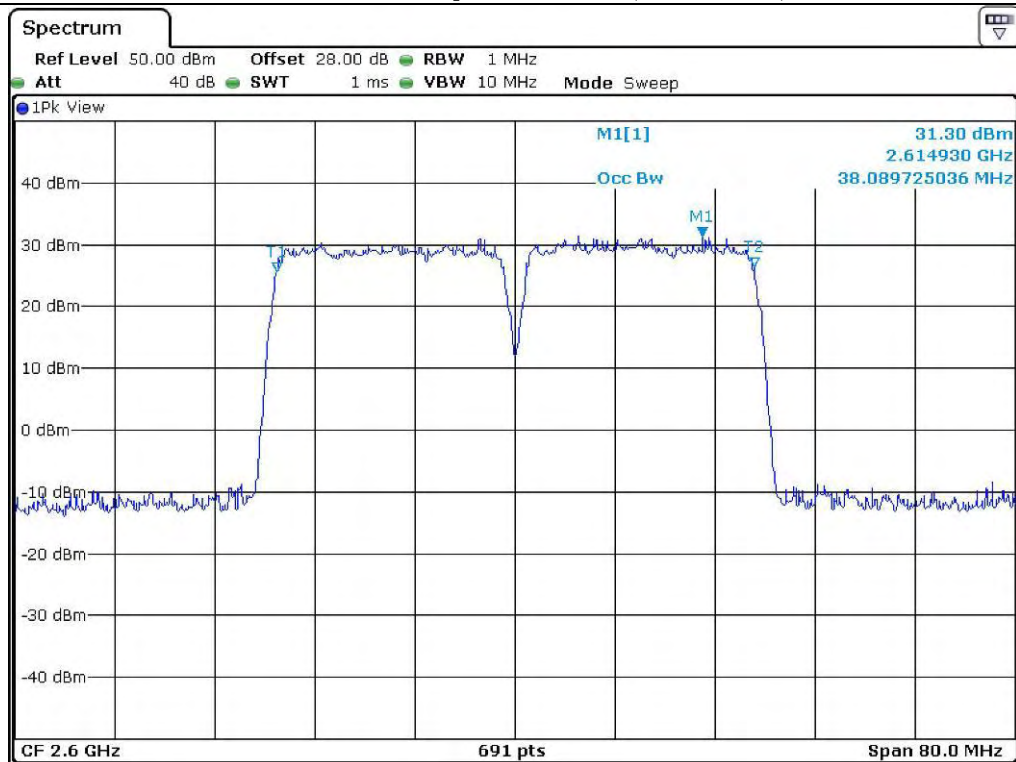


64 QAM – 99 % Occupied Bandwidth (Middle Channel)

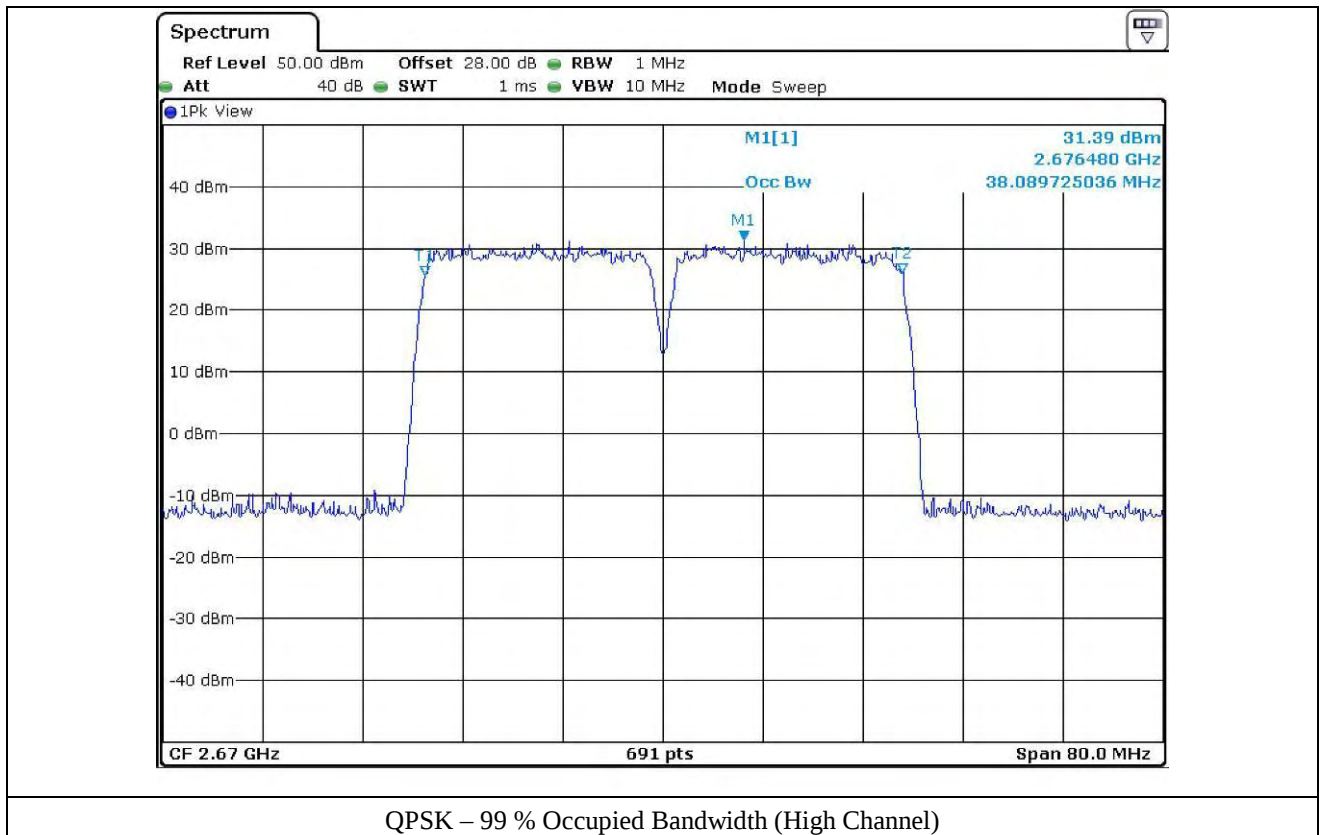




QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



6.5.3 Test Result (20 MHz/3 Carrier)

-. Test Date : July 31, 2014

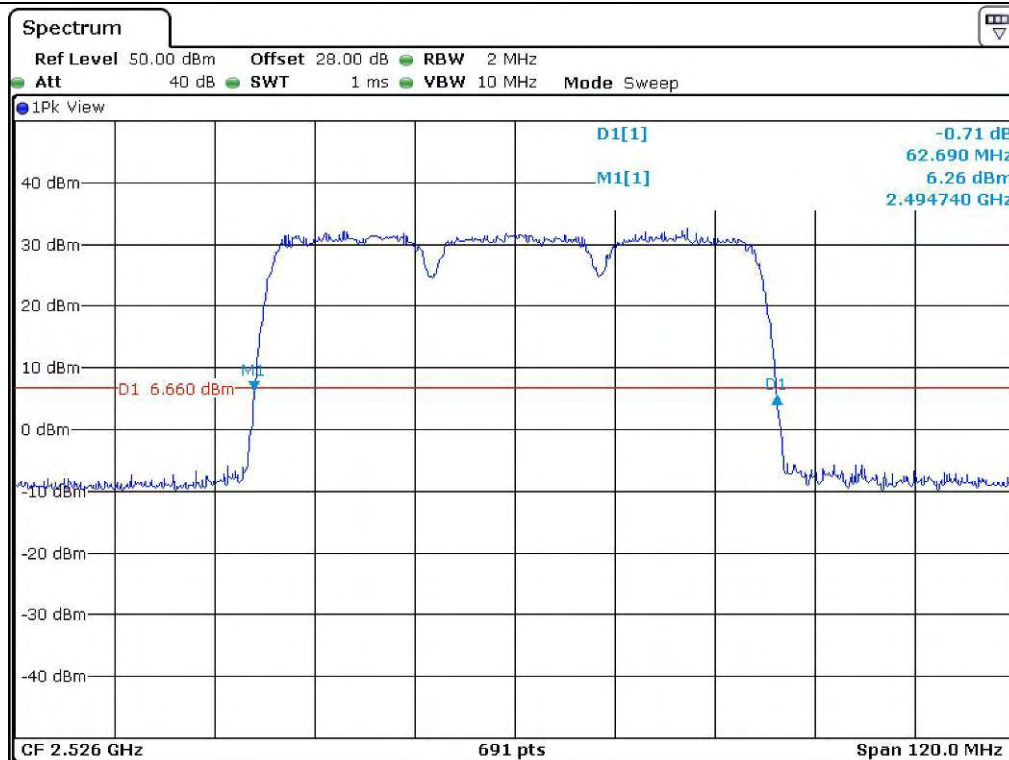
-. Test Result : Pass

Modulation	Channel	26 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)
16 QAM	Low	62.700	58.400
	Middle	62.700	58.500
	High	62.700	58.200
64 QAM	Low	62.500	58.200
	Middle	62.500	58.200
	High	62.300	58.200
QPSK	Low	62.500	58.400
	Middle	62.700	58.400
	High	62.700	58.400

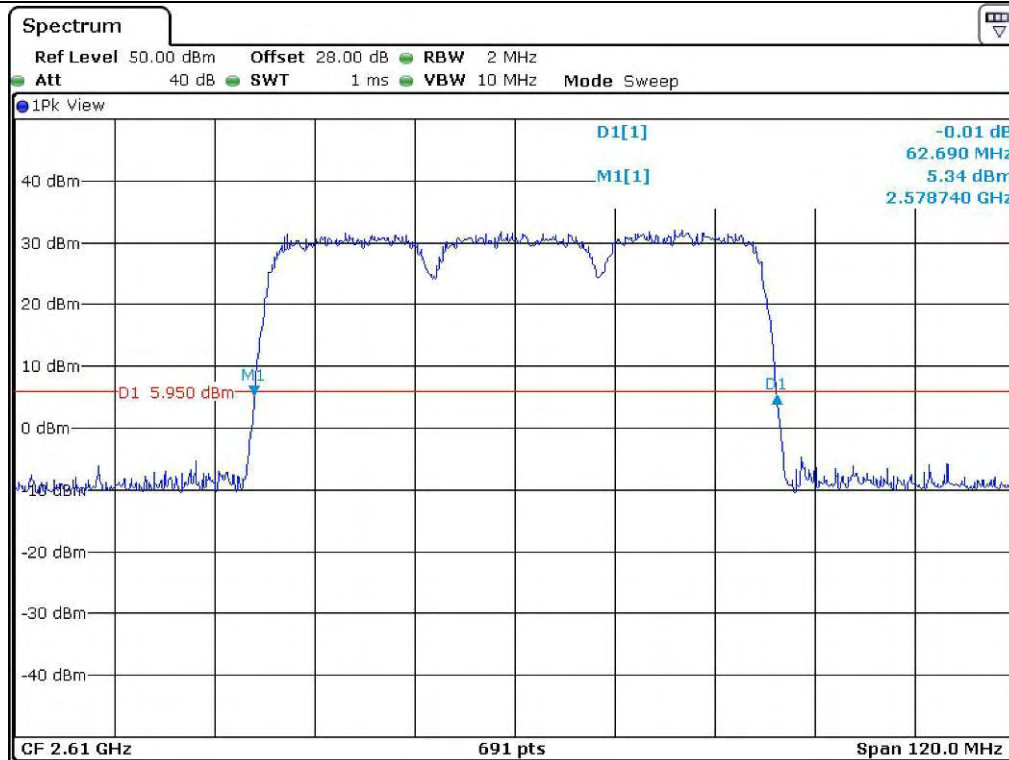
Remark: According to above result, the carrier frequency shall be within the frequency block edges.



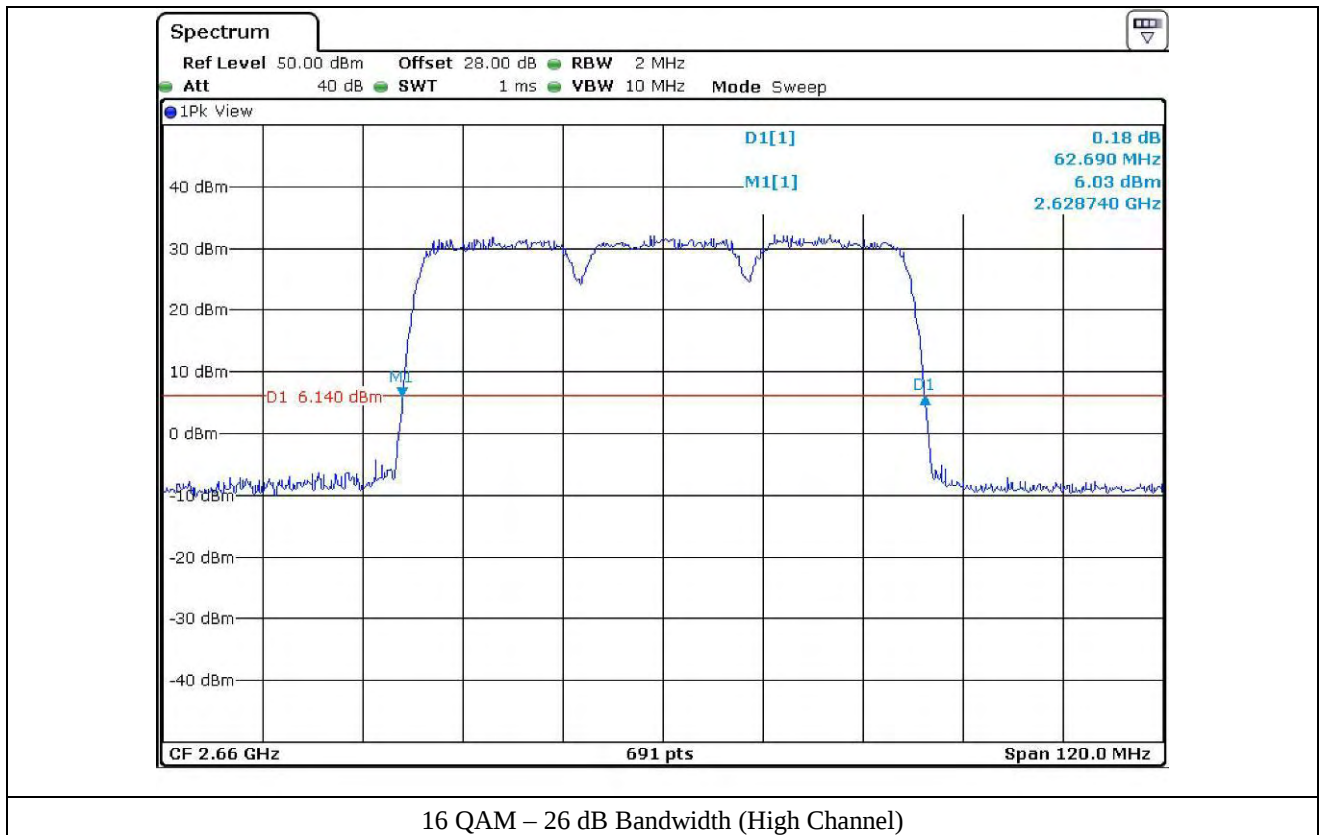
Tested by: Tae-Ho, Kim / Project Engineer

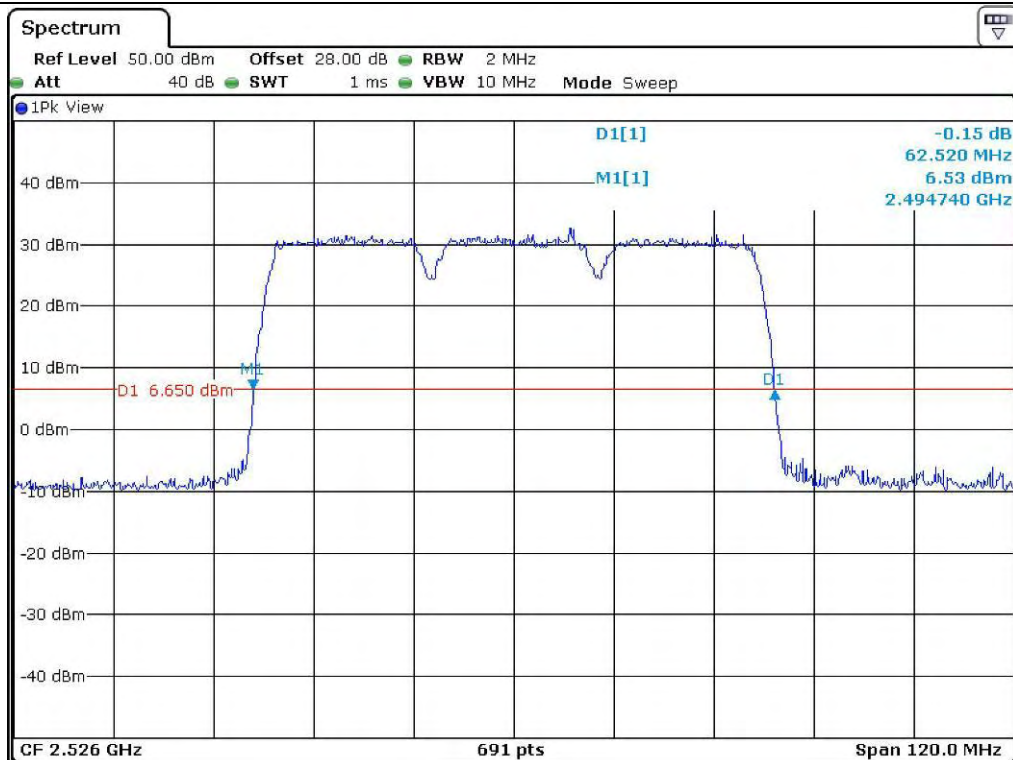


16 QAM – 26 dB Bandwidth (Low Channel)

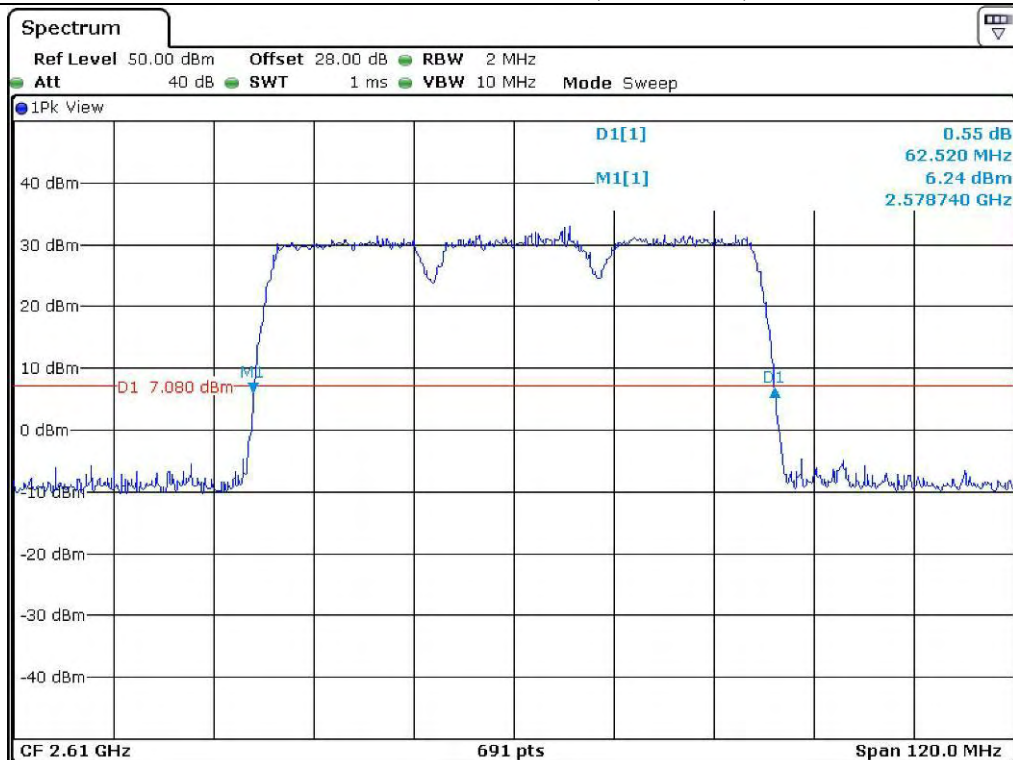


16 QAM – 26 dB Bandwidth (Middle Channel)

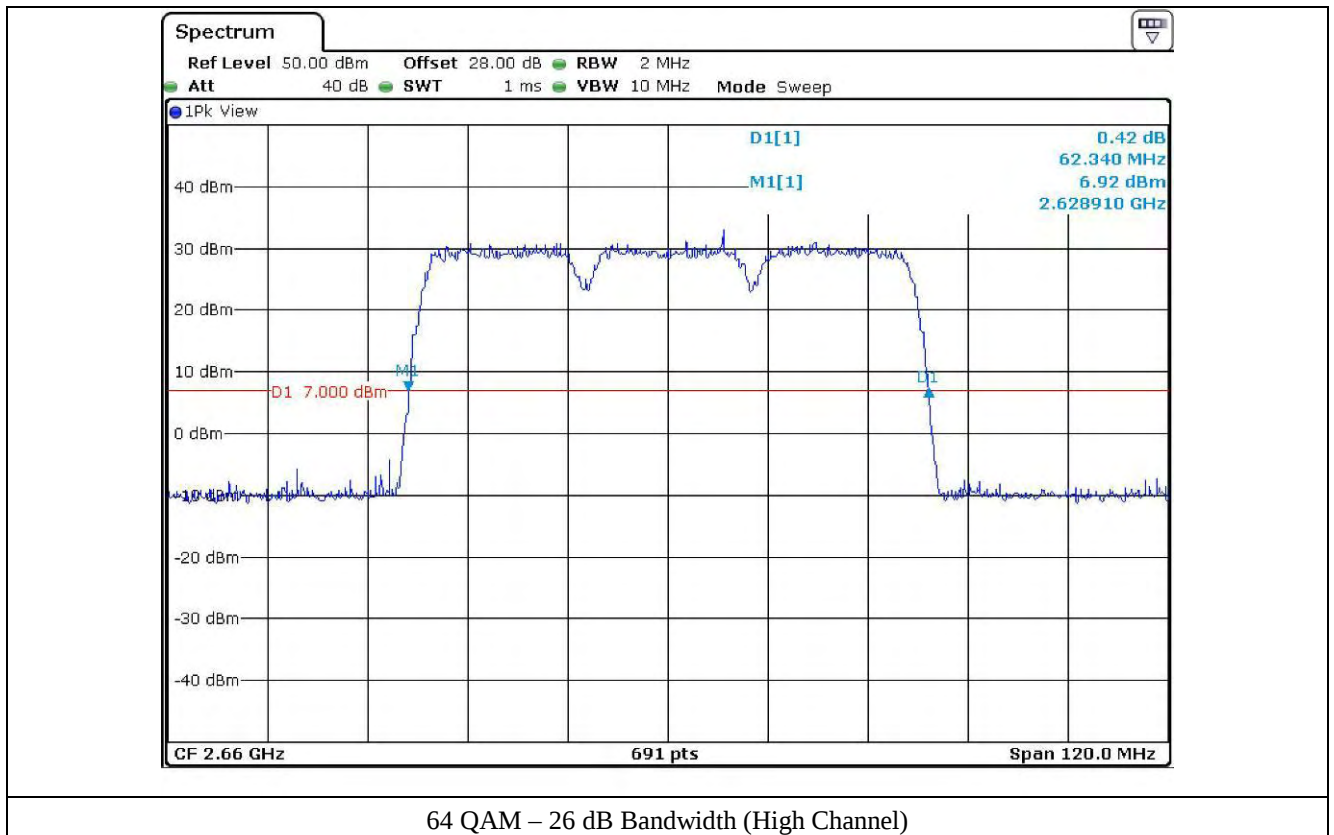


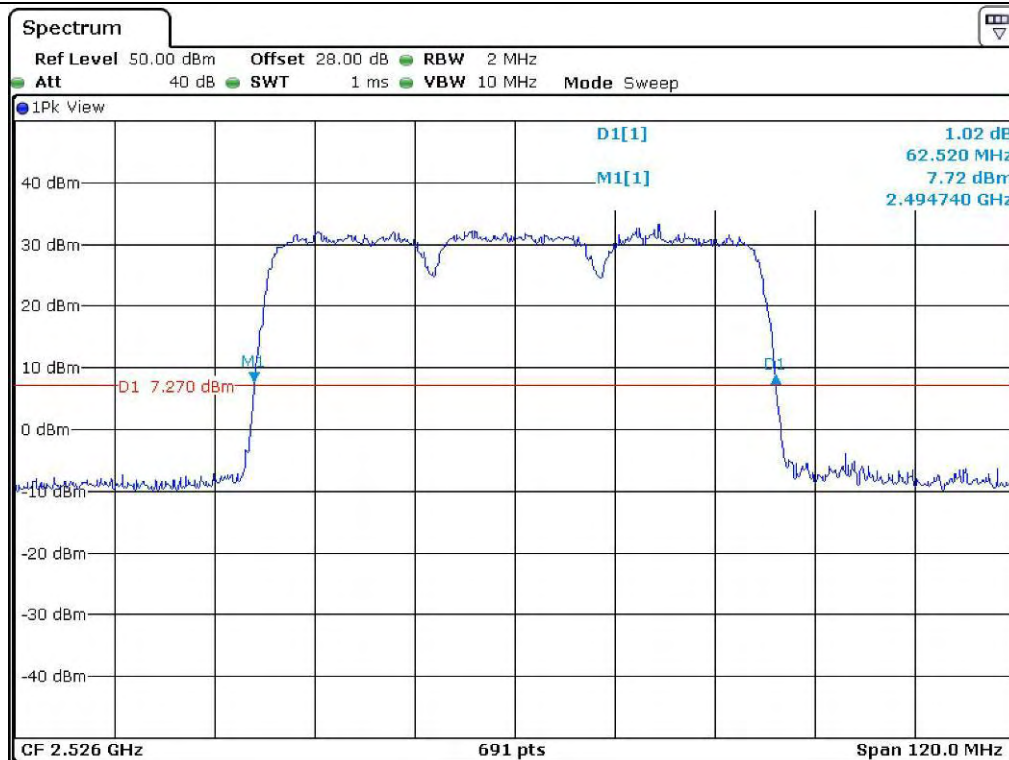


64 QAM – 26 dB Bandwidth (Low Channel)

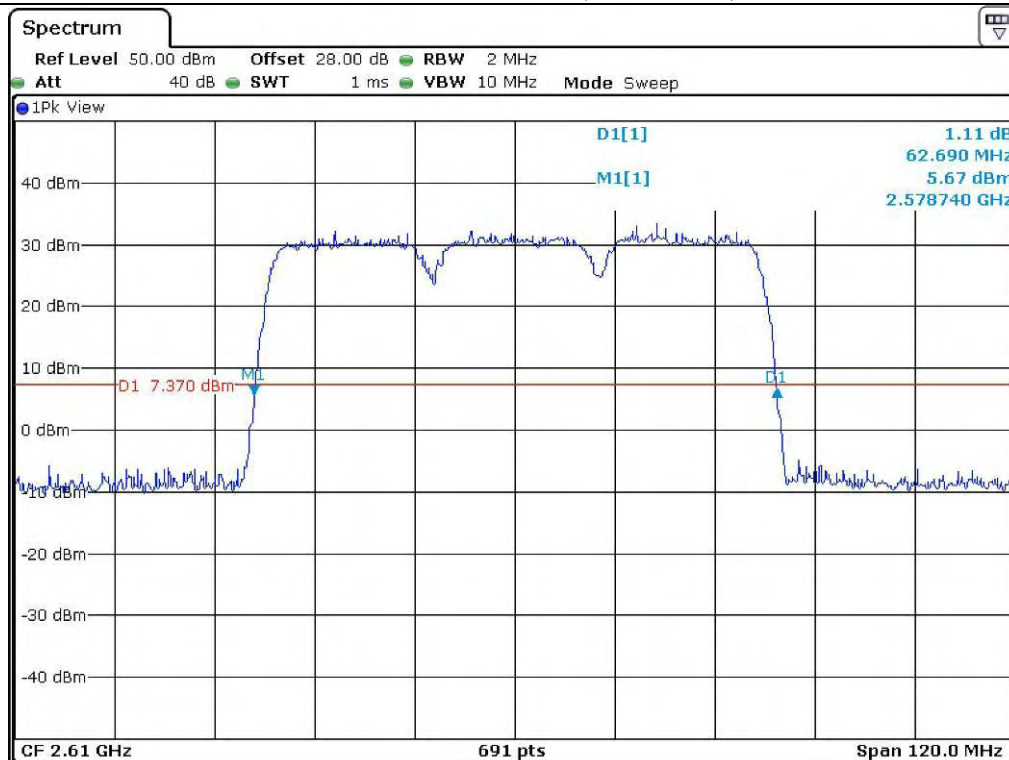


64 QAM – 26 dB Bandwidth (Middle Channel)

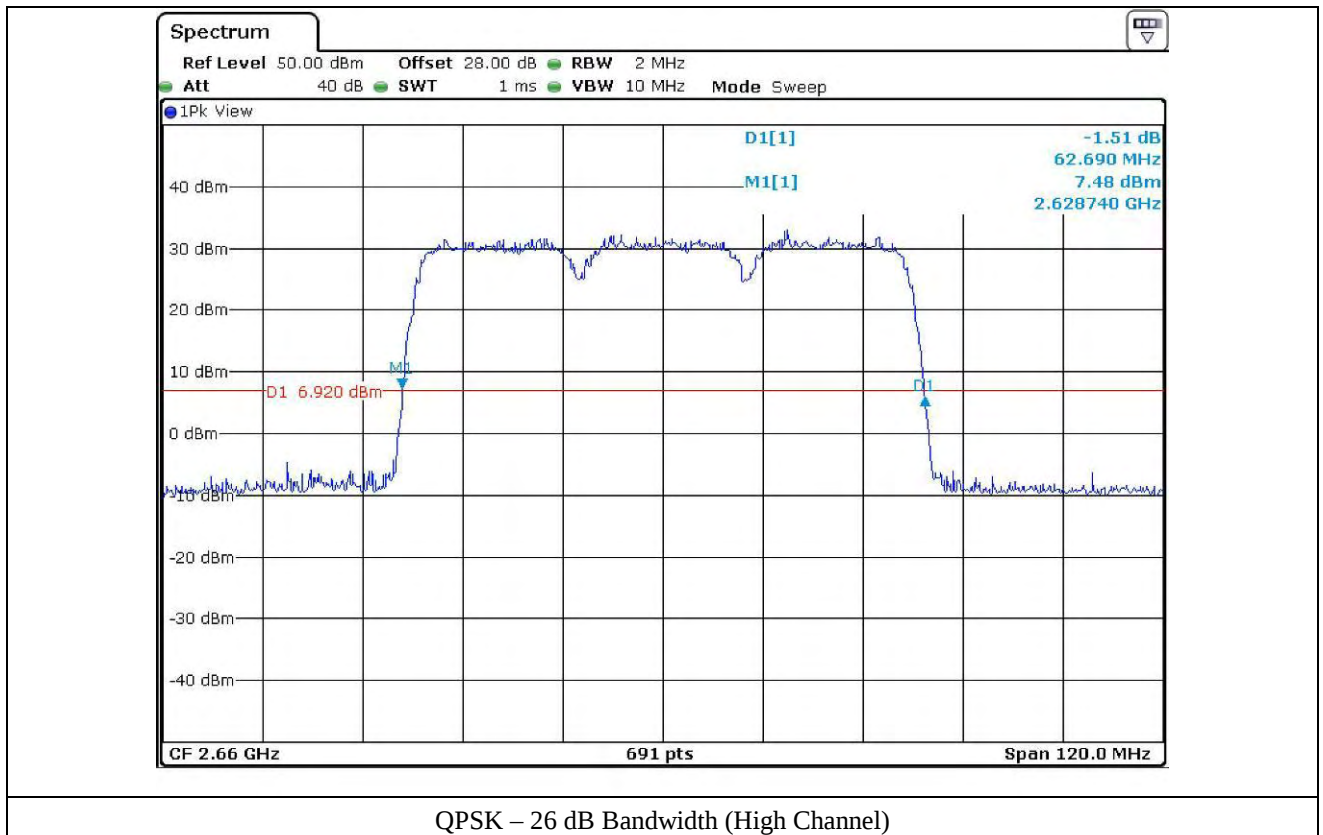


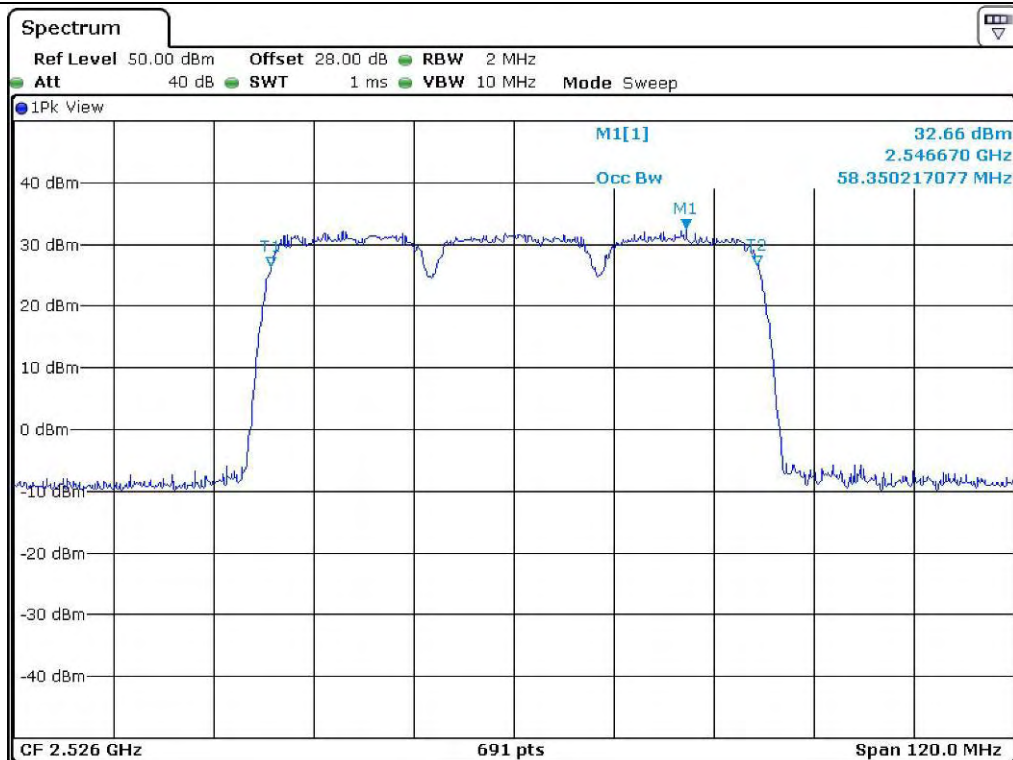


QPSK – 26 dB Bandwidth (Low Channel)

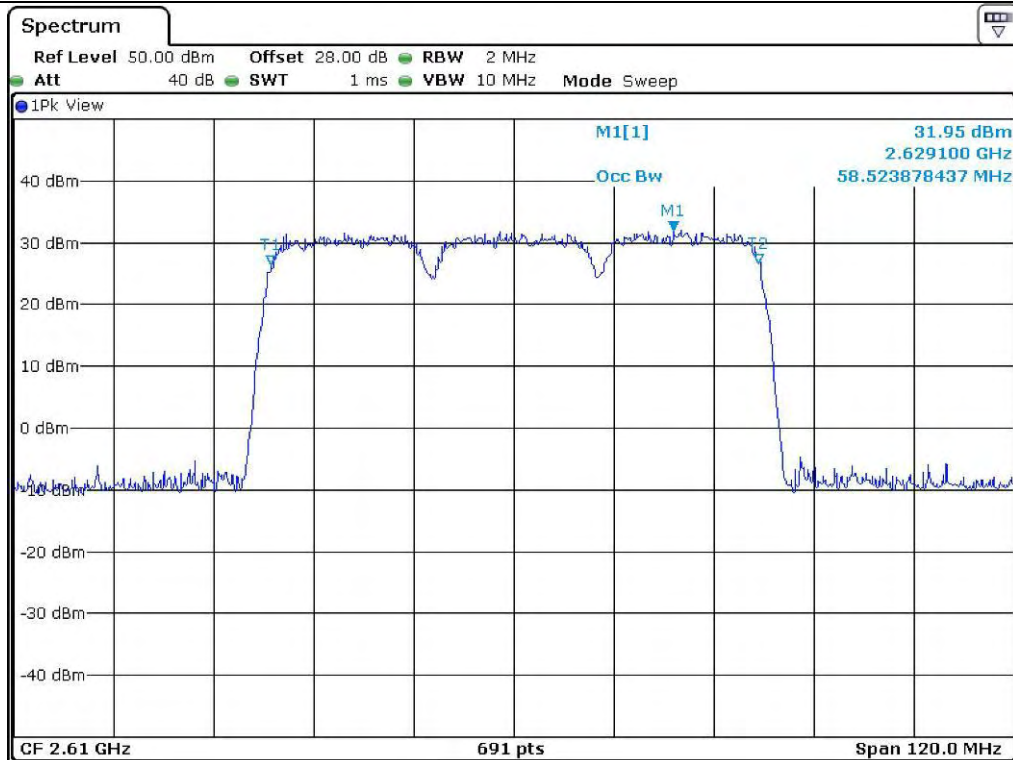


QPSK – 26 dB Bandwidth (Middle Channel)

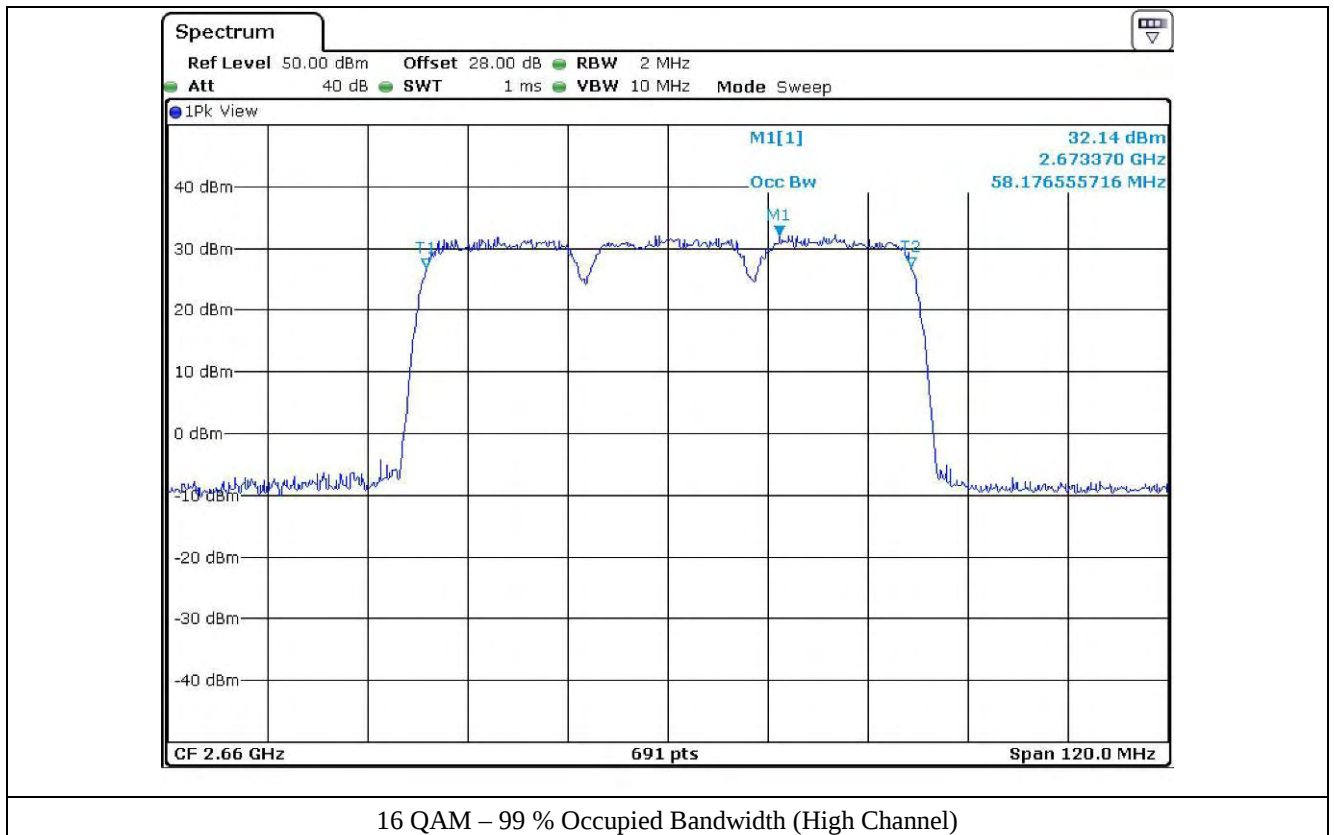


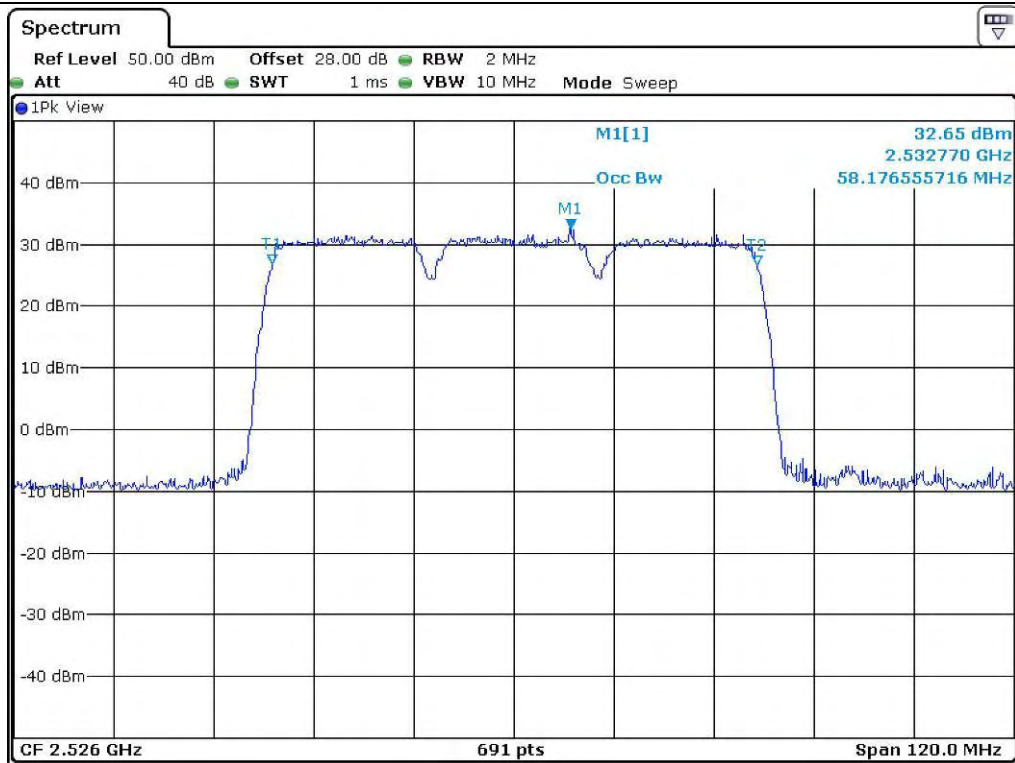


16 QAM – 99 % Occupied Bandwidth (Low Channel)

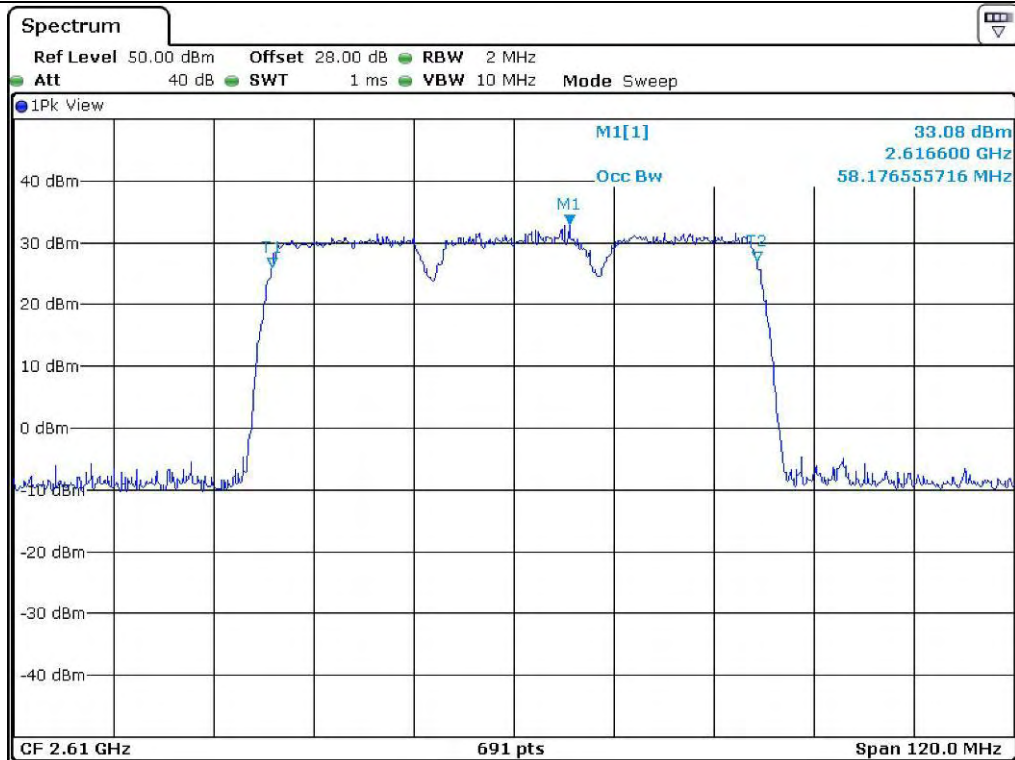


16 QAM – 99 % Occupied Bandwidth (Middle Channel)

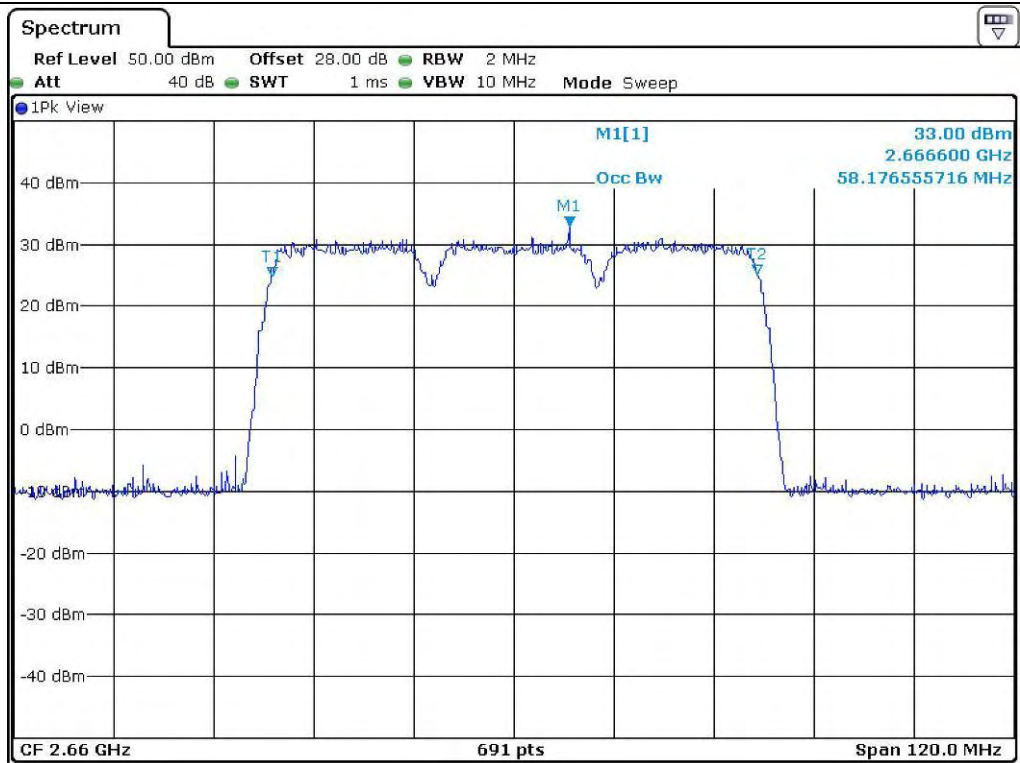




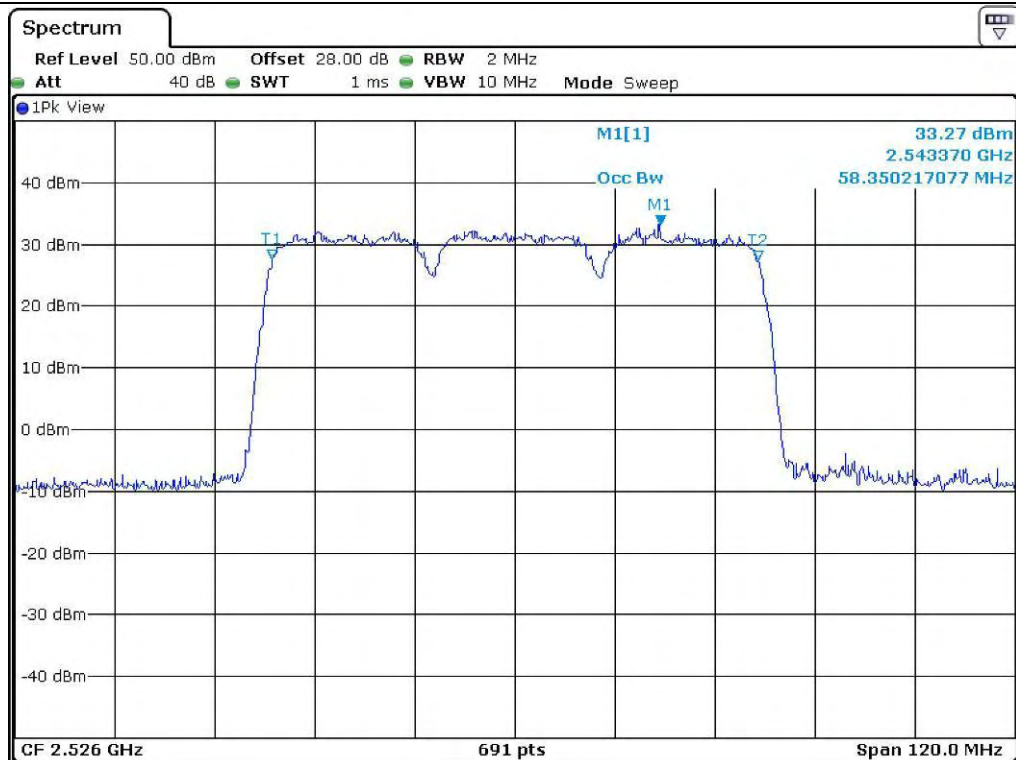
64 QAM – 99 % Occupied Bandwidth (Low Channel)



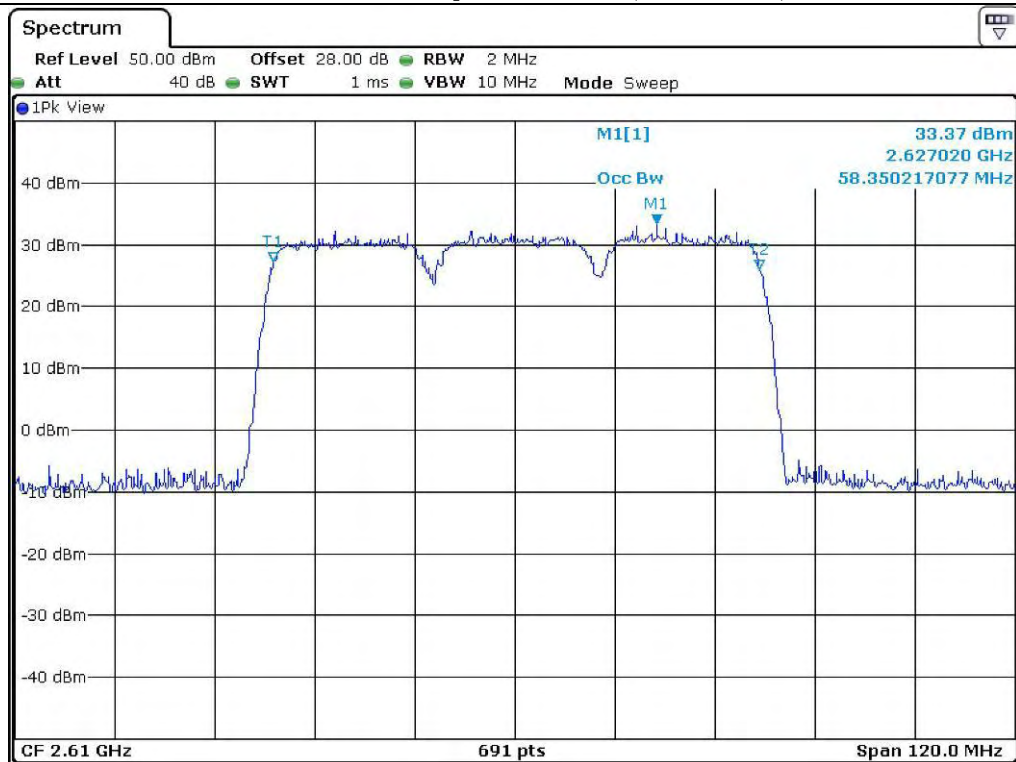
64 QAM – 99 % Occupied Bandwidth (Middle Channel)



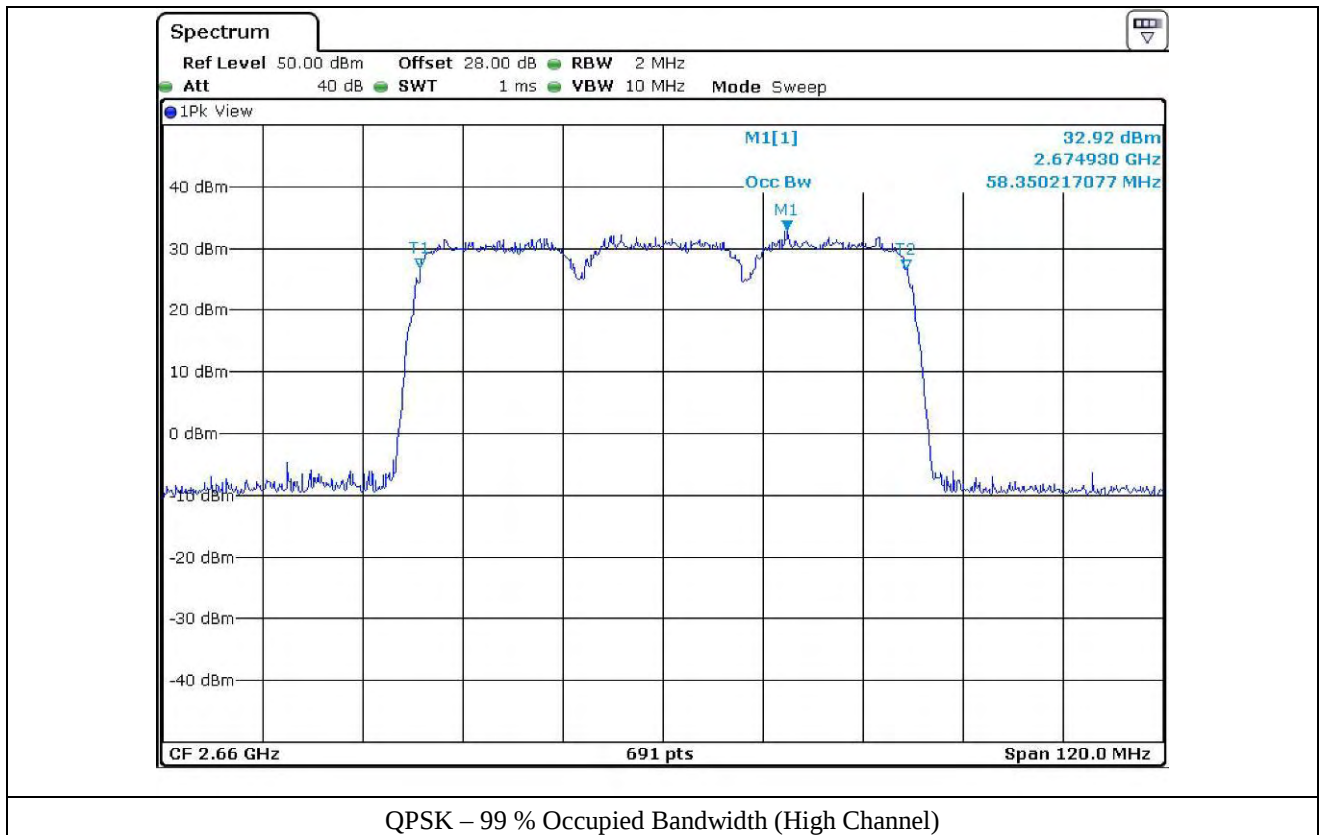
64 QAM – 99 % Occupied Bandwidth (High Channel)



QPSK – 99 % Occupied Bandwidth (Low Channel)



QPSK – 99 % Occupied Bandwidth (Middle Channel)



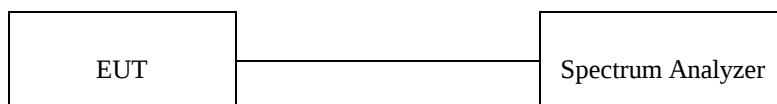
7. SPURIOUS EMISSION AT ANTENNA TERMINAL

7.1 Operating environment

Temperature : 24 °C
Relative humidity : 47 % R.H.

7.2 Test set-up for conducted measurement

The test was performed at three frequencies (low, middle, and high channels) at each band using all applicable modulation. The resolution bandwidth and video bandwidth of the spectrum analyzer was set at 1 MHz and sufficient scans were taken to show any out of band emissions up to 27.5 GHz.



7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV30	R/S	Signal Analyzer	101372	Apr. 28, 2014 (1Y)
■ -	67-30-43	Aeroflex/Weinschel, Inc.,	Attenuator	CA5760	Nov. 05, 2013 (1Y)
■ -	WA49-20-43	Weinschel Associates	Attenuator	A192	Apr. 04, 2014 (1Y)
■ -	DH-60	Dea Kwang Elec.	Slidacs	N/A	Sep. 03, 2013 (1Y)

All test equipment used is calibrated on a regular basis.

7.4 Test data for Port 0

7.4.1 Test Result (20 MHz/1 Carrier)

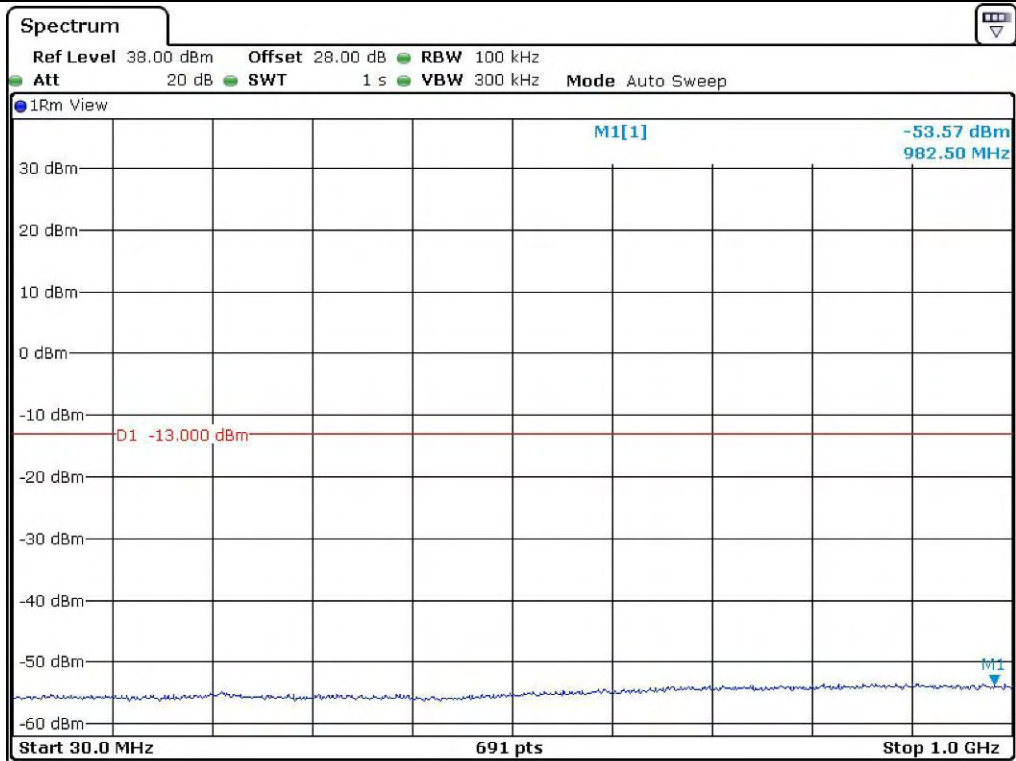
-. Test Date : July 31, 2014
-. Frequency range : 30 MHz ~ 27.5 GHz
-. Result : Pass

Modulation	Harmonic Frequency (MHz)		Measured Value (dBm)	Cable Loss (dB)	Total (dBm)	Limit (dBm)	Margin (dB)
16 QAM	Low	982.50	-53.57	0.30	-53.27	-13.00	40.27
		1 9581.00	-33.63	2.80	-30.83		17.83
	Middle	864.50	-53.13	0.20	-52.93		39.93
		1 9581.00	-33.56	2.80	-30.76		17.76
	High	894.00	-53.38	0.20	-53.18		40.18
		1 9581.00	-33.61	2.80	-30.81		17.81
64 QAM	Low	885.60	-53.43	0.20	-53.23	-13.00	40.23
		1 9618.00	-33.61	2.80	-30.81		17.81
	Middle	995.10	-53.55	0.30	-53.25		40.25
		1 9618.00	-33.59	2.80	-30.79		17.79
	High	972.60	-53.49	0.30	-53.19		40.19
		1 9581.00	-33.52	2.80	-30.72		17.72
QPSK	Low	870.20	-53.41	0.20	-53.21	-13.00	40.21
		1 9581.00	-33.58	2.80	-30.78		17.78
	Middle	978.20	-53.24	0.30	-52.94		39.94
		1 9581.00	-33.51	2.80	-30.71		17.71
	High	814.00	-53.16	0.20	-52.96		39.96
		1 9581.00	-33.46	2.80	-30.66		17.66
Other frequencies up to 27.5 GHz have margin more than 20 dB.							

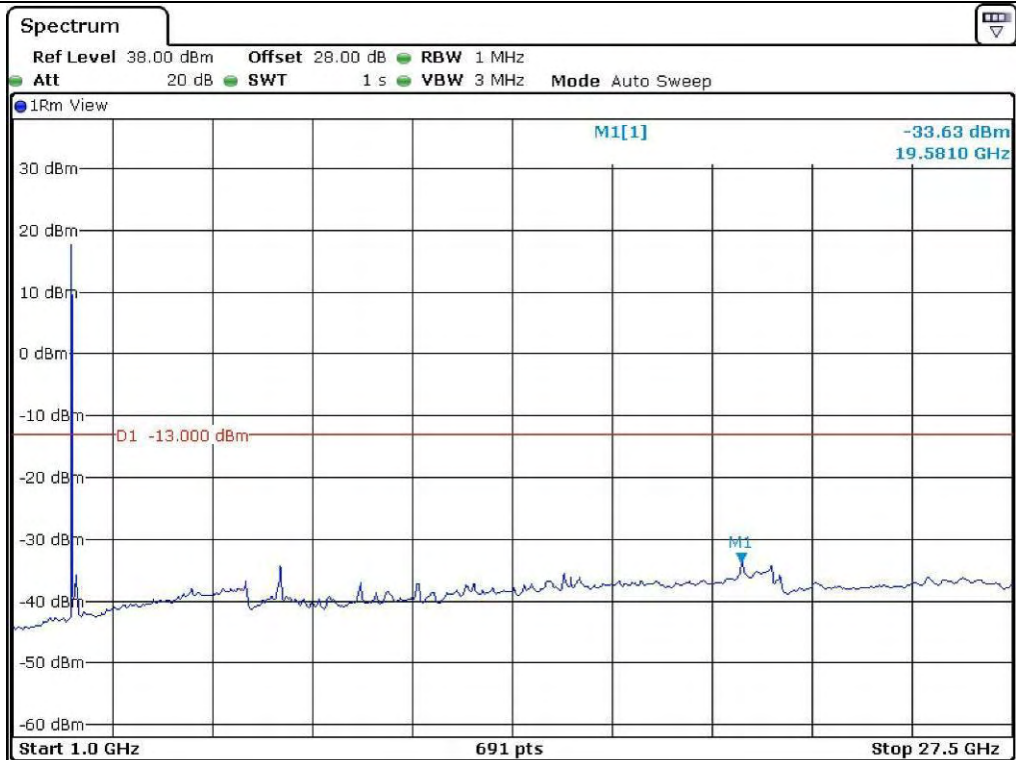
According to Part 27C, out of band emission shall be attenuated by $43 + 10 \log (P)$ dBc, equates to -13.0 dBm.



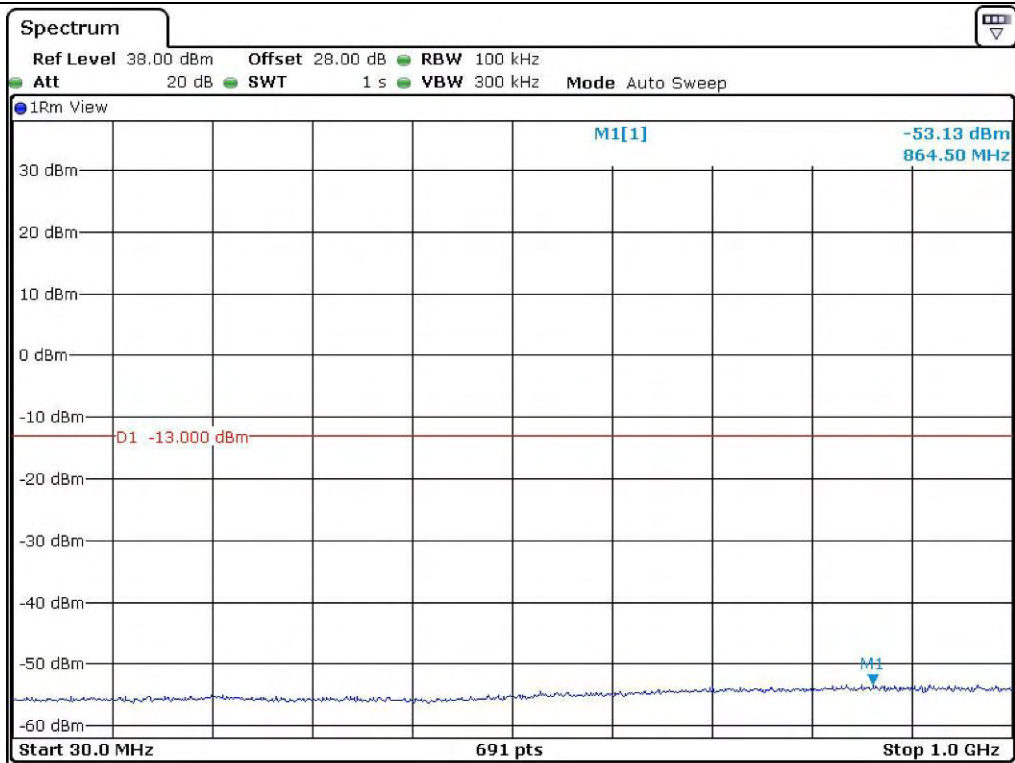
Tested by: Tae-Ho, Kim / Project Engineer



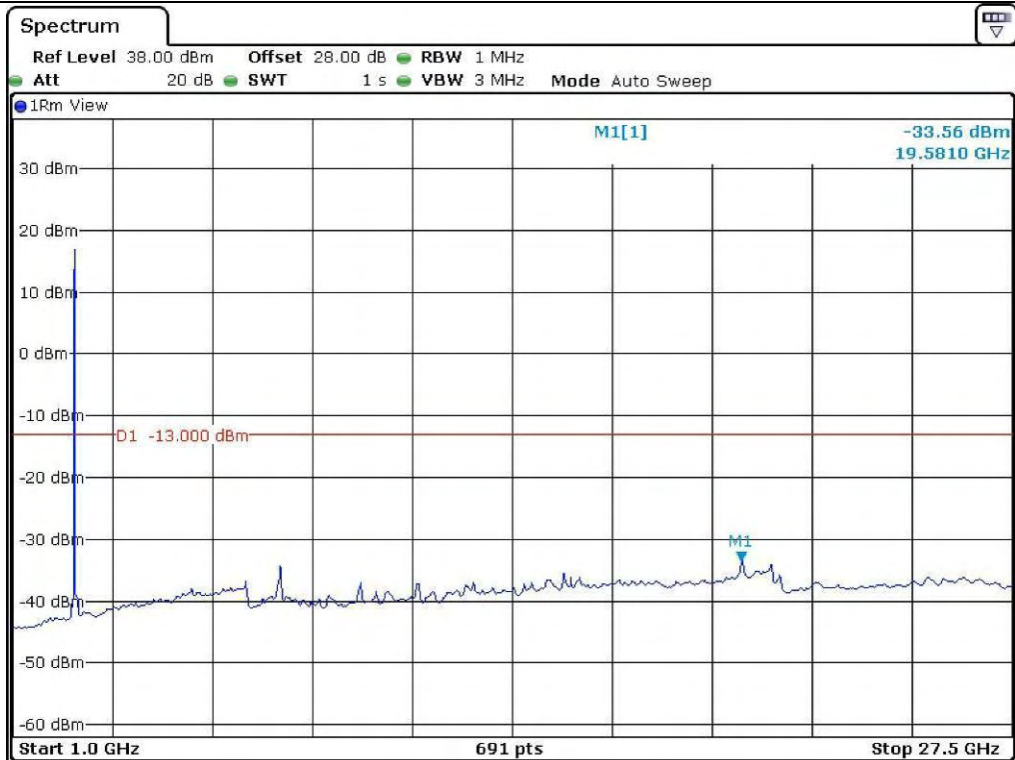
16 QAM – Low Channel



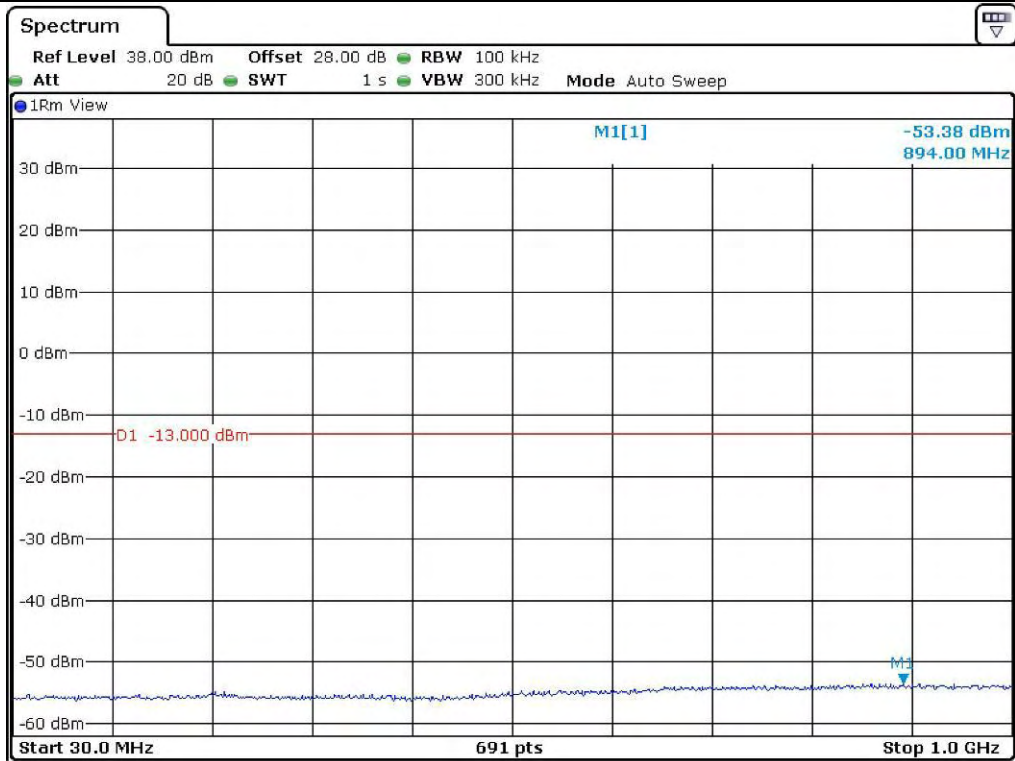
16 QAM – Low Channel



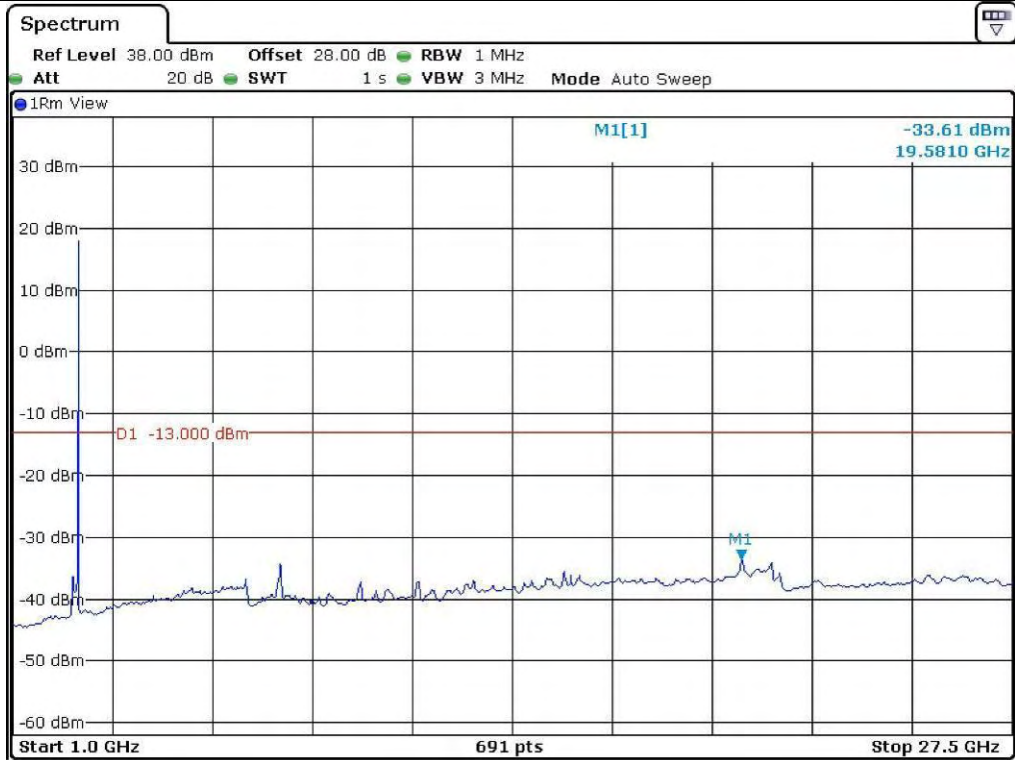
16 QAM – Middle Channel



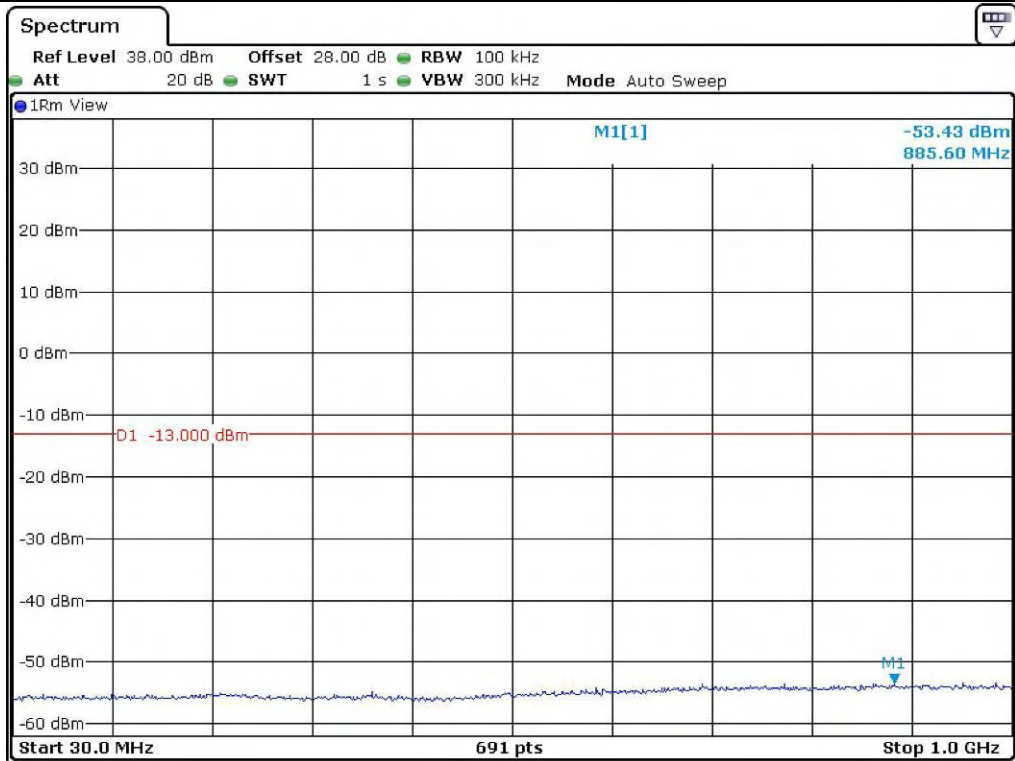
16 QAM – Middle Channel



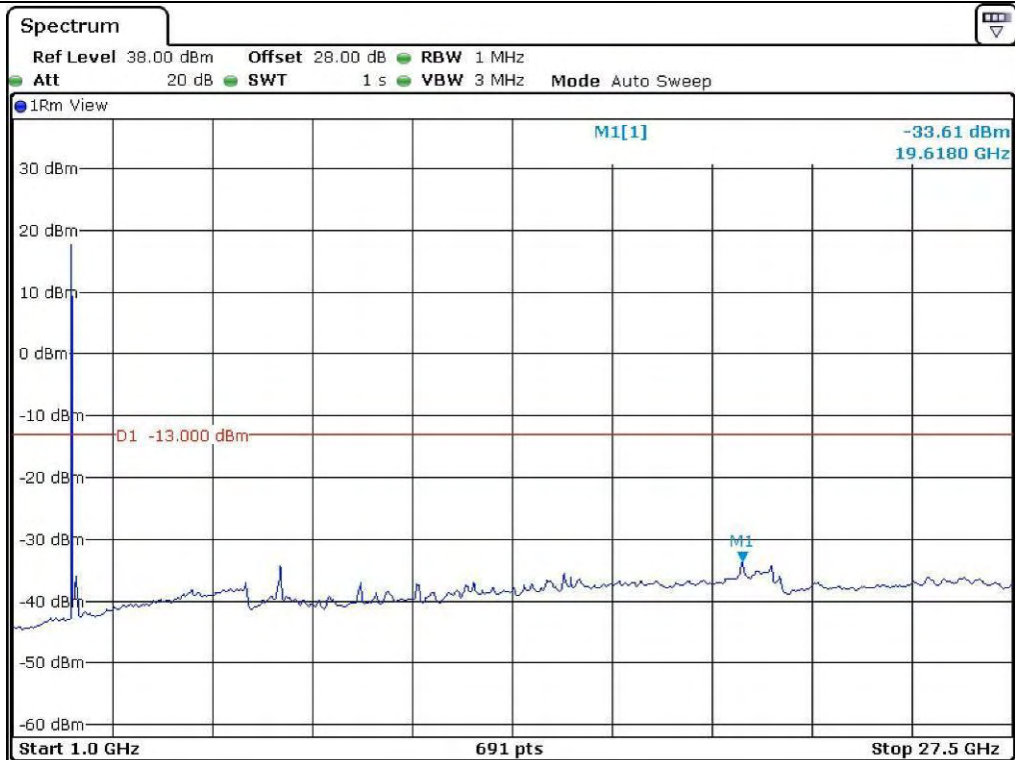
16 QAM – High Channel



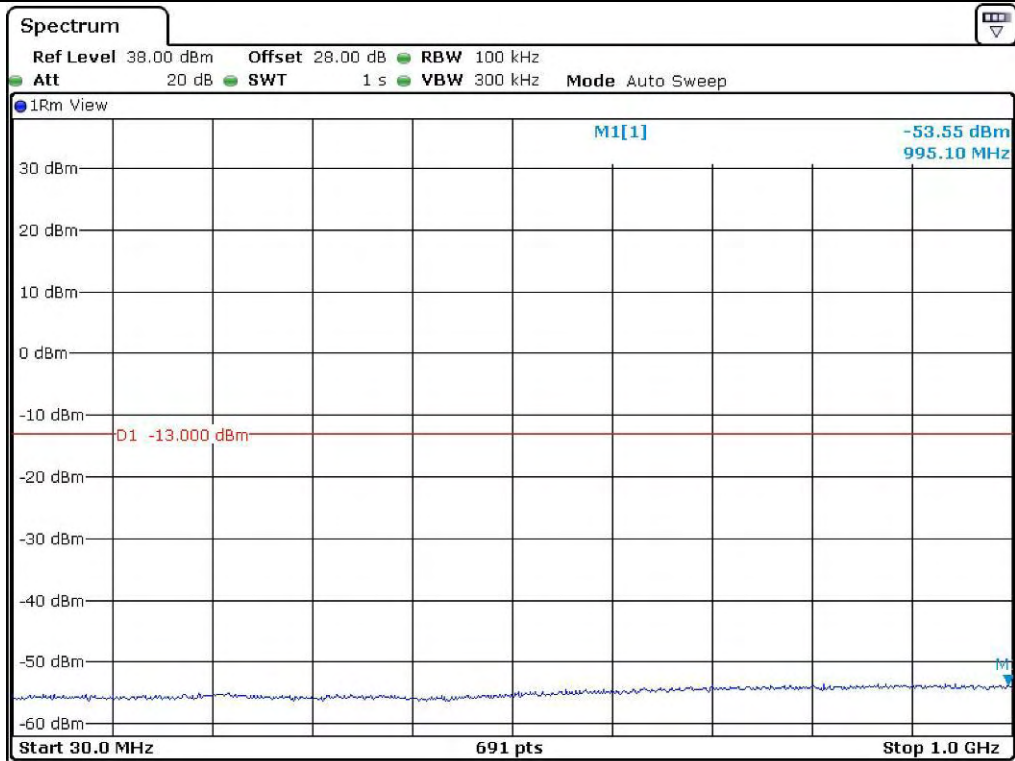
16 QAM – High Channel



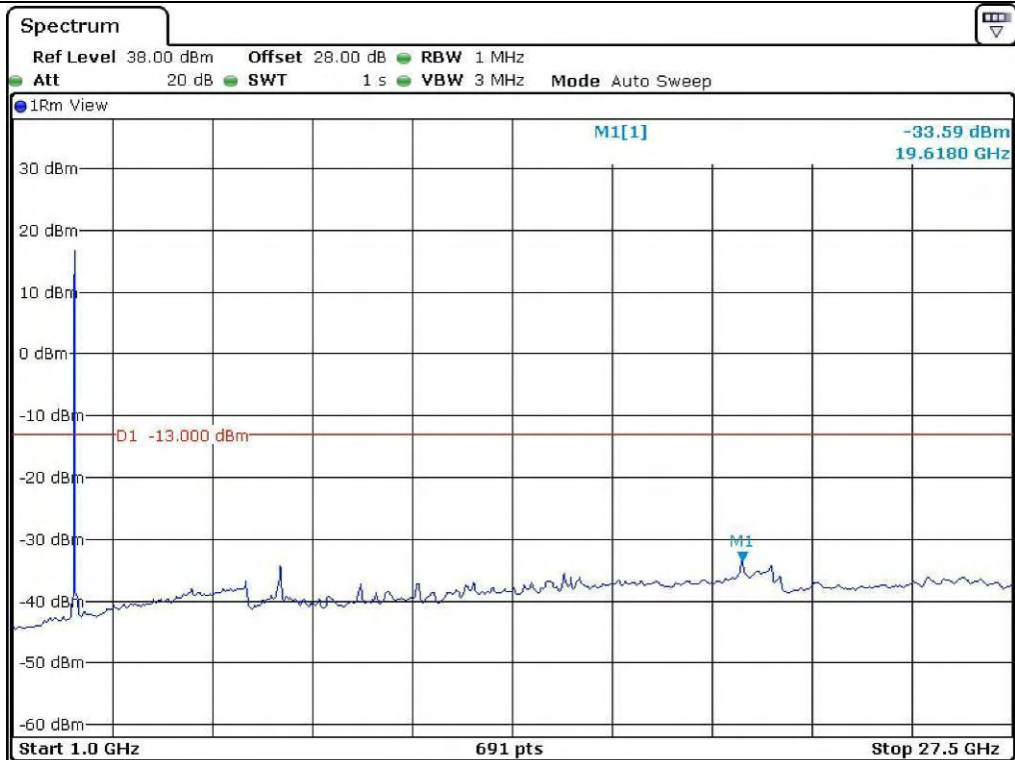
64 QAM – Low Channel



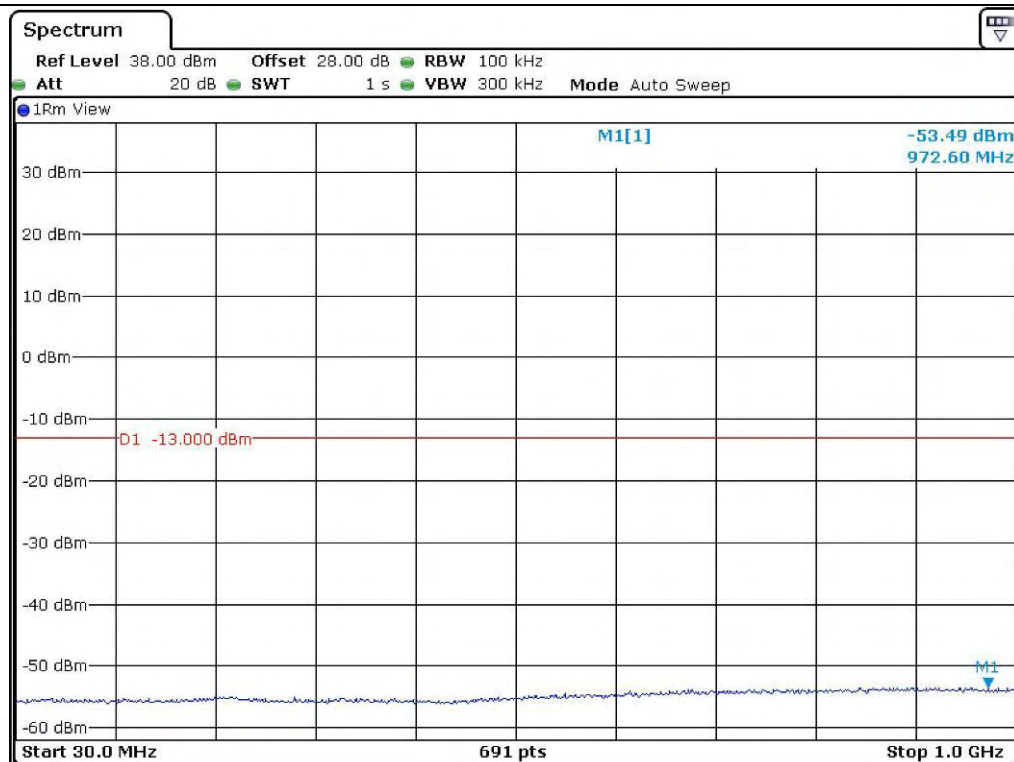
64 QAM – Low Channel



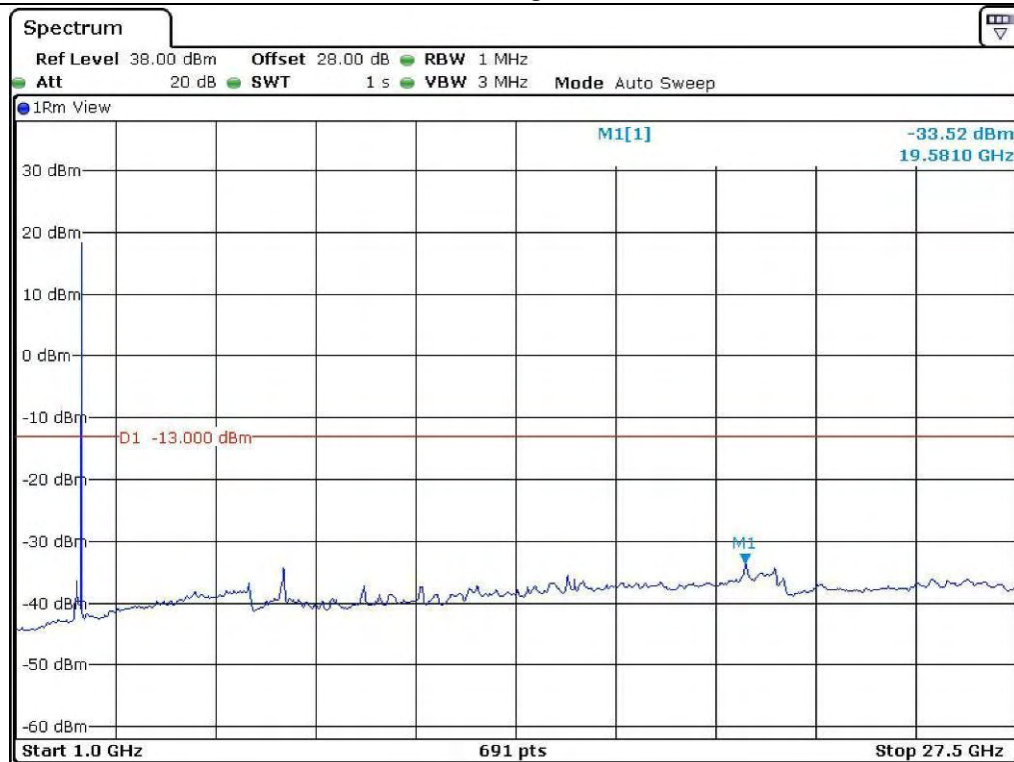
64 QAM – Middle Channel



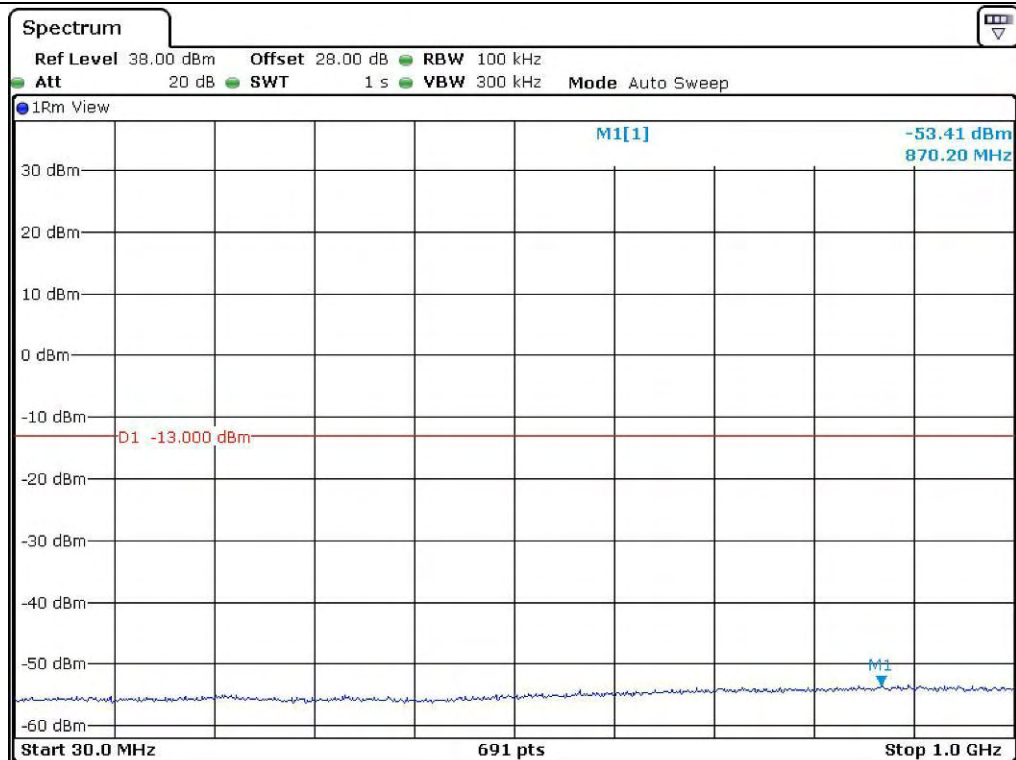
64 QAM – Middle Channel



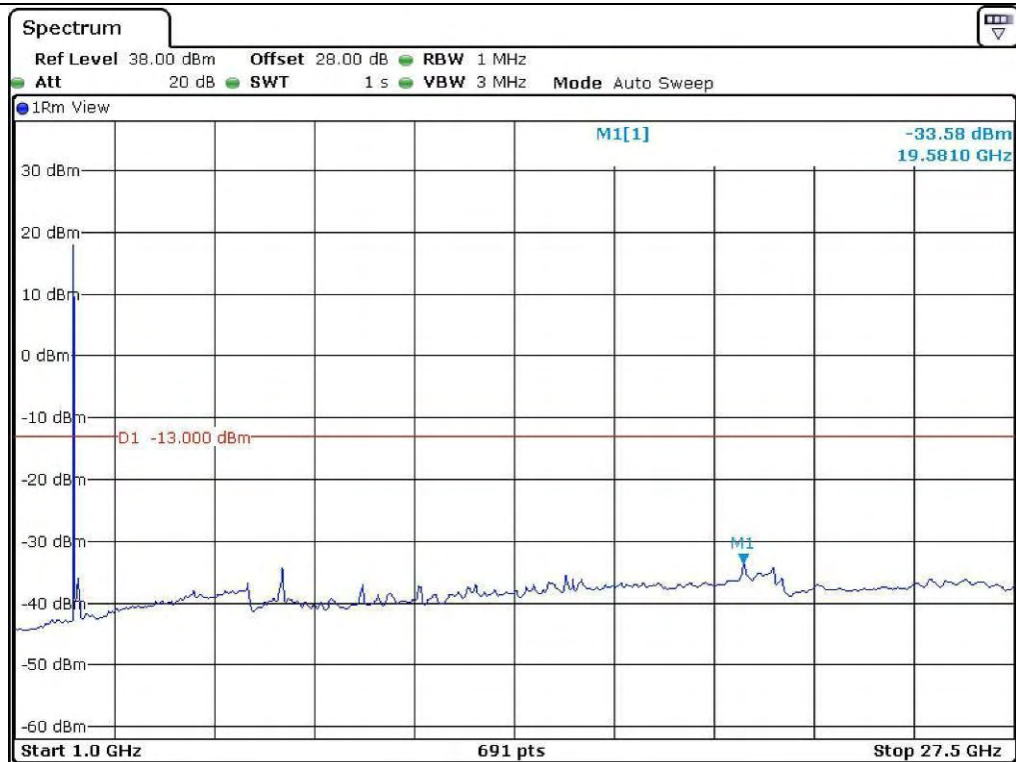
64 QAM – High Channel



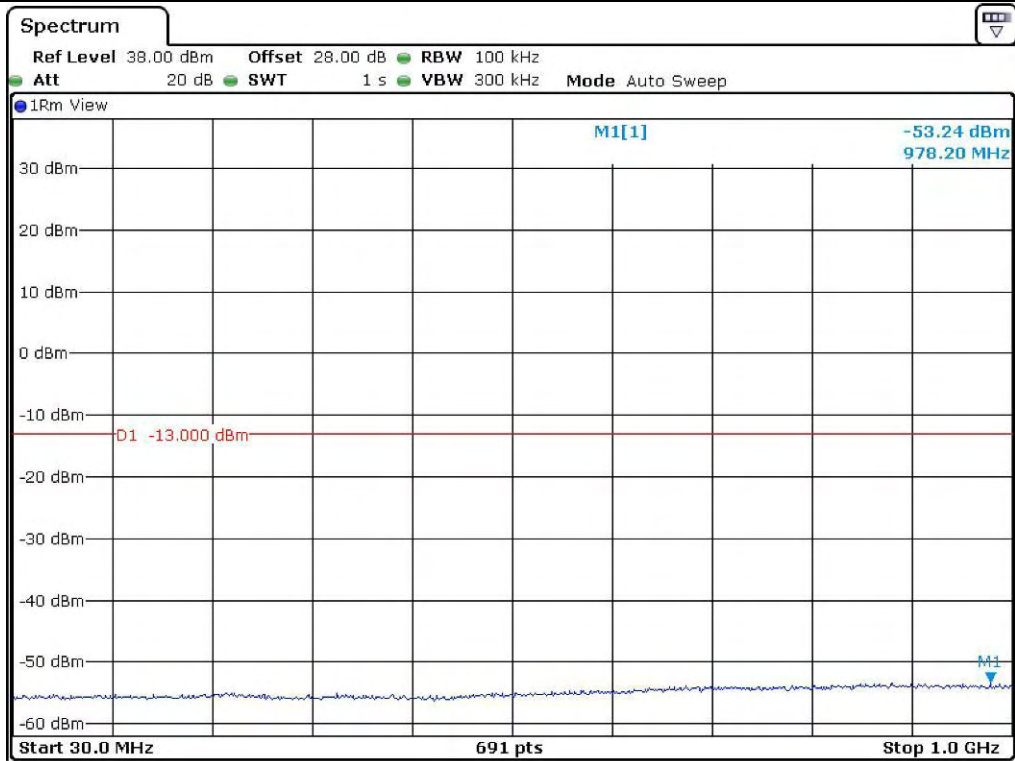
64 QAM – High Channel



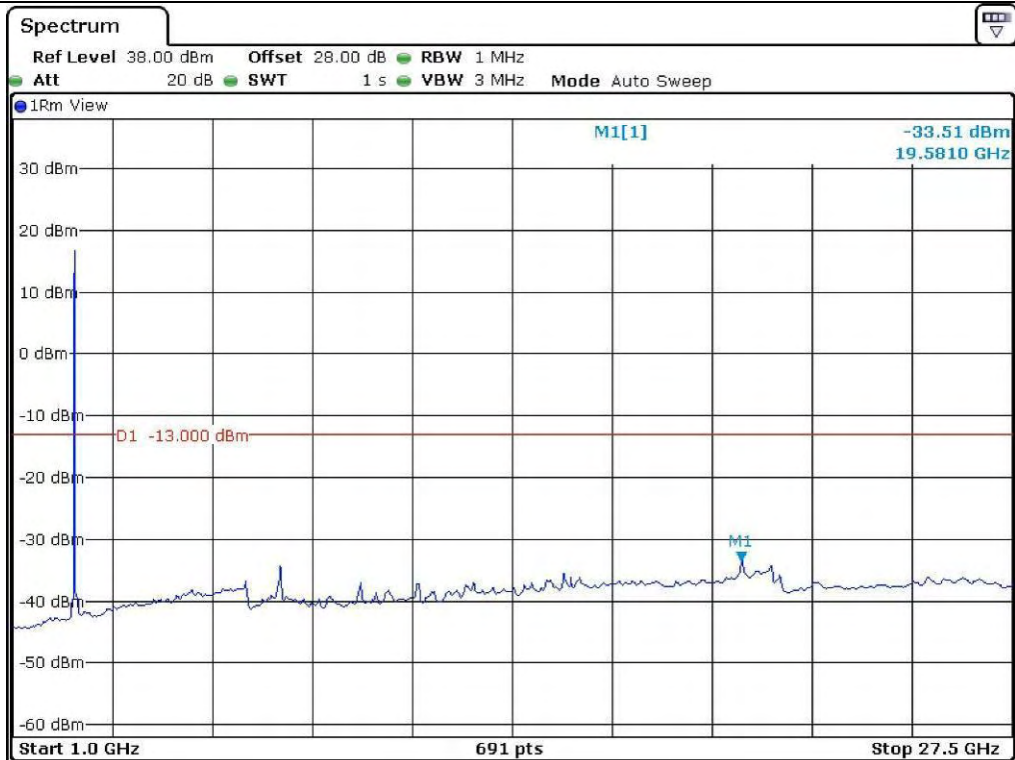
QPSK – Low Channel



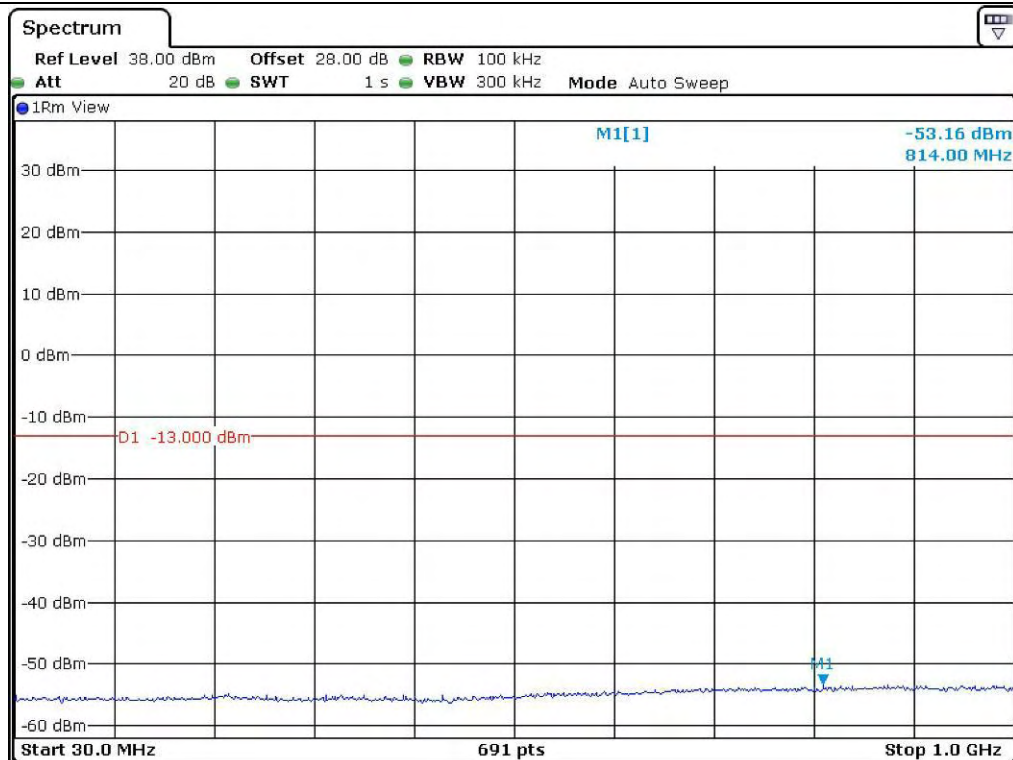
QPSK – Low Channel



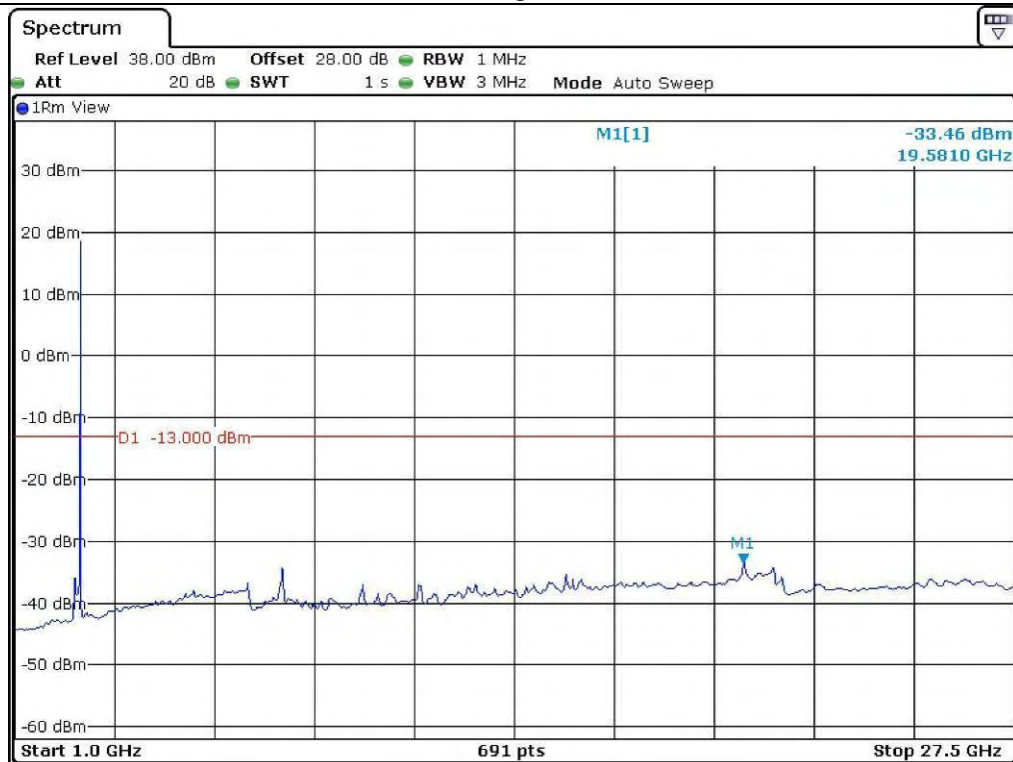
QPSK – Middle Channel



QPSK – Middle Channel



QPSK – High Channel



QPSK – High Channel

7.4.2 Test Result (20 MHz/2 Carrier)

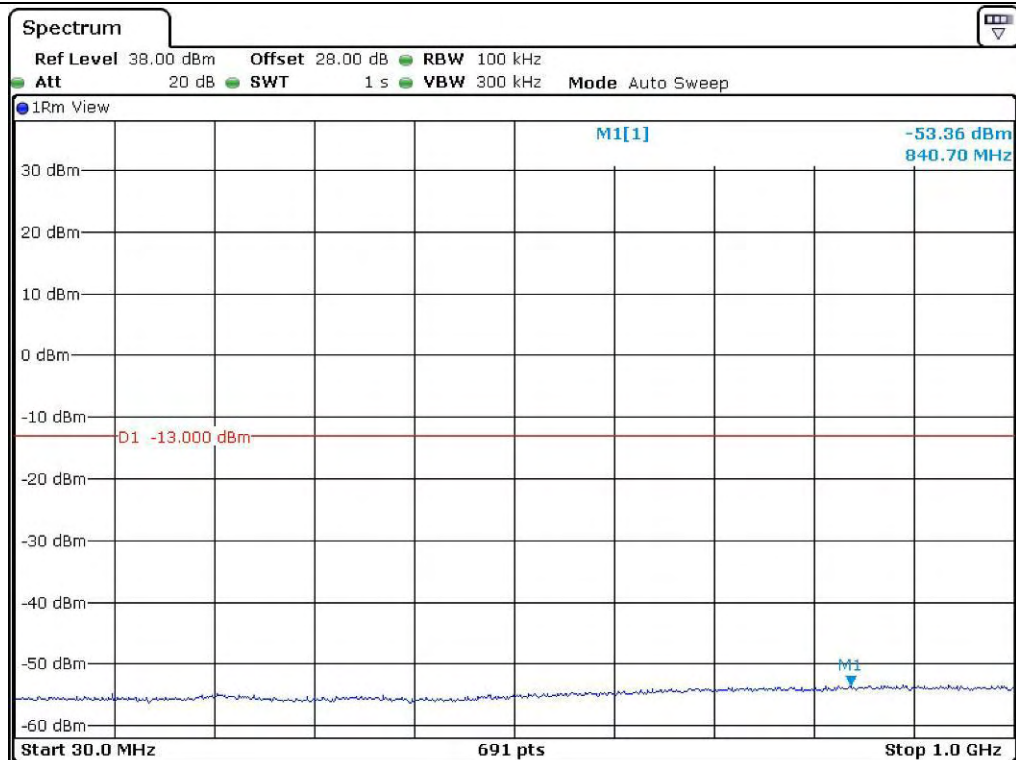
-. Test Date : July 31, 2014
-. Frequency range : 30 MHz ~ 27.5 GHz
-. Result : Pass

Modulation	Harmonic Frequency (MHz)		Measured Value (dBm)	Cable Loss (dB)	Total (dBm)	Limit (dBm)	Margin (dB)
16 QAM	Low	840.70	-53.36	0.20	-53.16	-13.00	40.16
		1 9601.00	-33.41	2.80	-30.61		17.61
	Middle	715.70	-53.40	0.20	-53.20		40.20
		1 9601.00	-33.40	2.80	-30.60		17.60
	High	861.70	-53.46	0.20	-53.26		40.26
		1 9618.00	-33.60	2.80	-30.80		17.80
64 QAM	Low	871.60	-53.33	0.20	-53.13	-13.00	40.13
		1 9601.00	-33.44	2.80	-30.64		17.64
	Middle	851.90	-53.36	0.20	-53.16		40.16
		1 9601.00	-33.29	2.80	-30.49		17.49
	High	887.00	-53.33	0.20	-53.13		40.13
		1 9581.00	-33.58	2.80	-30.78		17.78
QPSK	Low	933.30	-53.50	0.30	-53.20	-13.00	40.20
		1 9601.00	-33.44	2.80	-30.64		17.64
	Middle	924.90	-53.31	0.30	-53.01		40.01
		1 9601.00	-33.37	2.80	-30.57		17.57
	High	901.00	-53.24	0.30	-52.94		39.94
		1 9618.00	-33.59	2.80	-30.79		17.79
Other frequencies up to 27.5 GHz have margin more than 20 dB.							

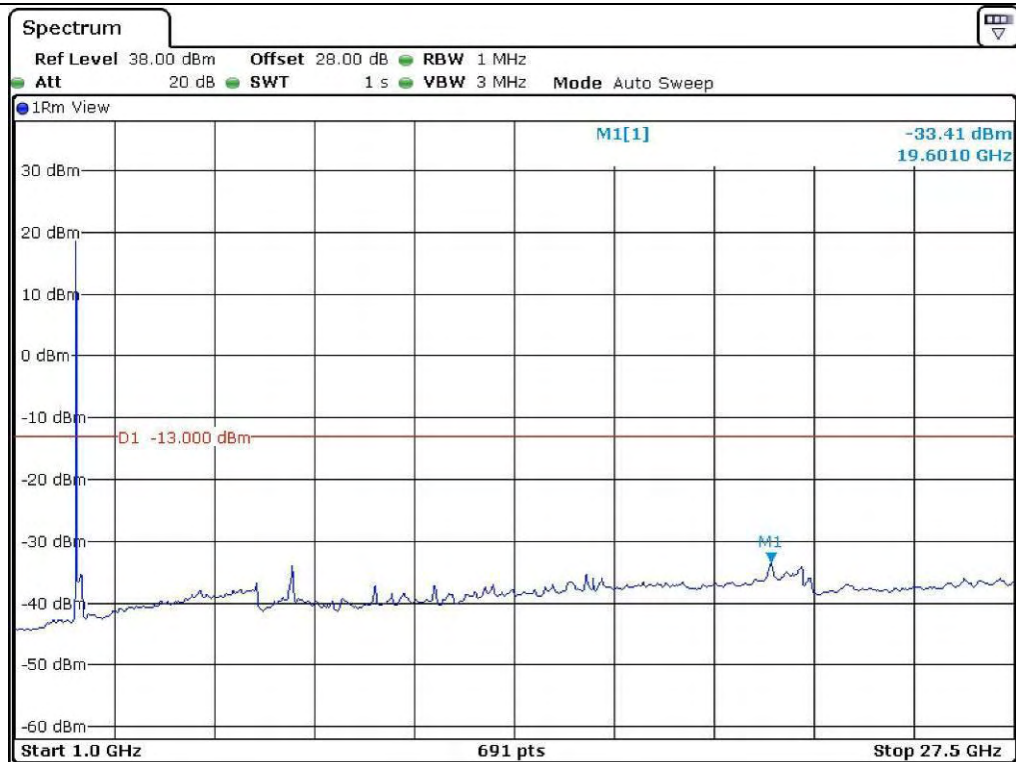
According to Part 27C, out of band emission shall be attenuated by $43 + 10 \log (P)$ dBc, equates to -13.0 dBm.



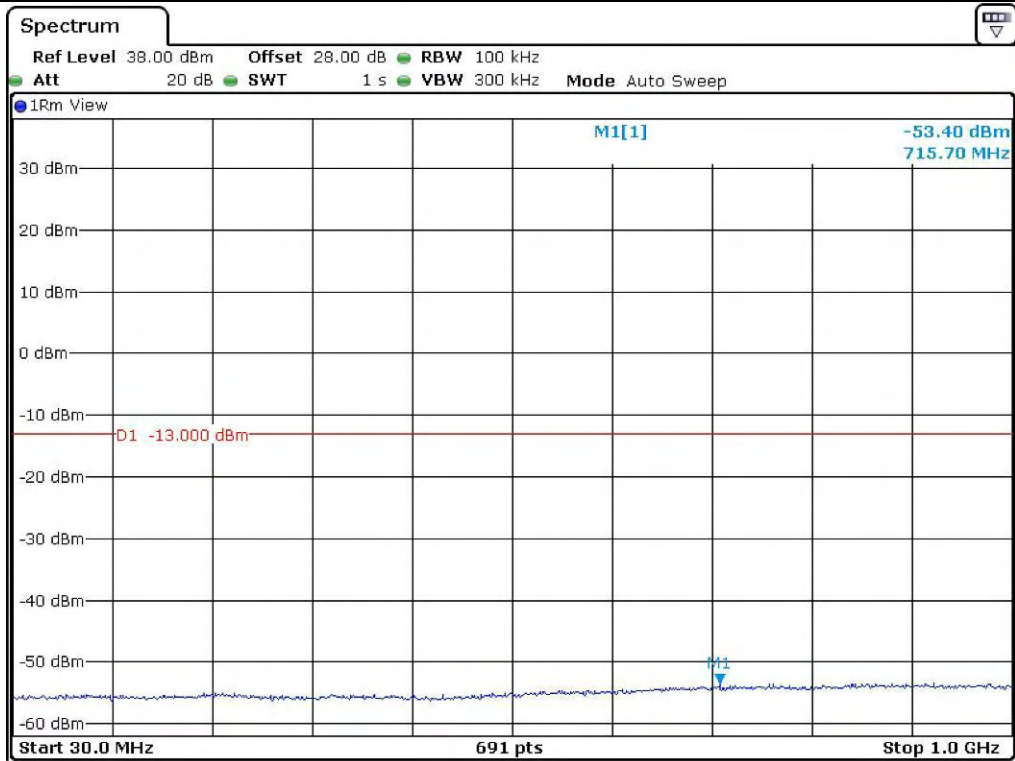
Tested by: Tae-Ho, Kim / Project Engineer



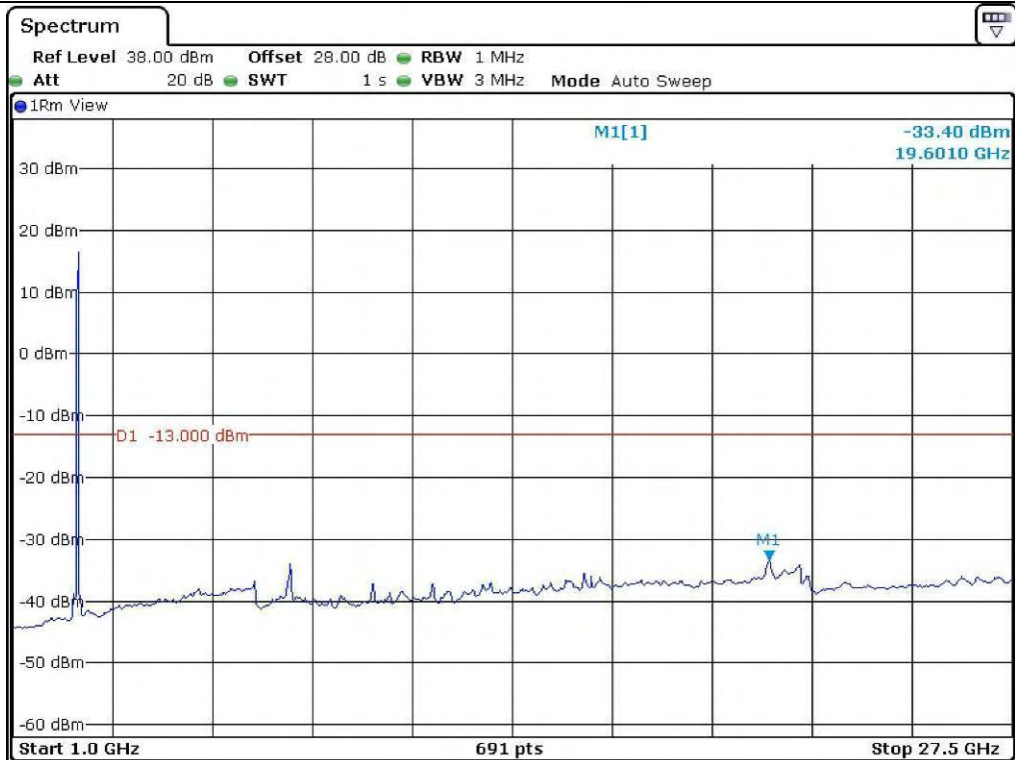
16 QAM – Low Channel



16 QAM – Low Channel



16 QAM – Middle Channel



16 QAM – Middle Channel