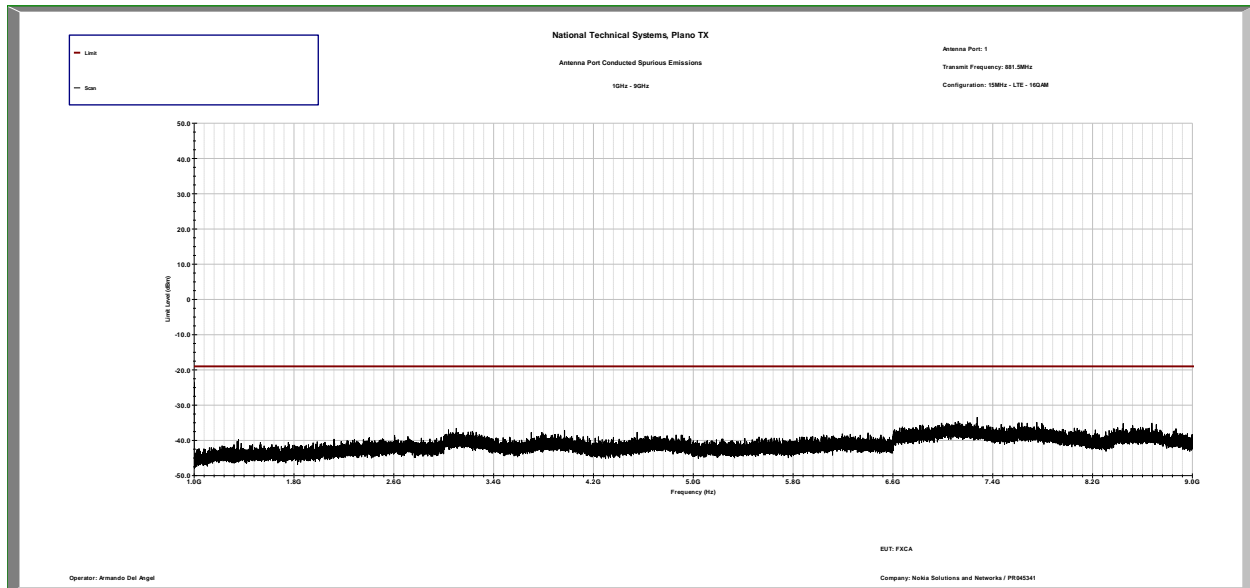
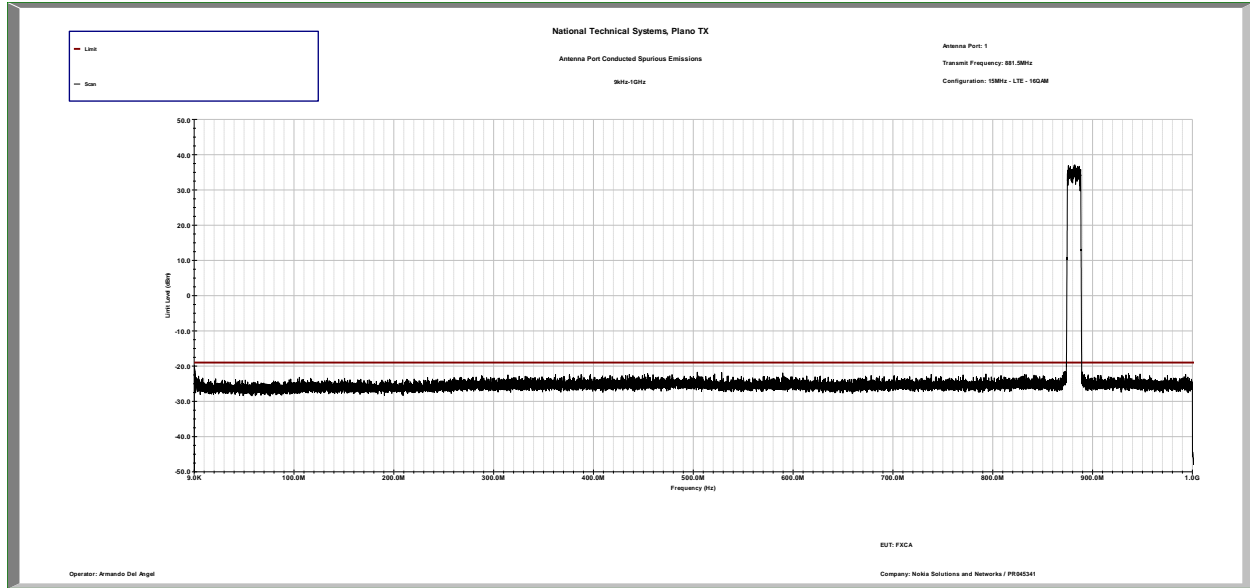
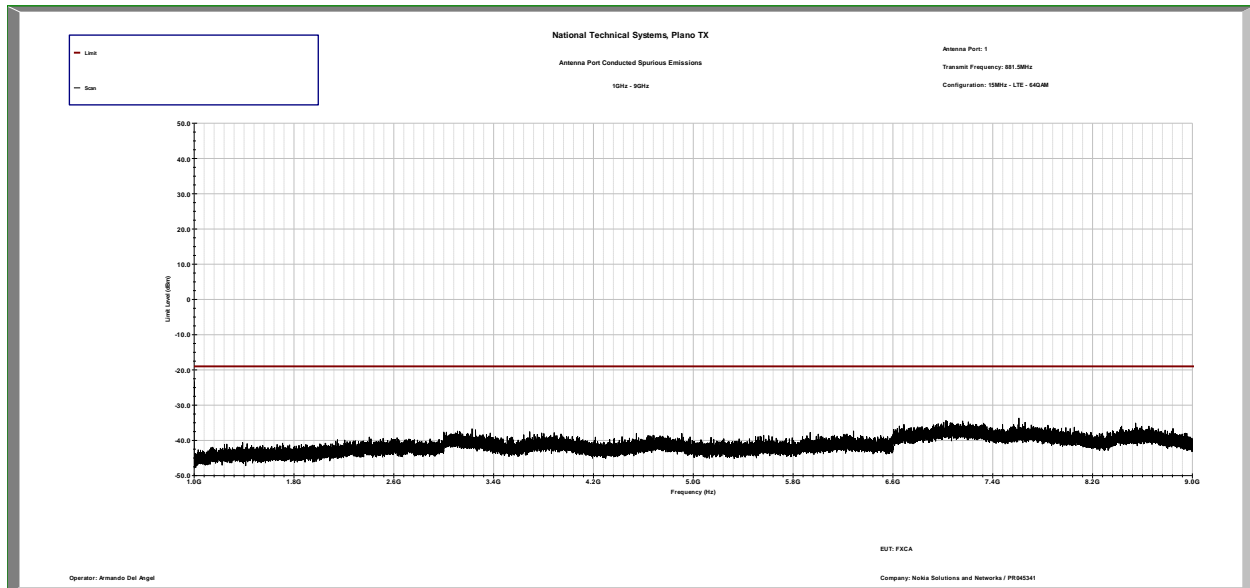
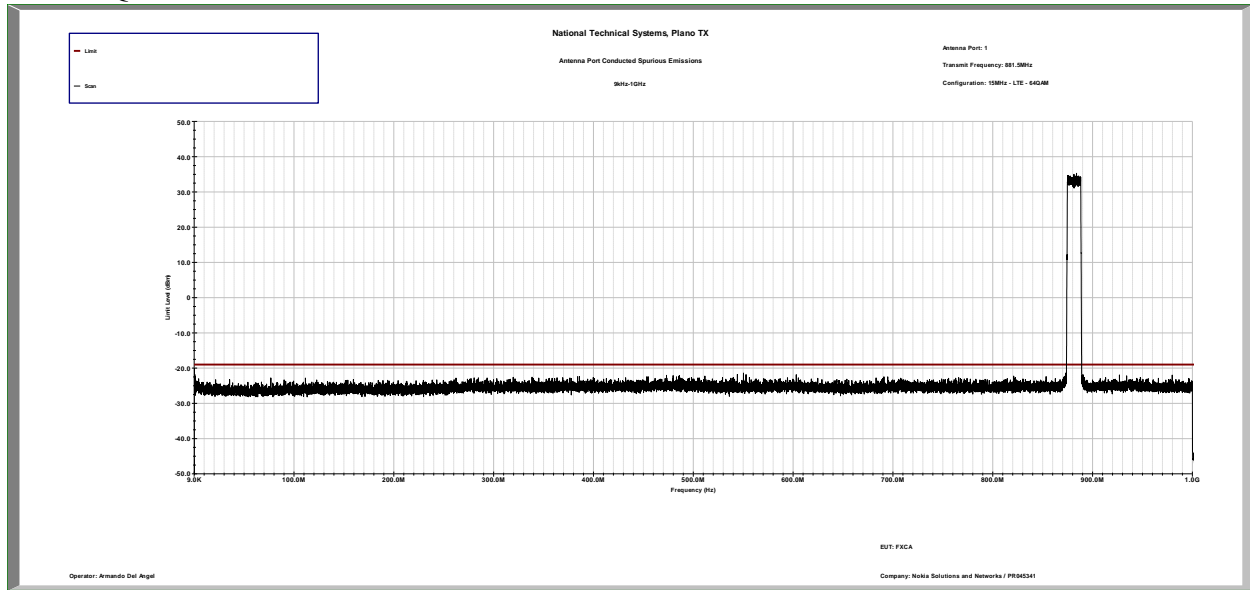


LTE – 16QAM – 15M



LTE – 64QAM – 15M



Transmitter Radiated Spurious Emissions

Based on antenna port conducted spurious emissions tests results, preliminary scans for radiated spurious emissions were performed in 30MHz – 10GHz frequency range in the following configurations:

LTE: 1.4M - QPSK transmitting at Low (869.7MHz), Mid (881.5MHz), and High (893.3MHz) channels on antennas 1, 3, and 5 respectively.

Final maximized peak radiated emissions were measured in these modes. During testing all antenna ports of the base station were terminated with 50ohm termination blocks and unit was transmitting on all of its ports at full power as described above.

Frequency MHz	Polarity H/V	Raw Peak dBuV/m	Antenna dB	Cable dB	PreAmp dB	Corrected dBuV/m	Limit dBuV/m	Margin dB
65.696	V	68.384	7.2	0.45	-36.927	39.106	82.2	-43.094
259.575	V	57.518	13.709	0.97	-37.281	34.915	82.2	-47.285
266.341	H	59.339	13.773	0.983	-37.265	36.83	82.2	-45.37
301.551	H	56.9	14.4	1.062	-37.184	35.178	82.2	-47.022
417.927	H	54.323	16.917	1.273	-36.814	35.699	82.2	-46.501
418.679	V	53.532	16.947	1.275	-36.813	34.941	82.2	-47.259
429.7	H	43.402	17.87	1.293	-36.791	33.969	82.2	-48.231
429.7	V	43.393	17.87	1.293	-36.791	33.697	82.2	-48.503
829.4	H	29.643	23.7	2.242	-35.962	35.322	82.2	-46.878
845.94	V	45.973	23.819	2.346	-35.952	36.186	82.2	-46.014
846.231	H	47.428	23.825	2.348	-35.952	37.648	82.2	-44.552
916.822	H	49.683	24.473	2.81	-35.903	41.063	82.2	-41.137
1739.459	V	45.648	26.398	2.707	-42.177	32.576	82.2	-49.624
1763.125	H	32.964	26.493	2.727	-42.169	20.015	82.2	-62.185
1763.527	V	39.067	26.494	2.727	-42.168	26.119	82.2	-56.081
1786.039	H	43.193	26.533	2.746	-42.161	30.311	82.2	-51.889
2607.71	H	42.235	28.712	3.366	-42.644	31.669	82.2	-50.531
2643.722	V	46.146	28.72	3.394	-42.691	35.569	82.2	-46.631
2645.222	H	35.571	28.721	3.395	-42.693	24.994	82.2	-57.206
2679.947	V	42.538	28.789	3.421	-42.738	32.01	82.2	-50.19
3479.952	V	41.841	31.092	4.202	-41.886	35.248	82.2	-46.952
3526.116	H	38.035	31.146	4.212	-41.875	31.517	82.2	-50.683
3526.703	H	35.692	31.147	4.212	-41.874	29.176	82.2	-53.024
3571.701	V	38.506	31.272	4.22	-41.772	32.226	82.2	-49.974

Corrected Field Strength = Raw Reading + Amplifier Gain + Antenna Factor + Cable Loss

Negative Margin Indicates Passing Result

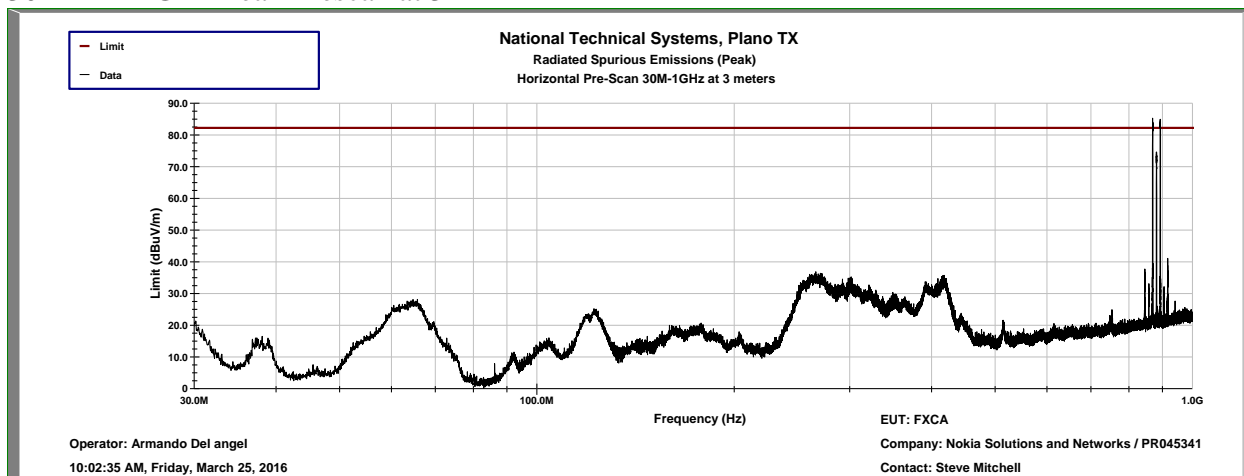
Detector = Peak, RBW = 1MHz, VBW = 3MHz, Max Hold

Highest noise floor of the measurement instrumentation was more than 20dB below the 82.2dBuV/m at 3m limit (equivalent to -13dBm EIRP).

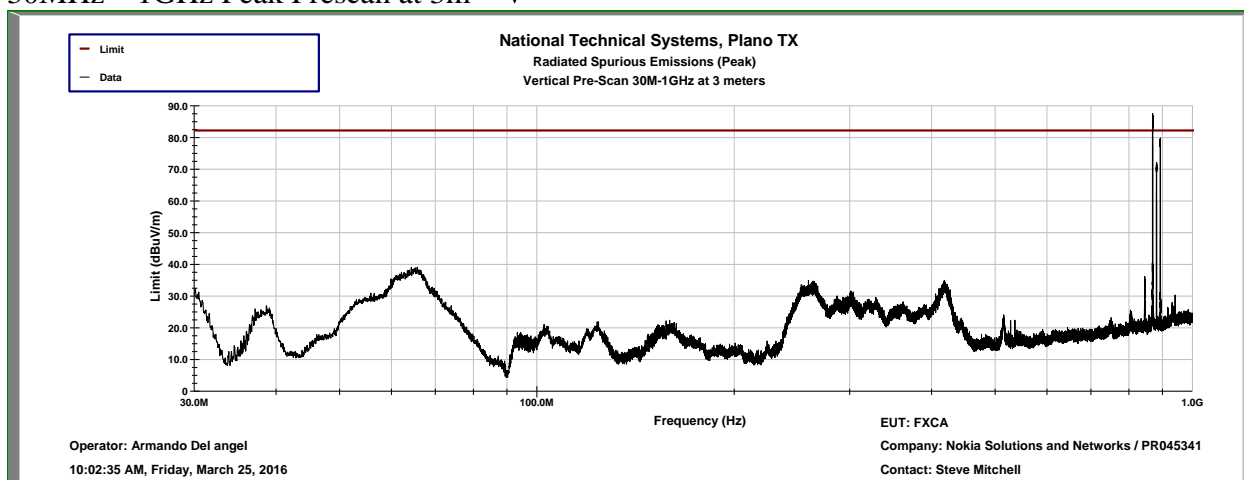
Since all maximized readings were more than 20dB below the 82.2dBuV/m at 3m limit (equivalent to -13dBm EIRP), substitution measurements were not performed.

TILE software was used for all prescans and plots included on the following pages.

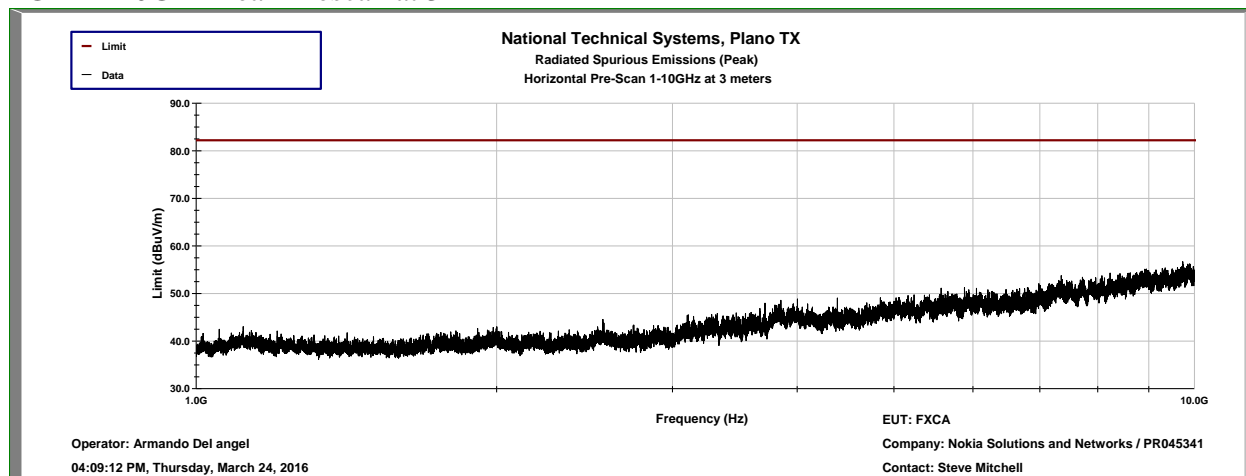
30MHz – 1GHz Peak Prescan at 3m – H



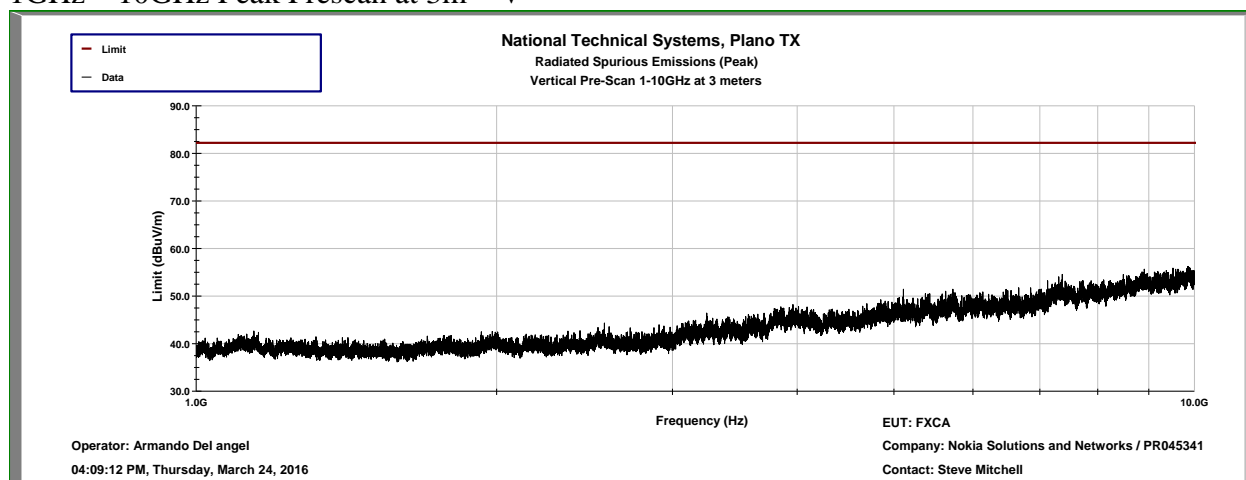
30MHz – 1GHz Peak Prescan at 3m – V



1GHz – 10GHz Peak Prescan at 3m – H



1GHz – 10GHz Peak Prescan at 3m – V



Appendix B Part 90 Test Data

RF Output Power

RF output power has been measured in both Peak and RMS Average terms for each transmit chain at center channel for all modulations and bandwidth modes. Peak to average ratio (PAR) has been calculated as described in Section 5.7.2 of KDB971168 D01 v02r02 and all results are presented in tabular form below.

		LTE - QPSK			LTE - 16QAM			LTE - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
Port 1 Center Channel	1.4M	56.72	49.59	7.13	56.82	49.64	7.18	56.62	49.54	7.08
	3M	57.47	49.6	7.87	57.57	49.6	7.97	57.46	49.57	7.89
	5M	57.74	49.64	8.1	58.4	49.62	8.78	57.53	49.6	7.93
	10M	57.95	49.65	8.3	58.51	49.51	9	57.7	49.57	8.13
	15M	57.73	49.58	8.15	58.67	49.55	9.12	57.66	49.51	8.15
Port 3 Center Channel	1.4M	56.46	49.36	7.1	56.55	49.33	7.22	56.43	49.32	7.11
	3M	57.26	49.37	7.89	57.31	49.36	7.95	57.25	49.33	7.92
	5M	57.58	49.46	8.12	58.22	49.27	8.95	57.37	49.36	8.01
	10M	57.7	49.31	8.39	58.3	49.34	8.96	57.5	49.33	8.17
	15M	57.51	49.38	8.13	58.38	49.31	9.07	57.45	49.34	8.11
Port 5 Center Channel	1.4M	56.68	49.57	7.11	56.81	49.58	7.23	56.54	49.45	7.09
	3M	57.39	49.54	7.85	57.48	49.42	8.06	57.42	49.54	7.88
	5M	57.73	49.53	8.2	58.33	49.46	8.87	57.53	49.51	8.02
	10M	57.83	49.5	8.33	58.51	49.51	9	57.67	49.51	8.16
	15M	57.64	49.49	8.15	58.63	49.5	9.13	57.71	49.48	8.23
Combined Center Channel	1.4M	61.39	54.28	7.11	61.5	54.29	7.21	61.3	54.21	7.09
	3M	62.15	54.28	7.87	62.23	54.23	8	62.15	54.25	7.9
	5M	62.46	54.32	8.14	63.09	54.22	8.87	62.25	54.26	7.99
	10M	62.6	54.26	8.34	63.21	54.23	8.98	62.4	54.24	8.16
	15M	62.4	54.26	8.14	63.33	54.23	9.1	62.38	54.22	8.16

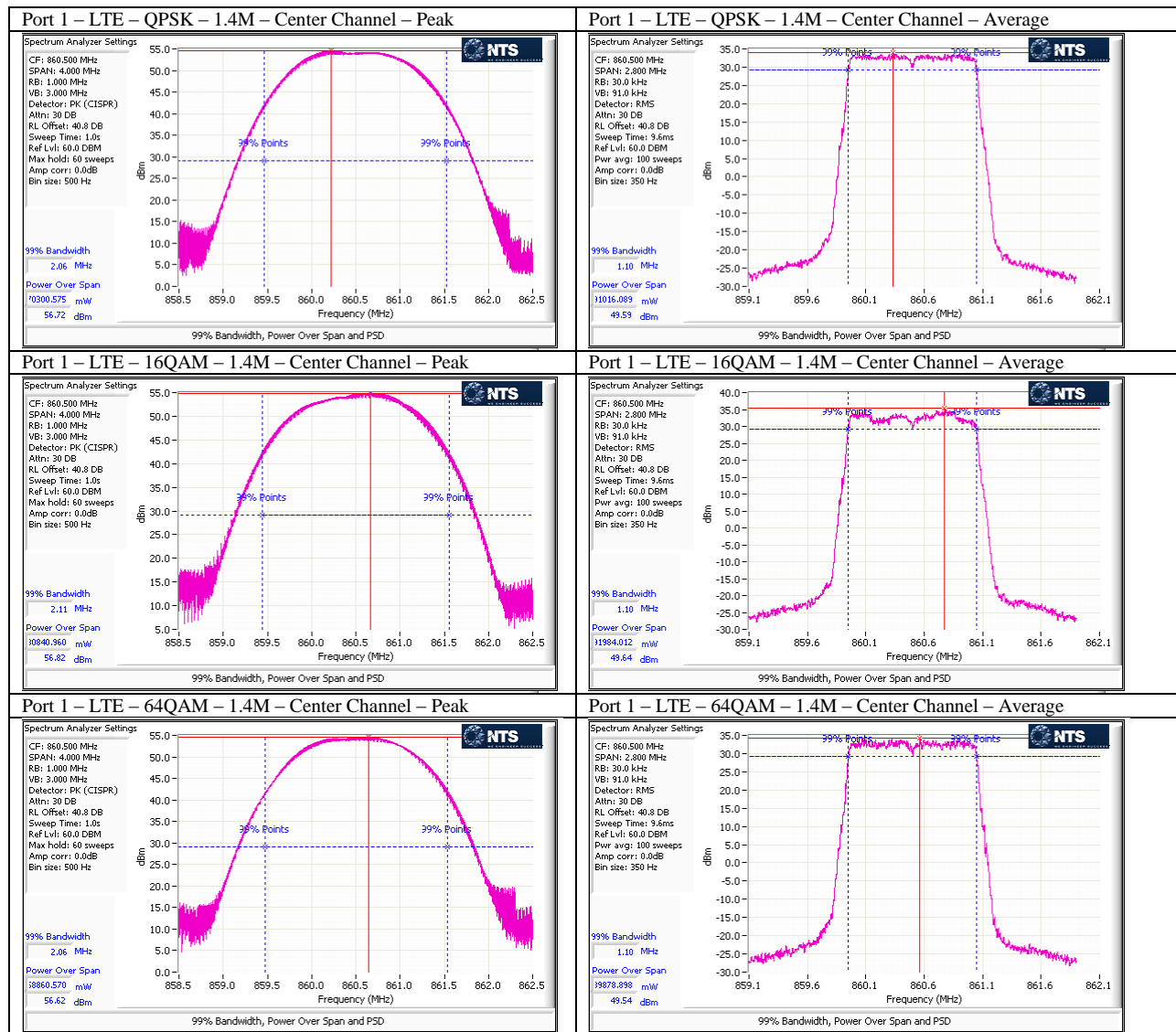
Based on the results above, Port 1 had the highest RMS average power and therefore it was selected for all the remaining antenna port tests on the product.

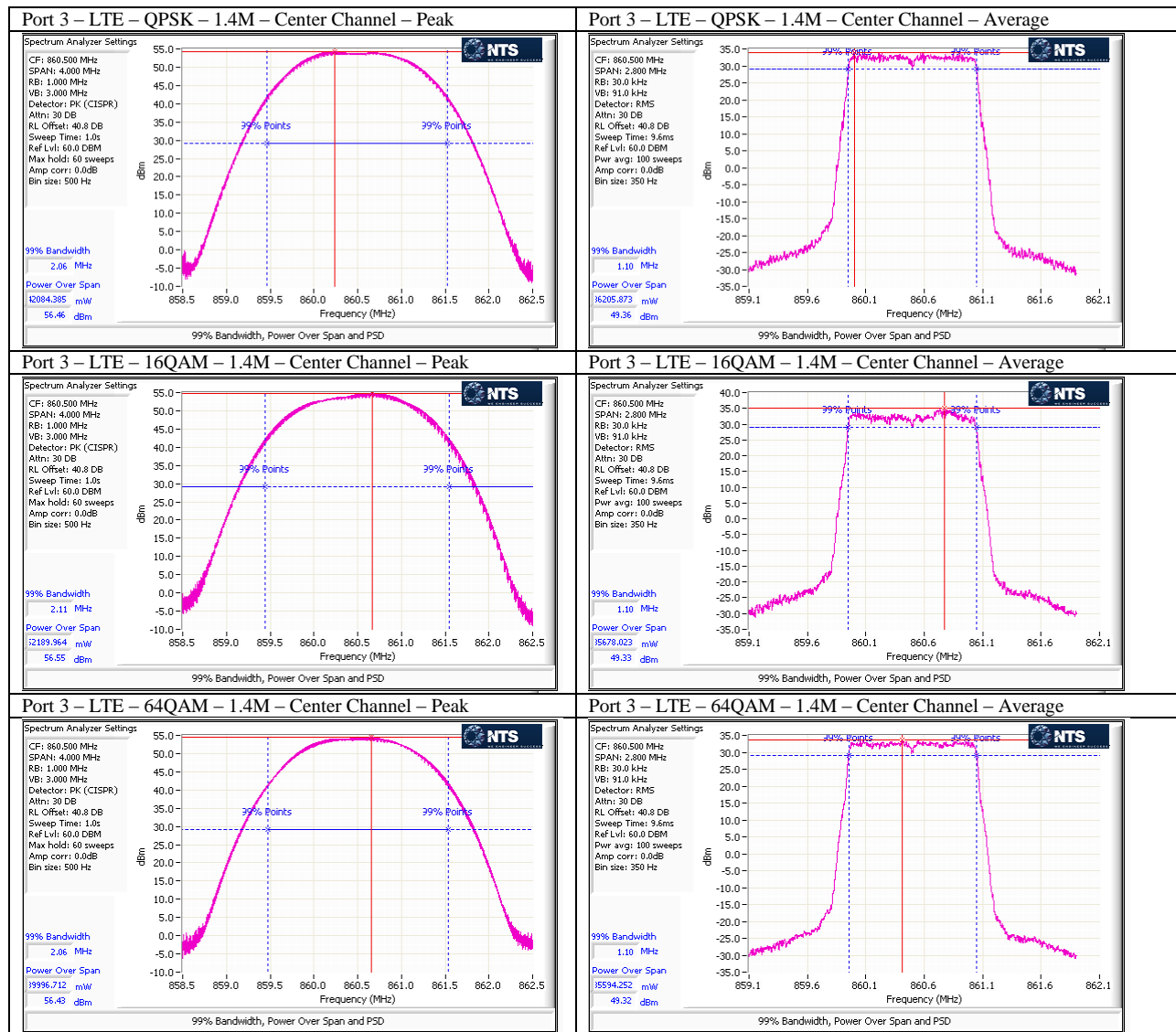
Subsequently output power levels on lowest and highest channels were tested only at Port 1 and results presented below.

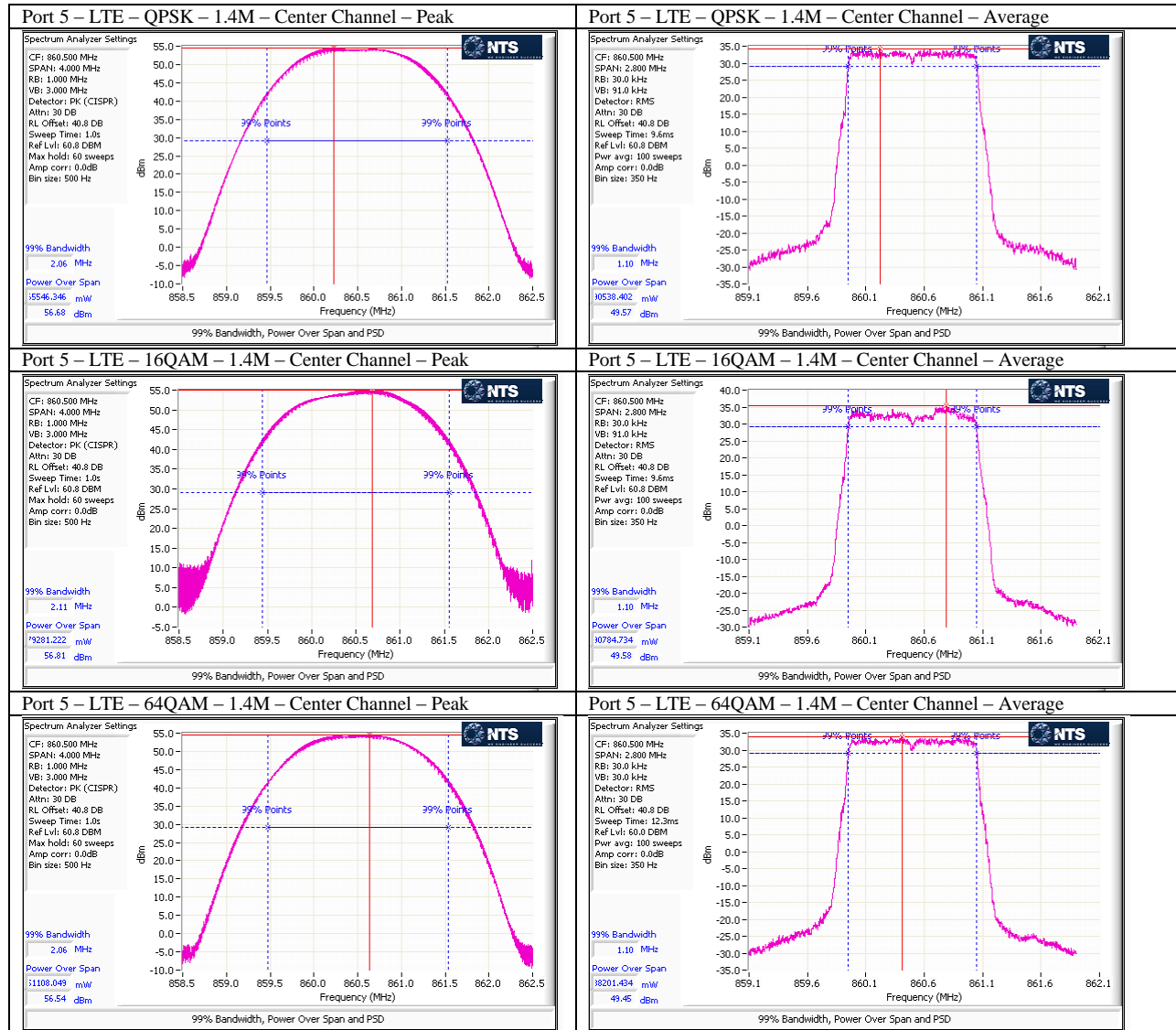
		LTE - QPSK			LTE - 16QAM			LTE - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
Port 1 Low Channel	1.4M*	48.1	40.99	7.11	48.29	41.04	7.25	48.08	40.9	7.18
	1.4M+4	56.76	49.7	7.06	56.95	49.54	7.41	56.7	47.57	9.13
	3M*	48.98	41.01	7.97	48.94	41.03	7.91	48.95	40.98	7.97
	3M+1	57.6	49.65	7.95	57.56	49.61	7.95	57.53	49.62	7.91
	5M	57.86	49.7	8.16	58.52	49.49	9.03	57.61	47.57	10.04
	10M	58.03	49.58	8.45	58.48	49.59	8.89	57.73	49.57	N/A
	15M	57.81	49.61	8.2	58.76	49.57	9.19	57.73	49.57	8.16
Port 1 High Channel	1.4M*	47.98	40.79	7.19	48.15	40.9	7.25	47.94	40.78	7.16
	1.4M-5	56.73	49.56	7.17	56.79	49.31	7.48	56.59	49.45	7.14
	3M*	48.74	40.83	7.91	48.81	40.82	7.99	48.83	40.86	7.97
	3M-1	57.45	49.54	7.91	57.47	49.49	7.98	57.49	49.52	7.97
	5M	57.75	49.55	8.2	58.35	49.43	8.92	57.53	49.49	8.04
	10M	57.94	49.62	8.32	58.52	49.51	9.01	57.66	49.48	8.18
	15M	57.81	49.61	8.2	58.63	49.51	9.12	57.75	49.51	8.24

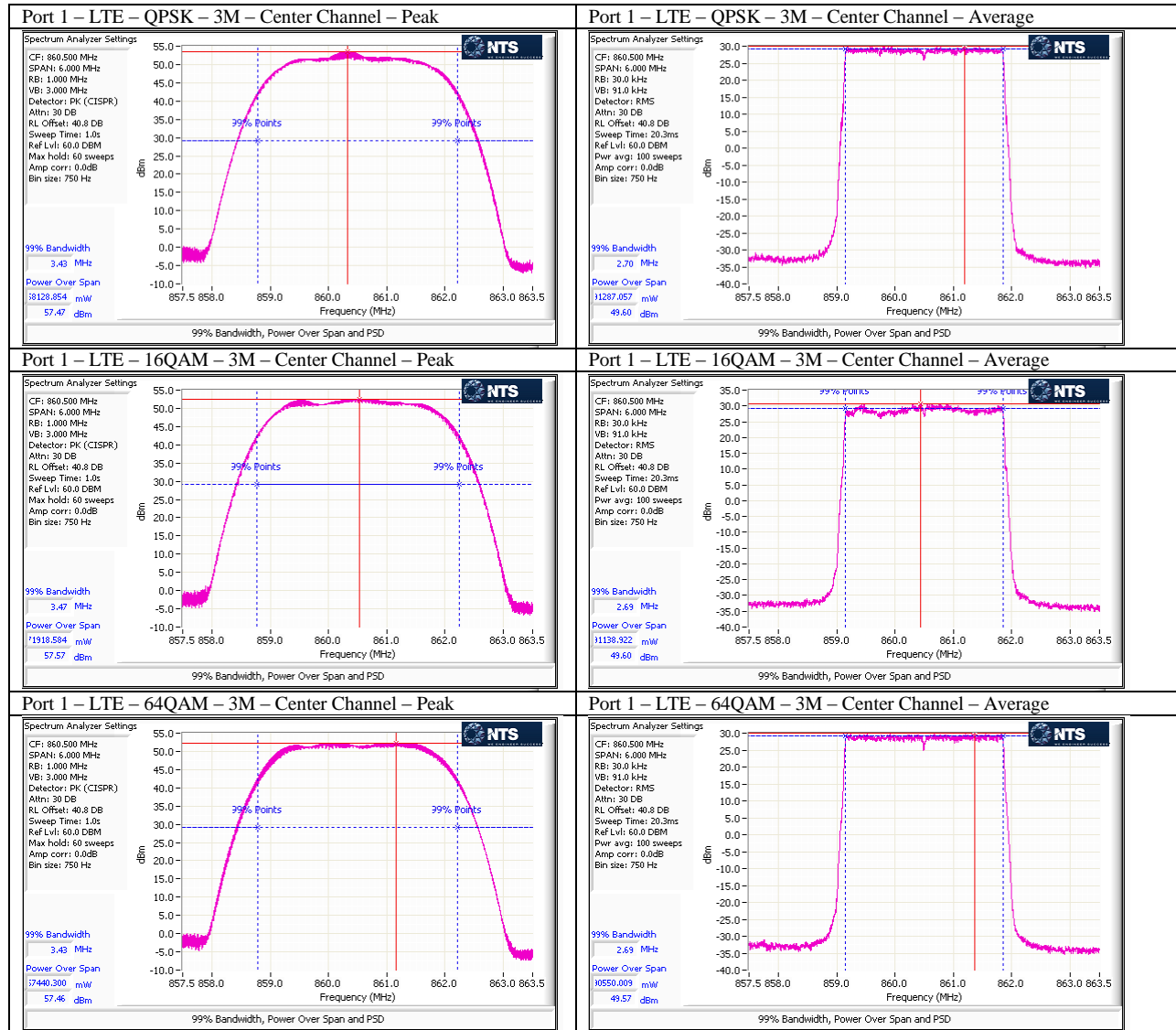
Note *: (For 1.4 MHz and 3 MHz LTE bandwidths only) In order to meet bandedge requirements the carrier power levels at the lowest and highest channels had to be reduced as indicated. The first full power channel that passes the bandedge requirements are provided.

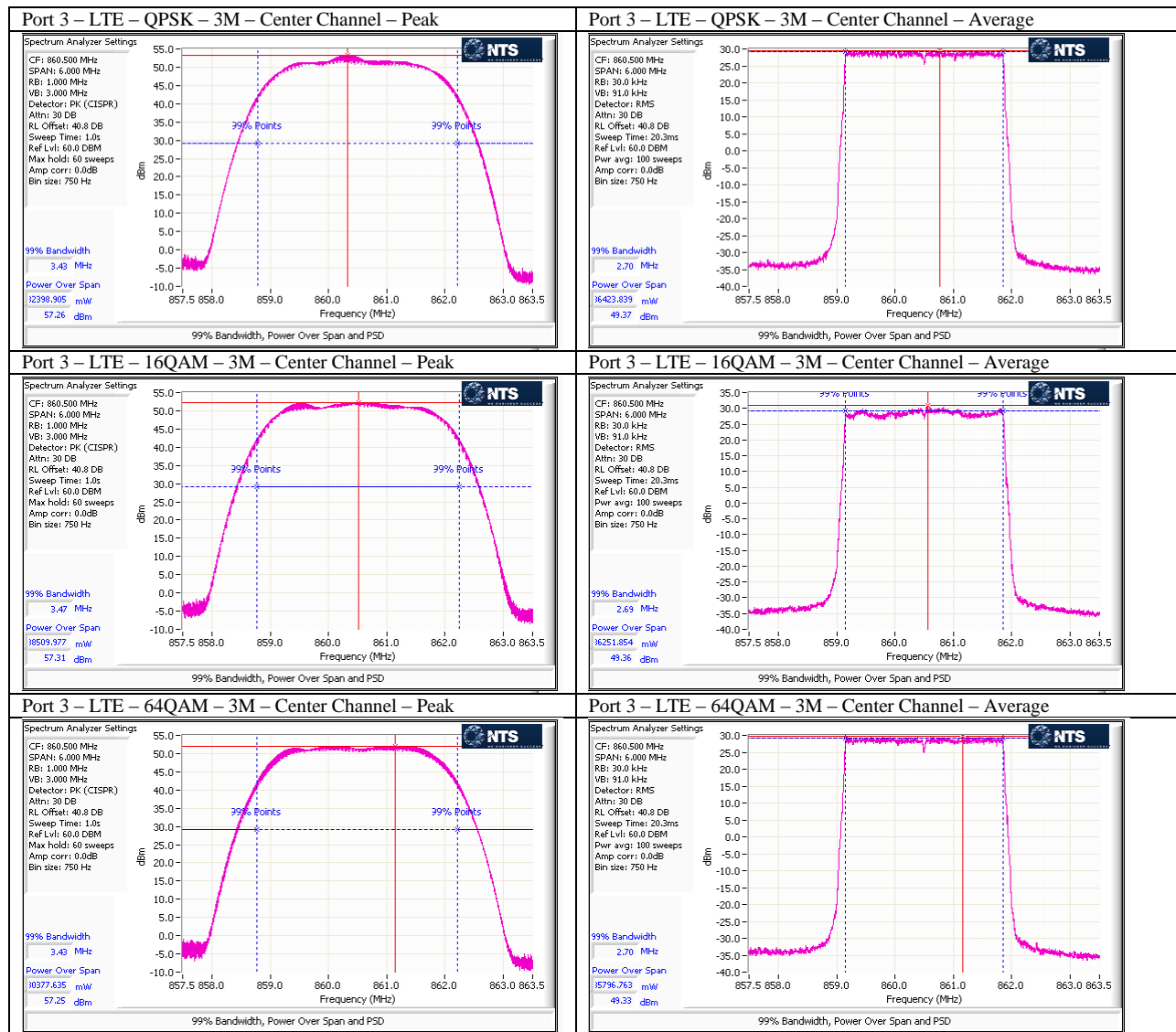
All corresponding plots included on the following pages. Total path loss of 40.8dB (Attenuator Loss: 40dB, RF cable loss: 0.8dB) accounted in via reference level offset to the spectrum analyzer.

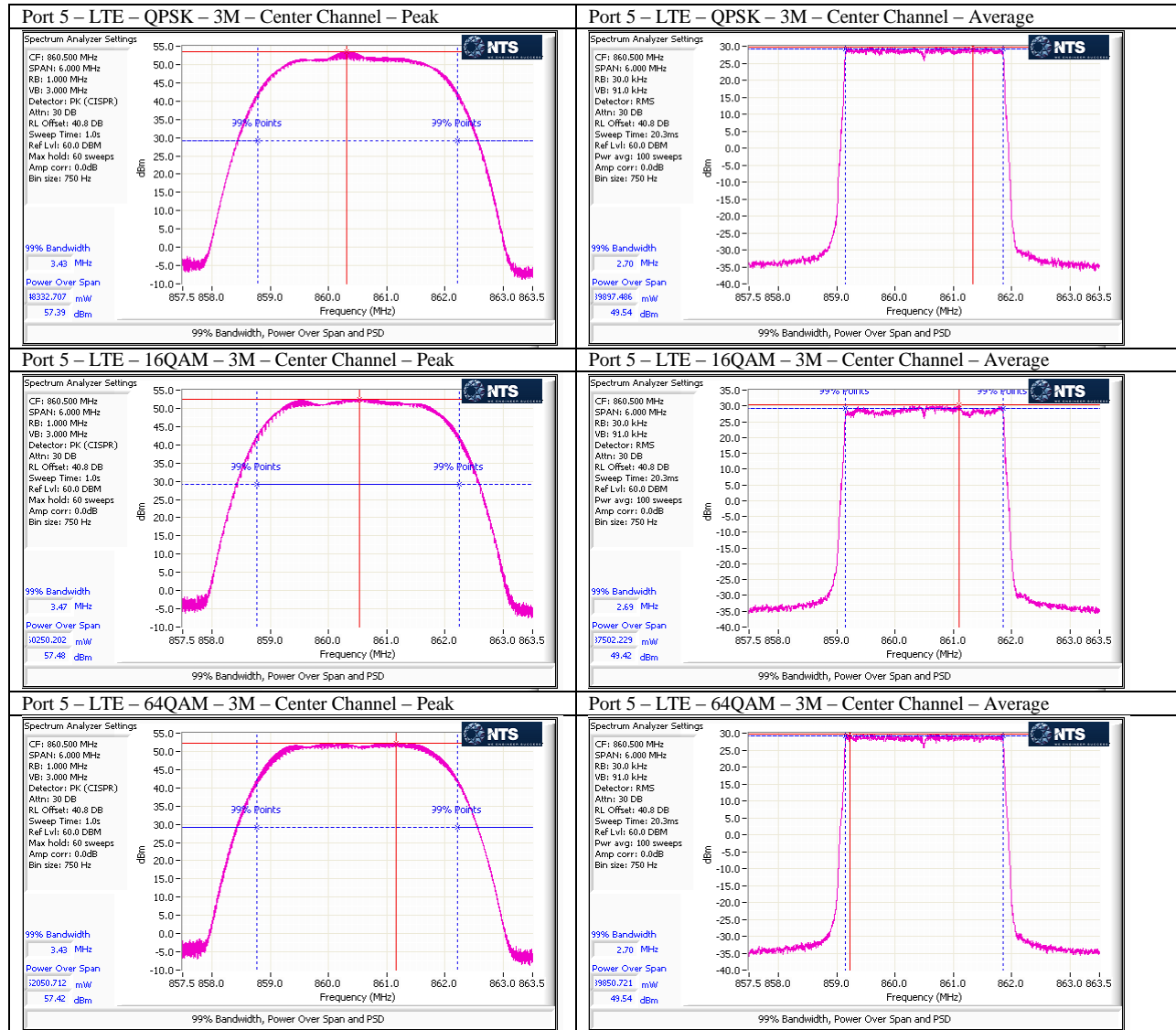


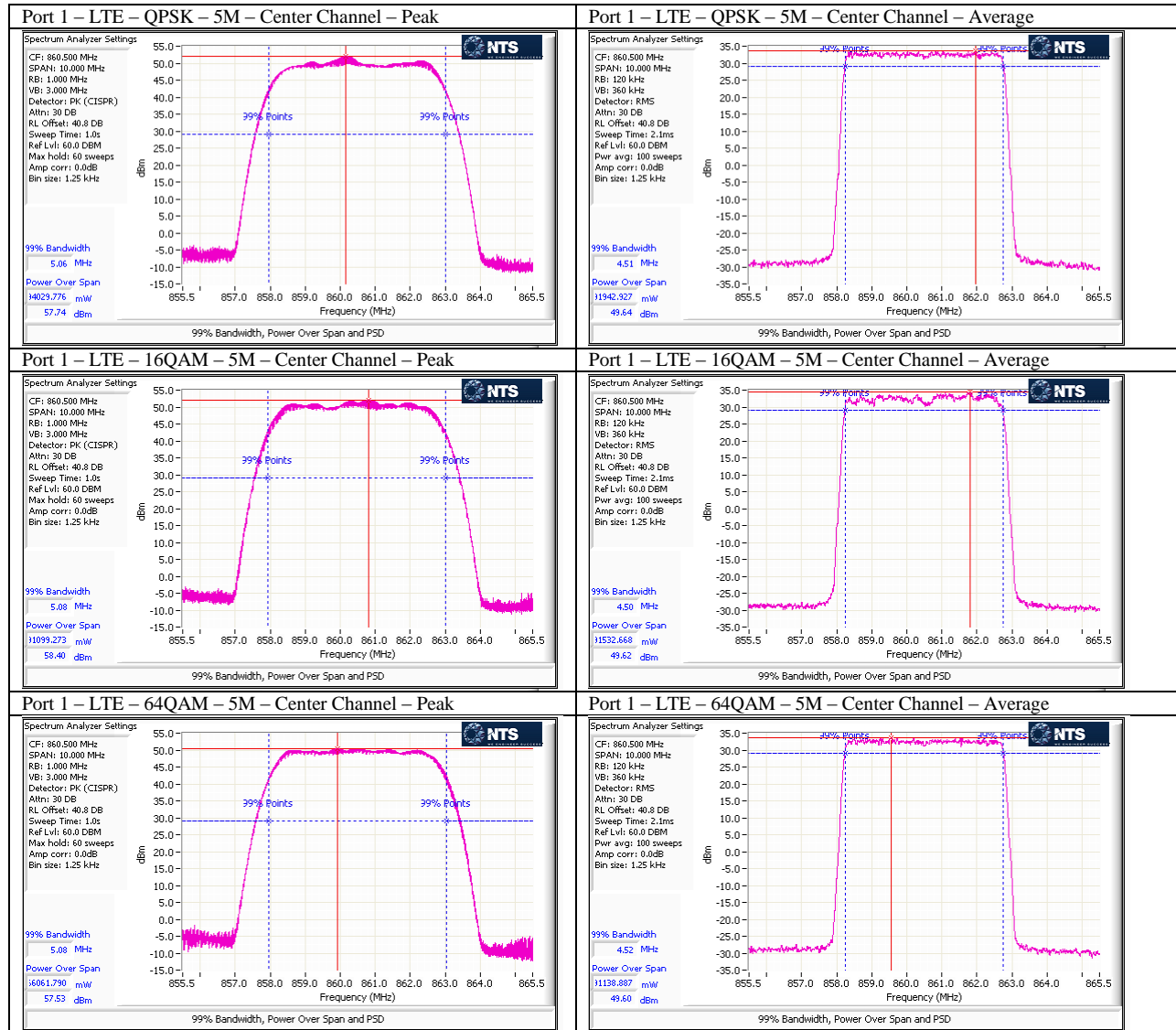


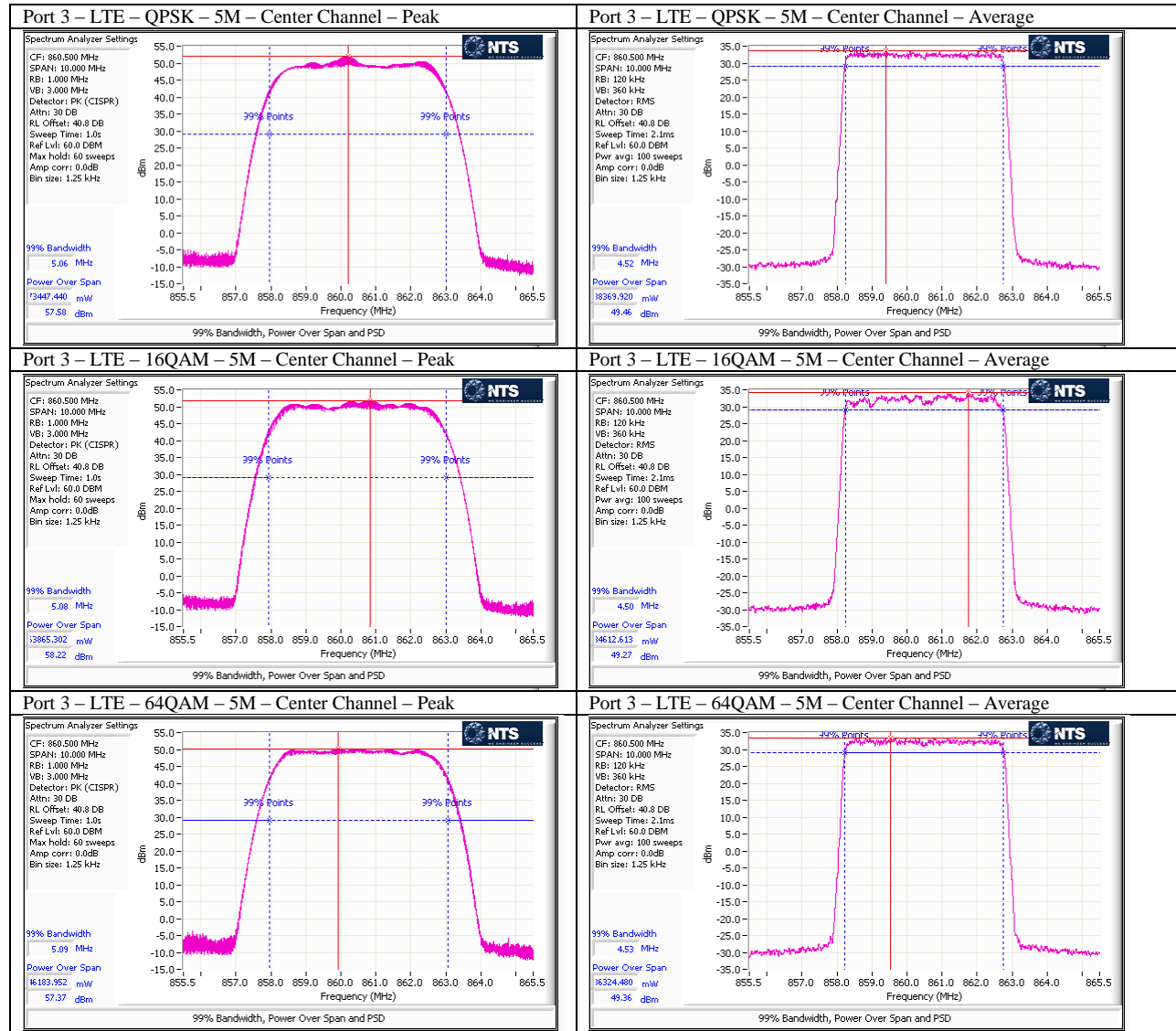


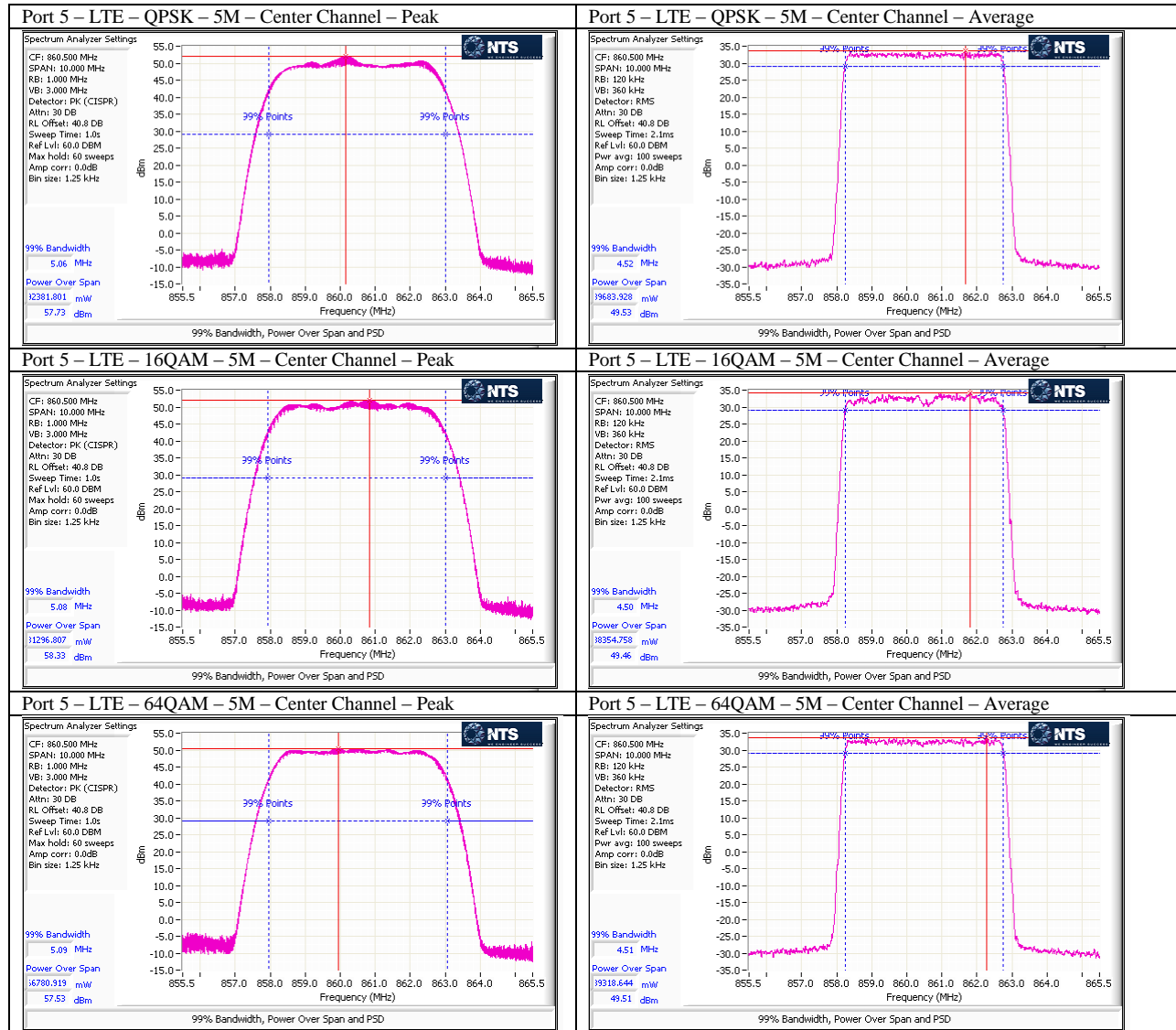


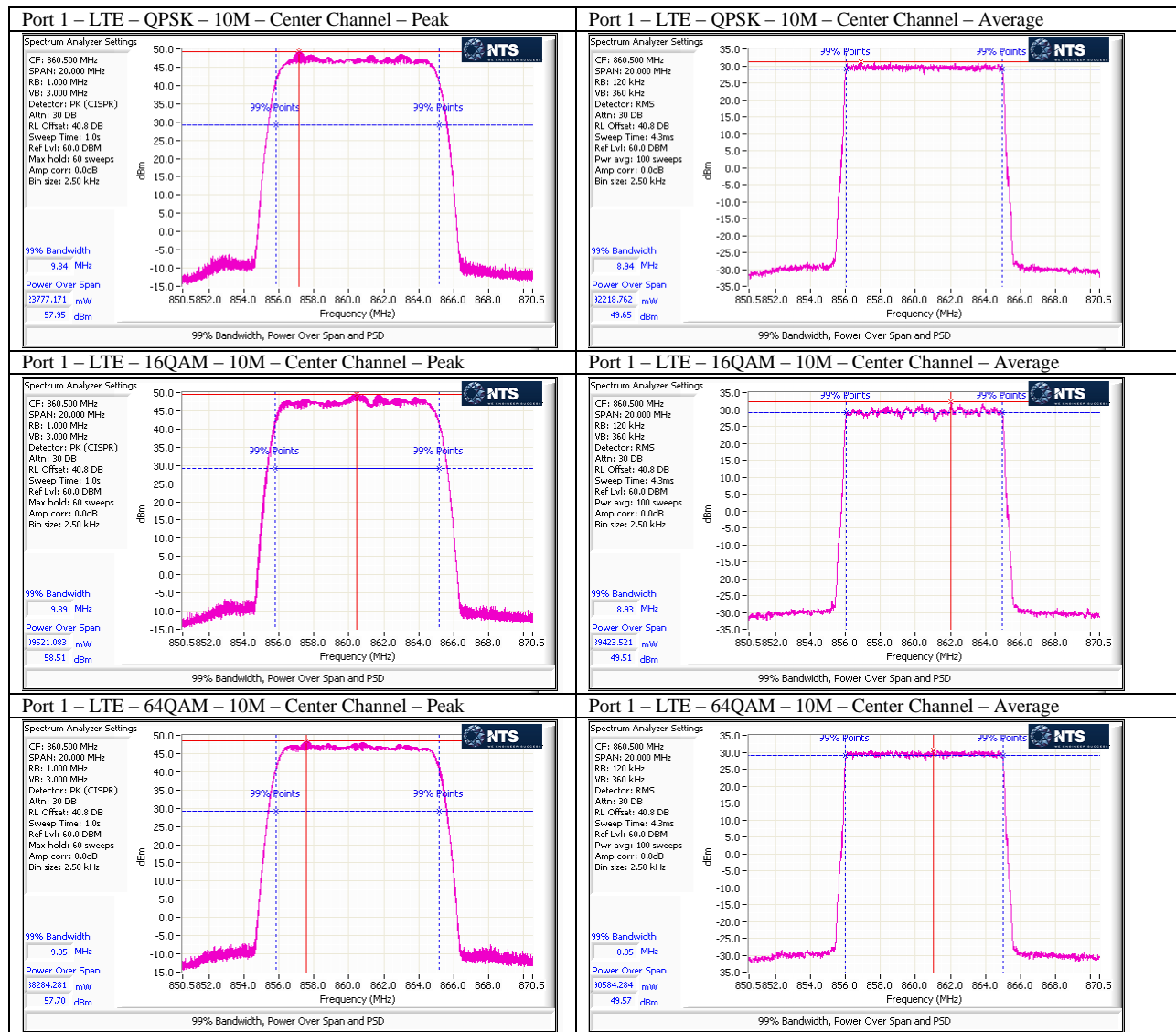


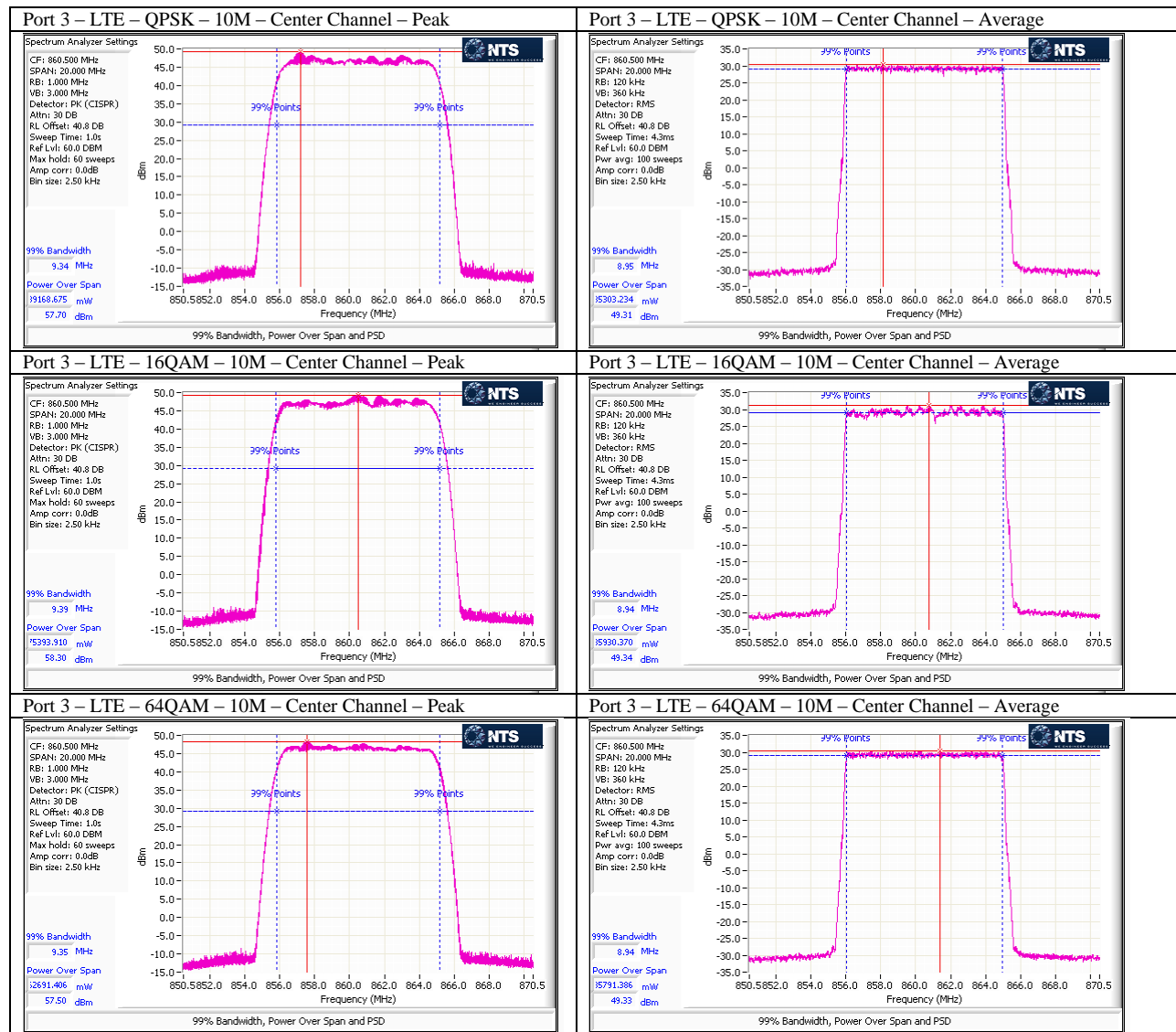


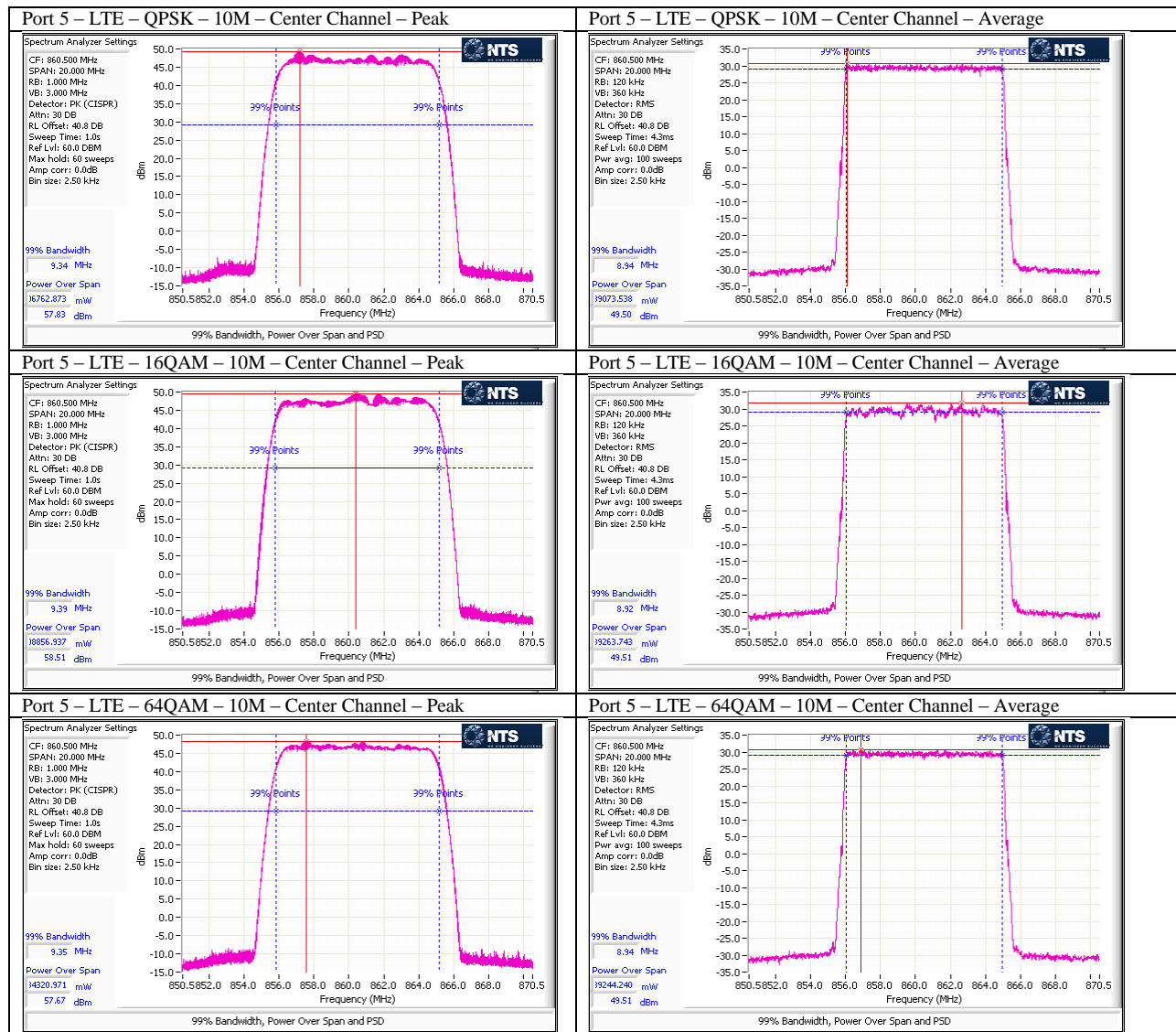


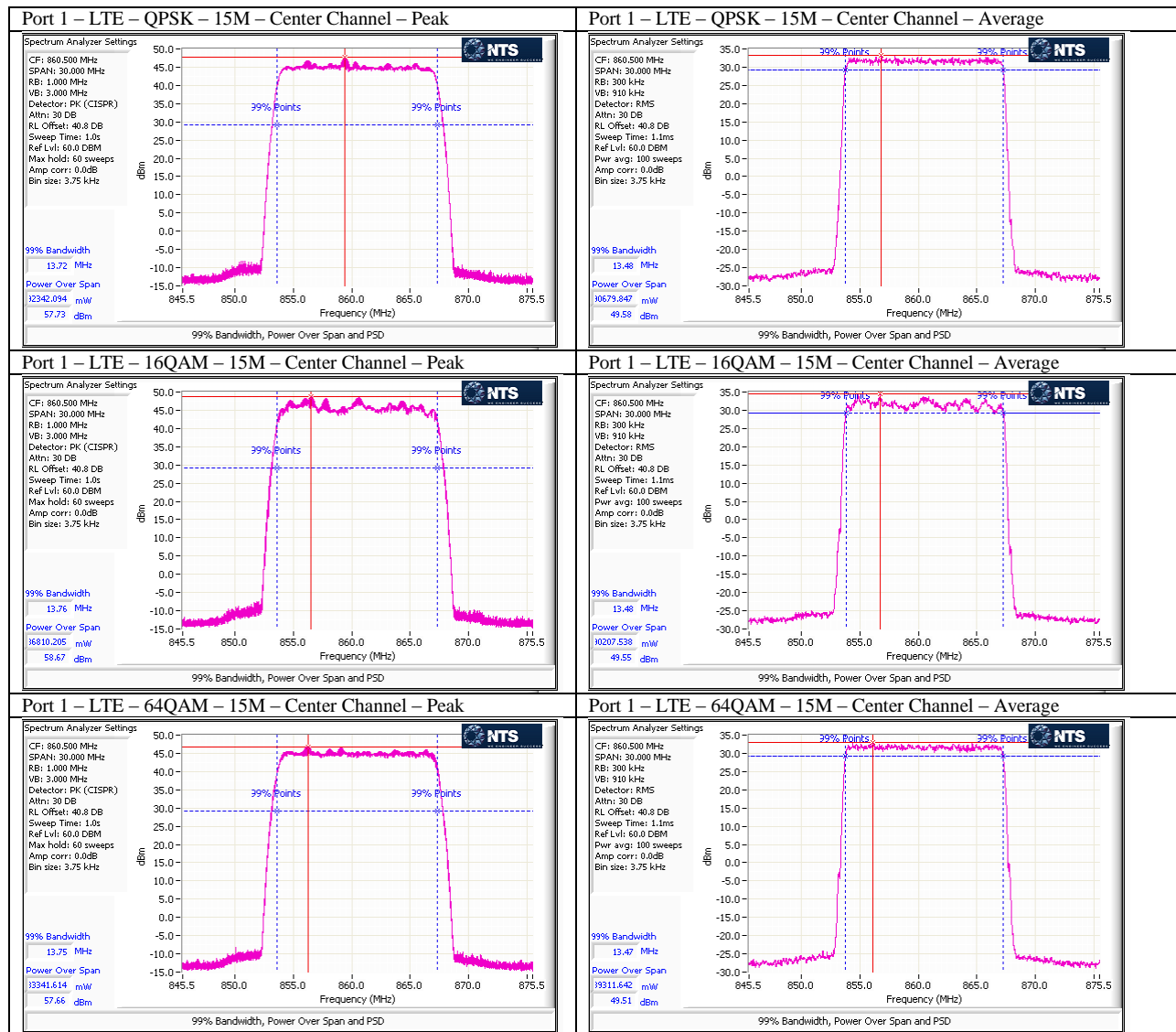


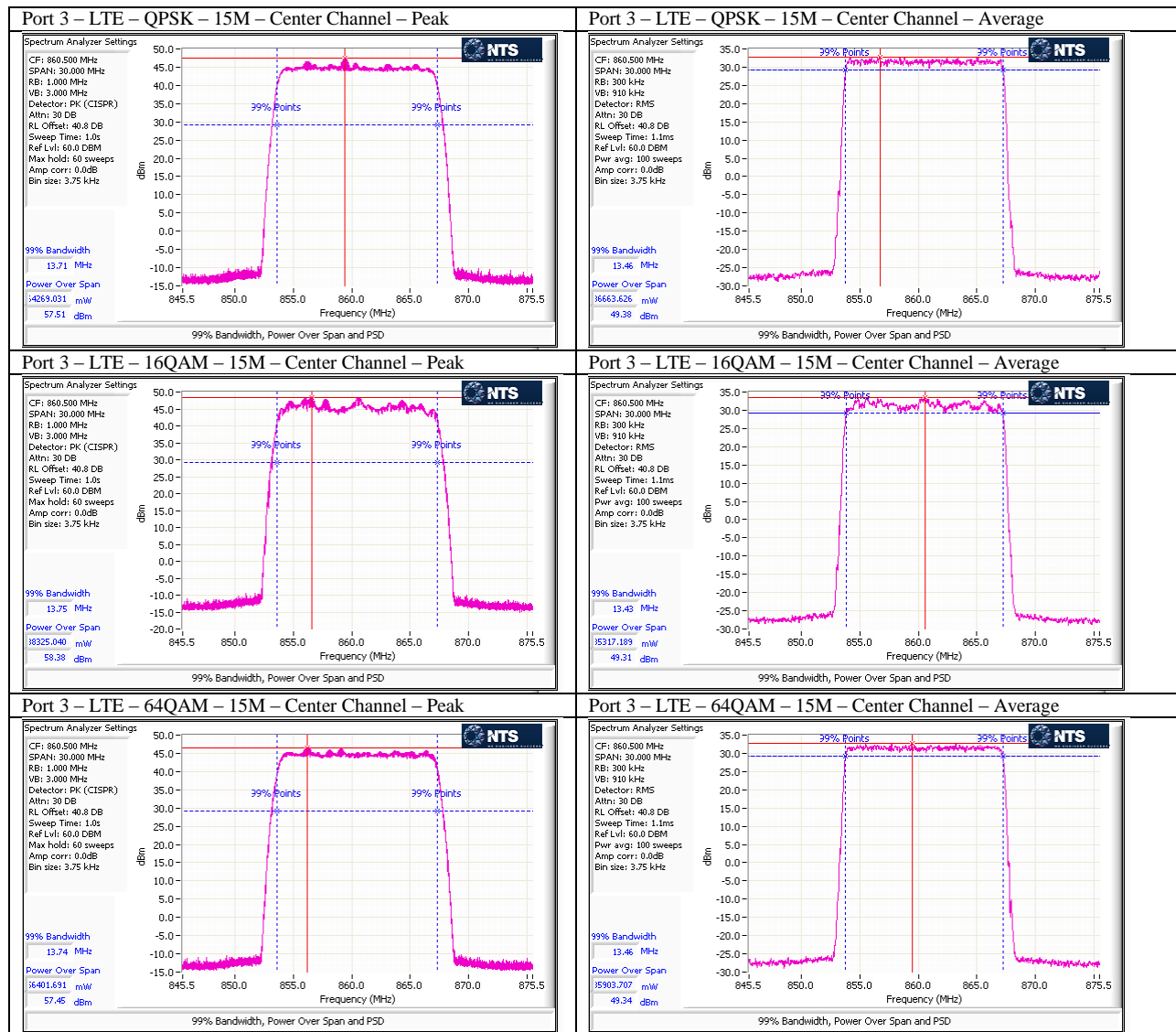


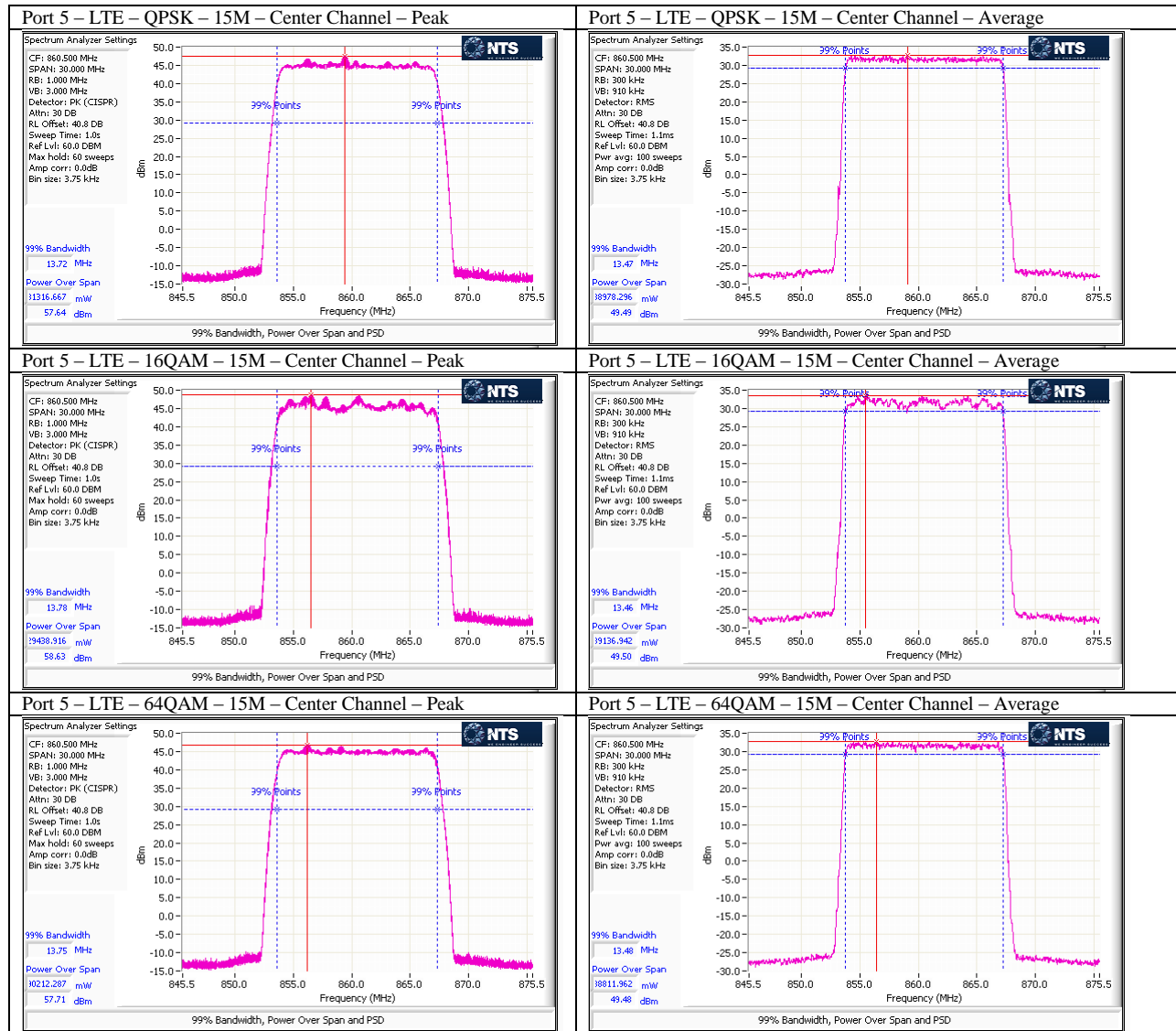


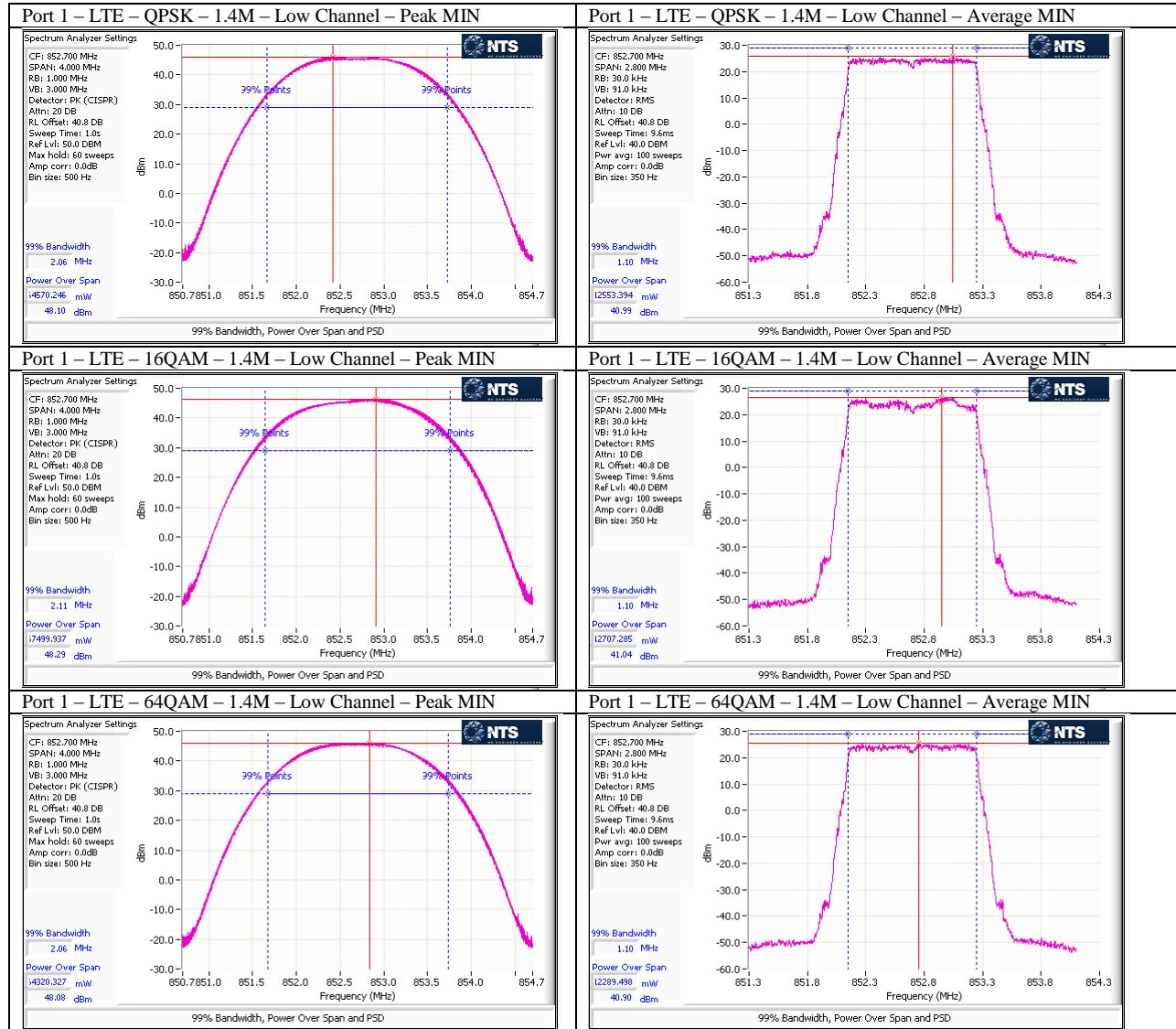


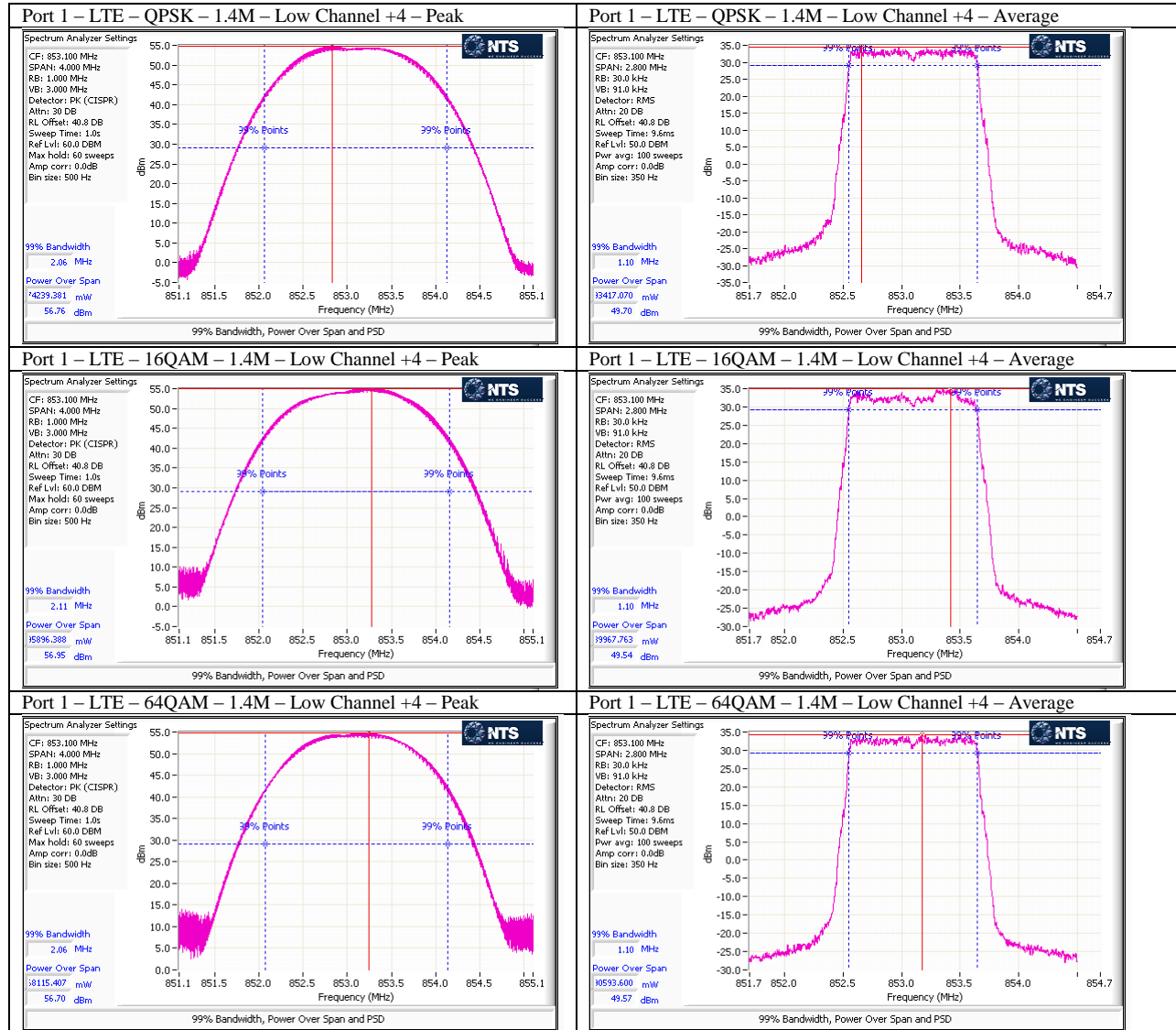




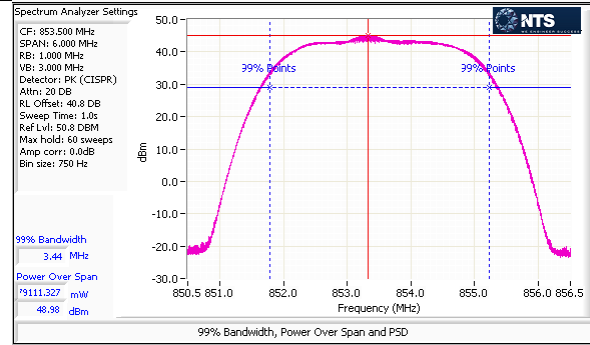




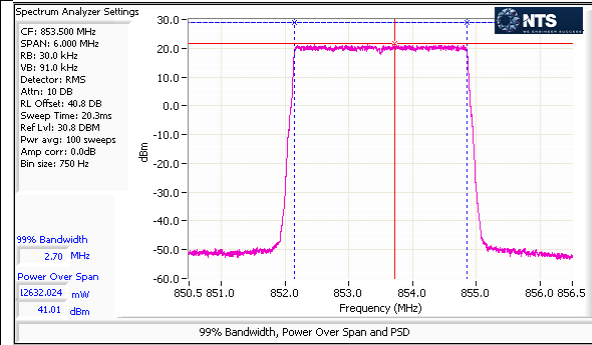




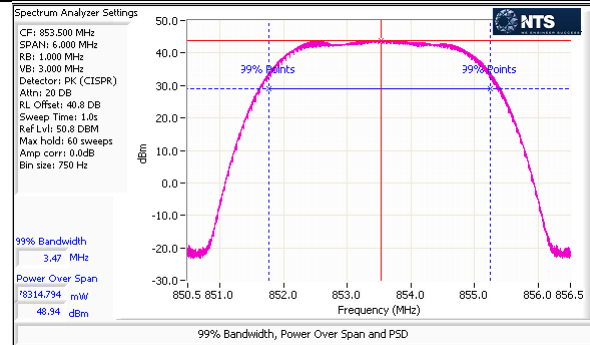
Port 1 – LTE – QPSK – 3M – Low Channel – Peak MIN



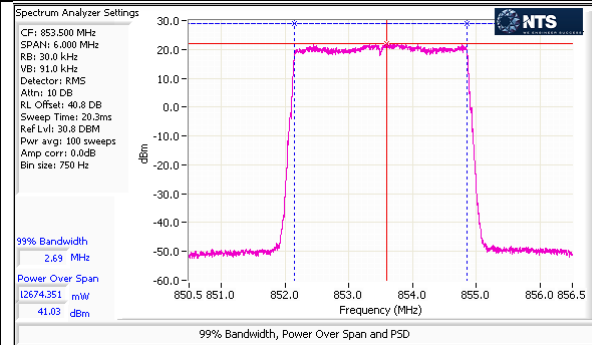
Port 1 – LTE – QPSK – 3M – Low Channel – Average MIN



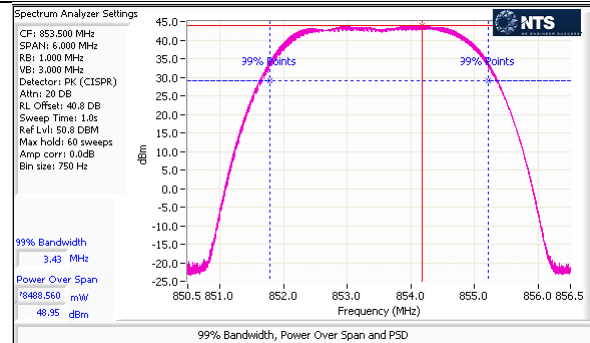
Port 1 – LTE – 16QAM – 3M – Low Channel – Peak MIN



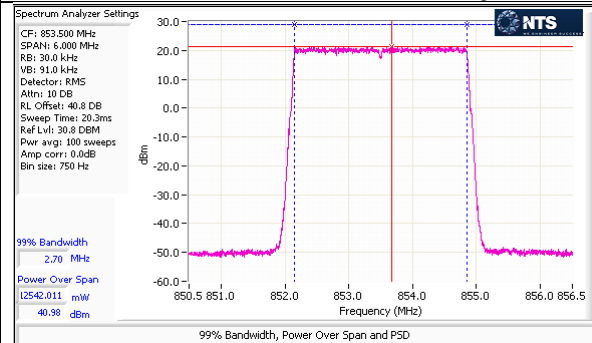
Port 1 – LTE – 16QAM – 3M – Low Channel – Average MIN

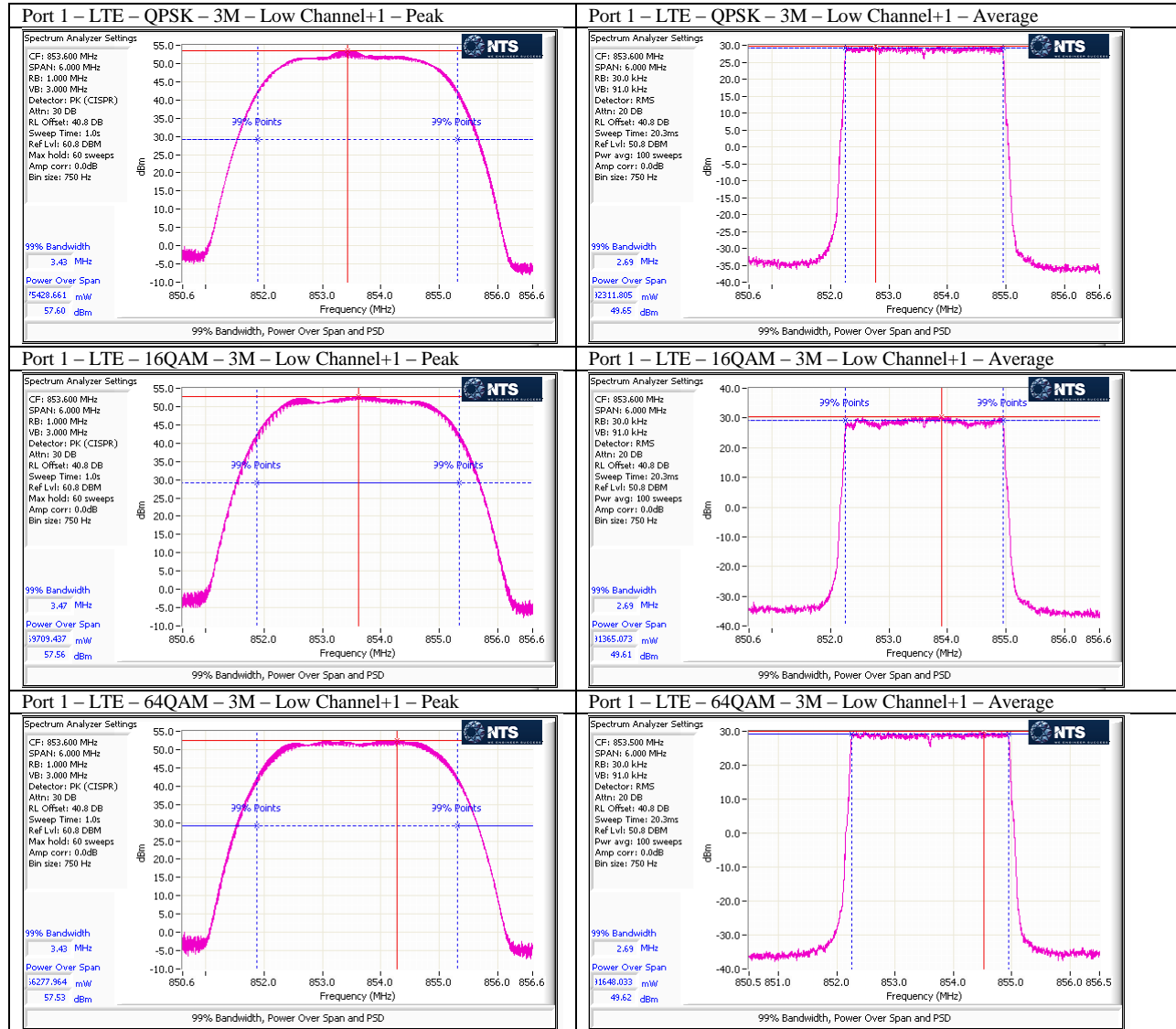


Port 1 – LTE – 64QAM – 3M – Low Channel – Peak MIN

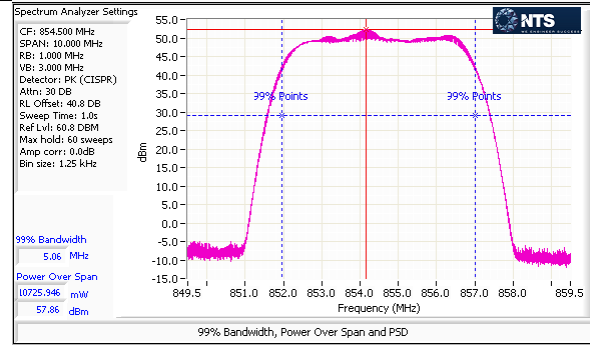


Port 1 – LTE – 64QAM – 3M – Low Channel – Average MIN

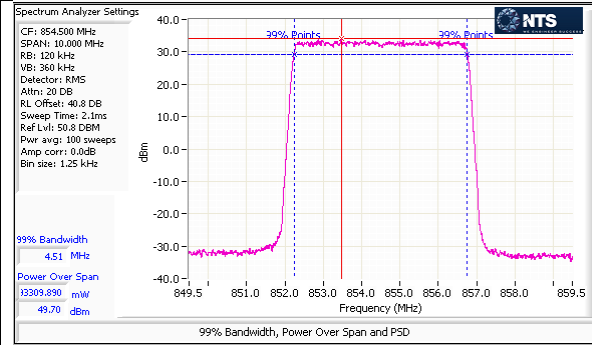




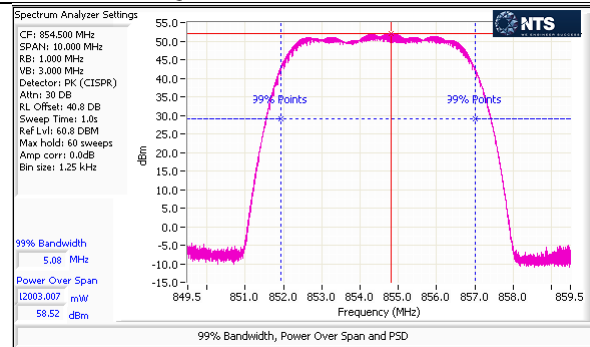
Port 1 – LTE – QPSK – 5M – Low Channel – Peak



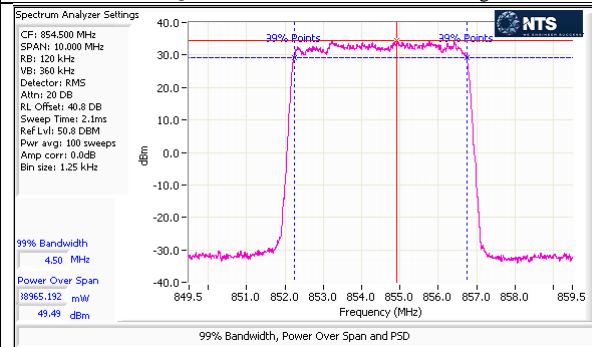
Port 1 – LTE – QPSK – 5M – Low Channel – Average



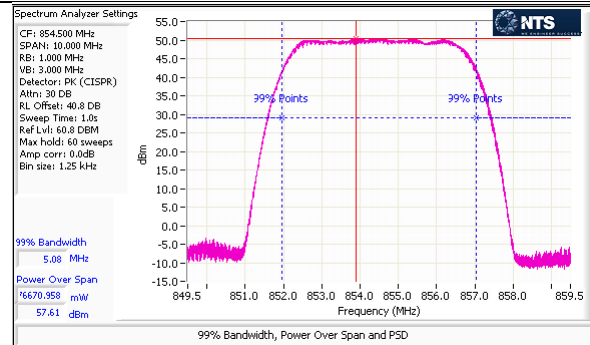
Port 1 – LTE – 16QAM – 5M – Low Channel – Peak



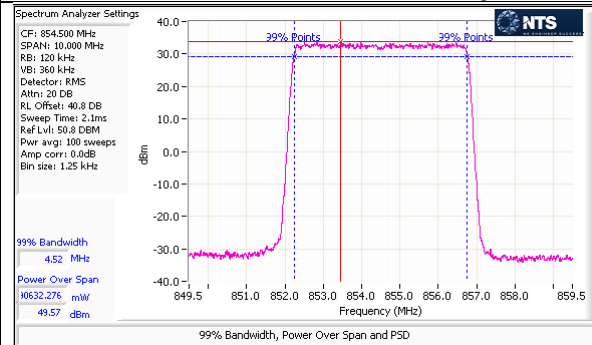
Port 1 – LTE – 16QAM – 5M – Low Channel – Average

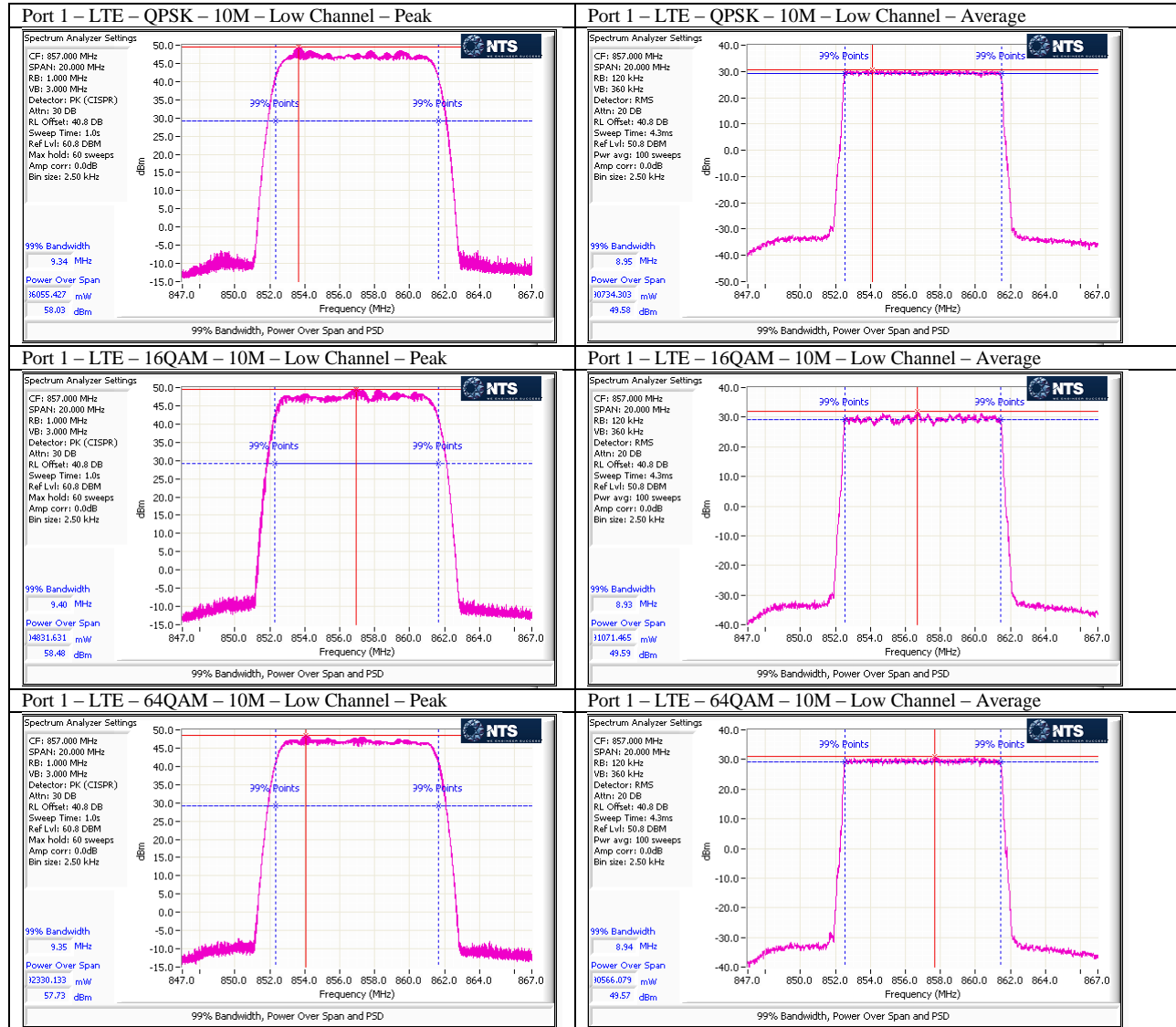


Port 1 – LTE – 64QAM – 5M – Low Channel – Peak

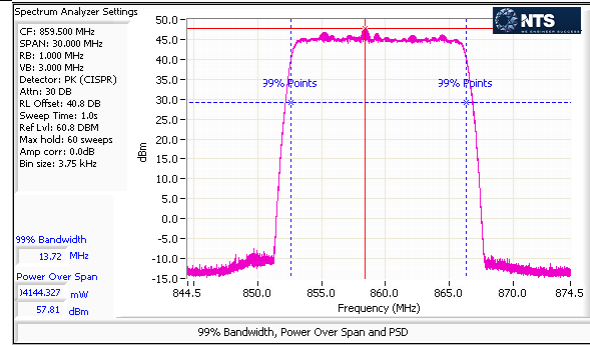


Port 1 – LTE – 64QAM – 5M – Low Channel – Average

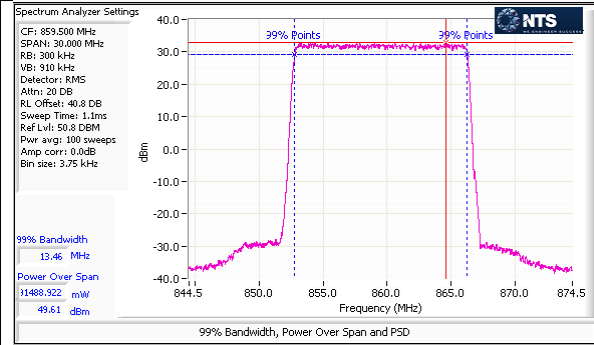




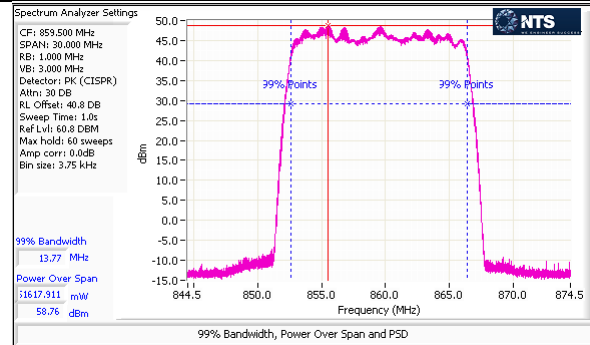
Port 1 – LTE – QPSK – 15M – Low Channel – Peak



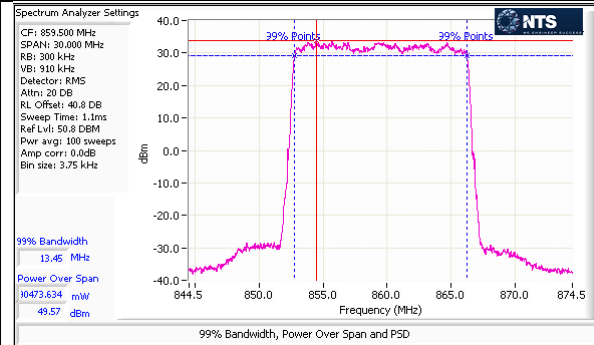
Port 1 – LTE – QPSK – 15M – Low Channel – Average



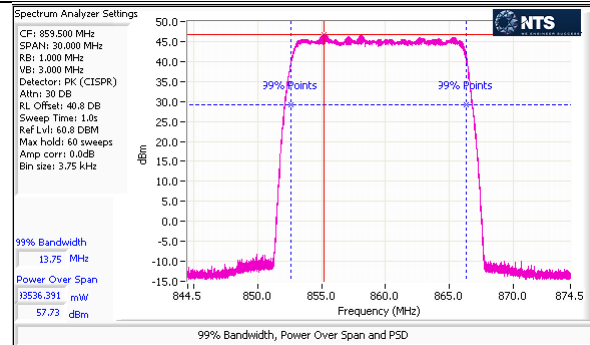
Port 1 – LTE – 16QAM – 15M – Low Channel – Peak



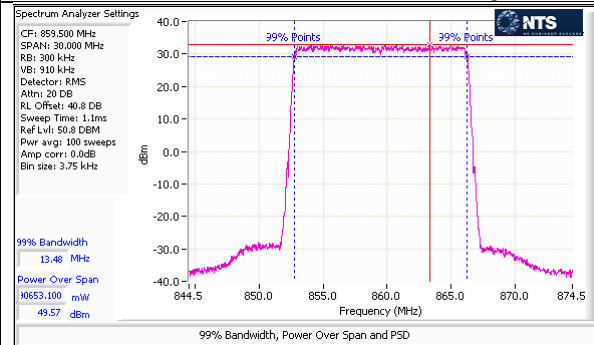
Port 1 – LTE – 16QAM – 15M – Low Channel – Average

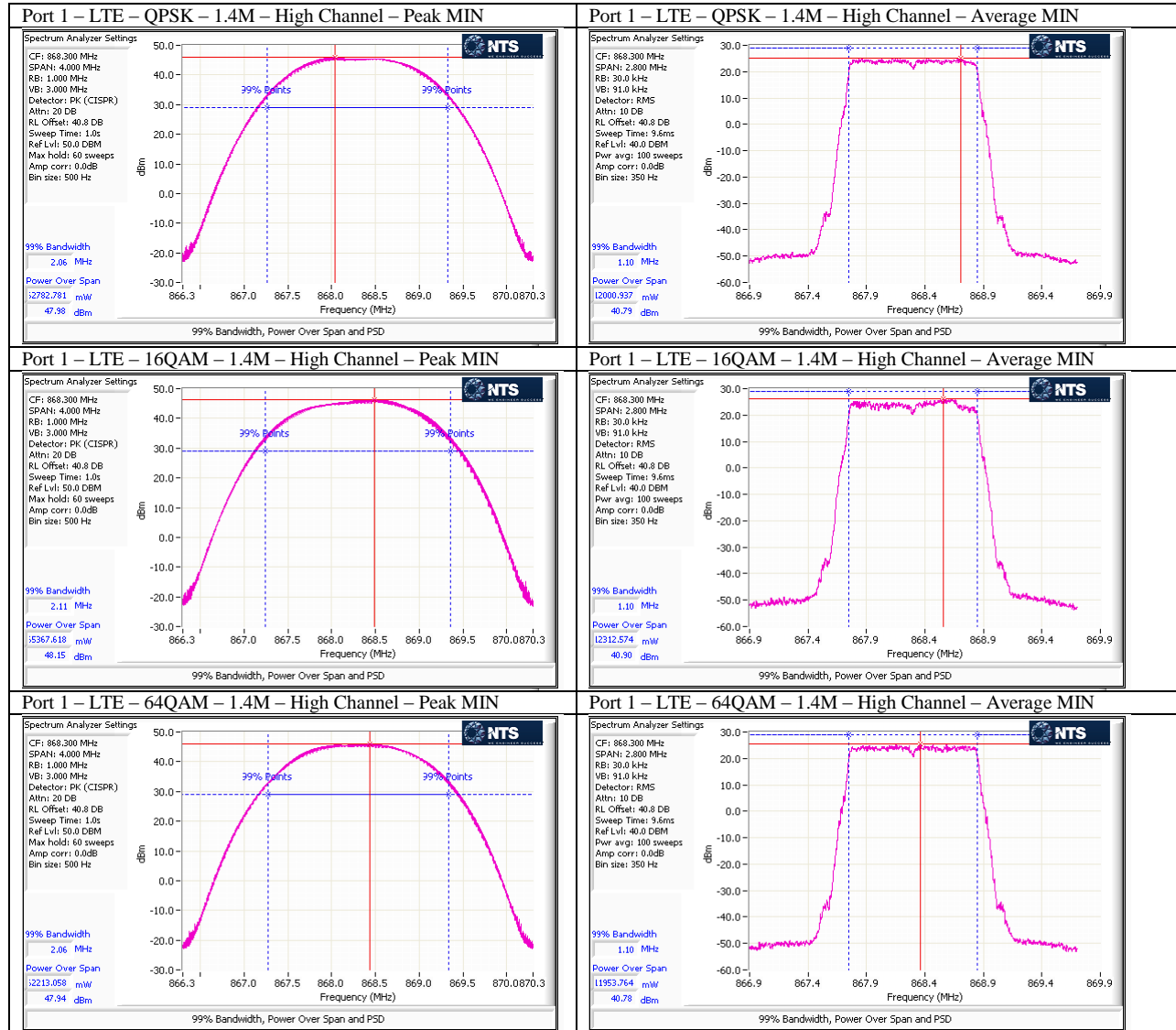


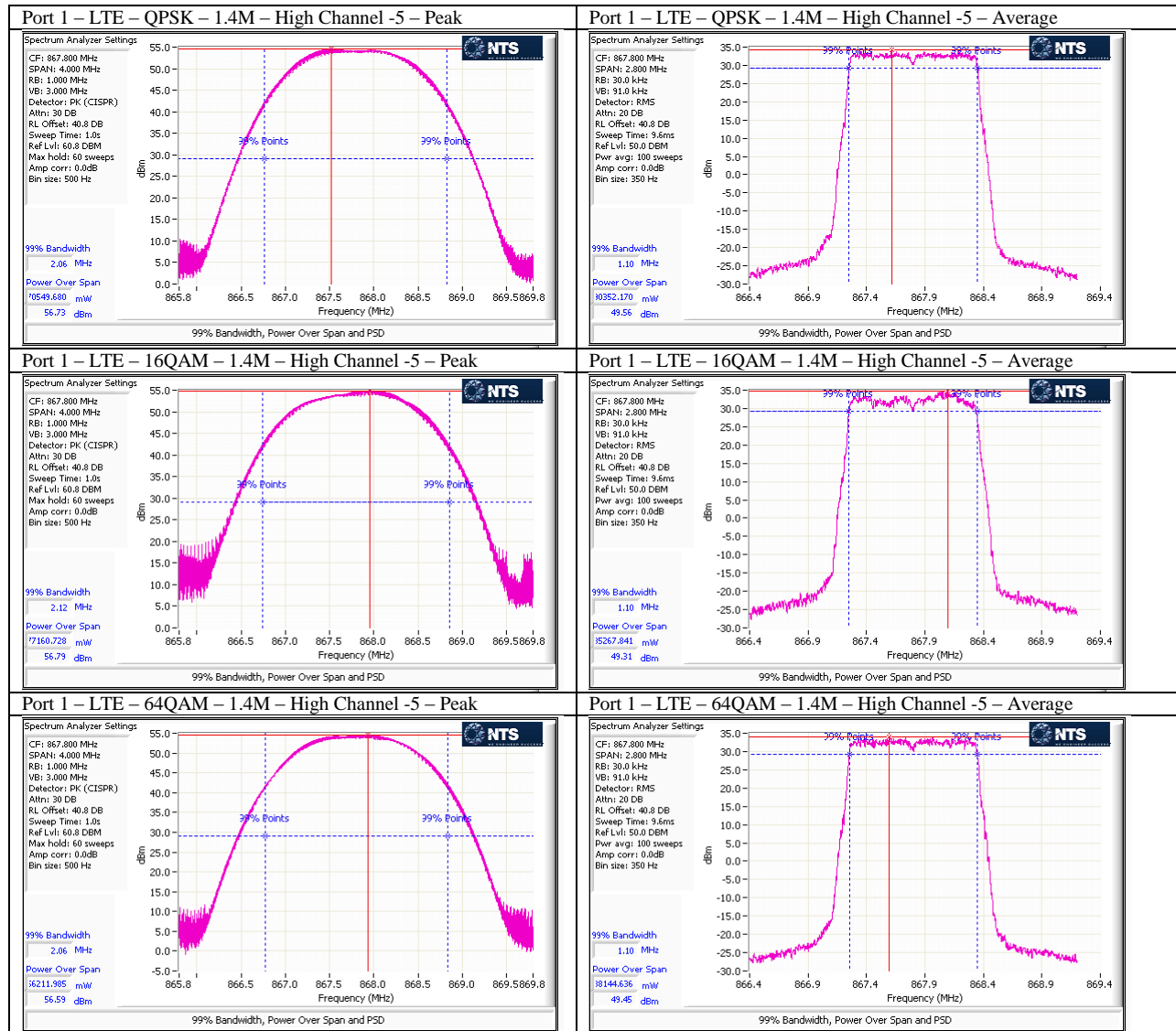
Port 1 – LTE – 64QAM – 15M – Low Channel – Peak



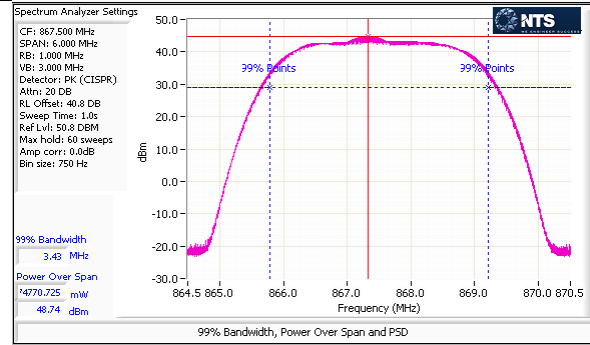
Port 1 – LTE – 64QAM – 15M – Low Channel – Average



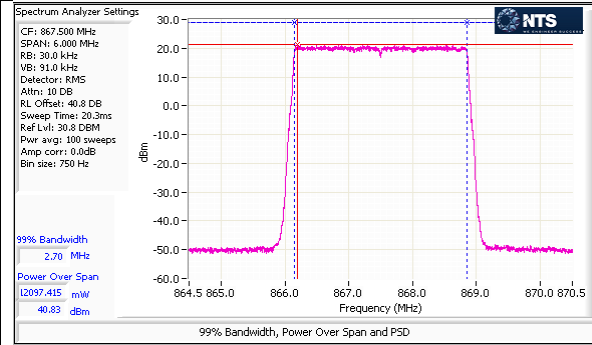




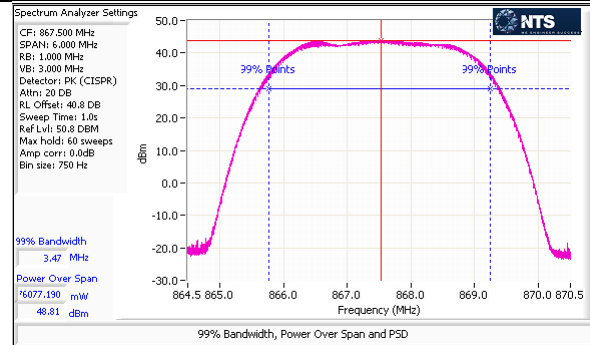
Port 1 – LTE – QPSK – 3M – High Channel – Peak MIN



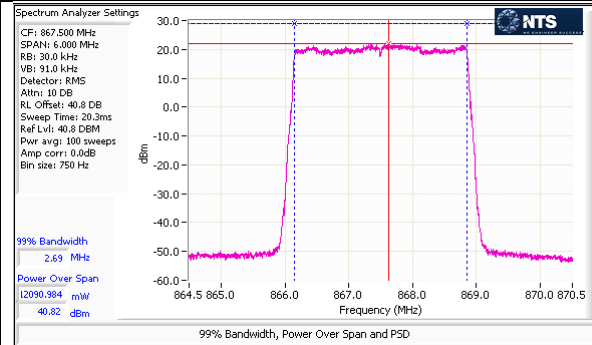
Port 1 – LTE – QPSK – 3M – High Channel – Average MIN



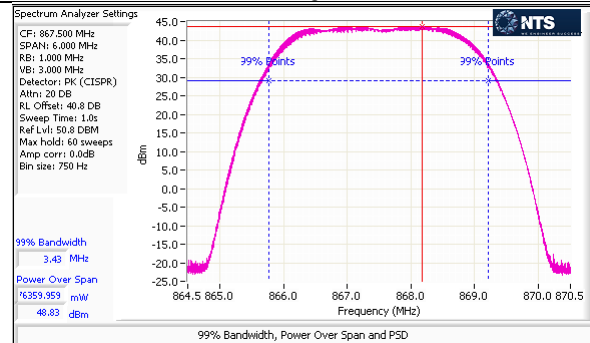
Port 1 – LTE – 16QAM – 3M – High Channel – Peak MIN



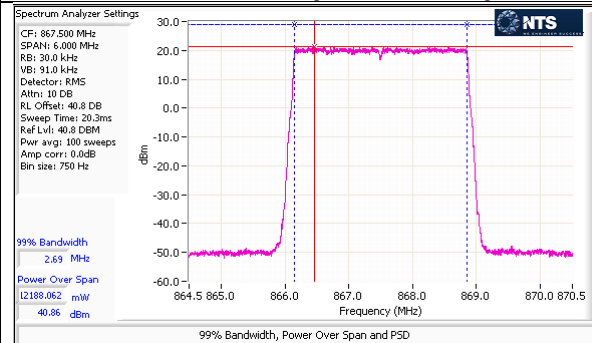
Port 1 – LTE – 16QAM – 3M – High Channel – Average MIN

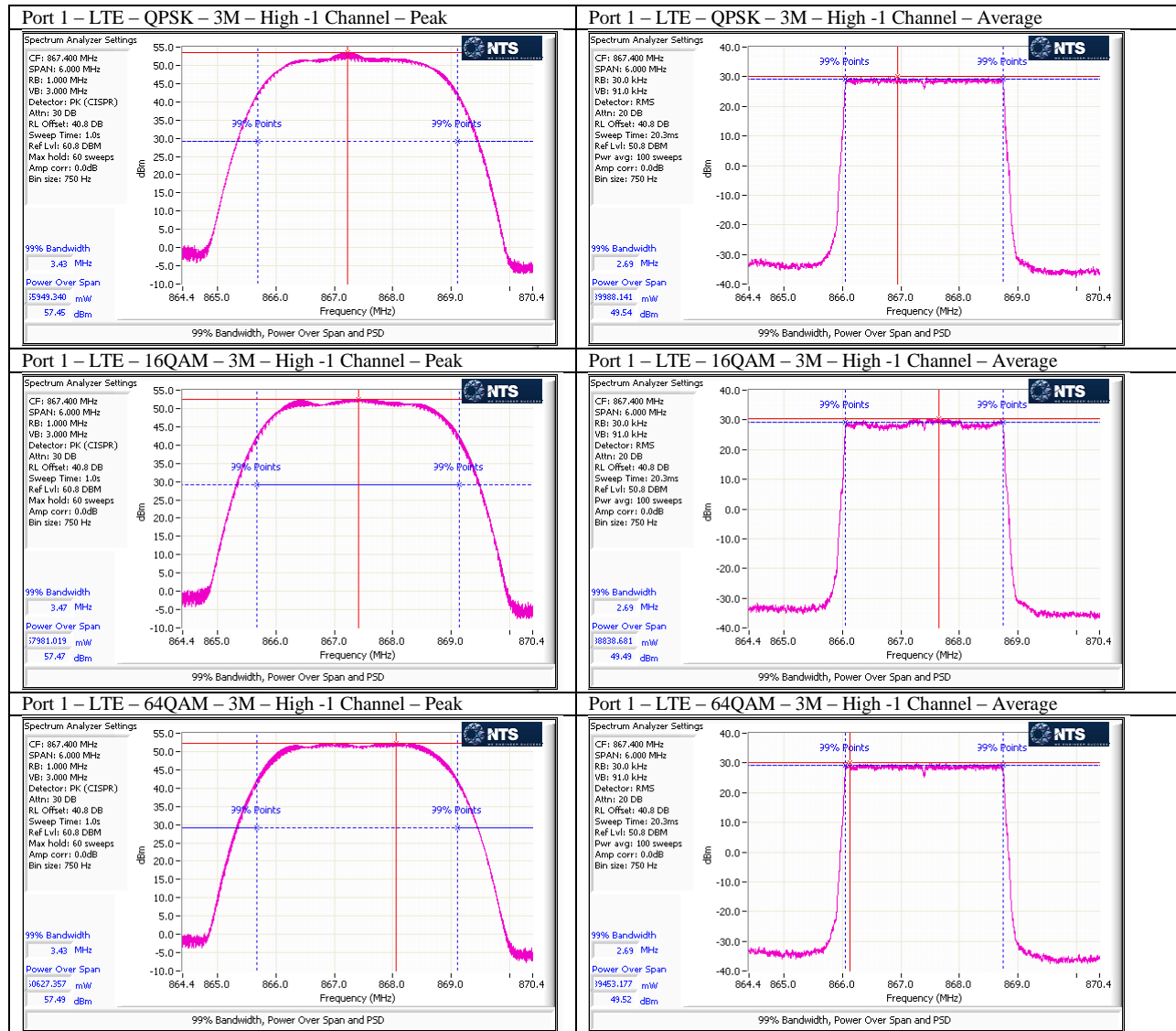


Port 1 – LTE – 64QAM – 3M – High Channel – Peak MIN

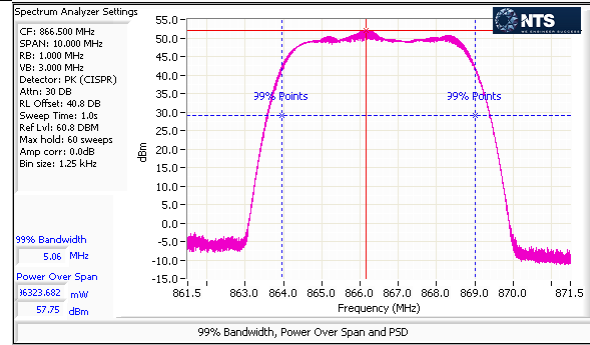


Port 1 – LTE – 64QAM – 3M – High Channel – Average MIN

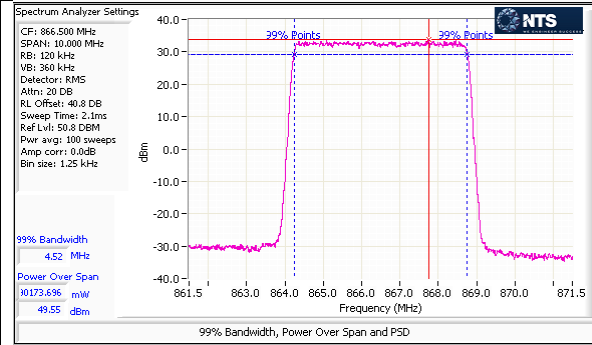




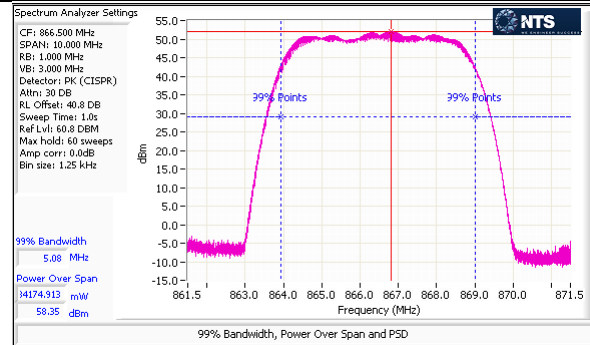
Port 1 – LTE – QPSK – 5M – High Channel – Peak



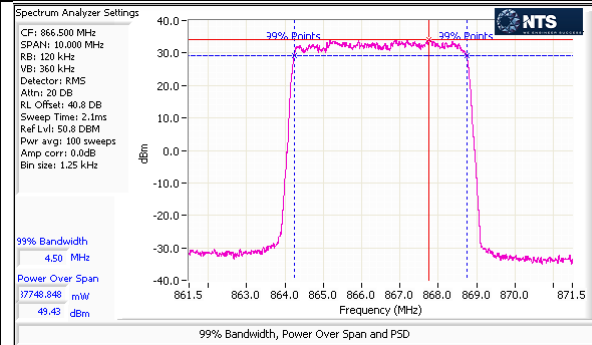
Port 1 – LTE – QPSK – 5M – High Channel – Average



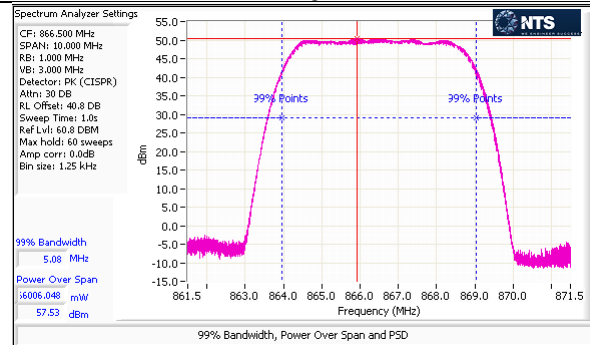
Port 1 – LTE – 16QAM – 5M – High Channel – Peak



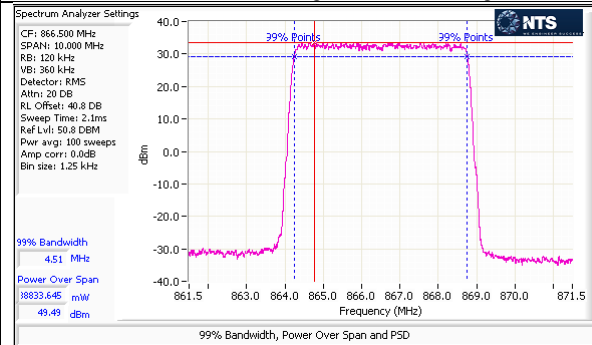
Port 1 – LTE – 16QAM – 5M – High Channel – Average



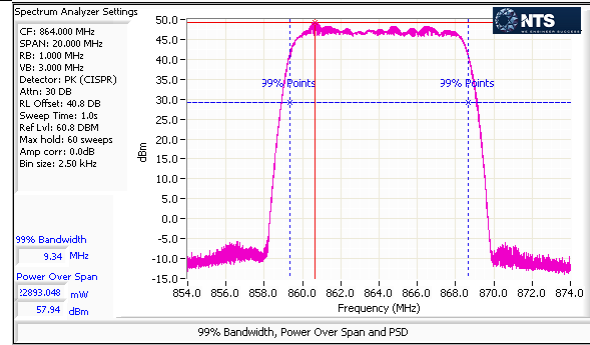
Port 1 – LTE – 64QAM – 5M – High Channel – Peak



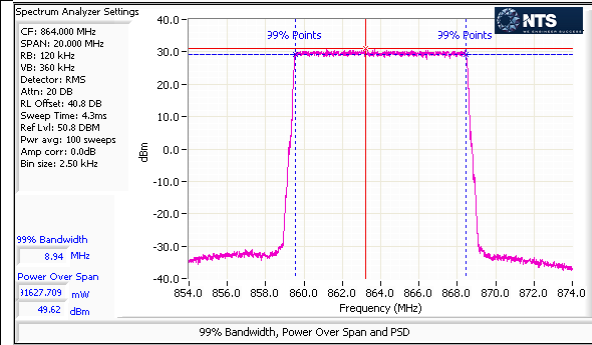
Port 1 – LTE – 64QAM – 5M – High Channel – Average



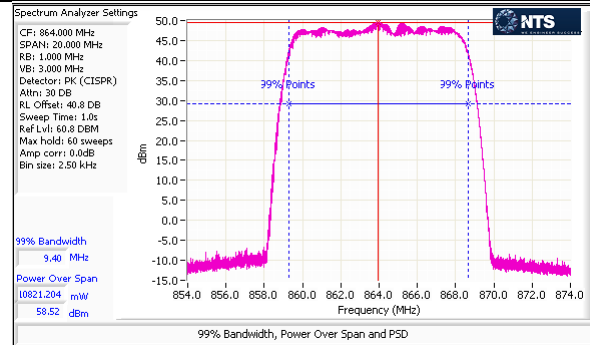
Port 1 – LTE – QPSK – 10M – High Channel – Peak



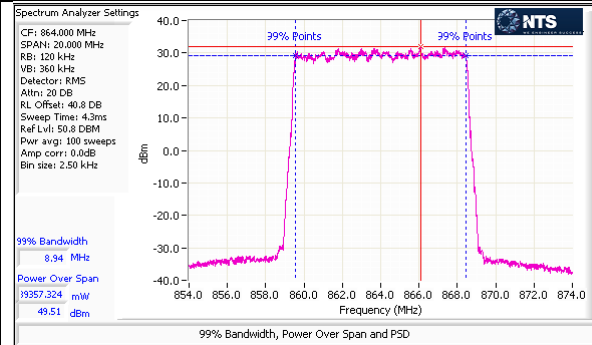
Port 1 – LTE – QPSK – 10M – High Channel – Average



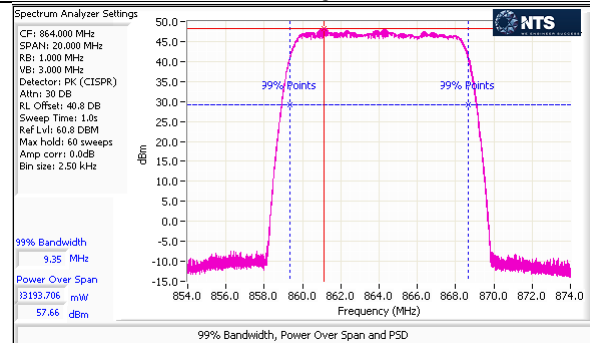
Port 1 – LTE – 16QAM – 10M – High Channel – Peak



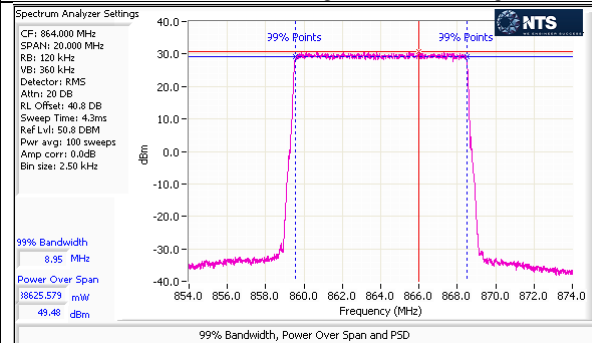
Port 1 – LTE – 16QAM – 10M – High Channel – Average

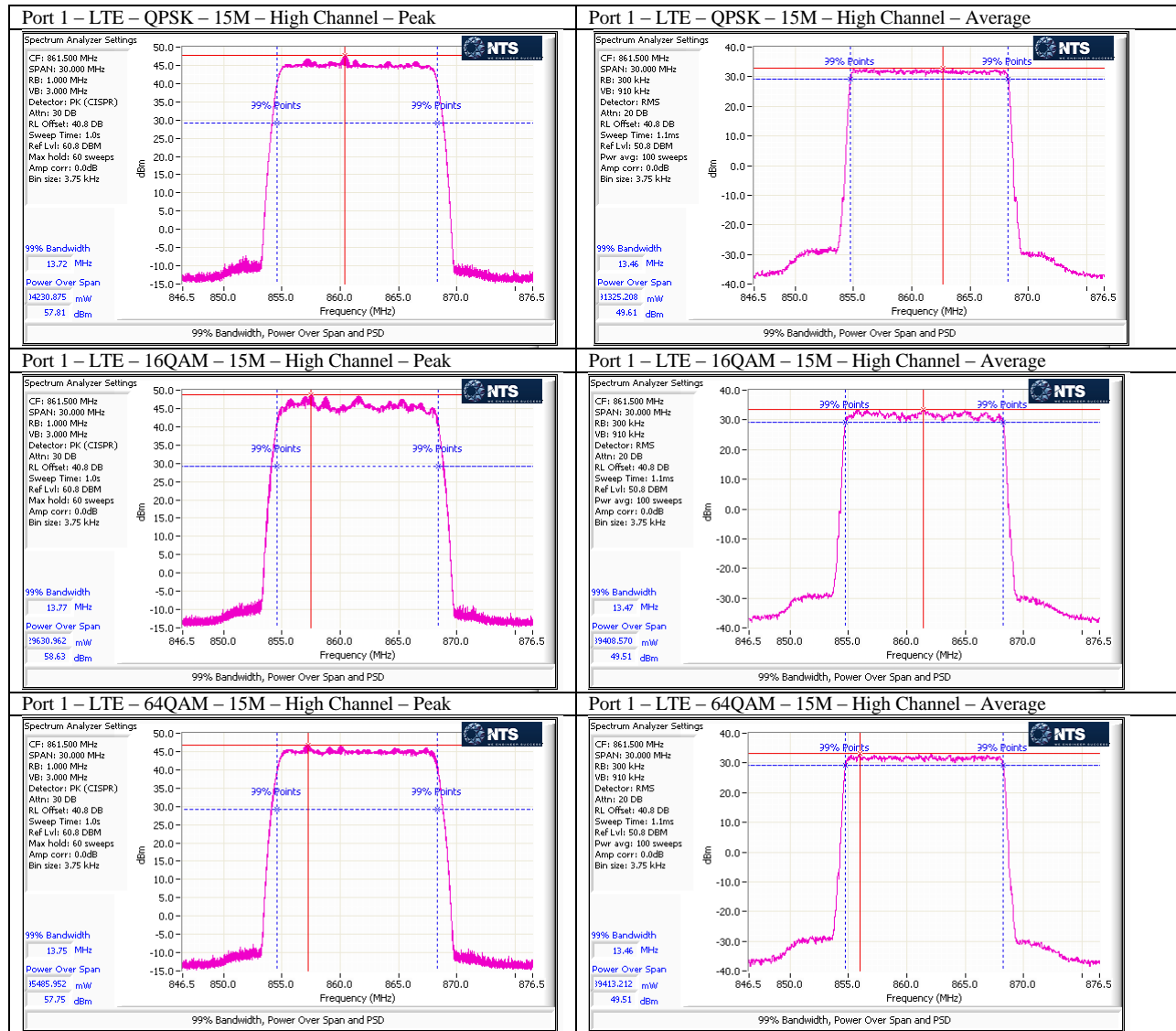


Port 1 – LTE – 64QAM – 10M – High Channel – Peak



Port 1 – LTE – 64QAM – 10M – High Channel – Average





Emission Bandwidths (26dB and 99%)

Emissions bandwidths were measured at Port 1 on low and high channels for all modulations and channel bandwidth modes and results presented below.

Max	LTE - QPSK				LTE - 16QAM				LTE - 64QAM			
	Low		High		Low		High		Low		High	
	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)
1.4M	1.279	1.118	1.288	1.12	1.266	1.113	1.264	1.11	1.261	1.111	1.259	1.111
3M	2.919	2.708	2.921	2.709	2.919	2.706	2.919	2.707	2.915	2.712	2.914	2.714
5M	4.852	4.492	4.871	4.491	4.841	4.482	4.849	4.481	4.862	4.502	4.859	4.501
10M	9.683	8.991	9.7	8.991	9.697	9.001	9.673	9.001	9.697	8.991	9.717	8.984
15M	14.539	13.491	14.509	13.491	14.512	13.502	14.501	13.513	14.588	13.491	14.584	13.498

Corresponding plots included on the following pages.

