Radio Test Report

Application for Grant of Equipment Authorization

FCC Part 22 Subpart H
IC RSS-132 Issue 3
869MHz – 894MHz

FCC ID:	**VBNFRCG-01**
IC:	**661W-FRCG**
Model:	**FRCG**
Product Name:	**Flexi Multiradio BTS**
APPLICANT:	**Nokia Solutions and Networks** **6000 Connection Drive** **Irving, TX 75039**
TEST SITE(S):	**National Technical Systems - Plano** **1701 E Plano Pkwy #150** **Plano, TX 75074**
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REVISION HISTORY

Rev#	Date	Comments	Modified By
0	Apr 13, 2015	1st release	Yunus Faziloglu
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SCOPE

Tests have been performed on Nokia Solutions and Networks product Flexi Multiradio BTS RRH Model FRCG, pursuant to the relevant requirements of the following standard(s) in order to obtain device certification against the regulatory requirements of the Federal Communications Commission and Industry Canada.

- Code of Federal Regulations (CFR) Title 47 Part 2
- CFR Title 47 Part 22 Subpart H
- RSS-Gen Issue 4 November 2014
- RSS-132 Issue 3 January 2013

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards:

ANSI C63.4-2009
ANSI TIA-603-C
FCC KDB 971168 D01 v02r02

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant FCC requirements.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of Nokia Solutions and Networks product Flexi Multiradio BTS RRH Model FRCG and therefore apply only to the tested sample. The sample was selected and prepared by Hobert Smith of Nokia Solutions and Networks.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, the device requires certification. Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

Testing was performed only on Model FRCG. No additional models were described or supplied for testing.

STATEMENT OF COMPLIANCE

The tested sample of Nokia Solutions and Networks product Flexi Multiradio BTS RRH Model FRCG complied with the requirements of the standards and frequency bands declared in the scope of this test report.

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS

FCC Part 22 Subpart H and RSS-132 Issue 3 (Base Stations Operating in 869MHz-894MHz band)

FCC	Canada	Description	Measured	Limit	Result
Transmitter Modulation, output power and other characteristics					
§22.905	RSS-132 Section 5.1	Frequency range(s)	871.4-891.6 (5M-WCDMA) 869.7-893.3 (1.4M-LTE) 870.5-892.5 (3M-LTE) 871.5-891.5 (5M-LTE) 874.0-889.0 (10M-LTE) 876.5-886.5 (15M-LTE) 879.0-884.0 (20M-LTE)	869-894 MHz	Pass
§2.1047	RSS-132 Section 5.2	Modulation Type	WCDMA: QPSK, 16QAM, 64QAM (5M only for each) LTE: QPSK, 16QAM, 64QAM (1.4M, 3M, 5M, 10M, 15M, 20M for each)	Digital	Pass
§22.913	RSS-132 Section 5.4	Output Power	Conducted Output Power (Highest on Port 1) RMS: 47.15Bm (WCDMA) RMS: 47.72Bm (LTE) ERP will depend on antenna gain (unknown)	1000W ERP	Pass
N/A Informational	RSS-132 Section 5.4	Peak to Average Ratio	10.97dB highest	<= 13 dB	Pass
§22.917(b)	-	Emission Bandwidth (26dB)	4.605MHz (5M-WCDMA) 1.330MHz (1.4M-LTE) 2.914MHz (3M-LTE) 4.883MHz (5M-LTE) 9.769MHz (10M-LTE) 14.617MHz (15M-LTE) 19.446MHz (20M-LTE)	Remain in Block	Pass
-	RSS-Gen Section 6.6	Emission Bandwidth (99%)	4.103MHz (5M-WCDMA) 1.126MHz (1.4M-LTE) 2.706MHz (3M-LTE) 4.500MHz (5M-LTE) 9.011MHz (10M-LTE) 13.495MHz (15M-LTE) 18.018MHz (20M-LTE)	Remain in Block	Pass
Transmitter spurious emissions[1]					
§22.917	RSS-132 Section 5.5	At the antenna terminals	< -16.02dBm	-16.02 dBm (per TX chain)	Pass
		Field strength	38.3dBuV/m at 3m Eq. to -56.9dBm EIRP	-13 dBm EIRP	Pass
Other details					
§2.1057	RSS-132 Section 5.3	Frequency stability	0.001ppm	1.5ppm	Pass
§1.1310	RSS-102 Issue 5	RF Exposure	N/A		Pass[2]

Notes

Note 1 – Based on 100kHz RBW. In 1MHz bands immediately outside and adjacent to the frequency block an RBW of at least 1% of the emission bandwidth has been used.
Note 2 – Applicant's declaration on a separate exhibit based on hypothetical antenna gains.

	Emission Designators					
	LTE-QPSK		LTE-16QAM		LTE-64QAM	
	FCC	IC	FCC	IC	FCC	IC
1.4M	1M33F9W	1M13F9W	1M30F9W	1M12F9W	1M29F9W	1M12F9W
3M	2M91F9W	2M70F9W	2M91F9W	2M70F9W	2M91F9W	2M71F9W
5M	4M88F9W	4M49F9W	4M87F9W	4M49F9W	4M88F9W	4M50F9W
10M	9M73F9W	8M99F9W	9M72F9W	9M01F9W	9M77F9W	8M99F9W
15M	14M6F9W	13M5F9W	14M5F9W	13M5F9W	14M6F9W	13M5F9W
20M	19M4F9W	18M0F9W	19M4F9W	18M0F9W	19M4F9W	17M9F9W

	Emission Designators					
	WCDMA-QPSK		WCDMA-16QAM		WCDMA-64QAM	
	FCC	IC	FCC	IC	FCC	IC
5M	4M61F9W	4M10F9W	4M60F9W	4M10F9W	4M60F9W	4M10F9W

Note: FCC based on 26dB emissions bandwidth, IC based on 99% emissions bandwidth

EXTREME CONDITIONS

Frequency stability is determined over extremes of temperature and voltage. The extremes of voltage were 85 to 115 percent of the nominal value.

The extremes of temperature were -30°C to +50°C as specified in FCC §2.1055(a)(1).

MEASUREMENT UNCERTAINTIES

Measurement uncertainties of the test facility based on a 95% confidence level are as follows,

Test	**Uncertainty**
Radio frequency	± 0.2ppm
RF power conducted	±1.2 dB
RF power radiated	±3.3 dB
RF power density conducted	±1.2 dB
Spurious emissions conducted	±1.2 dB
Adjacent channel power	±0.4 dB
Spurious emissions radiated	±4 dB
Temperature	±1°C
Humidity	±1.6 %
Voltage (DC)	±0.2 %
Voltage (AC)	±0.3 %

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The equipment under test (EUT) is a Nokia Solutions and Networks Flexi Multiradio Base Transceiver Station (BTS) Remote Radio Head (RRH) module, model FRCG which operates over 3GPP frequency band 5 (869 - 894 MHz). The FRCG has two co-located transmitters with each transmit port supporting 60 watts maximum rated RF output power. The FRCG can be operated as MIMO or as non-MIMO. Multi-carrier operation is supported.

The FRCG is multi-standard capable (GSM/EDGE/WCDMA/LTE), but for this effort only the WCDMA and LTE modes are tested. The FRCG supports three downlink modulation types for WCDMA and LTE (QPSK, 16QAM and 64QAM). The FRCG supports six LTE channel bandwidths (1.4, 3.0, 5, 10, 15 and 20 MHz) and for WCDMA it supports a 5 MHz channel bandwidth.

The FRCG has external interfaces including DC power, ground, TX/RX (Ant), RX monitor (RXO), external alarm (EAC), optical OBSAI (OPT) and remote electrical tilt (RET). The RRH with applicable installation kit may be pole or wall mounted.

The FRCG channel numbers and frequencies are as follows:

	Downlink EARFCN Band 5	Downlink Frequency (MHz)	LTE Channel Bandwidth					
			1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Band 5 (Ant 1, 2)	2400	869.0	Bandedge	Bandedge	Bandedge	Bandedge	Bandedge	Bandedge
	……							
	2407	869.7	Bottom Ch					
	……							
	2415	870.5		Bottom Ch				
	……							
	2425	871.5			Bottom Ch			
	……							
	2450	874.0				Bottom Ch		
	……							
	2475	876.5					Bottom Ch	
	……							
	2500	879.0						Bottom Ch
	……							
	2525	881.5	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch	Middle Ch
	……							
	2550	884.0						Top Channel
	……							
	2575	886.5					Top Channel	
	……							
	2600	889.0				Top Channel		
	……							
	2625	891.5			Top Channel			
	……							
	2635	892.5		Top Channel				
	……							
	2643	893.3	Top Channel					
	……							
	2650	894.0	Bandedge	Bandedge	Bandedge	Bandedge	Bandedge	Bandedge

FRCG Downlink LTE Frequency Channels

	Downlink UARFCN	Downlink Frequency (MHz)	WCDMA Channel
Band 5 (Ant 1, 2)	……	869.0	Bandedge
	……		
	4357	871.4	Bottom Channel
	4358	871.6	Bottom Channel + 1
	……		
	4408	881.6	Middle Channel
	……		
	4457	891.4	Top Channel - 1
	4458	891.6	Top Channel
	……		
	……	894.0	Bandedge

FRCG Downlink WCDMA Frequency Channels

The sample was received on Feb 24, 2015 and tested on Feb 24 – Mar 6, 2015. The EUT consisted of the following component(s):

Company	Model	Description	Part/Serial Number	FCC ID/IC Number
Nokia Solutions and Networks	FRCG	Flexi Multiradio BTS RRH	Part#: 473224A.x11 Serial#: YK145000089	FCC ID: VBNFRCG-01 IC: 661W-FRCG

ENCLOSURE

The EUT enclosure is made of heavy duty aluminum and measures approximately 12(W) x 7(D) x 24(H) inches.

AUXILLARY EQUIPMENT

Company	Model	Description	Part/Serial Number	FCC ID/IC Number
Nokia Solutions and Networks	FOSH	6GHz SFP Module (Plugs into RRH Opt Ports 1&2)	Part#: 472579A.101 (2 units per RRH) Serial#: CE30LC5Z2 and CE30LCCBA	N/A
Nokia Solutions and Networks	MDTA	Masthead Amplifier	Part#: CS7299112…01 Serial#: SK060418615	N/A

SUPPORT EQUIPMENT

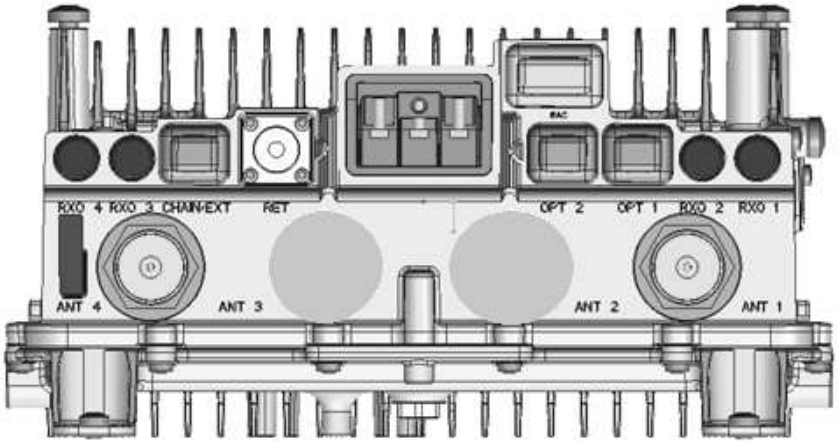
Company	Model	Description	Part/Serial Number	FCC ID/IC Number
Nokia Solutions and Networks	FSMF	Flexi System Module	Part#: 472181A.103	N/A
Nokia Solutions and Networks	FBBA	Baseband Extension Module	Part#: 472182A.101 (2 units per FSMF)	N/A
HP	Elite Book 6930p	Laptop PC	N/A	N/A

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Cable	Type	Shield	Length	Used in Test	Quantity	Termination
Power Input	Power	No	~ 3 m	Yes	1	Power Supply
Earth	Earth	No	~ 1 m	Yes	1	Lab earth ground
Antenna	RF	Yes	~ 3 m	Yes	2	50Ω Load
RX monitor	RF	Yes	~ 2 m	Yes	2	50Ω Load
External Alarm	Signal	Yes	~ 3 m	Yes	1	Un-terminated
Remote Electrical Tilt	Signal	Yes	~ 3 m	Yes	1	Un-terminated
Multimode Optical	Optical	No	>6 m	Yes	2	System Module

The connector layout for FRCG is provided below:



FRCG External Interfaces:

Name	Qty	Connector Type	Purpose (and Description)
DC In	1	Screw Terminal	3-port Power Input -48 VDC, up to AWG 4 cable
GND	1	Screw lug (2xM5/1xM8)	Ground
ANT	2	7/16	RF signal for Transmitter/Receiver (50 Ohm)
RXO	2	QMA	RX output for monitoring/location services
Unit	1	LED	Unit Status LED
LMP	1	Card edge	Local Management/Test Port (Ethernet 10Base-T/100Base-Tx and others, not field accessible)
EAC	1	MDR14	External Alarm Interface (4 alarms)
OPT	2	SFP+ cage	Optical OBSAI Interface up to 6 Gps.
RET	1	8-pin circular connector conforming to IEC 60130-9 – Ed.3.0	AISG 2.0 to external devices

EUT OPERATION

During testing, the EUT was transmitting continuously with 100% duty-cycle at full power on both ports.

EUT FIRMWARE/SOFTWARE

The laptop PC connects to the FSMF System Module over the LMP (Ethernet) port. The system module controls the FRCG RRH via the optical (OBSAI) interface. The laptop is used for changing configuration settings, monitoring tests and controlling the BTS. The following software versions are used for the FRCG testing:

(1) RRH Unit Software: FRM35.02.R04

(2) System Module Software: FB_PS_REL_2013_09_016

MODIFICATIONS

No modifications were made to the EUT during testing.

TESTING

GENERAL INFORMATION

Antenna port measurements were taken at NTS Plano branch located at 1701 E Plano Pkwy #150 Plano, TX 75074.

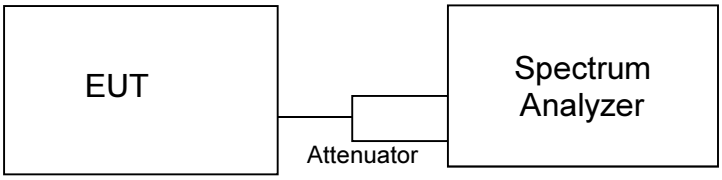
Radiated spurious emissions measurements were taken at the NTS Plano Anechoic Chamber listed below. The sites conform to the requirements of ANSI C63.4-2009 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz* and CISPR 16-1-4:2007 - *Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus Ancillary equipment Radiated disturbances*. They are on file with the FCC and industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
Chamber 1	A2LA Accredited Designation Number US1077	IC 4319A	1701 E Plano Pkwy #150 Plano, TX 75074.

Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements.

MEASUREMENT PROCEDURES

Output power, emission bandwidth, conducted spurious, conducted bandedge and carrier frequency stability measurements were all performed via a spectrum analyzer connected to the individual RF chains via a 40dB attenuator and an RF cable. The EUT was operating in 2x2 MIMO configuration at full power for all tests. While measuring one transmit chain, the other was terminated with a termination block. All measurements were corrected for the insertion loss of the attenuator and cable inserted between the RF port of the EUT and the spectrum analyzer. Simple test diagram is shown below.



Test Configuration for Antenna Port Measurements

26dB emission bandwidth was measured in accordance with Section 4.1 of FCC KDB 971168 D01 v02r02. 99% occupied bandwidth was measured in accordance with Section 6.6 of RSS-Gen Issue 4. For both measurements an NTS custom software tool was used. Spectrum analyzer settings are shown on their corresponding plots in test results section.

Emissions at the band-edges were also captured with an NTS custom software tool with settings described in the corresponding sections of the FCC and IC rules. Spectrum analyzer settings are shown on their corresponding plots in test results section.

Peak and average output power measurements were performed in accordance with FCC KDB 971168 D01 v02r02. An NTS custom software tool was used for power integration to compensate for resolution bandwidth limitations of the spectrum analyzer and settings are shown on their corresponding plots in test results section.

Peak to average power ratio was calculated in accordance with Section 5.7.2 of FCC KDB 971168 D01 v02r02.

Conducted spurious emissions were captured with TILE6 software which corrected the readings for cable loss and attenuator loss across the 9kHz-9GHz frequency span. Settings of the spectrum analyzer are described in the corresponding test result section.

For frequency stability, the EUT was placed inside a temperature chamber with all support and test equipment located outside of the chamber. Temperature was varied across the specified range in 10 degree increments and EUT was allowed enough time to stabilize at each temperature step. A signal analyzer as detailed in the test equipment section has been used for précised frequency error measurements.

Transmitter radiated spurious emissions measurements were made in accordance with ANSI C63.4-2009 by measuring the field strength of the emissions from the device at 3m test distance. The eirp limit as specified in the relevant rule part(s) is converted to a field

strength at the test distance and the emissions from the EUT are then compared to that limit. Only emissions within 20dB of this limit are subjected to a substitution measurement in accordance with TIA-603-C-2004. Both preliminary and final measurements were performed at the same FCC listed test chamber. Preliminary scans were performed with TILE6 software. This software corrected the measurements for antenna factors, cable losses and pre-amplifier gains. Both polarizations of the receiving antenna were scanned from 30MHz to 9GHz with a peak detector (RBW=100kHz, VBW=300kHz, with trace max hold over multiple sweeps). Based on the preliminary scan results, frequencies of interest have been maximized via rotating the EUT 360 degrees and varying the height of the test antenna (1m to 4m). Final measurements were also taken with the peak detector as described above. A biconilog antenna was used for 30MHz-1GHz range. A double ridged waveguide horn antenna was used for 1-9GHz range. The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. EUT was placed on a non-conductive RF transparent structure to provide 80cm height from the ground floor. A motorized turntable allowed it to be rotated during testing to determine the angle with the highest level of emissions.

Test Equipment

NTS Equipment #	Description	Manufacturer	Model	Calibration Duration	Calibration Due Date
E1345P	PSA	Agilent	E4440A	12 Months	11/6/2015
E1481P	PSA	Agilent	E4440A	12 Months	7/24/2015
E1554P	PreAmp (1GHz-40GHz)	MITEQ	JS32-00104000-62-5P	12 Months	5/14/2015
E1148P	PreAmp (30MHz-1GHz)	MITEQ	AM-1431-N-1179WP	12 Months	9/11/2015
E1524P	Biconilog Antenna (30MHz-1GHz)	ETS Lindgren	3142D	12 Months	3/19/2015
E1149P	Horn Antenna (1GHz-18GHz)	EMCO	3115	12 Months	12/10/2015
E1447P	RMS Multimeter	Fluke	87V	12 Months	5/20/2015
D1131P	Data Acquisition Switch Unit	Agilent	34970A	12 Months	7/2/2015
ENV1195P	Climatic Chamber	Thermotron	SE-300-2-2	N/A	NCR
* NM04508	MXA Signal Analyzer	Agilent	N9020A	24 Months	1/27/2017

* Test equipment supplied by the customer for LTE frequency error measurements

Appendix A 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 Results:

		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	56.13	**47.72**	8.41	56.34	47.57	8.77	56.06	47.58	8.48
	3M	57.04	47.61	9.43	57.13	47.63	9.5	57.1	47.59	9.51
	5M	57.51	47.49	10.02	58.14	47.46	10.68	57.36	47.42	9.94
	10M	57.57	47.36	10.21	58.22	47.44	10.78	57.49	47.36	10.13
	15M	57.45	47.56	9.89	**58.45**	47.58	10.87	57.52	47.54	9.98
	20M	57.65	47.7	9.95	58.35	47.6	10.75	57.5	47.57	9.93
Port 2 Center Channel	1.4M	55.84	47.42	8.42	56.05	47.32	8.73	55.8	47.37	8.43
	3M	56.98	47.48	9.5	57	47.57	9.43	56.96	47.46	9.5
	5M	57.22	47.21	10.01	57.87	47.26	10.61	57.08	47.23	9.85
	10M	57.4	47.22	10.18	57.97	47.01	**10.96**	57.29	47.19	10.1
	15M	57.29	47.46	9.83	58.14	47.4	10.74	57.27	47.42	9.85
	20M	57.47	47.45	10.02	58.19	47.46	10.73	57.37	47.44	9.93
Combined Center Channel	1.4M	59	50.58	8.42	59.21	50.46	8.75	58.94	50.49	8.45
	3M	60.02	50.56	9.46	60.08	50.61	9.47	60.04	50.54	9.5
	5M	60.38	50.36	10.02	61.02	50.37	10.65	60.23	50.34	9.89
	10M	60.5	50.3	10.2	61.11	50.24	10.87	60.4	50.29	10.11
	15M	60.38	50.52	9.86	61.31	50.5	10.81	60.41	50.49	9.92
	20M	60.57	50.59	9.98	61.28	50.54	10.74	60.45	50.52	9.93

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

Subsequently output power levels on lowest and highest channels were tested only on 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	55.6	47.19	8.41	55.87	47.25	8.62	55.6	47.06	8.54
	3M	56.74	47.3	9.44	56.82	47.23	9.59	56.76	47.25	9.51
	5M	57.32	47.21	10.11	57.83	47.08	10.75	57.03	47.07	9.96
	10M	57.57	47.35	10.22	58.02	47.25	10.77	57.3	47.19	10.11
	15M	57.51	47.59	9.92	58.39	47.5	10.89	57.36	47.47	9.89
	20M	57.46	47.46	10	58.32	47.54	10.78	57.48	47.5	9.98
Port 1 High Channel	1.4M	55.63	47.1	8.53	55.82	47.11	8.71	55.61	47.13	8.48
	3M	56.67	47.22	9.45	56.77	47.18	9.59	56.78	47.23	9.55
	5M	57.27	47.11	10.16	57.9	47.13	10.77	57.05	47.1	9.95
	10M	57.54	47.21	10.33	58.16	47.27	10.89	57.37	47.21	10.16
	15M	57.36	47.49	9.87	**58.43**	47.46	**10.97**	57.43	47.46	9.97
	20M	57.55	47.48	10.07	**58.43**	**47.65**	10.78	57.51	47.5	10.01

WCDMA Results:

		WCDMA - QPSK			WCDMA - 16QAM			WCDMA - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
Port 1 Center Ch	**5M**	**57.45**	47.13	10.32	56.92	47.07	9.85	56.92	**47.15**	9.77
Port 2 Center Ch	**5M**	57.41	47.08	**10.33**	56.77	47.03	9.74	56.84	46.99	9.85
Combined Center Ch	**5M**	60.44	50.12	10.32	59.86	50.06	9.8	59.89	50.08	9.81

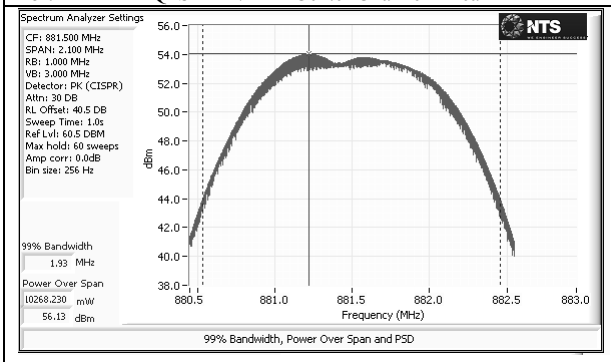
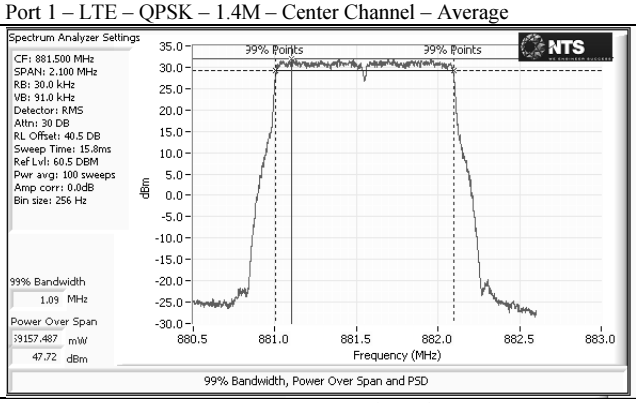
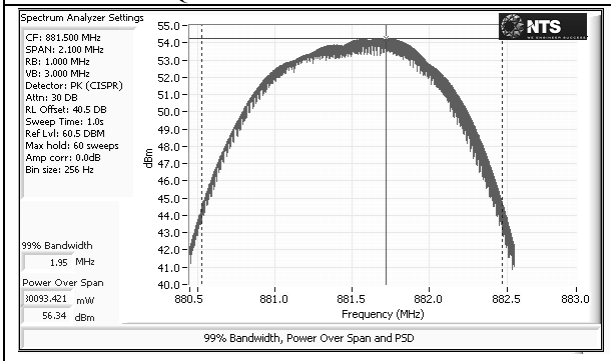
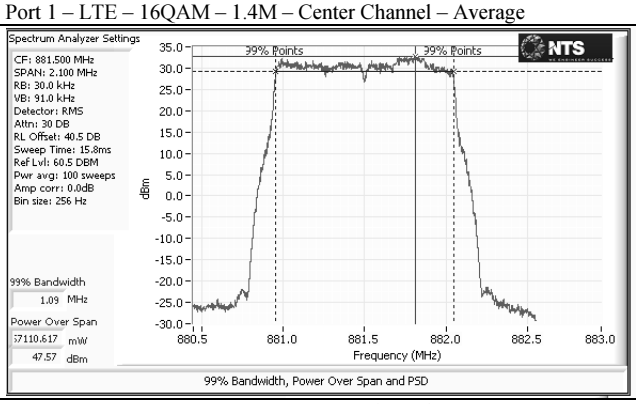
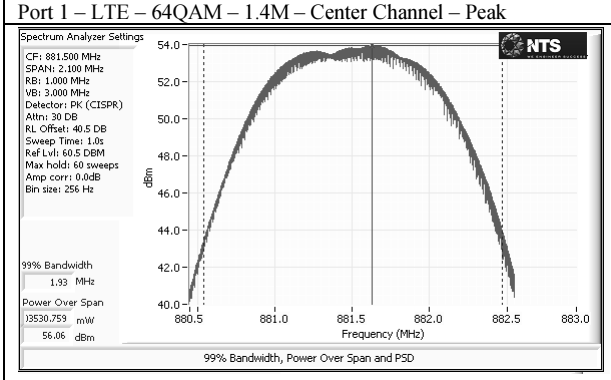
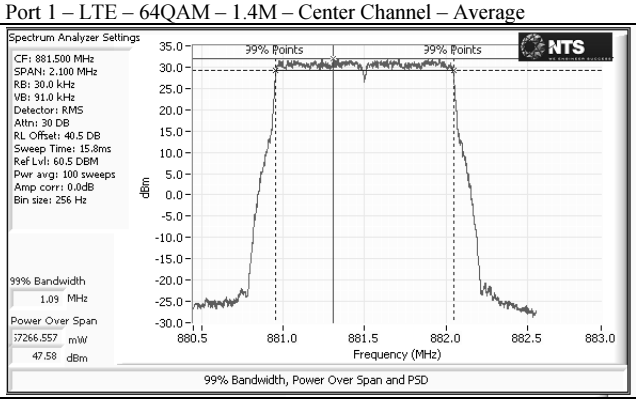
Based on the results above, Port 1 had the highest RMS average power and therefore it was selected for all the remaining LTE mode antenna port tests on the product.

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

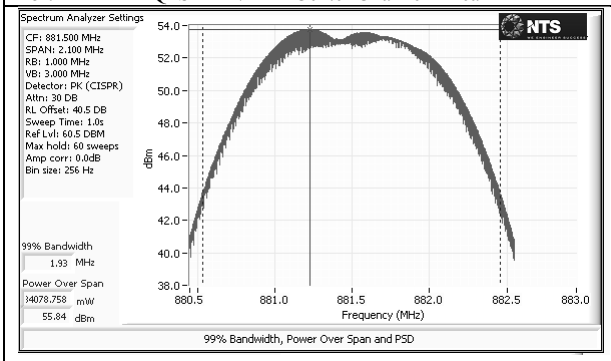
		WCDMA - QPSK			WCDMA - 16QAM			WCDMA - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
Port 1 Low Ch	**5M**	57.27	46.82	**10.45**	56.75	**46.97**	9.78	56.85	46.94	9.91
Port 1 High Ch	**5M**	**57.37**	46.93	10.44	56.79	46.91	9.88	56.81	46.93	9.88

All corresponding plots included on the following pages. Total path loss of 40.4dB (Attenuator Loss: 40dB, RF cable loss: 0.7dB) accounted in via reference level offset to the spectrum analyzer.

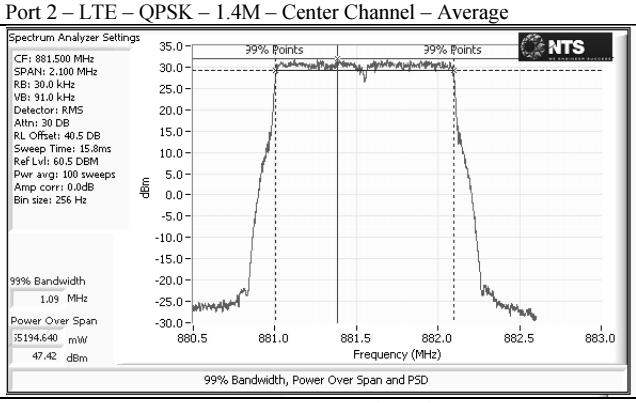
LTE Plots:

Port 1 – LTE – QPSK – 1.4M – Center Channel – Peak	Port 1 – LTE – QPSK – 1.4M – Center Channel – Average
	
Port 1 – LTE – 16QAM – 1.4M – Center Channel – Peak	Port 1 – LTE – 16QAM – 1.4M – Center Channel – Average
	
Port 1 – LTE – 64QAM – 1.4M – Center Channel – Peak	Port 1 – LTE – 64QAM – 1.4M – Center Channel – Average
	

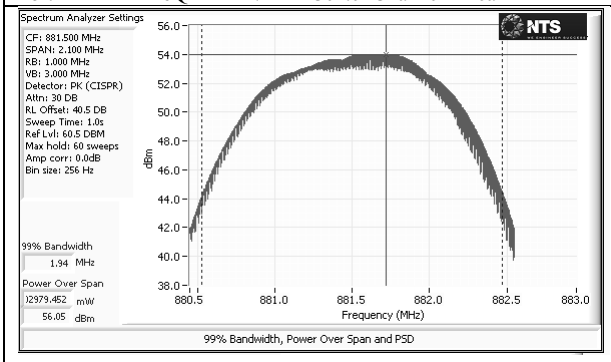
Port 2 – LTE – QPSK – 1.4M – Center Channel – Peak



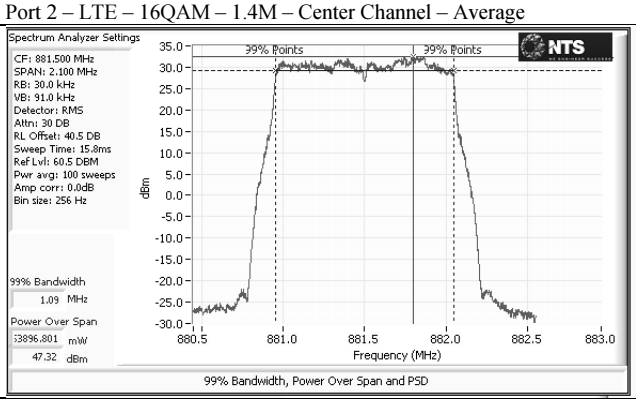
Port 2 – LTE – QPSK – 1.4M – Center Channel – Average



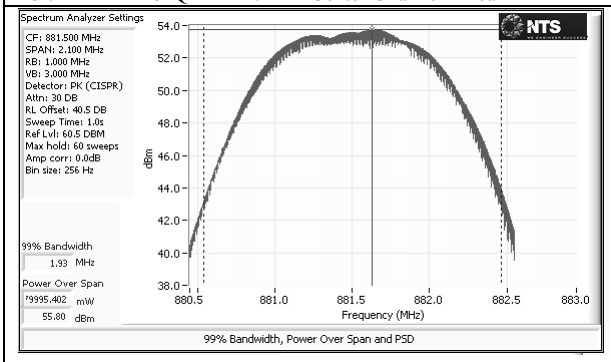
Port 2 – LTE – 16QAM – 1.4M – Center Channel – Peak



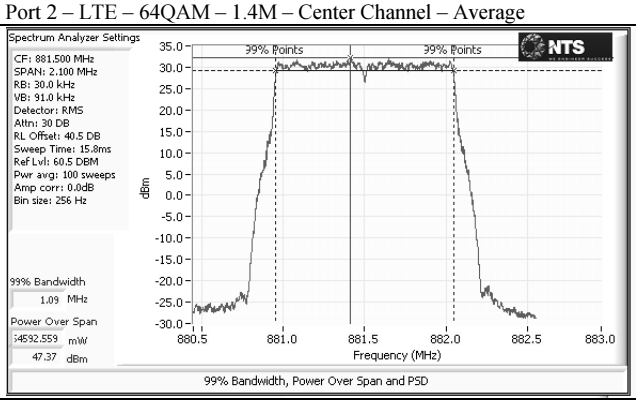
Port 2 – LTE – 16QAM – 1.4M – Center Channel – Average



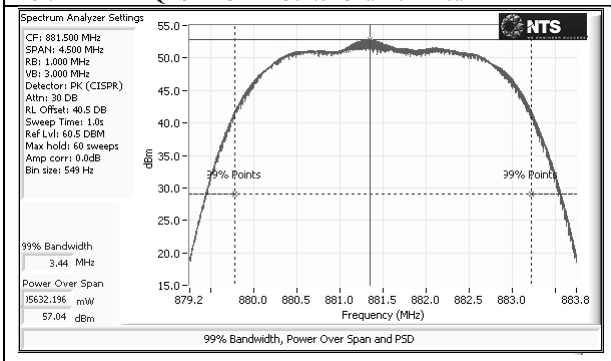
Port 2 – LTE – 64QAM – 1.4M – Center Channel – Peak



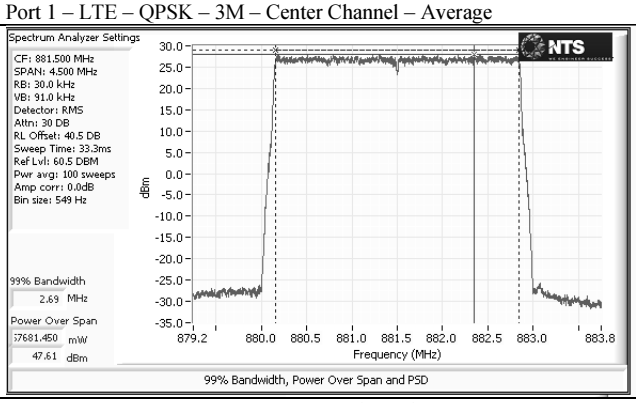
Port 2 – LTE – 64QAM – 1.4M – Center Channel – Average



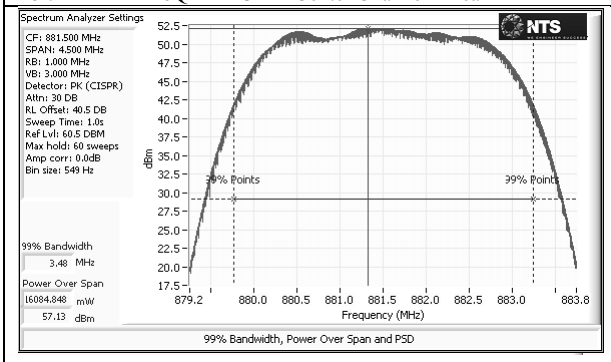
Port 1 – LTE – QPSK – 3M – Center Channel – Peak



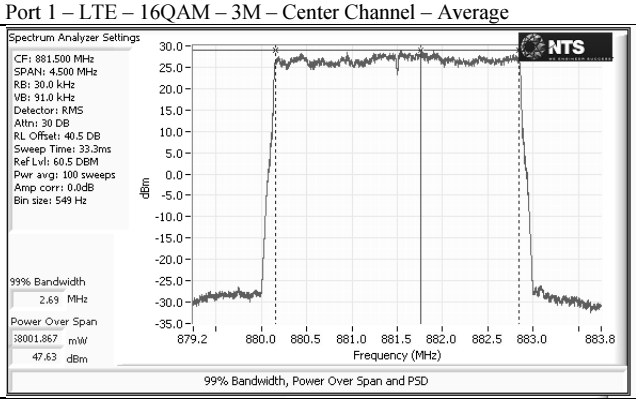
Port 1 – LTE – QPSK – 3M – Center Channel – Average



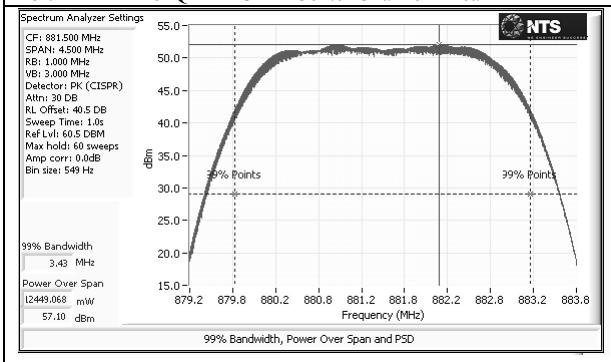
Port 1 – LTE – 16QAM – 3M – Center Channel – Peak



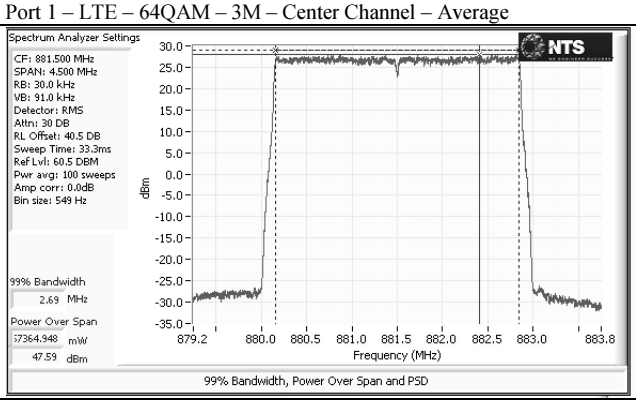
Port 1 – LTE – 16QAM – 3M – Center Channel – Average



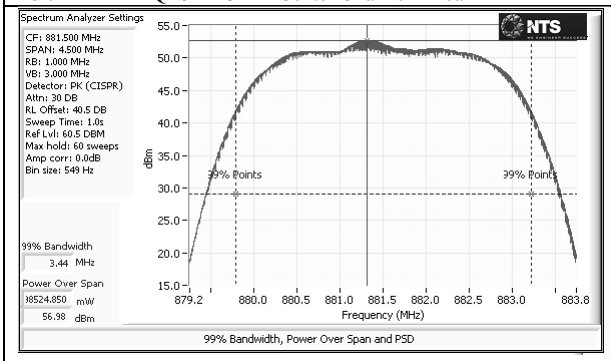
Port 1 – LTE – 64QAM – 3M – Center Channel – Peak



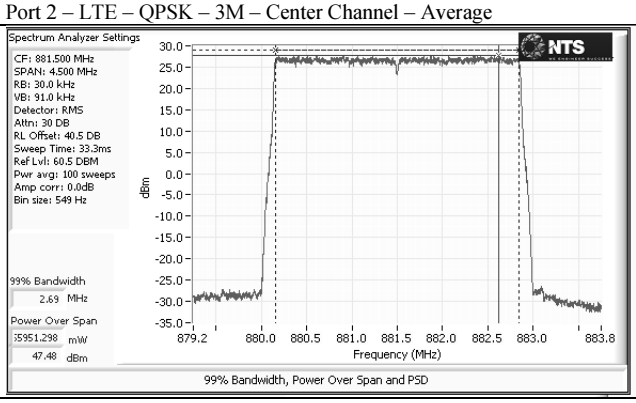
Port 1 – LTE – 64QAM – 3M – Center Channel – Average



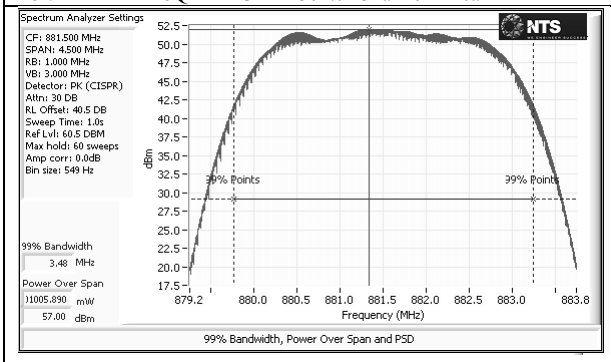
Port 2 – LTE – QPSK – 3M – Center Channel – Peak



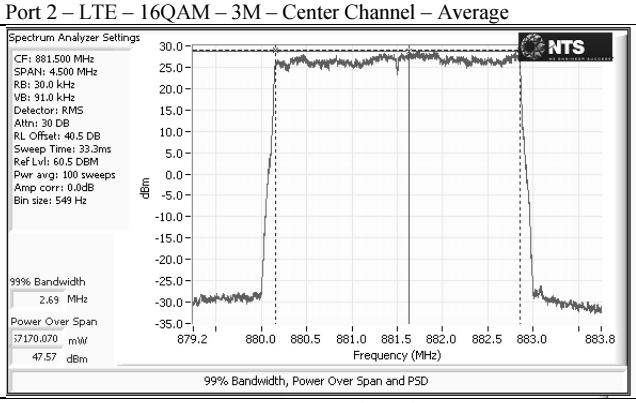
Port 2 – LTE – QPSK – 3M – Center Channel – Average



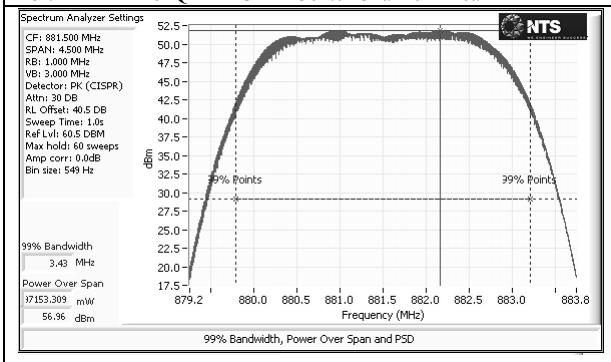
Port 2 – LTE – 16QAM – 3M – Center Channel – Peak



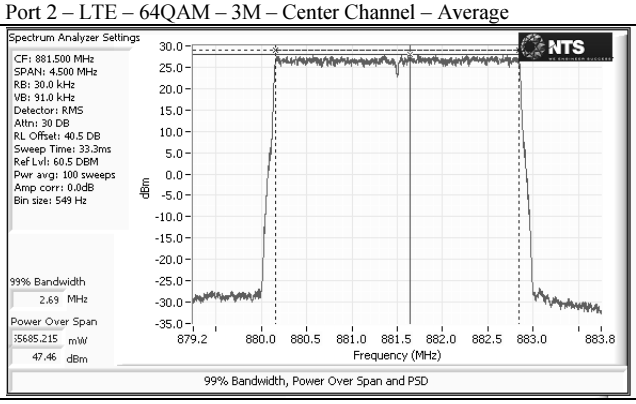
Port 2 – LTE – 16QAM – 3M – Center Channel – Average



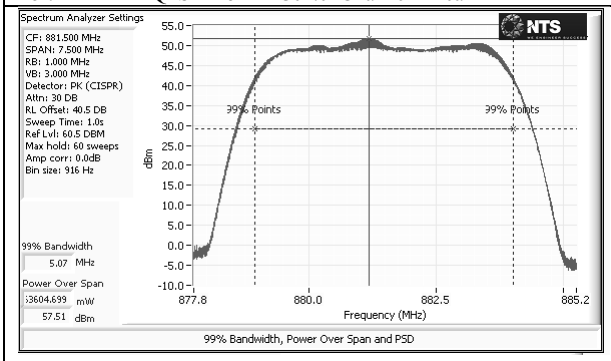
Port 2 – LTE – 64QAM – 3M – Center Channel – Peak



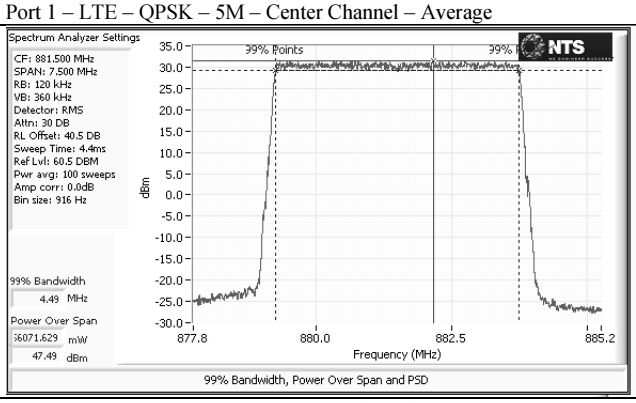
Port 2 – LTE – 64QAM – 3M – Center Channel – Average



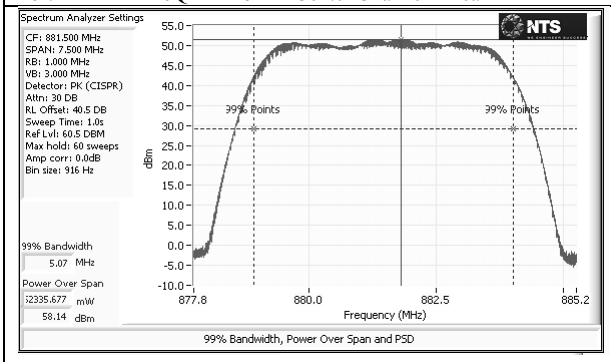
Port 1 – LTE – QPSK – 5M – Center Channel – Peak



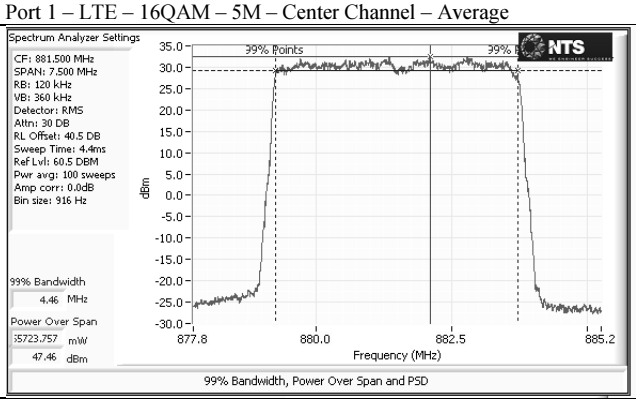
Port 1 – LTE – QPSK – 5M – Center Channel – Average



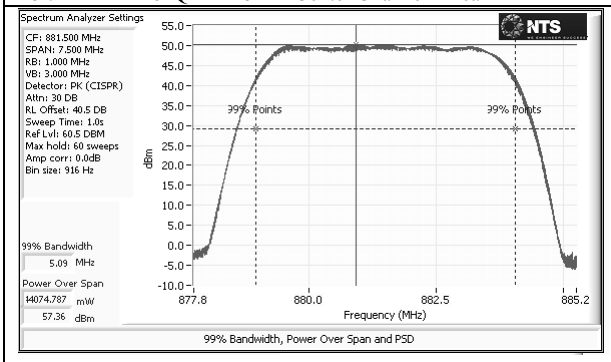
Port 1 – LTE – 16QAM – 5M – Center Channel – Peak



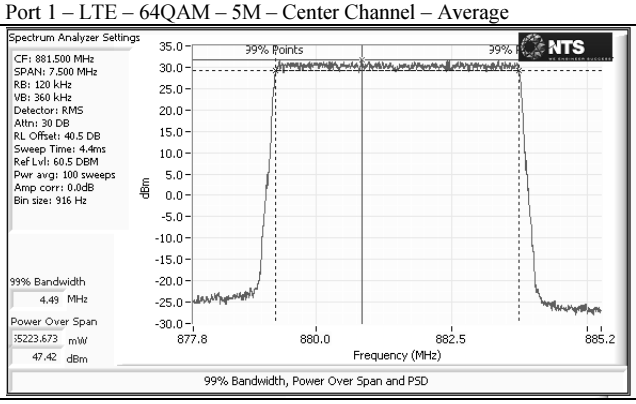
Port 1 – LTE – 16QAM – 5M – Center Channel – Average



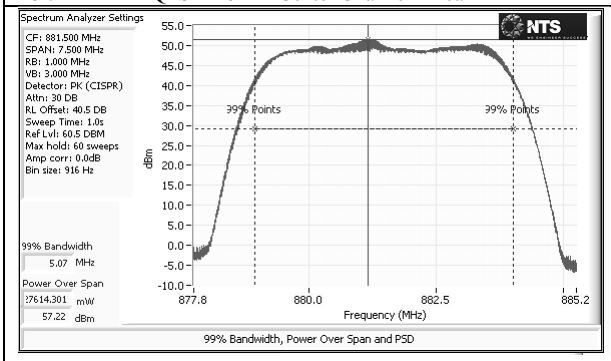
Port 1 – LTE – 64QAM – 5M – Center Channel – Peak



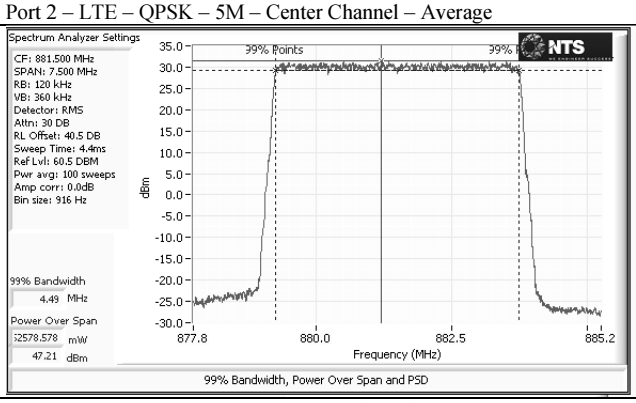
Port 1 – LTE – 64QAM – 5M – Center Channel – Average



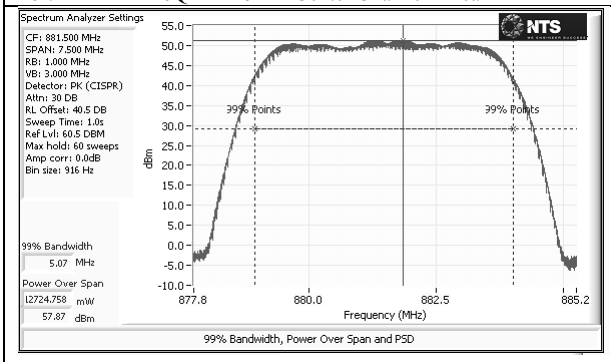
Port 2 – LTE – QPSK – 5M – Center Channel – Peak



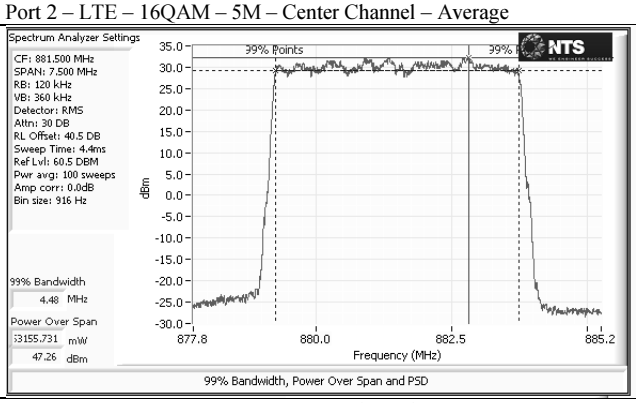
Port 2 – LTE – QPSK – 5M – Center Channel – Average



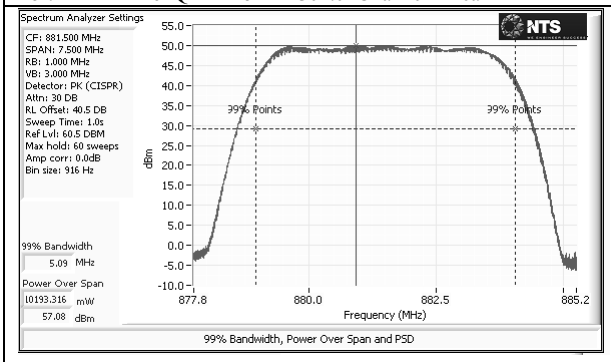
Port 2 – LTE – 16QAM – 5M – Center Channel – Peak



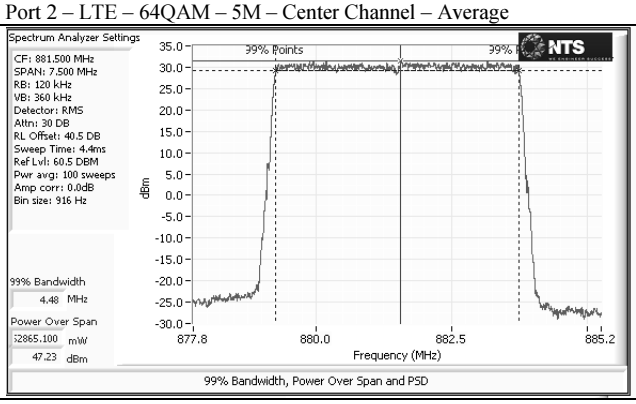
Port 2 – LTE – 16QAM – 5M – Center Channel – Average



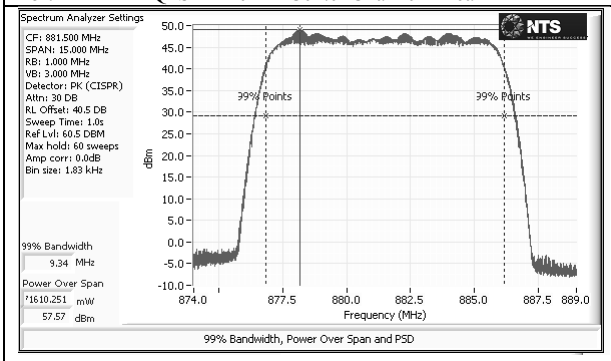
Port 2 – LTE – 64QAM – 5M – Center Channel – Peak



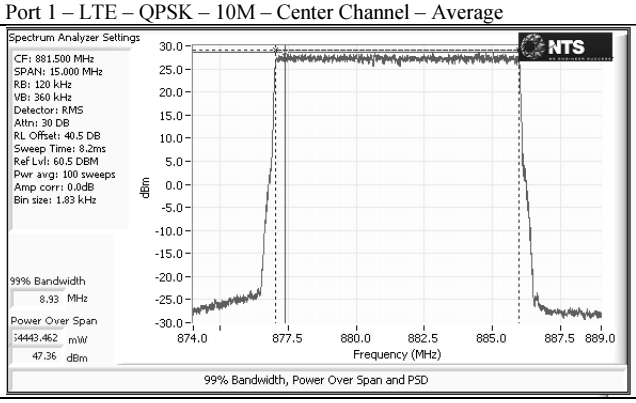
Port 2 – LTE – 64QAM – 5M – Center Channel – Average



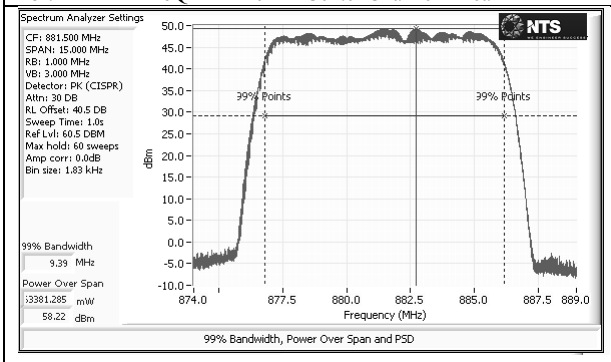
Port 1 – LTE – QPSK – 10M – Center Channel – Peak



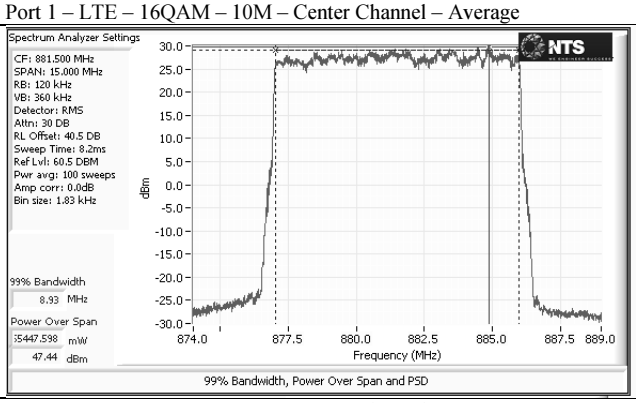
Port 1 – LTE – QPSK – 10M – Center Channel – Average



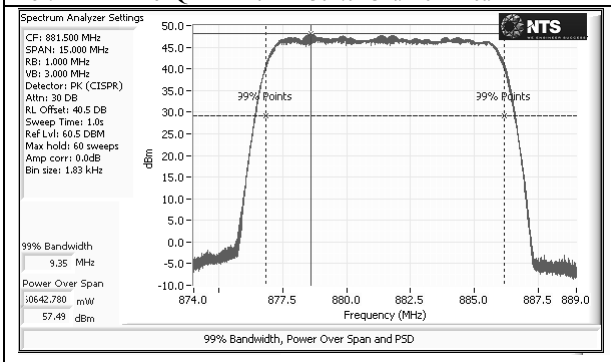
Port 1 – LTE – 16QAM – 10M – Center Channel – Peak



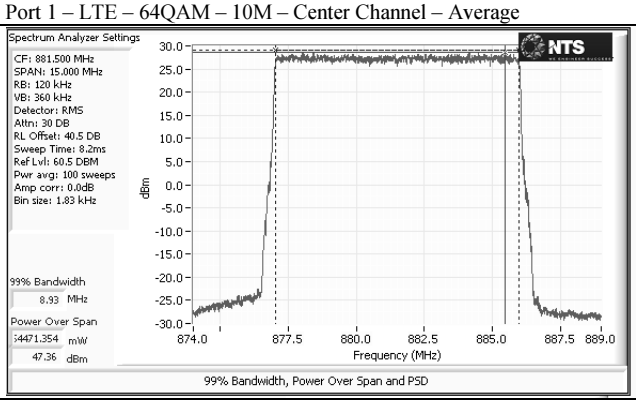
Port 1 – LTE – 16QAM – 10M – Center Channel – Average



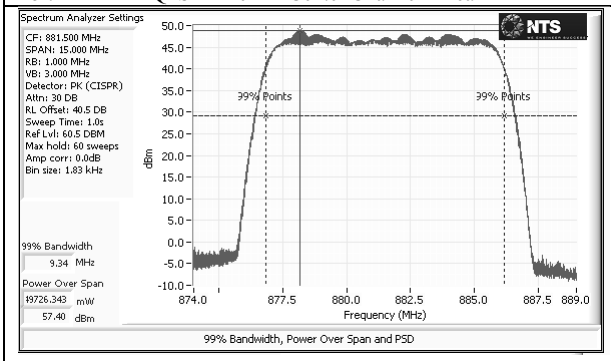
Port 1 – LTE – 64QAM – 10M – Center Channel – Peak



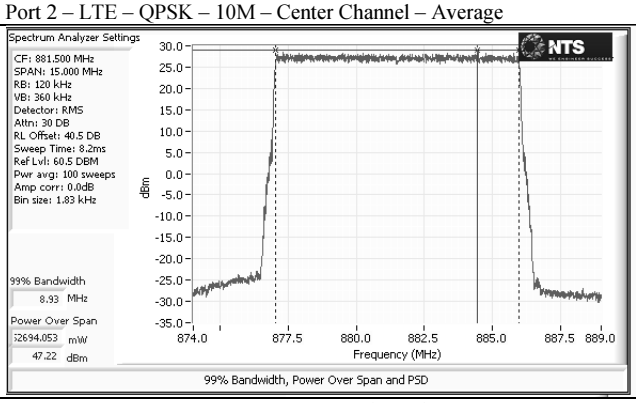
Port 1 – LTE – 64QAM – 10M – Center Channel – Average



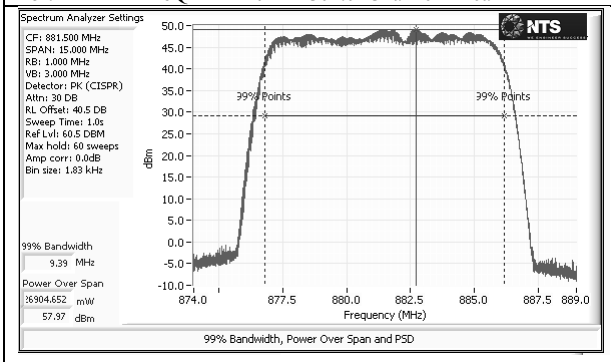
Port 2 – LTE – QPSK – 10M – Center Channel – Peak



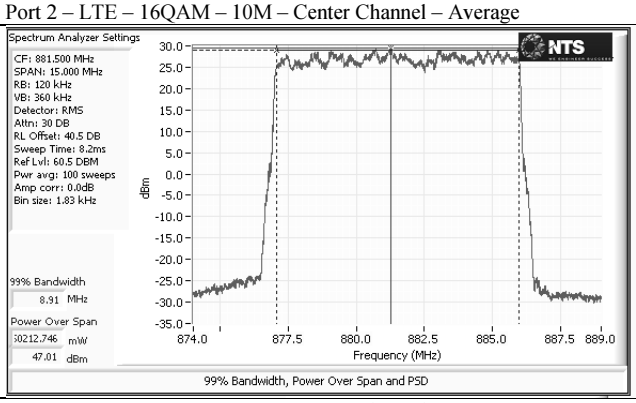
Port 2 – LTE – QPSK – 10M – Center Channel – Average



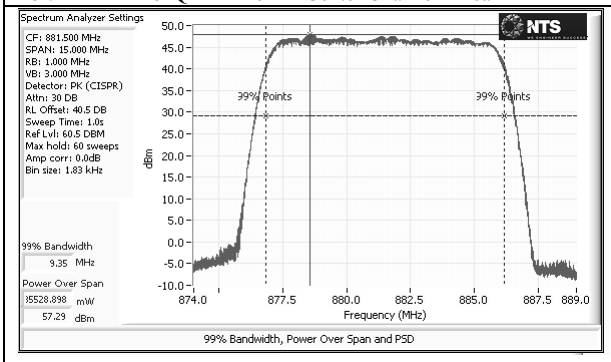
Port 2 – LTE – 16QAM – 10M – Center Channel – Peak



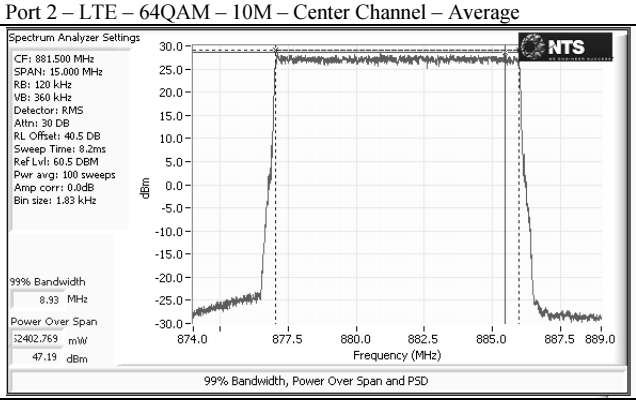
Port 2 – LTE – 16QAM – 10M – Center Channel – Average



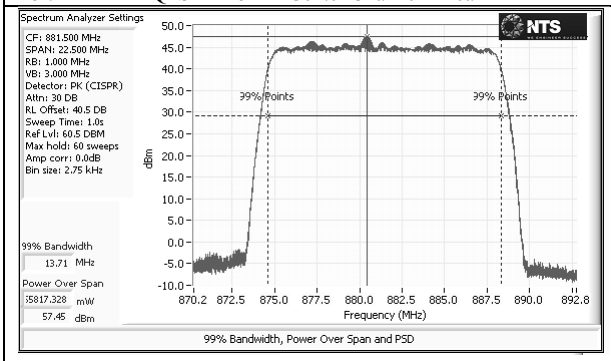
Port 2 – LTE – 64QAM – 10M – Center Channel – Peak



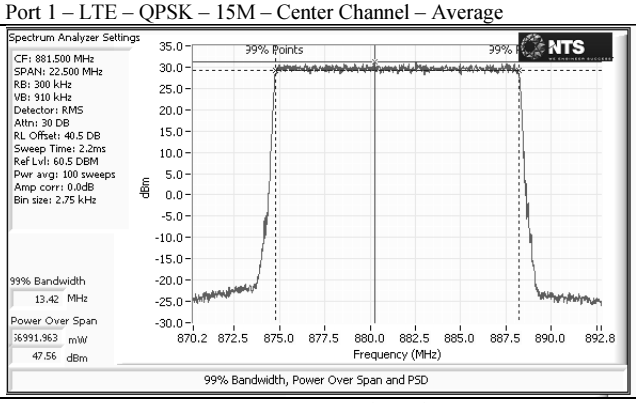
Port 2 – LTE – 64QAM – 10M – Center Channel – Average



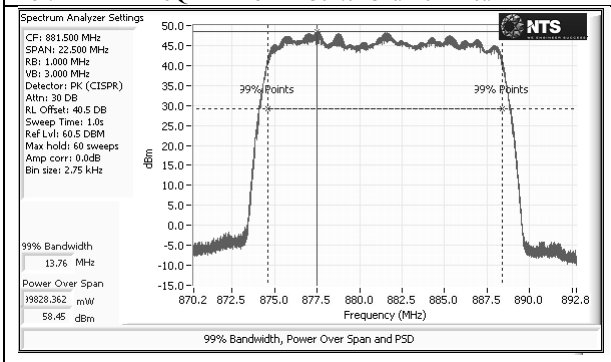
Port 1 – LTE – QPSK – 15M – Center Channel – Peak



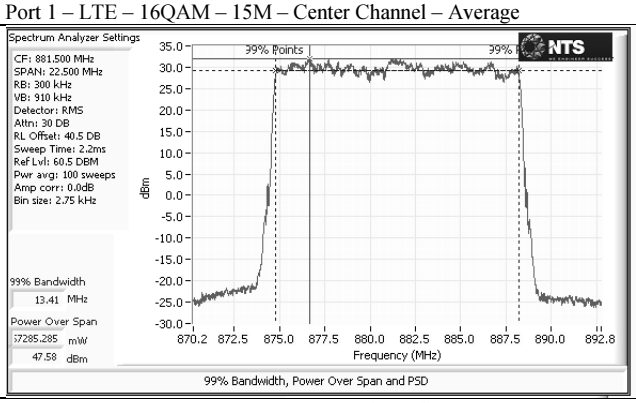
Port 1 – LTE – QPSK – 15M – Center Channel – Average



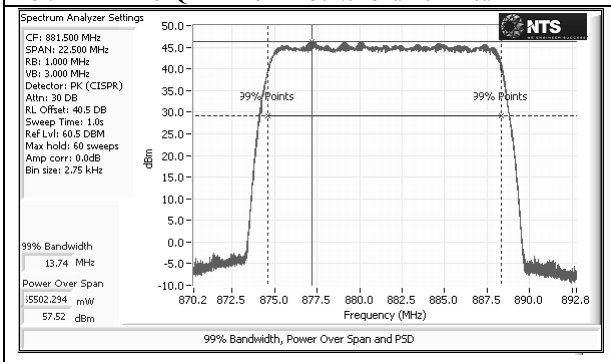
Port 1 – LTE – 16QAM – 15M – Center Channel – Peak



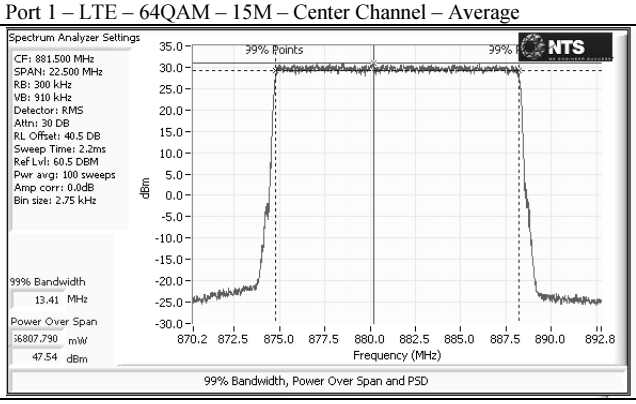
Port 1 – LTE – 16QAM – 15M – Center Channel – Average



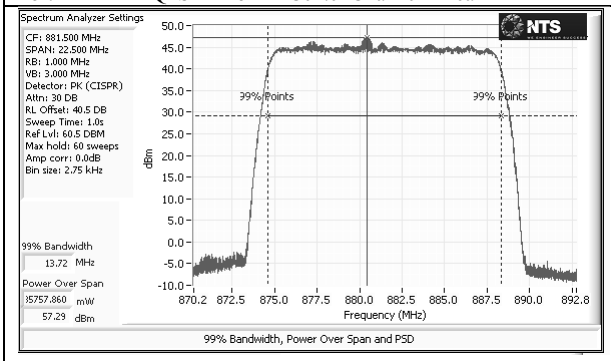
Port 1 – LTE – 64QAM – 15M – Center Channel – Peak



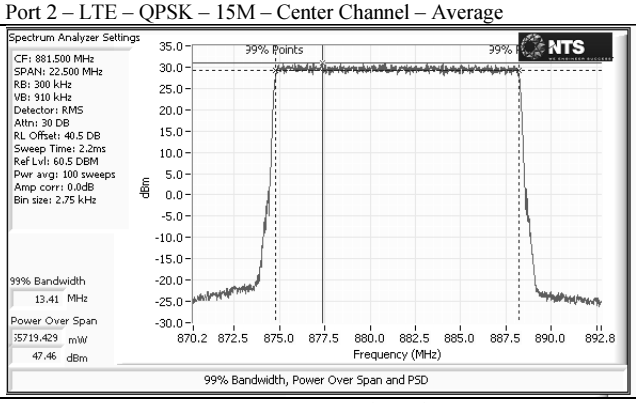
Port 1 – LTE – 64QAM – 15M – Center Channel – Average



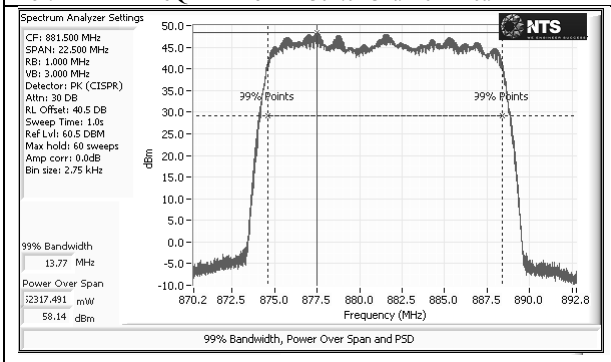
Port 2 – LTE – QPSK – 15M – Center Channel – Peak



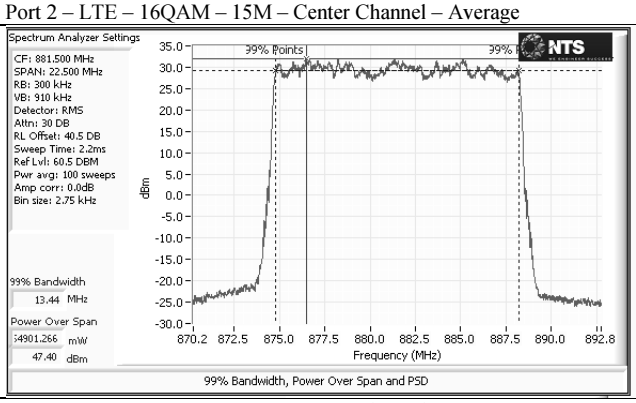
Port 2 – LTE – QPSK – 15M – Center Channel – Average



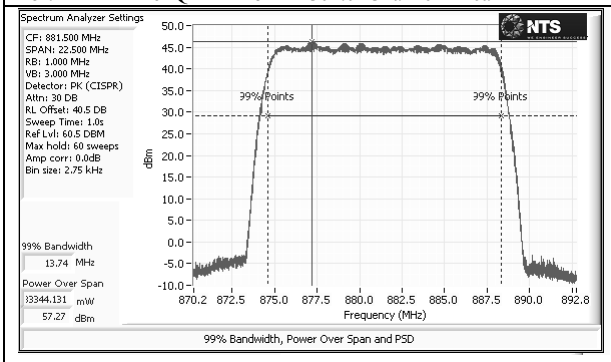
Port 2 – LTE – 16QAM – 15M – Center Channel – Peak



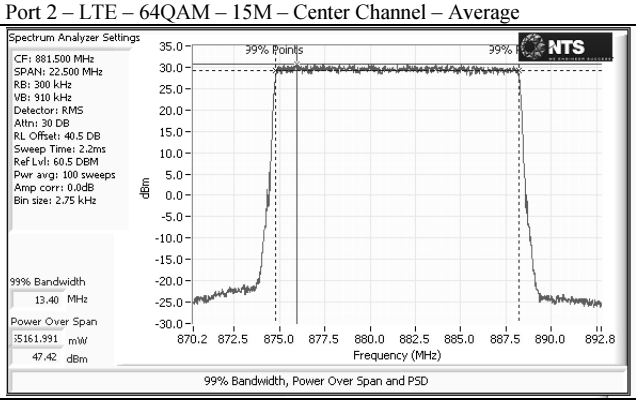
Port 2 – LTE – 16QAM – 15M – Center Channel – Average



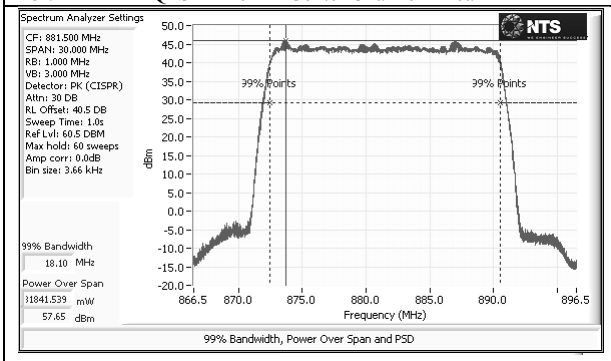
Port 2 – LTE – 64QAM – 15M – Center Channel – Peak



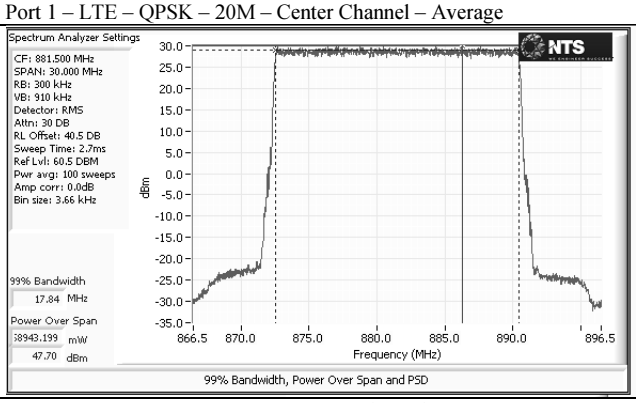
Port 2 – LTE – 64QAM – 15M – Center Channel – Average



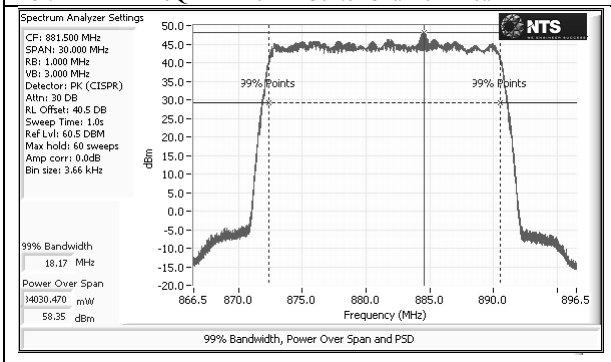
Port 1 – LTE – QPSK – 20M – Center Channel – Peak



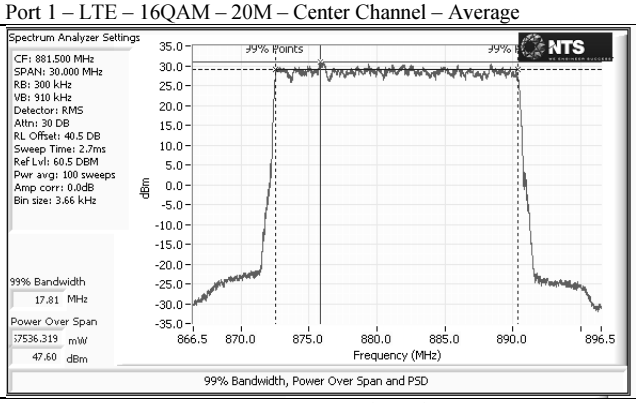
Port 1 – LTE – QPSK – 20M – Center Channel – Average



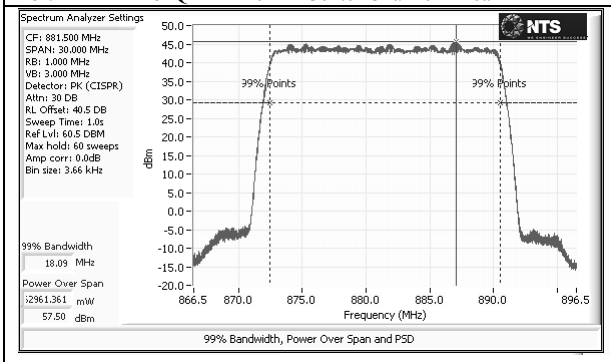
Port 1 – LTE – 16QAM – 20M – Center Channel – Peak



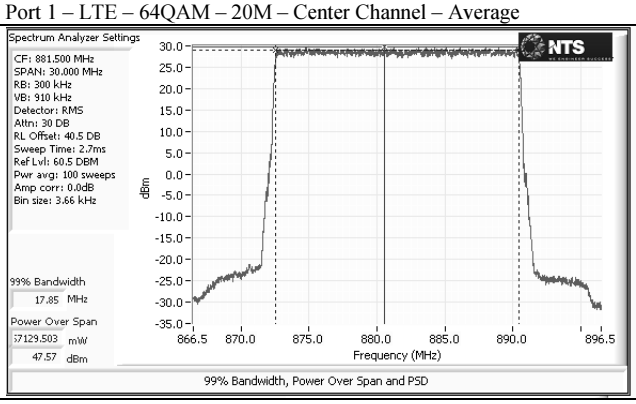
Port 1 – LTE – 16QAM – 20M – Center Channel – Average



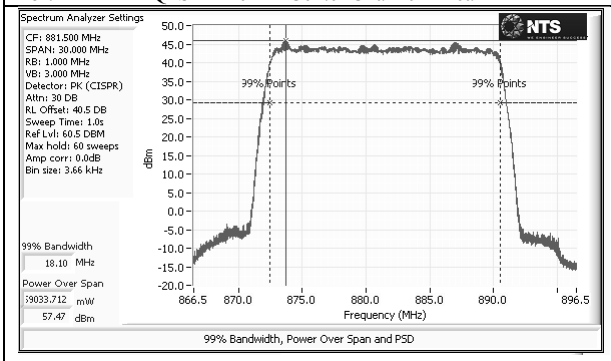
Port 1 – LTE – 64QAM – 20M – Center Channel – Peak



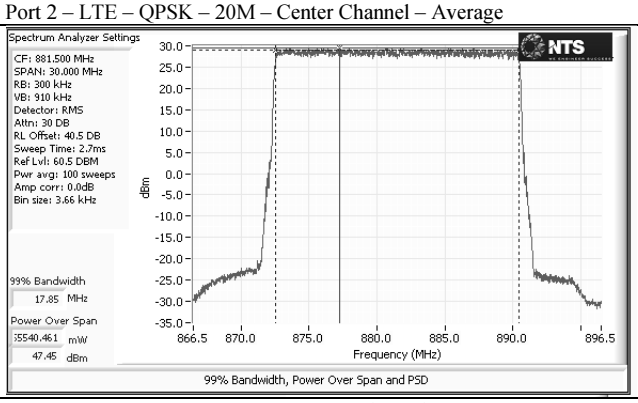
Port 1 – LTE – 64QAM – 20M – Center Channel – Average



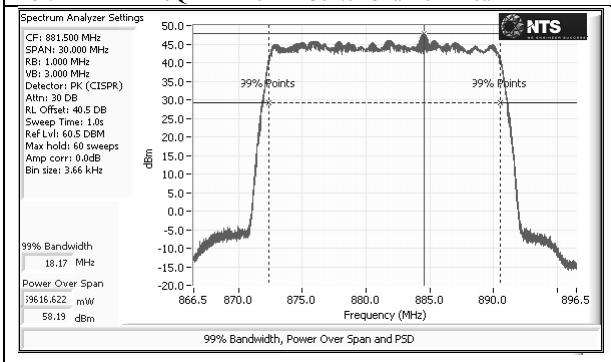
Port 2 – LTE – QPSK – 20M – Center Channel – Peak



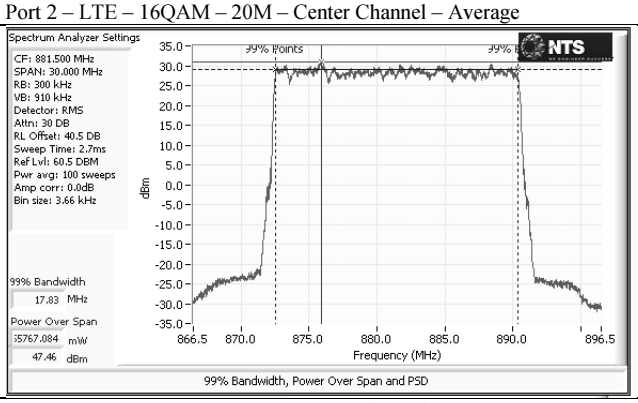
Port 2 – LTE – QPSK – 20M – Center Channel – Average



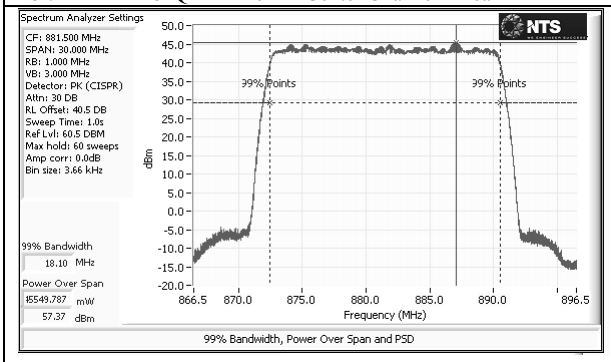
Port 2 – LTE – 16QAM – 20M – Center Channel – Peak



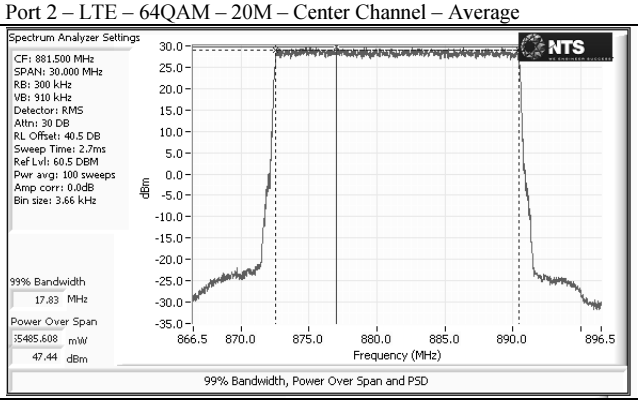
Port 2 – LTE – 16QAM – 20M – Center Channel – Average



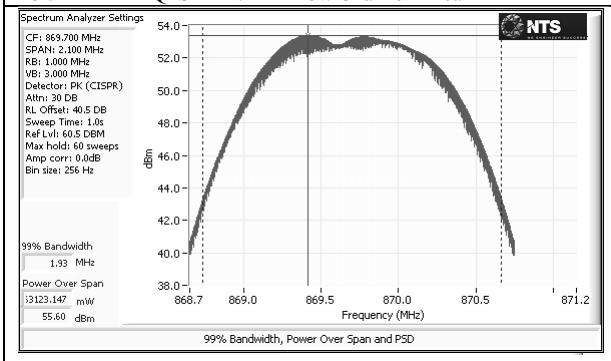
Port 2 – LTE – 64QAM – 20M – Center Channel – Peak



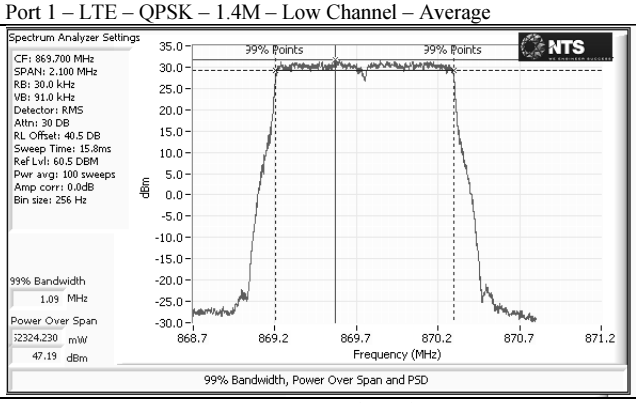
Port 2 – LTE – 64QAM – 20M – Center Channel – Average



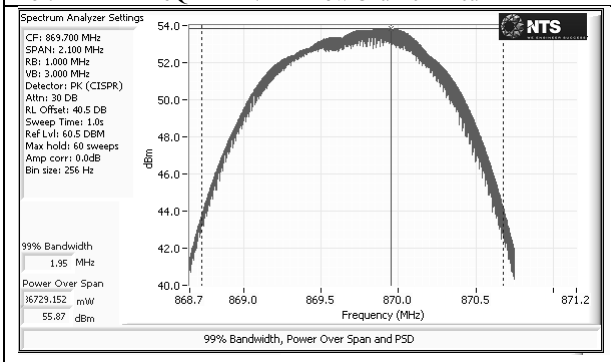
Port 1 – LTE – QPSK – 1.4M – Low Channel – Peak



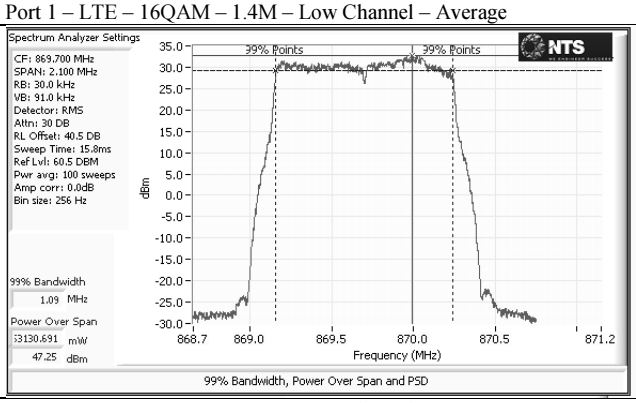
Port 1 – LTE – QPSK – 1.4M – Low Channel – Average



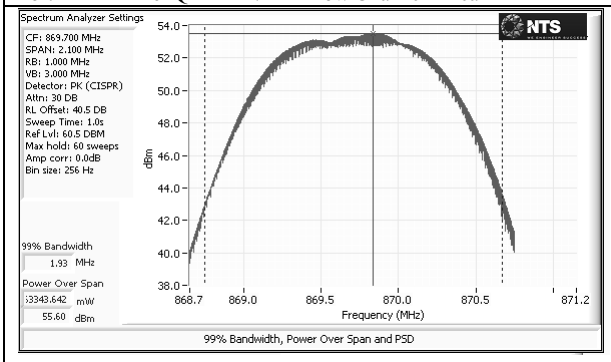
Port 1 – LTE – 16QAM – 1.4M – Low Channel – Peak



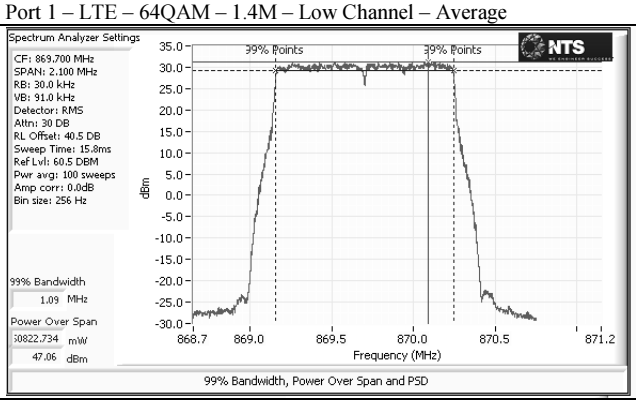
Port 1 – LTE – 16QAM – 1.4M – Low Channel – Average



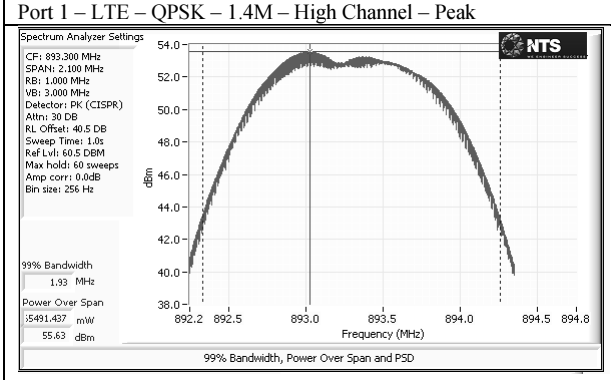
Port 1 – LTE – 64QAM – 1.4M – Low Channel – Peak



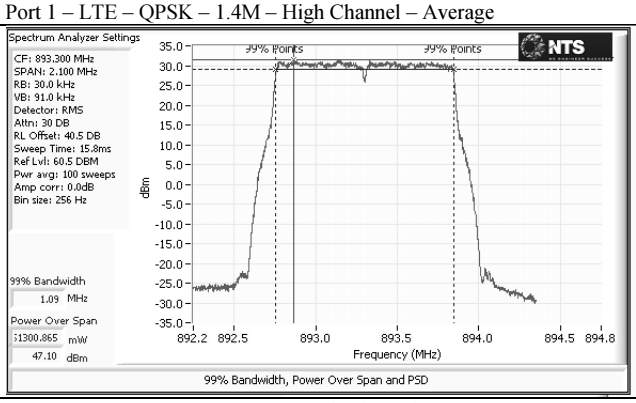
Port 1 – LTE – 64QAM – 1.4M – Low Channel – Average



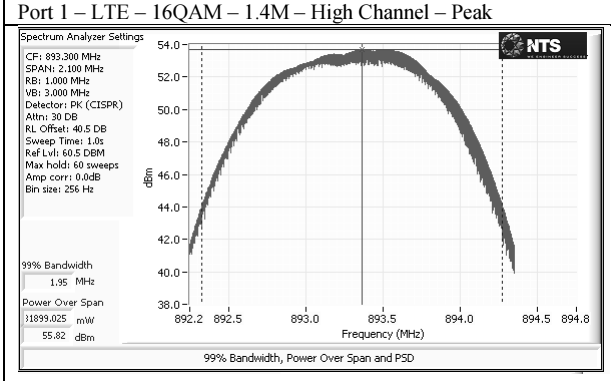
Port 1 – LTE – QPSK – 1.4M – High Channel – Peak



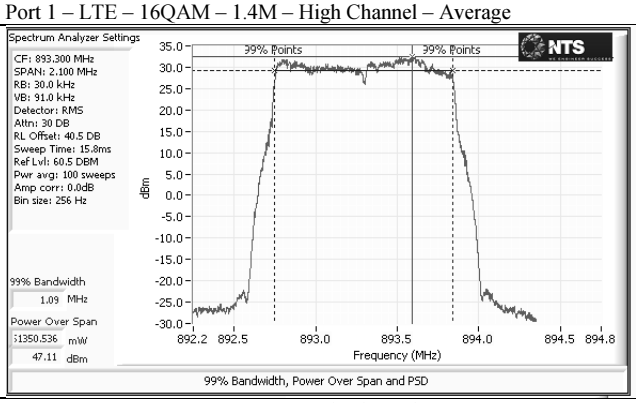
Port 1 – LTE – QPSK – 1.4M – High Channel – Average



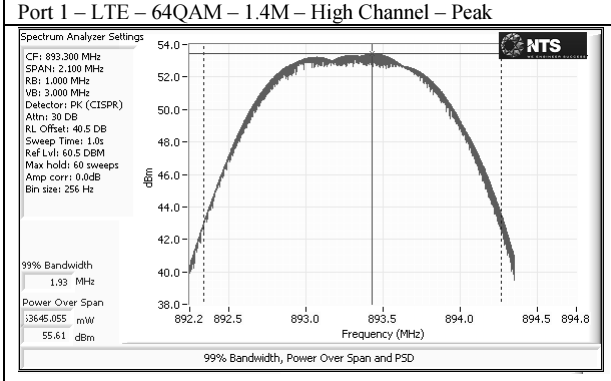
Port 1 – LTE – 16QAM – 1.4M – High Channel – Peak



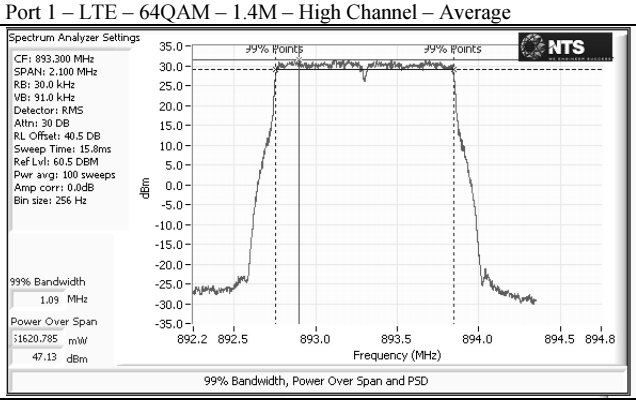
Port 1 – LTE – 16QAM – 1.4M – High Channel – Average



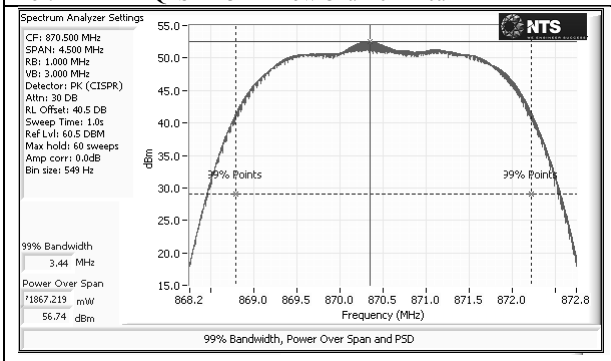
Port 1 – LTE – 64QAM – 1.4M – High Channel – Peak



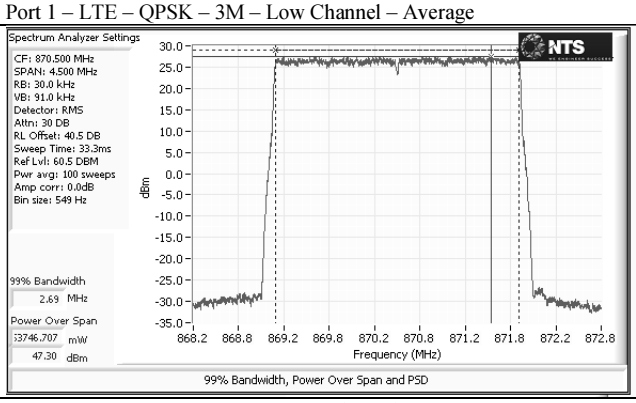
Port 1 – LTE – 64QAM – 1.4M – High Channel – Average



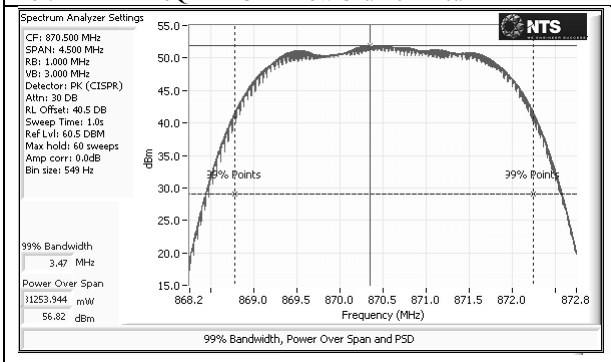
Port 1 – LTE – QPSK – 3M – Low Channel – Peak



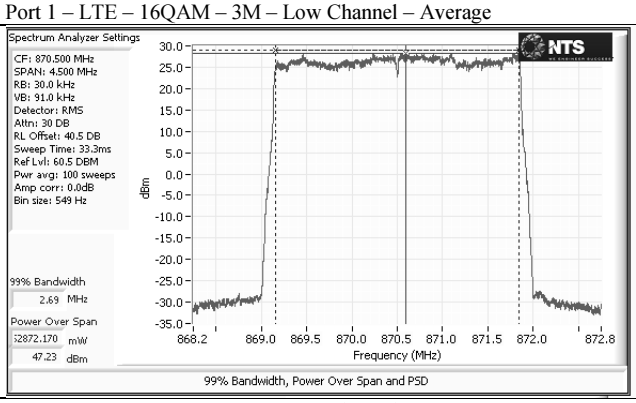
Port 1 – LTE – QPSK – 3M – Low Channel – Average



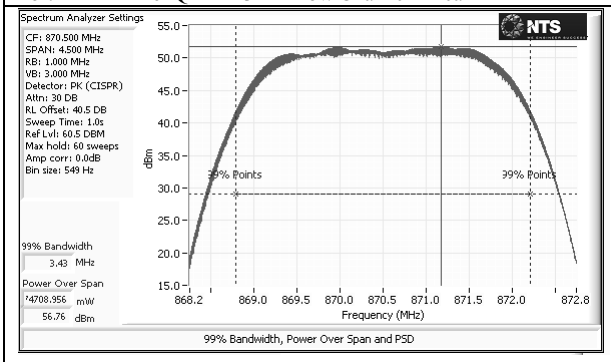
Port 1 – LTE – 16QAM – 3M – Low Channel – Peak



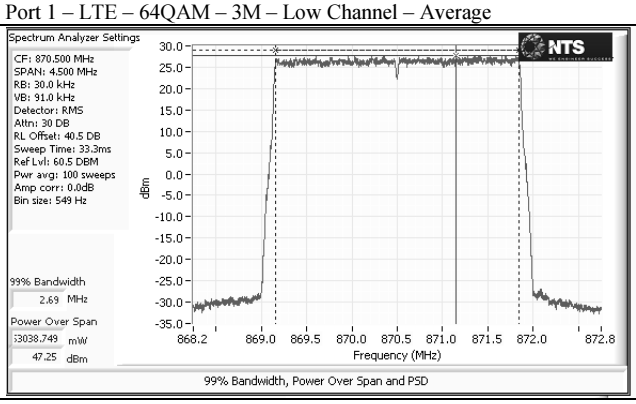
Port 1 – LTE – 16QAM – 3M – Low Channel – Average



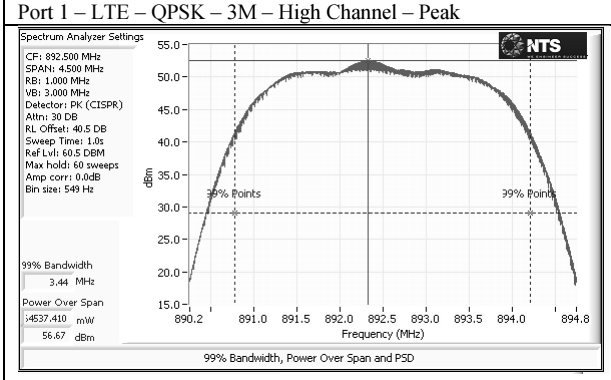
Port 1 – LTE – 64QAM – 3M – Low Channel – Peak



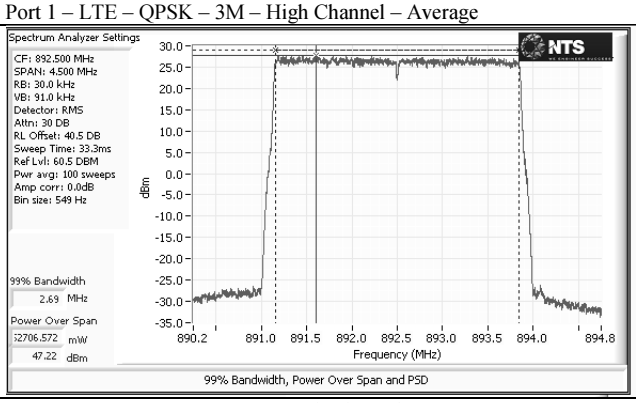
Port 1 – LTE – 64QAM – 3M – Low Channel – Average



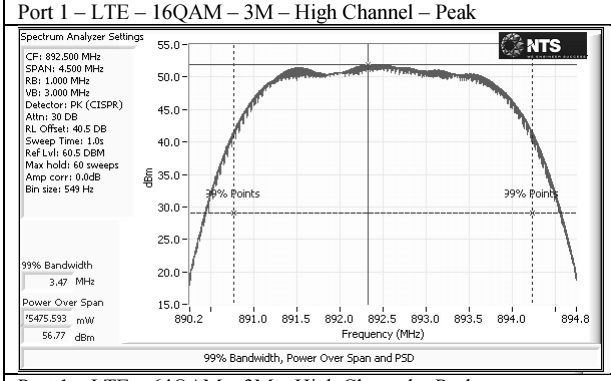
Port 1 – LTE – QPSK – 3M – High Channel – Peak



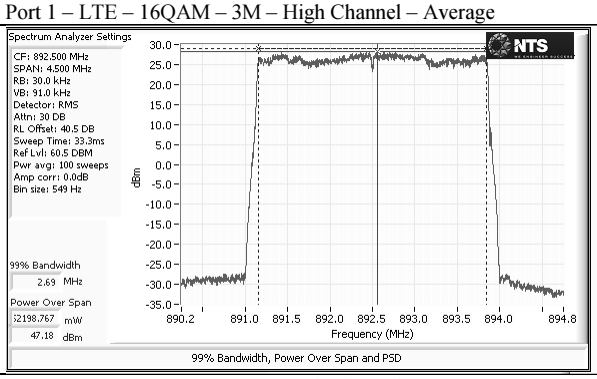
Port 1 – LTE – QPSK – 3M – High Channel – Average



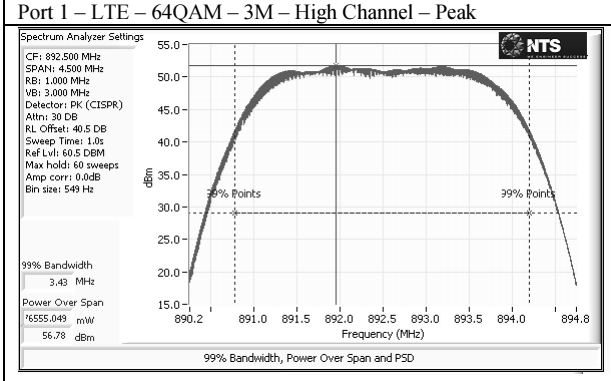
Port 1 – LTE – 16QAM – 3M – High Channel – Peak



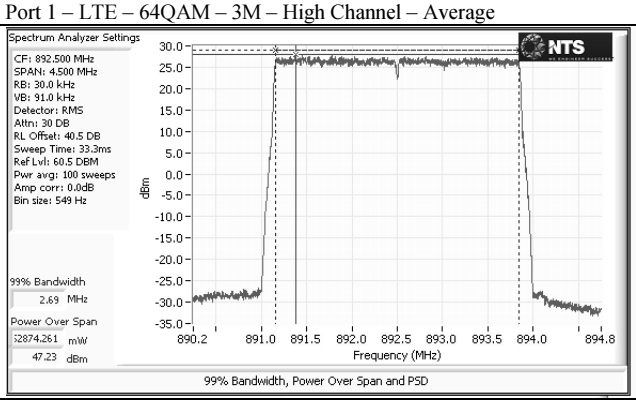
Port 1 – LTE – 16QAM – 3M – High Channel – Average



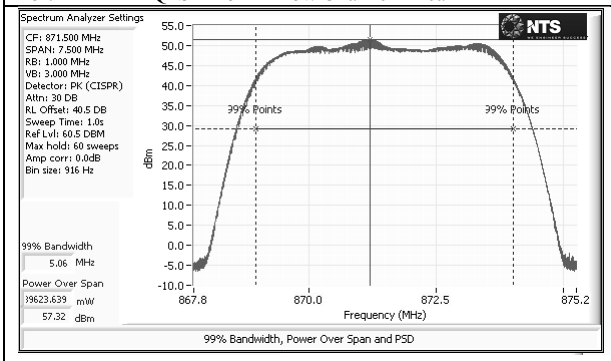
Port 1 – LTE – 64QAM – 3M – High Channel – Peak



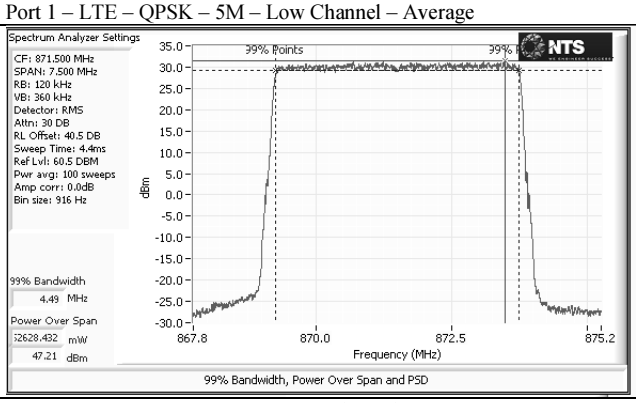
Port 1 – LTE – 64QAM – 3M – High Channel – Average



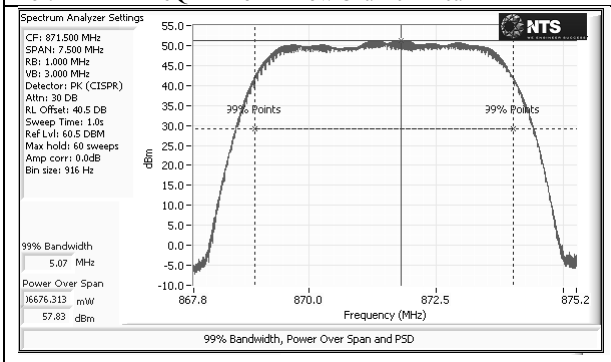
Port 1 – LTE – QPSK – 5M – Low Channel – Peak



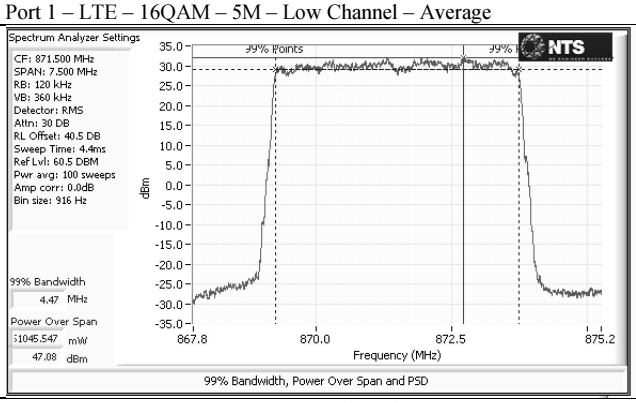
Port 1 – LTE – QPSK – 5M – Low Channel – Average



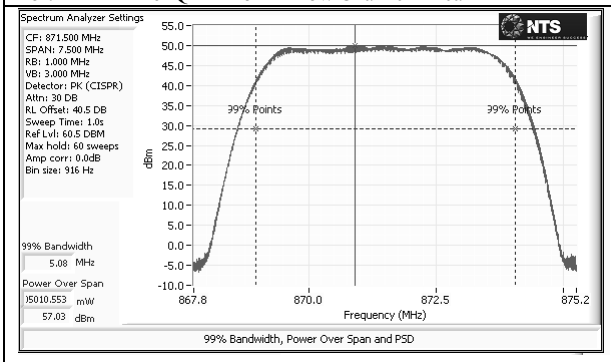
Port 1 – LTE – 16QAM – 5M – Low Channel – Peak



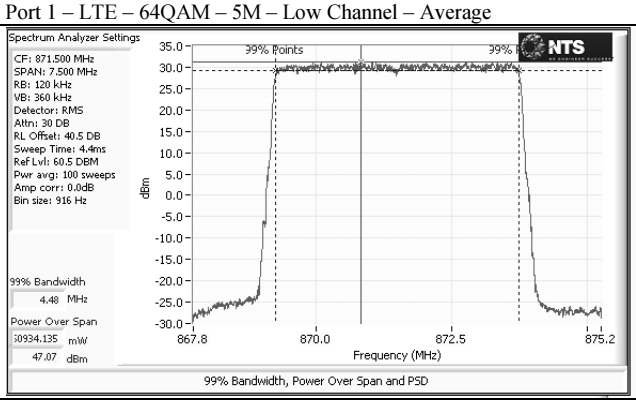
Port 1 – LTE – 16QAM – 5M – Low Channel – Average



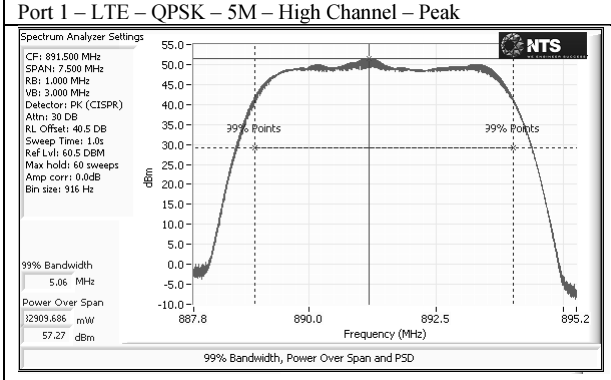
Port 1 – LTE – 64QAM – 5M – Low Channel – Peak



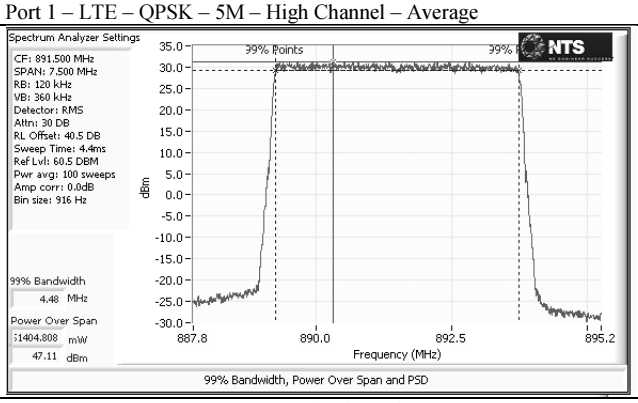
Port 1 – LTE – 64QAM – 5M – Low Channel – Average



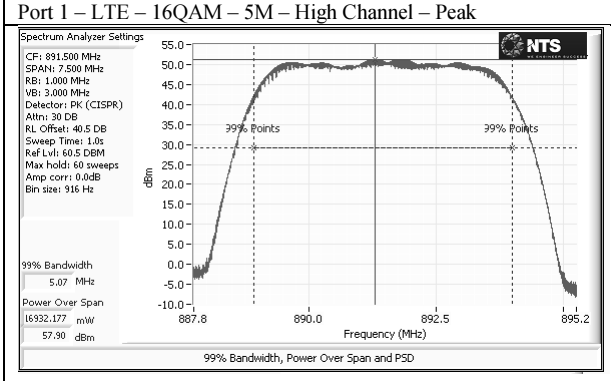
Port 1 – LTE – QPSK – 5M – High Channel – Peak



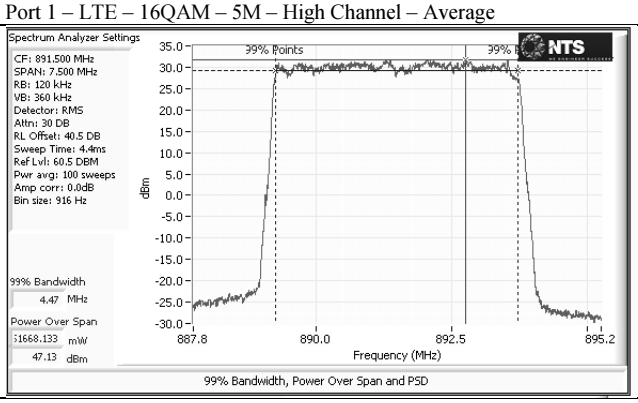
Port 1 – LTE – QPSK – 5M – High Channel – Average



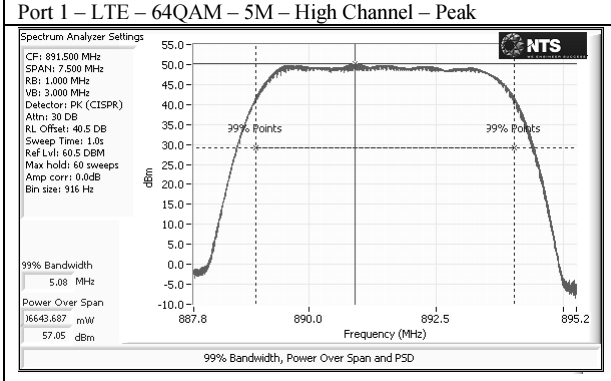
Port 1 – LTE – 16QAM – 5M – High Channel – Peak



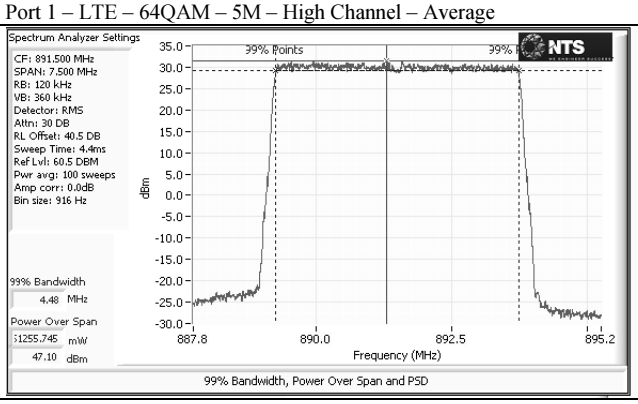
Port 1 – LTE – 16QAM – 5M – High Channel – Average



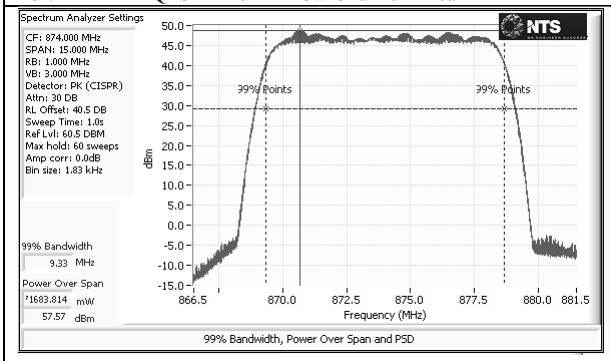
Port 1 – LTE – 64QAM – 5M – High Channel – Peak



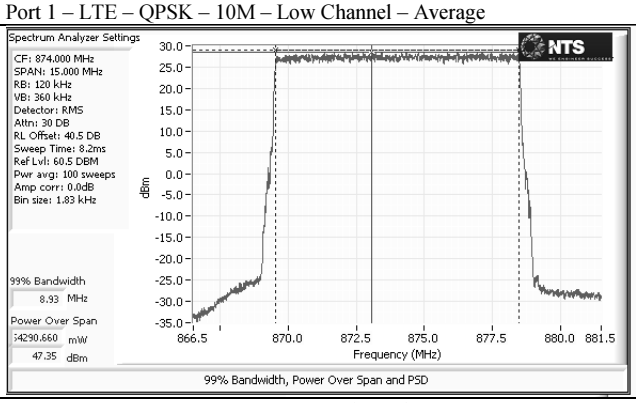
Port 1 – LTE – 64QAM – 5M – High Channel – Average



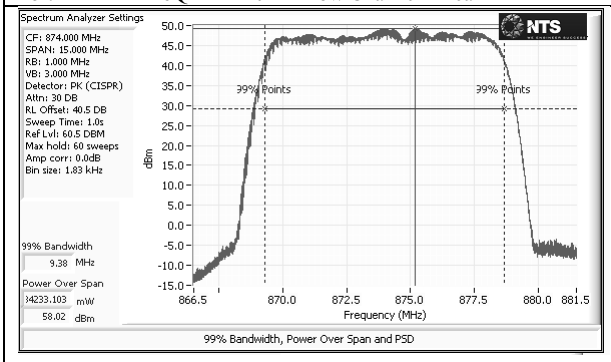
Port 1 – LTE – QPSK – 10M – Low Channel – Peak



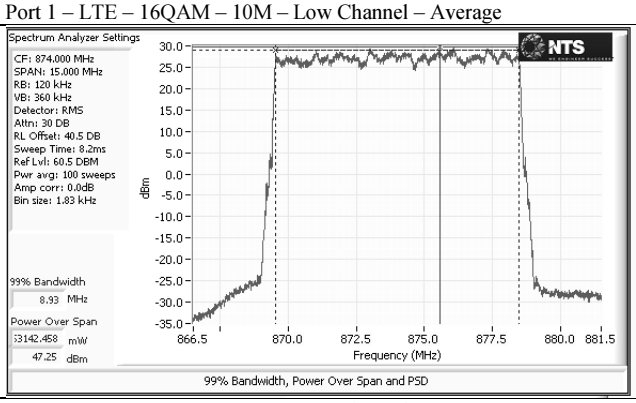
Port 1 – LTE – QPSK – 10M – Low Channel – Average



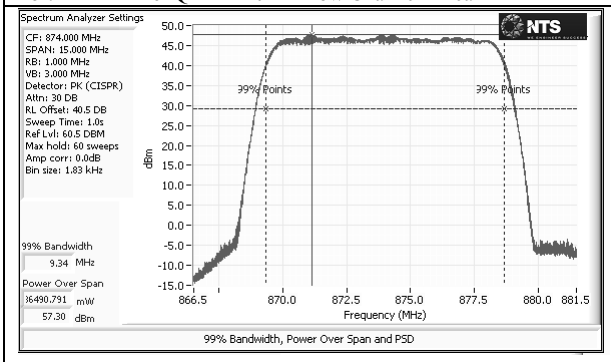
Port 1 – LTE – 16QAM – 10M – Low Channel – Peak



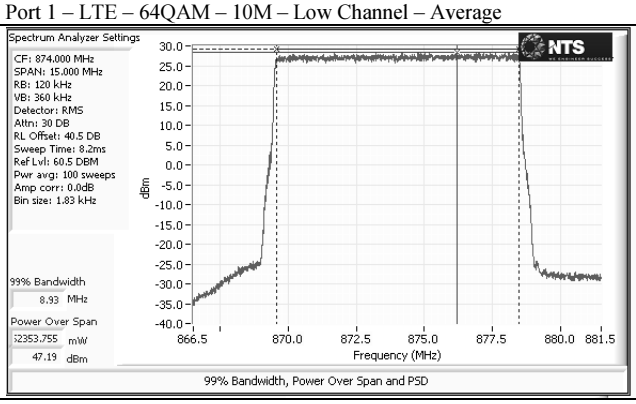
Port 1 – LTE – 16QAM – 10M – Low Channel – Average



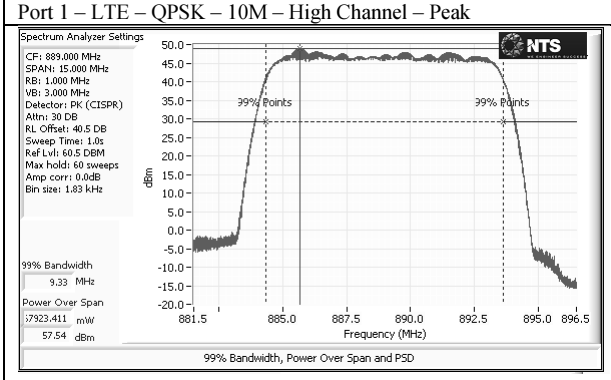
Port 1 – LTE – 64QAM – 10M – Low Channel – Peak



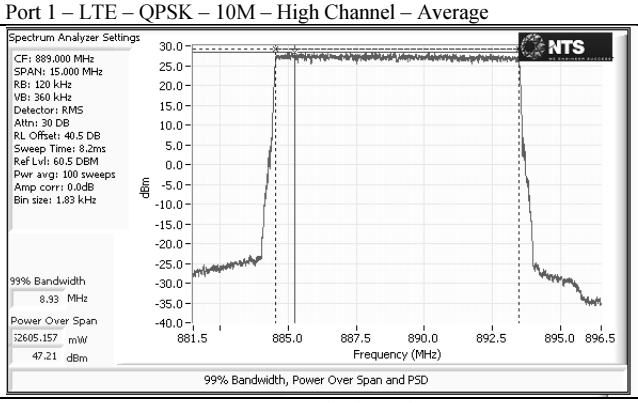
Port 1 – LTE – 64QAM – 10M – Low Channel – Average



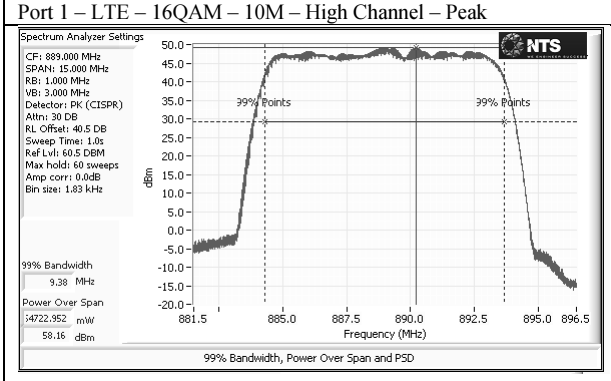
Port 1 – LTE – QPSK – 10M – High Channel – Peak



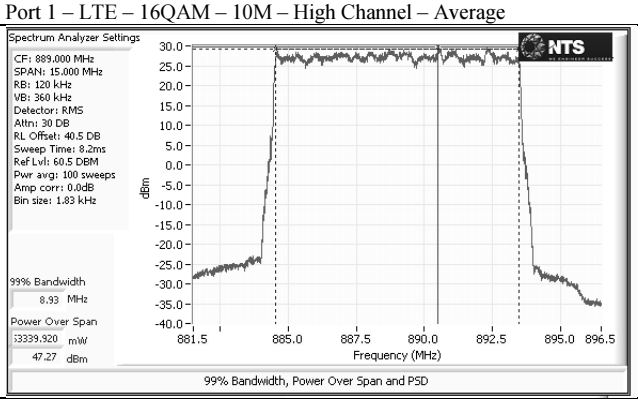
Port 1 – LTE – QPSK – 10M – High Channel – Average



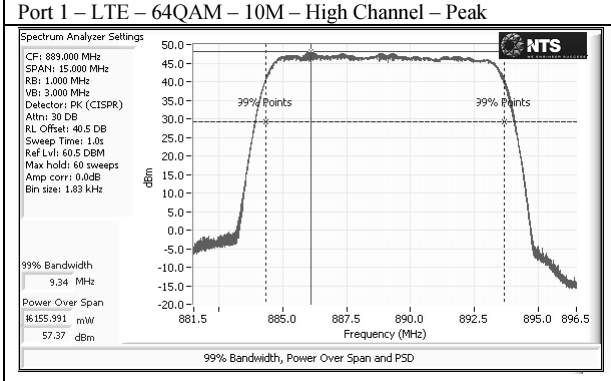
Port 1 – LTE – 16QAM – 10M – High Channel – Peak



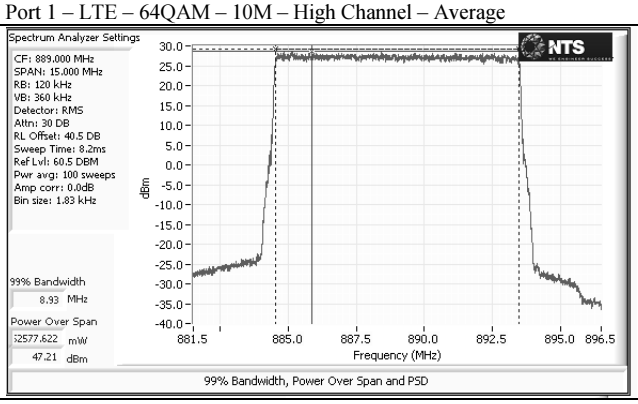
Port 1 – LTE – 16QAM – 10M – High Channel – Average



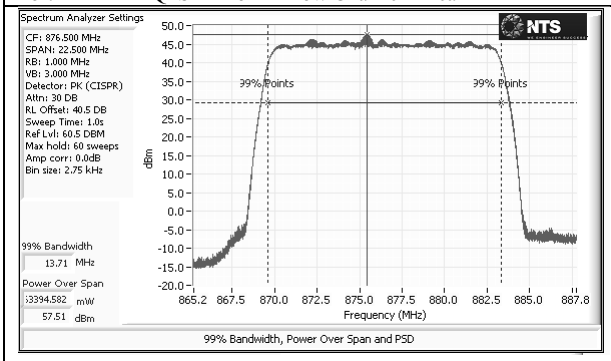
Port 1 – LTE – 64QAM – 10M – High Channel – Peak



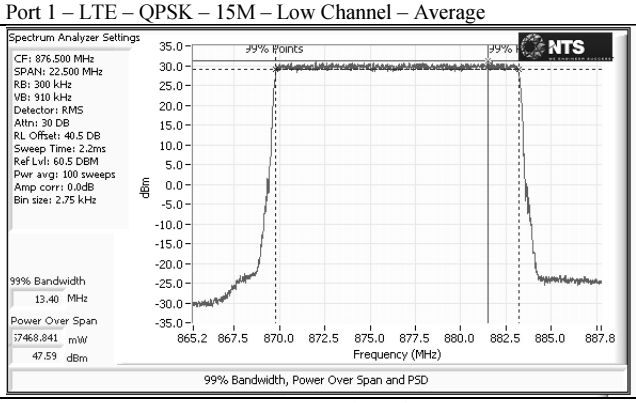
Port 1 – LTE – 64QAM – 10M – High Channel – Average



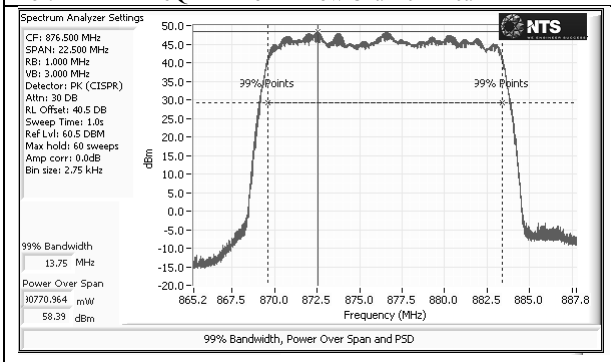
Port 1 – LTE – QPSK – 15M – Low Channel – Peak



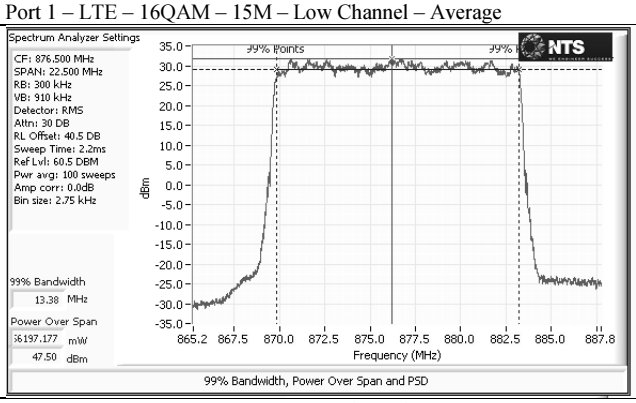
Port 1 – LTE – QPSK – 15M – Low Channel – Average



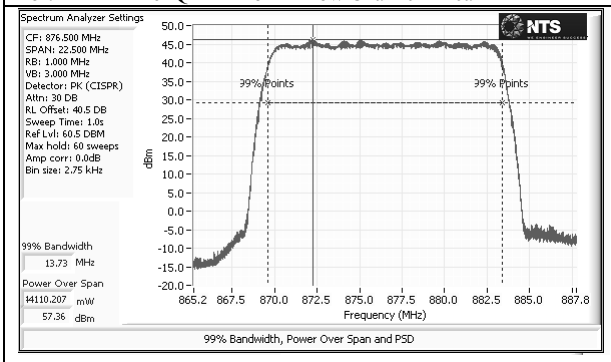
Port 1 – LTE – 16QAM – 15M – Low Channel – Peak



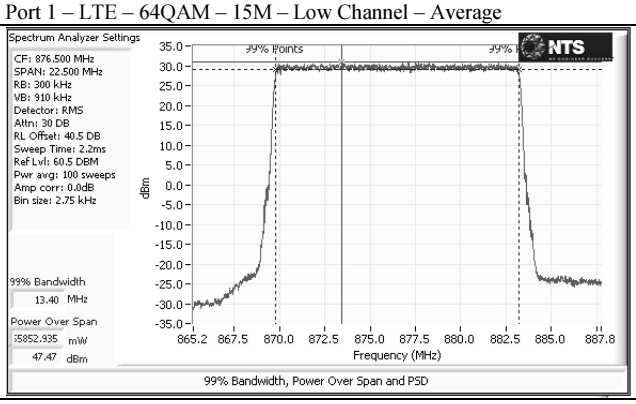
Port 1 – LTE – 16QAM – 15M – Low Channel – Average



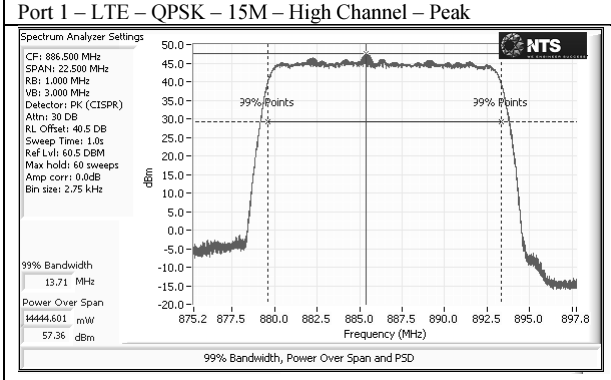
Port 1 – LTE – 64QAM – 15M – Low Channel – Peak



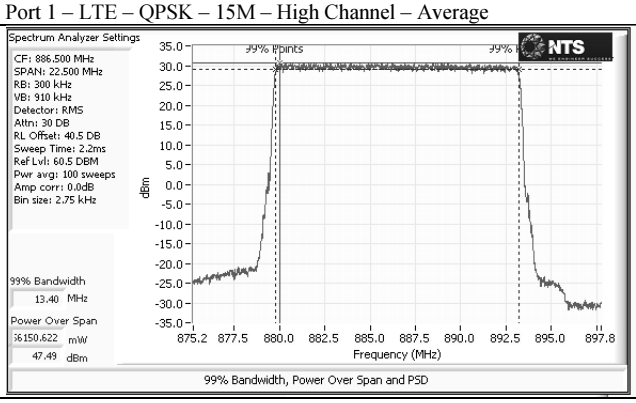
Port 1 – LTE – 64QAM – 15M – Low Channel – Average



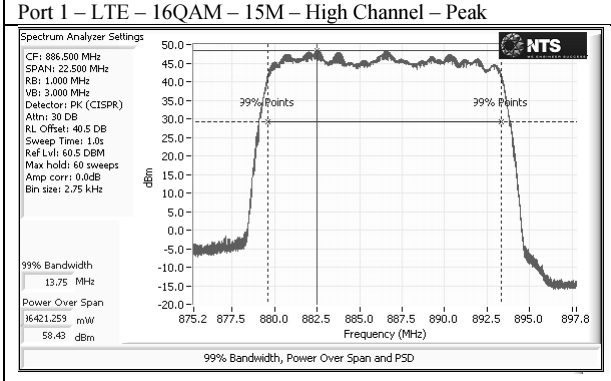
Port 1 – LTE – QPSK – 15M – High Channel – Peak



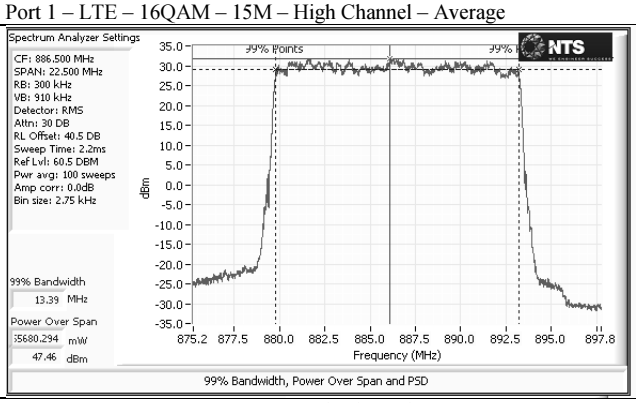
Port 1 – LTE – QPSK – 15M – High Channel – Average



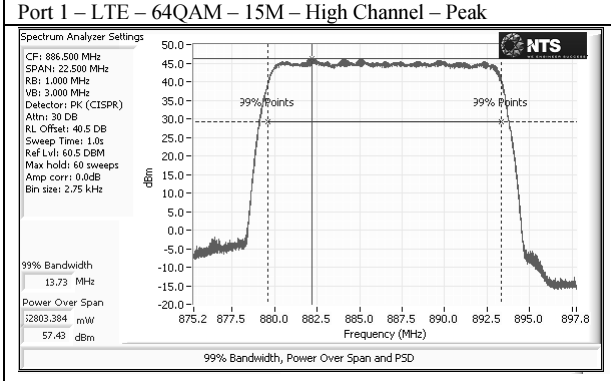
Port 1 – LTE – 16QAM – 15M – High Channel – Peak



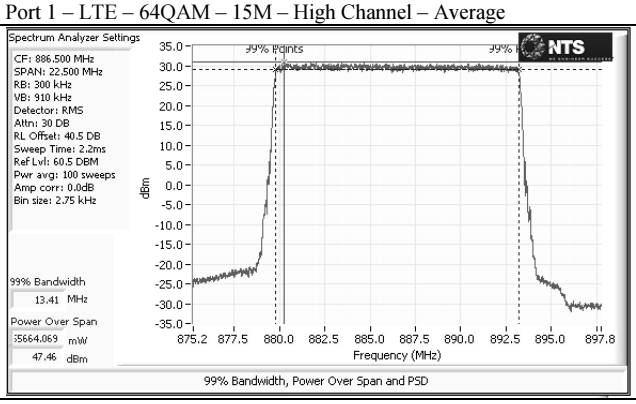
Port 1 – LTE – 16QAM – 15M – High Channel – Average



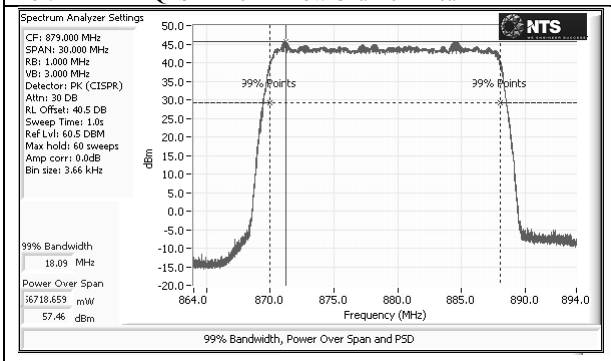
Port 1 – LTE – 64QAM – 15M – High Channel – Peak



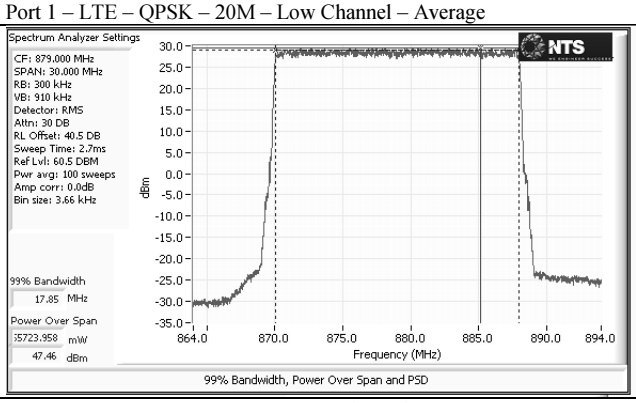
Port 1 – LTE – 64QAM – 15M – High Channel – Average



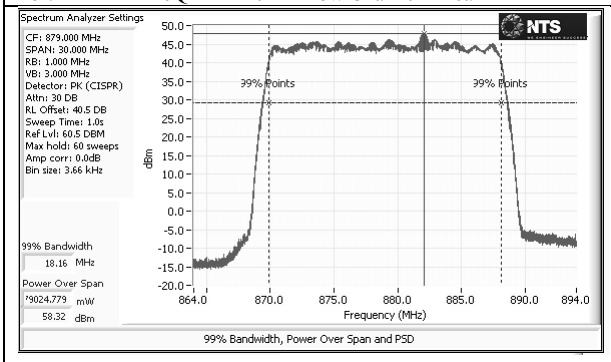
Port 1 – LTE – QPSK – 20M – Low Channel – Peak



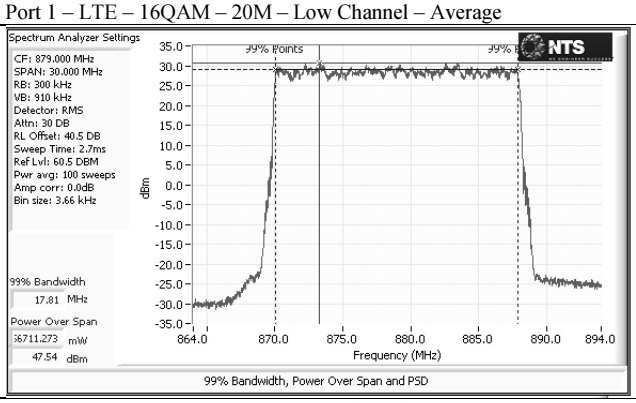
Port 1 – LTE – QPSK – 20M – Low Channel – Average



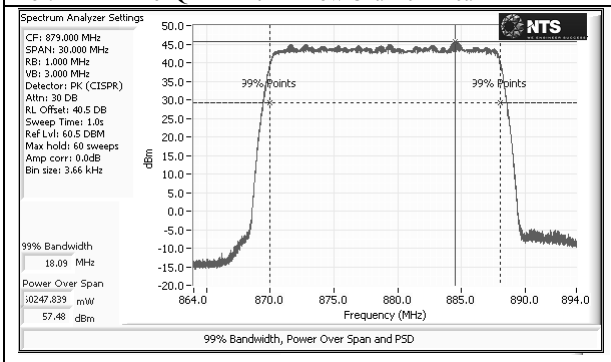
Port 1 – LTE – 16QAM – 20M – Low Channel – Peak



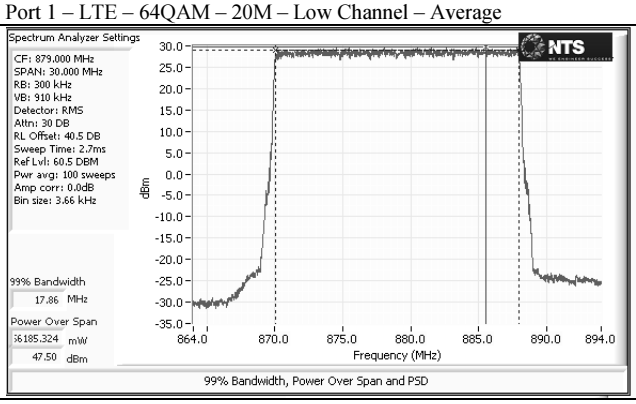
Port 1 – LTE – 16QAM – 20M – Low Channel – Average



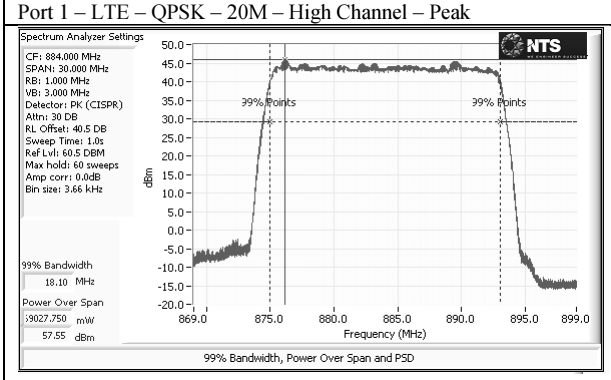
Port 1 – LTE – 64QAM – 20M – Low Channel – Peak



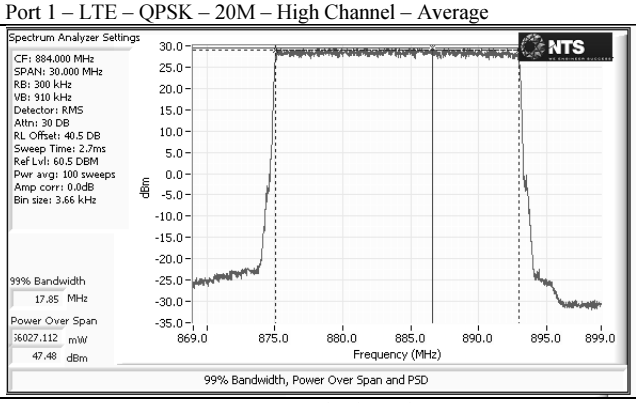
Port 1 – LTE – 64QAM – 20M – Low Channel – Average



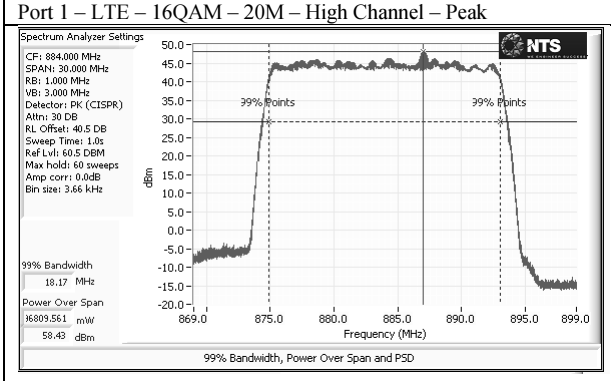
Port 1 – LTE – QPSK – 20M – High Channel – Peak



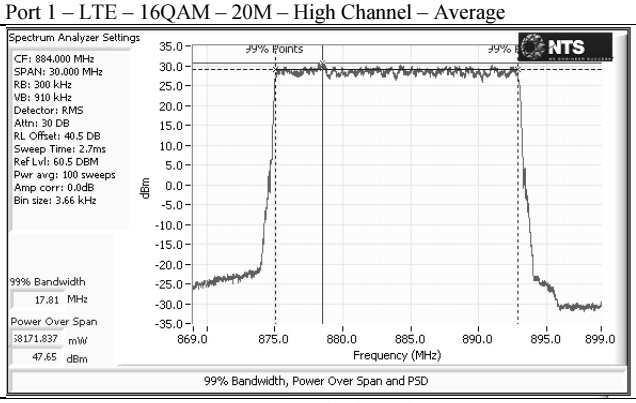
Port 1 – LTE – QPSK – 20M – High Channel – Average



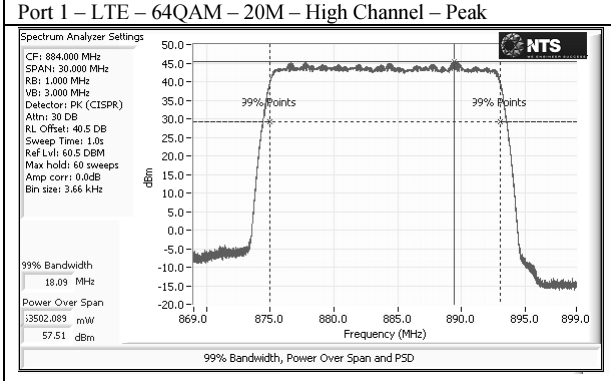
Port 1 – LTE – 16QAM – 20M – High Channel – Peak



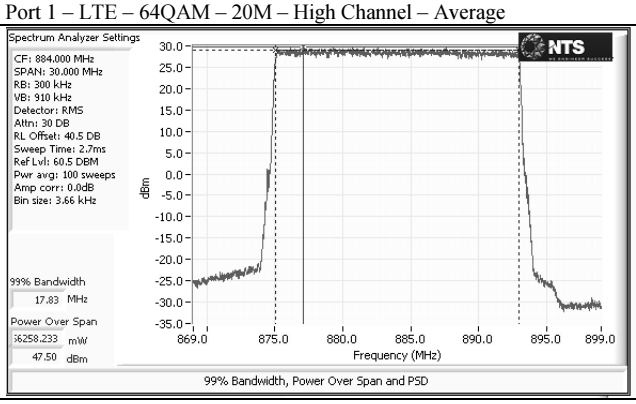
Port 1 – LTE – 16QAM – 20M – High Channel – Average



Port 1 – LTE – 64QAM – 20M – High Channel – Peak

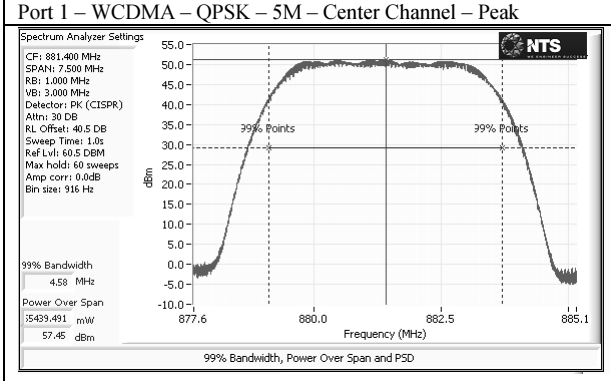


Port 1 – LTE – 64QAM – 20M – High Channel – Average

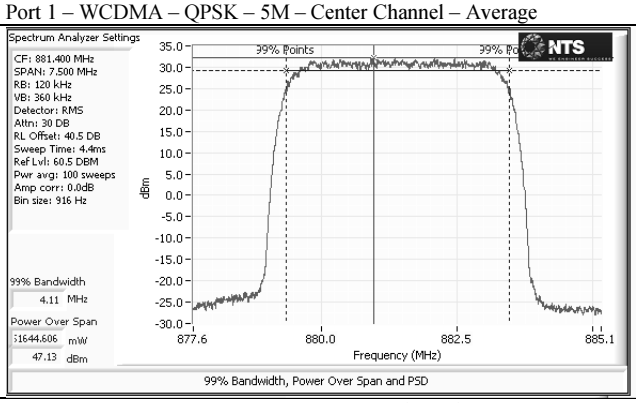


WCDMA Plots:

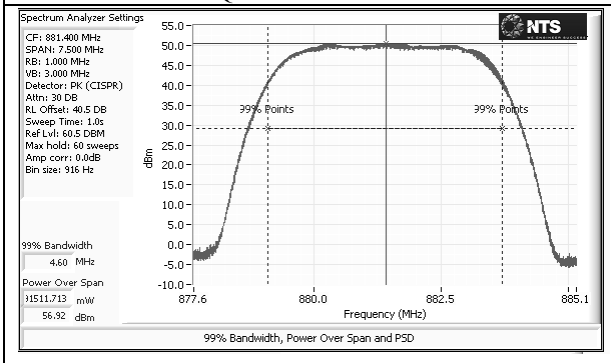
Port 1 – WCDMA – QPSK – 5M – Center Channel – Peak



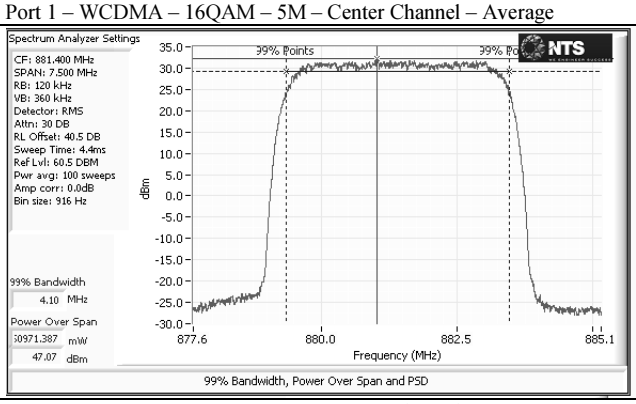
Port 1 – WCDMA – QPSK – 5M – Center Channel – Average



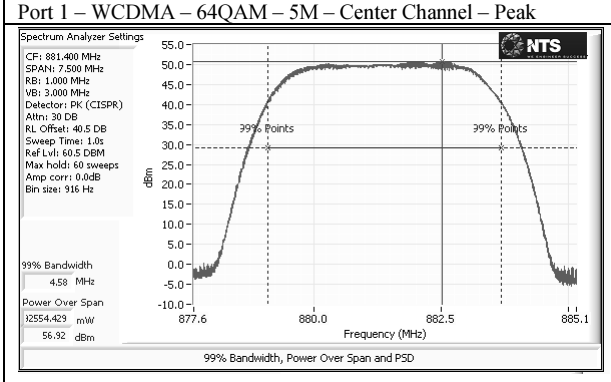
Port 1 – WCDMA – 16QAM – 5M – Center Channel – Peak



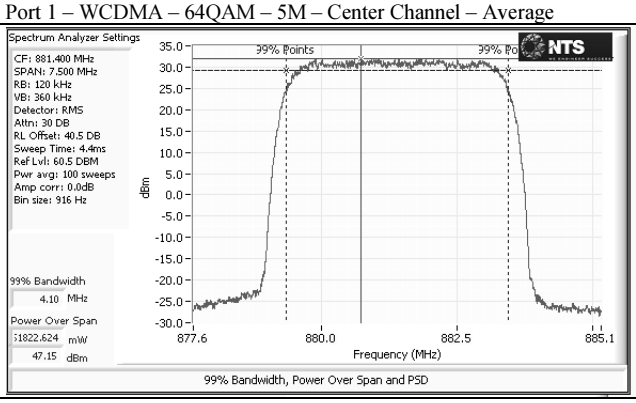
Port 1 – WCDMA – 16QAM – 5M – Center Channel – Average



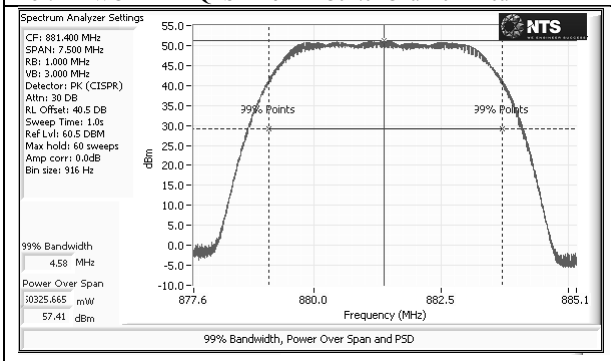
Port 1 – WCDMA – 64QAM – 5M – Center Channel – Peak



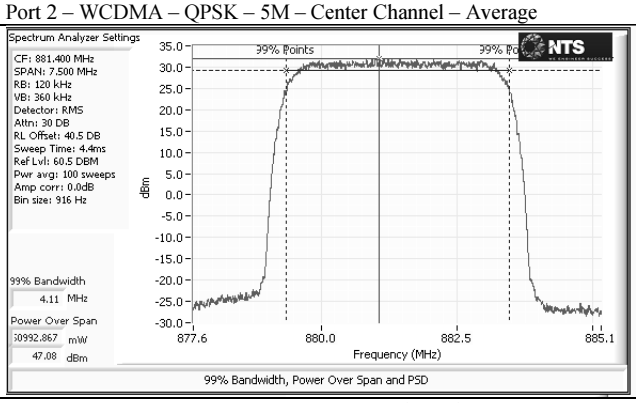
Port 1 – WCDMA – 64QAM – 5M – Center Channel – Average



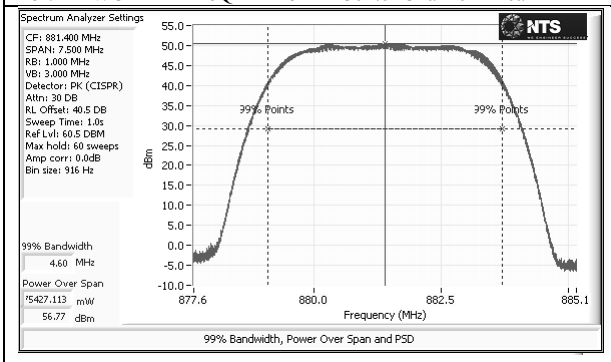
Port 2 – WCDMA – QPSK – 5M – Center Channel – Peak



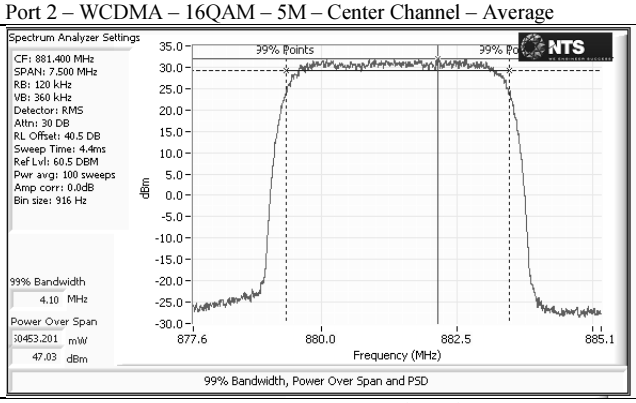
Port 2 – WCDMA – QPSK – 5M – Center Channel – Average



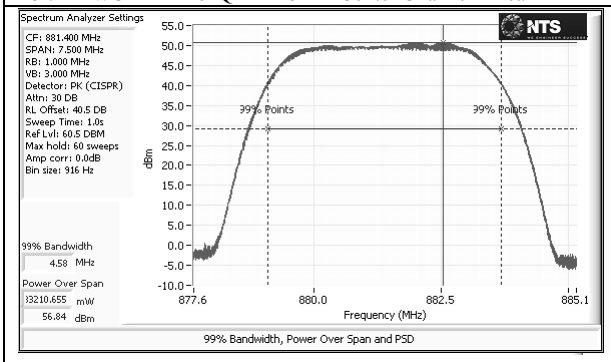
Port 2 – WCDMA – 16QAM – 5M – Center Channel – Peak



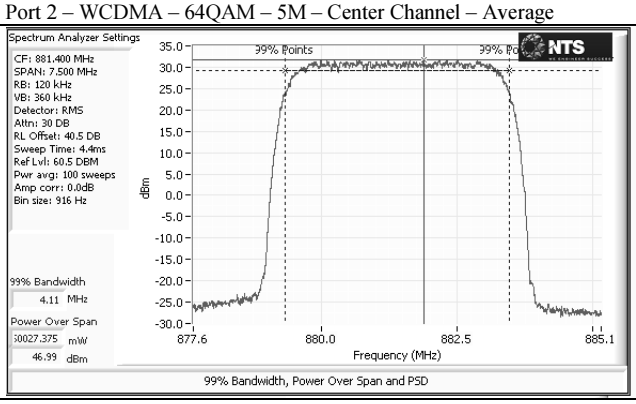
Port 2 – WCDMA – 16QAM – 5M – Center Channel – Average



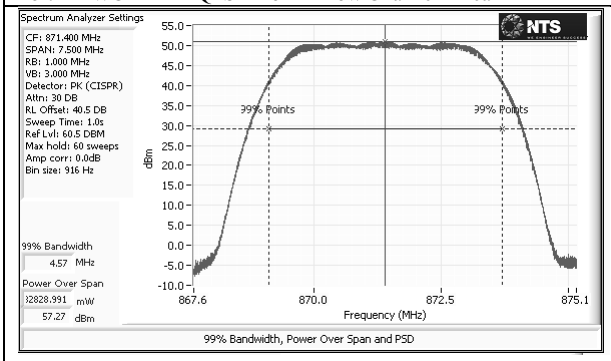
Port 2 – WCDMA – 64QAM – 5M – Center Channel – Peak



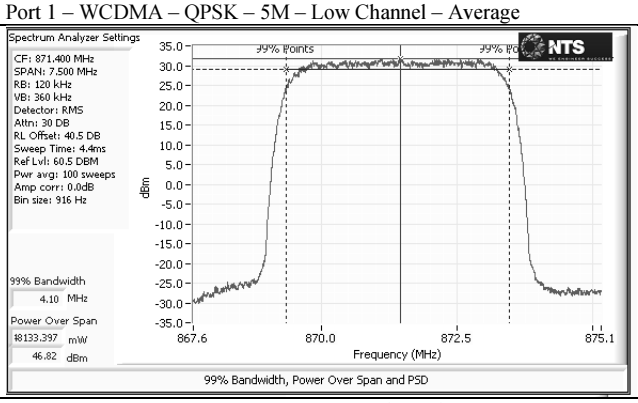
Port 2 – WCDMA – 64QAM – 5M – Center Channel – Average



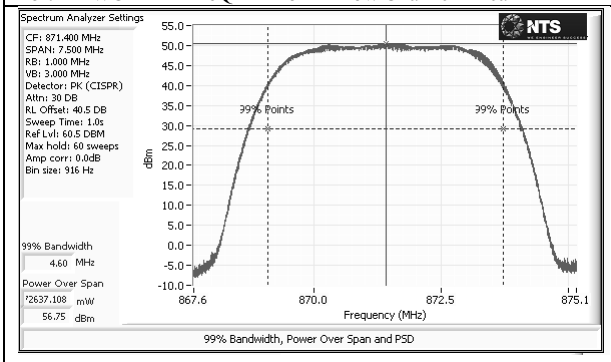
Port 1 – WCDMA – QPSK – 5M – Low Channel – Peak



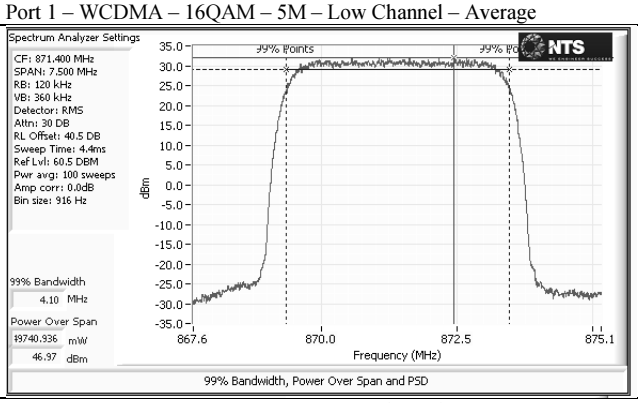
Port 1 – WCDMA – QPSK – 5M – Low Channel – Average



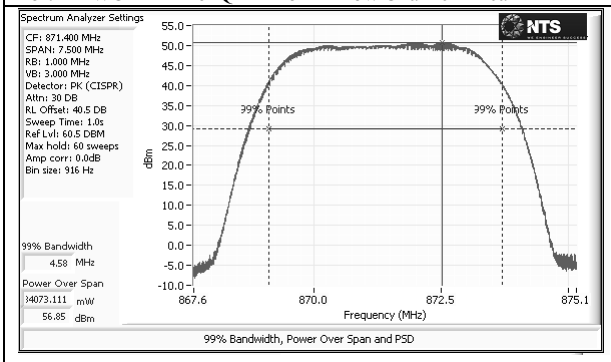
Port 1 – WCDMA – 16QAM – 5M – Low Channel – Peak



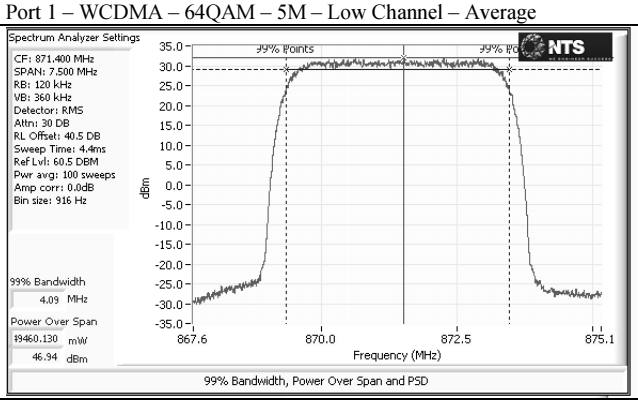
Port 1 – WCDMA – 16QAM – 5M – Low Channel – Average



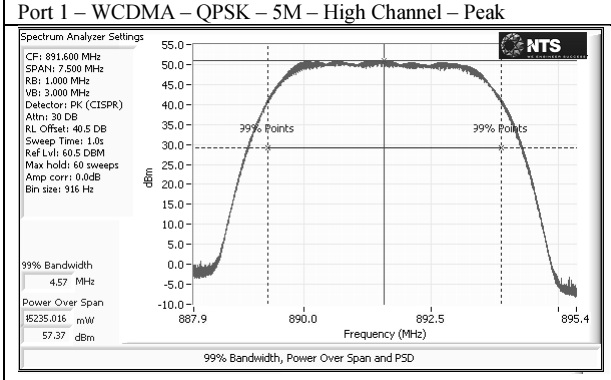
Port 1 – WCDMA – 64QAM – 5M – Low Channel – Peak



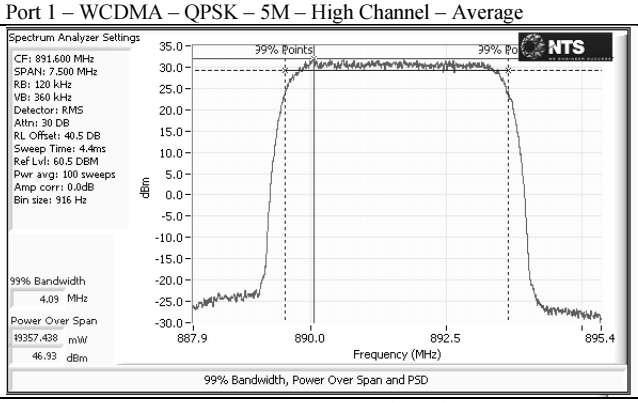
Port 1 – WCDMA – 64QAM – 5M – Low Channel – Average



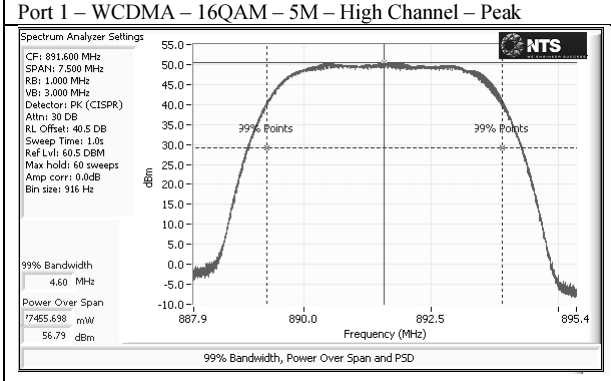
Port 1 – WCDMA – QPSK – 5M – High Channel – Peak



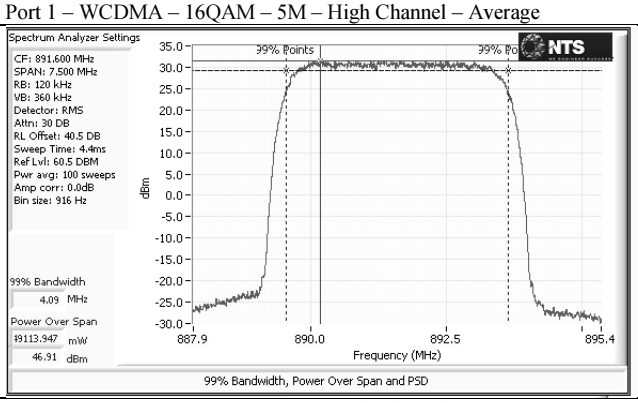
Port 1 – WCDMA – QPSK – 5M – High Channel – Average



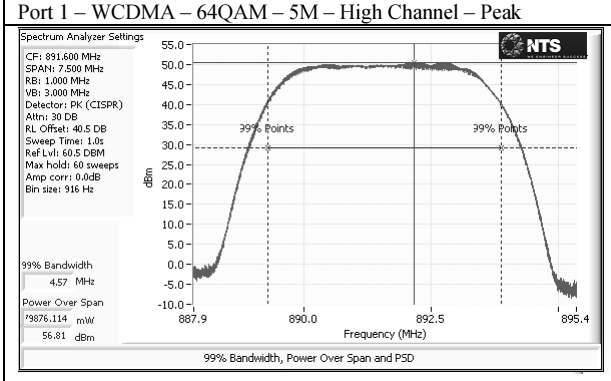
Port 1 – WCDMA – 16QAM – 5M – High Channel – Peak



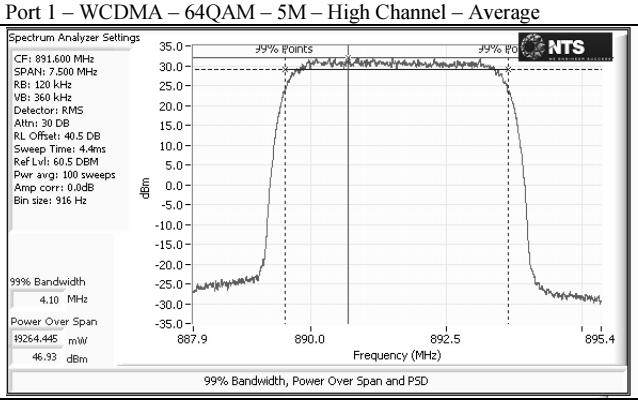
Port 1 – WCDMA – 16QAM – 5M – High Channel – Average



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



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



Emission Bandwidths (26dB and 99%)

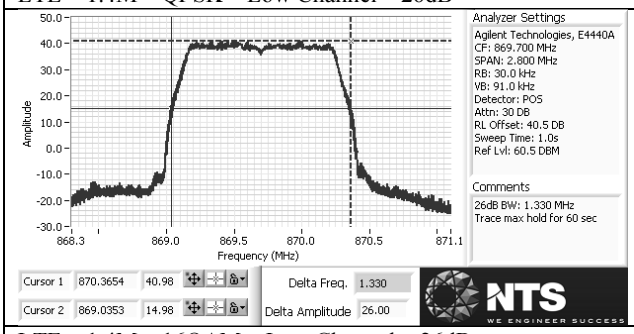
Emissions bandwidths were measured at Port 1 on low and high channels for all modulations and bandwidth modes and results presented below.

	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	**1.33**	**1.126**	1.329	1.125	1.295	1.115	1.296	1.116	1.285	1.115	1.291	1.116
3M	2.913	2.703	**2.914**	2.703	**2.914**	2.701	2.913	2.7	2.91	**2.706**	2.909	**2.706**
5M	4.882	4.491	**4.883**	4.49	4.865	4.484	4.866	4.487	4.876	**4.5**	4.877	**4.5**
10M	9.728	8.989	9.716	8.992	9.694	9.006	9.716	**9.011**	**9.769**	8.994	9.764	8.992
15M	14.566	13.48	14.548	13.477	14.522	13.491	14.522	**13.495**	14.614	13.48	**14.617**	13.484
20M	19.431	17.954	19.421	17.949	19.363	18.013	19.372	**18.018**	**19.446**	17.939	**19.446**	17.944

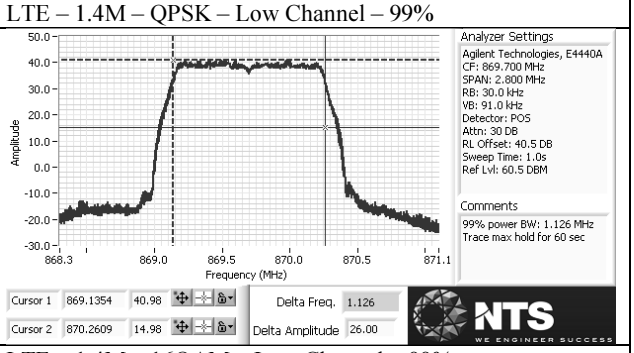
	WCDMA - QPSK				WCDMA - 16QAM				WCDMA - 64QAM			
	Low		High		Low		High		Low		High	
	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)
5M	4.6	**4.103**	**4.605**	4.099	4.603	4.095	4.592	4.097	4.597	4.097	4.594	4.093

Corresponding plots included on the following pages.

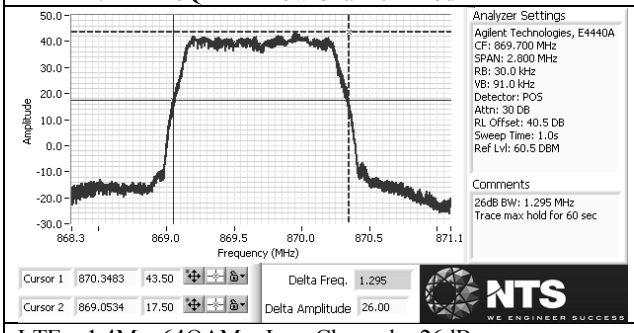
LTE – 1.4M – QPSK – Low Channel – 26dB



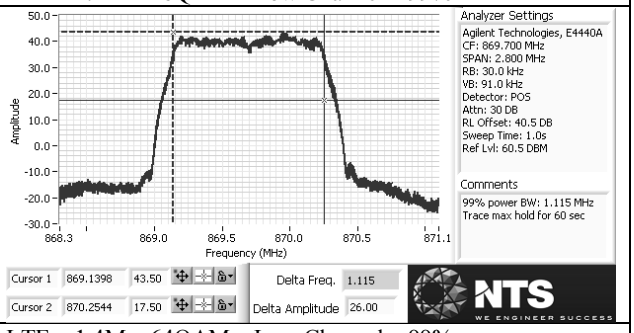
LTE – 1.4M – QPSK – Low Channel – 99%



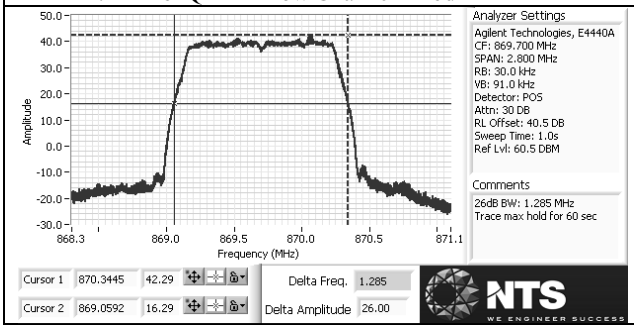
LTE – 1.4M – 16QAM – Low Channel – 26dB



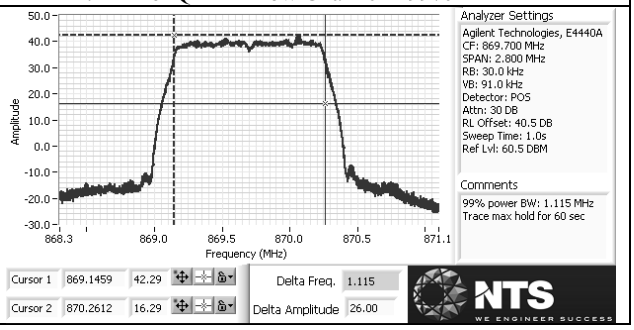
LTE – 1.4M – 16QAM – Low Channel – 99%



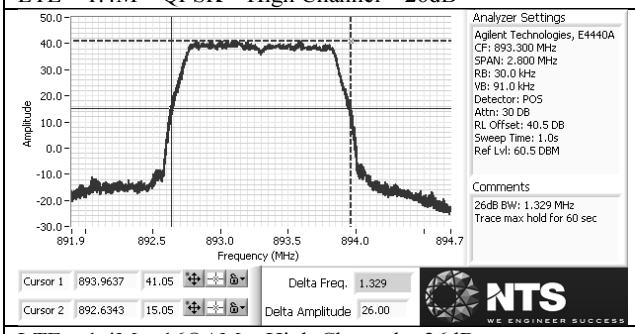
LTE – 1.4M – 64QAM – Low Channel – 26dB



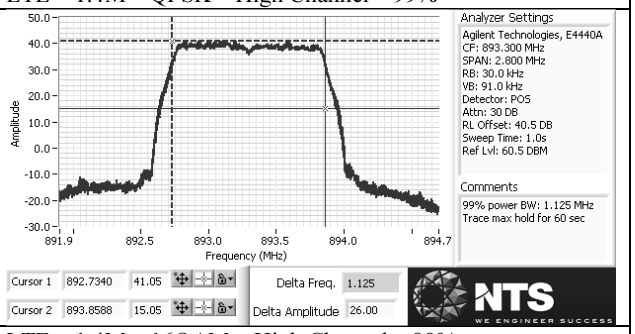
LTE – 1.4M – 64QAM – Low Channel – 99%



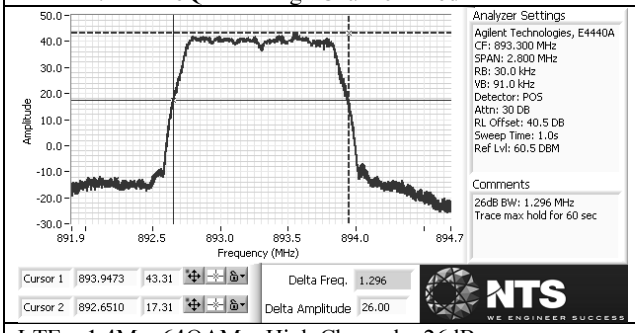
LTE – 1.4M – QPSK – High Channel – 26dB



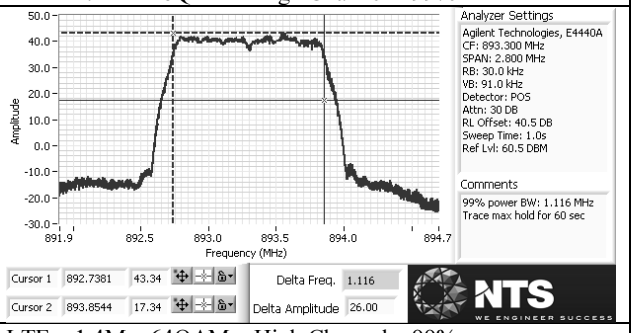
LTE – 1.4M – QPSK – High Channel – 99%



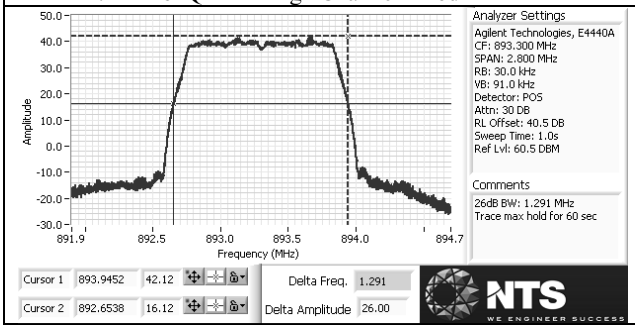
LTE – 1.4M – 16QAM – High Channel – 26dB



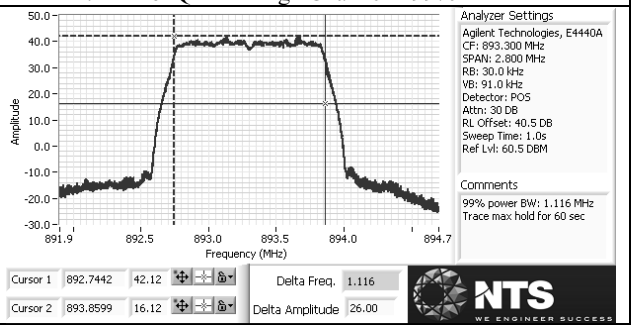
LTE – 1.4M – 16QAM – High Channel – 99%



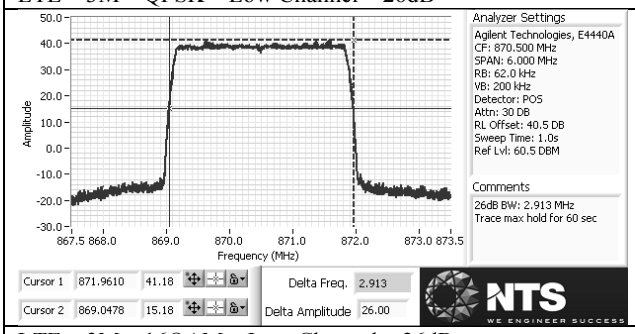
LTE – 1.4M – 64QAM – High Channel – 26dB



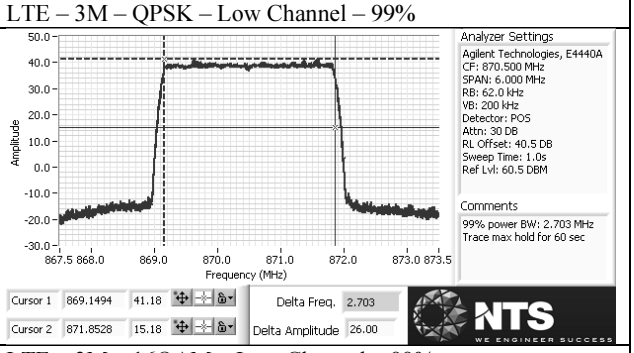
LTE – 1.4M – 64QAM – High Channel – 99%



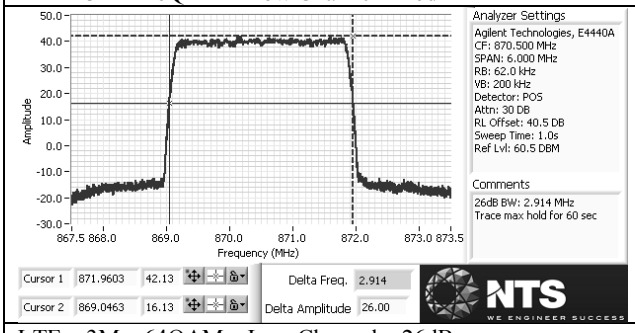
LTE – 3M – QPSK – Low Channel – 26dB



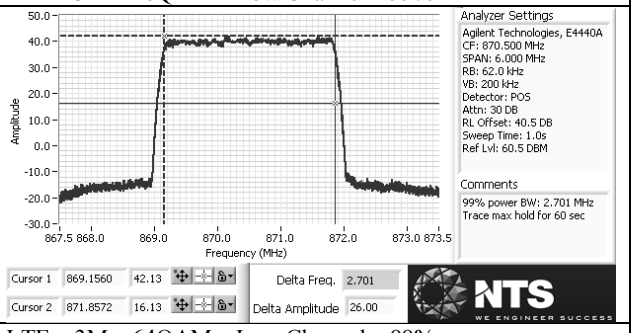
LTE – 3M – QPSK – Low Channel – 99%



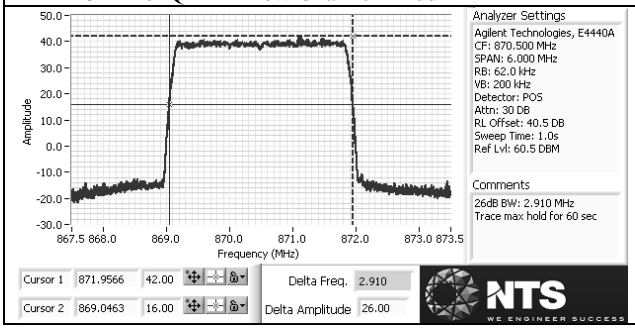
LTE – 3M – 16QAM – Low Channel – 26dB



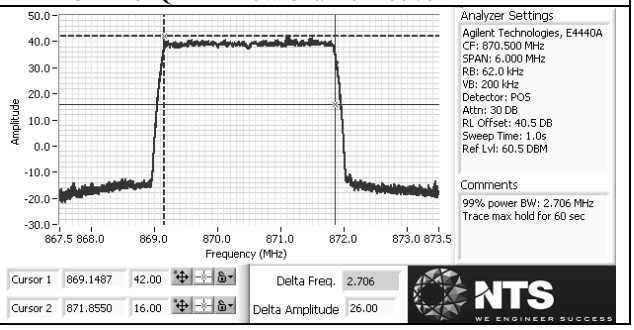
LTE – 3M – 16QAM – Low Channel – 99%



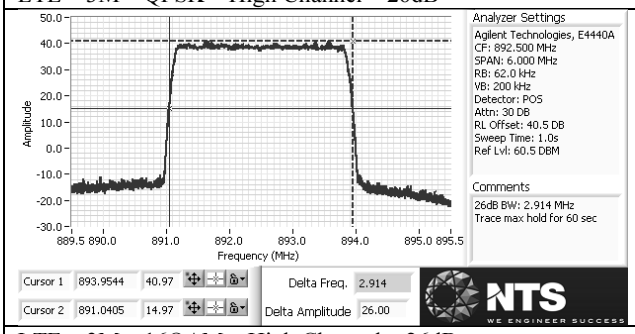
LTE – 3M – 64QAM – Low Channel – 26dB



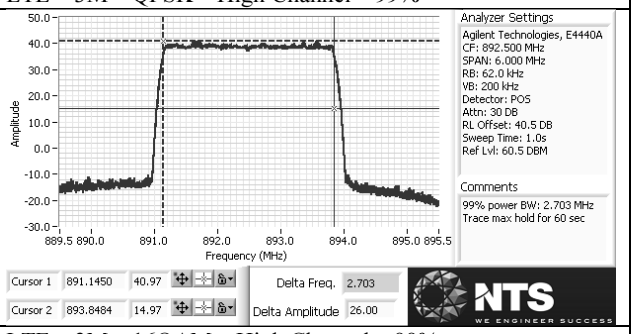
LTE – 3M – 64QAM – Low Channel – 99%



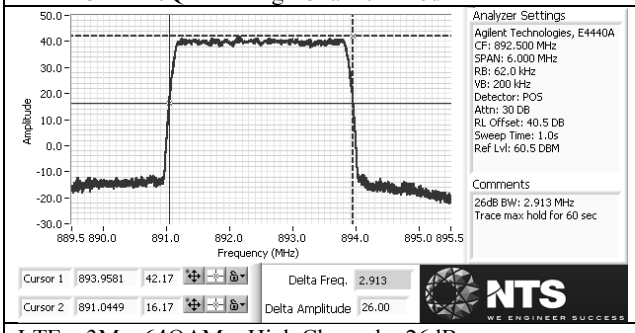
LTE – 3M – QPSK – High Channel – 26dB



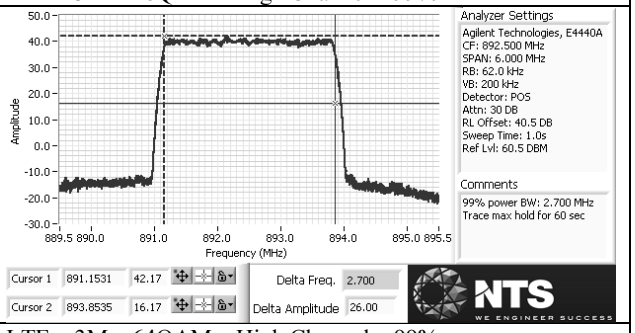
LTE – 3M – QPSK – High Channel – 99%



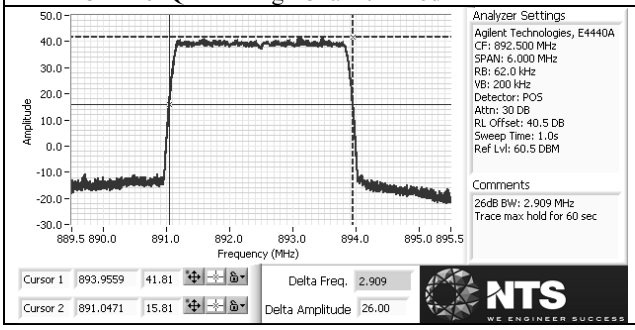
LTE – 3M – 16QAM – High Channel – 26dB



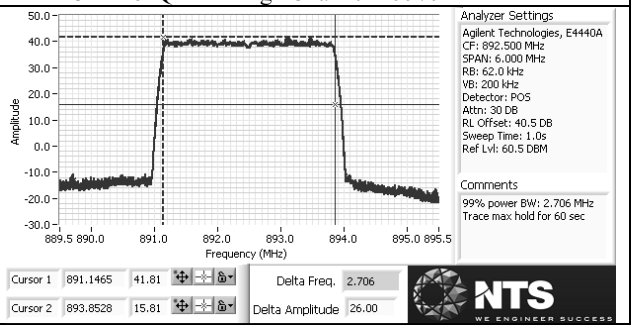
LTE – 3M – 16QAM – High Channel – 99%



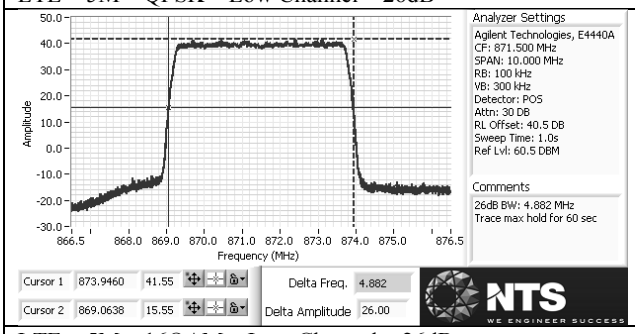
LTE – 3M – 64QAM – High Channel – 26dB



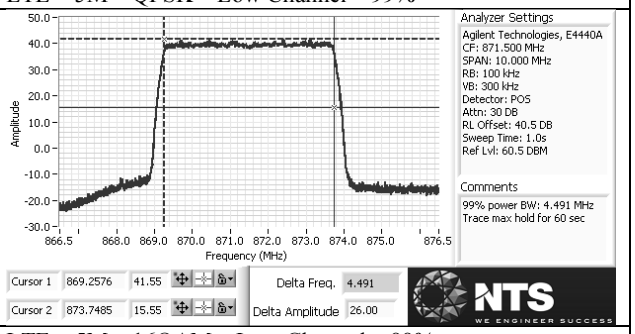
LTE – 3M – 64QAM – High Channel – 99%



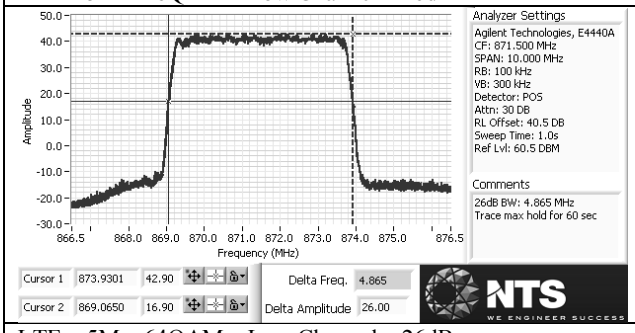
LTE – 5M – QPSK – Low Channel – 26dB



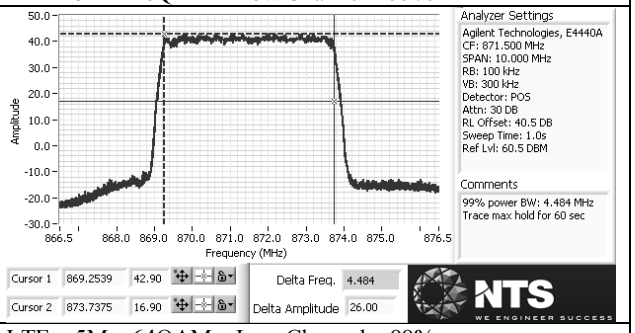
LTE – 5M – QPSK – Low Channel – 99%



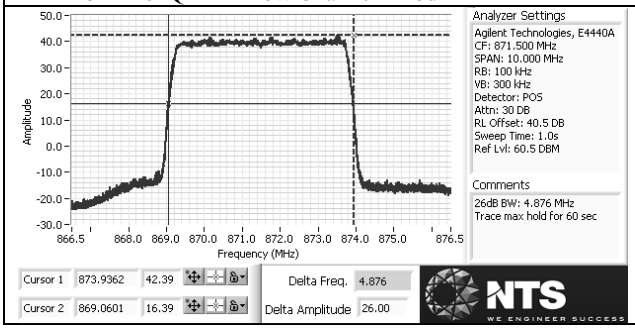
LTE – 5M – 16QAM – Low Channel – 26dB



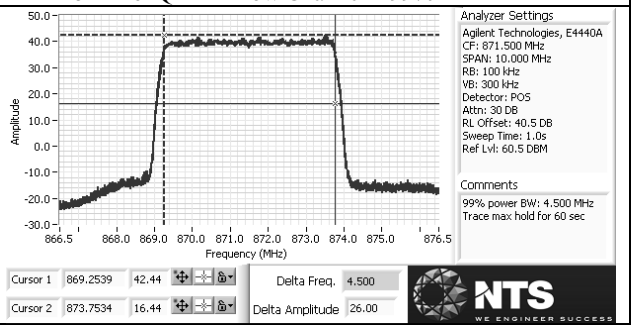
LTE – 5M – 16QAM – Low Channel – 99%



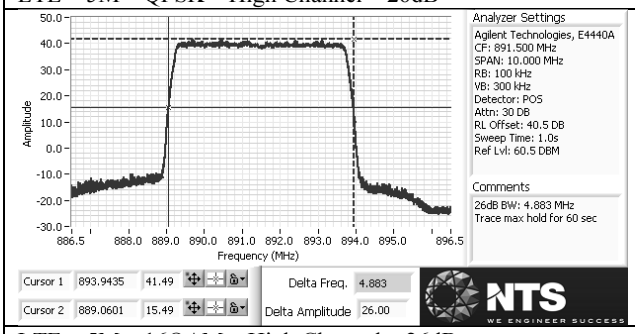
LTE – 5M – 64QAM – Low Channel – 26dB



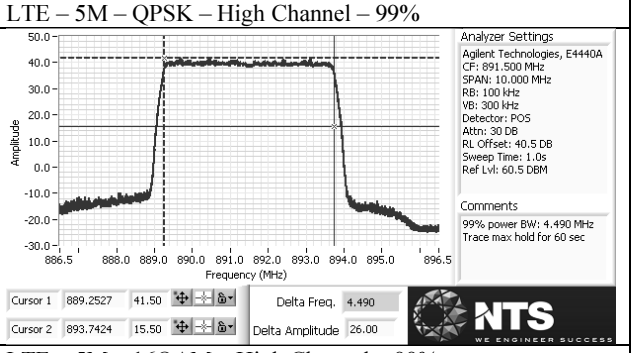
LTE – 5M – 64QAM – Low Channel – 99%



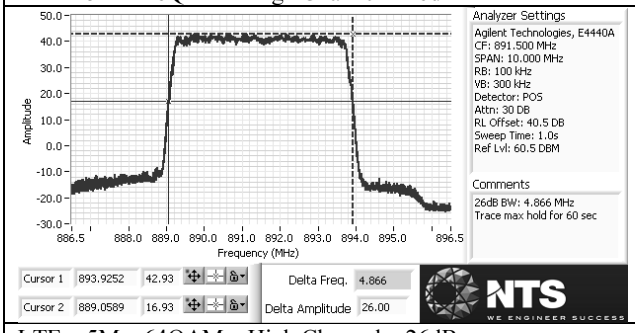
LTE – 5M – QPSK – High Channel – 26dB



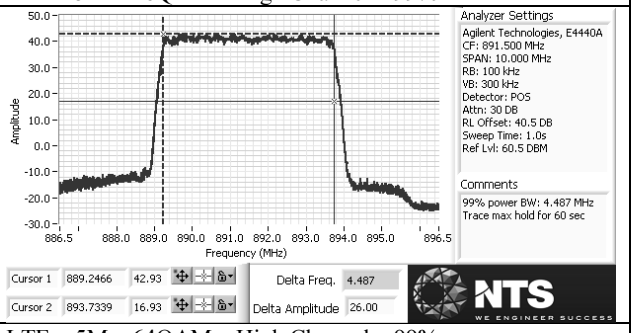
LTE – 5M – QPSK – High Channel – 99%



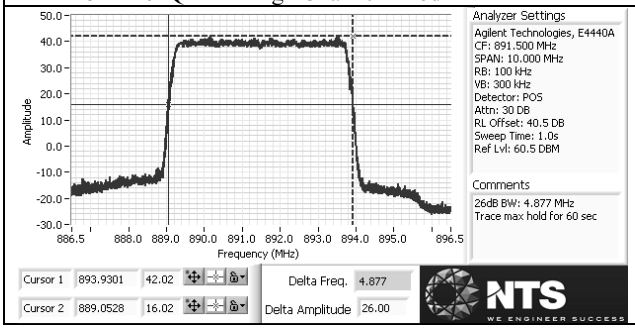
LTE – 5M – 16QAM – High Channel – 26dB



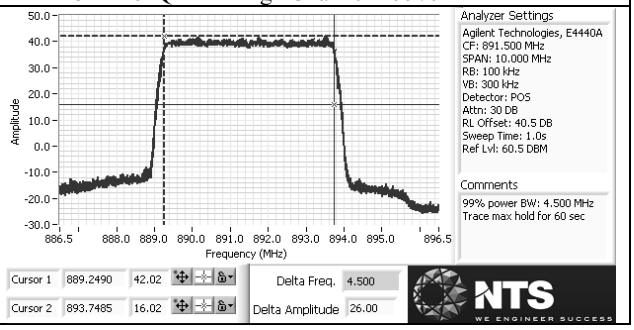
LTE – 5M – 16QAM – High Channel – 99%



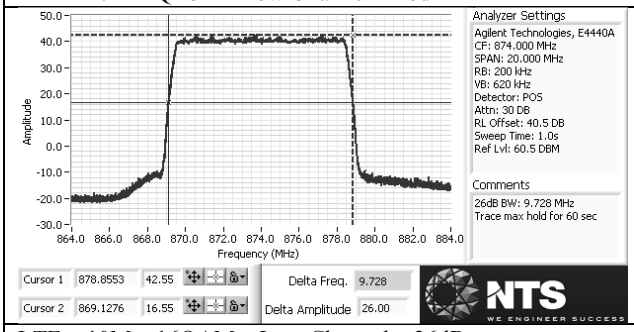
LTE – 5M – 64QAM – High Channel – 26dB



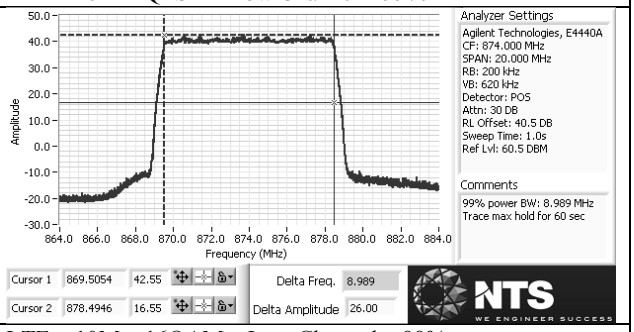
LTE – 5M – 64QAM – High Channel – 99%



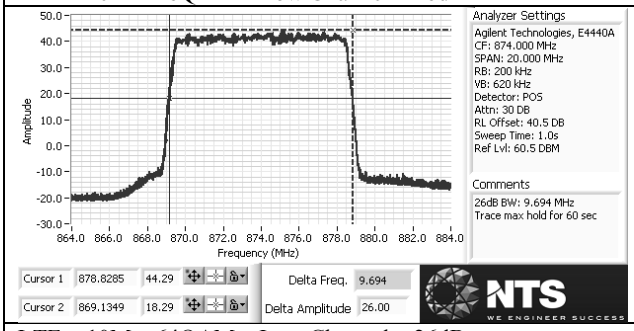
LTE – 10M – QPSK – Low Channel – 26dB



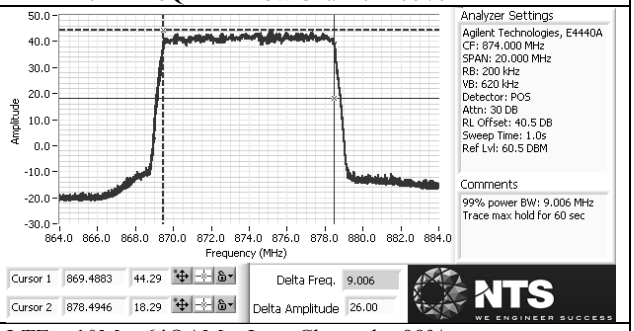
LTE – 10M – QPSK – Low Channel – 99%



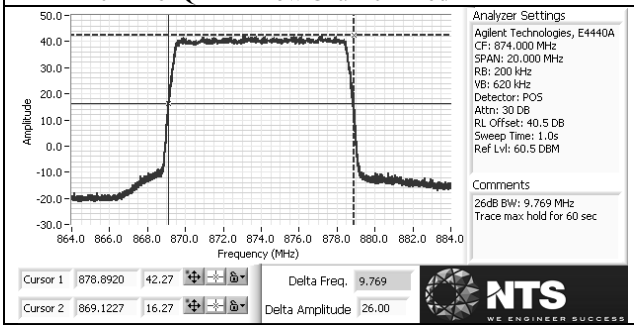
LTE – 10M – 16QAM – Low Channel – 26dB



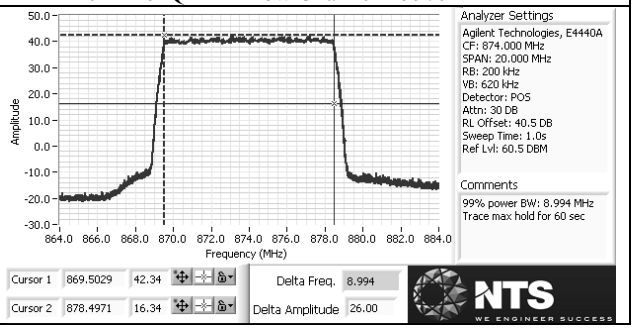
LTE – 10M – 16QAM – Low Channel – 99%



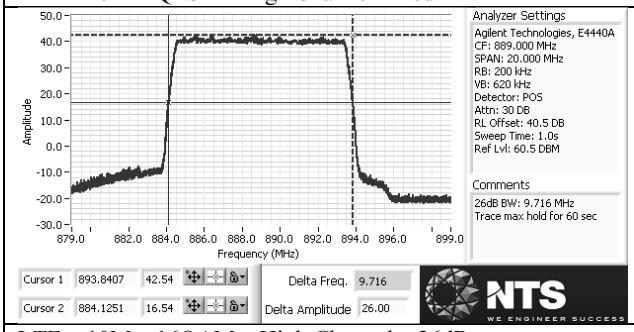
LTE – 10M – 64QAM – Low Channel – 26dB



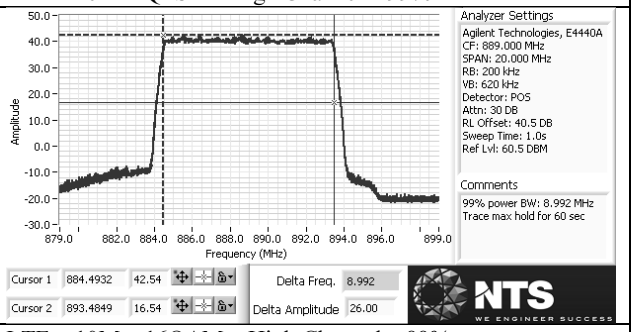
LTE – 10M – 64QAM – Low Channel – 99%



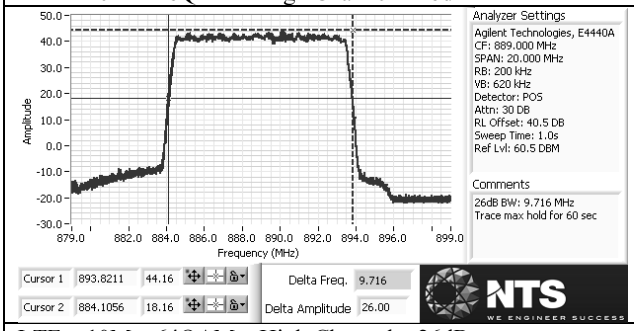
LTE – 10M – QPSK – High Channel – 26dB



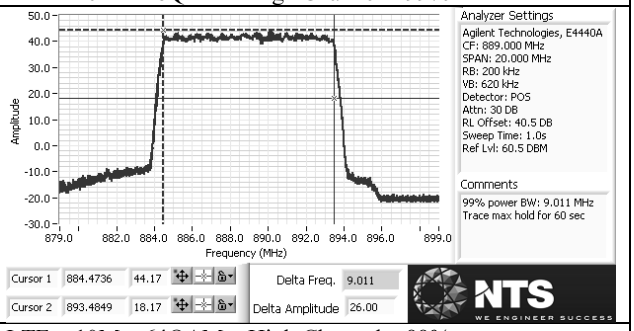
LTE – 10M – QPSK – High Channel – 99%



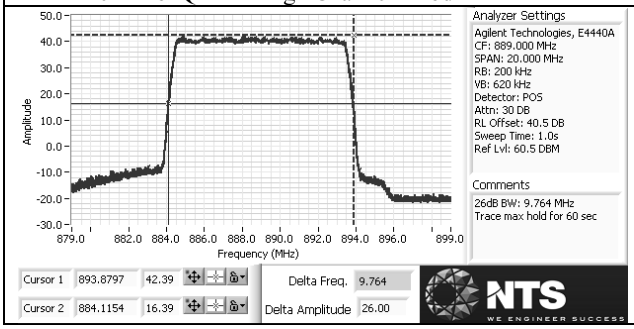
LTE – 10M – 16QAM – High Channel – 26dB



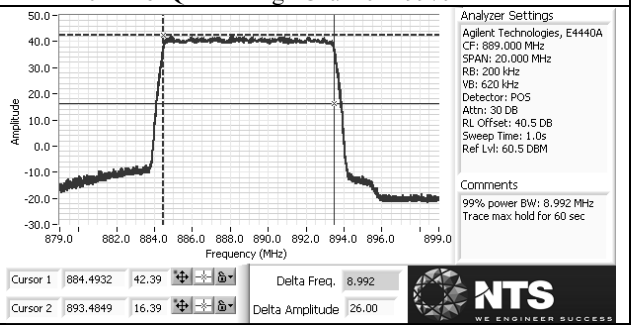
LTE – 10M – 16QAM – High Channel – 99%



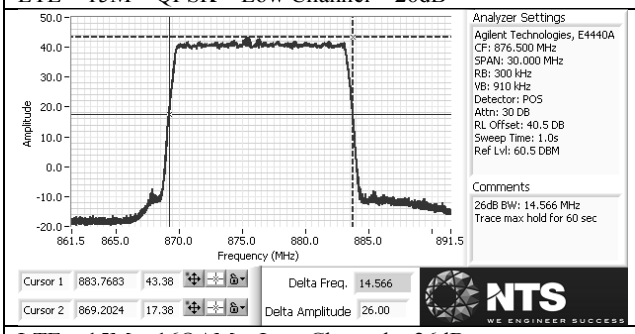
LTE – 10M – 64QAM – High Channel – 26dB



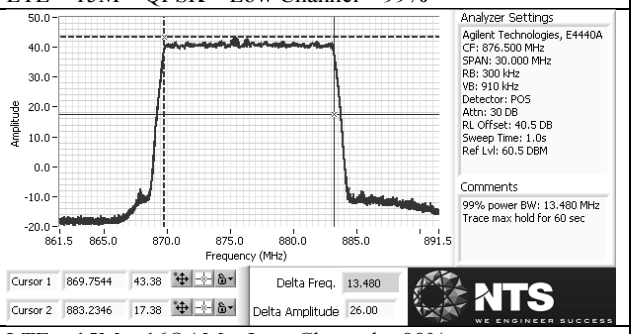
LTE – 10M – 64QAM – High Channel – 99%



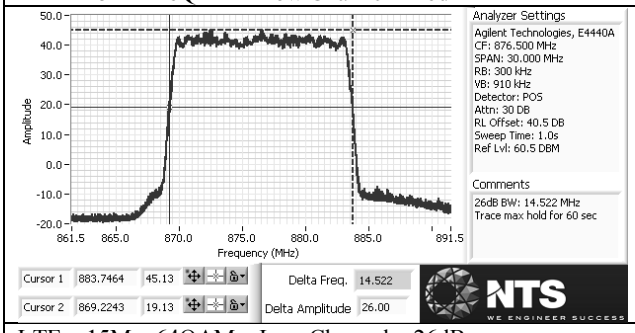
LTE – 15M – QPSK – Low Channel – 26dB



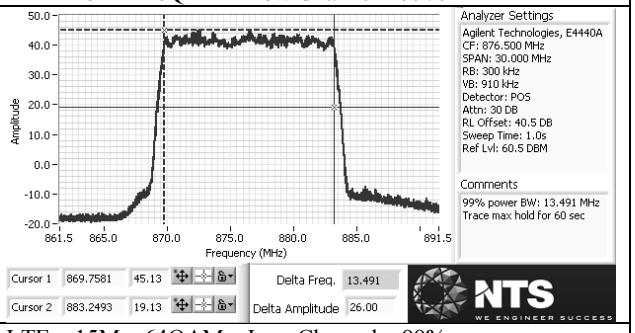
LTE – 15M – QPSK – Low Channel – 99%



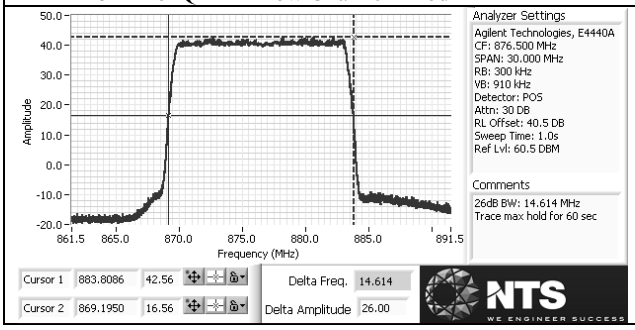
LTE – 15M – 16QAM – Low Channel – 26dB



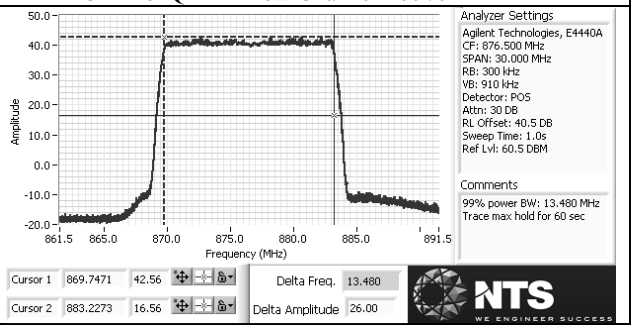
LTE – 15M – 16QAM – Low Channel – 99%



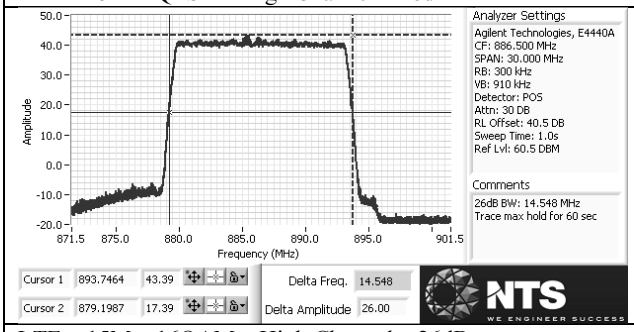
LTE – 15M – 64QAM – Low Channel – 26dB



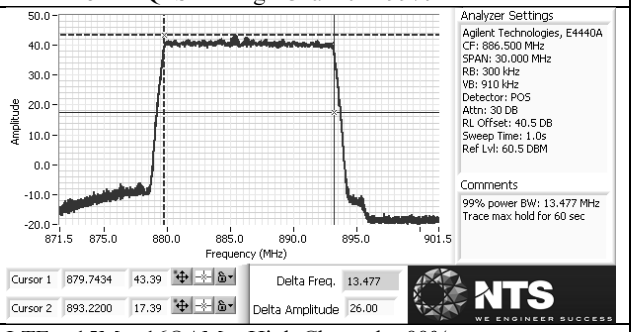
LTE – 15M – 64QAM – Low Channel – 99%



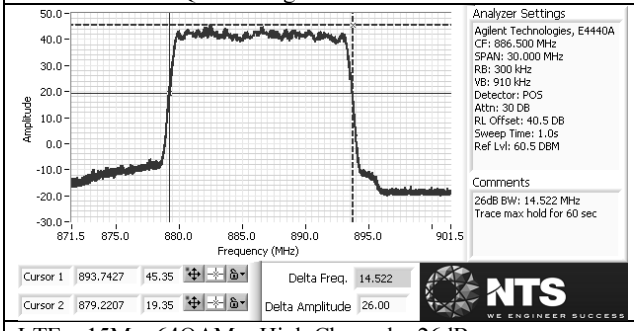
LTE – 15M – QPSK – High Channel – 26dB



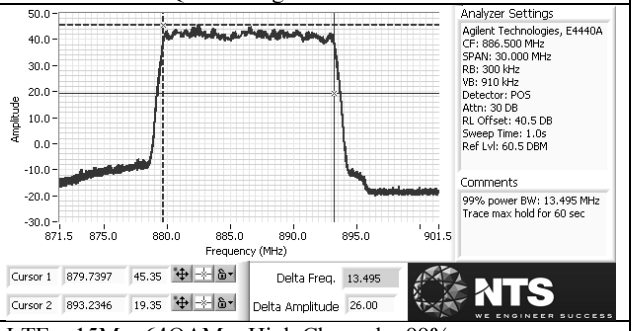
LTE – 15M – QPSK – High Channel – 99%



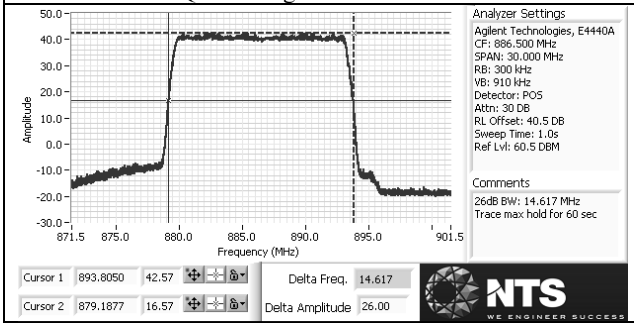
LTE – 15M – 16QAM – High Channel – 26dB



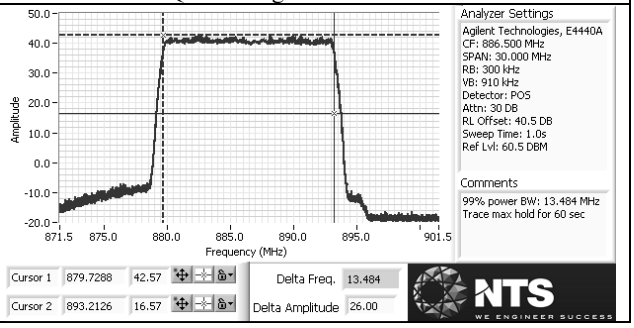
LTE – 15M – 16QAM – High Channel – 99%



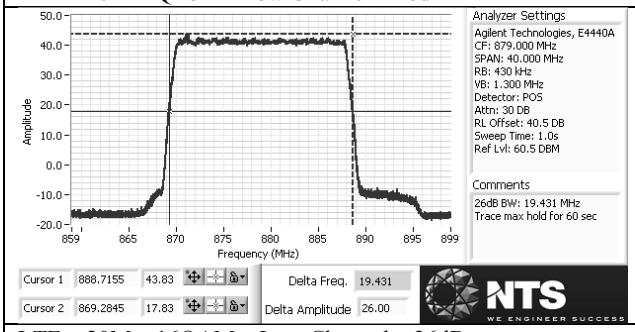
LTE – 15M – 64QAM – High Channel – 26dB



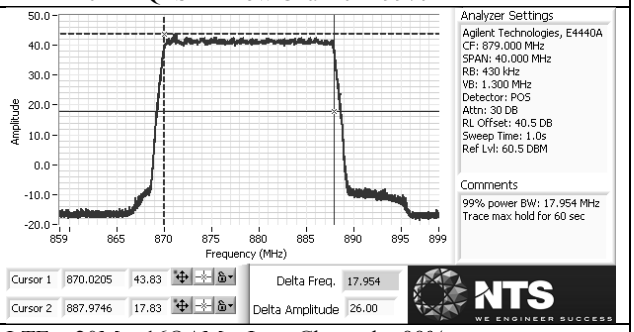
LTE – 15M – 64QAM – High Channel – 99%



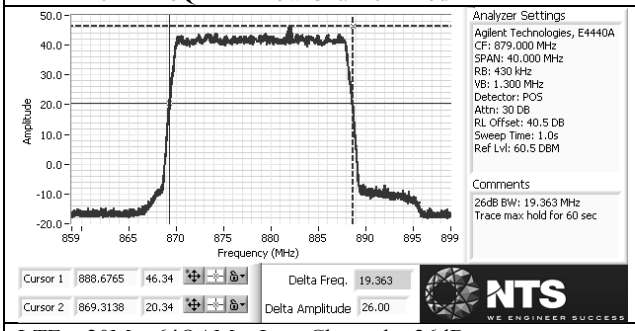
LTE – 20M – QPSK – Low Channel – 26dB



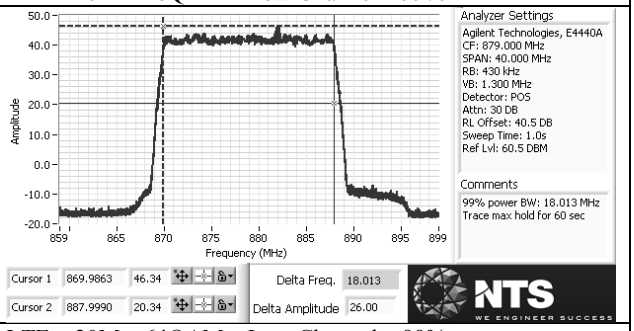
LTE – 20M – QPSK – Low Channel – 99%



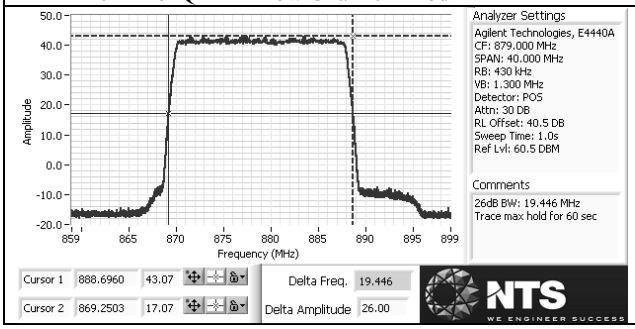
LTE – 20M – 16QAM – Low Channel – 26dB



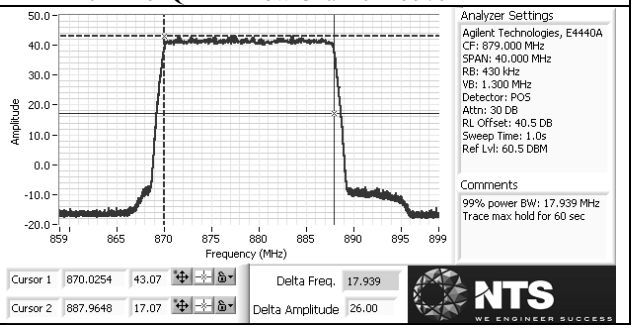
LTE – 20M – 16QAM – Low Channel – 99%



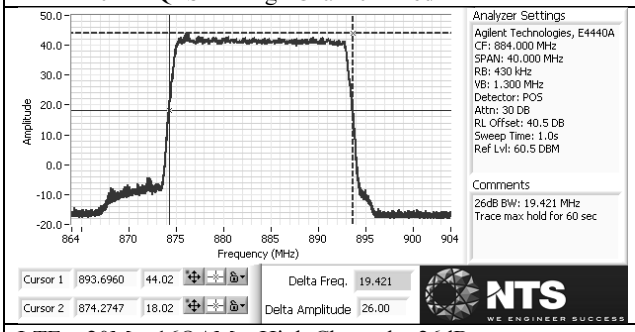
LTE – 20M – 64QAM – Low Channel – 26dB



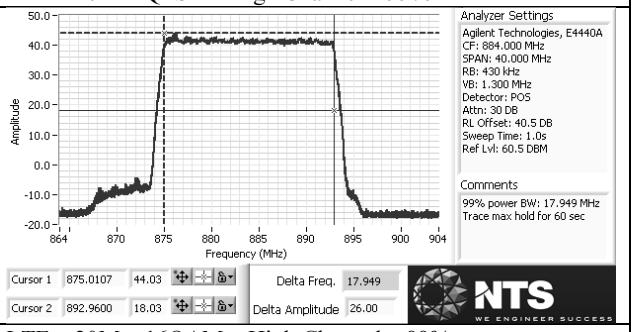
LTE – 20M – 64QAM – Low Channel – 99%



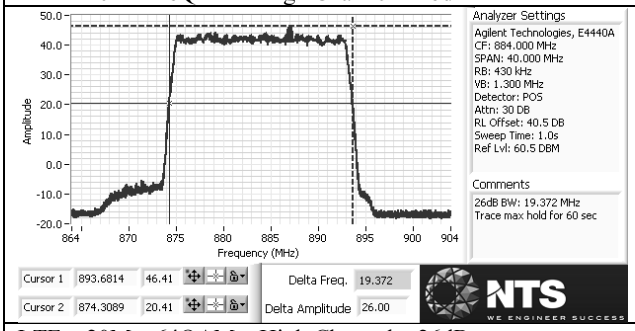
LTE – 20M – QPSK – High Channel – 26dB



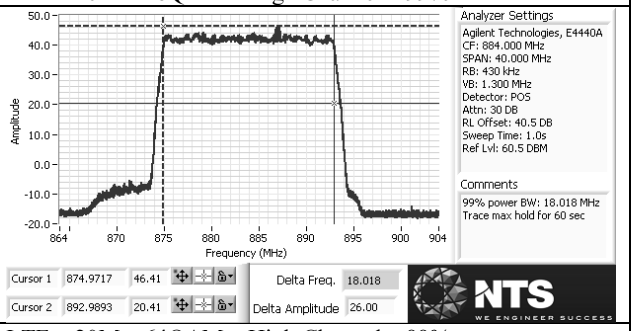
LTE – 20M – QPSK – High Channel – 99%



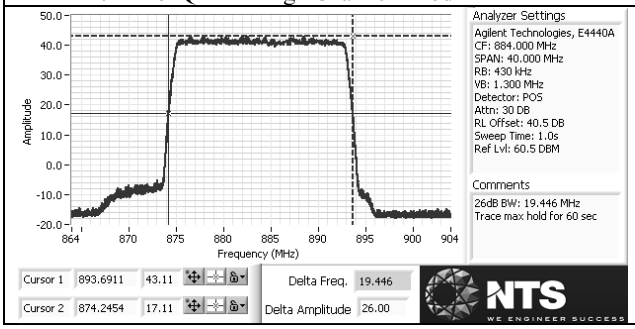
LTE – 20M – 16QAM – High Channel – 26dB



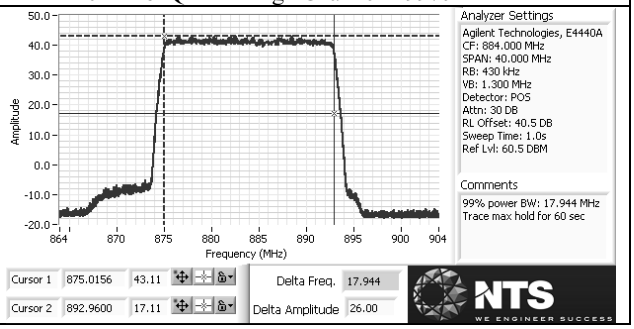
LTE – 20M – 16QAM – High Channel – 99%



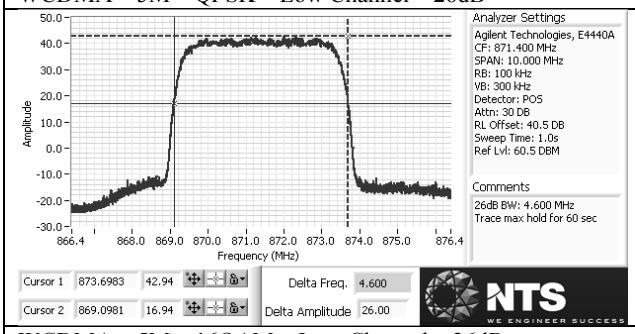
LTE – 20M – 64QAM – High Channel – 26dB



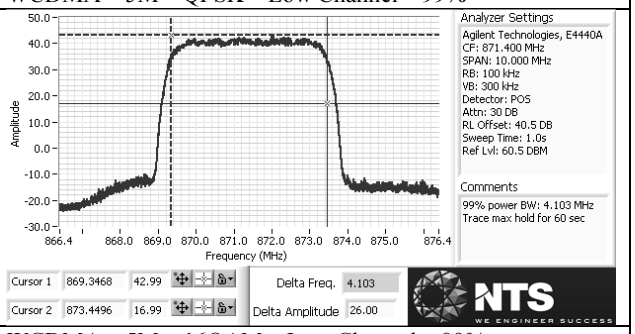
LTE – 20M – 64QAM – High Channel – 99%



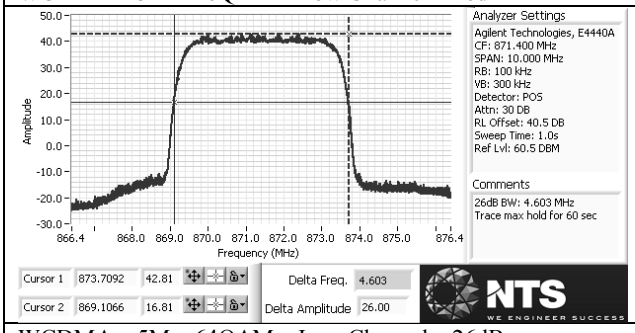
WCDMA – 5M – QPSK – Low Channel – 26dB



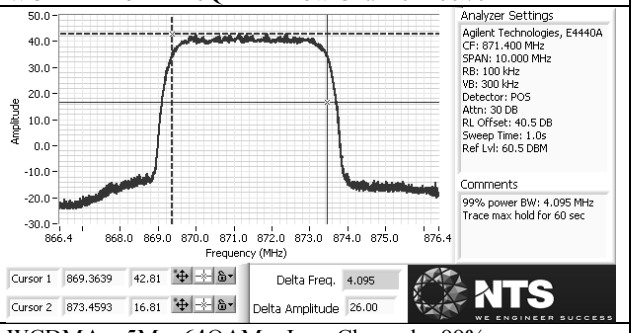
WCDMA – 5M – QPSK – Low Channel – 99%



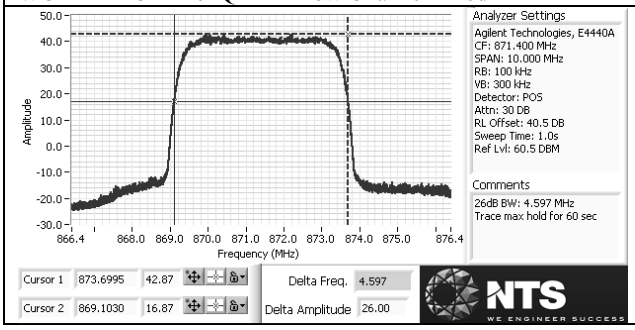
WCDMA – 5M – 16QAM – Low Channel – 26dB



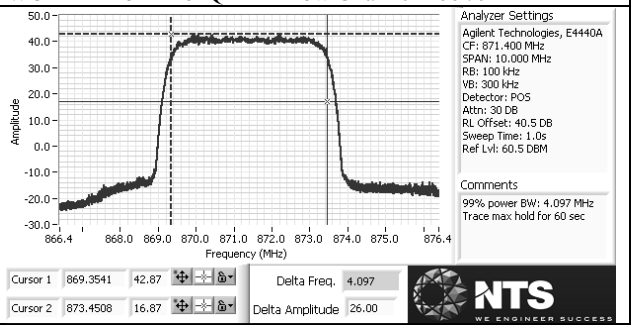
WCDMA – 5M – 16QAM – Low Channel – 99%



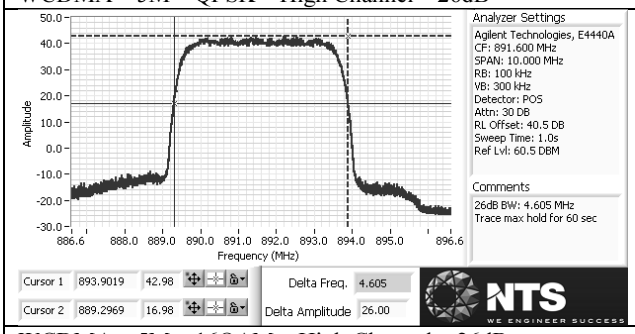
WCDMA – 5M – 64QAM – Low Channel – 26dB



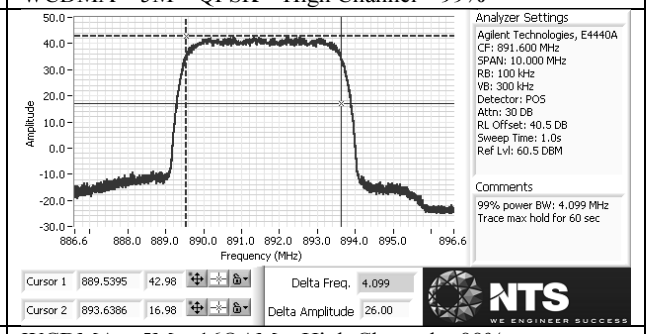
WCDMA – 5M – 64QAM – Low Channel – 99%



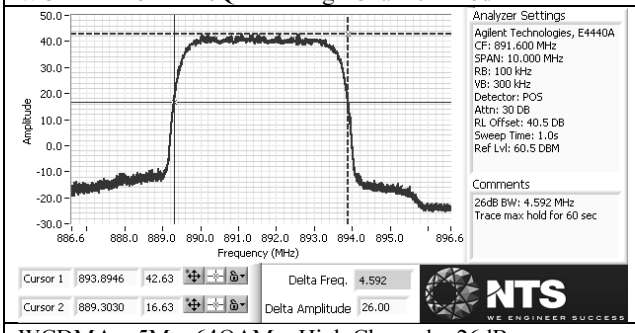
WCDMA – 5M – QPSK – High Channel – 26dB



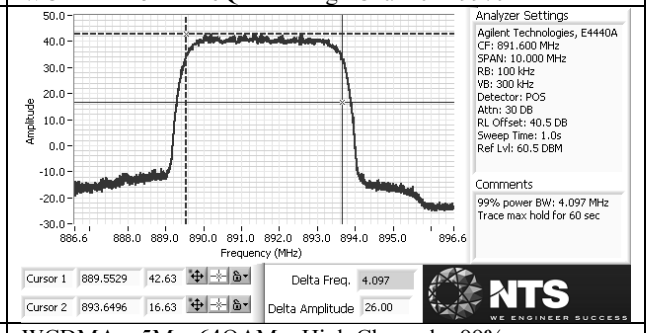
WCDMA – 5M – QPSK – High Channel – 99%



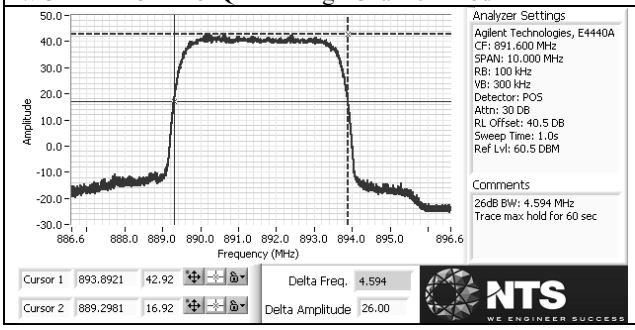
WCDMA – 5M – 16QAM – High Channel – 26dB



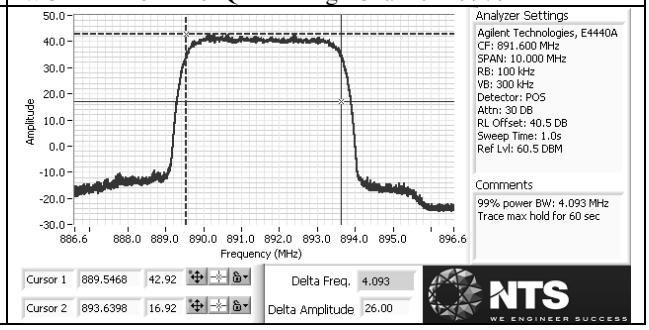
WCDMA – 5M – 16QAM – High Channel – 99%



WCDMA – 5M – 64QAM – High Channel – 26dB



WCDMA – 5M – 64QAM – High Channel – 99%



Antenna Port Conducted Bandedge

Limit is -13dBm and is further reduced by 10*log(2) per FCC KDB 662911D01 v02r01 due to 2x2 MIMO operation, which brings it down to -16.02dBm.

Tests performed at Port 1 on lowest and highest channels for all modulations and channel bandwidth modes.

	LTE - QPSK		LTE - 16QAM		LTE - 64QAM	
	Low	High	Low	High	Low	High
1.4M	-17.95	-18.97	-19.4	-19.37	-20.05	-19.28
3M	-24.97	-24.66	-24.67	-24.76	-24.94	-24.52
5M	-19.09	-19.99	-19.44	-18.99	-20.02	-20.85
10M	-19.79	-22.05	-20.12	-22.24	-20.76	-21.58
15M	-19.19	-21.19	-19.26	-20.54	-19.49	-20.73
20M	-24.2	-25.98	-23.91	-25.85	-24.58	-25.5
1.4M Dual	-21.73	-20.16	-21.2	-21.05	-22.88	-22.32

Note: 1.4M Dual Low = Dual carrier at lowest two channels
1.4M Dual High = Dual carrier at highest two channels

	WCDMA - QPSK		WCDMA - 16QAM		WCDMA - 64QAM	
	Low	High	Low	High	Low	High
5M	-19	-18.13	-19.3	-18.22	-18.35	-18.4
5M Dual	-19.95	-20.48	-20.92	-21.02	-20.83	-20.75

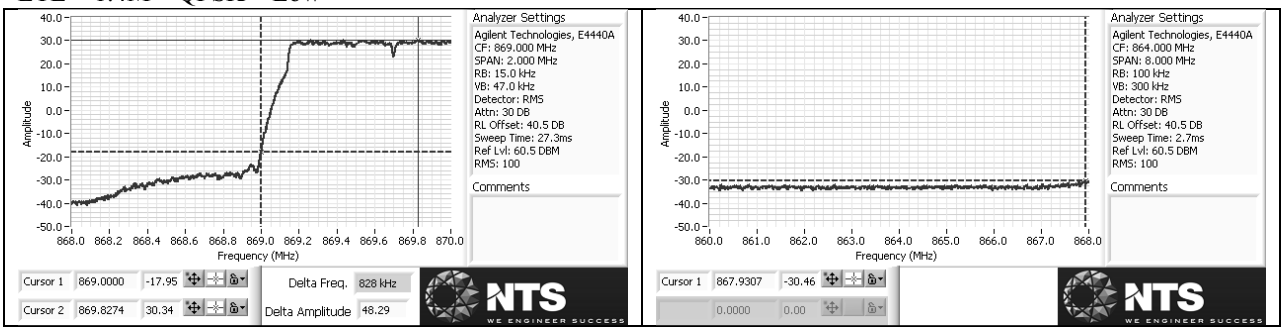
Note: 5M Dual Low = Dual carrier at lowest two channels
5M Dual High = Dual carrier at highest two channels

Measurements were performed in RMS average mode with 100kHz RBW and 300kHz VBW over 100 traces. In 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 1% of the emission bandwidth has been used.

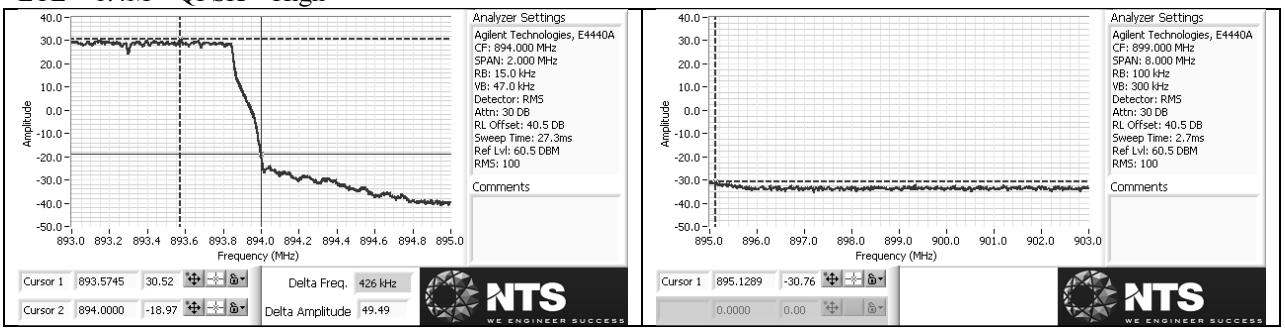
Total path loss of 40.4dB accounted in via reference level offset to the spectrum analyzer.

All corresponding plots are included on the following pages.

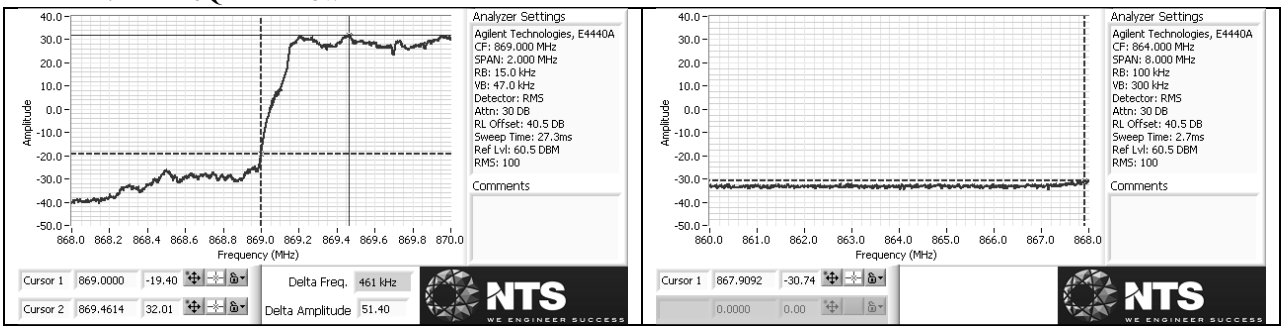
LTE – 1.4M – QPSK – Low



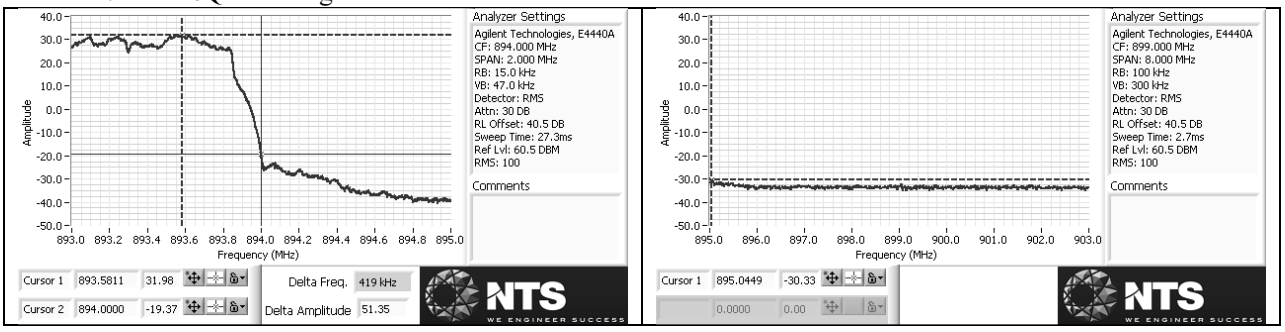
LTE – 1.4M – QPSK – High



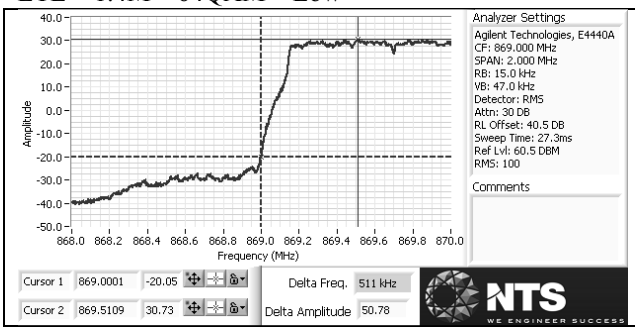
LTE – 1.4M – 16QAM – Low

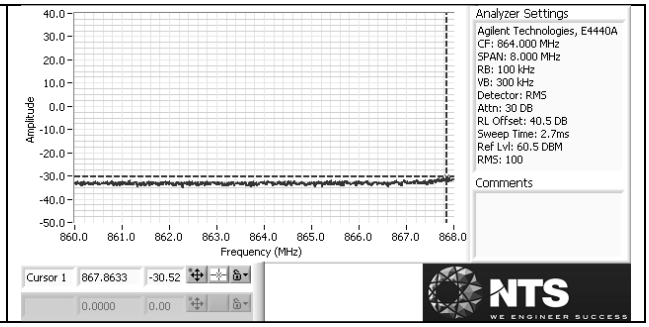


LTE – 1.4M – 16QAM – High

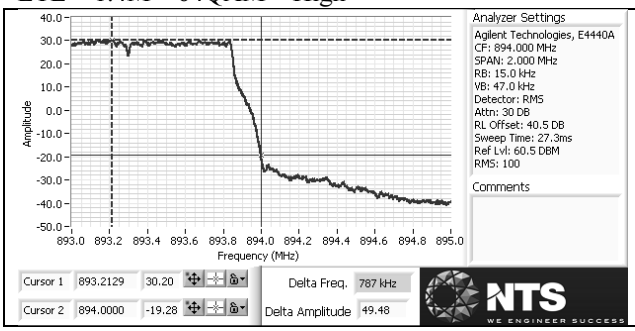


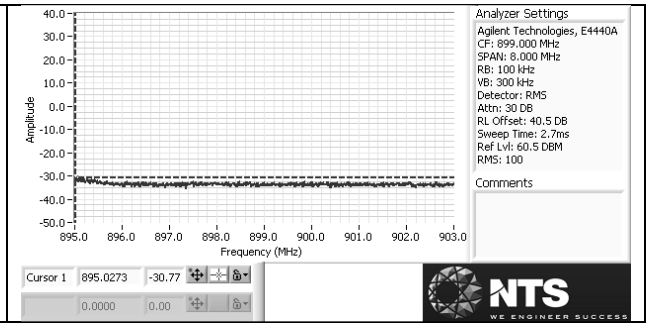
LTE – 1.4M – 64QAM – Low



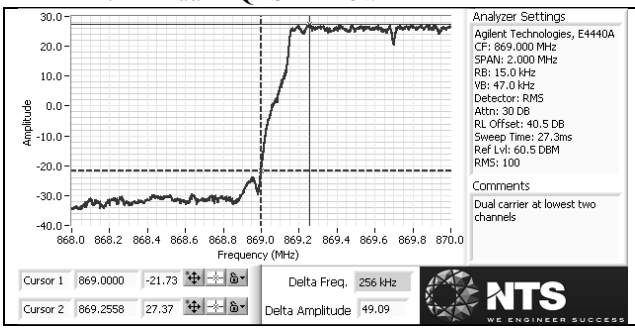


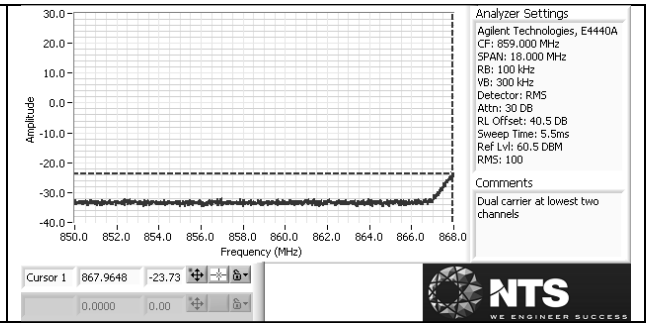
LTE – 1.4M – 64QAM – High



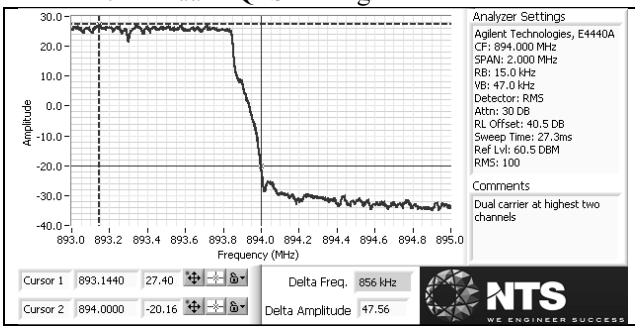


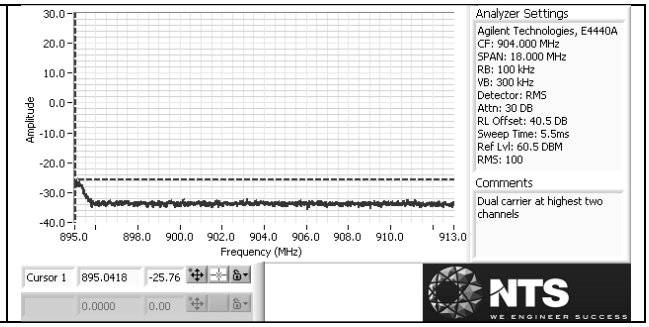
LTE – 1.4M Dual – QPSK – Low



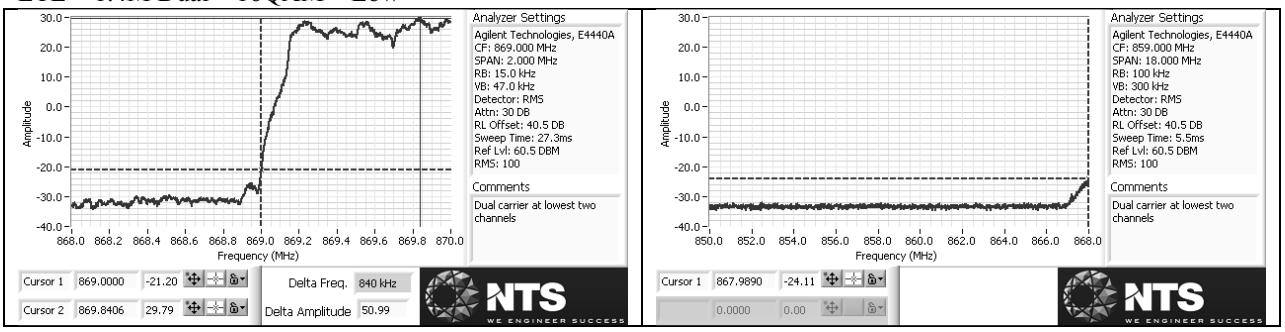


LTE – 1.4M Dual – QPSK – High

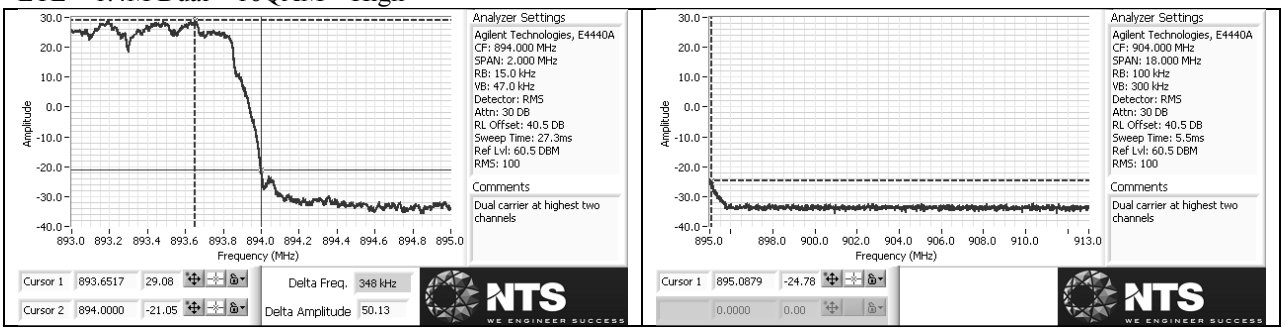




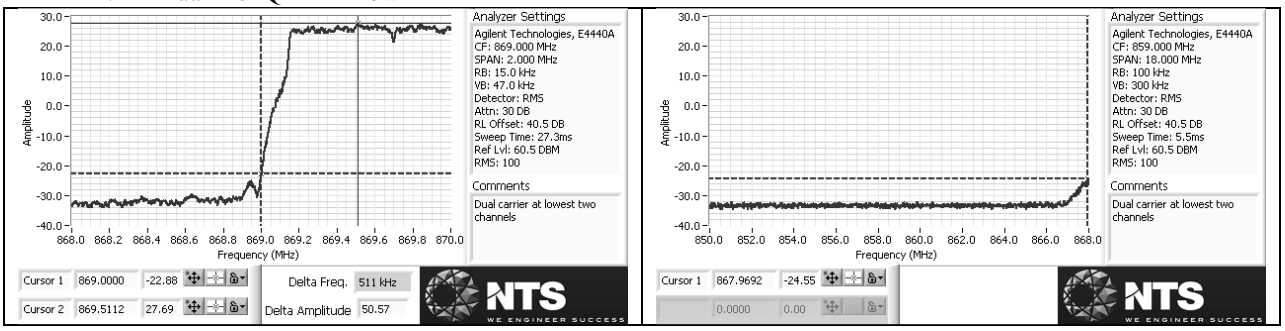
LTE – 1.4M Dual – 16QAM – Low



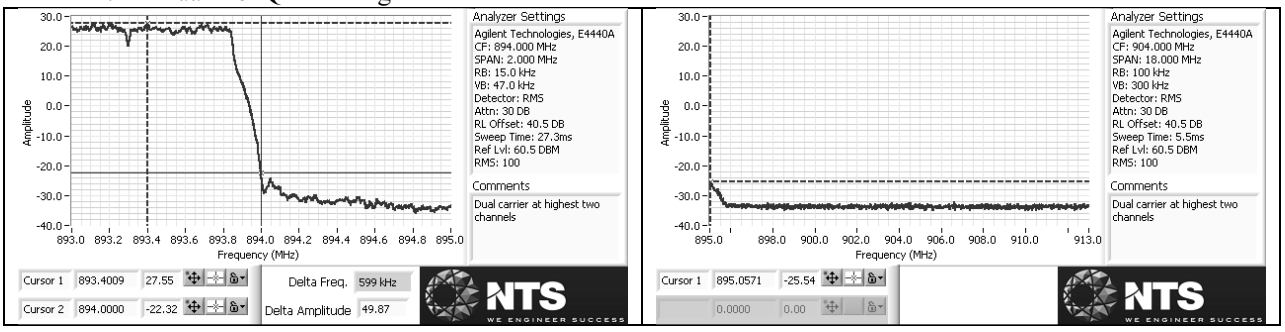
LTE – 1.4M Dual – 16QAM – High



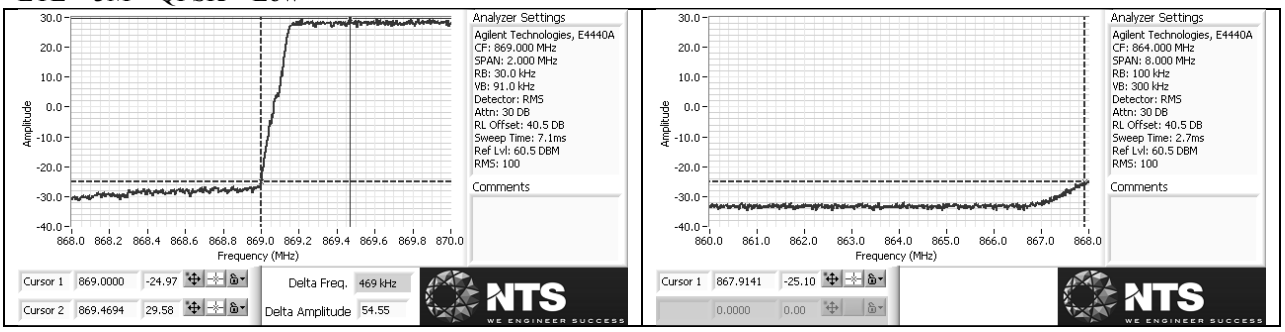
LTE – 1.4M Dual – 64QAM – Low



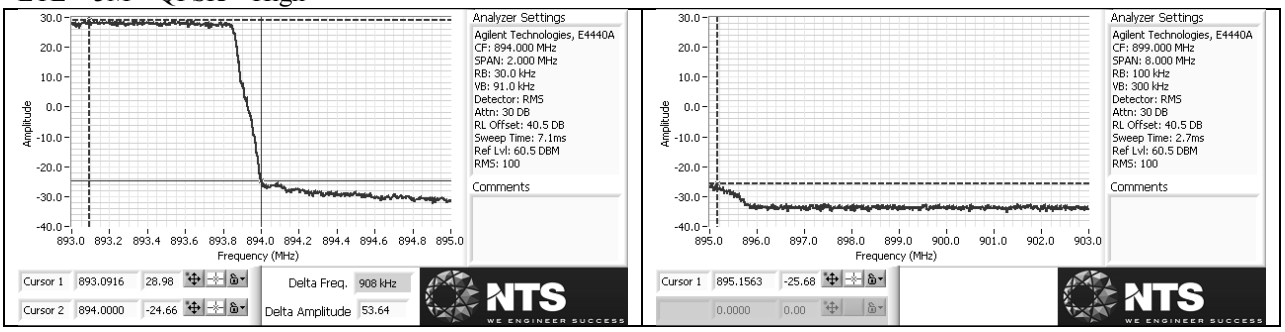
LTE – 1.4M Dual – 64QAM – High



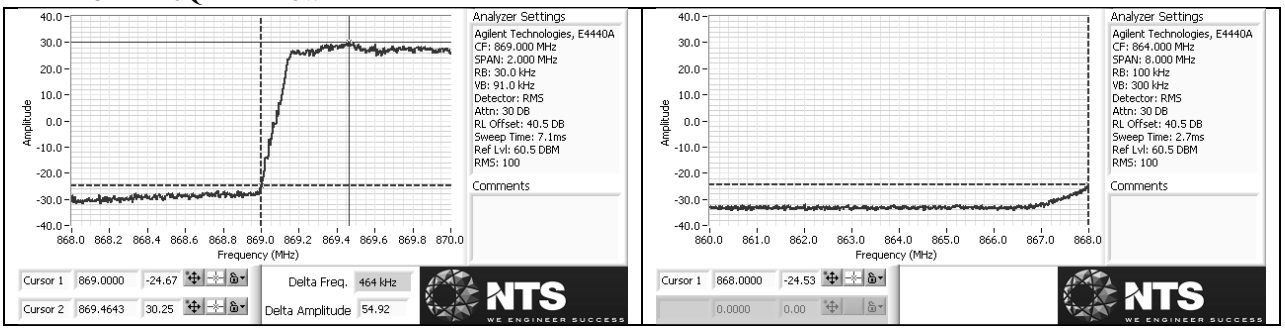
LTE – 3M – QPSK – Low



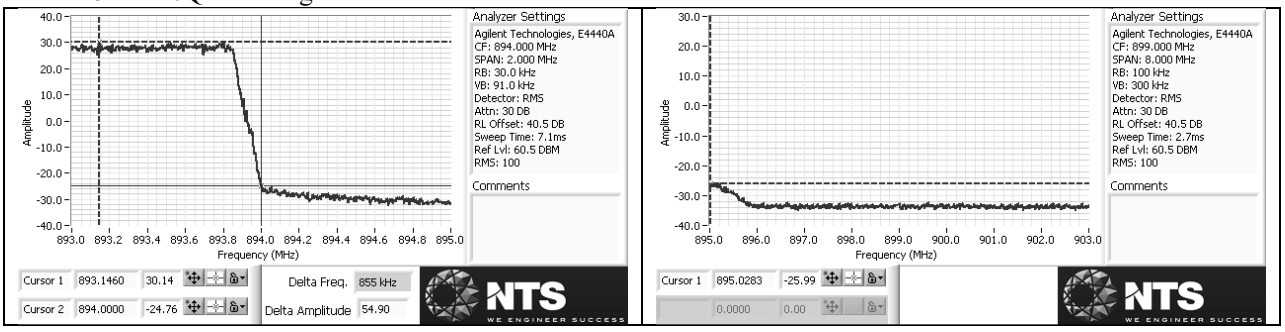
LTE – 3M – QPSK – High



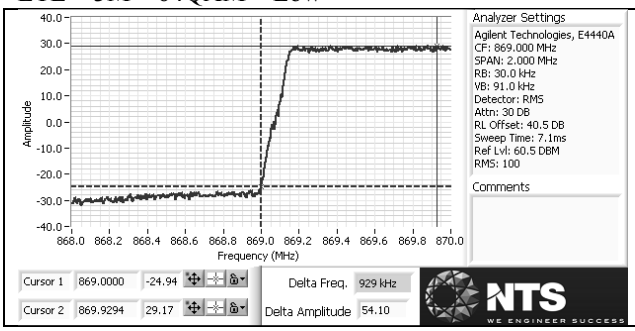
LTE – 3M – 16QAM – Low

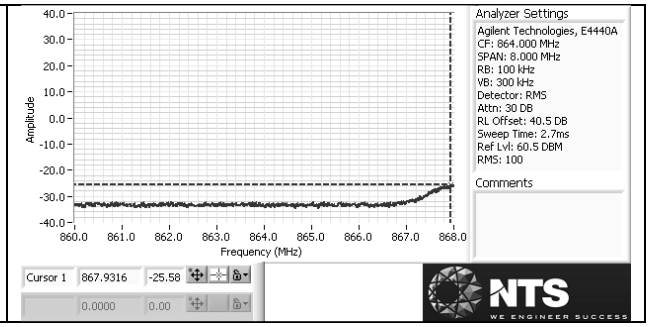


LTE – 3M – 16QAM – High

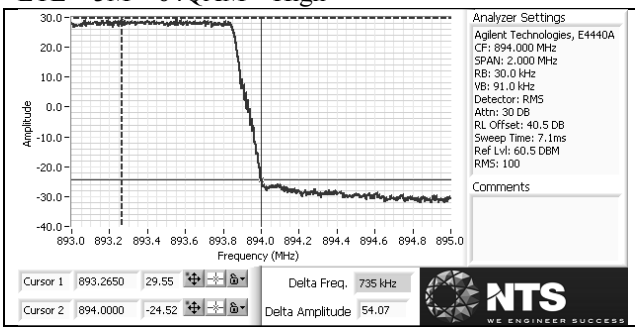


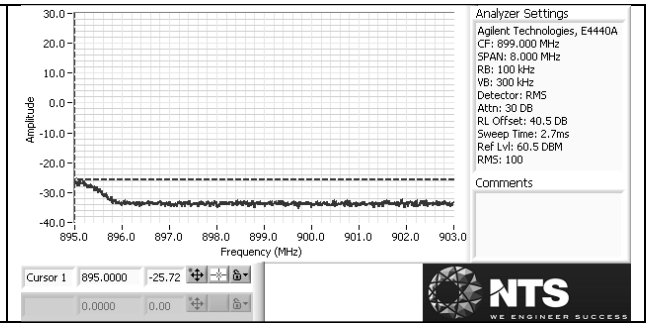
LTE – 3M – 64QAM – Low



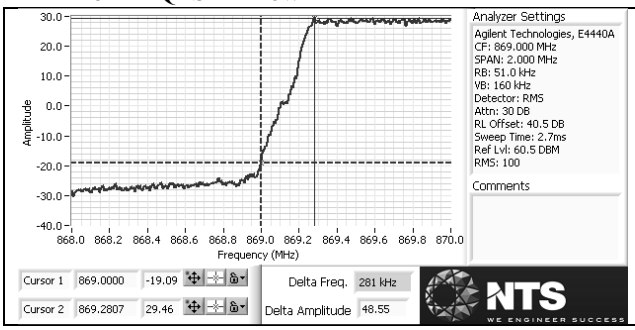


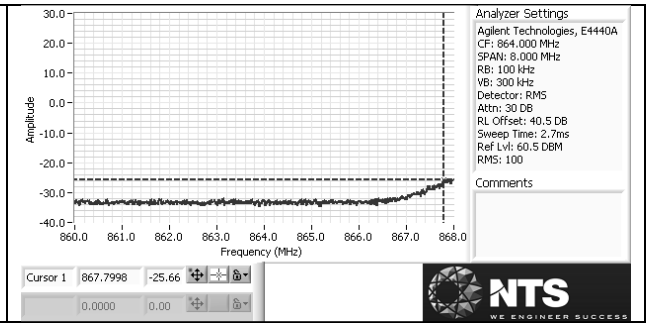
LTE – 3M – 64QAM – High



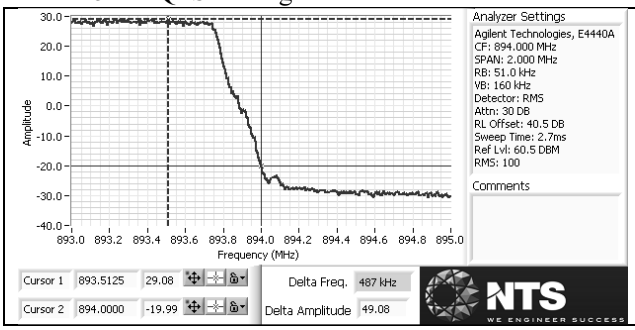


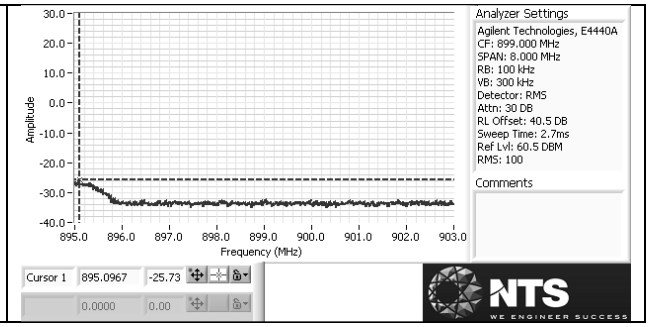
LTE – 5M – QPSK – Low



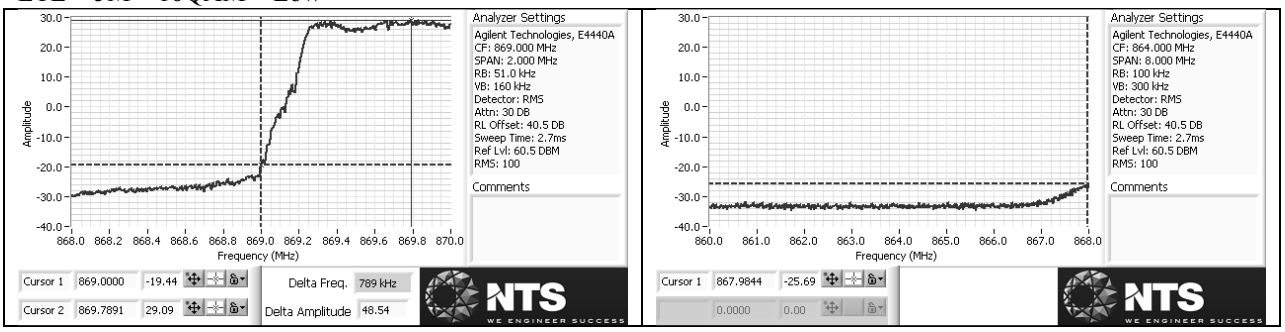


LTE – 5M – QPSK – High

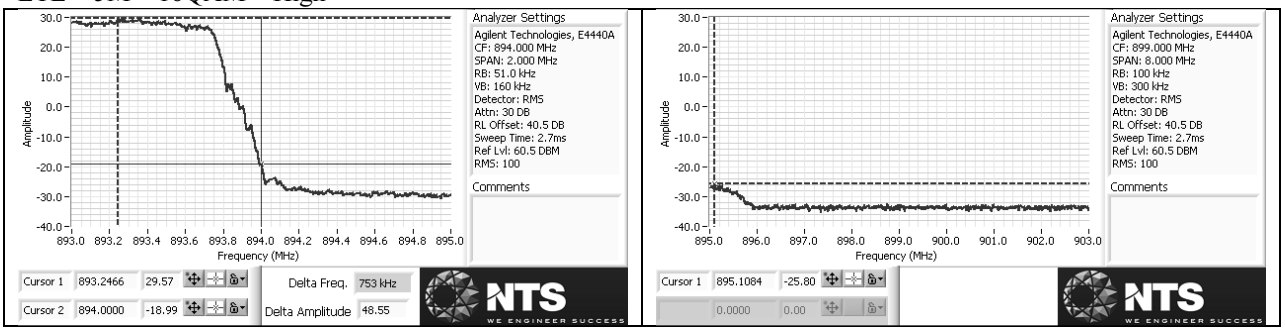




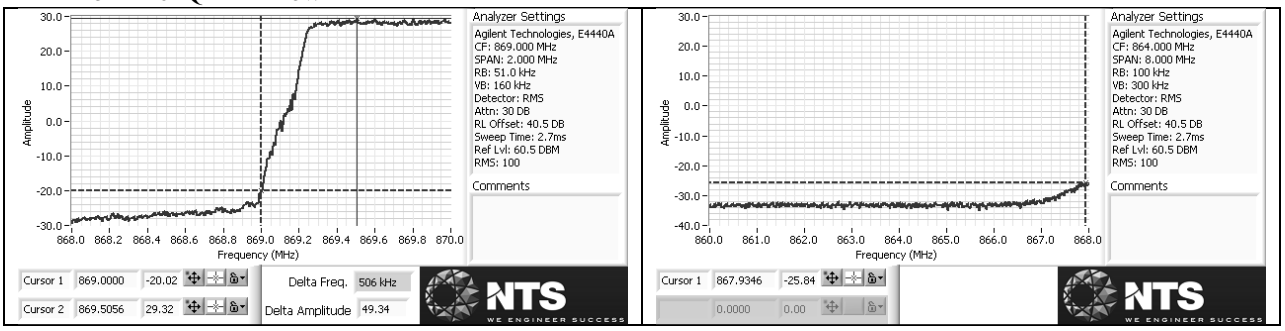
LTE – 5M – 16QAM – Low



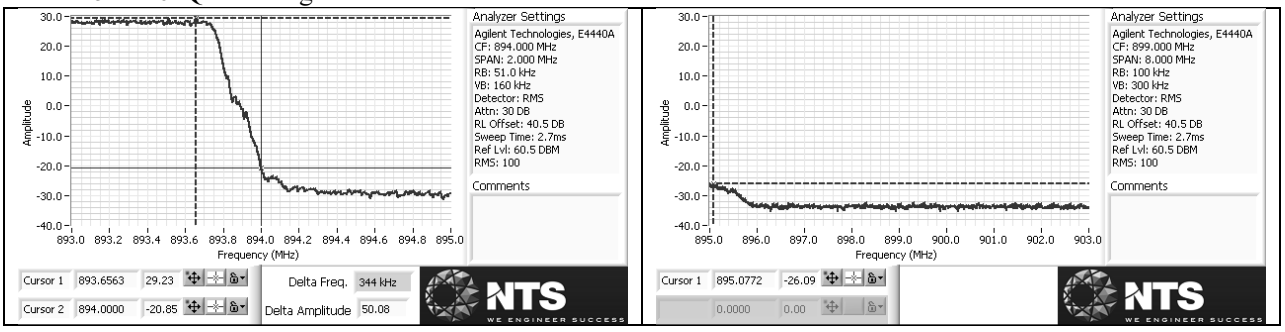
LTE – 5M – 16QAM – High



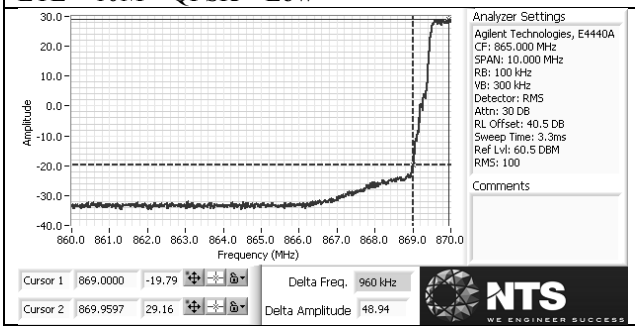
LTE – 5M – 64QAM – Low



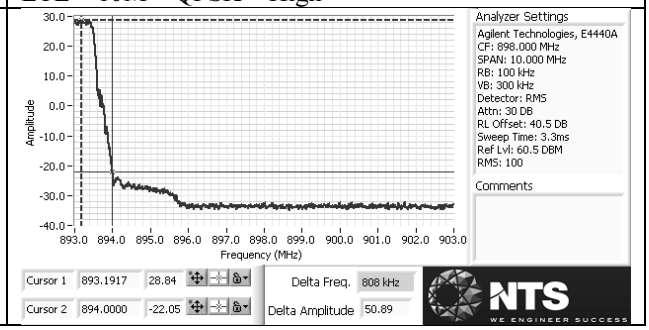
LTE – 5M – 64QAM – High



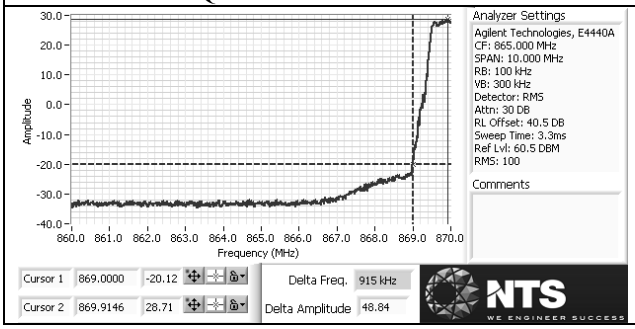
LTE – 10M – QPSK – Low



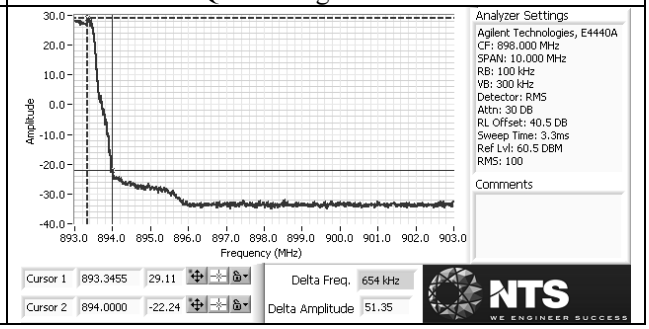
LTE – 10M – QPSK – High



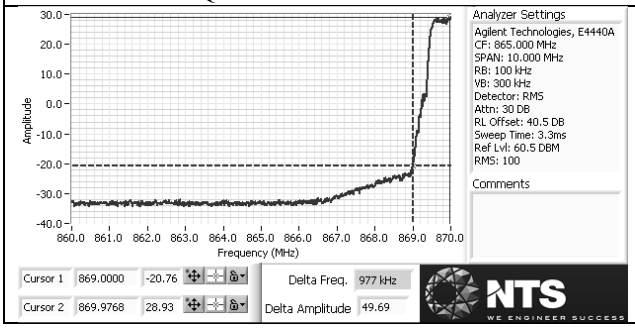
LTE – 10M – 16QAM – Low



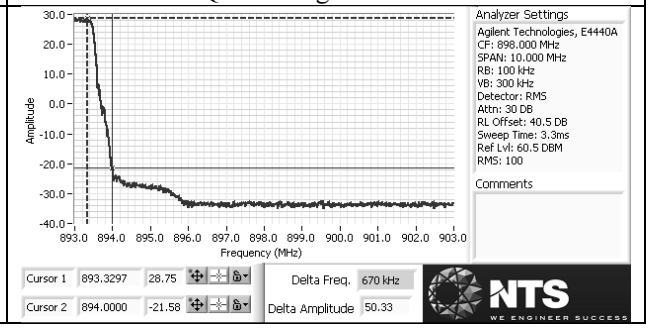
LTE – 10M – 16QAM – High



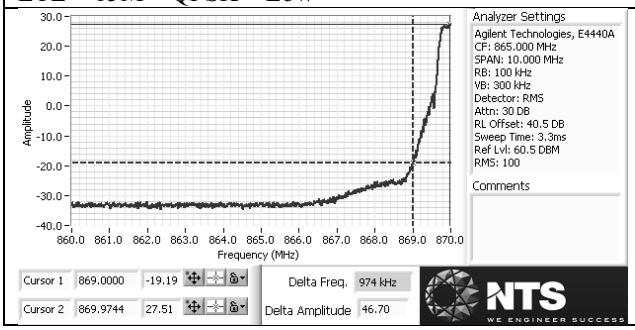
LTE – 10M – 64QAM – Low



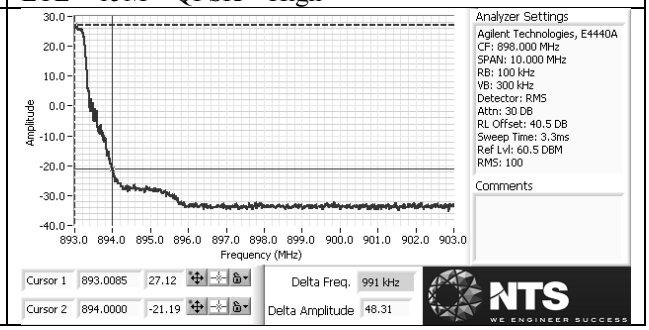
LTE – 10M – 64QAM – High



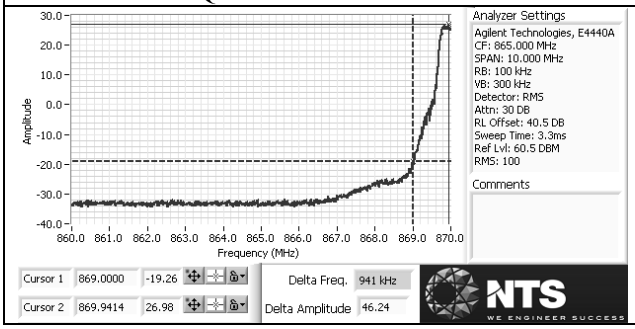
LTE – 15M – QPSK – Low



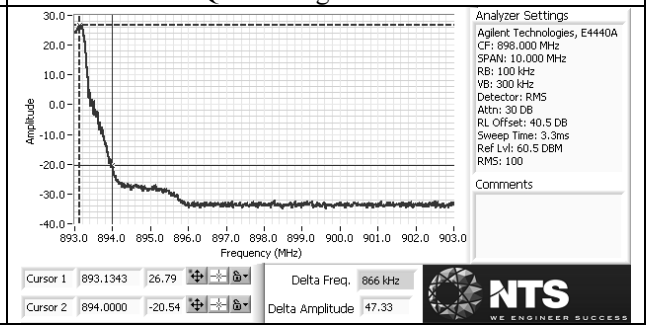
LTE – 15M – QPSK – High



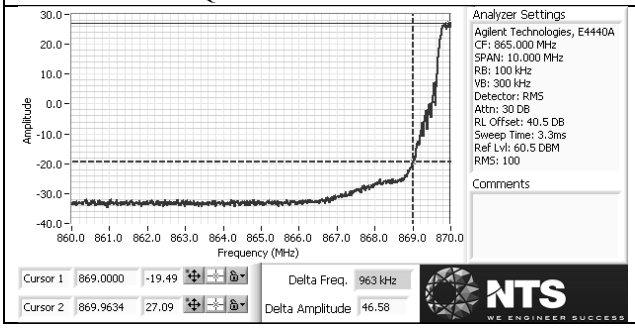
LTE – 15M – 16QAM – Low



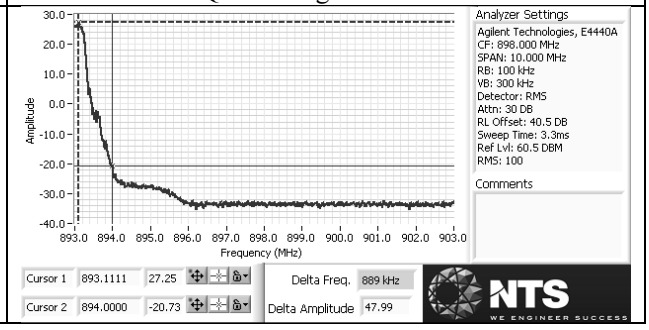
LTE – 15M – 16QAM – High



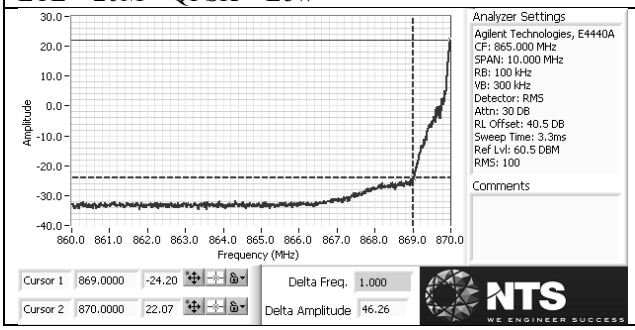
LTE – 15M – 64QAM – Low



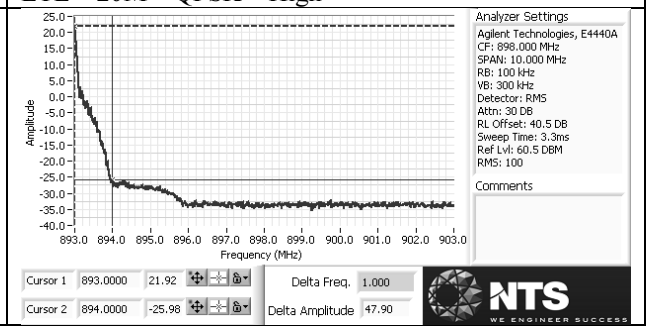
LTE – 15M – 64QAM – High



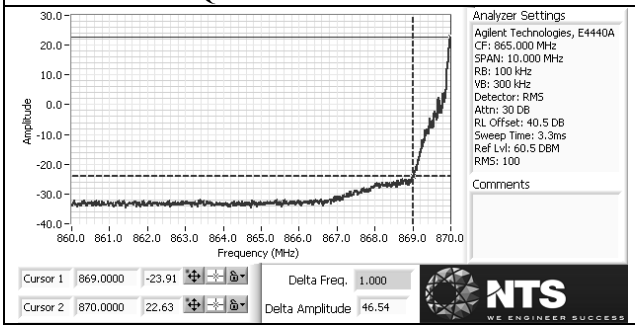
LTE – 20M – QPSK – Low



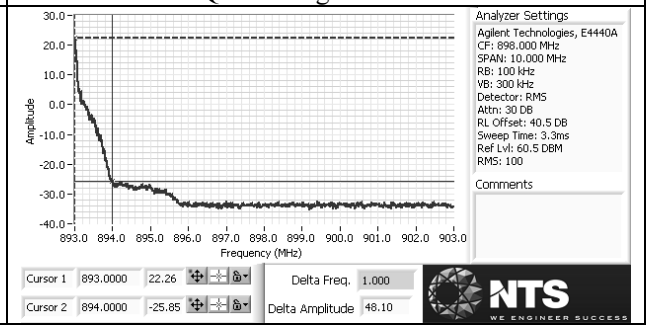
LTE – 20M – QPSK – High



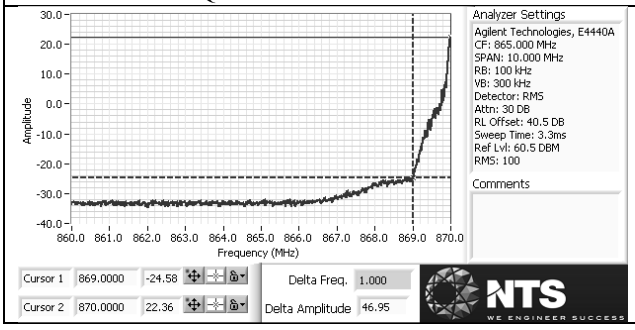
LTE – 20M – 16QAM – Low



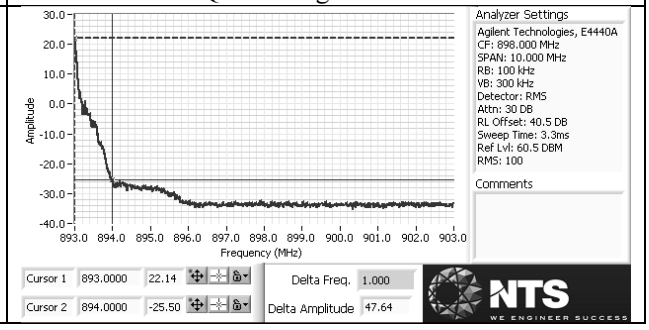
LTE – 20M – 16QAM – High



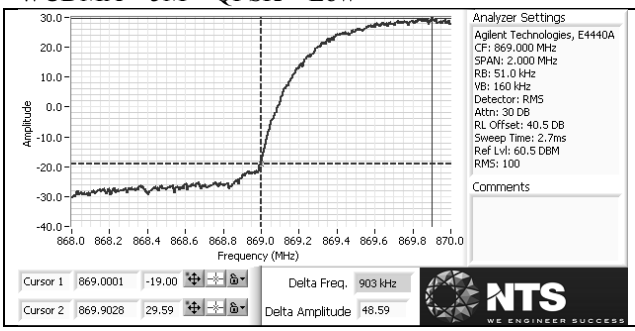
LTE – 20M – 64QAM – Low

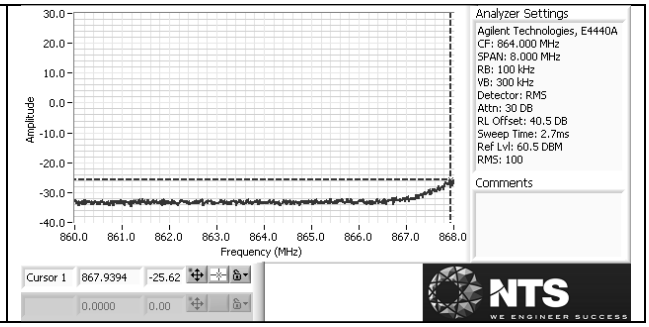


LTE – 20M – 64QAM – High

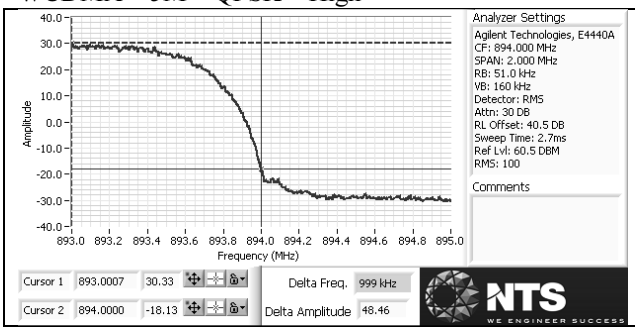


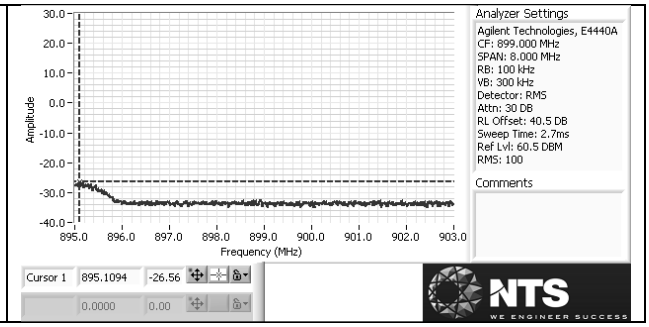
WCDMA – 5M – QPSK – Low



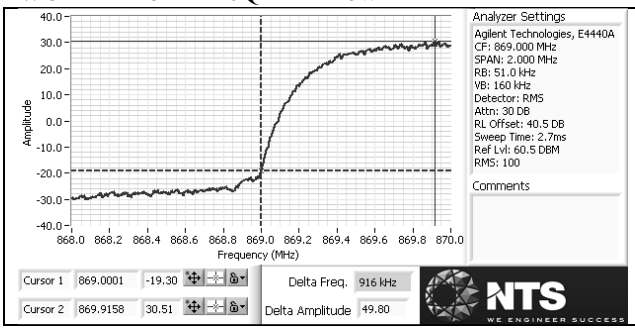


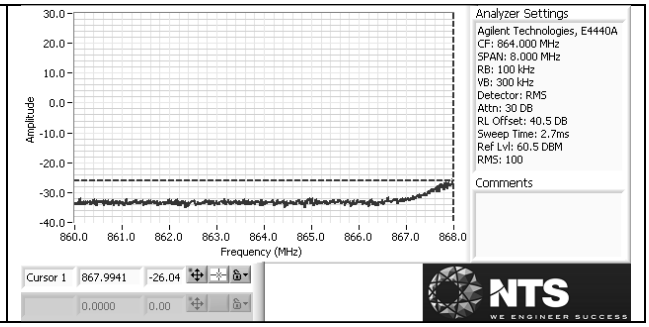
WCDMA – 5M – QPSK – High



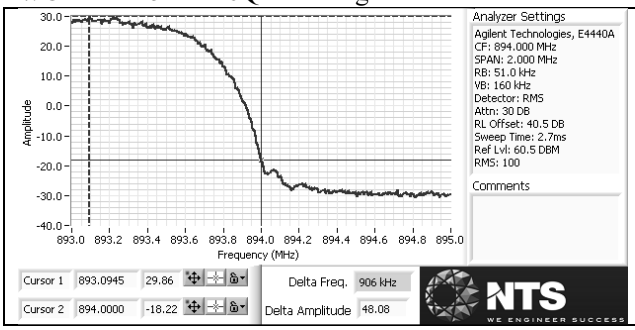


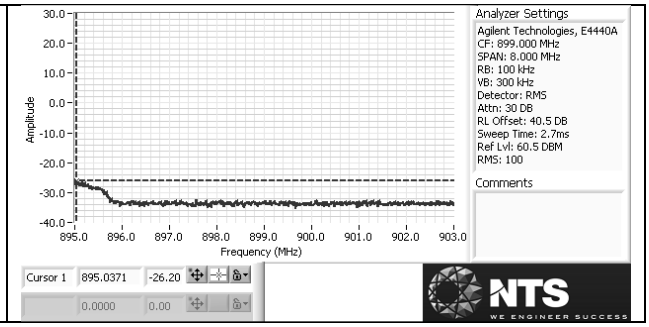
WCDMA – 5M – 16QAM – Low



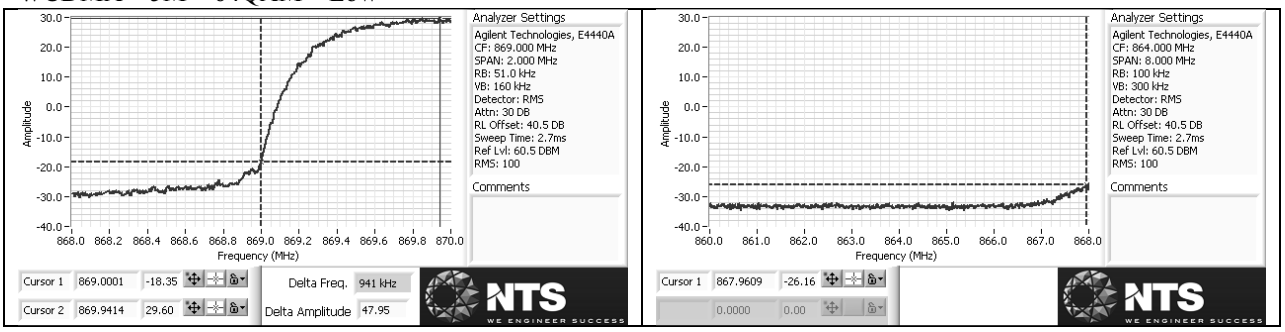


WCDMA – 5M – 16QAM – High

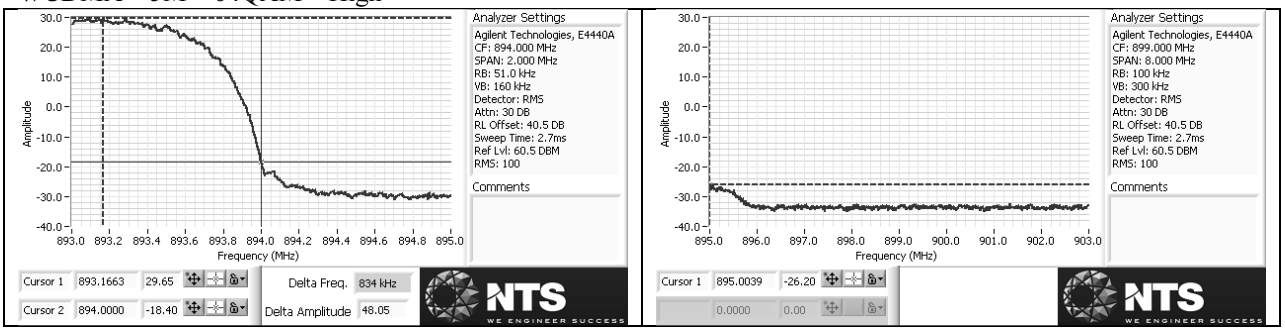




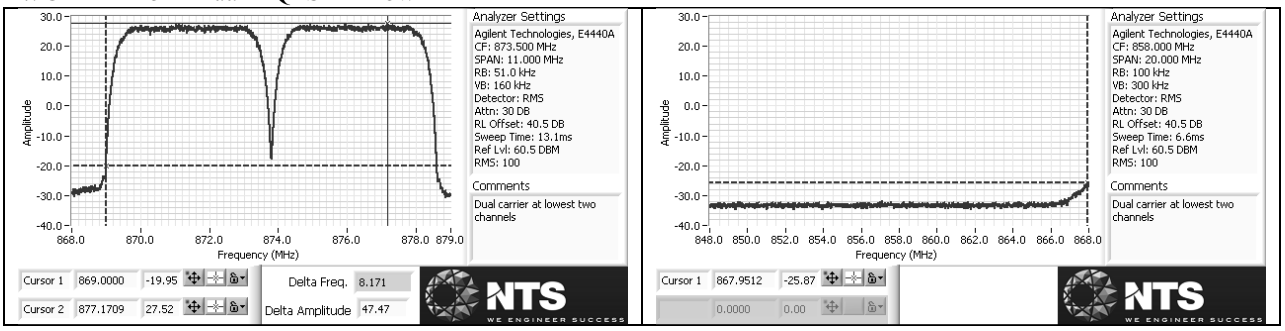
WCDMA – 5M – 64QAM – Low



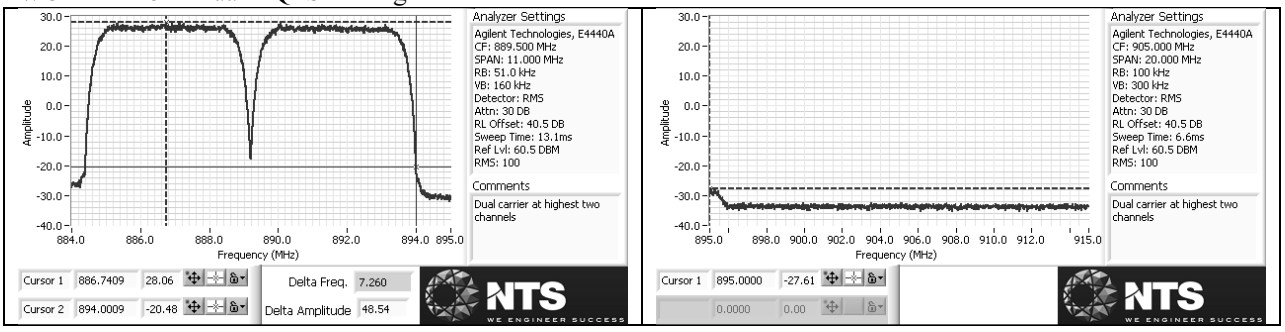
WCDMA – 5M – 64QAM – High



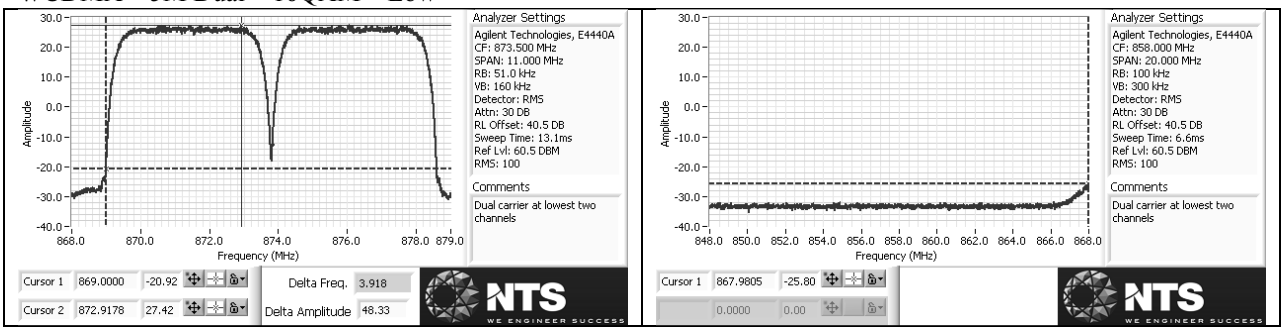
WCDMA – 5M Dual – QPSK – Low



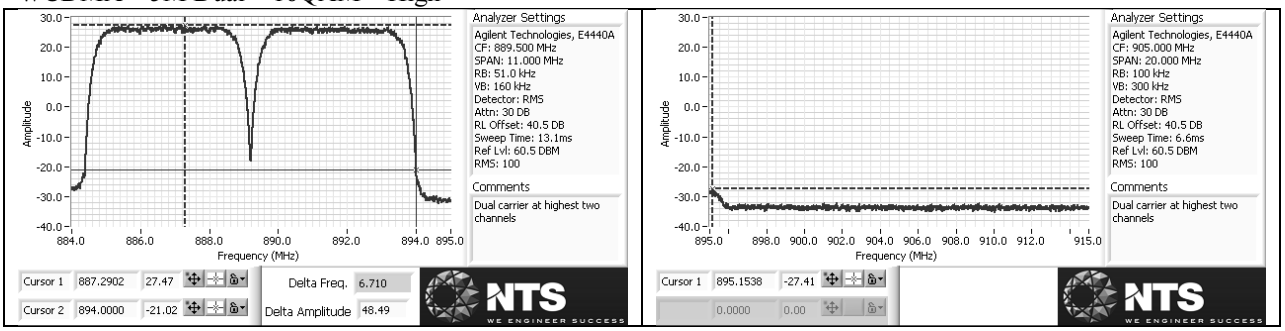
WCDMA – 5M Dual – QPSK – High



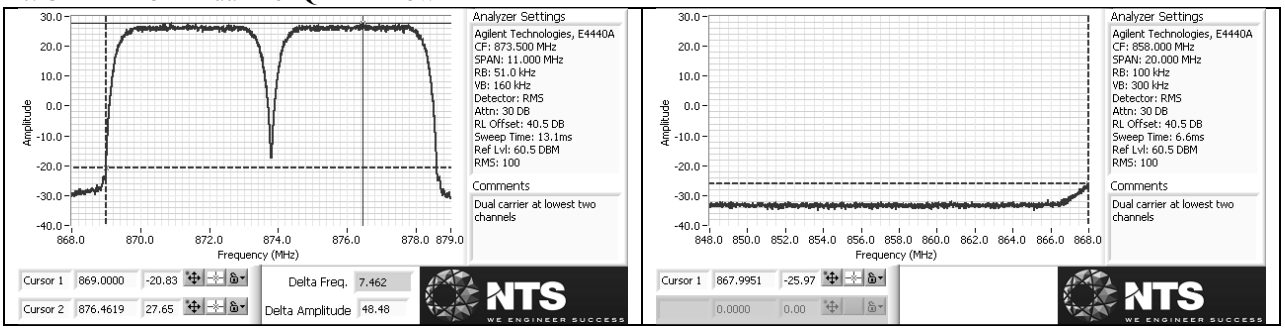
WCDMA – 5M Dual – 16QAM – Low



WCDMA – 5M Dual – 16QAM – High



WCDMA – 5M Dual – 64QAM – Low



WCDMA – 5M Dual – 64QAM – High