Radio Test Report

Application for Grant of Equipment Authorization

FCC Part 27 Subpart C
IC RSS-199 Issue 2
2496MHz – 2690MHz

FCC ID:	**2AD8UFZMFWHT01**
IC:	**109D-FZMFWHT01**
Model:	**FWHT**
Product Marketing Name:	**FlexiZone Micro BTS**
APPLICANT:	**Nokia Solutions and Networks 1455 W. Shure Dr. Arlington Heights, IL 60004**
TEST SITE(S):	**National Technical Systems - Plano 1701 E Plano Pkwy #150 Plano, TX 75074**
REPORT DATE:	**Sep 29, 2015**
FINAL TEST DATES:	**Sep 14 – Sep 22, 2015**
TOTAL NUMBER OF PAGES:	**73**

Prepared By:

Armando Del Angel
EMI Supervisor

Approved By:

Kimberly Zavala
Quality Assurance Manager

Reviewed By:

John Ngo
General Manager

REVISION HISTORY

Rev#	Date	Comments	Modified By
0	Sep 29, 2015	(DRAFT) 1st release	Armando Del Angel
1	Oct 2, 2015	Changes due to Customer Comments	Armando Del Angel
2	Oct 14, 2015	Changes Due to TCB comments	Armando del Angel

TABLE OF CONTENTS

SCOPE

Tests have been performed on Nokia Solutions and Networks product FlexiZone Micro BTS Model FWHT, 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.

- Code of Federal Regulations (CFR) Title 47 Part 2
- CFR Title 47 Part 27 Subpart C
- RSS-Gen Issue 4 November 2014
- RSS-199 Issue 2 October 2014

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 FlexiZone Micro BTS Model FWHT and therefore apply only to the tested sample. The sample was selected and prepared by Terrence Schwenk 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.

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 FWHT. No additional models were described or supplied for testing.

STATEMENT OF COMPLIANCE

The tested sample of Nokia Solutions and Networks product FlexiZone Micro BTS Model FWHT 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 27 Subpart C and RSS-199 Issue 2 (Base Stations Operating in 2496MHz-2690MHz band)

FCC	IC	Description	Measured	Limit	Result
Transmitter Modulation, output power and other characteristics					
§27.5(a)	N/A	Frequency range(s)	2498.5MHz - 2687.5MHz (5M LTE) 2501.0MHz – 2685.0MHz (10M LTE) 2503.5MHz – 2682.5MHz (15MHz LTE) 2506.0MHz – 2680.0MHz (20MHz)	2496.0MHz – 2690.0MHz	Pass
§2.1033(c)(4)	RSS-199 Section 4.1	Modulation Type	QPSK, 16QAM, 64QAM (5M, 10M, 15M, and 20M for each)	Digital	Pass
§27.50(a)	RSS-199 Section 4.4	Output Power	Conducted Output Power (Highest on Port 2) RMS: 38.69Bm EIRP will depend on antenna gain (unknown)	2000W EIRP	Pass
§27.50(a)	N/A	Peak to Average Ratio	10.5dB highest	13dB	Pass
§2.1049	RSS-199 Section 4.2	Emission Bandwidth (99%)	4.507MHz (5M LTE) 9.006MHz (10M LTE) 13.491MHz (15M LTE) 17.983MHz (20MHz LTE)	Remain in Block	Pass
N/A Informational	N/A Informational	Emission Bandwidth (26dB)	4.966MHz (5M LTE) 9.965MHz (10M LTE) 14.944MHz (15M LTE) 19.89MHz (20M LTE)	Remain in Block	Pass
Transmitter spurious emissions[1]					
§27.53(a)	RSS-199 Section 4.6	At the antenna terminals	< -16.03dBm	-16.03 dBm (per TX chain)	Pass
		Field strength	40.0dBuV/m at 3m Eq. to -55.2dBm EIRP	-13 dBm EIRP	Pass
Other details					
§27.54	RSS-199 Section 4.3	Frequency stability	Low = -20.98dBm High = -20.6dBm	Remain in Block (-16.03dBm)	Pass
§1.1310	RSS-102 Issue 5	RF Exposure	N/A		Pass[2]

Notes

Note 1 – Based on 1MHz 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
5M	4M93F9W	4M51F9W	4M95F9W	4M49F9W	4M97F9W	4M50F9W
10M	9M94F9W	8M98F9W	9M97F9W	9M01F9W	9M96F9W	8M98F9W
15M	14M87F9W	13M48F9W	14M82F9W	13M49F9W	14M94F9W	13M46F9W
20M	19M74F9W	17M98F9W	19M73F9W	17M98F9W	19M89F9W	17M98F9W

Note: FCC based on 26dB emission 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 FlexiZone Micro Base Transceiver Station (BTS), model FWHT which operates over 3GPP frequency band 41 (BTS Tx/RX: 2496 to 2690 MHz). The FWHT has two co-located transmitters with each transmit port supporting 5 watts maximum rated RF output power. The FWHT can be operated as MIMO or as non-MIMO. Multi-carrier operation is supported.

The FWHT supports three downlink modulation types for LTE (QPSK, 16QAM and 64QAM). The FWHT supports four LTE channel bandwidths (5 MHz, 10 MHz, 15 MHz, and 20 MHz).

The FWHT has external interfaces including AC power, ground, TX/RX (Ant), Ethernet "B", Ethernet "C", USB port, GPS and Bluetooth. The FWHT with applicable installation kit may be pole or wall mounted. Bluetooth interface has modular FCC and IC approval.

The FWHT LTE channel numbers and frequencies are as follows:

	Downlink EARFCN	Downlink Frequency (MHz)	LTE Channel Bandwidth			
			5 MHz	10 MHz	15 MHz	20 MHz
Band 41 (Ant 1 & 2)	39650	2496.0	Bandedge	Bandedge	Bandedge	Bandedge
	39675	2498.5	Low Ch.			
	39700	2501.0		Low Ch.		
	39725	2503.5			Low Ch.	
	39750	2506.0				Low Ch.
	40640	2595.0	Middle Ch.	Middle Ch.	Middle Ch.	Middle Ch.
	41490	2680.0				Top Ch.
	41515	2682.5			Top Ch.	
	41540	2685.0		Top Ch.		
	41565	2687.5	Top Ch.			
	41589	2690.0	Bandedge	Bandedge	Bandedge	Bandedge

FWHT Downlink LTE Frequency Channels

The samples were received on Sep 14, 2015 and tested on Sep 14 - Sep 22, 2015. The only difference between both serial numbers is the power supply used. Preliminary Pre-Scans were performed in order to determine the worst-case unit. All the results in this report were obtained from the worst case unit S/N: RY153106337. The EUT consisted of the following component(s):

Company	Model	Description	Part/Serial Number	FCC ID/IC Number
Nokia Solutions and Networks	FWHT	FlexiZone Micro BS	Part#: 473531 Serial#: RY153106337	FCC ID: 2AD8UFZMFWHT01 IC: 109D-FZMFWHT01
Nokia Solutions and Networks	FWHT	FlexiZone Micro BTS	Part#: 473531 Serial#: RY153106336	FCC ID: 2AD8UFZMFWHT01 IC: 109D-FZMFWHT01

ENCLOSURE

The EUT enclosure is made of heavy duty aluminum and measures approximately 12(W) x 4(D) x 12(H) inches.

AUXILLARY EQUIPMENT

Company	Model	Description	Part/Serial Number	FCC ID/IC Number
N/A	N/A	N/A	N/A	N/A

SUPPORT EQUIPMENT

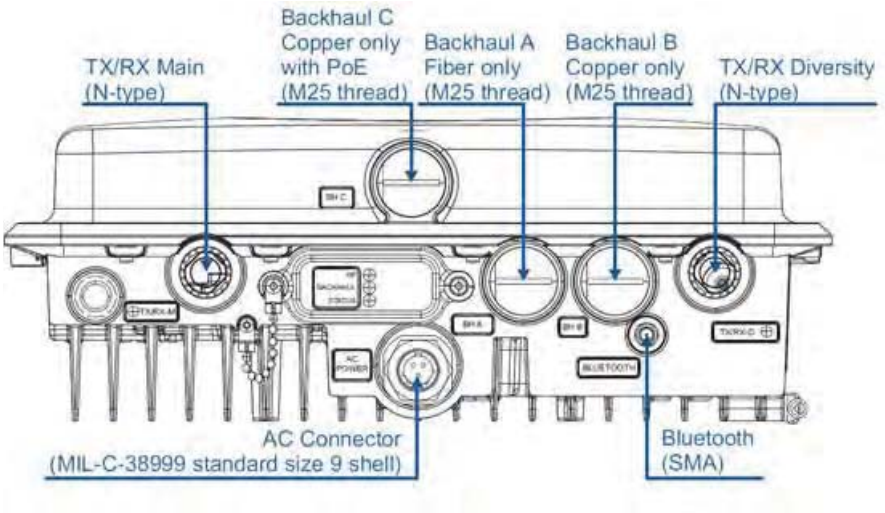
Company	Model	Description	Part/Serial Number	FCC ID/IC Number
Nokia Solutions and Networks	086479A. X31	Nokia Argon HDMI	RY134602016	N/A
HP	Elite Book 8530w	Laptop PC	2CE918Bk1Q	N/A

EUT INTERFACE PORTS

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

Cable	Type	Shield	Length	Used in Test	Quantity	Termination
AC Power	Power	No	~ 3 m	Yes	1	Power Supply
Earth	Earth	No	~ 1 m	Yes	1	Lab earth ground
TX/RD D	RF	Yes	~ 1 m	Yes	1	50Ω Load
TX/RD M	RF	Yes	~ 1 m	Yes	1	50Ω Load
BH B	Signal	Yes	> 6 m	Yes	1	Laptop
BH C	Signal	Yes	> 6 m	Yes	1	Laptop

The connector layout for FWHT is provided below:



FWHT External Interfaces:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	AC	Y	Y	None
2	Ethernet "B"	TP	Y	Y	BHB – Always connected
3	Ethernet "C"	TP	Y	Y	BHC – This is a technician service port and may also be used in normal operation.
4	USB	I/O	Y	Y	This is a technician service port only. Hooked up for monitoring data traffic only.

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

EUT OPERATION

During testing, the EUT was transmitting continuously with 70% duty-cycle at full power on all chains.

EUT FIRMWARE/SOFTWARE

The laptop PC connects to the EUT over the Ethernet port. The laptop is used for changing configuration settings, monitoring tests and controlling the FWHT. The following software versions are used for the FWHT testing:

(1) LabVIEW Software: Version 2012

(2) EUT Firmware: FB_PS_REL_2014_05_374

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.

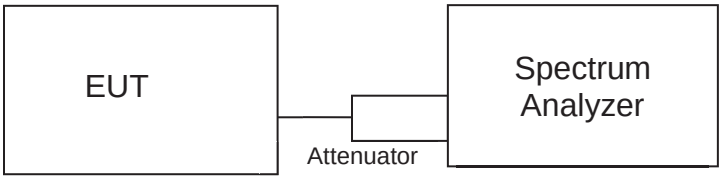
Radiated spurious emissions measurements were taken at the NTS Plano Anechoic Chamber listed below. The sites conform to the requirements of ANSI C63.4-2009 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range 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 one was terminated with termination blocks. 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. A 20dB attenuator was used in place of the 40dB attenuator to measure emissions in the 5-27GHz ranges to reduce measurement instrumentation noise floor.

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-27GHz 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 spectrum analyzer as detailed in the test equipment section has been used to measure the Low and High channels, making sure they remain inside the allocated frequency band.

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 27GHz with a peak detector (RBW=1MHz, VBW=3MHz, 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 1-18GHz range and a smaller horn antenna was used for 18-27GHz 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
E1529P	PSA	Agilent	E4446A	12 Months	3/3/2016
E1260P	PreAmp (1GHz-18GHz)	MITEQ	AFS44-01001800-45-10P-44	12 Months	6/4/2016
E1366P	PreAmp (30MHz-1GHz)	MITEQ	AM-1431-N-1197SC	12 Months	12/12/2015
E1009P	PreAmp (18-27GHz)	HP	8449B	12 Months	1/16/2016
E1289P	Biconilog Antenna (30MHz-1GHz)	ETS Lindgren	3142C	12 Months	3/19/2016
E1149P	Horn Antenna (1GHz-18GHz)	EMCO	3115	12 Months	12/10/2015
E1068P	Horn Antenna (18GHz-40GHz)	EMCO	3116	12 Months	6/5/2016
E1447P	RMS Multimeter	Fluke	87V	12 Months	5/27/2016
ENV1035P	Thermometer	Fluke	52 II	12 Months	4/9/2016
ENV1195P	Climatic Chamber	Thermotron	SE-300-2-2	N/A	NCR

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 the center channel for all modulations and bandwidth modes. Peak to average ratio (PAR) has been calculated as described in Section 5.7.2 of KDB971168 D01 v02r02 and all results are presented in tabular form below.

		LTE - QPSK			LTE - 16QAM			LTE - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
Port 1 Center Channel	5M	46.9	38.18	8.72	46.69	36.19	10.5	46.14	38.2	7.94
	10M	47.09	38.15	8.94	47.06	38.36	8.7	46.21	38.29	7.92
	15M	46.95	38.35	8.6	46.98	37.97	9.01	46.24	38.18	8.06
	20M	47.04	38.2	8.84	47.02	38.26	8.76	46.35	38.11	8.24
Port 2 Center Channel	5M	47.08	38.15	8.93	46.8	38.27	8.53	46.18	38.31	7.87
	10M	47.14	38.37	8.77	47.12	38.48	8.64	46.39	38.34	8.05
	15M	47.08	38.35	8.73	47.04	38.1	8.94	46.49	38.42	8.07
	20M	47.03	38.29	8.74	47.06	38.25	8.81	46.67	38.2	8.47
Combined Center Channel	5M	50	41.18	8.82	49.76	40.36	9.4	49.17	41.27	7.9
	10M	50.13	41.27	8.86	50.1	41.43	8.67	49.31	41.33	7.98
	15M	50.03	41.36	8.67	50.02	41.05	8.97	49.38	41.31	8.07
	20M	50.05	41.26	8.79	50.05	41.27	8.78	49.52	41.17	8.35

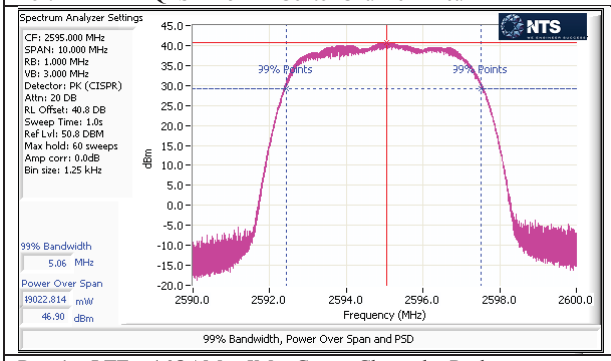
Based on the results above, Port 2 had the highest RMS average power and therefore it was selected for all the remaining antenna port tests on the product.

Subsequently output power levels on lowest and highest channels in all 4 channel bandwidths were tested only at Port 2 and results presented below.

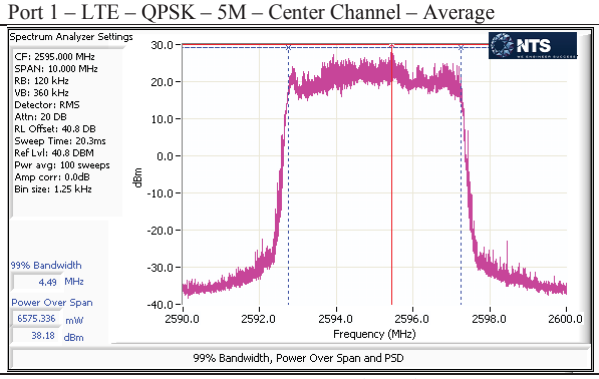
		LTE - QPSK			LTE - 16QAM			LTE - 64QAM		
		Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)	Peak (dBm)	Average (dBm)	PAR (dB)
Port 2 Low Channel	5M	46.97	37.46	9.51	46.81	38.05	8.76	45.06	38.26	6.8
	10M	47.33	38.46	8.87	47.24	38.48	8.76	46.41	38.43	7.98
	15M	47.59	38.66	8.93	47.83	38.63	9.2	46.55	38.51	8.04
	20M	47.69	38.69	9	47.24	38.47	8.77	46.43	38.33	8.1
Port 2 High Channel	5M	47.27	38.23	9.04	46.92	38.35	8.57	45.32	38.41	6.91
	10M	47.25	38.37	8.88	47.24	38.51	8.73	46.45	38.42	8.03
	15M	47.48	38.56	8.92	47.64	38.41	9.23	46.5	38.47	8.03
	20M	47.64	38.68	8.96	47.49	38.61	8.88	46.59	38.35	8.24

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

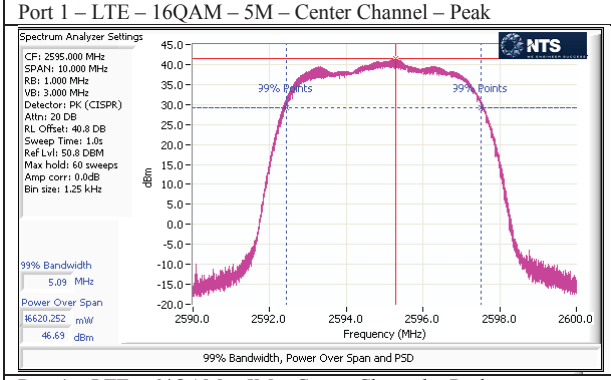
Port 1 – LTE – QPSK – 5M – Center Channel – Peak



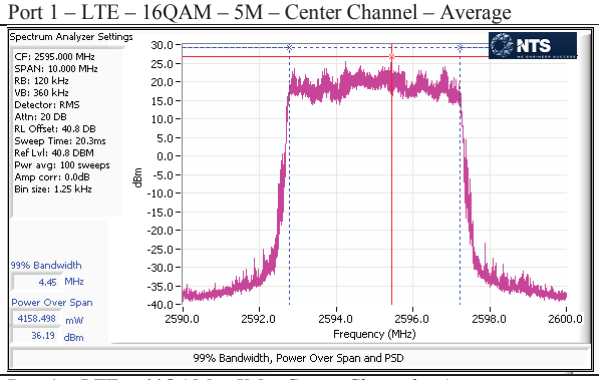
Port 1 – LTE – QPSK – 5M – Center Channel – Average



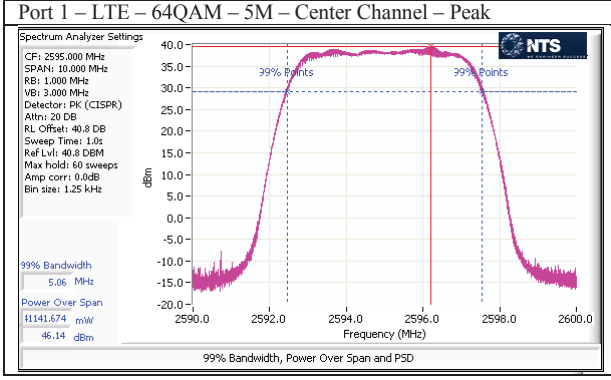
Port 1 – LTE – 16QAM – 5M – Center Channel – Peak



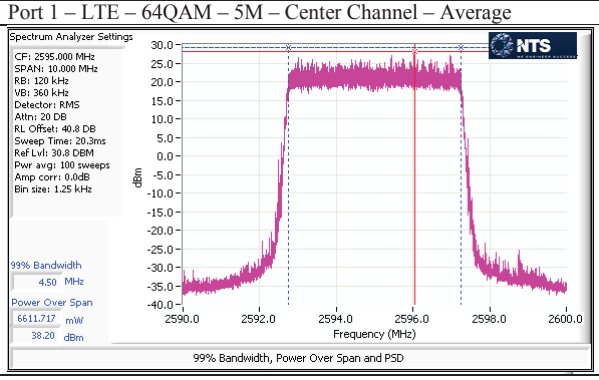
Port 1 – LTE – 16QAM – 5M – Center Channel – Average



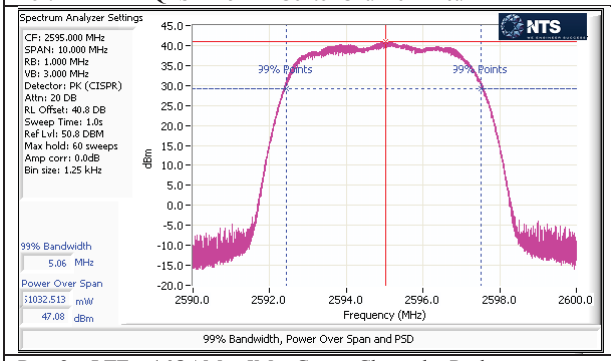
Port 1 – LTE – 64QAM – 5M – Center Channel – Peak



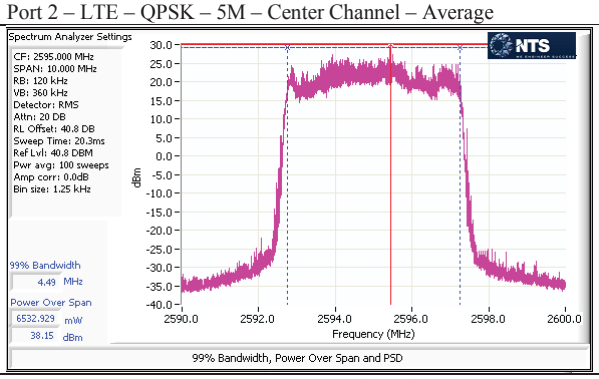
Port 1 – LTE – 64QAM – 5M – Center Channel – Average



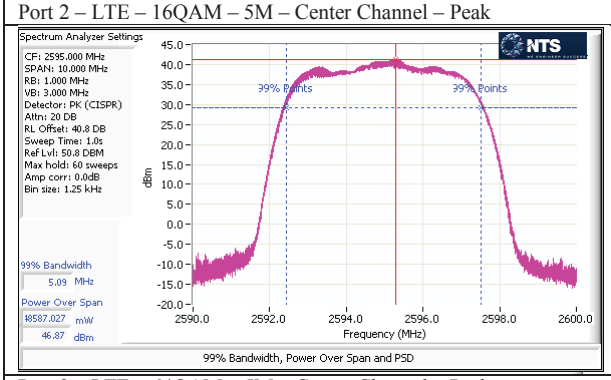
Port 2 – LTE – QPSK – 5M – Center Channel – Peak



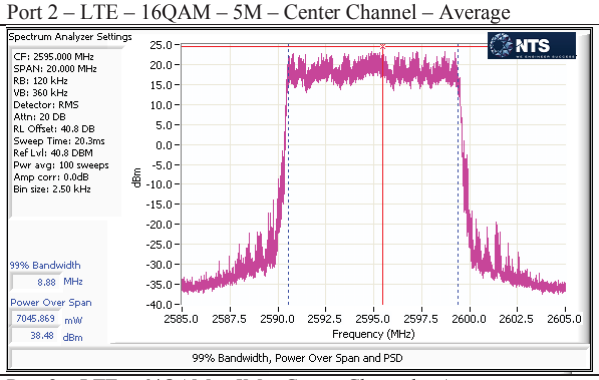
Port 2 – LTE – QPSK – 5M – Center Channel – Average



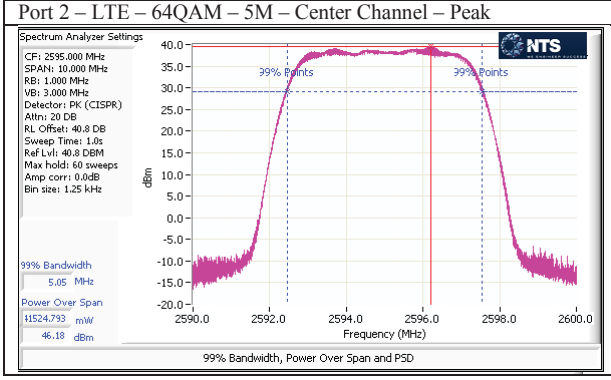
Port 2 – LTE – 16QAM – 5M – Center Channel – Peak



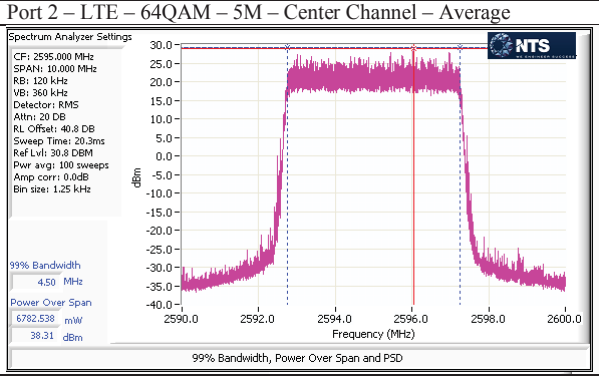
Port 2 – LTE – 16QAM – 5M – Center Channel – Average



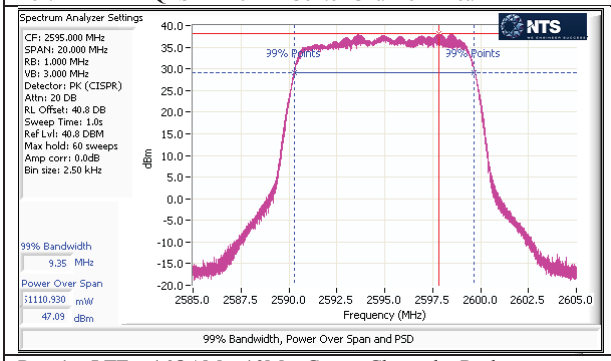
Port 2 – LTE – 64QAM – 5M – Center Channel – Peak



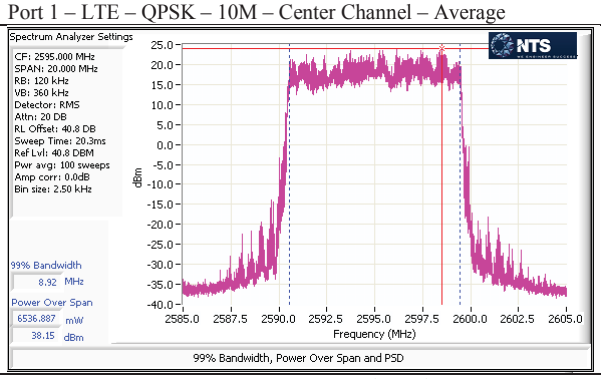
Port 2 – LTE – 64QAM – 5M – Center Channel – Average



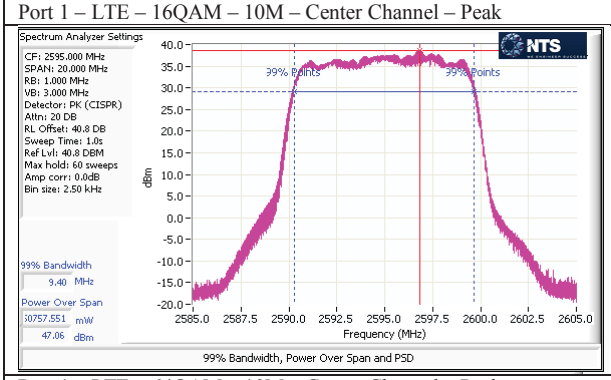
Port 1 – LTE – QPSK – 10M – Center Channel – Peak



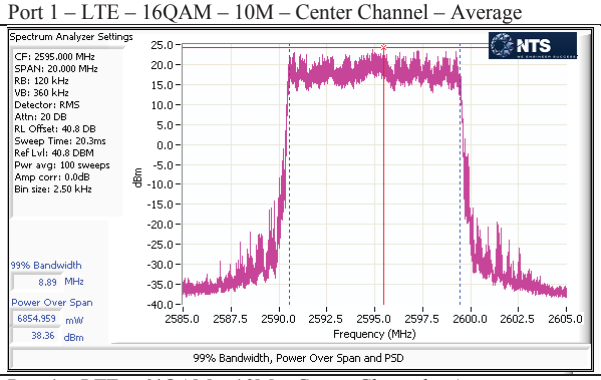
Port 1 – LTE – QPSK – 10M – Center Channel – Average



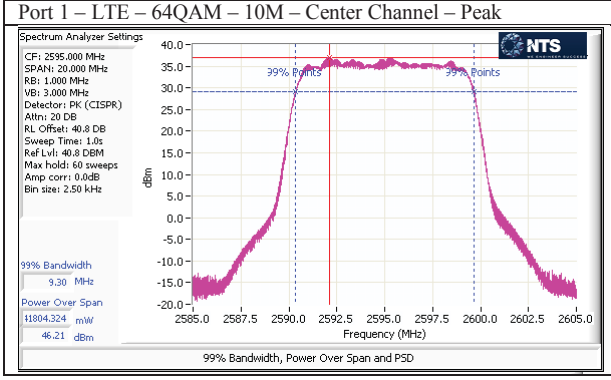
Port 1 – LTE – 16QAM – 10M – Center Channel – Peak



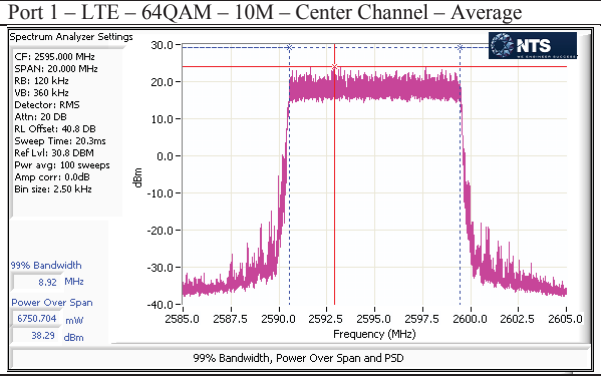
Port 1 – LTE – 16QAM – 10M – Center Channel – Average

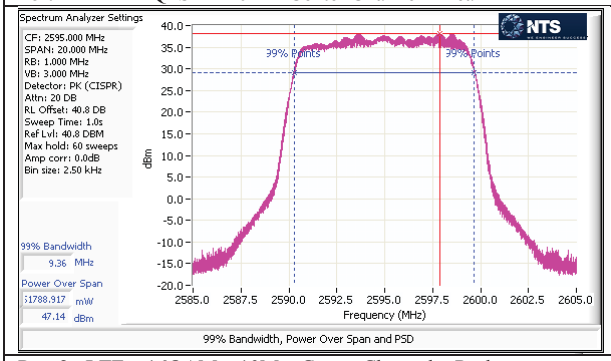
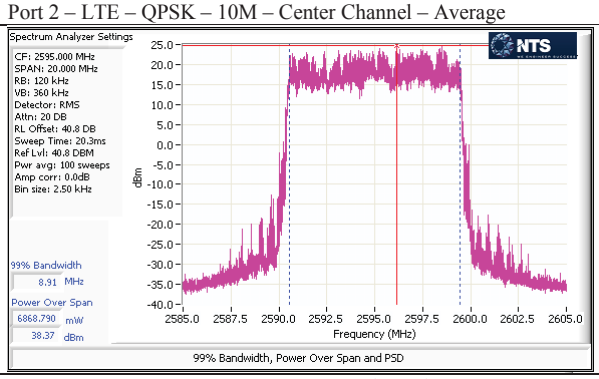
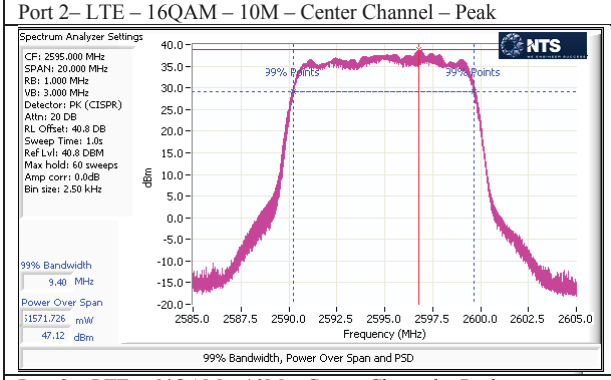
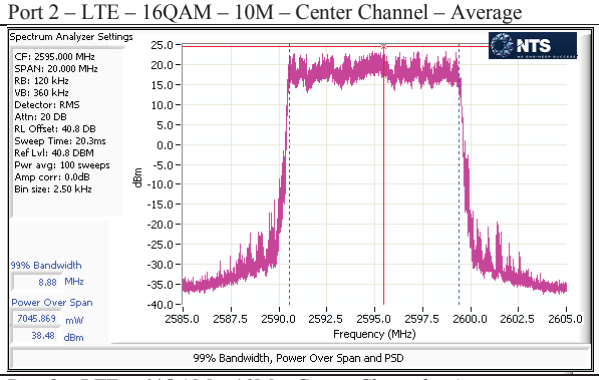
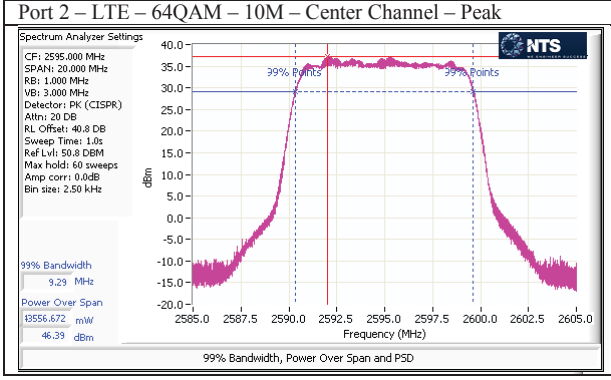
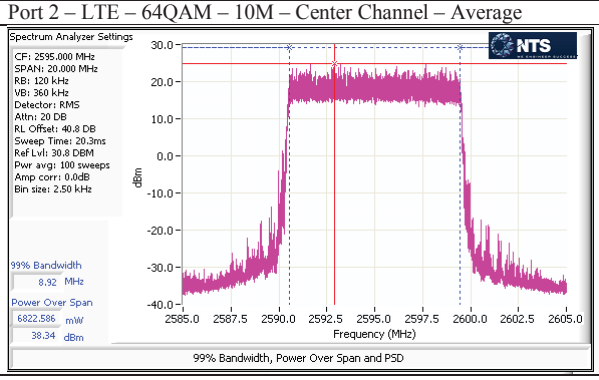


Port 1 – LTE – 64QAM – 10M – Center Channel – Peak

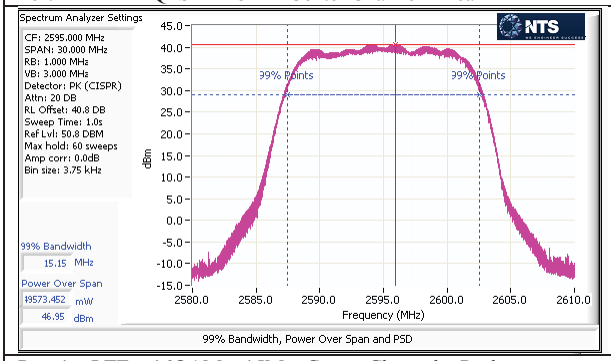


Port 1 – LTE – 64QAM – 10M – Center Channel – Average

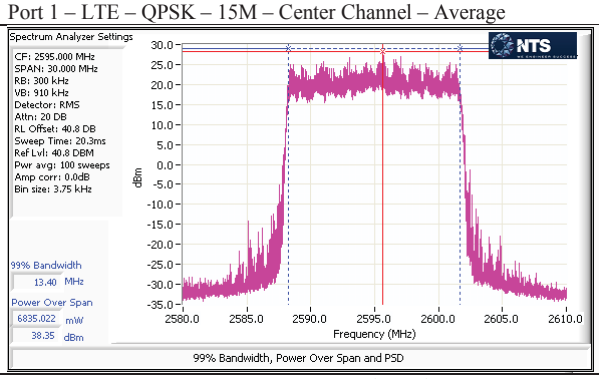


Port 2 – LTE – QPSK – 10M – Center Channel – Peak	Port 2 – LTE – QPSK – 10M – Center Channel – Average
	
Port 2– LTE – 16QAM – 10M – Center Channel – Peak	Port 2 – LTE – 16QAM – 10M – Center Channel – Average
	
Port 2 – LTE – 64QAM – 10M – Center Channel – Peak	Port 2 – LTE – 64QAM – 10M – Center Channel – Average
	

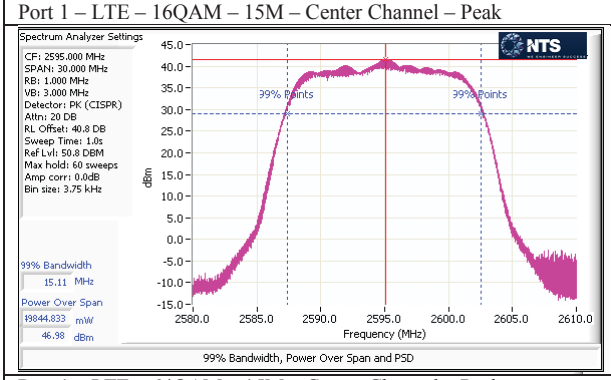
Port 1 – LTE – QPSK – 15M – Center Channel – Peak



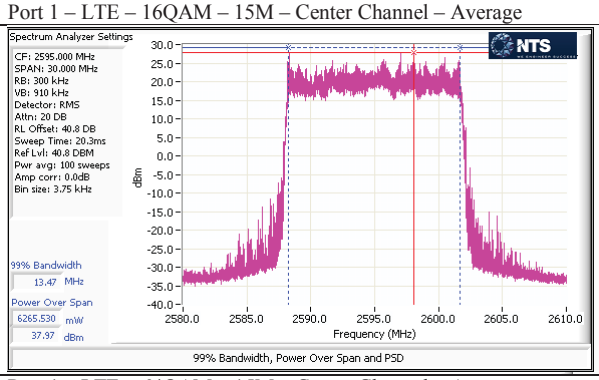
Port 1 – LTE – QPSK – 15M – Center Channel – Average



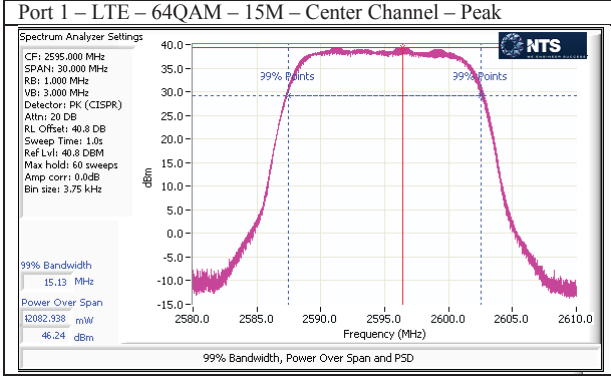
Port 1 – LTE – 16QAM – 15M – Center Channel – Peak



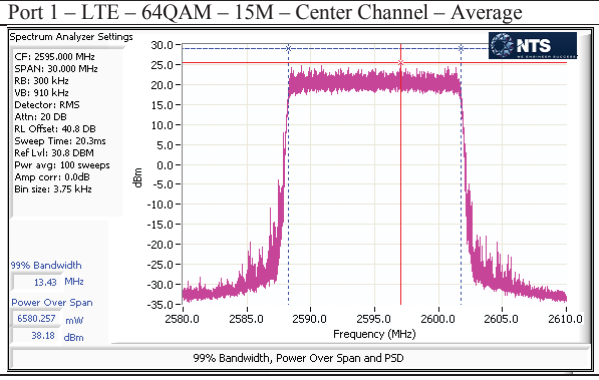
Port 1 – LTE – 16QAM – 15M – Center Channel – Average



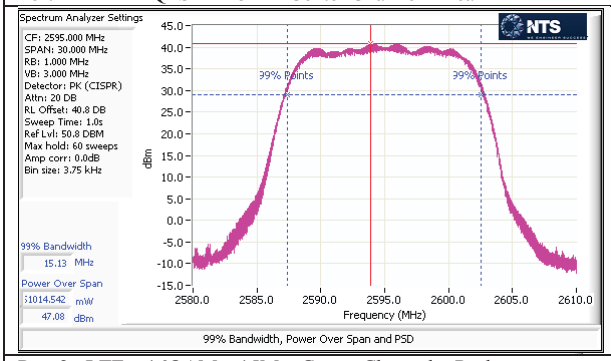
Port 1 – LTE – 64QAM – 15M – Center Channel – Peak



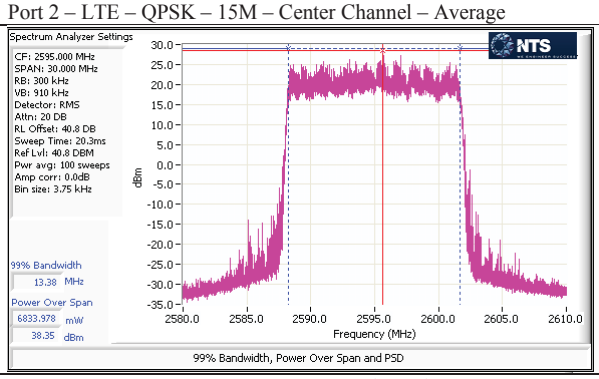
Port 1 – LTE – 64QAM – 15M – Center Channel – Average



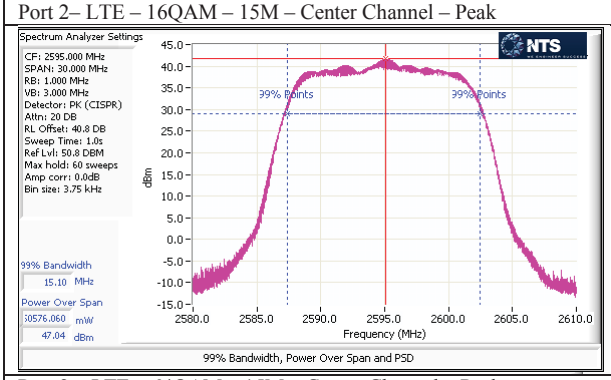
Port 2 – LTE – QPSK – 15M – Center Channel – Peak



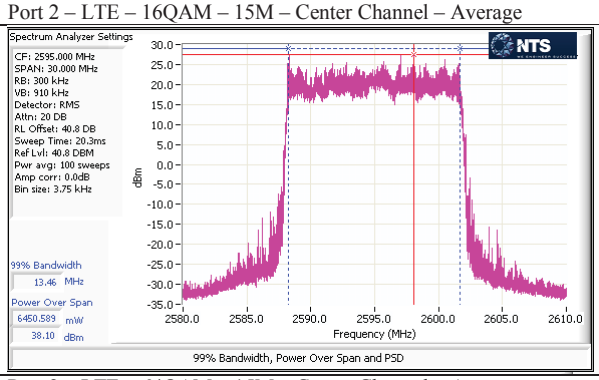
Port 2 – LTE – QPSK – 15M – Center Channel – Average



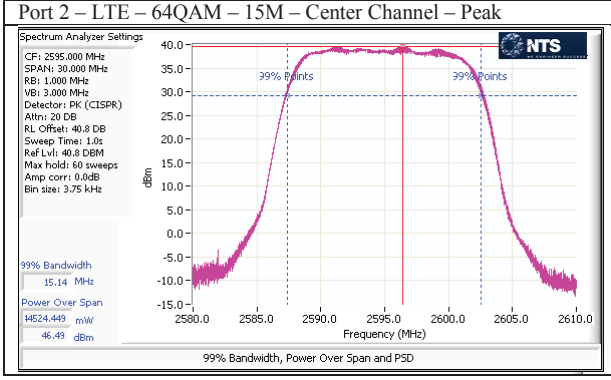
Port 2– LTE – 16QAM – 15M – Center Channel – Peak



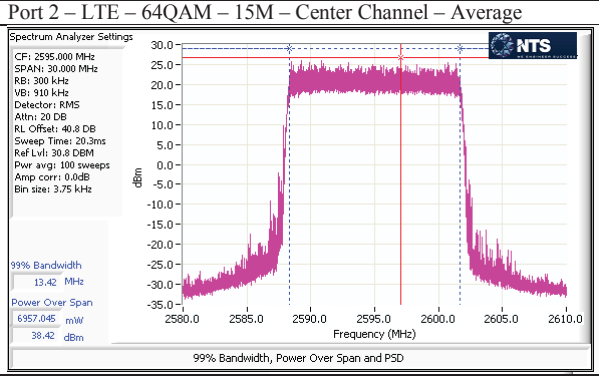
Port 2 – LTE – 16QAM – 15M – Center Channel – Average

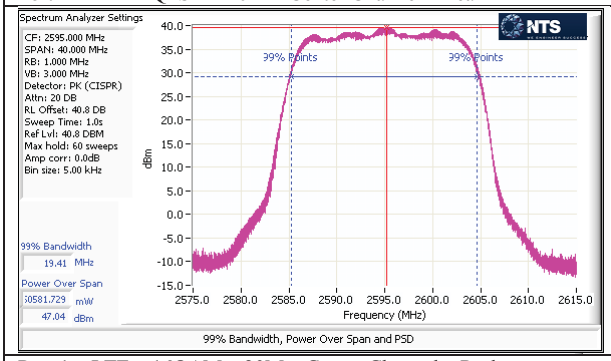
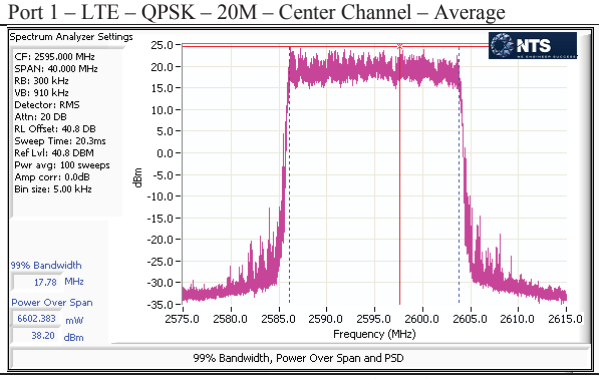
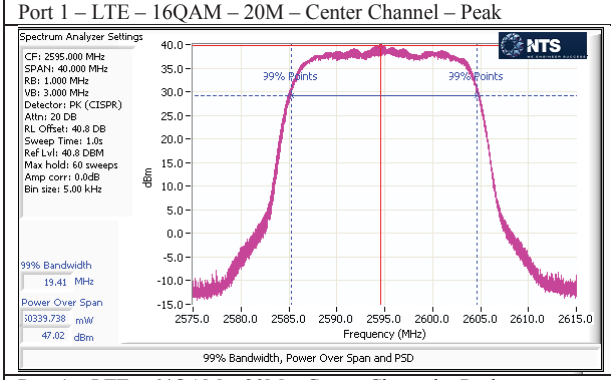
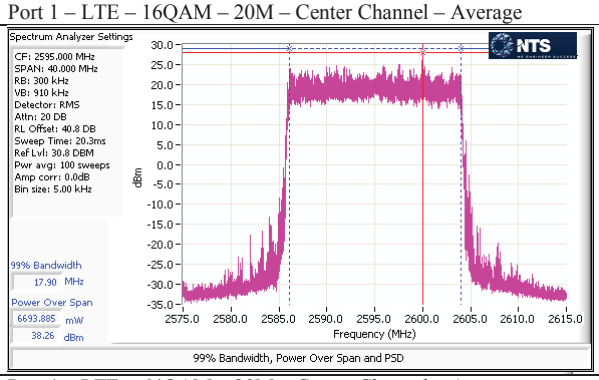
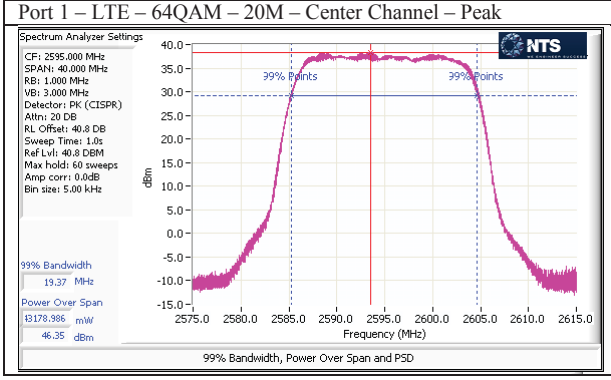
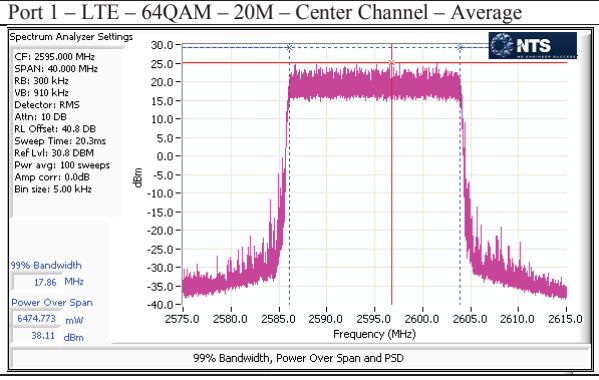


Port 2 – LTE – 64QAM – 15M – Center Channel – Peak

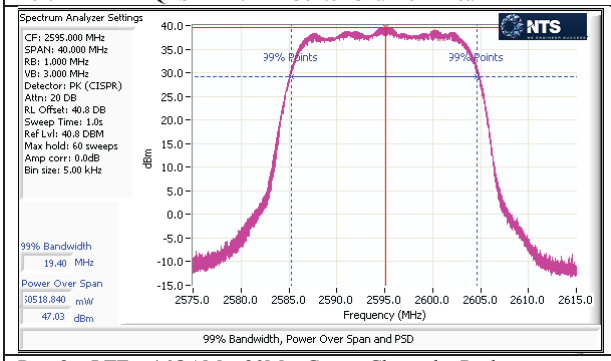


Port 2 – LTE – 64QAM – 15M – Center Channel – Average

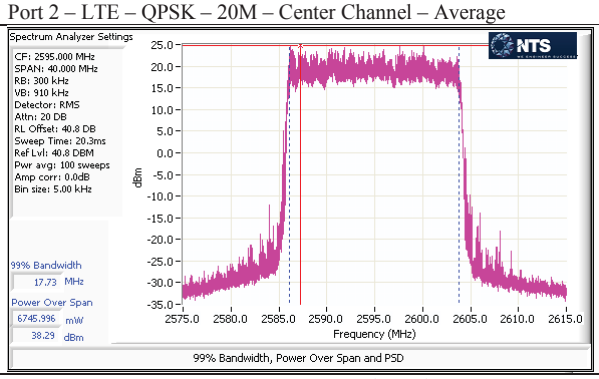


Port 1 – LTE – QPSK – 20M – Center Channel – Peak	Port 1 – LTE – QPSK – 20M – Center Channel – Average
	
Port 1 – LTE – 16QAM – 20M – Center Channel – Peak	Port 1 – LTE – 16QAM – 20M – Center Channel – Average
	
Port 1 – LTE – 64QAM – 20M – Center Channel – Peak	Port 1 – LTE – 64QAM – 20M – Center Channel – Average
	

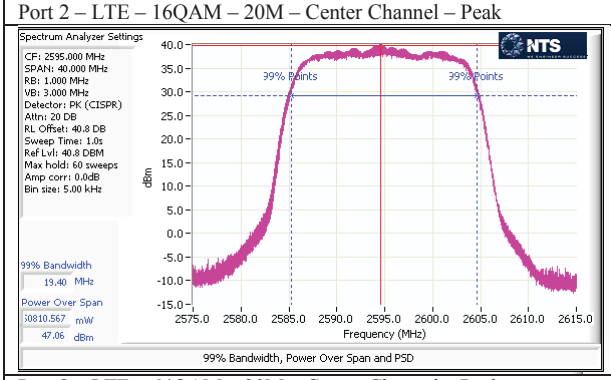
Port 2 – LTE – QPSK – 20M – Center Channel – Peak



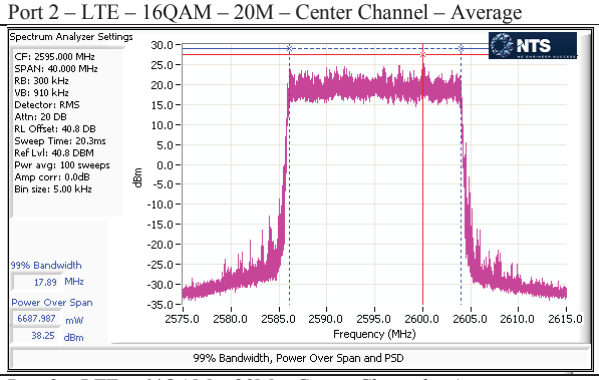
Port 2 – LTE – QPSK – 20M – Center Channel – Average



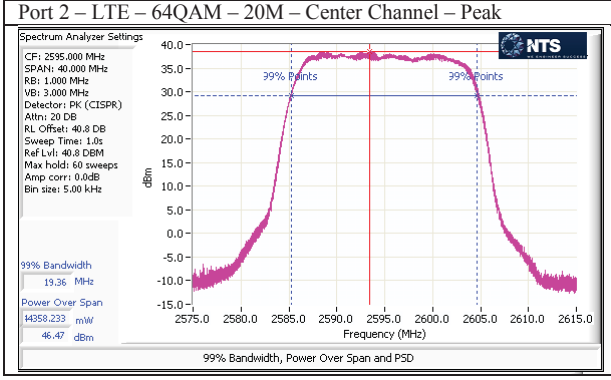
Port 2 – LTE – 16QAM – 20M – Center Channel – Peak



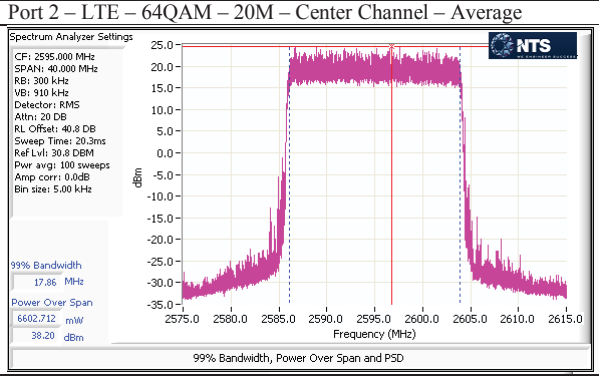
Port 2 – LTE – 16QAM – 20M – Center Channel – Average



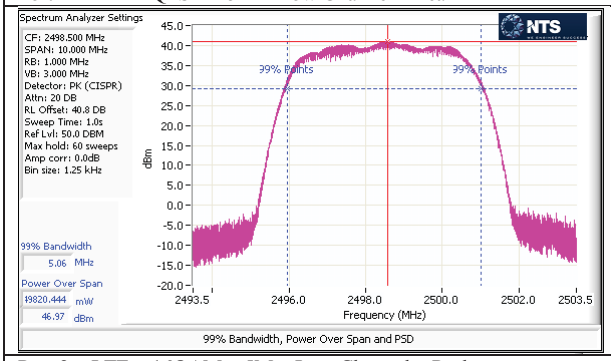
Port 2 – LTE – 64QAM – 20M – Center Channel – Peak



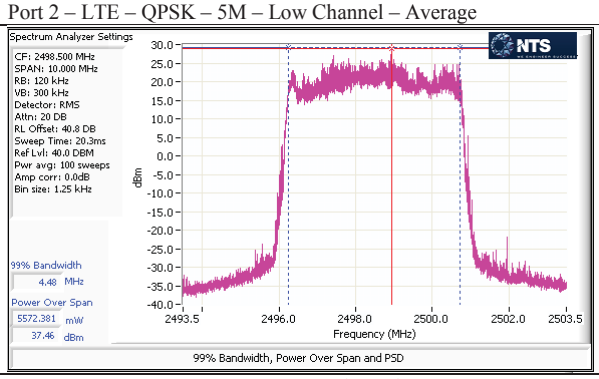
Port 2 – LTE – 64QAM – 20M – Center Channel – Average



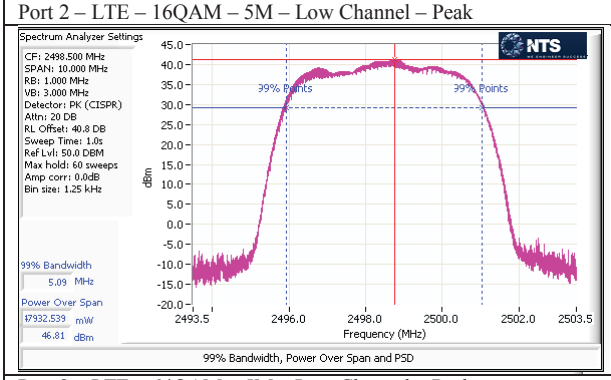
Port 2 – LTE – QPSK – 5M – Low Channel – Peak



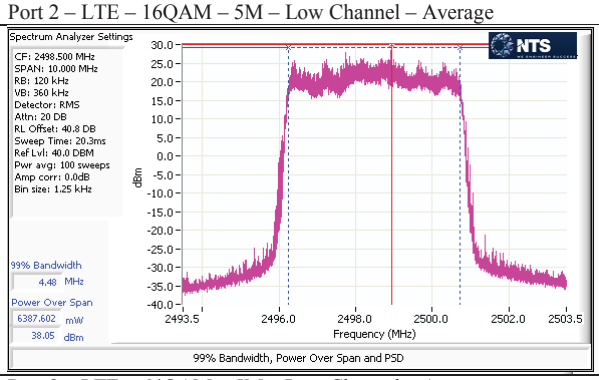
Port 2 – LTE – QPSK – 5M – Low Channel – Average



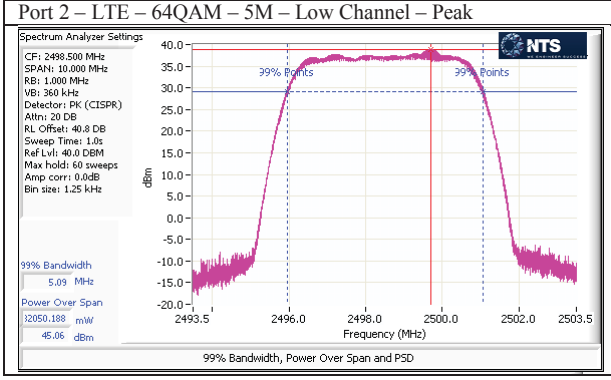
Port 2 – LTE – 16QAM – 5M – Low Channel – Peak



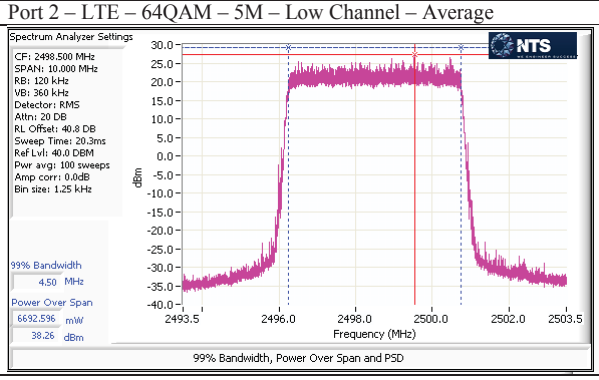
Port 2 – LTE – 16QAM – 5M – Low Channel – Average



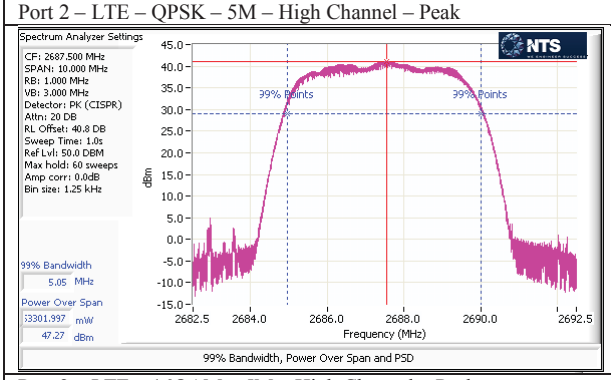
Port 2 – LTE – 64QAM – 5M – Low Channel – Peak



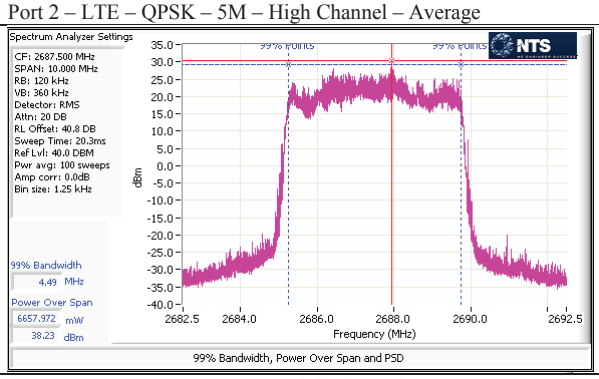
Port 2 – LTE – 64QAM – 5M – Low Channel – Average



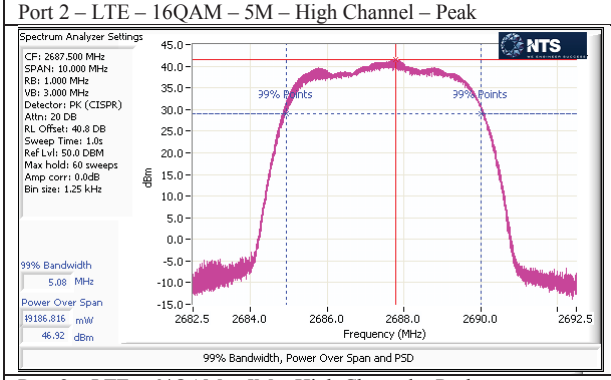
Port 2 – LTE – QPSK – 5M – High Channel – Peak



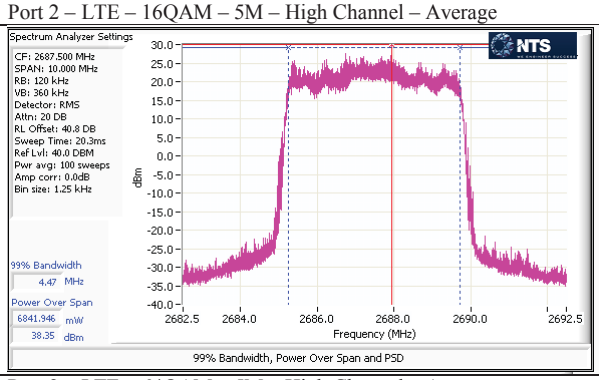
Port 2 – LTE – QPSK – 5M – High Channel – Average



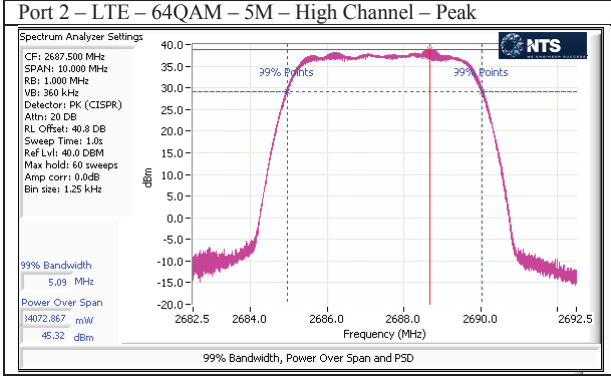
Port 2 – LTE – 16QAM – 5M – High Channel – Peak



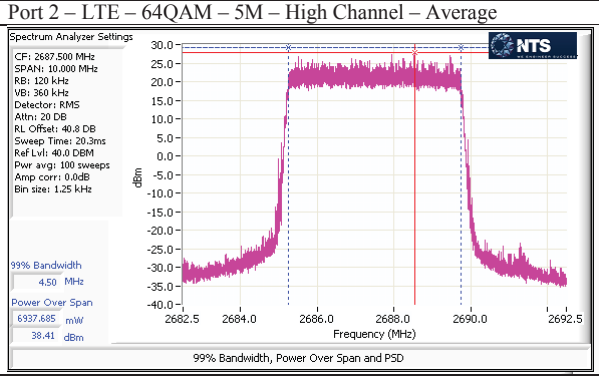
Port 2 – LTE – 16QAM – 5M – High Channel – Average



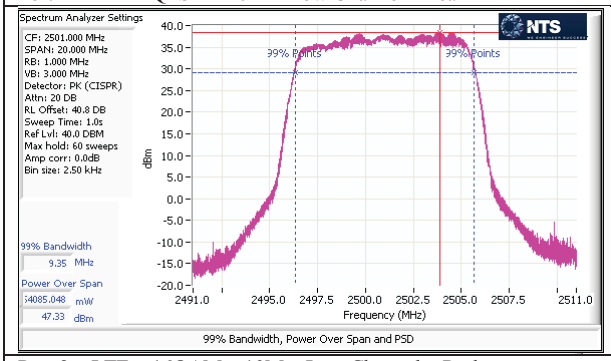
Port 2 – LTE – 64QAM – 5M – High Channel – Peak



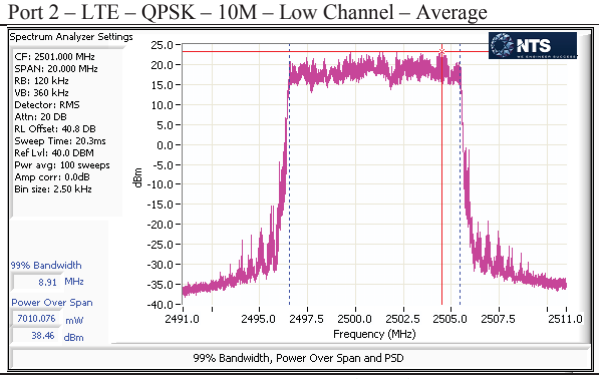
Port 2 – LTE – 64QAM – 5M – High Channel – Average



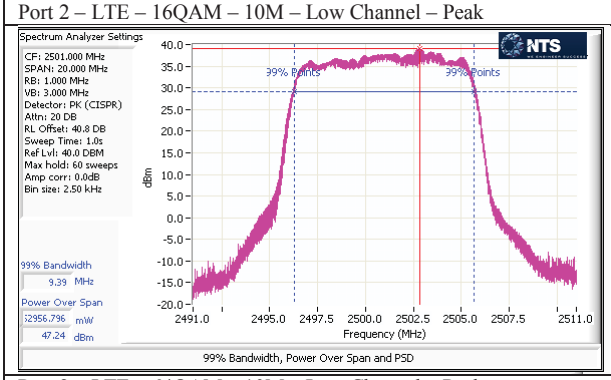
Port 2 – LTE – QPSK – 10M – Low Channel – Peak



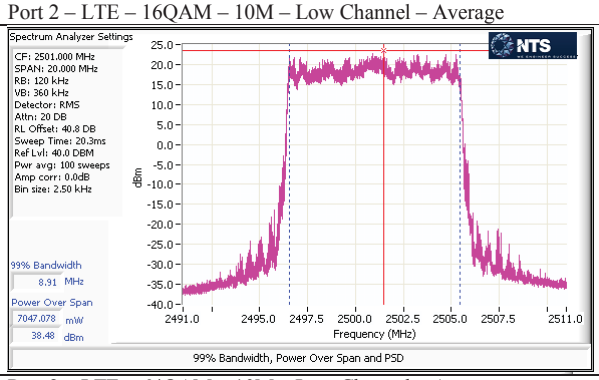
Port 2 – LTE – QPSK – 10M – Low Channel – Average



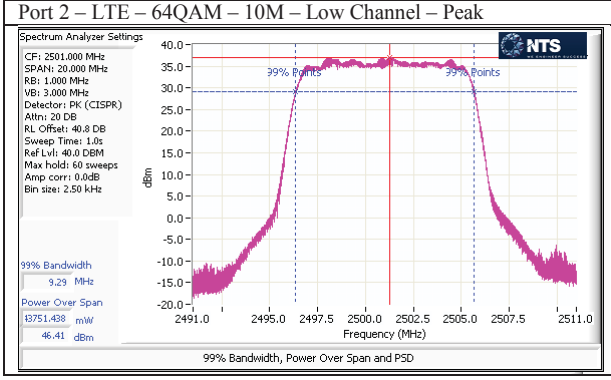
Port 2 – LTE – 16QAM – 10M – Low Channel – Peak



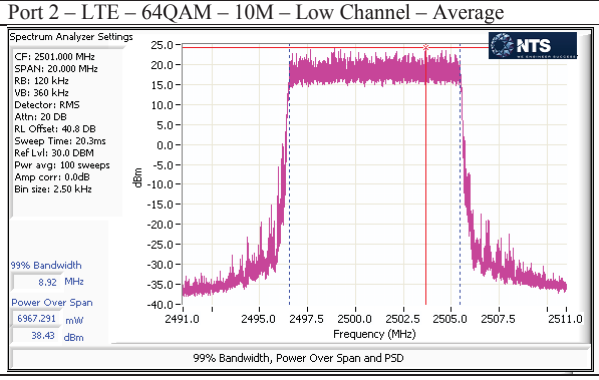
Port 2 – LTE – 16QAM – 10M – Low Channel – Average



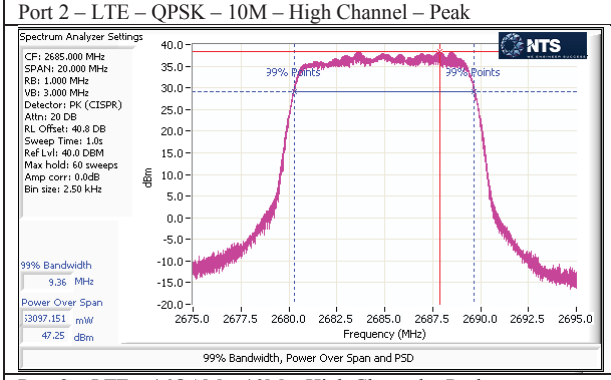
Port 2 – LTE – 64QAM – 10M – Low Channel – Peak



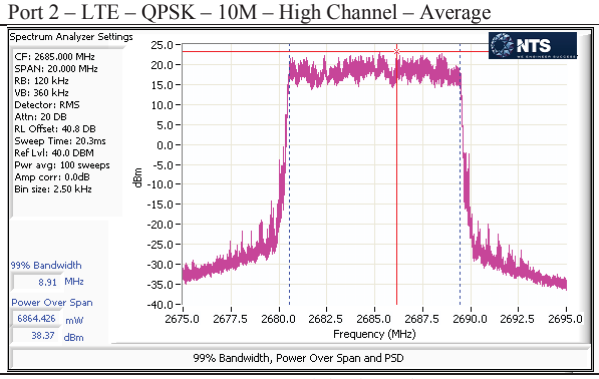
Port 2 – LTE – 64QAM – 10M – Low Channel – Average



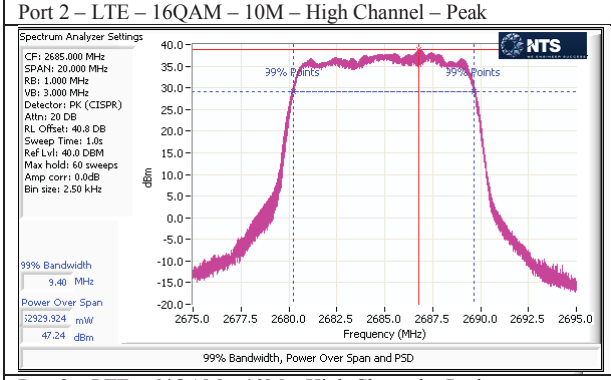
Port 2 – LTE – QPSK – 10M – High Channel – Peak



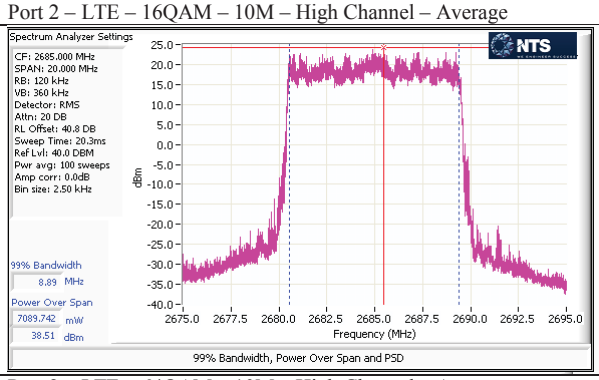
Port 2 – LTE – QPSK – 10M – High Channel – Average



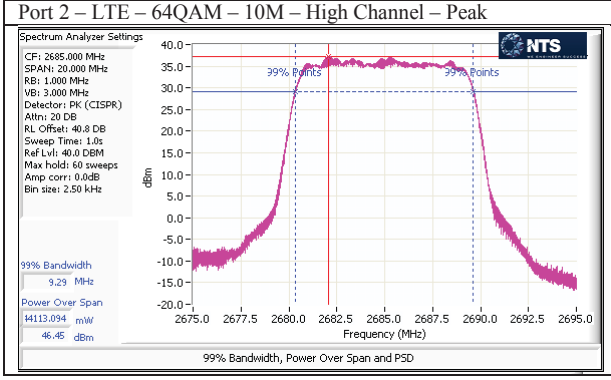
Port 2 – LTE – 16QAM – 10M – High Channel – Peak



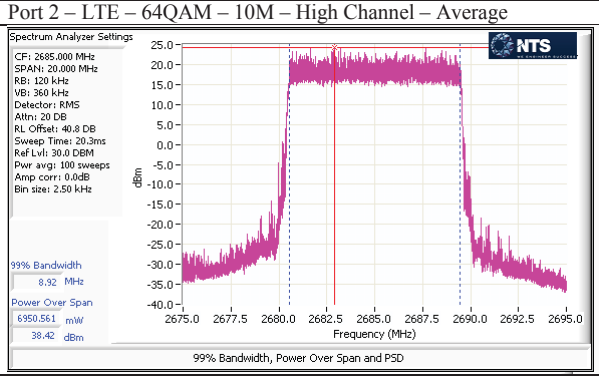
Port 2 – LTE – 16QAM – 10M – High Channel – Average



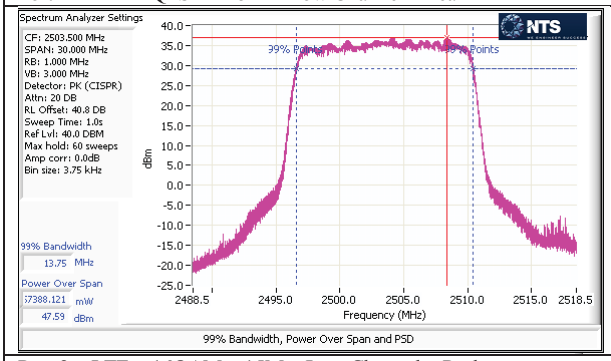
Port 2 – LTE – 64QAM – 10M – High Channel – Peak



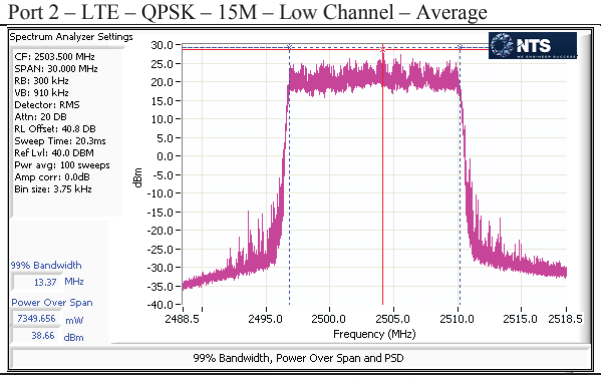
Port 2 – LTE – 64QAM – 10M – High Channel – Average



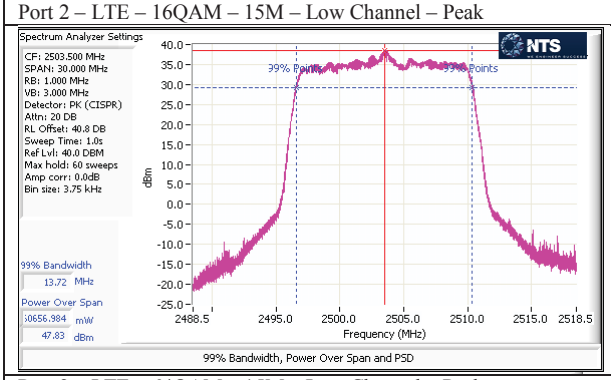
Port 2 – LTE – QPSK – 15M – Low Channel – Peak



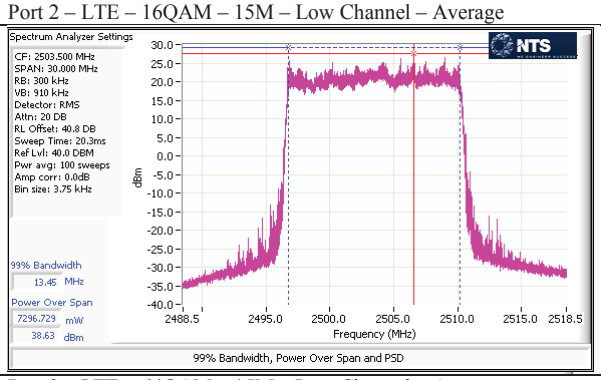
Port 2 – LTE – QPSK – 15M – Low Channel – Average



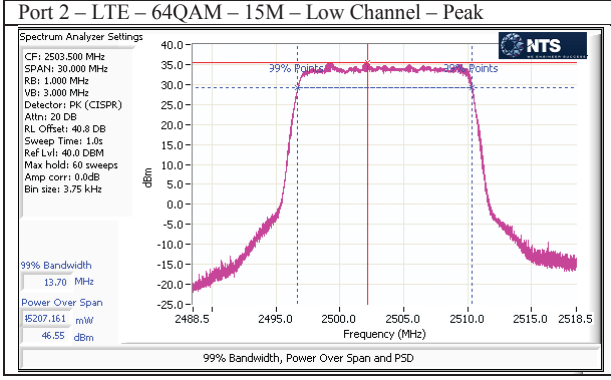
Port 2 – LTE – 16QAM – 15M – Low Channel – Peak



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



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



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