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Radio Test Report

FCC Part 90
217-220 MHz and 220-222 MHz

Model: Xeta2m-T

COMPANY:	Xetawave LLC 258 S. Taylor Avenue Louisville, CO 80027
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
REPORT DATE:	August 19, 2015
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PROGRAM MGR / TECHNICAL REVIEWER:	QUALITY ASSURANCE DELEGATE / FINAL REPORT PREPARER:
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ACCREDITED
Testing Cert #0214.26

REVISION HISTORY

Rev#	Date	Comments	Modified By
	August 19, 2015	First release	
1	September 17, 2015	Emission type information in page #6 has been removed. Emission designators will be declared by manufacturer.	Deniz Demirci

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SCOPE

Tests have been performed on the Xetawave LLC model Xeta2m-T, 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 47 Part 90 (Private Land Mobile Radio Service)

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 and as outlined in National Technical Systems - Silicon Valley test procedures:

ANSI TIA-603-C August 17, 2004

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 the Xetawave LLC model Xeta2m-T and therefore apply only to the tested sample. The sample was selected and prepared by Sandee Malang of Xetawave LLC.

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.).

STATEMENT OF COMPLIANCE

The tested sample of Xetawave LLC model Xeta2m-T 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 90

FCC	Description	Limit	Measured	Result
Transmitter Modulation, output power and other characteristics				
§2.1033 (c) (5) § 90.35	Frequency range(s)	217-220 MHz 220-222 MHz	217-220 MHz 220-222 MHz	Pass
§2.1033 (c) (6) §2.1033 (c) (7) § 2.1046 § 90.205	RF power output	217-220 MHz: 2 W 220-222 MHz: 50 W e.r.p.	217-220 MHz: 2 W 220-222 MHz: 2 W, 3 W and 5 W	Pass
§2.1033 (c) (4)	Emission types		Declared by manufacturer	
§ 2.1047 § 90.210	Emission masks	217-220 MHz: Mask C 220-222 MHz: Mask F	Emissions within the mask	Pass
§ 2.1049 § 90.209	Occupied Bandwidth	217-220 MHz: 11.25/20/45[1] kHz 220-222 MHz: 14[1]/49[1] kHz	See Run #3a, 3b, 3c and 3d	Pass
Transmitter spurious emissions				
§ 2.1051 § 2.1057	At the antenna terminals	-25 dBm (Mask F)	-29.0 dBm @ 193.41MHz (-4.0 dB)	Pass
§ 2.1053 § 2.1057	Field strength	-25 dBm (Mask F)	-36.5 dBm @ 1110.0 MHz (-11.5 dB)	Pass
Other details				
§ 2.1055 § 90.213	Frequency stability	217-220 MHz: 1 ppm 220-222 MHz: Mask F	217-220 MHz: 0.7 ppm 220-222 MHz: Within mask F	Pass
§ 2.1093	RF Exposure		See separate exhibit	
§2.1033 (c) (8)	Final radio frequency amplifying circuit's dc voltages and currents for normal operation over the power range		See operational description exhibit	
-	Antenna Gain		2.1 dBi (Declared by manufacturer)	
Note 1:	Aggregated channels can be licensed by the rule part. Two 25 kHz channel aggregate in 217-220 MHz band were tested. Authorized Bandwidth is 45 kHz. Three 5 kHz channel aggregate in 220-222 MHz band were tested. Authorized Bandwidth is 14 kHz. Ten 5 kHz channel aggregate in 220-222 MHz band were tested. Authorized Bandwidth is 49 kHz.			

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

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2) and were calculated in accordance with NAMAS document NIS 81 and M3003.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF frequency	Hz	25 to 7,000 MHz	1.7×10^{-7}
RF power, conducted	dBm	25 to 7,000 MHz	± 0.52 dB
Conducted emission of transmitter	dBm	25 to 40,000 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 40,000 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 40,000 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1,000 MHz 1 to 40 GHz	± 3.6 dB ± 6.0 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Xetawave LLC model Xeta2m-T is a radio module which is designed to be used for licensed radio operations for private data transmission networking or telemetry. Since the EUT would be placed on a tabletop during operation, the EUT was treated as tabletop equipment during testing to simulate the worst case user environment. The electrical rating of the EUT is 12 Volts DC, 3 Amps.

The sample was received on July 6, 2015 and tested on July 6, 7, 8, 9 and 10, 2015. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
XetaWave	Xeta2	Radio Module	E5015E06	

OTHER EUT DETAILS

The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. In some cases, the highest internal source determines the frequency range of test for radiated emissions. The highest internal source of the EUT was declared as: 1138 MHz.

217 - 220 MHz band of operations;

EUT transmits 12.5 kHz, 25 kHz and 2 aggregated 25 kHz channels with MSK, QPSK, 8PSK, 16QAM and 32QAM modulations.

220 - 222 MHz band of operations;

EUT transmits 3 aggregated 5 kHz and 10 aggregated 5 kHz channels with MSK, QPSK, 8PSK, 16QAM and 32QAM modulations.

ENCLOSURE

The EUT does not have an enclosure. The radio module dimensions are 50.8 mm x 50.8 mm x 12mm.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at National Technical Systems - Silicon Valley.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Xetawave	-	Test bed (Heat sink and fan)	-	-
HP	6024A	AC/DC power supply	Asset# 3004	-

The following equipment was used as remote support equipment for emissions testing:

Company	Model	Description	Serial Number	FCC ID
HP	Pavilion dv7	Laptop	-	-

Note: The computer was used to configure the radio via serial port. It was not connected during the radiated emission tests.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
DC power	AC/DC power supply	DC power cable	Unshielded.	1

EUT OPERATION

During emissions testing the EUT was transmitting with the rated RF power in each required modulation types and data rates.

TESTING

GENERAL INFORMATION

Antenna port measurements were taken at the National Technical Systems - Silicon Valley test site located at 41039 Boyce Road, Fremont, CA 94538-2435.

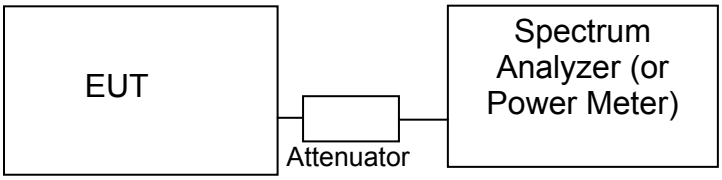
Radiated spurious emissions measurements were taken at the National Technical Systems - Silicon Valley Anechoic Chambers listed below. The sites conform to the requirements of ANSI C63.4: 2014 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical 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	Designation / Registration Numbers		Location
	FCC	Canada	
Chamber 7	US0027	IC 2845B-7	41039 Boyce Road Fremont, CA 94538-2435

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

RF PORT MEASUREMENT PROCEDURES

Conducted measurements are performed with the EUT's rf input/output connected to the input of a spectrum analyzer, power meter or modulation analyzer. When required an attenuator, filter and/or dc block is placed between the EUT and the spectrum analyzer to avoid overloading the front end of the measurement device. Measurements are corrected for the insertion loss of the attenuators and cables inserted between the rf port of the EUT and the measurement equipment.



Test Configuration for Antenna Port Measurements

For devices with an integral antenna the output power and spurious emissions are measured as a field strength at a test distance of (typically) 3m and then converted to an eirp using a substitution measurement (refer to RADIATED EMISSIONS MEASUREMENTS). All other measurements are made as detailed below but with the test equipment connected to a measurement antenna directed at the EUT.

OUTPUT POWER

Output power is measured using a power meter and an average sensor head, a spectrum analyzer or a power meter and peak power sensor head as required by the relevant rule part(s). Where necessary measurements are gated to ensure power is only measured over periods that the device is transmitting.

BANDWIDTH MEASUREMENTS

The 99% bandwidth is measured using the methods detailed in ANSI C63.10 and RSS-GEN with RBW 1% to 5% of the OBW and VBW ≥ 3xRBW.

CONDUCTED SPURIOUS EMISSIONS

Initial scans are made using a peak detector (VBW ≥ 3xRBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode measurements). For transmitter measurements the appropriate detector (average, peak, normal, sample, quasi-peak) is used when making measurements for licensed devices.

TRANSMITTER MASK MEASUREMENTS

The transmitter mask measurements are made using resolution bandwidths as specified in the pertinent rule part(s). Where narrower bandwidths are used the measurement is corrected to account for the reduced bandwidth by either using the adjacent channel power function of the spectrum analyzer to sum the power across the required measurement bandwidth. The frequency span of the analyzer is set to ensure the fundamental signal and all significant sidebands are displayed.

The top of the mask may be set by the total output power of the signal, the power of the unmodulated signal or the peak value of the signal in the reference bandwidth being used for the mask measurement.

FREQUENCY STABILITY

The EUT is placed inside a temperature chamber with all support and test equipment located outside of the chamber. The temperature is varied across the specified frequency range in 10 degree increments with frequency measurements made at each temperature step. The EUT is allowed enough time to stabilize at each temperature variation.

The spectrum analyzer is configured to give a 5- or 6-digit display for the marker-frequency function. Where possible the device is set to transmit an unmodulated signal. Where this is not possible the frequency drift is determined by finding a stable point on the signal (e.g. the null at the centre of an OFDM signal) or by calculating a centre frequency based on the upper and lower X dB points (where X is typically 6 dB or 10 dB) on the signal's skirts.

RADIATED EMISSIONS MEASUREMENTS

Transmitter radiated spurious emissions are initially measured as a field strength. The eirp or erp 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. Emissions within 20 dB of this limit are the subjected to a substitution measurement.

All radiated emissions measurements are performed in two phases. A preliminary scan of emissions is conducted in an anechoic chamber during which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed across the complete frequency range of interest and at each operating frequency identified in the reference standard. One or more of these is with the antenna polarized vertically while the one or more of these are with the antenna polarized horizontally. Initial scans are made using a peak detector (VBW $\geq$ 3xRBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode).

During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit. For transmitter spurious emissions, where the limit is expressed as an effective radiated power, the eirp or erp is converted to a field strength limit.

Final measurements are made in a semi-anechoic chamber at the significant frequencies observed during the preliminary scan(s) using the same process of rotating the EUT and raising/lowering the measurement antenna to find the highest level of the emission.

For transmitter spurious emissions, the radiated power of all emissions within 20 dB of the calculated field strength limit are determined using a substitution measurement. The substitution measurement is made by replacing the EUT with an antenna of known gain (typically a dipole antenna or a double-ridged horn antenna), connected to a signal source. The output power of the signal generator is adjusted until the maximum field strength from the substitution antenna is similar to the field strength recorded from the EUT. The erp of the EUT is then calculated.

INSTRUMENTATION

An EMI receiver as specified in CISPR 16-1-1 is used for radiated emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary.

For measurements above the frequency range of the receivers and for all conducted measurements a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis.

Measurement bandwidths for the test instruments are set in accordance with the requirements of the standards referenced in this document.

Software control is used to correct the measurements for transducer factors (e.g. antenna) and the insertion loss of cables, attenuators and other series elements to obtain the final measurement value. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are exported in a graphic and/or tabular format, as appropriate.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the EUT antenna port or receiving antenna and the test receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A combination of biconical, log periodic or bi-log antennas are used to cover the range from 30 MHz to 1000 MHz. Broadband antennas or tuned dipole antennas are used over the entire 25 to 1000 MHz frequency range as the reference antenna for substitution measurements.

Above 1000 MHz, a dual-ridge guide horn antenna or octave horn antenna are used as reference and measurement antennas.

The antenna calibration factors are included in site factors that are programmed into the test receivers and instrument control software when measuring the radiated field strength.

ANTENNA MAST AND EQUIPMENT TURNTABLE

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.

Table mounted devices are placed on a non-conductive table at a height of 80 centimeters above the floor. Floor mounted equipment is placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. The EUT is positioned on a motorized turntable to allow it to be rotated during testing to determine the angel with the highest level of emissions.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED SPURIOUS EMISSIONS

Measurements are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

R_r = Measured value in dBm
S = Specification Limit in dBm
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH

Measurements of radiated field strength are compared directly to the specification limit (decibel form). The receiver and/or control software corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor is sued when measurements are made at a test distance that is different to the specified limit distance by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBµV/m
F_d = Distance Factor in dB
R_c = Corrected Reading in dBµV/m
L_s = Specification Limit in dBµV/m
M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS –RADIATED POWER

The erp/eirp limits for transmitter spurious measurements are converted to a field strength in free space using the following formula:

$$E = \frac{\sqrt{30\ P\ G}}{d}$$

where:

E = Field Strength in V/m
P = Power in Watts
G = Gain of isotropic antenna (numeric gain) = 1
D = measurement distance in meters

The field strength limit is then converted to decibel form (dBµV/m) and the margin of a given emission peak relative to the limit is calculated (refer to *SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH*).

When substitution measurements are required (all signals with less than 20 dB of margin relative to the calculated field strength limit) the eirp of the spurious emission is calculated using:

$$P_{EUT} = P_S - (E_S - E_{EUT})$$

and

$$P_S = G + P_{in}$$

where:

P_S = effective isotropic radiated power of the substitution antenna (dBm)
P_{in} = power input to the substitution antenna (dBm)
G = gain of the substitution antenna (dBi)
E_S = field strength the substitution antenna (dBm) at eirp P_S
E_{EUT} = field strength measured from the EUT

Where necessary the effective isotropic radiated power is converted to effective radiated power by subtracting the gain of a dipole (2.2 dBi) from the eirp value.

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 30 - 2,500 MHz, 06-Jul-15					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	2/13/2014	2/13/2016
Substitution Measurements, 07-Jul-15					
Agilent Technologies	PSG, Vector Signal Generator, (250kHz - 20GHz)	E8267C	1877	6/16/2015	6/16/2016
Compliance Design	Tuned Dipole Antenna	Roberts (400-1000MHz)	1896	1/2/2014	1/2/2016
EMCO	Antenna, Horn, 1-18 GHz	3115	2870	8/20/2013	8/20/2015
Radiated Emissions, 30 - 2,500 MHz, 07-Jul-15					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	2/13/2014	2/13/2016
Radiated Emissions, 2.5 - 12 GHz, 07-Jul-15					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/20/2015	2/20/2016
Filtek	Filter, 1 GHz High Pass	HP12/1000-5BA	957	5/11/2015	5/11/2016
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	9/20/2014	9/20/2015
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
RF conducted measurements, 08-Jul-15					
Rohde & Schwarz	Power Meter, Single Channel, +1795+1796	NRVS	1534	7/31/2014	7/31/2015
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts (w/ 20 dB pad, SN BJ5155)	NRV-Z32	1536	1/15/2015	1/15/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016
Agilent Technologies	PSG, Vector Signal Generator, (250kHz - 20MHz)	E8267D	3011	1/8/2015	1/8/2016
RF conducted and Frequency stability measurements, 09-Jul-15					
Fluke	Multimeter, True RMS	111	1480	3/30/2015	3/30/2016
Rohde & Schwarz	Power Meter, Single Channel, +1795+1796	NRVS	1534	7/31/2014	7/31/2015
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts (w/ 20 dB pad, SN BJ5155)	NRV-Z32	1536	1/15/2015	1/15/2016
Watlow	Temp Chamber (w/ F4 Watlow Controller)	F4	2170	7/18/2014	7/18/2015
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016
Agilent Technologies	PSG, Vector Signal Generator, (250kHz - 20MHz)	E8267D	3011	1/8/2015	1/8/2016

RF Conducted measurements, 10-Jul-15

Rohde & Schwarz	Power Meter, Single Channel, +1795+1796	NRVS	1534	7/31/2014	7/31/2015
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts (w/ 20 dB pad, SN BJ5155)	NRV-Z32	1536	1/15/2015	1/15/2016
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016

Appendix B Test Data

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Client:	Xetawave LLC	Job Number:	J98677
Product	Xeta2	T-Log Number:	T98773
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Emissions Standard(s):	FCC Part 90	Class:	A
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xetawave LLC

Product

Xeta2

Date of Last Test: 8/21/2015

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

FCC Part 90

Power, Occupied Bandwidth, Frequency Stability and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

With the exception of the radiated spurious emissions tests, all measurements are made with the EUT's rf port connected to the measurement instrument via an attenuator or dc-block if necessary. All amplitude measurements are adjusted to account for the attenuation between EUT and measuring instrument. For frequency stability measurements the EUT was place inside an environmental chamber.

Radiated measurements are made with the EUT located on a non-conductive table, 3m from the measurement antenna.

Ambient Conditions:

Temperature: 20-22 °C

Rel. Humidity: 30-35 %

Summary of Results

Run #	Spacing	Data Rate	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	217-220 MHz: 2 W 220-222 MHz: 50 W e.r.p.	Pass	217-220 MHz: 2W 220-222 MHz: 2W, 3W and 5W
2	-	-	Spectral Mask	217-220 MHz: Mask C 220-222 MHz: Mask F	Pass	Emissions within the mask
3	-	-	99 % or Occupied Bandwidth	11.25/20/45[1] kHz 14[1]/49[1] kHz	Pass	See Run #3a, 3b, 3c and 3d
4	-	-	Spurious Emissions (conducted)	-25 dBm	Pass	-29.0 dBm @ 193.41MHz (-4.0 dB)
5	-	-	Spurious emissions (radiated)	-25 dBm	Pass	-36.5 dBm @ 1110.0 MHz (-11.5 dB)
6	-	-	Frequency Stability	217-220 MHz: 1 ppm 220-222 MHz: Mask F	Pass	Pass/ 0.7 ppm Pass/ Within mask F

Note 1: Aggregated channels

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #1: Output Power

Date of Test: 7/8/2015, 7/9/2015 and 7/10/2015 Config. Used: 1
Test Engineer: Deniz Demirci Config Change: None
Test Location: FT Lab #4b EUT Voltage: 12 Vdc

Cable Loss: 0.0 dB Attenuator: 30.0 dB Total Loss: 30.0 dB
Cable ID(s): Direct connection Attenuator IDs: Asset #1875 and asset #2098

Run #1a: Output power at 217-220 MHz band

Power setting	Frequency (MHz)	Modulation	Channel plan	Output Power (dBm) [1]	Output Power W	Ant. Gain (dBi)	Result	EIRP dBm	EIRP W
3200	218.5	MSK	12.5 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4800	218.5	QPSK	12.5 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4800	218.5	8PSK	12.5 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4800	218.5	16QAM	12.5 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4800	218.5	32QAM	12.5 kHz	33.0	2.00	2.1	Pass	35.1	3.236
3200	218.5	MSK	25.0 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4700	218.5	QPSK	25.0 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4700	218.5	8PSK	25.0 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4700	218.5	16QAM	25.0 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4700	218.5	32QAM	25.0 kHz	33.0	2.00	2.1	Pass	35.1	3.236

Run #1b: Output power at 217-220 MHz band. 2x25 kHz aggregated channels.

Power setting	Frequency (MHz)	Modulation	Channel plan	Output Power (dBm) [1]	Output Power W	Ant. Gain (dBi)	Result	EIRP dBm	EIRP W
3150	218.5	MSK	2x25 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4500	218.5	QPSK	2x25 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4500	218.5	8PSK	2x25 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4600	218.5	16QAM	2x25 kHz	33.0	2.00	2.1	Pass	35.1	3.236
4700	218.5	32QAM	2x25 kHz	33.0	2.00	2.1	Pass	35.1	3.236

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #1c: Output power at 220-222 MHz band. 3x5 kHz aggregated channels.

Power setting	Frequency (MHz)	Modulation	Channel plan	Output Power (dBm) [1]	Output Power W	Ant. Gain (dBi)	Result	EIRP dBm	EIRP W
3 Watts	221.0	MSK	3x5 kHz	35.5	3.55	2.1	Pass	37.6	5.754
5 Watts	221.0	QPSK	3x5 kHz	37.5	5.62	2.1	Pass	39.6	9.120
5 Watts	221.0	8PSK	3x5 kHz	37.5	5.62	2.1	Pass	39.6	9.120
5 Watts	221.0	16QAM	3x5 kHz	37.6	5.75	2.1	Pass	39.7	9.333
5 Watts	221.0	32QAM	3x5 kHz	37.5	5.62	2.1	Pass	39.6	9.120

Run #1d: Output power at 220-222 MHz band. 10x5 kHz aggregated channels.

Power setting	Frequency (MHz)	Modulation	Channel plan	Output Power (dBm) [1]	Output Power W	Ant. Gain (dBi)	Result	EIRP dBm	EIRP W
2 Watts	221.0	MSK	10x5 kHz	33.7	2.34	2.1	Pass	35.8	3.802
5 Watts	221.0	QPSK	10x5 kHz	37.7	5.89	2.1	Pass	39.8	9.550
5 Watts	221.0	8PSK	10x5 kHz	37.6	5.75	2.1	Pass	39.7	9.333
5 Watts	221.0	16QAM	10x5 kHz	37.7	5.89	2.1	Pass	39.8	9.550
5 Watts	221.0	32QAM	10x5 kHz	37.6	5.75	2.1	Pass	39.7	9.333

Note 1:	Output power measured using a peak power meter
Note 2:	Power setting - the software power setting used during testing, included for reference only.

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #2: Spectral Mask, FCC Part 90.210 Mask C and Mask F

Date of Test: 7/8/2015 and 7/10/2015
Test Engineer: Deniz Demirci
Test Location: FT Lab #4b

Config. Used: 1
Config Change: None
EUT Voltage: 12 Vdc

Run #2a: Spectral Mask at 217-220 MHz band, Mask C.

Power setting	Data rate	Channel plan	Modulation	Frequency (MHz)	Emission mask	Result
3200	9.6 kbps	12.5 kHz	MSK	218.5	C	Pass
4800	17.5 kbps	12.5 kHz	QPSK	218.5	C	Pass
4800	26.2 kbps	12.5 kHz	8PSK	218.5	C	Pass
4800	36.1 kbps	12.5 kHz	16QAM	218.5	C	Pass
4800	45.1 kbps	12.5 kHz	32QAM	218.5	C	Pass
3200	18.1 kbps	25.0 kHz	MSK	218.5	C	Pass
4700	29.5 kbps	25.0 kHz	QPSK	218.5	C	Pass
4700	44.2 kbps	25.0 kHz	8PSK	218.5	C	Pass
4700	58.9 kbps	25.0 kHz	16QAM	218.5	C	Pass
4700	75.6 kbps	25.0 kHz	32QAM	218.5	C	Pass

Run #2b: Spectral Mask at 217-220 MHz band. Mask C of 2x25 kHz aggregated channels.

Power setting	Data rate	Channel plan	Modulation	Frequency (MHz)	Emission mask	Result
3150	43.4 kbps	2x25 kHz	MSK	218.5	C	Pass
4500	72.0 kbps	2x25 kHz	QPSK	218.5	C	Pass
4500	104.9 kbps	2x25 kHz	8PSK	218.5	C	Pass
4600	143.9 kbps	2x25 kHz	16QAM	218.5	C	Pass
4700	179.9 kbps	2x25 kHz	32QAM	218.5	C	Pass

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #2c: Spectral Mask at 220-222 MHz band. Mask F of 3x5 kHz aggregated channels.

Power setting	Data rate	Channel plan	Modulation	Frequency (MHz)	Emission mask	Result
3 Watts	8.75 kbps	3x5 kHz	MSK	221.0	F	Pass
5 Watts	18.7 kbps	3x5 kHz	QPSK	221.0	F	Pass
5 Watts	28.0 kbps	3x5 kHz	8PSK	221.0	F	Pass
5 Watts	37.3 kbps	3x5 kHz	16QAM	221.0	F	Pass
5 Watts	46.6 kbps	3x5 kHz	32QAM	221.0	F	Pass

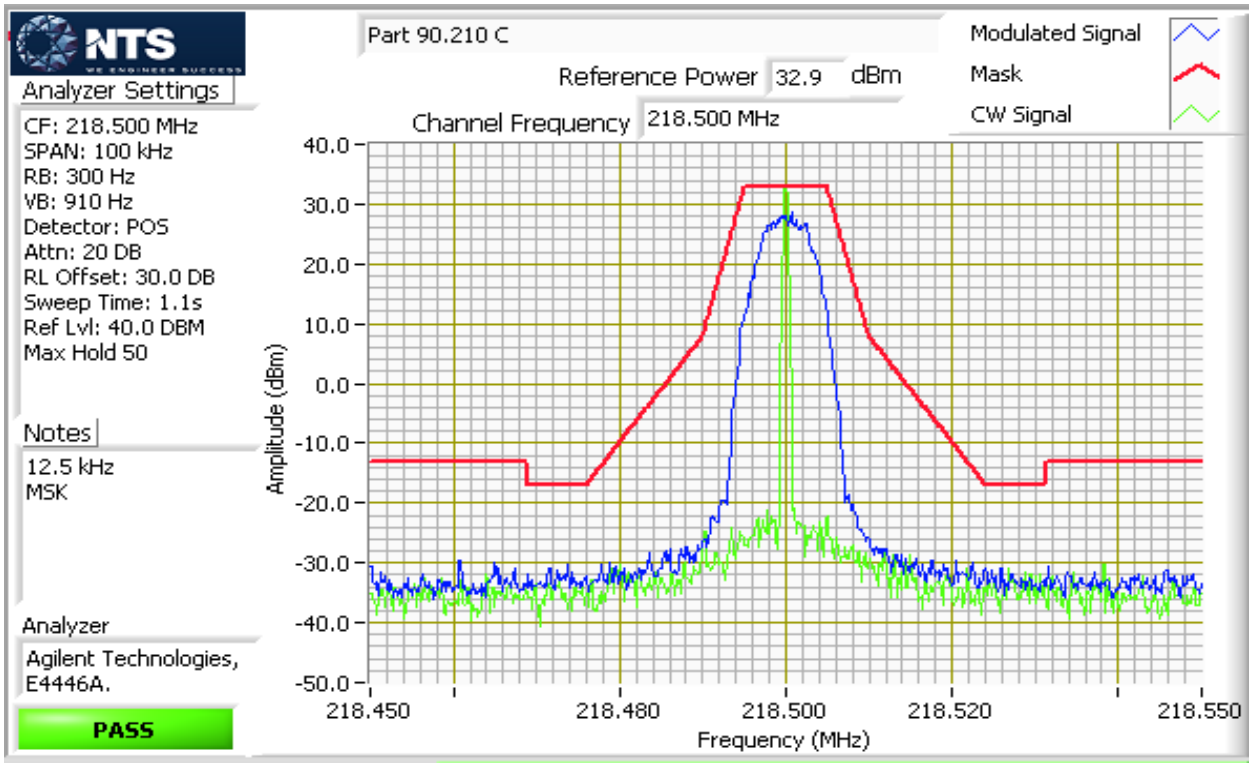
Run #2d: Spectral Mask at 220-222 MHz band. Mask F of 10x5 kHz aggregated channels.

Power setting	Data rate	Channel plan	Modulation	Frequency (MHz)	Emission mask	Result
2 Watts	36.0 kbps	10x5 kHz	MSK	221.0	F	Pass
5 Watts	58.6 kbps	10x5 kHz	QPSK	221.0	F	Pass
5 Watts	87.9 kbps	10x5 kHz	8PSK	221.0	F	Pass
5 Watts	117.2 kbps	10x5 kHz	16QAM	221.0	F	Pass
5 Watts	146.4 kbps	10x5 kHz	32QAM	221.0	F	Pass

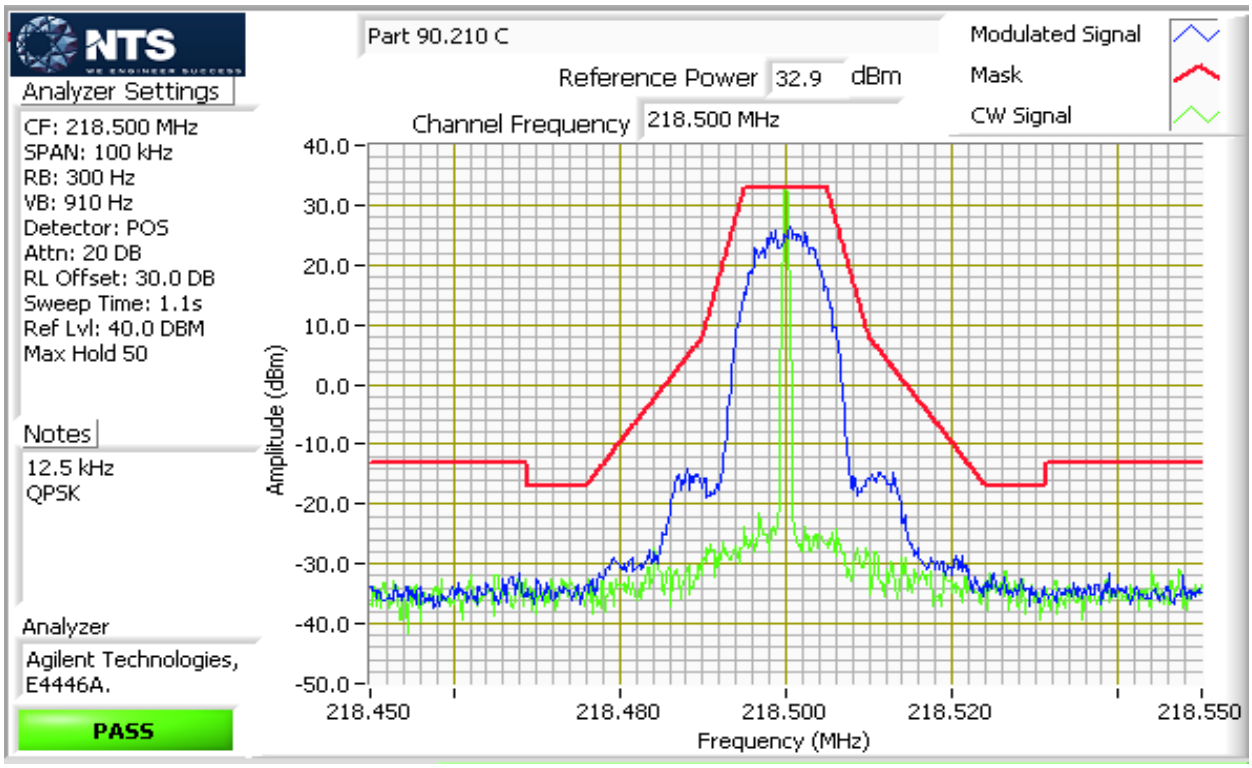
Note 1:	Power setting - the software power setting used during testing, included for reference only (Power control).
Note 2:	An unmodulated carrier power was measured to determine the reference power level for each spectral mask measurement.

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

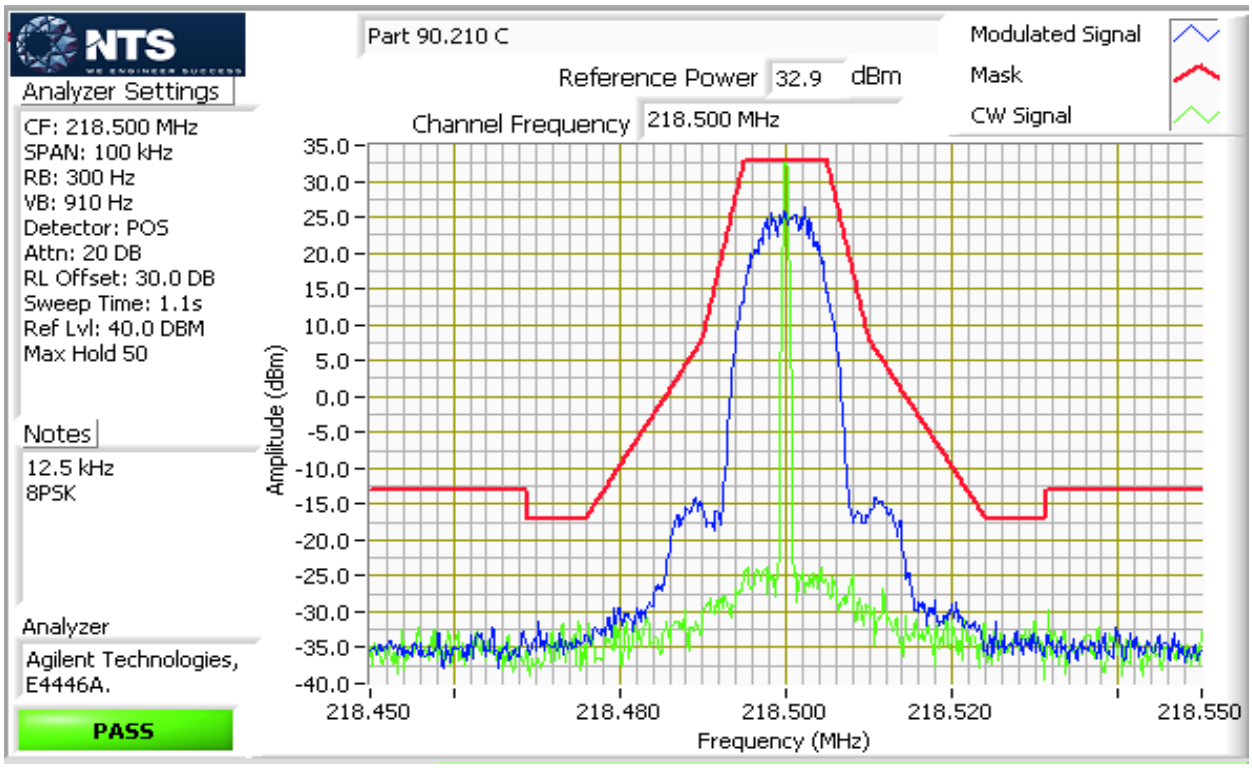
Spectral Mask at 217-220 MHz band, Mask C.



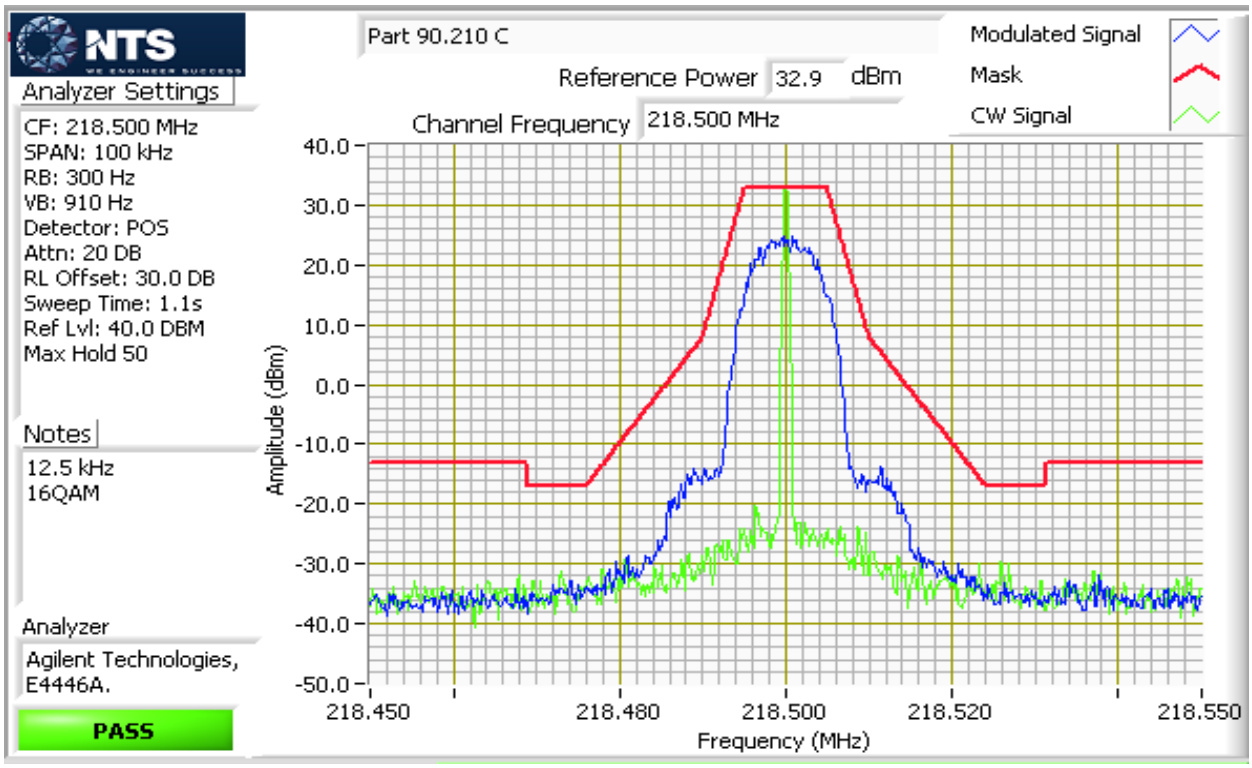
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



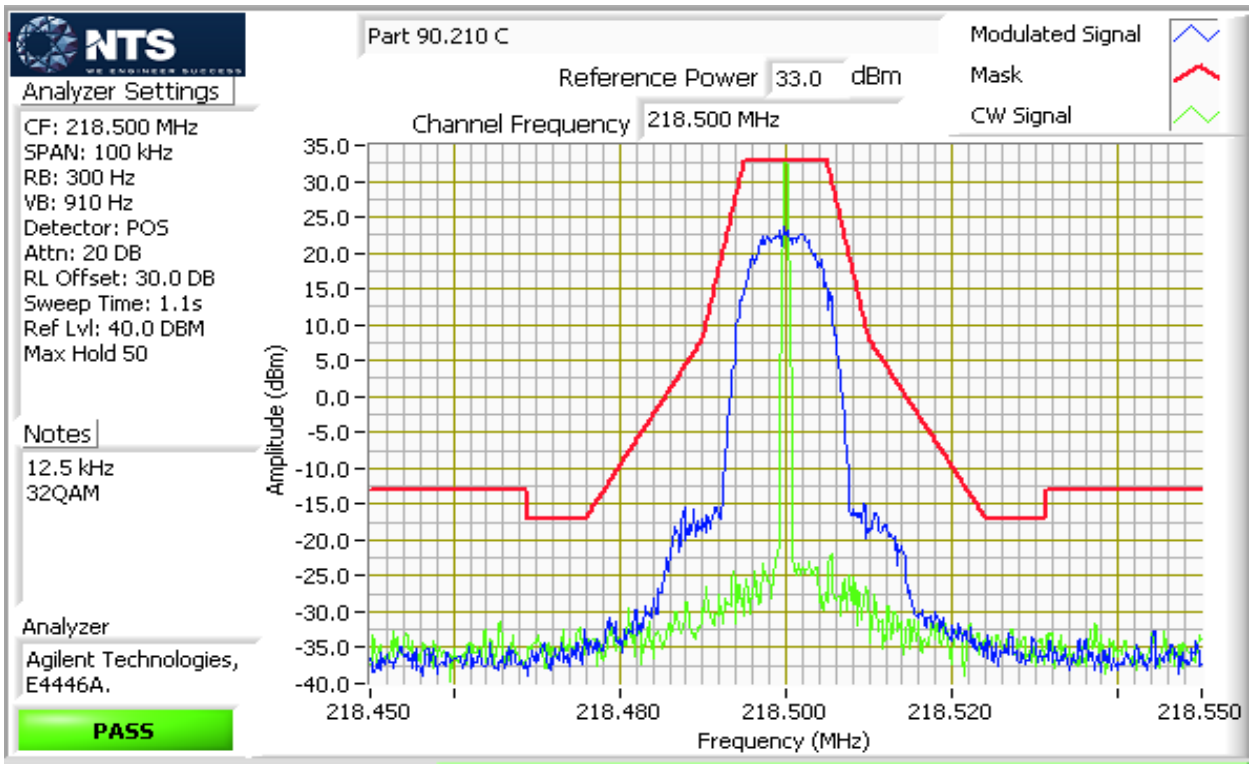
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



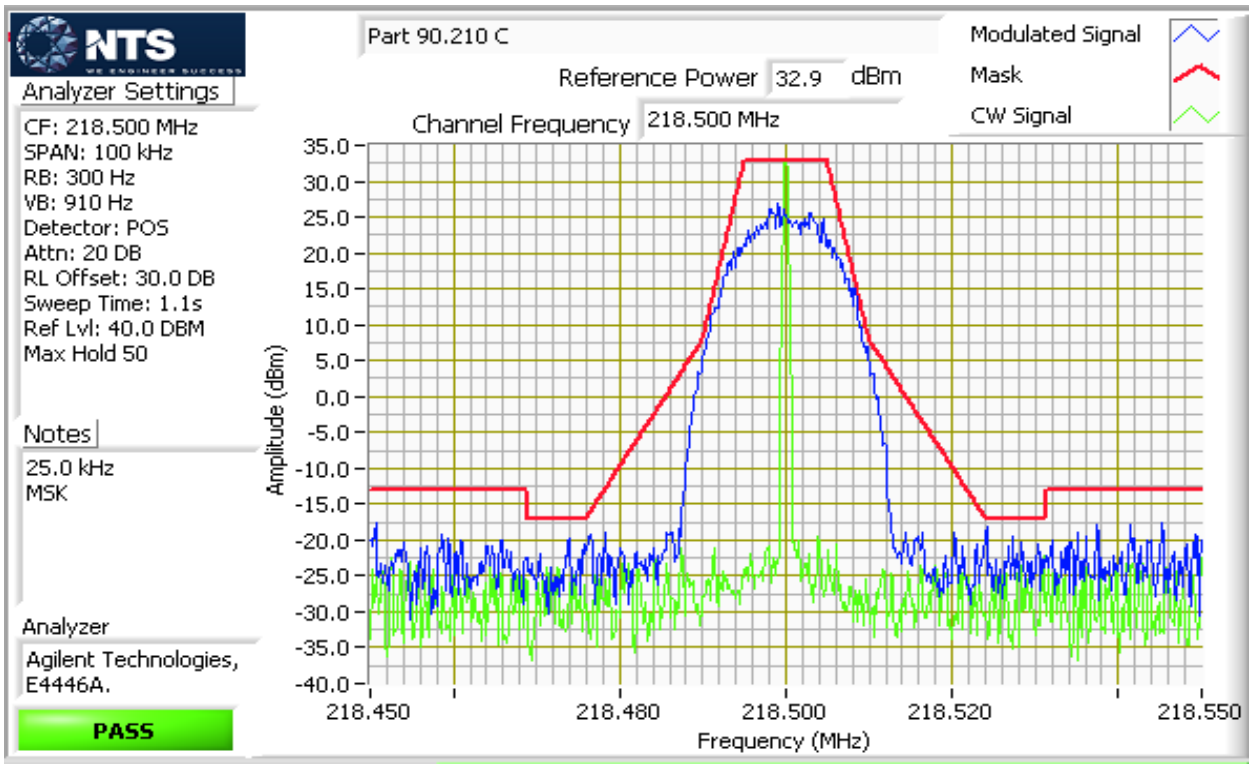
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



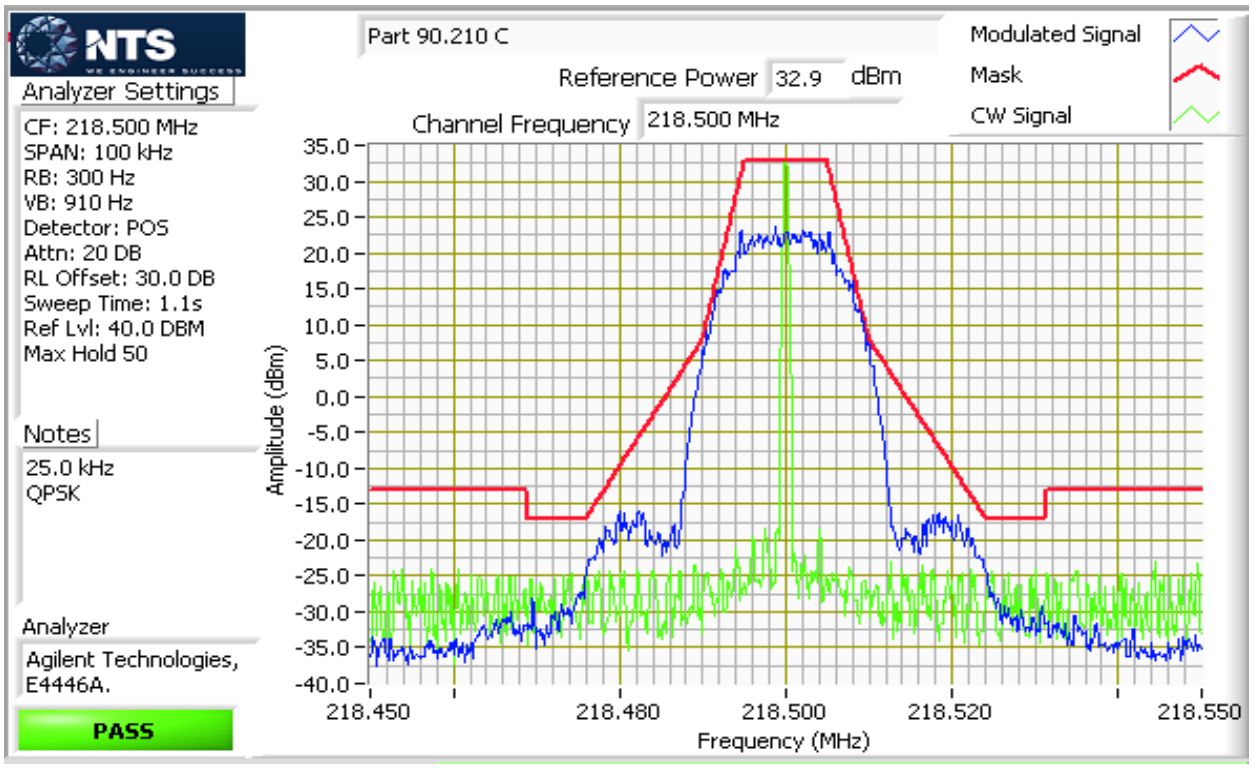
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



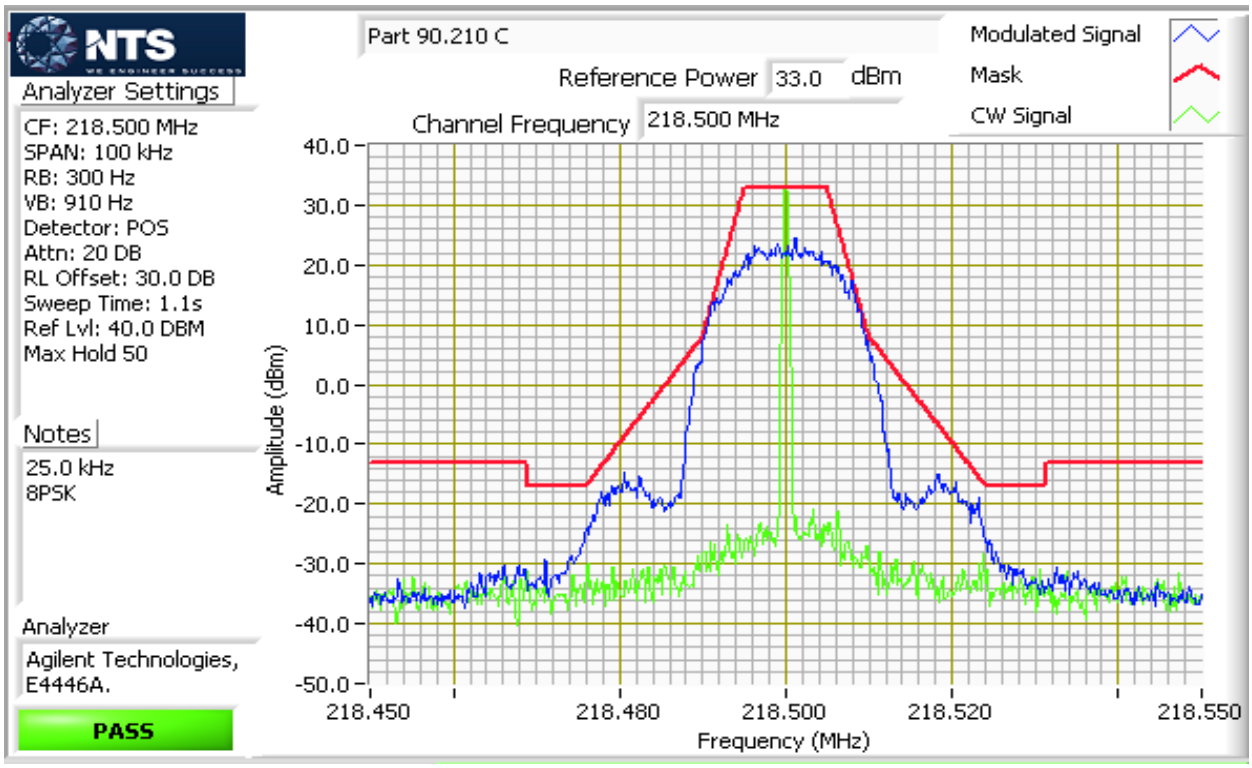
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



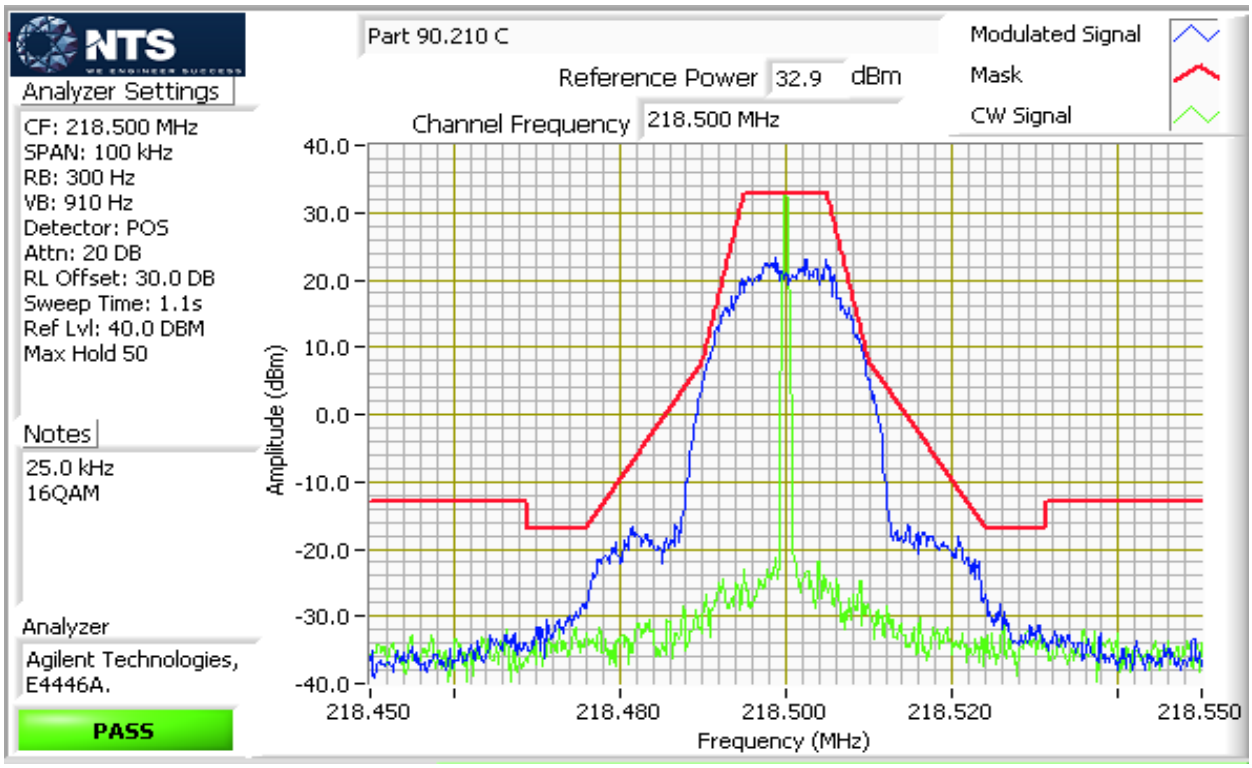
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



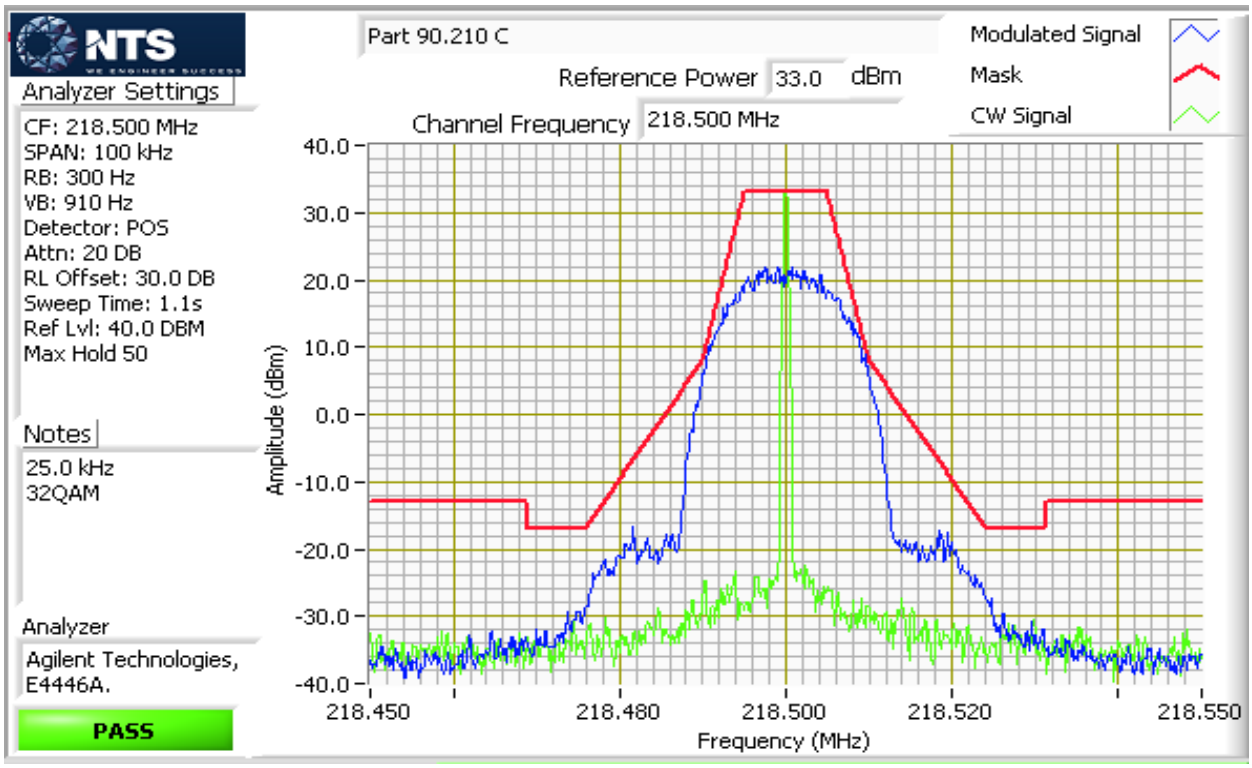
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

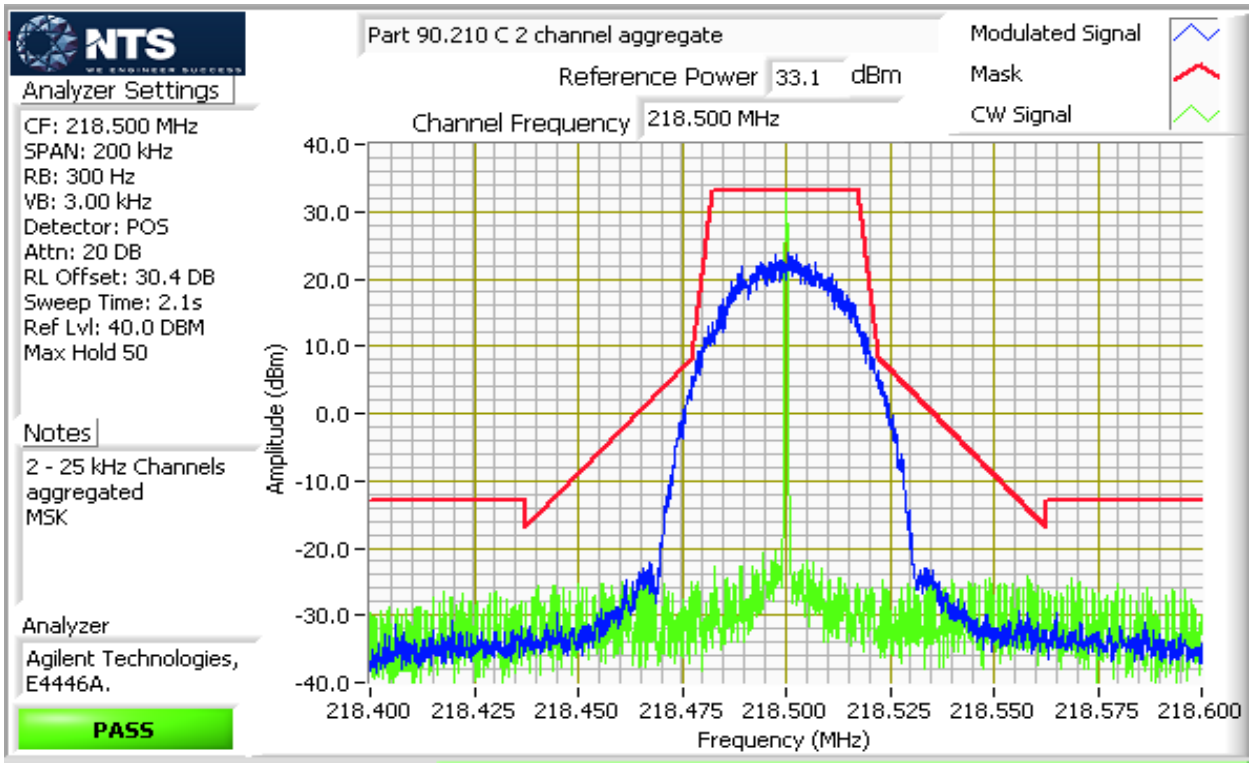


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

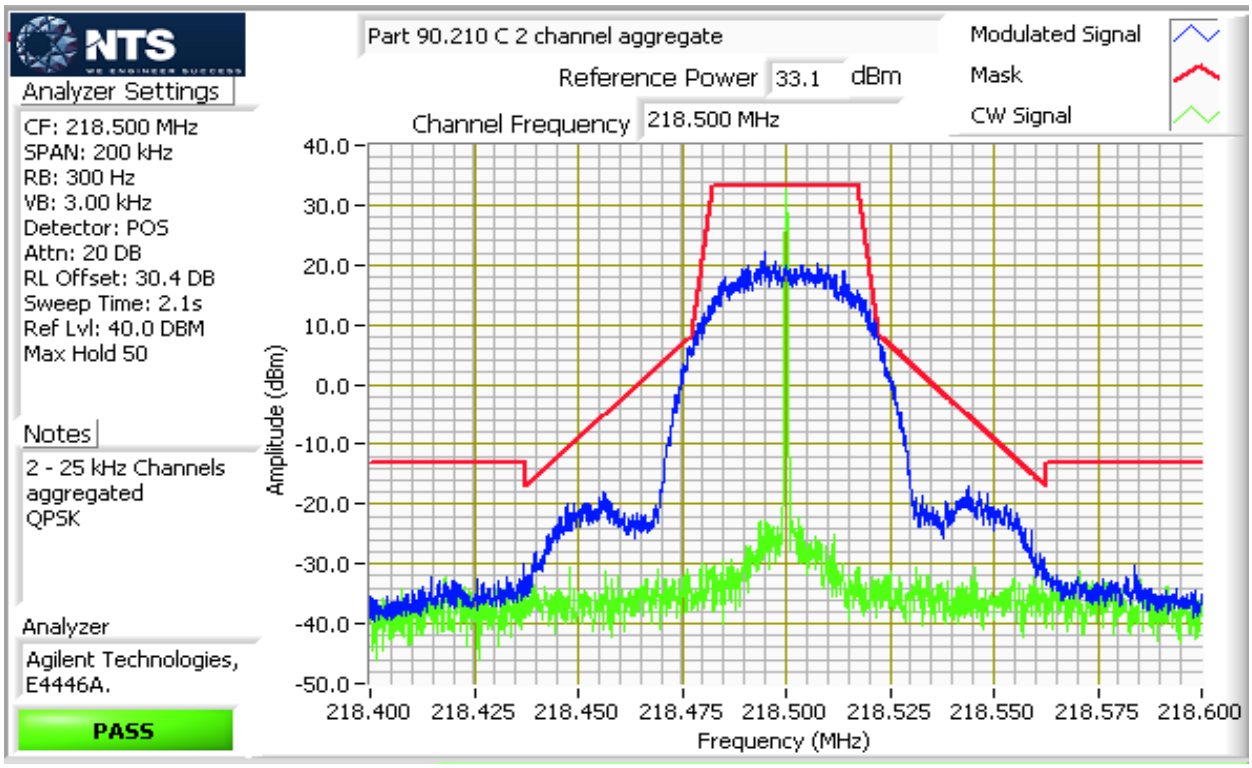


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

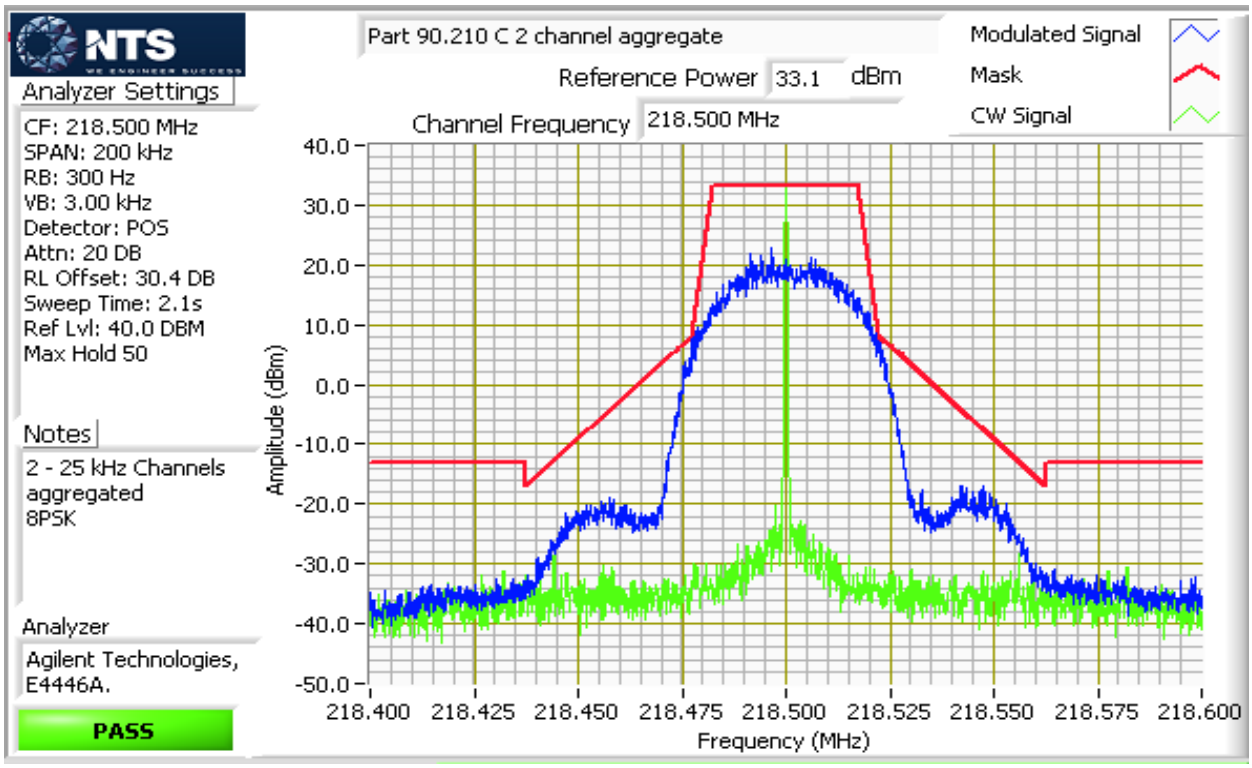
Spectral Mask at 217-220 MHz band. Mask C of 2x25 kHz aggregated channels.



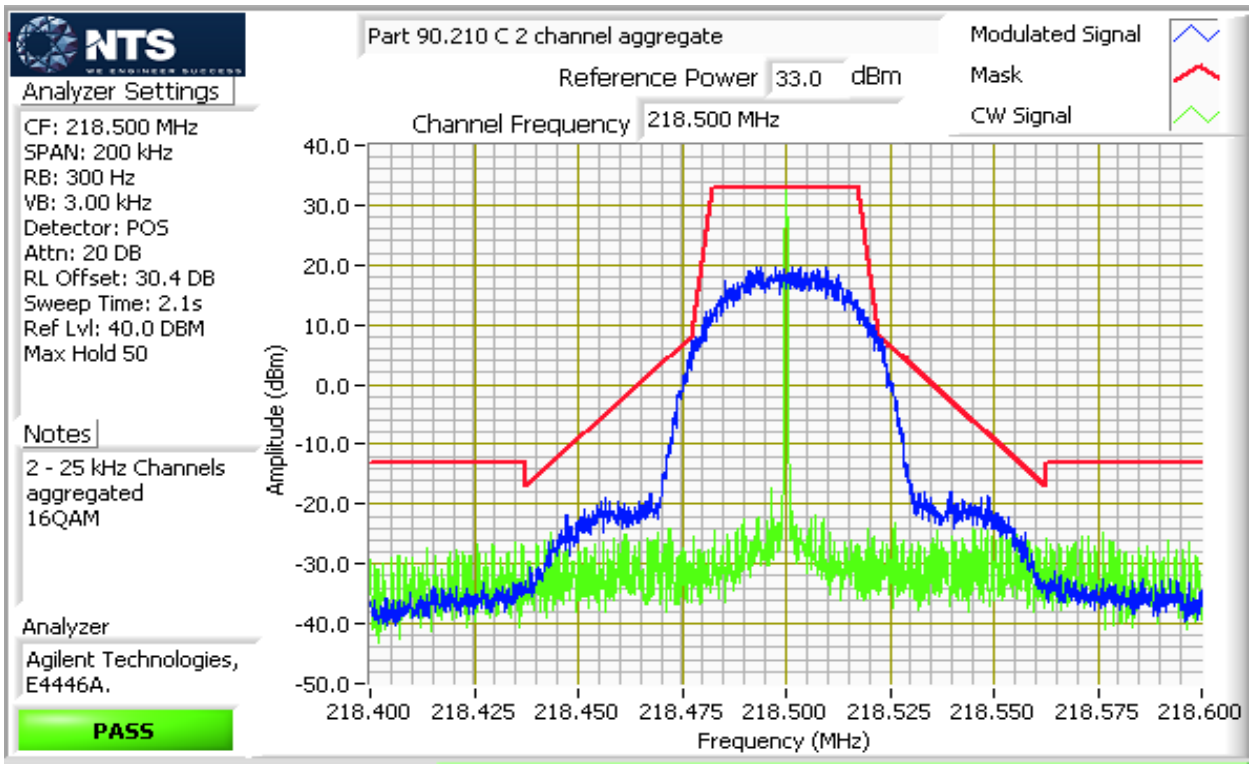
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



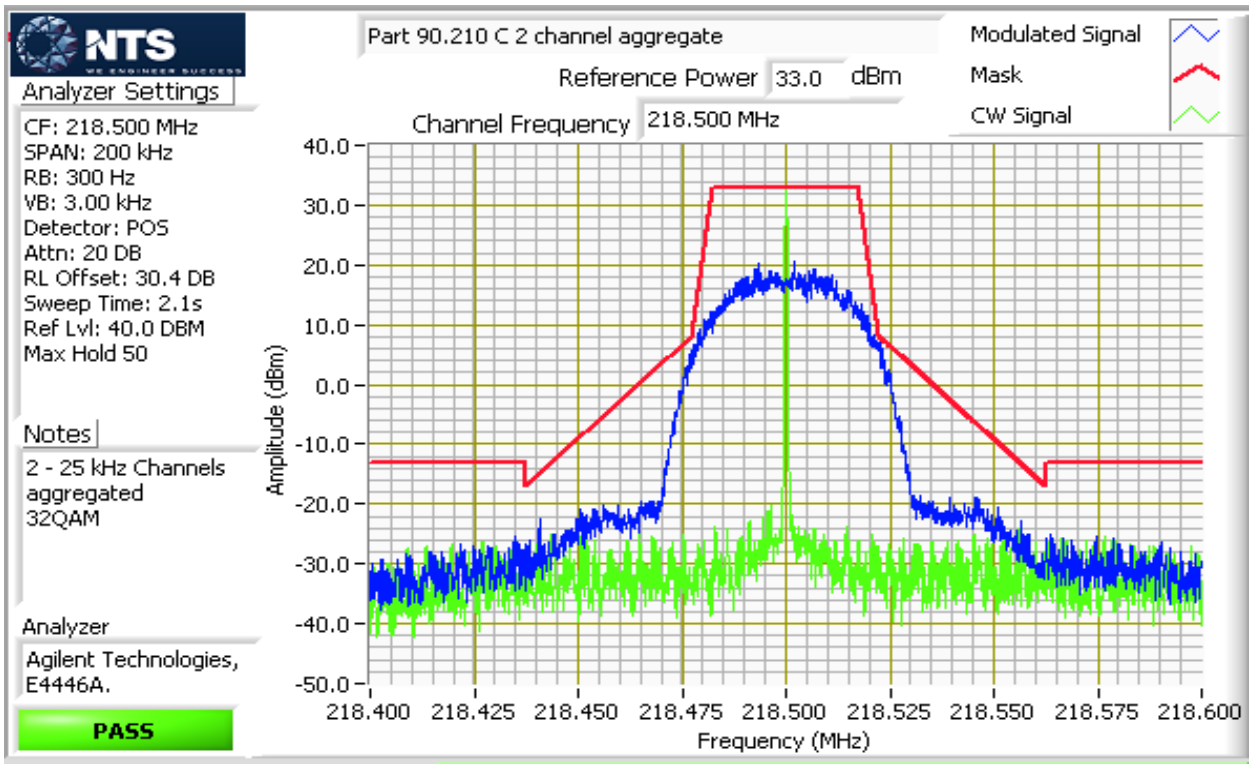
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

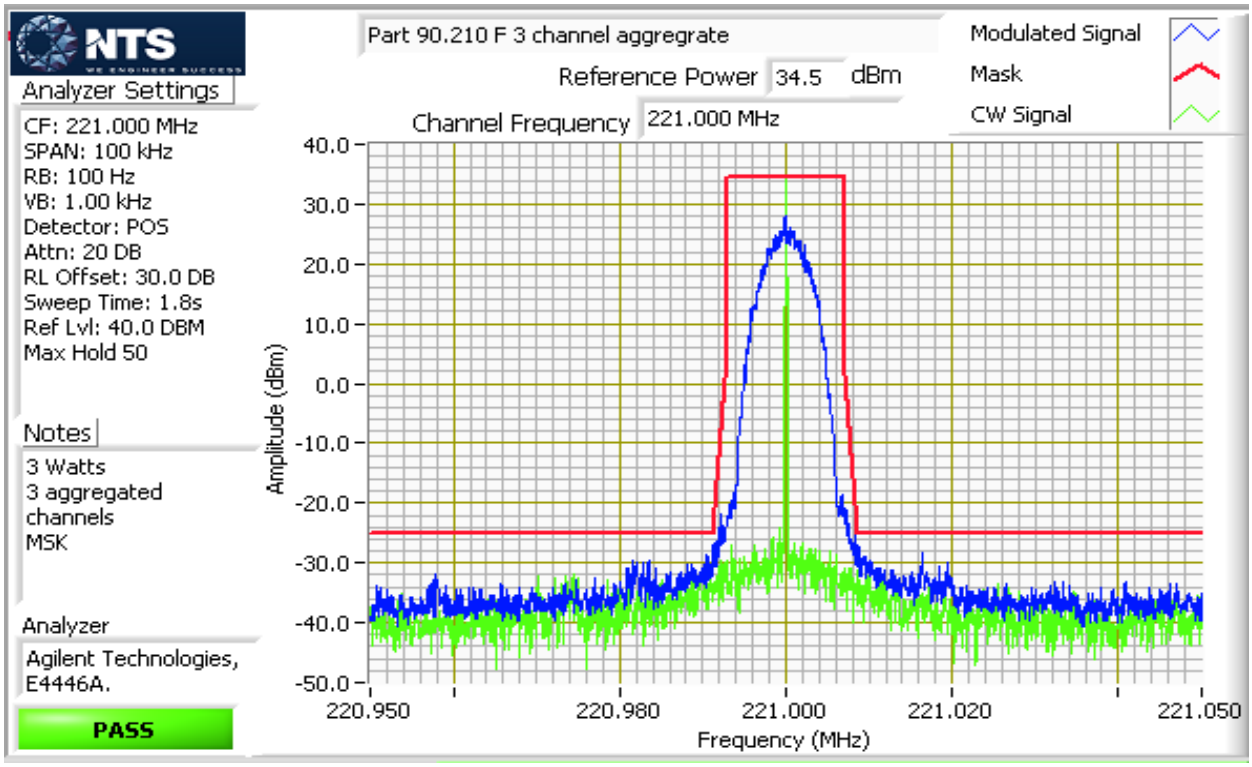


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

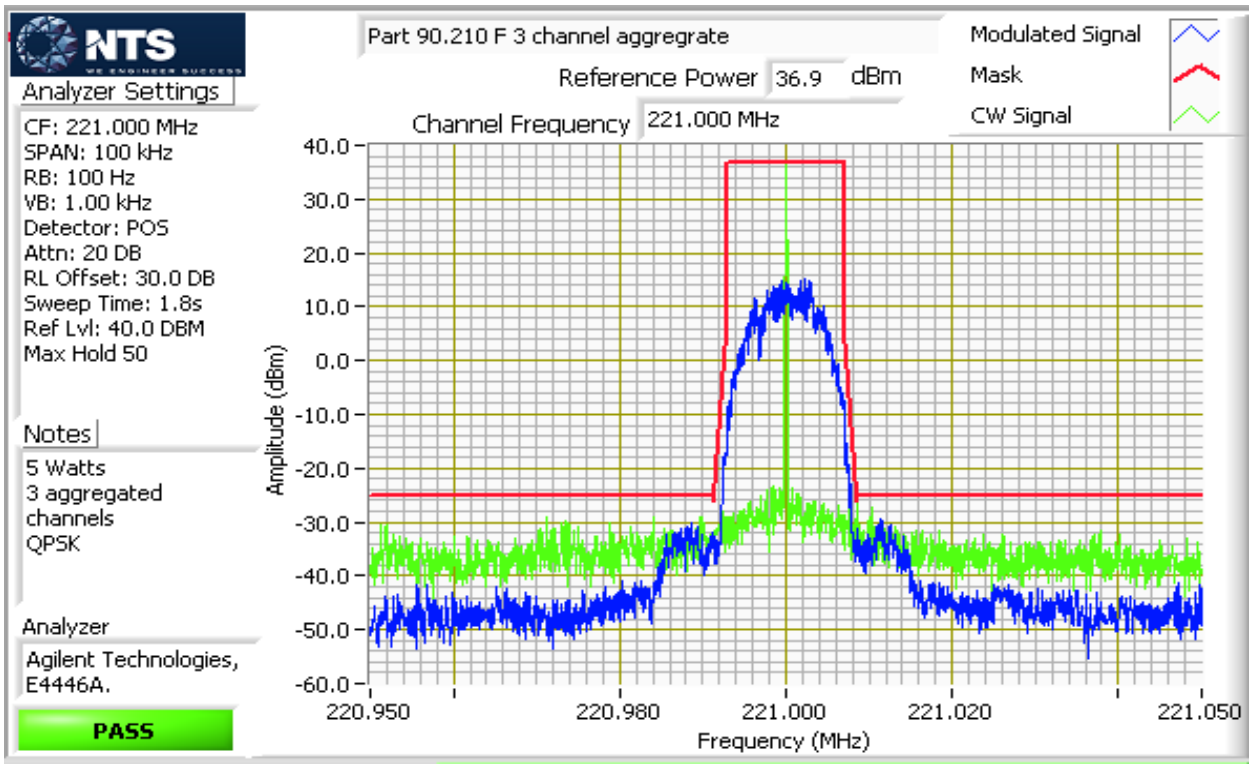


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

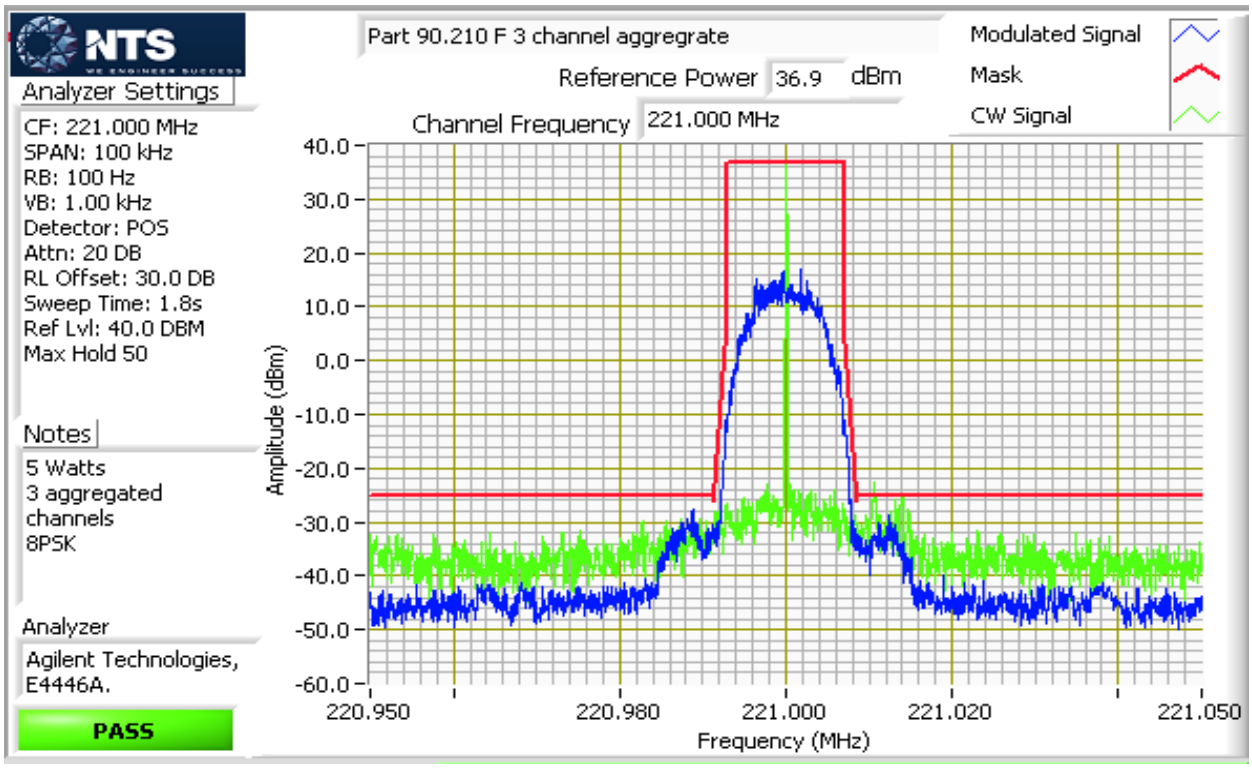
Spectral Mask at 220-222 MHz band. Mask F of 3x5 kHz aggregated channels.



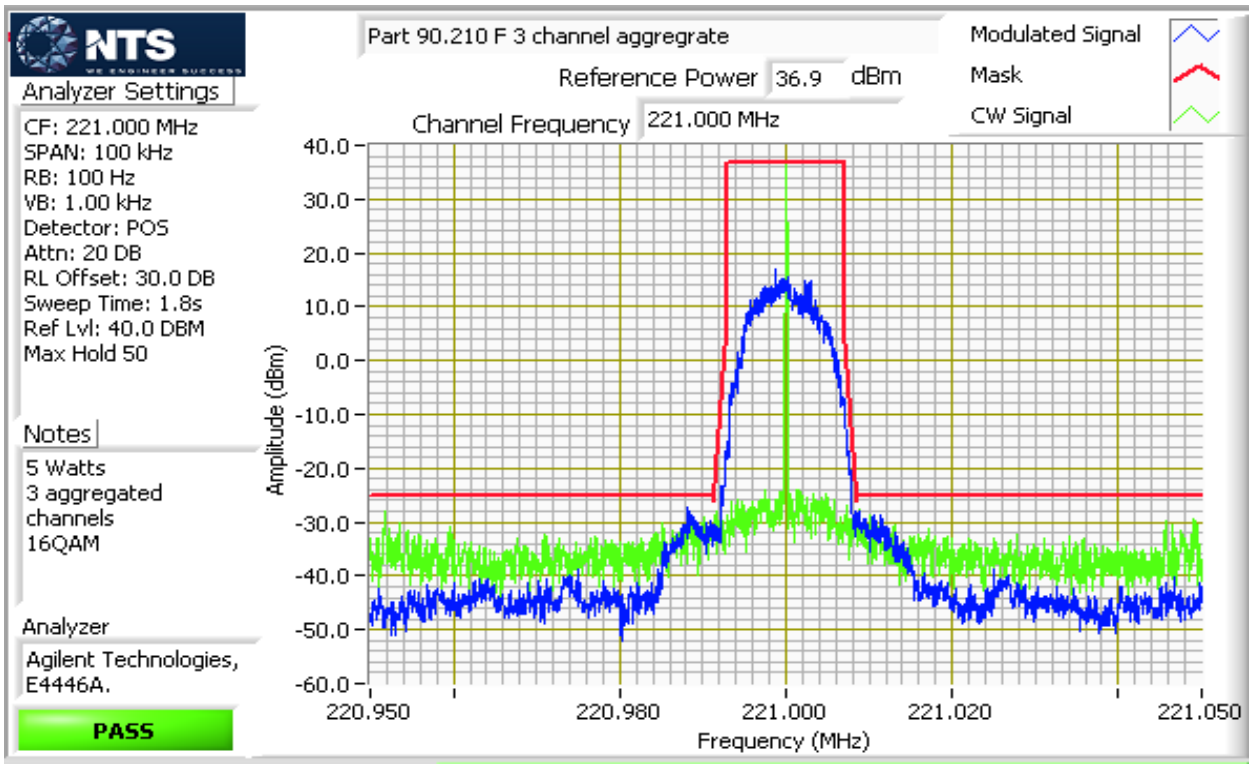
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



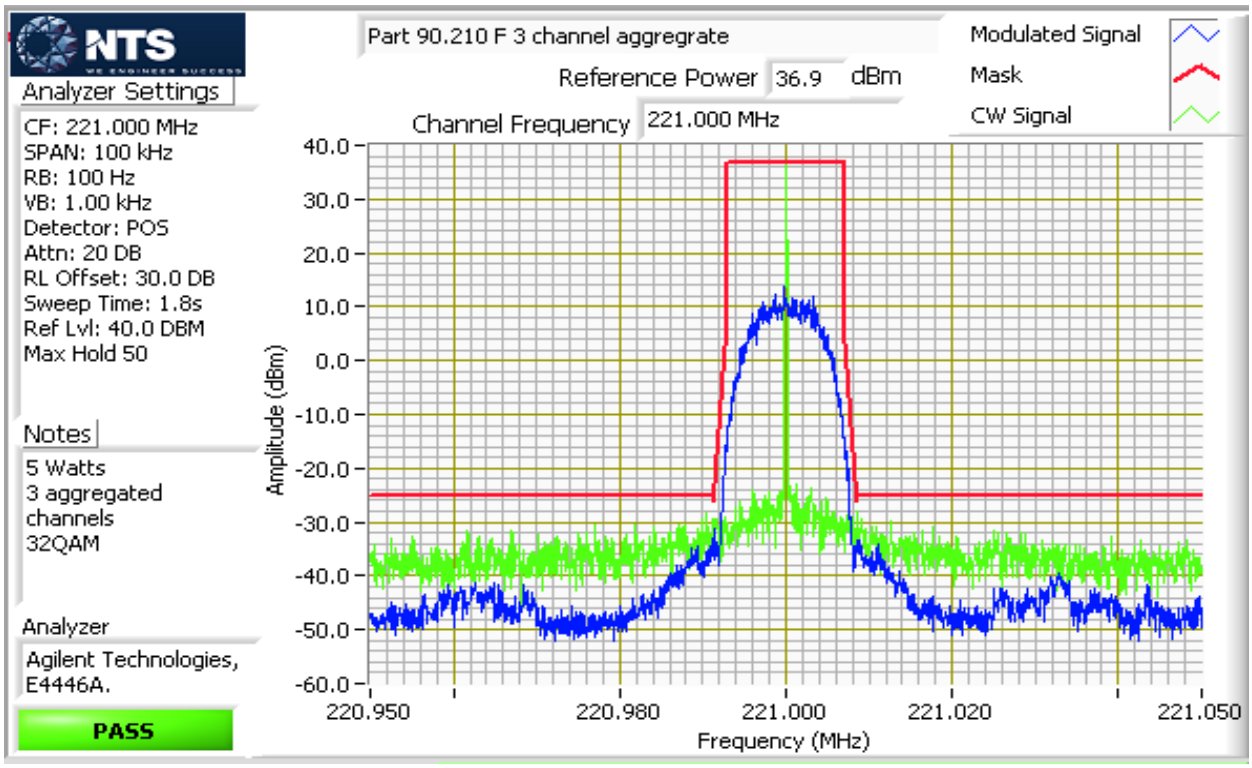
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

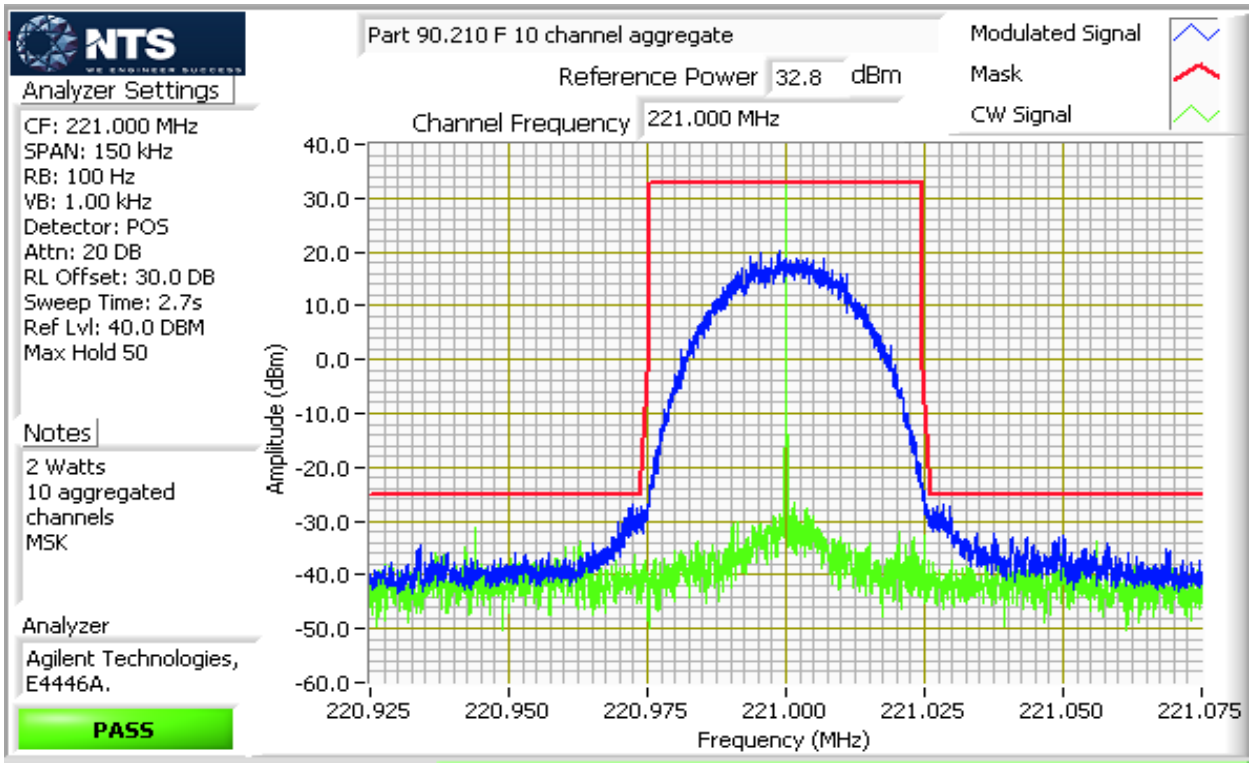


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

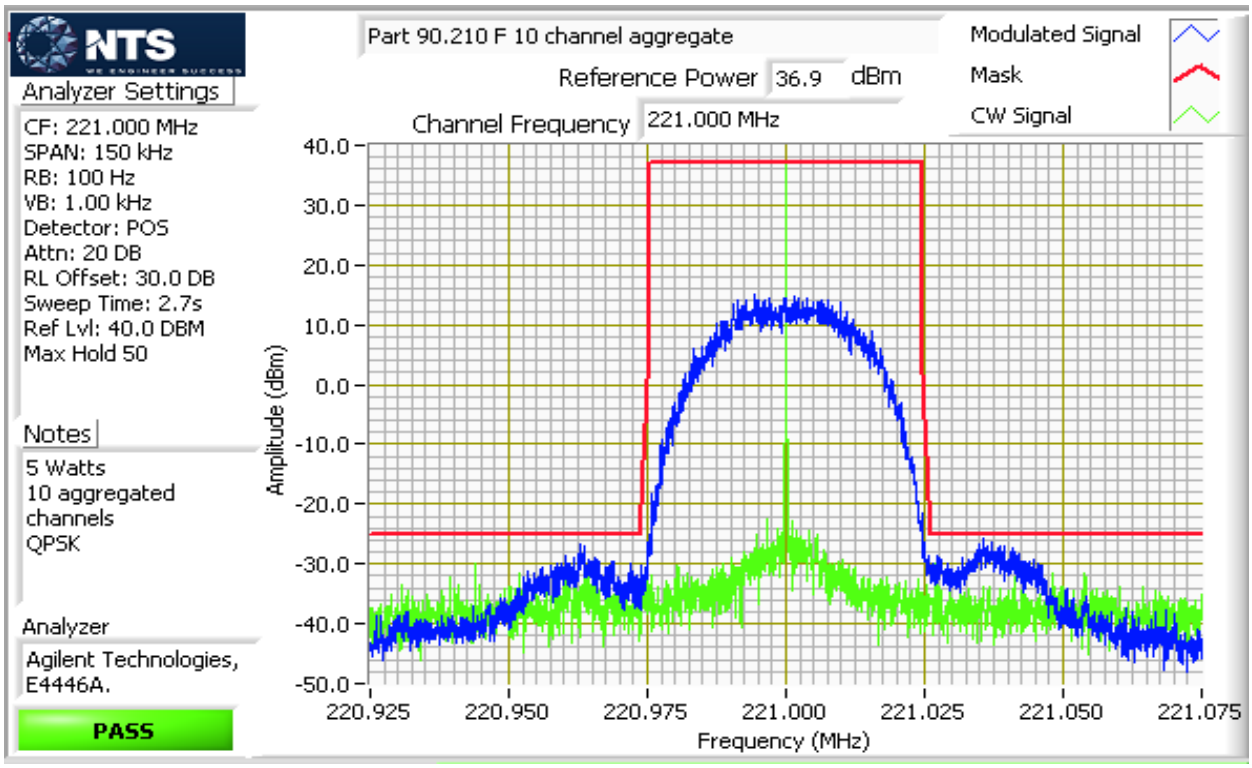


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

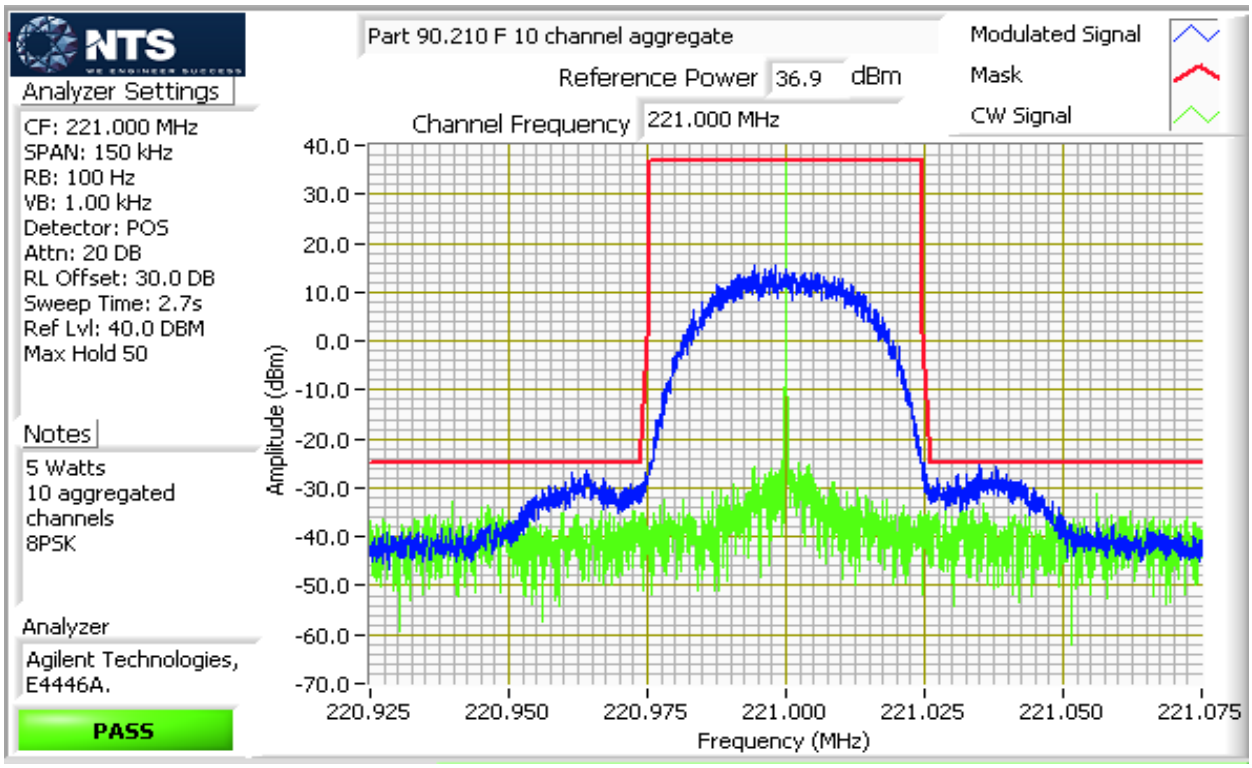
Spectral Mask at 220-222 MHz band. Mask F of 10x5 kHz aggregated channels.



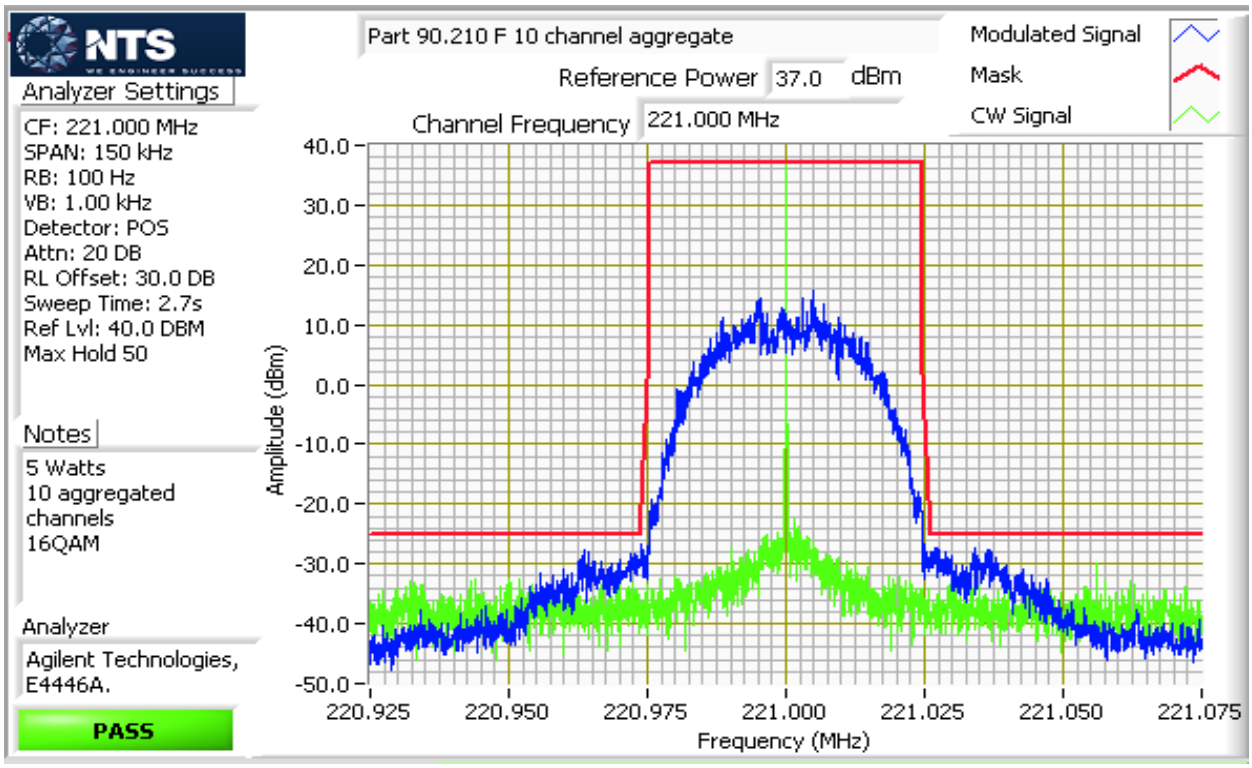
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



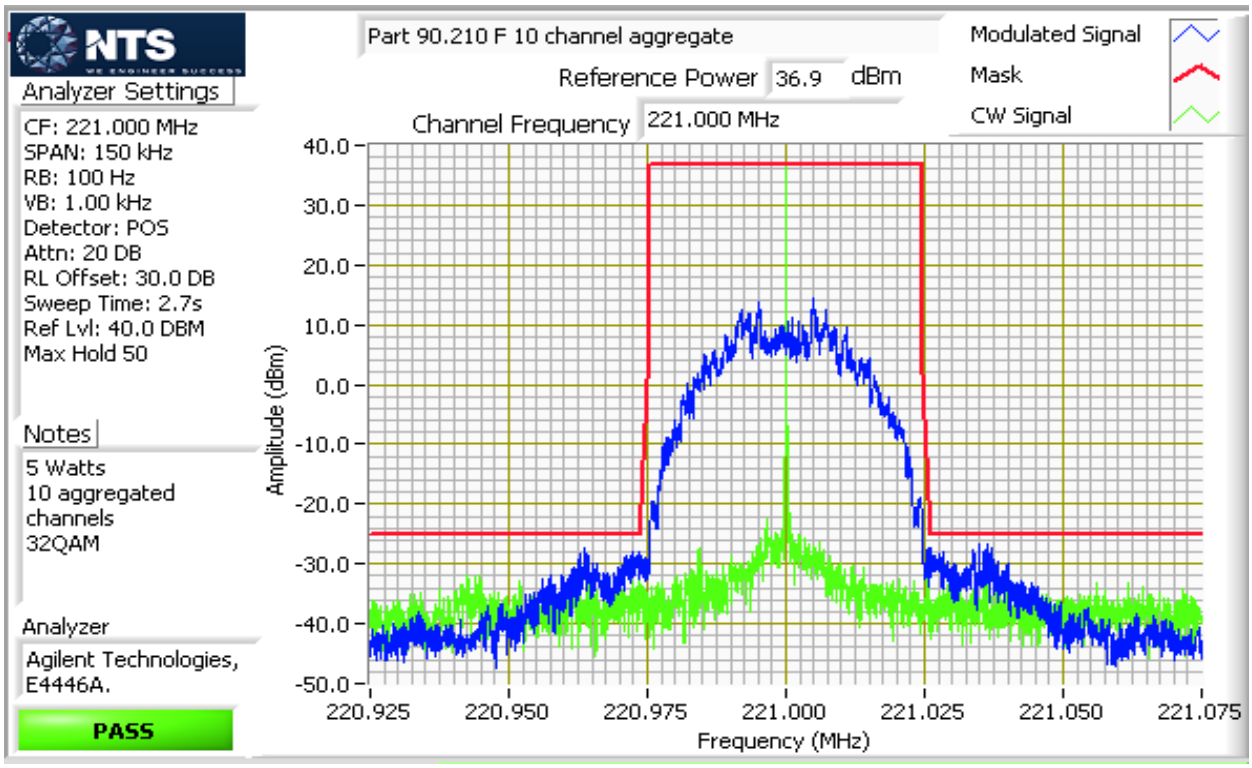
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #3: Signal Bandwidth

Run #3a: Signal Bandwidth at 217-220 MHz band

Power setting	Data rate	Channel plan	Modulation	Frequency MHz	RB (Hz)	Bandwidth (kHz) 26 dB	Bandwidth (kHz) 99%	Authorized bandwidth
3200	9.6 kbps	12.5 kHz	MSK	218.5	300		9.00	11.25 kHz
4800	17.5 kbps	12.5 kHz	QPSK	218.5	300		11.1	11.25 kHz
4800	26.2 kbps	12.5 kHz	8PSK	218.5	300		10.8	11.25 kHz
4800	36.1 kbps	12.5 kHz	16QAM	218.5	300		11.1	11.25 kHz
4800	45.1 kbps	12.5 kHz	32QAM	218.5	300		11.1	11.25 kHz
3200	18.1 kbps	25.0 kHz	MSK	218.5	300		16.80	20 kHz
4700	29.5 kbps	25.0 kHz	QPSK	218.5	300		18.00	20 kHz
4700	44.2 kbps	25.0 kHz	8PSK	218.5	300		18.50	20 kHz
4700	58.9 kbps	25.0 kHz	16QAM	218.5	300		18.30	20 kHz
4700	75.6 kbps	25.0 kHz	32QAM	218.5	300		18.80	20 kHz

Run #3b:Signal Bandwidth at 217-220 MHz band. 2x25 kHz aggregated channels.

Power setting	Data rate	Channel plan	Modulation	Frequency MHz	RB (Hz)	Bandwidth (kHz) 26 dB	Bandwidth (kHz) 99%	Authorized bandwidth
3150	43.4 kbps	2x25 kHz	MSK	218.5	510		40.70	45 kHz
4500	72.0 kbps	2x25 kHz	QPSK	218.5	510		44.50	45 kHz
4500	104.9 kbps	2x25 kHz	8PSK	218.5	510		43.30	45 kHz
4600	143.9 kbps	2x25 kHz	16QAM	218.5	510		44.50	45 kHz
4700	179.9 kbps	2x25 kHz	32QAM	218.5	510		44.10	45 kHz

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #3c: Signal Bandwidth at 220-222 MHz band. 3x5 kHz aggregated channels.

Power setting	Data rate	Channel plan	Modulation	Frequency MHz	RB (Hz)	Bandwidth (kHz) 26 dB	Bandwidth (kHz) 99%	Authorized bandwidth
3 Watts	8.75 kbps	3x5 kHz	MSK	221.0	200		7.90	14 kHz
5 Watts	18.7 kbps	3x5 kHz	QPSK	221.0	200		11.4	14 kHz
5 Watts	28.0 kbps	3x5 kHz	8PSK	221.0	200		11.4	14 kHz
5 Watts	37.3 kbps	3x5 kHz	16QAM	221.0	200		11.7	14 kHz
5 Watts	46.6 kbps	3x5 kHz	32QAM	221.0	200		11.4	14 kHz

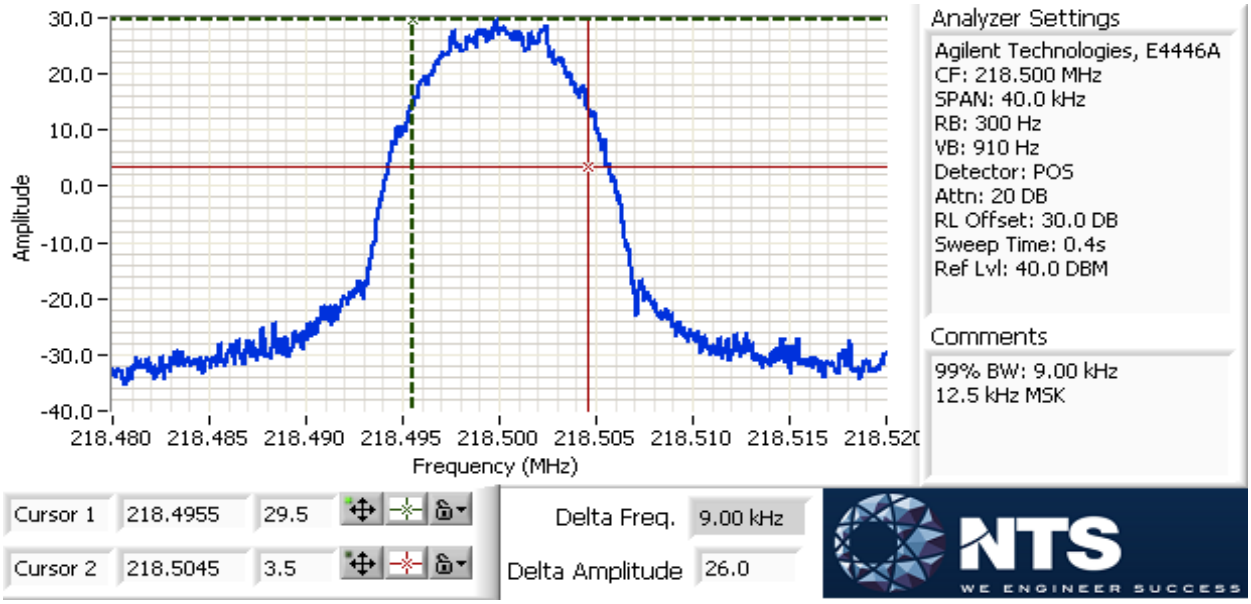
Run #3d: Signal Bandwidth at 220-222 MHz band. 10x5 kHz aggregated channels.

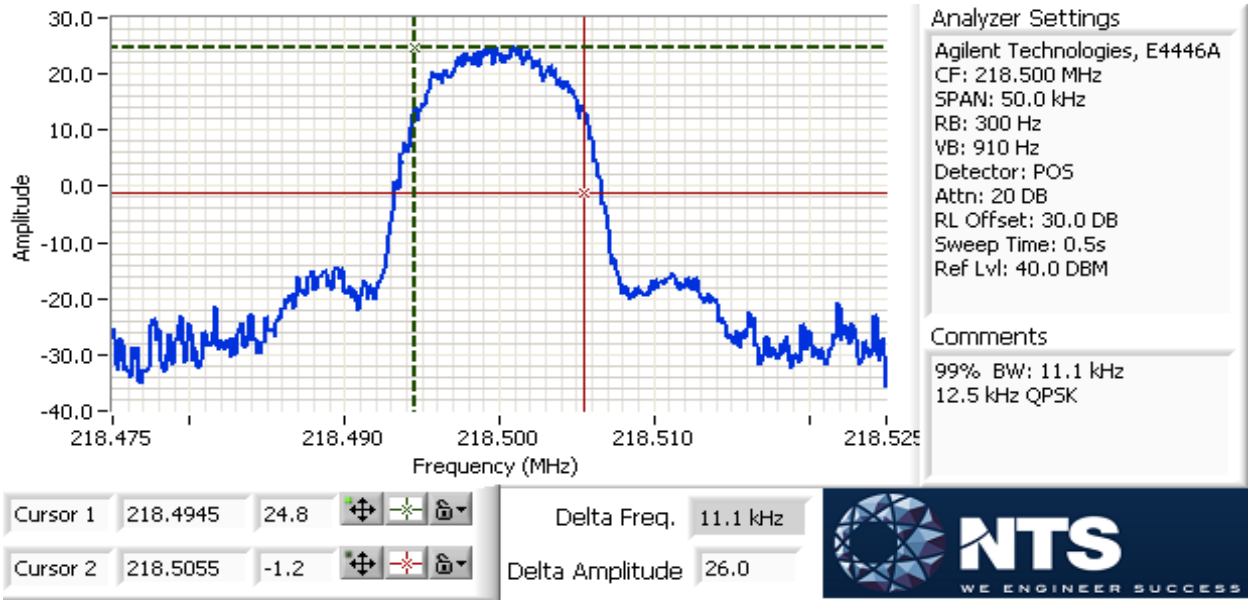
Power setting	Data rate	Channel plan	Modulation	Frequency MHz	RB (Hz)	Bandwidth (kHz) 26 dB	Bandwidth (kHz) 99%	Authorized bandwidth
2 Watts	36.0 kbps	10x5 kHz	MSK	221.0	390		32.9	49 kHz
5 Watts	58.6 kbps	10x5 kHz	QPSK	221.0	390		35.9	49 kHz
5 Watts	87.9 kbps	10x5 kHz	8PSK	221.0	390		35.6	49 kHz
5 Watts	117.2 kb	10x5 kHz	16QAM	221.0	390		35.5	49 kHz
5 Watts	146.4 kb	10x5 kHz	32QAM	221.0	390		35.9	49 kHz

Note 1:	99% bandwidth measured in accordance with ANSI C63.10 and RSS GEN, with RBW 1% to 5% of the OBW and VBW ≥ 3xRBW

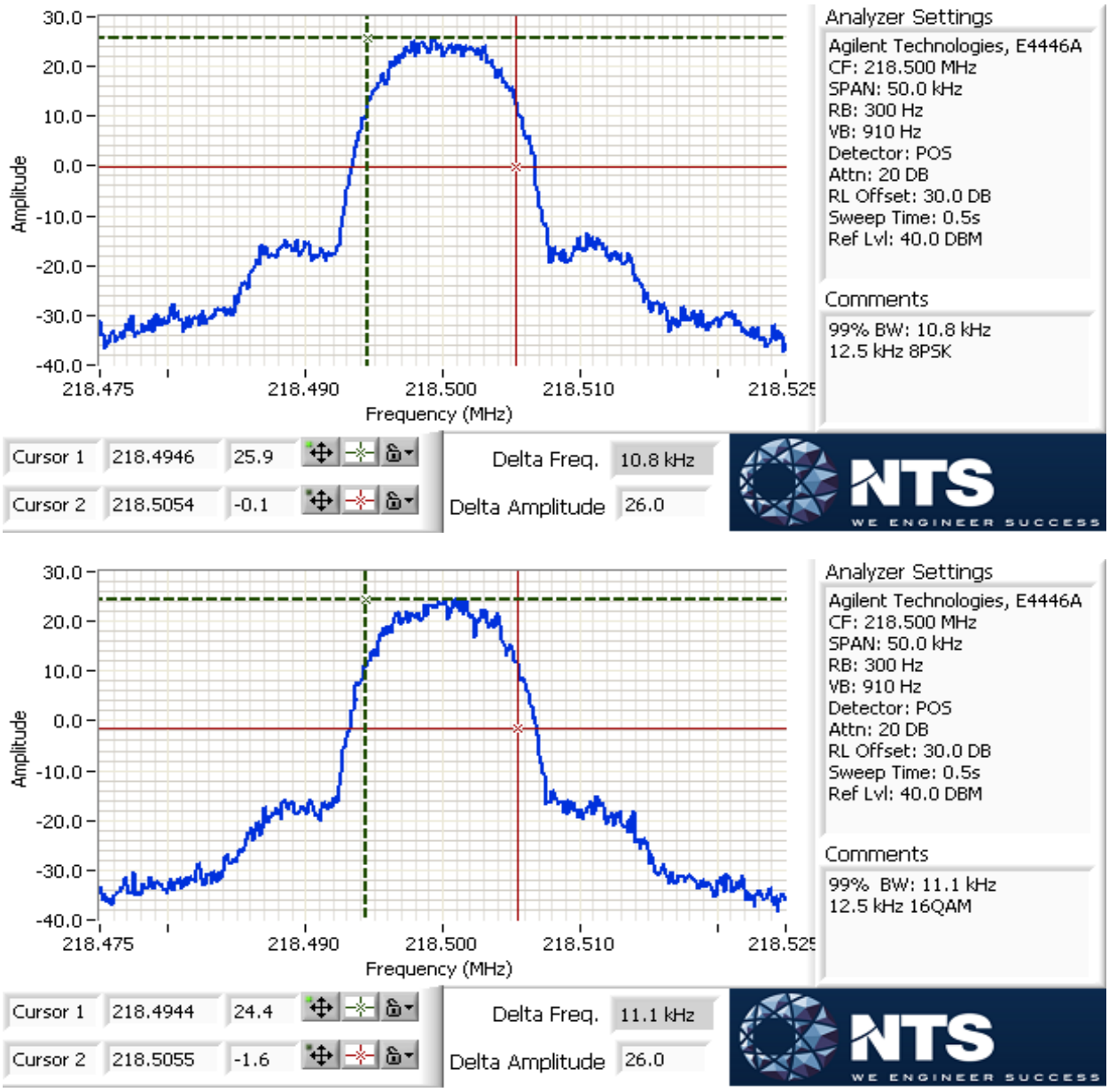
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Signal Bandwidth at 217-220 MHz band. 12.5 kHz and 25 kHz channels.

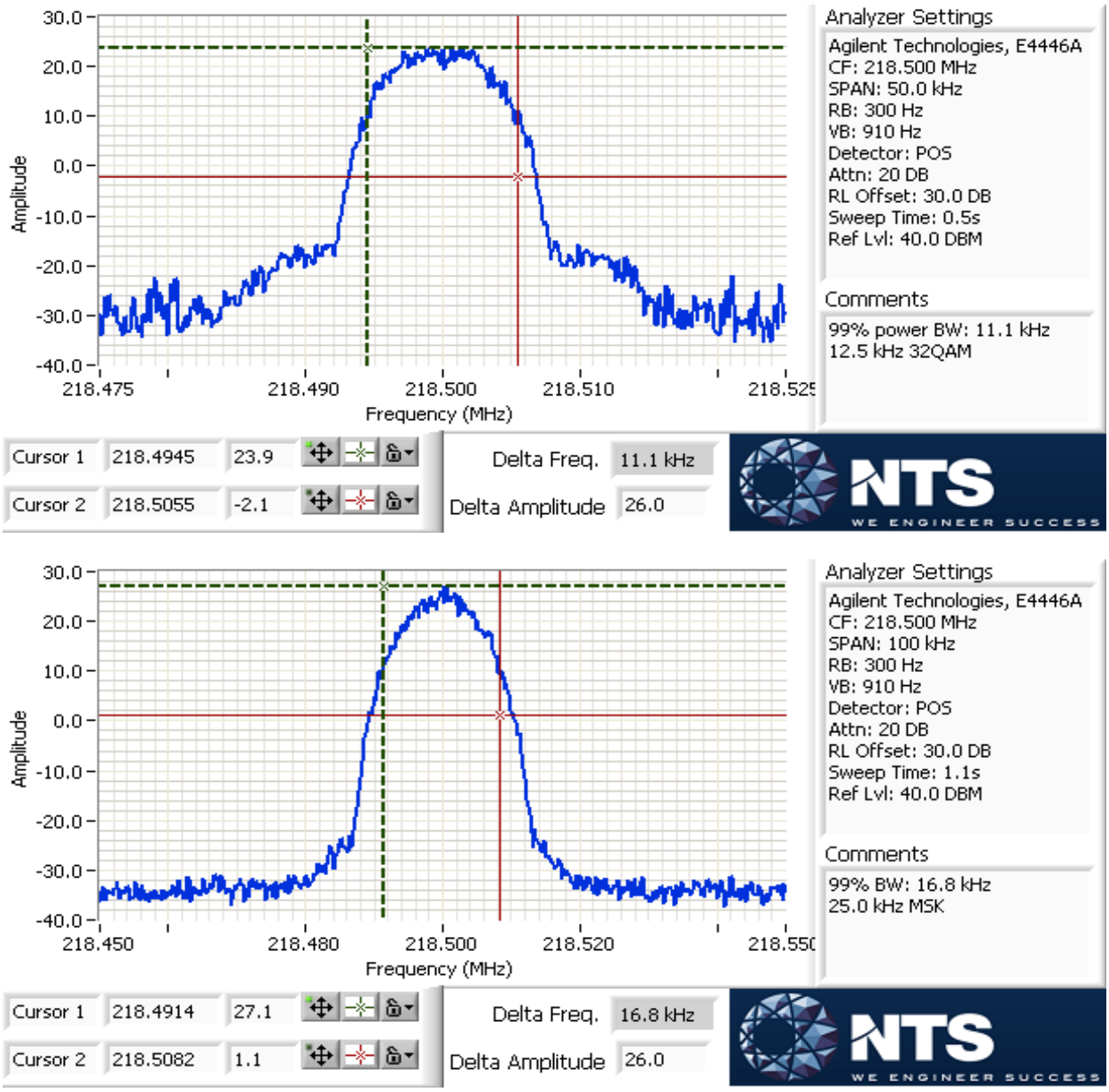




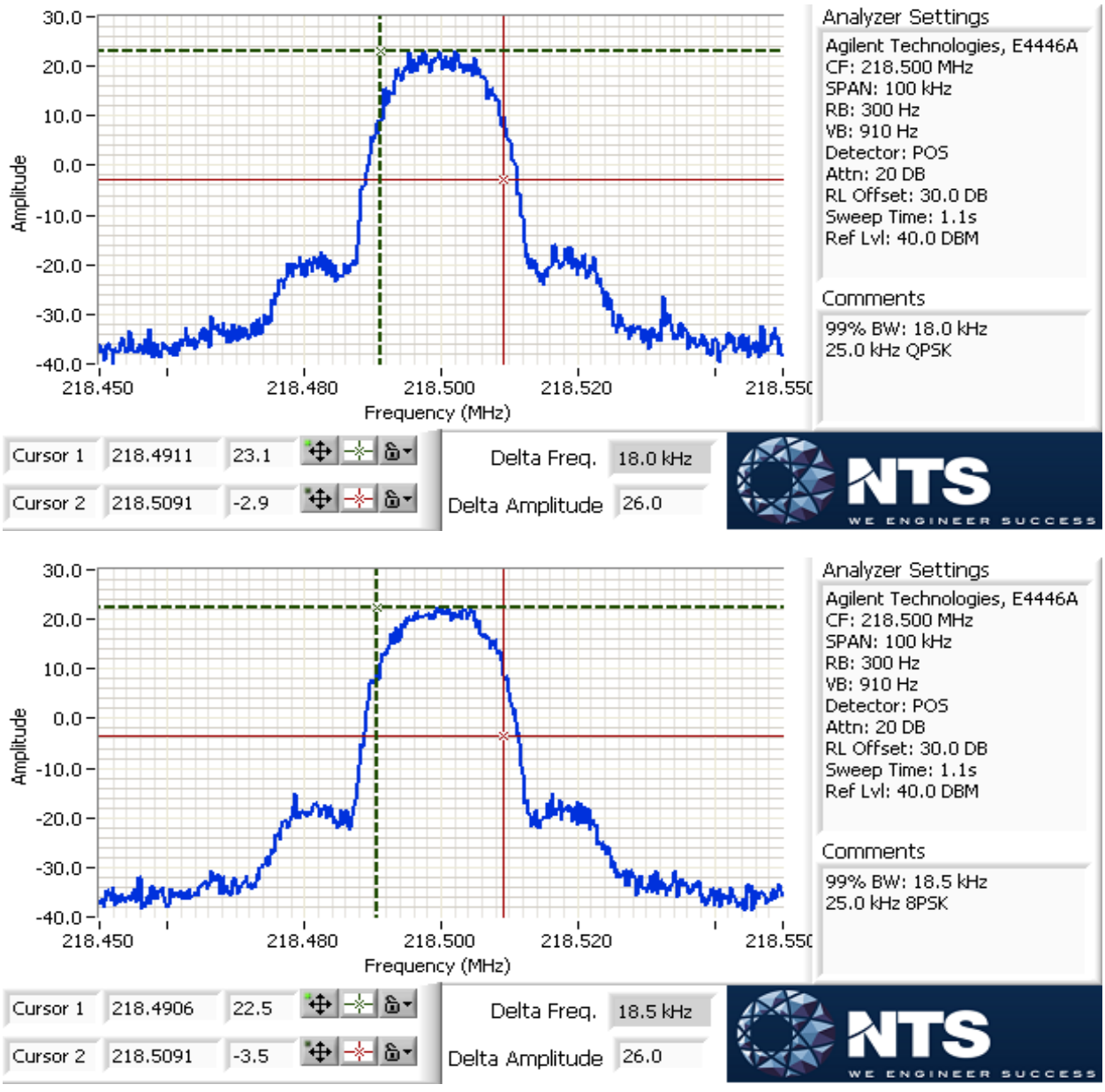
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



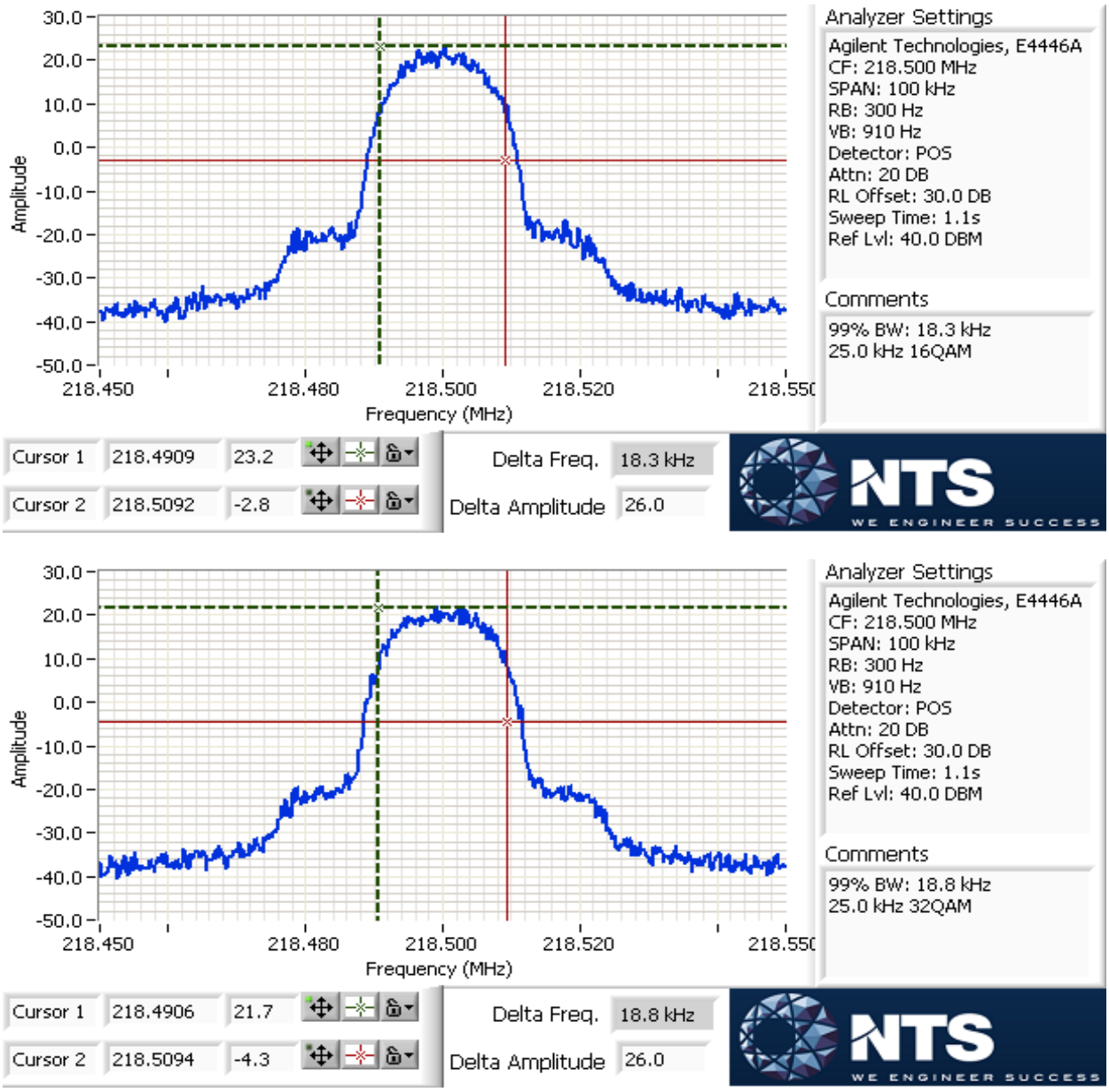
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

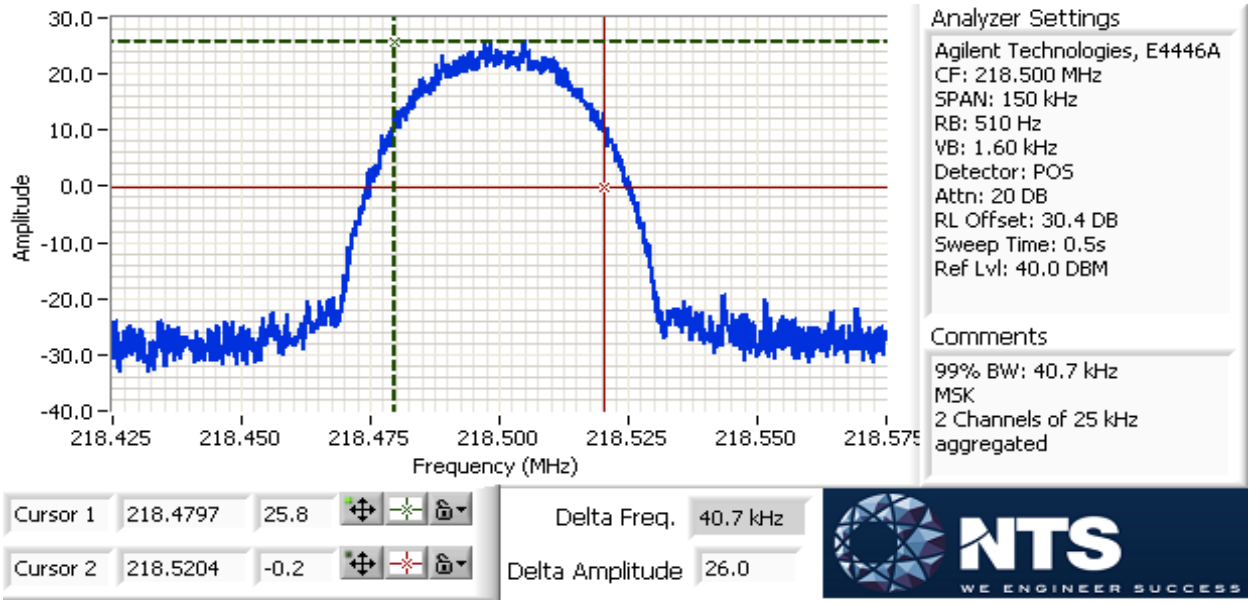


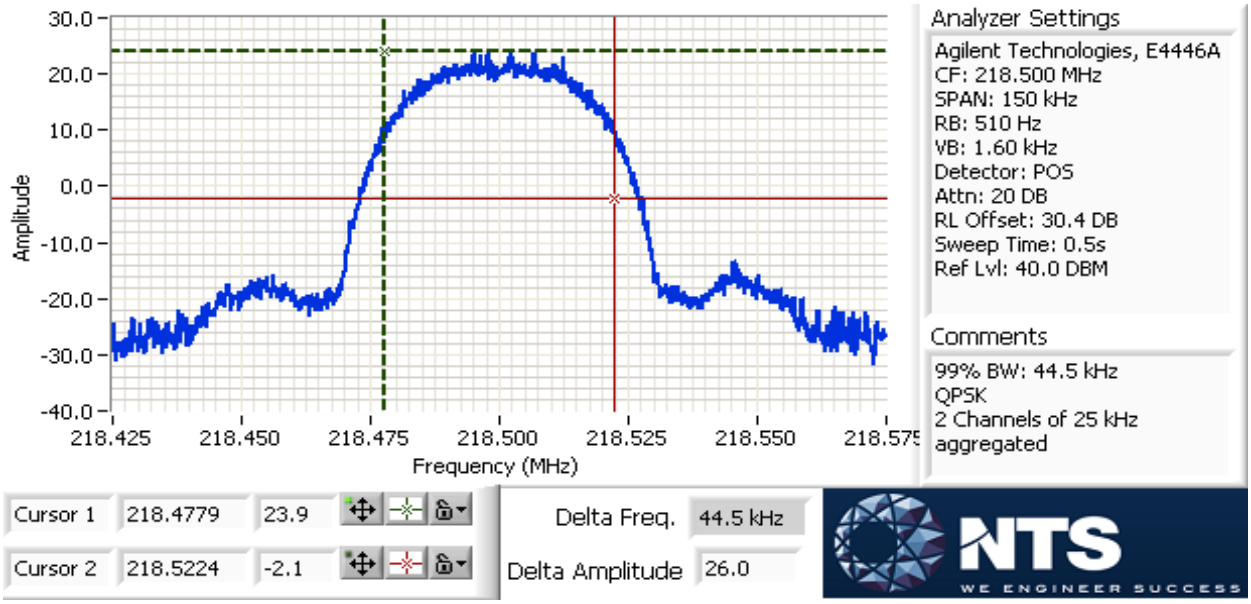
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



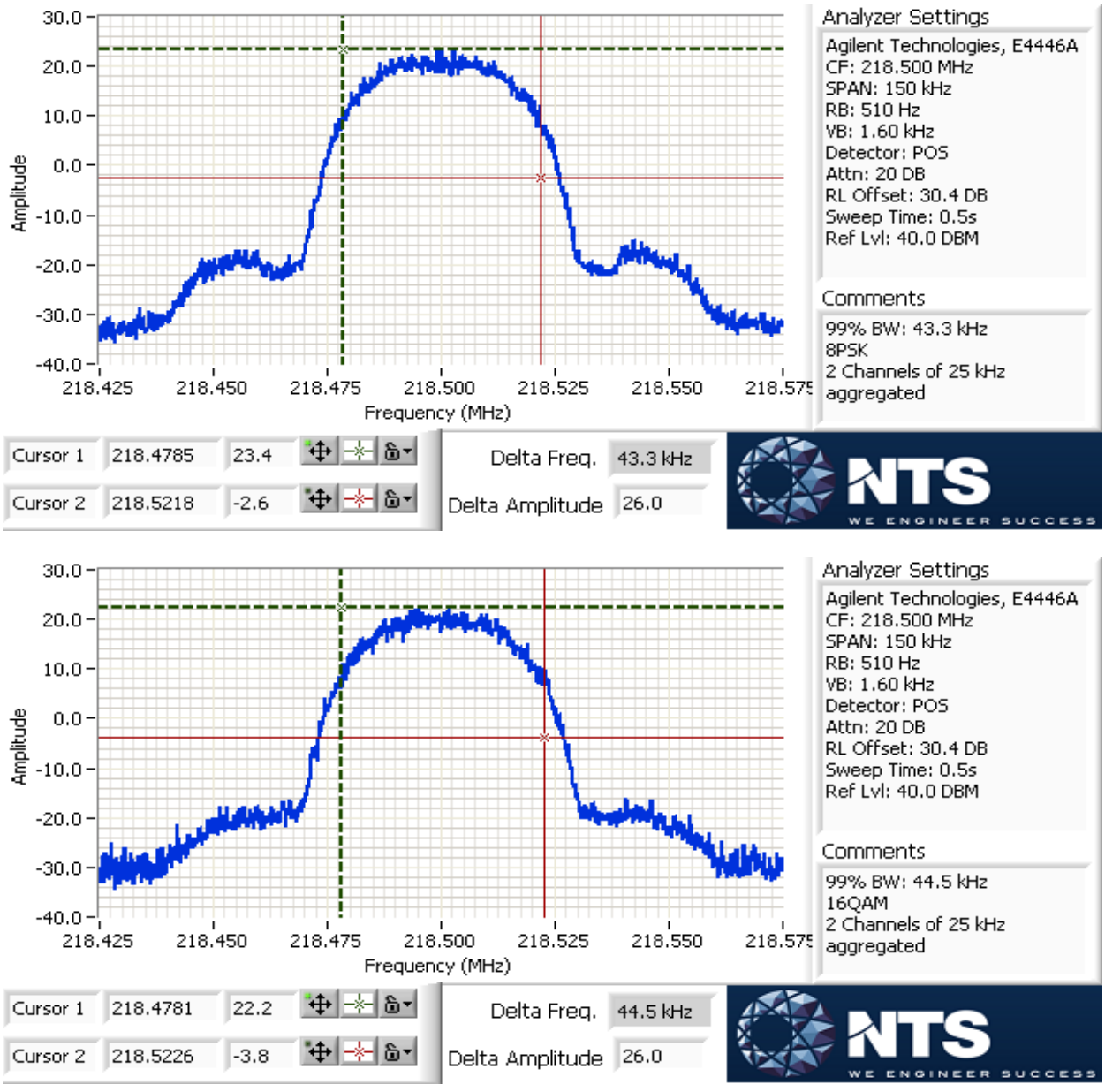
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Signal Bandwidth at 217-220 MHz band. 2x25 kHz aggregated channels.

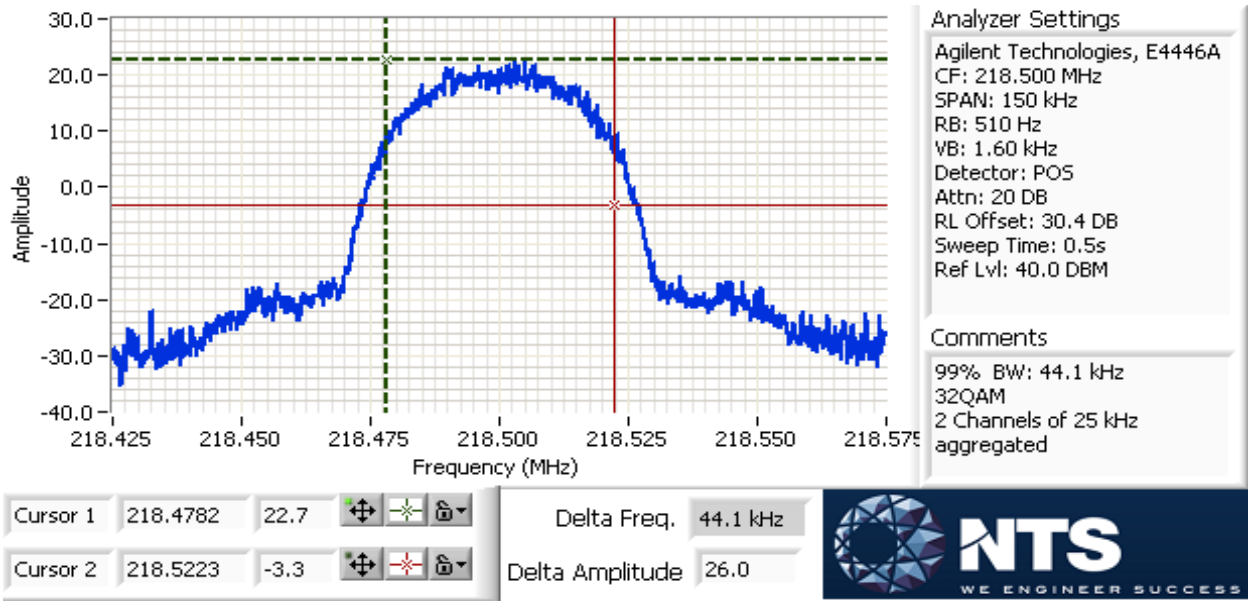




Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

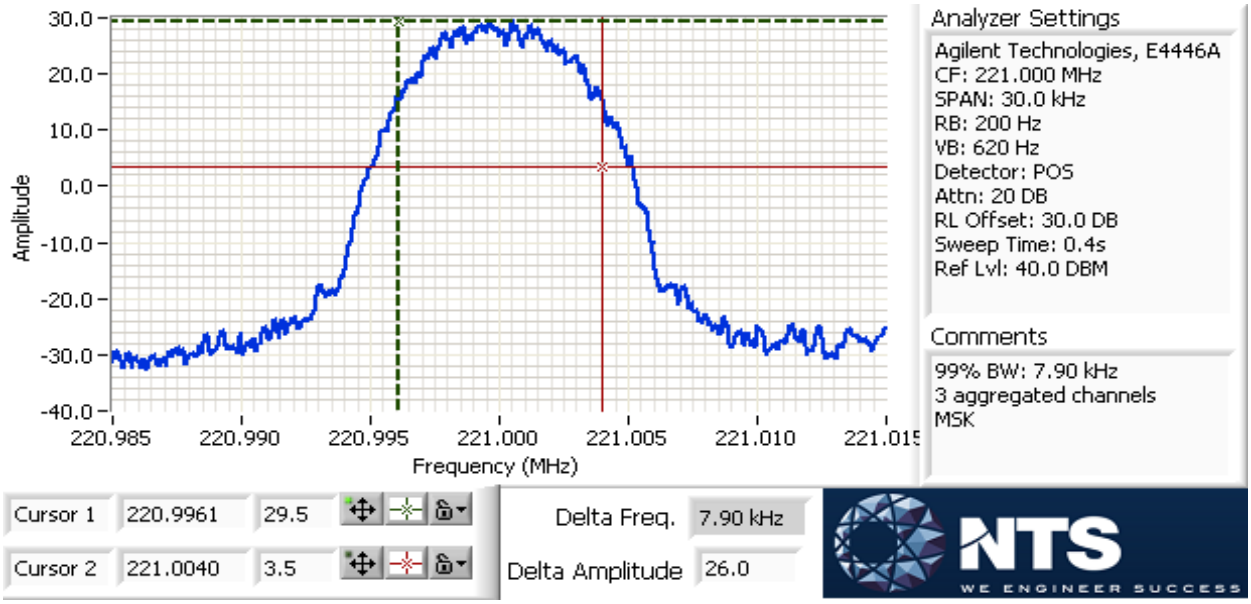


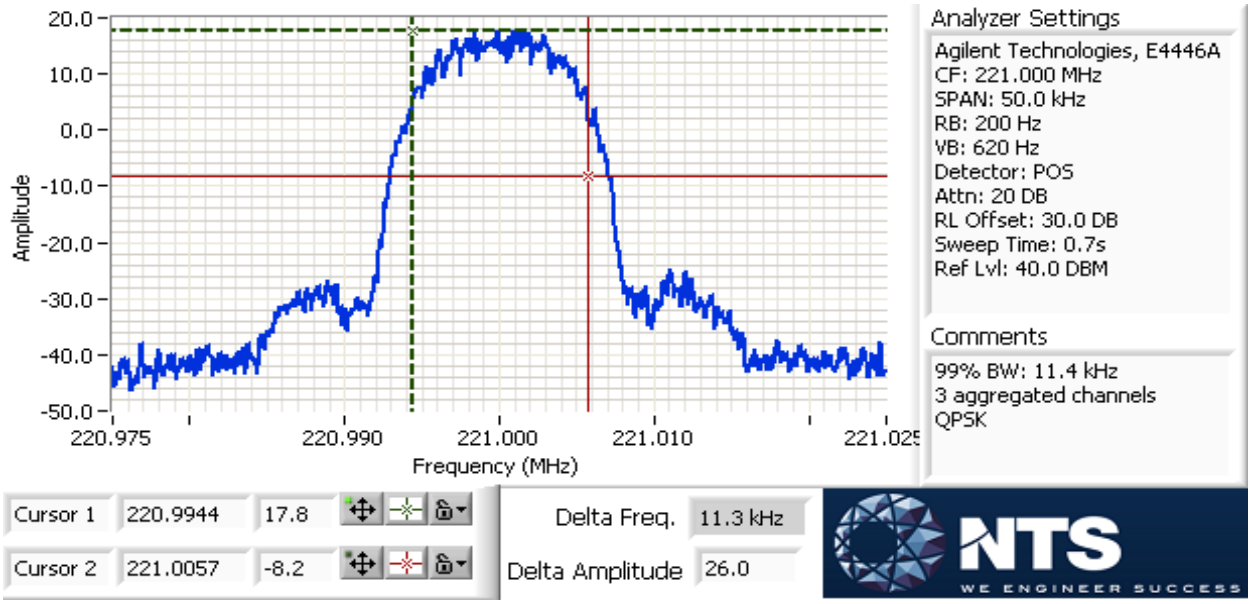
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



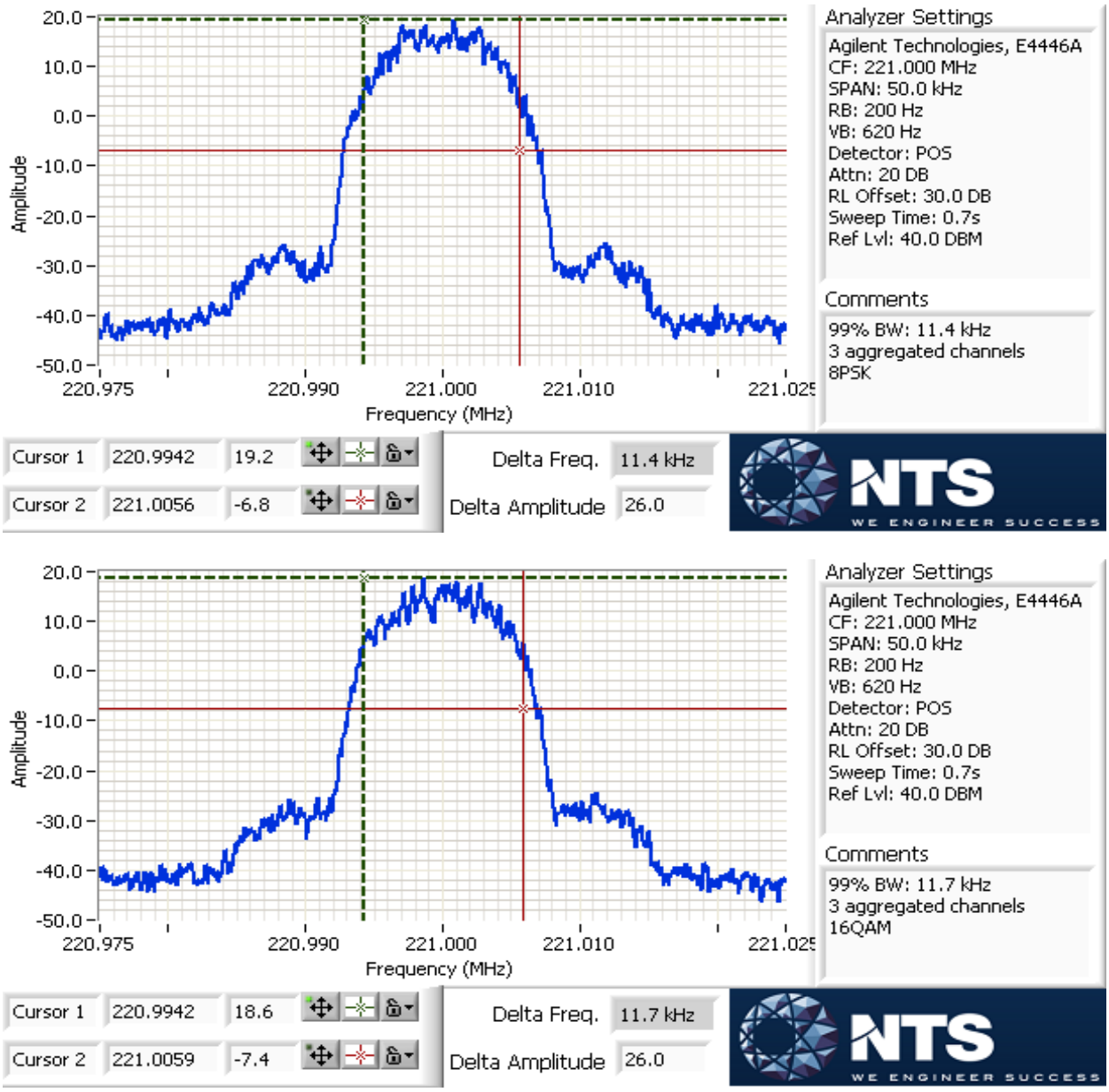
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Signal Bandwidth at 220-222 MHz band. 3x5 kHz aggregated channels.

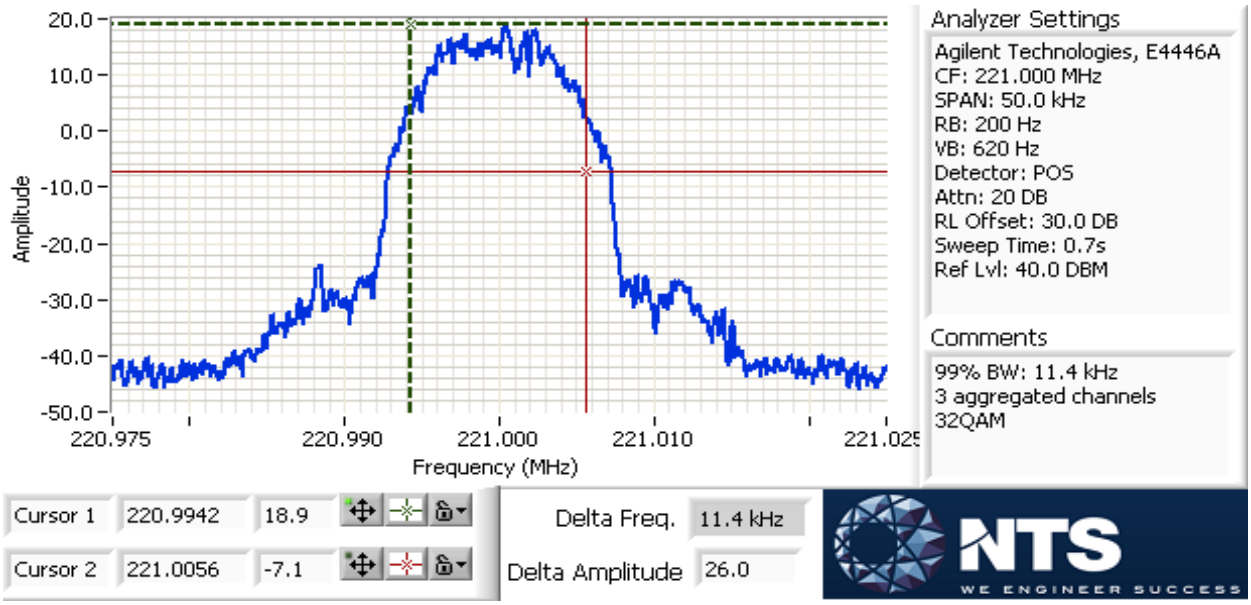




Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

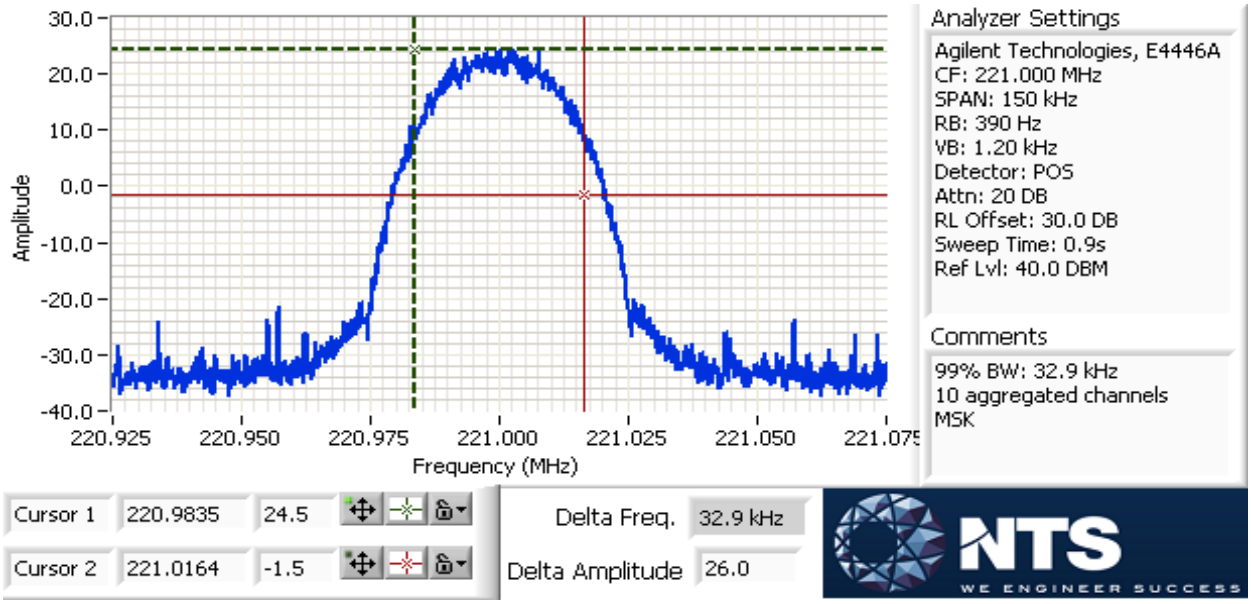


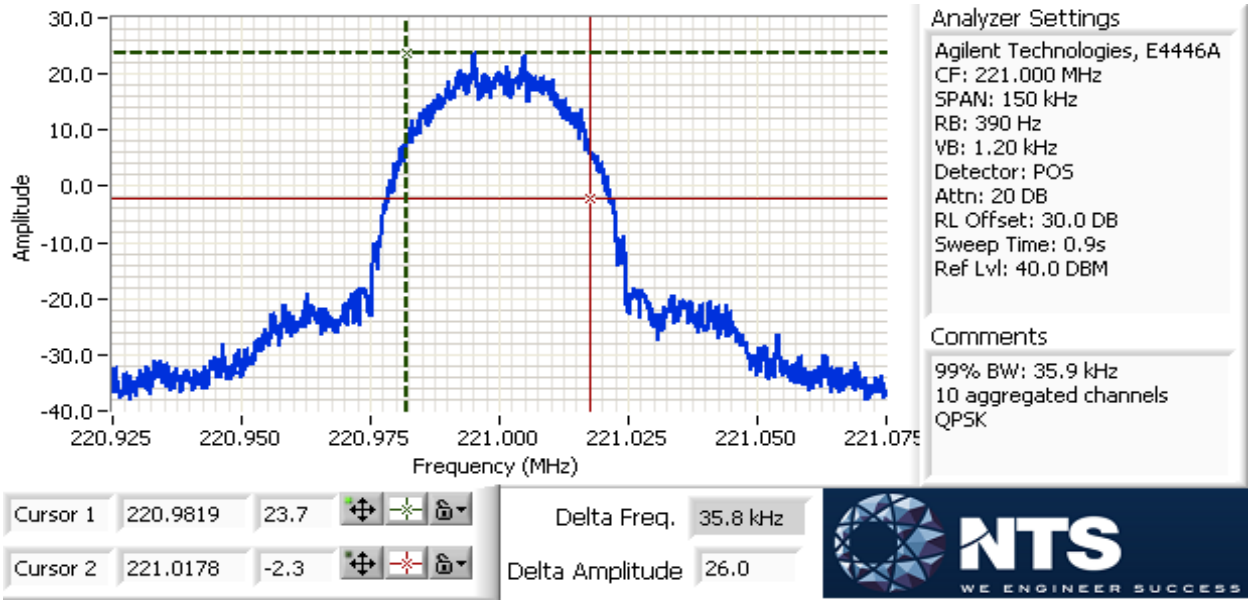
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



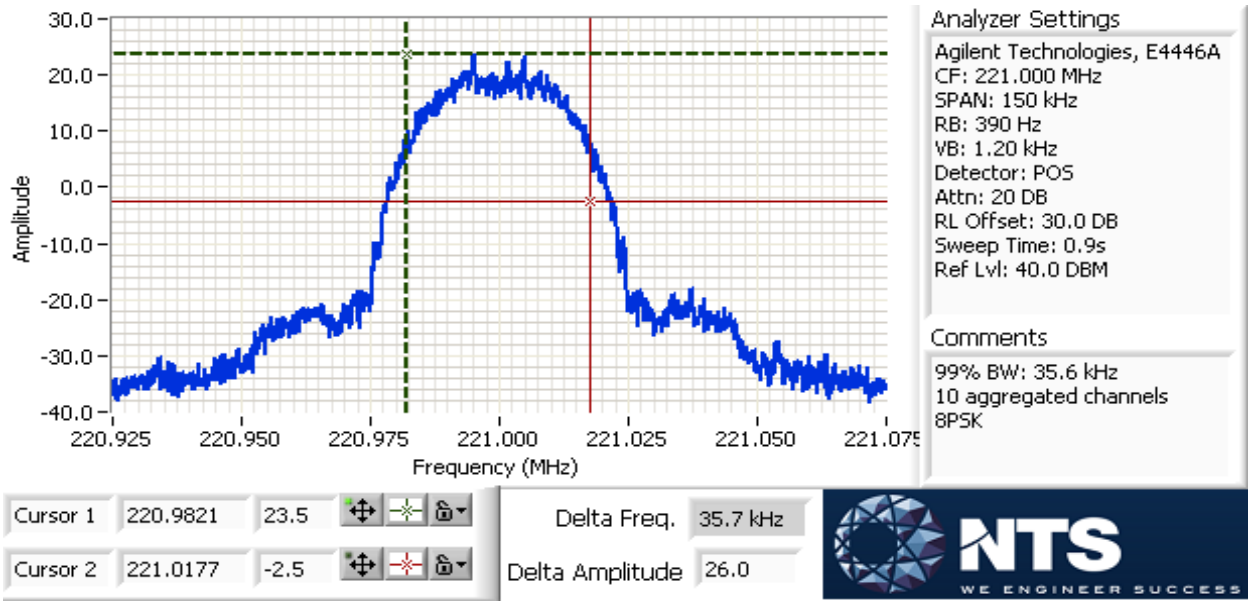
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

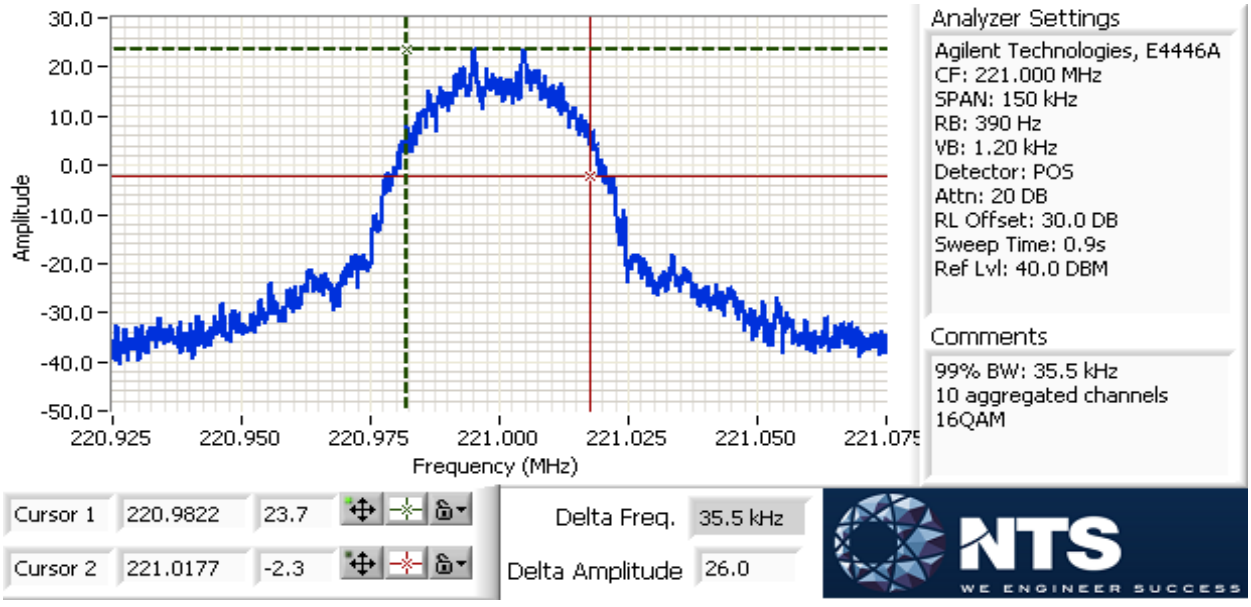
Signal Bandwidth at 220-222 MHz band. 10x5 kHz aggregated channels.



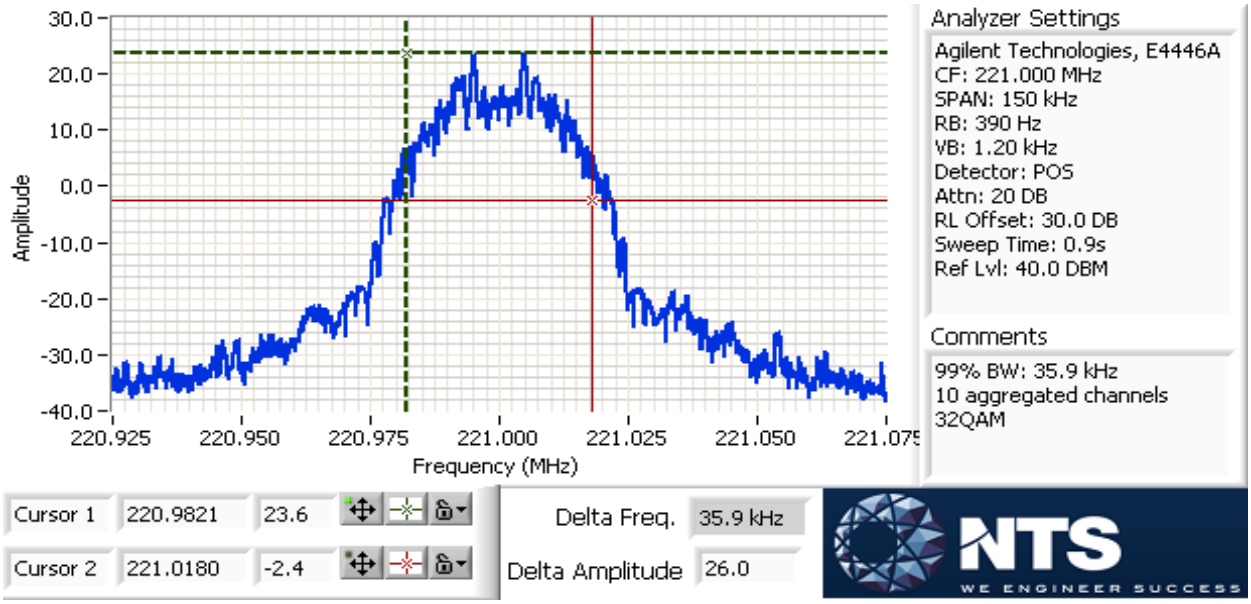


Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A





Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #4: Out of Band Spurious Emissions, Conducted

Date of Test: 7/7/2015 Config. Used: 1

Test Engineer: Deniz Demirci Config Change: None

Test Location: FT Ch #7 EUT Voltage: 12 Vdc

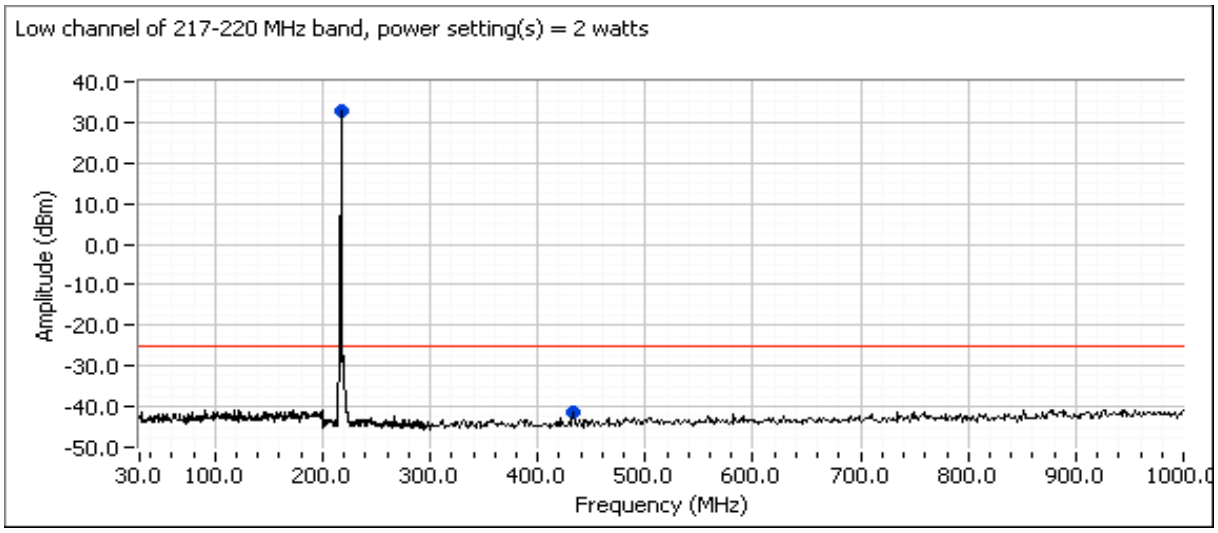
The limit is taken from FCC Part 90.210 Mask F (55 + 10 log (P)) as a worst case limit. (Mask C limit is 43 + 10 log(P))

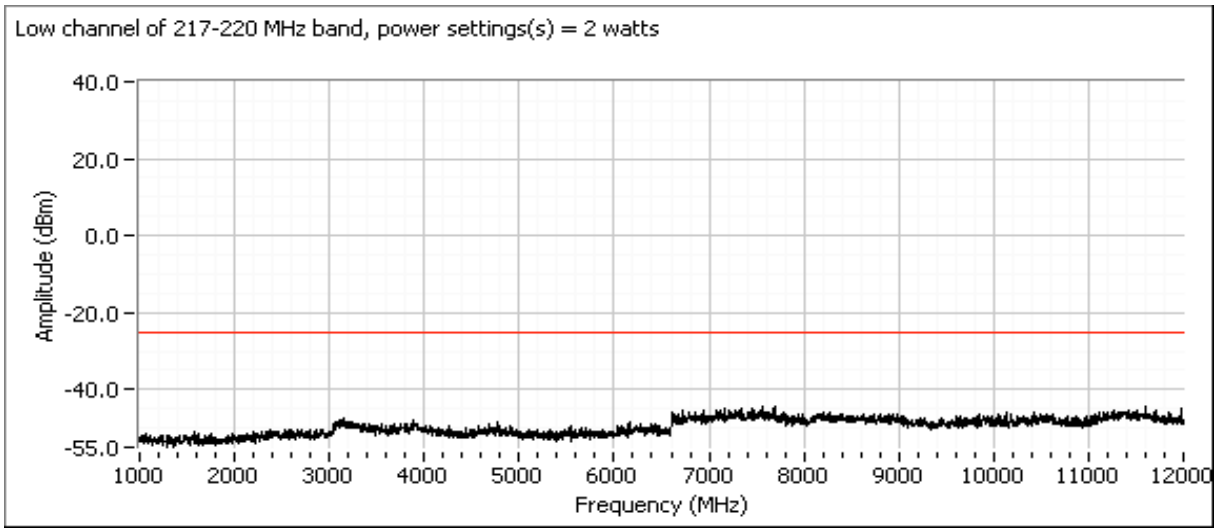
Frequency	Level	Port	FCC Part 90.210		Detector	Azimuth	Height	Comments	Channel
MHz	dBm		Limit	Margin	Pk/QP/Avg	degrees	meters		
217.014	33.1	RF Port	-	-	Peak	-	-	Carrier signal	217.00625
433.267	-41.4	RF Port	-25.0	-16.4	Peak	-	-		217.00625
219.990	33.0	RF Port	-	-	Peak	-	-	Carrier signal	219.99375
256.713	-37.4	RF Port	-25.0	-12.4	Peak	-	-		219.99375
438.878	-41.3	RF Port	-25.0	-16.3	Peak	-	-		219.99375
183.667	-32.3	RF Port	-25.0	-7.3	Peak	-	-		220.00750
220.004	40.1	RF Port	-	-	Peak	-	-	Carrier signal	220.00750
256.713	-34.8	RF Port	-25.0	-9.8	Peak	-	-		220.00750
440.081	-40.3	RF Port	-25.0	-15.3	Peak	-	-		220.00750
660.021	-38.4	RF Port	-25.0	-13.4	Peak	-	-		220.00750
193.407	-29.0	RF Port	-25.0	-4.0	Peak	-	-		221.99250
221.994	40.0	RF Port	-	-	Peak	-	-	Carrier signal	221.99250
250.762	-30.5	RF Port	-25.0	-5.5	Peak	-	-		221.99250
443.086	-40.4	RF Port	-25.0	-15.4	Peak	-	-		221.99250
666.132	-39.4	RF Port	-25.0	-14.4	Peak	-	-		221.99250

Note 1:	EUT was set to transmit an un-modulated signal during the emission tests. The power setting was 10 watts which is higher than the rated power of 5 watts at the 220-222 MHz band in order to present the worst case spurious emissions.

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

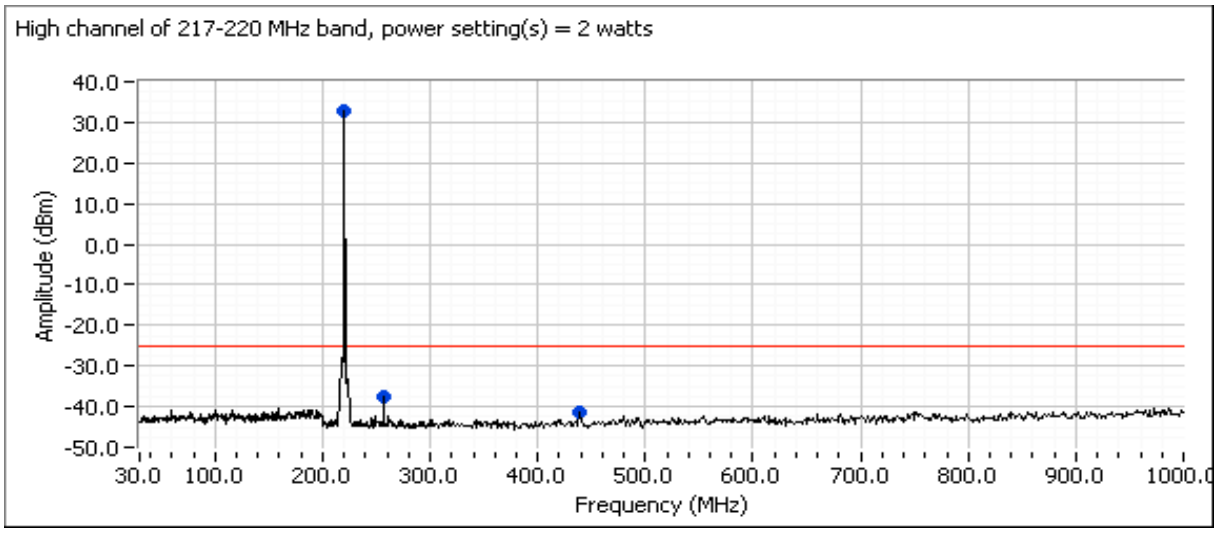
Plots for low channel of 217-220 MHz band, power setting(s) = 2 watts

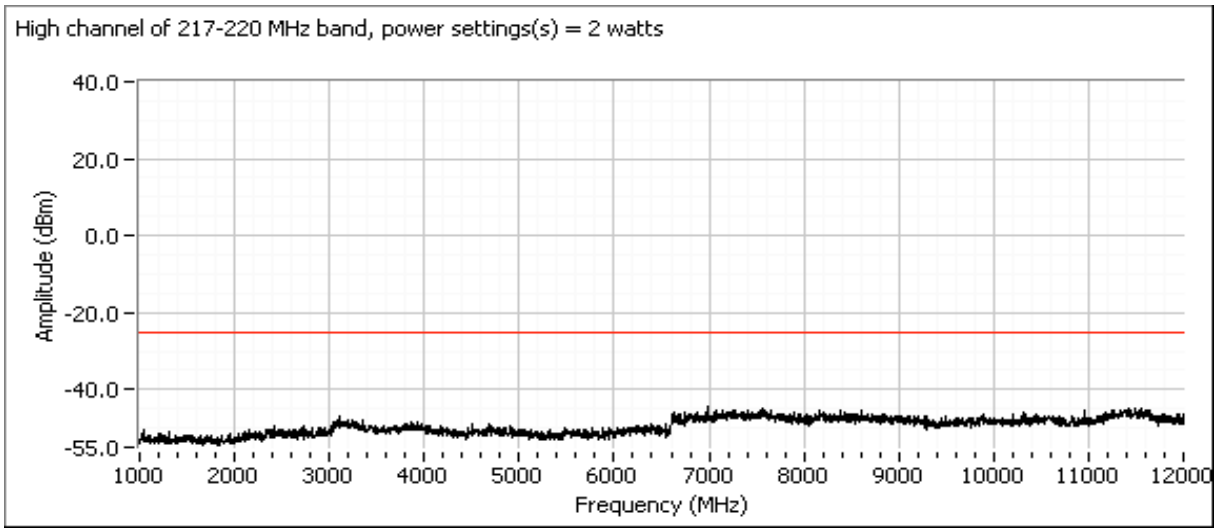




Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

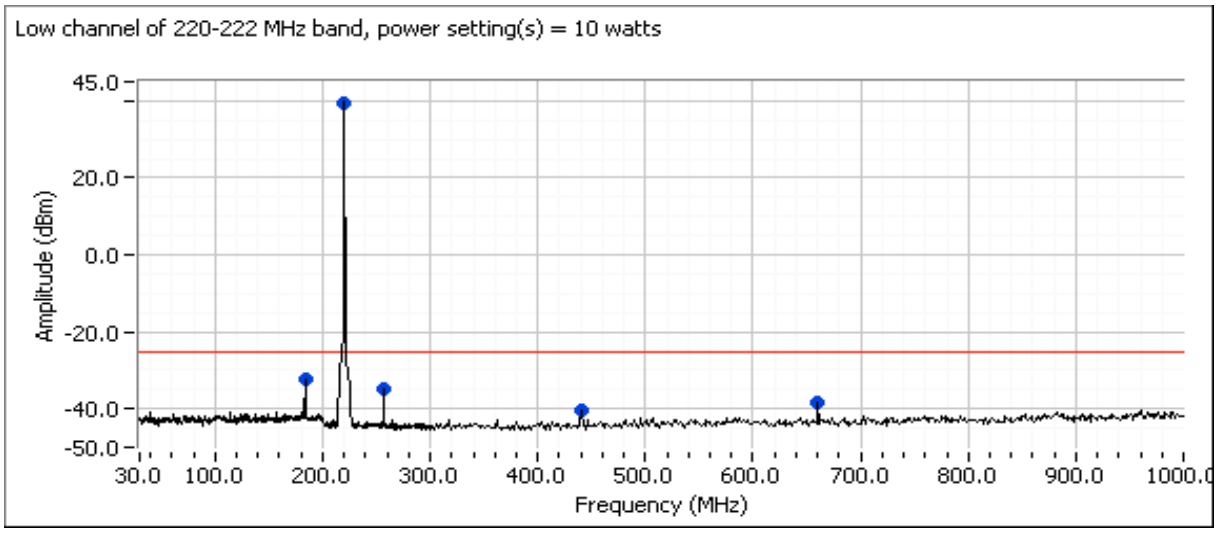
Plots for High channel of 217-220 MHz band, power setting(s) = 2 watts

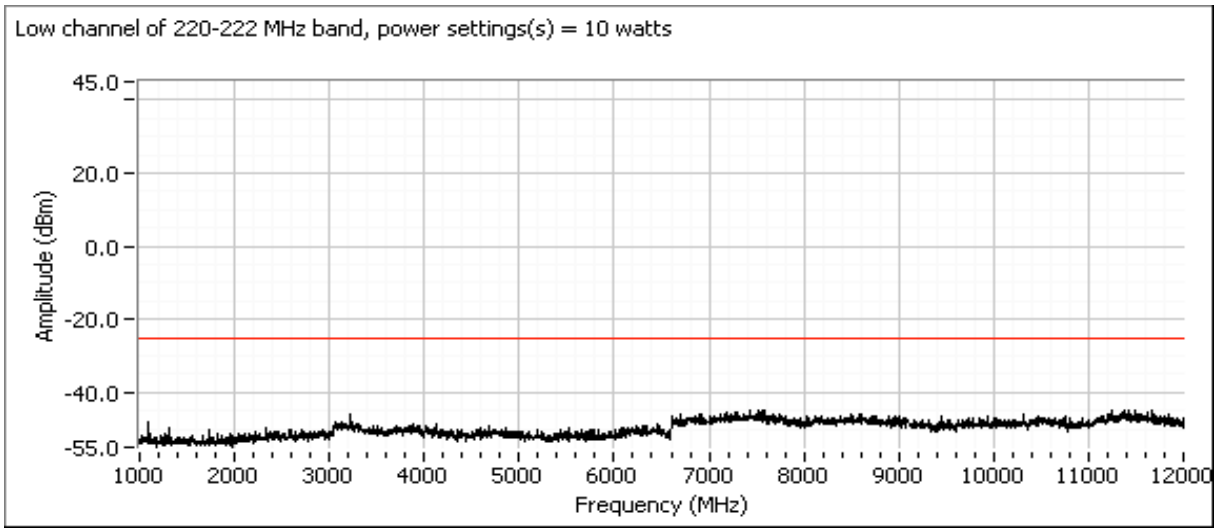




Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

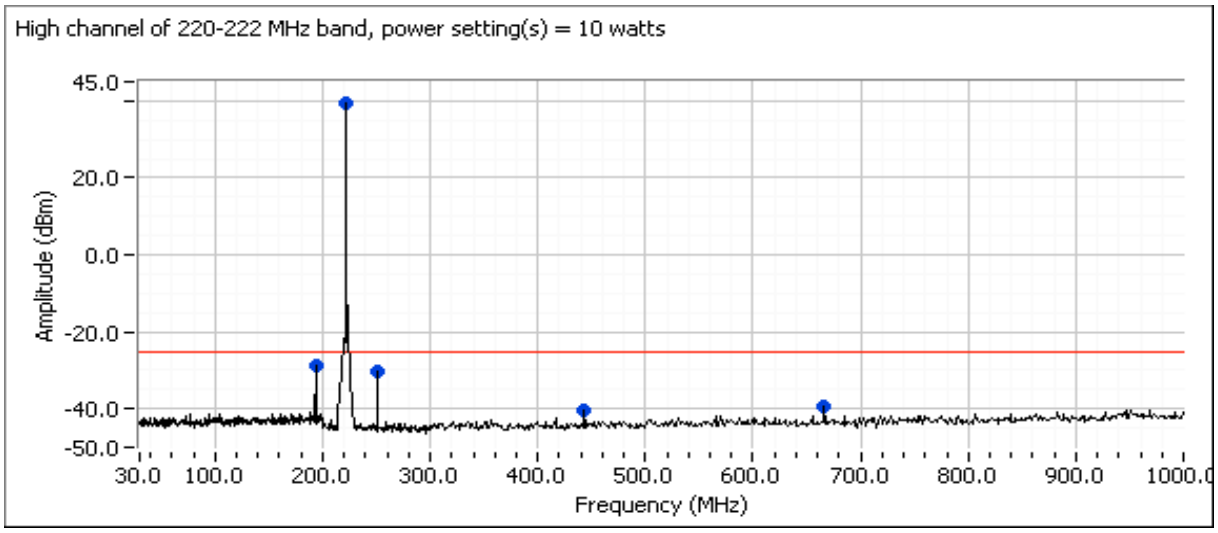
Plots for low channel of 220-222 MHz band, power setting(s) = 10 watts

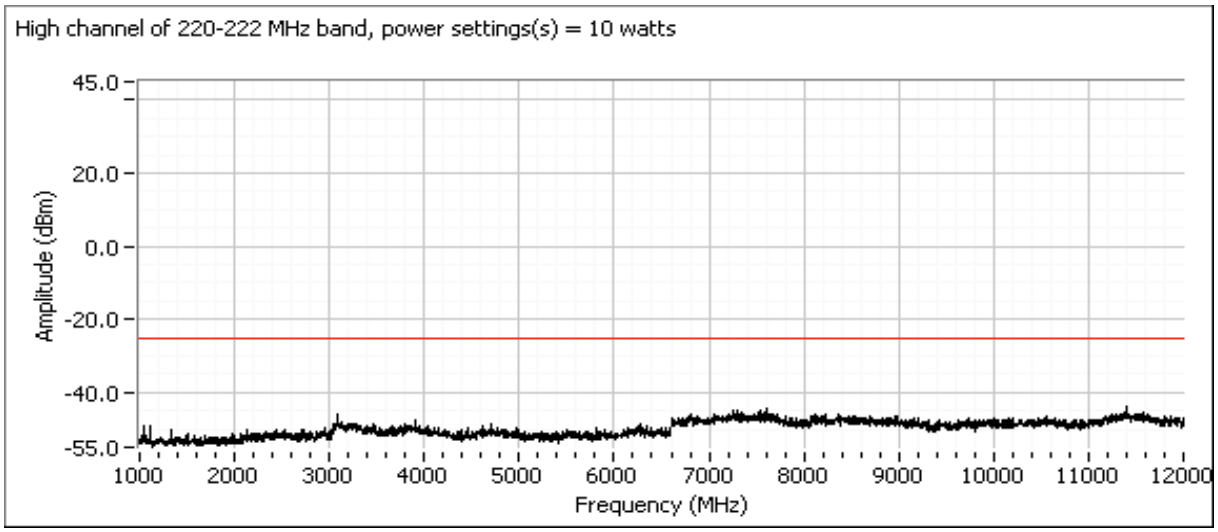




Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Plots for High channel of 220-222 MHz band, power setting(s) = 10 watts





Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #5: Out of Band Spurious Emissions, Radiated

Run #5a - Preliminary measurements

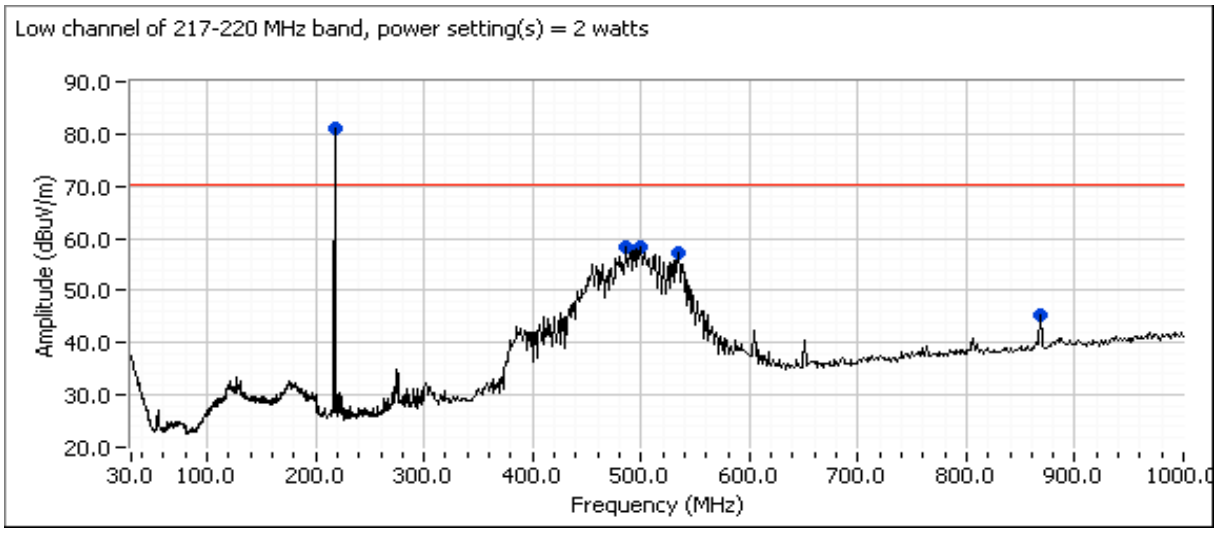
Date of Test: 7/6/2015 and 7/7/2015 Test Engineer: Deniz Demirci Test Location: Ft Ch# 7 EUT Voltage: 12 Vdc
Config Used: 1, Config. Change: None, EUT Voltage: 12 Vdc
The limit is taken from FCC Part 90.210 Mask F (55 + 10 log (P)) as a worst case limit. (Mask C limit is 43 + 10 log(P))

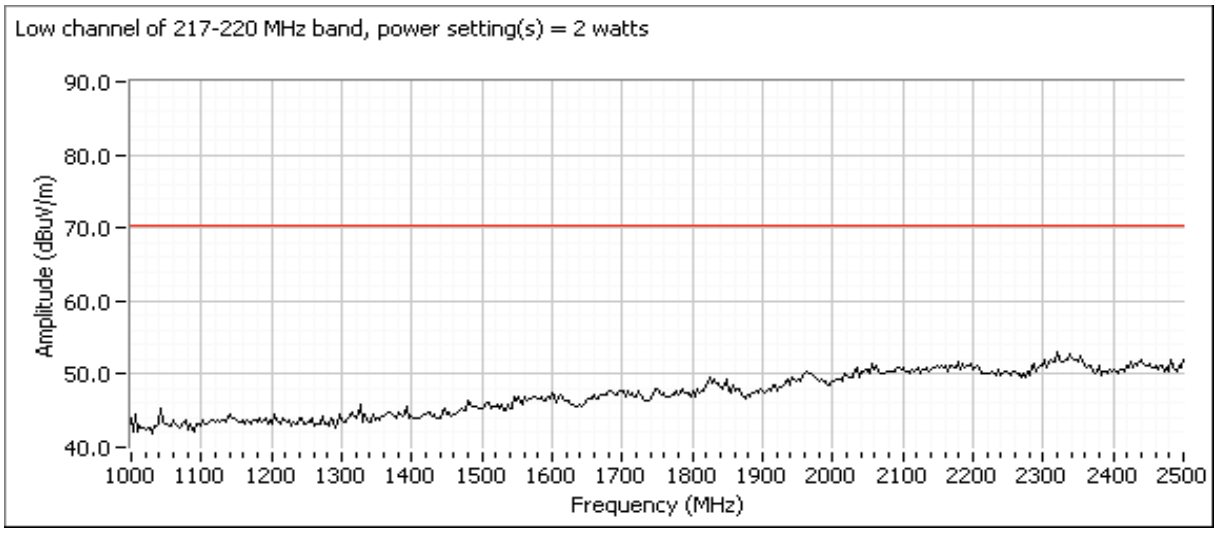
Frequency	Level	Pol	FCC Part 90.210		Detector	Azimuth	Height	Comments	Channel
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
217.007	81.3	H	-	-	PK	256	1.0	Carrier signal	217.00625
486.278	62.0	H	70.2	-8.2	PK	255	1.6	PK (0.10s)	217.00625
499.296	59.8	H	70.2	-10.4	PK	261	1.4	PK (0.10s)	217.00625
533.969	58.8	H	70.2	-11.4	PK	250	1.0	PK (0.10s)	217.00625
868.032	52.5	H	70.2	-17.7	PK	200	1.8	PK (0.10s)	217.00625
219.994	81.9	H	-	-	PK	262	1.1	Carrier signal	219.99375
477.739	57.3	H	70.2	-12.9	PK	268	1.5	PK (0.10s)	219.99375
534.087	60.6	H	70.2	-9.6	PK	254	1.5	PK (0.10s)	219.99375
879.979	53.8	H	70.2	-16.4	PK	187	2.3	PK (0.10s)	219.99375
220.010	84.3	H	-	-	PK	242	1.0	Carrier signal	220.00750
497.311	60.3	H	70.2	-9.9	PK	261	1.5	PK (0.10s)	220.00750
533.211	59.9	H	70.2	-10.3	PK	248	1.5	PK (0.10s)	220.00750
660.030	51.4	V	70.2	-18.8	PK	204	1.0	PK (0.10s)	220.00750
880.030	60.5	H	70.2	-9.7	PK	200	1.7	PK (0.10s)	220.00750
1100.060	63.0	H	70.2	-7.2	PK	222	1.6	PK (0.10s)	220.00750
221.996	84.5	H	-	-	PK	266	1.1	Carrier signal	221.99250
484.293	60.4	H	70.2	-9.8	PK	246	1.5	PK (0.10s)	221.99250
533.088	61.1	H	70.2	-9.1	PK	253	1.5	PK (0.10s)	221.99250
665.983	54.0	V	70.2	-16.2	PK	203	1.0	PK (0.10s)	221.99250
887.974	62.4	V	70.2	-7.8	PK	284	1.7	PK (0.10s)	221.99250
1109.970	64.3	H	70.2	-5.9	PK	200	2.1	PK (0.10s)	221.99250
1331.960	63.3	H	70.2	-6.9	PK	202	1.0	PK (0.10s)	221.99250

Note 1:	Measurements are made with the antenna port terminated.
Note 2:	EUT was set to transmit an un-modulated signal during the emission tests. The power setting was 10 watts which is higher than the rated power of 5 watts at the 220-222 MHz band in order to present the worst case spurious emissions.
Note 3:	EUT was pre-scanned in all 3 orientations. Flat on the table orientation was the worst case orientation for all spurious emisisons. The final measurements were taken with this orientation.
Note 4:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: E=√(30PG)/d. This limit is conservative - it does not consider the presence of the ground plane. The erp or eirp for all signals with less than 20 dB of margin relative to this field strength limit is determined using substitution measurements.

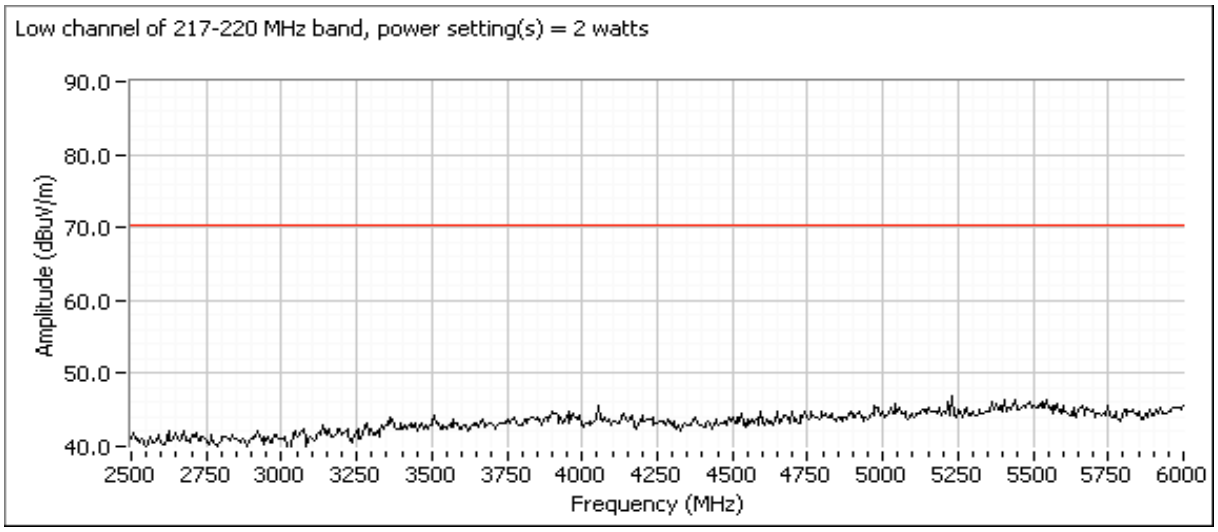
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

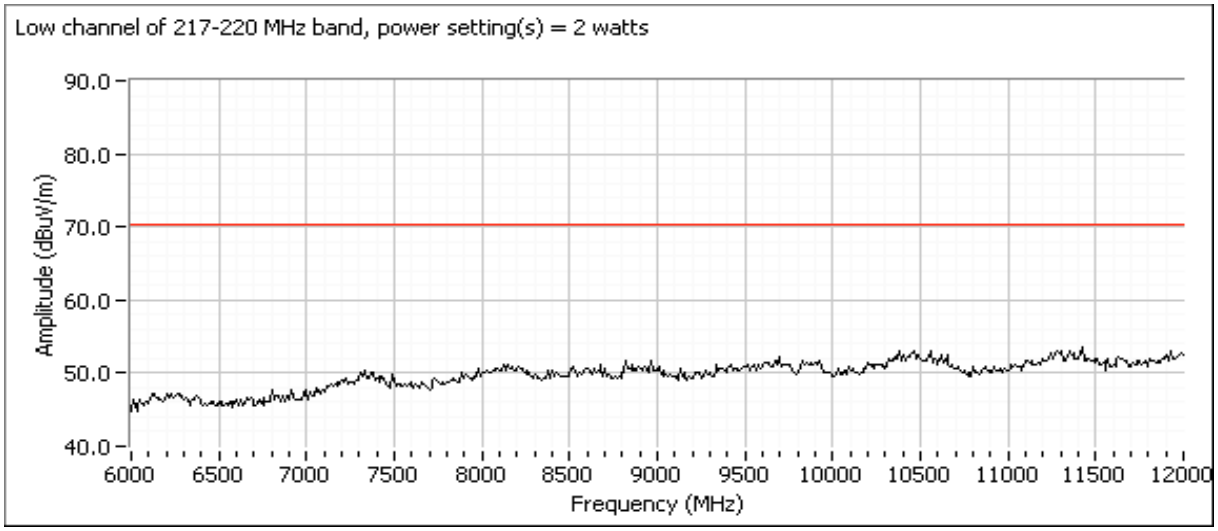
Plots for low channel of 217-220 MHz band, power setting(s) = 2 watts





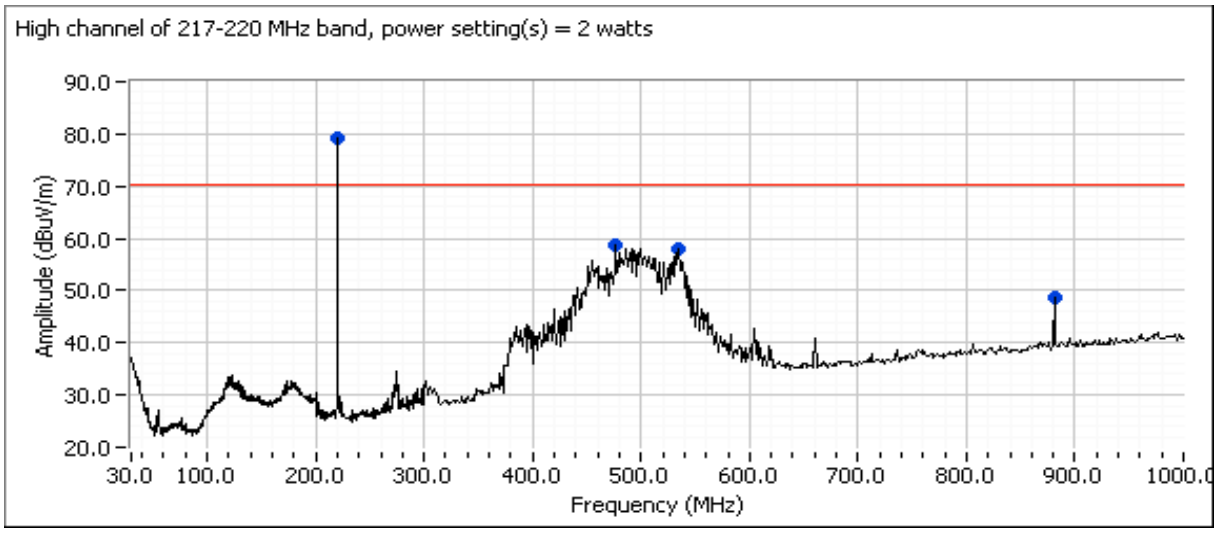
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

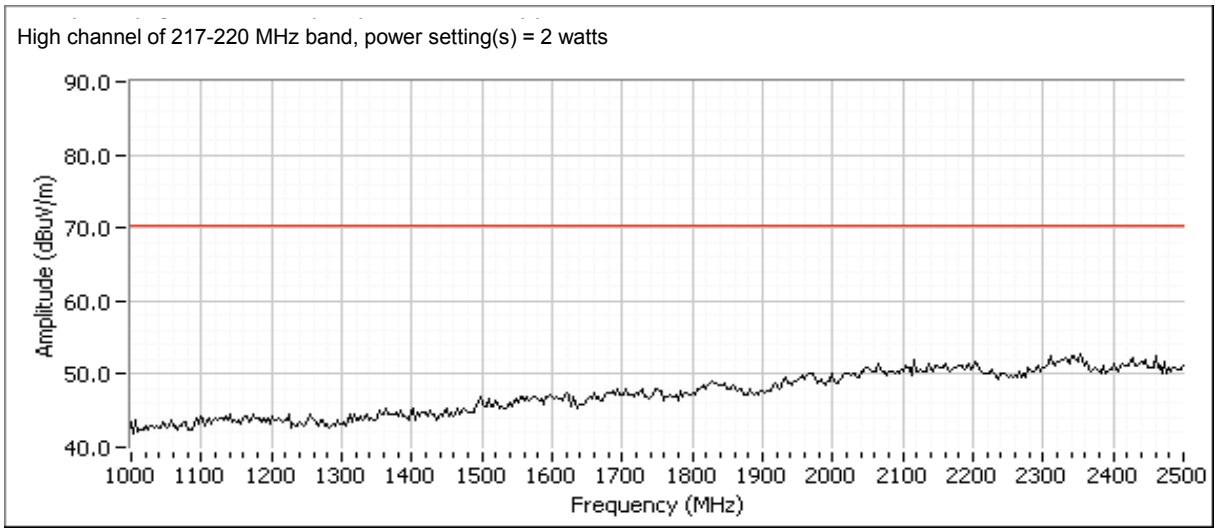




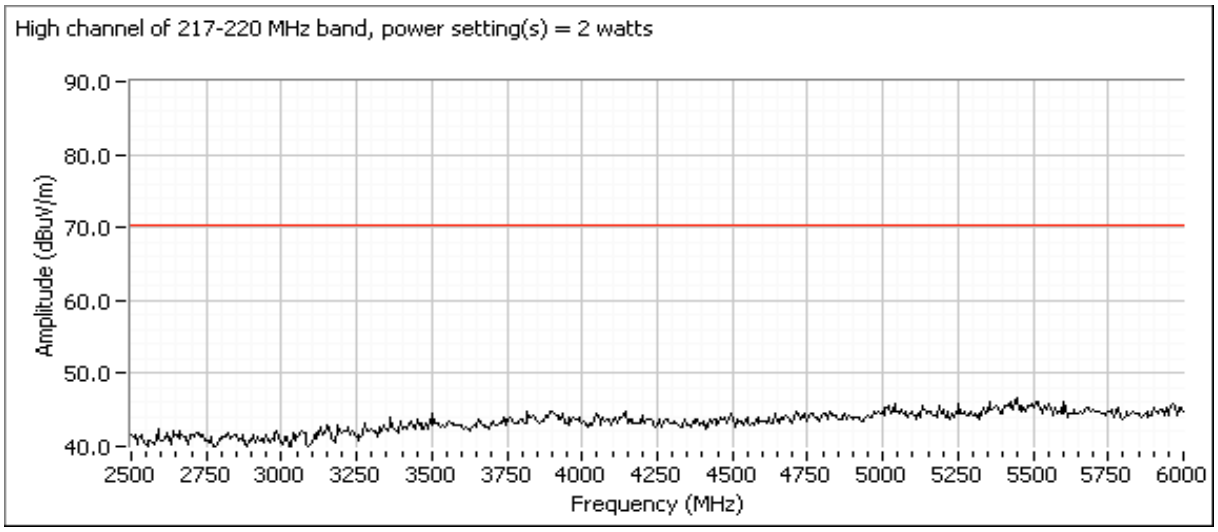
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

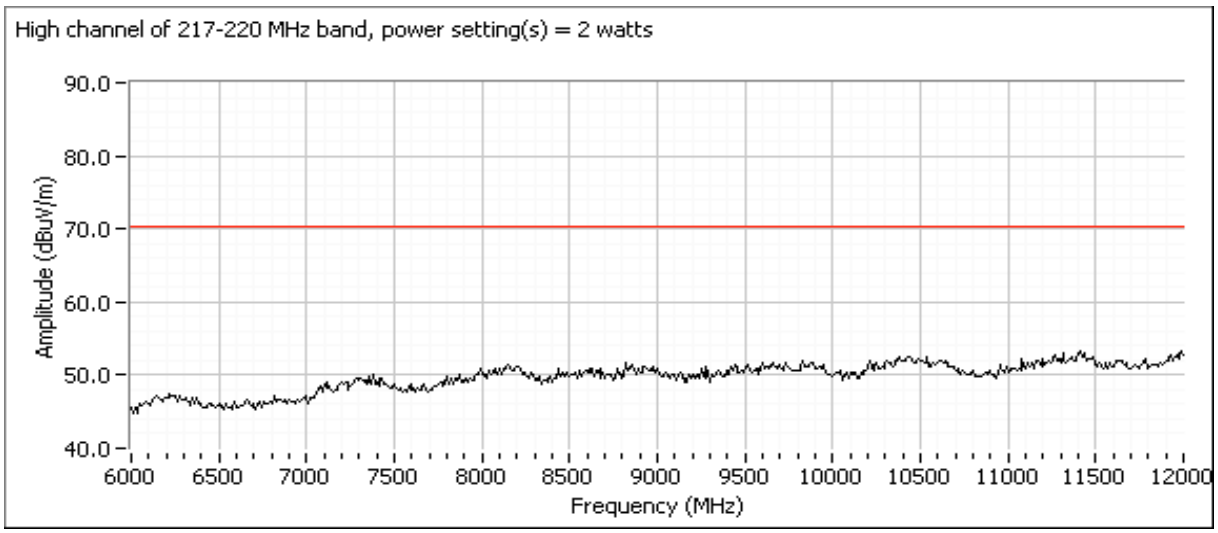
Plots for High channel of 217-220 MHz band, power setting(s) = 2 watts





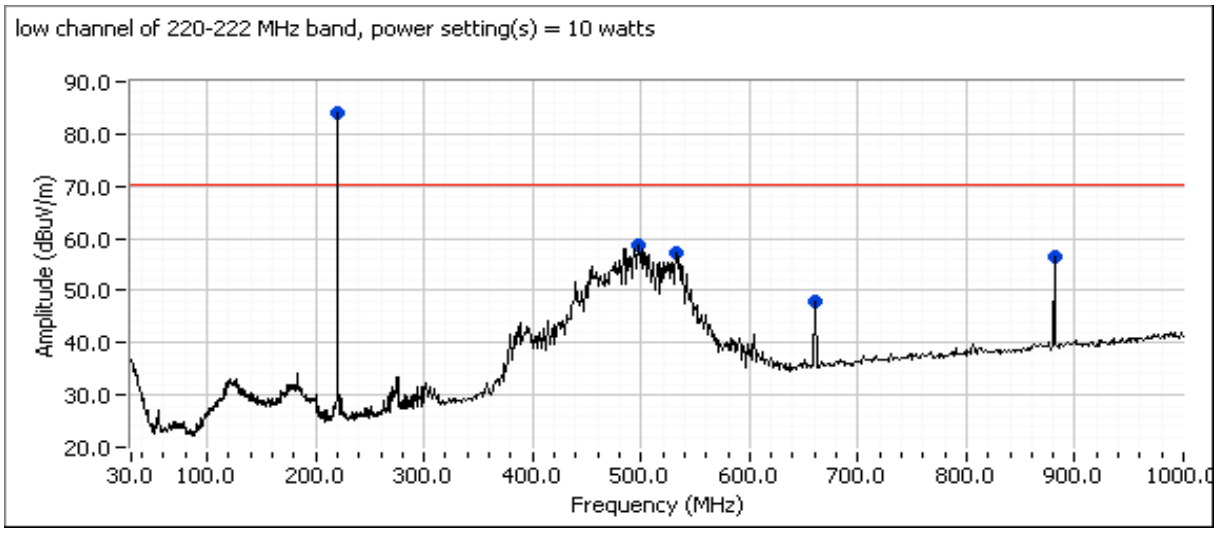
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

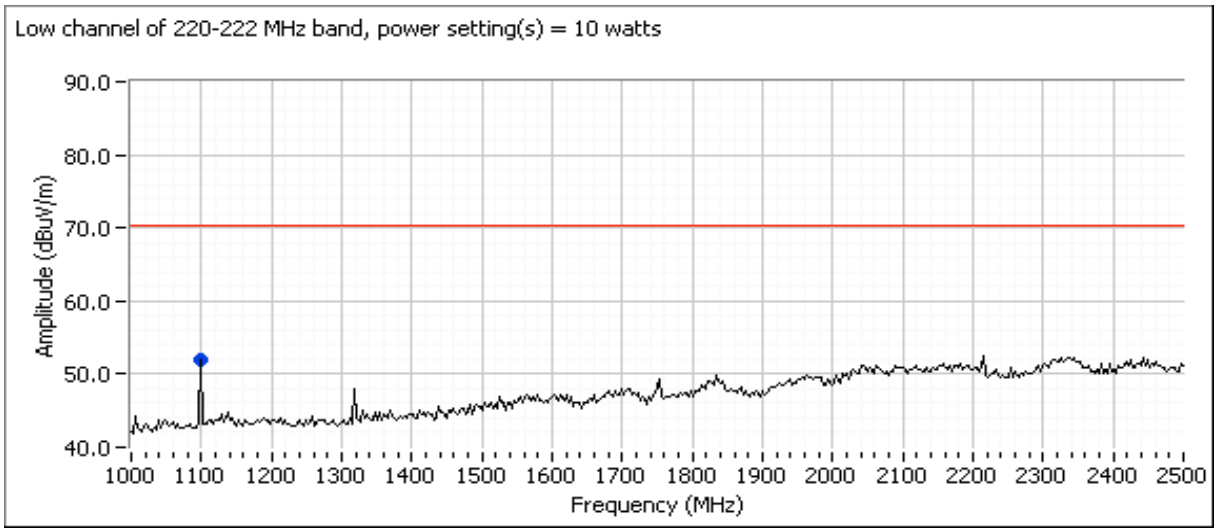




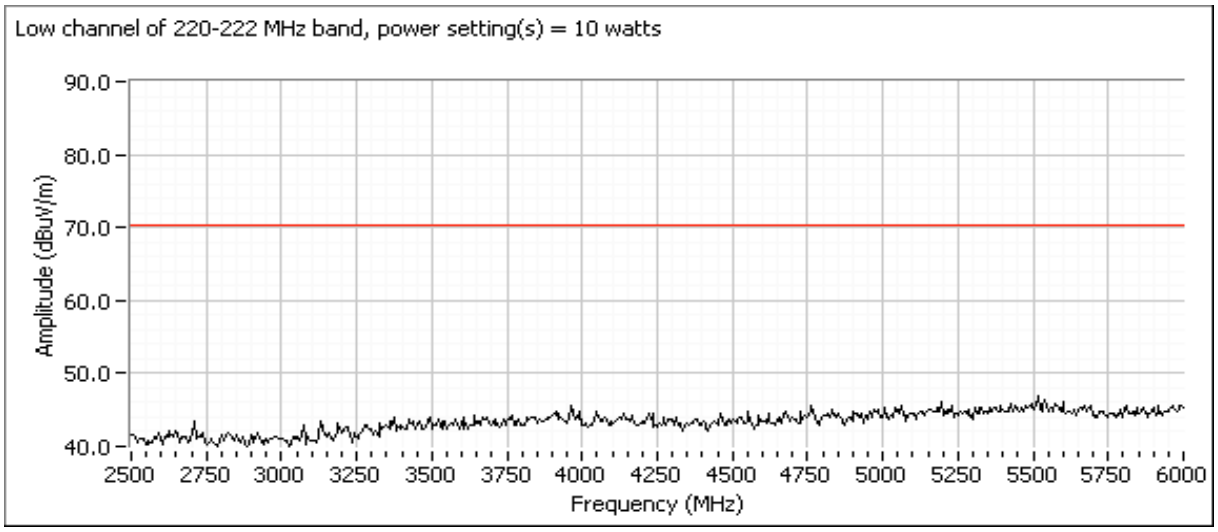
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

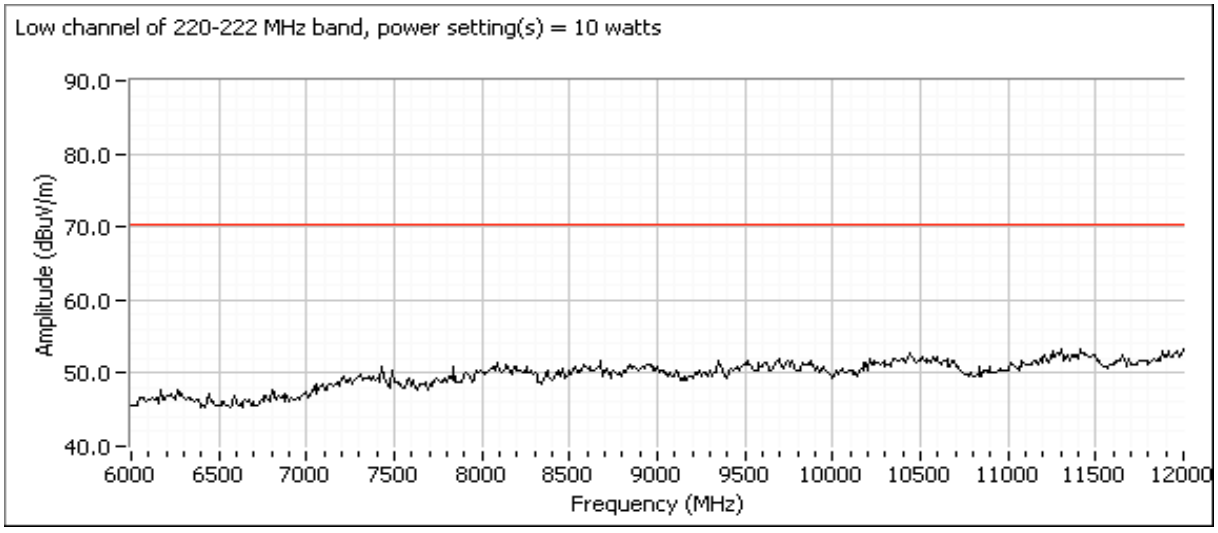
Plots for low channel of 220-222 MHz band, power setting(s) = 10 watts





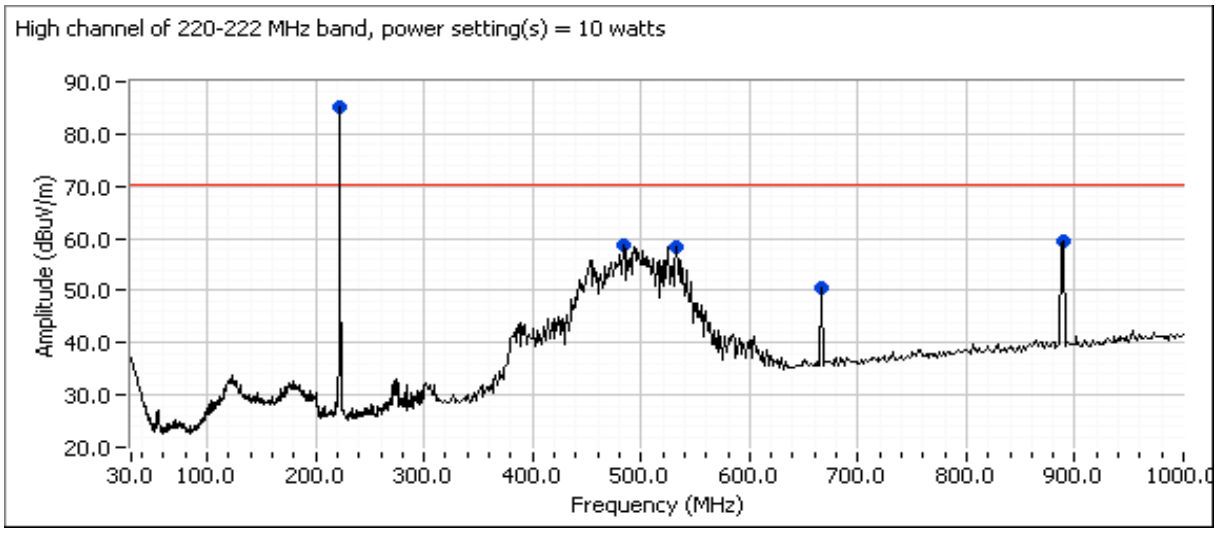
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

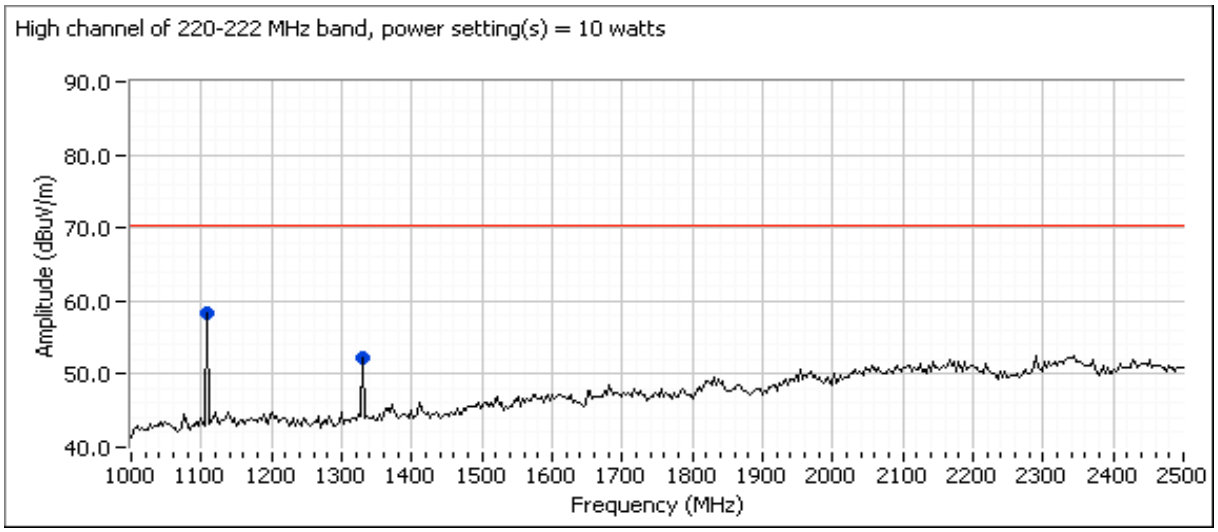




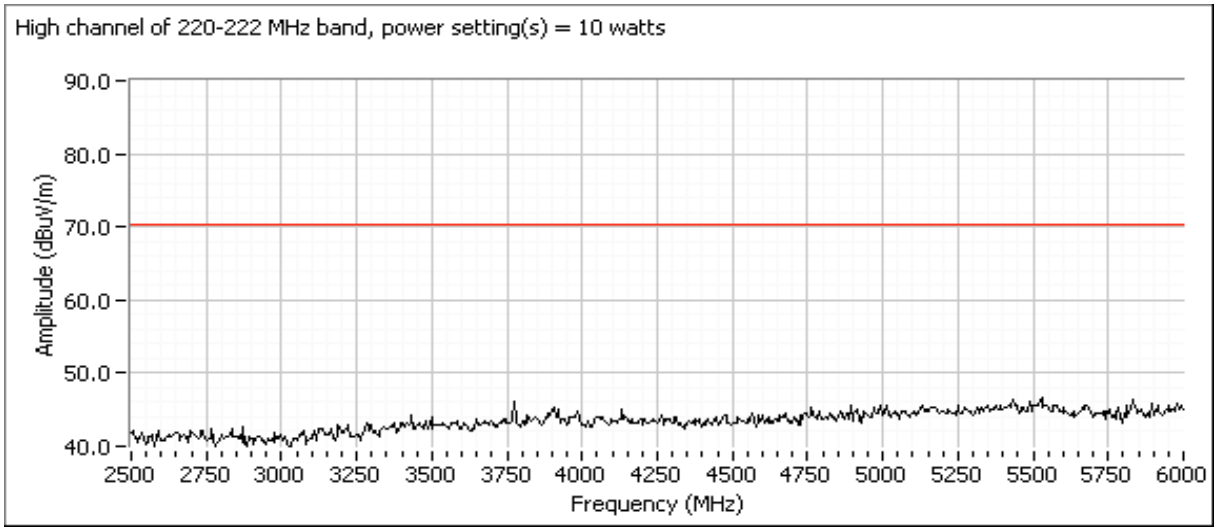
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

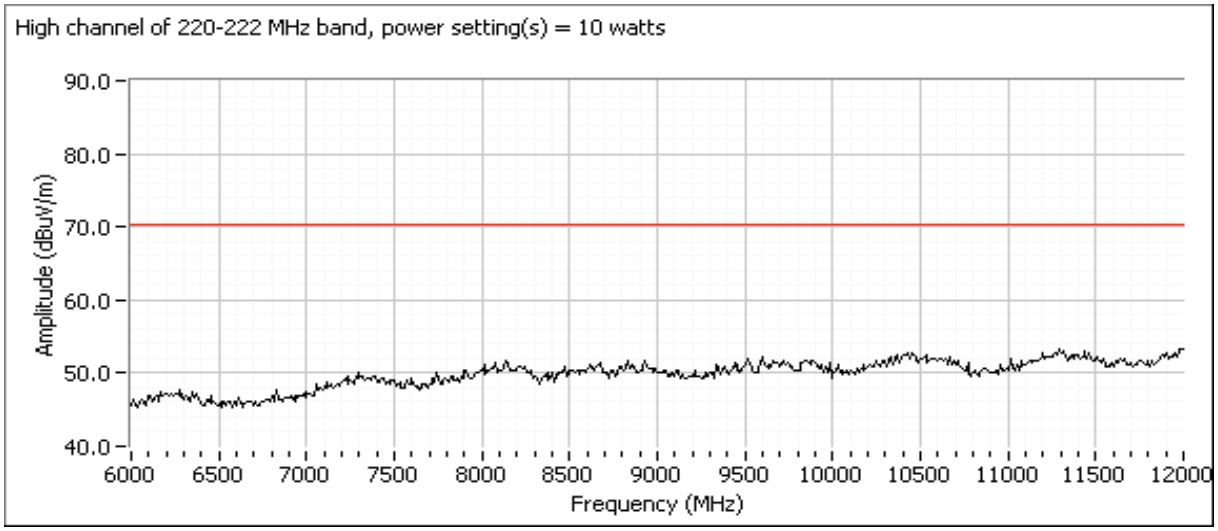
Plots for High channel of 220-222 MHz band, power setting(s) = 10 watts





Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A





Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #5b: - Substitution Measurements

Date of Test: 7/7/2015 Config. Used: 1

Test Engineer: Deniz Demirci Config Change: None

Test Location: FT Ch #7 EUT Voltage: N/A

Substitution measurements

Horizontal

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
486.278	-25.0	2.1	75.9	98.8	62.0	-36.8	-39.0		-25.0	-14.0
499.296	-25.0	2.1	75.7	98.6	59.8	-38.8	-41.0		-25.0	-16.0
533.969	-25.0	2.1	75.4	98.3	58.8	-39.5	-41.7		-25.0	-16.7
868.032	-25.0	1.6	74.5	97.9	52.5	-45.4	-47.6		-25.0	-22.6
477.739	-25.0	2.1	75.6	98.5	57.3	-41.2	-43.4		-25.0	-18.4
534.087	-25.0	2.1	75.5	98.4	60.6	-37.8	-40.0		-25.0	-15.0
879.979	-25.0	1.6	74.8	98.2	53.8	-44.4	-46.6		-25.0	-21.6
497.311	-25.0	2.1	75.5	98.4	60.3	-38.1	-40.3		-25.0	-15.3
533.211	-25.0	2.1	75.4	98.3	59.9	-38.4	-40.6		-25.0	-15.6
880.030	-25.0	1.6	75.1	98.5	60.5	-38.0	-40.2		-25.0	-15.2
1100.060	-25.0	5.8	79.4	98.6	63.0	-35.6	-37.8		-25.0	-12.8
484.293	-25.0	2.1	75.8	98.7	60.4	-38.3	-40.5		-25.0	-15.5
533.088	-25.0	2.1	75.3	98.2	61.1	-37.1	-39.3		-25.0	-14.3
1109.970	-25.0	5.8	79.4	98.6	64.3	-34.3	-36.5		-25.0	-11.5
1331.960	-25.0	7.0	80.9	98.9	63.3	-35.6	-37.8		-25.0	-12.8

Vertical

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
660.030	-25.0	2.1	74.1	97.0	51.4	-45.6	-47.8		-25.0	-22.8
665.983	-25.0	2.1	73.9	96.8	54.0	-42.8	-45.0		-25.0	-20.0
887.974	-25.0	1.6	73.5	96.9	62.4	-34.5	-36.7		-25.0	-11.7

Note 1:	Pin is the input power (dBm) to the substitution antenna
Note 2:	Gain is the gain (dBi) for the substitution antenna.
Note 3:	FS is the field strength (dBuV/m) measured from the substitution antenna.
Note 4:	Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.
Note 5:	EUT field strength as measured during initial run.

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #6: Frequency Stability

Date of Test: 7/9/2015
Test Engineer: Deniz Demirci
Test Location: FT Lab #4b

Config. Used: 1
Config Change: None
EUT Voltage: 12 Vdc

Run #6a: Frequency Stability at 217-220 MHz band

Nominal Frequency: 218.50000 MHz

Frequency Stability Over Temperature

The EUT was soaked at each temperature for a minimum of 30 minutes prior to making the measurements to ensure the EUT and chamber had stabilized at that temperature.

Limit: 1 ppm

Temperature	Frequency Measured	Drift	
(Celsius)	(MHz)	(Hz)	(ppm)
-30	218.500144	144	0.7
-20	218.500133	133	0.6
-10	218.500072	72	0.3
0	218.499998	-2	0.0
10	218.500028	28	0.1
20	218.500048	48	0.2
30	218.500028	28	0.1
40	218.500022	22	0.1
50	218.500065	65	0.3
	Worst case:	144	0.7

Frequency Stability Over Input Voltage

Nominal Voltage is 12 Vdc.

Voltage	Frequency Measured	Drift	
(DC)	(MHz)	(Hz)	(ppm)
85%	218.500021	21	0.1
115%	218.500031	31	0.1
	Worst case:	31	0.1

Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #6b: Frequency Stability at 220-222 MHz band, 3x5 kHz aggregated channels.

Per §90.733 (e) In combining authorized, contiguous channels (including channels derived from multiple authorizations) to form channels wider than 5 kHz, the emission limits in §90.210(f) must be met only at the outermost edges of the contiguous channels. Transmitters shall be tested to confirm compliance with this requirement with the transmission located as close to the band edges as permitted by the design of the transmitter. The frequency stability requirements in §90.213 shall apply only to the outermost of the contiguous channels authorized to the licensee. However, the frequency stability employed for transmissions operating inside the outermost contiguous channels must be such that the emission limits in §90.210(f) are met over the temperature and voltage variations prescribed in §2.995 of

The worst case spectral mask result at ambient temperature was 16QAM modulation with 3 aggregated channel mode. This mode was used for the frequency stability measurements.

Nominal Frequency: 221.00000 MHz

Temperature	Result	Notes	Drift	
(Celsius)			(Hz)	(ppm)
-30	Pass	Comply with mask F	-	-
-20	Pass	Comply with mask F	-	-
-10	Pass	Comply with mask F	-	-
0	Pass	Comply with mask F	-	-
10	Pass	Comply with mask F	-	-
20	Pass	Comply with mask F	-	-
30	Pass	Comply with mask F	-	-
40	Pass	Comply with mask F	-	-
50	Pass	Comply with mask F	-	-

Frequency Stability Over Input Voltage

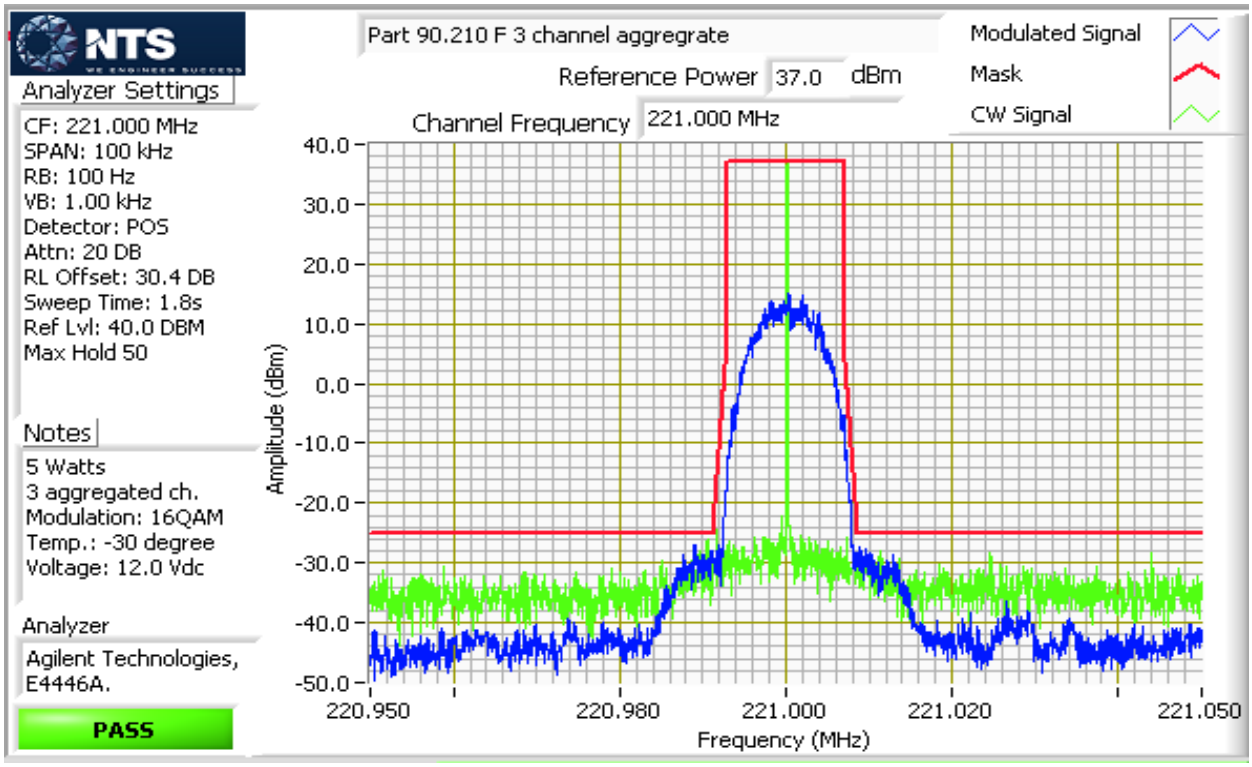
Nominal Voltage is 12 Vdc. (Min. 10.2 Vdc, Max. 13.8 Vdc)

Voltage	Result	Notes	Drift	
(DC)			(Hz)	(ppm)
85%	Pass	Comply with mask F	-	-
115%	Pass	Comply with mask F	-	-

Note 1: An unmodulated carrier power was measured to determine the reference power level for each spectral mask measurement.

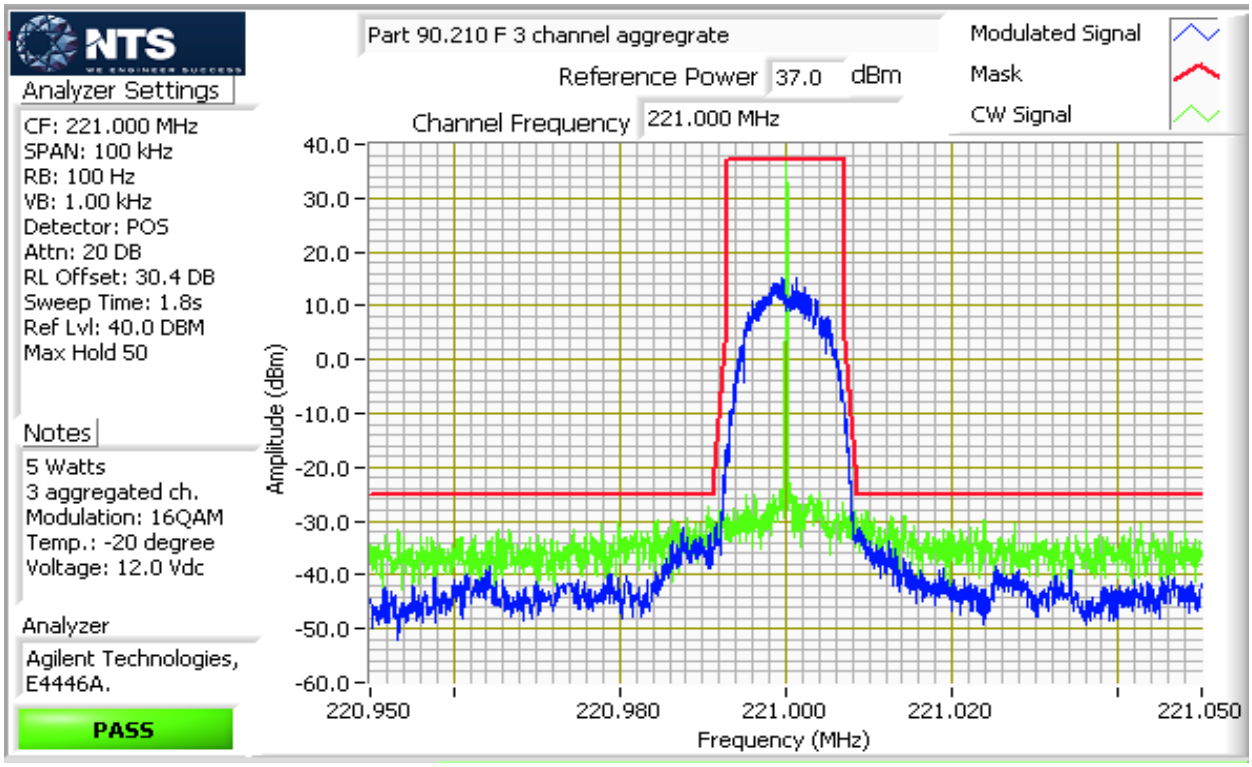
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at -30°C



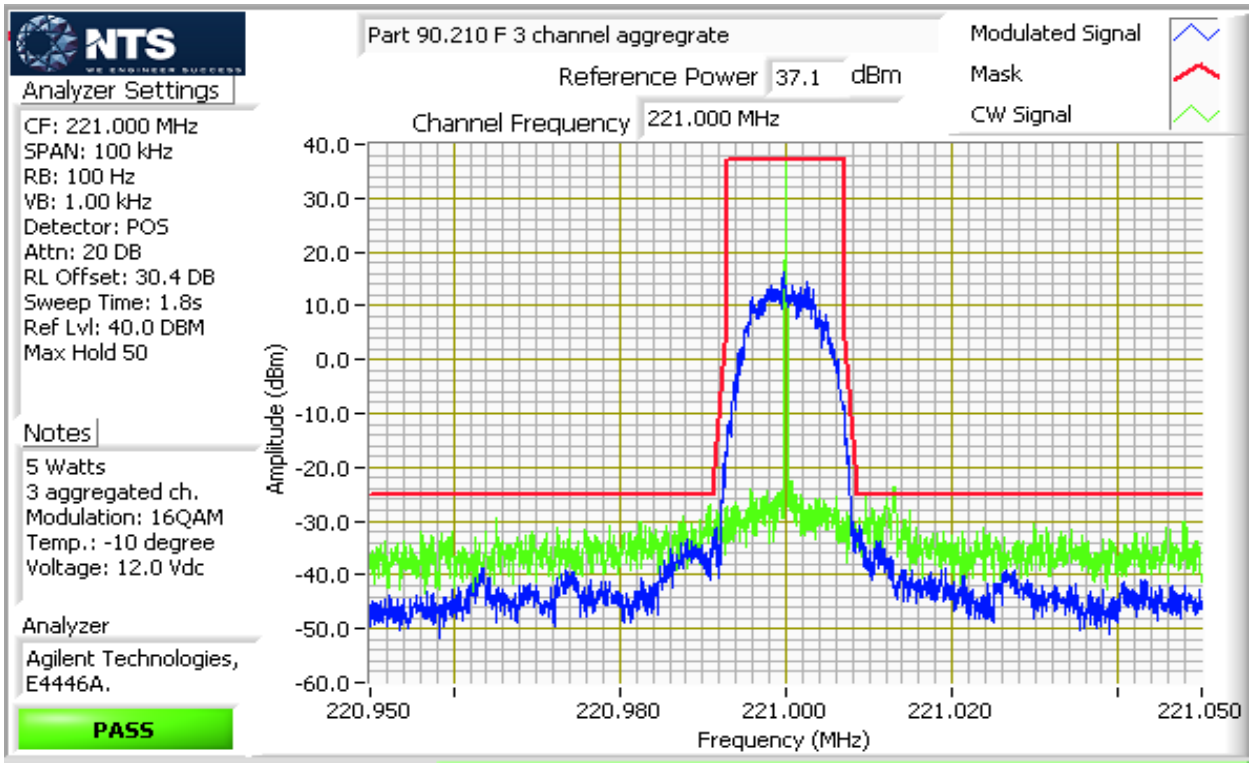
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at -20°C



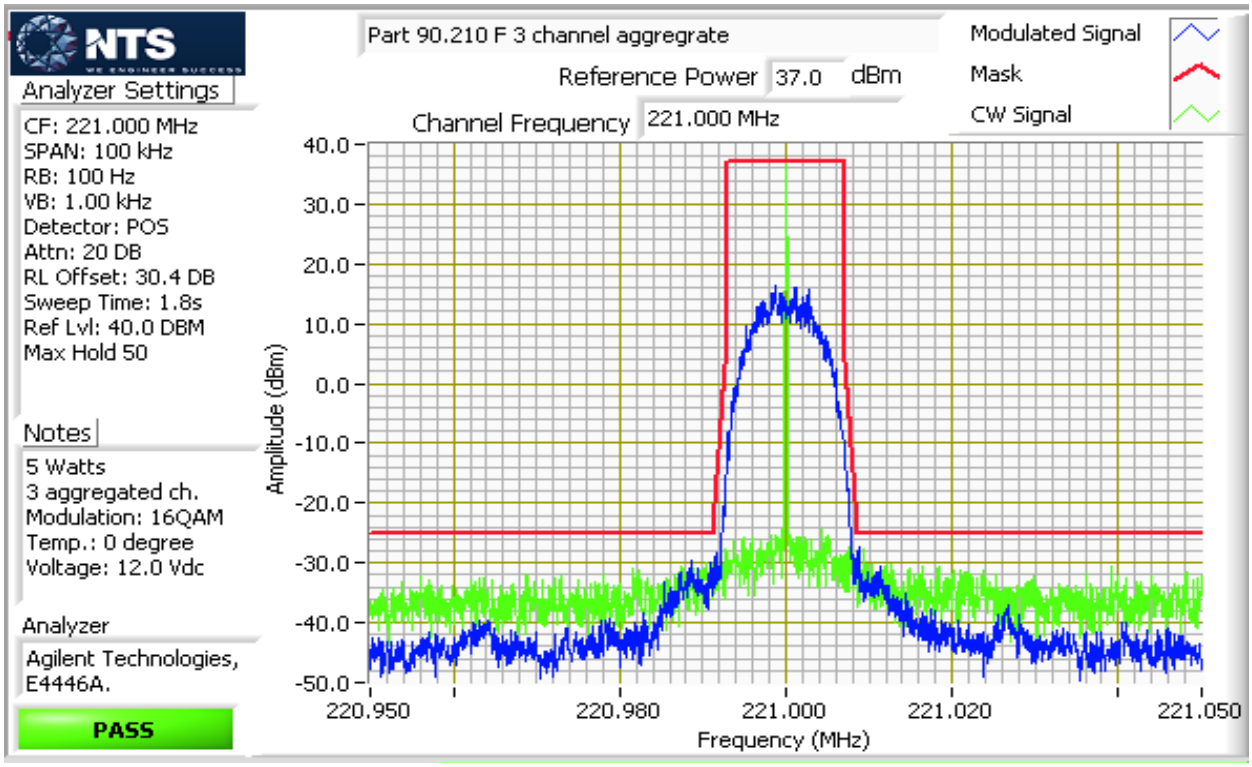
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at -10°C



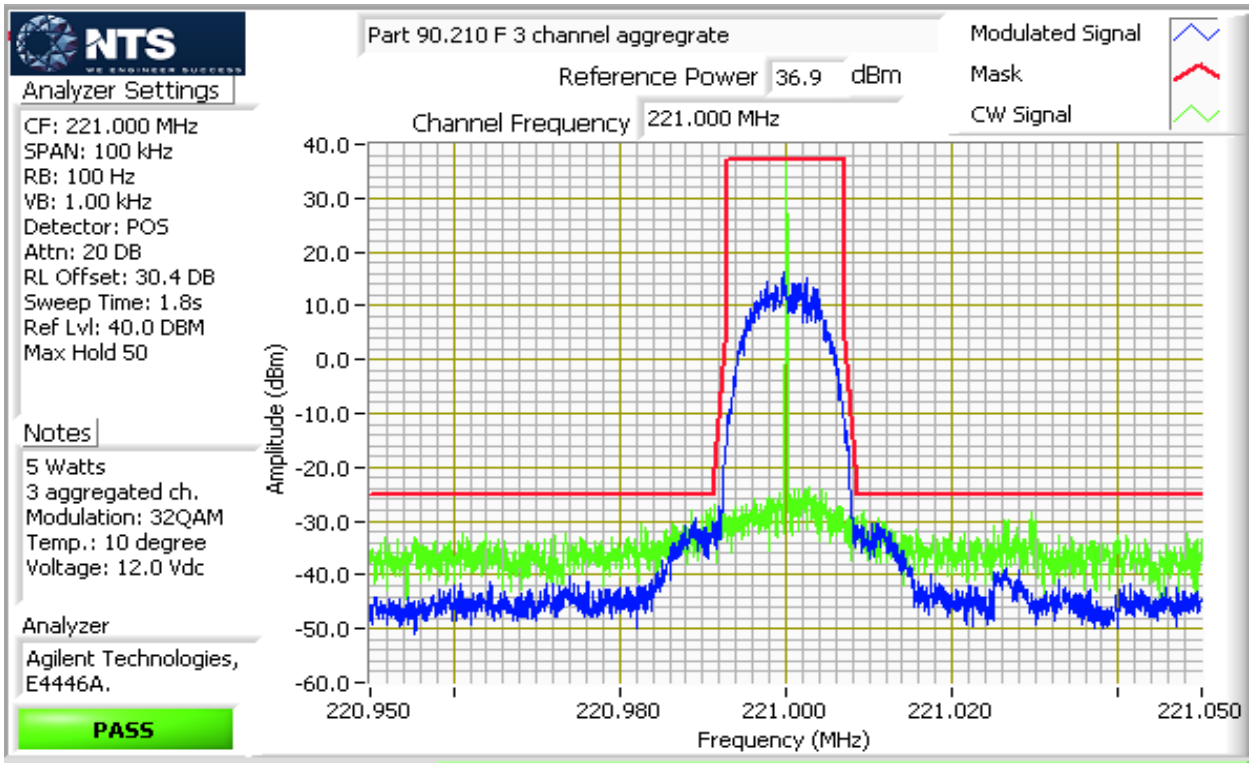
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 0°C



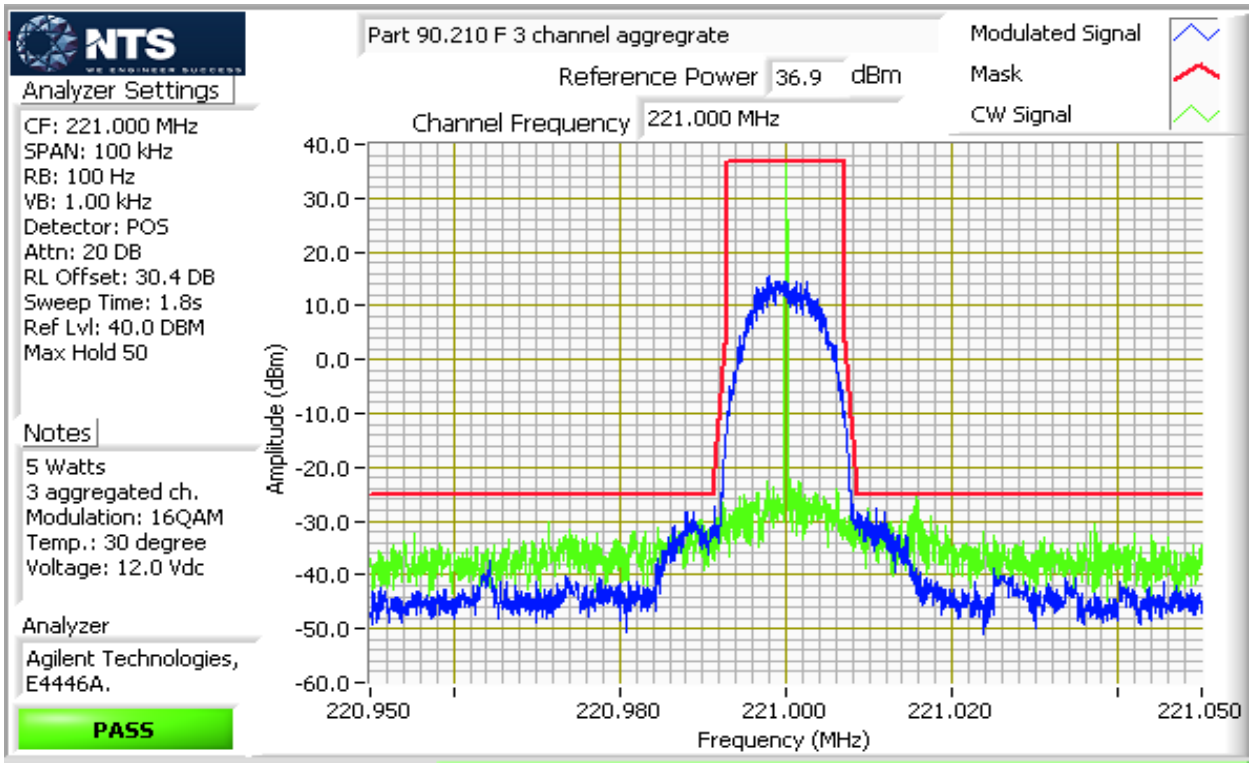
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 10°C



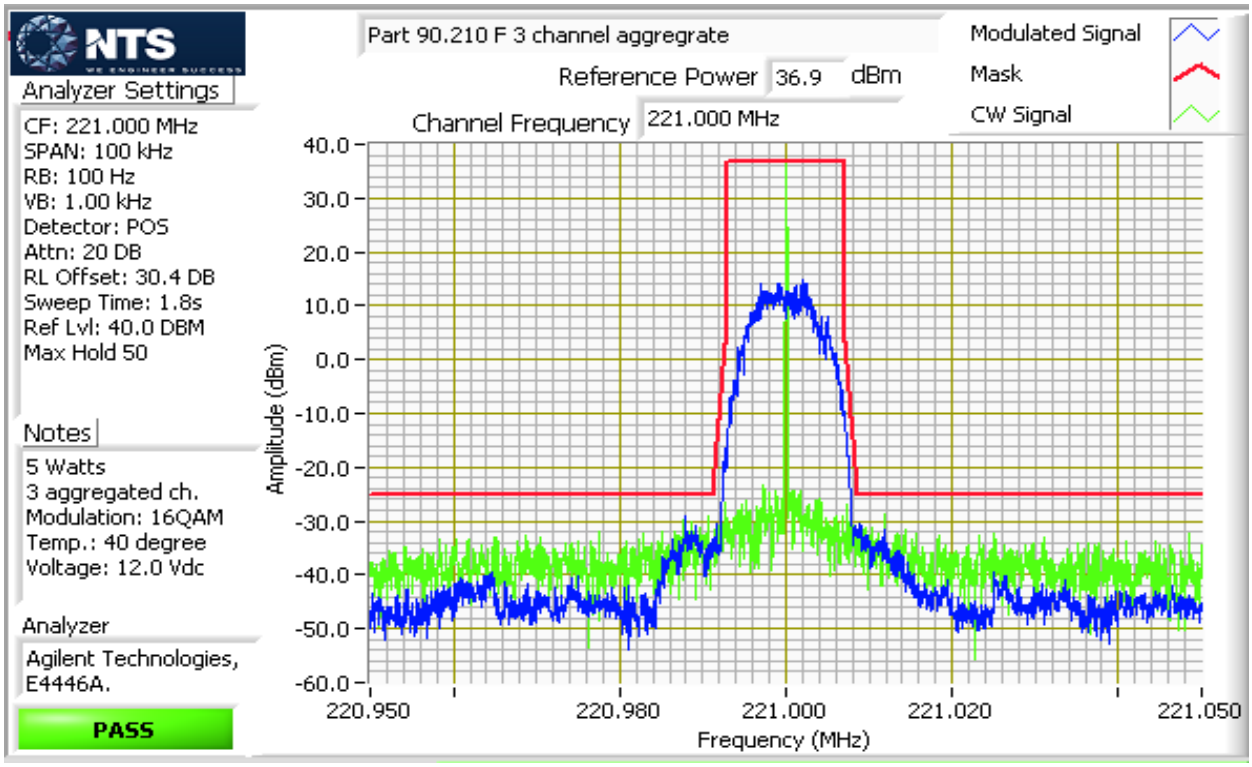
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 30°C



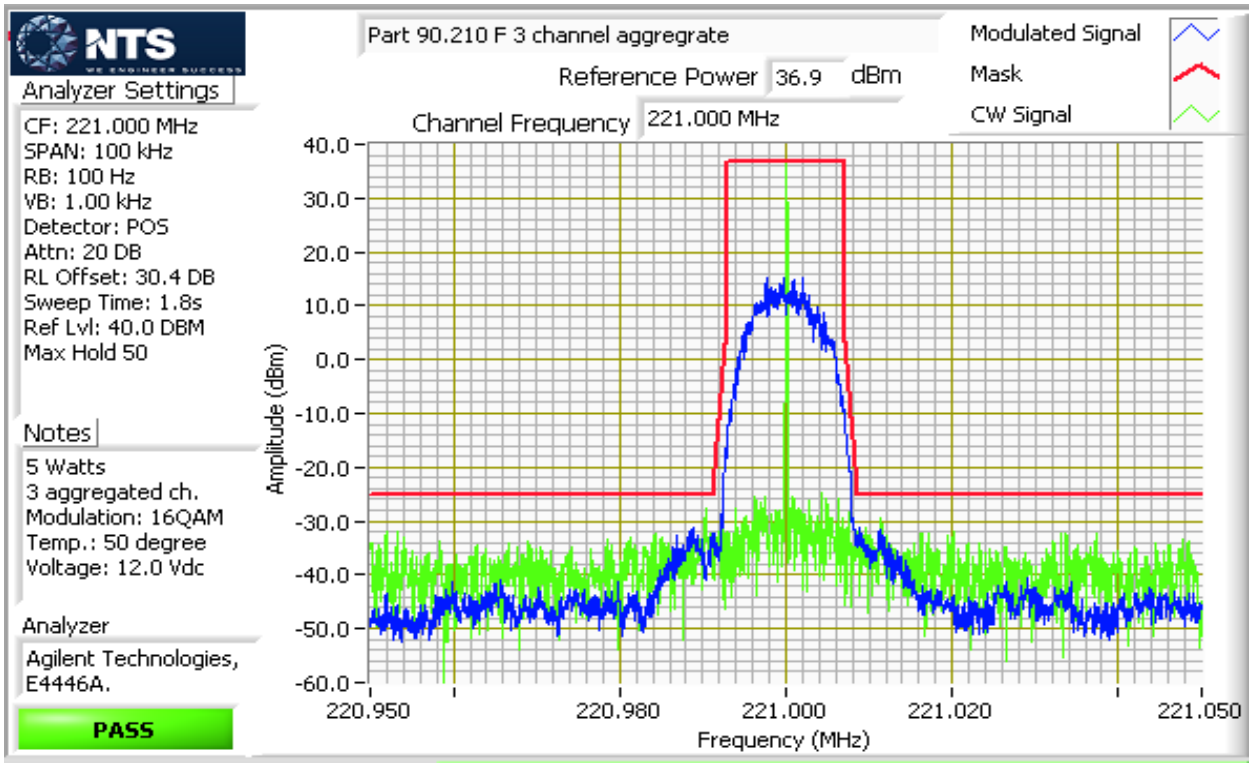
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 40°C



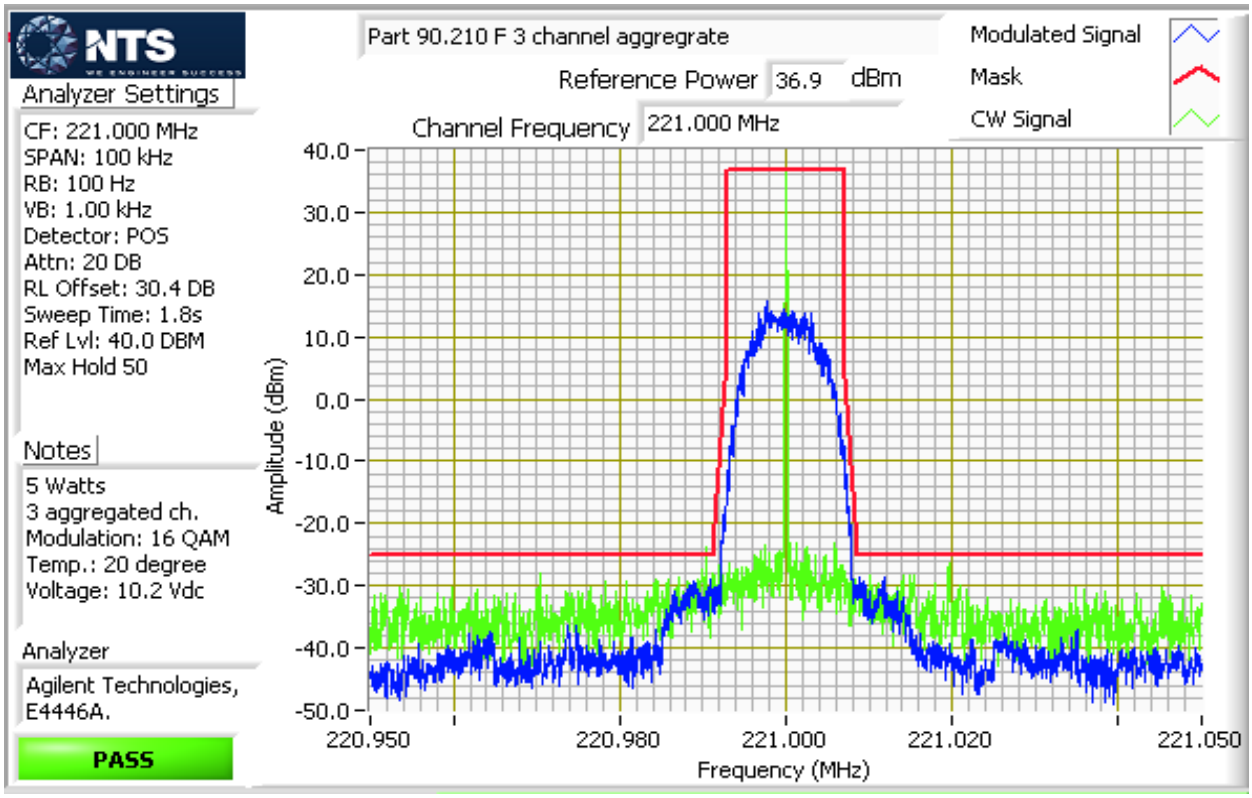
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 50°C



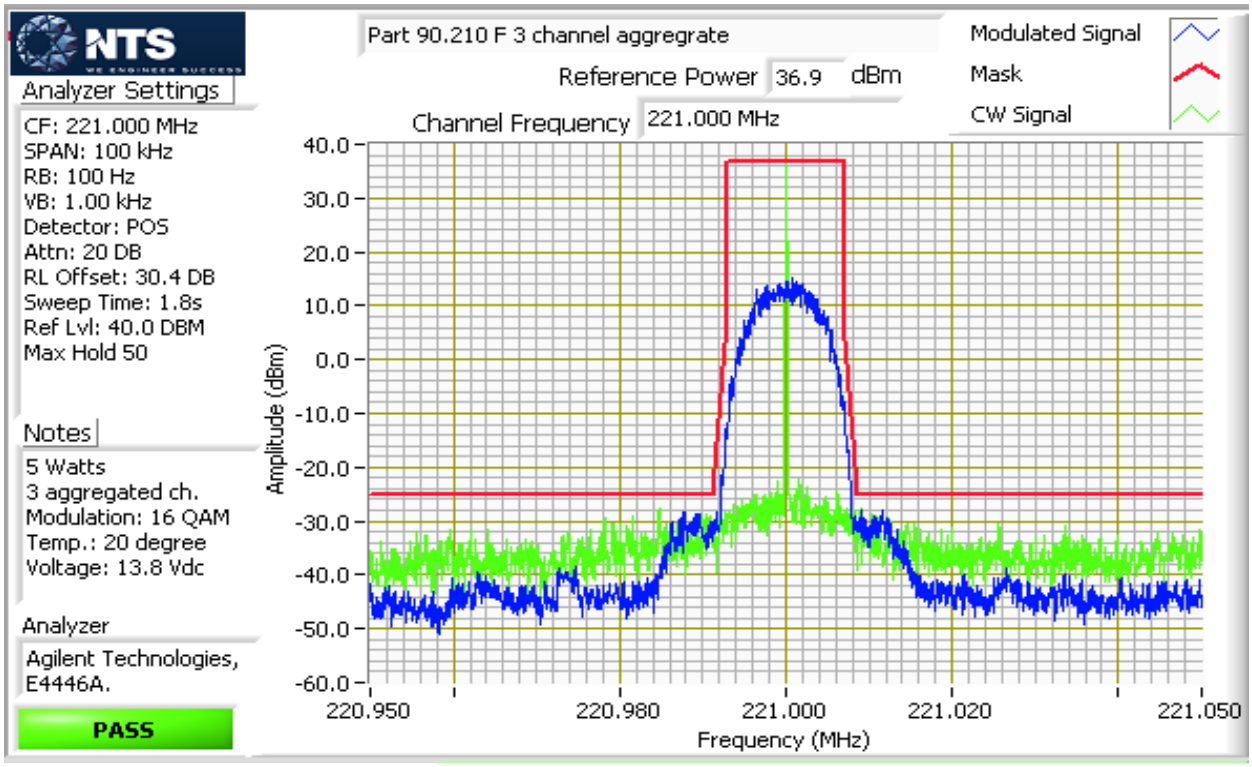
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability over 85% of Input voltage



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability over 115% of Input voltage



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Run #6c: Frequency Stability at 220-222 MHz band. 10x5 kHz aggregated channels.

Per §90.733 (e) In combining authorized, contiguous channels (including channels derived from multiple authorizations) to form channels wider than 5 kHz, the emission limits in §90.210(f) must be met only at the outermost edges of the contiguous channels. Transmitters shall be tested to confirm compliance with this requirement with the transmission located as close to the band edges as permitted by the design of the transmitter. The frequency stability requirements in §90.213 shall apply only to the outermost of the contiguous channels authorized to the licensee. However, the frequency stability employed for transmissions operating inside the outermost contiguous channels must be such that the emission limits in §90.210(f) are met over the temperature and voltage variations prescribed in §2.995 of

The worst case spectral mask result at ambient temperature was 32QAM modulation with 10 aggregated channel mode. This mode was used for the frequency stability measurements.

Nominal Frequency: 221.00000 MHz

Temperature	Result	Notes	Drift	
(Celsius)			(Hz)	(ppm)
-30	Pass	Comply with mask F	-	-
-20	Pass	Comply with mask F	-	-
-10	Pass	Comply with mask F	-	-
0	Pass	Comply with mask F	-	-
10	Pass	Comply with mask F	-	-
20	Pass	Comply with mask F	-	-
30	Pass	Comply with mask F	-	-
40	Pass	Comply with mask F	-	-
50	Pass	Comply with mask F	-	-

Frequency Stability Over Input Voltage

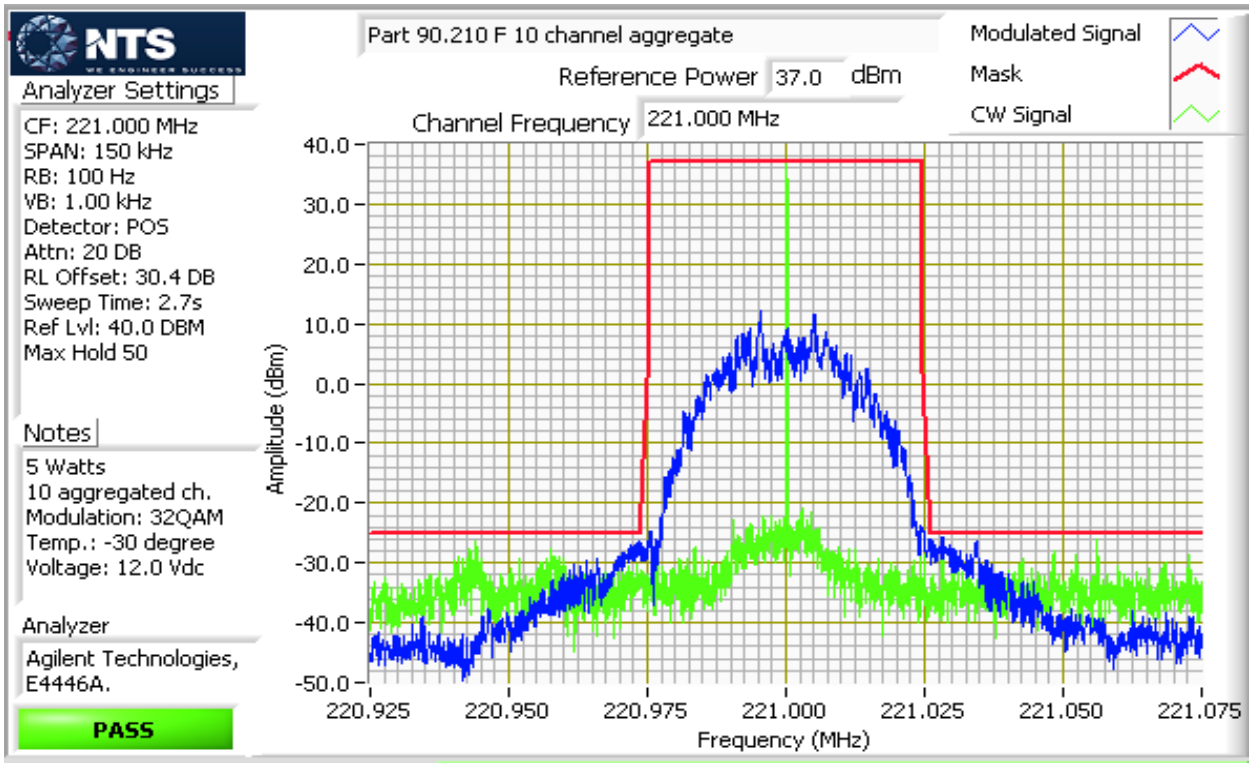
Nominal Voltage is 12 Vdc. (Min. 10.2 Vdc, Max. 13.8 Vdc)

Voltage	Result	Notes	Drift	
(DC)			(Hz)	(ppm)
85%	Pass	Comply with mask F	-	-
115%	Pass	Comply with mask F	-	-

Note 1: An unmodulated carrier power was measured to determine the reference power level for each spectral mask measurement.

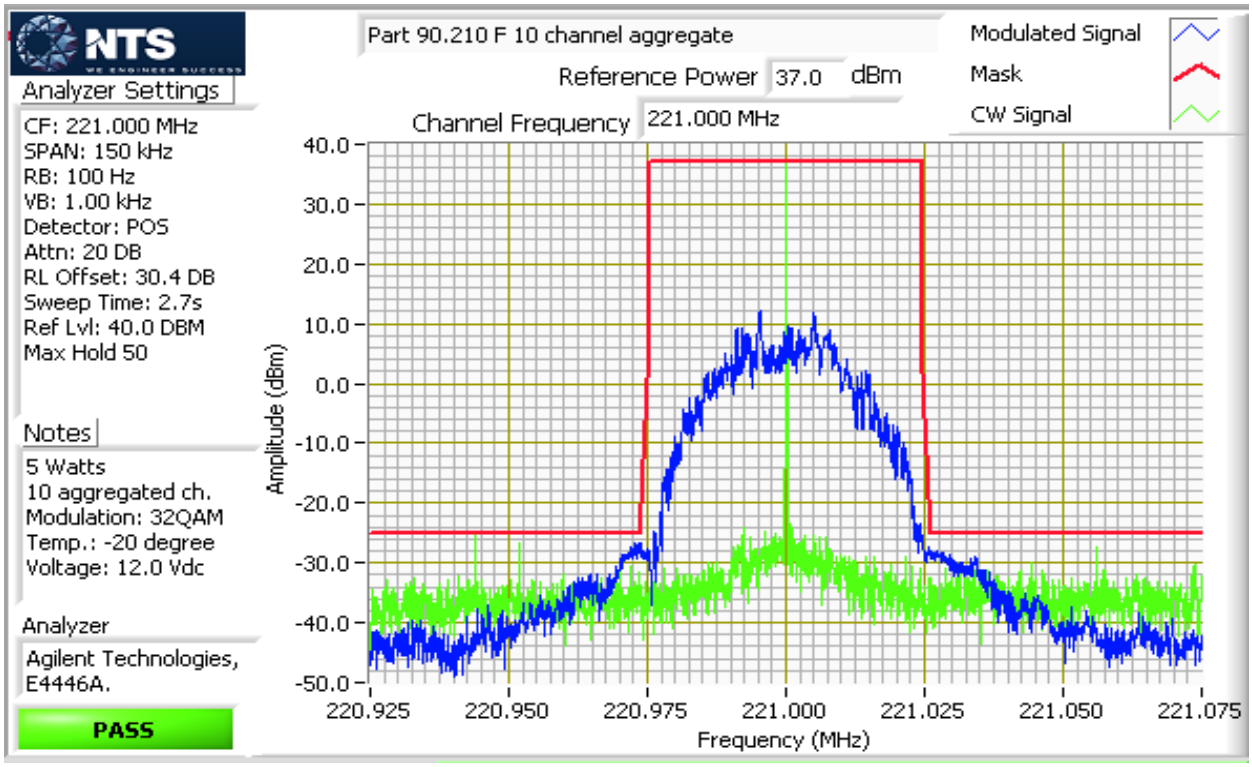
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at -30°C



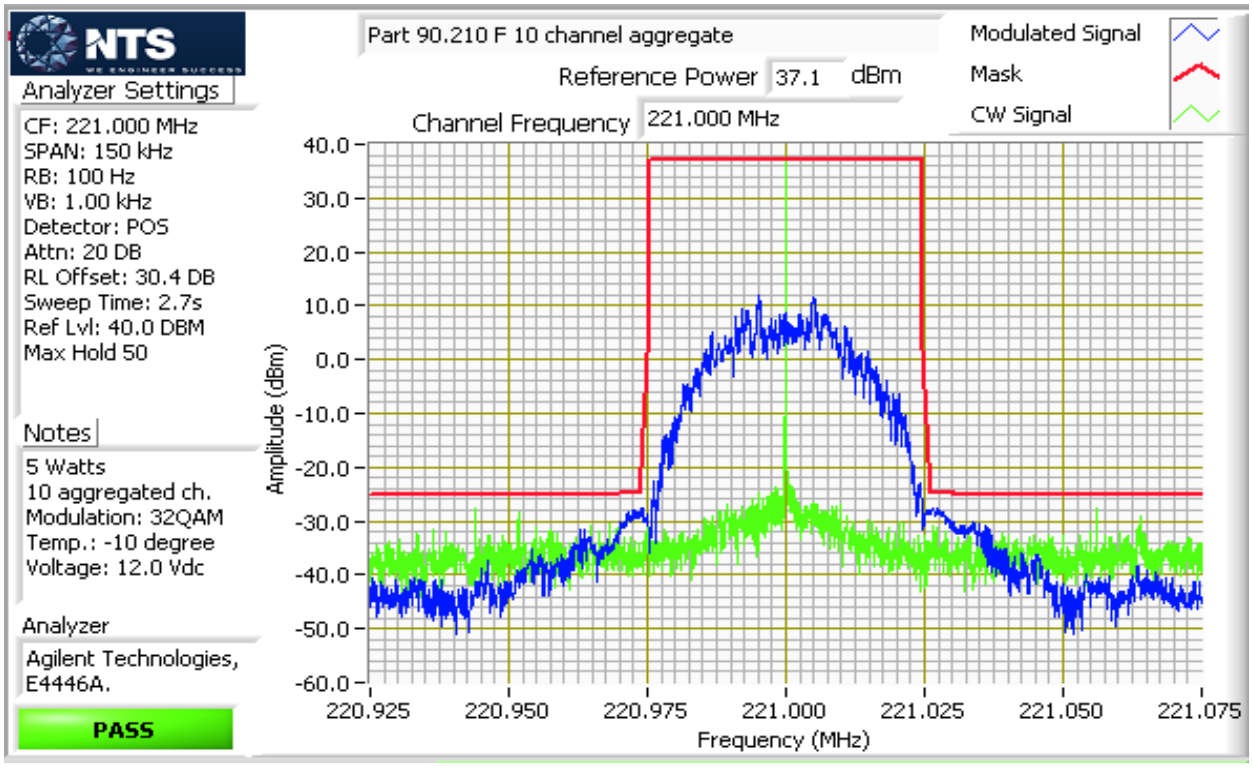
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at -20°C



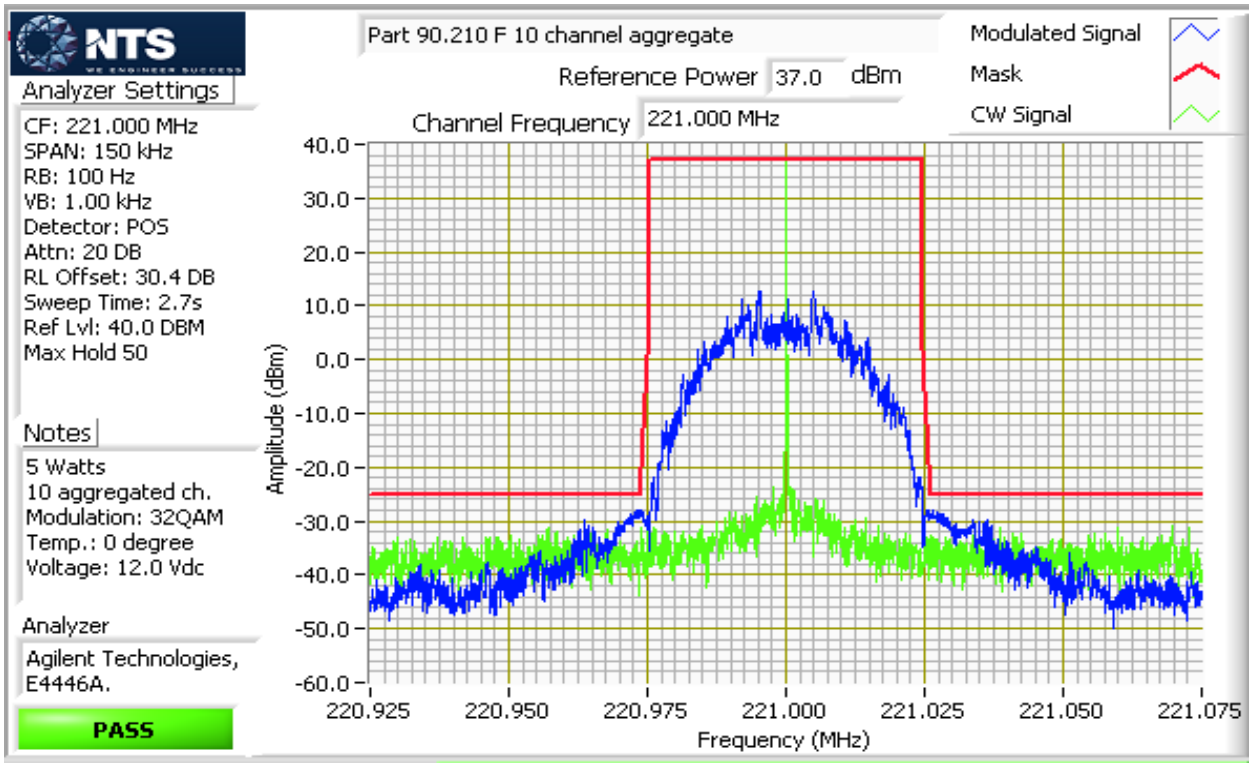
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at -10°C



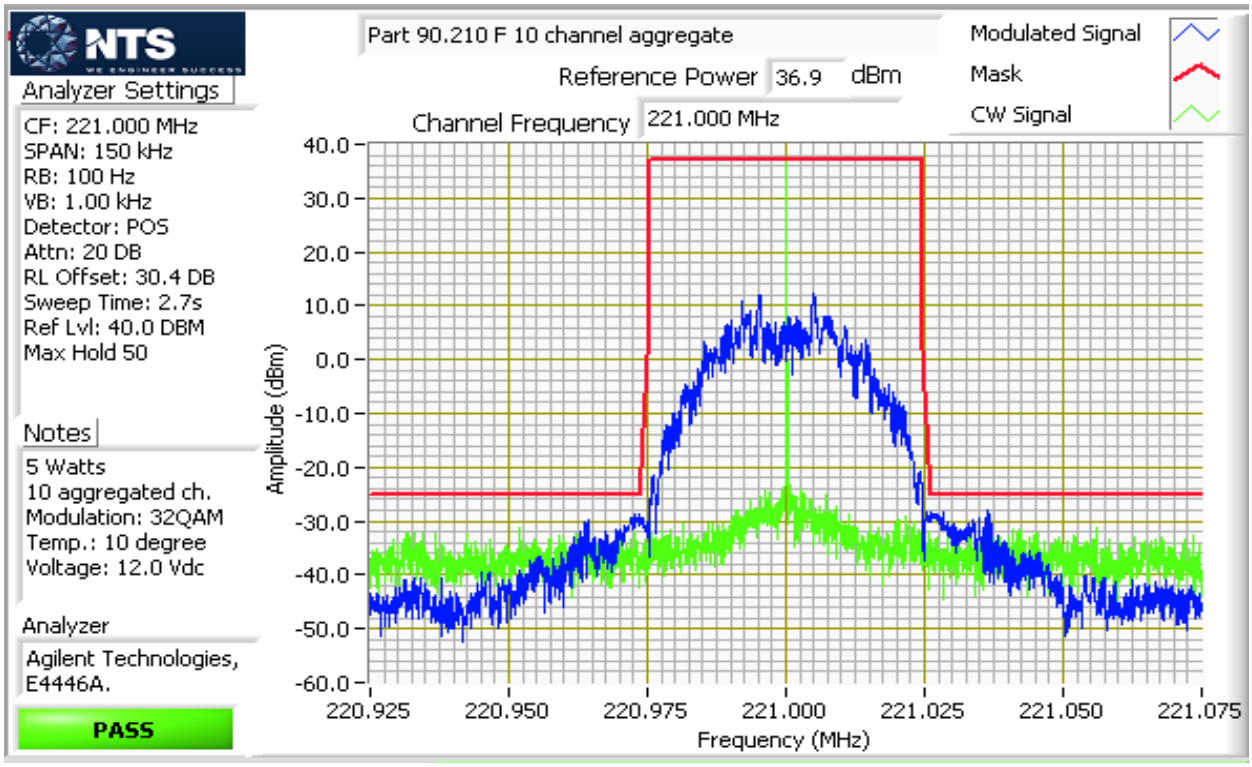
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 0°C



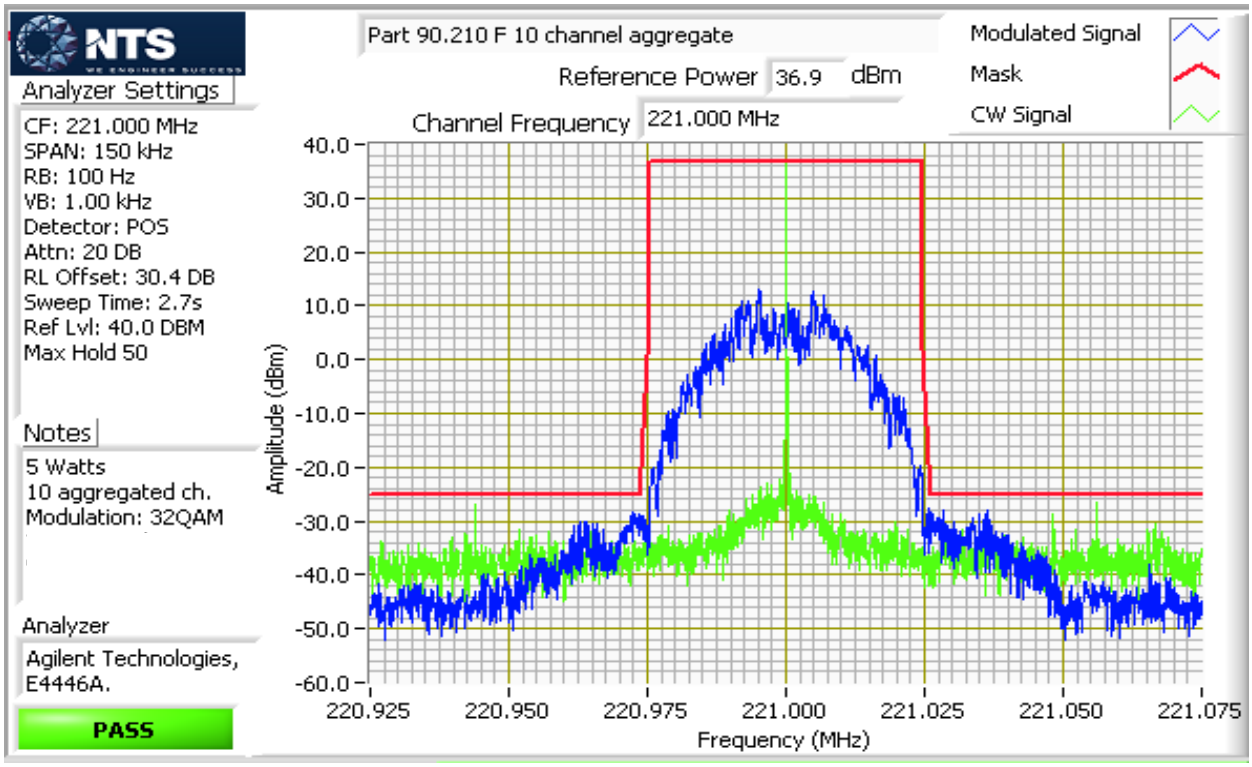
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 10°C



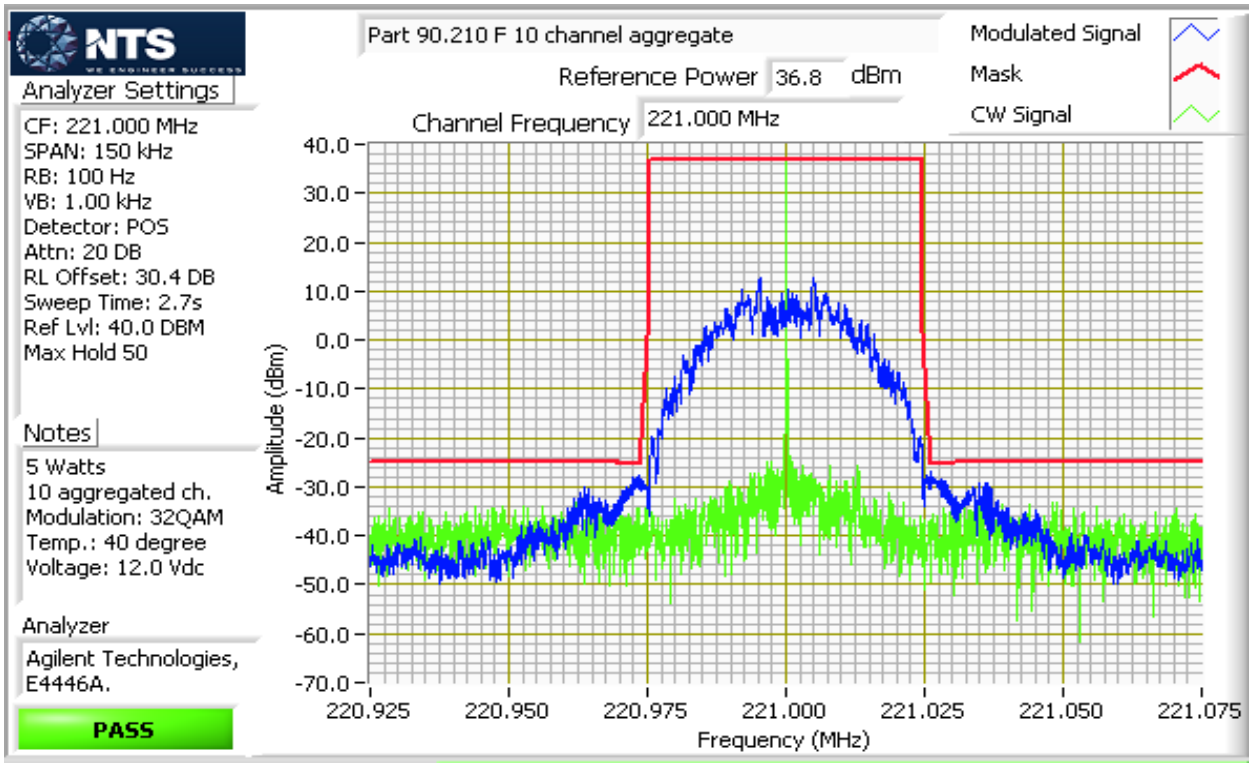
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 30°C



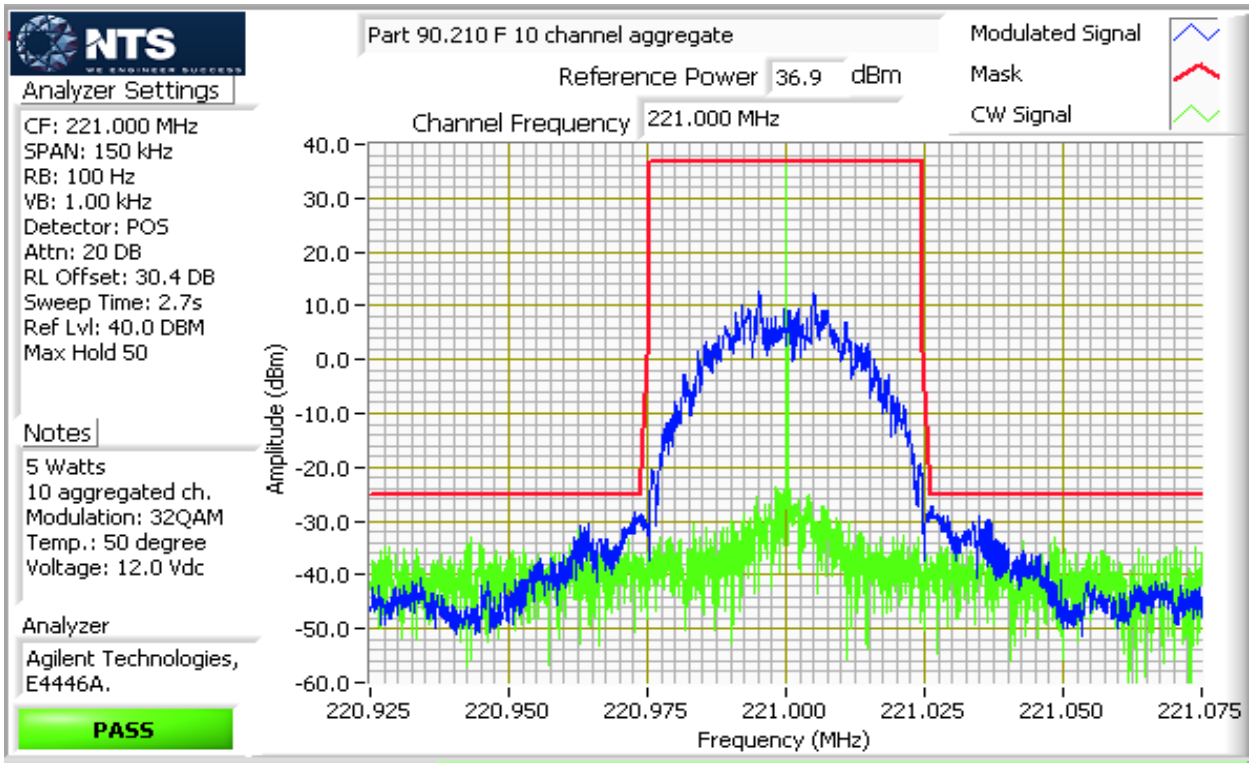
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 40°C



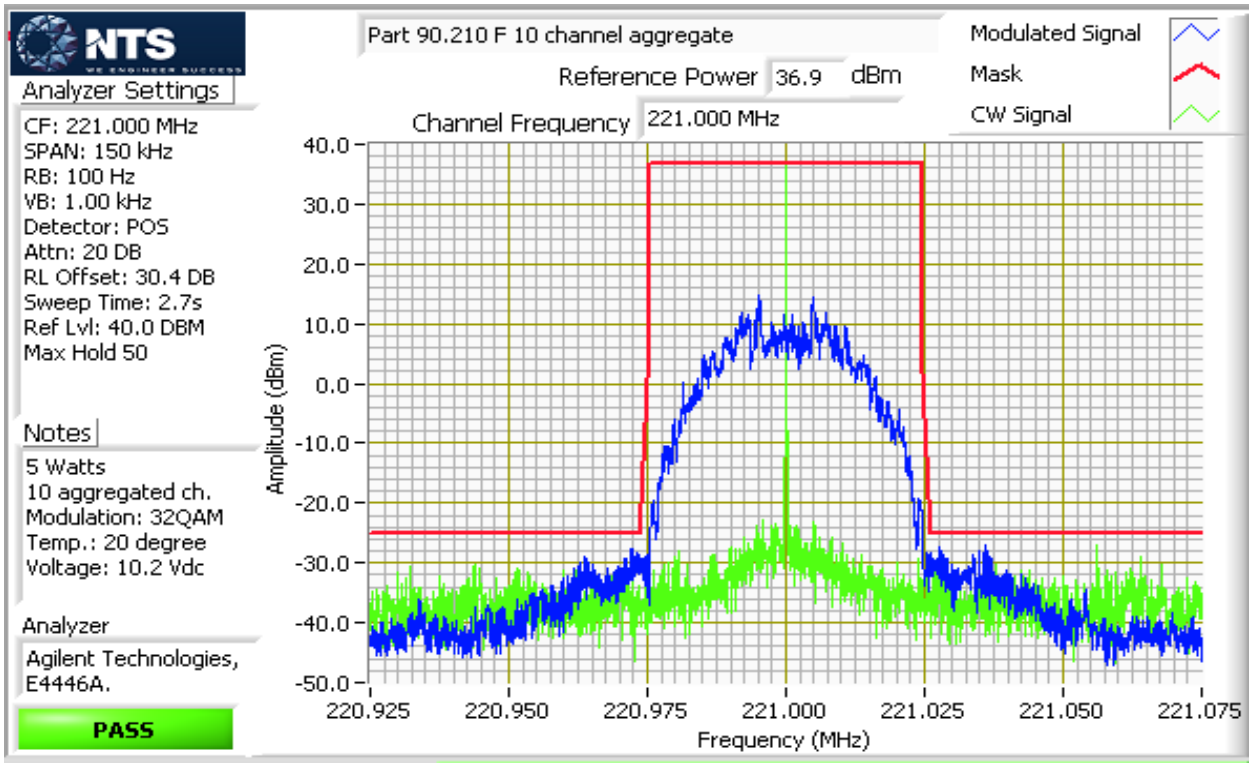
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability at 50°C



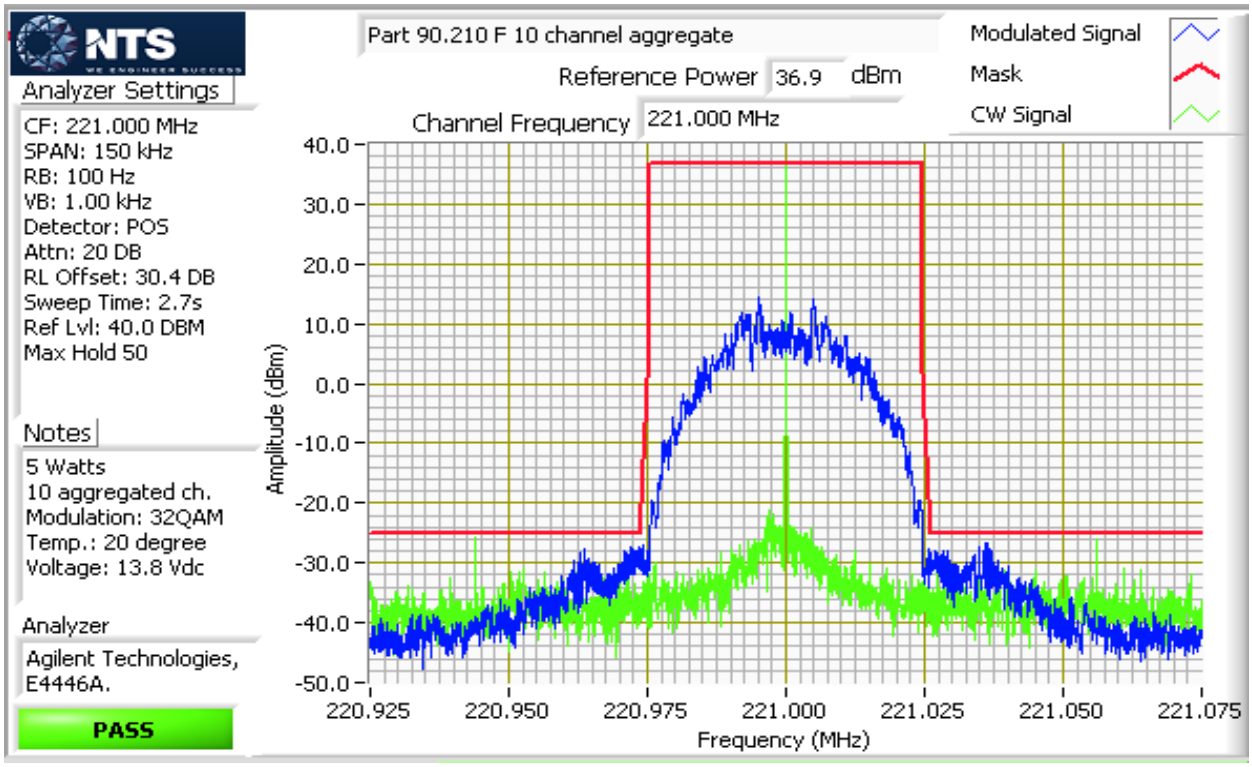
Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability over 85% of Input voltage



Client:	Xetawave LLC	Job Number:	J98677
Model:	Xeta2	T-Log Number:	T98773
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 90	Class:	N/A

Frequency stability over 115% of Input voltage



End of Report

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