NTS Silicon Valley
www.nts.com
41039 Boyce Road
Fremont, CA 94538
510-578-3500 Phone
510-440-9525 Fax

Radio Test Report

FCC Part 80
217 to 218 MHz and 219 to 220 MHz

Model: Xeta2

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:	February 16, 2016
FINAL TEST DATES:	January 25 and 26, 2016
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PROGRAM MGR / TECHNICAL REVIEWER:	QUALITY ASSURANCE DELEGATE / FINAL REPORT PREPARER:
Deniz Demirci	David Guidotti
Senior Wireless / EMC Engineer	Senior Technical Writer

A2LA ACCREDITED
Testing Cert #0214.26

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	February 16, 2016	First release	

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SCOPE

Tests have been performed on the Xetawave LLC model Xeta2, 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 47 Part 80 (Stations in the maritime services)

Conducted 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-D August 17, 2010

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 Xeta2 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 to add a new rule part to existing grant of the radio module.

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 Xeta2 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 80

FCC	Description	Limit	Measured	Result
Transmitter Modulation, output power and other characteristics				
§2.1033 (c) (5) § 80.385	Frequency range(s)	217-218 MHz 219-220 MHz	217-218 MHz 219-220 MHz	Pass
§2.1033 (c) (6) §2.1033 (c) (7) § 2.1046 § 80.215(h)	RF power output	1000 W (e.r.p.)	2 W(e.r.p.) (2 W conducted)	Pass
§2.1033 (c) (4) § 2.1047 § 80.481	Emission types		Declared by manufacturer	
	Emission limitations	§ 80.211(f)	Emissions within the mask	Pass
§ 2.1049 § 80.481	Occupied Bandwidth	500 kHz	MSK: 171 kHz QPSK, 8PSK, 16QAM and 32QAM: 176 kHz	Pass
Transmitter spurious emissions				
§ 2.1051 § 2.1057	At the antenna terminals	-13 dBm	Same as original filing.	
§ 2.1053 § 2.1057	Field strength	-13 dBm	Same as original filing.	
Other details				
§ 2.1055 § 80.209	Frequency stability	5 ppm	Same as original filing.	
§ 2.1093	RF Exposure		Same as original filing.	
§2.1033 (c) (8)	Final radio frequency amplifying circuit's dc voltages and currents for normal operation over the power range		Same as original filing.	
-	Antenna Gain		2.1 dBi (Declared by manufacturer)	

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 power, conducted	dBm	25 to 7,000 MHz	± 0.52 dB
Conducted emission of transmitter	dBm	25 to 40,000 MHz	± 0.7 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Xetawave LLC model Xeta2 is a radio module which is designed to be used for licensed radio operations for private data transmission networking or telemetry.

This test report covers § 80.385 AMTS (Automated maritime telecommunications system) bands of operation.

The electrical rating of the EUT is 12 Volts DC, 3 Amps.

The sample was received on January 25, 2016 and tested on January 25 and 26, 2016. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
XetaWave	Xeta2	Radio Module	E5019055	PEJ-XETA2

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 - 218 MHz band of operations for FCC Part 80 AMTS;

EUT transmits at 217.1250 MHz, 217.3750 MHz, 217.6250 MHz and 217.8750 MHz channel frequencies with MSK modulation, 217.2500 MHz and 217.7500 MHz channel frequencies with QPSK, 8PSK, 16QAM, and 32QAM modulations.

219- 220 MHz band of operations for FCC Part 80 AMTS;

EUT transmits at 219.1250 MHz, 219.3750 MHz, 219.6250 MHz and 219.8750 MHz channel frequencies with MSK modulation, 219.2500 MHz and 219.7500 MHz channel frequencies with 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 12 mm

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	-	Heat sink and fan	-	-
MASTECH	HY6020EX	AC/DC power supply	-	-
HP	Pavilion dv7	Laptop	-	-
FTDI	None	Serial/USB adapter	-	-

No remote support equipment was used during testing.

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
Serial	USB/Serial adapter	Serial cable	Unshielded.	0.3

EUT OPERATION

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

TESTING

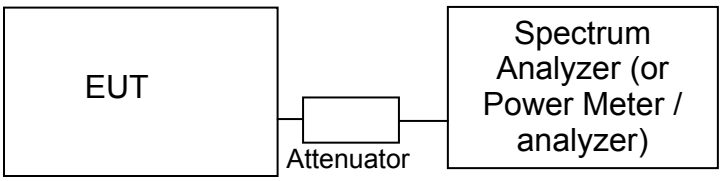
GENERAL INFORMATION

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

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

OUTPUT POWER

Output power is measured using a power meter and a peak sensor head as required by the relevant rule part. Where necessary measurements are gated to ensure power is only measured over periods that the device is transmitting.

Power measurements made directly on the rf power port are, when appropriate, converted to an ERP by adding the gain of the highest gain antenna that can be used with the device under test, as specified by the manufacturer.

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.

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.

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

Appendix A Test Equipment Calibration Data

Antenna port measurements, 25-Jan-16

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
NTS	NTS EMI Software (rev 2.10)	N/A	0		N/A
NTS	NTS Mask Software (rev 3.8)	N/A	0		N/A
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016

Antenna port measurements, 26-Jan-16

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	12/17/2015	12/17/2016
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016
Rohde & Schwarz	Peak Power Sensor 100 uW - 2 Watts use with 20dB attenuator sn:1031.6959.00 only	NRV-Z32	3225	9/24/2015	9/24/2016

Appendix B Test Data

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Client:	Xetawave LLC	Job Number:	JD100445
Product	Xeta2	T-Log Number:	T100552
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Emissions Standard(s):	FCC Part 80	Class:	A
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xetawave LLC

Product

Xeta2

Date of Last Test: 1/26/2016

Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

FCC Part 80

Power, Spurious Emissions and Occupied Bandwidth

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

All measurements are made with the EUT's rf port connected to the measurement instrument via an attenuator if necessary. All amplitude measurements are adjusted to account for the attenuation between EUT and measuring instrument.

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	217-218 MHz 219-220 MHz 1000 W e.r.p. (60 dBm)	Pass	33 dBm
2	-	-	Emission Limitations	217-218 MHz, 219-220 MHz: FCC 80.211(f)	Pass	Within Mask
3	-	-	99 % or Occupied Bandwidth	None	-	MSK: 171 kHz QPSK, 8PSK, 16QAM and 32QAM: 176 kHz

EUT Ser #: E5019055

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:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

Run #1: Output Power

Date of Test: 1/25/2016, 1/26/2016
Test Engineer: Deniz Demirci
Test Location: FT Lab #4b

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

Cable Loss: 0.0 dB
Cable ID(s): Direct connection

Attenuator: 30.0 dB
Attenuator IDs: Asset #1875 and asset #2101

Total Loss: 30.0 dB

Run #1a: Output power

Power setting	Frequency (MHz)	Modulation	Occupied BW	Output Power (dBm) [1]	Output Power W	Ant. Gain (dBi)	Result	ERP dBm	ERP W
4500	217.1250	MSK	171 kHz	33.0	2.00	2.1	Pass	33.0	1.995
6800	217.2500	QPSK	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
6850	217.2500	8PSK	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
7000	217.2500	16QAM	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
7100	217.2500	32QAM	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
4050	219.8750	MSK	171 kHz	33.0	2.00	2.1	Pass	33.0	1.995
6700	219.7500	QPSK	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
6850	219.7500	8PSK	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
7000	219.7500	16QAM	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995
7100	219.7500	32QAM	176 kHz	33.0	2.00	2.1	Pass	33.0	1.995

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:	JD100445
Model:	Xeta2	T-Log Number:	T100552
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Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

Run #2: Emission Limitations, FCC Part 80

§80.481 Alternative technical parameters for AMTS transmitters.

In lieu of the technical parameters set forth in this part, AMTS transmitters may utilize any modulation or channelization scheme so long as emissions are attenuated in accordance with §80.211 at the band edges of each station's assigned channel group or groups.

§80.211 Emission limitations.

(f) The mean power when using emissions other than those in paragraphs (a), (b), (c) and (d) of this section:

(1) On any frequency removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: At least 25 dB;

(2) On any frequency removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: At least 35 dB; and

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus 10log10 (mean power in watts) dB.

Date of Test:	1/25/2016, 1/26/2016	Config. Used:	1
Test Engineer:	Deniz Demirci	Config Change:	None
Test Location:	FT Lab #4b	EUT Voltage:	12 Vdc

Run #2a: 217-218 MHz, Group B

Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
4200		171 kHz	MSK	217.1250	217.0000 - 217.5000	Pass
4200		171 kHz	MSK	217.3750	217.0000 - 217.5000	Pass

Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
6800		176 kHz	QPSK	217.2500	217.0000 - 217.5000	Pass
6850		176 kHz	8PSK	217.2500	217.0000 - 217.5000	Pass
7000		176 kHz	16QAM	217.2500	217.0000 - 217.5000	Pass
7100		176 kHz	32QAM	217.2500	217.0000 - 217.5000	Pass

Note 1:	-13 dBm band edge frequencies were calculated as 216.9625 MHz and 217.5375 MHz (Group B) using 20 kHz authorized bandwidth per §80.385.

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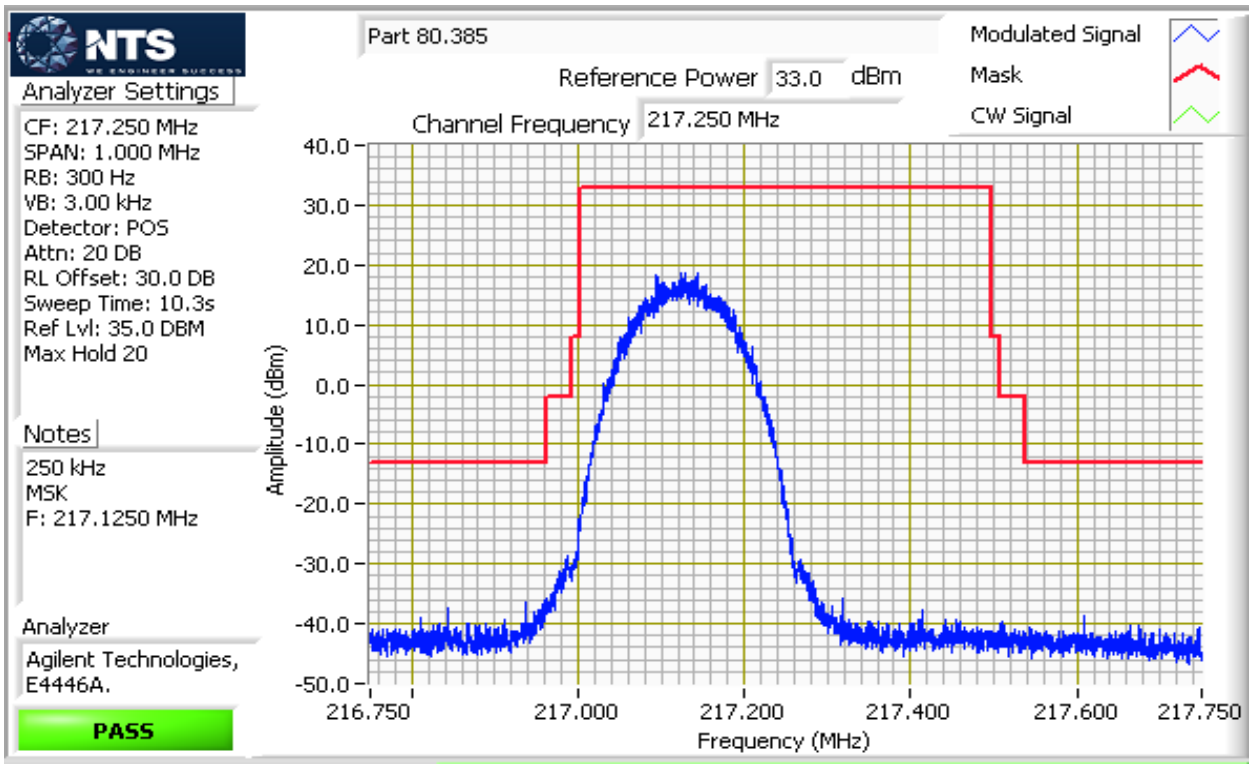
Standard:	FCC Part 80	Class:	N/A



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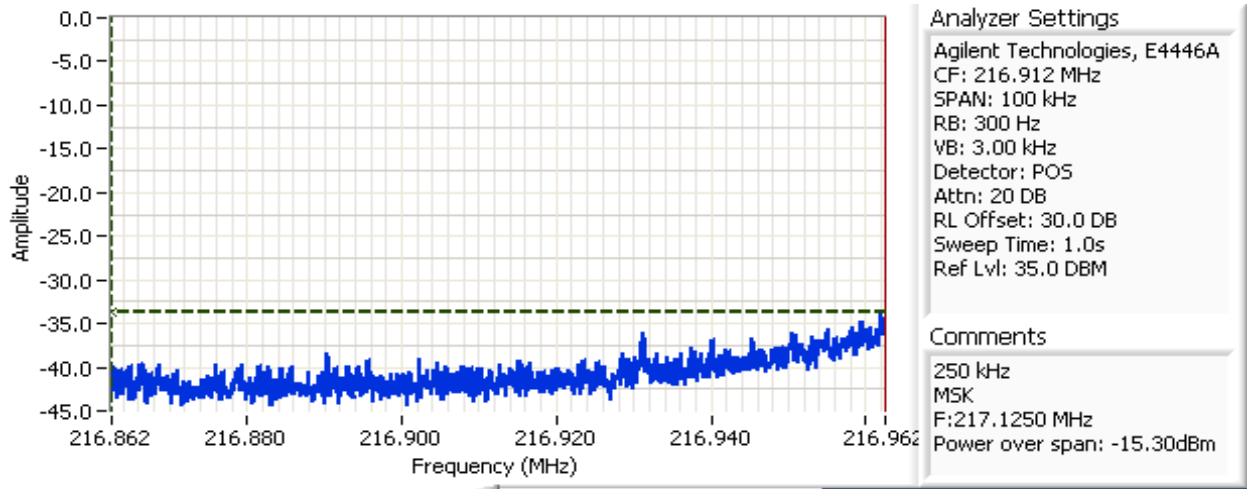

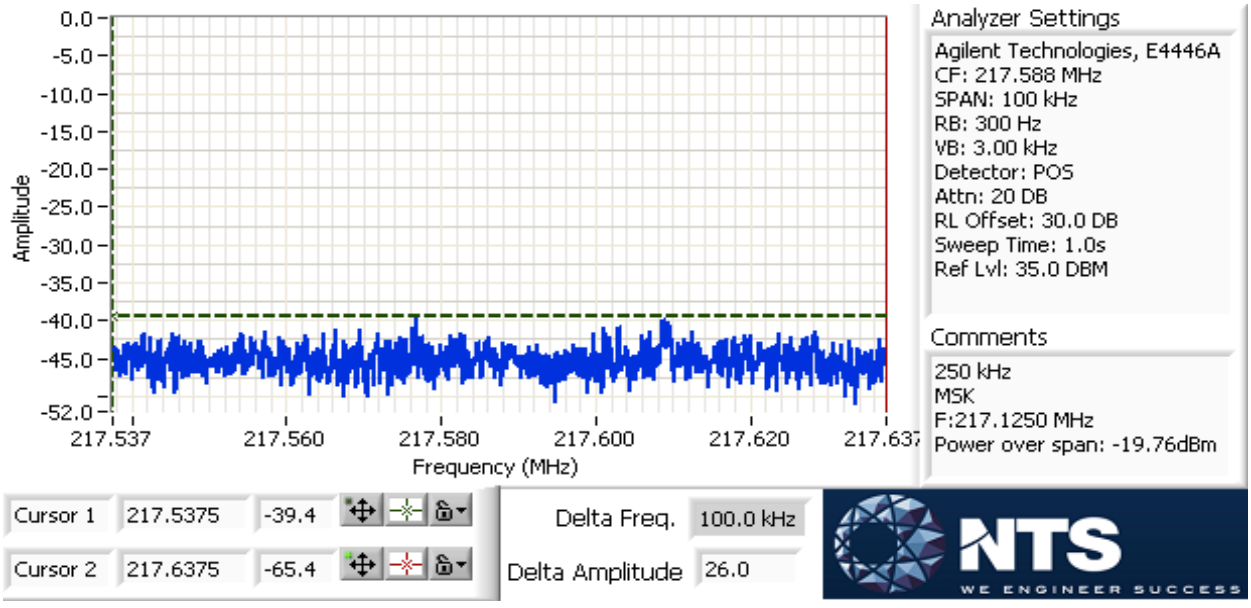

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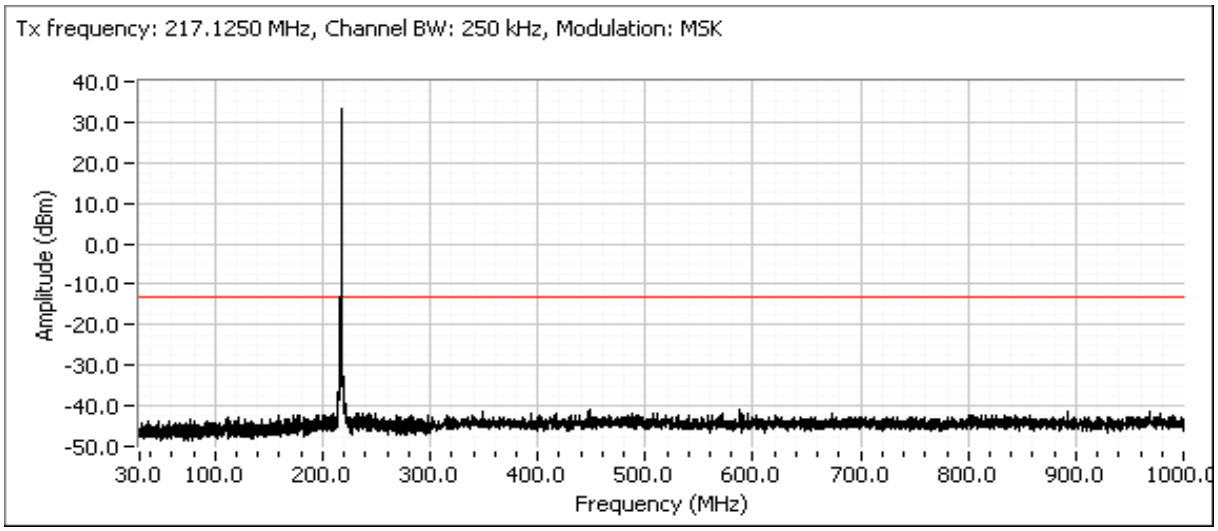

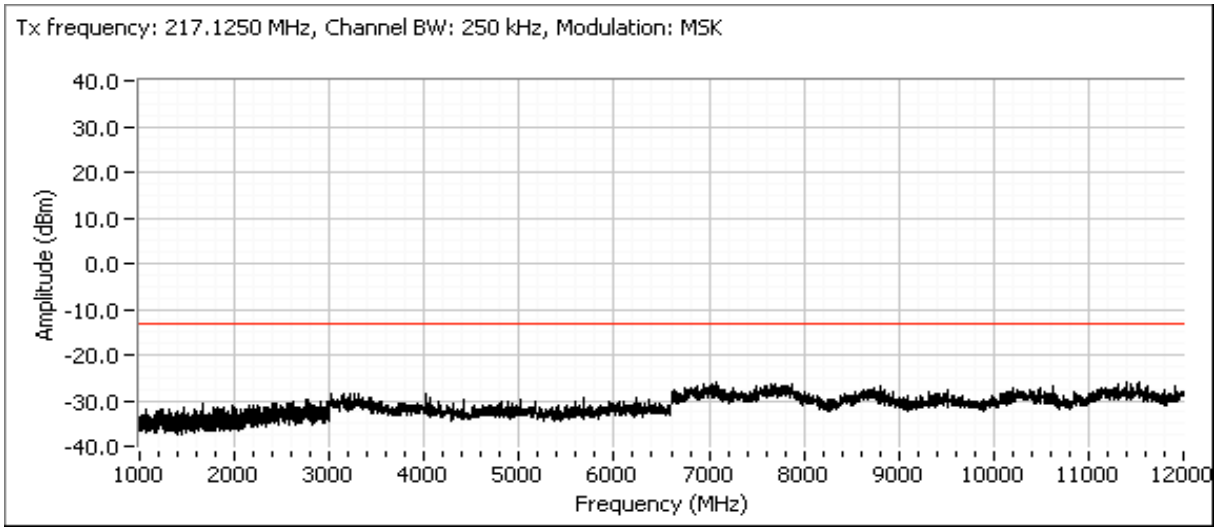

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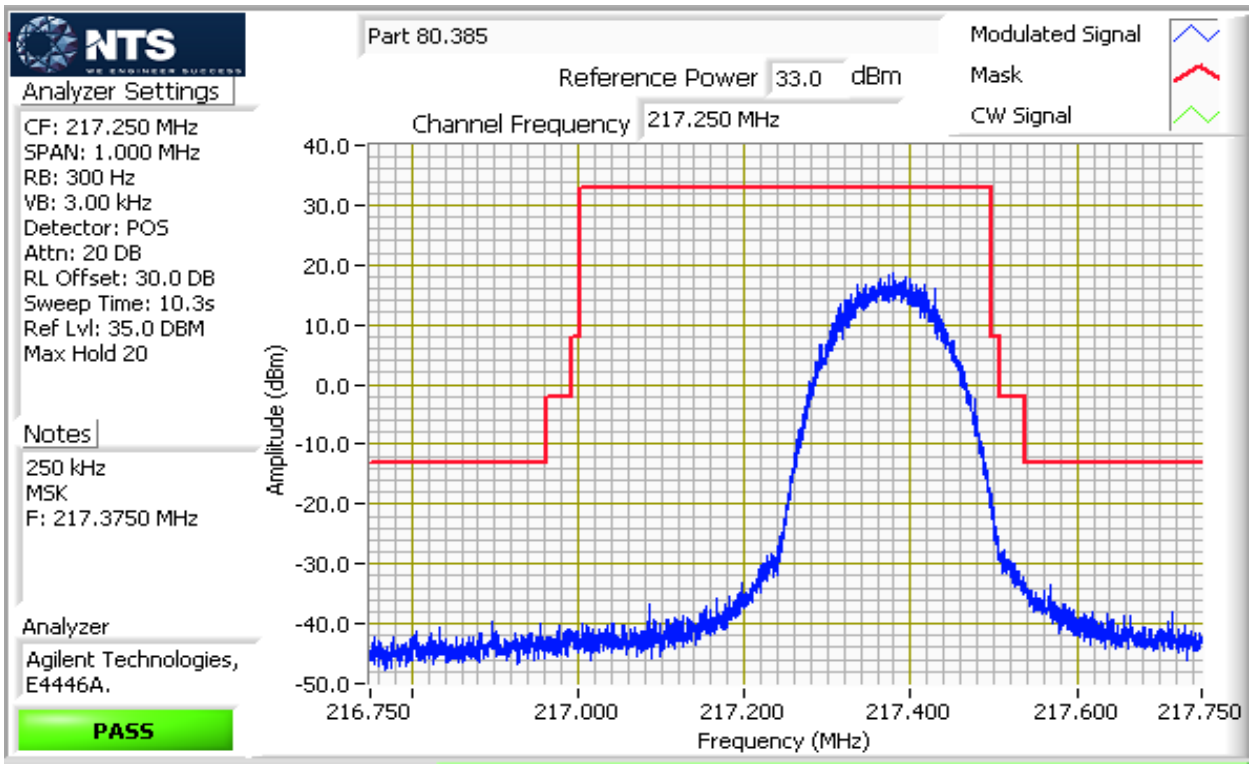

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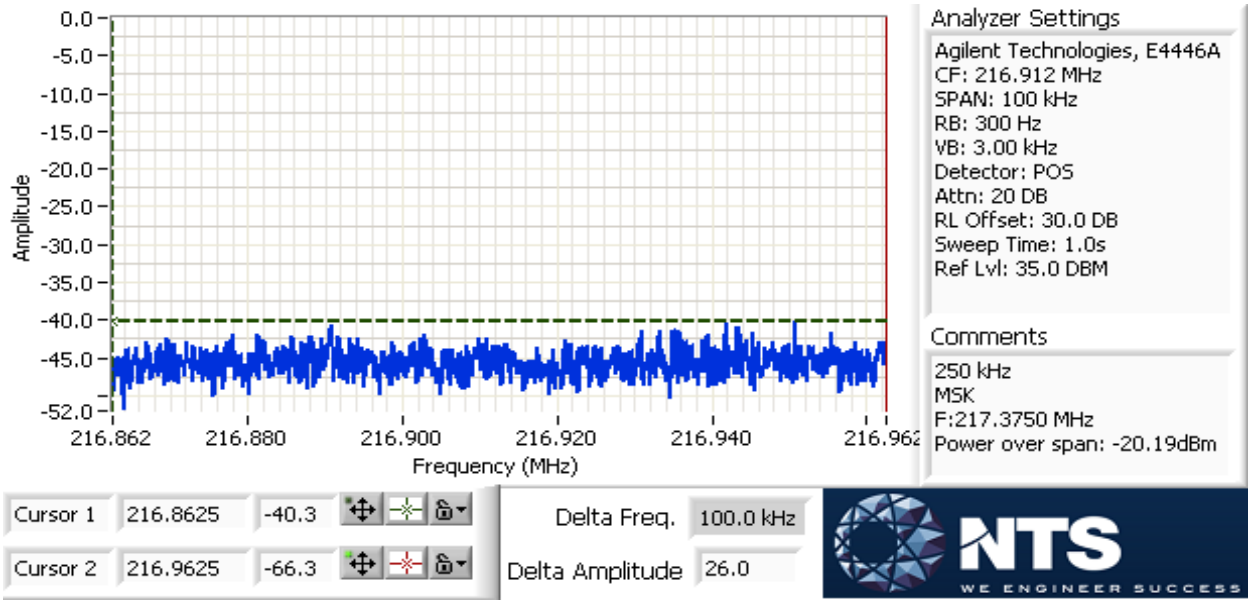

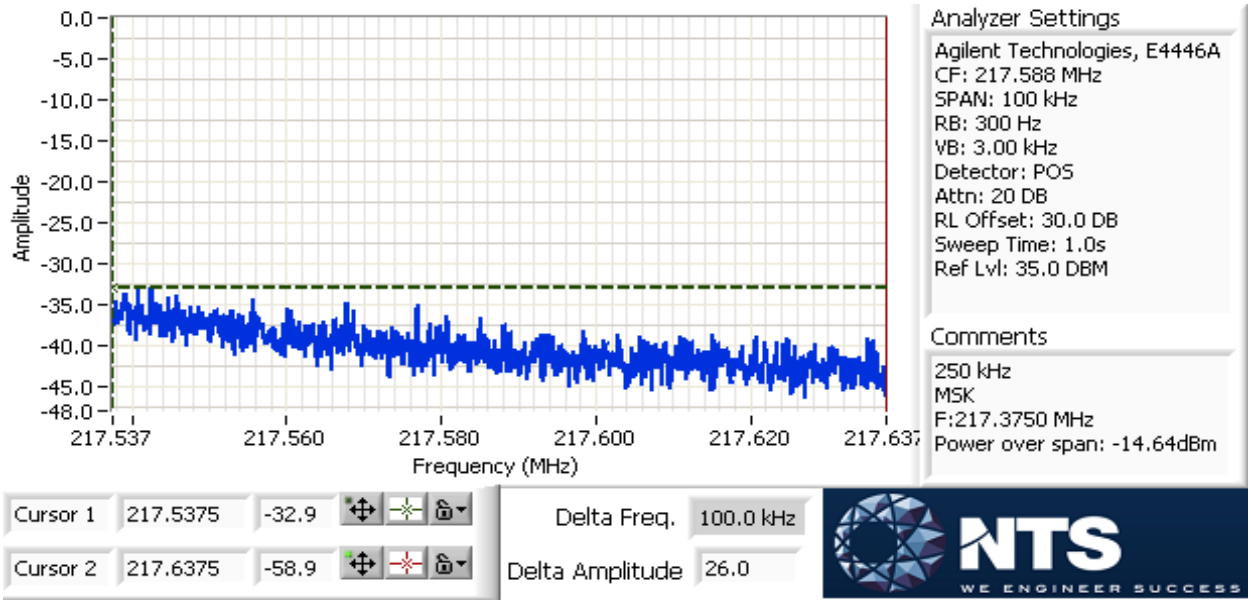

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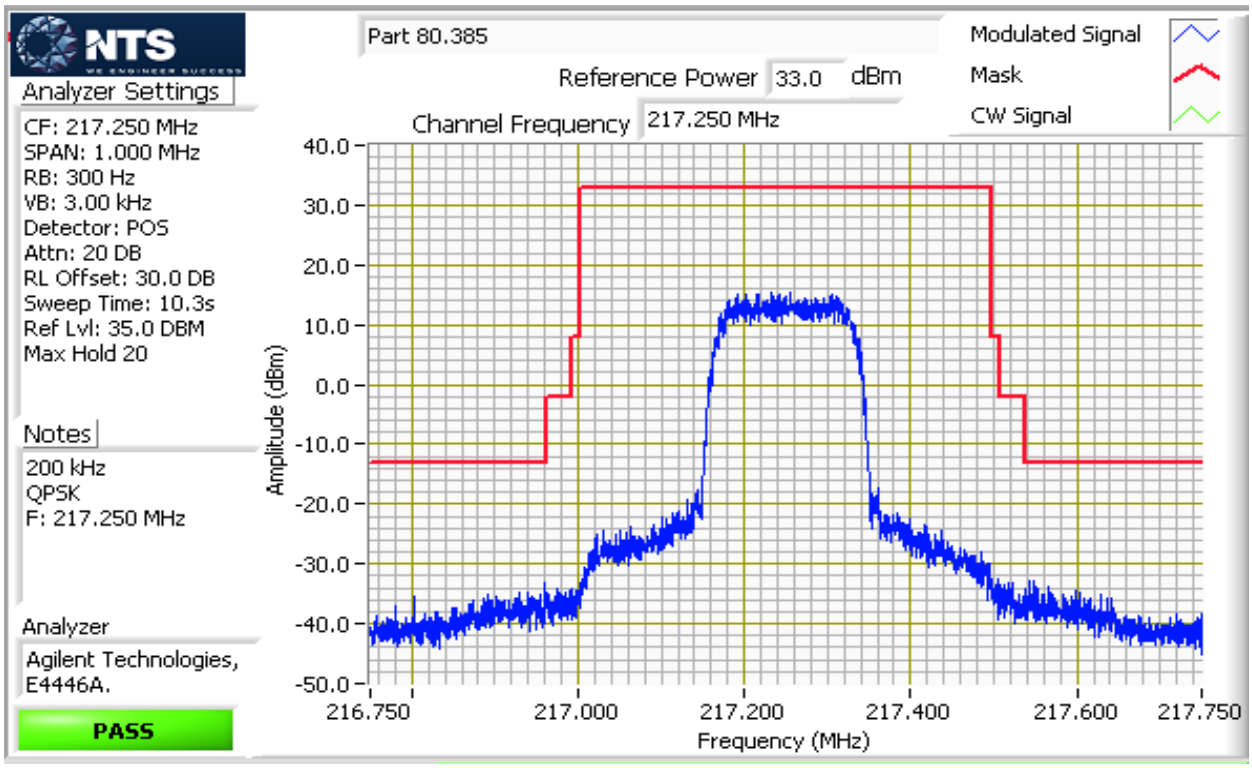

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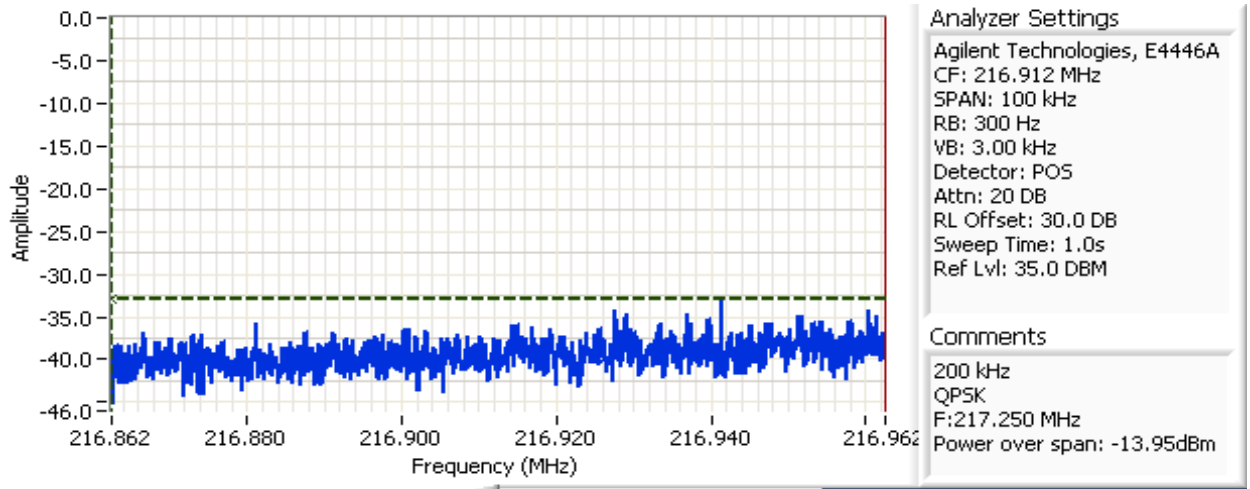

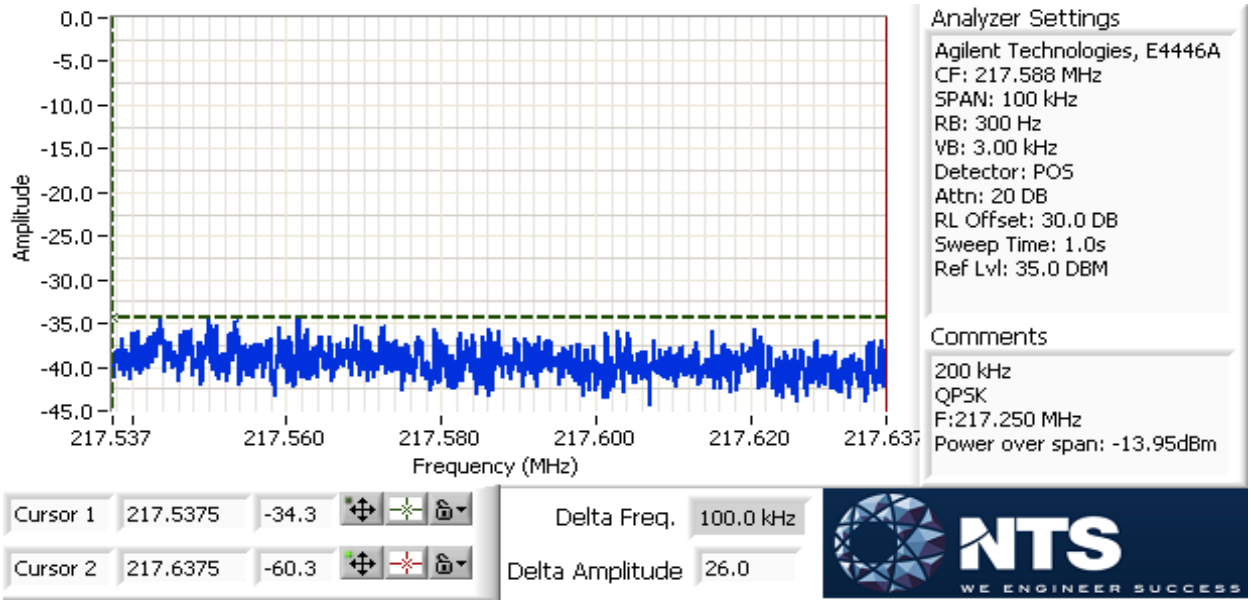

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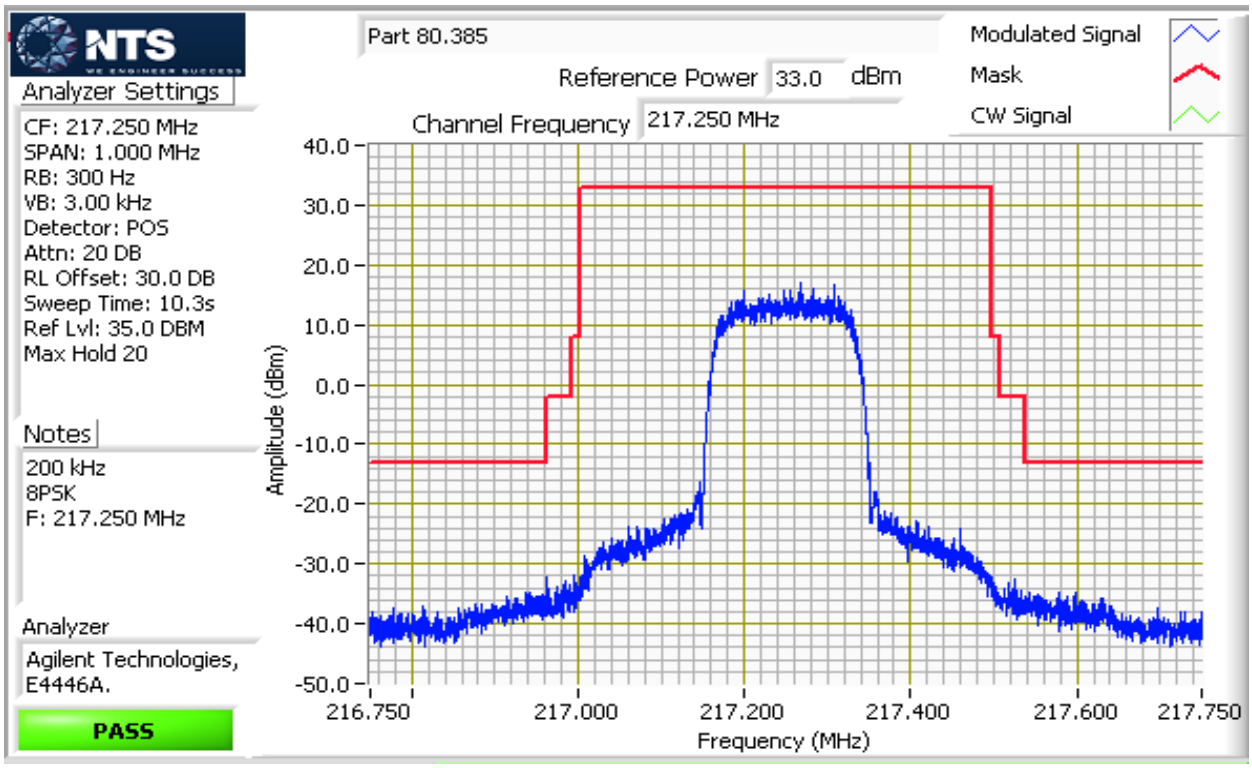

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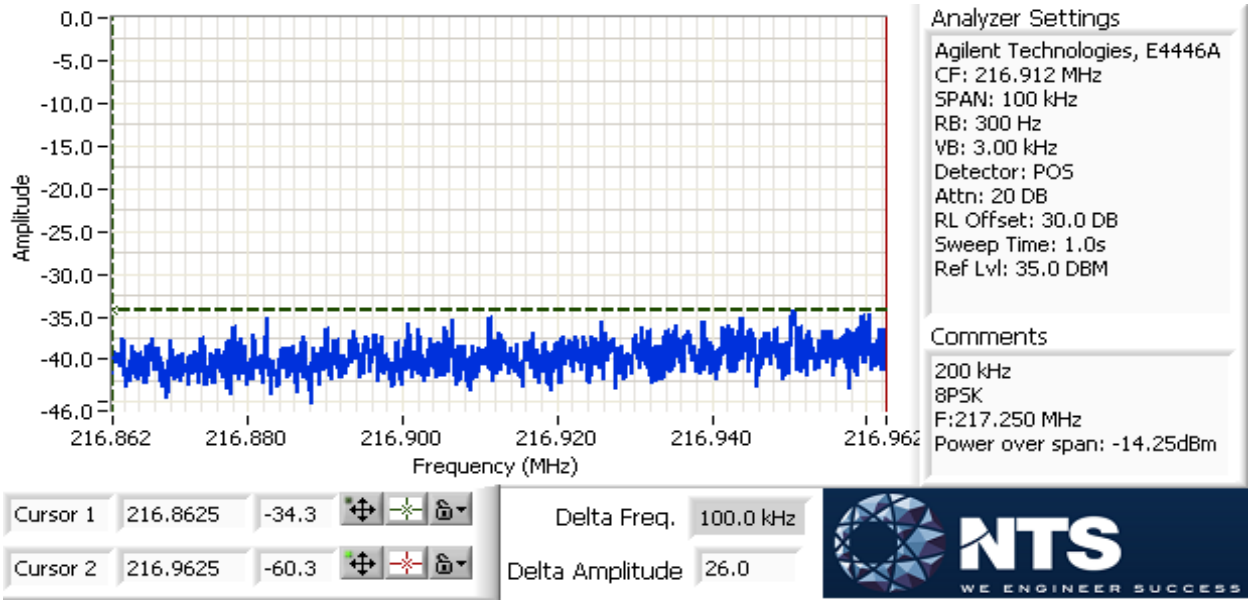

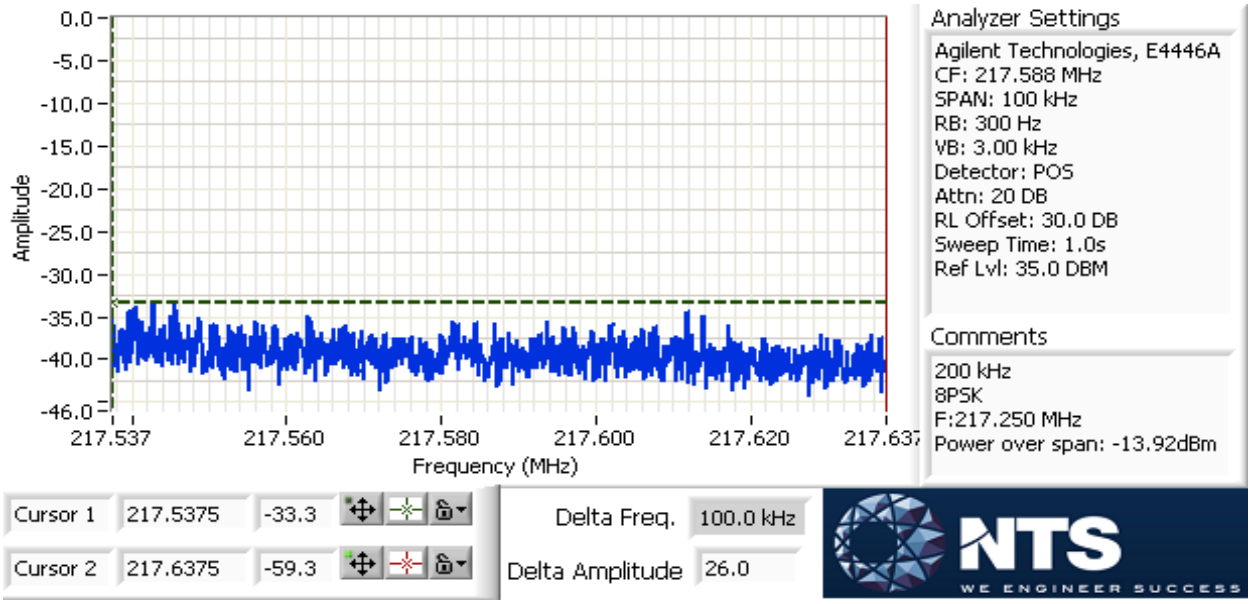

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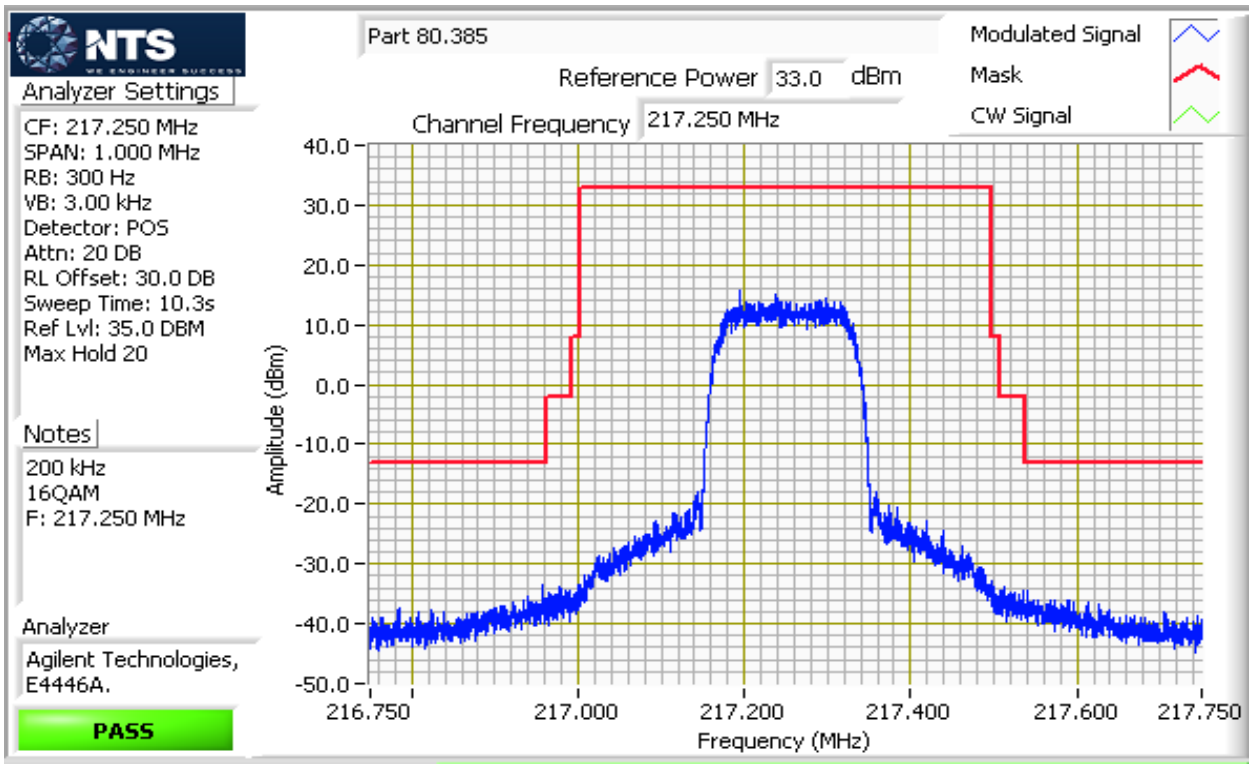
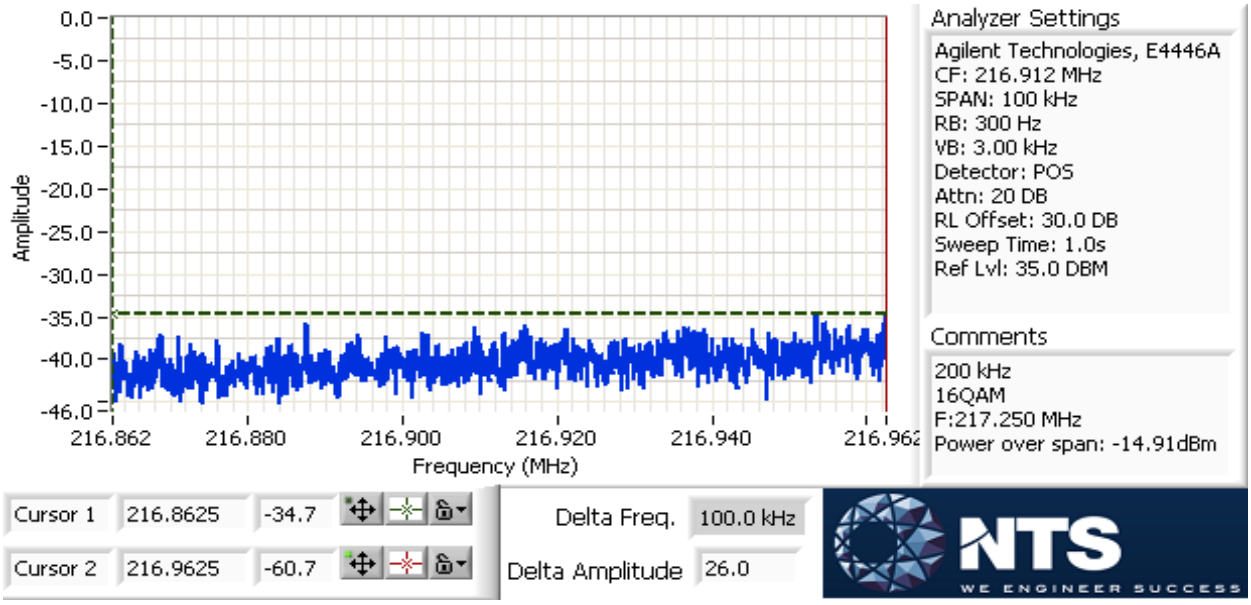
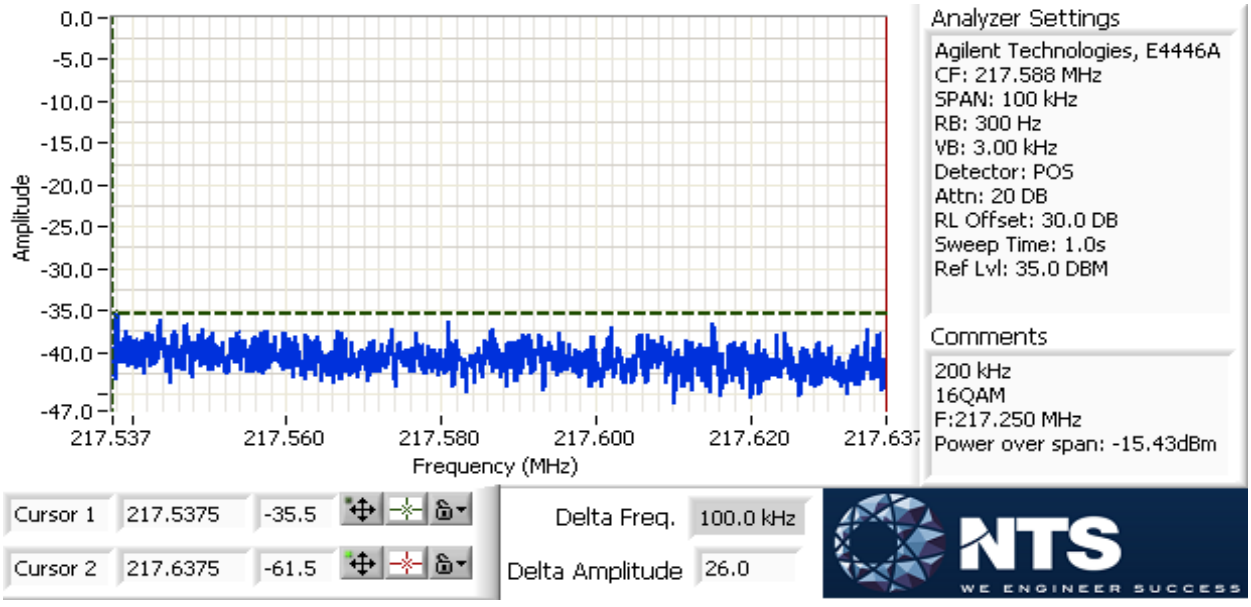
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

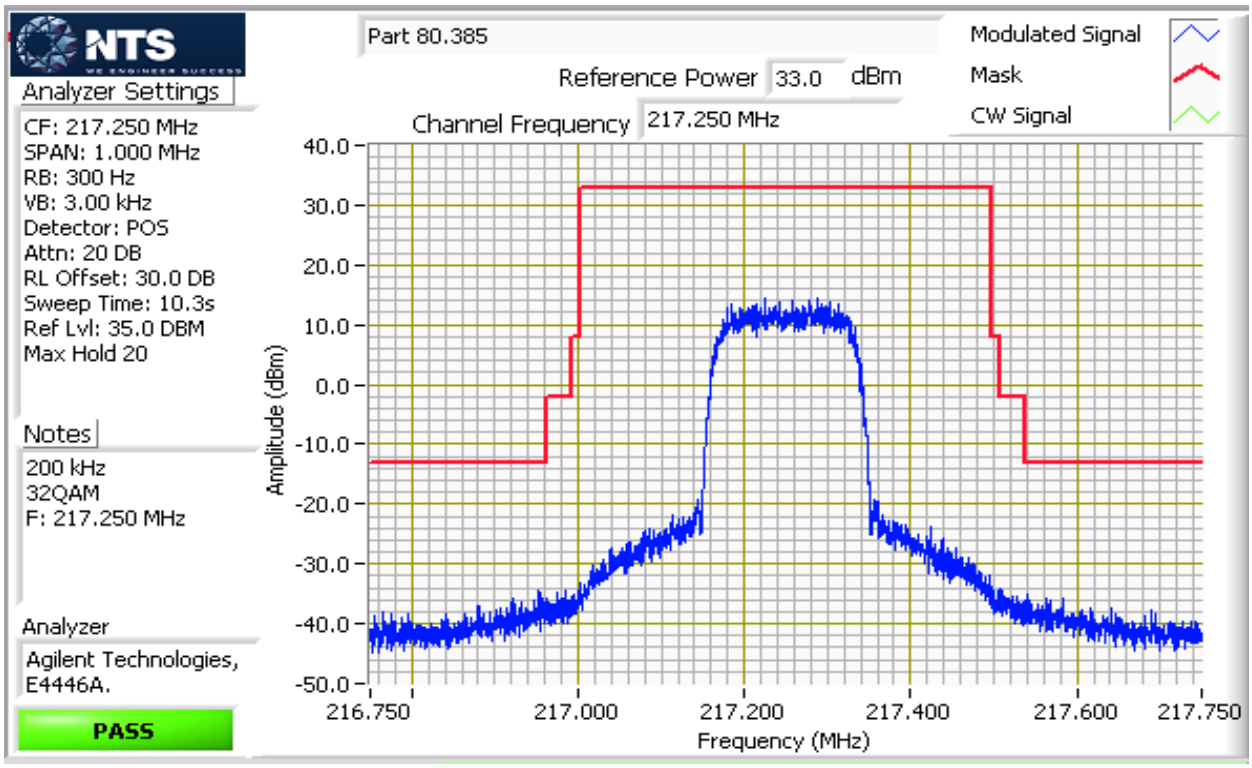


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

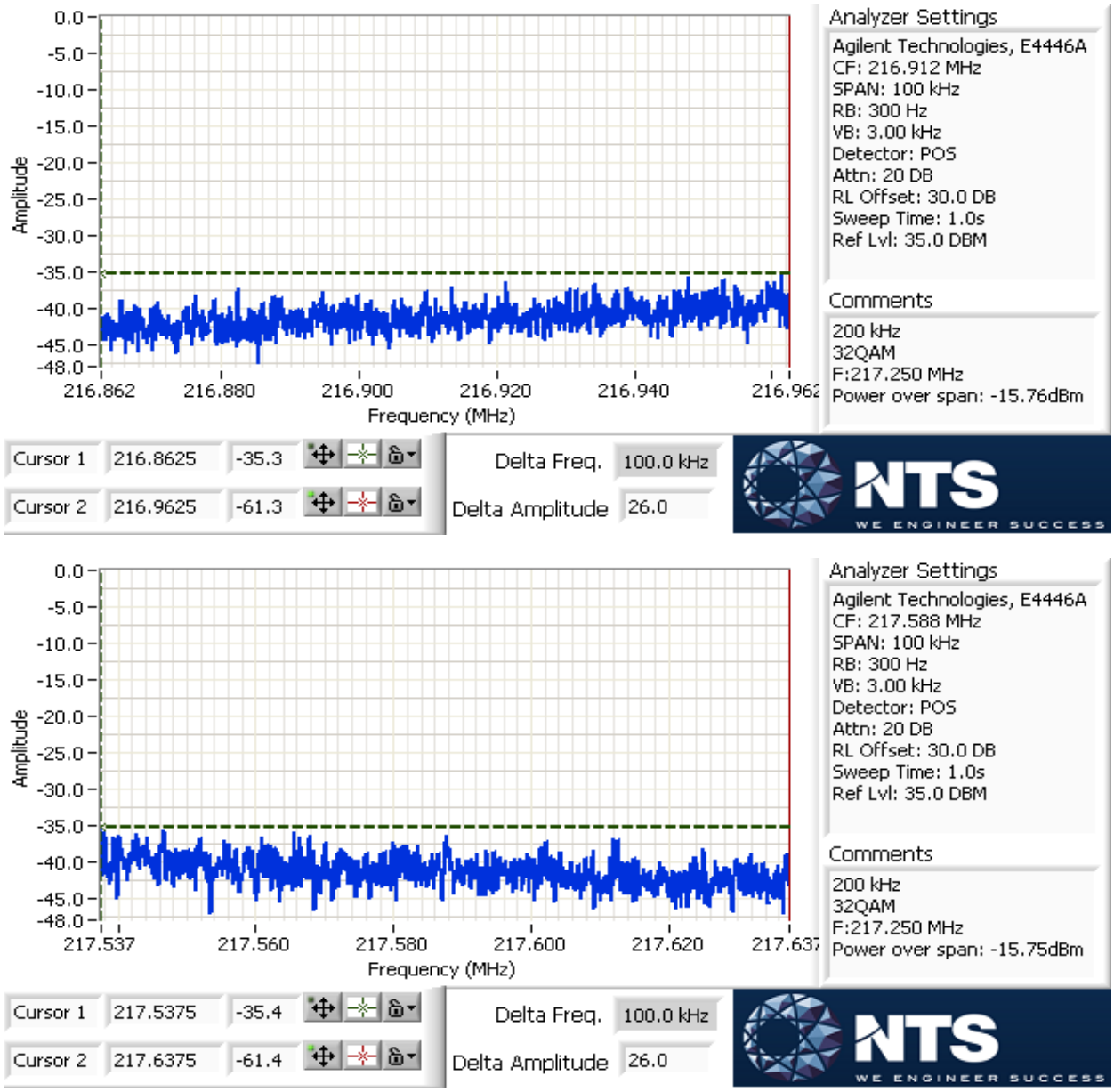




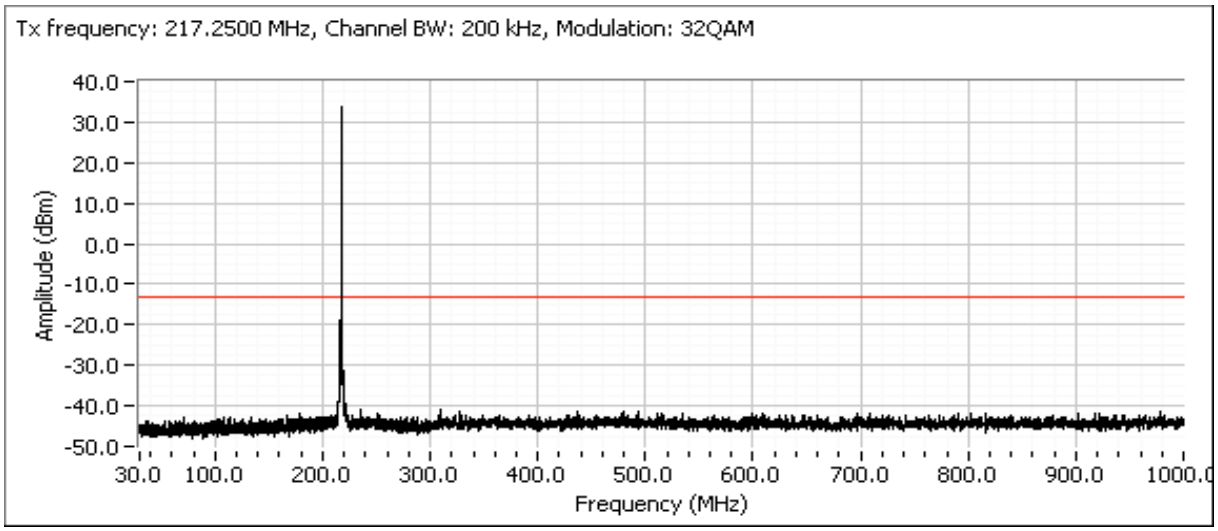
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

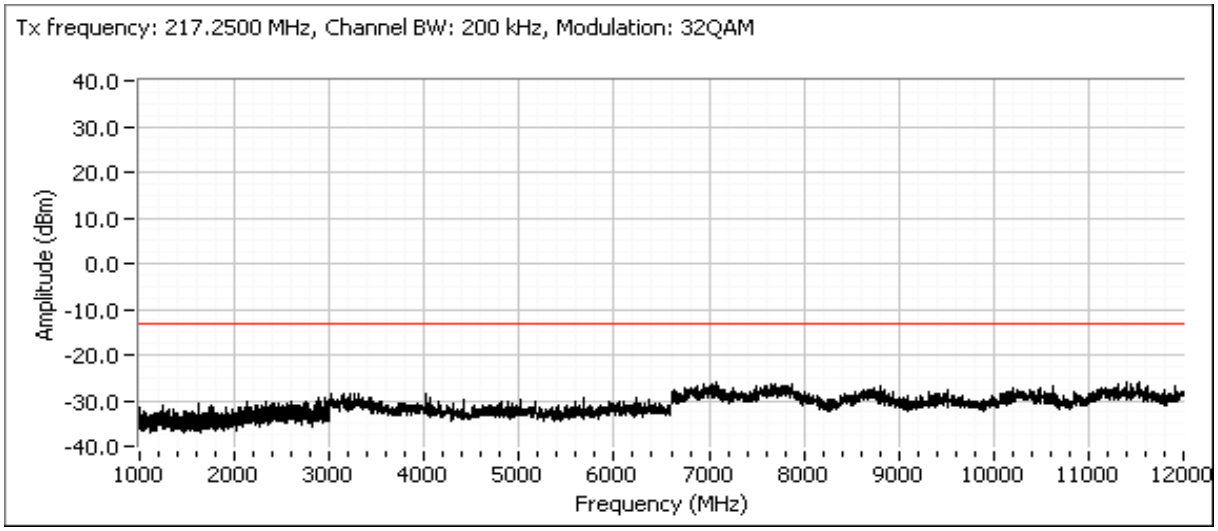


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

Date of Test: 1/26/2016
Test Engineer: Deniz Demirci
Test Location: FT Lab #4b

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

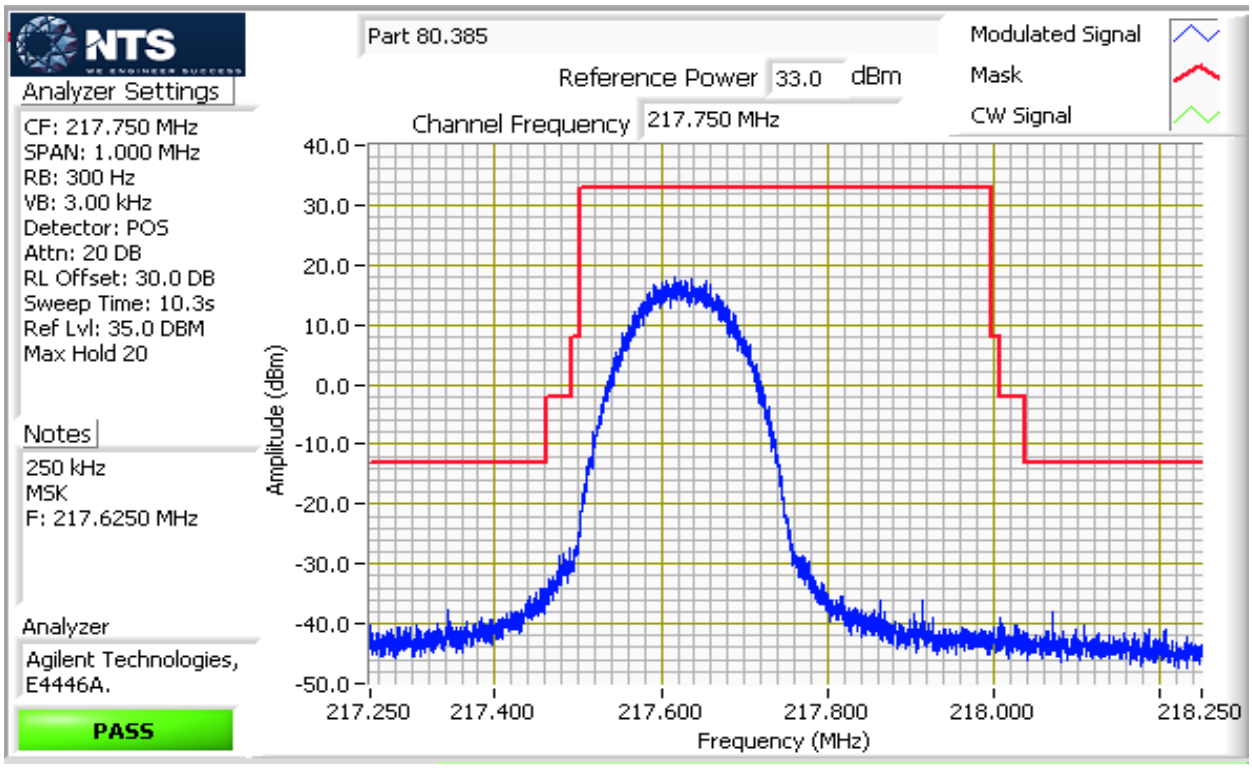
Run #2b: 217-218 MHz, Group A

Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
4200		171 kHz	MSK	217.6250	217.5000 - 218.0000	Pass
4200		171 kHz	MSK	217.8750	217.5000 - 218.0000	Pass

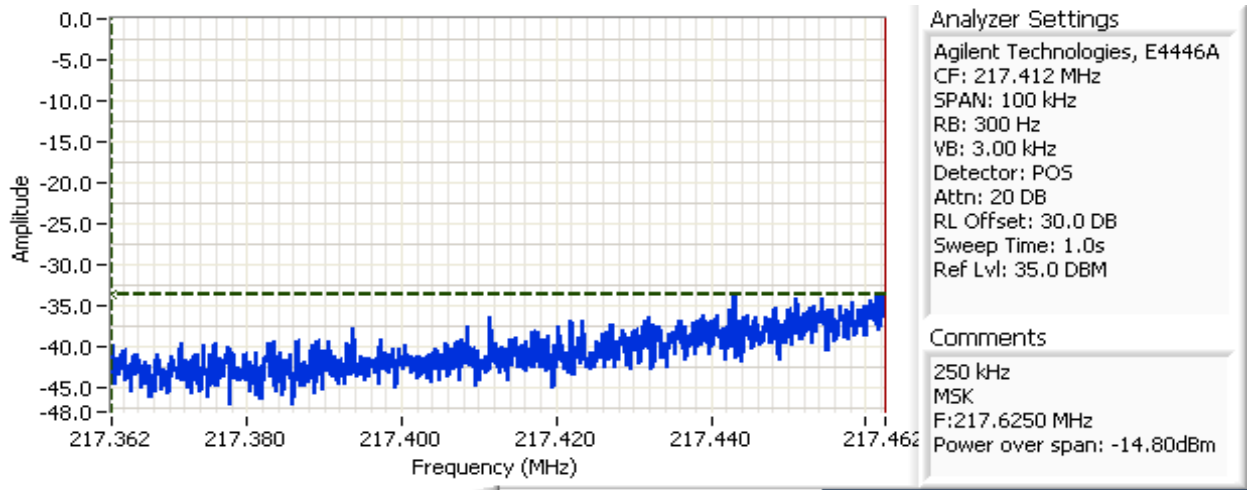
Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
6800		176 kHz	QPSK	217.7500	217.5000 - 218.0000	Pass
6850		176 kHz	8PSK	217.7500	217.5000 - 218.0000	Pass
7000		176 kHz	16QAM	217.7500	217.5000 - 218.0000	Pass
7100		176 kHz	32QAM	217.7500	217.5000 - 218.0000	Pass

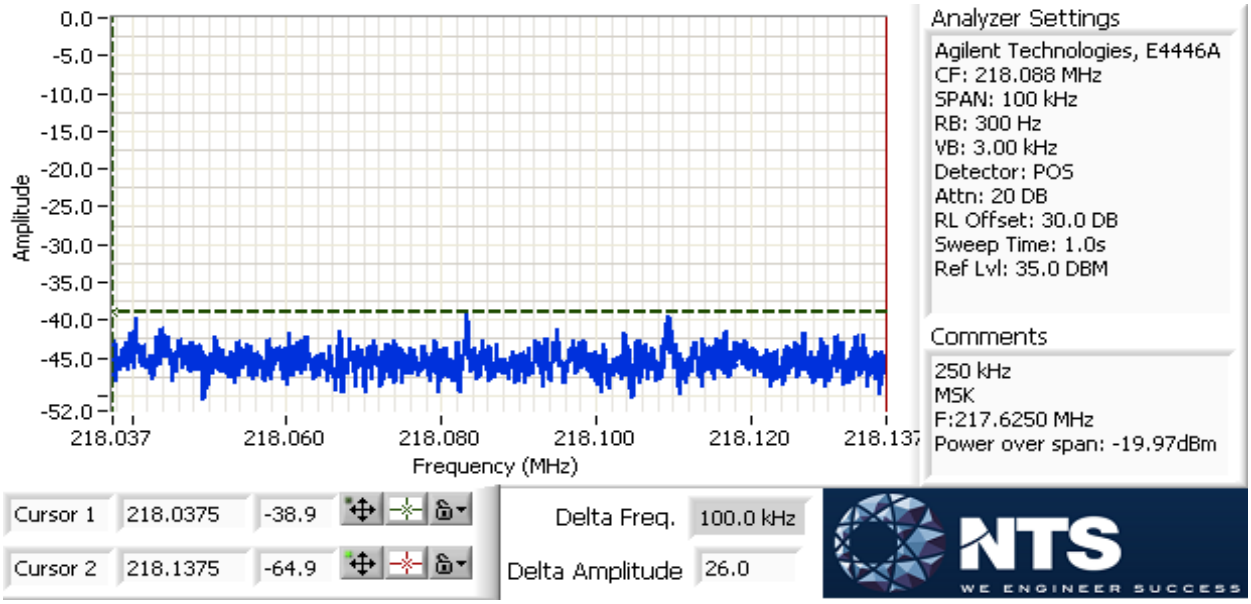
Note 1:	-13 dBm band edge frequencies were calculated as 217.4625 MHz and 218.0375 MHz (Group A) using 20 kHz authorized bandwidth per §80.385.

Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

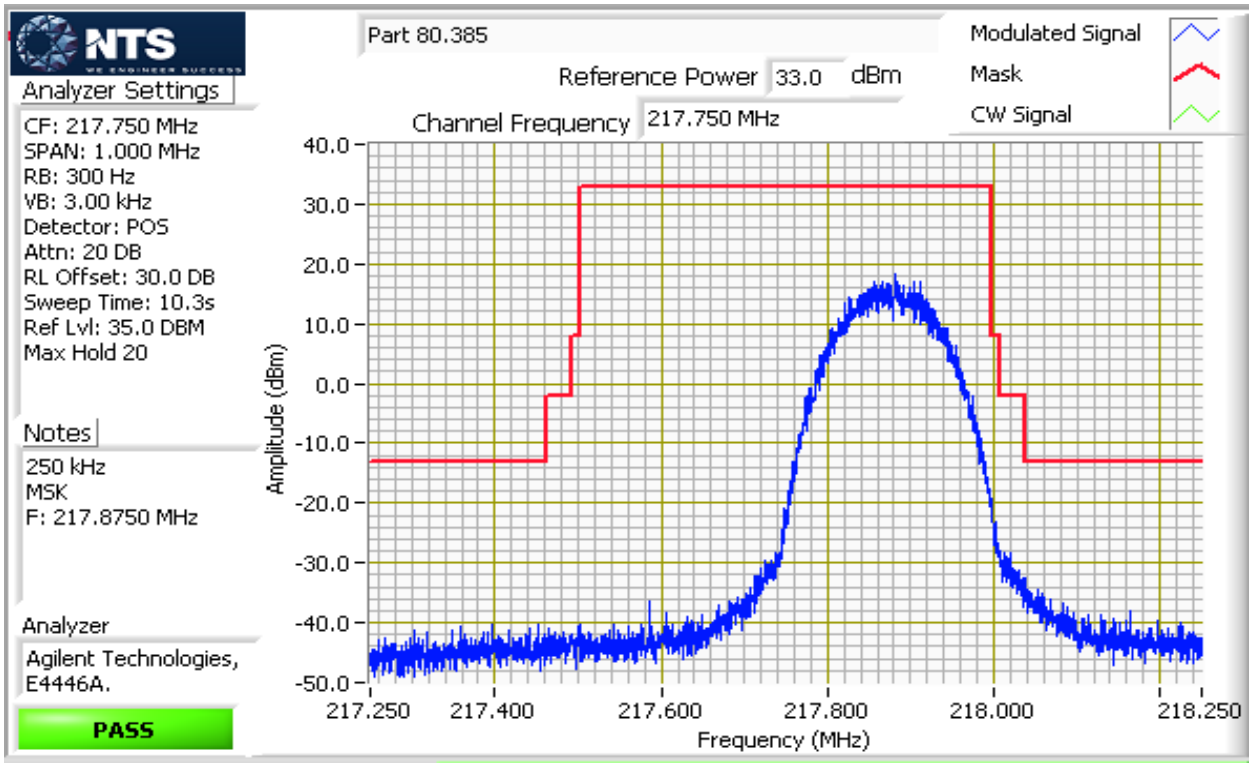


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

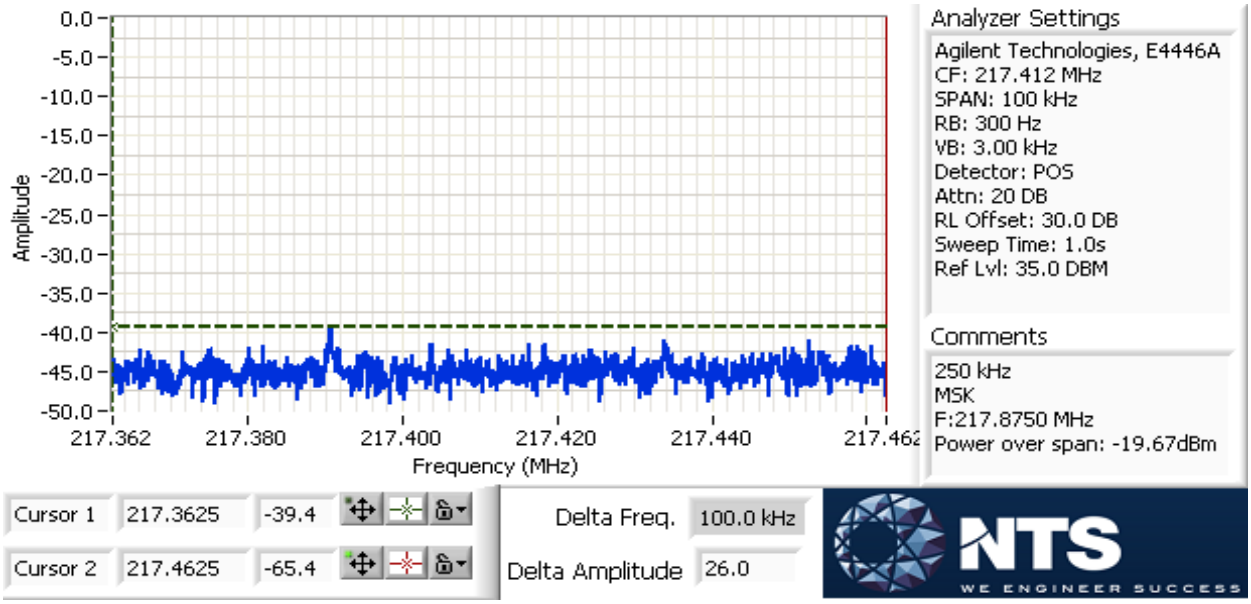


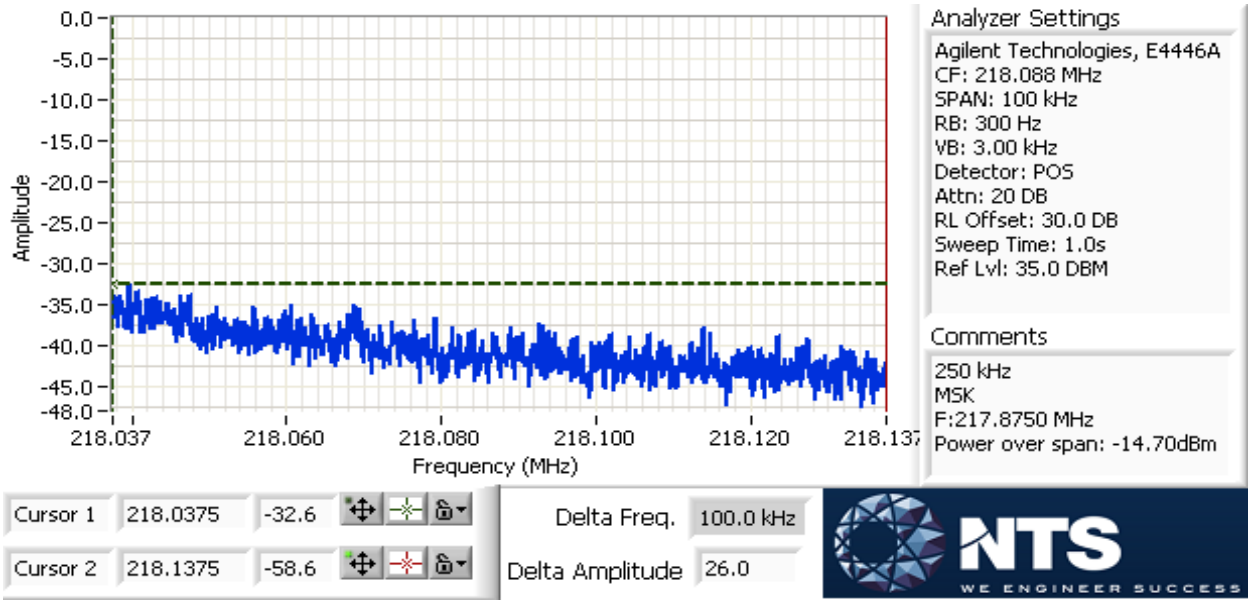


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

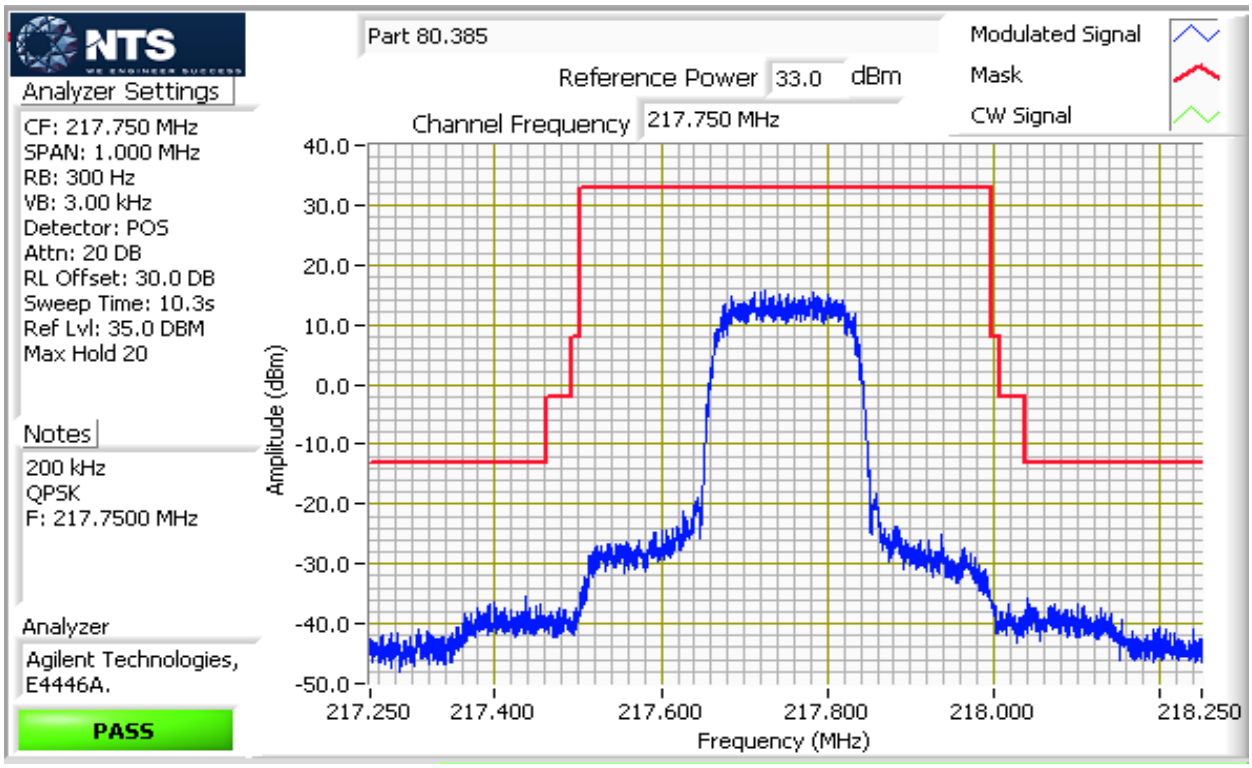


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

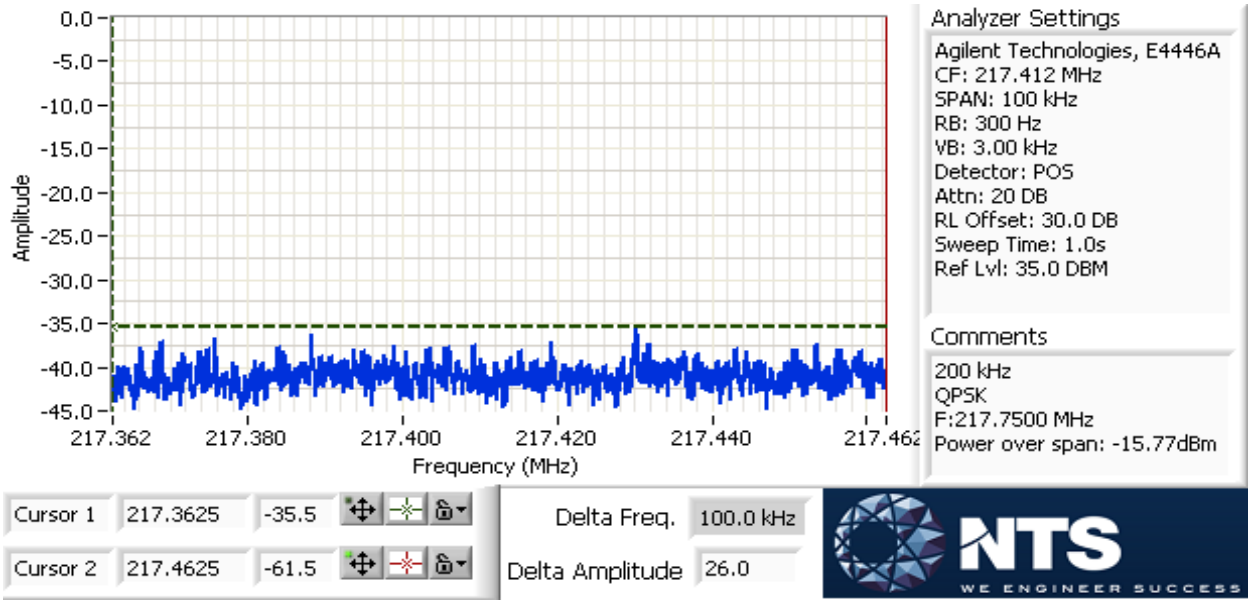


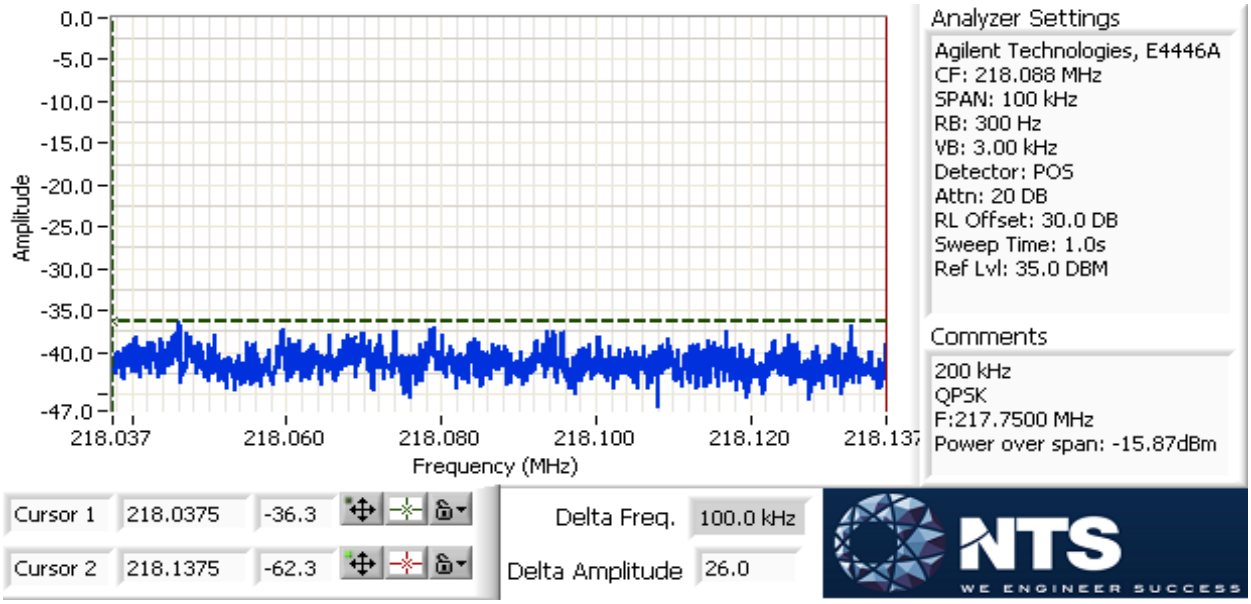


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

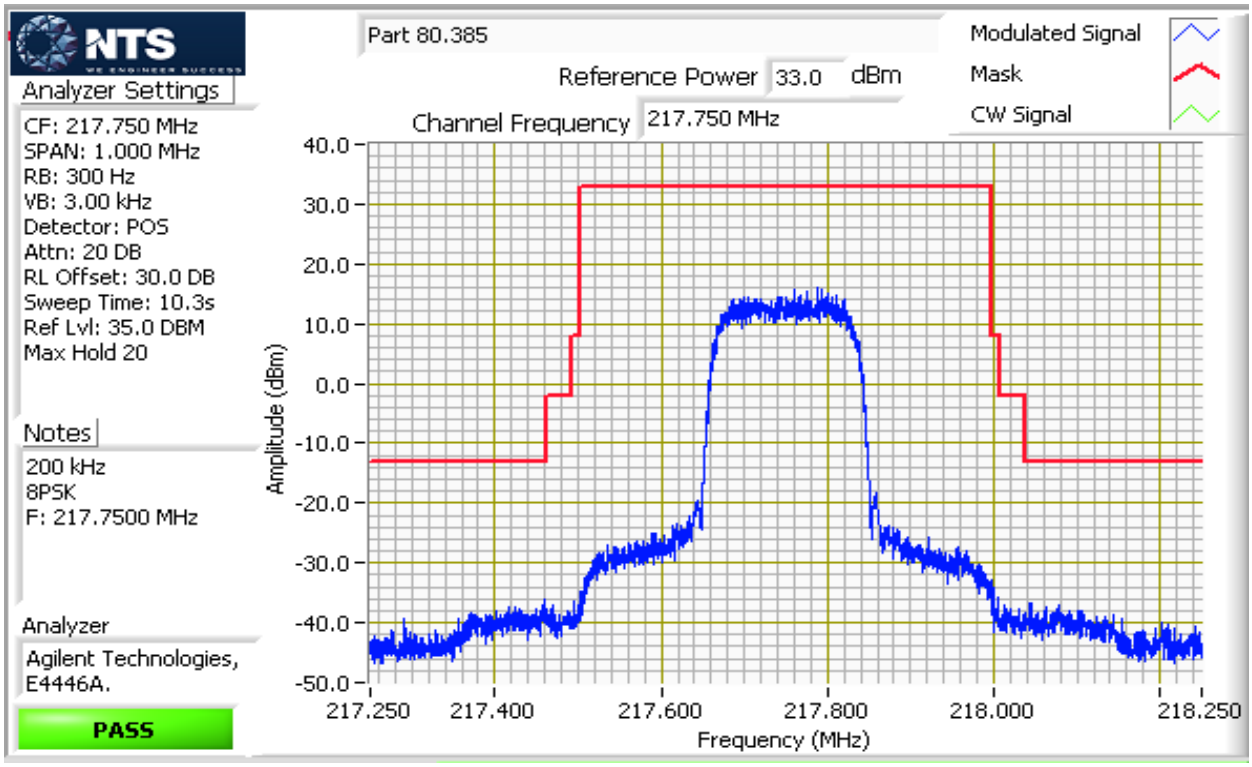


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

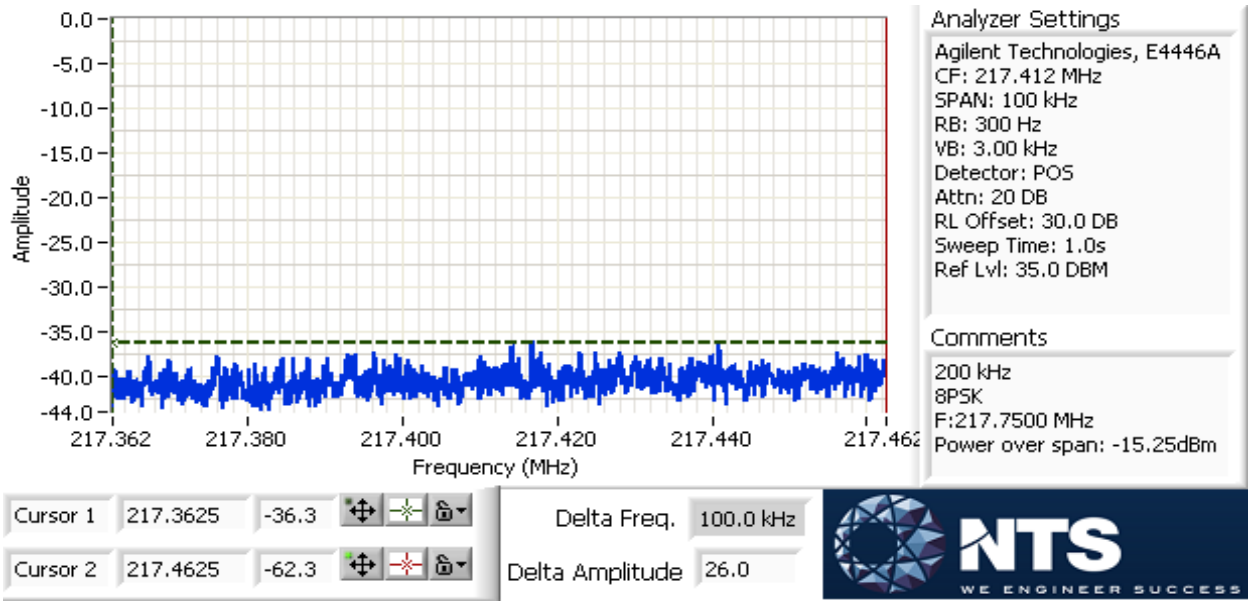


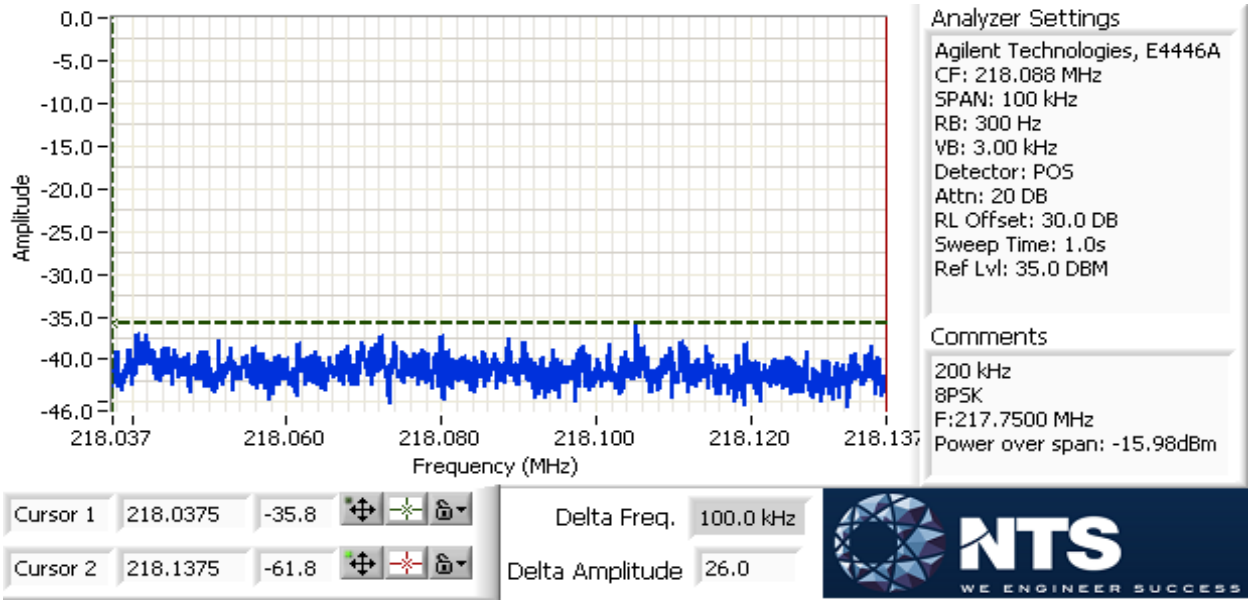


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

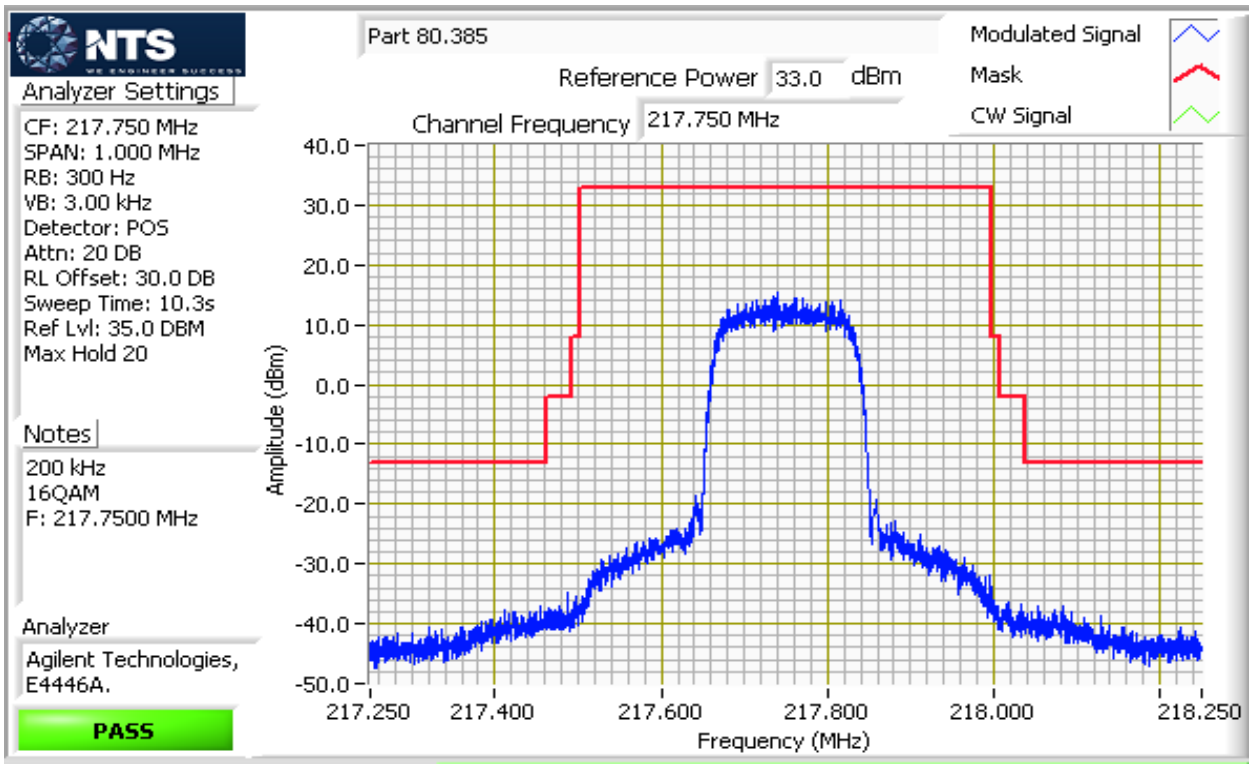


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

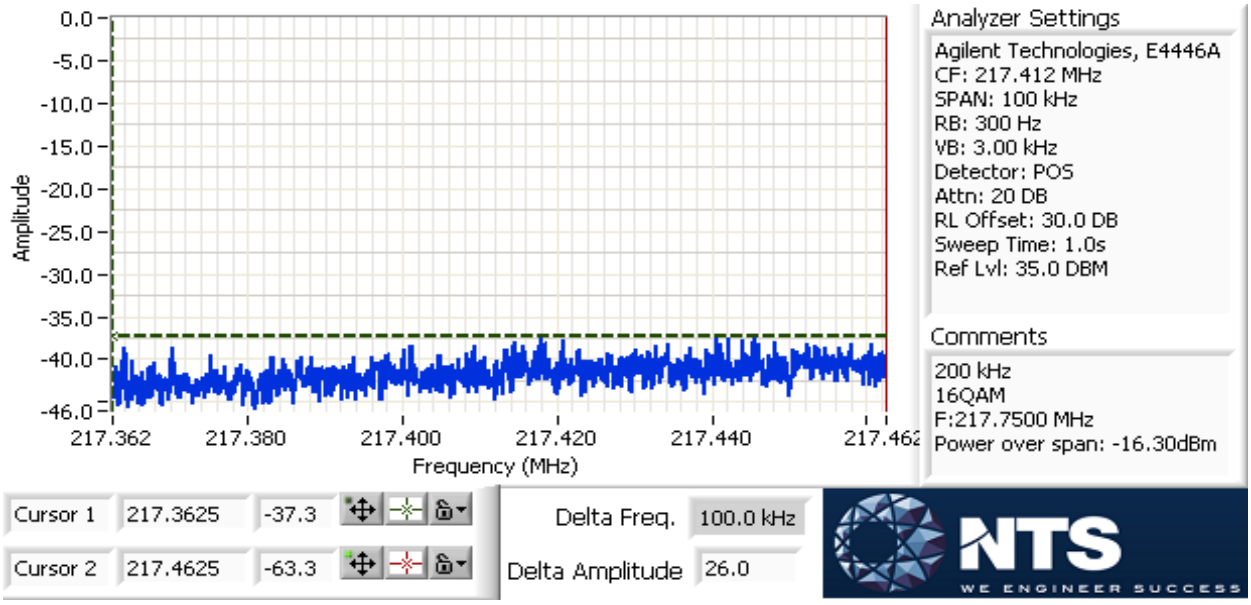


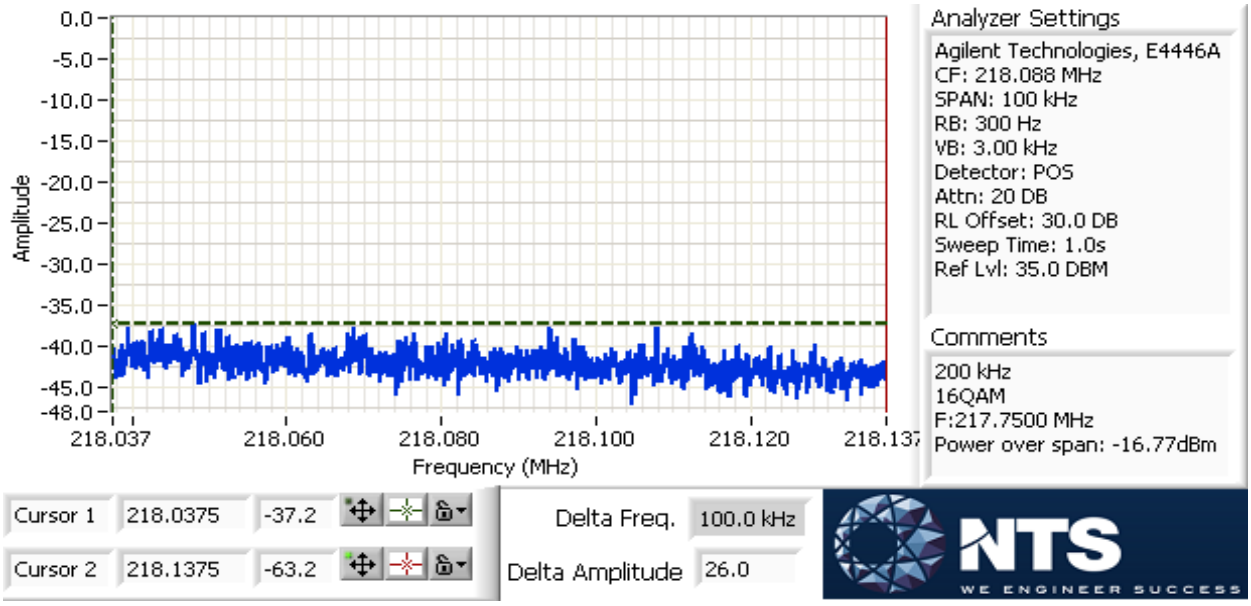


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

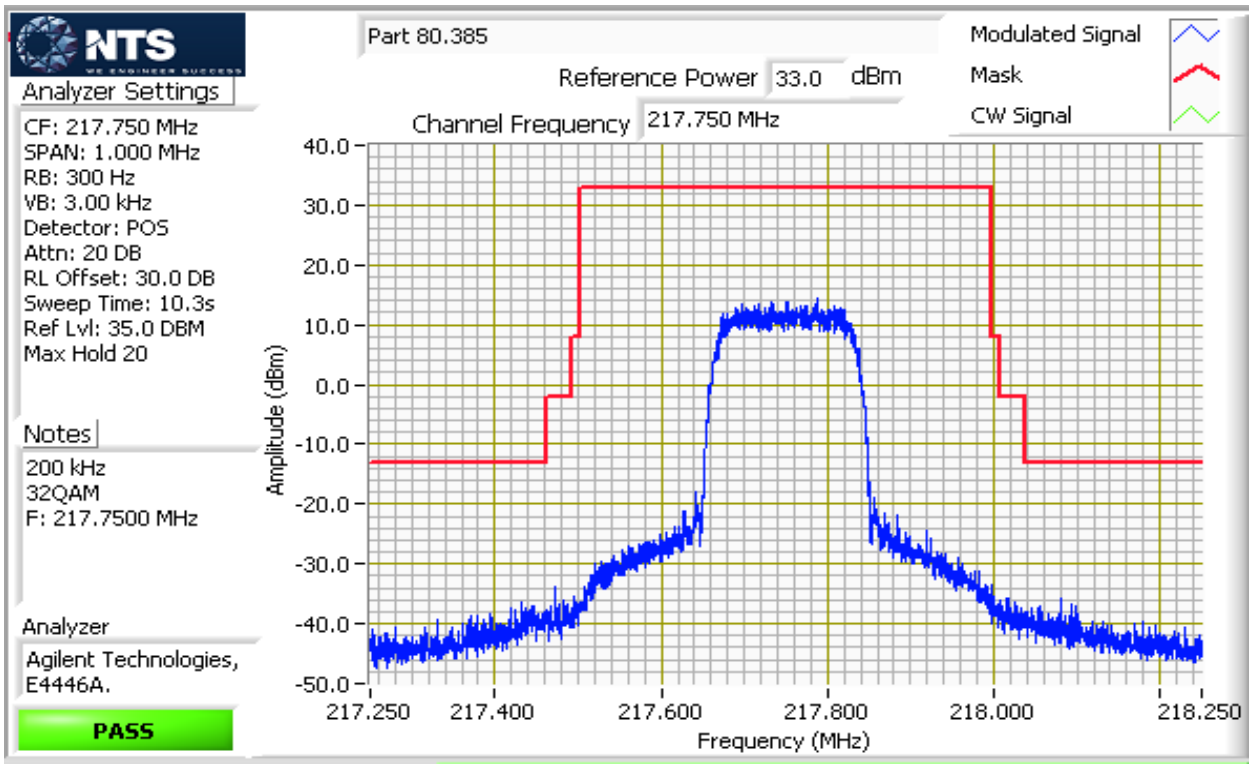


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

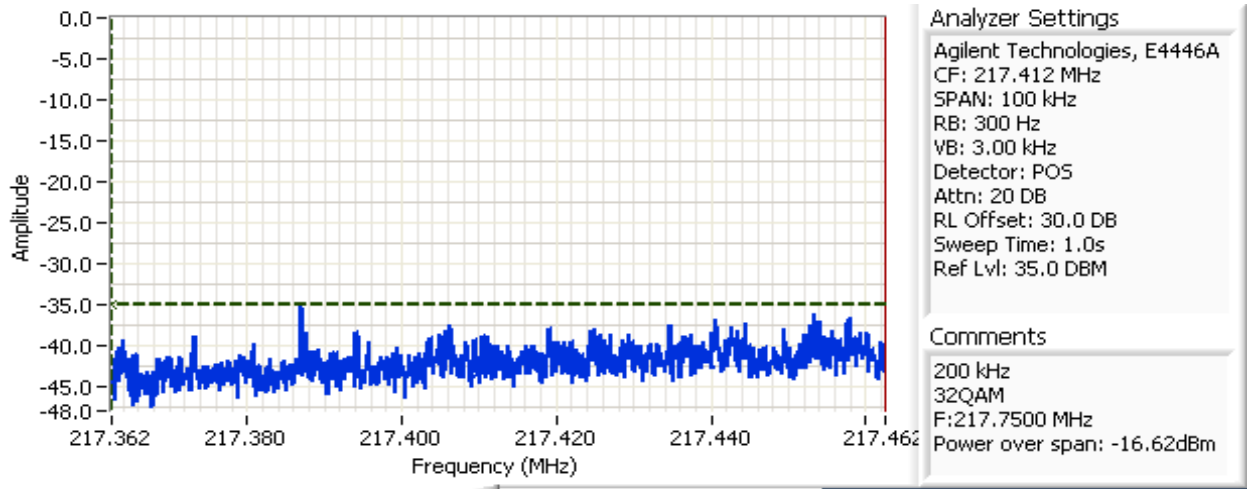


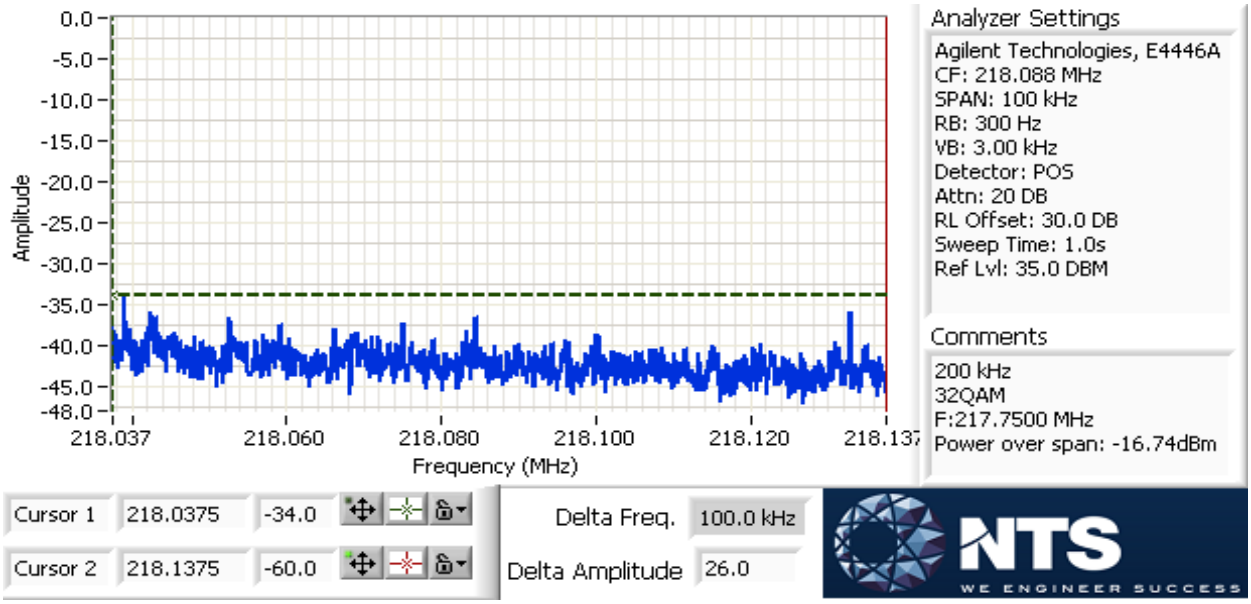


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

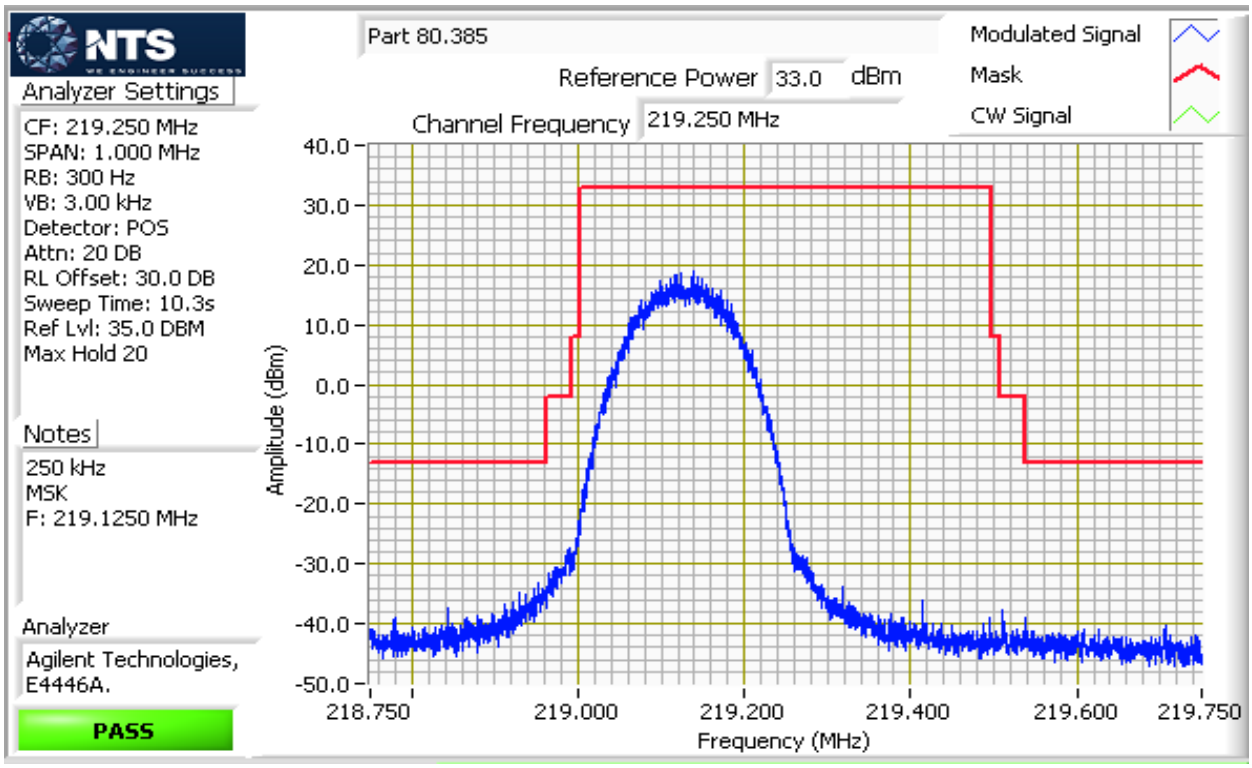
Run #2c: 219-220 MHz, Group B

Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
4050		171 kHz	MSK	219.1250	219.0000 - 219.5000	Pass
4050		171 kHz	MSK	219.3750	219.0000 - 219.5000	Pass

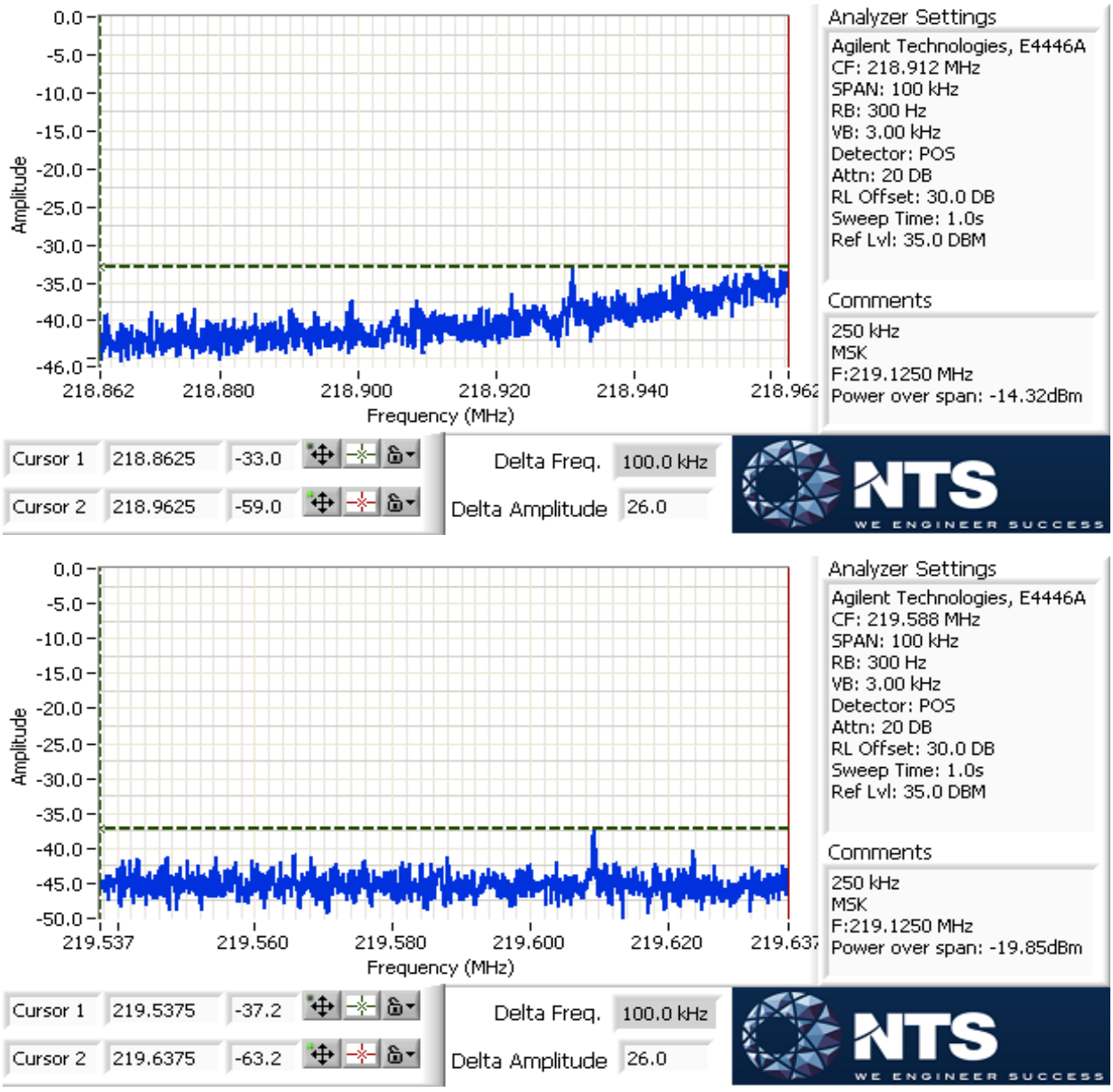
Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
6700		176 kHz	QPSK	219.2500	219.0000 - 219.5000	Pass
6850		176 kHz	8PSK	219.2500	219.0000 - 219.5000	Pass
7000		176 kHz	16QAM	219.2500	219.0000 - 219.5000	Pass
7100		176 kHz	32QAM	219.2500	219.0000 - 219.5000	Pass

Note 1:	-13 dBm band edge frequencies were calculated as 218.9625 MHz and 219.5375 MHz (Group B) using 20 kHz authorized bandwidth per §80.385.

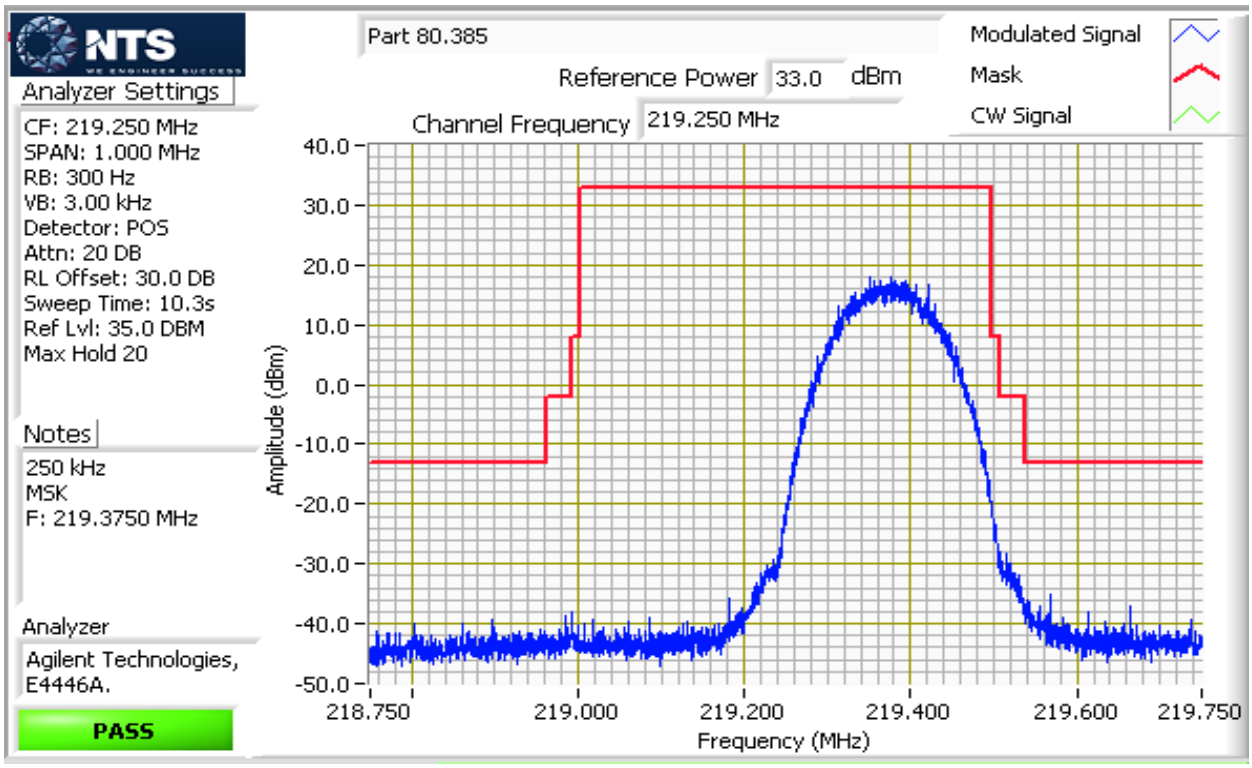
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



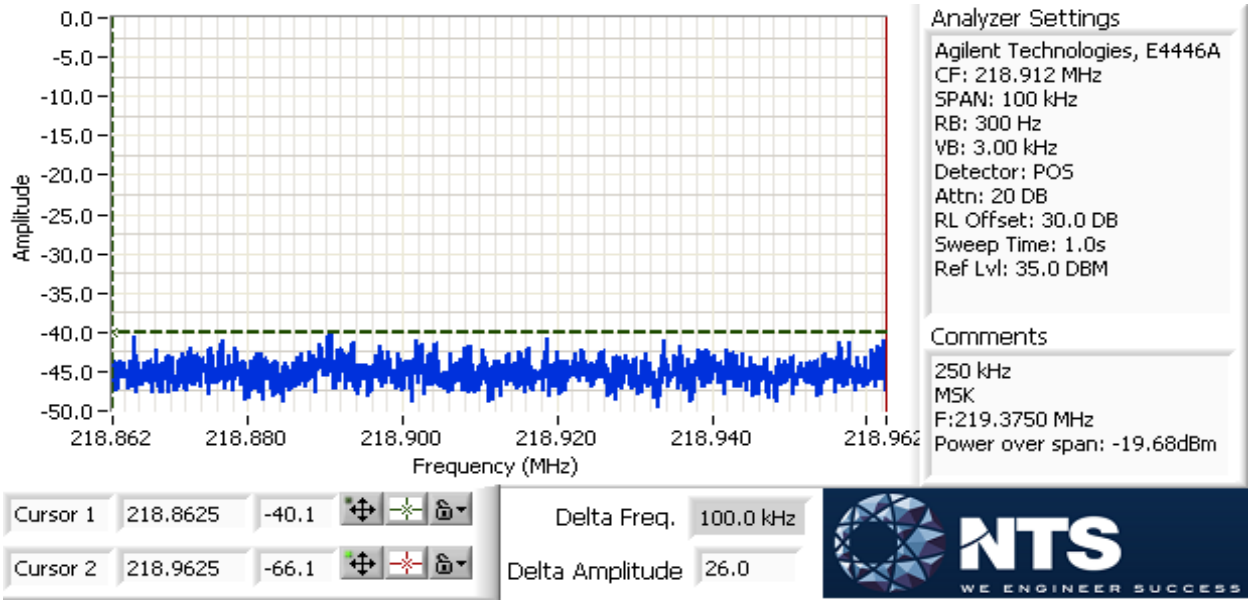
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

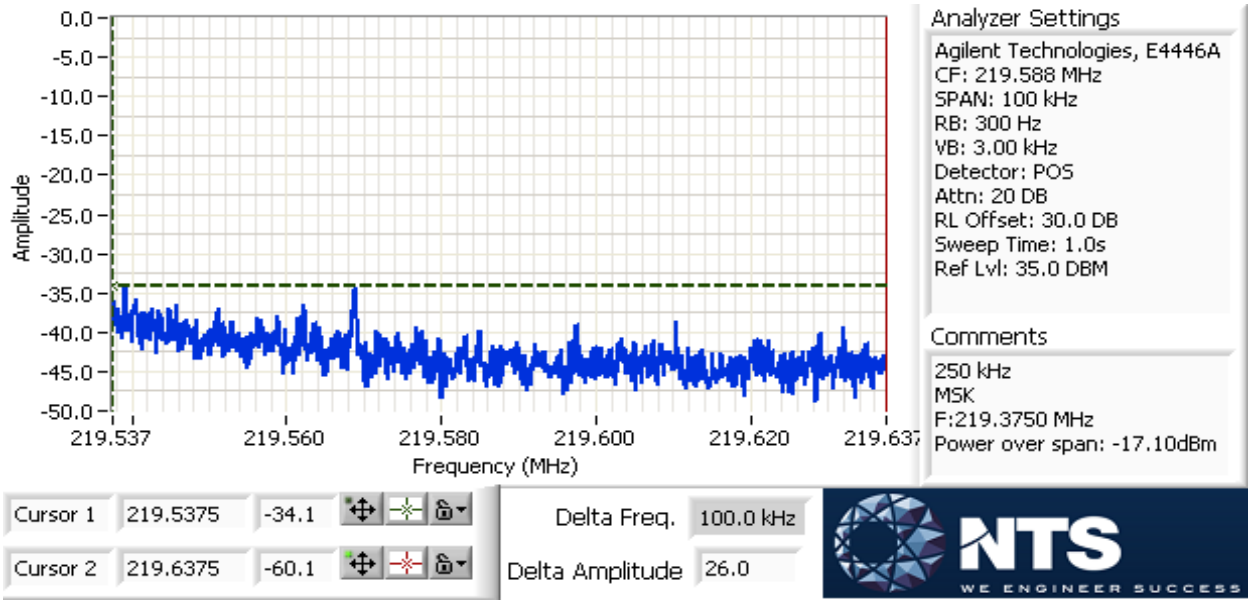


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

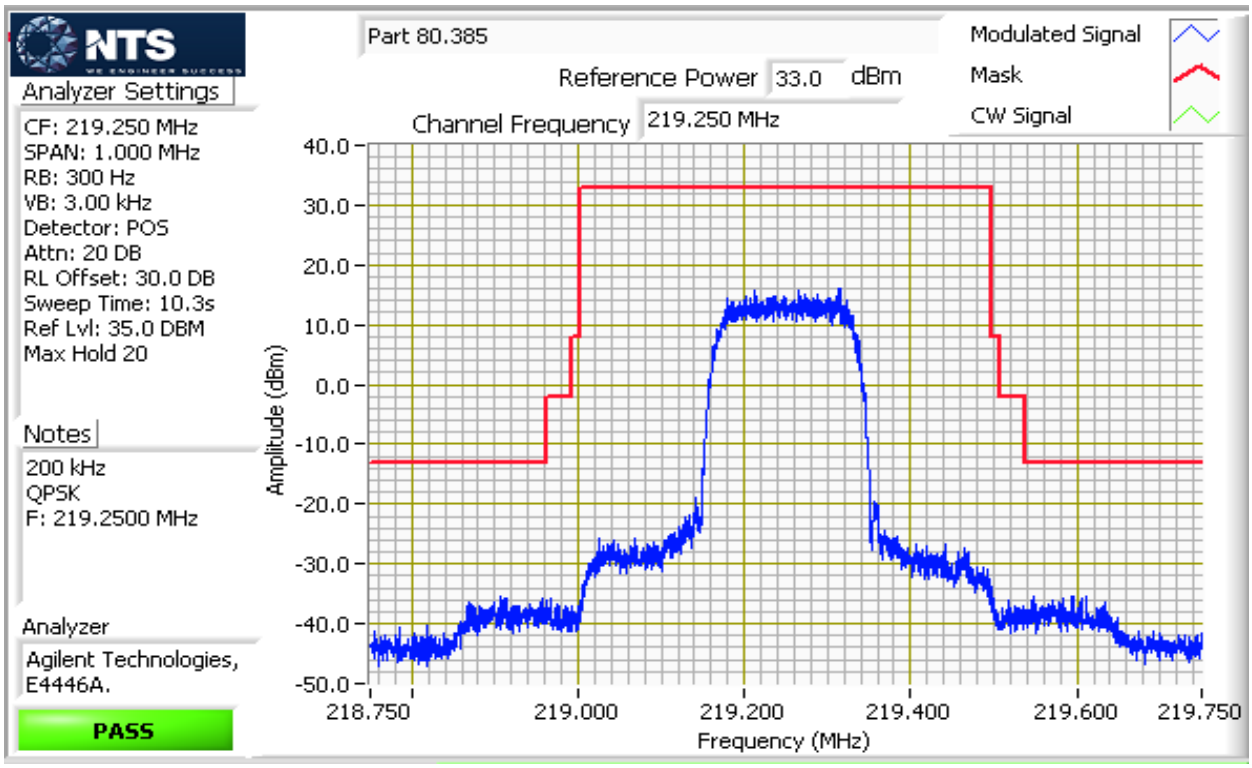


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

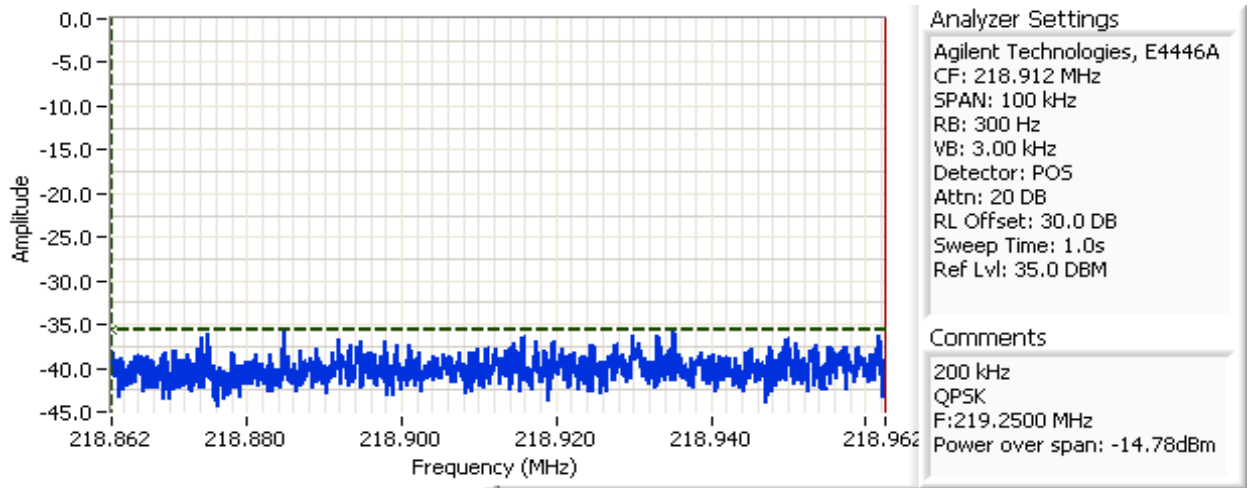


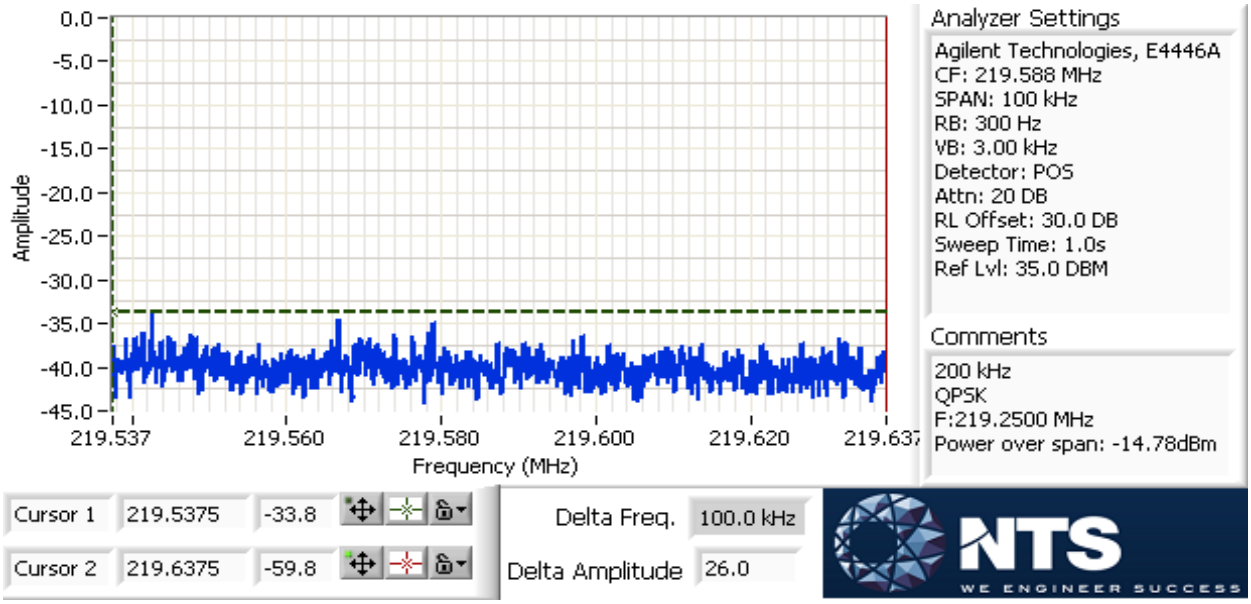


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

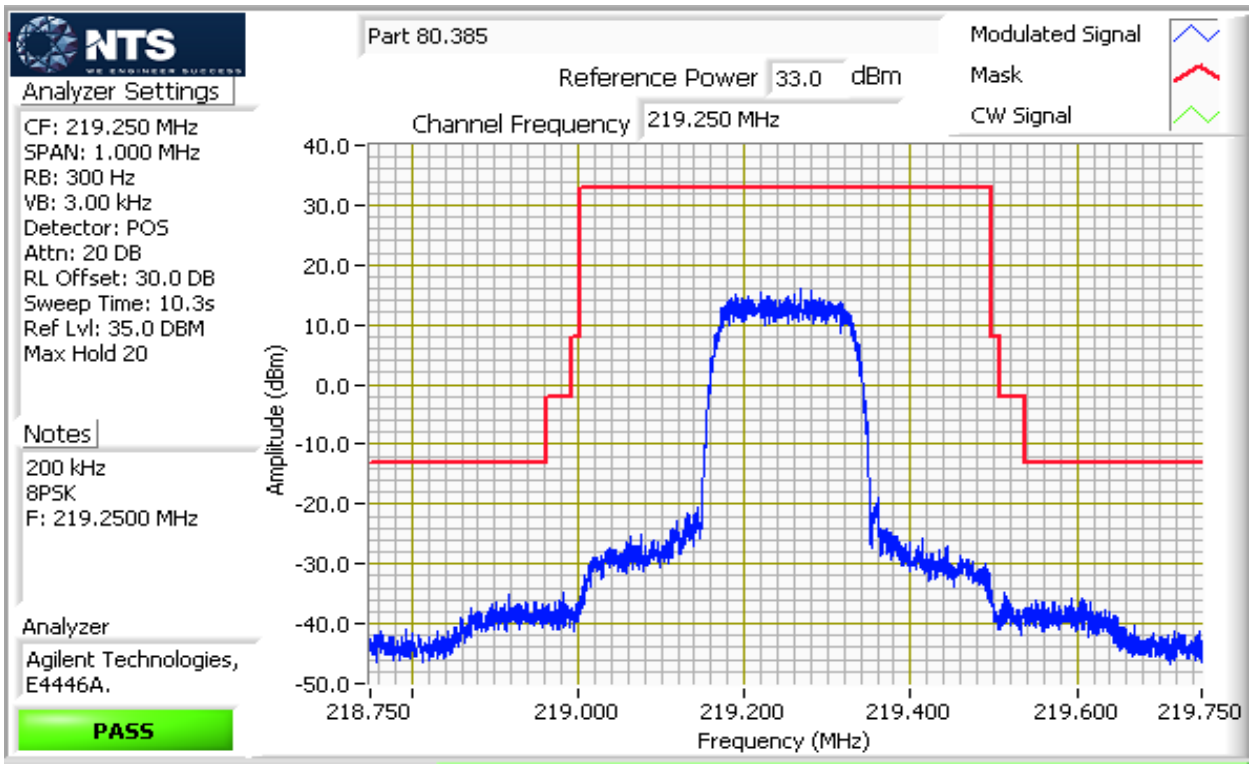


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

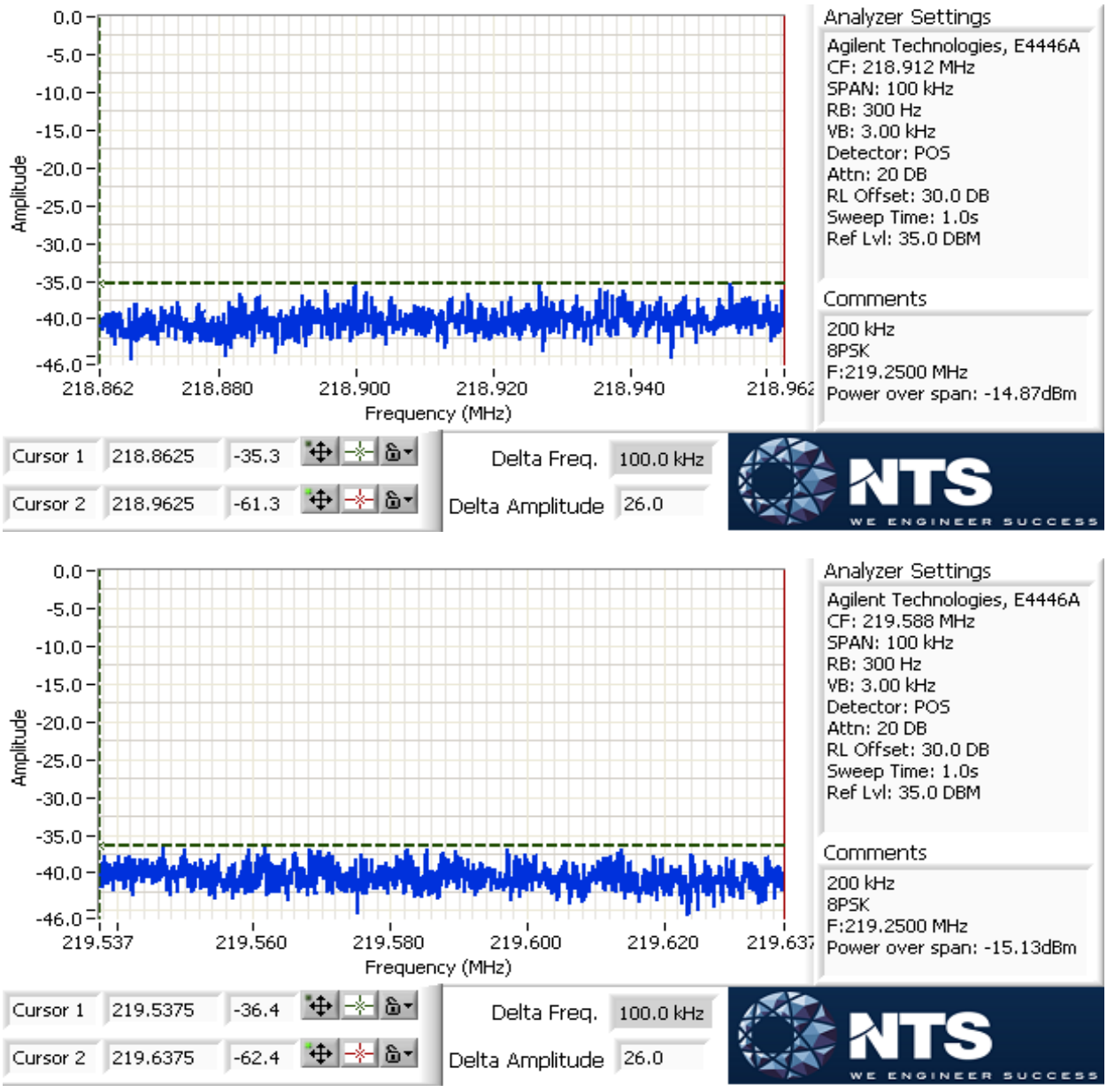




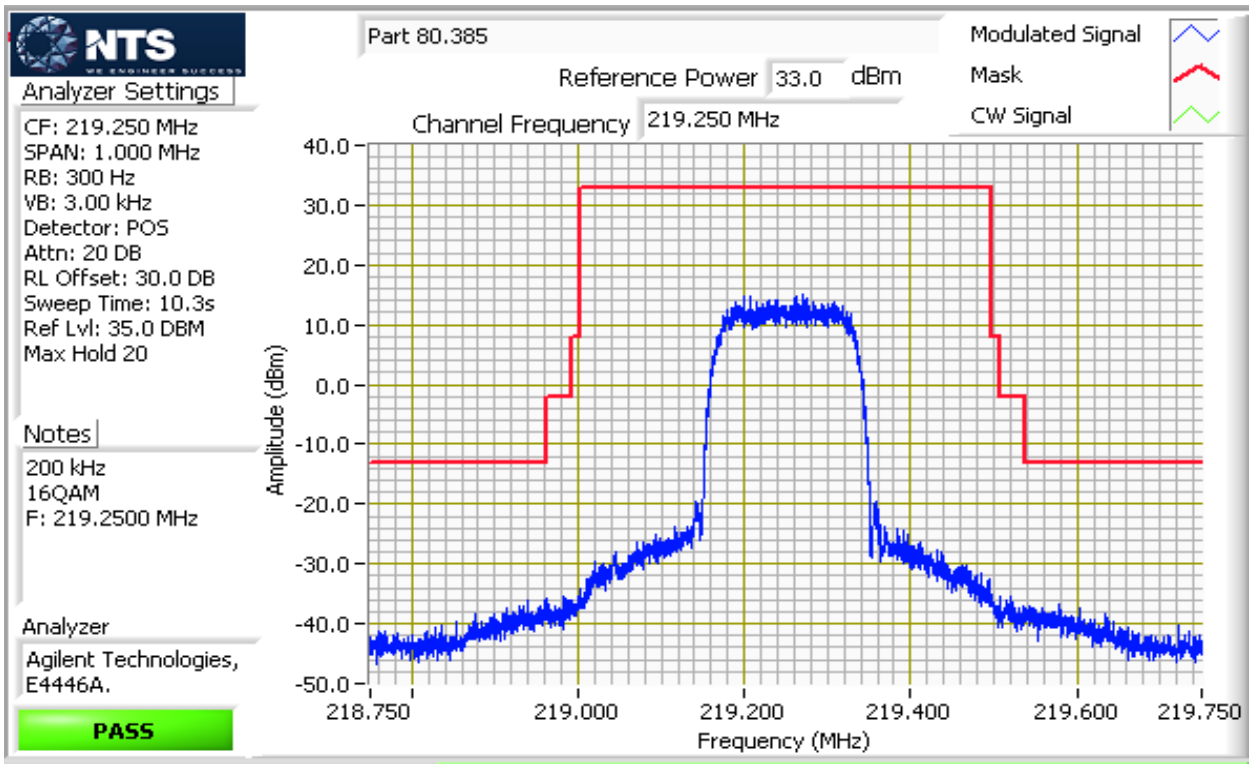
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



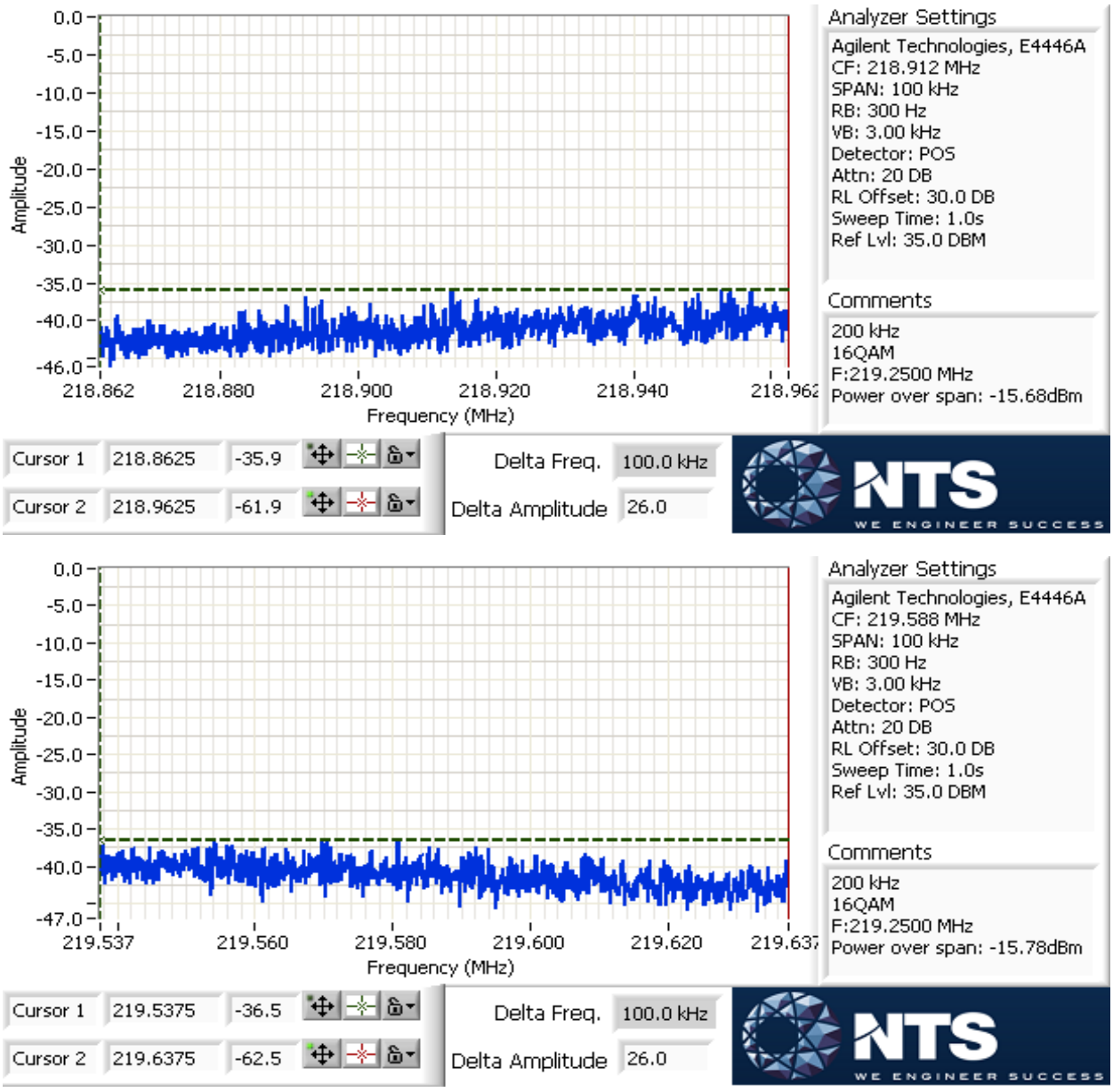
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



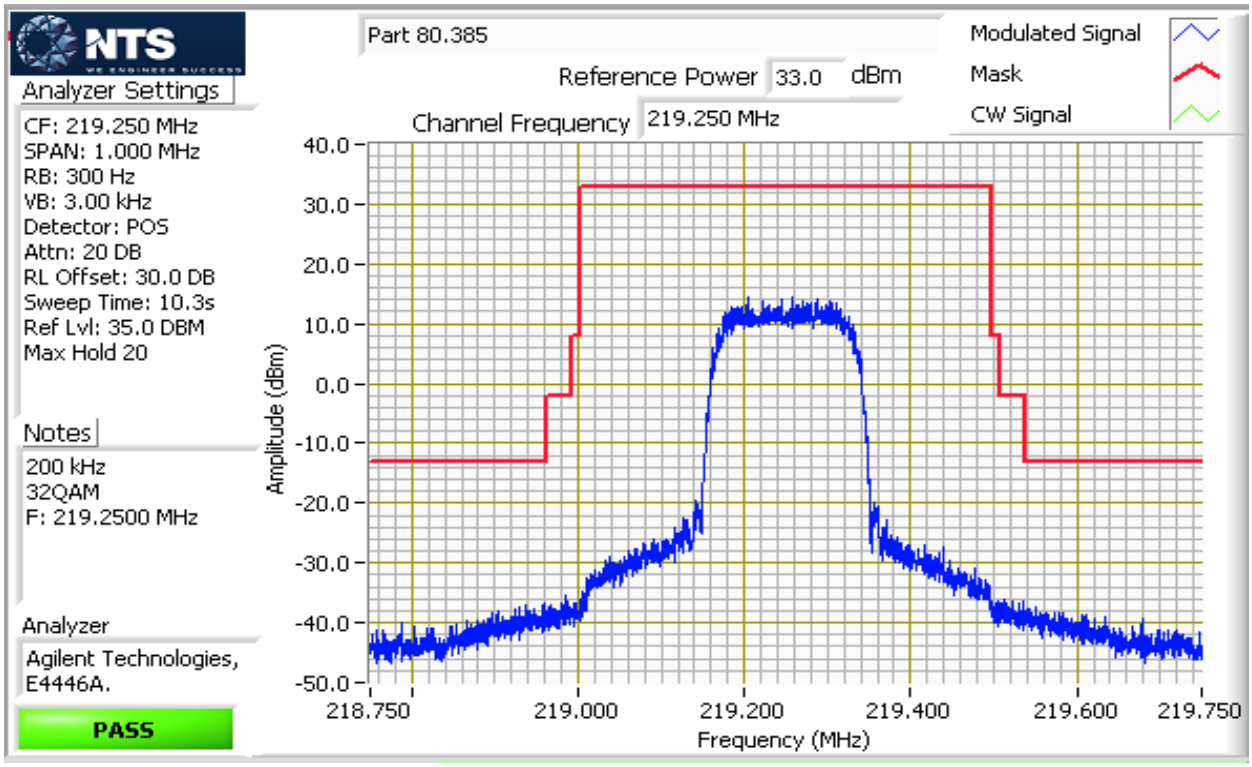
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



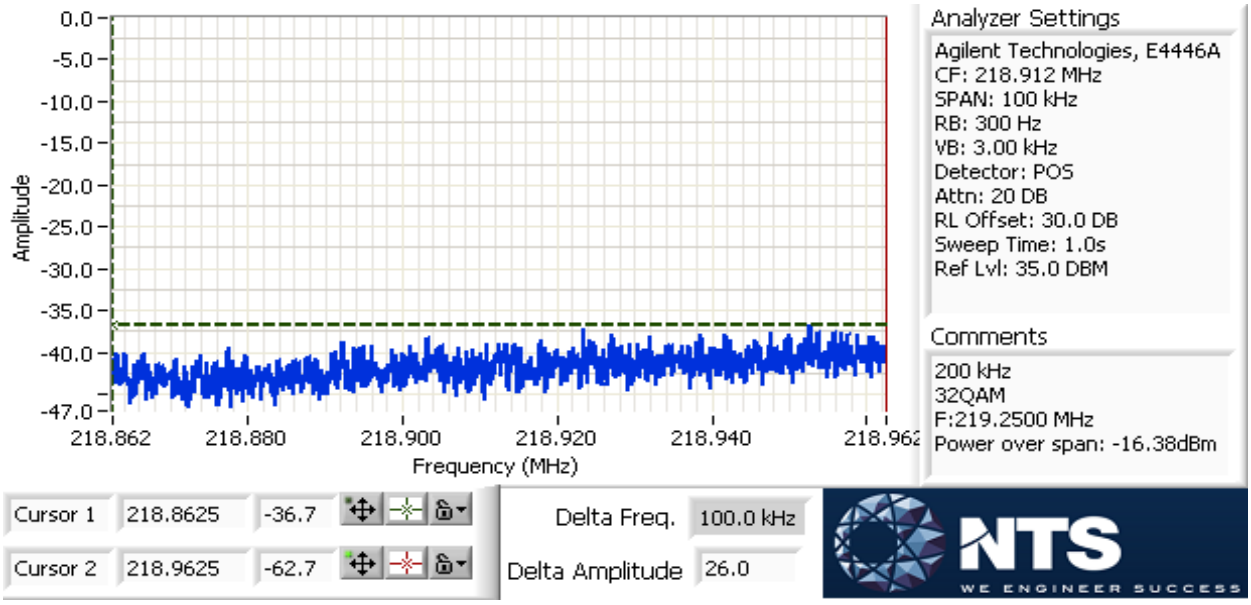
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

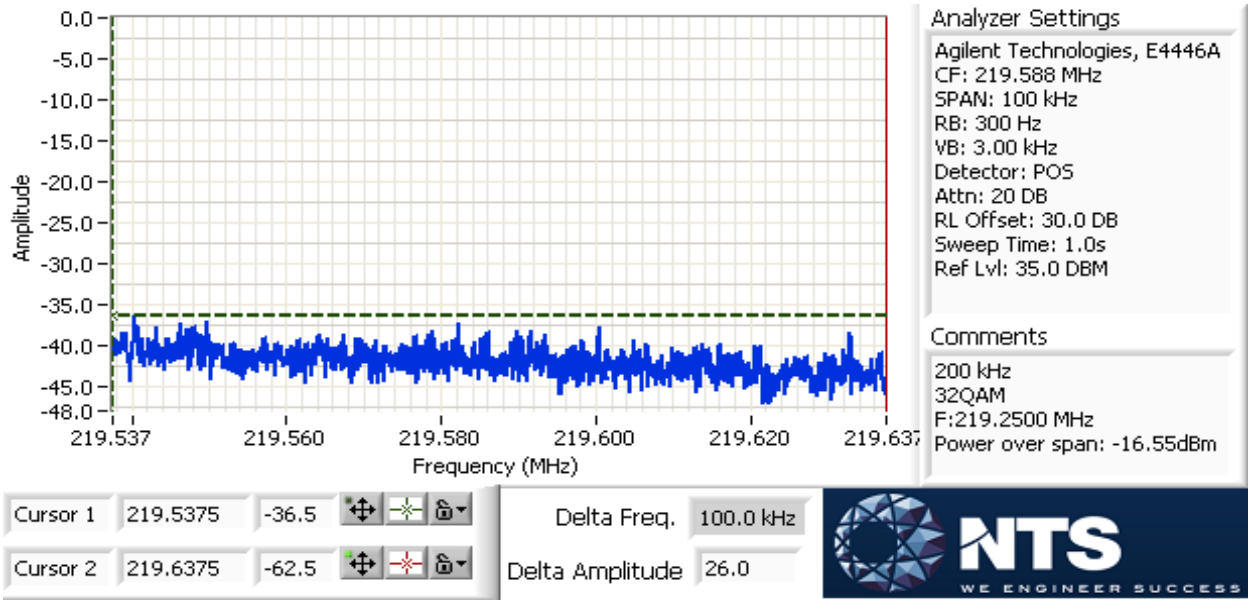


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

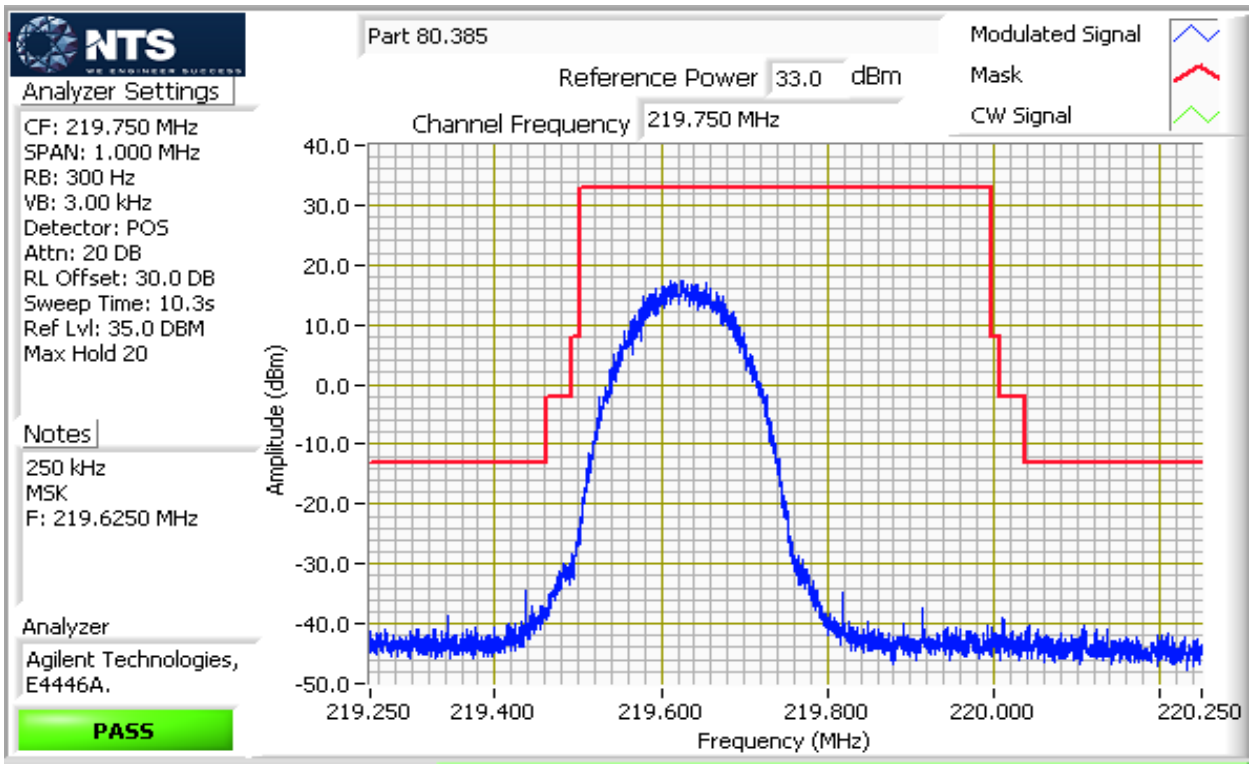
Run #2d: 219-220 MHz, Group A

Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
4050		171 kHz	MSK	219.6250	219.5000 - 220.000	Pass
4050		171 kHz	MSK	219.8750	219.5000 - 220.000	Pass

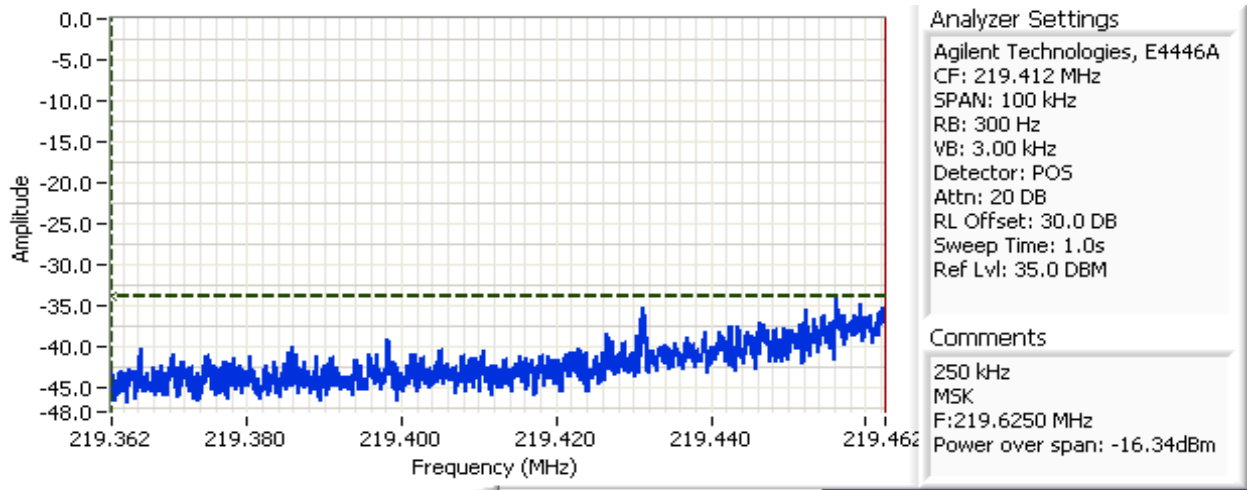
Power setting	Data rate	Occupied BW	Modulation	Carrier Frequency (MHz)	Group Edge Frequency (MHz)	Result
6700		176 kHz	QPSK	219.7500	219.5000 - 220.000	Pass
6850		176 kHz	8PSK	219.7500	219.5000 - 220.000	Pass
7000		176 kHz	16QAM	219.7500	219.5000 - 220.000	Pass
7100		176 kHz	32QAM	219.7500	219.5000 - 220.000	Pass

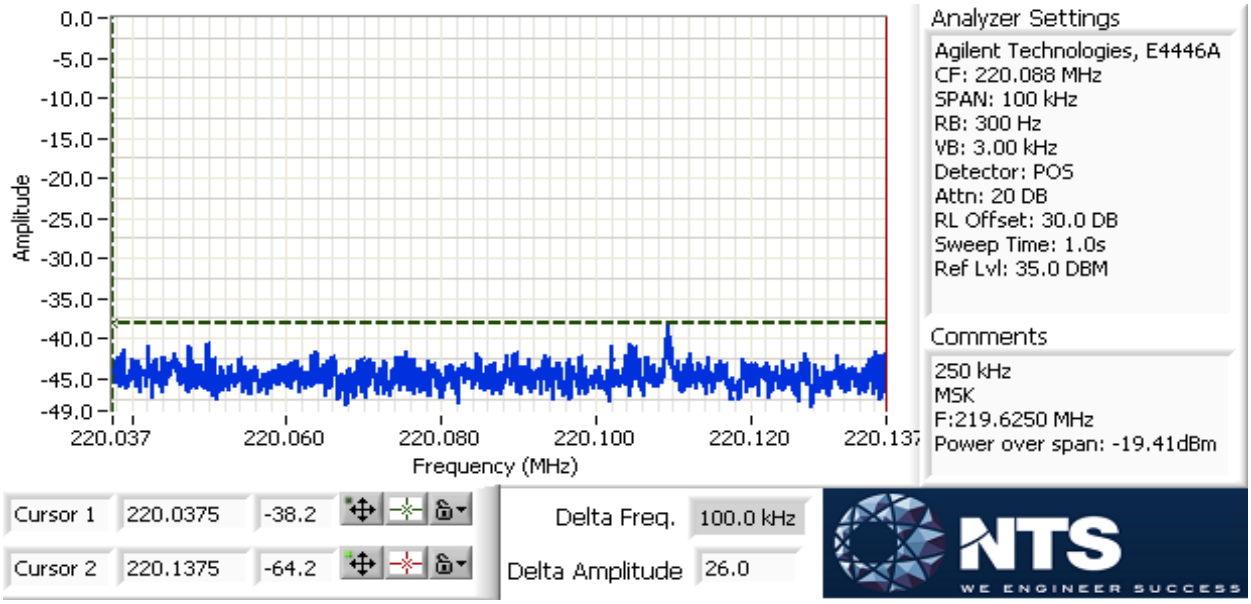
Note 1:	-13 dBm band edge frequencies were calculated as 219.4625 MHz and 220.0375 MHz (Group A) using 20 kHz authorized bandwidth per §80.385.

Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

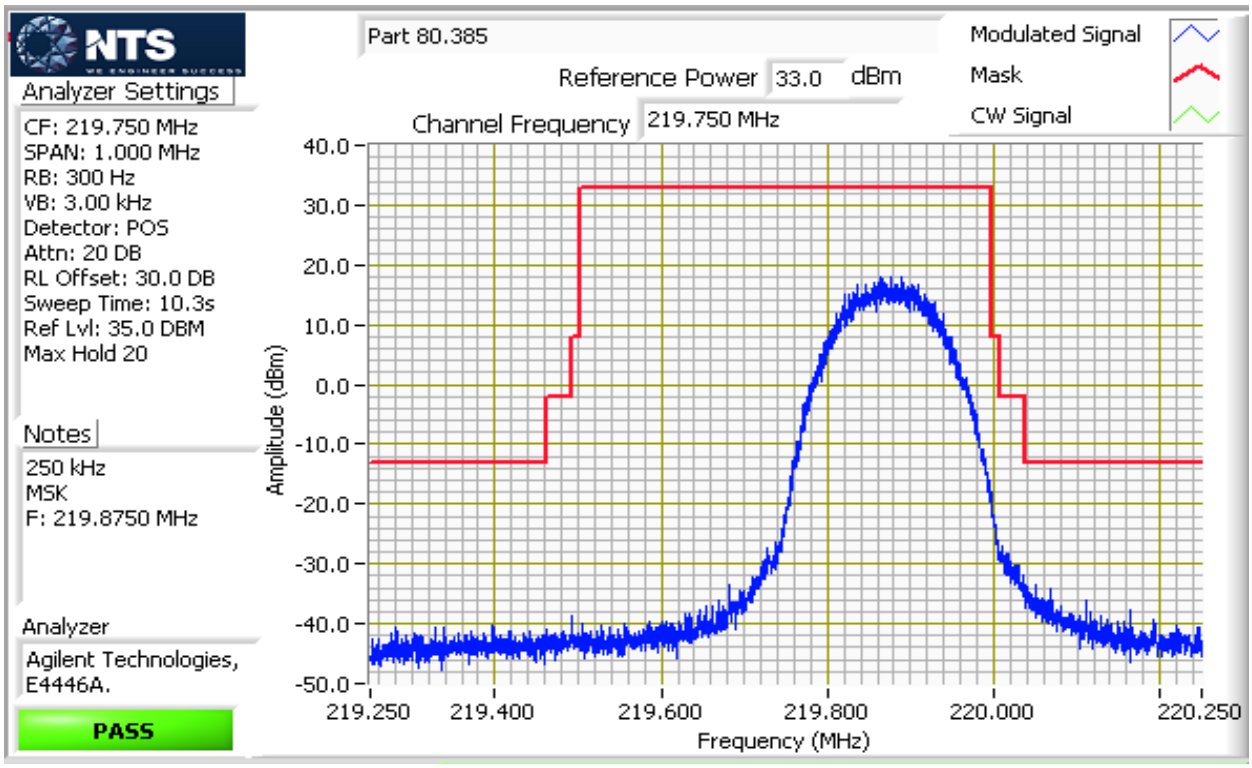


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

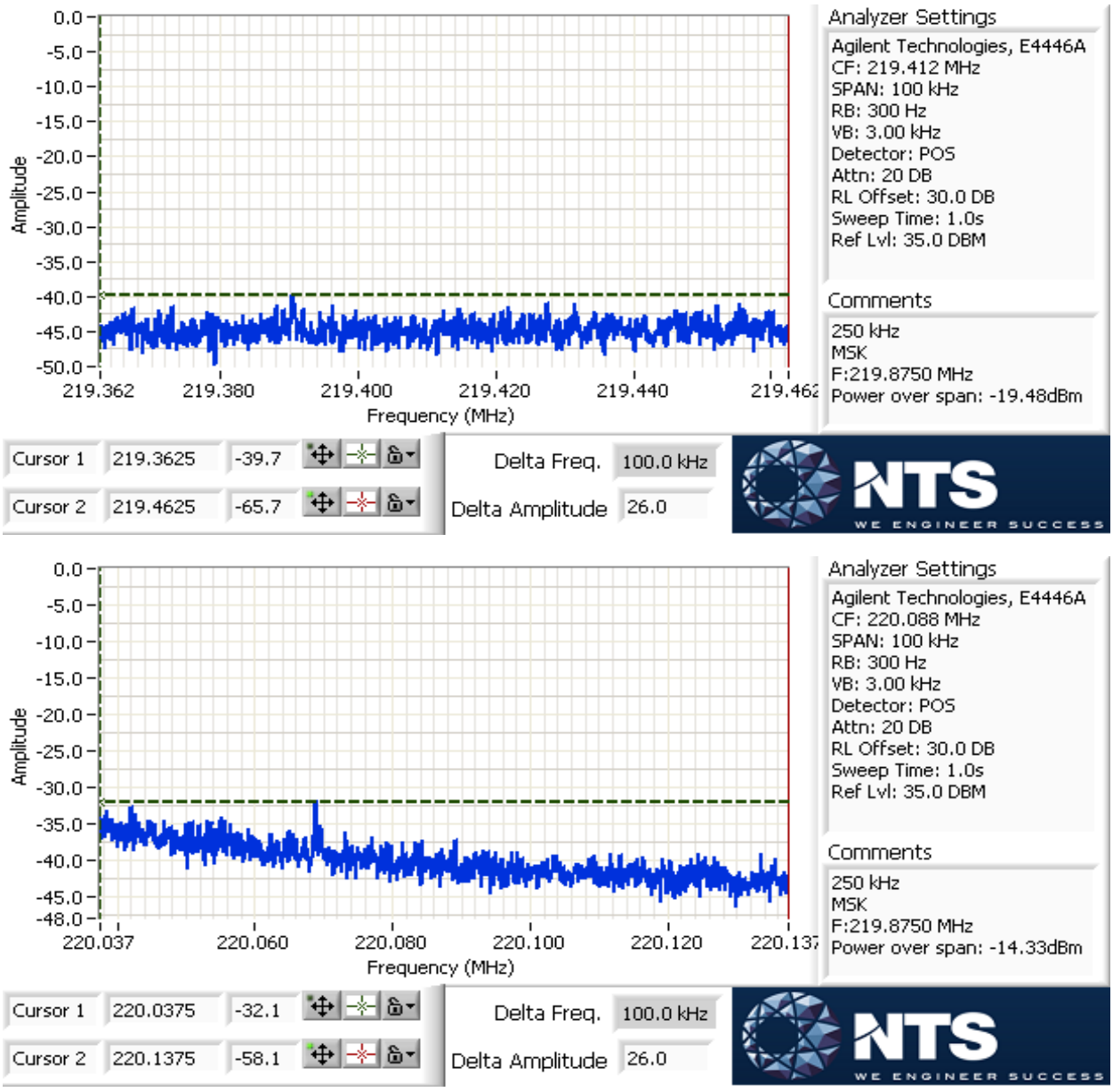




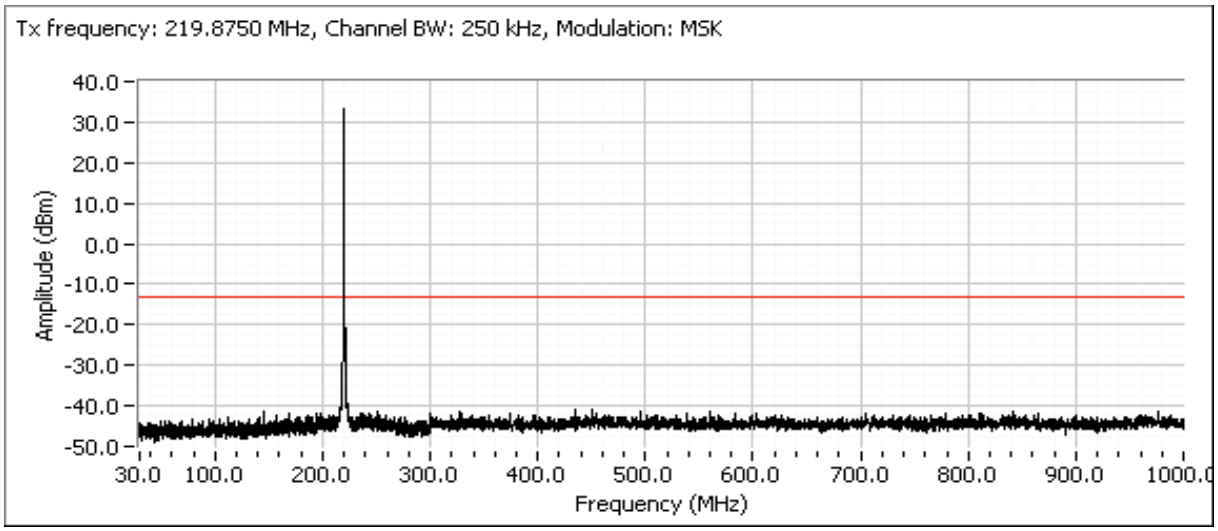
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

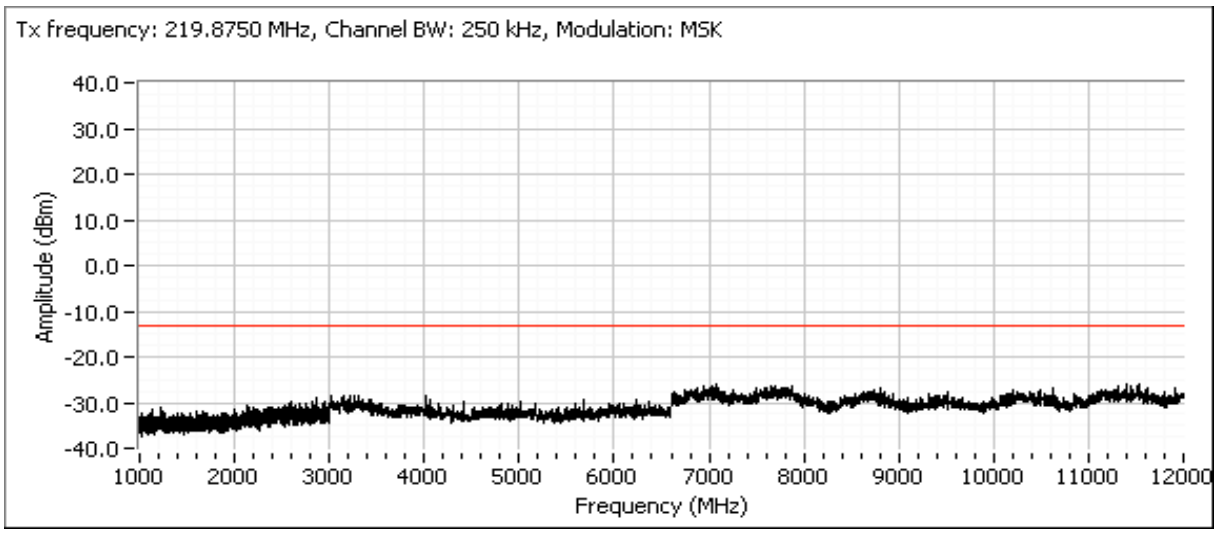


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

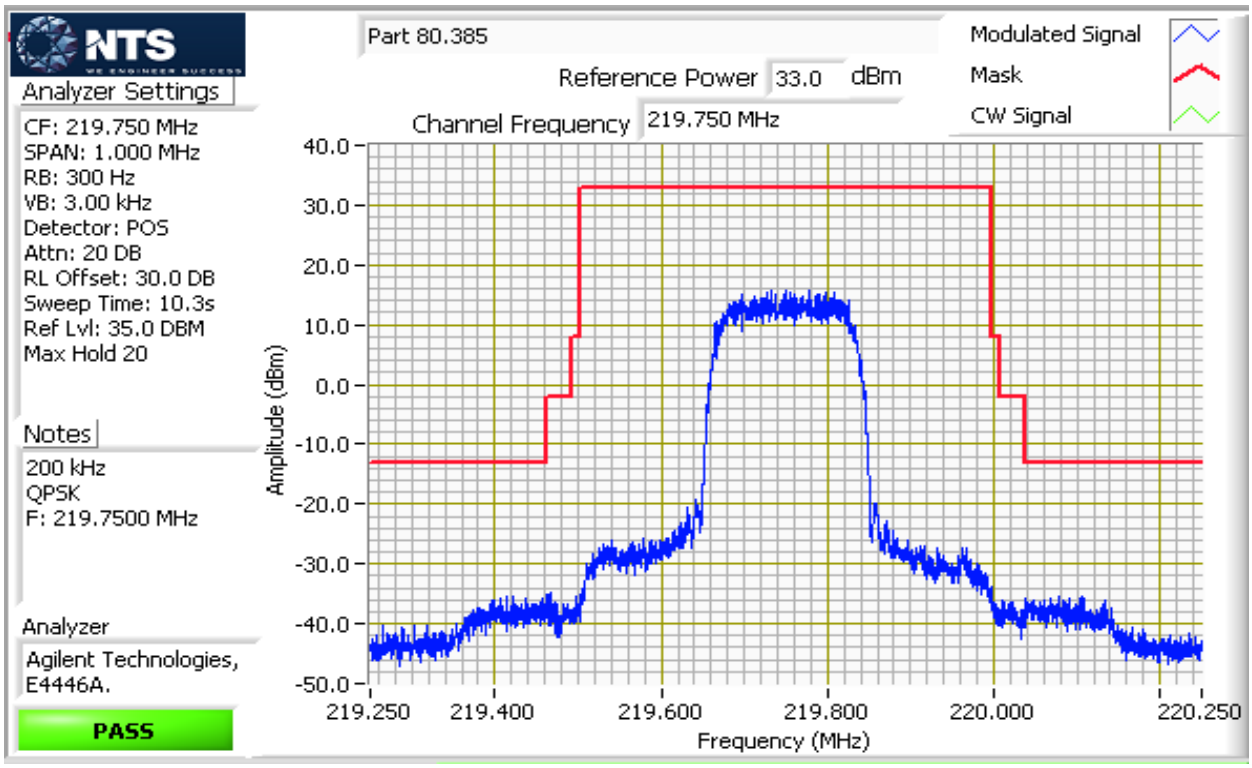


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

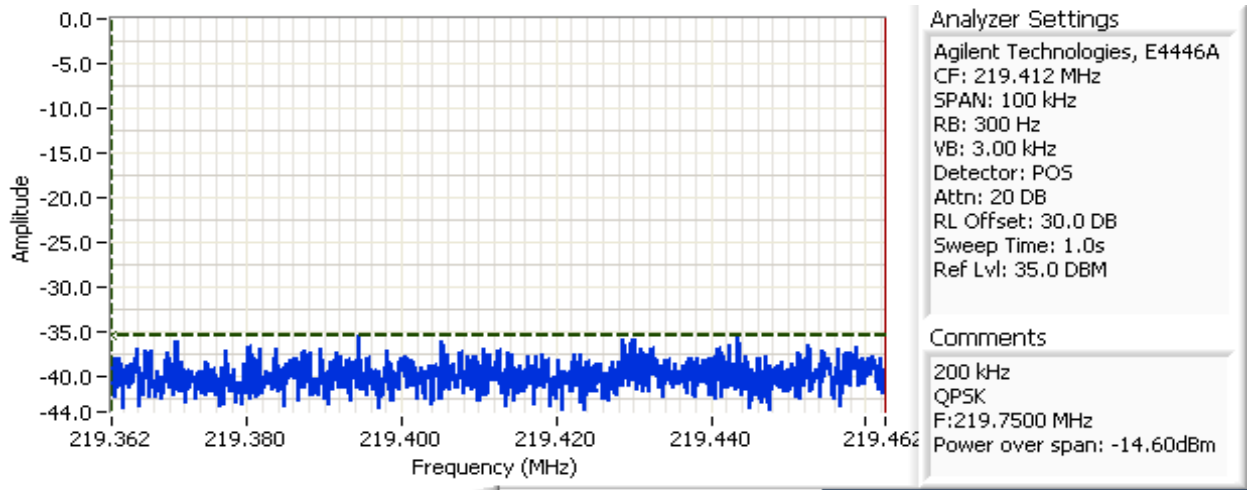


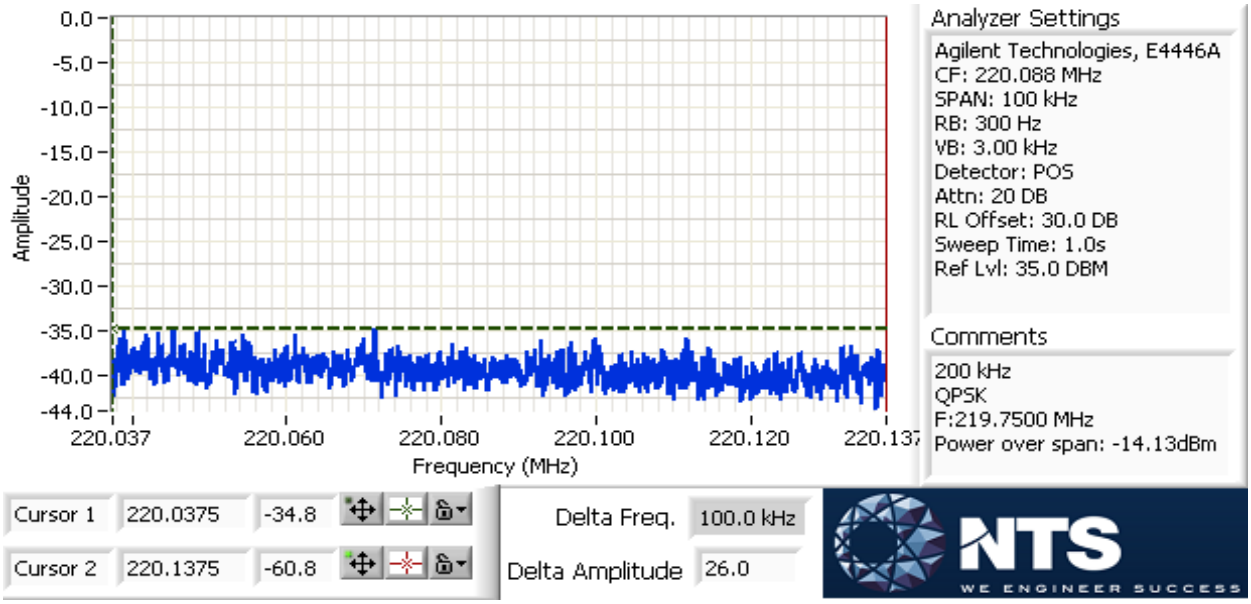


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





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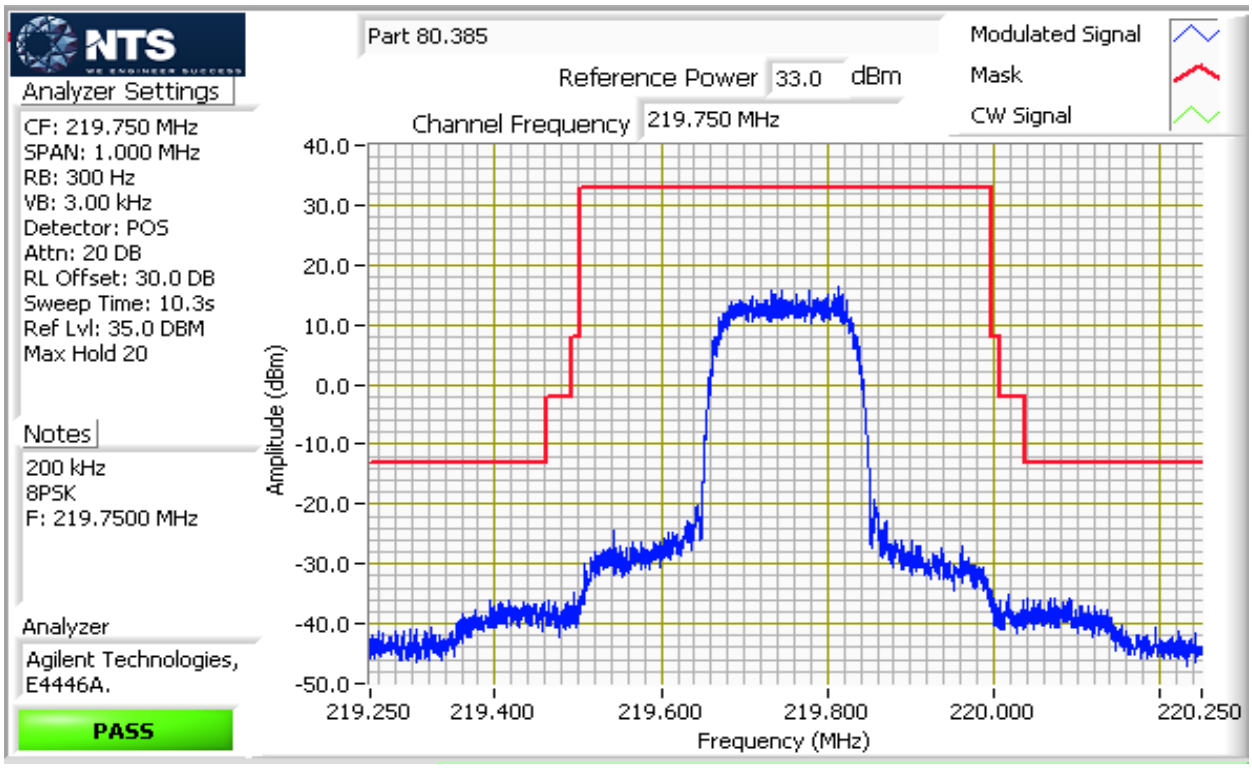
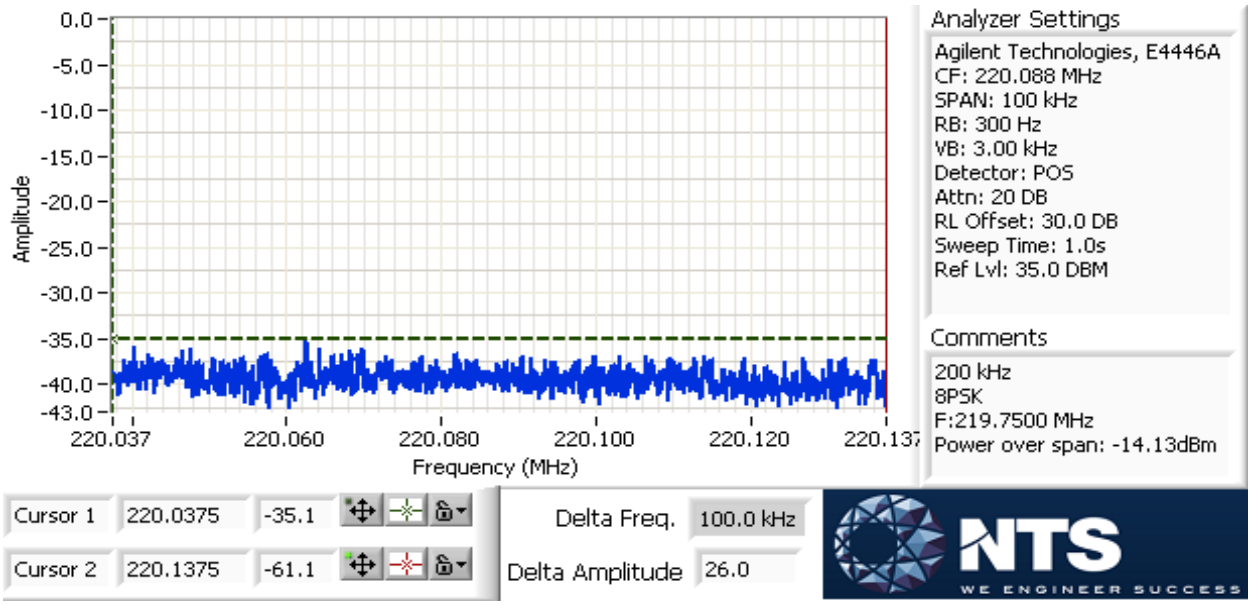
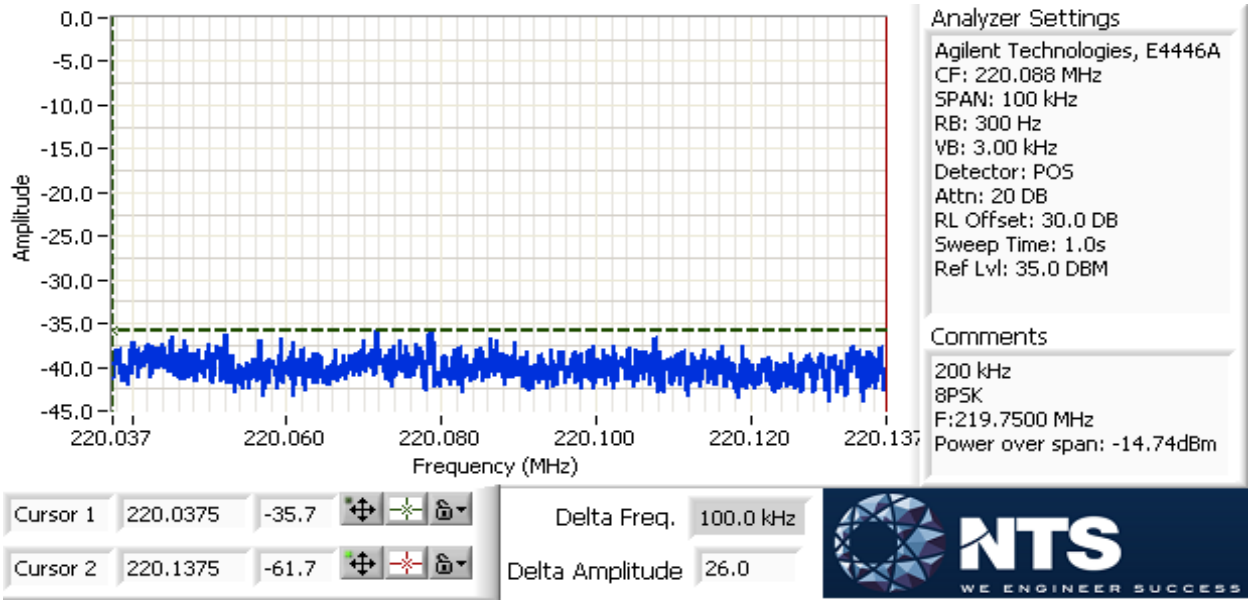
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

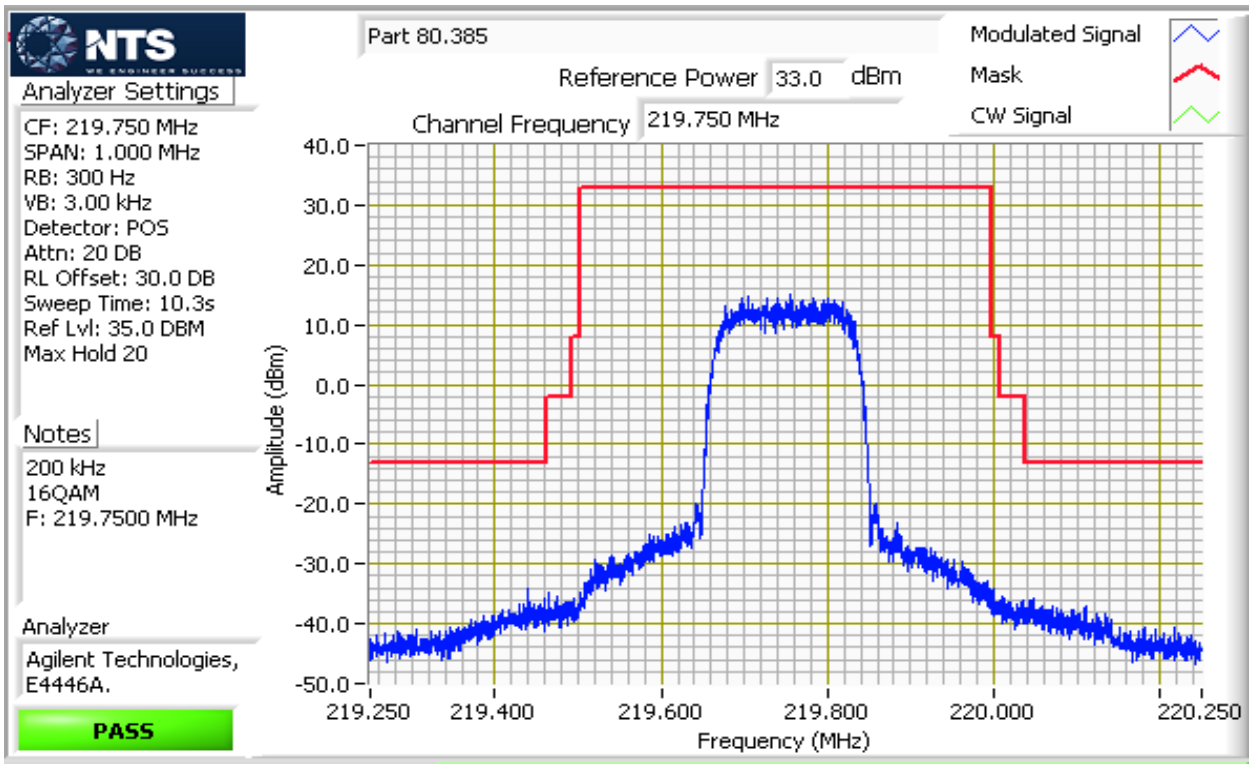


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

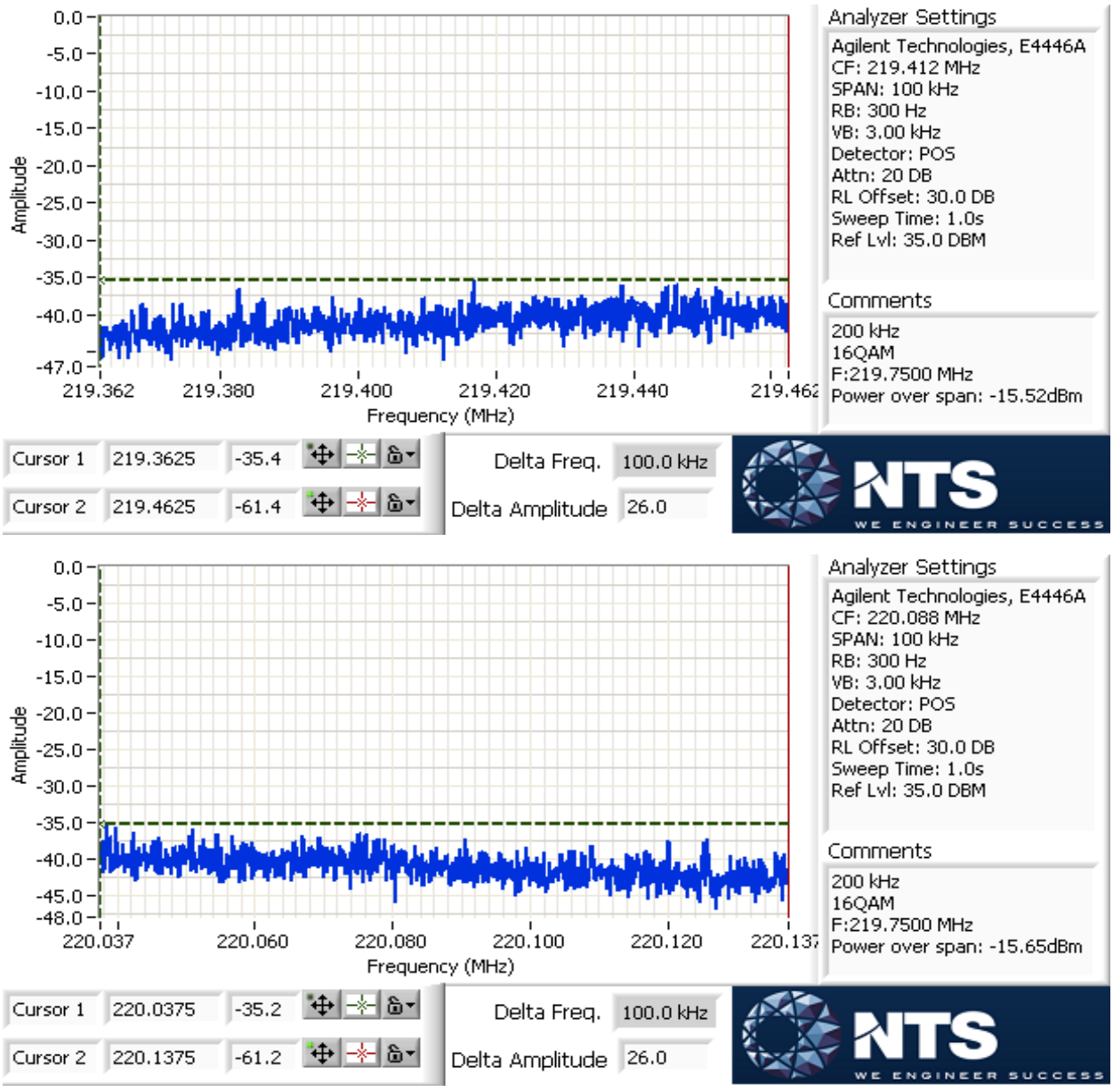




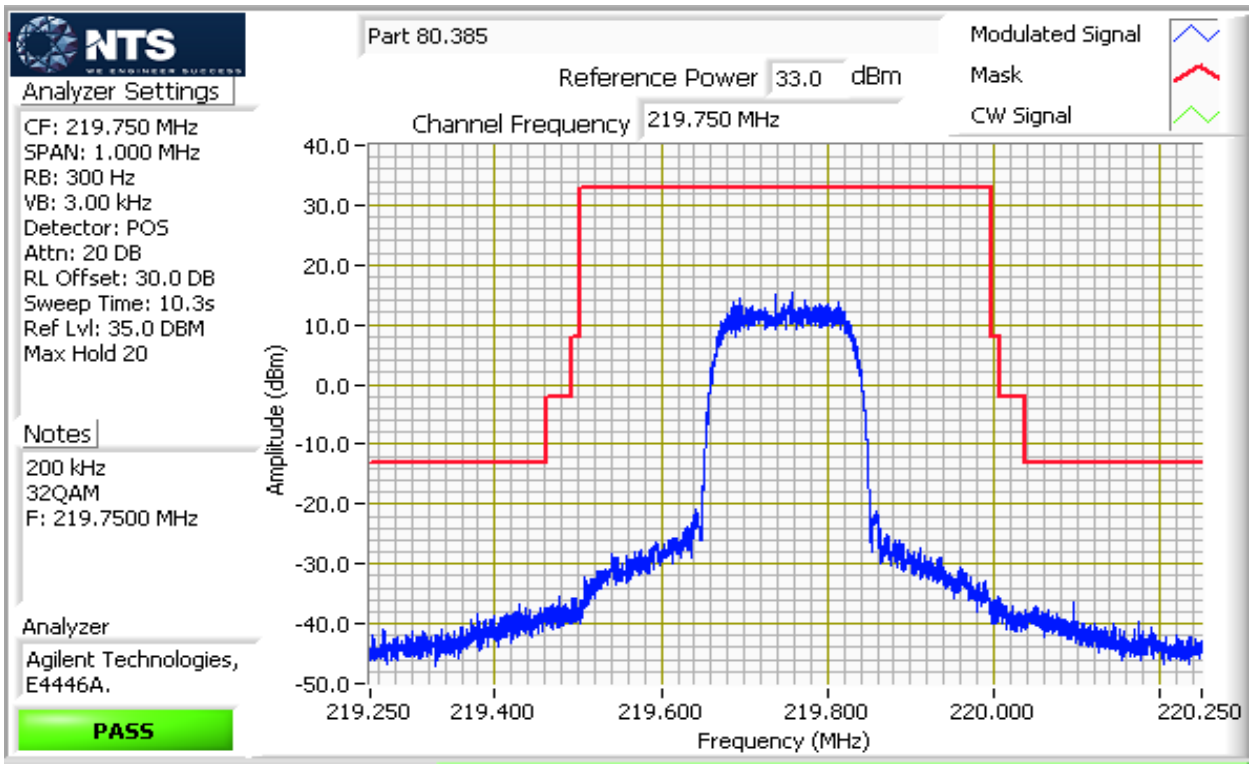
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



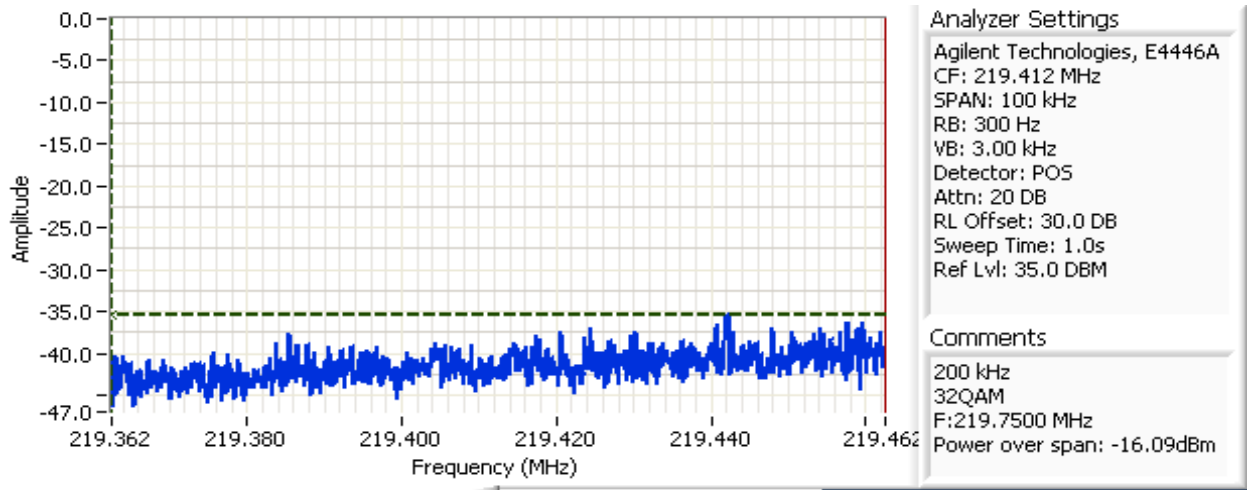
Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

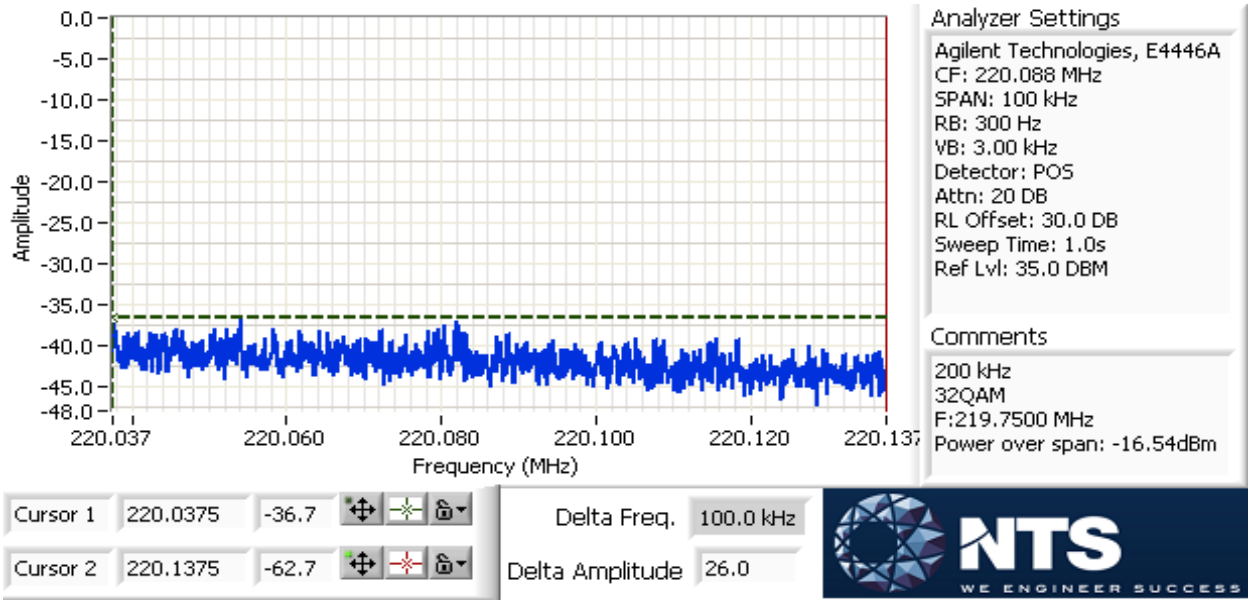


Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



Client:	Xetawave LLC	Job Number:	JD100445
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





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Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
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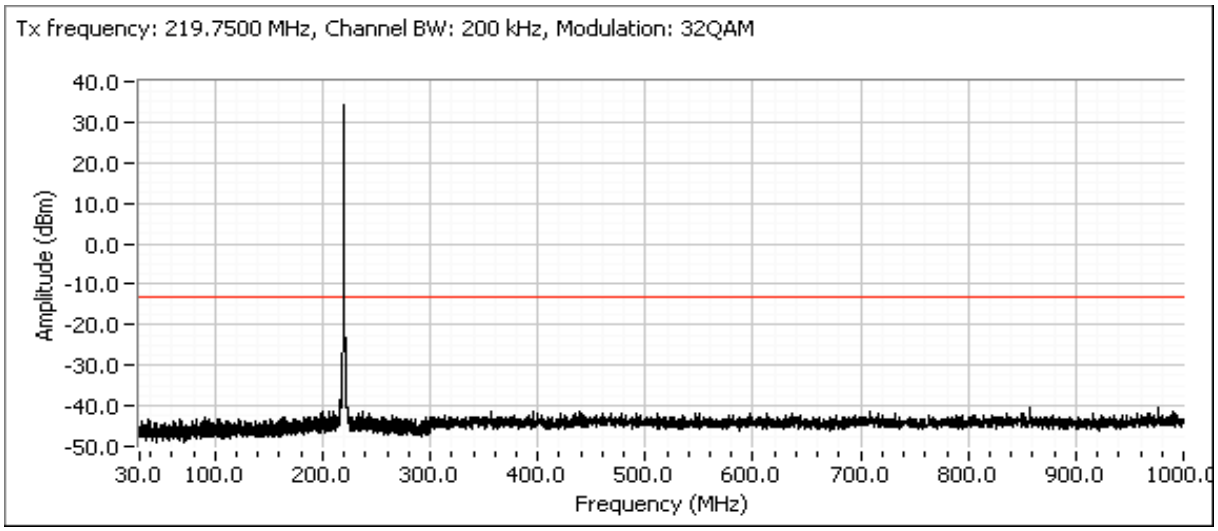

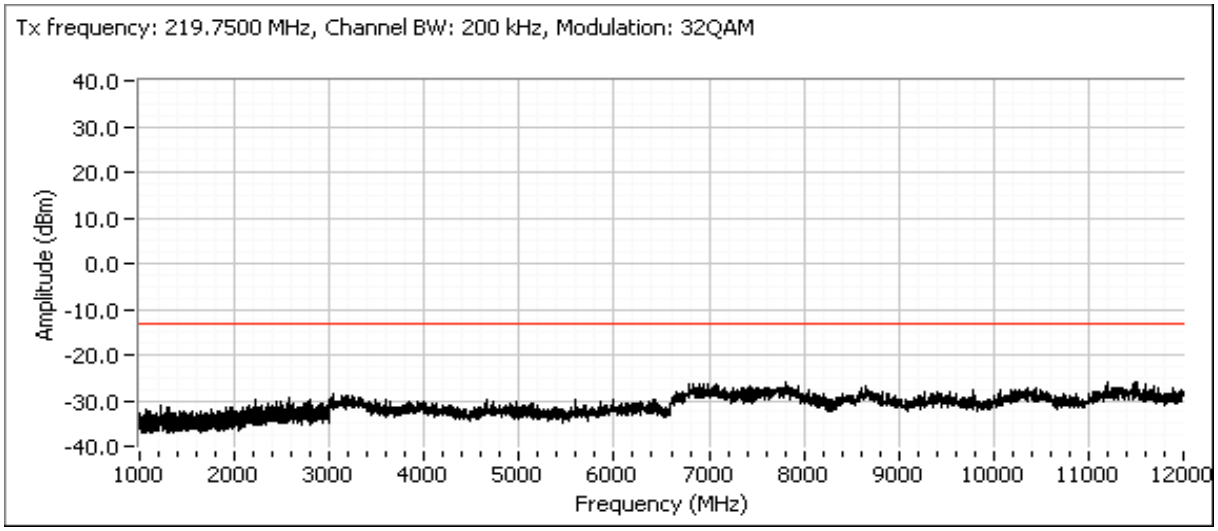

Client:	Xetawave LLC	Job Number:	JD100445
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		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A

Run #3: Signal Bandwidth

Power setting	Frequency (MHz)	Modulation	Channel plan	RB (kHz)	Bandwidth (kHz)		Authorized bandwidth
					26 dB	99%	
4500	217.1250	MSK	250 kHz	3		171	-
6800	217.2500	QPSK	500 kHz	3		176	-
6850	217.2500	8PSK	500 kHz	3		176	-
7000	217.2500	16QAM	500 kHz	3		176	-
7100	217.2500	32QAM	500 kHz	3		176	-
4050	219.8750	MSK	250 kHz	3		171	-
6700	219.7500	QPSK	500 kHz	3		176	-
6850	219.7500	8PSK	500 kHz	3		176	-
7000	219.7500	16QAM	500 kHz	3		176	-
7100	219.7500	32QAM	500 kHz	3		176	-

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:	JD100445
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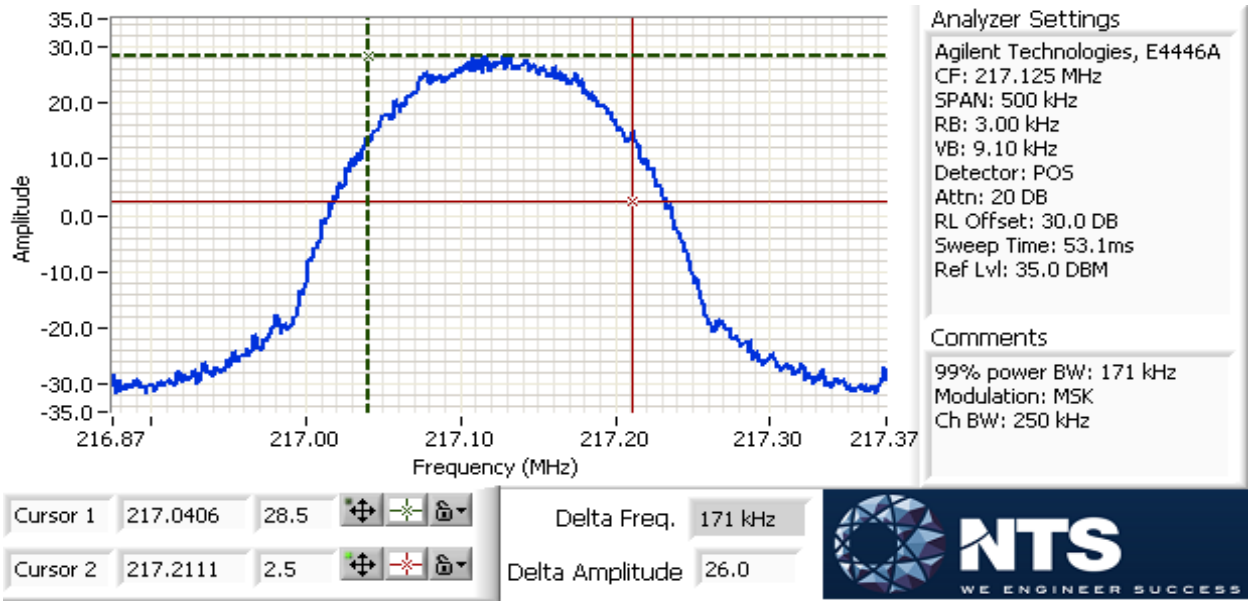
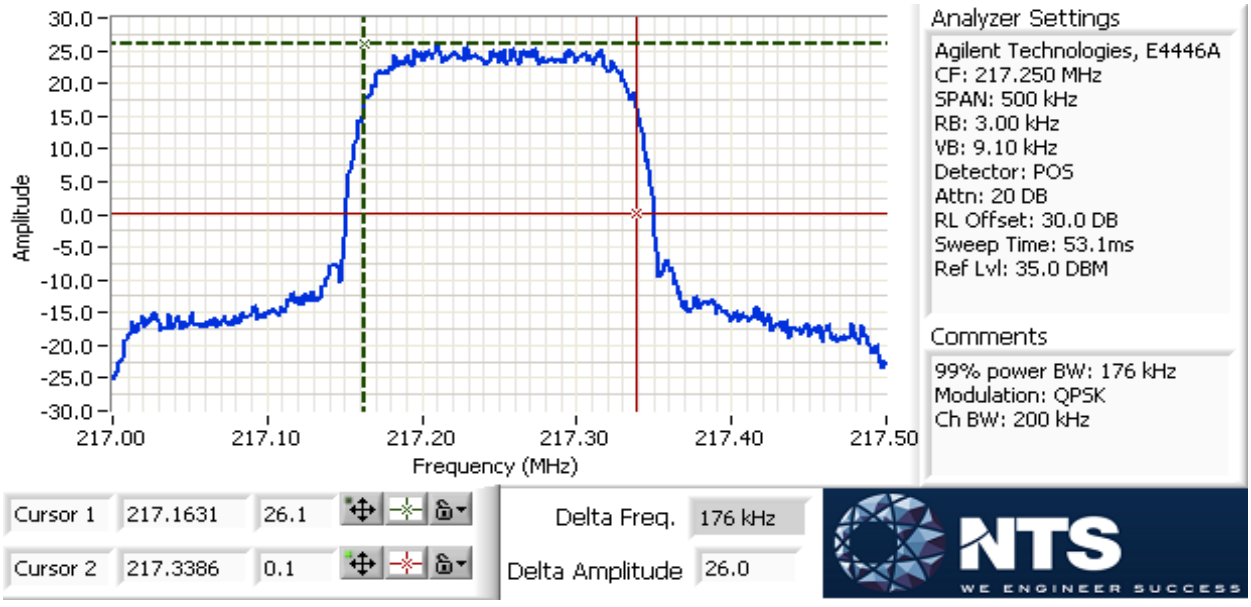
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





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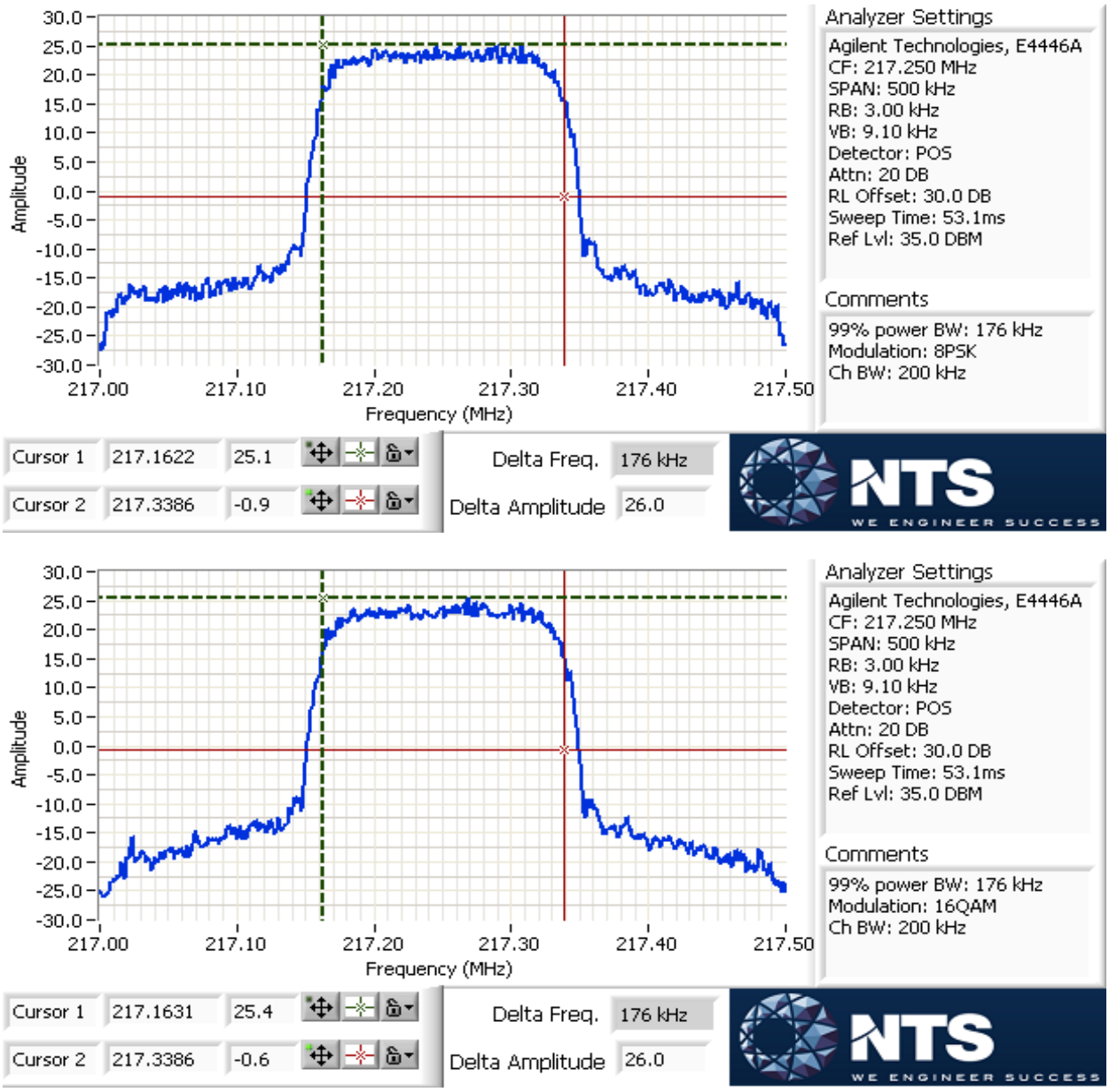
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A



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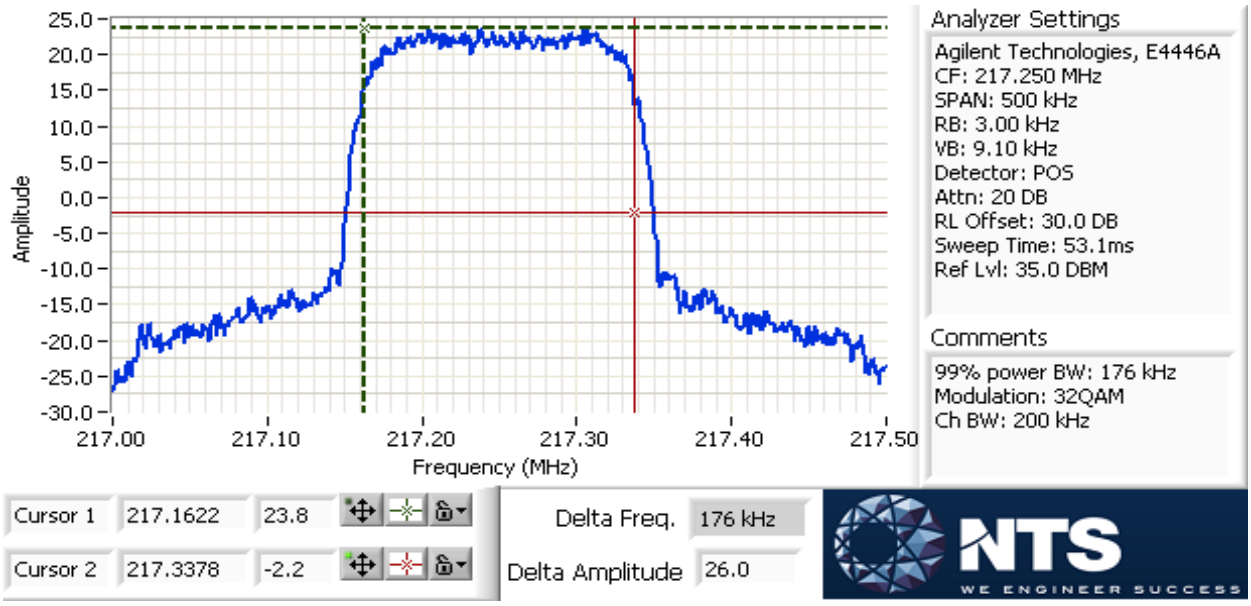
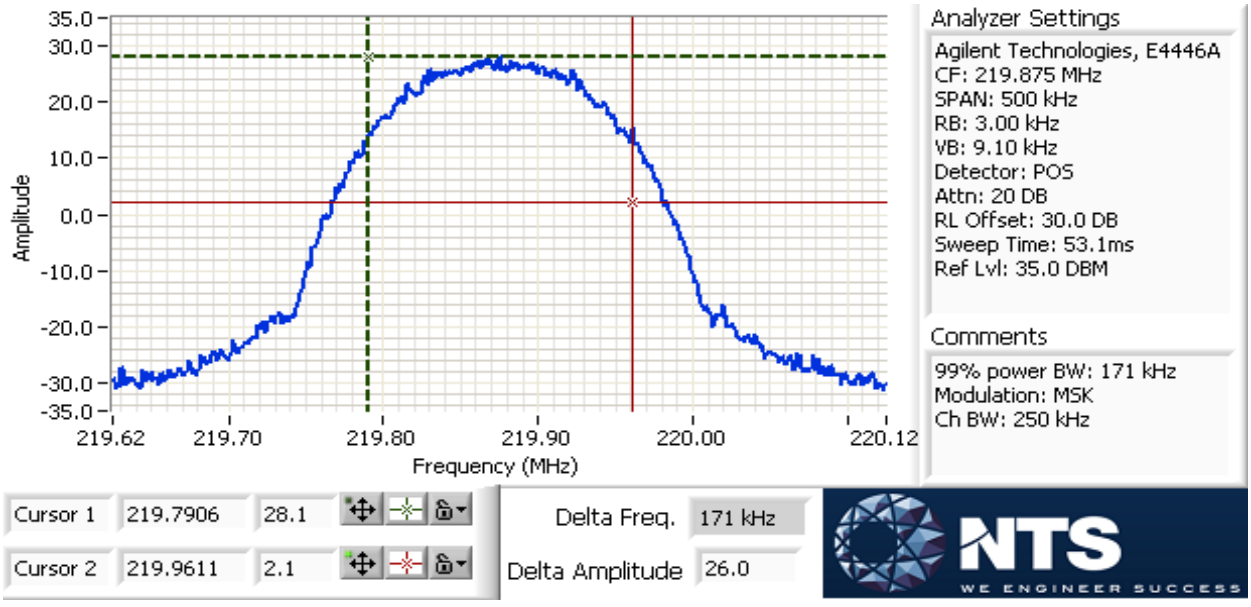
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





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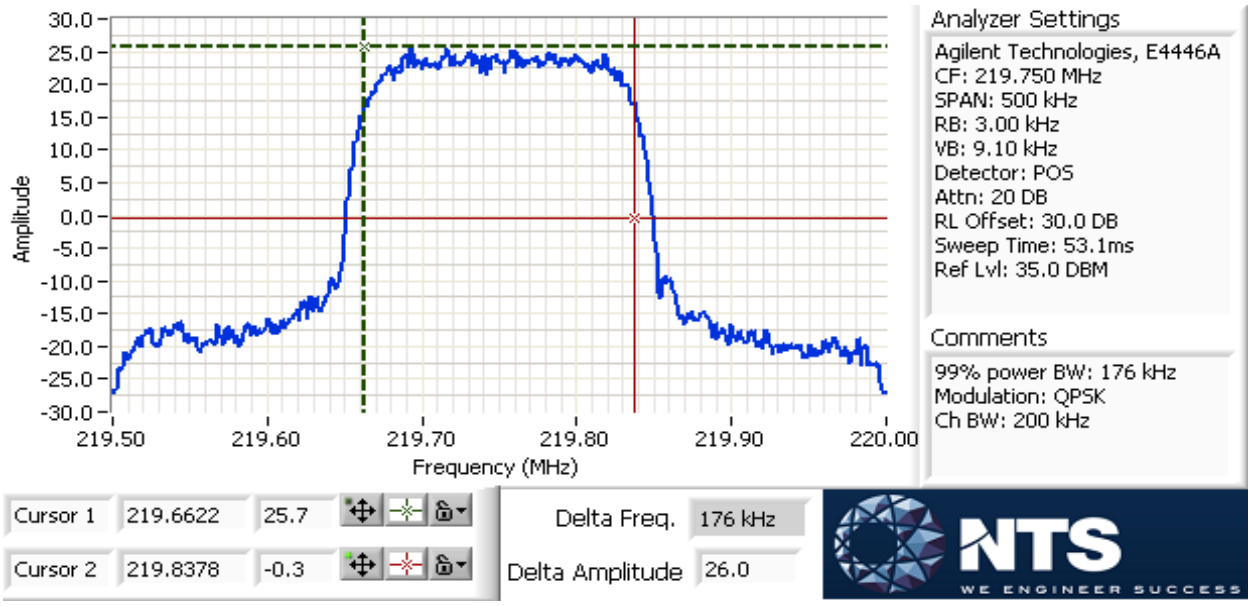
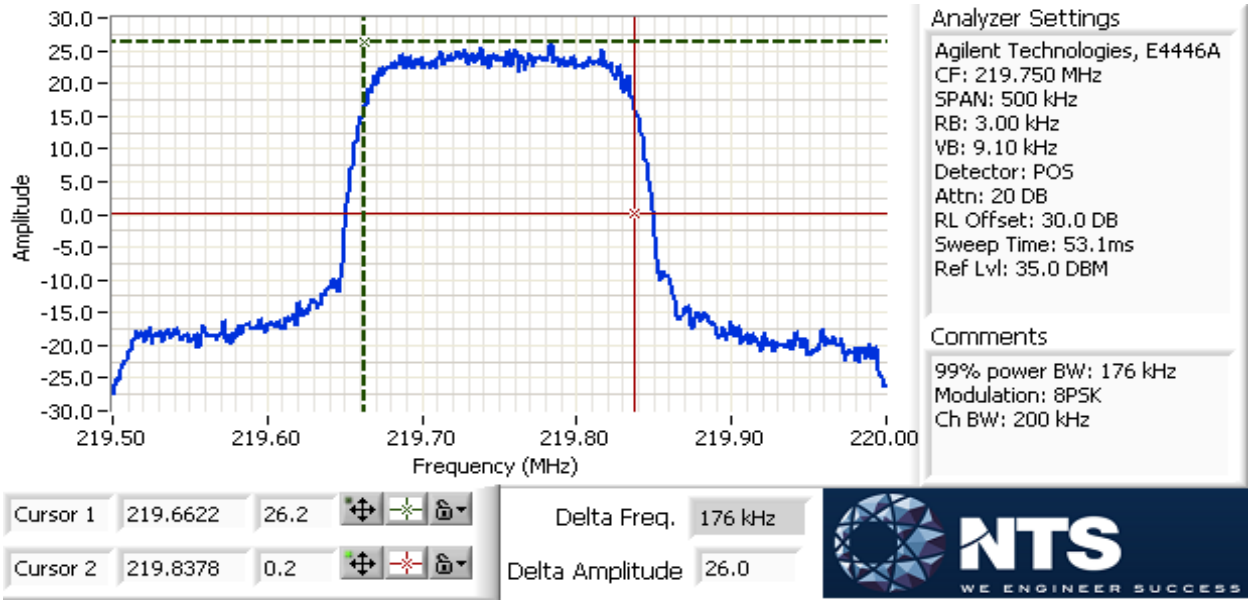
Model:	Xeta2	T-Log Number:	T100552
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





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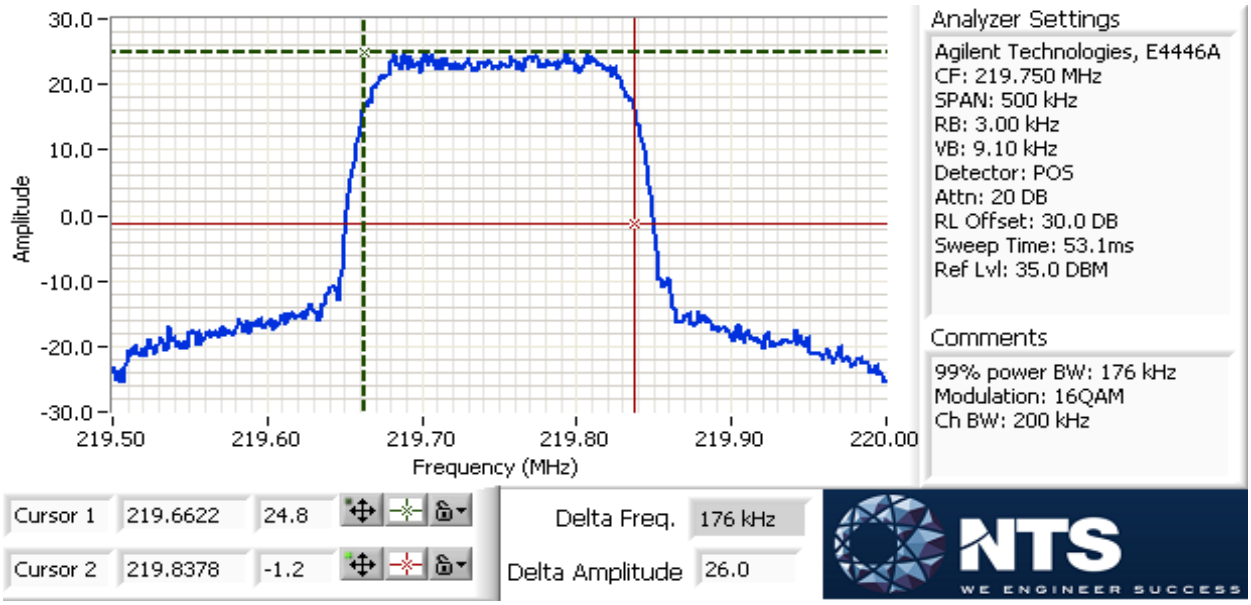
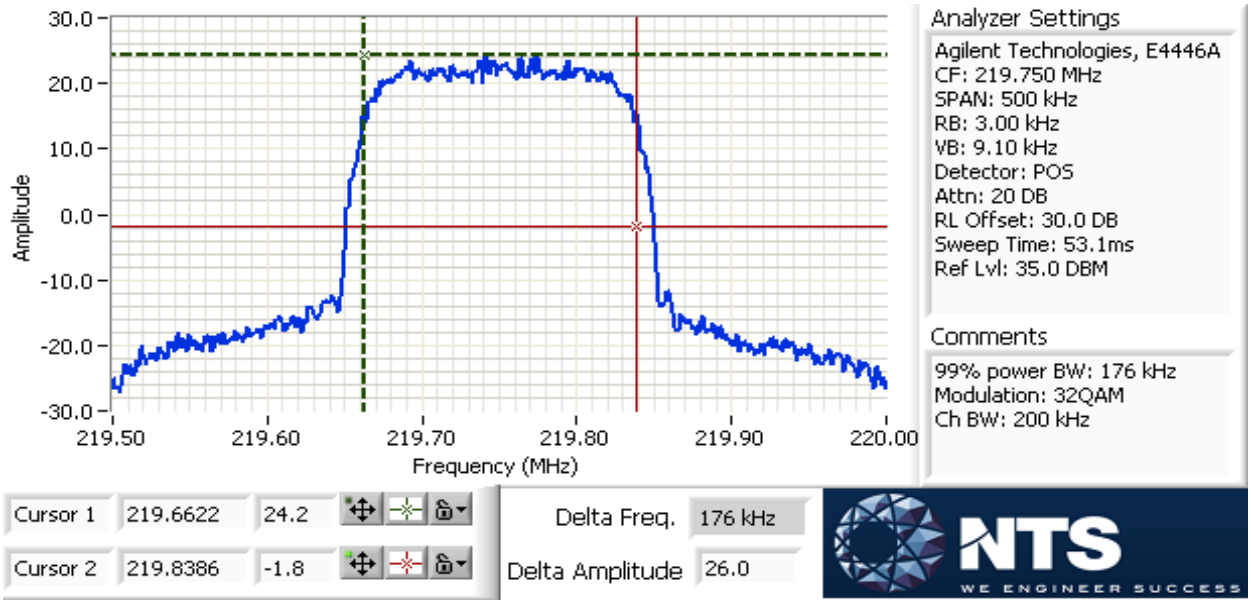
		Project Manager:	Christine Krebill
Contact:	Sandee Malang	Project Coordinator:	-
Standard:	FCC Part 80	Class:	N/A





End of Report

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