DIVERSIFIED
T.E.S.T.
TECHNOLOGIES, INC.
4675 Burr Drive • Liverpool, NY 13088 • 1-800-724-6452 • FAX: 315-457-0428 • 315-457-0245

July, 15 2014

James Midyette
Genie Company
One Door Drive
Mt. Hope, OH 44660

Dear Mr. Midyette**:**

Enclosed is the test report for the NGX WKEP Transmitter 315/390 MHz garage door opener transmitter model GK and OKP tested at our facility, located at 4675 Burr Drive in Liverpool, NY. This facility is on file with the Federal Communications Commission (FCC) per 47 CFR 2.948 (Site File Number 306552) and Industry Canada Site# 3034a-1.

We have completed our testing of Emissions to the FCC per 47 CFR Part 15.231 Class C for intentional radiators, and IC RSS 210 for Industry Canada Radio Standards Specification.

Thank you for selecting Diversified T.E.S.T. Technologies, Inc. for your testing needs. We look forward to working with you on future projects. Should you have any questions or concerns regarding this report, contact me at 315-457-0245. Please feel free to visit our website at www.dttlab.com.

Sincerely,

Steve Frierson
Technical Associate

Test Report – Table of Contents

Test Information

Laboratory
Diversified TEST Technologies, Inc.
4675 Burr Drive
Liverpool, NY 13088

Manufacturer
Genie Company
One Door Drive, Mt. Hope, OH 44660

Report Issue Date: July 15, 2014
Report Number: 6484-06202014- 15.231 (Edition 1)
Project Number: 6484

Date Received: June 5, 2014
Date Tested: June 6, 2014 – June 20, 2014

Product: NGX WKEP Transmitter 315/390 MHz
Models: GK and OKP

Traceability: *Reference standards of measurement have been calibrated by a competent body using standards traceable to NIST.*

The testing performed by Diversified TEST Technologies, Inc. has shown that the product referenced above complies with the electromagnetic compatibility requirements according to the FCC per 47 CFR Part 15.231, and IC RSS 210 for Industry Canada Radio Standards Specification. The results in this test report apply only to the NGX WKEP 315/390 MHz, Models: GK and OKP.
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It is the responsibility of the manufacturer to ensure that the product identification and labeling are in compliance with the applicable standards requirements. The manufacturer is also responsible for ensuring that additional units are manufactured with identical mechanical and electrical characteristics.

The equipment listed above conforms to the specified requirements of the test standards listed in the Test Regulations section of this report.

Compiled by:
Signature: _____ Date: July 15, 2014
Steven Frierson
Technical Lab Manager

Authorized by:
Signature: _____ Date: July 18, 2014
Tom Sims
President

Test Regulations

The tests were performed according to the following standards:

☒ FCC Part 15.231& IC RSS 210 for Industry Canada RSS	☐ Class A	☒ Class C
☒ FCC Part 15	☐ Class A	☒ Class B

☒Certification
☐Verification

Summary of Test Data

Name of Test	Paragraph Number	Results
Transmission Requirements	15.231 (a)	Complies
Radiated Emissions	15.231 (b)	Complies
Occupied Bandwidth	15.231 (c)	Complies
Frequency Tolerance	15.231 (d)	N/A
Alternate Field Strength Requirements	15.231 (e)	N/A
Power line Conducted Emissions	15.207	N/A

Note:

1.) The Device does not operate between 40.66 to 40.70 MHz
2.) The Device does not operate at a periodic rate
3.)The Device is battery powered

Equipment under Test (EUT) Testing Operation Mode

The EUT was operated under the following conditions during testing:

☐ Standby

☒ Normal Operating Mode

☐ Practice Operation

Description / Configuration of the EUT:

The NGX WKEP Transmitter is a remote garage door opener transmitter. It is a Dual Frequency Transmitter operating at both 315 MHz and 390 MHz for the use of opening garage doors. The transmitter utilizes OOK Modulation techniques. The NGX WKEP Transmitter Model: GK is marked under the Genie Brand name while the Model: OKP-A is marked under the Overhead Door Brand name.

The EUT was powered with 2 AAA 1.5 V batteries during the collection of data included within this report.

Rationale for EUT setup / configuration:

ANSI C63.4 (2003) / FCC Part 15.231

IC RSS 210 for Industry Canada Radio Standards Specification

Modifications:

None

Technical Contact:

James Midyette
Genie Company
One Door Drive
Mt. Hope, OH 44660

Test Setup Photographs

1.1 Radiated Emissions above 1 GHz / Occupied Bandwidth

1.2. Radiated Emissions above 1 GHz

Emissions Testing Conditions
Radiated Emissions

The Radiated Emissions measurements, in the frequency range of 30 MHz – 6000 MHz, were tested in a horizontal and vertical polarization at the following test location:

☒ Diversified TEST Technologies, Inc. Open Area Test Site
☐ Diversified TEST Technologies, Inc. Lab

at a test distance of:

☒ 3 meters
☐ 10 meters
☐ 30 meters

Measurements above 1 GHz were made at a test distance of 1 Meter

DTT uses automated data reductions to determine product compliance to Radiated Emissions regulations. The product's signal data is compared to a current ambient scan. The frequencies that are of significant amplitude are sorted and are brought out to be further analyzed and maximized.

Test equipment used:

Manufacturer	Model	Description	Serial #	Last Cal	Cal Due
Hewlett Packard	8596E	Spectrum Analyzer	3235A00144	5/16/14	5/16/15
Agilent	E7402A	EMC Analyzer	MY45103221	8/29/13	8/29/14
Electro-Metrics	LPA25	Log Periodic Antenna	1242	7/10/13	7/10/14
Electro-Metrics	RGA60	Ridge Horn Antenna	2981	12/9/13	12/9/14
Hewlett Packard	7550A	Plotter	2407A00476	N/A	N/A
	MFR-57500	Blue low-loss transmit cable	337	N/A	N/A
		Non-conductive wooden turntable		N/A	N/A
		10-meter open field test range, grounded with 1/4" x 1/4" hardware cloth		N/A	N/A

Transmission Requirements

Test Title: Transmission Requirements

Minimum Standard:

15.231 (a): Continuous transmissions such as voice, video, or data transmissions are not permitted.

15.231 (a) (1): A Manually operated transmitter shall employ a switch that will automatically deactivate within not more than 5 seconds after being released.

15.231 (a) (2): A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231 (a) (3): Periodic Transmission at regular predetermined intervals are not permitted. However, polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231 (a) (4): Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life when activated to signal an alarm, may operate during the pendency of the alarm.

Test Results: Complies

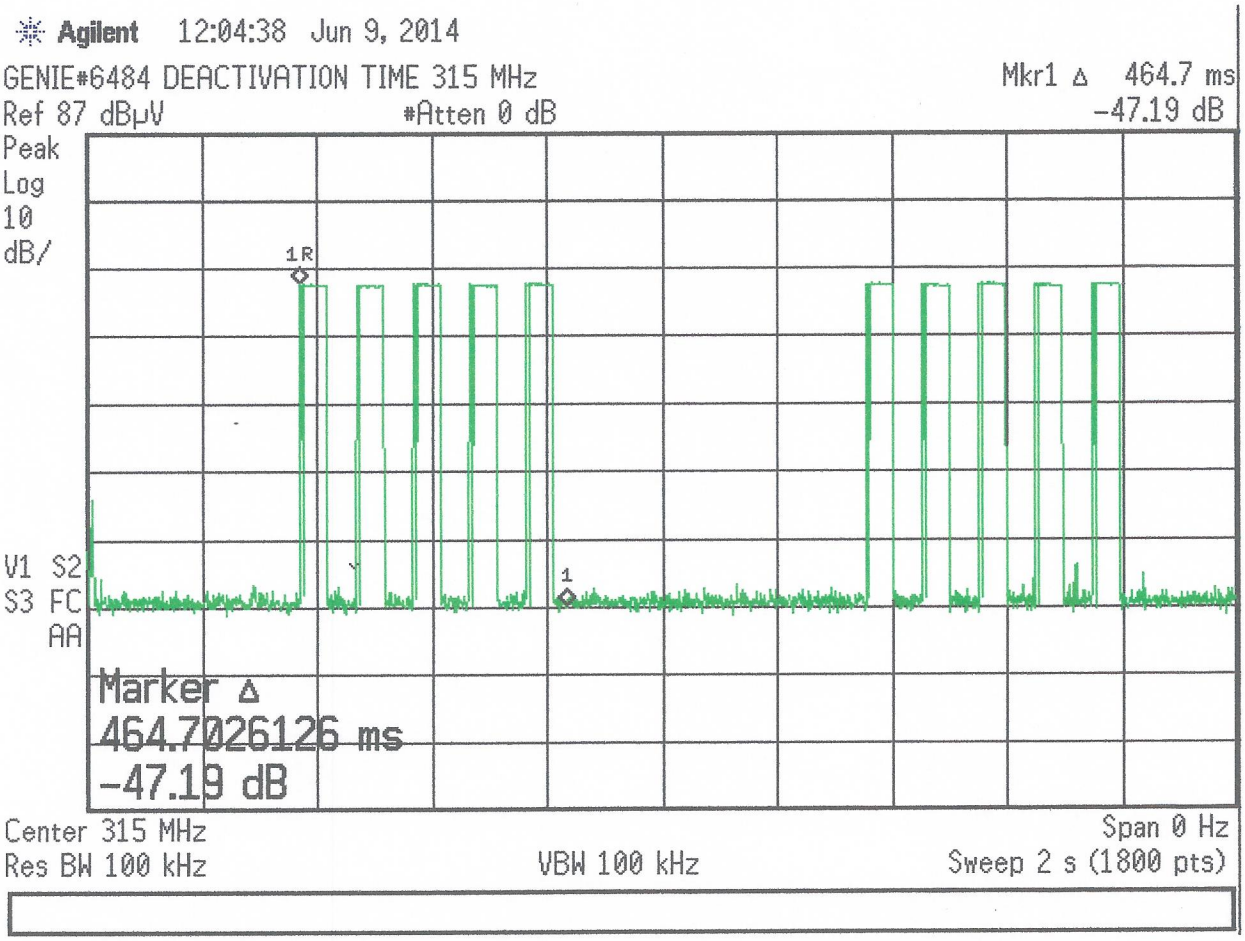
Test Data: Compliance was determined by verification of technical specifications and functional tests on the equipment.

Rationale for Compliance with Transmission Requirements

15.231 (a) (1) 15.231 (a) (2)	☒ Manual Activation ☐ Automatic Activation	Tx deactivation time:
15.231 (a) (3)	☒ Regular, predetermined transmissions ☐ Polling or supervisory transmissions	Tx rate and duration
15.231 (a) (4)	☐ Alarm device operating during the pendency of alarm condition ☒ Non-Alarm Device	

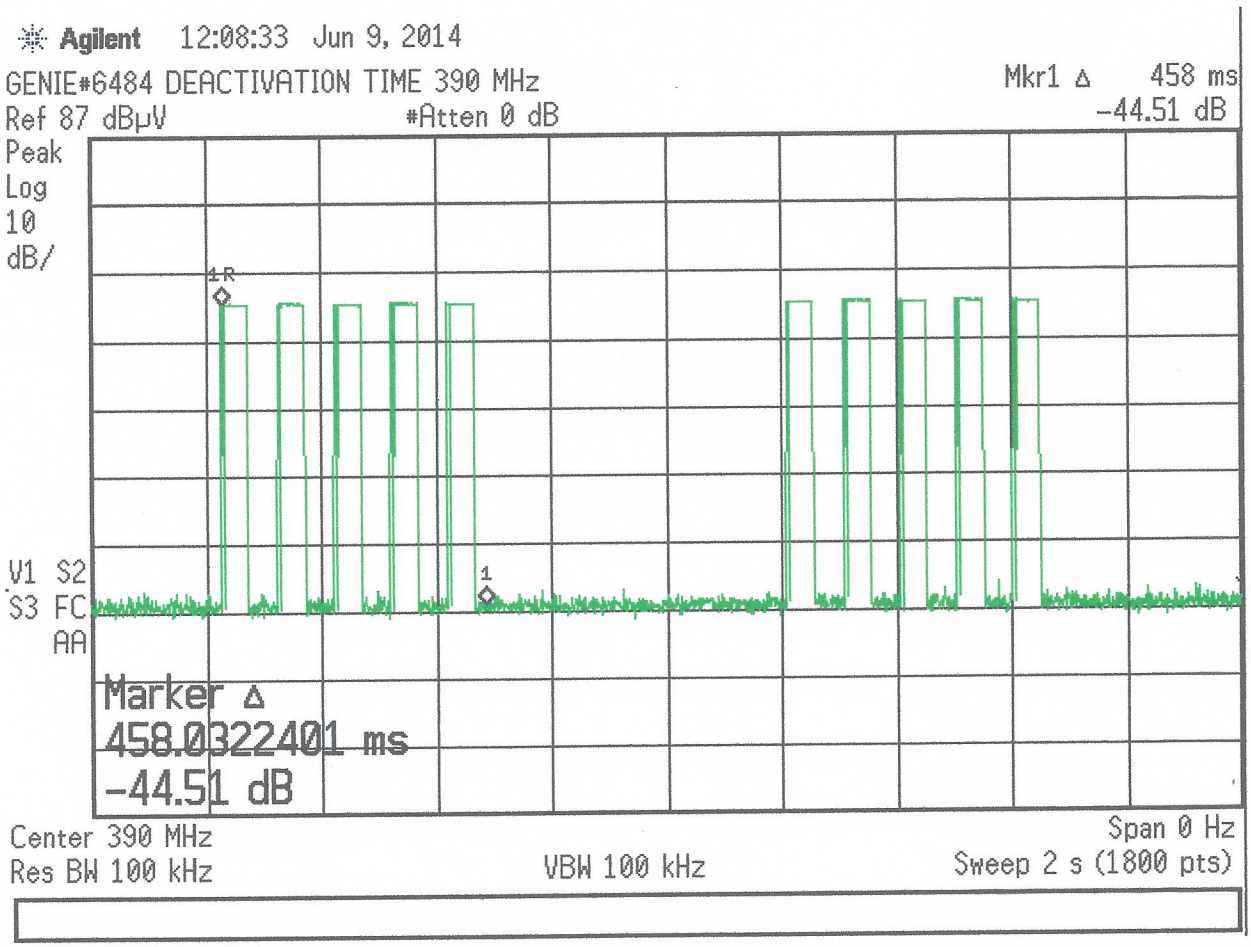
Test Data: Transmission Requirements

Deactivation Time 315 MHz


Agilent 12:04:38 Jun 9, 2014
GENIE#6484 DEACTIVATION TIME 315 MHz
Ref 87 dBµV
#Atten 0 dB
Mkr1 Δ 464.7 ms
-47.19 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
464.7026126 ms
-47.19 dB
Center 315 MHz
Res BW 100 kHz
VBW 100 kHz
Span 0 Hz
Sweep 2 s (1800 pts)

Test Data: Transmission Requirements

Deactivation Time 390 MHz


Agilent 12:08:33 Jun 9, 2014
GENIE#6484 DEACTIVATION TIME 390 MHz
Ref 87 dBµV
#Atten 0 dB
Mkr1 Δ 458 ms
-44.51 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
458.0322401 ms
-44.51 dB
Center 390 MHz
Res BW 100 kHz
VBW 100 kHz
Span 0 Hz
Sweep 2 s (1800 pts)

Radiated Emissions 15.231 (b)

Minimum Standard:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	[1]1,250 to 3,750	[1]125 to 375
174-260	3,750	375
260-470	[1]3,750 to 12,500	[1]375 to 1,250
Above 470	12,500	1,250

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	**Field Strength (µV/m @ 3m)**	**Field Strength (dB @ 3m)**
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

Test Result: Complies, see attached data table.

Above 1 GHz a spectrum analyzer is used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was set to 1 MHz.

Test Data: Radiated Emissions

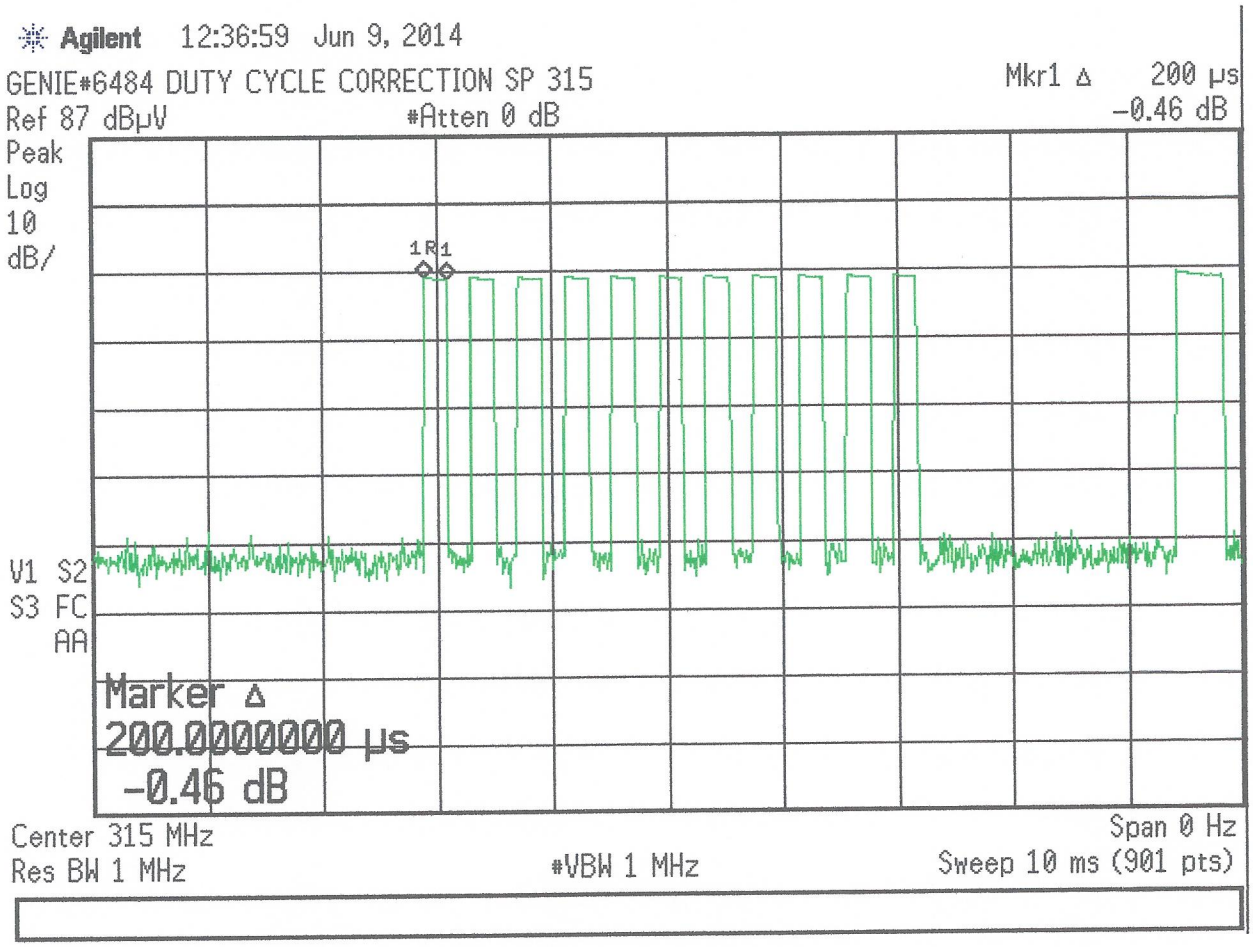
Freq. (MHz)	Antenna Polarization	Meter Reading (dBuV)	LESS Duty Factor (dB)	ADD Cable Factor (dB)	ADD Antenna Factor (dB)	LESS 1 m to 3 m Distance Factor (dB)	Corrected Reading (dBuV/m)	FCC Spec Limit (dBuV/m)	Margin (dB)	Results	Comments
315	H	58.6	-11.9	7.2	15.1	0.0	69.0	75.6	-6.6	Pass	
	V	60.0	-11.9	7.2	15.1	0.0	70.4	75.6	-5.2	Pass	
630	H	18.4	-11.9	12.4	19.7	0.0	38.7	55.6	-16.9	Pass	
	V	25.1	-11.9	12.4	19.7	0.0	45.4	55.6	-10.2	Pass	
945	H	20.7	-11.9	17.6	23.5	0.0	49.9	55.6	-5.7	Pass	
	V	21.0	-11.9	17.6	23.5	0.0	50.2	55.6	-5.4	Pass	
1260	H	33.7	-11.9	0.3	25.0	-9.5	37.6	55.6	-18.0	Pass	
	V	36.8	-11.9	0.3	25.0	-9.5	40.8	55.6	-14.8	Pass	
1575	H	27.6	-11.9	0.5	26.3	-9.5	33.0	54.0	-21.0	Pass	
	V	29.5	-11.9	0.5	26.3	-9.5	34.9	54.0	-19.1	Pass	
1890	H	27.9	-11.9	0.4	28.1	-9.5	34.9	55.6	-20.7	Pass	
	V	29.6	-11.9	0.4	28.1	-9.5	36.6	55.6	-19.0	Pass	
2205	H	27.7	-11.9	0.2	28.9	-9.5	35.4	54.0	-18.6	Pass	
	V	29.4	-11.9	0.2	28.9	-9.5	37.1	54.0	-16.9	Pass	
2520	H	29.2	-11.9	0.3	29.3	-9.5	37.3	55.6	-18.3	Pass	
	V	30.2	-11.9	0.3	29.3	-9.5	38.3	55.6	-17.3	Pass	
2835	H	28.7	-11.9	0.3	30.1	-9.5	37.7	54.0	-16.3	Pass	
	V	30.4	-11.9	0.3	30.1	-9.5	39.3	54.0	-14.7	Pass	
3150	H	29.1	-11.9	0.4	31.0	-9.5	39.1	55.6	-16.5	Pass	
	V	29.4	-11.9	0.4	31.0	-9.5	39.4	55.6	-16.2	Pass	

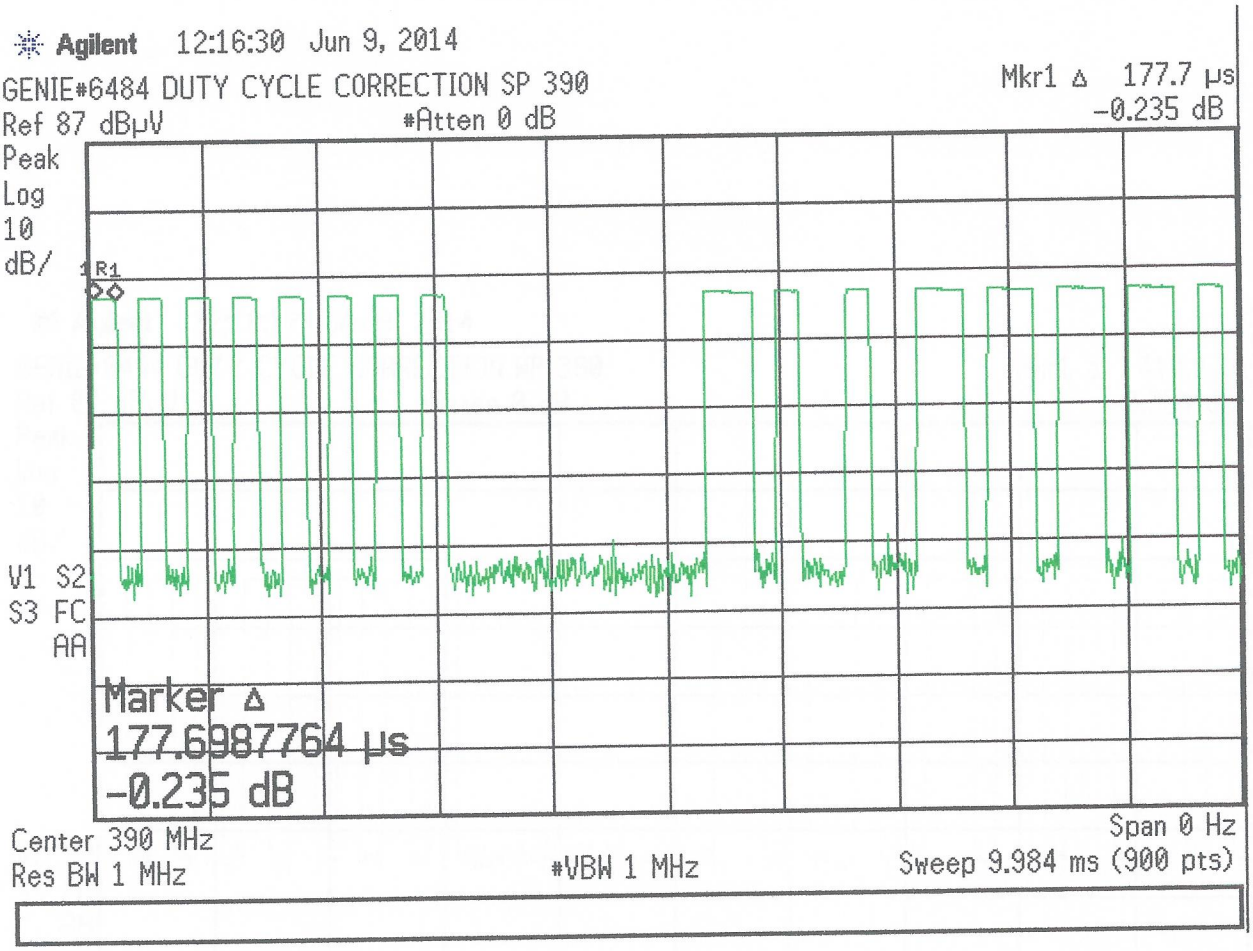
Freq. (MHz)	Antenna Polarization	Meter Reading (dBuV)	LESS Duty Factor (dB)	ADD Cable Factor (dB)	ADD Antenna Factor (dB)	LESS 1 m to 3 m Distance Factor (dB)	Corrected Reading (dBuV/m)	FCC Spec Limit (dBuV/m)	Margin (dB)	Results	Comments
390	H	54.3	-11.6	9.5	15.8	0.0	67.9	79.2	-11.3	Pass	
	V	59.2	-11.6	9.5	15.8	0.0	72.9	79.2	-6.3	Pass	
780	H	17.1	-11.6	17.0	21.6	0.0	44.0	59.2	-15.2	Pass	
	V	18.6	-11.6	17.0	21.6	0.0	45.6	59.2	-13.6	Pass	
1170	H	27.7	-11.6	0.3	24.7	-9.5	31.6	54.0	-22.4	Pass	Noise Floor
	V	36.6	-11.6	0.3	24.7	-9.5	40.5	54.0	-13.5	Pass	Noise Floor
1560	H	29.9	-11.6	0.5	26.2	-9.5	35.4	54.0	-18.6	Pass	
	V	34.4	-11.6	0.5	26.2	-9.5	39.9	54.0	-14.1	Pass	
1950	H	36.1	-11.6	0.5	28.4	-9.5	43.8	59.2	-15.4	Pass	Noise Floor
	V	38.7	-11.6	0.5	28.4	-9.5	46.4	59.2	-12.8	Pass	Noise Floor
2340	H	29.9	-11.6	0.3	29.0	-9.5	38.0	54.0	-16.0	Pass	
	V	29.1	-11.6	0.3	29.0	-9.5	37.2	54.0	-16.8	Pass	
2730	H	32.1	-11.6	0.2	29.8	-9.5	40.9	54.0	-13.1	Pass	
	V	31.5	-11.6	0.2	29.8	-9.5	40.3	54.0	-13.7	Pass	
3120	H	29.6	-11.6	0.4	30.9	-9.5	39.7	59.2	-19.5	Pass	Noise Floor
	V	29.7	-11.6	0.4	30.9	-9.5	39.9	59.2	-19.3	Pass	Noise Floor
3510	H	30.2	-11.6	0.4	32.2	-9.5	41.6	54.0	-12.4	Pass	Noise Floor
	V	30.4	-11.6	0.4	32.2	-9.5	41.8	54.0	-12.2	Pass	Noise Floor
3900	H	29.7	-11.6	0.1	33.0	-9.5	41.6	54.0	-12.4	Pass	Noise Floor
	V	30.5	-11.6	0.1	33.0	-9.5	42.4	54.0	-11.6	Pass	Noise Floor

The EUT was tested on all three axis
The EUT was tested with fresh batteries
The spectrum was searched from 30 MHz to 6 GHz

Duty Cycle Correction

Short Pulses


Agilent 12:36:59 Jun 9, 2014
GENIE#6484 DUTY CYCLE CORRECTION SP 315
Ref 87 dBµV
#Atten 0 dB
Mkr1 Δ 200 µs
-0.46 dB
Peak
Log
10
dB/
1R1
V1 S2
S3 FC
AA
Marker Δ
200.0000000 µs
-0.46 dB
Center 315 MHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 10 ms (901 pts)


Agilent 12:16:30 Jun 9, 2014
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Ref 87 dBµV
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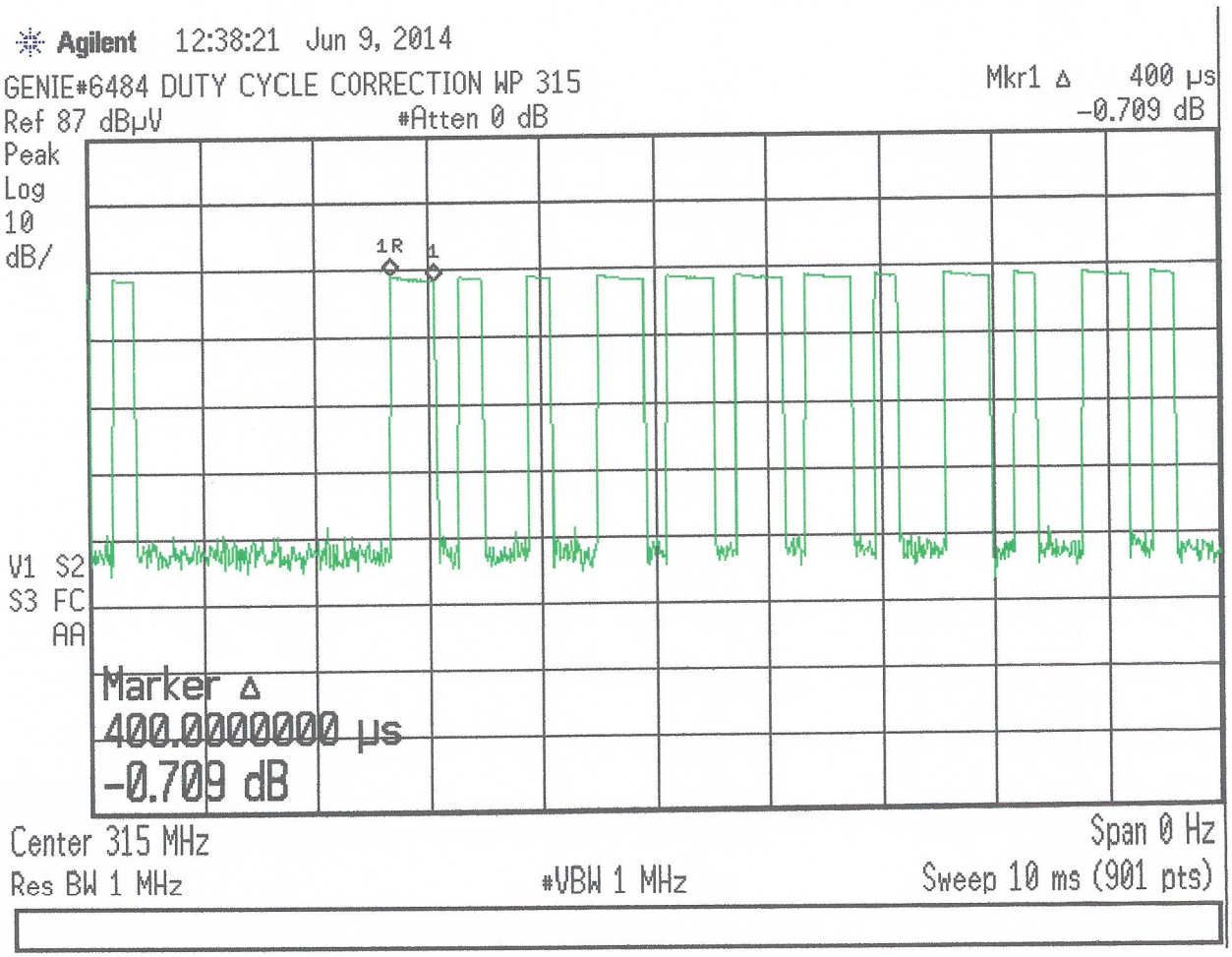
Mkr1 Δ 177.7 µs
-0.235 dB
Peak
Log
10
dB/
1R1
V1 S2
S3 FC
AA
Marker Δ
177.6987764 µs
-0.235 dB
Center 390 MHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 9.984 ms (900 pts)

Duty Cycle Correction

Wide Pulses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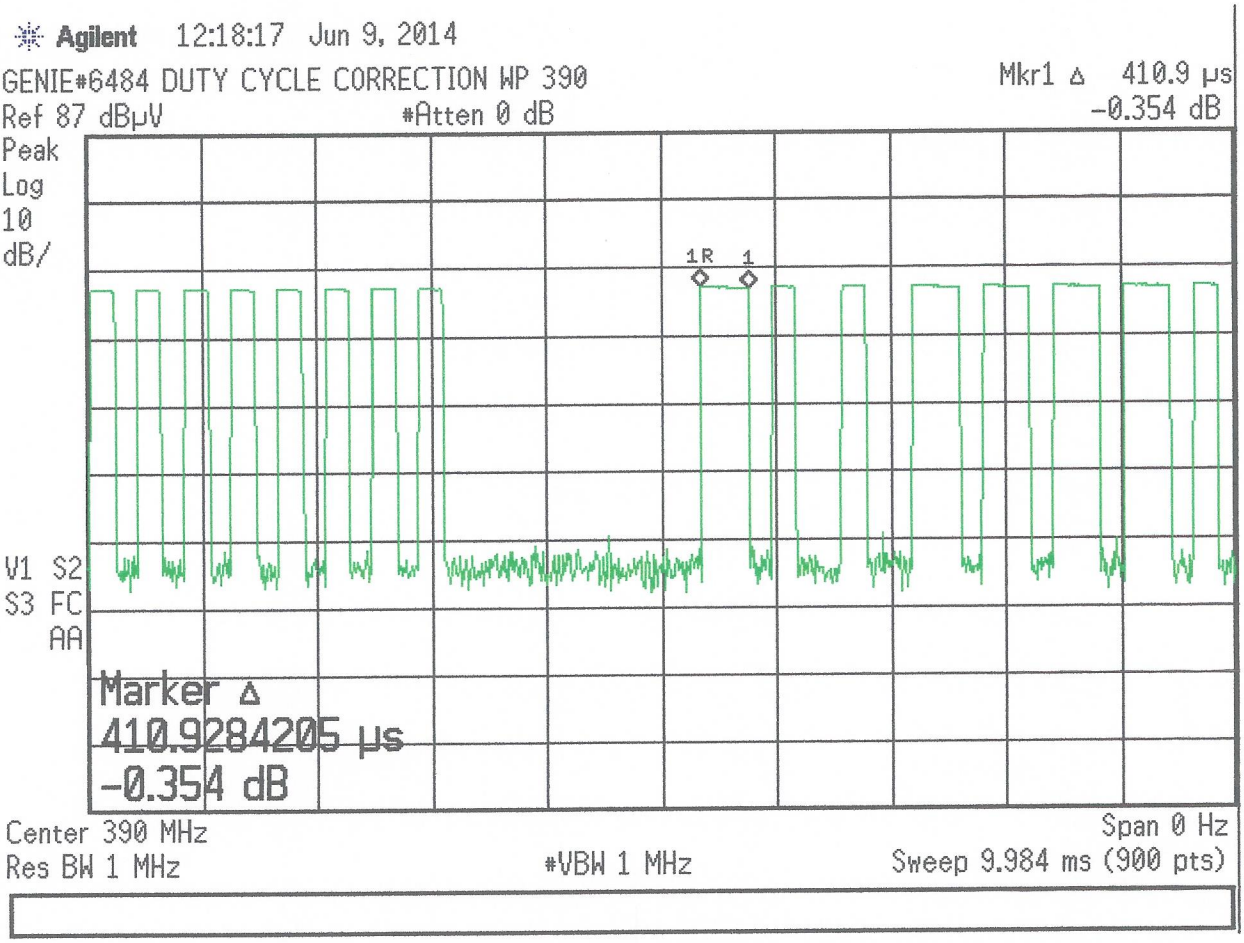
GENIE#6484 DUTY CYCLE CORRECTION WP 315
Ref 87 dBµV
#Atten 0 dB
Mkr1 Δ 400 µs
-0.709 dB
Peak
Log
10
dB/
1R 1
V1 S2
S3 FC
AA
Marker Δ
400.0000000 µs
-0.709 dB
Center 315 MHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 10 ms (901 pts)

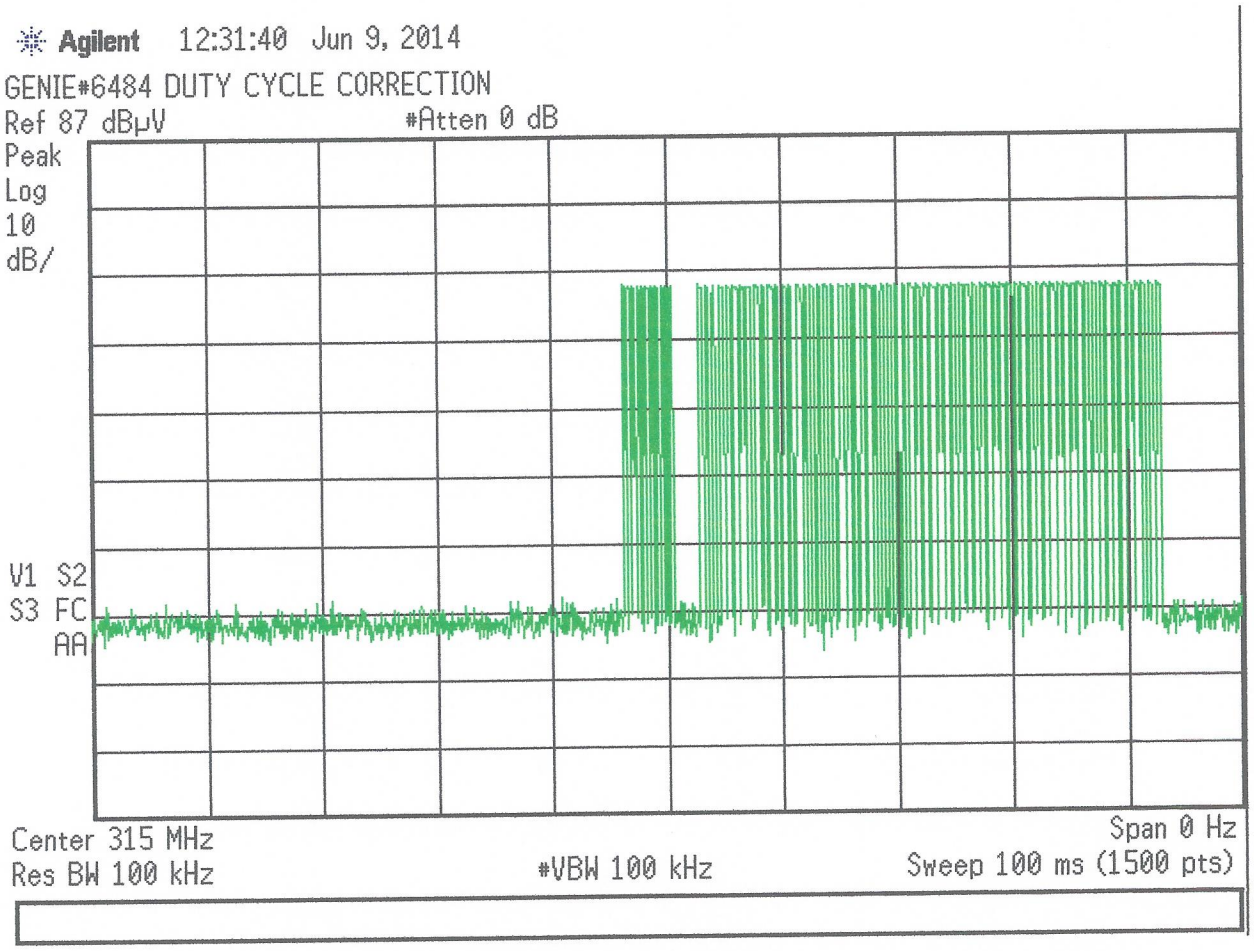

Agilent 12:18:17 Jun 9, 2014
GENIE#6484 DUTY CYCLE CORRECTION WP 390
Ref 87 dBµV
#Atten 0 dB
Mkr1 Δ 410.9 µs
-0.354 dB
Peak
Log
10
dB/
1R 1
V1 S2
S3 FC
AA
Marker Δ
410.9284205 µs
-0.354 dB
Center 390 MHz
Res BW 1 MHz
#VBW 1 MHz
Span 0 Hz
Sweep 9.984 ms (900 pts)

Duty Cycle Correction

100 ms

315 MHz Duty Cycle Correction at 100 ms
47 wide pulses (t = 19.3 ms)
30 narrow pulses (t = 6.2 ms)
25.5 ms total time on
20 log(25.5/100) = 11.9 dB

390 MHz Duty Cycle Correction at 100 ms
48 wide pulses (t = 20.4 ms)
28 narrow pulses (t = 5.8 ms)
26.2 ms total time on
20*log(26.2/100) = 11.6 dB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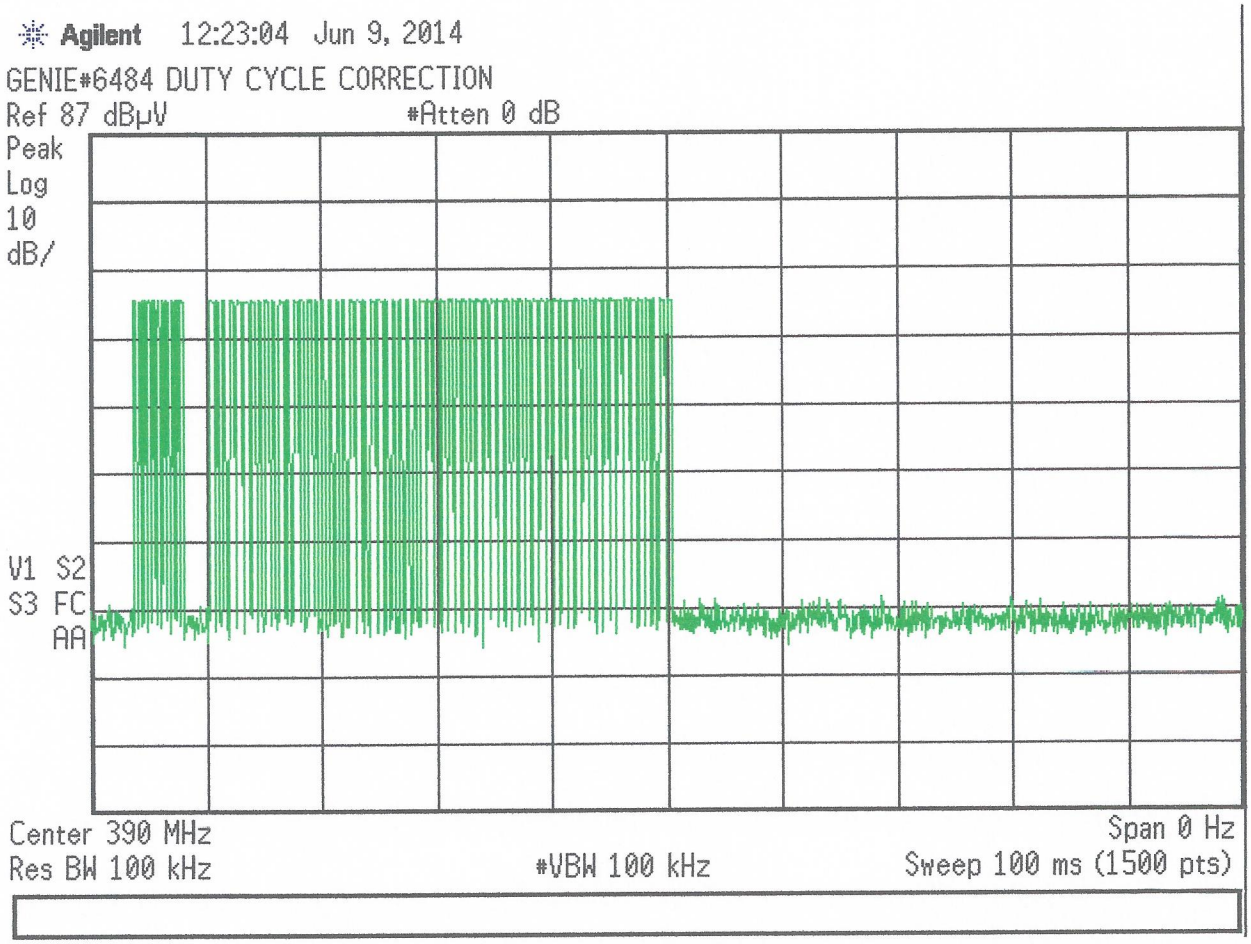
GENIE#6484 DUTY CYCLE CORRECTION
Ref 87 dBµV
#Atten 0 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 315 MHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 100 ms (1500 pts)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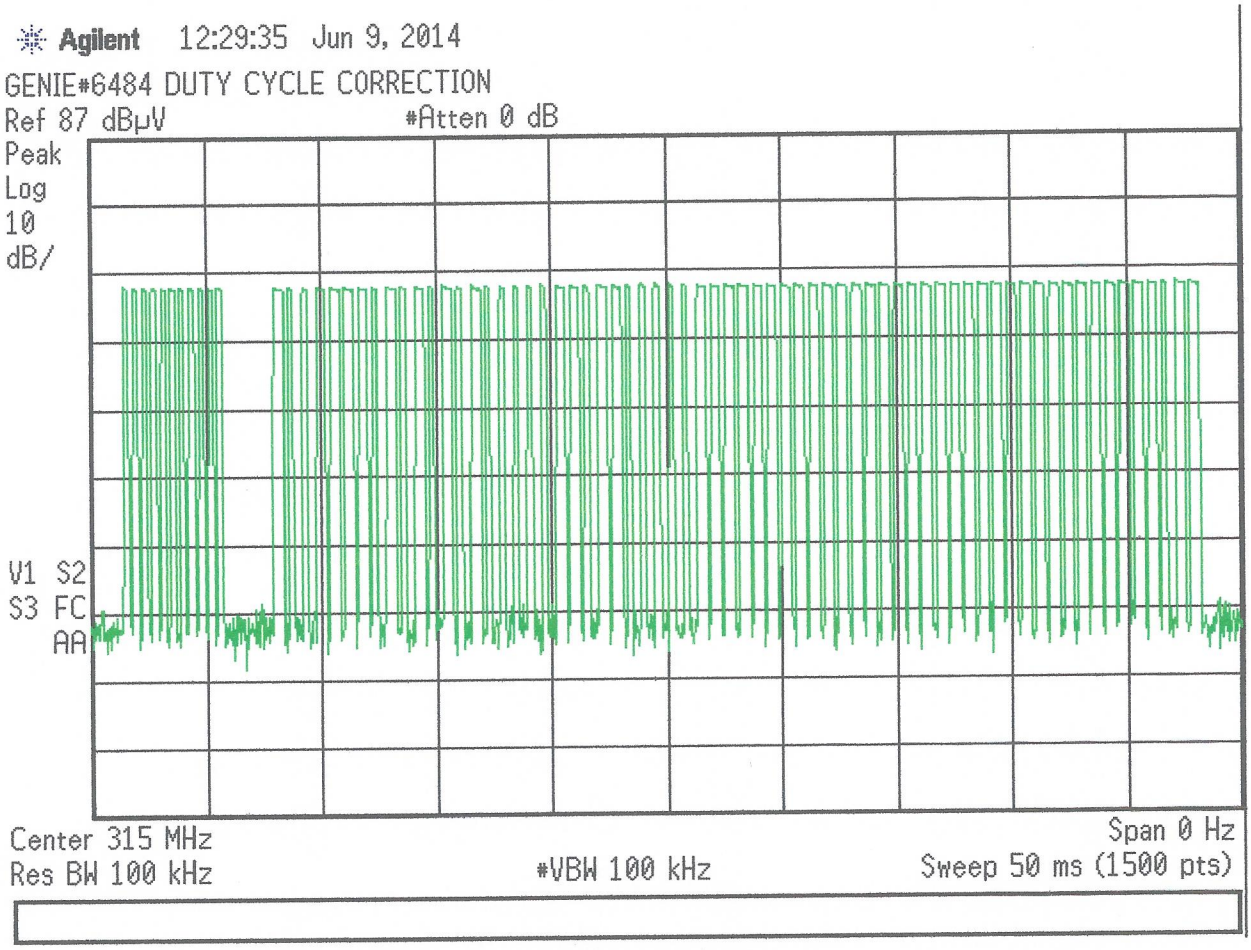
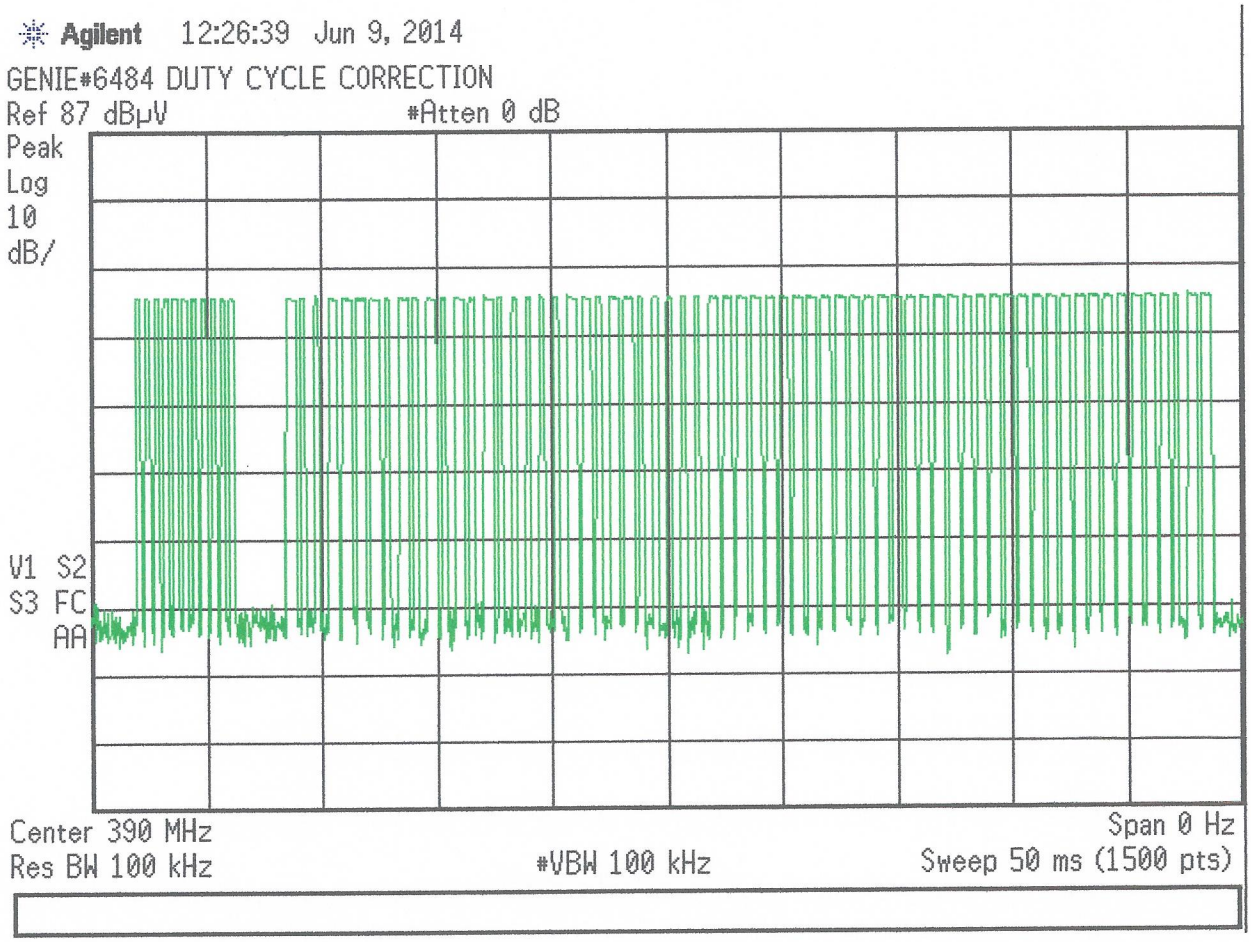
GENIE#6484 DUTY CYCLE CORRECTION
Ref 87 dBµV
#Atten 0 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 390 MHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 100 ms (1500 pts)

Duty Cycle Correction

50 ms


Agilent 12:29:35 Jun 9, 2014
GENIE#6484 DUTY CYCLE CORRECTION
Ref 87 dBµV
#Atten 0 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 315 MHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 50 ms (1500 pts)


Agilent 12:26:39 Jun 9, 2014
GENIE#6484 DUTY CYCLE CORRECTION
Ref 87 dBµV
#Atten 0 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 390 MHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 50 ms (1500 pts)

Occupied Bandwidth

Minimum Standard:

15.231 (c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Results: Complies, see attached graphs

Test Data - Occupied Bandwidth 315 MHz

Agilent 12:47:29 Jun 9, 2014

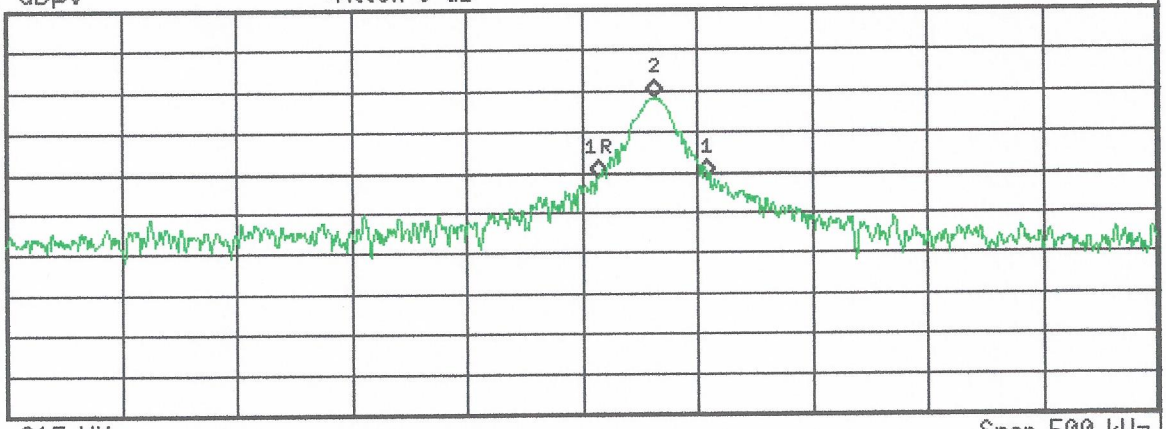
GENIE#6484 OCCUPIED BANDWIDTH 315 MHz

Mkr1 Δ 47.364 kHz
−0.247 dB

Ref 87 dBµV

#Atten 0 dB

Peak
Log
10
dB/



Center 315 MHz

Span 500 kHz

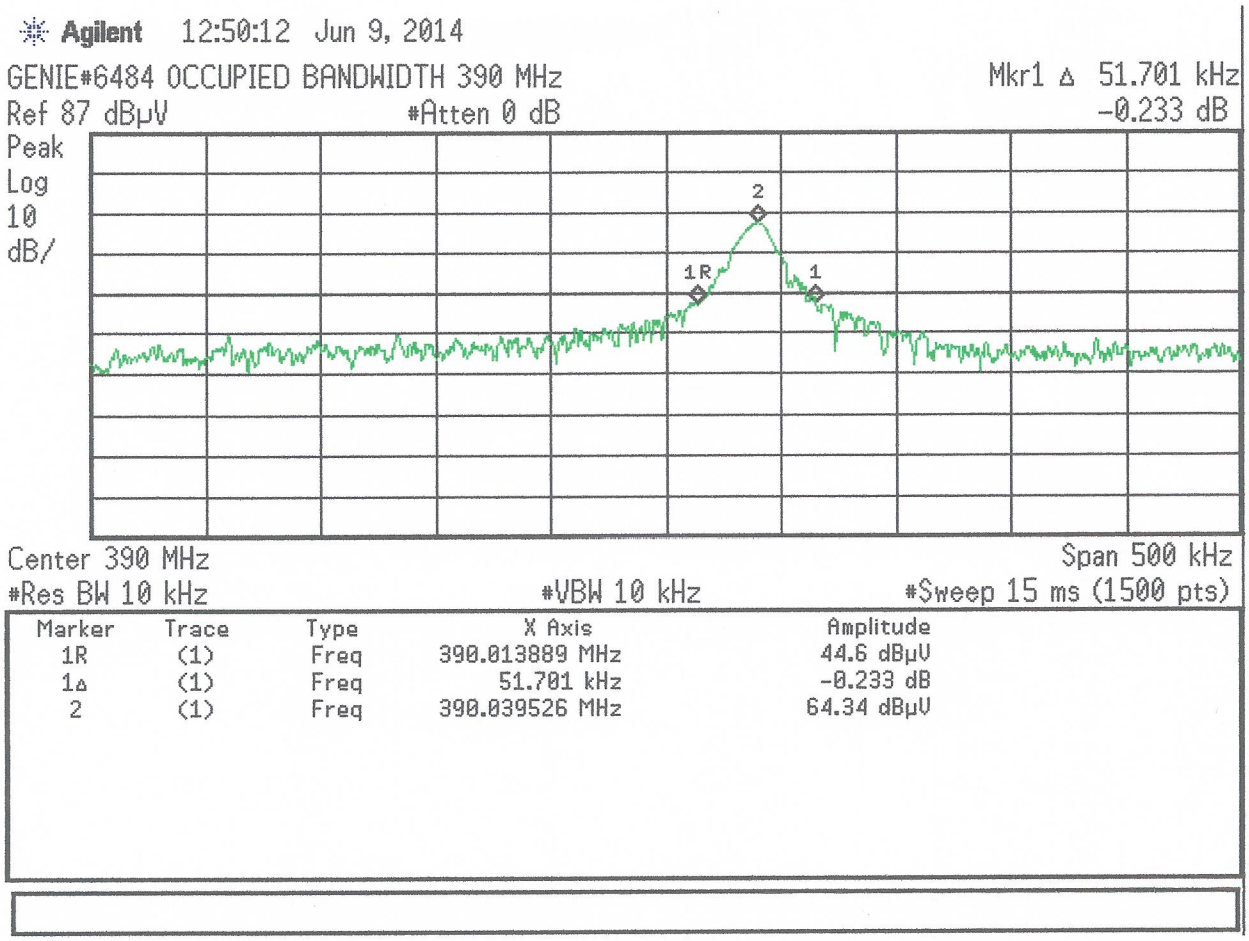
#Res BW 10 kHz

#VBW 10 kHz

#Sweep 15 ms (1500 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	315.006884 MHz	45.98 dBµV
1Δ	(1)	Freq	47.364 kHz	−0.247 dB
2	(1)	Freq	315.031854 MHz	65.26 dBµV

Test Data - Occupied Bandwidth 390 MHz


Agilent 12:50:12 Jun 9, 2014
GENIE#6484 OCCUPIED BANDWIDTH 390 MHz
Mkr1 Δ 51.701 kHz
-0.233 dB
Ref 87 dBµV
#Atten 0 dB
Peak
Log
10
dB/
2
1R
1
Center 390 MHz
Span 500 kHz
#Res BW 10 kHz
#VBW 10 kHz
#Sweep 15 ms (1500 pts)
Marker Trace Type X Axis Amplitude
1R (1) Freq 390.013889 MHz 44.6 dBµV
1Δ (1) Freq 51.701 kHz -0.233 dB
2 (1) Freq 390.039526 MHz 64.34 dBµV

Restricted Bands of Operation

15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

Spurious Emissions

Minimum Requirements:

15.109 Radiated emission limits.

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

Test Result: Complies; highest spurious emission level recorded from 1 MHz - 6 GHz is 27.62 dBuV at 1.575 MHz.

15.209 Radiated emission limits; general requirements.
(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3