Technical Information

Applicant		Manufacturer	
Name:	Greenwald Industries	Name:	Greenwald Industries
Address:	212 Middlesex Avenue	Address:	212 Middlesex Avenue
City, State, Zip:	Chester, CT 06412	City, State, Zip:	Chester, CT 06412

Test Specifications: FCC Part 15, Subpart C Paragraph 15.247

Test Procedure: ANSI C63.4: 2003

Test Sample Description

Date of Report: February 25, 2011

Test Sample: Flash Card Reader

Brandname: Flash Cash

Model Number: Not Applicable

FCC ID: YHMA001211CR

Type: Frequency Hopping Spread Spectrum Transceiver

Power Requirements: 12-24 VDC derived from 120 VAC, 60 Hz transformer

Frequency of Operation: 2400 MHz to 2483.5 MHz

Tests Performed

Testing Date(s)	FCC	Test Method
August 24, 2010	15.247(a)(1)	Carrier Frequency Separation / Number of hopping frequencies
August 24, 2010	15.247(a)(1)	20 dB Bandwidth
August 24, 2010	15.247(a)(1)(i)	Occupancy Time
August 20, 2010	15.247(b)(2)	Output Power
August 20 - 26, 2010	15.247 (d)	Transmitter Spurious Radiated Emissions, Restricted Bands / Band edge Measurements
August 20, 2010	15.35	Duty Cycle Determination
November 4, 2010	15.207(a)	Conducted Emissions

TESTS RESULTS

DETERMINATION OF FIELD STRENGTH LIMITS

15.203: The intentional radiator is designed to ensure that no antenna other than that furnished by the applicant can be used with the device. The antenna is permanently soldered in place to the PCB.

15.204: The antenna used is not commercially available and is internal to the chassis.

15.247(a)(1): The frequency hopping system has hopping channel carrier frequencies separated by 1 MHz, which is less than 20 dB bandwidth of the hopping channel.

15.247(a)(1)(i): The frequency hopping system was operated in the 2400-2483.5 MHz band and used 79 frequencies. The average time of occupancy on any frequency was 2.9 msec within a 20 second period.

15.247(b)(3): The device operates in the 2400-2483.5 MHz band. The maximum peak output power measured to be 0.27 mWatts and did not exceed 1 watt.

15.247(b)(3): The system operating under the provisions of this section is operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. The maximum Output Power was measured to be 0.27 mWatts at 3.0 meters.

15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the Spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. All emissions, which fell within the restricted bands specified in 15.205(a), were measured and found to be in compliance with the limits specified in 15.209(a).

15.247 (c): MPE Calculation

$S = (EIRP) / (4 * \pi * R^2)$

Where,

S = Power Density, in mW/cm^2
EIRP = Measured Power in mW = 0.27
R = Distance to antenna, equal to 20 cm.

$S = (EIRP) / (4 * \pi * R^2)$
$= (0.27) / (4 * \pi * 20^2)$
$= 0.27 / (5026)$
$= 0.0537\ mW/cm^2$

The expected RF exposure complies with Table B (limits for General Population / Uncontrolled Environments) of OET Bulletin 65, Supplement C, Appendix A where:

$$S_{max} = 1.0\ mW/cm^2$$

Spectrum Analyzer Desensitization Considerations

Due to the nature of the emissions being measured, care was taken to ensure that the resolution bandwidth of the spectrum analyzer was adequate to provide accurate measurements. FCC specified bandwidths of 100 kHz and 1 MHz were utilized below and above 1 GHz, respectively.

General Notes

1. All readings were taken utilizing a peak and/or Average detector function at a test distance of 3 meters.

2. The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not reported were more than 20dB below the specified limit.

3. The device has no provisions for external accessories.

4. The device was mounted and operated in a representative host.

5. The unit tunes over the frequency range of: 2400 to 2483.5 MHz.
   The unit was tested at the following frequencies: 2402 MHz, 2441 MHz, & 2480 MHz.

Conducted Emissions Modification:
October 4, 2010
Flash Cash Cable description:

- The cable is constructed of individual seven (7) 22AWG wires. The wires are wound around several ferrite cores.
- All seven wires are wound to pass 5 times through the core (Fair-Rite 2631102002) near the reader end connector.
- This is repeated with two additional cores.
- Each individual wire is then wound to pass 3 times through a core (Fair-Rite 2631250202) using one core for each conductor.
- This is repeated three additional times.
- Finally, all seven wires are wound to pass 5 times through an additional core (Fair-Rite 2531102002)

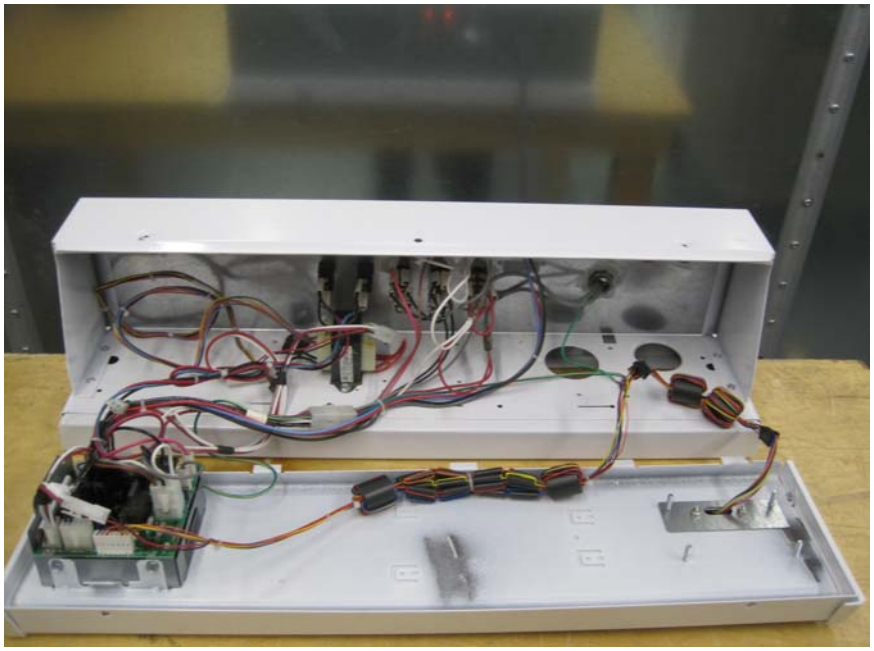
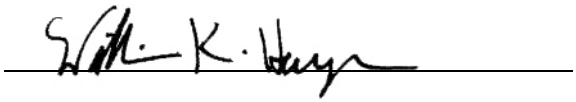


Photo of modification

Certification and Signatures

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

Donald Lerner
EMC Engineer
NVLAP Approved Signatory



William K. Hayes
Executive Vice President
NARTE Certified Engineer EMC-000157-NE
NVLAP Approved Signatory

Non-Warranty Provision
The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

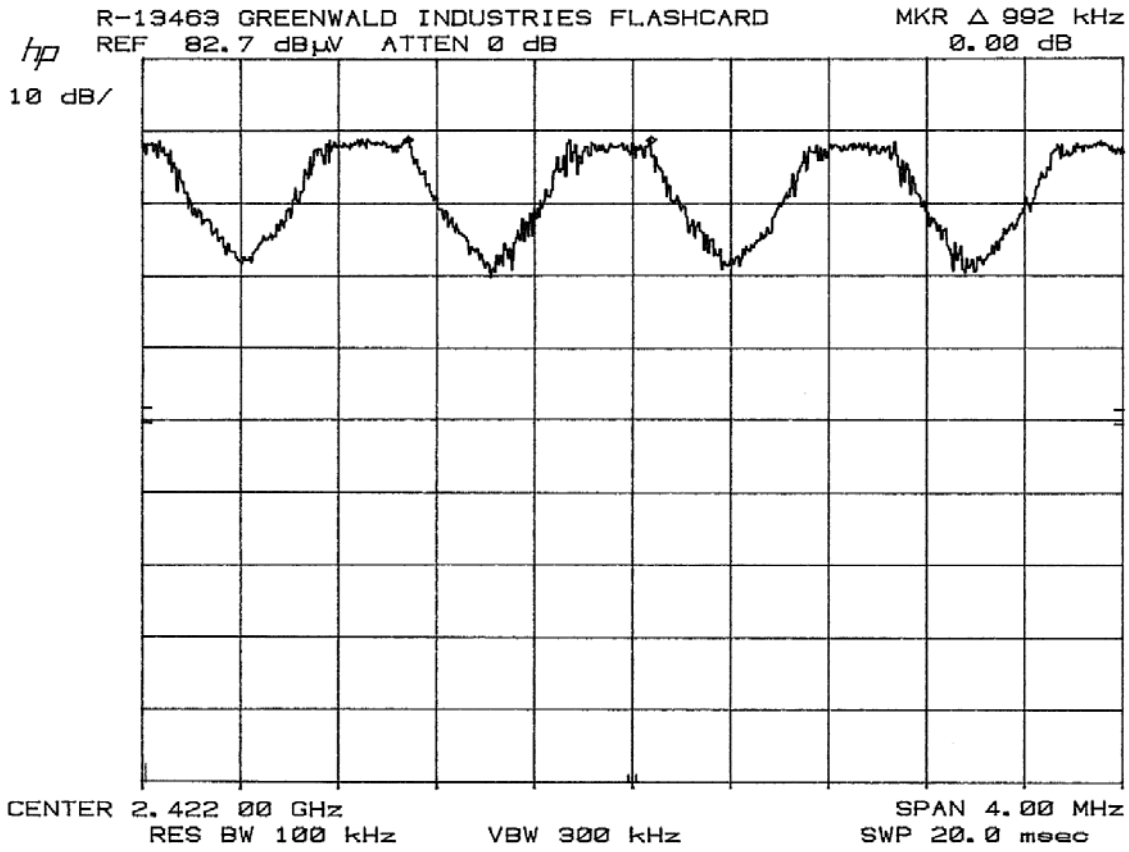
Non-Endorsement
This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

Test Photograph(s)
FCC Part 15, Subpart C, 15.247 (a)(1) Carrier Frequency Separation
and 15.247 (a)(1) (iii) Number of Hopping Frequency
2400 – 2483.5 MHz Band

Test Photograph(s)
Carrier Frequency Separation and Number of Hopping Frequency

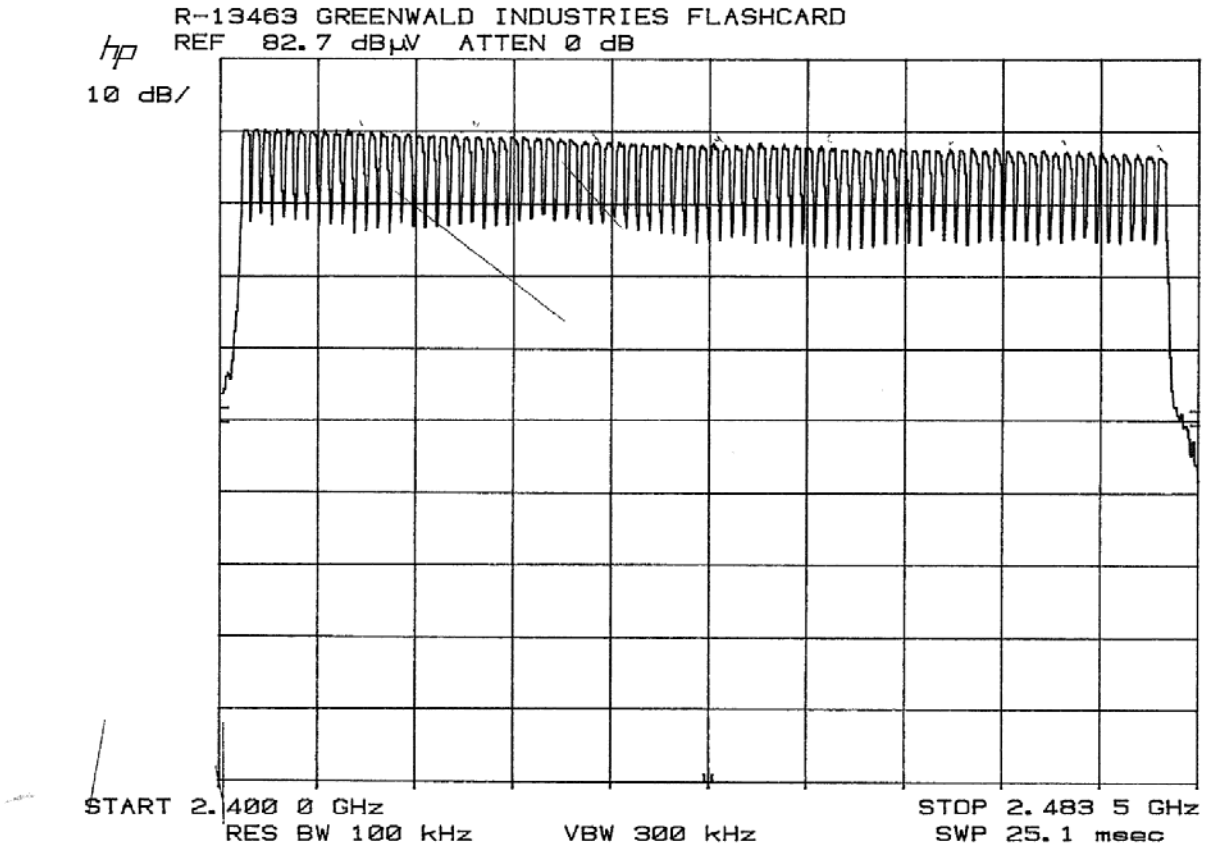
Test Setup

FCC Part 15, Subpart C, 15.247 (a)(1) Carrier Frequency Separation and 15.247 (a)(1) (iii) Number of Hopping Frequency
2400 – 2483.5 MHz Band
Retest Data



FCC Part 15, Subpart C, 15.247(a) (1)Hopping Channel Carrier Separation, 2400 to 2483.5 MHz Band
Note: Hopping channel carrier frequency meets the required minimum separation of 25 kHz
(Measured carrier separation = 992.0 kHz)
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24,2010	Tech: R.Soodoo	Sheet 1 of 2



FCC Part 15, Subpart C, 15.247(a) (1)(iii) Number of Hopping Frequency, 2400 to 2483.5 MHz Band
Note: EUT uses 79 hopping frequencies which meets the 15 minimum hopping frequencies.
FCC ID: YHMA001211CR

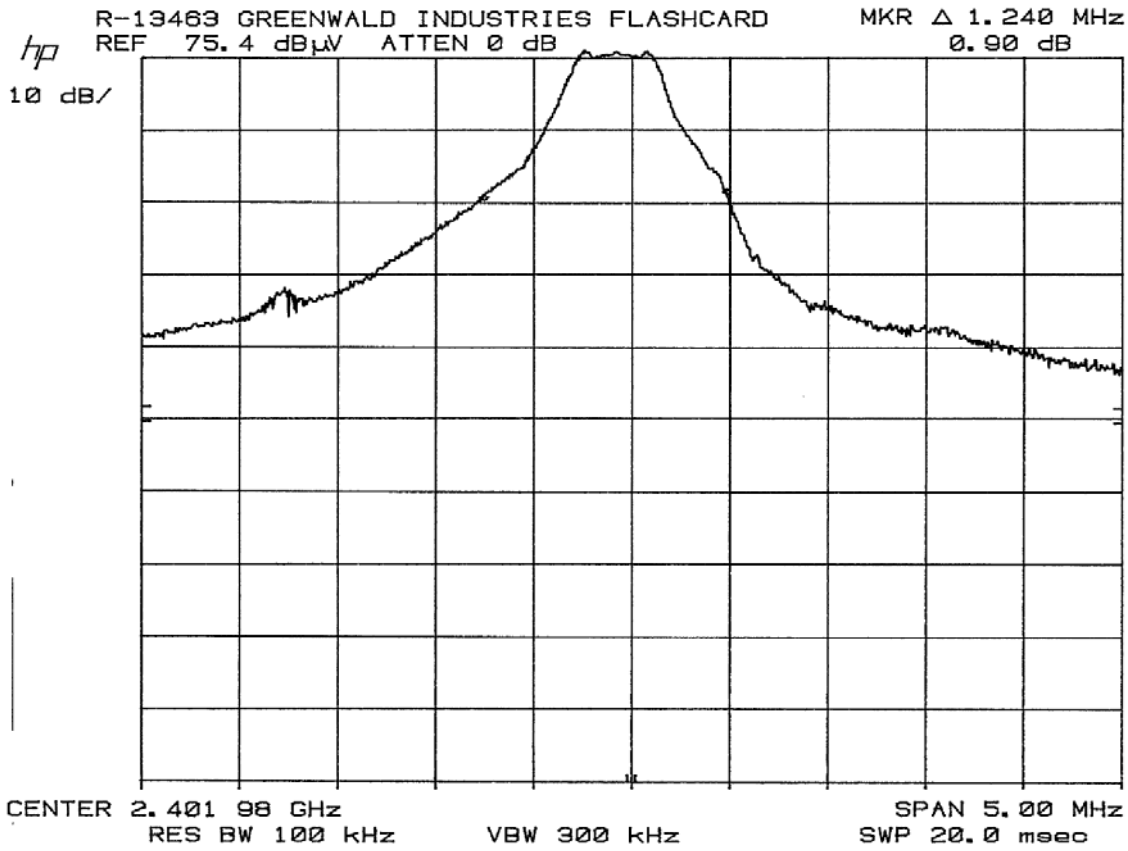
Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24,2010	Tech: R.Soodoo	Sheet 2 of 2

Test Photograph(s)
FCC Part 15, Subpart C, 15.247 (a)(1) Occupied Bandwidth
2400 – 2483.5 MHz Band

Test Photograph(s)
Occupied Bandwidth

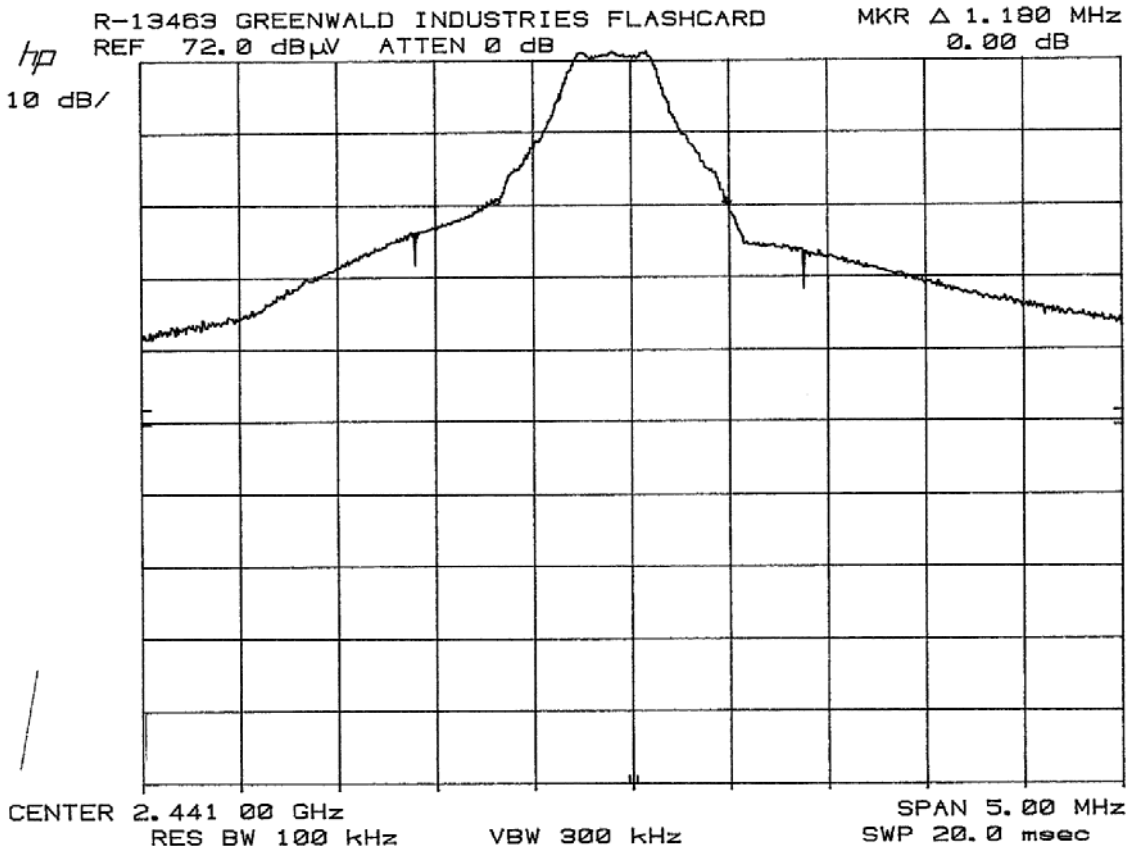
Test Setup

FCC Part 15, Subpart C, 15.247 (a)(1) Occupied Bandwidth
2400 – 2483.5 MHz Band
Retest Data



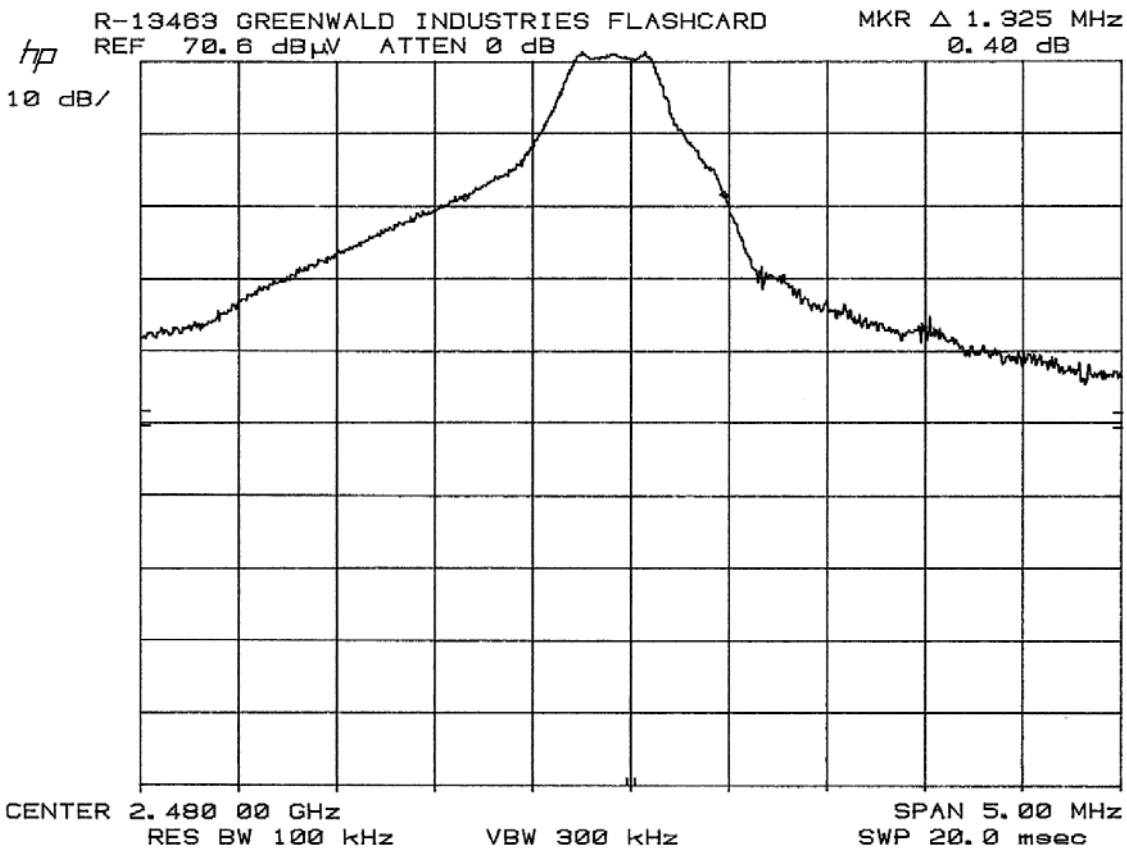
FCC Part 15, Subpart C, 15.247(a) (1) Occupied Bandwidth, 2400 to 2483.5 MHz Band
Note: 20dB bandwidth measured at 1.240 MHz
Note: EUT transmitting at 2402.0 MHz.
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24, 2010	Tech: R.Soodoo	Sheet 1 of 3



FCC Part 15, Subpart C, 15.247(a) (1) Occupied Bandwidth, 2400 to 2483.5 MHz Band
Note: 20dB bandwidth measured at 1.180 MHz
Note: EUT transmitting at 2441 MHz.
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24, 2010	Tech: R.Soodoo	Sheet 2 of 3



FCC Part 15, Subpart C, 15.247(a) (1) Occupied Bandwidth, 2400 to 2483.5 MHz Band
Note: 20dB bandwidth measured at 1.325 MHz
Note: EUT transmitting at 2480.0 MHz.
FCC ID: YHMA001211CR

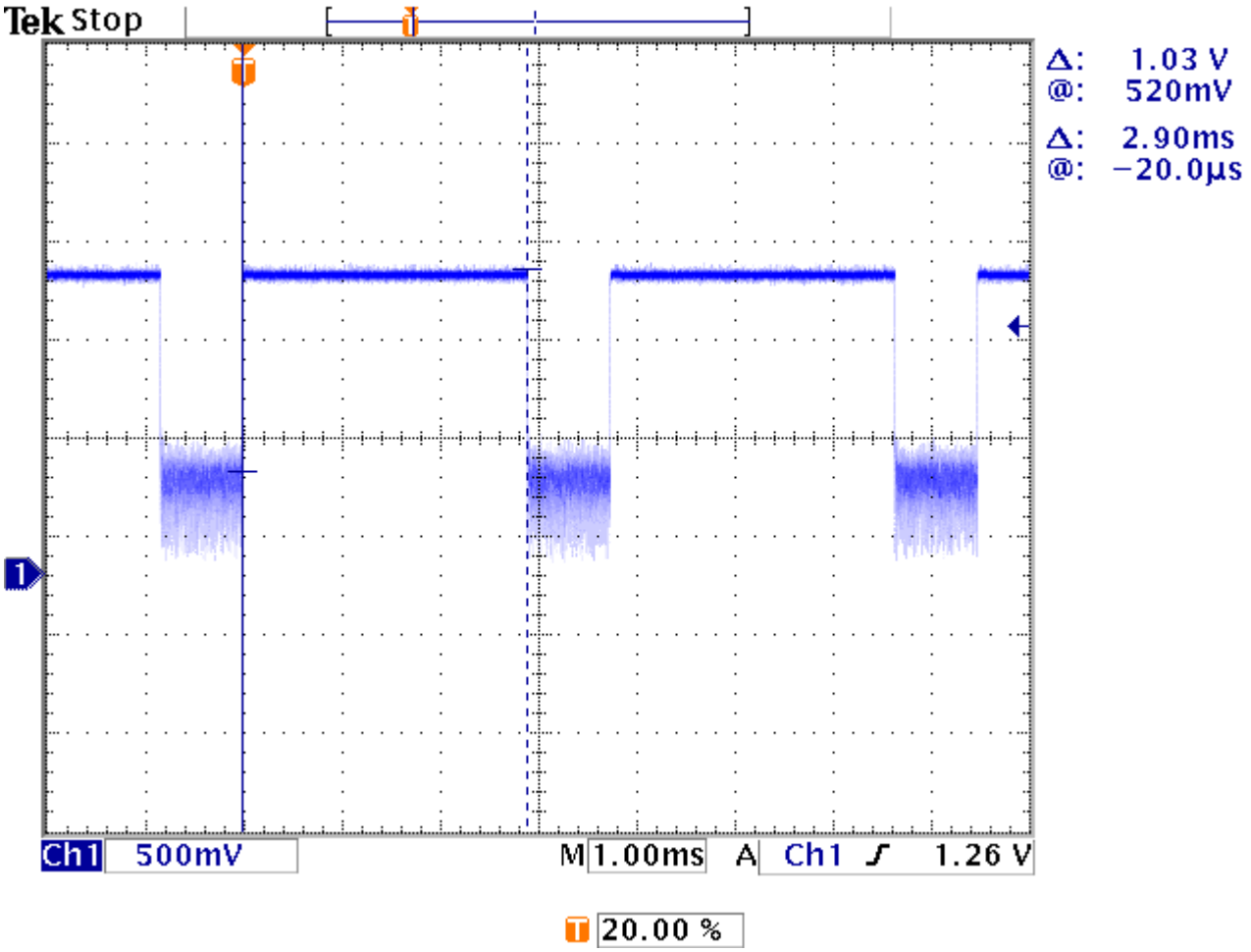
Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24, 2010	Tech: R.Soodoo	Sheet 3 of 3

Test Photograph(s)
FCC Part 15, Subpart C, 15.247 (a)(1)(iii) Occupancy Time

Test Photograph(s)
FCC Part 15, Subpart C, 15.247 (a)(1)(iii) Occupancy Time

Test Setup

FCC Part 15, Subpart C, 15.247 (a)(1)(iii) Occupancy Time
2400 – 2483.5 MHz Retest Data



FCC Part 15, Subpart C, 15.247(a)(1)(iii) Occupancy Time, 2400 to 2483.5 MHz Band
Note: The measured occupancy time does not exceed the 0.4 seconds (Measured time =2.90mSec.)
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24,2010	Tech: R.Soodoo	Sheet 1 of 1

Test Photograph(s)
FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output

Test Photograph(s)
FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output

EUT Configuration, Front View

EUT Configuration, Rear View

Test Photograph(s)
FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output

Horizontal Antenna Polarization

Vertical Antenna Polarization

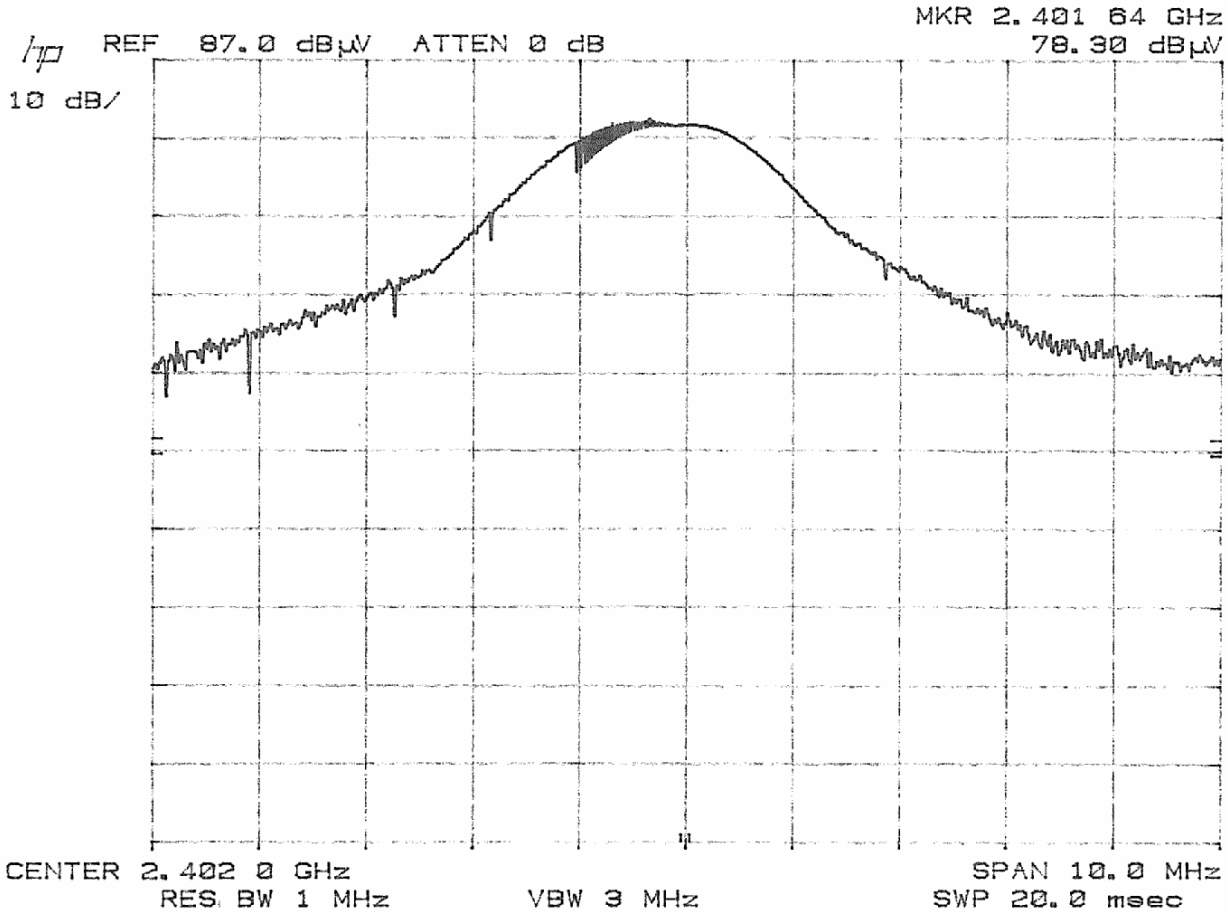
FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output
Paragraph 15.247(b)(1)
Retest Data

Test Method:	FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output Retest.		
Customer:	Greenwald Industries	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader	**Paragraph**	15.247(b)(1)
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2402.0 MHz, 2441.0 MHz and 2480.0 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 20, 2010

Notes: Test Distance: 3 Meters Temp : 29.0°C Humidity : 62.0%
Detector: Peak

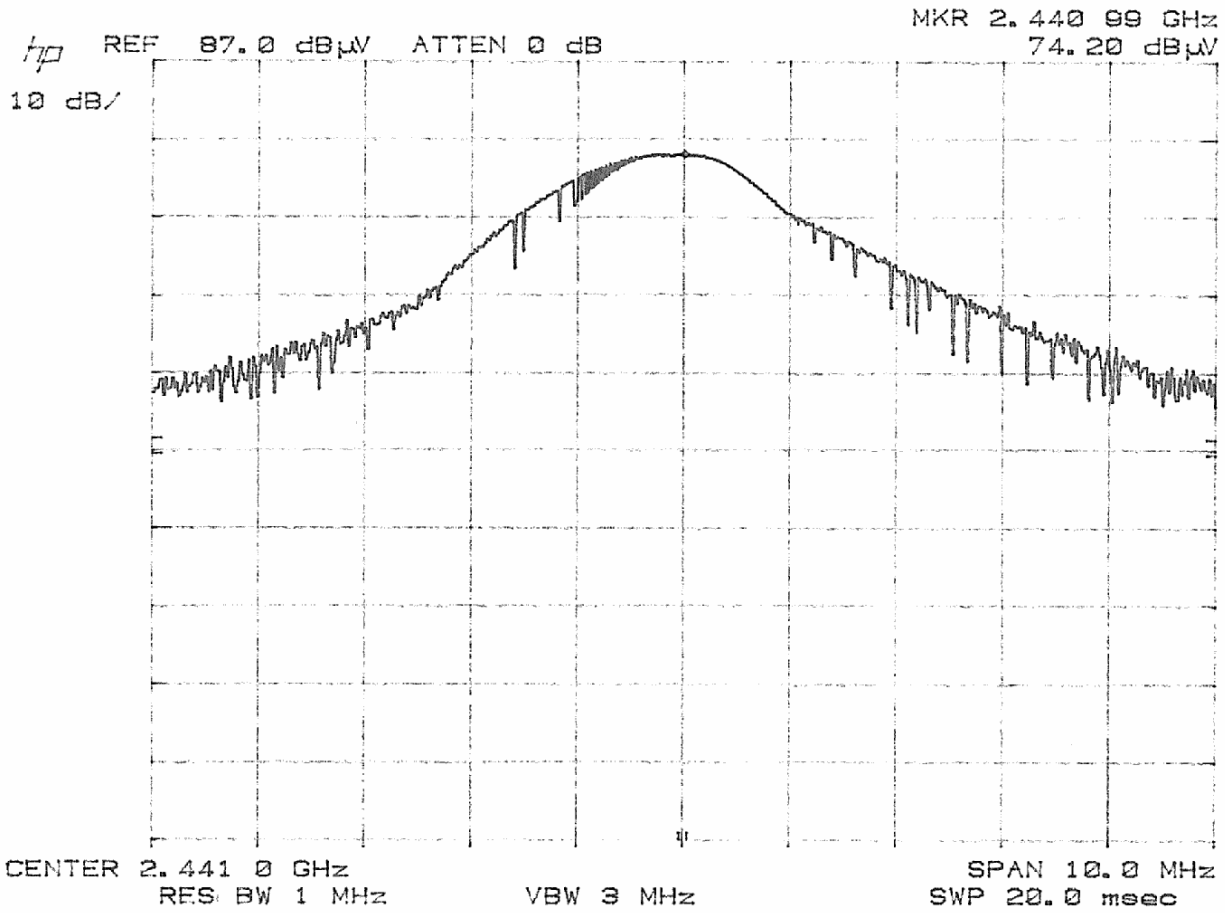
Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Converted Reading	Peak Limit
GHz	(V/H) / Meters	Degree	dBµV	dB	dBµV/m	V/m	mWatts	Watts
2.402	V / 1.1	114.0	78.3	10.0	88.3	0.03	0.27	1.0
2.402	H / 1.3	81.0	75.4	10.0	85.4	0.02	0.1	|
								|
2.441	V / 1.0	113.0	74.2	10.0	84.2	0.02	0.1	|
2.441	H / 1.6	82.0	74.3	10.0	84.3	0.02	0.1	|
								|
2.480	V / 1.0	111.0	78.1	10.0	88.1	0.03	0.2	|
2.480	H / 1.3	195.0	75.0	10.0	85.0	0.02	0.1	1.0

The EUT meets the required limit indicated above.
The following Formulae were used to convert the field strength in dBµV into V/m and V/m to Watts
V/m = 10^((dBuV/m-120) / 20)
Power = $(V/m \times 3)^2 / 30$



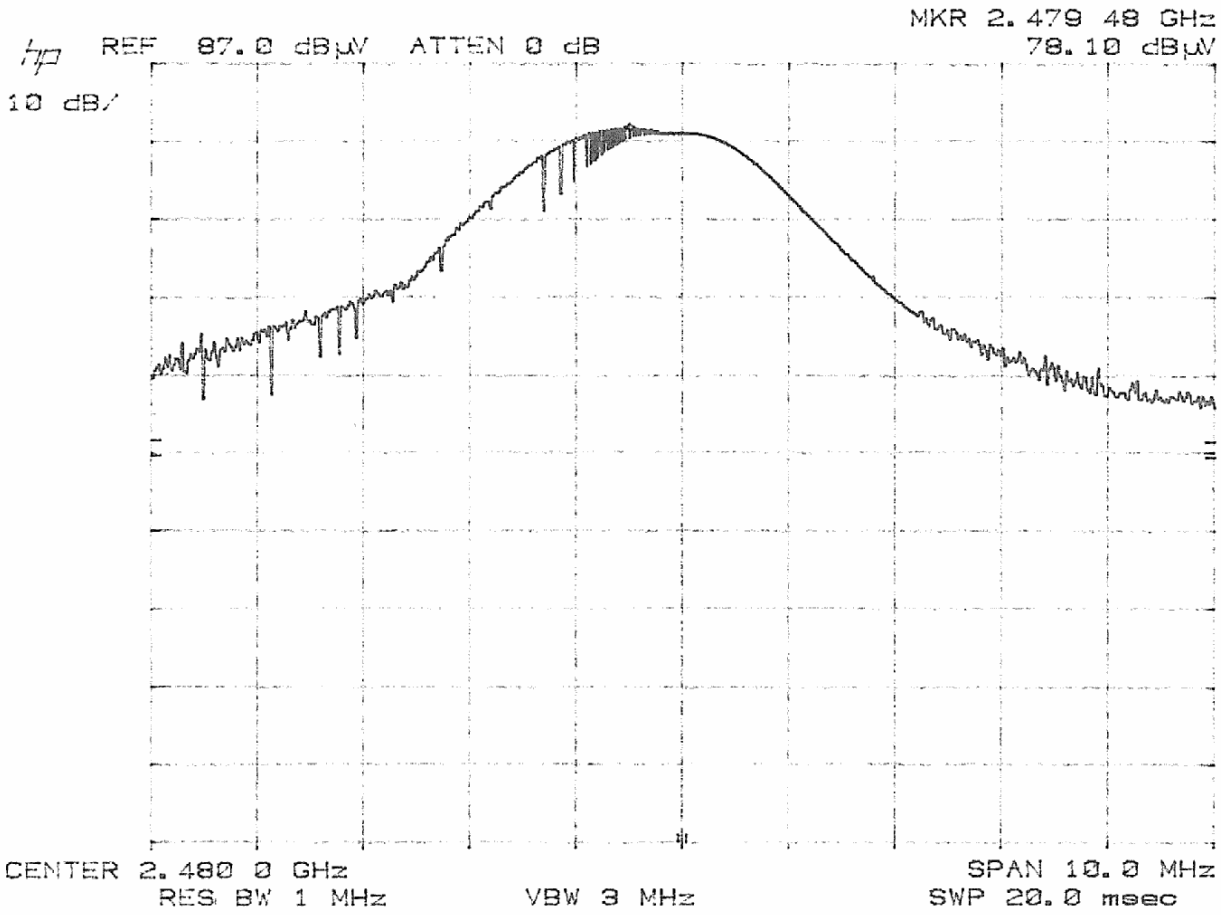
FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output,Para.15.247(b)(1)
Note: EUT transmitting at 2.402 GHz.
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 20, 2010	Tech: R.Soodoo	Sheet 1 of 3



FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output,Para.15.247(b)(1)
Note: EUT transmitting at 2.441 GHz.
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 20, 2010	Tech: R.Soodoo	Sheet 2 of 3



FCC Part 15, Subpart C Radiated Emissions, Fundamental Power Output,Para.15.247(b)(1)
Note: EUT transmitting at 2.480 GHz.
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 20, 2010	Tech: R.Soodoo	Sheet 3 of 3

Test Photograph(s)
FCC Part 15 Subpart C, Radiated Emissions, Harmonics

Test Photograph(s)
FCC Part 15 Subpart C, Radiated Emissions, Harmonics

EUT Configuration, Front View

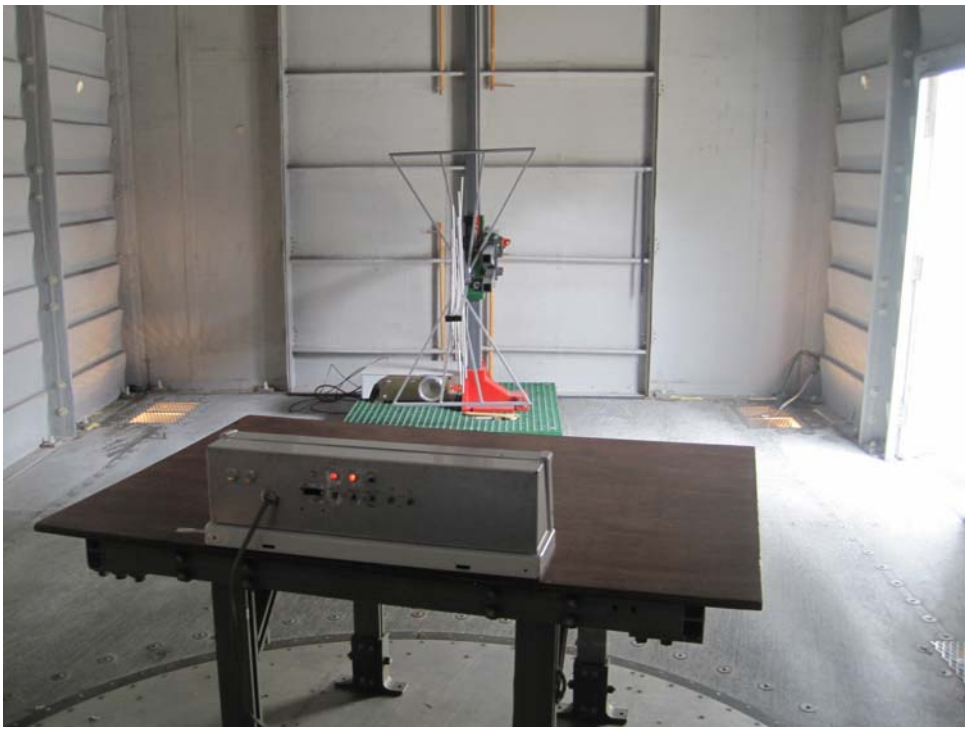
EUT Configuration, Rear View

Test Photograph(s)
FCC Part 15 Subpart C, Radiated Emissions, Harmonics

Horizontal Antenna Polarization, 80 MHz to 1 GHz

Horizontal Antenna Polarization, > 1 GHz

Test Photograph(s)
FCC Part 15 Subpart C, Radiated Emissions, Harmonics



Vertical Antenna Polarization, 80 MHz to 1 GHz

Vertical Antenna Polarization, > 1 GHz

FCC Part 15 Subpart C, Radiated Emissions, Harmonics
Paragraphs 15.247(d)
EUT transmitting at the Fundamental signal of 2402.0 MHz
Retest Data

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Harmonics Emissions para.15.247(d)		
Customer:	Greenwald Industries	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader		
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2402.0 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 20, 2010

Notes: Test Distance: 3 Meters
Detector: Peak

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
GHz	(V/H)/Meters	Degree	dBµV	dB	dBµV/m	uV/m	uV/m
4.804	V / 1.0	200.0	48.2	17.1	65.3	1840.8	2600.2
4.804	H / 1.0	189.0	45.3	17.1	62.4	1318.3	2600.2
7.206	V / 1.0	0.0	30.9	5.1	36.0	*63.1	2600.2
7.206	H / 1.0	0.0	30.9	5.1	36.0	*63.1	2600.2
9.608	V / 1.0	0.0	30.0	8.0	38.0	*79.4	2600.2
9.608	H / 1.0	0.0	30.0	8.0	38.0	*79.4	2600.2
12.010	V / 1.0	0.0	30.0	10.9	40.9	*110.9	500.0
12.010	H / 1.0	0.0	30.0	10.9	40.9	*110.9	500.0
14.412	V / 1.0	0.0	30.0	14.5	44.5	*167.9	2600.2
14.412	H / 1.0	0.0	30.0	14.5	44.5	*167.9	2600.2
16.814	V / 1.0	0.0	30.0	18.2	48.2	*257.0	2600.2
16.814	H / 1.0	0.0	30.0	18.2	48.2	*257.0	2600.2
19.216	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
19.216	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
21.618	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
21.618	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
24.020	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
24.020	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2

The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not recorded were more than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*= Noise Floor Measurements (minimum sensitivity).

FCC Part 15 Subpart C, Radiated Emissions, Harmonics
Paragraphs 15.247(d)
EUT transmitting at the Fundamental signal of 2441.0 MHz

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Harmonics Emissions para.15.247(d)		
Customer:	Greenwald Industries	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader		
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2441.0 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 20, 2010

Notes: Test Distance: 3 Meters
Detector: Peak

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H)/Meters	Degree	dBµV	dB	dBµV/m	uV/m	uV/m
4882.0	V / 1.0	193.0	47.4	17.1	64.5	1678.8	2600.2
4882.0	H / 1.0	156.0	46.0	17.1	63.1	1428.9	2600.2
*7.323	V / 1.0	0.0	30.9	5.1	36.0	*63.1	2600.2
*7.323	H / 1.0	0.0	30.9	5.1	36.0	*63.1	2600.2
*9.764	V / 1.0	0.0	30.0	8.0	38.0	*79.4	2600.2
*9.764	H / 1.0	0.0	30.0	8.0	38.0	*79.4	2600.2
*12.205	V / 1.0	0.0	30.0	10.9	40.9	*110.9	500.0
*12.205	H / 1.0	0.0	30.0	10.9	40.9	*110.9	500.0
*14.646	V / 1.0	0.0	30.0	14.5	44.5	*167.9	2600.2
*14.646	H / 1.0	0.0	30.0	14.5	44.5	*167.9	2600.2
*16.646	V / 1.0	0.0	30.0	18.2	48.2	*257.0	2600.2
*16.646	H / 1.0	0.0	30.0	18.2	48.2	*257.0	2600.2
*17.087	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
*17.087	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
*19.528	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
*19.528	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
*21.969	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
*21.969	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
24.410	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
24.410	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
	The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not recorded were more						
	than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.						
	*= Noise Floor Measurements (minimum sensitivity).						

FCC Part 15 Subpart C, Radiated Emissions, Harmonics
Paragraphs 15.247(d)
EUT transmitting at the Fundamental signal of 2480.0 MHz

Test Method:	FCC Part 15 Subpart C, Radiated Emissions, Harmonics Emissions para.15.247(d)		
Customer:	Greenwald Industries	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader		
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2480.0 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 20, 2010

Notes: Test Distance: 3 Meters
Detector: Peak

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit
MHz	(V/H)/Meters	Degree	dBµV	dB	dBµV/m	uV/m	uV/m
4960.0	V / 1.0	131.0	48.8	17.1	65.9	1972.4	2600.2
4960.0	H / 1.0	200.0	47.0	17.1	64.1	1603.2	2600.2
7.440	V / 1.0	0.0	30.9	5.1	36.0	*63.1	2600.2
7.440	H / 1.0	0.0	30.9	5.1	36.0	*63.1	2600.2
9.920	V / 1.0	0.0	30.0	8.0	38.0	*79.4	2600.2
9.920	H / 1.0	0.0	30.0	8.0	38.0	*79.4	2600.2
12.400	V / 1.0	0.0	30.0	10.9	40.9	*110.9	5000.0
12.400	H / 1.0	0.0	30.0	10.9	40.9	*110.9	5000.0
14.880	V / 1.0	0.0	30.0	14.5	44.5	*167.9	2600.2
14.880	H / 1.0	0.0	30.0	14.5	44.5	*167.9	2600.2
17.360	V / 1.0	0.0	30.0	18.2	48.2	*257.0	2600.2
17.360	H / 1.0	0.0	30.0	18.2	48.2	*257.0	2600.2
19.840	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
19.840	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
22.320	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
22.320	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
24.800	V / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2
24.800	H / 1.0	0.0	29.0	30.0	59.0	*891.3	2600.2

The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not recorded were more than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*= Noise Floor Measurements (minimum sensitivity).

FCC Part 15, Subpart C, Spurious Emissions,
Paragraph 15.247(d)
Test Data

Test Method:	FCC Part 15 Subpart C Spurious Emissions, Paragraph 15.247(d)		
Customer:	Greenwald Industries Technology Product	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader		
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2402 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 26, 2010

Notes: Test Distance: 3 Meters
Detector: Peak

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H)/Meters	Degree	dBµV	dB	dBµV/m	uV/m	uV/m
30.0							2600.0
|							|
|							|
|							|
|							|
|							|
|							|
203.2	V / 1.0	60.0	45.7	-7.4	38.3	82.2	|
230.0	H / 1.0	114.0	40.0	-5.8	34.2	51.3	2600.0
**244.5	H / 1.0	114.0	41.1	-4.8	36.3	65.3	200.0
**257.6	V / 1.0	159.0	43.2	-4.8	38.4	83.2	200.0
**284.9	V / 1.0	159.0	44.3	-3.0	41.3	116.1	200.0
339.0	V / 1.0	112.0	45.2	-1.0	44.2	162.2	2600.0
371.0	H / 1.0	125.0	37.4	-0.2	37.2	72.4	|
393.0	V / 1.0	113.0	45.5	16	61.5	1188.5	|
407.0	V / 1.0	75.0	33.5	1.6	35.1	56.9	|
434.0	V / 1.0	75.0	49.6	1.2	50.8	346.7	|
502.0	H / 1.0	83.0	41.5	2.4	43.9	156.7	|
556.0	V / 10.	200.0	48.1	3.8	51.9	393.6	|
665.0	V / 1.0	189.0	40.6	7.0	47.6	239.9	|
*2402.0	V / 1.0	0.0	57.8	10	67.8	2454.7	|
*2480.0	V / 1.0	0.0	40.6	10.0	50.6	338.8	|
|							|
|							|
|							|
|							|
|							|
|							|
|							|
|							|
25000.0							2600.0

The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not recorded were more than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*** These measurements were taken at the transmitter band edge**

**** These frequencies meet the required restricted band limit.**

Test Method:	FCC Part 15 Subpart C Spurious Emissions, Paragraph 15.247(d)		
Customer:	Greenwald Industries Technology Product	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader		
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2441 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 26, 2010

Notes: Test Distance: 3 Meters
Detector: Peak

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H)/Meters	Degree	dBµV	dB	dBµV/m	uV/m	uV/m
30.0							2600.0
|							|
|							|
|							|
|							|
|							|
|							|
|							|
216.0							|
189.5	V / 1.0	165.0	45.5	-7.4	38.1	80.4	|
203.4	V / 1.0	84.0	49.0	-7.4	41.6	120.2	2600.0
**257.6	V / 1.0	128.0	46.7	-4.8	41.9	124.5	200.0
**284.7	V / 1.0	137.0	40.9	-3.0	37.9	78.5	200.0
312.8	V / 1.0	138.0	39.1	-2.1	37.0	70.8	2600.0
340.0	V / 1.0	189.0	42.1	-1.1	41.0	112.2	|
393.2	V / 1.4	65.0	49.7	1.6	51.3	367.3	|
420.3	V / 1.0	59.0	52.7	0.5	53.2	457.1	|
433.0	V / 1.0	174.0	39.8	0.8	40.6	107.2	|
447.0	V / 1.0	174.0	44.0	2.0	46.0	199.5	|
501.7	V / 1.0	100.0	47.5	2.4	49.9	312.6	|
555.9	V / 1.0	155.9	49.0	3.8	52.8	436.5	|
569.5	V / 1.0	200.0	36.4	3.8	40.2	102.3	|
583.4	V / 1.0	200.0	38.7	4.0	42.7	136.5	|
*2402.0	V / 1.0	0.0	57.8	10	67.8	2454.7	|
*2480.0	V / 1.0	0.0	40.6	10.0	50.6	338.8	|
|							|
|							|
|							|
|							|
|							|
25000.0							2600.0

The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not recorded were more than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

*** These measurements were taken at the transmitter band edge**

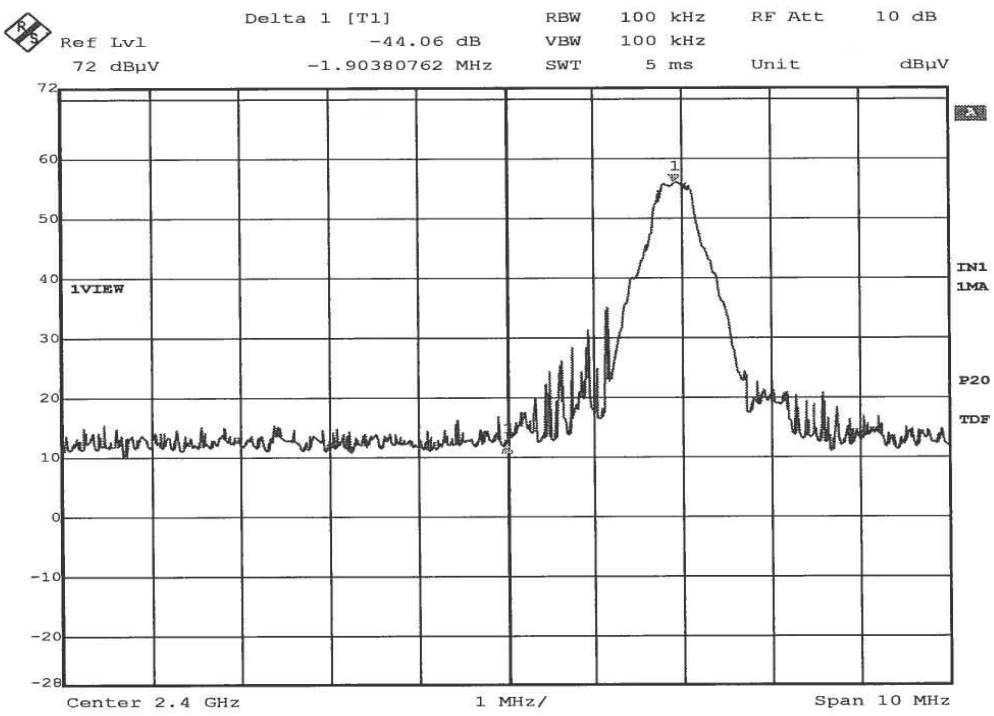
**** These frequencies meet the required restricted band limit.**

Test Method:	FCC Part 15 Subpart C Spurious Emissions, Paragraph 15.247(d)		
Customer:	Greenwald Industries Technology Product	**Job No.**	R-13463-1
Test Sample:	Flash Card Reader		
Model No.:	N/A	**FCC ID:**	YHMA001211CR
Operating Mode:	EUT continuously transmitting a 2480 MHz signal.		
Technician:	R. Soodoo	**Date:**	August 26, 2010

Notes: Test Distance: 3 Meters
Detector: Peak

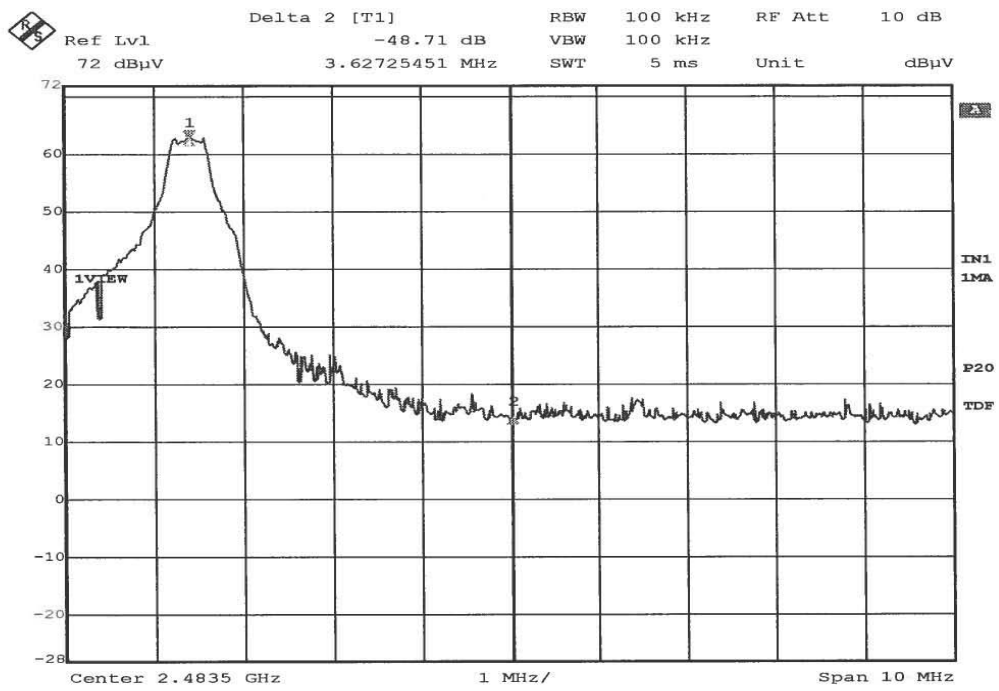
Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H)/Meters	Degree	dBµV	dB	dBµV/m	uV/m	uV/m
30.0							2600.0
|							|
|							|
|							|
|							|
|							|
|							|
|							|
216.0							|
189.5	V / 1.0	165.0	45.5	-7.4	38.1	80.4	|
203.4	V / 1.0	84.0	49.0	-7.4	41.6	120.2	2600.0
*257.6	V / 1.0	128.0	46.7	-4.8	41.9	124.5	200.0
*284.7	V / 1.0	137.0	40.9	-3.0	37.9	78.5	200.0
312.8	V / 1.0	138.0	39.1	-2.1	37.0	70.8	2600.0
340.0	V / 1.0	189.0	42.1	-1.1	41.0	112.2	|
393.2	V / 1.4	65.0	49.7	1.6	51.3	367.3	|
420.3	V / 1.0	59.0	52.7	0.5	53.2	457.1	|
433.0	V / 1.0	174.0	39.8	0.8	40.6	107.2	|
447.0	V / 1.0	174.0	44.0	2.0	46.0	199.5	|
501.7	V / 1.0	100.0	47.5	2.4	49.9	312.6	|
555.9	V / 1.0	155.9	49.0	3.8	52.8	436.5	|
569.5	V / 1.0	200.0	36.4	3.8	40.2	102.3	|
583.4	V / 1.0	200.0	38.7	4.0	42.7	136.5	|
*2402.0	V / 1.0	0.0	57.8	10	67.8	2454.7	|
*2480.0	V / 1.0	0.0	40.6	10.0	50.6	338.8	|
|							|
|							|
|							|
|							|
|							|
25000.0							2600.0
	The frequency range was scanned from 30 MHz to 25.0 GHz. All emissions not recorded were more						
	than 20 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.						
	*** These measurements were taken at the transmitter band edge**						
	**** These frequencies meet the required restricted band limit.**						

FCC Part 15, Subpart C, Section 15.247
Band Edge 2.4 & 2.4835GHz
Test Data



2.4 GHz band edge measurement. Sample transmitting at 2402 MHz

Customer	Greenwald Industries Technology Product		
Test Sample	Flash Card Reader		
Model	N/A		
Date 8-26-10		Tech: DL	Sheet 1 of 2



2.4835 GHz band edge measurement. Sample transmitting at 2480 MHz

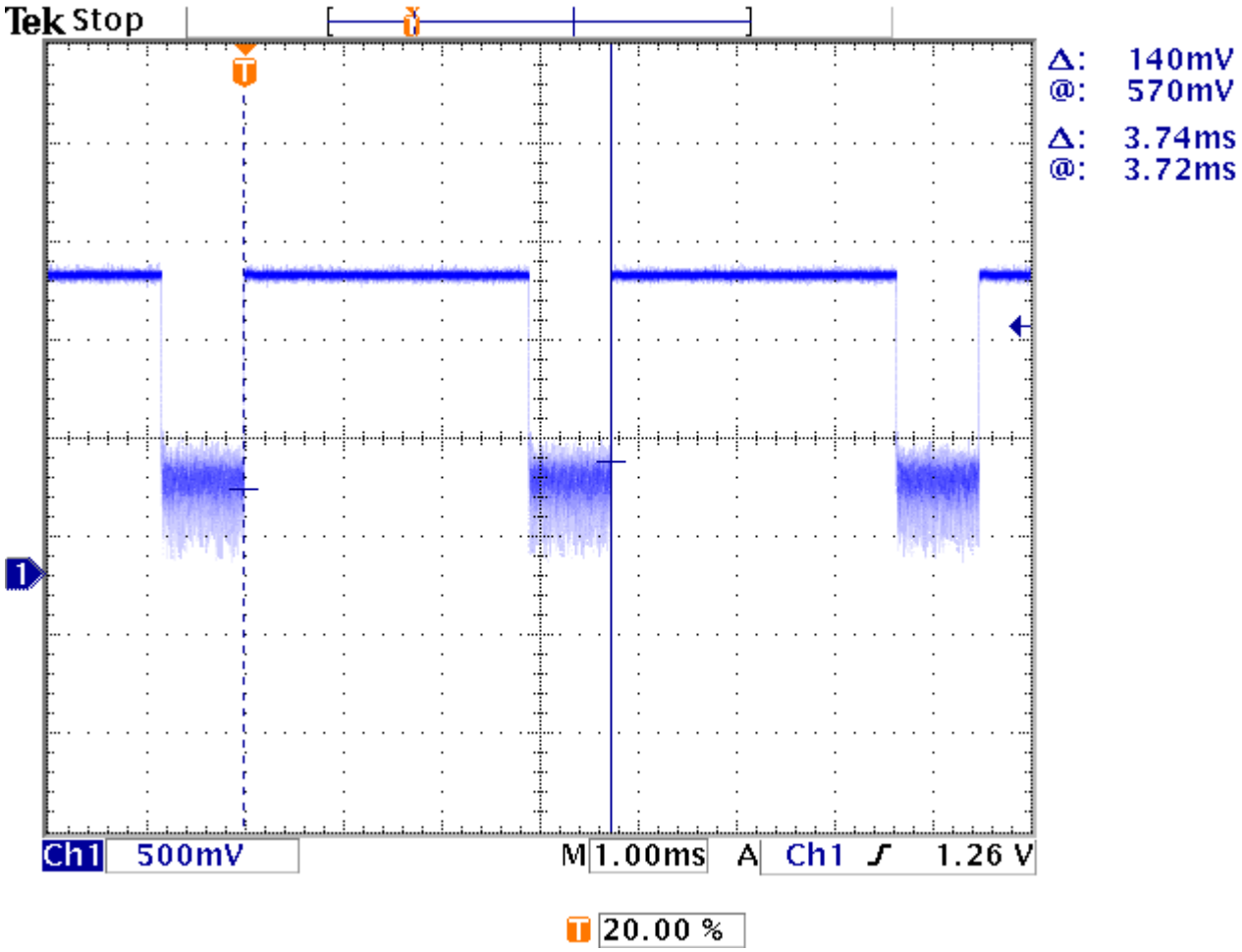
Customer	Greenwald Industries Technology Product		
Test Sample	Flash Card Reader		
Model	N/A		
Date 8-26-10		Tech: DL	Sheet 2 of 2

Test Photograph(s)
FCC Part 15.35, Duty Cycle Determination

Test Photograph(s)
Duty Cycle Determination

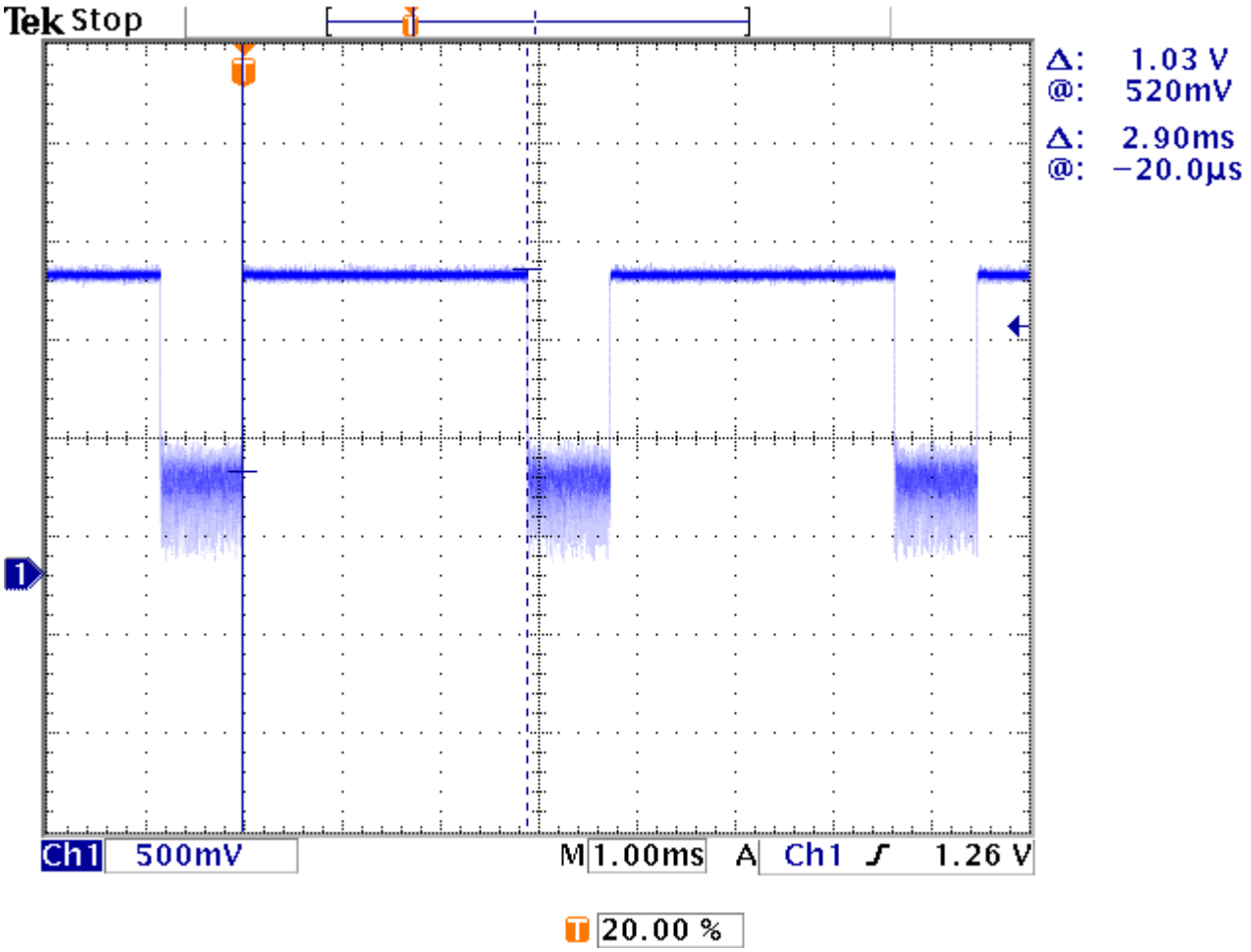
Test Setup

FCC Part 15.35, Duty Cycle Determination
Retest Data



Test Method: **FCC Part 15.35, Duty Cycle Determination**.
Notes: Period measured = 3.74ms
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24,2010	Tech: R.Soodoo	Sheet 1 of 2

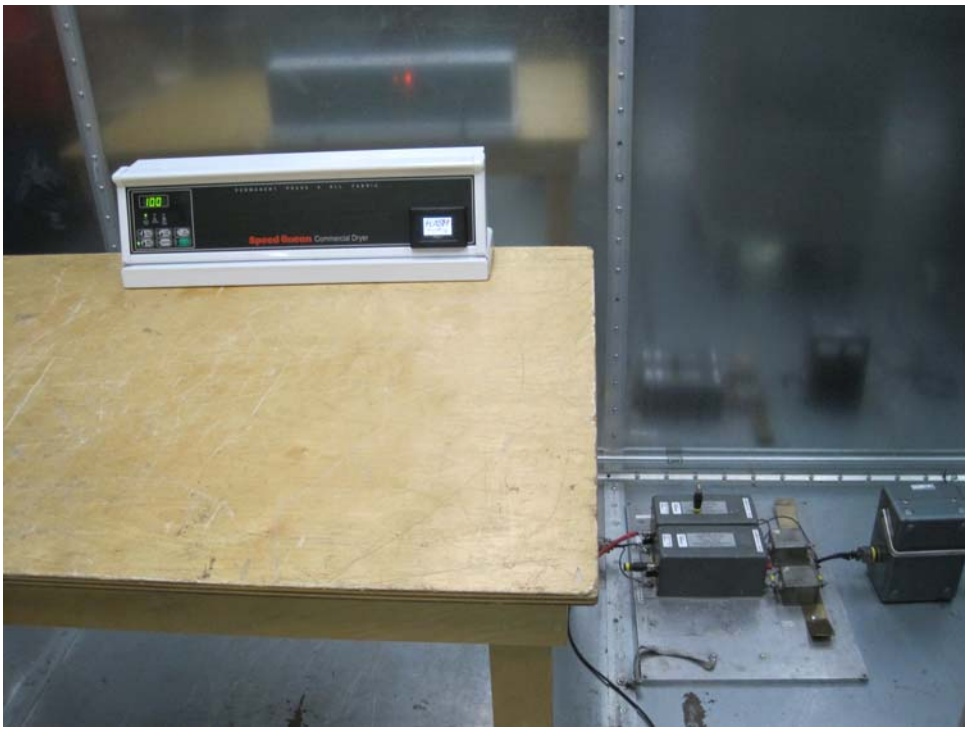


Test Method: **FCC Part 15.35, Duty Cycle Determination**.
Notes: Duty cycle = (2.90 mSec / 3.74) = 0.77 = 77.0%
= 20 log 0.77= -2.2dB
FCC ID: YHMA001211CR

Customer	Greenwald Industries	
Test Sample	Flash Card Reader	
Model Number	N/A	
Date: August 24,2010	Tech: R.Soodoo	Sheet 2 of 2

Test Photograph(s)
FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads, 150 kHz to 30 MHz

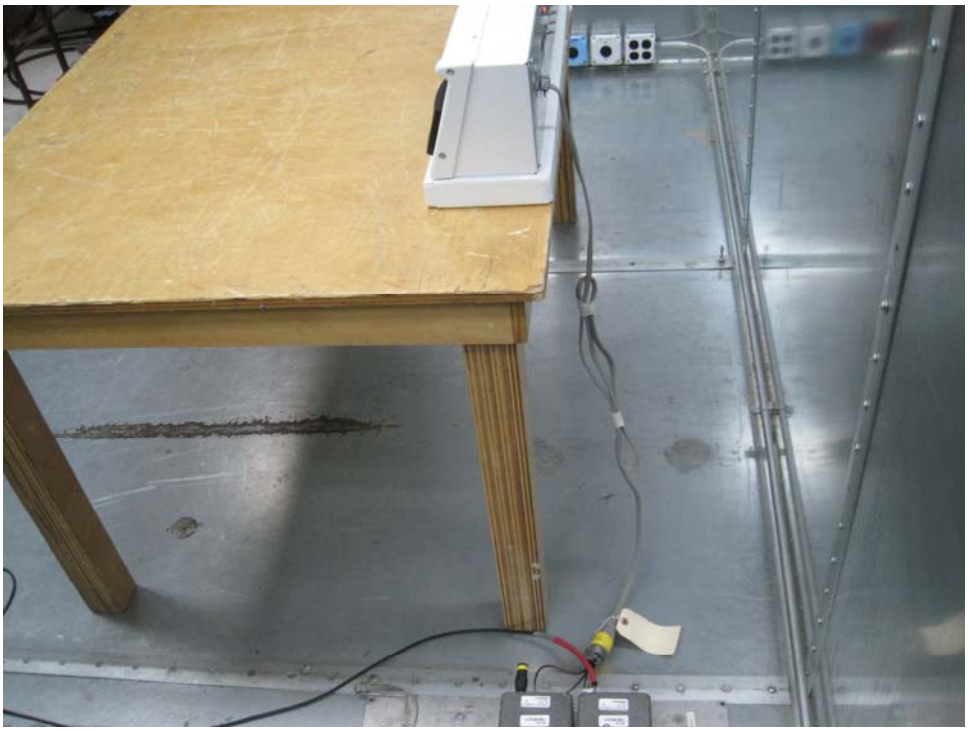
Test Photograph(s)
FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads, 150 kHz to 30 MHz



EUT Configuration

Test Setup

Test Photograph(s)
Conducted Emissions



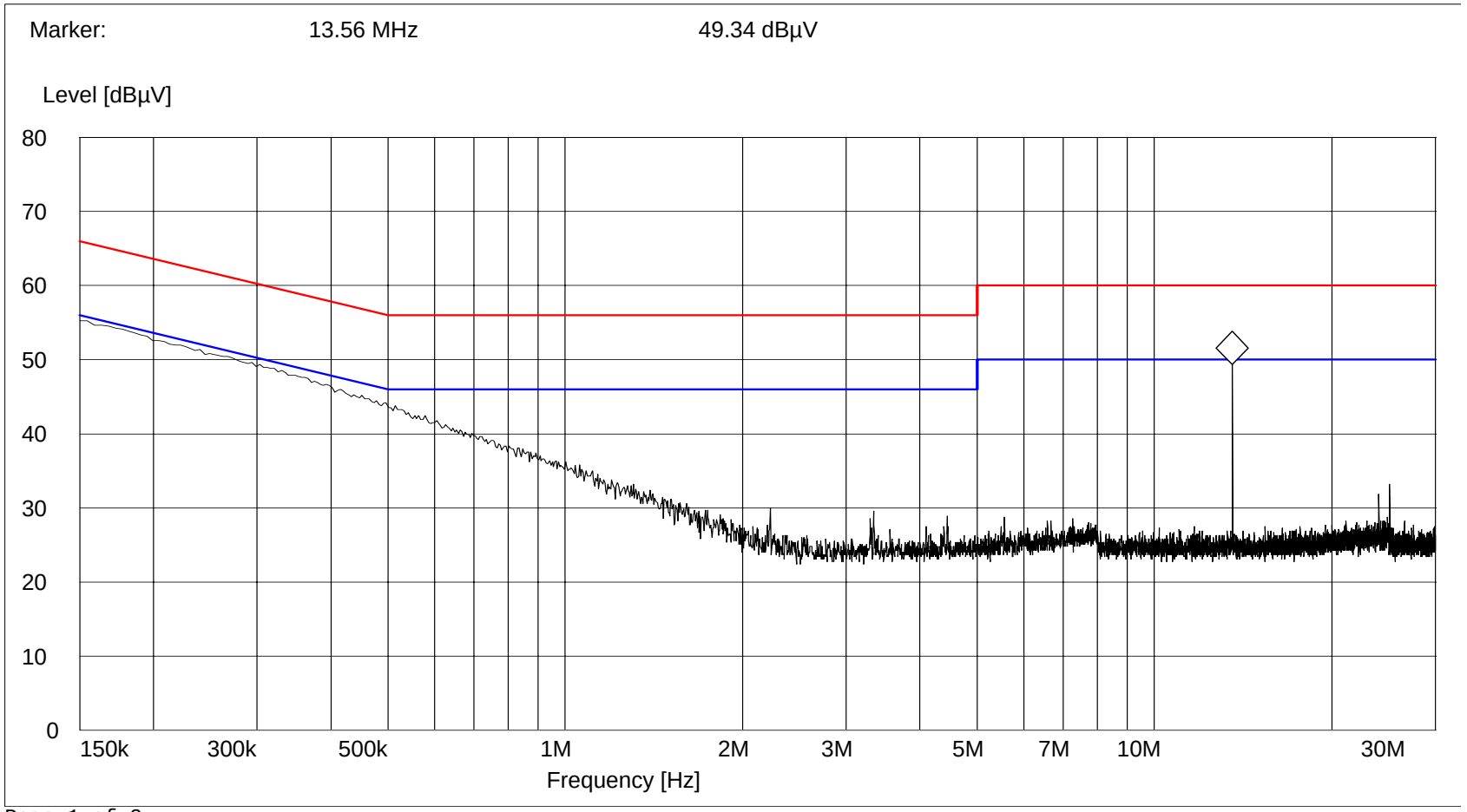
Cable Setup

FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads, 150 kHz to 30 MHz
EUT transmitting at 2402 MHz
Retest Data

RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

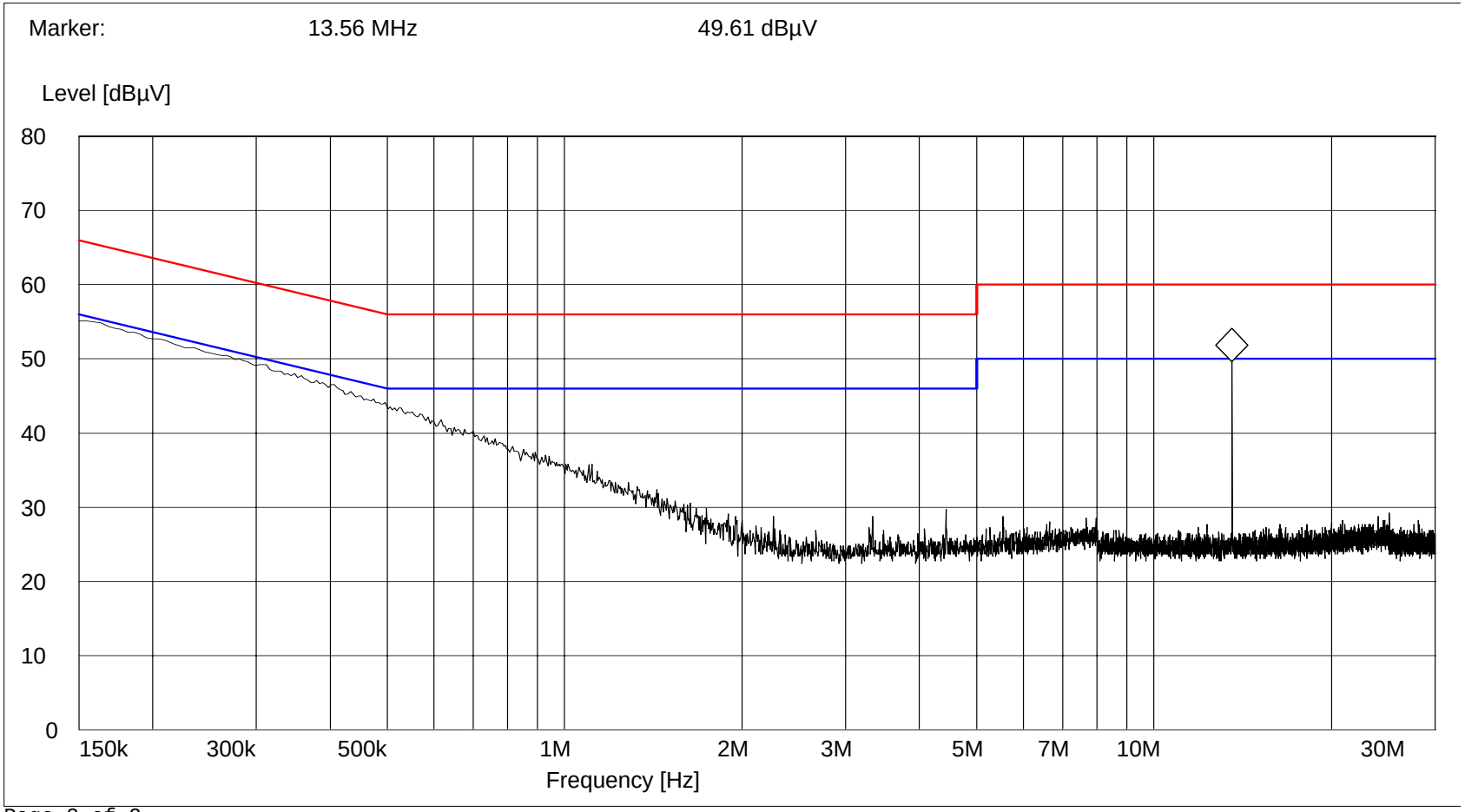
```
Customer:           Greenwald Industries
Test Sample:        Flash Card Reader
Model Number:       N/A
FCC ID.:            YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:  EUT continuously transmitting a 2402.0 MHz signal.
Lead Tested:        120 VAC/60 Hz hot input to EUT
Technician / Date:  R. Soodoo / October 4, 2010
Detector / Note:    Peak / Peak emissions passed average limit.
```



RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

```
Customer:           Greenwald Industries
Test Sample:        Flash Card Reader
Model Number:       N/A
FCC ID.:            YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:  EUT continuously transmitting a 2402.0 MHz signal.
Lead Tested:        120 VAC/60 Hz neutral input to EUT
Technician / Date:  R. Soodoo / October 4, 2010
Detector / Note:    Peak / Peak emissions passed average limit.
```

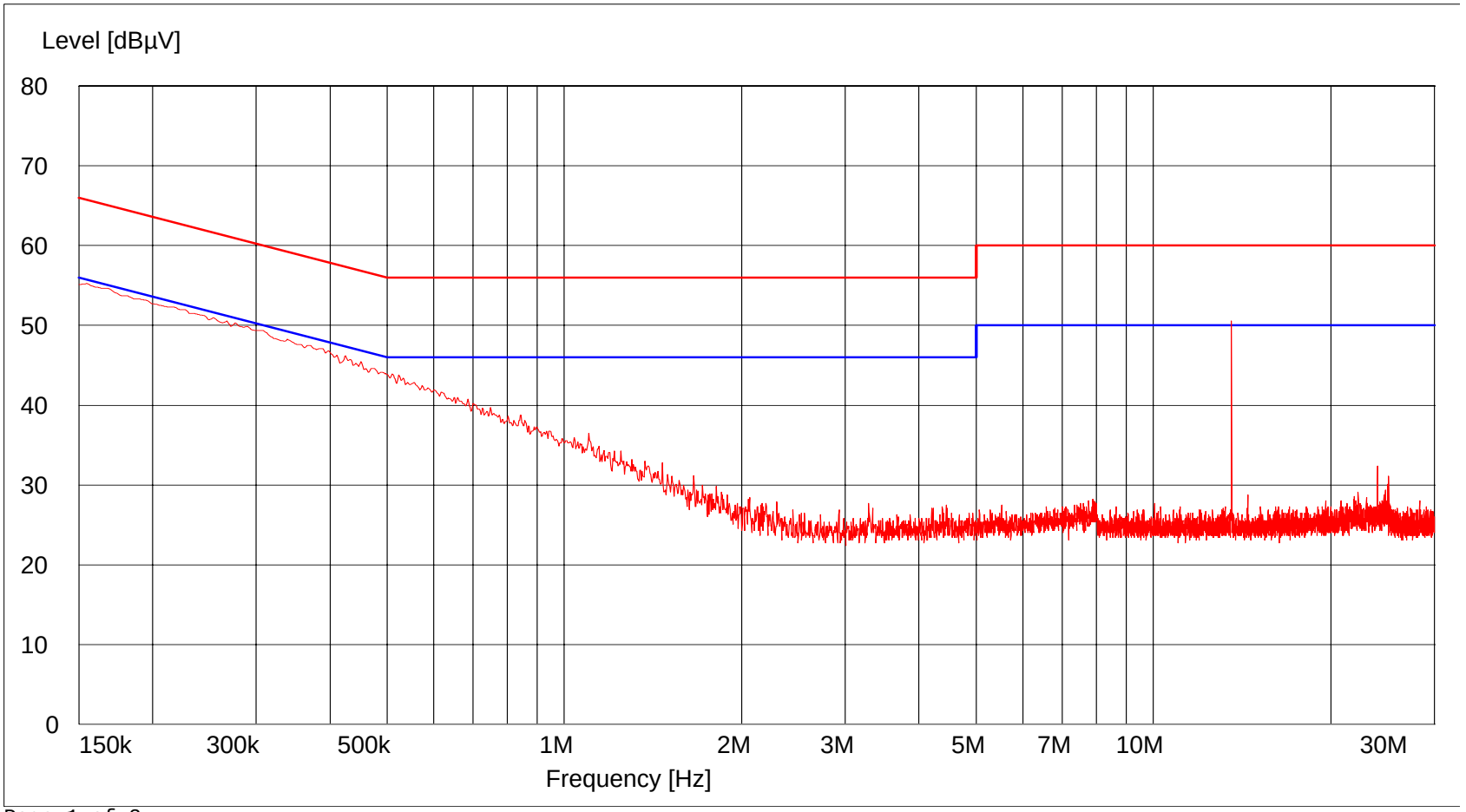


FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads, 150 kHz to 30 MHz
EUT transmitting at 2441 MHz
Retest Data

RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

```
Customer:            Greenwald Industries
Test Sample:         Flash Card Reader
Model Number:        N/A
FCC ID.:             YHMA001211CR
Test Specification:  FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:   EUT continuously transmitting a 2441.0 MHz signal.
Lead Tested:         120 VAC/60 Hz hot input to EUT
Technician / Date:   R. Soodoo / October 4, 2010
Detector / Note:     Peak / Peak emissions passed quasi-peak limit. Average detector required
```



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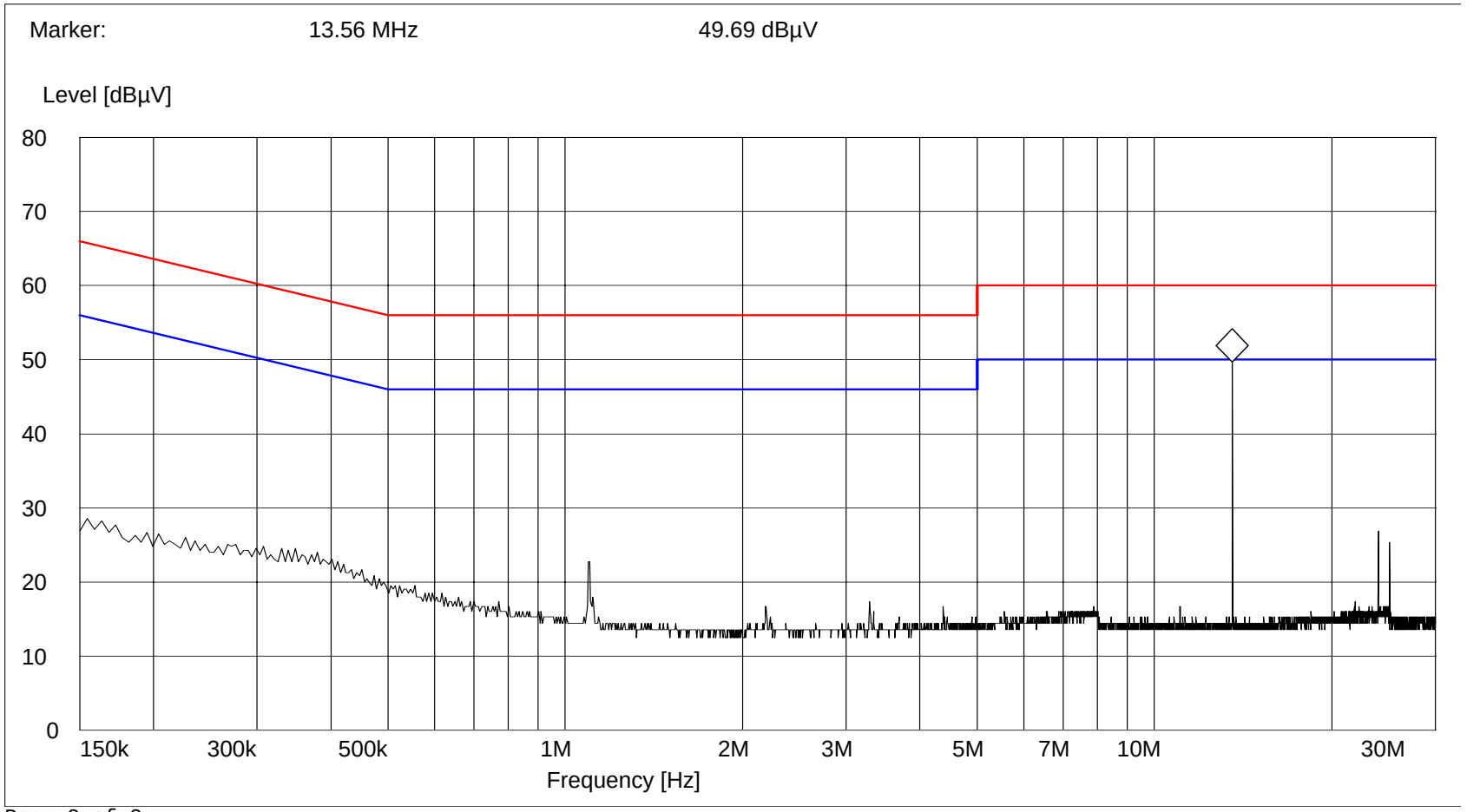
RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

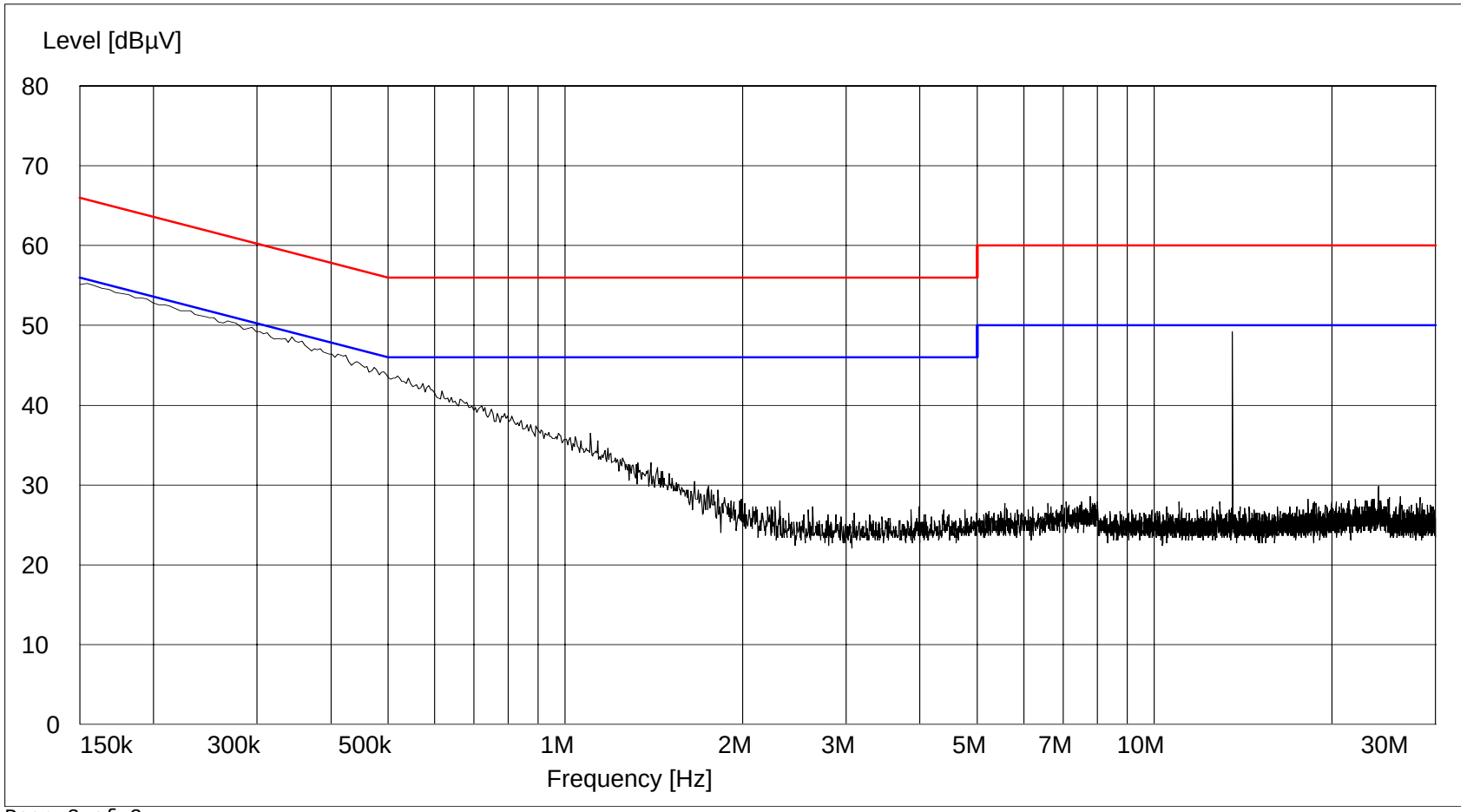
```
Customer:           Greenwald Industries
Test Sample:        Flash Card Reader
Model Number:       N/A
FCC ID.:            YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:  EUT continuously transmitting a 2441.0 MHz signal.
Lead Tested:        120 VAC/60 Hz hot input to EUT
Technician / Date:  R. Soodoo / October 4, 2010
Detector / Note:    Average / Average emissions passed average limit.
```



RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

Customer: Greenwald Industries
Test Sample: Flash Card Reader
Model Number: N/A
FCC ID.: YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation: EUT continuously transmitting a 2441.0 MHz signal.
Lead Tested: 120 VAC/60 Hz neutral input to EUT
Technician / Date: R. Soodoo / October 4, 2010
Detector / Note: Peak / Peak emissions passed average limit.



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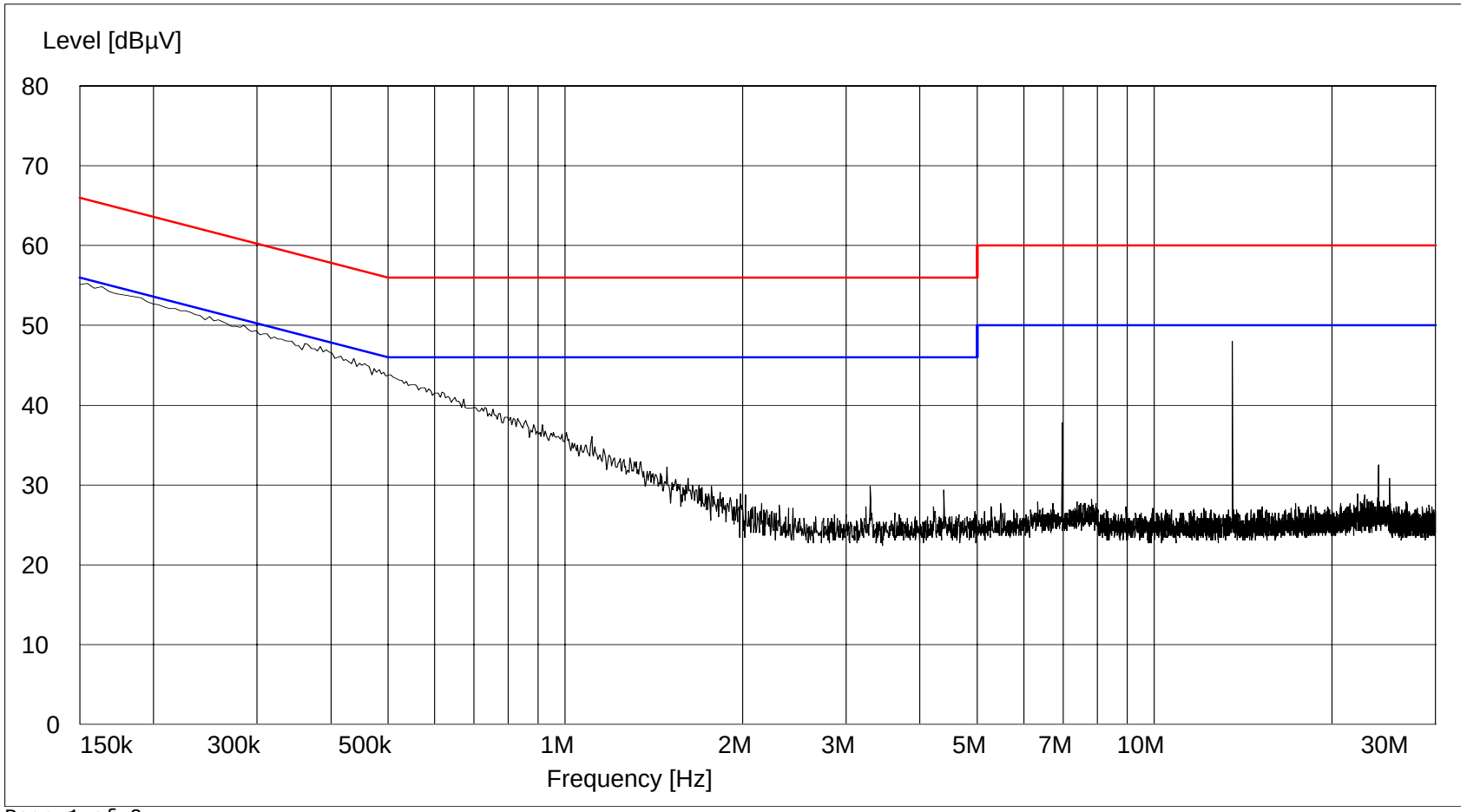
FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads, 150 kHz to 30 MHz
EUT transmitting at 2480 MHz
Retest Data

RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

Customer: Greenwald Industries
Test Sample: Flash Card Reader
Model Number: N/A
FCC ID.: YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation: EUT continuously transmitting a 2480.0 MHz signal.
Lead Tested: 120 VAC/60 Hz hot input to EUT
Technician / Date: R. Soodoo / October 4, 2010
Detector / Note: Peak / Peak emissions passed average limit.

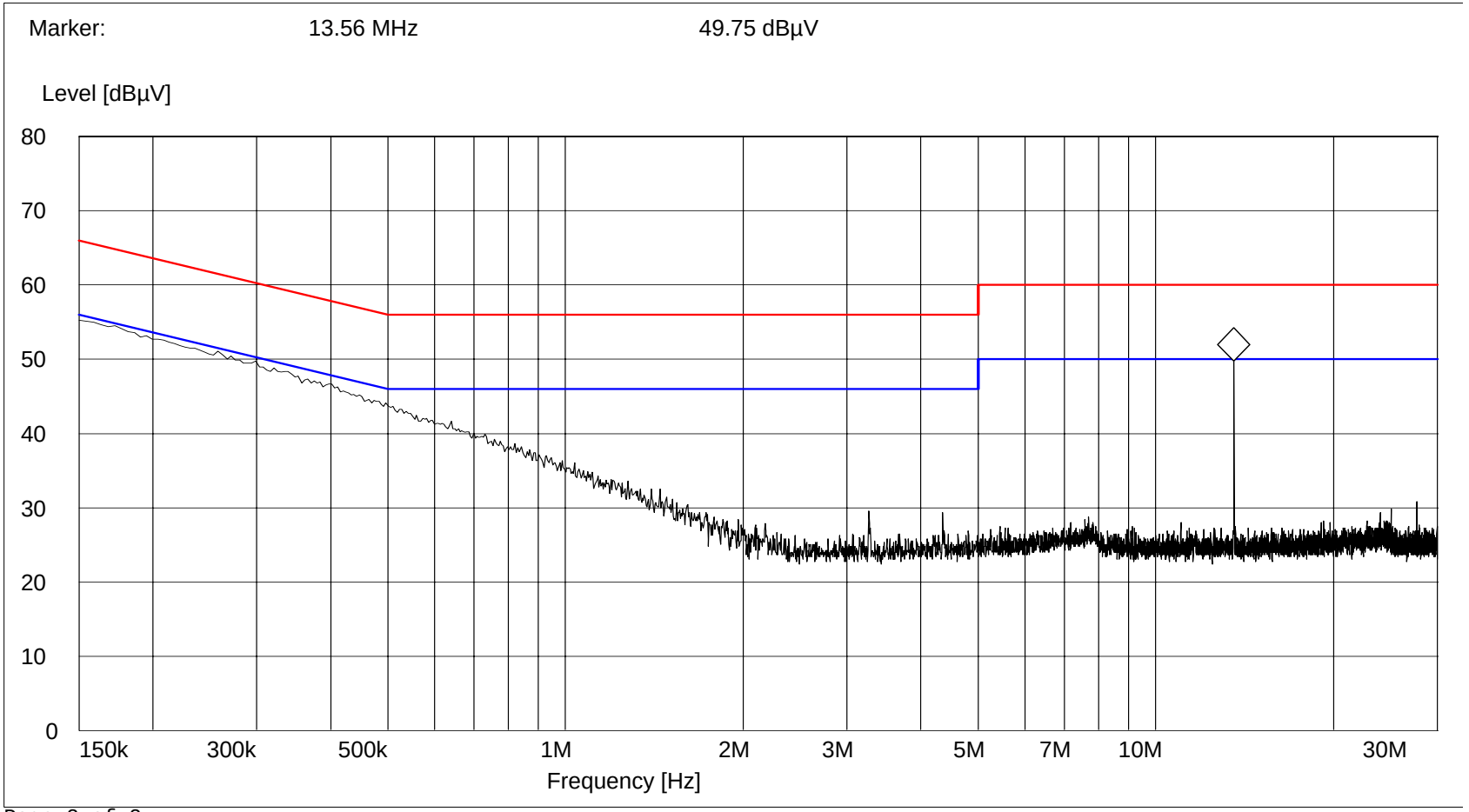


Page 1 of 2

RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

```
Customer:           Greenwald Industries
Test Sample:        Flash Card Reader
Model Number:       N/A
FCC ID.:            YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:  EUT continuously transmitting a 2480.0 MHz signal.
Lead Tested:        120 VAC/60 Hz neutral input to EUT
Technician / Date:  R. Soodoo / October 4, 2010
Detector / Note:    Peak / Peak emissions passed average limit.
```



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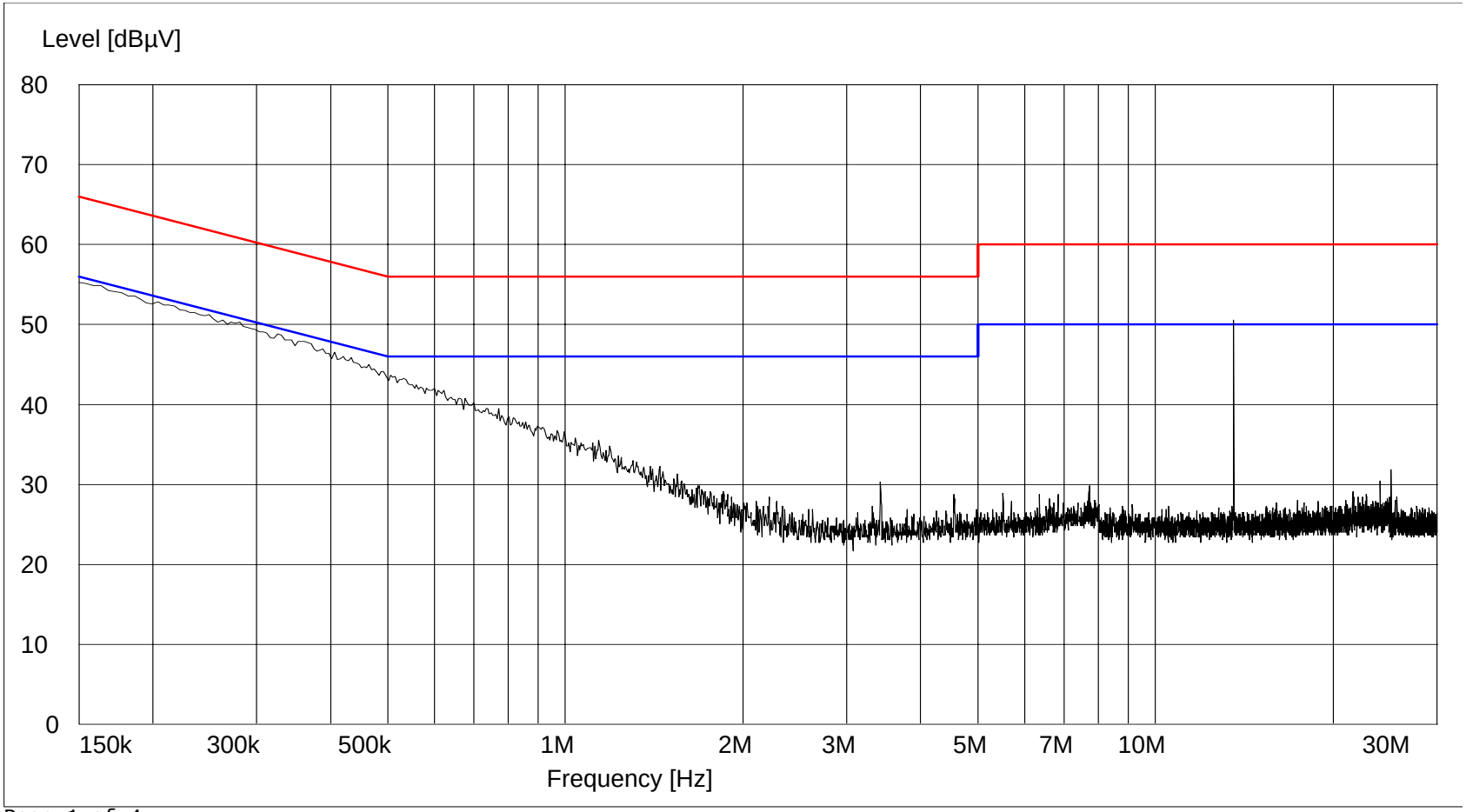
FCC Part 15, Subpart C, Section 15.207(a), Conducted Emissions, Power Leads, 150 kHz to 30 MHz
Normal Hopping Frequency EUT
Retest Data

RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

Customer: Greenwald Industries
Test Sample: Flash Card Reader
Model Number: N/A
FCC ID.: YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation: EUT in normal operating frequency hopping mode.
Lead Tested: 120 VAC/60 Hz hot input to EUT
Technician / Date: R. Soodoo / October 4, 2010
Detector / Note: Peak / Peak emissions passed quasi-peak limit. Average detector required



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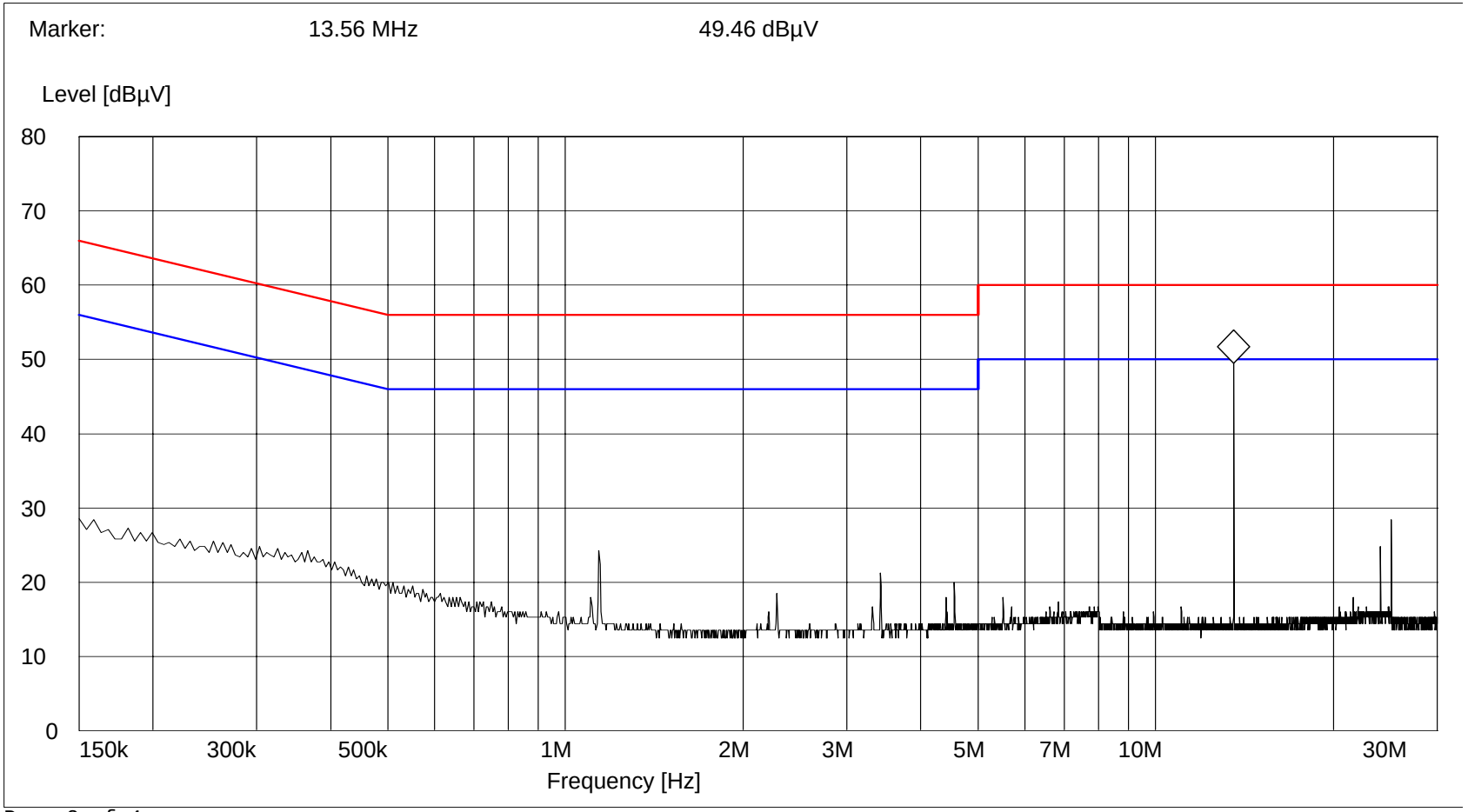
RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

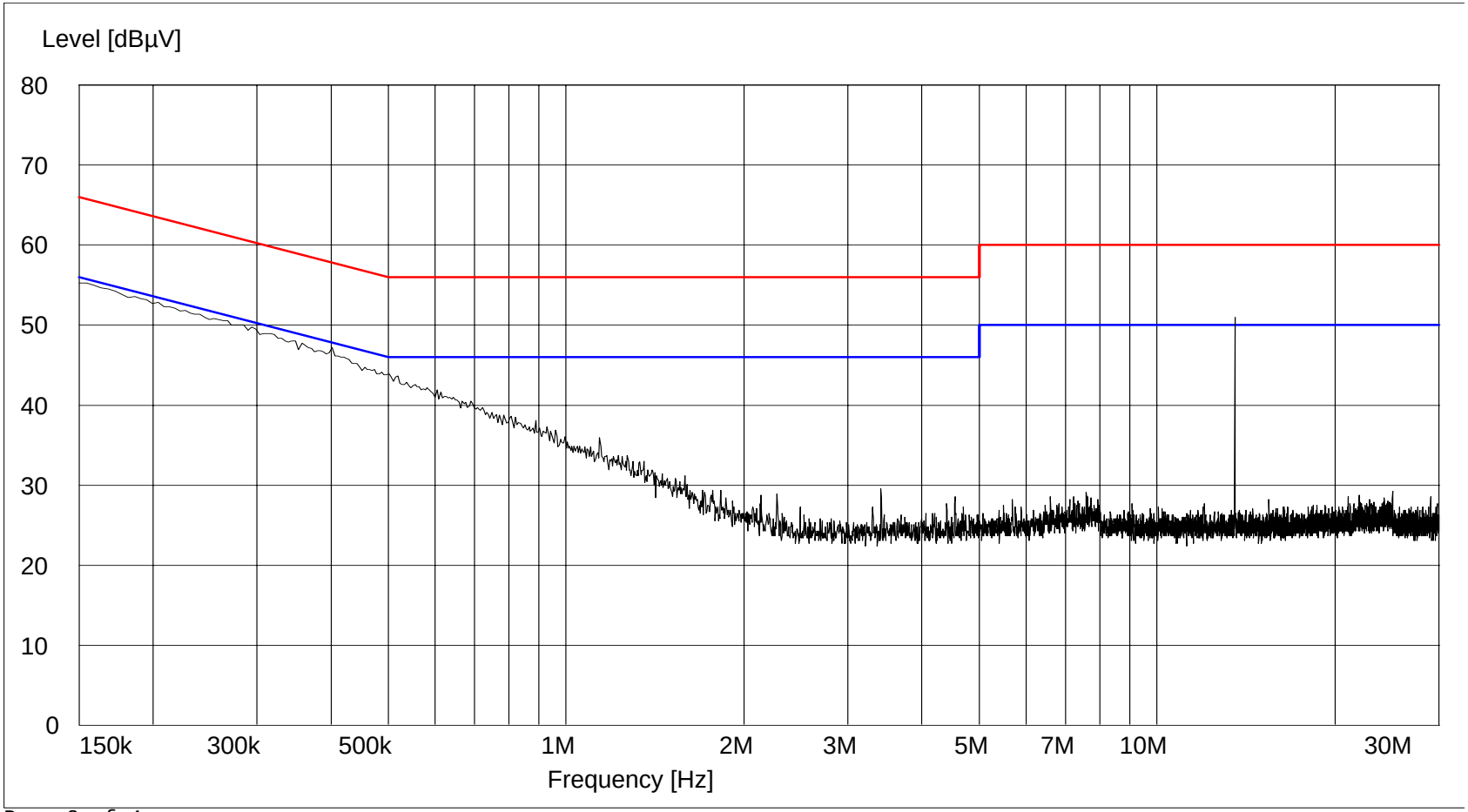
```
Customer:           Greenwald Industries
Test Sample:        Flash Card Reader
Model Number:       N/A
FCC ID.:            YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:  EUT in normal operating frequency hopping mode.
Lead Tested:        120 VAC/60 Hz hot input to EUT
Technician / Date:  R. Soodoo / October 4, 2010
Detector / Note:    Average / Average emissions passed average limit.
```



RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

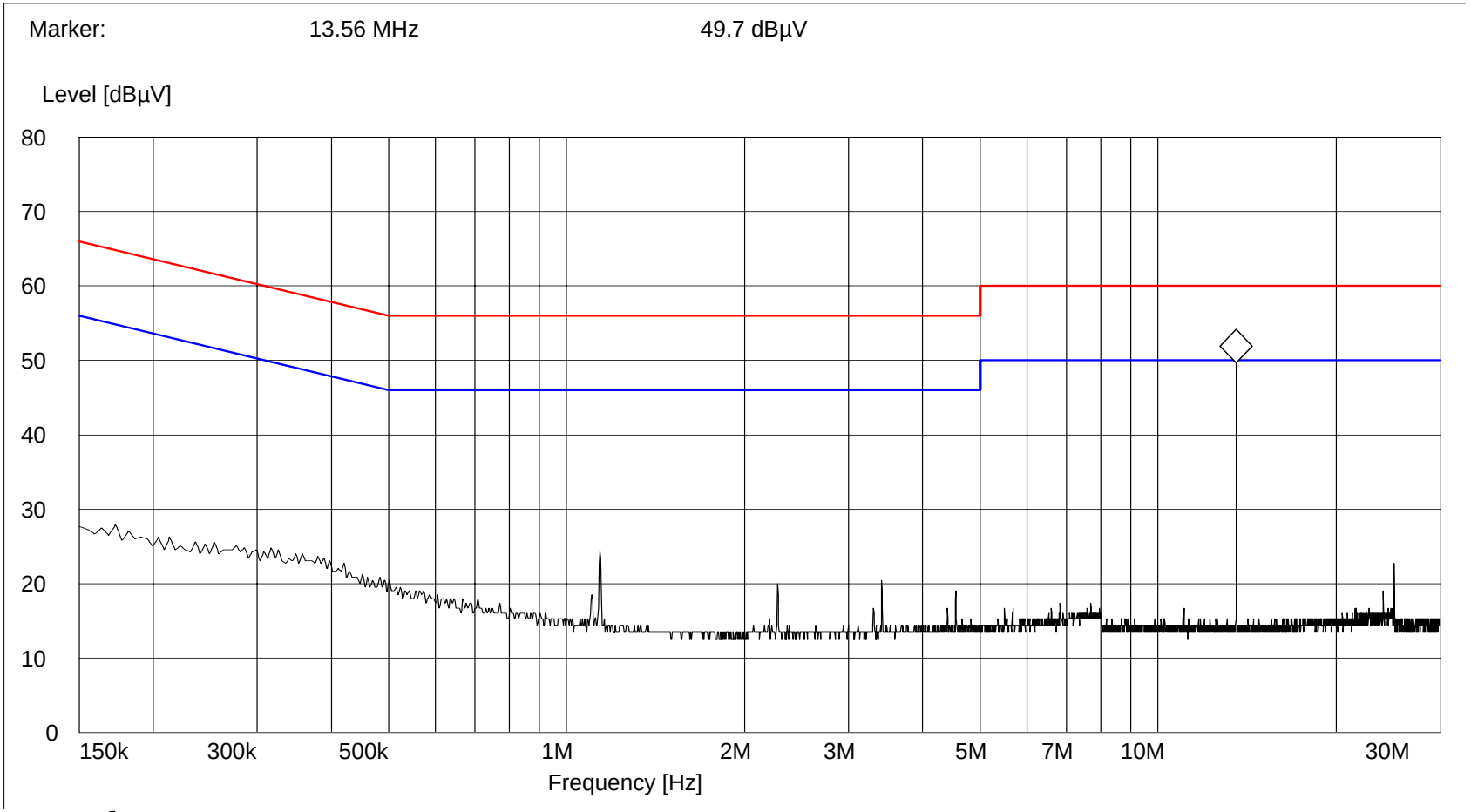
Customer: Greenwald Industries
Test Sample: Flash Card Reader
Model Number: N/A
FCC ID.: YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation: EUT in normal operating frequency hopping mode.
Lead Tested: 120 VAC/60 Hz neutral input to EUT
Technician / Date: R. Soodoo / October 4, 2010
Detector / Note: Peak / Peak emissions passed quasi-peak limit. Average detector required



RETLIF Testing Laboratories, Job Number R-13463-1 Retest

FCC Part 15, Subpart C, Conducted Emissions, 150 kHz to 30 MHz

```
Customer:           Greenwald Industries
Test Sample:        Flash Card Reader
Model Number:       N/A
FCC ID.:            YHMA001211CR
Test Specification: FCC Part 15 Subpart C Section 15.207(a)
Mode of Operation:  EUT in normal operating frequency hopping mode.
Lead Tested:        120 VAC/60 Hz neutral input to EUT
Technician / Date:  R. Soodoo / October 4, 2010
Detector / Note:    Average / Average emissions passed average limit.
```



Page 4 of 4