



# Retlif Testing Laboratories

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## FCC/IC Test Report on

PocketWizard Flex TT5 Transceiver  
Model: TT5-N-US

Customer Name: LPA Design, Inc.

Customer P.O: D1219

Date of Report: December 8, 2010

Test Report No: R-5329N-1, Rev. A

Test Start Date: April 22, 2010

Test Finish Date: April 22, 2010

Test Technician: M. Seamans

Laboratory Supervisor: T. Hannemann

Branch Manager: S. Wentworth

Report Prepared By: J. Ramsey

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### Technical Information

APPLICANT		MANUFACTURER	
Name:	LPA Design, Inc.	Name:	LPA Design, Inc.
Address:	41 IDX Drive, Suite 265	Address:	41 IDX Drive, Suite 265
City, State, Zip:	South Burlington, VT 05403	City, State, Zip:	South Burlington, VT 05403

#### TEST SPECIFICATION:

FCC Rules and Regulations Part 15, Subpart C, Section 15.231

Radio Standards Specification, RSS-210, Issue 7, June, 2007 and RSS-GEN, Issue 2, June 2007

**TEST PROCEDURE:** ANSI C63.4:2003

#### Test Sample Description

TEST SAMPLE: PocketWizard Flex TT5 Transceiver

BRANDNAME(s): PocketWizard

MODEL: TT5-N-US

FCC ID: KDS-PW3-008

IC: 2170A-PW3008

TYPE: Remote Control Flash Transceiver

POWER REQUIREMENTS: 3VDC via two AA batteries

FREQUENCY OF OPERATION: 340 MHz to 354 MHz

#### Support Equipment

Description	Manufacturer	Model Number	Serial Number
Digital Camera	Fujifilm Corp.	Finepix S5 Pro	73A01917
Flash/Light	Nikon	Speedlight SB-600	N/A

## Tests Performed

The test methods performed on the PocketWizard MiniTT1 Transceiver are shown below:

<b>FCC Part 15, Subpart C</b>	<b>Industry Canada RSS-210 Issue 7, June 2007</b>	<b>Industry Canada RSS-GEN Issue 2, June 2007</b>	<b>Test Method</b>
15.231(b)	A1.1.2(1)	N/A	Field Strength of Emissions
15.231(b)(2)	A1.1.2(2)	4.5	Duty Cycle Determination
15.231(b)(3)	A1.1.2(3)	N/A	Field Strength of Spurious Emissions
15.231(c)	A1.1.3	N/A	Bandwidth of Emission
N/A	N/A	4.10	Receiver Spurious Emissions

## General Test Requirements

1. The measurement procedures of ANSI C63.4:2003 were utilized as specified in FCC Part 15, Subpart C, Section 15.31(a)(3) and IC RSS-GEN Section 4.1.
2. All radiated emissions measurements were performed on an Open Area Test Site (OATS), listed with the FCC and IC, in accordance with FCC Section 15.31(d) and IC Section 4.2.
3. The level of the fundamental field strength was recorded with a new battery installed in the EUT, in accordance with FCC Section 15.231(e) and IC Section 4.3(e).
4. All measurements were performed at the specified 3 meter test distance as required by FCC Section 15.31(f) and IC Section 7.25.
5. The EUT was rotated throughout 360 degrees for all radiated emissions measurements as specified in FCC Section 15.31(f)(5) and IC Section 4.3(h).
6. All readily accessible EUT controls were adjusted in such a manner as to maximize the level of emissions in accordance with FCC Section 15.31(g) and IC Section 4.3(h).
7. Appropriate accessories were attached to all EUT ports during the performance of radiated emissions measurements as required by FCC Section 15.31(i) and IC Section 4.3(d).
8. The EUT operated over the frequency range of 340 MHz to 354 MHz. A total range of 14 MHz. Testing was performed with the device operating at
  - a. 3 frequencies, 1 at the top, 1 in the middle and 1 at the bottom of the range of operation in accordance with FCC Section 15.31(m) and IC Section 4.3(f)(g).
9. The frequency spectrum was investigated from the lowest frequency generated in the device up to the 10<sup>th</sup> harmonic of the highest fundamental frequency in accordance with FCC Section 15.33(a)(1) and IC Section 4.9.
10. All measurements were taken with a peak detector function as specified in FCC Section 15.35(a) and IC Section 4.4. The duty cycle, calculated in accordance with FCC Section 15.35(c) and IC Section 4.5, was applied to the peak readings in order to obtain the average value of emissions. The peak value of emissions was verified to meet the 20 dB requirement of FCC Section 15.35(b) and IC Section 7.2.1.

## 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.



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Scott Wentworth  
Branch Manager  
NVLAP Approved Signatory



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Todd Hannemann  
Laboratory Supervisor  
iNARTE Certified ATL-0255-T

### 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.

## Revision History

Revisions to this document are listed below; the latest revised document supersedes all previous issues of this document.

Revision	Date	Pages Affected
-	November 22, 2010	Original Release
A	December 8, 2010	2, 9

## **Requirements and Test Results**

### **Requirement:**

#### **FCC Section 15.231(a) - Periodic operation in the band 40.66 - 40.7 MHz and above 70 MHz**

The provisions of this Section are restricted to periodic operation within the band 40.66-40.7 MHz and above 70 MHz. Except as shown in Paragraph (e) of this Section, the intentional radiator is restricted to the transmissions of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal.

#### **IC RSS-210, A1.1 - Momentarily Operated Devices**

The frequency bands and field strength limits in Tables 4 and 5 are only for the transmission of a control signal such as that used with alarm systems, door openers, remote switches, etc. Radio control of toys or model aircrafts, and continuous transmissions such as voice or video are not permitted except as provided in A1.1.5. Data is permitted to be sent with a control signal.

- Results:  
The device was operates over the frequency range of 340 MHz to 354 MHz and is for the transmission of a control signal in the photography industry for remote flash control.

### **Requirement:**

#### **FCC Sections 15.231(a)(1)-(5)**

#### **Periodic operation in the band 40.66 - 40.7 MHz and above 70 MHz**

The following conditions were met in order to comply with the provisions for momentary operation:

#### **IC RSS-210, A1.1.1(a)-(d) - Types of Momentary Signals**

The following conditions were met in order to comply with the provisions for momentary operation:

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

IC A1.1.1(a): A manually operated transmitter shall employ a push-to-operate switch and be under manual control at all transmission times. When released, the transmitter shall cease transmission (holdover time of up to 5 seconds of operation).

- Results:  
The device is a manually operated, push to operate transmitter under manual control. The device ceased transmission within 5 seconds of deactivation.

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

IC A1.1.1(b): A transmitter activated automatically shall cease transmission with 5 seconds after activation, (i.e. maximum 5 seconds of operation).

- Results:  
Transmission is not automatically activated.

## Requirements and Test Results (con't)

FCC 15.231(a)(3): Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

IC A1.1.1(c): Periodic transmissions at regular predetermined intervals are not permitted, except as provided in A1.1.5. However, polling or supervision transmissions, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed 2 seconds per hour for each transmitter.

- Results:  
The transmitter does not perform periodic transmissions.

FCC 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 condition.

IC A1.1.1(d): Intentional radiators employed for radio control purposes during emergencies involving fire, security of goods (e.g. burglar alarms), and safety-of-life, when activated to signal an alarm, may operate during the interval of the alarm condition.

- Results:  
This device is not employed for radio control purposes during emergencies involving fire, security and safety for life.

FCC 15.231(a)(5): Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmission are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

- Results:  
The device is not employed for security systems.

## Requirements and Test Results (con't)

### Requirement:

#### FCC Section 15.231(b) - Field Strength of Emissions

In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the limits specified in Table 1.

#### IC RSS-210, A1.1.2(1) - Field Strengths and Frequency Bands

The field strength of emissions from momentarily operated intentional radiators shall not exceed the limits specified in Table 1:

Table 1 - Test Limits, Field Strength of Emissions

Fundamental Frequency (MHz)	Field Strength of Fundamental microvolts/meter @3 meters (watts, e.i.r.p.) Quasi Peak or Average	Field Strength of Spurious Emissions microvolts/meter @3 meters Quasi Peak or Average
40.66 to 40.70	2,250	225
70 to 130	1,250 (470 nW)	125
130 to 174	1,250 to 3,750**	125 to 375**
174 to 260	3,750 (4.2 µW)	375
260 to 470	3,750 to 12,500**	375 to 1,250**
Above 470	12,500 (47 µW)	1,250
**Linear Interpolations For 130-174 MHz: FS (microvolts/m) = (56.82 x F) - 6,136 For 260-470 MHz: FS (microvolts/m) = (41.67 x F) - 7,083 The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.		

The Fundamental and Harmonic Emissions limits for a device operating at 340 MHz, 347 MHz & 354 MHz are listed in Table 2.

Table 2 - Fundamental and Harmonic Limits

Frequency of Operation MHz	Fundamental µV/m	Harmonics µV/m
340.0	7083.4	708.34
347.0	7375.1	737.51
354.0	7666.7	766.67

- Results:

The Fundamental and Harmonics field strengths did not exceed the limits specified in Table 2 at a test distance of 3 meters. See Table 3 for the Fundamental and Harmonic emissions test results.



## Requirements and Test Results (con't)

### Field Strength Calculation:

The final average field strength of the emission was calculated by subtracting the duty cycle factor in dB from the maximized corrected peak reading in dBuV/m.

The maximized peak field strength of the emission was obtained as follows:

$$P_C = M_R + C_F$$

Where:

$P_C$  = Corrected Peak Reading in dB $\mu$ V/m

$M_R$  = Uncorrected Meter Reading in dB $\mu$ V

$C_F$  = Correction Factor in dB (Antenna Factor + Cable Loss)

The final average field strength of the emission was obtained as follows:

$$A_F = P_C - D_F$$

Where:

$A_F$  = Average Field Strength in dB $\mu$ V/m

$P_C$  = Corrected Peak Reading in dB $\mu$ V/m

$D_F$  = Duty Cycle Factor in dB

Example: For the frequency of 340 MHz:

$$M_R = 76.09 \text{ dB}\mu\text{V}$$

$$C_F = 18.08 \text{ dB}$$

$$P_C = 76.09 \text{ dB}\mu\text{V} + 18.08 \text{ dB} = 94.17 \text{ dB}\mu\text{V/m}$$

$$D_F = 23.54 \text{ dB}$$

$$A_F = 94.17 \text{ dB}\mu\text{V/m} - 23.54 \text{ dB} = 70.63 \text{ dB}\mu\text{V/m}$$

$$70.63 \text{ dB}\mu\text{V/m} = 3398 \text{ }\mu\text{V/m}$$

Table 3 - Fundamental and Harmonics Test Results

<b>Fundamental Frequency MHz</b>	<b>Maximum Fundamental <math>\mu</math>V/m</b>	<b>Maximum Harmonics <math>\mu</math>V/m</b>
340.0	3398.0	No Harmonics Observed
347.0	2895.0	No Harmonics Observed
354.0	2403.0	No Harmonics Observed

## Requirements and Test Results (con't)

### Requirement:

#### FCC Section 15.231(b)(2) - Duty Cycle Determination-Pulsed Operation

Intentional radiators operating under the provisions of the Section shall demonstrate compliance with the limits on the field strength emissions, as shown in Table 1, based on the average value of the measured emissions. As an alternative, compliance with the limits in the Table 1 may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in Section 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of Section 15.205 shall be demonstrated using the measurement instrumentation specified in that Section.

#### IC RSS-GEN, Paragraph 4.5, Pulsed Operation

When the field strength (or envelope power) is not constant or when it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train, including blanking intervals within the pulse train, as long as the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 seconds, the average value (of field strength or output power) shall be determined during a 0.1 second interval during which the field strength or power is at its maximum value.

The unit's RF output was coupled to the input of the spectrum analyzer. The analyzer was set for a frequency span of 0 Hz. The sweep time was then adjusted in order to display one full pulse train. The transmitter on time was then summed and compared to the time for one full cycle in order to obtain the duty cycle. The pulse train exceeded 100msec so 100msec was used as the cycle time and the period with the "worst case" on time was used to calculate the duty cycle. (See plots for additional information).

- Results:  
The emissions did not exceed the limits specified in Table 1. See below for the exact method of calculating the average field strength.

$$\begin{aligned}\text{Transmitter On Time} &= \underline{6.65} \text{ milliseconds (maximum per cycle)} \\ \text{Transmitter Cycle Time} &= \underline{100} \text{ milliseconds (100 ms maximum)} \\ \text{Transmitter Duty Cycle} &= \underline{6.65} \%\end{aligned}$$

#### CALCULATION

$$\begin{aligned}\text{On time for long pulse} &= 2.805 \text{ milliseconds} \\ 2.805 \times 2 \text{ long pulses in 100msec} &= 5.61 \text{ milliseconds} \\ \text{On time short pulse} &= 0.521 \text{ milliseconds} \\ 0.521 \times 2 \text{ short pulses in 100msec} &= 1.042 \text{ milliseconds} \\ \text{Total on Time} &= 6.65 \text{ milliseconds} \\ \text{Duty Cycle (6.65/100)} &= 6.65 \% \\ \text{Correction Factor} = 20 \log (0.0665) &= 23.54 \text{ dB}\end{aligned}$$

## Requirements and Test Results (con't)

### Requirement:

#### FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions

The limits on the field strength of the spurious emissions specified in Table 1 are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in Table 1 or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.

#### IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions

The limits on the field strength of unwanted emissions in Table 4 of RSS-210 are based on the fundamental frequency of the intentional radiator. Unwanted emissions shall be attenuated to the limits shown in Table 2 of RSS-210 or to the limits shown in Table 4 of RSS-210, whichever is less stringent.

- Results:  
No spurious emissions were observed within 10 dB of the specified limit.

### Requirement:

#### FCC Section 15.231(c) - Bandwidth of Emissions

The bandwidth of the emissions 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 frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

- Results:  
The bandwidth was measured and did not exceed the specified limits. See Table 4 for the occupied bandwidth test results.

Table 4 – Occupied Bandwidth Test Results

<b>Fundamental Frequency MHz</b>	<b>Occupied Bandwidth kHz</b>	<b>Occupied Bandwidth Limit kHz</b>
340.0	424.85	850 kHz
347.0	424.85	867.5 kHz
354.0	424.85	885 kHz

## Requirements and Test Results (con't)

### IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals

For the purpose of Section A1.1, the 99% bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

- Results:  
The bandwidth was measured and did not exceed the specified limits. See Table 5 for the occupied bandwidth test results.

Table 5 – 99% Bandwidth Test Results

<b>Fundamental Frequency MHz</b>	<b>99% Bandwidth kHz</b>	<b>Occupied Bandwidth Limit kHz</b>
340.0	829.659	850 kHz
347.0	829.659	867.5 kHz
354.0	801.603	885 kHz

## **Equipment Lists**

### **FCC Section 15.231(b) - Field Strength of Emissions IC RSS-210, A1.1.2(1) - Field Strength and Frequency Bands**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	1/14/2010	1/14/2011
5070	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	1/14/2009	5/14/2010
8165	Biconilog	EMCO	26 - 2000 MHz	3142	11/12/2009	11/12/2010

### **FCC Section 15.231(b)(2) - Duty Cycle Determination - Pulsed Operation IC RSS-210, A1.1.2(2), RSS-GEN, 4.5 - Pulsed Operation**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
3130	20 dB Attenuator	Narda	DC - 18 GHz	768-20	1/11/2010	1/11/2011
5070	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	1/14/2009	5/14/2010

### **FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
3116	Pre-Amplifier	Miteq	0.1 GHz - 18 GHz	AFS42-35	1/12/2010	1/12/2011
3117	Power Supply	B&K Precision	0-30 Vdc, 3.0 A	1630	1/31/2010	1/31/2011
3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	1/14/2010	1/14/2011
5070	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	1/14/2009	5/14/2010
8165	Biconilog	EMCO	26 - 2000 MHz	3142	11/12/2009	11/12/2010

### **FCC Section 15.231(c) - Bandwidth of Emission IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
3130	20 dB Attenuator	Narda	DC - 18 GHz	768-20	1/11/2010	1/11/2011
5070	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	1/14/2009	5/14/2010

**FCC Section 15.231(b) - Field Strength of Emissions  
IC RSS-210, A1.1.2(1) - Field Strength and Frequency Bands**

**Photographs**



Test Configuration



Horizontal Antenna Polarization, 30 to 1000 MHz



Vertical Antenna Polarization, 30 to 1000 MHz



**FCC Section 15.231(b) - Field Strength of Emissions  
IC RSS-210, A1.1.2(1) - Field Strength and Frequency Bands**

**Test Data**

# RETLIF TESTING LABORATORIES

# TABULAR DATA SHEET

Test Method:	Fundamental Field Strength		
Customer:	LPA Design, Inc.	Job No:	R-5329N-1
Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver		
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.231(b)		
Operating Mode:	Continuously Transmitting		
Technician:	M.Seamans	Date:	April 22, 2010
Notes:	Corrected peak readings meet peak limit (20dB above average limit) per 15.35		

[illegible]

**FCC Section 15.231(b)(2) - Duty Cycle Determination - Pulsed Operation  
IC RSS-210, A1.1.2(2), RSS-GEN, 4.5 - Pulsed Operation**

**Test Photograph**



Test Setup

**FCC Section 15.231(b)(2) - Duty Cycle Determination - Pulsed Operation  
IC RSS-210, A1.1.2(2), RSS-GEN, 4.5 - Pulsed Operation**

**Test Data**

# RETLIF TESTING LABORATORIES

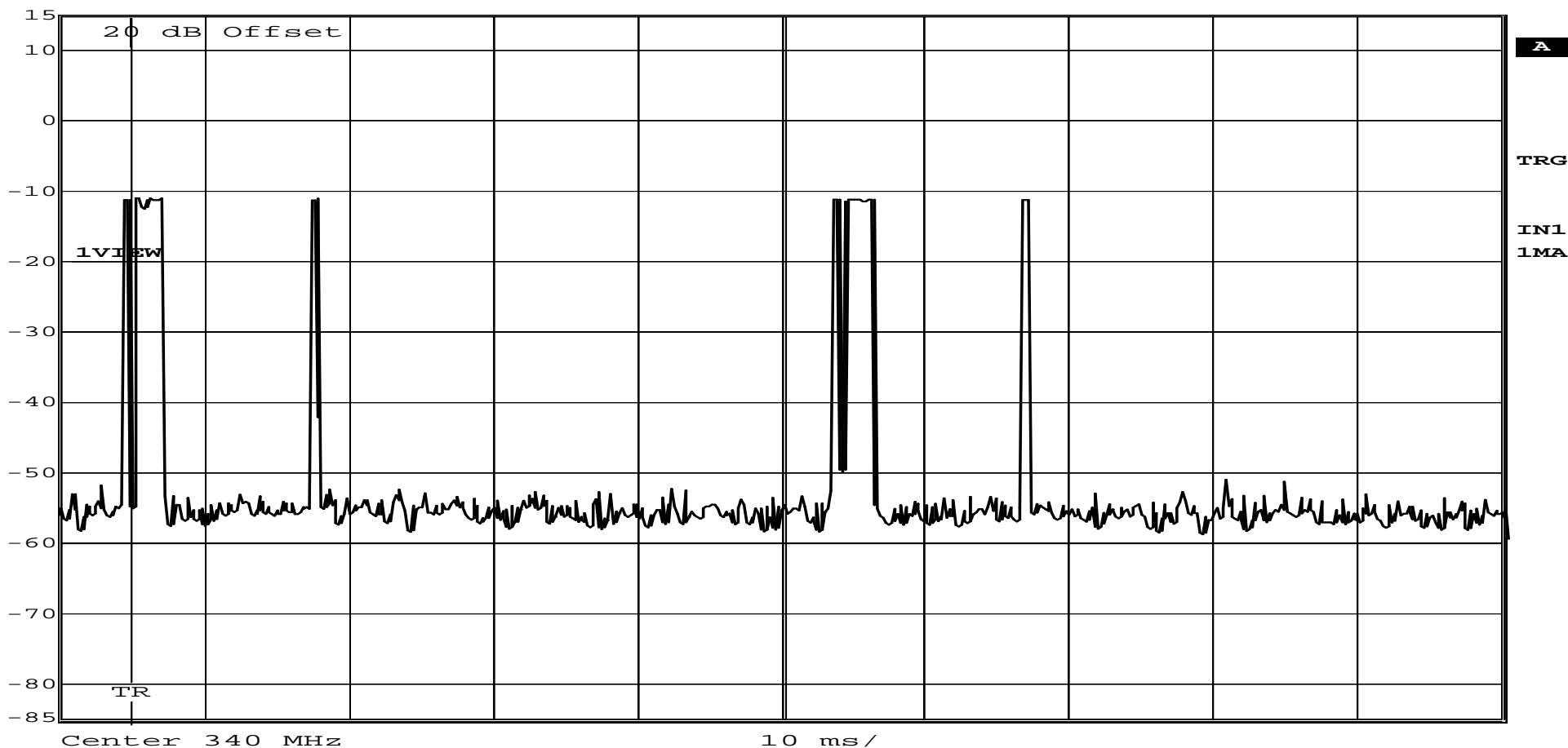
## EMISSIONS DATA SHEET

Test Method:	Duty Cycle Plots		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C	15.231(b)	Job No: R-5329N-1
Operating Mode:	Continuously Transmitting		Technician: M. Seamans
Notes:	Maximum Duty Cycle		Date: 4/22/2010



Ref Lvl  
15 dBm

RBW 100 kHz RF Att 20 dB  
VBW 100 kHz  
SWT 100 ms Unit dBm

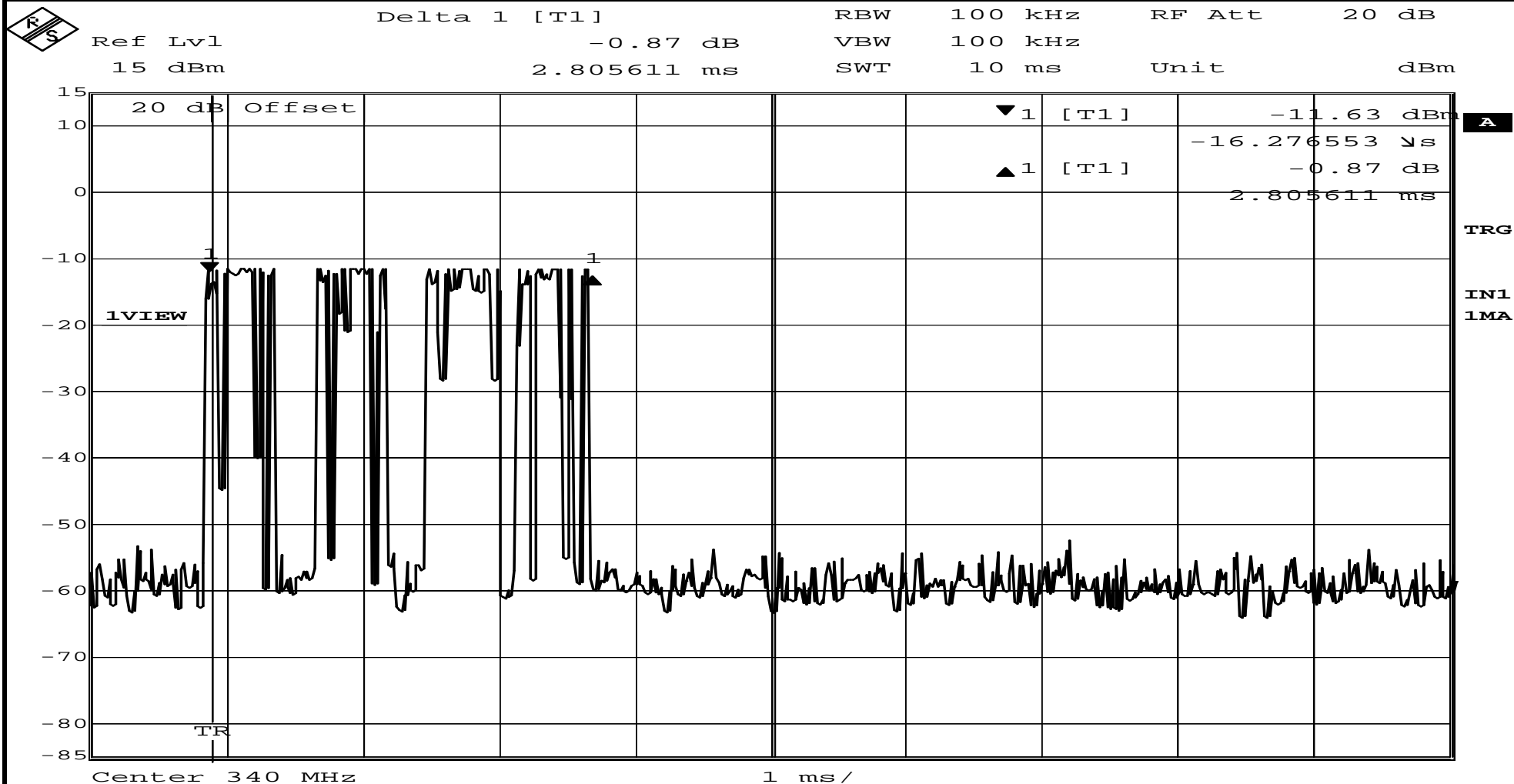


Date: 22.APR.2010 10:51:51

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Duty Cycle Plots		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C	15.231(b)	Job No: R-5329N-1
Operating Mode:	Continuously Transmitting		Technician: M. Seamans
Notes:	Maximum Duty Cycle		Date: 4/22/2010



Date: 22.APR.2010 10:53:53

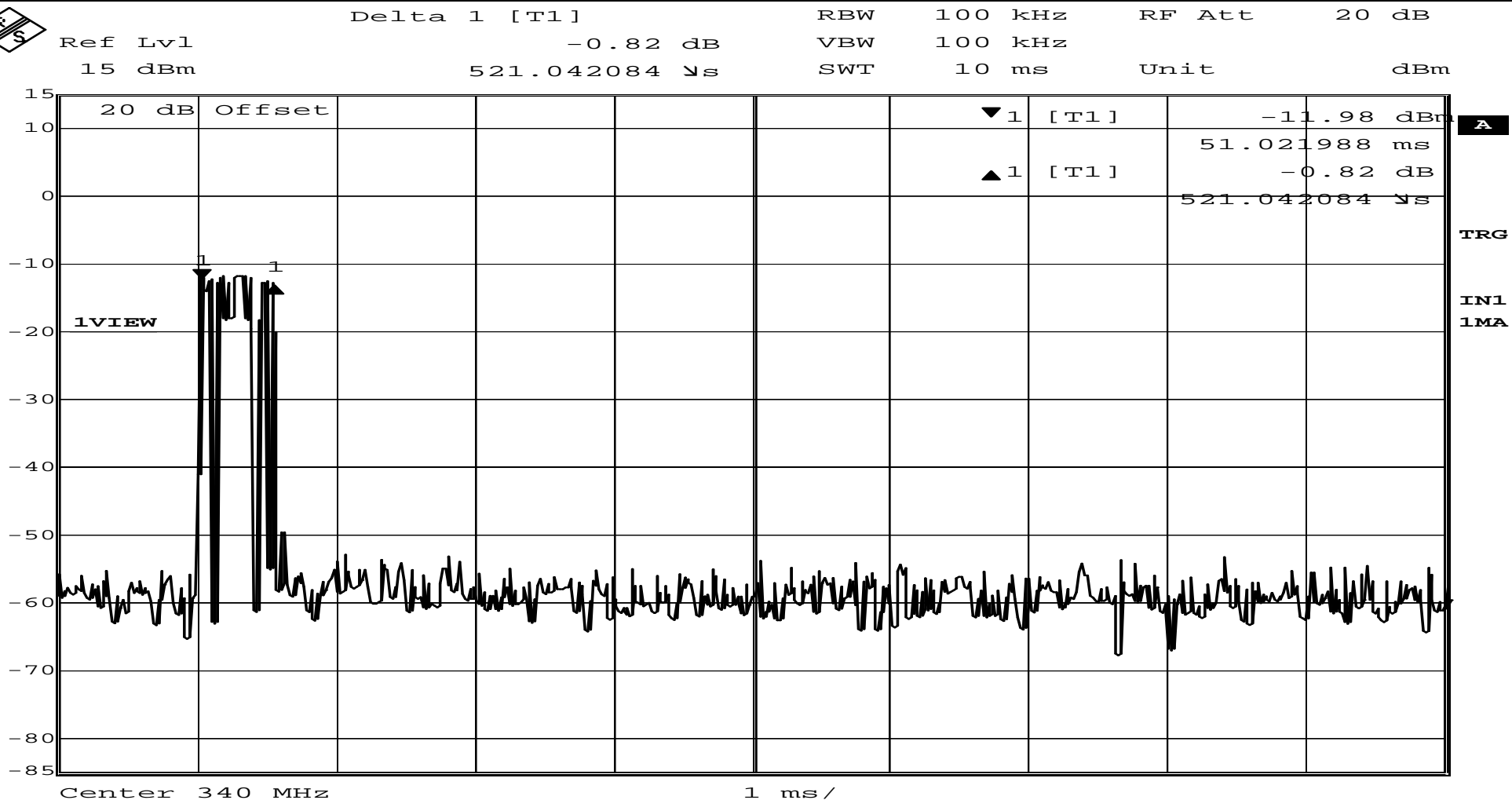
Data Sheet 2 of 3

R-5329N-1

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Duty Cycle Plots		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C	15.231(b)	Date: 4/22/2010
Operating Mode:	Continuously Transmitting		
Notes:	Maximum Duty Cycle		



Date: 22.APR.2010 10:55:41



**FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions  
IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions**

**Test Photographs**



Test Configuration



Horizontal Antenna Polarization, 30 to 1000 MHz



Vertical Antenna Polarization, 30 to 1000 MHz



Horizontal Antenna Polarization, 1 to 4 GHz



Vertical Antenna Polarization, 1 to 4 GHz

**FCC Section 15.231(b)(3) - Field Strength of Spurious Emissions  
IC RSS-210, A1.1.2(3) - Field Strength of Unwanted Emissions**

**Test Data**

# RETLIF TESTING LABORATORIES

## TABULAR DATA SHEET

<b>Test Method:</b>	Spurious Emissions 30MHz to 3.6GHz		
<b>Customer:</b>	LPA Design, Inc.	<b>Job No:</b>	R-5329N-1
<b>Test Sample:</b>	Nikon PocketWizard FLEX TT5 Transceiver		
<b>Model No:</b>	TT5-N-US	<b>Serial No:</b>	5NU000017
<b>Test Specification:</b>	FCC Part 15, Subpart C Paragraph: 15.231(b)		
<b>Operating Mode:</b>	Continuously Transmitting		
<b>Technician:</b>	M.Seamans	<b>Date:</b>	4/22/2010
<b>Notes:</b>	Fundamental Frequency: 340 MHz		

[illegible]

# RETLIF TESTING LABORATORIES

# TABULAR DATA SHEET

<b>Test Method:</b>	Spurious Emissions 30MHz to 3.6GHz		
<b>Customer:</b>	LPA Design, Inc.	<b>Job No:</b>	R-5329N-1
<b>Test Sample:</b>	Nikon PocketWizard FLEX TT5 Transceiver		
<b>Model No:</b>	TT5-N-US	<b>Serial No:</b>	5NU000017
<b>Test Specification:</b>	FCC Part 15, Subpart C Paragraph: 15.231(b)		
<b>Operating Mode:</b>	Continuously Transmitting		
<b>Technician:</b>	M.Seamans	<b>Date:</b>	4/22/2010
<b>Notes:</b>	Fundamental Frequency: 347 MHz		

[illegible]

# RETLIF TESTING LABORATORIES

# TABULAR DATA SHEET

<b>Test Method:</b>	Spurious Emissions 30MHz to 3.6GHz		
<b>Customer:</b>	LPA Design, Inc.	<b>Job No:</b>	R-5329N-1
<b>Test Sample:</b>	Nikon PocketWizard FLEX TT5 Transceiver		
<b>Model No:</b>	TT5-N-US	<b>Serial No:</b>	5NU000017
<b>Test Specification:</b>	FCC Part 15, Subpart C Paragraph: 15.231(b)		
<b>Operating Mode:</b>	Continuously Transmitting		
<b>Technician:</b>	M.Seamans	<b>Date:</b>	4/22/2010
<b>Notes:</b>	Fundamental Frequency: 354 MHz		

[illegible]



**FCC Section 15.231(c) - Bandwidth of Emission  
IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals**

**Test Photograph**



Test Setup

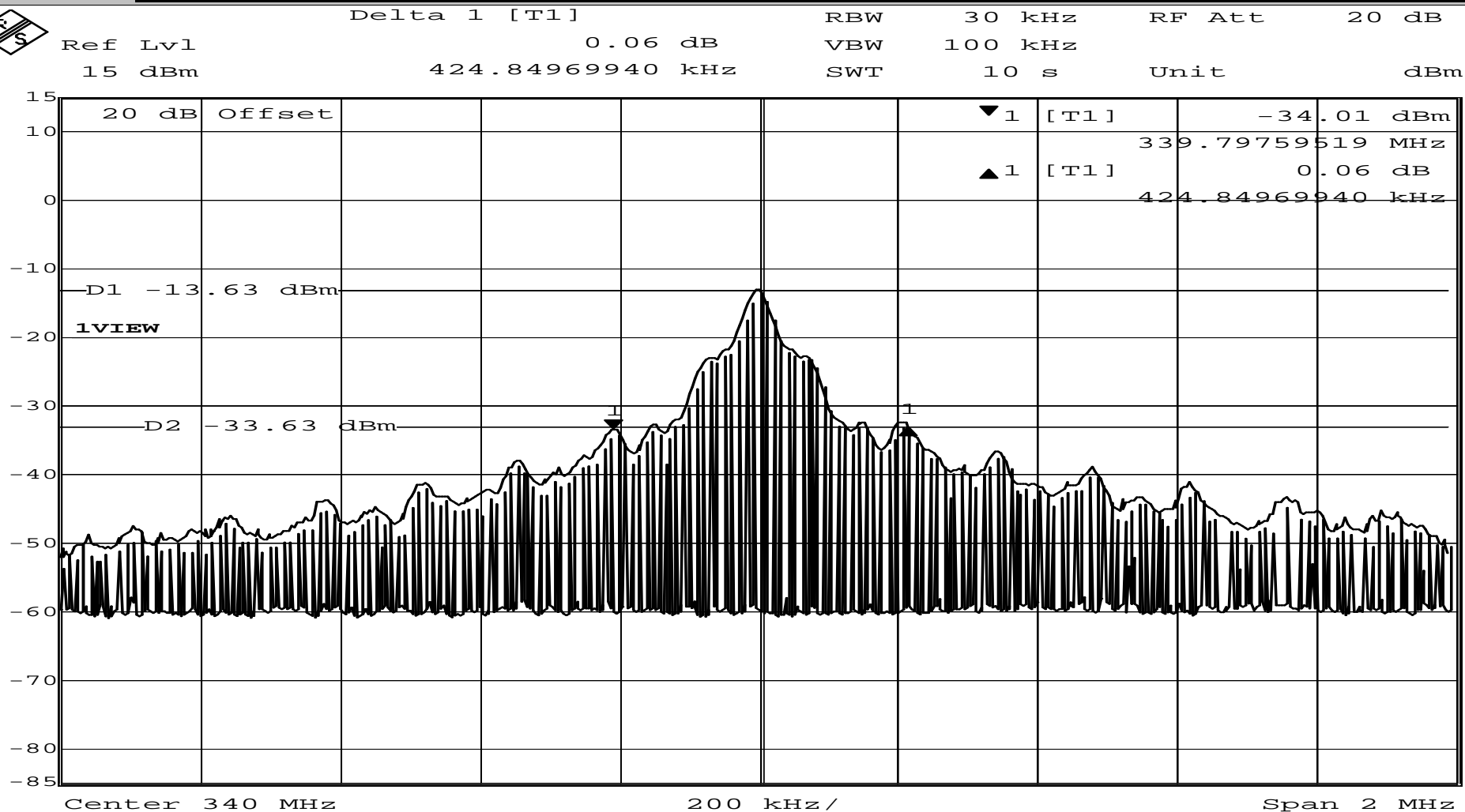
**FCC Section 15.231(c) - Bandwidth of Emission  
IC RSS-210, A1.1.3 - Bandwidth of Momentary Signals**

**Test Data**

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Occupied Bandwidth		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C	15.231(c)	Job No: R-5329N-1
Operating Mode:	Continuously Transmitting		
Notes:	Transmit Frequency 340 MHz Occupied Bandwidth: 424.849 kHz		
Technician: M. Seamans			
Date: 4/22/2010			

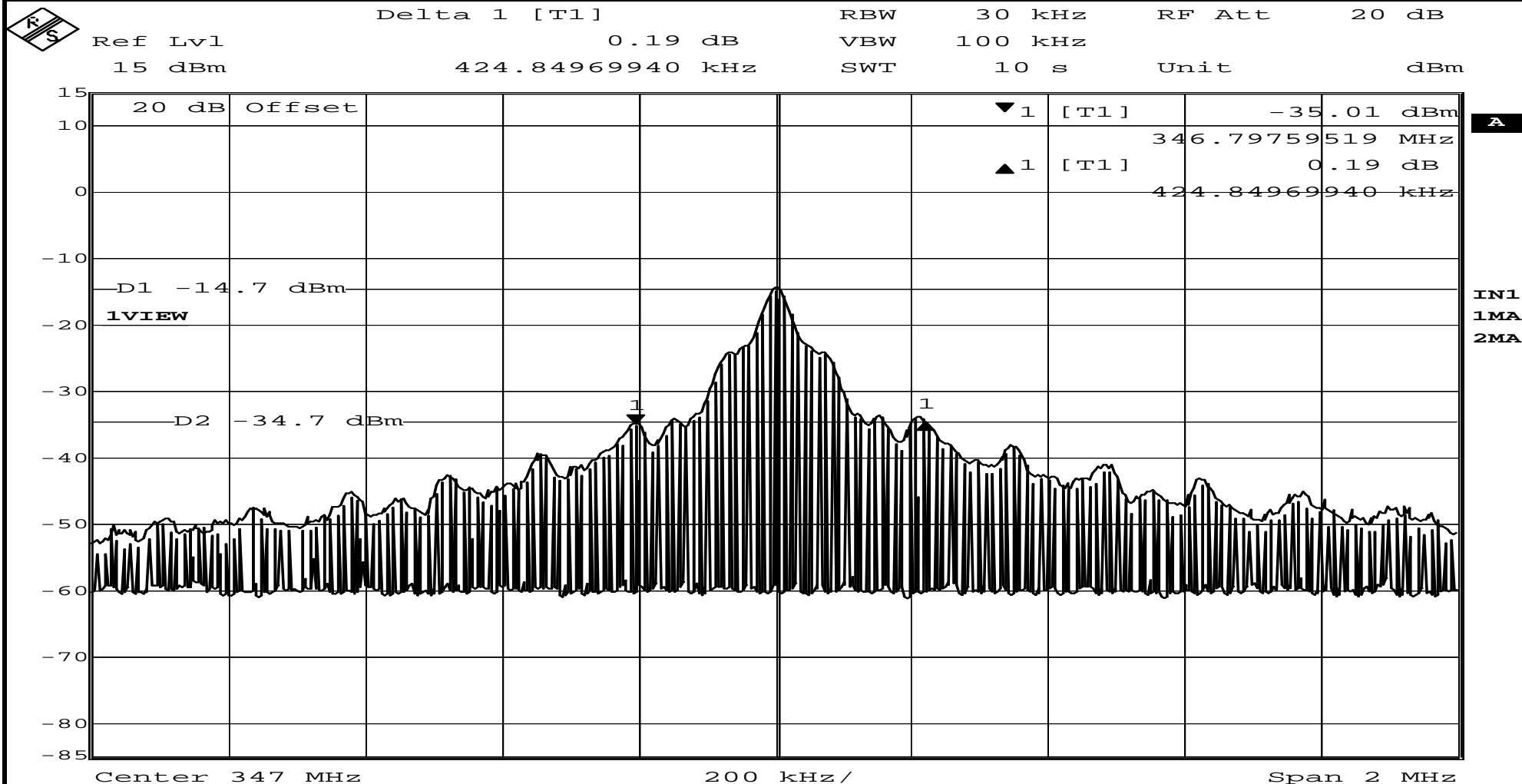


Date: 22.APR.2010 10:32:07

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Occupied Bandwidth		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C	15.231(c)	Date: 4/22/2010
Operating Mode:	Continuously Transmitting		
Notes:	Transmit Frequency 347 MHz Occupied Bandwidth: 424.849 kHz		



Date: 22.APR.2010 10:25:13

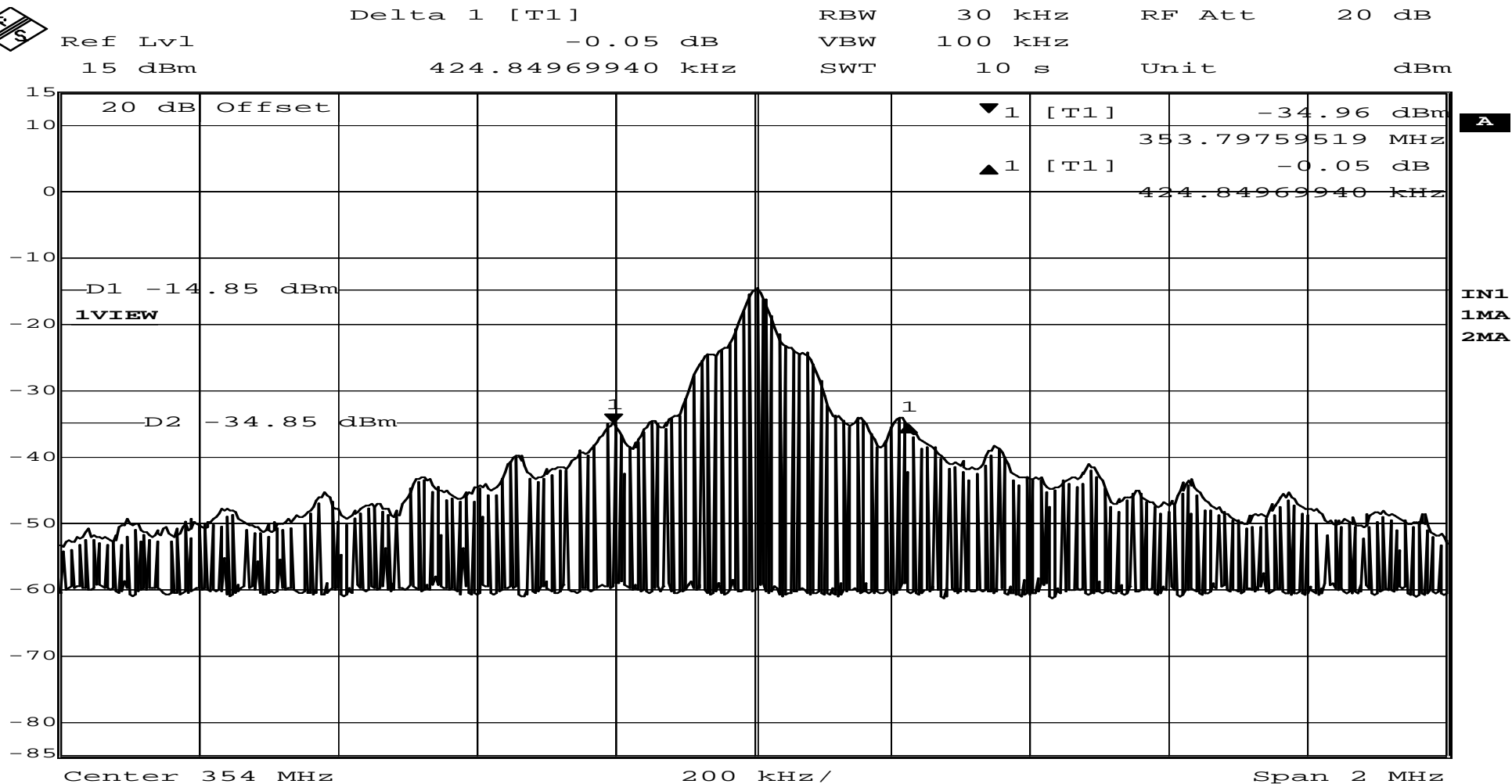
Data Sheet 2 of 3

R-5329N-1

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Occupied Bandwidth		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	FCC Part 15, Subpart C	15.231(c)	Job No: R-5329N-1
Operating Mode:	Continuously Transmitting		Technician: M. Seamans
Notes:	Transmit Frequency 354 MHz Occupied Bandwidth: 424.849 kHz		
Date:	4/22/2010		

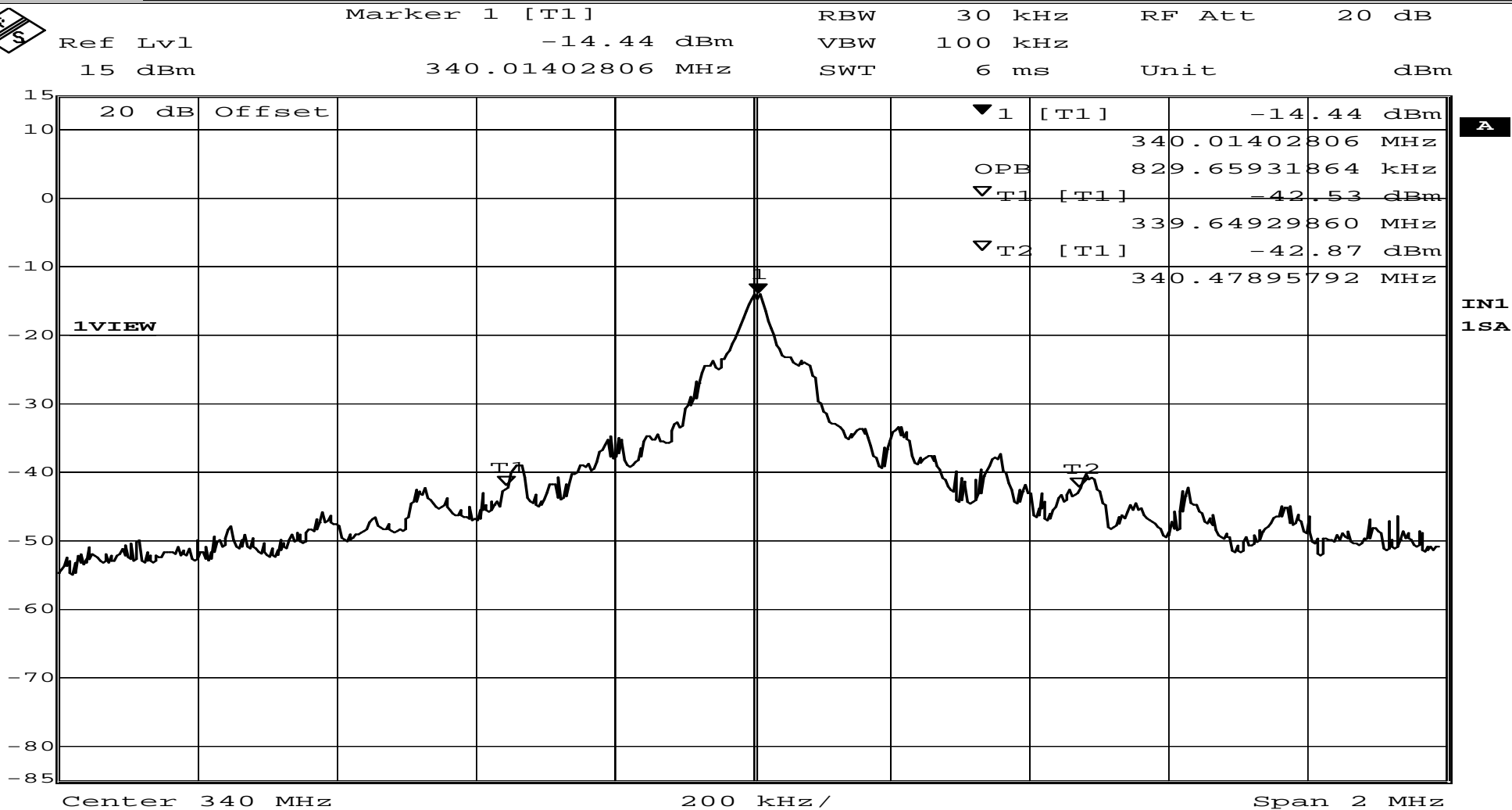


Date: 22.APR.2010 10:16:37

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	99% Bandwidth		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	RSS-210		Job No:
Operating Mode:	Continuously Transmitting		Technician:
Notes:	Transmit Frequency 340.0 MHz, 99% BW 829.659 kHz		Date:



Date: 22.APR.2010 09:25:03

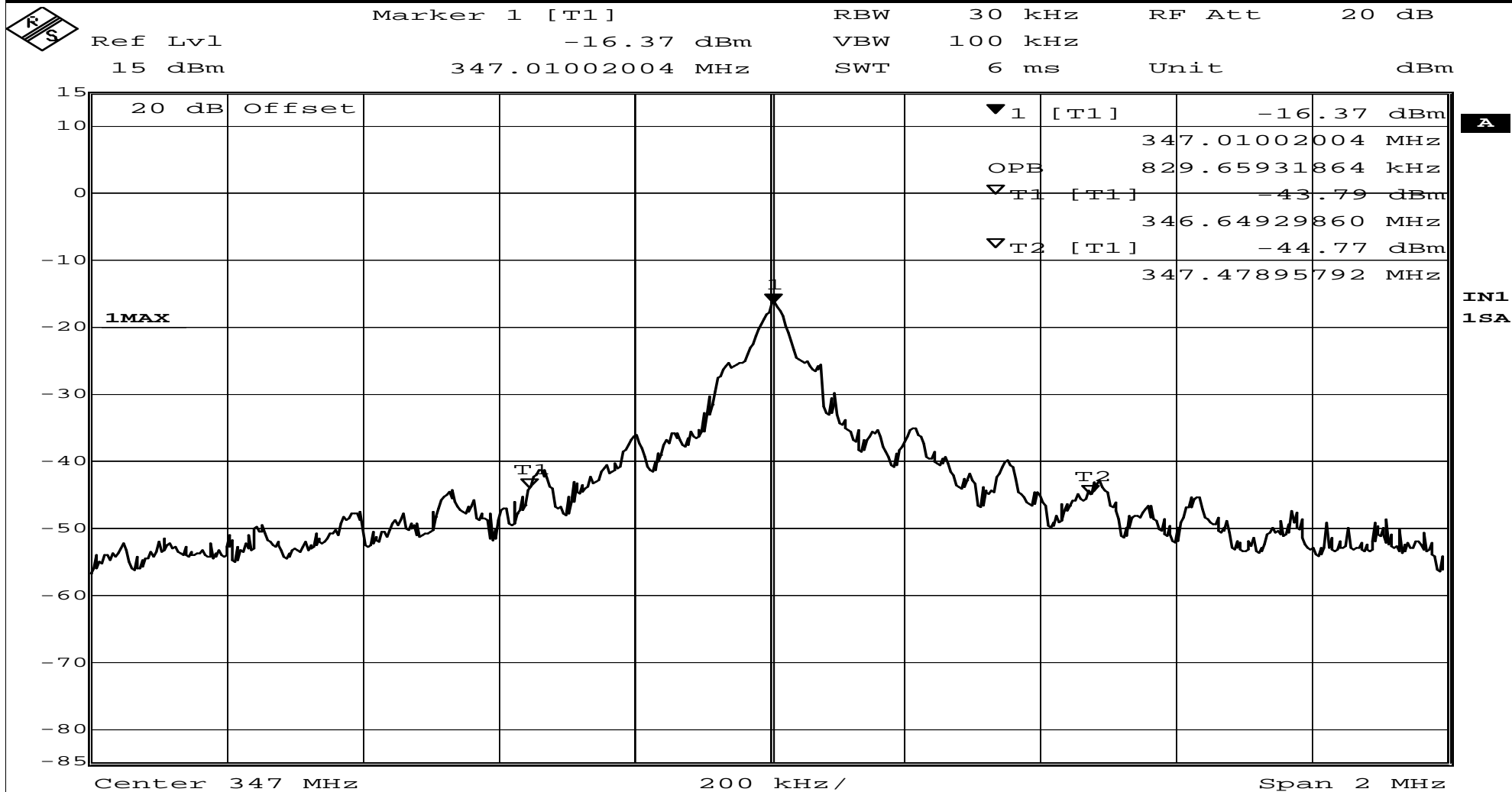
Data Sheet 1 of 3

R-5329N-1

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	99% Bandwidth		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	RSS-210		Job No:
Operating Mode:	Continuously Transmitting		Technician:
Notes:	Transmit Frequency 347.0 MHz, 99% BW 829.659 kHz		Date:



Date: 22.APR.2010 09:34:21

Data Sheet 2 of 3

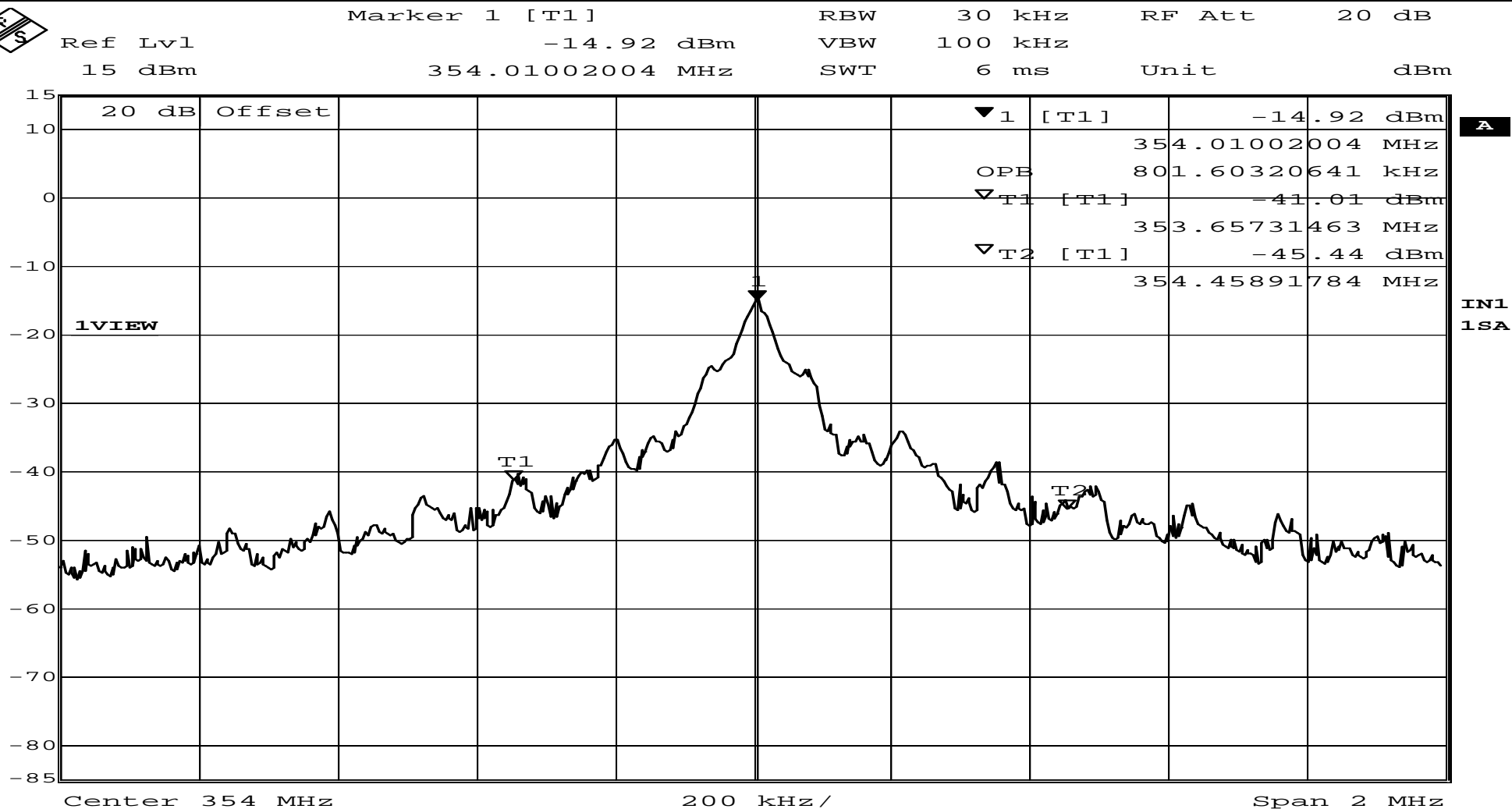
R-5329N-1



# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	99% Bandwidth		
Customer:	LPA Design, Inc.	Test Sample:	Nikon PocketWizard FLEX TT5 Transceiver
Model No:	TT5-N-US	Serial No:	5NU000017
Test Specification:	RSS-210		Job No:
Operating Mode:	Continuously Transmitting		Technician:
Notes:	Transmit Frequency 354.0 MHz, 99% BW 801.603 kHz		Date:



Date: 22.APR.2010 09:51:33  
 Data Sheet 3 of 3

R-5329N-1

**IC RSS-GEN, 4.10 - Field Strength of Receiver Spurious Emissions**

**Test Photographs**



Horizontal Antenna Polarization, 30 to 2000 MHz



Vertical Antenna Polarization, 30 to 2000 MHz

## **IC RSS-GEN, 4.10 - Field Strength of Receiver Spurious Emissions**

### **Test Data**

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

<b>Test Method:</b>	Radiated Emissions 30 MHz to 2 GHz		
<b>Customer</b>	LPA Design, Inc.	<b>Job No.</b>	R-5329N-2
<b>Test Sample</b>	Nikon PocketWizard Flex TT5 Transceiver		
<b>Model No.</b>	TT5-N-US	<b>Serial No.</b>	5NU000017
<b>Test Specification:</b>	RSS-Gen <div style="text-align: center;">n/a</div>		
<b>Operating Mode:</b>	Receiving Signal		
<b>Technician:</b>	M. Seamans	<b>Date:</b>	April 22, 2010
<b>Notes:</b>	Test Distance: 3 Meters Detector: Quasi-Peak<1000 MHz      Average>1000 MHz		

Test Frequency	Antenna Position	Turntable Position	Uncorrected Reading	Correction Factor	Corrected Reading					Limit at 3 Meters
MHz	(H/V) - Height	Degrees	dBuV	dB	dBuV/m					dBuV/m
30.00	-	-	-	-	-					40.0
	-	-	-	-	-					
35.00	H-1m	0.0	6.36	16.44	22.80	*				
35.00	V-1m	0.0	7.56	16.44	24.00	*				
	-	-	-	-	-					
88.00	-	-	-	-	-					40.0
88.00	-	-	-	-	-					43.5
	-	-	-	-	-					
110.00	H-1m	0.0	6.97	10.13	17.10	*				
110.00	V-1m	0.0	7.67	10.13	17.80	*				
195.00	H-1m	0.0	7.80	12.20	20.00	*				
195.00	V-1m	0.0	7.70	12.20	19.90	*				
205.00	H-1m	0.0	7.84	12.46	20.30	*				
205.00	V-1m	0.0	7.04	12.46	19.50	*				
	-	-	-	-	-					
216.00	-	-	-	-	-					43.5
216.00	-	-	-	-	-					46.0
	-	-	-	-	-					
600.00	H-1m	0.0	8.72	23.78	32.50	*				
600.00	V-1m	0.0	8.62	23.78	32.40	*				
	-	-	-	-	-					
960.00	-	-	-	-	-					46.0
960.00	-	-	-	-	-					54.0
	-	-	-	-	-					
995.00	H-1m	0.0	9.31	29.59	38.90	*				
995.00	V-1m	0.0	9.21	29.59	38.80	*				
	-	-	-	-	-					
2000.00	-	-	-	-	-					54.0

All EUT emissions observed and recorded were more than 10 db below the specified limit throughout the given frequency spectrum. \* This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).