

July 6, 2001

Federal Communications Commission
Equipment Authorization Branch
7435 Oakland Mills Road
Columbia, MD 21046

Dear Sir/Madam:

Enclosed you will find an application for Certification of PocketWizard Plus Intentional Radiator, FCC ID: KDS-PW2-002. Certification is requested to the requirements of Part 15, Subpart C of the Commission's rules. This application is being filed by Retlif Testing Laboratories on behalf of LPA Design.

I trust that you will find the enclosed application to be complete; however, should you have any questions or require any additional information, please feel free to contact us.

Very truly yours,

RETLIF TESTING LABORATORIES

Scott Wentworth
Manager

Enc. (as stated)

APPLICANT

LPA Design
1350 Shelburne Road
South Burlington, VT 05403

MANUFACTURER Test Report No. R-3378N1
FCC ID: KDS-PW2-002

SAME

TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

Test Report No. R-3378N1

FCC ID: KDS-PW2-002

_ TEST PROCEDURE: ANSI C63.4:1992

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

TEST SAMPLE DESCRIPTION

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

BRANDNAME: PocketWizard Plus MODEL: N/A
Test Report No. R-3378N1
FCC ID: KDS-PW2-002

TYPE: Intentional Radiator - Transmitter

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

POWER REQUIREMENTS: 3VDC (Internal Battery or External Power Supply)

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

FREQUENCY OF OPERATION: 344MHz

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

TESTS PERFORMED

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Para. 15.231(a), Radiated Emissions, Fundamental and Harmonics

Test Report No. R-3378N1

FCC ID: KDS-PW2-002

Para. 15.231(c), Occupied Bandwidth

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Para. 15.207(a), Conducted Emissions

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

REPORT OF MEASUREMENTS

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Applicant:

LPA Design

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Device:

Intentional Radiator - Transmitter

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

FCC ID:

KDS-PW2-002

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Power Requirements: 3VDC (Internal Battery or External Power Supply)

Test Report No. R-3378N1

FCC ID: KDS-PW2-002

Applicable Rule Section: Part 15, Subpart C, Section 15.231

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

REPORT OF MEASUREMENTS (continued)

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

TEST RESULTS

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

15.231 (a) -

The device is a transmitter for remote flash control of photographic strobes.

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

15.231 (a)(1) &- The transmitter is manually operated and ceases transmission less than 5

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

15.231 (2) seconds after deactivation.

15.231 (a)(3) - The transmitter does not perform periodic transmissions at regularly predetermined

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

intervals.

15.231 (a)(4)-

The device is not employed for RC purposes involving security.

15.231 (b) -

The fundamental field strength did not exceed 7,244 $\mu\text{V/M}$ (Average) at a test

distance of 3 meters. In addition, the requirements of section 15.35 for

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

averaging pulsed emissions and for limiting peak emissions were met.

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

The field strength of harmonic and spurious emissions did not exceed 724

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

$\mu\text{V/M}$ (AVERAGE).

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

15.231 (c) -

The device operates at a frequency range of 344MHz. The bandwidth of

emissions did not exceed 0.25% of the operating frequency (860kHz).

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

DETERMINATION OF FIELD STRENGTH LIMITS

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

The field strength limits shown below are found in Section 15.231.

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Frequency

Limit

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

F1 = 260 3750 = L1

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Fo = 344

Lo

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

F2 = 470 12500 = L2

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

The formula below was utilized to determine the limits:

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

$$\text{Limit} = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]$$

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Solving yields:

Fundamental Limit = 7,244 μ V/M (AVERAGE) @ 3 Meters

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Harmonic Limit = 724 μ V/M (AVERAGE) @ 3 Meters

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

REPORT OF MEASUREMENTS (continued)

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

DETERMINATION OF DUTY CYCLE

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

The unit's RF output was directly coupled to the input of the spectrum analyzer. The analyzer was

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

set for a frequency span of 0Hz. The sweep time was then adjusted in order to display one full pulse

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

train. The transmitter on time was then summed and compared to the time for one full cycle in order

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

to obtain the duty cycle.

Transmitter On Time = 0.450 milliseconds (maximum)

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Transmitter Cycle Time = 5.350 milliseconds

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Transmitter Duty Cycle = 0.0841

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

*See Attached Duty Cycle Timing Diagram

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

SPECTRUM ANALYZER DESENSITIZATION CONSIDERATIONS

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Due to the nature of the emissions being measured, care was taken to ensure that the resolution

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

bandwidth of the spectrum analyzer was adequate to provide accurate measurements.

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

GENERAL NOTES

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

1. All readings were taken utilizing a peak detector function at

a test distance of 3 meters.

2. The duty cycle was applied to the peak readings in order to

determine the average value of the emissions.

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

3. The frequency range for radiated emissions was scanned from 30

MHz to 3.4 GHz. The frequency range for conducted emissions

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

was scanned from 450 kHz to 30 MHz.

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

EQUIPMENT LIST

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Radiated Emissions

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

EN	Type	Manufacturer	Frequency Range	Model No.	Cal Date	Due Date
----	------	--------------	-----------------	-----------	----------	----------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

3116 Pre-Amplifier

Miteq

0.1 GHz - 18 GHz

AFS42-35

12/3/98

12/3/99

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

3118 Broadband Pre-Amplifier Electro-Metrics 10 KHz - 1 GHz BPA-1000 6/24/98 6/24/99

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	4/3/98	4/3/99
------	--------------------	------	------------	------	--------	--------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4029	Open Area Test Site	Retlif	3 / 10 Meters	RNH	6/15/98	6/15/99
------	---------------------	--------	---------------	-----	---------	---------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4202 Biconilog

EMCO

26 MHz - 2 GHz

3142

6/10/98

6/10/99

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4895 Spectrum Analyzer

Hewlett Packard

9kHz - 22GHz

8593EM

9/18/98

9/18/99

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4896	Graphics Plotter	Hewlett Packard	N/A	7470A	8/23/98	8/23/99
------	------------------	-----------------	-----	-------	---------	---------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

EQUIPMENT LIST

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

Conducted Emissions

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

EN	Type	Manufacturer	Frequency Range	Model No.	Cal Date	Due Date
----	------	--------------	-----------------	-----------	----------	----------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

3107	Spectrum Analyzer	Advantest	10 KHz - 3 GHz	4131B	2/9/98	2/9/99
------	-------------------	-----------	----------------	-------	--------	--------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4027 LISN

Solar Electronics

10 KHz - 30 MHz

9252-50-R-24BNC

6/24/98

6/24/99

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4028	Isolation Transformer	Acme	N/A	120x240	1/24/98	1/24/99
------	-----------------------	------	-----	---------	---------	---------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4050	Transient Limiter	Hewlett Packard	9 KHz - 200 MHz	11970K	12/9/98	12/9/99
------	-------------------	-----------------	-----------------	--------	---------	---------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

4896	Graphics Plotter	Hewlett Packard	N/A	7470A	8/23/98	8/23/99
------	------------------	-----------------	-----	-------	---------	---------

Test Report No. R-3378N1
FCC ID: KDS-PW2-002

