

APPLICANT Fomotech International Corporation 2F-1, 286-3, Hsin Ya Road Chein, Chen District, Kaoshing, Taiwan	MANUFACTURER SAME AS APPLICANT
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TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

TEST PROCEDURE: ANSI C63.4:1992

TEST SAMPLE DESCRIPTION

BRANDNAME: Fomotech International Corporation MODEL: Twister 2X

TYPE: Pulsed RF Transmitter

POWER REQUIREMENTS: 7.2 VDC from rechargeable battery

FREQUENCY OF OPERATION: 433 MHz

TESTS PERFORMED

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

Para. 15.209(a), Radiated Emissions, Spurious Case

Para. 15.231(c), Occupied Bandwidth

Duty Cycle Determination

REPORT OF MEASUREMENTS

Applicant: Fomotech International Corporation

Device: 433 MHz Pulsed RF Transmitter

FCC ID: LZ6TWISTER2XA5000

Power Requirements: 7.2 VDC from rechargeable battery

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

Test Report No. R-8697-1
FCC ID: LZ6TWISTER2XA5000

REPORT OF MEASUREMENTS (continued)

TEST RESULTS

- 15.231 (a) - The device is used as a transmitter for RF Remote Control purposes.
- 15.231 (a)(1) & - The transmitter is manually operated and ceases transmission within 5
15.231(2) seconds after deactivation.
- 15.231 (a)(3) - The transmitter does not perform periodic transmissions.
- 15.231 (a)(4)- Not applicable
- 15.231 (b) - The fundamental field strength did not exceed 10,960 $\mu\text{V/M}$ (Average) at a test distance of 3 meters. In addition, the requirements of section 15.35 for averaging pulsed emissions and for limiting peak emissions were met.
- The field strength of harmonic and spurious emissions did not exceed 1,096 $\mu\text{V/M}$ (AVERAGE).
- 15.231 (c) - The device operates at 433 MHz. The bandwidth of emissions did not exceed 0.25% of the operating frequency (1083 kHz).

DETERMINATION OF FIELD STRENGTH LIMITS

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

	Frequency		Limit
F1	= 260	3750 =	L1
Fo	= 433		Lo
F2	= 470	12500 =	L2

The formula below was utilized to determine the limits:

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

Solving yields:

Fundamental Limit = 10,960 $\mu\text{V/M}$ (AVERAGE) @ 3 Meters

Harmonic Limit = 1,096 $\mu\text{V/M}$ (AVERAGE) @ 3 Meters

REPORT OF MEASUREMENTS (continued)

DETERMINATION OF DUTY CYCLE

The unit's RF output was directly coupled to the input of the spectrum analyzer. The analyzer was set for a frequency span of 0Hz. 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. (See plots for additional information)

Transmitter On Time	=	50 milliseconds (maximum- worst case in 100 ms)
Transmitter Cycle Time	=	Greater than 100 milliseconds
Transmitter Duty Cycle	=	50 %

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. The following formula was utilized:

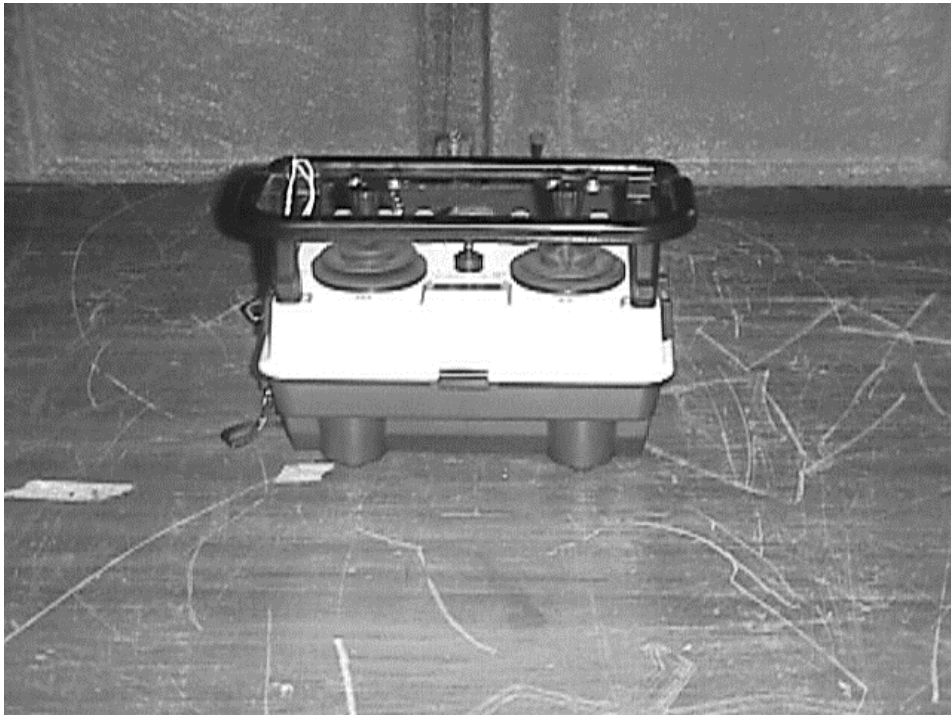
Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 500 μ s yields a minimum required bandwidth of 1333 Hz. FCC specified bandwidths of 100kHz and 1MHz were utilized below and above 1GHz, respectively.

REPORT OF MEASUREMENTS (continued)

GENERAL NOTES

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.
3. All measurements were made with a fully charged 7.2 VDC rechargeable Lithium battery.
4. The frequency range was scanned from 30 MHz to 4.3 GHz. All emissions not reported were more than 20 dB below the specified limit.

TEST SETUP PHOTOGRAPH
RADIATED EMISSIONS



EQUIPMENT LIST

Radiated Emissions, 30MHz-4.34GHz

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	10/15/2000	10/15/2003
128C	Double Ridge Guide	Eaton Corporation	1 GHz - 18 GHz	96001	09/18/2000	09/18/2001
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	06/13/2000	06/13/2001
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	08/03/2000	02/03/2001
141A	Graphics Plotter	Hewlett Packard	N/A	7470A	03/08/2000	03/08/2001
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	08/02/2000	02/02/2001
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	06/13/2000	06/13/2001
523	Biconilog	Electro-Mechanics	26 - 2000 MHz	3142B	06/08/2000	06/08/2001
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	06/16/1999	06/16/2001
617	Interference Analyzer	Electro-Metrics	10 kHz - 1 GHz	EMC-30	01/17/2000	01/17/2001

FCC 15.209(a)

RADIATED EMISSIONS

(Please see separate e-file attachment named REFundHarm.doc and RESpurious.doc)

FCC 15.231(c)

OCCUPIED BANDWIDTH

(Please see separate e-file attachment named Occbw.pdf)