

APPLICANT

Fomotech International Corporation
2F-1, 286-3, Hsin Ya Road
Chein Chen District
Kaohsing, Taiwan

MANUFACTURER

Fomotech International Corporation
2F-1, 286-3, Hsin Ya Road
Chein Chen District
Kaohsing, Taiwan

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 Corp. MODEL: Alpha 560

TYPE: 301.4 MHz Low Power Remote Control Transmitter

POWER REQUIREMENTS: 4.5 VDC derived from (3) 1.5 VDC "AA" Batteries

FREQUENCY OF OPERATION: 301.4 MHz

TESTS PERFORMED

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

Para. 15.231(c), Occupied Bandwidth

**Retlif Testing Laboratories**

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

REPORT OF MEASUREMENTS

Applicant: Fomotech International Corp.
Device: 301.4 MHz Low Power Remote Control Transmitter
FCC ID: LZ6ALPHA506SERIES
Power Requirements: 4.5 VDC derived from (3) 1.5 VDC "AA" Batteries
Applicable Rule Section: Part 15, Subpart C, Section 15.231

TEST RESULTS

- 15.231 (a) - The device is used for industrial remote control/security applications (ie: remote control of cranes, hoists, trolleys, etc.)
- 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)- The device is employed for RC purposes involving security as described in Paragraph 15.231(a) above.
- 15.231 (b) - The fundamental field strength did not exceed 5546 $\mu\text{V/M}$ (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 546 $\mu\text{V/M}$ (AVERAGE).
- 15.231 (c) - The device operates at 301.4 MHz. The bandwidth of emissions did not exceed 0.25% of the operating frequency (752.7Hz).



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

REPORT OF MEASUREMENTS (continued)

DETERMINATION OF FIELD STRENGTH LIMITS

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

Frequency			Limit		
F1	=	260	3750	=	L1
Fo	=	301.4			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:

$$\text{Fundamental Limit} = 5,460 \mu\text{V/M (AVERAGE) @ 3 Meters}$$

$$\text{Harmonic Limit} = 546 \mu\text{V/M (AVERAGE) @ 3 Meters}$$

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.

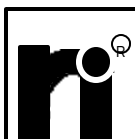
$$\text{Transmitter On Time} = >100.0 \text{ milliseconds (maximum- worst case in 100 ms)}$$

$$\text{Transmitter Cycle Time} = >100 \text{ milliseconds}$$

$$\text{Transmitter Duty Cycle} = 100 \%$$

SPECTRUM ANALYZER DESENSITIZATION CONSIDERATIONS

NOT APPLICABLE - The device transmits a Continuous Wave (CW) signal.



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

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 (3) new 1.5 VDC “AA” batteries installed in the unit.
4. The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not reported were more than 20 dB below the specified limit.



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

Exhibit 6

Report of Measurements

Radiated Emissions Data, Para. 15.231(a)



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

Test Method:		FCC Part 15 Subpart C Radiated Emissions Paragraph 15.231(b)					
Customer:		Mitsuboshi Boeki, Inc			Job No.	R-8870-1	
Test Sample:		Remote Control Transmitter			FCC ID:	LZ6ALPHA506SERIES	
Model No.:		Alpha 560			Serial No.	00500056	
Operating Mode:		Continuously Transmitter 301.4 Mhz Signal					
Technician:		Dennis Cortes			ate:	March 31,1999	
Notes:		Test Distance: 3 Meters		Temp: 20C Humidity: 18%			
		Detector: Peak		Duty Cycle: 100%			
Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Average Limit
Mhz	(V/H) / Degrees	X / Y / Z	dBuv	dB	dBuV/m	uV/m	uV/m
301.4	H / 1.0	X	61.8	-4.3	57.5	749.9	5460
301.4	H / 1.0	Y	73.0	-4.3	68.7	2722.7	5460
301.4	H / 1.0	Z	73.7	-4.3	69.4	2951.2	5460
301.4	V / 1.4	X	72.3	-4.3	68.0	2511.9	5460
301.4	V / 1.0	Y	62.1	-4.3	57.8	776.2	5460
301.4	V / 1.0	Z	63.0	-4.3	58.7	861.0	5460
602.9	H / 1.0	X	31.0	2.5	33.5	47.3	546
602.9	H / 1.0	Y	37.9	2.5	40.4	104.7	546
602.9	H / 1.3	Z	37.1	2.5	39.6	95.5	546
602.9	V / 1.5	X	37.5	2.5	40.0	100.0	546
602.9	V / 1.5	Y	32.8	2.5	35.3	58.2	546
602.9	V / 1.2	Z	32.7	2.5	35.2	57.5	546
904.4	H / 1.0	X	26.3	7.2	33.5	*47.3	546
904.4	H / 1.0	Y	26.3	7.2	33.5	*47.3	546
904.4	H / 1.0	Z	26.3	7.2	33.5	*47.3	546
904.4	V / 1.0	X	26.3	7.2	33.5	*47.3	546
904.4	V / 1.0	Y	26.3	7.2	33.5	*47.3	546
904.4	V / 1.0	Z	26.3	7.2	33.5	*47.3	546
1205.9	H / 1.0	X	45.0	-3.9	41.1	113.5	500
1205.9	H / 1.1	Y	44.8	-3.9	40.9	110.9	500
1205.9	H / 1.0	Z	45.1	-3.9	41.2	114.8	500
1205.9	V / 1.0	X	46.1	-3.9	42.2	128.8	500
1205.9	V / 1.0	Y	46.8	-3.9	42.9	139.6	500
1205.9	V / 1.5	Z	45.6	-3.9	41.7	121.6	500
1507.3	H / 1.0	X	42.4	-1.3	41.1	*113.5	500
1507.3	H / 1.0	Y	42.4	-1.3	41.1	*113.5	500
1507.3	H / 1.0	Z	42.4	-1.3	41.1	*113.5	500
1507.3	V / 1.0	X	42.4	-1.3	41.1	*113.5	500
1507.3	V / 1.0	Y	42.4	-1.3	41.1	*113.5	500
1507.3	V / 1.0	Z	42.4	-1.3	41.1	*113.5	500
	The frequency range was scanned from 30 Mhz to 3.1 Ghz. All emissions not recorded were more						
	Than 10 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (Minimum system sensitivity)						



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

Test Method:	FCC Part 15 Subpart C Radiated Emissions Paragraph 15.231(b)						
Customer:	Mitsuboshi Boeki, Inc				Job No.	R-8870-1	
Test Sample:	Remote Control Transmitter				FCC ID:	LZ6ALPHA506SERIES	
Model No.:	Alpha 560				Serial No.	00500056	
Operating Mode:	Continuously Transmitter 301.4 Mhz Signal						
Technician:	Dennis Cortes				Date:	March 31,1999	
Notes:	Test Distance: 3 Meters Temp: 20C Humidity: 18% Detector: Peak Duty Cycle: 100%						
Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Average Limit
Mhz	(V/H) / Degrees	X / Y / Z	dBuv	dB	dBuV/m	UV/m	uV/m
1808.8	H / 1.0	X	42.8	1.5	44.3	*164.1	546
1808.8	H / 1.0	Y	42.8	1.5	44.3	*164.1	546
1808.8	H / 1.0	Z	42.8	1.5	44.3	*164.1	546
1808.8	V / 1.0	X	42.8	1.5	44.3	*164.1	546
1808.8	V / 1.0	Y	42.8	1.5	44.3	*164.1	546
1808.8	V / 1.0	Z	42.8	1.5	44.3	*164.1	546
2110.3	H / 1.0	X	42.7	-1.4	41.3	*116.1	546
2110.3	H / 1.0	Y	42.7	-1.4	41.3	*116.1	546
2110.3	H / 1.0	Z	42.7	-1.4	41.3	*116.1	546
2110.3	V / 1.0	X	42.7	-1.4	41.3	*116.1	546
2110.3	V / 1.0	Y	42.7	-1.4	41.3	*116.1	546
2110.3	V / 1.0	Z	42.7	-1.4	41.3	*116.1	546
2411.8	H / 1.0	X	42.6	-0.3	42.3	*130.3	546
2411.8	H / 1.0	Y	42.6	-0.3	42.3	*130.3	546
2411.8	H / 1.0	Z	42.6	-0.3	42.3	*130.3	546
2411.8	V / 1.0	X	42.6	-0.3	42.3	*130.3	546
2411.8	V / 1.0	Y	42.6	-0.3	42.3	*130.3	546
2411.8	V / 1.0	Z	42.6	-0.3	42.3	*130.3	546
2713.2	H / 1.0	X	42.8	0.9	43.7	*153.1	500
2713.2	H / 1.0	Y	42.8	0.9	43.7	*153.1	500
2713.2	H / 1.0	Z	42.8	0.9	43.7	*153.1	500
2713.2	V / 1.0	X	42.8	0.9	43.7	*153.1	500
2713.2	V / 1.0	Y	42.8	0.9	43.7	*153.1	500
2713.2	V / 1.0	Z	42.8	0.9	43.7	*153.1	500
3014.7	H / 1.0	X	42.9	3.1	46.0	*199.5	546
3014.7	H / 1.0	Y	42.9	3.1	46.0	*199.5	546
3014.7	H / 1.0	Z	42.9	3.1	46.0	*199.5	546
3014.7	V / 1.0	X	42.9	3.1	46.0	*199.5	546
3014.7	V / 1.0	Y	42.9	3.1	46.0	*199.5	546
3014.7	V / 1.0	Z	42.9	3.1	46.0	*199.5	546
	The frequency range was scanned from 30 Mhz to 3.1 Ghz. All emissions not recorded were more						
	Than 10 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (Minimum system sensitivity)						



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

Exhibit 6

Report of Measurements

Occupied Bandwidth, Para. 15.231(c)



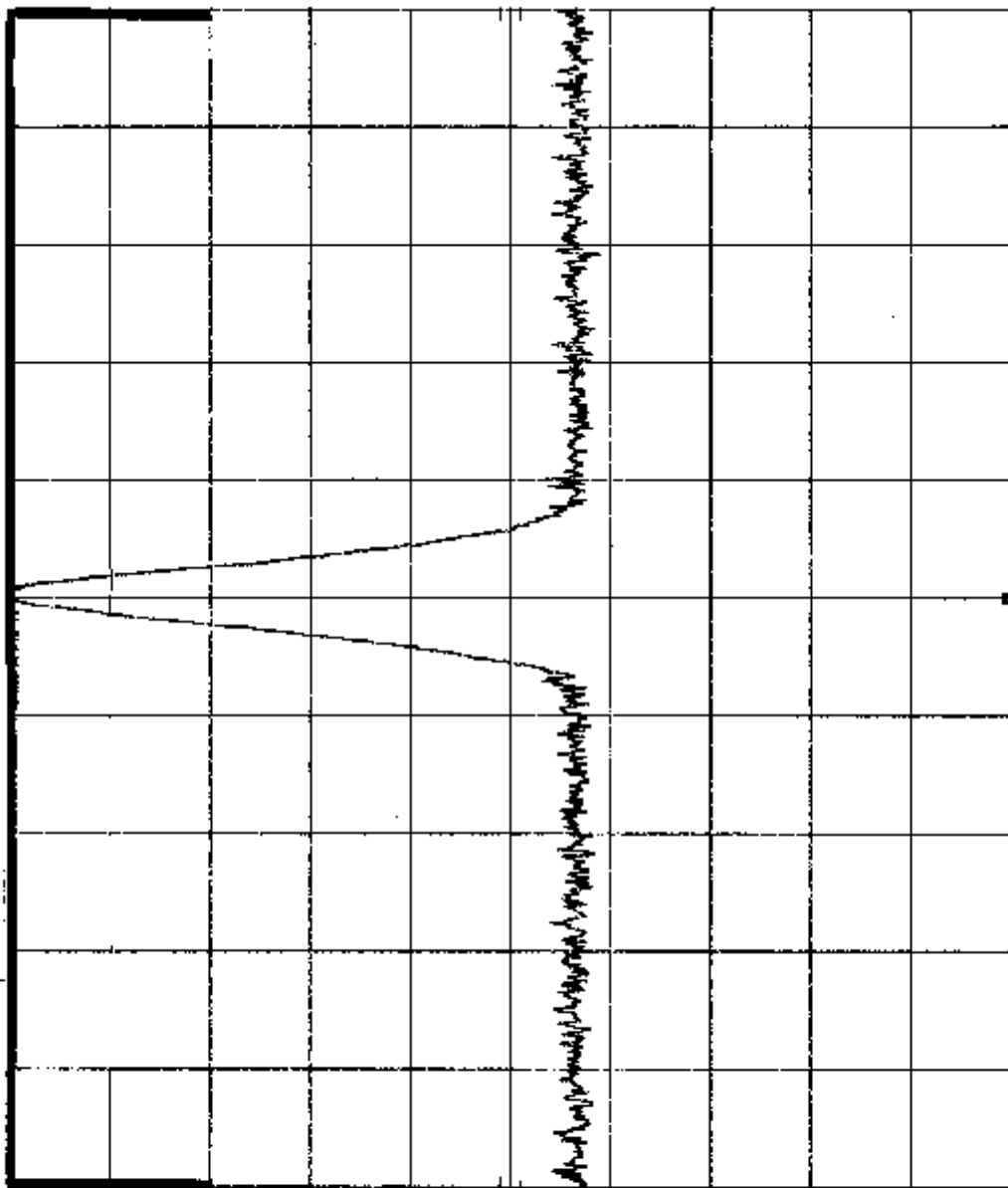
Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

R-8027 OCC BW 3/31/99 DC
REF 72.8 dBμV ATTN 10 dB

hp

10 dB/



CENTER 301.480 MHz
RES BW 10 kHz
SPAN 754 kHz
SWP 30.0 msec
VBW 30 kHz



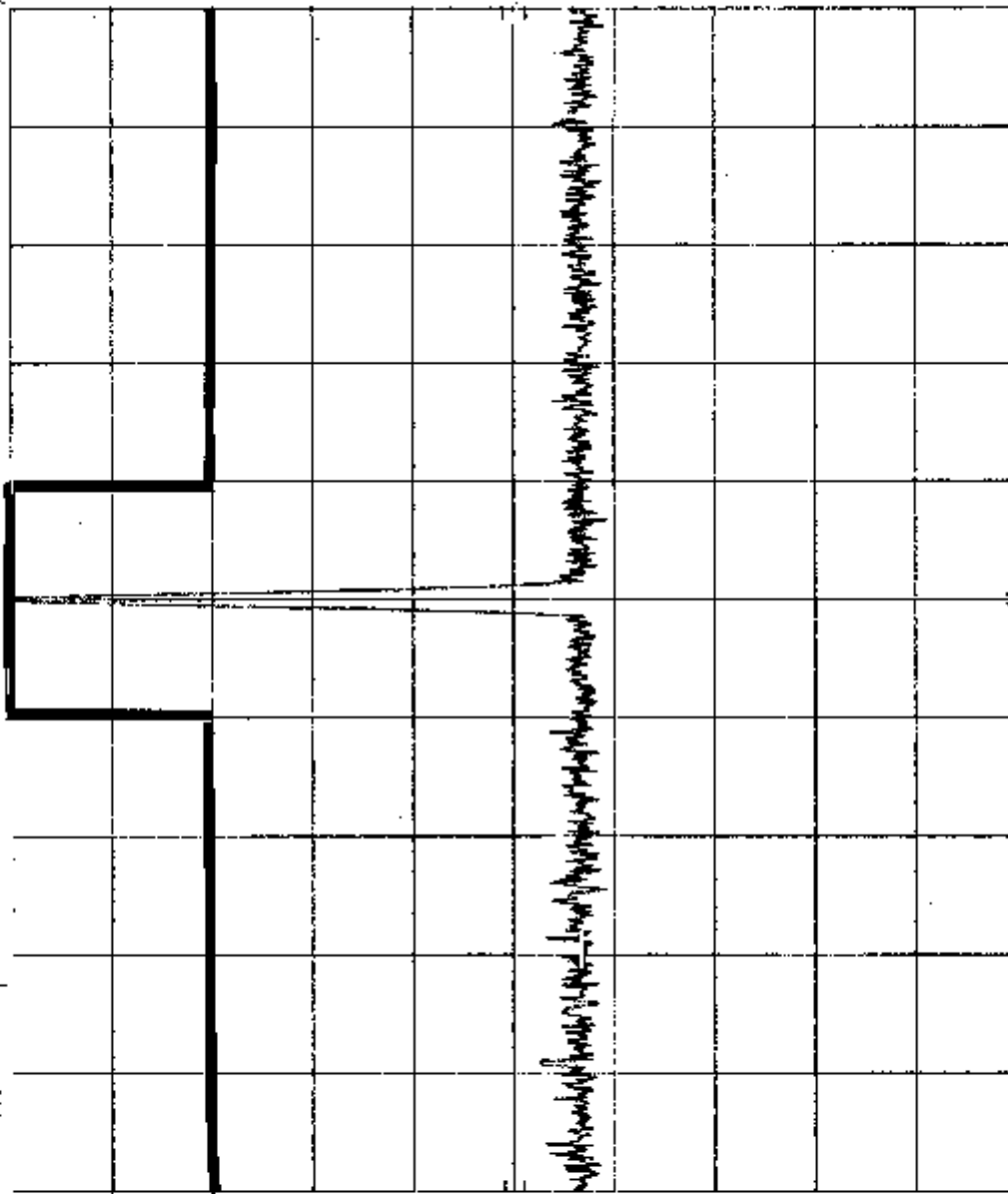
Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

R-8027 OCC BW 3/31/99 DC
REF 72.8 dBμV ATTN 10 dB

HP

10 dB/



CENTER 301.48 MHz
RES BW 10 kHz
VBW 30 kHz
SPAN 3.77 MHz
SWP 113 msec



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES

EQUIPMENT LIST

FCC Paragraph 15.231(b) Radiated Emissions. 30 MHz to 3.1 GHz

EN	Type	Manufacturer	Frequency Range	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	8/30/97	8/30/99
128C	Double Ridge Guide	Eaton Corporation	1 GHz - 18 GHz	96001	10/6/98	10/6/99
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	6/22/98	6/22/99
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	3/16/99	9/16/99
141A	Graphics Plotter	Hewlett Packard	N/A	7470A	3/5/99	3/5/00
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	3/16/99	9/16/99
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	6/22/98	6/22/99
523	Biconilog	Electro-Mechanics	26 - 2000 MHz	3142B	10/22/98	4/22/00
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	9/3/98	9/3/99



Retlif Testing Laboratories

Test Report No. R-8870-1
FCC ID: LZ6ALPHA506SERIES