APPLICANT	MANUFACTURER
Fomotech International Corporation 2F-1, 286-3, Hsin Ya Road Chein, Chen District, Kaoshing, Taiwan	SAME AS APPLICANT

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: Alpha 580

TYPE: Pulsed RF Transmitter

POWER REQUIREMENTS: 3 VDC derived from 2 "AA" batteries

FREQUENCY OF OPERATION: 433.25 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:	433.25 MHz Pulsed RF Transmitter
FCC ID:	LZ6ALPHA510SERIES
Power Requirements:	3 VDC derived from 2 "AA" batteries
Applicable Rule Section:	Part 15, Subpart C, Section 15.231

Retlif Testing Laboratories

Test Report No. R-8882-1
FCC ID: LZ6ALPHA510SERIES

REPORT OF MEASUREMENTS (continued)

TEST RESULTS

15.231 (a) - The device is used as a transmitter for Remote Control purposes.

15.231 (a)(1) & 15.231(2) - The transmitter is manually operated and ceases transmission within 5 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 10,970 µV/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 1,097 µV/M (AVERAGE).

15.231 (c) - The device operates at 433.25 MHz. The bandwidth of emissions did not exceed 0.25% of the operating frequency (1.1 MHz).

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:

Limit = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]

Solving yields:

Fundamental Limit = 10,970 µV/M (AVERAGE) @ 3 Meters

Harmonic Limit = 1,097 µV/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. (See plots for additional information)

Transmitter On Time	=	75.67 milliseconds (maximum- worst case in 100 ms)
Transmitter Cycle Time	=	Greater than 100 milliseconds
Transmitter Duty Cycle	=	75.7 %

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 75.76 milliseconds yields a minimum required bandwidth of 8.8 Hz. FCC specified bandwidths of 100kHz and 1MHz were utilized below and above 1GHz, respectively.

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 VDC derived from 2 “AA” batteries.

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 LISTS

Radiated Emissions, Fundamental and Harmonics, 433.25MHz-4332.5MHz

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	09/20/2000	09/20/2003
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	02/20/2001	08/20/2001
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
544	EMC Analyzer	Hewlett Packard	9.0 kHz - 1.8 GHz	8591EM	12/14/2000	12/14/2001
617	Interference Analyzer	Electro-Metrics	10 kHz - 1 GHz	EMC-30	01/17/2000	03/17/2001
712	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ESI26	03/01/2000	03/01/2001

Radiated Emissions, Spurious Case, 30MHz-4332.5MHz

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	09/20/2000	09/20/2003
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	02/20/2001	08/20/2001
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
544	EMC Analyzer	Hewlett Packard	9.0 kHz - 1.8 GHz	8591EM	12/14/2000	12/14/2001
617	Interference Analyzer	Electro-Metrics	10 kHz - 1 GHz	EMC-30	01/17/2000	03/17/2001

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)

DUTY CYCLE

(Please see separate e-file attachment named Dutycycle.doc)

Test Sample Photographs

Test Method:	FCC Part 15 Subpart C, Spurious Case Radiated Emissions, Paragraph 15.209(a)		
Customer:	Fomotech International Corp.	**Job No.**	R-8882-1
Test Sample:	433.25MHz Transmitter		
Model No.:	ALPHA 580	**Serial No.**	00500001
Operating Mode:	Continuously transmitting a pulsed signal at 433.25MHz.		
Technician:	Peter Lananna	**Date:**	February 21, 2000

Notes: Test Distance: 3 Meters Temp:10C Humidity:63%
Detector: Quasi-Peak Below 30 MHz to 1 GHz, Peak above 1 GHz

Test Freq.	Antenna Position	EUT Orientation	Meter Readings	Correction Factor	Corrected Reading	Converted Reading	**LIMIT**
MHz	(V/H) / Meters	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
30.00							100
88.00							100
88.00							150

No emissions detected at specified test distance.

216.00							150
216.00							200
960.00							200
960.00							500
4332.5							500

The EUT was scanned from 30 MHz to 4.3325 GHz

The emissions observed from the EUT do not exceed the specified limits. Emissions not recorded were more than 10dB under the specified limit

Retlif Testing Laboratories

Retlif Job Number R-8882-1

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	Fomotech International Corp.	**Job No.**	R-8882-1
Test Sample:	433.25 Transmitter	**Paragraph:**	15.231
Model No.:	ALPHA580	**FCC ID:**	LZ6ALPHA510SERIES
Operating Mode:	Continuously Transmitting a 433.25 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 21, 2001

Notes: Test Distance: 3 Meters
Detector: Peak, Unless otherwise specified

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit
MHz	(V/H)/Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
433.25	H / 4.0	X	62.8	-0.6	62.2	1288.2	109700
|	H / 1.8	Y	77.5	-0.6	76.9	6998.4	|
|	H / 2.5	Z	75.3	-0.6	74.7	5432.5	|
|	V / 1.0	X	80.0	-0.6	79.4	9332.5	|
|	V / 2.3	Y	71.2	-0.6	70.6	3388.4	|
433.25	V / 2.0	Z	72.2	-0.6	71.6	3801.9	109700
866.5	H / 1.0	X	26.9	7.9	34.8	55.0*	10970
|	H / 1.0	Y	26.9	7.9	34.8	55.0*	|
|	H / 1.0	Z	26.9	7.9	34.8	55.0*	|
|	V / 1.0	X	26.9	7.9	34.8	55.0*	|
|	V / 1.0	Y	26.9	7.9	34.8	55.0*	|
866.5	V / 1.0	Z	26.9	7.9	34.8	55.0*	10970
1299.75	H / 1.0	X	42.3	-3.0	39.3	92.3*	10970
|	H / 1.0	Y	42.3	-3.0	39.3	92.3*	|
|	H / 1.0	Z	42.3	-3.0	39.3	92.3*	|
|	V / 1.0	X	42.3	-3.0	39.3	92.3*	|
|	V / 1.0	Y	42.3	-3.0	39.3	92.3*	|
1299.75	V / 1.0	Z	42.3	-3.0	39.3	92.3*	10970
1733.0	H / 1.0	X	45.0	2.2	47.2	229.1*	10970
|	H / 1.0	Y	45.0	2.2	47.2	229.1*	|
|	H / 1.0	Z	45.0	2.2	47.2	229.1*	|
|	V / 1.0	X	45.0	2.2	47.2	229.1*	|
|	V / 1.0	Y	45.0	2.2	47.2	229.1*	|
1733.0	V / 1.0	Z	45.0	2.2	47.2	229.1*	10970
2166.25	H / 1.0	X	41.2	0.8	42.0	125.9*	10970
|	H / 1.0	Y	41.2	0.8	42.0	125.9*	|
|	H / 1.0	Z	41.2	0.8	42.0	125.9*	|
|	V / 1.0	X	41.2	0.8	42.0	125.9*	|
|	V / 1.0	Y	41.2	0.8	42.0	125.9*	|
2166.25	V / 1.0	Z	41.2	0.8	42.0	125.9*	10970
	Than 10 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (Minimum system sensitivity)						

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	Fomotech International Corp.	**Job No.**	R-8882-1
Test Sample:	433.25 Transmitter	**Paragraph:**	15.231
Model No.:	ALPHA580	**FCC ID:**	LZ6ALPHA510SERIES
Operating Mode:	Continuously Transmitting a 433.25 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 21, 2001

Notes: Test Distance: 3 Meters
Detector: Peak, unless otherwise specified

Test Freq.	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Peak Limit
MHz	(V/H)-Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	UV/m
2599.5	H / 1.0	X	32.0	3.8	35.8	61.7*	10970
|	H / 1.0	Y	32.0	3.8	35.8	61.7*	|
|	H / 1.0	Z	32.0	3.8	35.8	61.7*	|
|	V / 1.0	X	32.0	3.8	35.8	61.7*	|
|	V / 1.0	Y	32.0	3.8	35.8	61.7*	|
2599.5	V / 1.0	Z	32.0	3.8	35.8	61.7*	10970
3032.75	H / 1.0	X	32.1	6.4	38.5	84.1*	10970
|	H / 1.0	Y	32.1	6.4	38.5	84.1*	|
|	H / 1.0	Z	32.1	6.4	38.5	84.1*	|
|	V / 1.0	X	32.1	6.4	38.5	84.1*	|
|	V / 1.0	Y	32.1	6.4	38.5	84.1*	|
3032.75	V / 1.0	Z	32.1	6.4	38.5	84.1*	10970
3466.0	H / 1.0	X	32.0	8.3	40.3	103.5*	10970
|	H / 1.0	Y	32.0	8.3	40.3	103.5*	|
|	H / 1.0	Z	32.0	8.3	40.3	103.5*	|
|	V / 1.0	X	32.0	8.3	40.3	103.5*	|
|	V / 1.0	Y	32.0	8.3	40.3	103.5*	|
3466.0	V / 1.0	Z	32.0	8.3	40.3	103.5*	10970
3899.25	H / 1.0	X	31.7	9.1	40.8	109.6*	5000
|	H / 1.0	Y	31.7	9.1	40.8	109.6*	|
|	H / 1.0	Z	31.7	9.1	40.8	109.6*	|
|	V / 1.0	X	31.7	9.1	40.8	109.6*	|
|	V / 1.0	Y	31.7	9.1	40.8	109.6*	|
3899.25	V / 1.0	Z	31.7	9.1	40.8	109.6*	5000
4332.5	H / 1.0	X	31.2	10.6	41.8	123.0*	5000
|	H / 1.0	Y	31.2	10.6	41.8	123.0*	|
|	H / 1.0	Z	31.2	10.6	41.8	123.0*	|
|	V / 1.0	X	31.2	10.6	41.8	123.0*	|
|	V / 1.0	Y	31.2	10.6	41.8	123.0*	|
4332.5	V / 1.0	Z	31.2	10.6	41.8	123.0*	5000
	Than 10 dB below the specified limit. Emissions from the EUT do not exceed the specified limits.						
	*=Noise Floor Measurements (Minimum system sensitivity)						

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	Fomotech International Corp.	**Job No.**	R-8882-1
Test Sample:	433.25 Transmitter	**Paragraph:**	15.231
Model No.:	ALPHA580	**FCC ID:**	LZ6ALPHA510SERIES
Operating Mode:	Continuously Transmitting a 433.25 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 21, 2001

Notes: Test Distance: 3 Meters — Duty Cycle: 75.7%

Detector: Peak, unless otherwise specified — Duty Cycle Correction: - 2.4 dB

Test Freq.	Antenna Pol./Height	EUT Orientation	Peak Reading	Correction Factor	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
433.25	H / 4.0	X	62.2	-2.4	59.8	977.2	10970
|	H / 1.8	Y	76.9	-2.4	74.5	5308.8	|
|	H / 2.5	Z	74.7	-2.4	72.3	4121.0	|
|	V / 1.0	X	79.4	-2.4	77.0	7079.5	|
|	V / 2.3	Y	70.6	-2.4	68.2	2570.4	|
433.25	V / 2.0	Z	71.6	-2.4	69.2	2884.0	10970
866.5	H / 1.0	X	34.8	-2.4	32.4	41.7*	1097
|	H / 1.0	Y	34.8	-2.4	32.4	41.7*	|
|	H / 1.0	Z	34.8	-2.4	32.4	41.7*	|
|	V / 1.0	X	34.8	-2.4	32.4	41.7*	|
|	V / 1.0	Y	34.8	-2.4	32.4	41.7*	|
866.5	V / 1.0	Z	34.8	-2.4	32.4	41.7*	1097
1299.75	H / 1.0	X	39.3	-2.4	36.9	70.0*	1097
|	H / 1.0	Y	39.3	-2.4	36.9	70.0*	|
|	H / 1.0	Z	39.3	-2.4	36.9	70.0*	|
|	V / 1.0	X	39.3	-2.4	36.9	70.0*	|
|	V / 1.0	Y	39.3	-2.4	36.9	70.0*	|
1299.75	V / 1.0	Z	39.3	-2.4	36.9	70.0*	1097
1733.0	H / 1.0	X	47.2	-2.4	44.8	173.8*	1097
|	H / 1.0	Y	47.2	-2.4	44.8	173.8*	|
|	H / 1.0	Z	47.2	-2.4	44.8	173.8*	|
|	V / 1.0	X	47.2	-2.4	44.8	173.8*	|
|	V / 1.0	Y	47.2	-2.4	44.8	173.8*	|
1733.0	V / 1.0	Z	47.2	-2.4	44.8	173.8*	1097
2166.25	H / 1.0	X	42.0	-2.4	39.6	95.5*	1097
|	H / 1.0	Y	42.0	-2.4	39.6	95.5*	|
|	H / 1.0	Z	42.0	-2.4	39.6	95.5*	|
|	V / 1.0	X	42.0	-2.4	39.6	95.5*	|
|	V / 1.0	Y	42.0	-2.4	39.6	95.5*	|
2166.25	V / 1.0	Z	42.0	-2.4	39.6	95.5*	1097
	The frequency range was scanned from 30 MHz to 4.4 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

Retlif Job Number R-8882-1

Test Method:	FCC Part 15 Subpart C Radiated Emissions, Fundamental & Harmonic Emissions		
Customer:	Fomotech International Corp.	**Job No.**	R-8882-1
Test Sample:	433.25 Transmitter	**Paragraph:**	15.231
Model No.:	ALPHA580	**FCC ID:**	LZ6ALPHA510SERIES
Operating Mode:	Continuously Transmitting a 433.25 MHz Signal		
Technician:	Peter Lananna	**Date:**	February 21, 2001

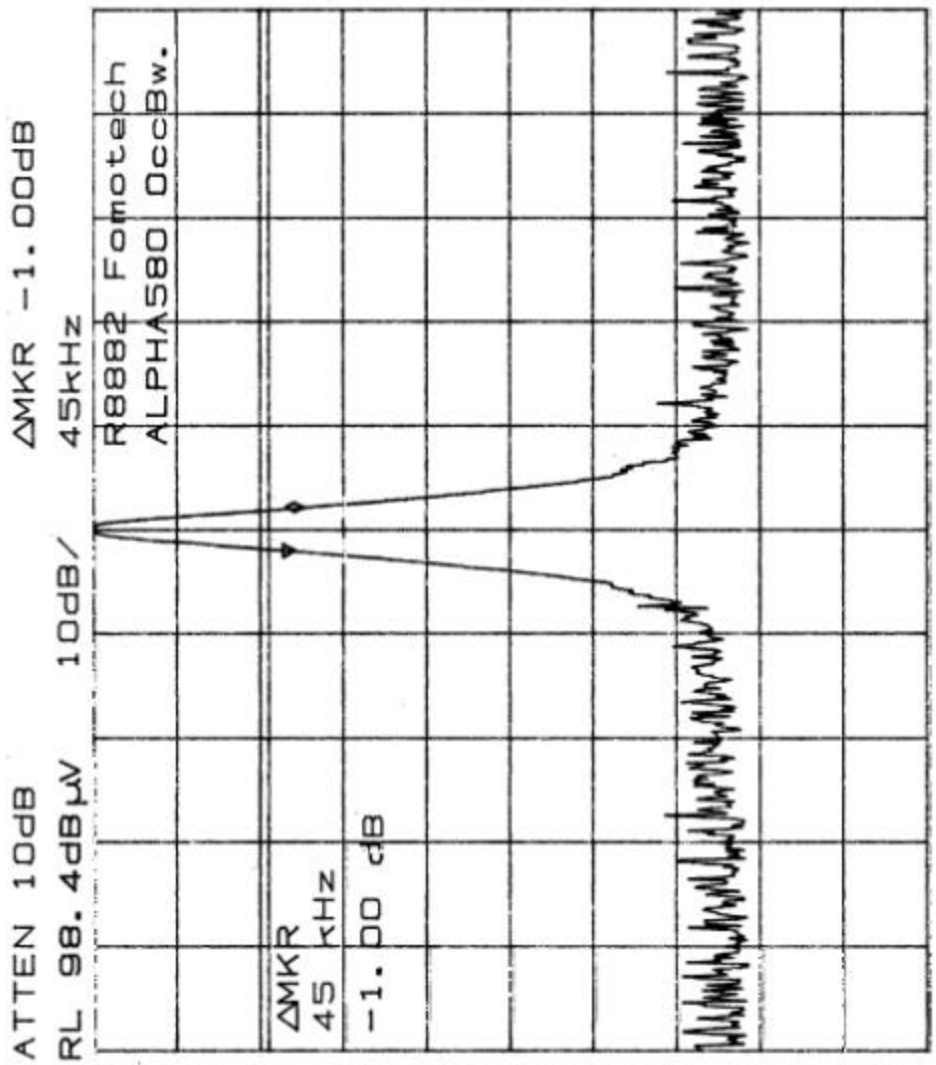
Notes: Test Distance: 3 Meters — Duty Cycle: 75.7%

Detector: Peak, unless otherwise specified — Duty Cycle Correction: - 2.4dB

Test Freq.	Antenna Pol./Height	EUT Orientation	Peak Reading	Correction Factor	Corrected Reading	Converted Reading	Avg. Limit
MHz	(V/H)-Meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m	uV/m
2599.5	H / 1.0	X	35.8	-2.4	33.4	46.8*	1097
|	H / 1.0	Y	35.8	-2.4	33.4	46.8*	|
|	H / 1.0	Z	35.8	-2.4	33.4	46.8*	|
|	V / 1.0	X	35.8	-2.4	33.4	46.8*	|
|	V / 1.0	Y	35.8	-2.4	33.4	46.8*	|
2599.5	V / 1.0	Z	35.8	-2.4	33.4	46.8*	1097
3032.75	H / 1.0	X	38.5	-2.4	36.1	63.8*	1097
|	H / 1.0	Y	38.5	-2.4	36.1	63.8*	|
|	H / 1.0	Z	38.5	-2.4	36.1	63.8*	|
|	V / 1.0	X	38.5	-2.4	36.1	63.8*	|
|	V / 1.0	Y	38.5	-2.4	36.1	63.8*	|
3032.75	V / 1.0	Z	38.5	-2.4	36.1	63.8*	1097
3466.0	H / 1.0	X	40.3	-2.4	37.9	78.5*	1097
|	H / 1.0	Y	40.3	-2.4	37.9	78.5*	|
|	H / 1.0	Z	40.3	-2.4	37.9	78.5*	|
|	V / 1.0	X	40.3	-2.4	37.9	78.5*	|
|	V / 1.0	Y	40.3	-2.4	37.9	78.5*	|
3466.0	V / 1.0	Z	40.3	-2.4	37.9	78.5*	1097
3899.25	H / 1.0	X	40.8	-2.4	38.4	83.2*	500
|	H / 1.0	Y	40.8	-2.4	38.4	83.2*	|
|	H / 1.0	Z	40.8	-2.4	38.4	83.2*	|
|	V / 1.0	X	40.8	-2.4	38.4	83.2*	|
|	V / 1.0	Y	40.8	-2.4	38.4	83.2*	|
3899.25	V / 1.0	Z	40.8	-2.4	38.4	83.2*	500
4332.5	H / 1.0	X	41.8	-2.4	39.4	93.3*	500
|	H / 1.0	Y	41.8	-2.4	39.4	93.3*	|
|	H / 1.0	Z	41.8	-2.4	39.4	93.3*	|
|	V / 1.0	X	41.8	-2.4	39.4	93.3*	|
|	V / 1.0	Y	41.8	-2.4	39.4	93.3*	|
4332.5	V / 1.0	Z	41.8	-2.4	39.4	93.3*	500
	The frequency range was scanned from 30 MHz to 4.4 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

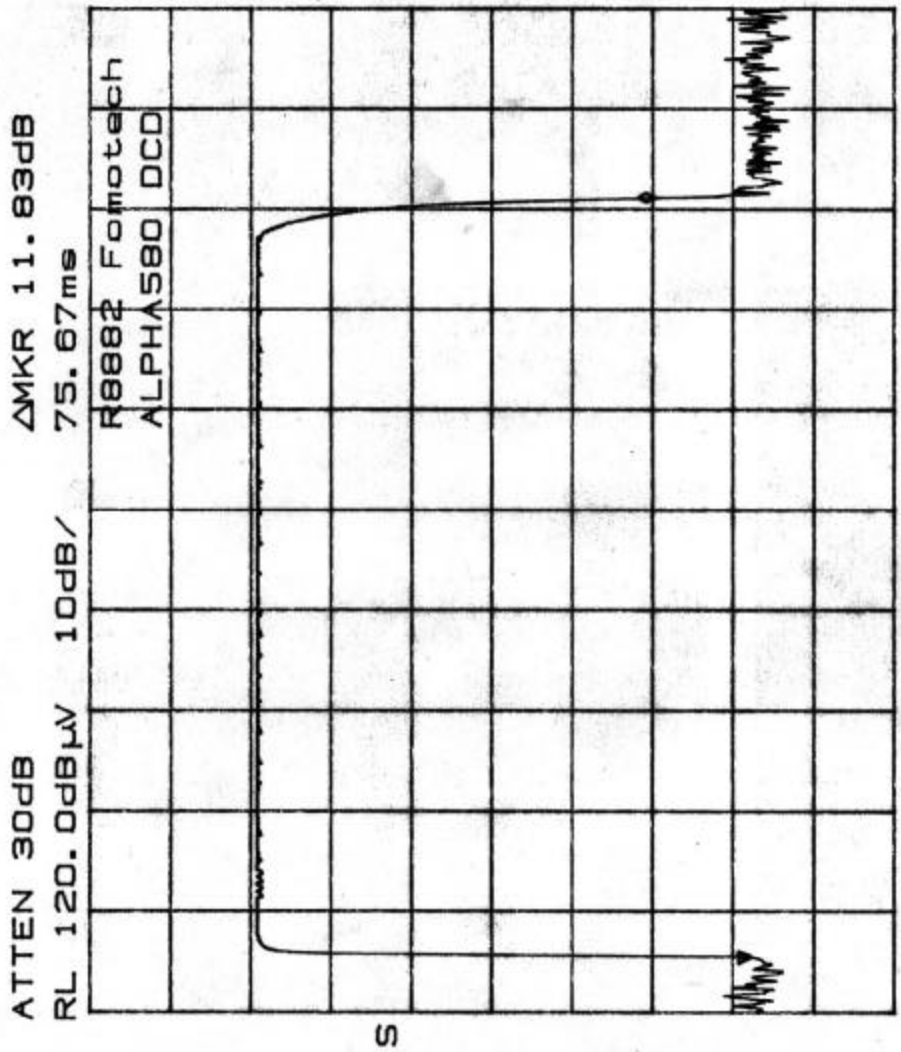
Retlif Job Number R-8882-1



Customer:	Fomotech International Corp.
Test Sample:	433.25MHz Pulsed Transmitter
Model No:	ALPHA 580
Test Method:	FCC15.231(c) Occupied Bandwidth.
Notes:	FCC ID: LZ6ALPHA51B SERIES Emission is less than 0.25% of center frequency, measured 20dB(c) from the modulated carrier.
Date:	February 21, 2001
Tech:	Peter Lananna
Sheet:	1 of 1

Retlif Testing Laboratories

Report No. 8882-1



Customer:	Fomotech International Corp.
Test Sample:	433.25MHz Pulsed Transmitter
Model No.:	ALPHA 580
Test Method:	FCC 15.35(c) Duty Cycle Determination.
Notes:	FCC ID: - LZ6ALPHA510 SERIES Worst case pulse per 100milliseconds=75.67% 20log(0.757)=-2.4dB
Date:	February 21, 2001
Tech:	Peter Lanzenna
Sheet:	1 of 1

Retlif Testing Laboratories

Report No. 8882-1