Standards Council of Canada
Accredited Laboratory
Scope of Accreditation 75

Conseil canadien des normes
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Portée d'accréditation 75

TM

Test Report:	6W72155.1
Applicant:	Ingrid Inc. 920 Cassatt Road Suite 220 Berwyn, PA 19312
Apparatus:	SS470 Siren Strobe
FCC ID:	S9PSS470
In Accordance With:	FCC Part 15 Subpart C, 15.231 Periodic operation in the band 40.66-40.70MHz and above 70 MHz.
Tested By:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Authorized By:	Jin Xu, wireless Specialist
Date:	September 27, 2006
Total Number of Pages:	21

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	SS470 Siren Strobe
Specification:	FCC Part 15 Subpart C, 15.231
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon, Telecom Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

TABLE OF CONTENTS

Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

SS470 Siren Strobe

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
3	Power Supply	None
6	SS470 Siren Strobe	090606

The first samples were received on: August 25, 2006

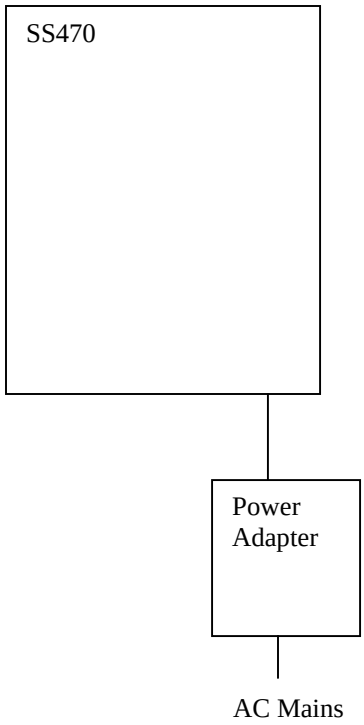
1.3 Theory of Operation

The EUT is used as part of a home security system. The EUT transmits at 345MHz and receives from the controller at 2.4GHz.

1.4 Technical Specifications of the EUT

Manufacturer:	Ingrid Inc.
Operating Frequency:	345MHz
Emission Designator:	P1D
Modulation:	On/Off keying
Antenna Data:	Integral
Power Source:	120VAC

1.5 Block Diagram of the EUT



Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.231

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 ^{o}C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
LISN	EMCO	4825/2	FA001545	Jan. 30/07
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 16/07
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 16/07
International Power Supply	California Inst.	1001WP	FA000995	Jan. 11/07
Transient Limiter	Hewlett-Packard	1194 7A	FA000975	May 18/07
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 17/07
Biconical (1) Antenna	EMCO	3109	FA000805	May 03/07
Log Periodic Antenna #2	EMCO	3148	FA001355	May 16/07
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 02/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 02/07

COU – Calibrate on Use

NCR – No Calibration Required

Section 3 : Observations

3.1 Modifications Performed During Assessment

The following modification was performed during this assessment:

3.1.1 Modification 1

As originally submitted the EUT was found to be non-compliant to the radiated emissions requirements of 15.231(b). A biasing resistor (R226) was added to the Tx IC to reduce the Icc to the PA. Following this modification the apparatus was found to be fully compliant.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 15 Subpart C : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N	No : not applicable / not relevant.
Y	Yes : Mandatory i.e. the apparatus shall conform to these tests.
N/T	Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	Y (1)	PASS
15.207(a)	Powerline Conducted Emissions	Y	PASS
15.209(a)	Radiated Emissions within Restricted Bands	Y	PASS
15.231(a)(1)	Manually operated transmitter	Y	PASS
15.231(a)(2)	Automatically activated transmitter	Y	PASS
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	Y	PASS
15.231(a)(4)	Radiators used in cases of emergency	Y	PASS
15.231(a)(5)	Set-up information for security systems	Y	PASS
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	
15.231(e)	Radiated emissions for Periodic radiators	N	

Notes:

(1) The AC voltage was varied by +/-15% and there was no change in the field strength.

Appendix A : Test Results

Clause 15.207(a) Powerline Conducted Emissions

Frequency of Emission (MHz)	Conducted limit (dBmV) Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

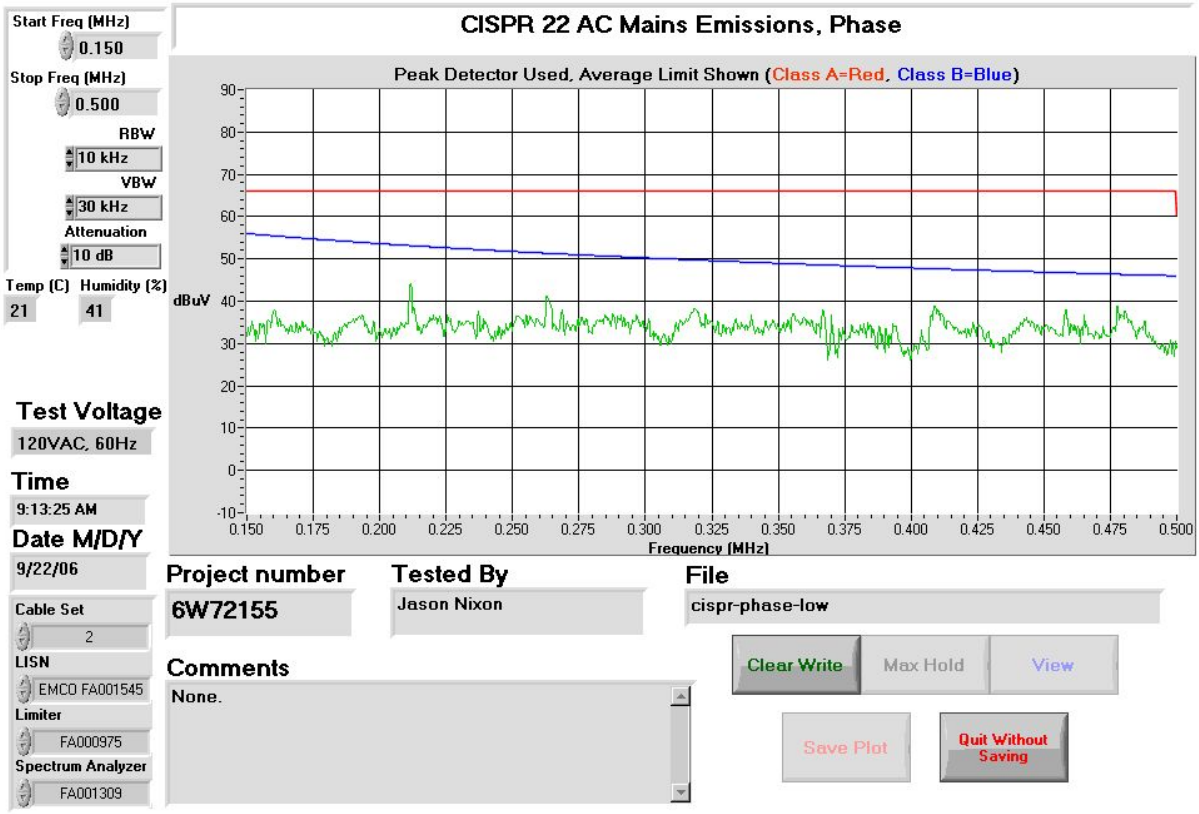
Test Conditions:

Sample Number:	6	**Temperature (°C):**	21
Date:	September 22, 2006	**Humidity (%):**	41
Modification State:	1	**Tester:**	Jason Nixon
		Laboratory:	Shielded Room

Test Results: See Attached Plots.

Additional Observations:

All plots were obtained using a peak detector and compared to the average limit. The measurements have been corrected with the LISN, cable and transient limiter losses to show compliance.


Start Freq (MHz)
0.150
Stop Freq (MHz)
0.500
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
21
Humidity (%)
41
CISPR 22 AC Mains Emissions, Phase
Peak Detector Used, Average Limit Shown (Class A=Red, Class B=Blue)
dBuV
Frequency (MHz)
Test Voltage
120VAC, 60Hz
Time
9:13:25 AM
Date M/D/Y
9/22/06
Project number
6W72155
Tested By
Jason Nixon
File
cispr-phase-low
Cable Set
2
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Comments
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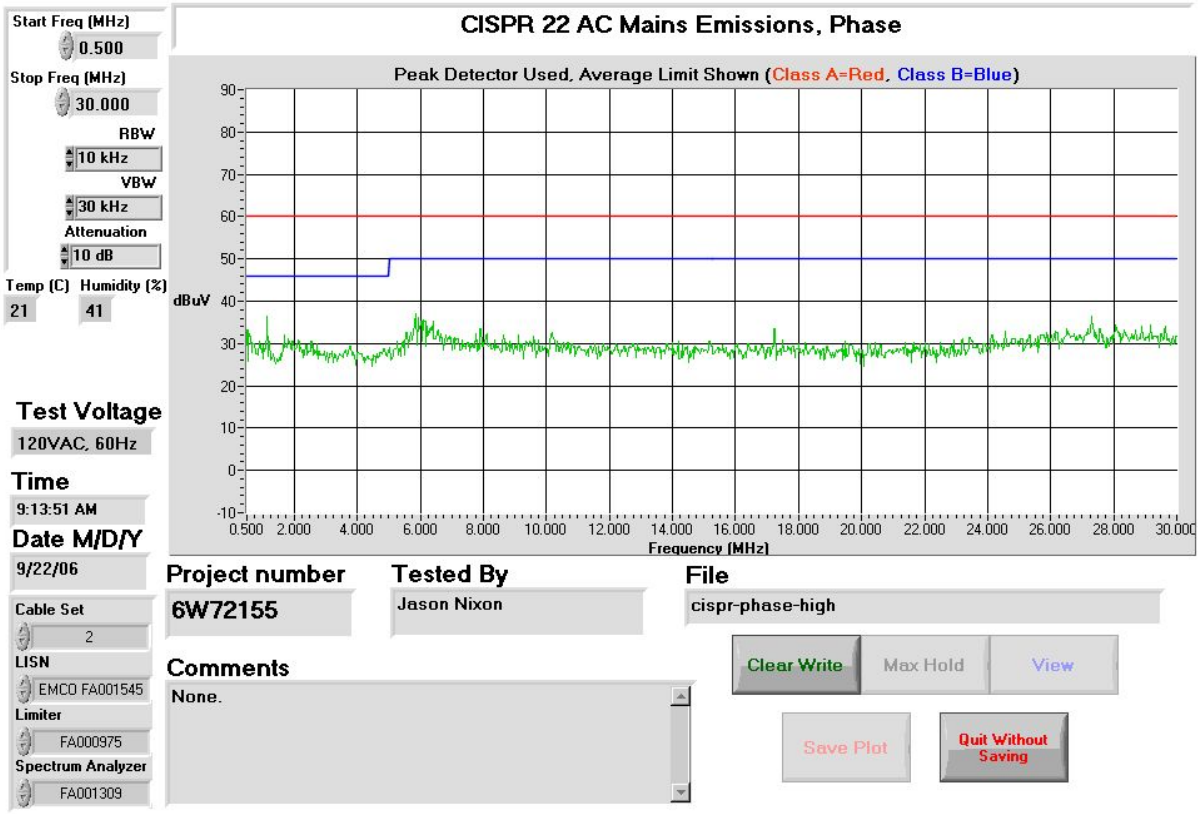
Clear Write
Max Hold
View
Save Plot
Quit Without Saving


Start Freq (MHz)
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Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
21
Humidity (%)
41
CISPR 22 AC Mains Emissions, Phase
Peak Detector Used, Average Limit Shown (Class A=Red, Class B=Blue)
dBuV
Frequency (MHz)
Test Voltage
120VAC, 60Hz
Time
9:13:51 AM
Date M/D/Y
9/22/06
Project number
6W72155
Tested By
Jason Nixon
File
cispr-phase-high
Cable Set
2
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Comments
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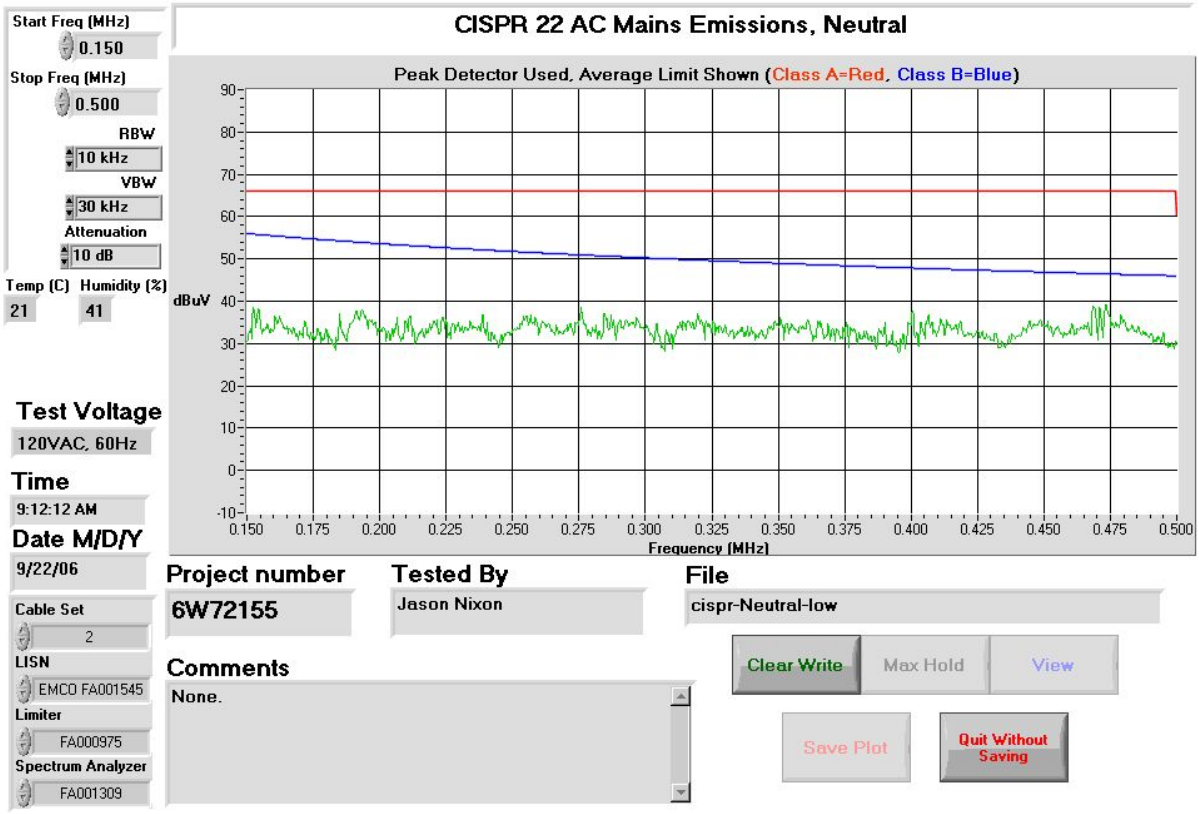
Clear Write
Max Hold
View
Save Plot
Quit Without Saving


Start Freq (MHz)
0.150
Stop Freq (MHz)
0.500
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
21
Humidity (%)
41
CISPR 22 AC Mains Emissions, Neutral
Peak Detector Used, Average Limit Shown (Class A=Red, Class B=Blue)
dBuV
Frequency (MHz)
Test Voltage
120VAC, 60Hz
Time
9:12:12 AM
Date M/D/Y
9/22/06
Project number
6W72155
Tested By
Jason Nixon
File
cispr-Neutral-low
Cable Set
2
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Comments
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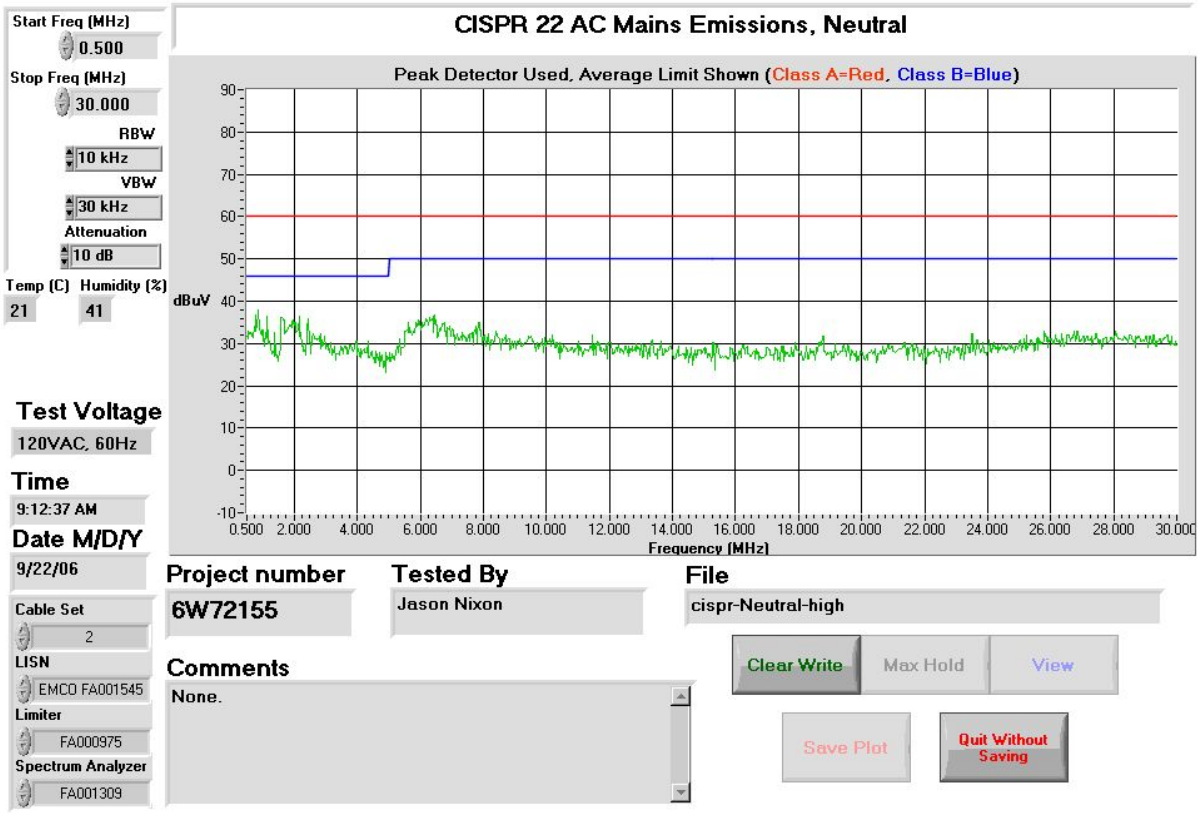
Clear Write
Max Hold
View
Save Plot
Quit Without Saving


Start Freq (MHz)
0.500
Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
21
Humidity (%)
41
CISPR 22 AC Mains Emissions, Neutral
Peak Detector Used, Average Limit Shown (Class A=Red, Class B=Blue)
dBuV
Frequency (MHz)
Test Voltage
120VAC, 60Hz
Time
9:12:37 AM
Date M/D/Y
9/22/06
Project number
6W72155
Tested By
Jason Nixon
File
cispr-Neutral-high
Cable Set
2
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Comments
None.
Clear Write
Max Hold
View
Save Plot
Quit Without Saving

Clause 15.209(a) Radiated Emissions within Restricted Bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvoltsmeter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Conditions:

Sample Number:	6	**Temperature (°C):**	12
Date:	September 22, 2006	**Humidity (%):**	79
Modification State:	1	**Tester:**	Jason Nixon
		Laboratory:	OATS

Test Results:

No emissions within 20dB below the limit were detected in the restricted bands of operation.

Additional Observations:

The Spectrum was searched from 30MHz to 4GHz.

These results apply to emissions found in the Restricted bands defined in FCC Part 15 Subpart C, 15.205.

All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission 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. The following conditions shall be met to comply with the provisions for this periodic operation:

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

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

(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.

(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.

(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 transmissions 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.

Test Conditions:

Sample Number:	6	**Temperature (°C):**	21
Date:	September 25, 2006	**Humidity (%):**	40
Modification State:	1	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results:

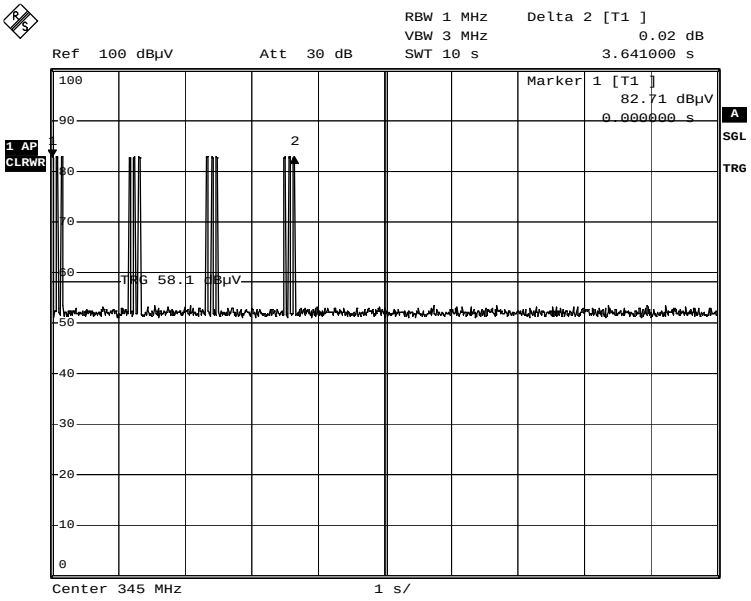
1) The EUT is not manually triggered.

2) The EUT transmits for 3.64seconds when it is automatically triggered. See attached plot.

3) The EUT does not periodically transmit. The EUT must receive an indication to transmit from another product.

4) The EUT only transmits of the period of time displayed in (a)(2).

5) The EUT does not send setup information that exceeds the requirements of (a)(1) or (2).



SS470 Siren Strobe - Total Alarm Time

Date: 25.SEP.2006 16:30:11

Clause 15.231(b) Radiated Emissions

In addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

Test Conditions:

Sample Number:	6	**Temperature (°C):**	12
Date:	September 22, 2006	**Humidity (%):**	79
Modification State:	1	**Tester:**	Jason Nixon
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 30MHz to 4GHz.

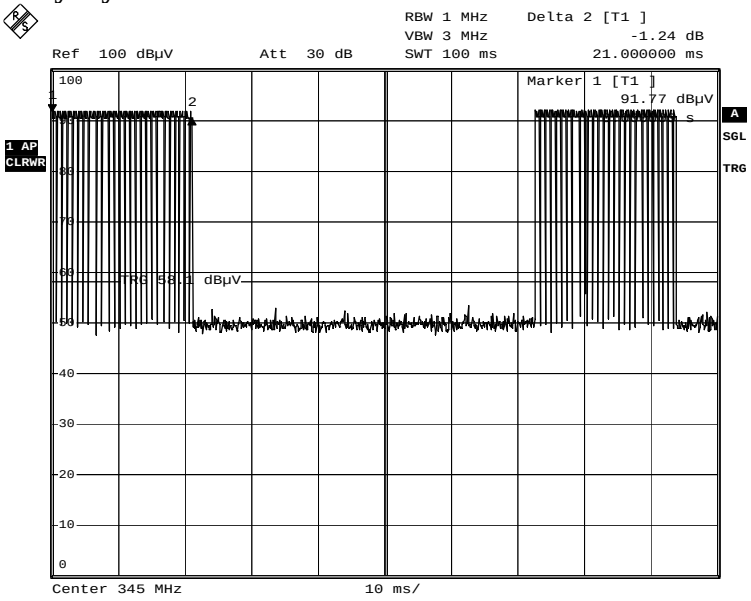
All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

Only emissions within 20dB below the limit have been reported.

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)
345.0000	LP2	V	71.8	15.3	N/A	-13.3	2.7	76.5	77.3	0.8
345.0000	LP2	H	69.5	15.6	N/A	-13.3	2.7	74.5	77.3	2.8
690.0000	LP2	V	29.5	21.4	N/A	-13.3	3.8	41.4	57.3	15.9
690.0000	LP2	H	26.3	21.8	N/A	-13.3	3.8	38.6	57.3	18.7
1725.0000	Horn2	V	62.6	27.5	49.0	-13.3	4.0	31.8	57.3	25.5
1725.0000	Horn2	H	69.9	27.6	49.0	-13.3	4.0	39.2	57.3	18.1
2070.0000	Horn2	V	73.9	28.3	57.9	-13.3	4.5	35.5	57.3	21.8
2070.0000	Horn2	H	72.7	28.3	57.9	-13.3	4.5	34.3	57.3	23.0

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Duty Cycle:



SS470 Siren Strobe - On-time in 100msec
Date: 25.SEP.2006 16:22:19

Coding = Bi-phase Manchester with 50% duty cycle

Actual RF on = 80bits x 1/3700bps x 50% = 10.81msec

Duty cycle correction = 20log ((2 x 10.81)/100) = -13.3dB

Clause 15.231(c) 20dB Bandwidth

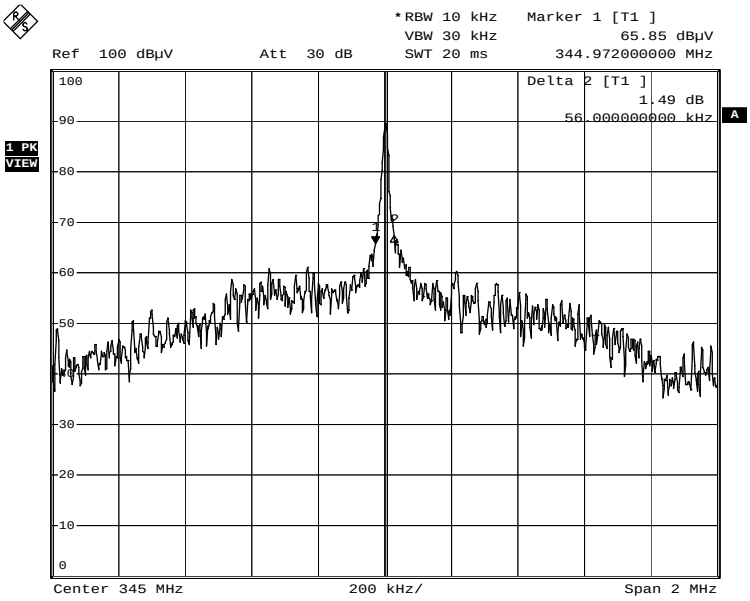
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Conditions:

Sample Number:	6	**Temperature (°C):**	21
Date:	September 25, 2006	**Humidity (%):**	40
Modification State:	1	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results:

20dB Bandwidth:



SS470 Siren Strobe - 20dB Bandwidth

Date: 25.SEP.2006 16:20:52

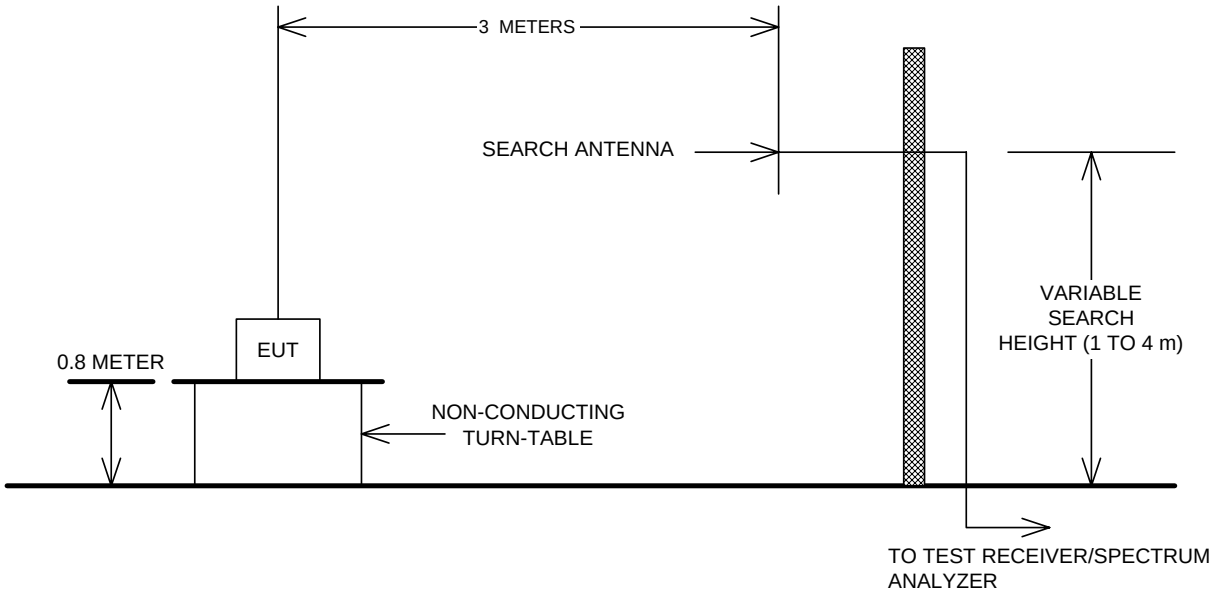
Appendix B : Setup Photographs

Conducted Emissions Setup:

Spurious Emissions Setup:

Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions